DRAINAGE ANALYSIS

for

Apartment Complex

Franklin Street

Worcester, Massachusetts

November 12, 2021

Revised Through October 18, 2024

Prepared for: ***GoVenture Captial Group, LLC***
Brendan Gove
10 E. Worcester Street, Suite 3A
Worcester, MA 01605

Prepared by: ***Hannigan Engineering, Inc.***
8 Monument Square
Leominster, Massachusetts 01453
(978) 534-1234

TABLE OF CONTENTS

COVER SHEET

TABLE OF CONTENTS

1.0 Drainage Narrative

- **1.1** Introduction
- **1.2** Methods of Analysis
- **1.3** Site Description
- **1.4** Runoff Curve Numbers
- **1.5** Design Criteria
- **1.6** Conclusions

2.0 Hydrological Calculations

- **2.1** Pre-Development Calculations
- **2.2** Post-Development Calculations

3.0 Storm Water Management Forms

- **3.1** Operation and Maintenance

Figures

Figure 1 - Locus Map & Soils Mapping
Figure 2 - Pre-Development Watershed Map
Figure 3 - Post-Development Watershed Map

1.0
DRAINAGE NARRATIVE

1.0 NARRATIVE

1.1 INTRODUCTION

Revised Through October 18, 2024

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, Keese and Plastic Streets consisting of approximately 5.9-acres of Developed land. It is the intent of the applicant to construct a new high-rise apartment building for a total of 364 dewlling units along with applicable surface parking, roadway 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 5.9-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 364 dwelling units. The building has been designed as a rectangular structure within the properties between Arctic and Plastic Street, with single center courtyard areas near the center of development, being at grade.

As part of the overall redevelopment of the area, the existing private portion of Arctic Street, south of the fire station as well as approximatly 400-feet of Plastic Street, will reconstructed to bring the existing roadway into current City Standards, including upgrades to several utilities. Access to several areas of surface parking areas between Arctic and Plastic Street via new driveways as well as new additional surface parking lot area located south of Keese Street.

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 six 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 2 Keese Street Property that discharges to an existing 48" drainage line that runs under Interstate 290 and Design Point #5 is located at a catchbasin located within Keyes Street. Design Point #6 is designated as runoff to an offsite point within the Interstate 290 Layout.

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 as well as provide a new drainage trunkline within Plastic Street 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 trunklines, with the portions of the flows being directed to one of two small underground storage systems comprised of concrete galley 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, which is the case under existing conditions.

Additionally, southerly portions of the development will be captured and treated by one of the two underground storage systems, with a new trunkline being installed to direct runoff from the surrounding area to an exiting 48" drainage line that runs through the development. Prior to construction this line will be reviewed to insure it is capable of accomoating the flows. Similar to the other discharge points the runoff from this area will be treated through a water quality device to provide TSS Removal before discharge.

The proposed underground stormwater system utilizes a concrete galley underground storage systems to capture stormwater and provide peak rate mitigation. The system is comprised of a series of pre-cast concrete structures with orifices distributed around the structure 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 Galley sytem will discharge stormwater to an the aforementioned drainage line extension within Plastic Street or the aforementioned existing drainge trunkline.

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 DMH#102, DMH#107, DMH#110, and DMH#114, 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 six 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. With other flows being primarily directed towards Design Point #4, the existing draingae trunkline that is located within the property. 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-	10.15	16.25	21.00	30.75
	Post-	7.44	12.85	17.23	27.03
#3	Pre-	0.31	0.61	0.85	1.36
	Post-	0.31	0.61	0.85	1.36
#4	Pre-	4.57	8.59	12.28	19.13
	Post-	1.33	3.36	5.19	11.96
#5	Pre-	0.30	0.46	0.58	0.83
	Post-	0.00	0.00	0.00	0.94
#6	Pre-	0.07	0.15	0.21	0.35
	Post-	0.02	0.09	0.16	0.34

All flows are in cubic feet per second.

As outlined 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. Additionally, the incorporation of water quality units will provide additional cleaning of the runoff prior to discharge in the municipal drainage system. The storm water management as outlined herein and as shown on the accompanying plans has the following positive values relative to storm water management:

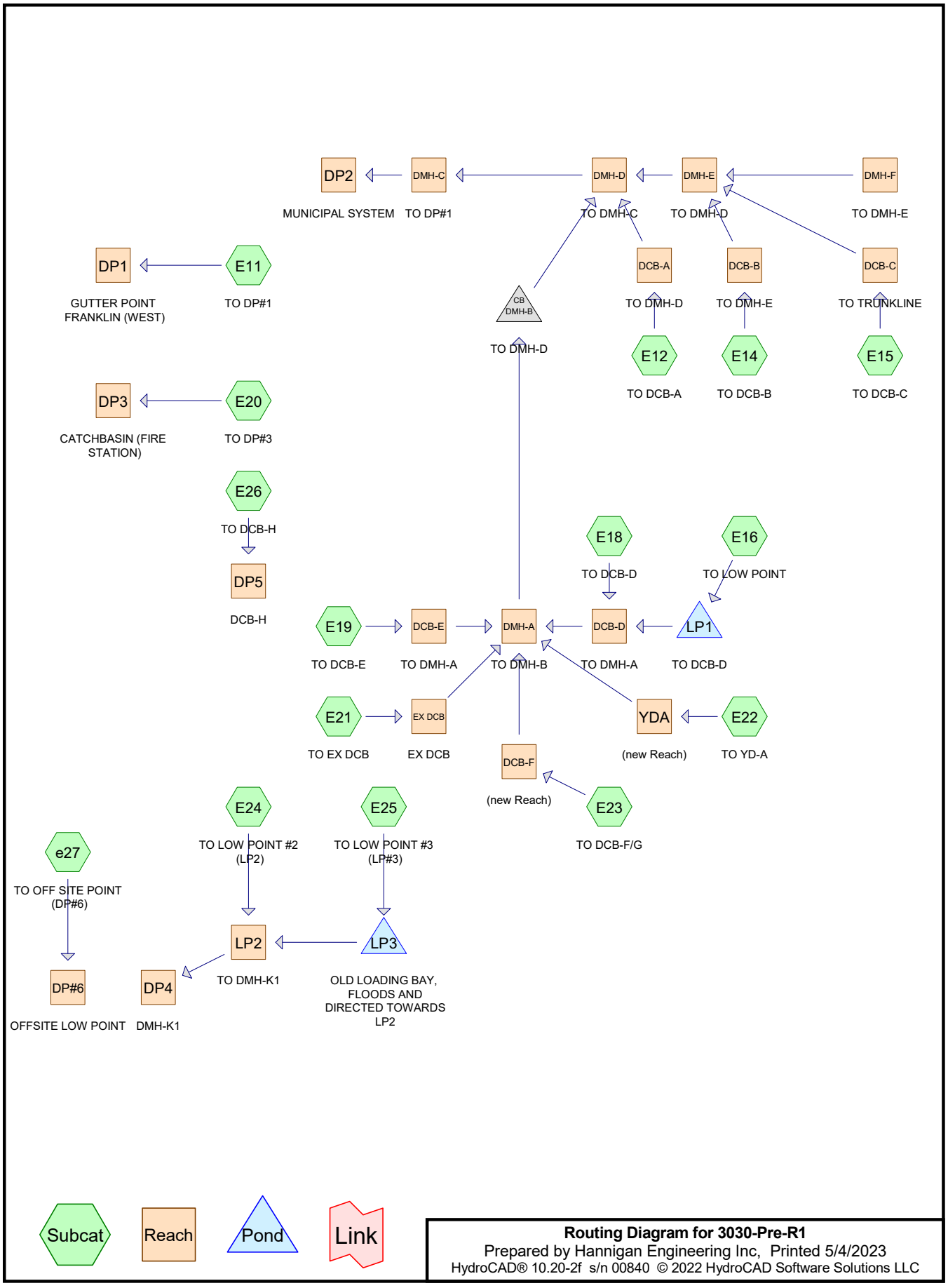
A) Attenuation of the 2-, 10-, 25- and 100-year storm events has mitigated increases in peak rates of runoff or has been justified herein.
B) On-site roadway and pavement areas are directed to standard catch basins with deep sumps for collection of debris and sediments prior to discharge.
C) The development 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

---

[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-R1

Prepared by Hannigan Engineering Inc, Printed 5/4/2023

HydroCAD® 10.20-2f s/n 00840 © 2022 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "Atlas-14-Rain.txt" for 449 MA Worcester North

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NRCC 24-hr	D	Default	24.00	1	3.13	2
2	10-Year	NRCC 24-hr	D	Default	24.00	1	4.68	2
3	25-Year	NRCC 24-hr	D	Default	24.00	1	5.88	2
4	100-Year	NRCC 24-hr	D	Default	24.00	1	8.34	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.391	39	>75% Grass cover, Good, HSG A (E11, E15, E16, E18, E19, E20, E21, E23, E24, E25, e27)
0.015	48	Brush, Poor, HSG A (E24)
0.807	96	Gravel surface, HSG A (E12, E14, E15, E16, E18, E22, E23, E26)
6.022	98	Paved parking, HSG A (E11, E12, E14, E15, E16, E18, E19, E20, E21, E22, E23, E24, E25, E26, e27)
8.235	**88**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.235	HSG A	E11, E12, E14, E15, E16, E18, E19, E20, E21, E22, E23, E24, E25, E26, e27
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
8.235		**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
1.391	0.000	0.000	0.000	0.000	1.391	>75% Grass cover, Good	E11, E15, E16, E18, E19, E20, E21, E23, E24, E25, e27
0.015	0.000	0.000	0.000	0.000	0.015	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
6.022	0.000	0.000	0.000	0.000	6.022	Paved parking	E11, E12, E14, E15, E16, E18, E19, E20, E21, E22, E23, E24, E25, E26, e27
8.235	**0.000**	**0.000**	**0.000**	**0.000**	**8.235**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	DCB-D	469.11	466.67	15.0	0.1627	0.011	0.0	12.0	0.0
2	DCB-E	467.63	466.57	12.0	0.0883	0.011	0.0	12.0	0.0
3	DMH-D	455.90	455.21	99.0	0.0070	0.011	0.0	36.0	0.0
4	DMH-E	456.57	455.90	121.0	0.0055	0.011	0.0	36.0	0.0
5	DMH-F	458.13	456.57	268.0	0.0058	0.011	0.0	36.0	0.0
6	DMH-B	456.80	455.90	45.0	0.0200	0.011	0.0	15.0	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 LOW POINT #2 (LP2) Runoff Area=49,908 sf 75.09% Impervious Runoff Depth=1.55"
Flow Length=276' Tc=5.0 min CN=83 Runoff=1.97 cfs 0.148 af

Subcatchment E25: TO LOW POINT #3 (LP#3) Runoff Area=88,999 sf 74.89% Impervious Runoff Depth=1.55"
Flow Length=401' Tc=5.2 min CN=83 Runoff=3.47 cfs 0.264 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

Subcatchment e27: TO OFF SITE POINT (DP#6) Runoff Area=2,493 sf 63.62% Impervious Runoff Depth=1.16"
Flow Length=117' Tc=5.0 min CN=77 Runoff=0.07 cfs 0.006 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=6.06 cfs 0.515 af
12.0" Round Pipe n=0.011 L=15.0' S=0.1627 '/' Capacity=16.98 cfs Outflow=6.06 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=8.76 cfs 0.736 af
Outflow=8.76 cfs 0.736 af

Reach DMH-C: TO DP#1 Inflow=10.15 cfs 0.887 af
Outflow=10.15 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=10.15 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 DP#6: OFFSITE LOW POINT Inflow=0.07 cfs 0.006 af
Outflow=0.07 cfs 0.006 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=10.15 cfs 0.887 af
Outflow=10.15 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: DMH-K1 Inflow=4.57 cfs 0.362 af
Outflow=4.57 cfs 0.362 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 LP2: TO DMH-K1 Inflow=4.57 cfs 0.362 af
Outflow=4.57 cfs 0.362 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=459.60' Inflow=8.76 cfs 0.736 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=8.76 cfs 0.736 af

Pond LP1: TO DCB-D Peak Elev=473.89' Storage=85 cf Inflow=1.98 cfs 0.158 af
Outflow=1.95 cfs 0.157 af

Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS Peak Elev=464.61' Storage=2,978 cf Inflow=3.47 cfs 0.264 af
Outflow=2.83 cfs 0.214 af

Total Runoff Area = 8.235 ac Runoff Volume = 1.367 af Average Runoff Depth = 1.99"
26.88% Pervious = 2.214 ac 73.12% Impervious = 6.022 ac

Summary for Subcatchment E11: TO DP#1

[49] Hint: Tc<2dt may require smaller dt

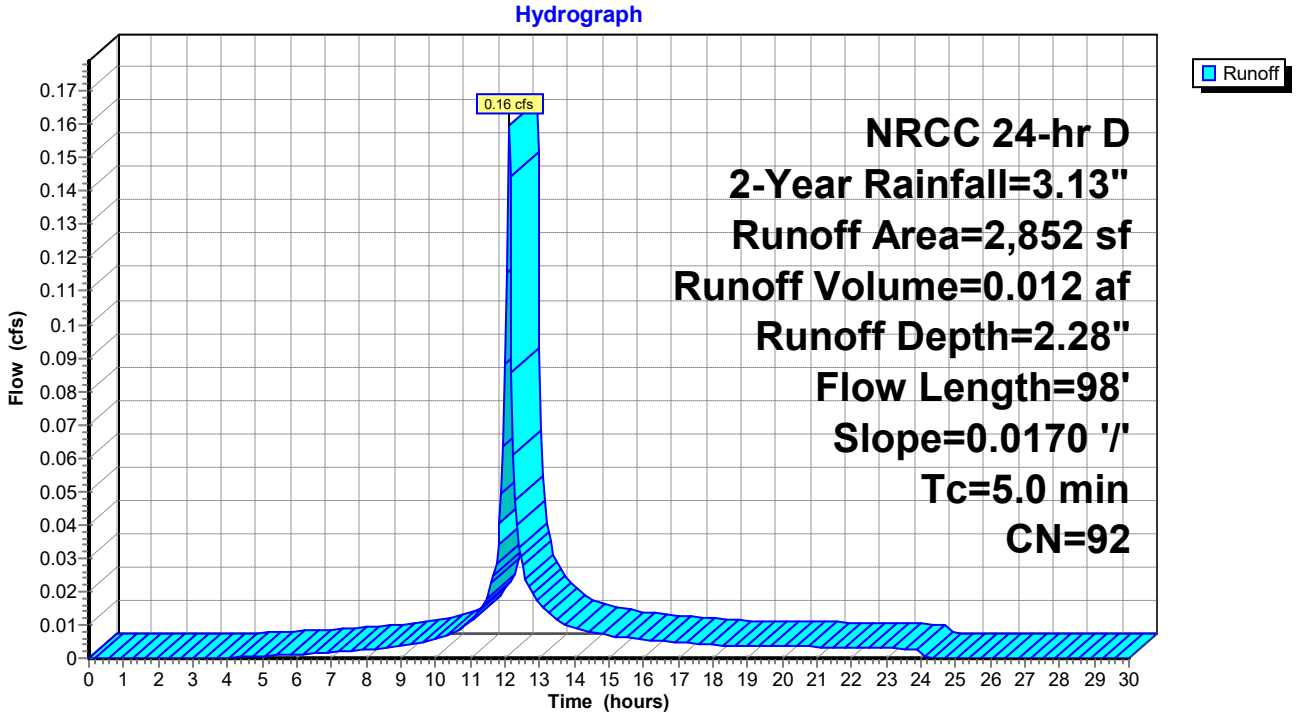
Runoff = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 2.28"
Routed to Reach DP1 : GUTTER POINT FRANKLIN (WEST)

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

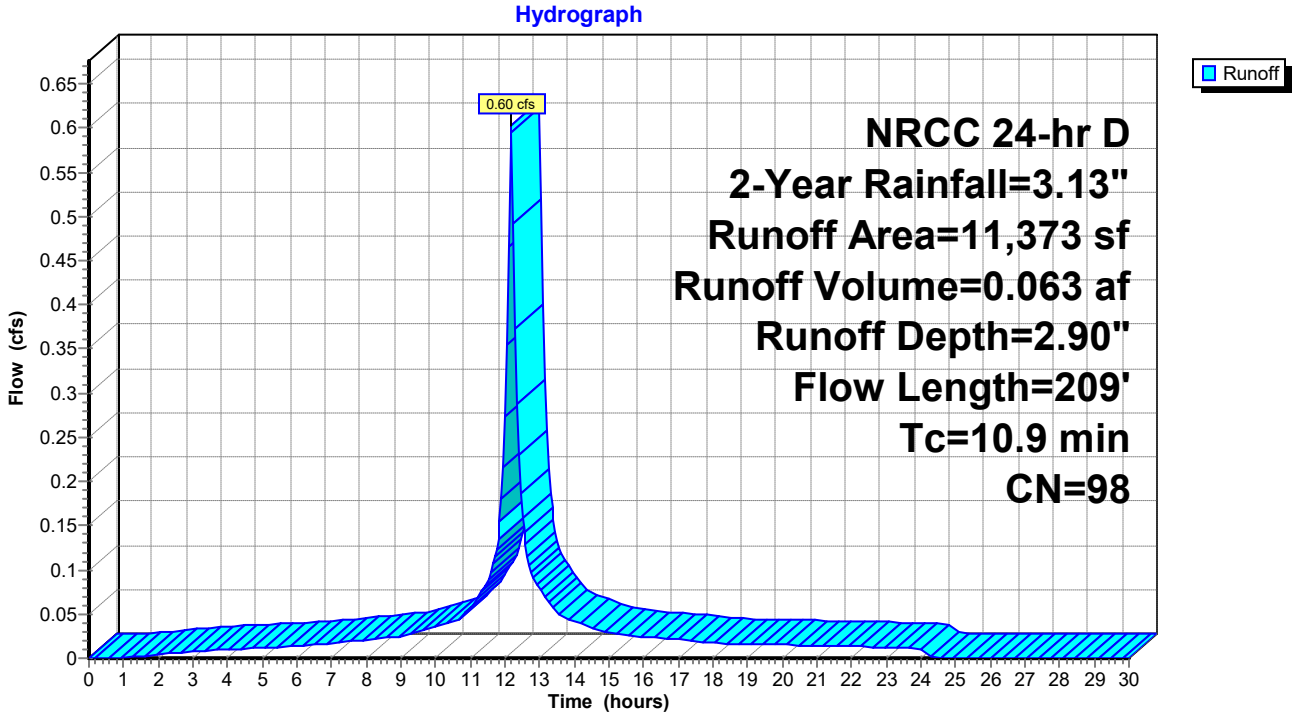
Runoff = 0.60 cfs @ 12.18 hrs, Volume= 0.063 af, Depth= 2.90"
Routed to Reach DCB-A : TO DMH-D

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

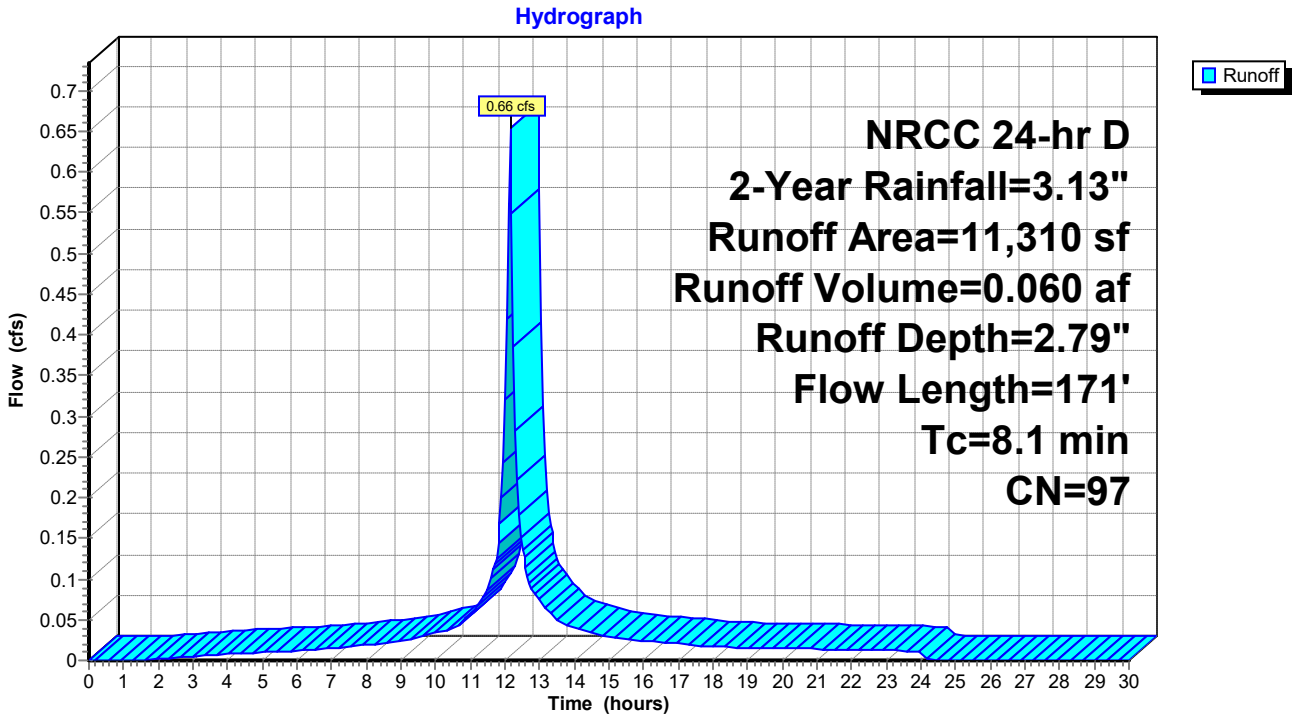
Runoff = 0.66 cfs @ 12.15 hrs, Volume= 0.060 af, Depth= 2.79"
Routed to Reach DCB-B : TO DMH-E

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

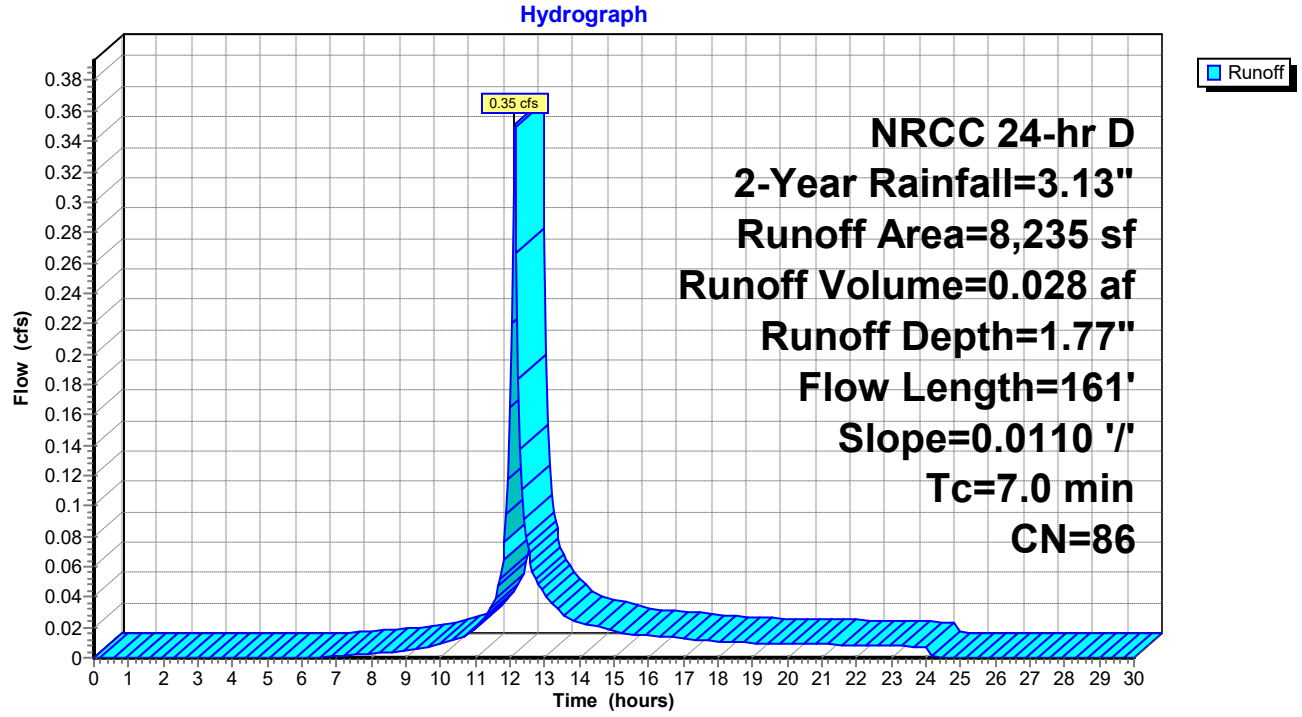
Runoff = 0.35 cfs @ 12.14 hrs, Volume= 0.028 af, Depth= 1.77"
Routed to Reach DCB-C : TO TRUNKLINE

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

[49] Hint: Tc<2dt may require smaller dt

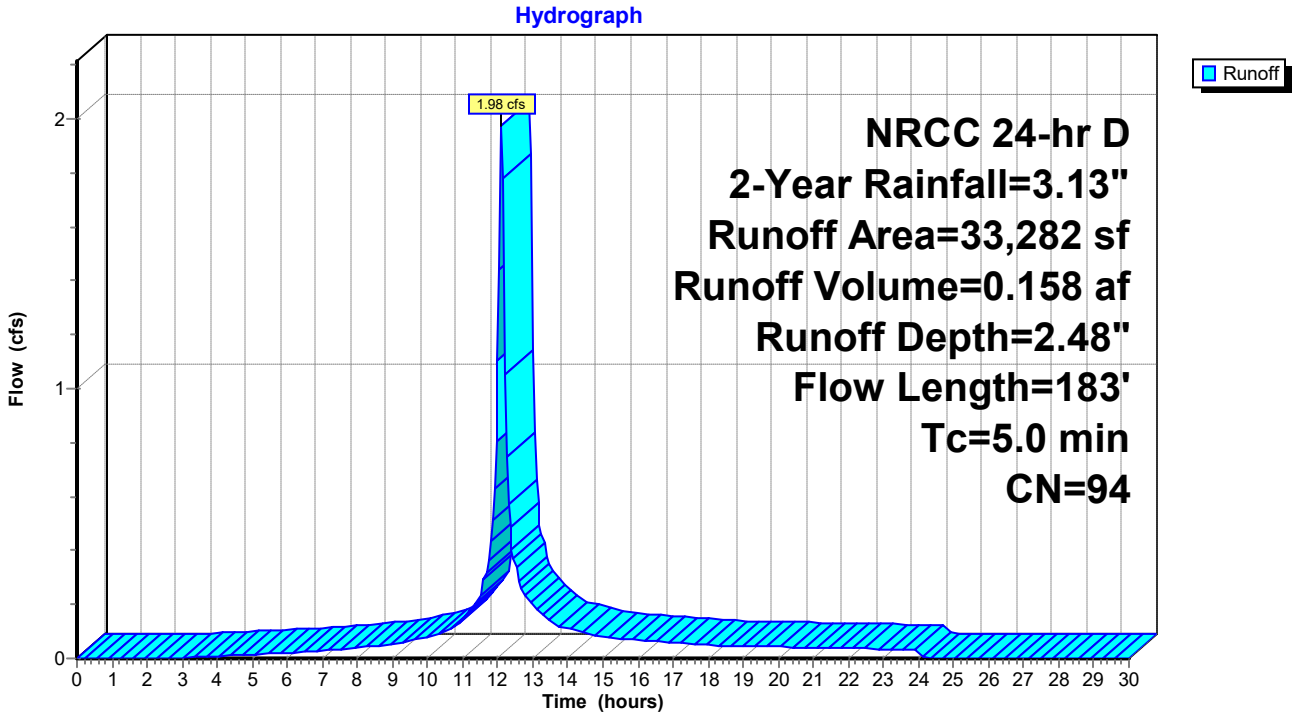
Runoff = 1.98 cfs @ 12.11 hrs, Volume= 0.158 af, Depth= 2.48"
Routed to Pond LP1 : TO DCB-D

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

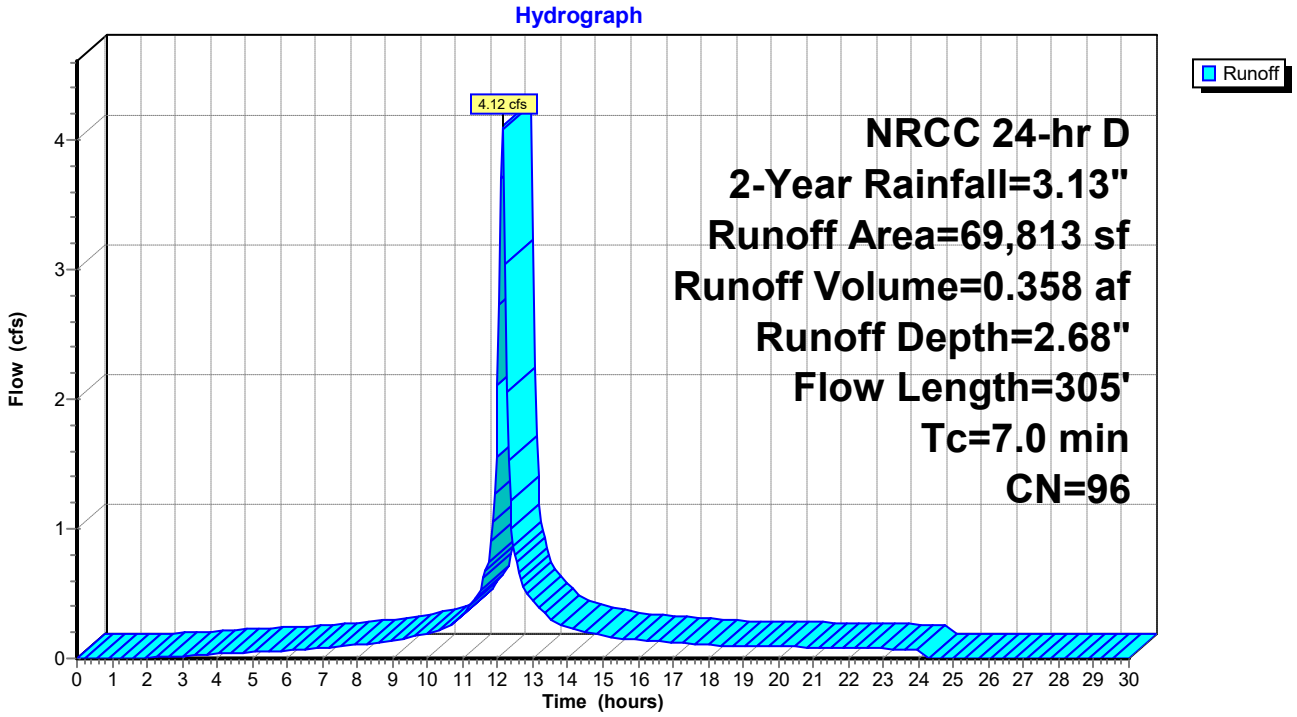
Runoff = 4.12 cfs @ 12.14 hrs, Volume= 0.358 af, Depth= 2.68"
Routed to Reach DCB-D : TO DMH-A

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

[49] Hint: Tc<2dt may require smaller dt

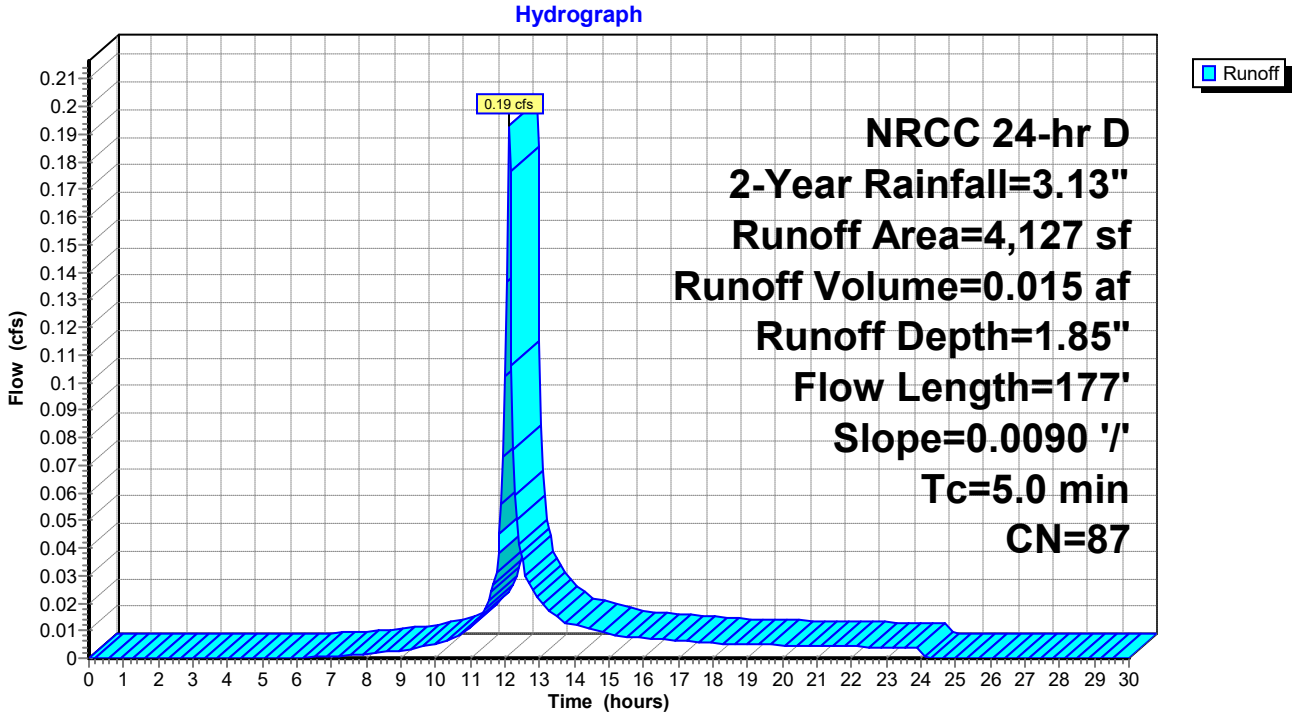
Runoff = 0.19 cfs @ 12.11 hrs, Volume= 0.015 af, Depth= 1.85"
Routed to Reach DCB-E : TO DMH-A

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

[49] Hint: Tc<2dt may require smaller dt

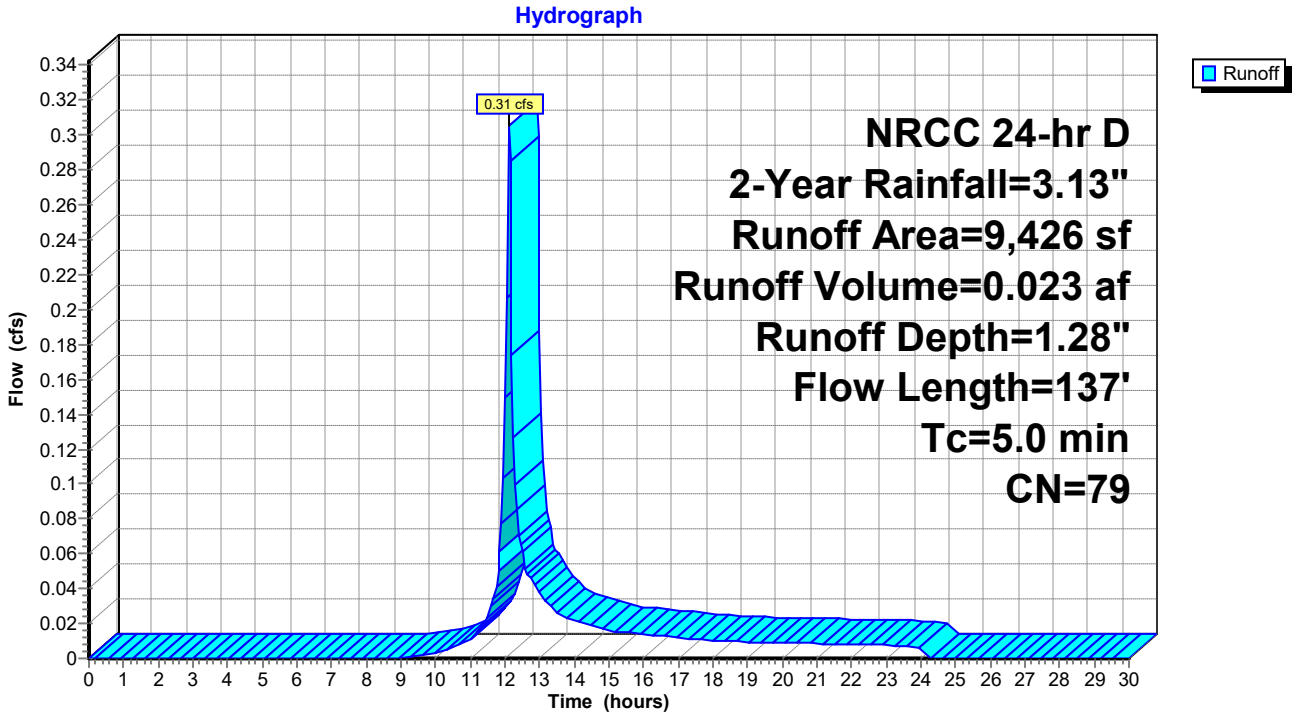
Runoff = 0.31 cfs @ 12.12 hrs, Volume= 0.023 af, Depth= 1.28"
Routed to Reach DP3 : CATCHBASIN (FIRE STATION)

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

[49] Hint: Tc<2dt may require smaller dt

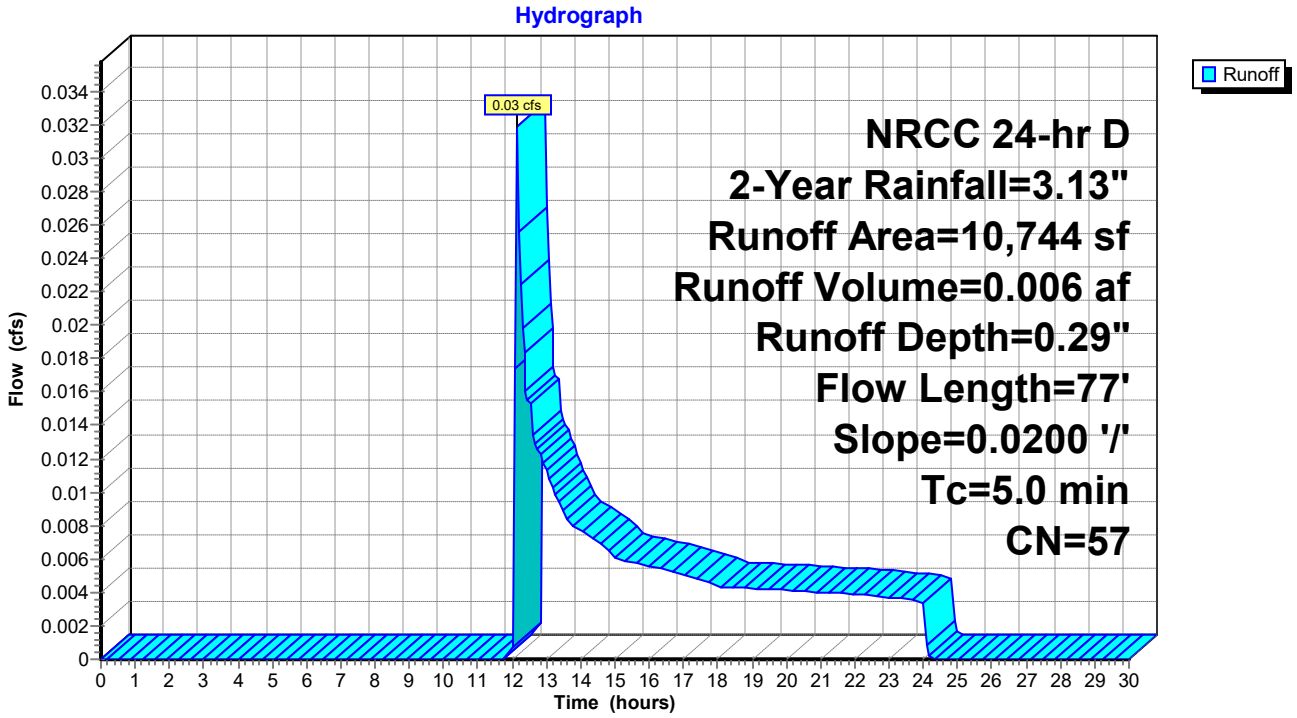
Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.006 af, Depth= 0.29"
Routed to Reach EX DCB : EX DCB

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

[49] Hint: Tc<2dt may require smaller dt

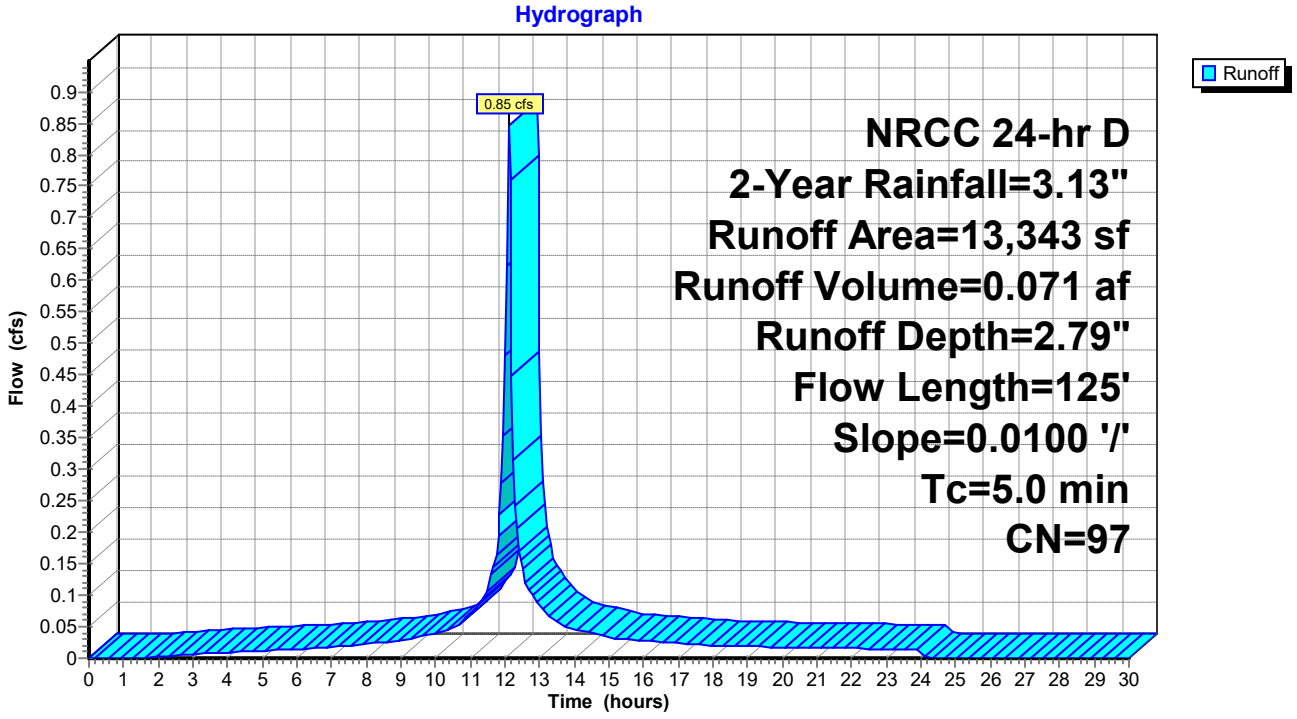
Runoff = 0.85 cfs @ 12.11 hrs, Volume= 0.071 af, Depth= 2.79"
Routed to Reach YDA : (new Reach)

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

[49] Hint: Tc<2dt may require smaller dt

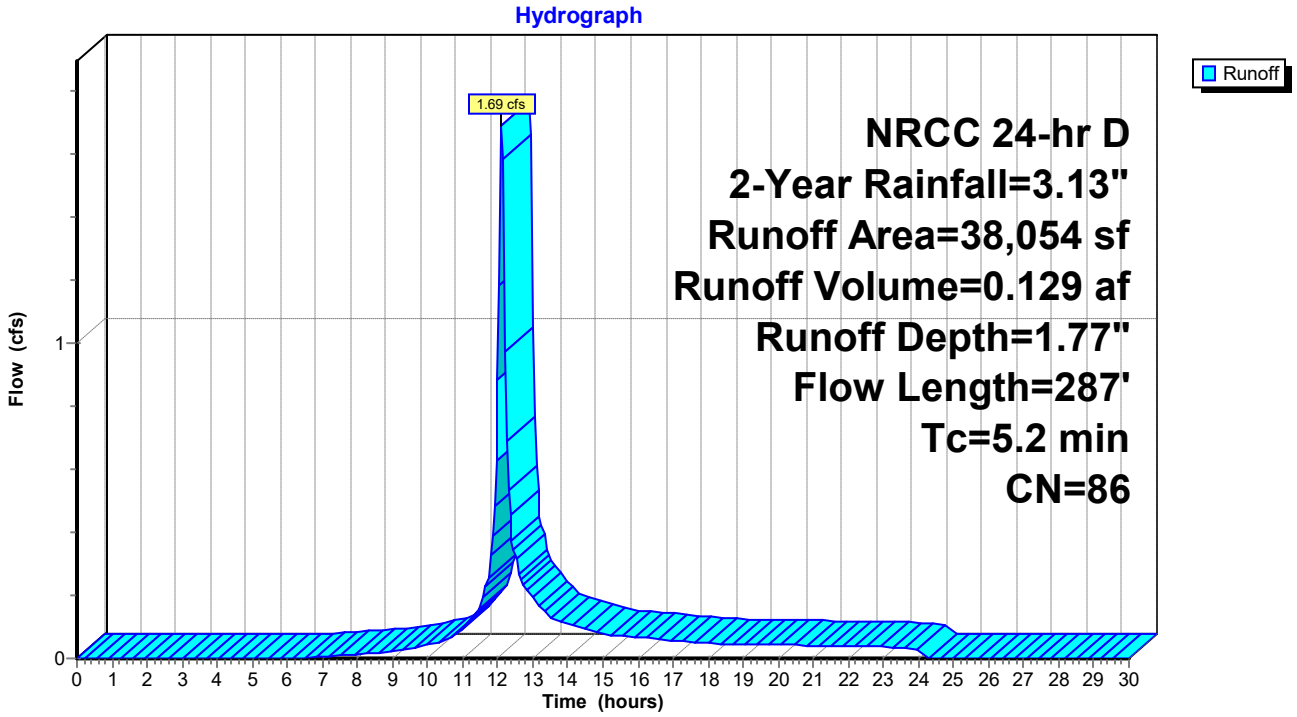
Runoff = 1.69 cfs @ 12.12 hrs, Volume= 0.129 af, Depth= 1.77"
Routed to Reach DCB-F : (new Reach)

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 LOW POINT #2 (LP2)

[49] Hint: Tc<2dt may require smaller dt

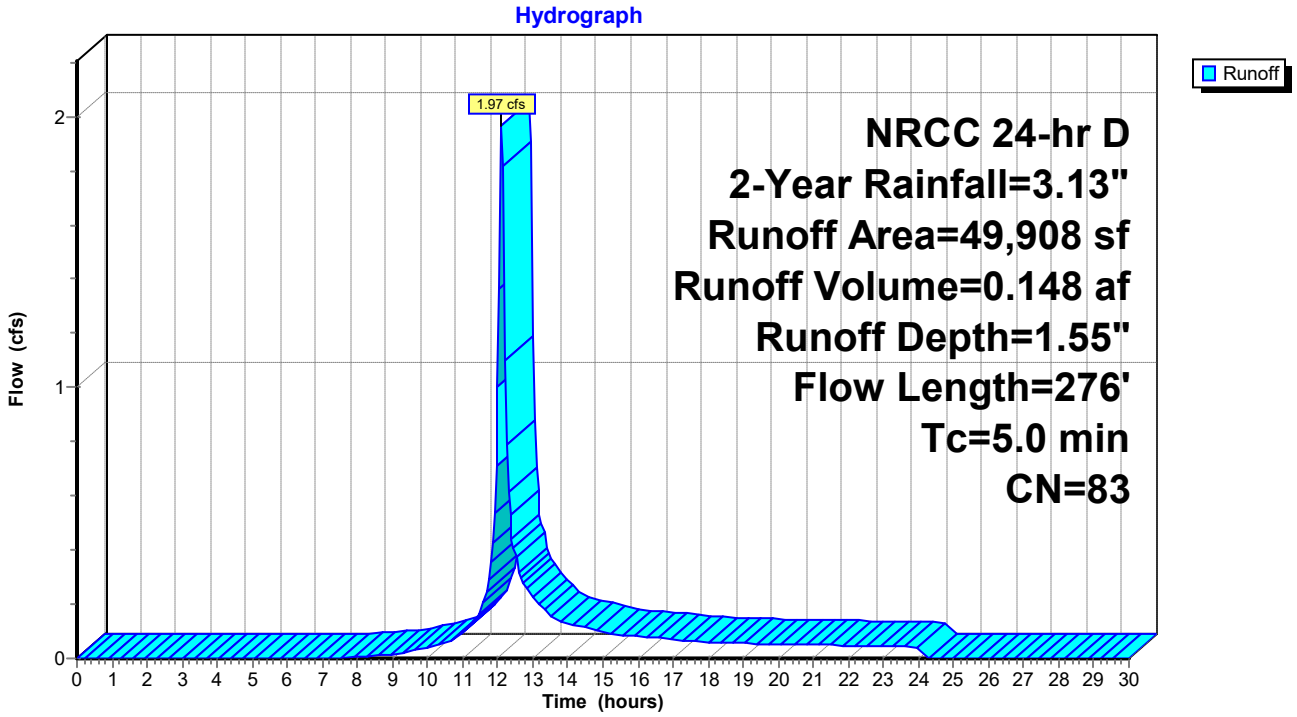
Runoff = 1.97 cfs @ 12.12 hrs, Volume= 0.148 af, Depth= 1.55"
Routed to Reach LP2 : TO DMH-K1

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
11,774	39	>75% Grass cover, Good, HSG A
37,475	98	Paved parking, HSG A
659	48	Brush, Poor, HSG A
49,908	83	Weighted Average
12,433		24.91% Pervious Area
37,475		75.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	45	0.0600	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	5	0.0380	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.0	226	0.0380	3.96		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	276	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E24: TO LOW POINT #2 (LP2)



Summary for Subcatchment E25: TO LOW POINT #3 (LP#3)

[49] Hint: Tc<2dt may require smaller dt

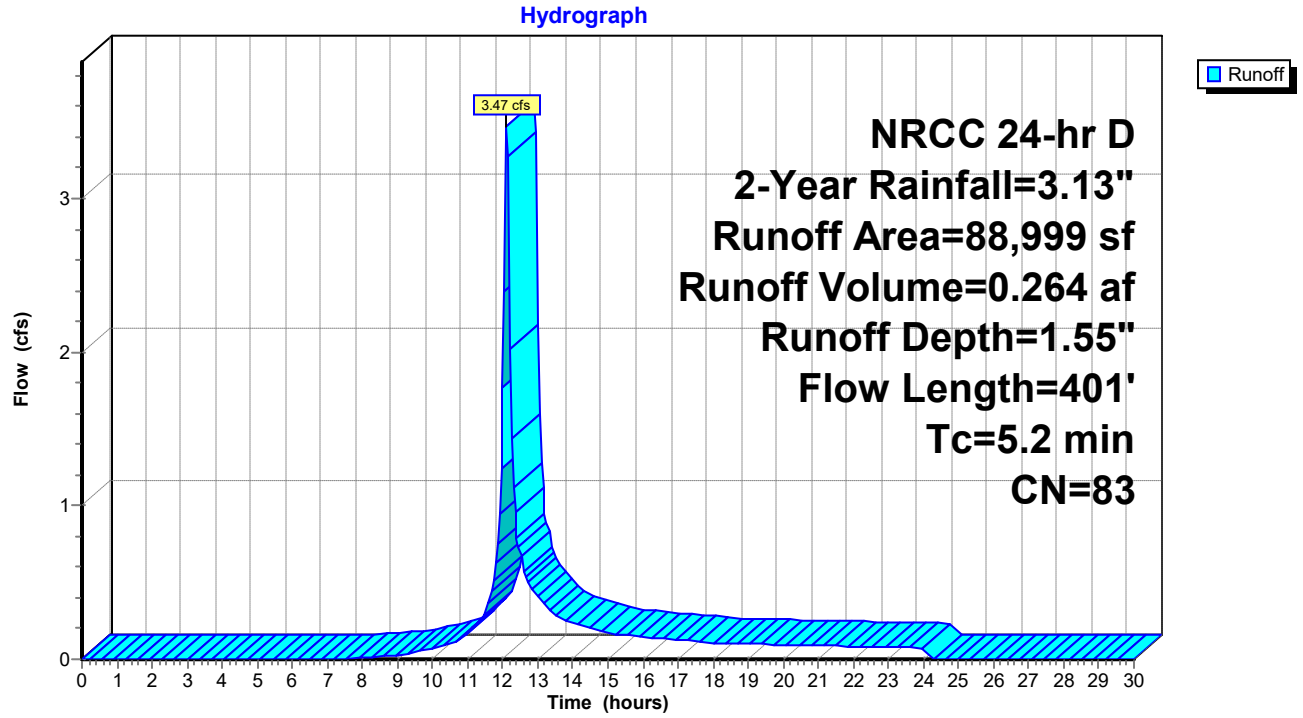
Runoff = 3.47 cfs @ 12.12 hrs, Volume= 0.264 af, Depth= 1.55"
Routed to Pond LP3 : OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2

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
22,346	39	>75% Grass cover, Good, HSG A
66,653	98	Paved parking, HSG A
88,999	83	Weighted Average
22,346		25.11% Pervious Area
66,653		74.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	75	0.1300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.0	10	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.5	316	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.2	401	Total			

Subcatchment E25: TO LOW POINT #3 (LP#3)



Summary for Subcatchment E26: TO DCB-H

[49] Hint: Tc<2dt may require smaller dt

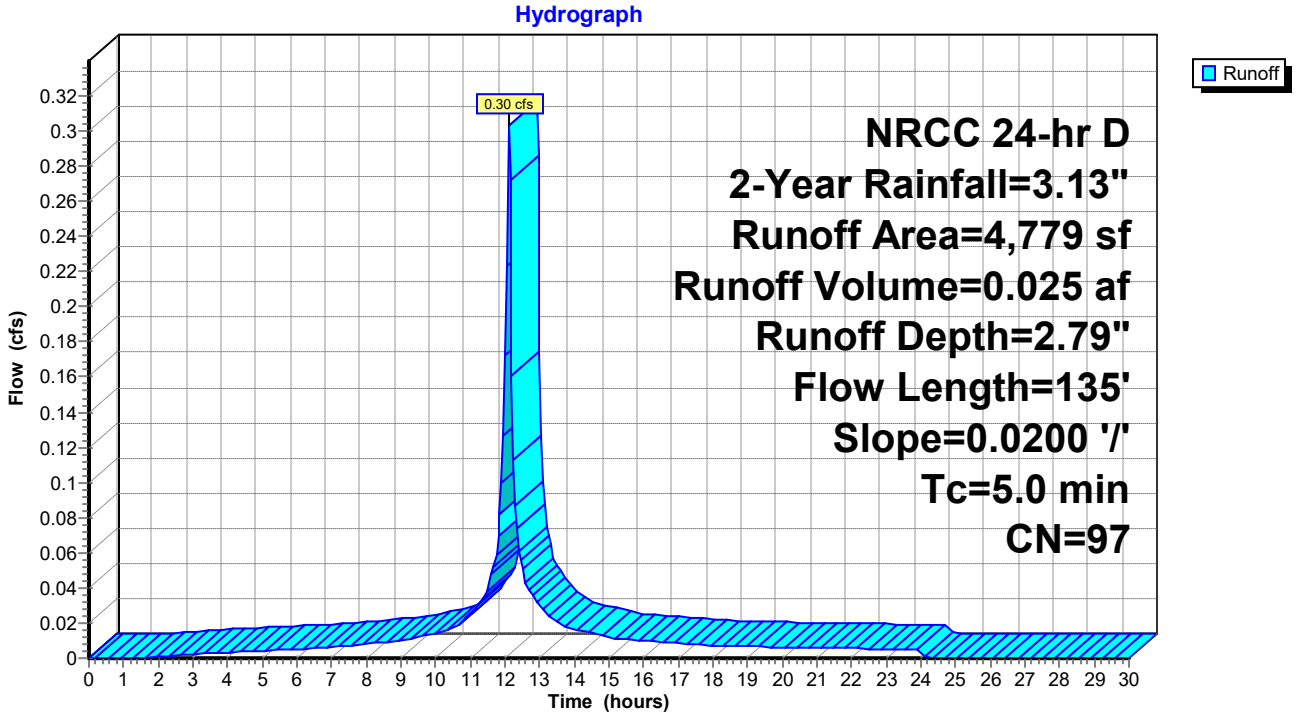
Runoff = 0.30 cfs @ 12.11 hrs, Volume= 0.025 af, Depth= 2.79"
Routed to Reach DP5 : DCB-H

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 Subcatchment e27: TO OFF SITE POINT (DP#6)

[49] Hint: Tc<2dt may require smaller dt

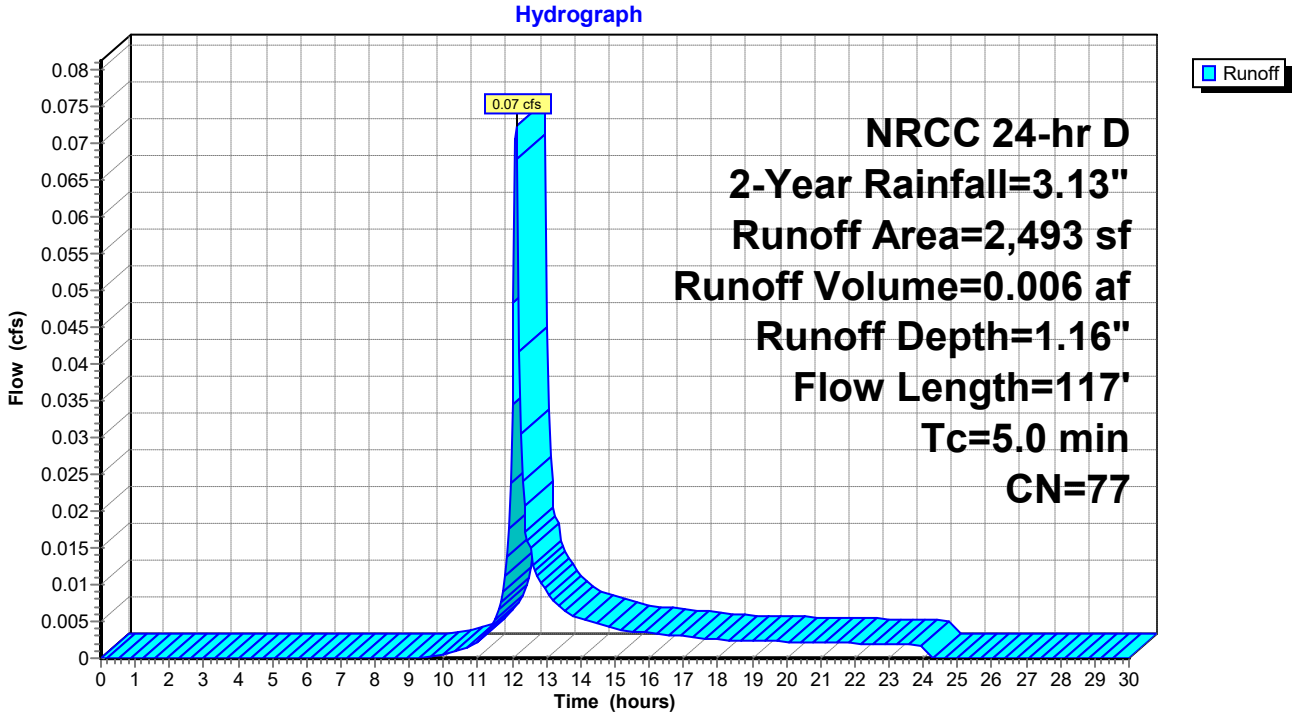
Runoff = 0.07 cfs @ 12.12 hrs, Volume= 0.006 af, Depth= 1.16"
Routed to Reach DP#6 : OFFSITE LOW POINT

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
907	39	>75% Grass cover, Good, HSG A
1,586	98	Paved parking, HSG A
2,493	77	Weighted Average
907		36.38% Pervious Area
1,586		63.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	75	0.1000	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	42	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.3	117	Total, Increased to minimum Tc = 5.0 min			

Subcatchment e27: TO OFF SITE POINT (DP#6)



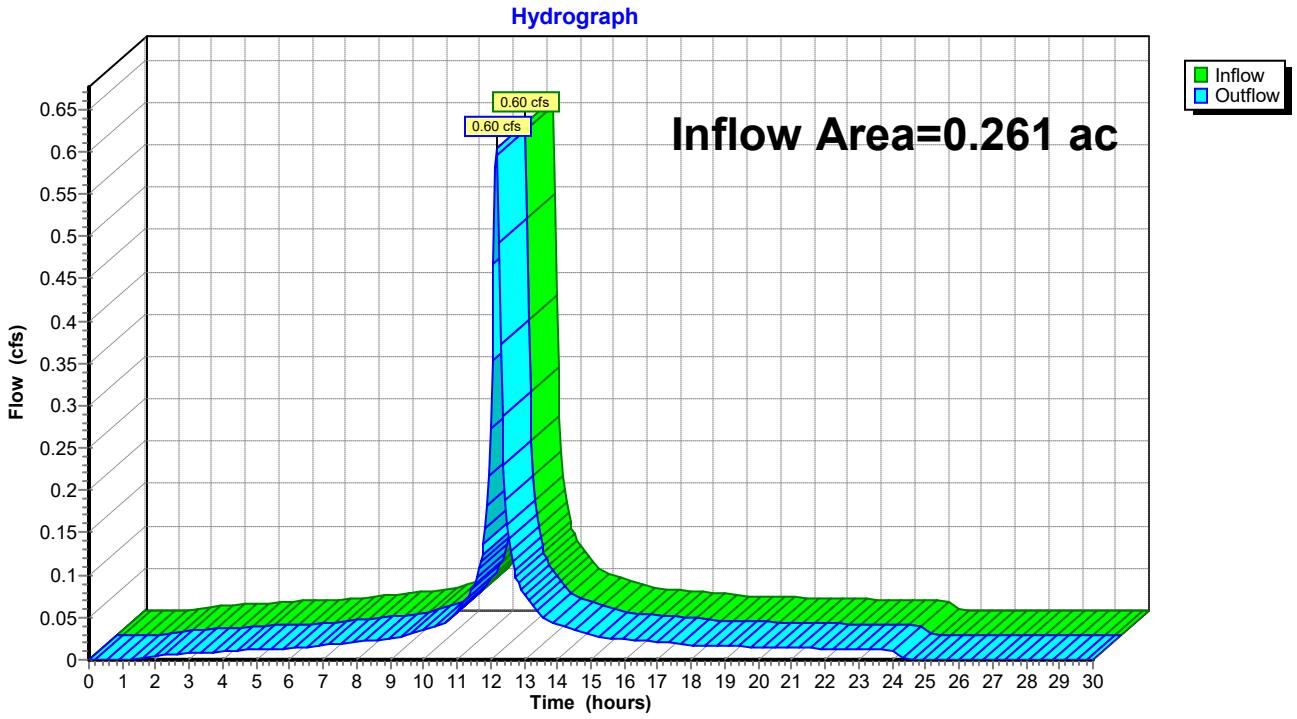
Summary for Reach DCB-A: TO DMH-D

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-D : TO DMH-C

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

Reach DCB-A: TO DMH-D



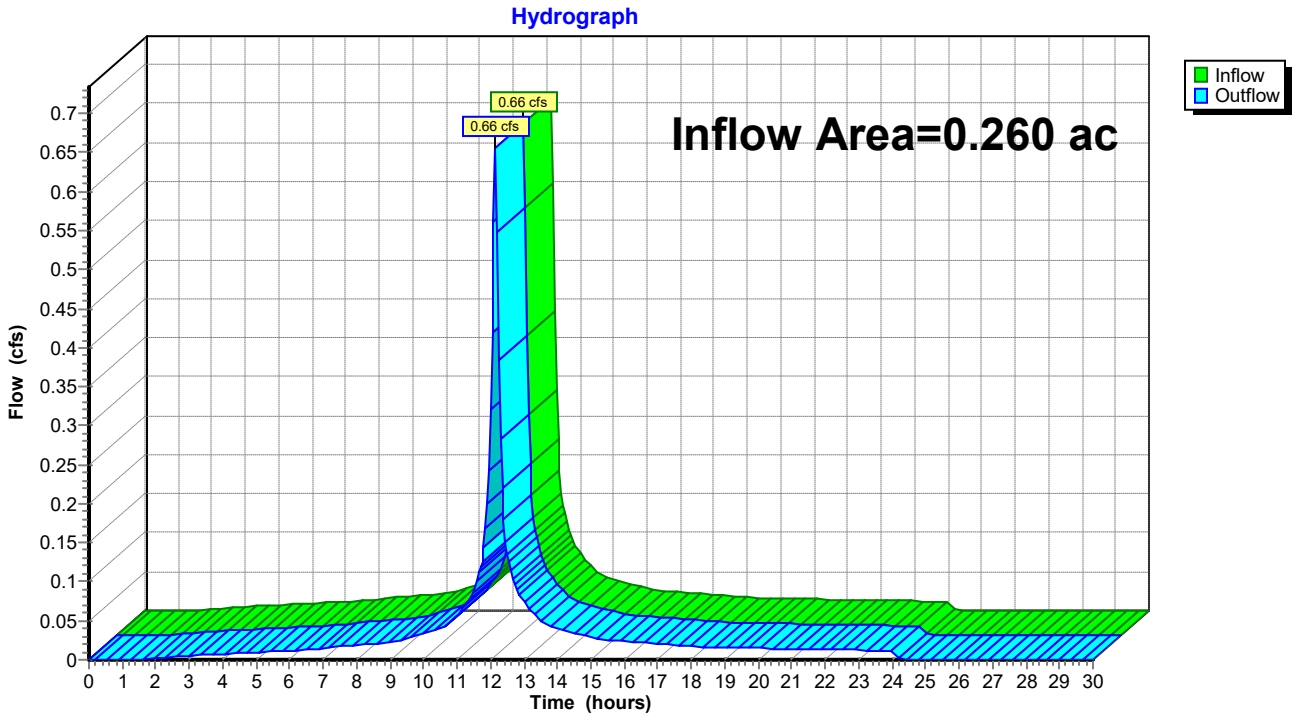
Summary for Reach DCB-B: TO DMH-E

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-E : TO DMH-D

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

Reach DCB-B: TO DMH-E



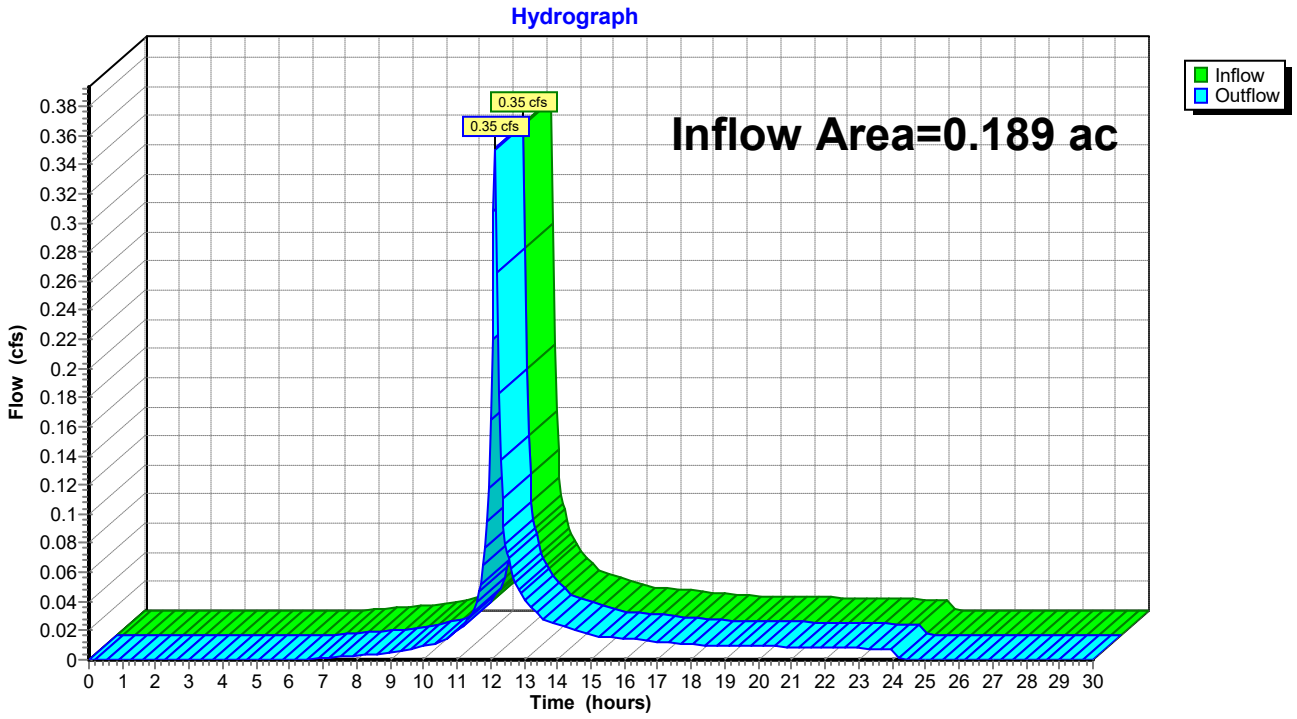
Summary for Reach DCB-C: TO TRUNKLINE

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-E : TO DMH-D

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

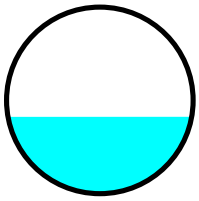
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 2.367 ac, 77.91% Impervious, Inflow Depth = 2.61" for 2-Year event
Inflow = 6.06 cfs @ 12.13 hrs, Volume= 0.515 af
Outflow = 6.06 cfs @ 12.14 hrs, Volume= 0.515 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-A : TO DMH-B

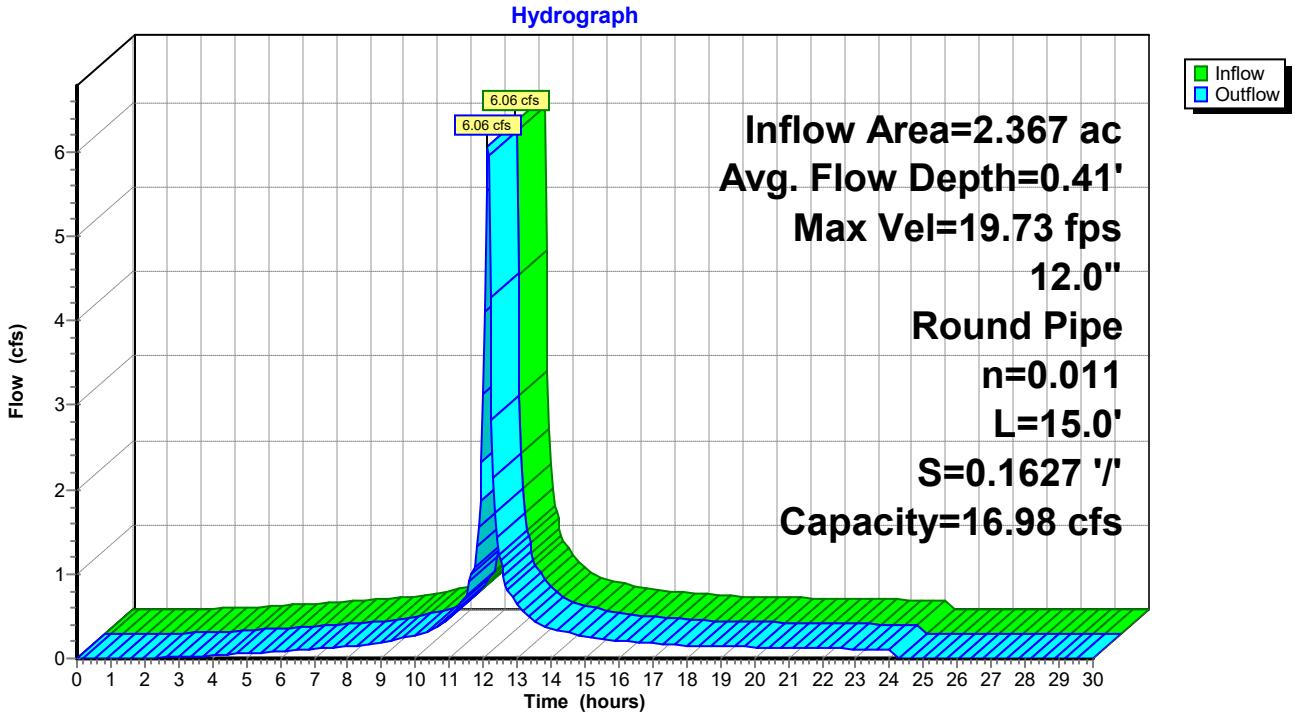
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 19.73 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 6.97 fps, Avg. Travel Time= 0.0 min

Peak Storage= 5 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.41' , Surface Width= 0.98'
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

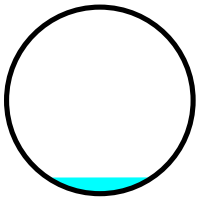
[52] Hint: Inlet/Outlet conditions not evaluated

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
Routed to Reach DMH-A : TO DMH-B

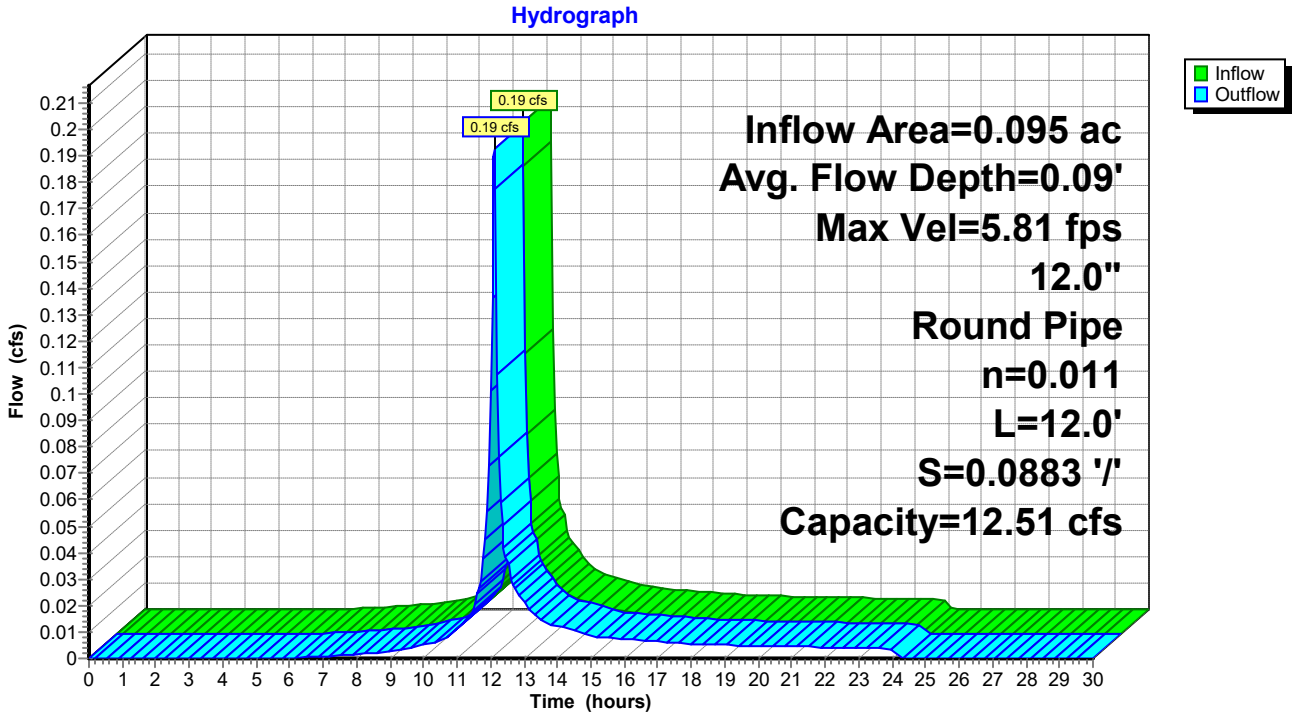
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.81 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 0.56'
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



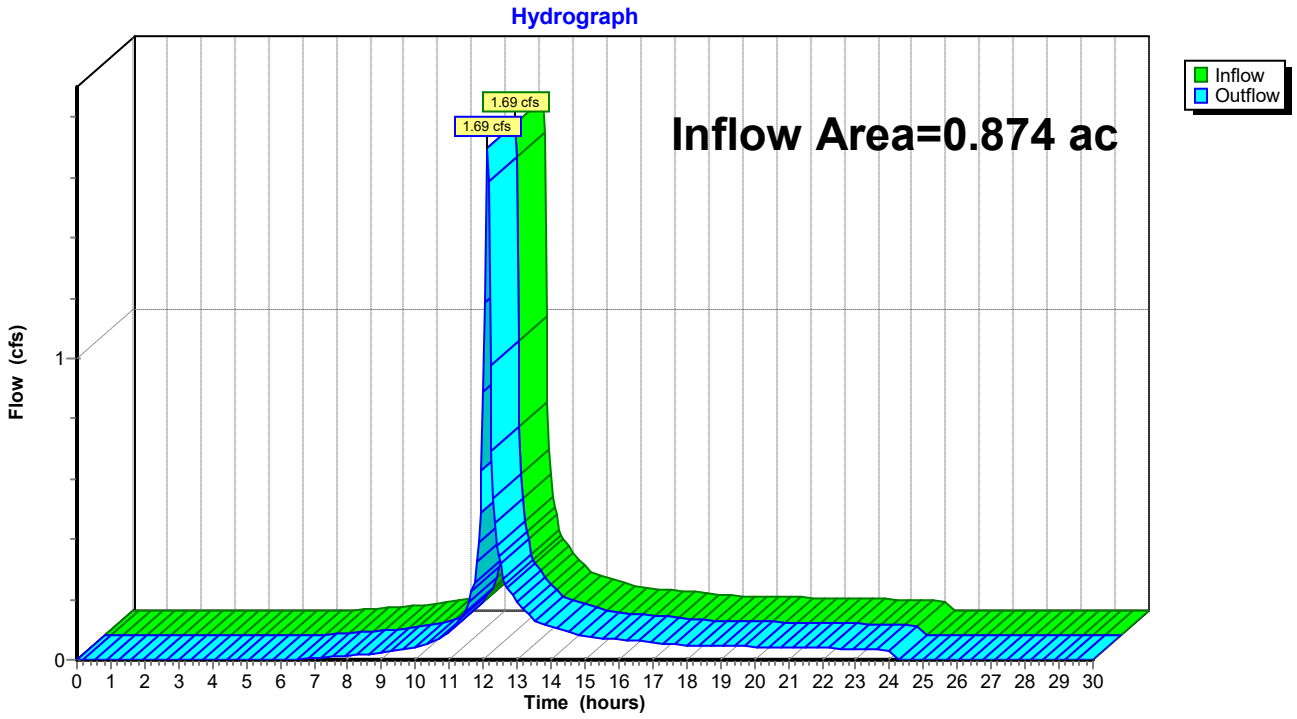
Summary for Reach DCB-F: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

Reach DCB-F: (new Reach)



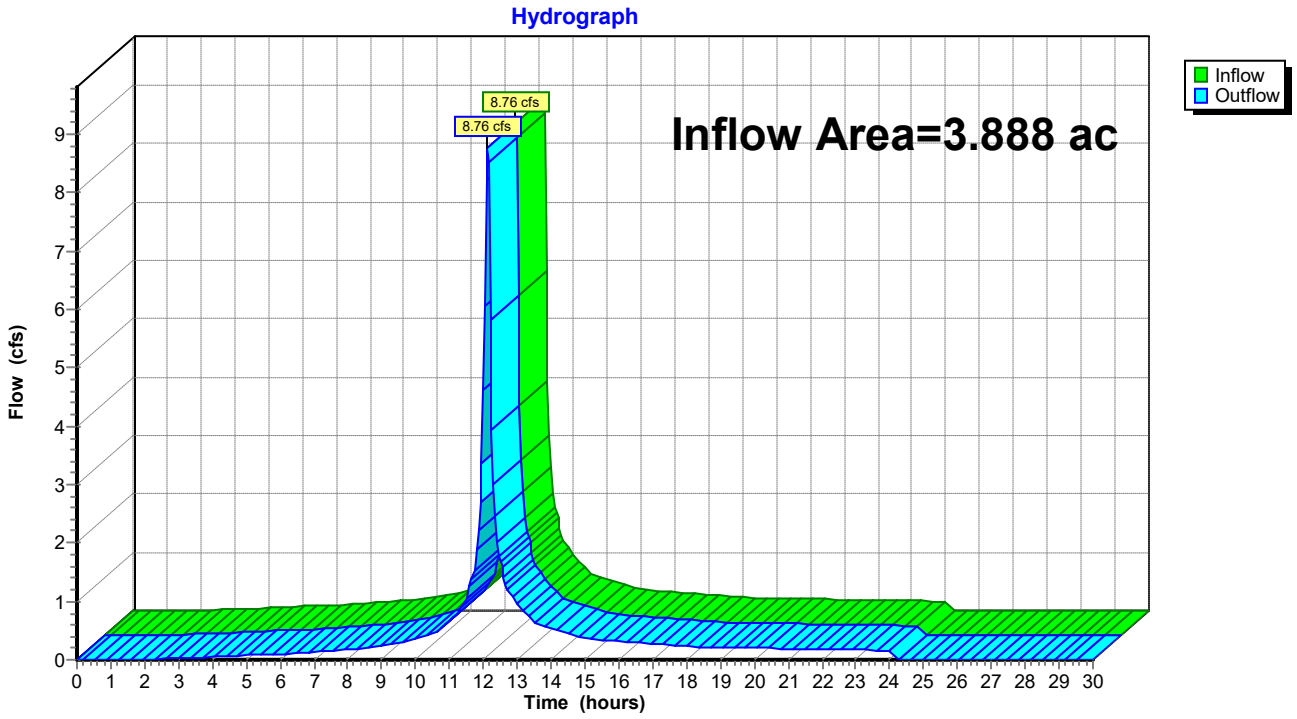
Summary for Reach DMH-A: TO DMH-B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 2.27" for 2-Year event
Inflow = 8.76 cfs @ 12.13 hrs, Volume= 0.736 af
Outflow = 8.76 cfs @ 12.13 hrs, Volume= 0.736 af, Atten= 0%, Lag= 0.0 min
Routed to Pond DMH-B : TO DMH-D

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

Reach DMH-A: TO DMH-B



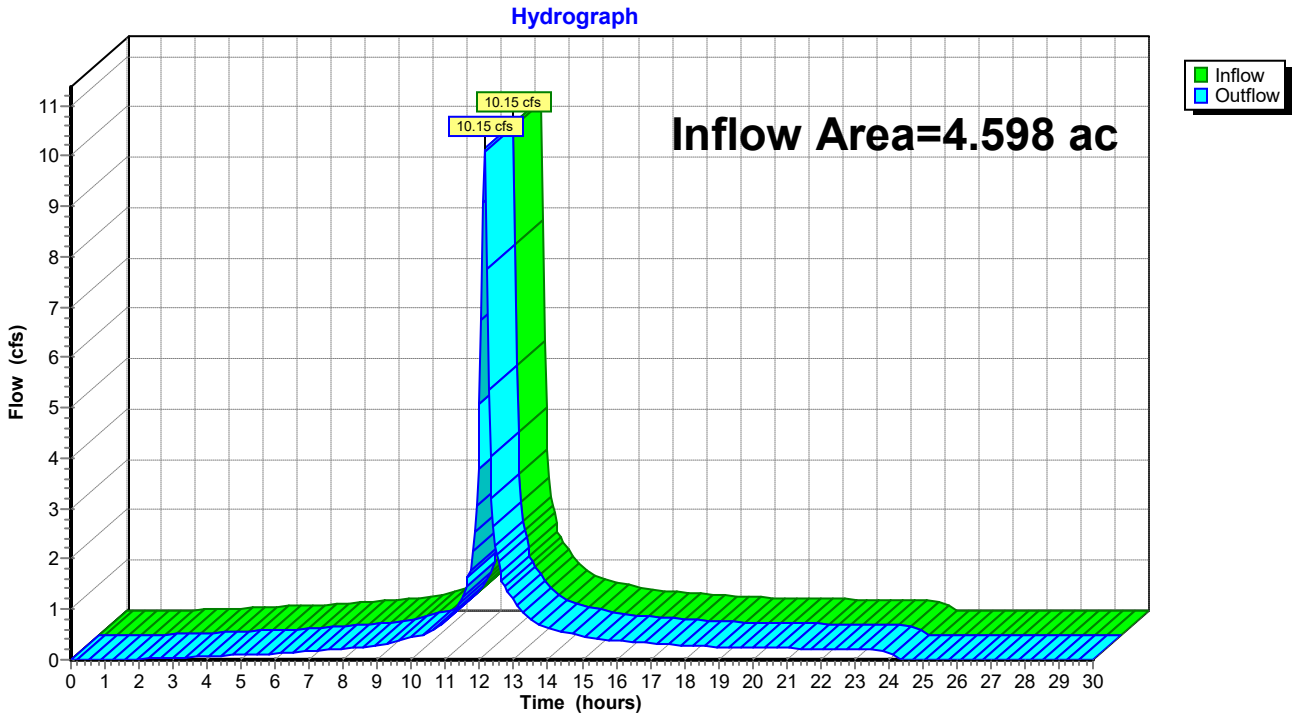
Summary for Reach DMH-C: TO DP#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 2.32" for 2-Year event
Inflow = 10.15 cfs @ 12.14 hrs, Volume= 0.887 af
Outflow = 10.15 cfs @ 12.14 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

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

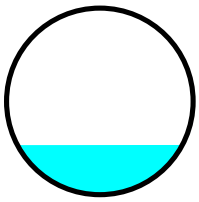
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH-E OUTLET depth by 0.52' @ 12.15 hrs
[79] Warning: Submerged Pond DMH-B Primary device # 1 OUTLET by 0.80'

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 2.32" for 2-Year event
Inflow = 10.23 cfs @ 12.13 hrs, Volume= 0.887 af
Outflow = 10.15 cfs @ 12.14 hrs, Volume= 0.887 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH-C : TO DP#1

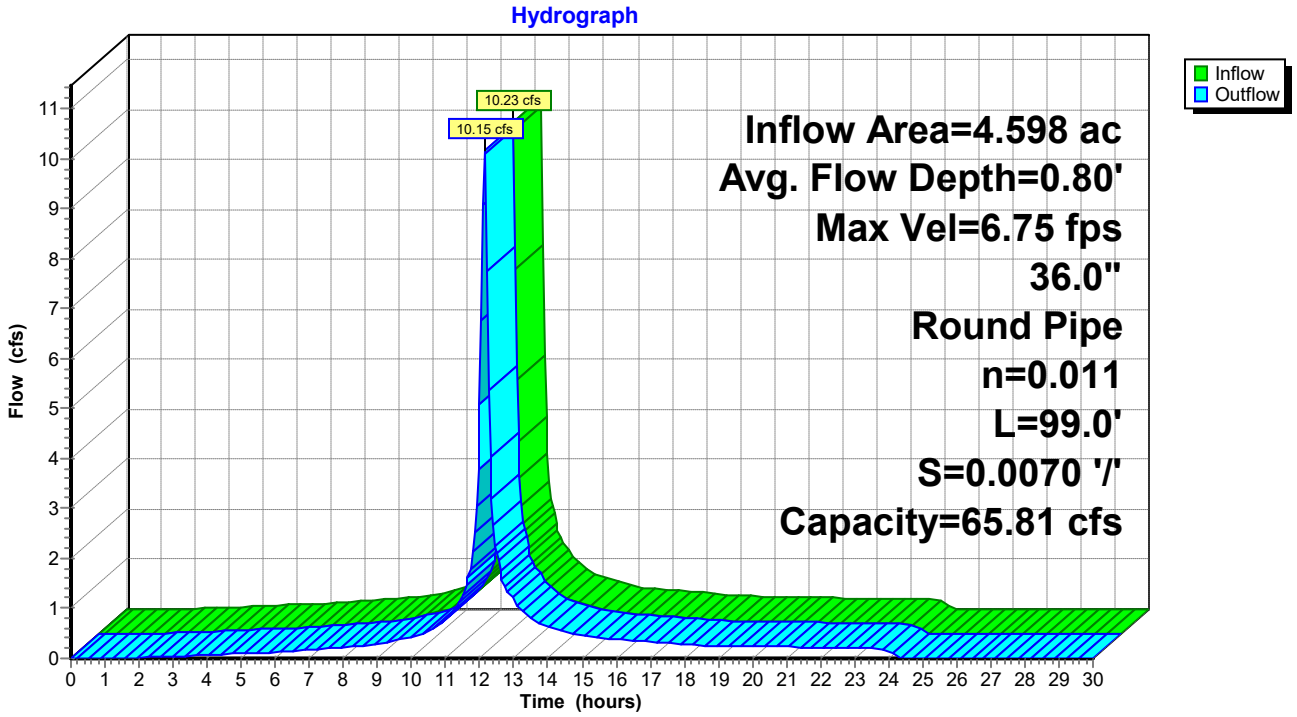
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.7 min

Peak Storage= 150 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.80' , Surface Width= 2.65'
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

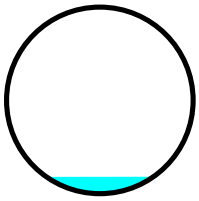
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-F outlet invert by 0.27' @ 12.15 hrs

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
Routed to Reach DMH-D : TO DMH-C

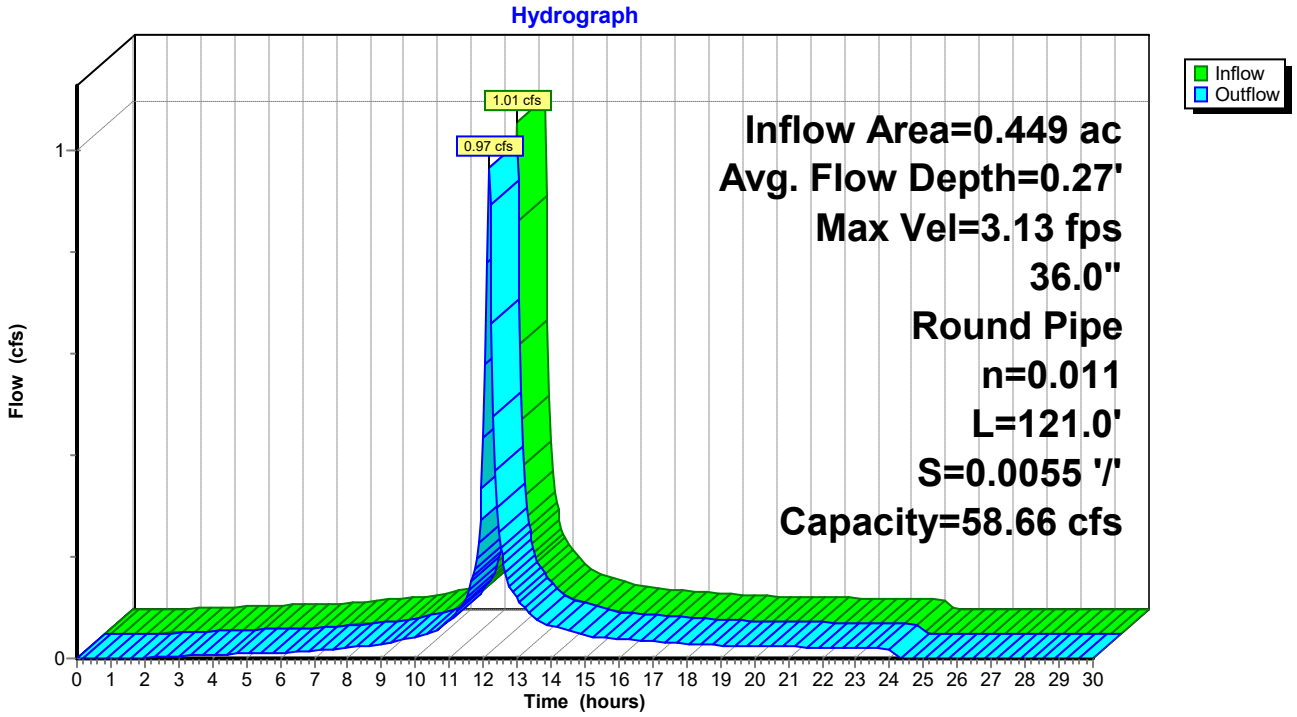
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.13 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 1.8 min

Peak Storage= 39 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 1.72'
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

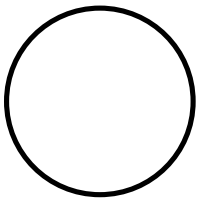


Summary for Reach DMH-F: TO DMH-E

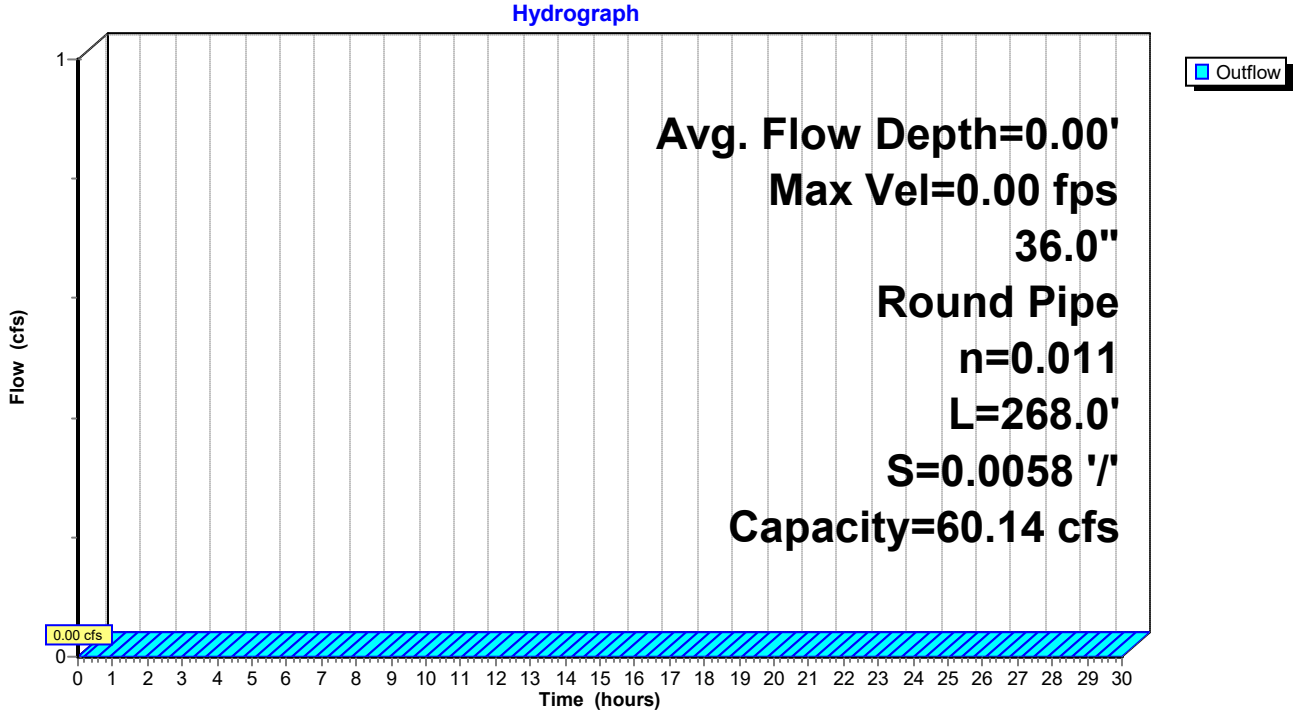
[43] Hint: Has no inflow (Outflow=Zero)

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



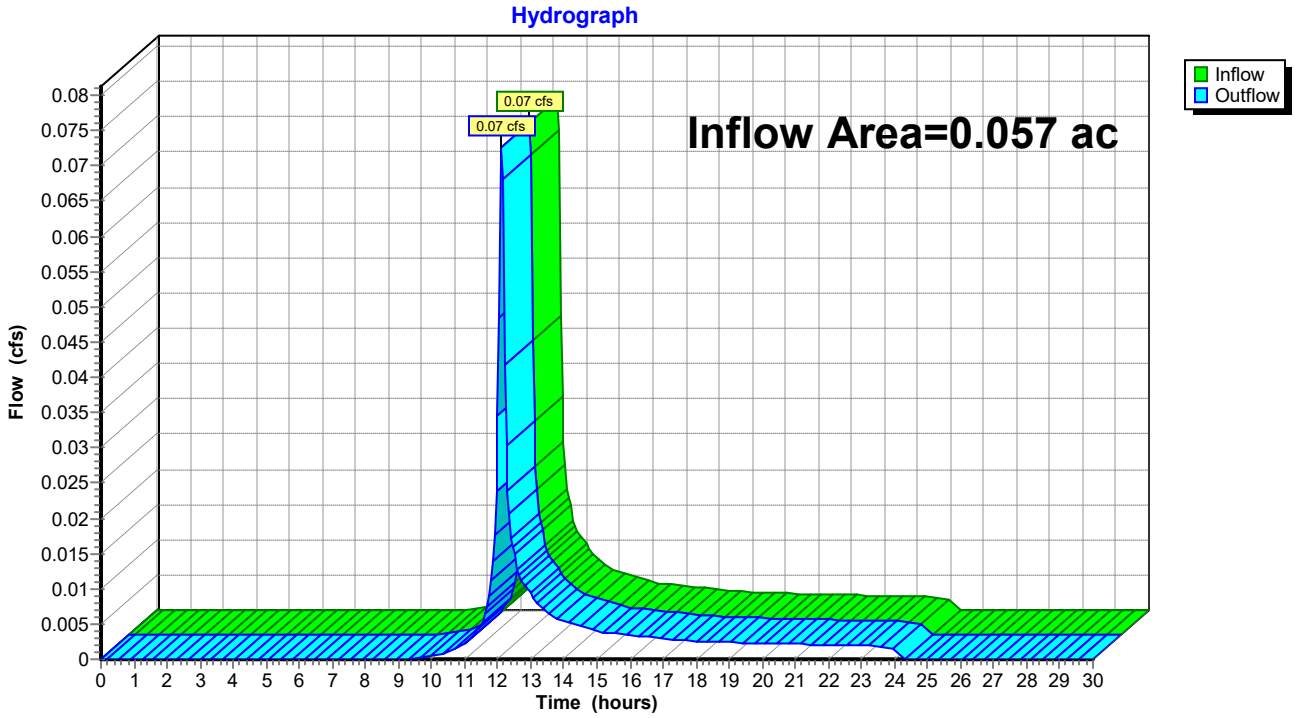
Summary for Reach DP#6: OFFSITE LOW POINT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.057 ac, 63.62% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 0.07 cfs @ 12.12 hrs, Volume= 0.006 af
Outflow = 0.07 cfs @ 12.12 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 DP#6: OFFSITE LOW POINT



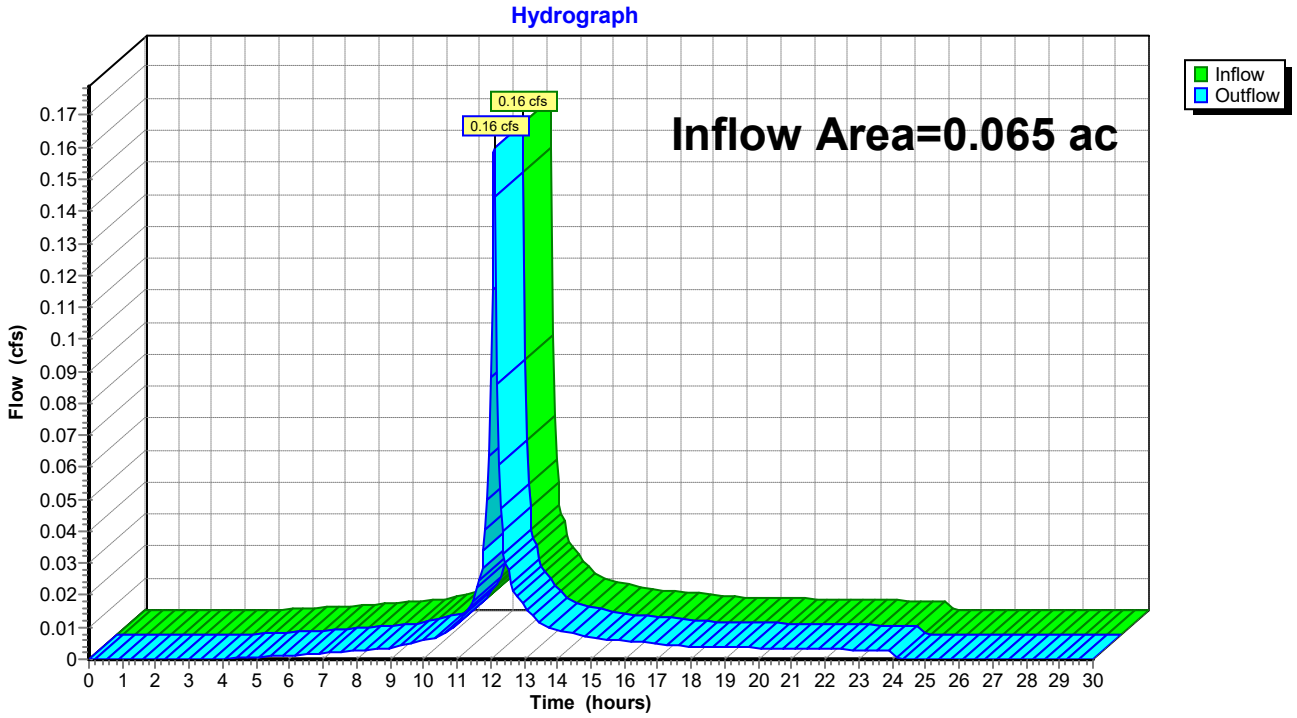
Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

[40] Hint: Not Described (Outflow=Inflow)

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)



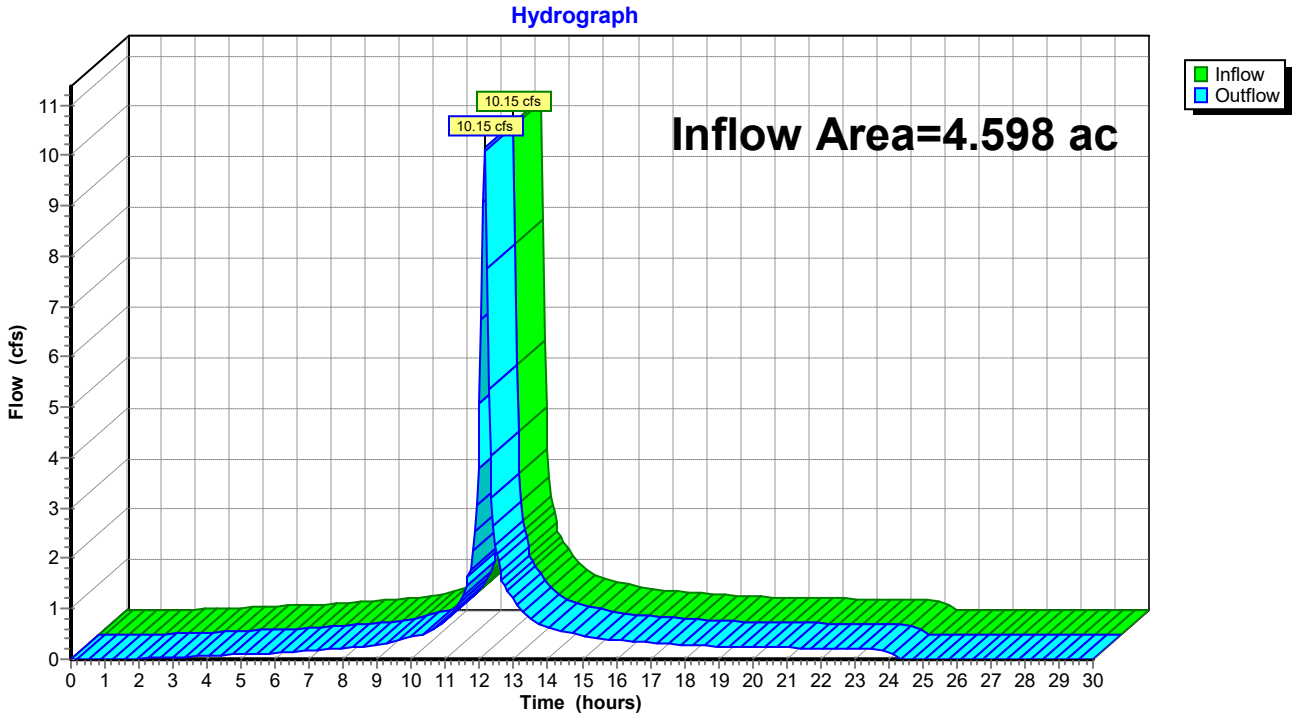
Summary for Reach DP2: MUNICIPAL SYSTEM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 2.32" for 2-Year event
Inflow = 10.15 cfs @ 12.14 hrs, Volume= 0.887 af
Outflow = 10.15 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



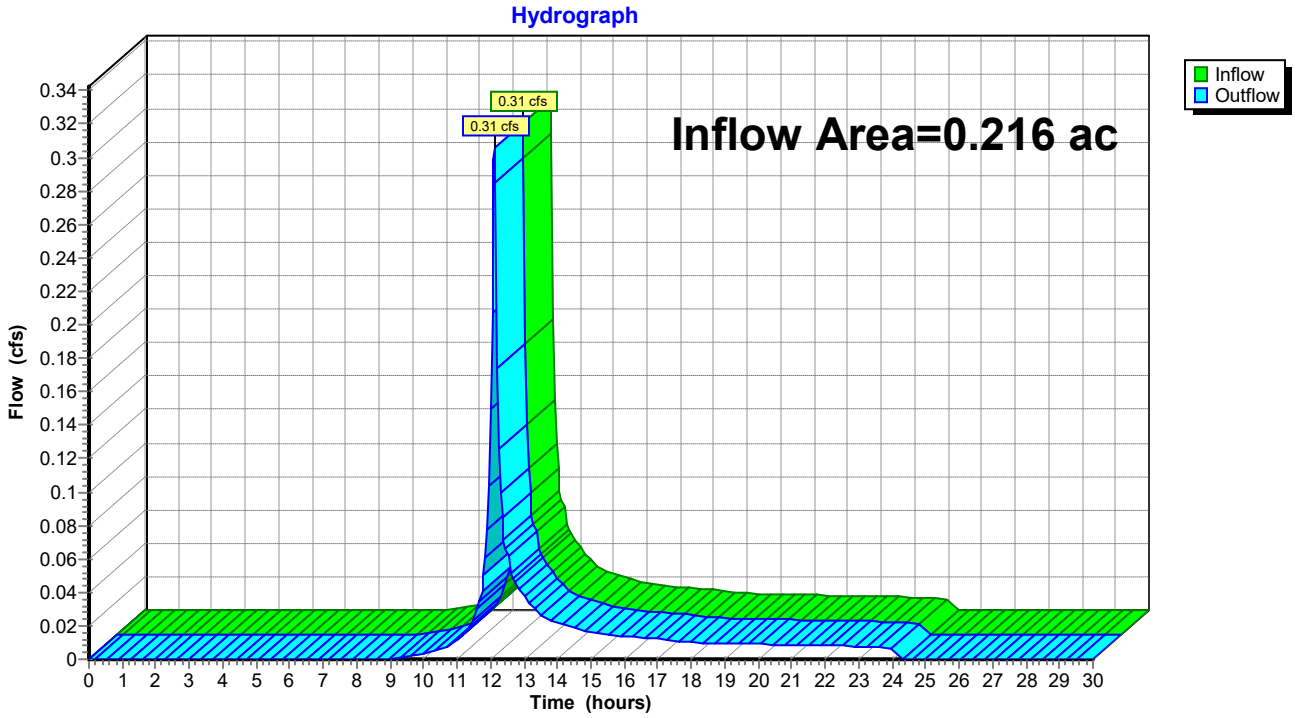
Summary for Reach DP3: CATCHBASIN (FIRE STATION)

[40] Hint: Not Described (Outflow=Inflow)

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)



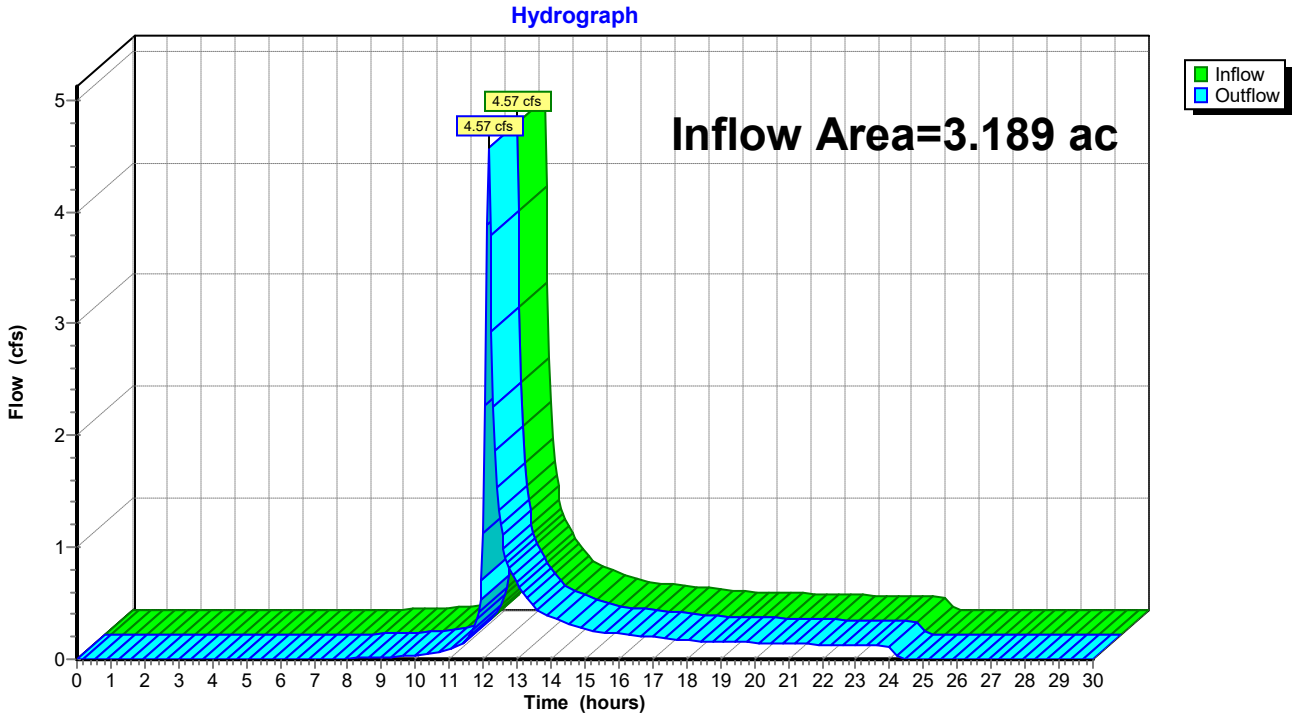
Summary for Reach DP4: DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.189 ac, 74.96% Impervious, Inflow Depth = 1.36" for 2-Year event
Inflow = 4.57 cfs @ 12.15 hrs, Volume= 0.362 af
Outflow = 4.57 cfs @ 12.15 hrs, Volume= 0.362 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: DMH-K1



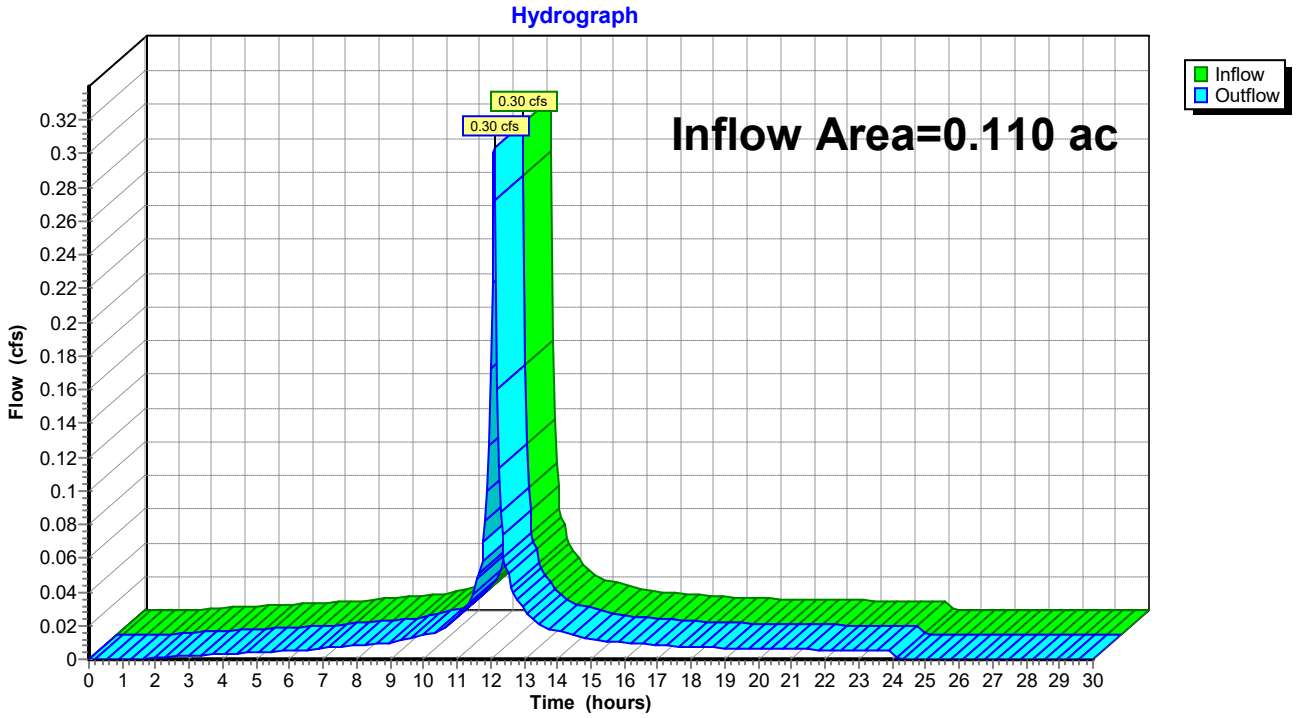
Summary for Reach DP5: DCB-H

[40] Hint: Not Described (Outflow=Inflow)

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



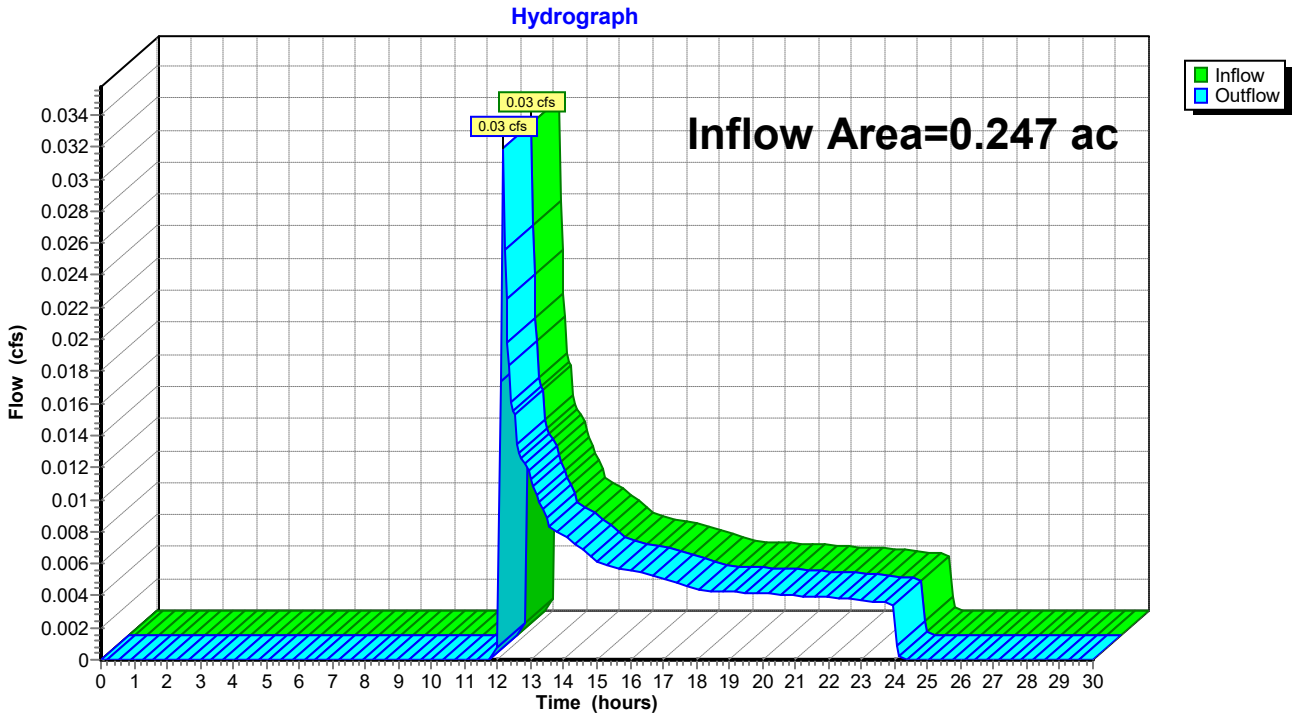
Summary for Reach EX DCB: EX DCB

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

Reach EX DCB: EX DCB



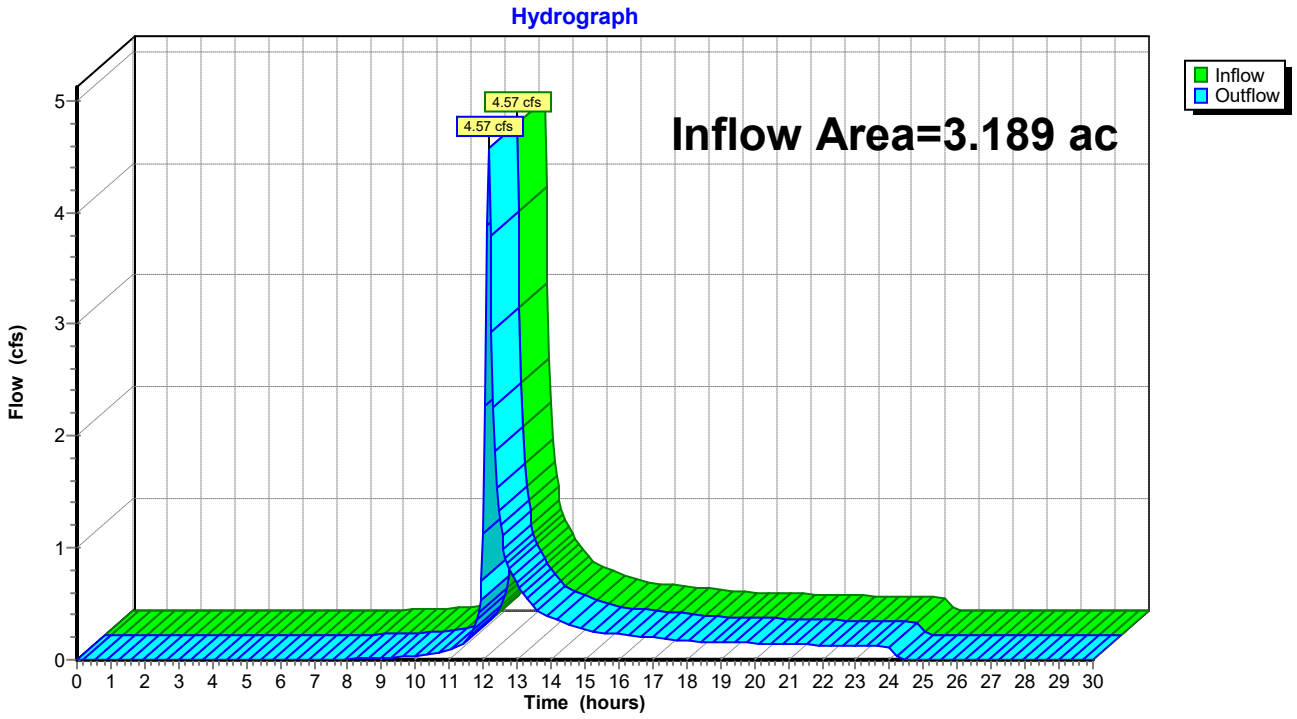
Summary for Reach LP2: TO DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.189 ac, 74.96% Impervious, Inflow Depth = 1.36" for 2-Year event
Inflow = 4.57 cfs @ 12.15 hrs, Volume= 0.362 af
Outflow = 4.57 cfs @ 12.15 hrs, Volume= 0.362 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

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

Reach LP2: TO DMH-K1



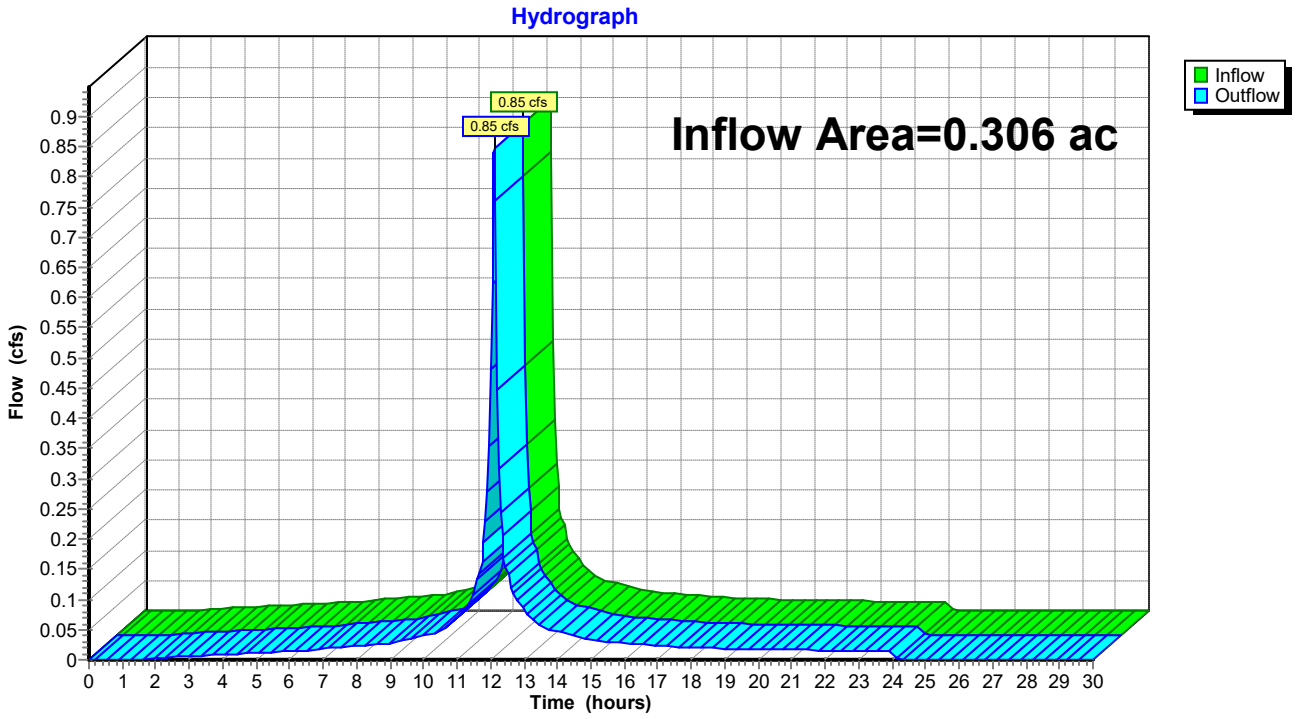
Summary for Reach YDA: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

[57] Hint: Peaked at 459.60' (Flood elevation advised)

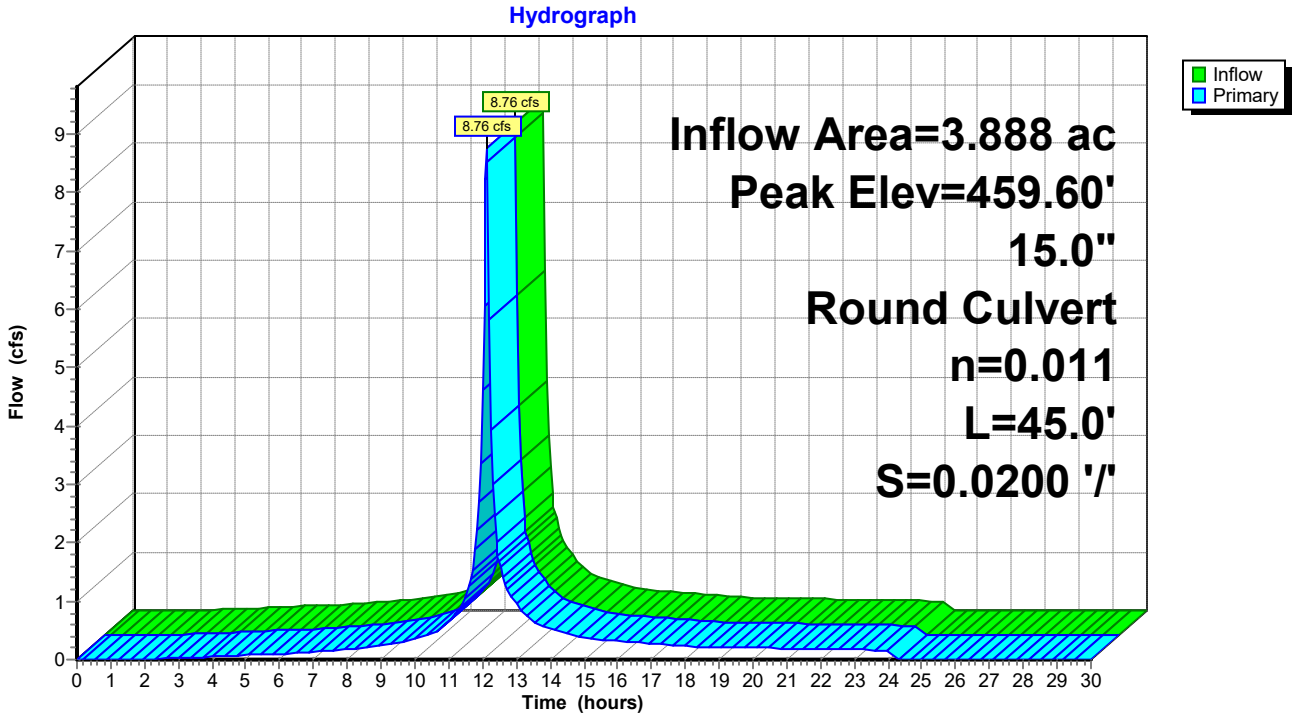
Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 2.27" for 2-Year event
Inflow = 8.76 cfs @ 12.13 hrs, Volume= 0.736 af
Outflow = 8.76 cfs @ 12.13 hrs, Volume= 0.736 af, Atten= 0%, Lag= 0.0 min
Primary = 8.76 cfs @ 12.13 hrs, Volume= 0.736 af
Routed to Reach DMH-D : TO DMH-C

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 459.60' @ 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=459.45' (Free Discharge)
1=Culvert (Inlet Controls 8.40 cfs @ 6.85 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 = 1.95 cfs @ 12.13 hrs, Volume= 0.157 af, Atten= 1%, Lag= 0.9 min
Primary = 1.95 cfs @ 12.13 hrs, Volume= 0.157 af
Routed to Reach DCB-D : TO DMH-A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 473.89' @ 12.13 hrs Surf.Area= 1,050 sf Storage= 85 cf

Plug-Flow detention time= 3.5 min calculated for 0.157 af (100% of inflow)
Center-of-Mass det. time= 2.2 min (800.9 - 798.7)

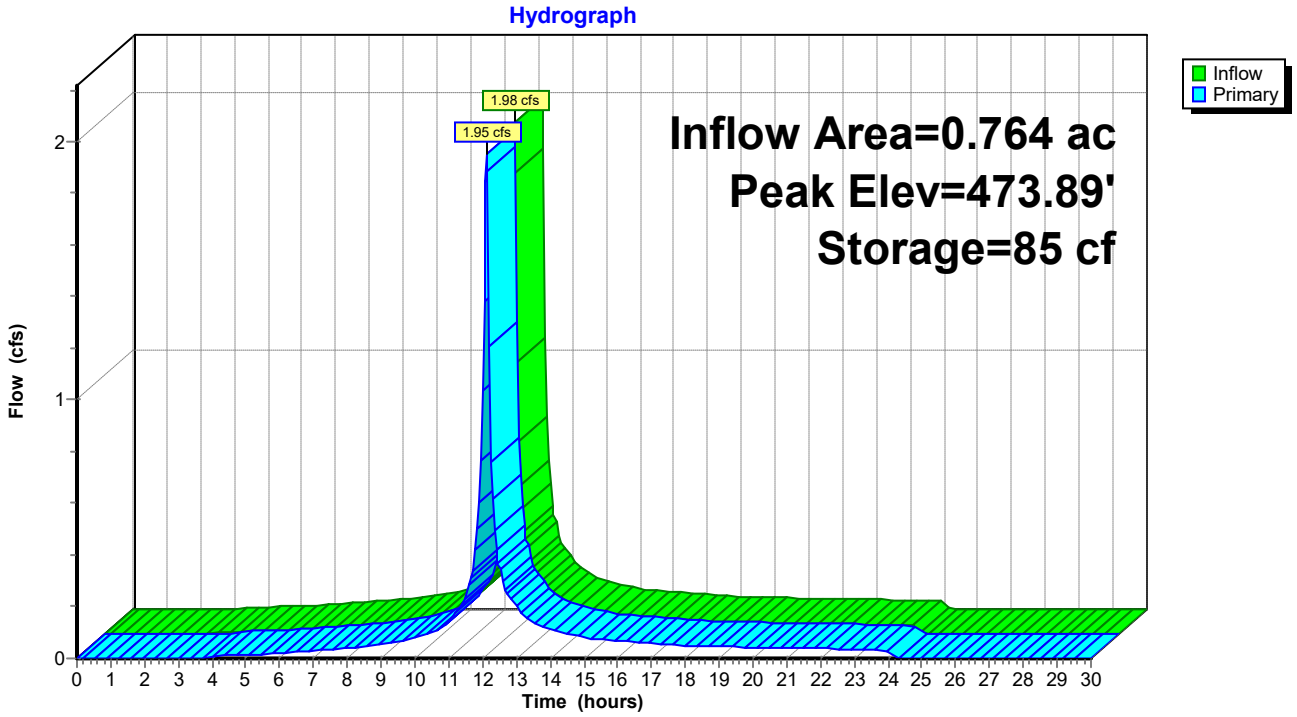
Volume	Invert	Avail.Storage	Storage Description
#1	473.75'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

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	473.80'	**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=473.89' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.86 cfs @ 0.81 fps)

Pond LP1: TO DCB-D



Summary for Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2

Inflow Area = 2.043 ac, 74.89% Impervious, Inflow Depth = 1.55" for 2-Year event
Inflow = 3.47 cfs @ 12.12 hrs, Volume= 0.264 af
Outflow = 2.83 cfs @ 12.17 hrs, Volume= 0.214 af, Atten= 18%, Lag= 3.1 min
Primary = 2.83 cfs @ 12.17 hrs, Volume= 0.214 af
Routed to Reach LP2 : TO DMH-K1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 464.61' @ 12.17 hrs Surf.Area= 8,146 sf Storage= 2,978 cf

Plug-Flow detention time= 137.3 min calculated for 0.214 af (81% of inflow)
Center-of-Mass det. time= 50.4 min (909.0 - 858.6)

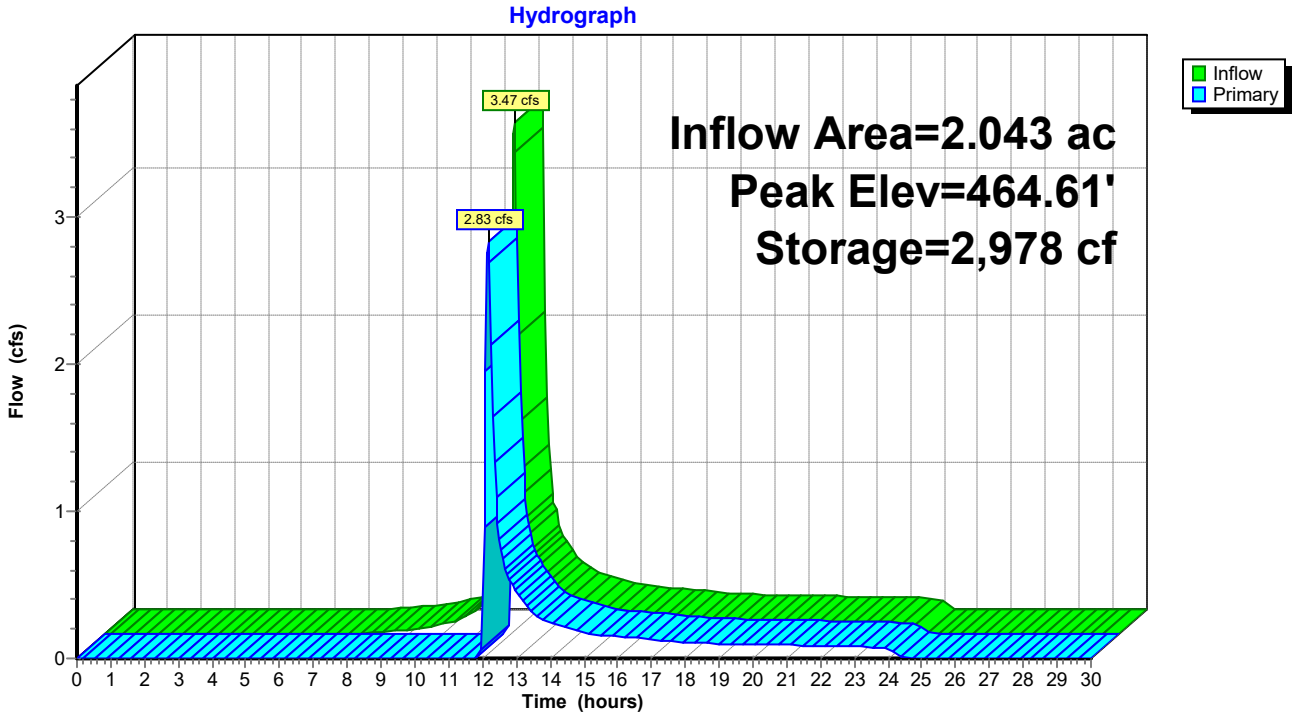
Volume	Invert	Avail.Storage	Storage Description
#1	461.50'	16,070 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
461.50	133	0	0
462.00	180	78	78
463.00	269	225	303
464.00	376	323	625
464.50	5,887	1,566	2,191
465.00	15,961	5,462	7,653
465.50	17,706	8,417	16,070

Device	Routing	Invert	Outlet Devices
#1	Primary	464.50'	**27.0' long + 10.0 '/' SideZ x 20.0' 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=2.70 cfs @ 12.17 hrs HW=464.61' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 2.70 cfs @ 0.88 fps)

Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2



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 LOW POINT #2 (LP2) Runoff Area=49,908 sf 75.09% Impervious Runoff Depth=2.89"
Flow Length=276' Tc=5.0 min CN=83 Runoff=3.63 cfs 0.276 af

Subcatchment E25: TO LOW POINT #3 (LP#3) Runoff Area=88,999 sf 74.89% Impervious Runoff Depth=2.89"
Flow Length=401' Tc=5.2 min CN=83 Runoff=6.40 cfs 0.491 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

Subcatchment e27: TO OFF SITE POINT (DP#6) Runoff Area=2,493 sf 63.62% Impervious Runoff Depth=2.36"
Flow Length=117' Tc=5.0 min CN=77 Runoff=0.15 cfs 0.011 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=9.34 cfs 0.817 af
12.0" Round Pipe n=0.011 L=15.0' S=0.1627 '/' Capacity=16.98 cfs Outflow=9.34 cfs 0.817 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=14.04 cfs 1.203 af
Outflow=14.04 cfs 1.203 af

Reach DMH-C: TO DP#1 Inflow=16.25 cfs 1.443 af
Outflow=16.25 cfs 1.443 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.02' Max Vel=7.70 fps Inflow=16.36 cfs 1.443 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=16.25 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 DP#6: OFFSITE LOW POINT Inflow=0.15 cfs 0.011 af
Outflow=0.15 cfs 0.011 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=16.25 cfs 1.443 af
Outflow=16.25 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: DMH-K1 Inflow=8.95 cfs 0.717 af
Outflow=8.95 cfs 0.717 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 LP2: TO DMH-K1 Inflow=8.95 cfs 0.717 af
Outflow=8.95 cfs 0.717 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=463.00' Inflow=14.04 cfs 1.203 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=14.04 cfs 1.203 af

Pond LP1: TO DCB-D Peak Elev=473.93' Storage=123 cf Inflow=3.09 cfs 0.254 af
Outflow=3.05 cfs 0.254 af

Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS Peak Elev=464.67' Storage=3,528 cf Inflow=6.40 cfs 0.491 af
Outflow=5.59 cfs 0.441 af

Total Runoff Area = 8.235 ac Runoff Volume = 2.328 af Average Runoff Depth = 3.39"
26.88% Pervious = 2.214 ac 73.12% Impervious = 6.022 ac

Summary for Subcatchment E11: TO DP#1

[49] Hint: Tc<2dt may require smaller dt

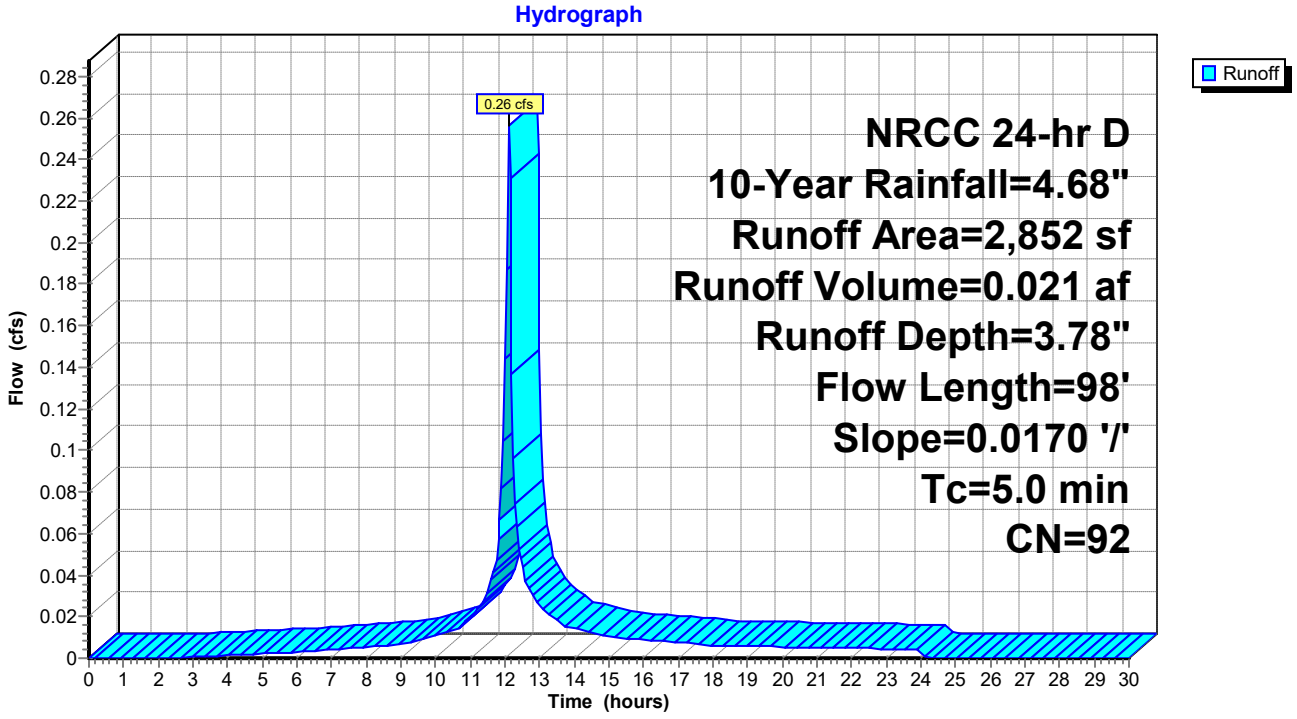
Runoff = 0.26 cfs @ 12.11 hrs, Volume= 0.021 af, Depth= 3.78"
Routed to Reach DP1 : GUTTER POINT FRANKLIN (WEST)

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

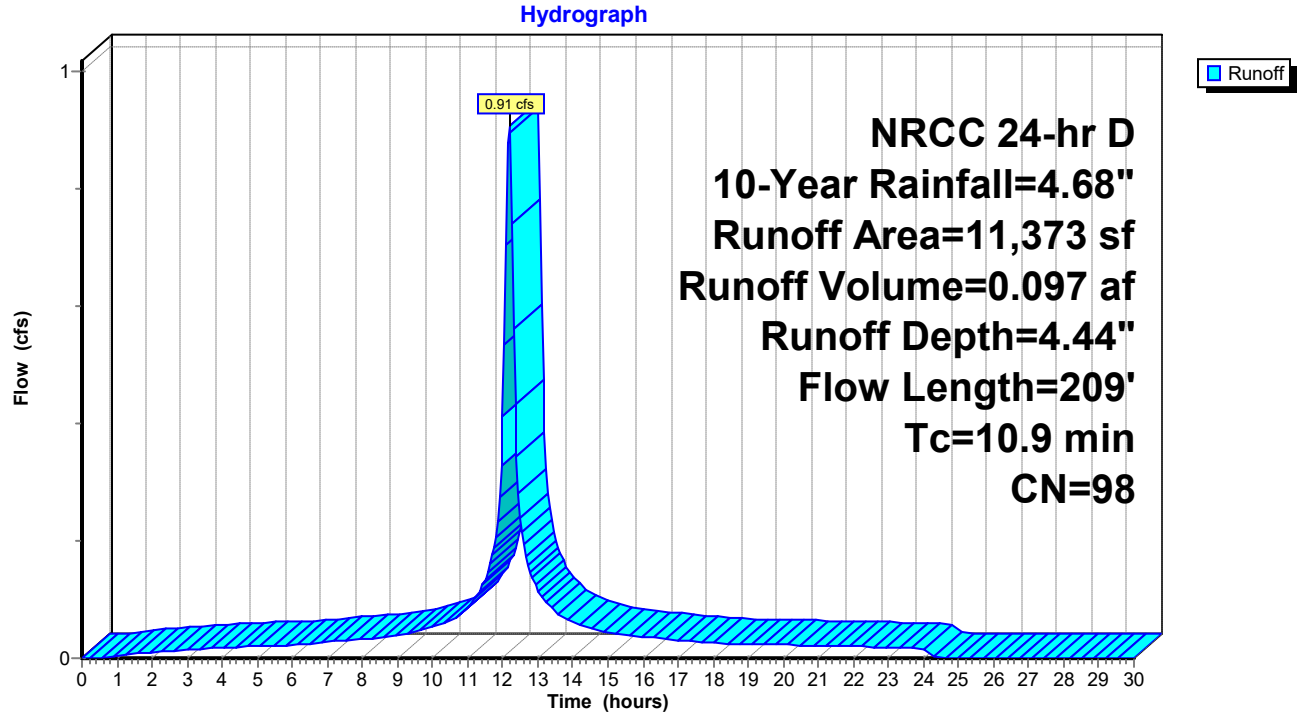
Runoff = 0.91 cfs @ 12.18 hrs, Volume= 0.097 af, Depth= 4.44"
Routed to Reach DCB-A : TO DMH-D

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

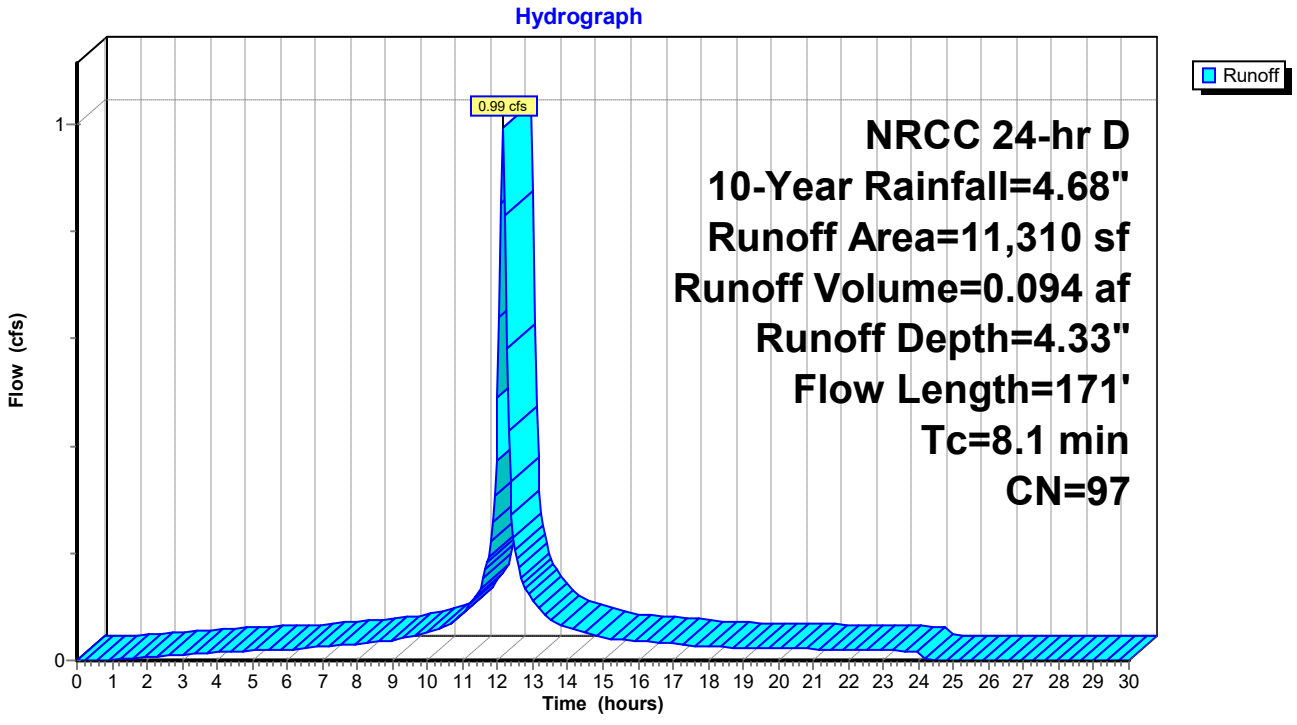
Runoff = 0.99 cfs @ 12.15 hrs, Volume= 0.094 af, Depth= 4.33"
Routed to Reach DCB-B : TO DMH-E

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

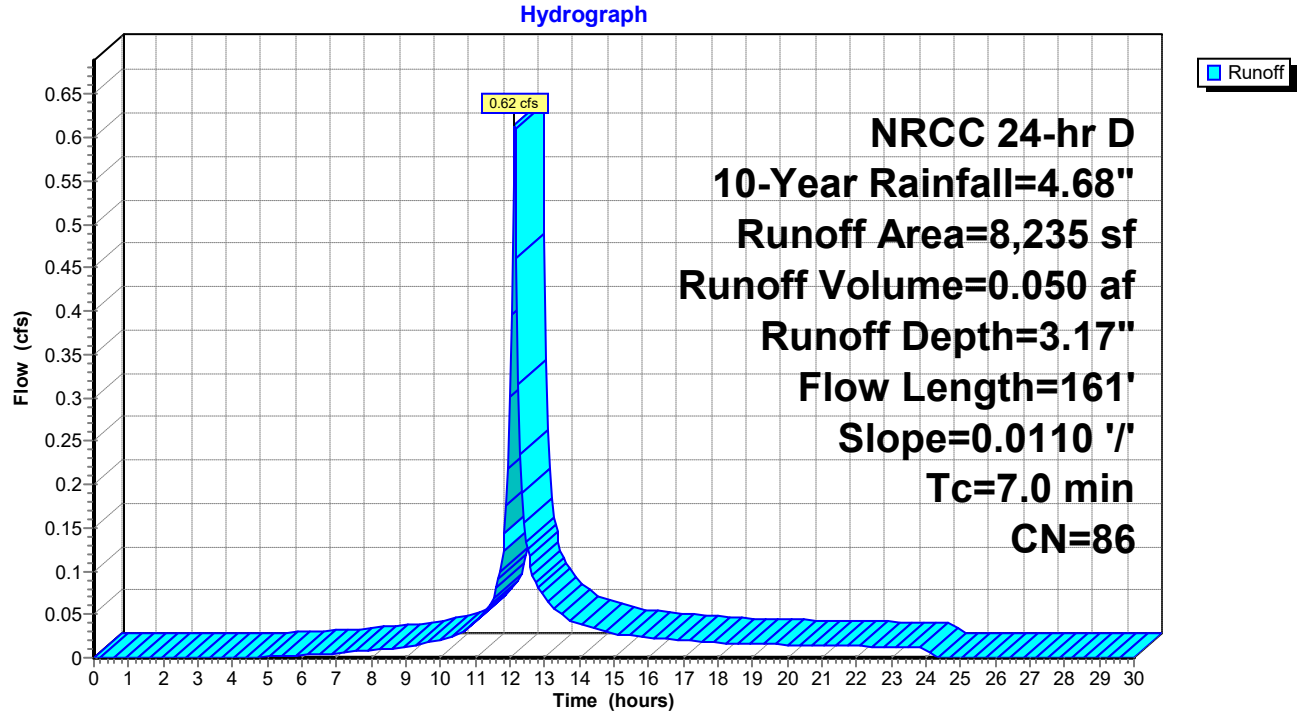
Runoff = 0.62 cfs @ 12.14 hrs, Volume= 0.050 af, Depth= 3.17"
Routed to Reach DCB-C : TO TRUNKLINE

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

[49] Hint: Tc<2dt may require smaller dt

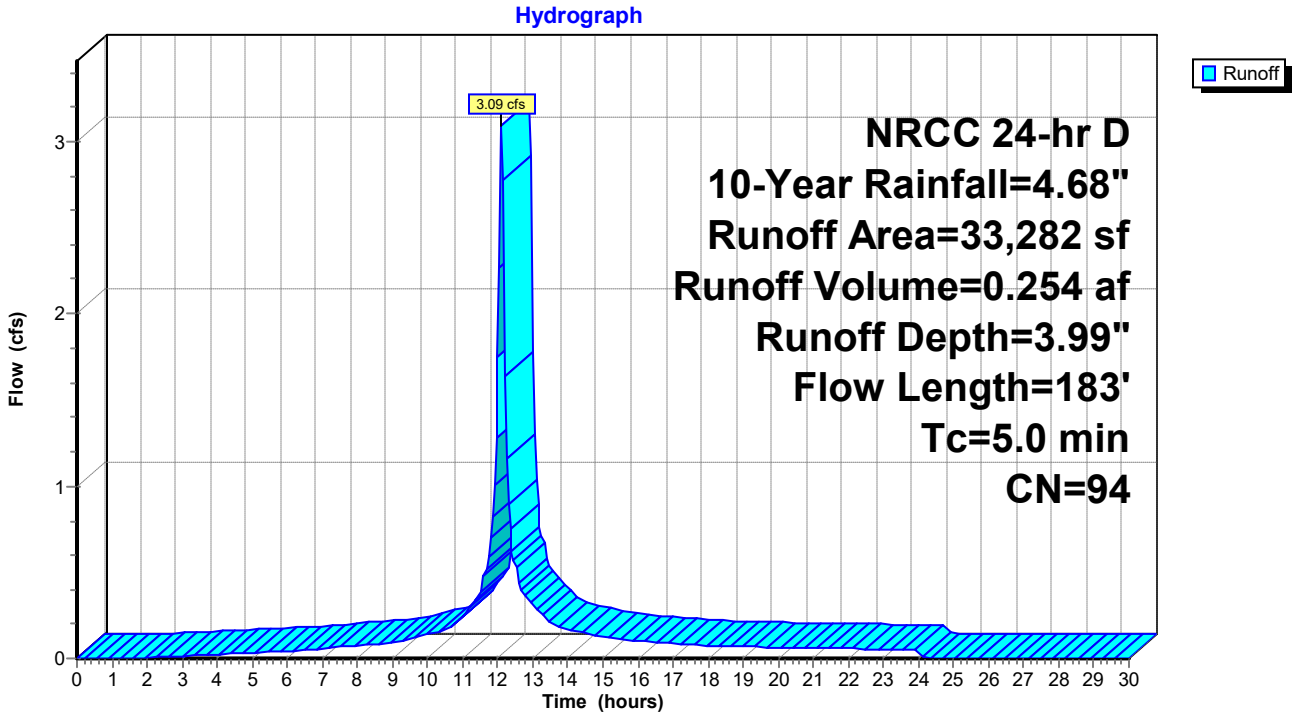
Runoff = 3.09 cfs @ 12.11 hrs, Volume= 0.254 af, Depth= 3.99"
Routed to Pond LP1 : TO DCB-D

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

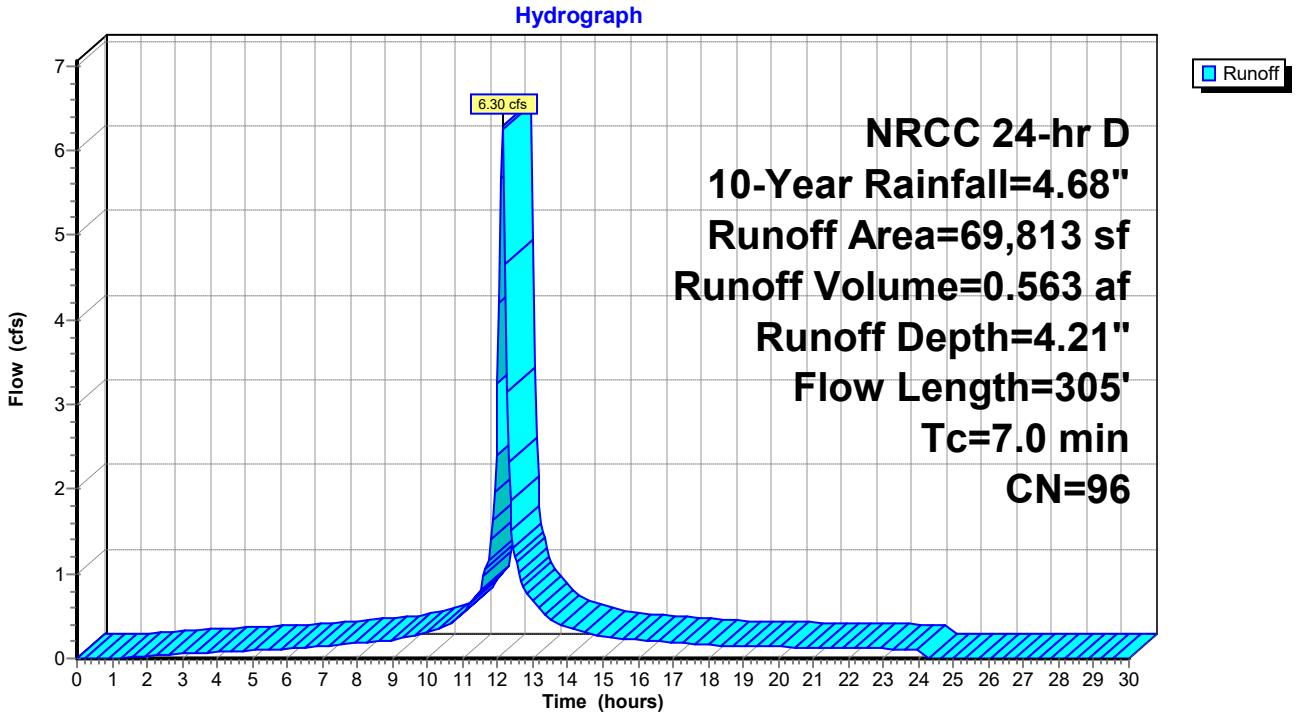
Runoff = 6.30 cfs @ 12.14 hrs, Volume= 0.563 af, Depth= 4.21"
Routed to Reach DCB-D : TO DMH-A

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

[49] Hint: Tc<2dt may require smaller dt

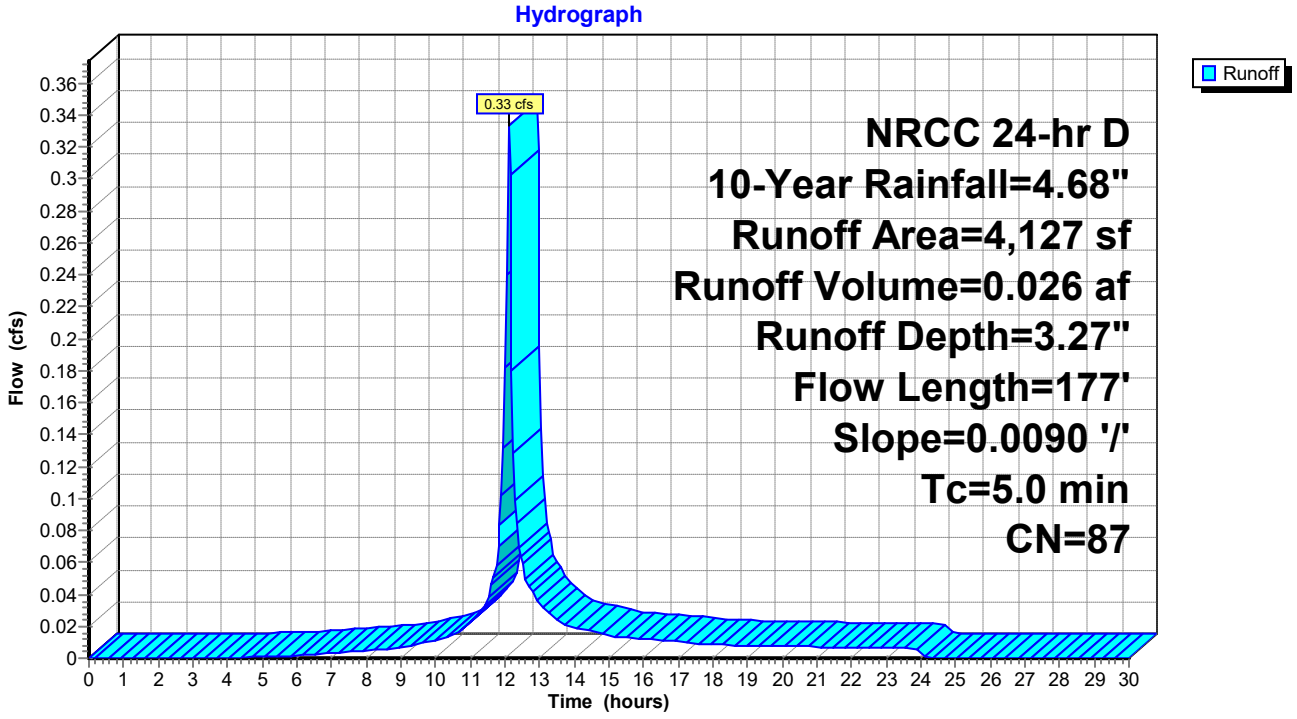
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.026 af, Depth= 3.27"
Routed to Reach DCB-E : TO DMH-A

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

[49] Hint: Tc<2dt may require smaller dt

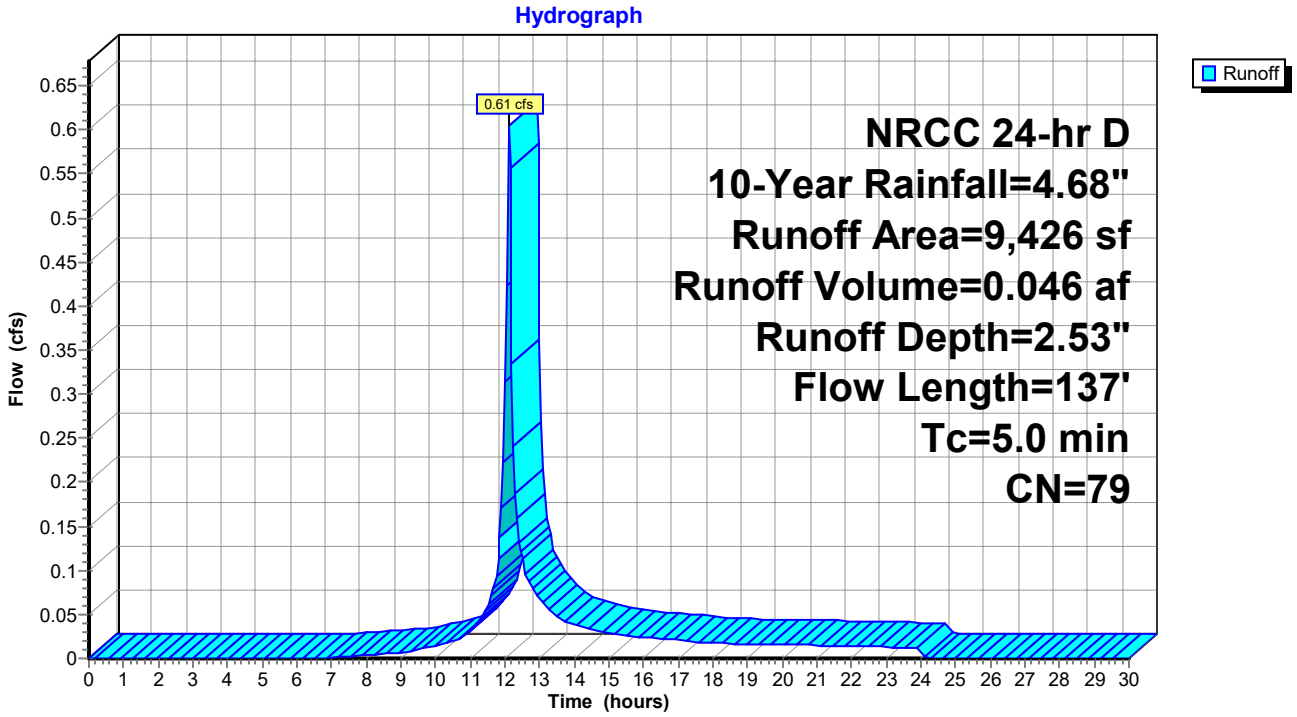
Runoff = 0.61 cfs @ 12.12 hrs, Volume= 0.046 af, Depth= 2.53"
Routed to Reach DP3 : CATCHBASIN (FIRE STATION)

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

[49] Hint: Tc<2dt may require smaller dt

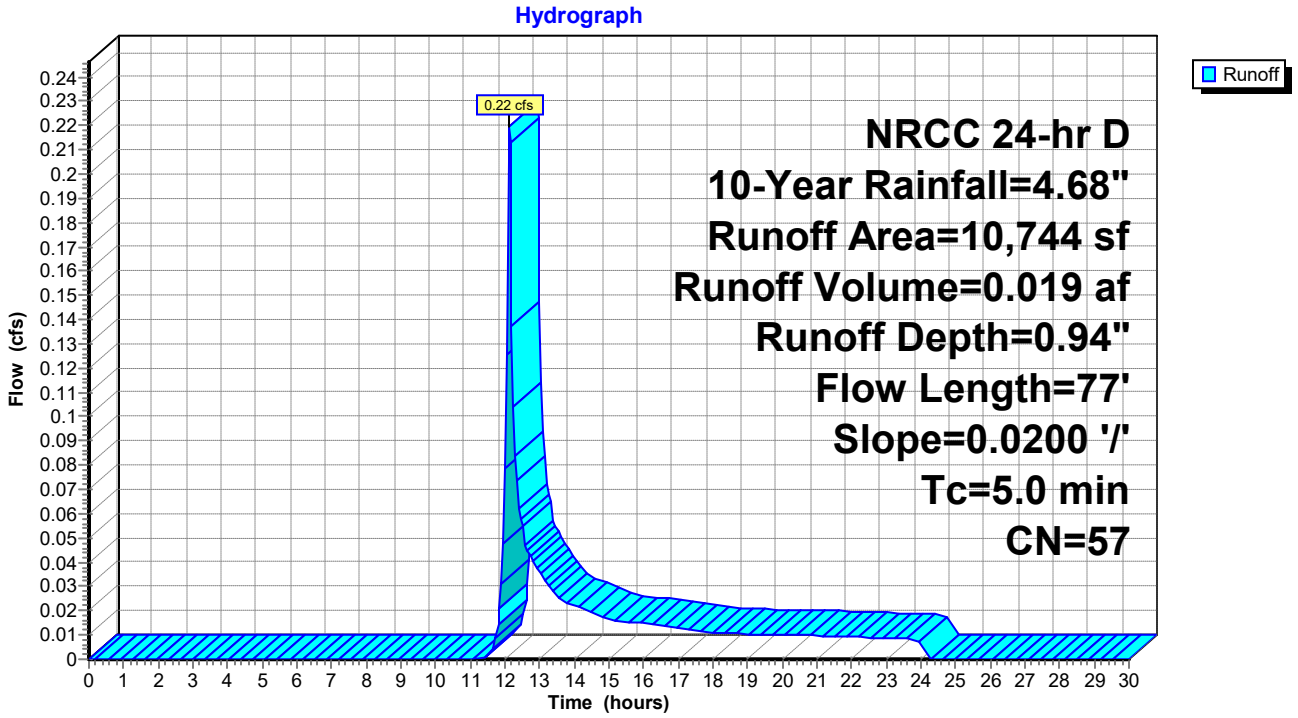
Runoff = 0.22 cfs @ 12.13 hrs, Volume= 0.019 af, Depth= 0.94"
Routed to Reach EX DCB : EX DCB

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

[49] Hint: Tc<2dt may require smaller dt

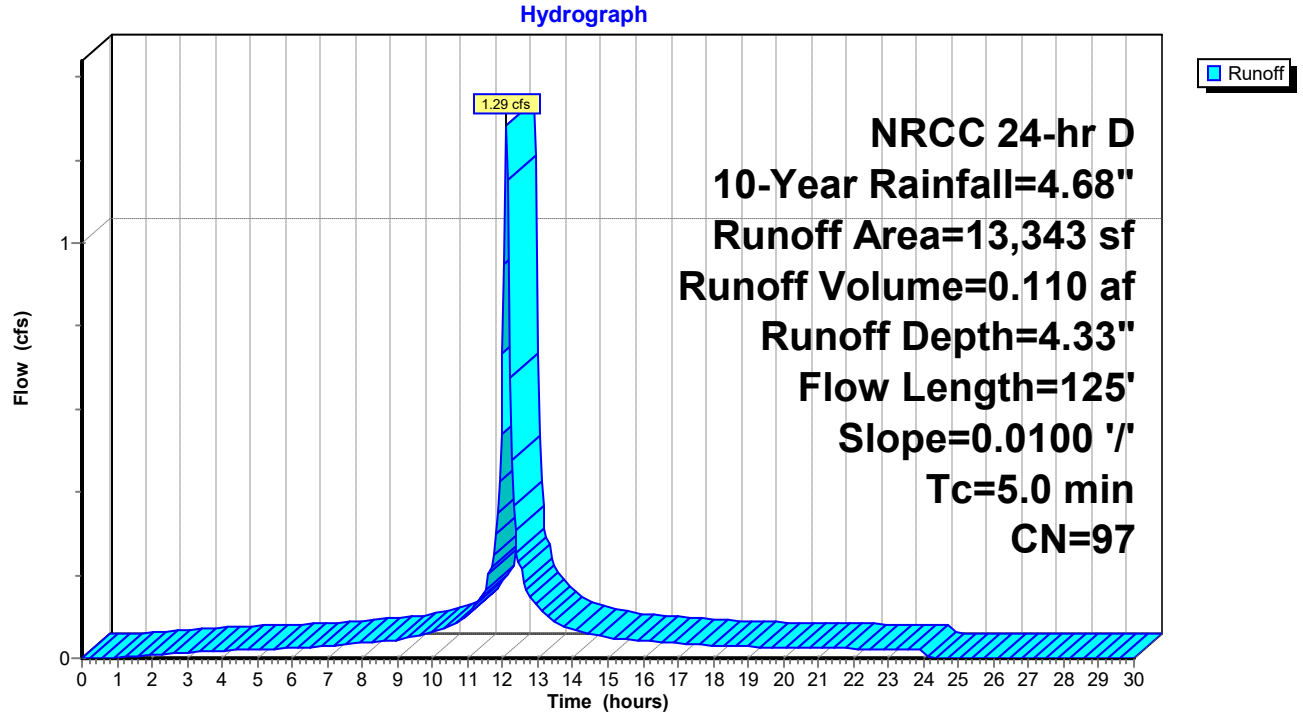
Runoff = 1.29 cfs @ 12.11 hrs, Volume= 0.110 af, Depth= 4.33"
Routed to Reach YDA : (new Reach)

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

[49] Hint: Tc<2dt may require smaller dt

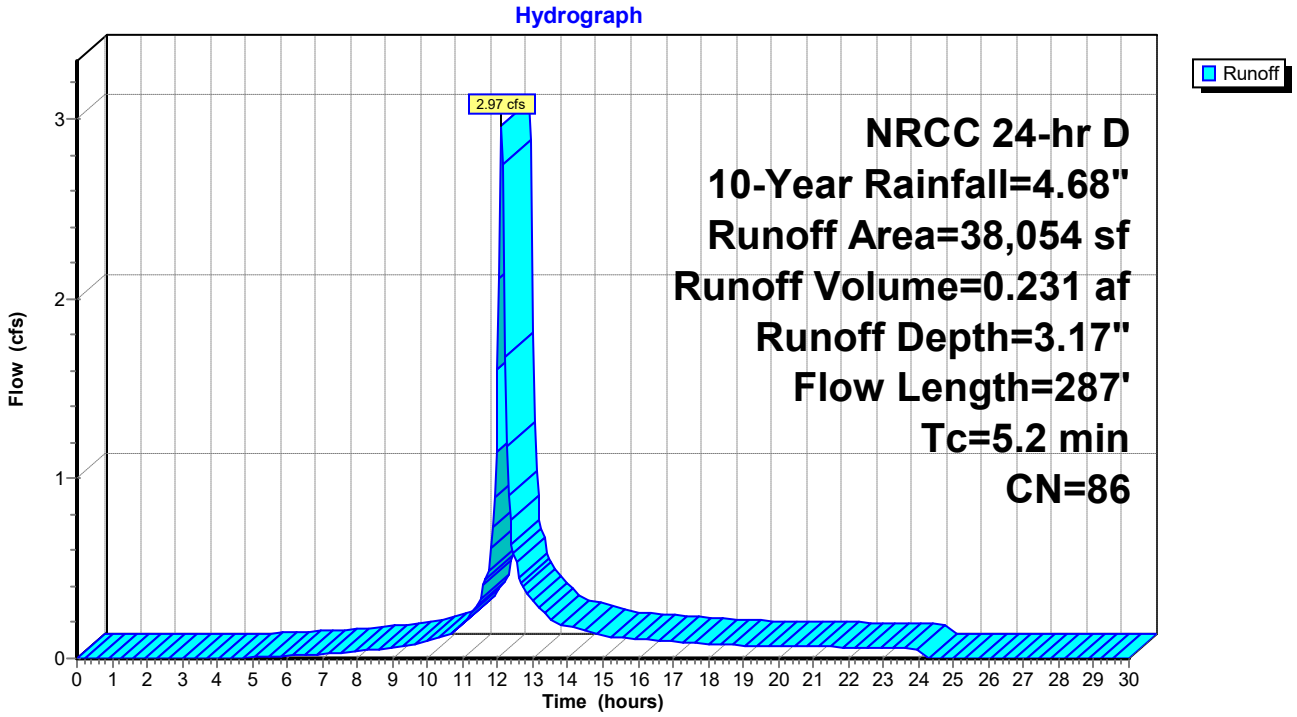
Runoff = 2.97 cfs @ 12.12 hrs, Volume= 0.231 af, Depth= 3.17"
Routed to Reach DCB-F : (new Reach)

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 LOW POINT #2 (LP2)

[49] Hint: Tc<2dt may require smaller dt

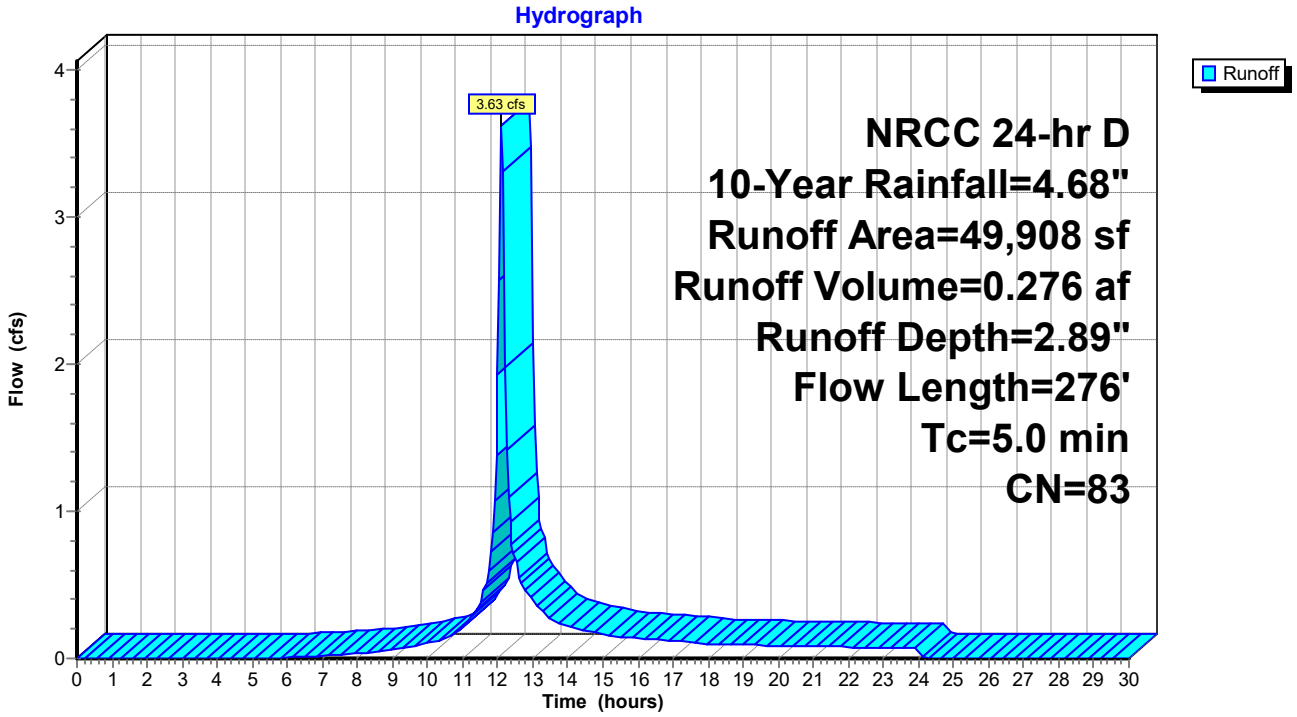
Runoff = 3.63 cfs @ 12.11 hrs, Volume= 0.276 af, Depth= 2.89"
Routed to Reach LP2 : TO DMH-K1

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
11,774	39	>75% Grass cover, Good, HSG A
37,475	98	Paved parking, HSG A
659	48	Brush, Poor, HSG A
49,908	83	Weighted Average
12,433		24.91% Pervious Area
37,475		75.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	45	0.0600	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	5	0.0380	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.0	226	0.0380	3.96		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	276	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E24: TO LOW POINT #2 (LP2)



Summary for Subcatchment E25: TO LOW POINT #3 (LP#3)

[49] Hint: Tc<2dt may require smaller dt

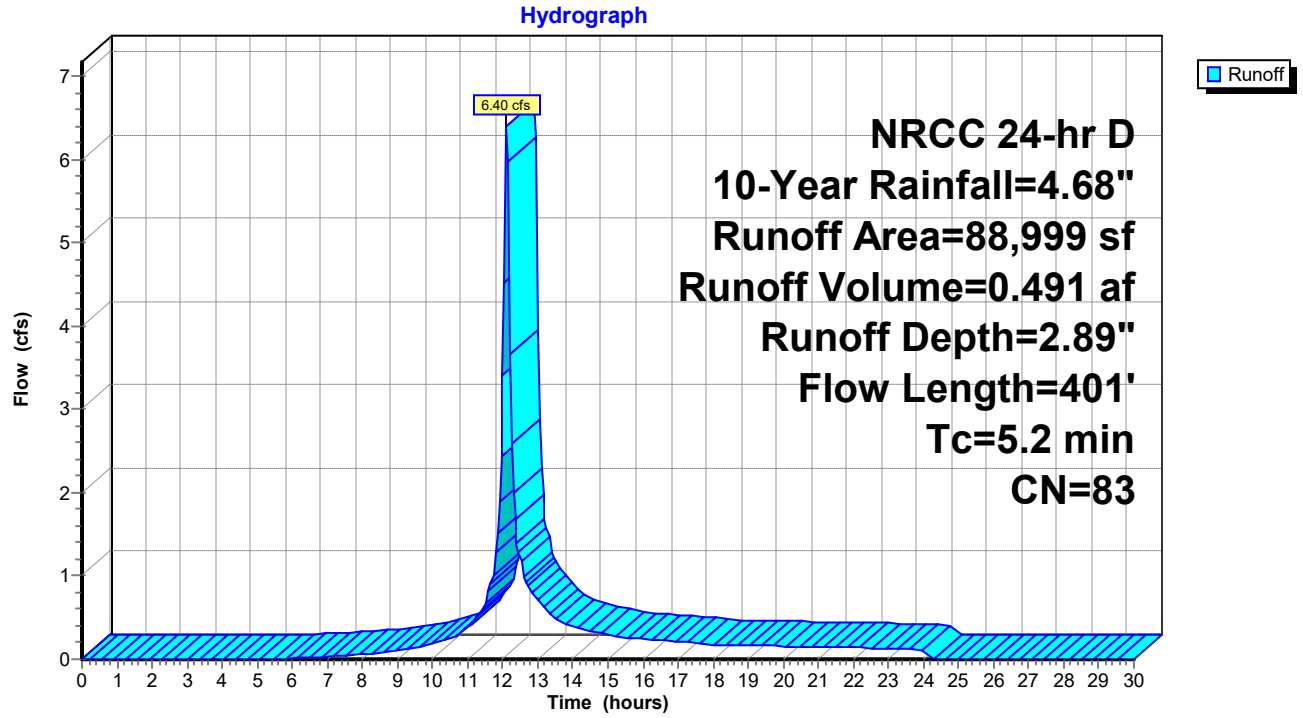
Runoff = 6.40 cfs @ 12.12 hrs, Volume= 0.491 af, Depth= 2.89"
Routed to Pond LP3 : OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2

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
22,346	39	>75% Grass cover, Good, HSG A
66,653	98	Paved parking, HSG A
88,999	83	Weighted Average
22,346		25.11% Pervious Area
66,653		74.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	75	0.1300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.0	10	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.5	316	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.2	401	Total			

Subcatchment E25: TO LOW POINT #3 (LP#3)



Summary for Subcatchment E26: TO DCB-H

[49] Hint: Tc<2dt may require smaller dt

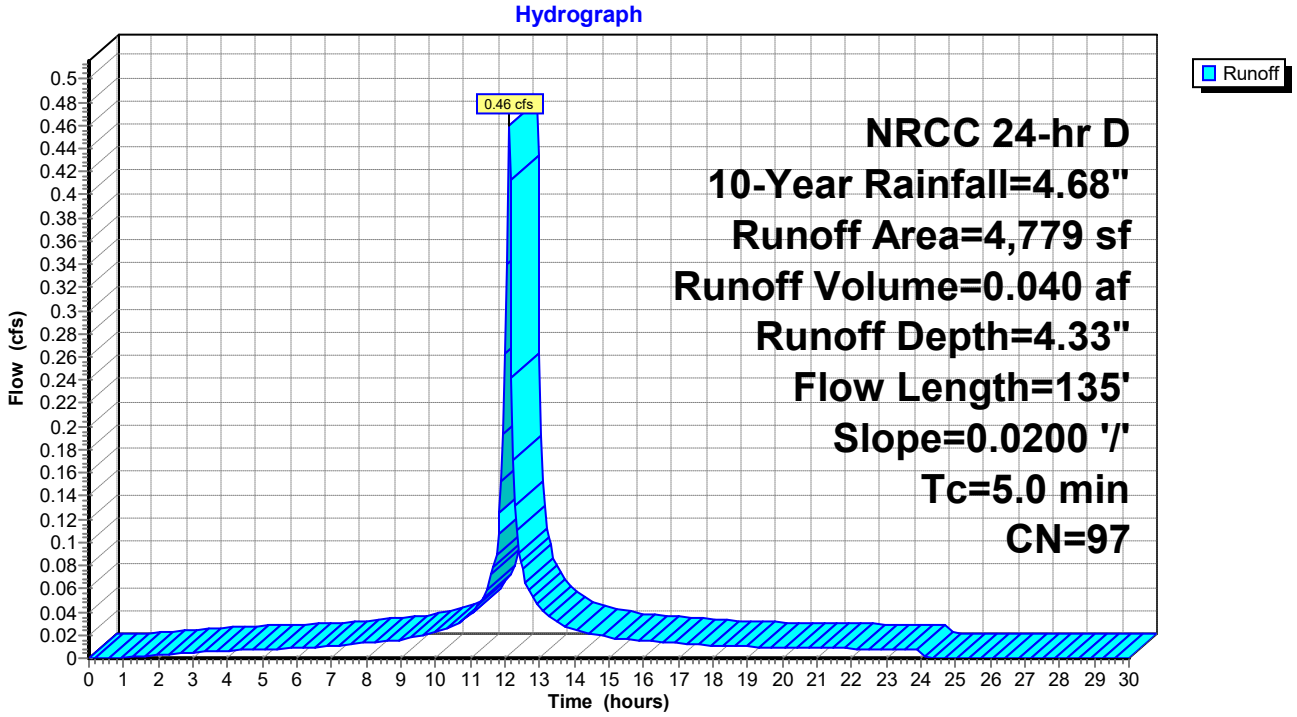
Runoff = 0.46 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 4.33"
Routed to Reach DP5 : DCB-H

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 Subcatchment e27: TO OFF SITE POINT (DP#6)

[49] Hint: Tc<2dt may require smaller dt

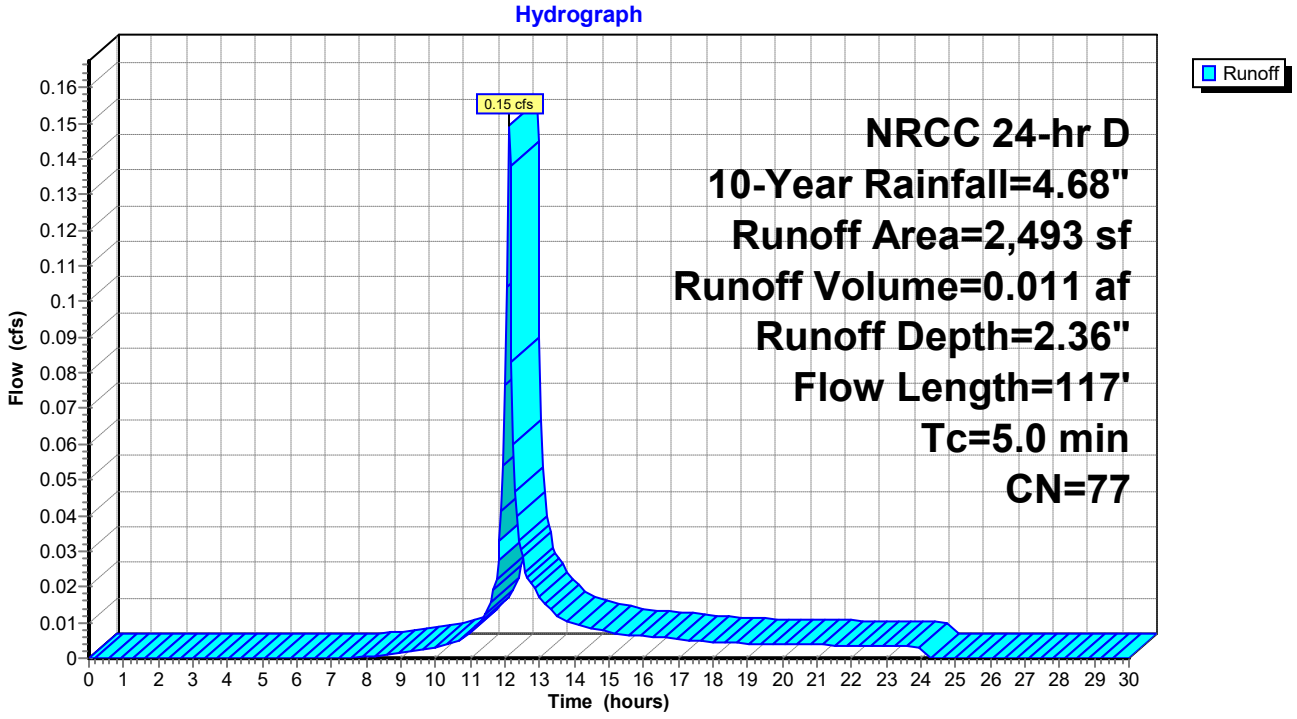
Runoff = 0.15 cfs @ 12.12 hrs, Volume= 0.011 af, Depth= 2.36"
Routed to Reach DP#6 : OFFSITE LOW POINT

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
907	39	>75% Grass cover, Good, HSG A
1,586	98	Paved parking, HSG A
2,493	77	Weighted Average
907		36.38% Pervious Area
1,586		63.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	75	0.1000	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	42	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.3	117	Total, Increased to minimum Tc = 5.0 min			

Subcatchment e27: TO OFF SITE POINT (DP#6)



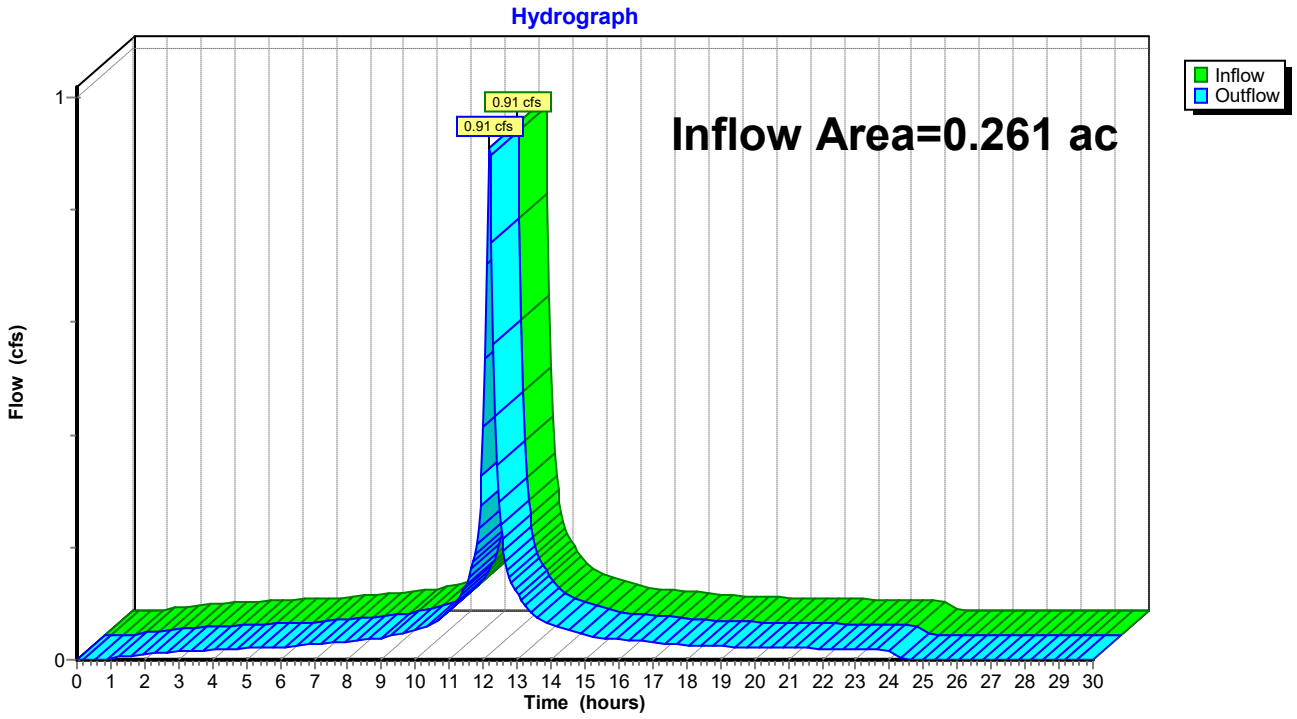
Summary for Reach DCB-A: TO DMH-D

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-D : TO DMH-C

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

Reach DCB-A: TO DMH-D



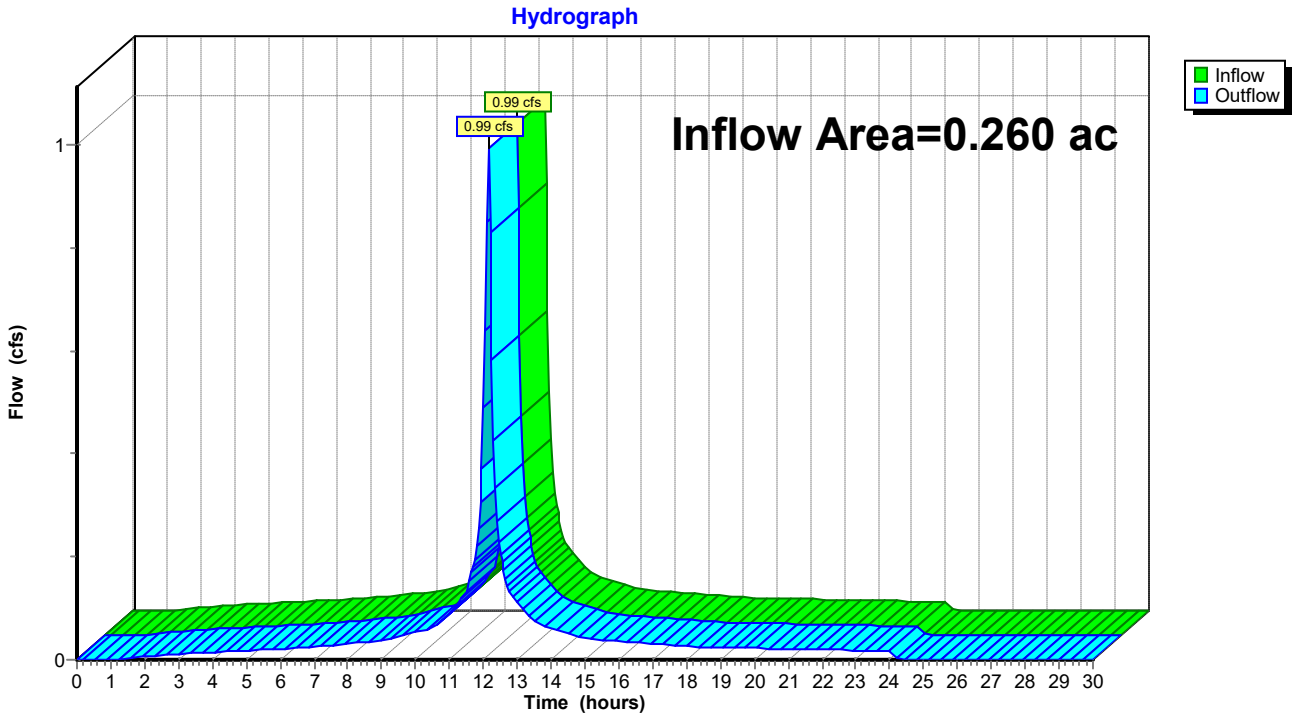
Summary for Reach DCB-B: TO DMH-E

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-E : TO DMH-D

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

Reach DCB-B: TO DMH-E



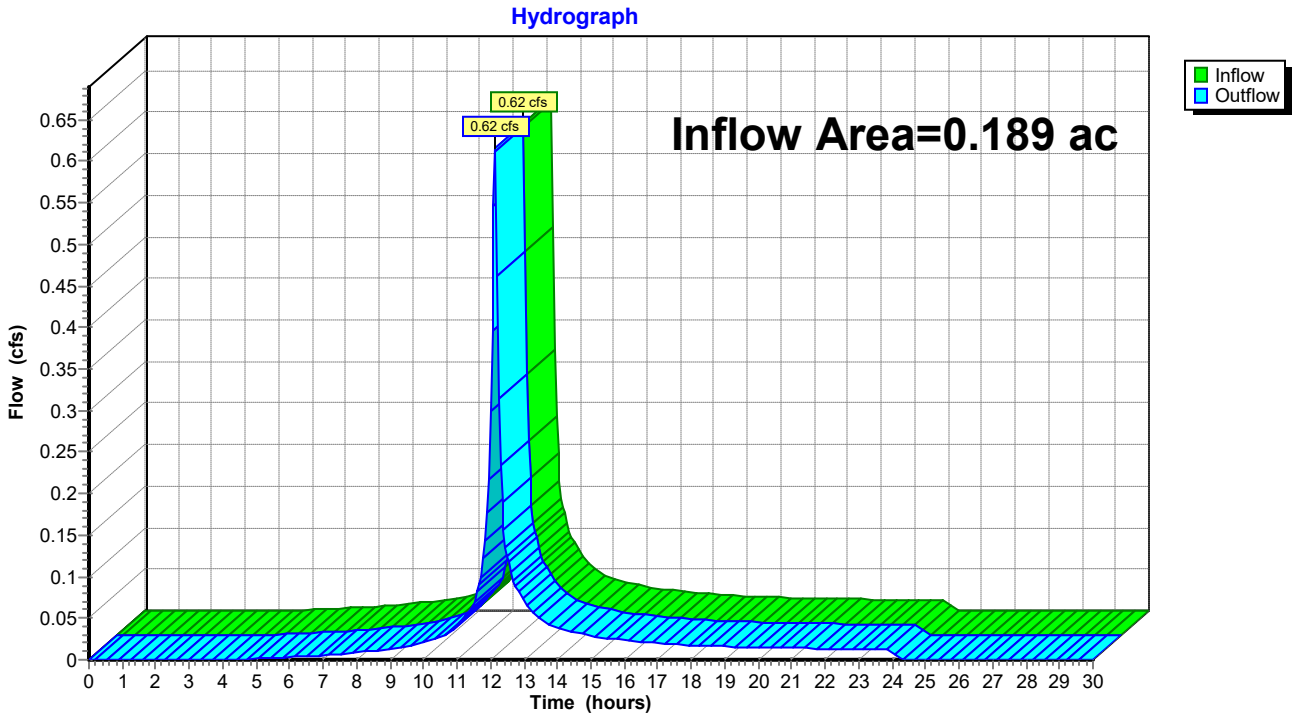
Summary for Reach DCB-C: TO TRUNKLINE

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-E : TO DMH-D

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

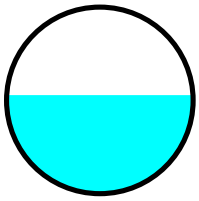
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 2.367 ac, 77.91% Impervious, Inflow Depth = 4.14" for 10-Year event
Inflow = 9.34 cfs @ 12.13 hrs, Volume= 0.817 af
Outflow = 9.34 cfs @ 12.13 hrs, Volume= 0.817 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-A : TO DMH-B

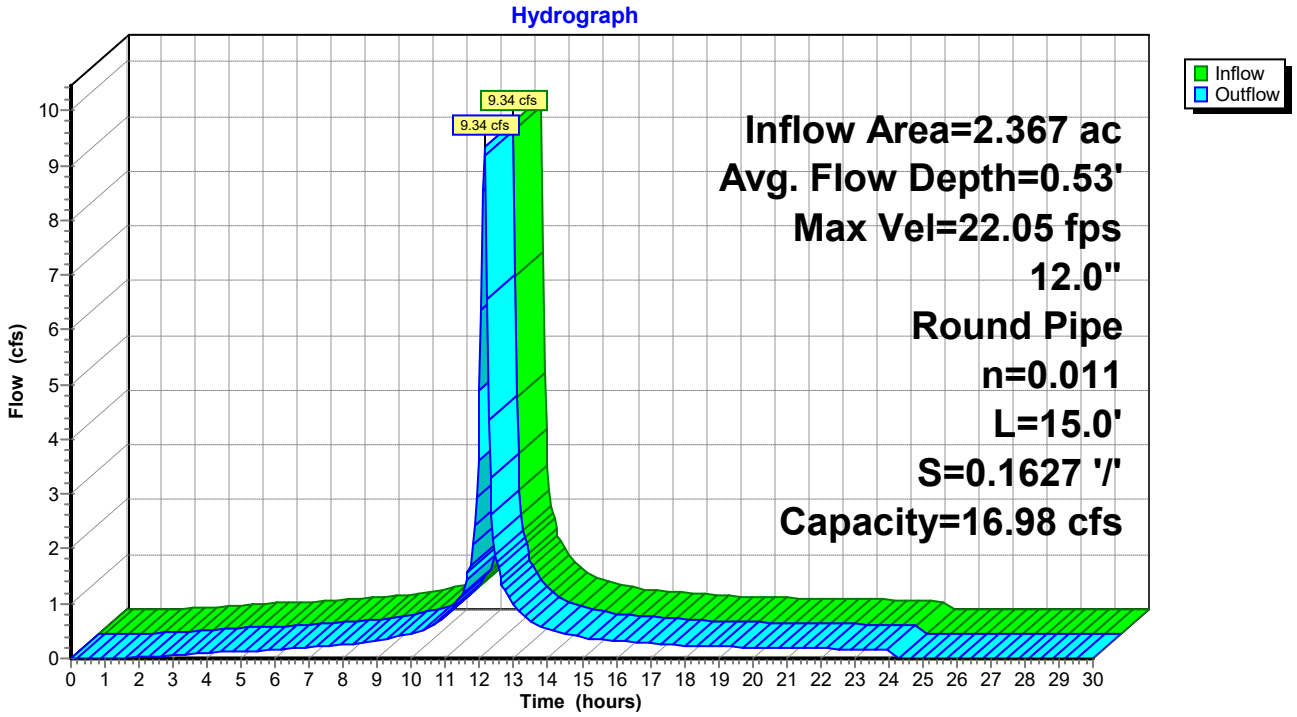
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 22.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 8.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 6 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 1.00'
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

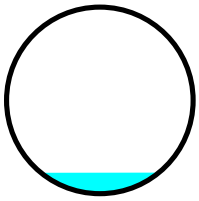
[52] Hint: Inlet/Outlet conditions not evaluated

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
Routed to Reach DMH-A : TO DMH-B

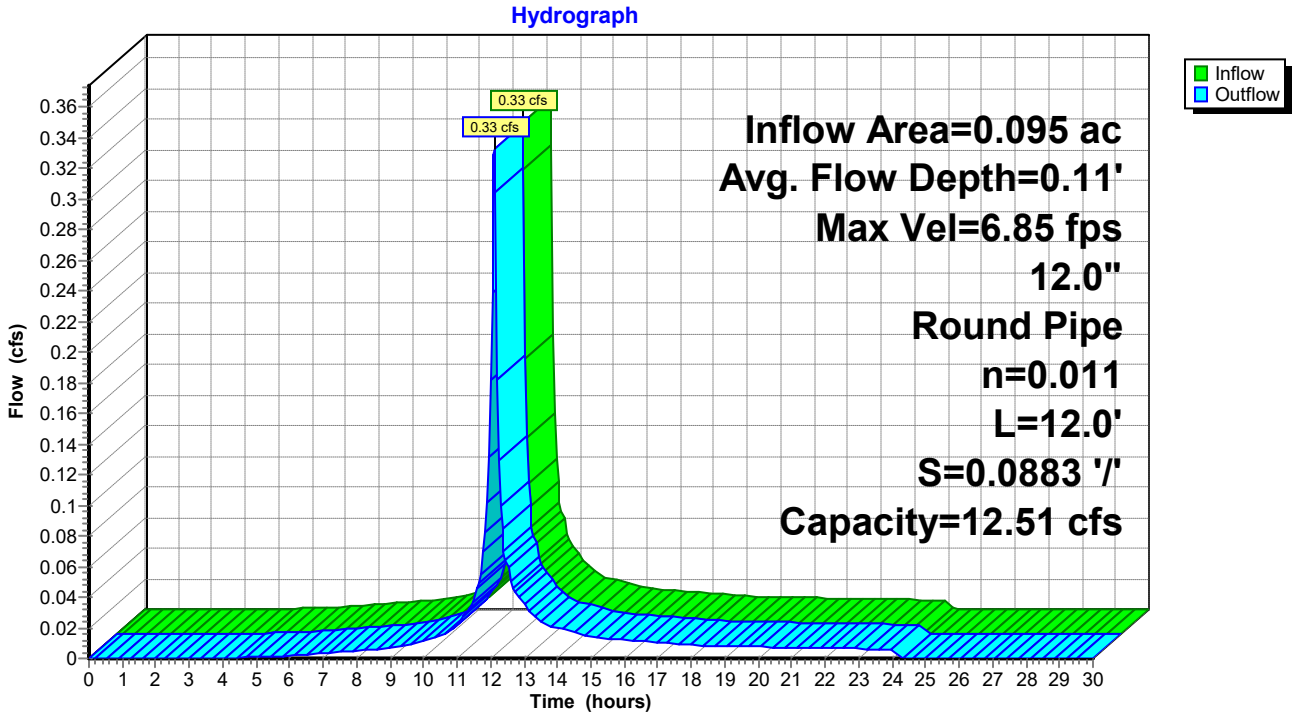
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.85 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.42 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 0.63'
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



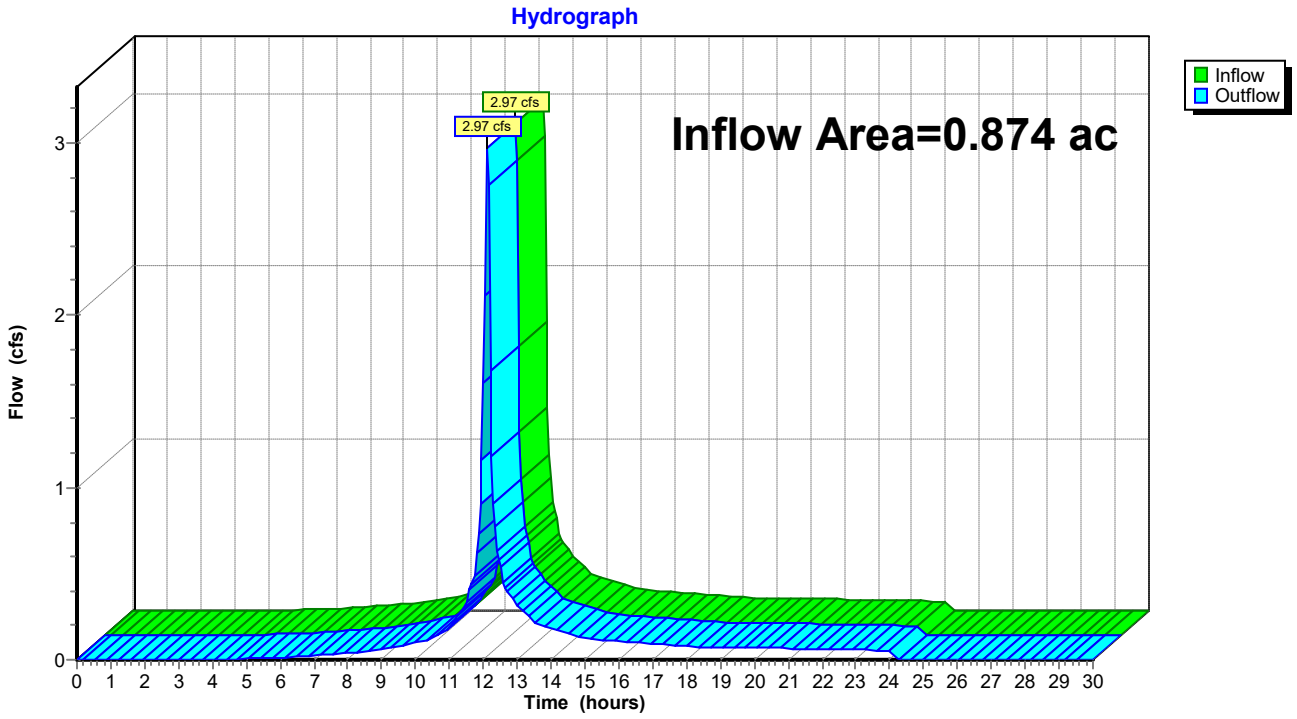
Summary for Reach DCB-F: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

Reach DCB-F: (new Reach)



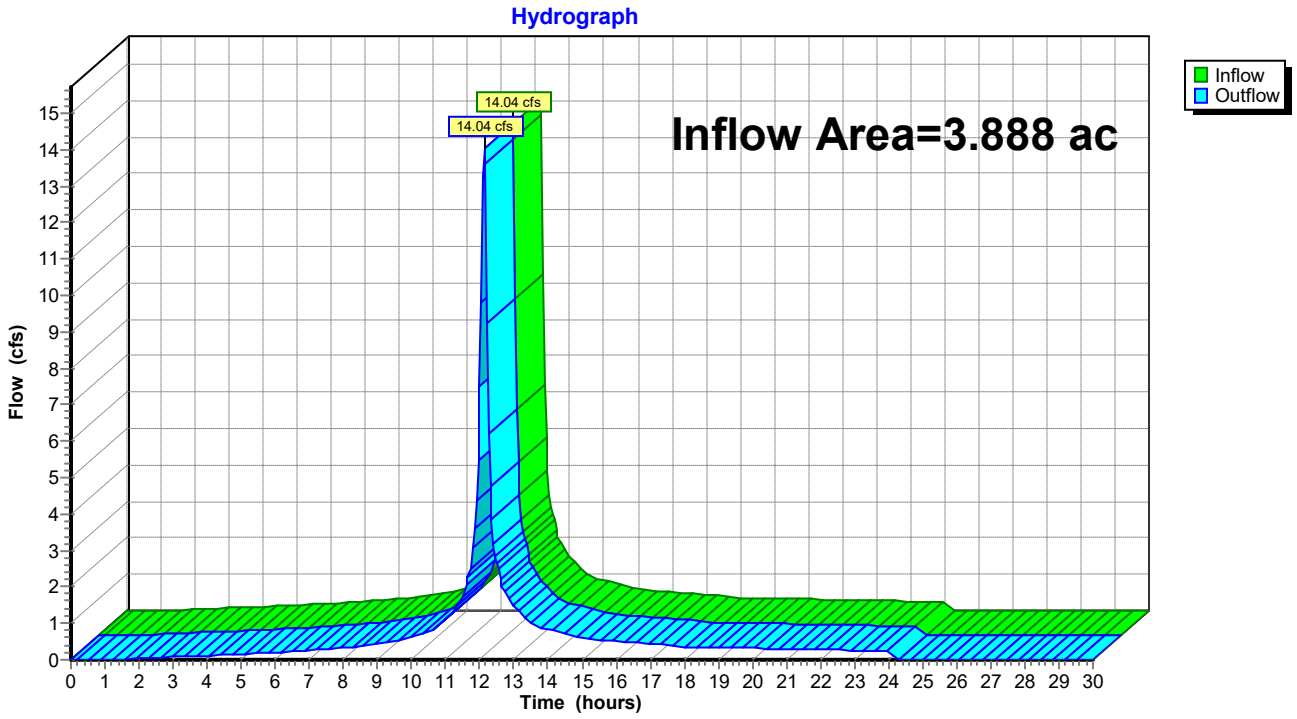
Summary for Reach DMH-A: TO DMH-B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 3.71" for 10-Year event
Inflow = 14.04 cfs @ 12.13 hrs, Volume= 1.203 af
Outflow = 14.04 cfs @ 12.13 hrs, Volume= 1.203 af, Atten= 0%, Lag= 0.0 min
Routed to Pond DMH-B : TO DMH-D

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

Reach DMH-A: TO DMH-B



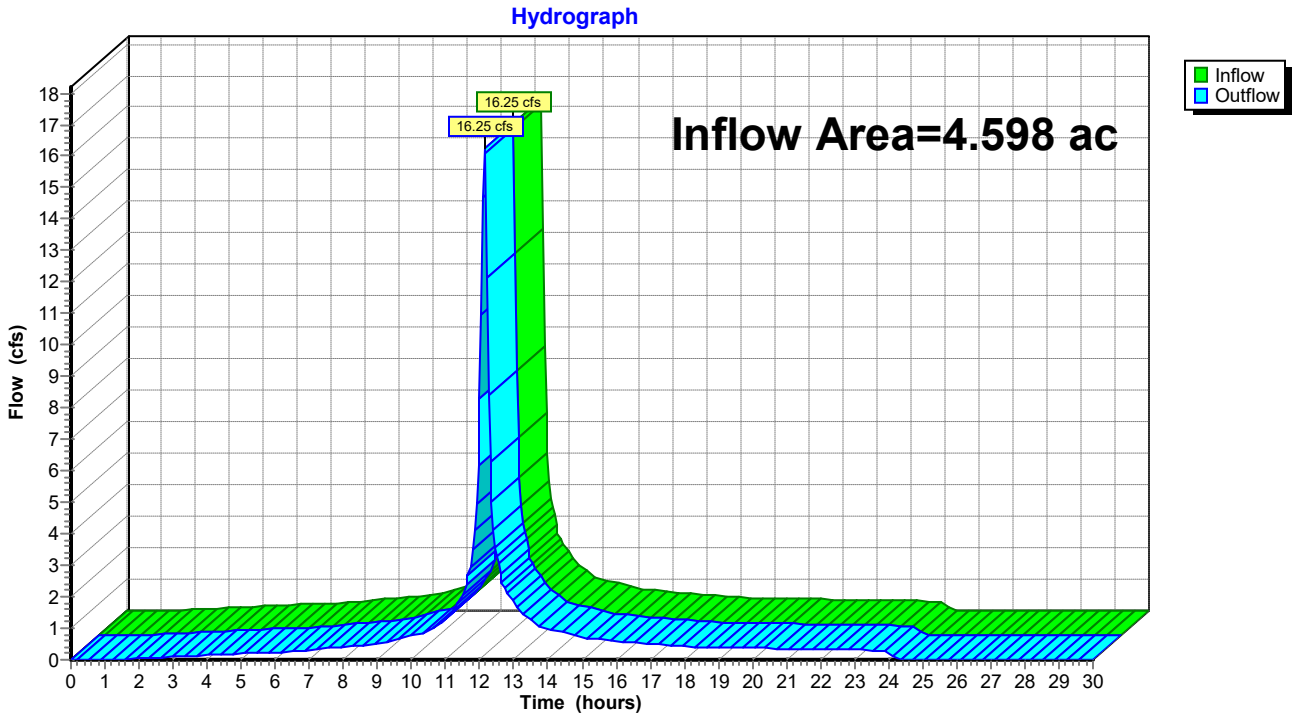
Summary for Reach DMH-C: TO DP#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 3.77" for 10-Year event
Inflow = 16.25 cfs @ 12.14 hrs, Volume= 1.443 af
Outflow = 16.25 cfs @ 12.14 hrs, Volume= 1.443 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

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

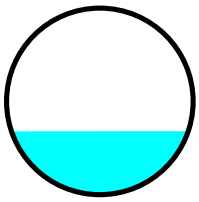
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH-E OUTLET depth by 0.67' @ 12.15 hrs
[79] Warning: Submerged Pond DMH-B Primary device # 1 INLET by 0.11'

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 3.77" for 10-Year event
Inflow = 16.36 cfs @ 12.13 hrs, Volume= 1.443 af
Outflow = 16.25 cfs @ 12.14 hrs, Volume= 1.443 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH-C : TO DP#1

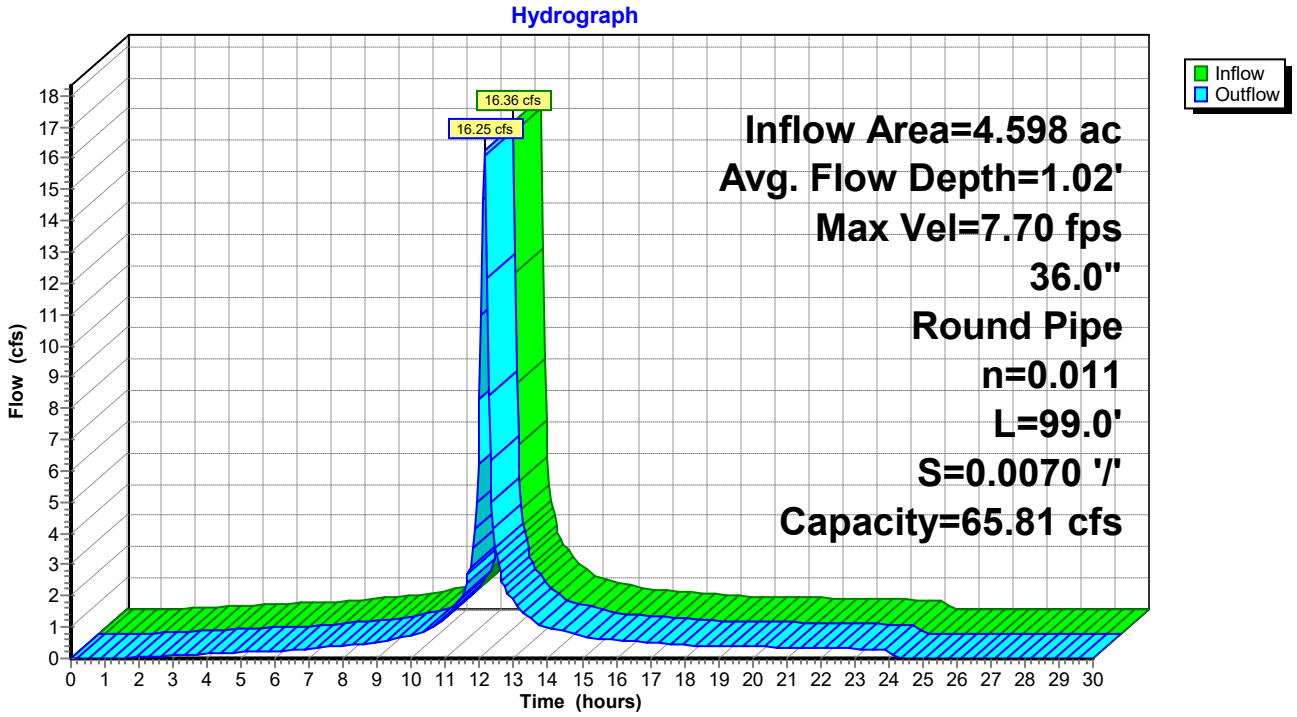
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.70 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.66 fps, Avg. Travel Time= 0.6 min

Peak Storage= 210 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.02' , Surface Width= 2.84'
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

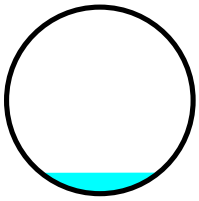
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-F outlet invert by 0.34' @ 12.15 hrs

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
Routed to Reach DMH-D : TO DMH-C

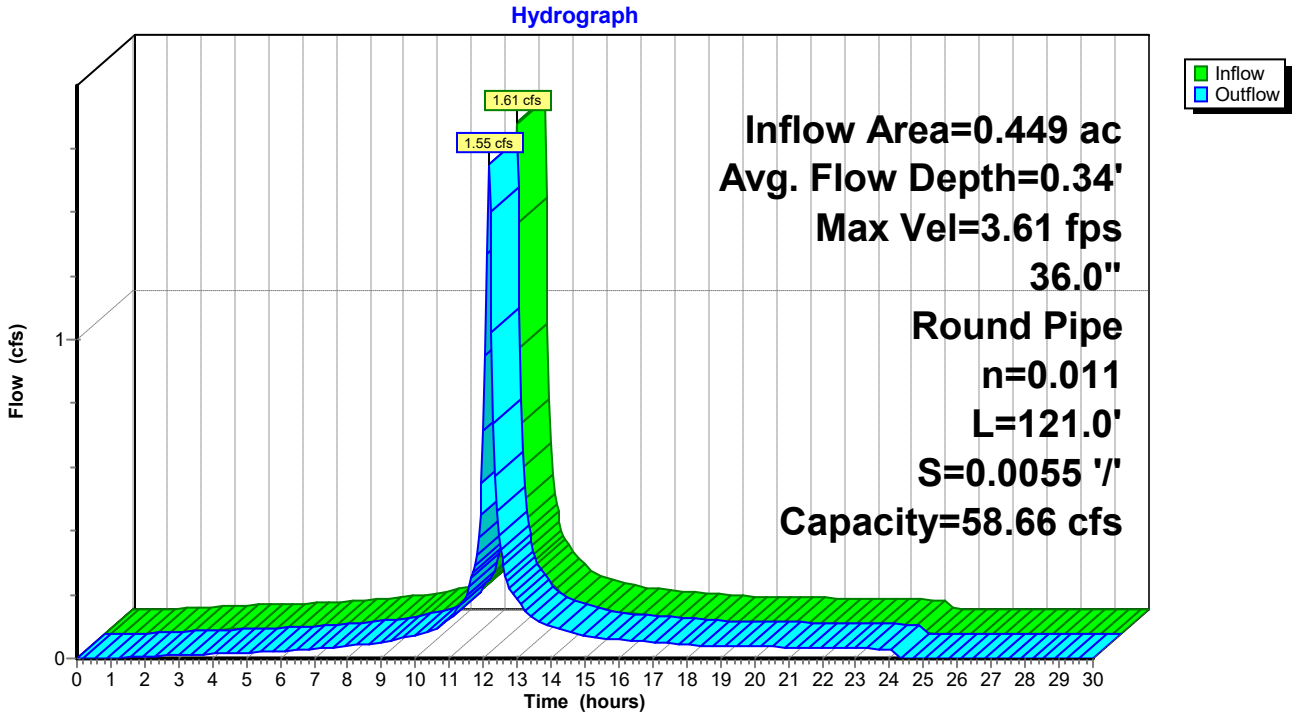
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.61 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 1.6 min

Peak Storage= 54 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 1.90'
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

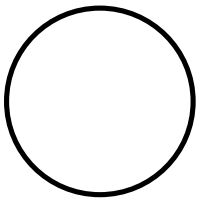


Summary for Reach DMH-F: TO DMH-E

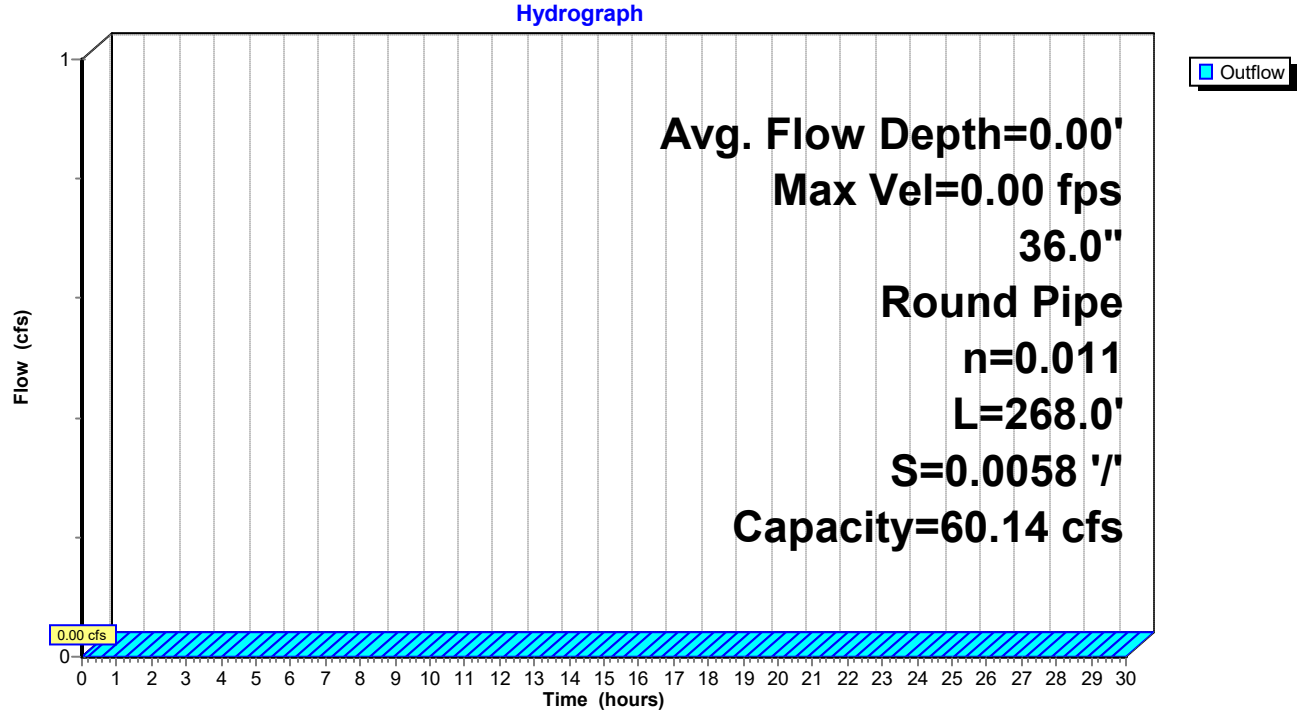
[43] Hint: Has no inflow (Outflow=Zero)

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



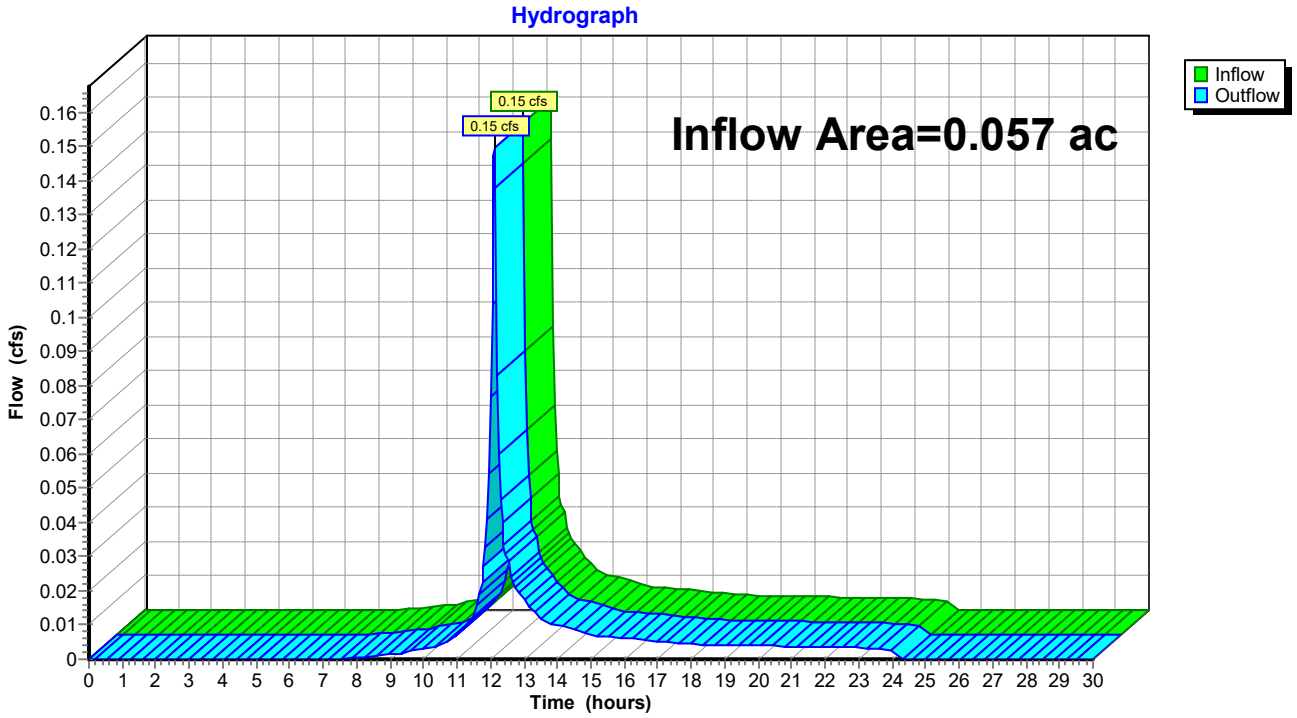
Summary for Reach DP#6: OFFSITE LOW POINT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.057 ac, 63.62% Impervious, Inflow Depth = 2.36" for 10-Year event
Inflow = 0.15 cfs @ 12.12 hrs, Volume= 0.011 af
Outflow = 0.15 cfs @ 12.12 hrs, Volume= 0.011 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 DP#6: OFFSITE LOW POINT



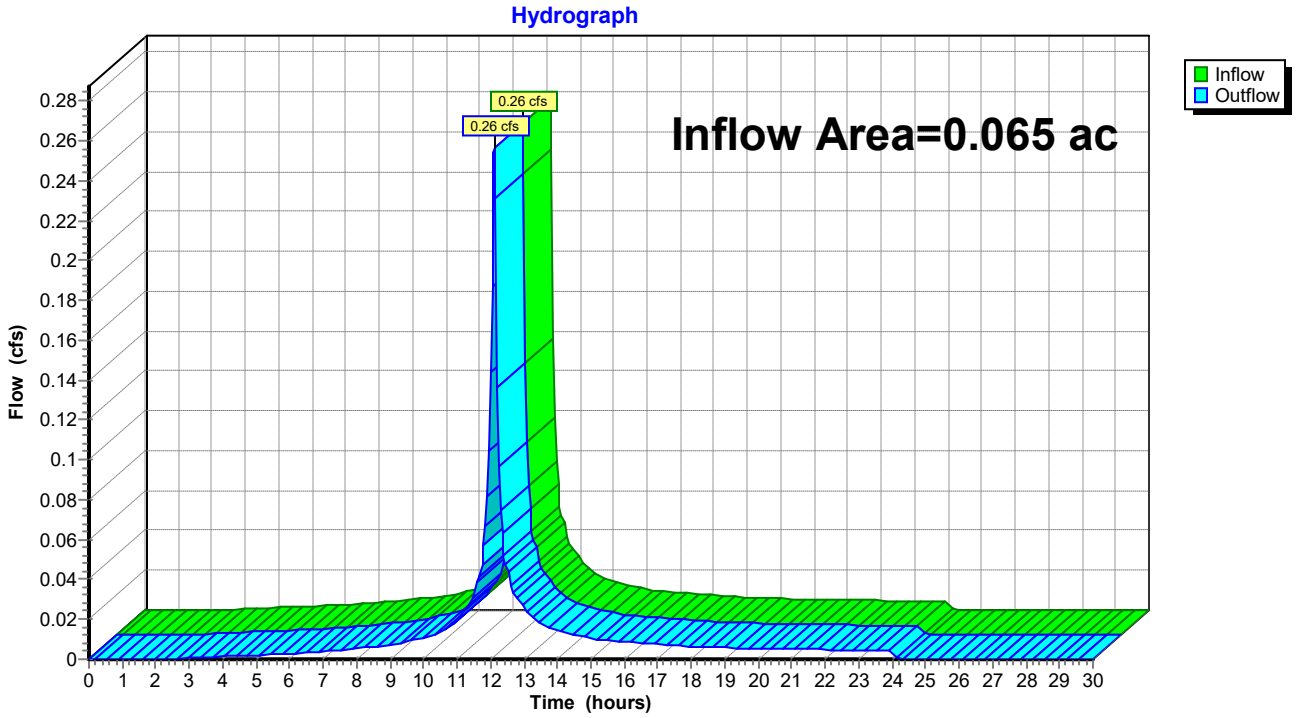
Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

[40] Hint: Not Described (Outflow=Inflow)

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)



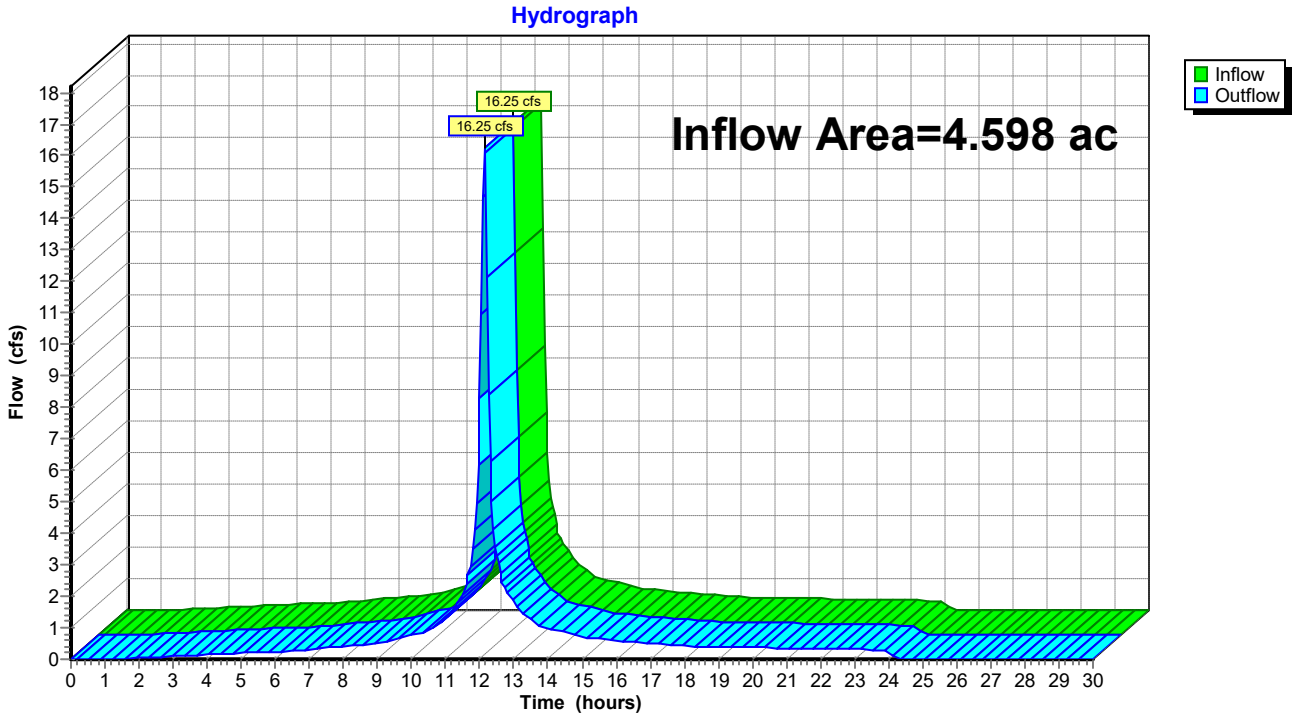
Summary for Reach DP2: MUNICIPAL SYSTEM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 3.77" for 10-Year event
Inflow = 16.25 cfs @ 12.14 hrs, Volume= 1.443 af
Outflow = 16.25 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



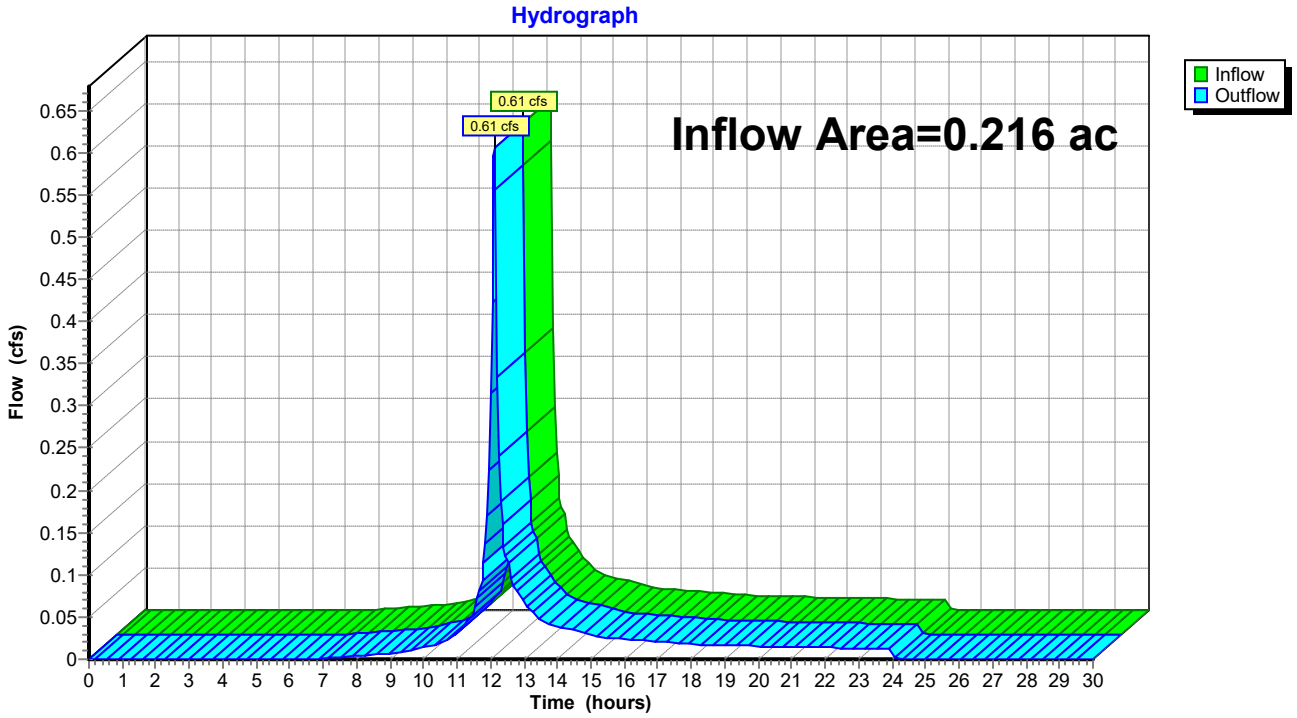
Summary for Reach DP3: CATCHBASIN (FIRE STATION)

[40] Hint: Not Described (Outflow=Inflow)

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)



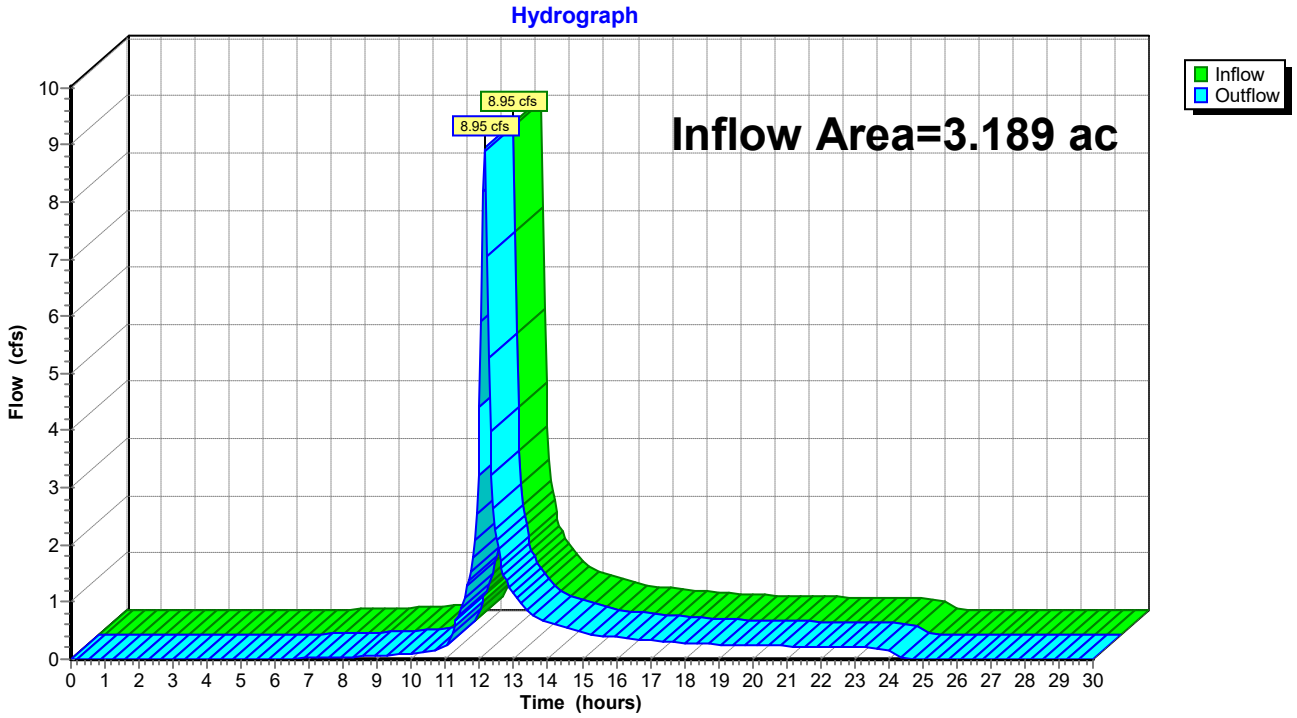
Summary for Reach DP4: DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.189 ac, 74.96% Impervious, Inflow Depth = 2.70" for 10-Year event
Inflow = 8.95 cfs @ 12.14 hrs, Volume= 0.717 af
Outflow = 8.95 cfs @ 12.14 hrs, Volume= 0.717 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: DMH-K1



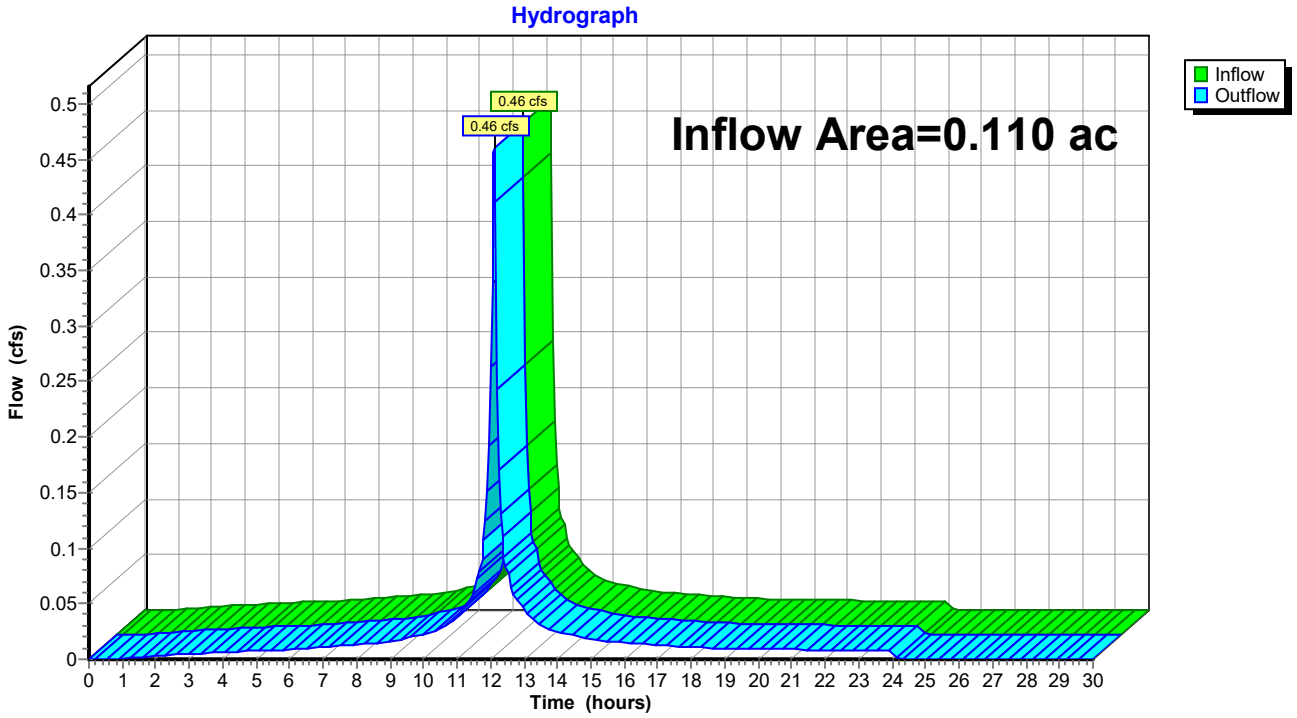
Summary for Reach DP5: DCB-H

[40] Hint: Not Described (Outflow=Inflow)

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



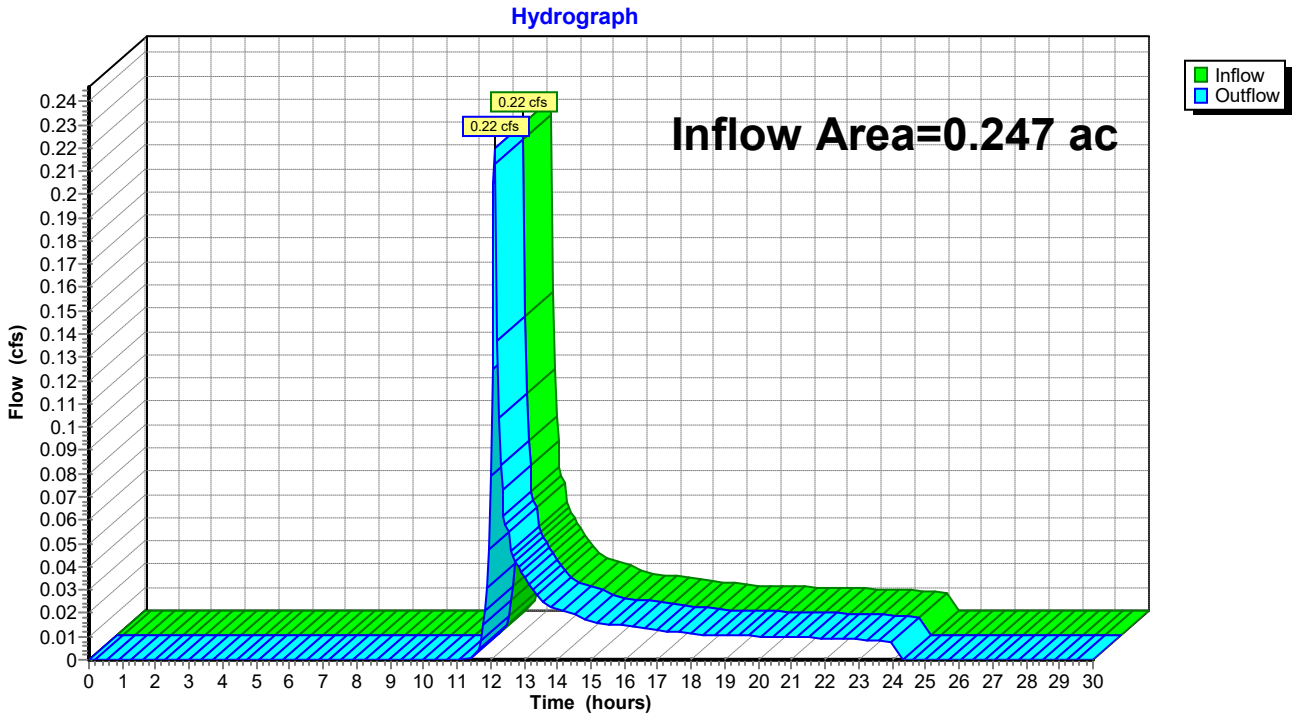
Summary for Reach EX DCB: EX DCB

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

Reach EX DCB: EX DCB



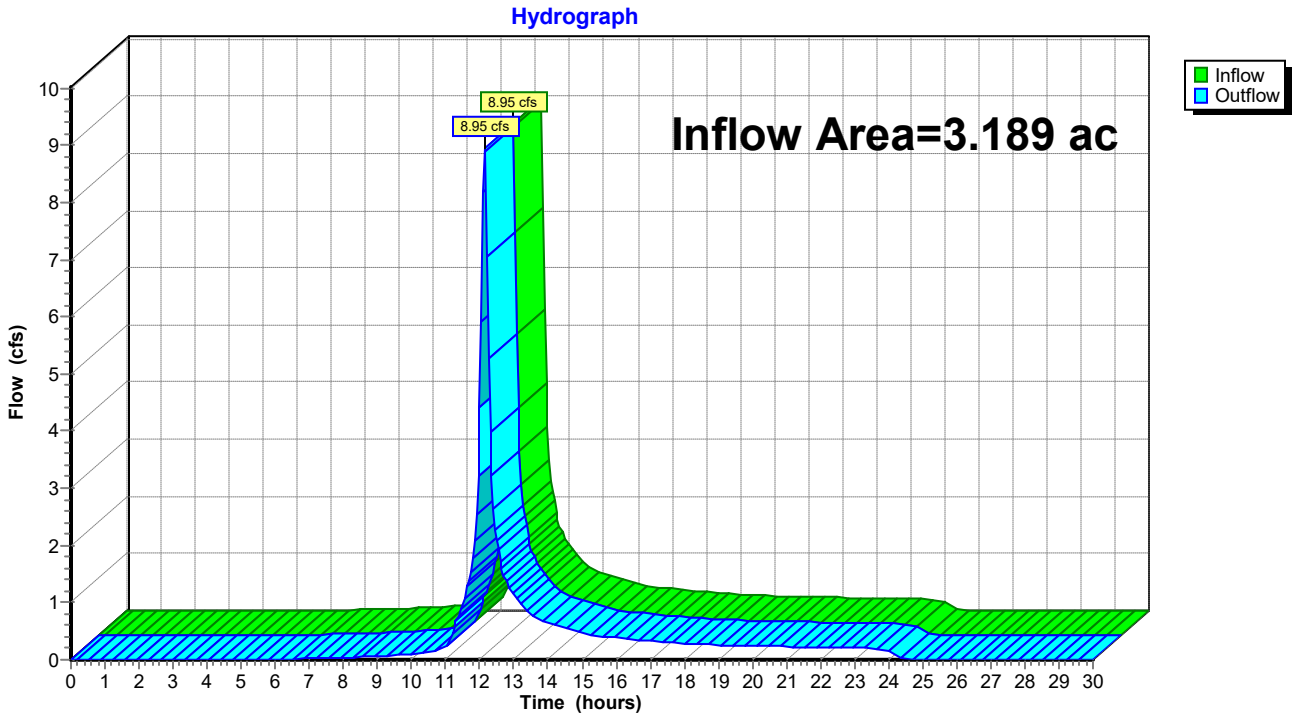
Summary for Reach LP2: TO DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.189 ac, 74.96% Impervious, Inflow Depth = 2.70" for 10-Year event
Inflow = 8.95 cfs @ 12.14 hrs, Volume= 0.717 af
Outflow = 8.95 cfs @ 12.14 hrs, Volume= 0.717 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

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

Reach LP2: TO DMH-K1



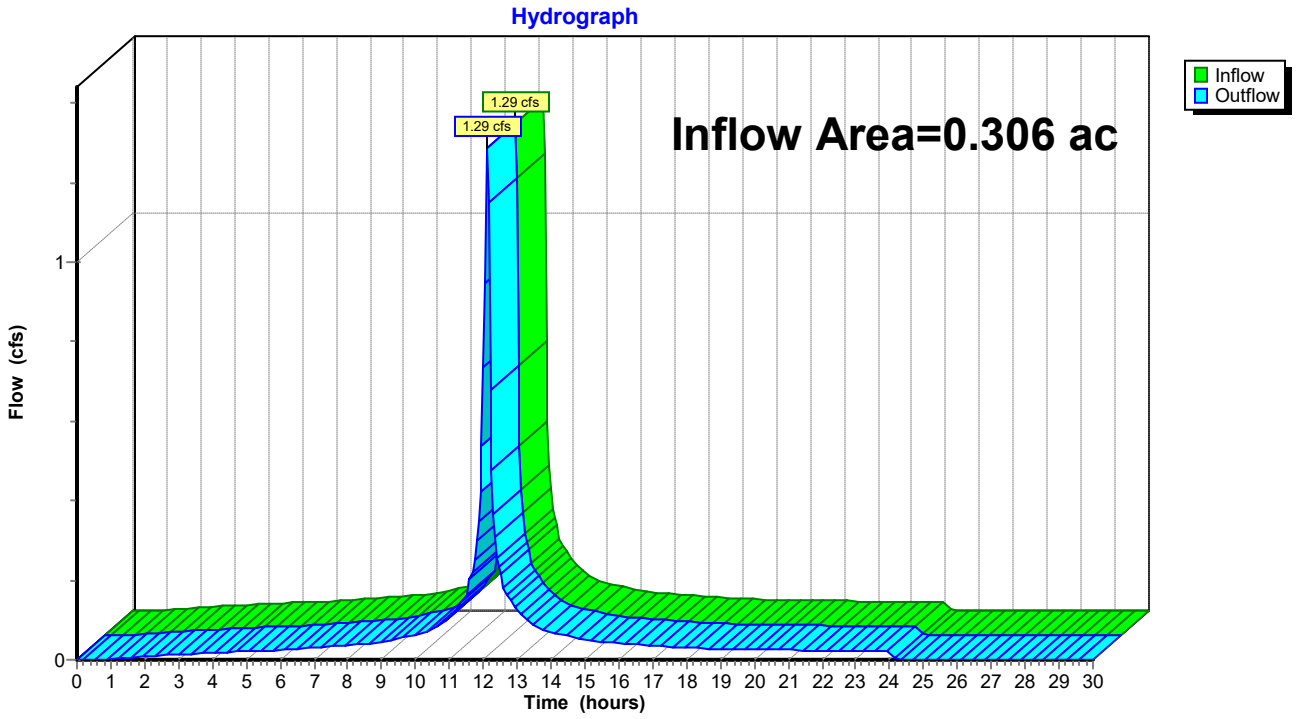
Summary for Reach YDA: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

[57] Hint: Peaked at 463.00' (Flood elevation advised)

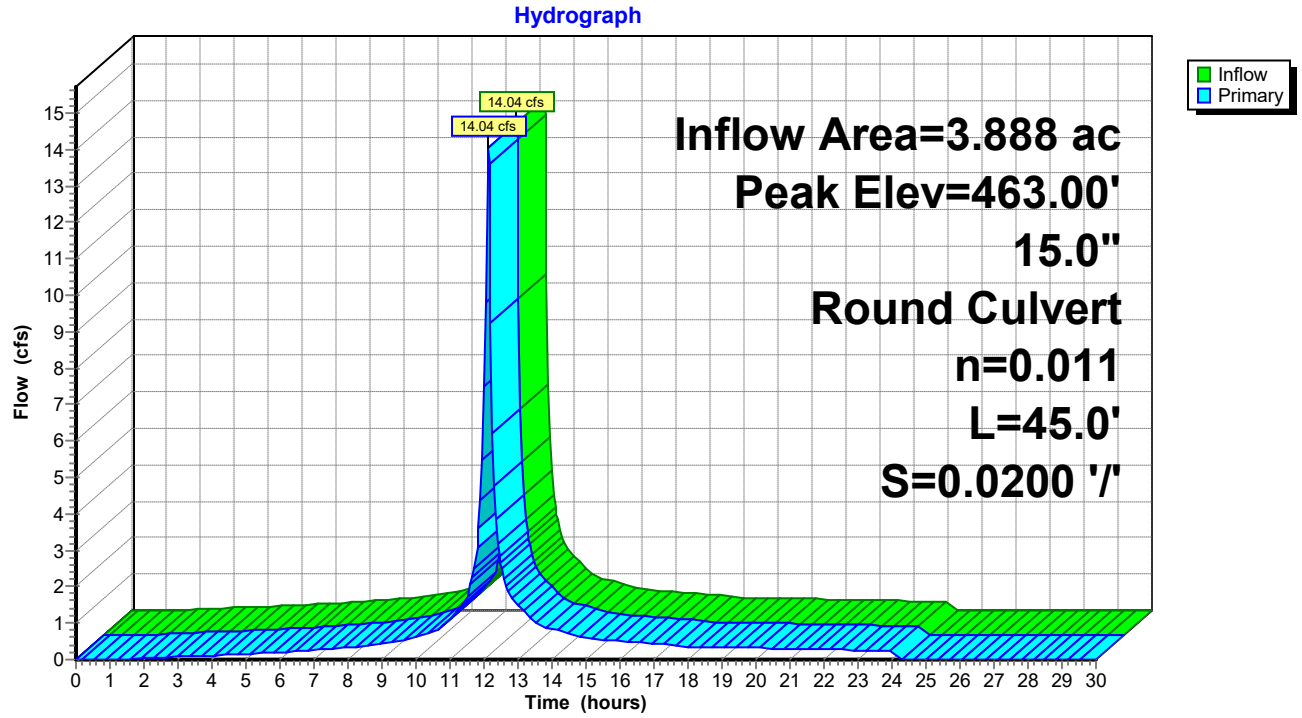
Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 3.71" for 10-Year event
Inflow = 14.04 cfs @ 12.13 hrs, Volume= 1.203 af
Outflow = 14.04 cfs @ 12.13 hrs, Volume= 1.203 af, Atten= 0%, Lag= 0.0 min
Primary = 14.04 cfs @ 12.13 hrs, Volume= 1.203 af
Routed to Reach DMH-D : TO DMH-C

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 463.00' @ 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=13.46 cfs @ 12.13 hrs HW=462.62' (Free Discharge)
1=Culvert (Inlet Controls 13.46 cfs @ 10.97 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 = 3.05 cfs @ 12.13 hrs, Volume= 0.254 af, Atten= 1%, Lag= 0.9 min
Primary = 3.05 cfs @ 12.13 hrs, Volume= 0.254 af
Routed to Reach DCB-D : TO DMH-A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 473.93' @ 12.13 hrs Surf.Area= 1,261 sf Storage= 123 cf

Plug-Flow detention time= 2.5 min calculated for 0.253 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (784.6 - 782.9)

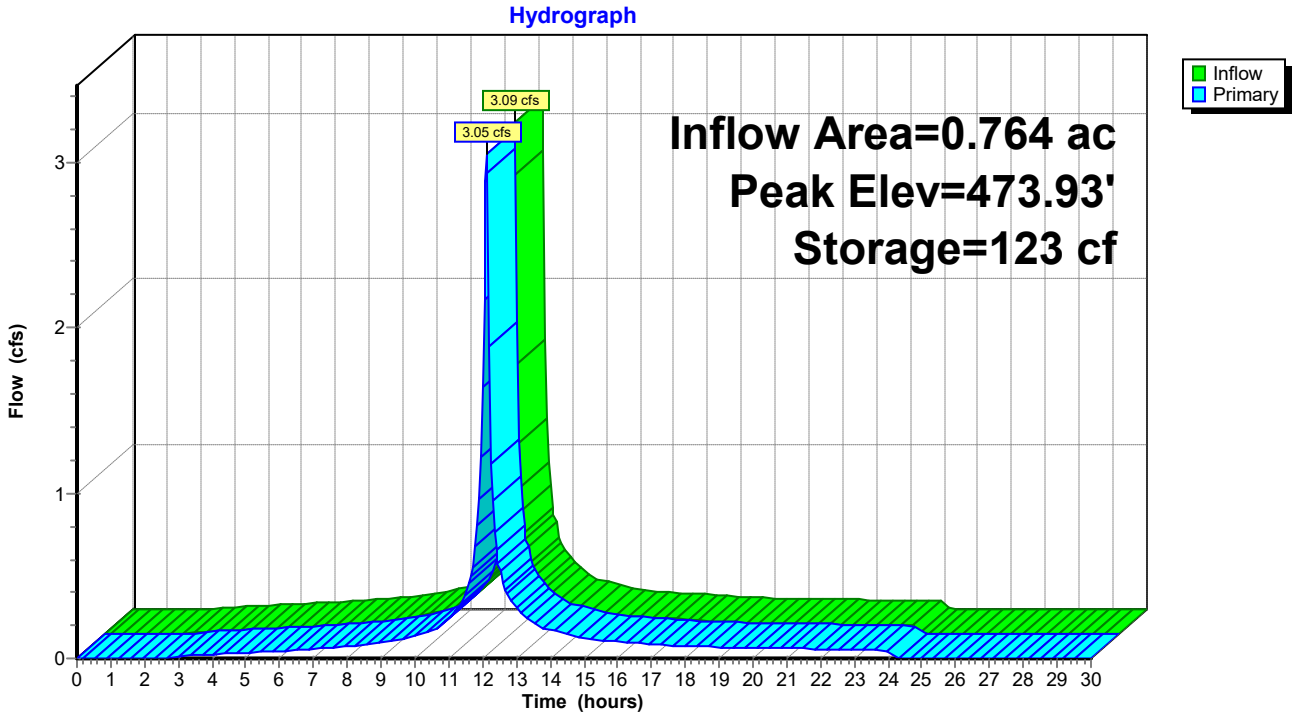
Volume	Invert	Avail.Storage	Storage Description
#1	473.75'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

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	473.80'	**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=473.92' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.91 cfs @ 0.94 fps)

Pond LP1: TO DCB-D



Summary for Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2

Inflow Area = 2.043 ac, 74.89% Impervious, Inflow Depth = 2.89" for 10-Year event
Inflow = 6.40 cfs @ 12.12 hrs, Volume= 0.491 af
Outflow = 5.59 cfs @ 12.16 hrs, Volume= 0.441 af, Atten= 13%, Lag= 2.4 min
Primary = 5.59 cfs @ 12.16 hrs, Volume= 0.441 af
Routed to Reach LP2 : TO DMH-K1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 464.67' @ 12.16 hrs Surf.Area= 9,410 sf Storage= 3,528 cf

Plug-Flow detention time= 88.5 min calculated for 0.440 af (90% of inflow)
Center-of-Mass det. time= 35.1 min (870.7 - 835.5)

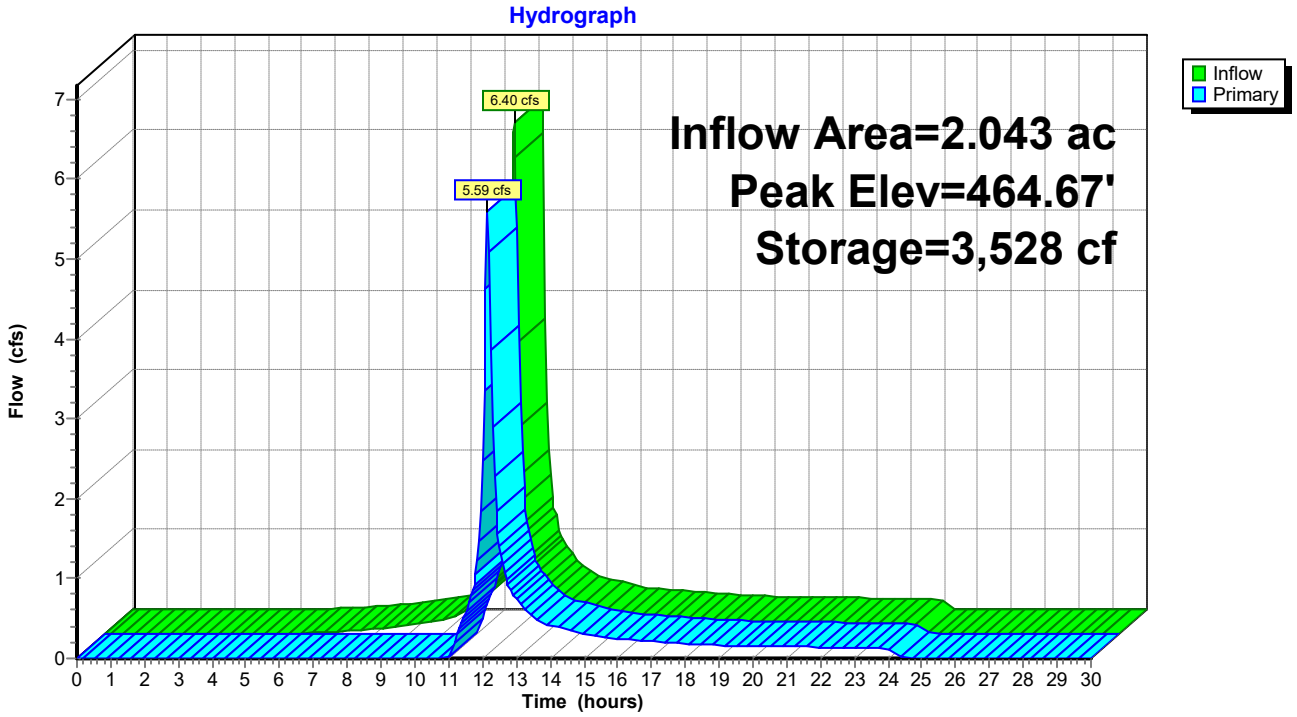
Volume	Invert	Avail.Storage	Storage Description
#1	461.50'	16,070 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
461.50	133	0	0
462.00	180	78	78
463.00	269	225	303
464.00	376	323	625
464.50	5,887	1,566	2,191
465.00	15,961	5,462	7,653
465.50	17,706	8,417	16,070

Device	Routing	Invert	Outlet Devices
#1	Primary	464.50'	**27.0' long + 10.0 '/' SideZ x 20.0' 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=5.47 cfs @ 12.16 hrs HW=464.67' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.47 cfs @ 1.10 fps)

Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2



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 LOW POINT #2 (LP2) Runoff Area=49,908 sf 75.09% Impervious Runoff Depth=3.98"
Flow Length=276' Tc=5.0 min CN=83 Runoff=4.95 cfs 0.380 af

Subcatchment E25: TO LOW POINT #3 (LP#3) Runoff Area=88,999 sf 74.89% Impervious Runoff Depth=3.98"
Flow Length=401' Tc=5.2 min CN=83 Runoff=8.72 cfs 0.678 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

Subcatchment e27: TO OFF SITE POINT (DP#6) Runoff Area=2,493 sf 63.62% Impervious Runoff Depth=3.37"
Flow Length=117' Tc=5.0 min CN=77 Runoff=0.21 cfs 0.016 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 1.052 af
12.0" Round Pipe n=0.011 L=15.0' S=0.1627 '/' Capacity=16.98 cfs Outflow=11.85 cfs 1.052 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=18.15 cfs 1.573 af
Outflow=18.15 cfs 1.573 af

Reach DMH-C: TO DP#1 Inflow=21.00 cfs 1.883 af
Outflow=21.00 cfs 1.883 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.17' Max Vel=8.26 fps Inflow=21.12 cfs 1.883 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=21.00 cfs 1.883 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 DP#6: OFFSITE LOW POINT Inflow=0.21 cfs 0.016 af
Outflow=0.21 cfs 0.016 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=21.00 cfs 1.883 af
Outflow=21.00 cfs 1.883 af

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

Reach DP4: DMH-K1 Inflow=12.28 cfs 1.007 af
Outflow=12.28 cfs 1.007 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 LP2: TO DMH-K1 Inflow=12.28 cfs 1.007 af
Outflow=12.28 cfs 1.007 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=466.74' Inflow=18.15 cfs 1.573 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=18.15 cfs 1.573 af

Pond LP1: TO DCB-D Peak Elev=473.95' Storage=153 cf Inflow=3.95 cfs 0.330 af
Outflow=3.89 cfs 0.329 af

Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS Peak Elev=464.71' Storage=3,920 cf Inflow=8.72 cfs 0.678 af
Outflow=7.69 cfs 0.627 af

Total Runoff Area = 8.235 ac Runoff Volume = 3.099 af Average Runoff Depth = 4.52"
26.88% Pervious = 2.214 ac 73.12% Impervious = 6.022 ac

Summary for Subcatchment E11: TO DP#1

[49] Hint: Tc<2dt may require smaller dt

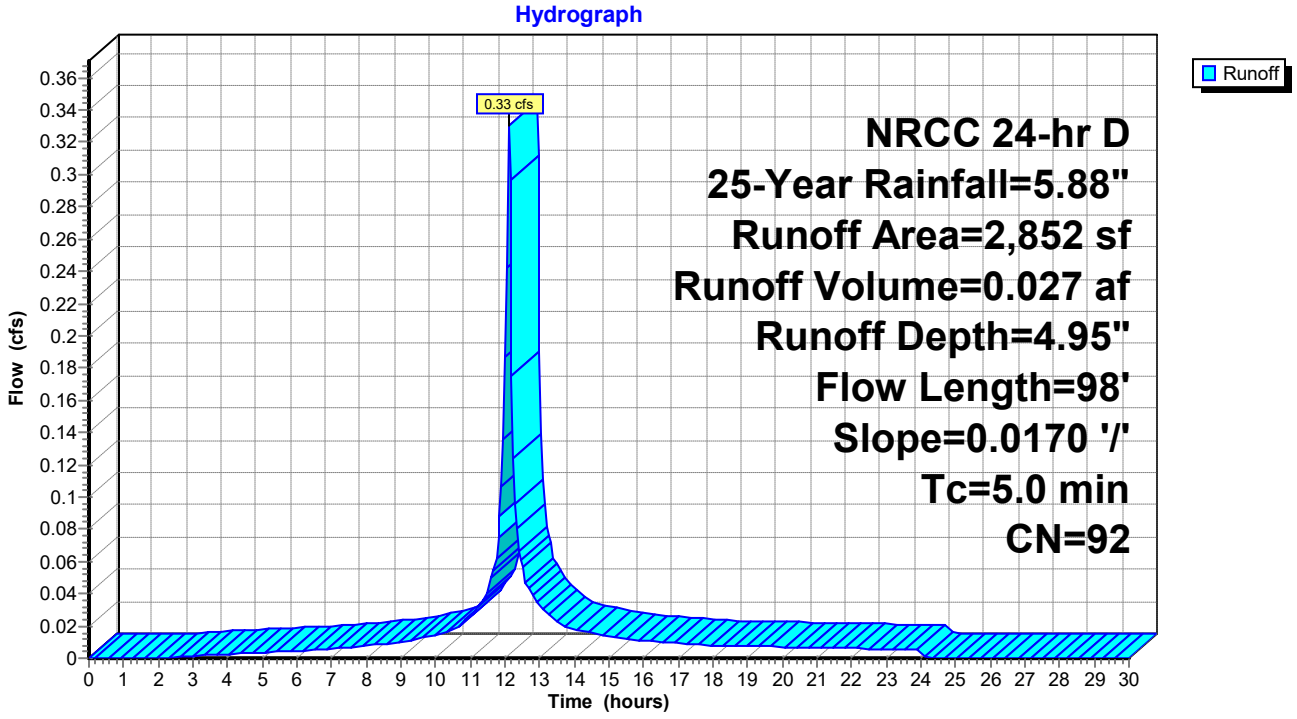
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 4.95"
Routed to Reach DP1 : GUTTER POINT FRANKLIN (WEST)

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

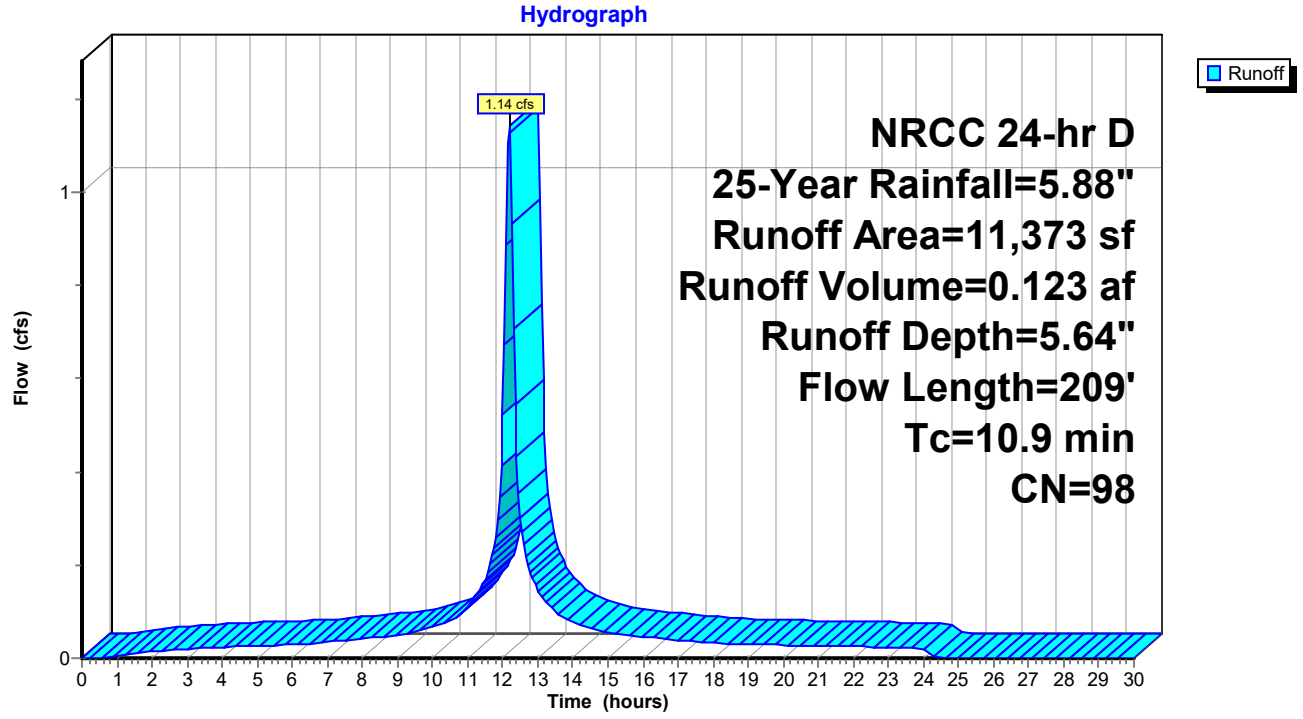
Runoff = 1.14 cfs @ 12.18 hrs, Volume= 0.123 af, Depth= 5.64"
Routed to Reach DCB-A : TO DMH-D

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

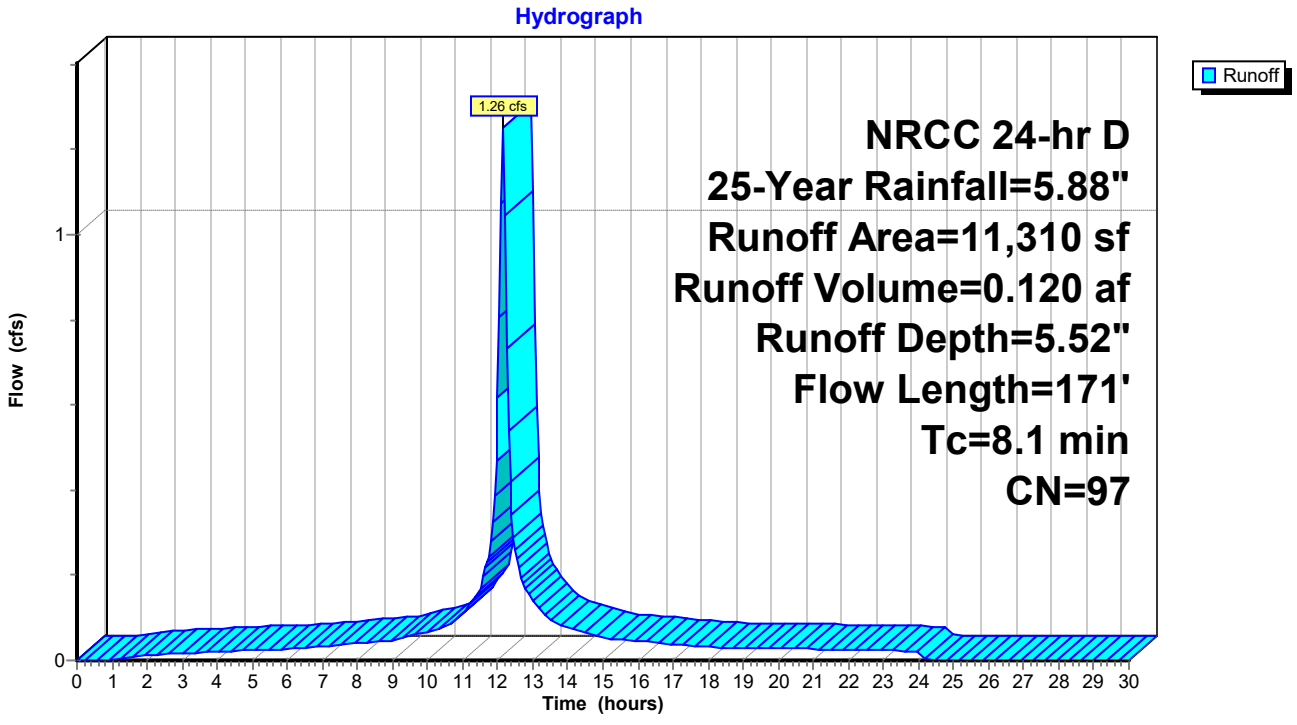
Runoff = 1.26 cfs @ 12.15 hrs, Volume= 0.120 af, Depth= 5.52"
Routed to Reach DCB-B : TO DMH-E

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

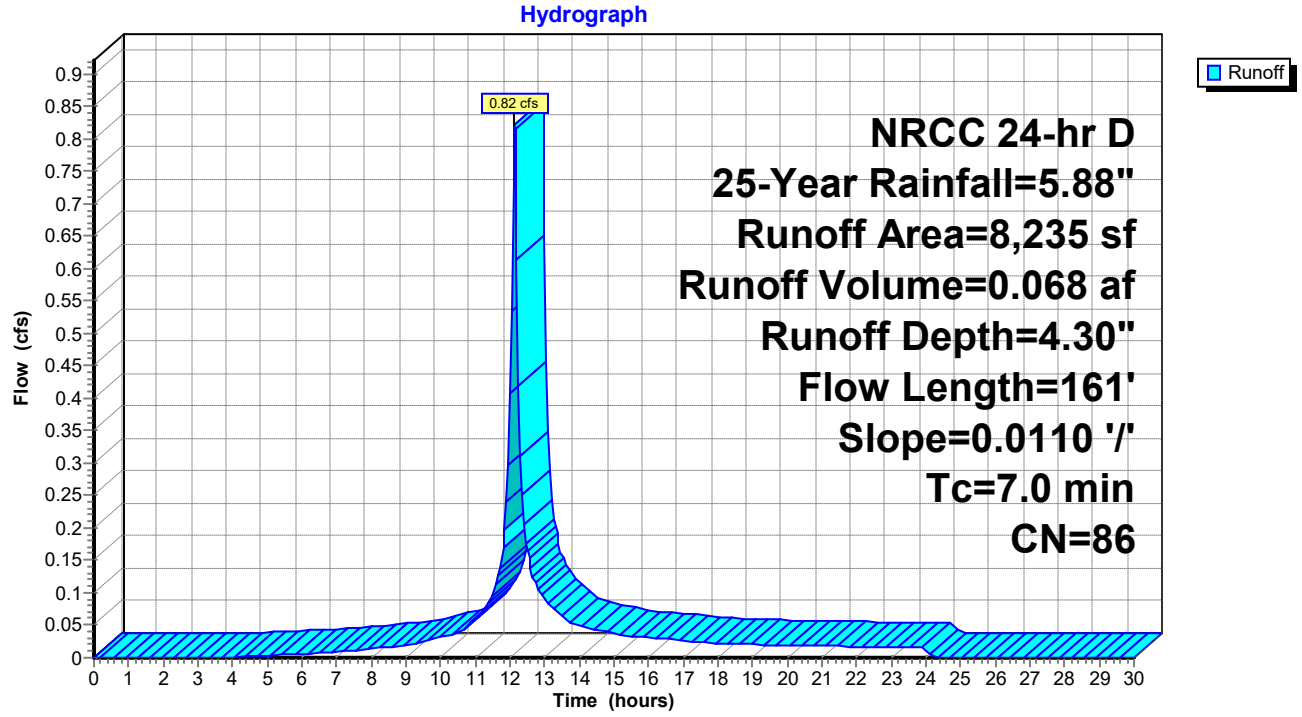
Runoff = 0.82 cfs @ 12.14 hrs, Volume= 0.068 af, Depth= 4.30"
Routed to Reach DCB-C : TO TRUNKLINE

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

[49] Hint: Tc<2dt may require smaller dt

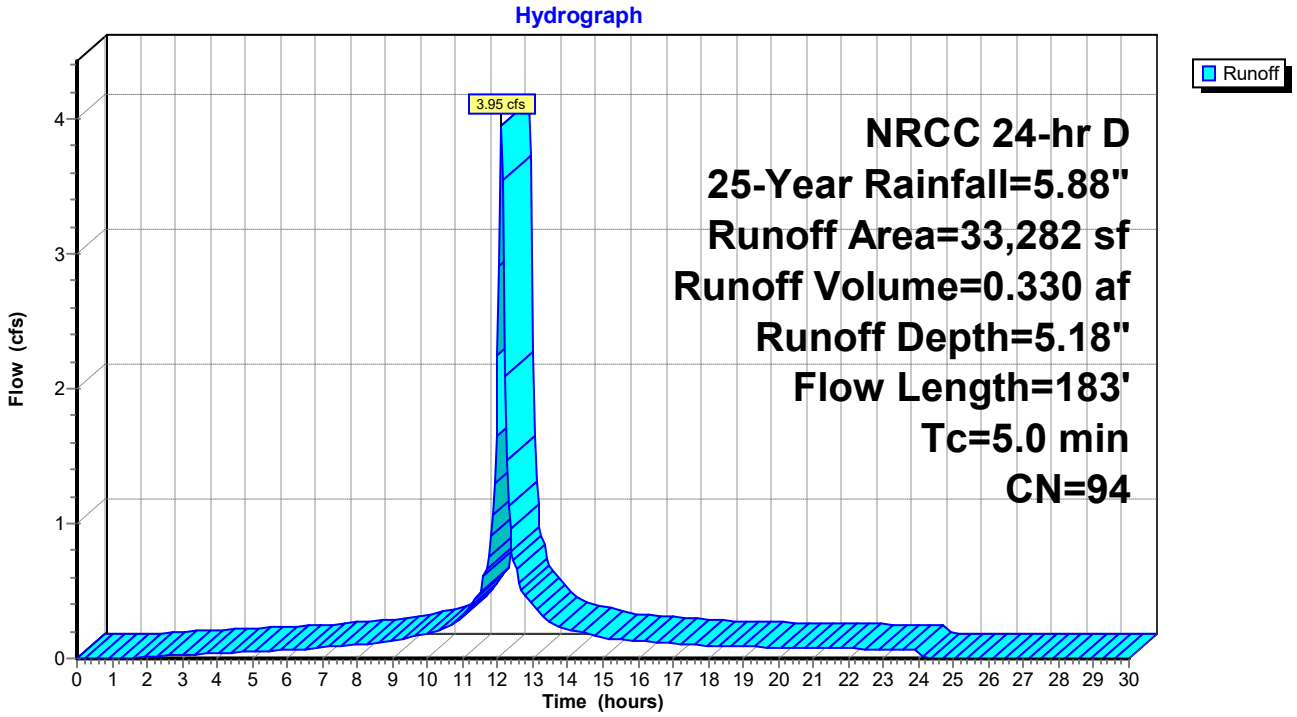
Runoff = 3.95 cfs @ 12.11 hrs, Volume= 0.330 af, Depth= 5.18"
Routed to Pond LP1 : TO DCB-D

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

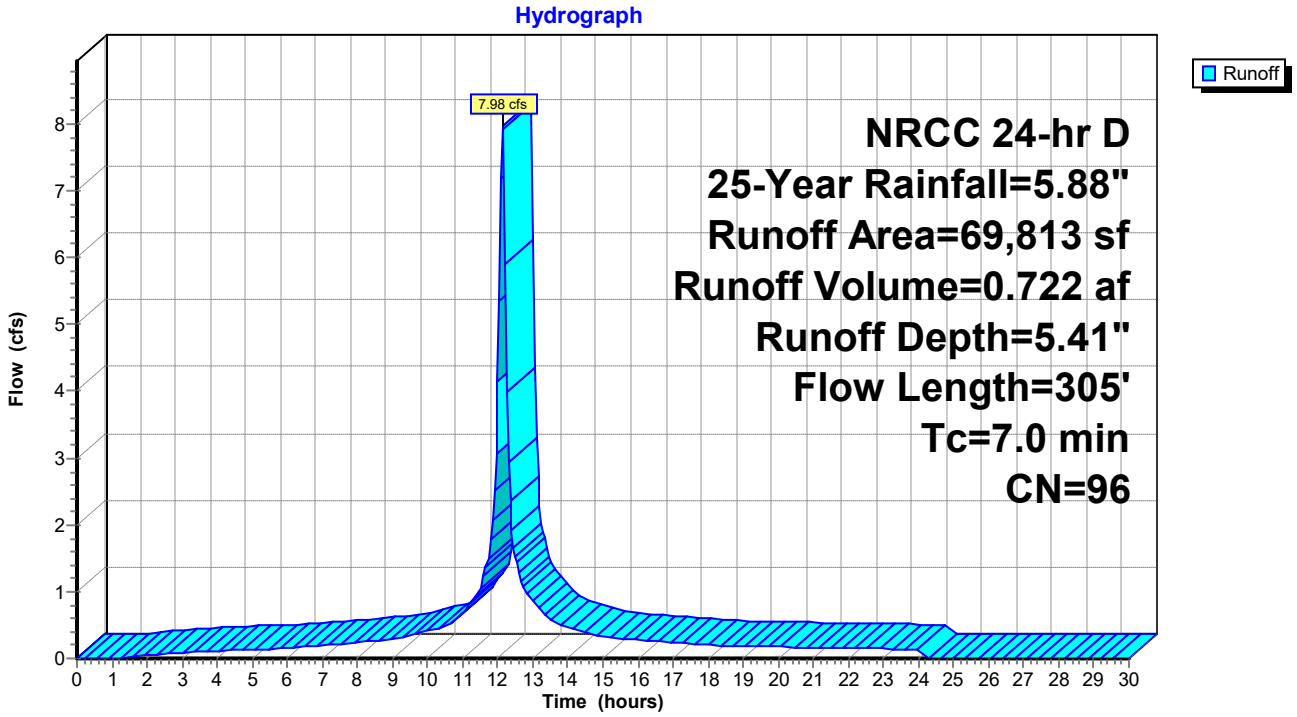
Runoff = 7.98 cfs @ 12.14 hrs, Volume= 0.722 af, Depth= 5.41"
Routed to Reach DCB-D : TO DMH-A

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

[49] Hint: Tc<2dt may require smaller dt

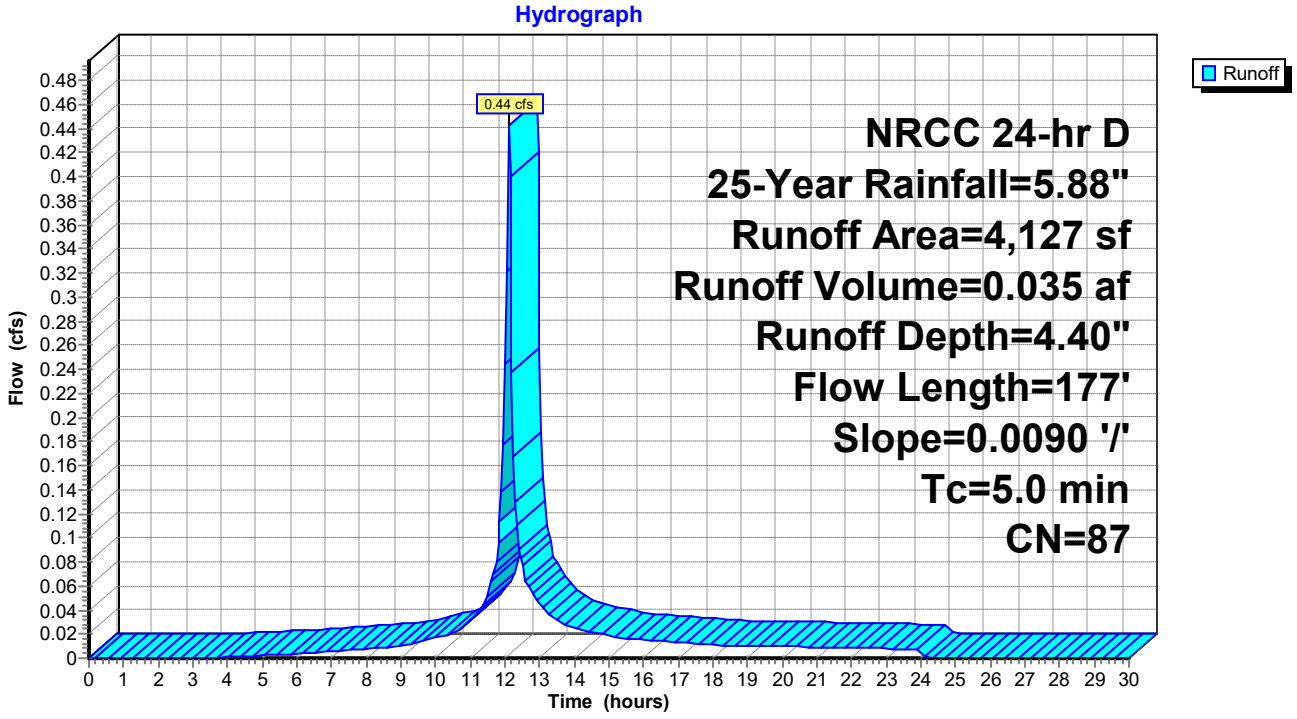
Runoff = 0.44 cfs @ 12.11 hrs, Volume= 0.035 af, Depth= 4.40"
Routed to Reach DCB-E : TO DMH-A

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

[49] Hint: Tc<2dt may require smaller dt

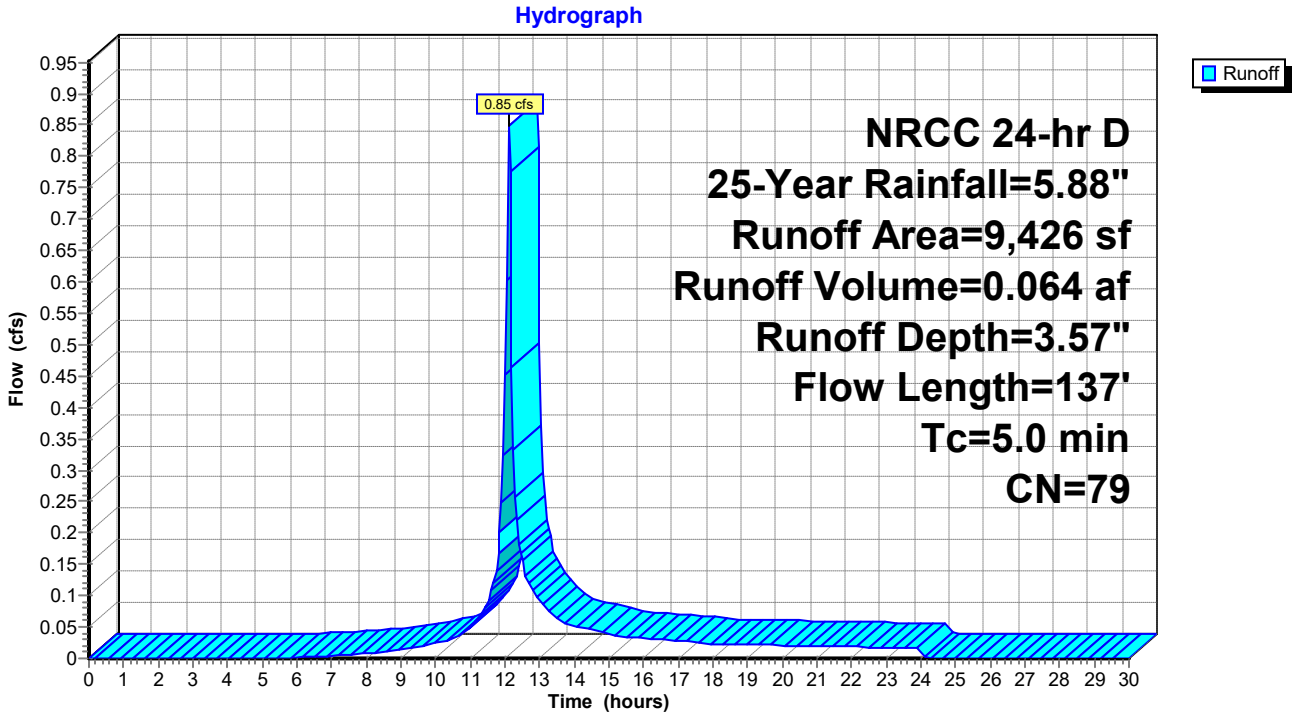
Runoff = 0.85 cfs @ 12.11 hrs, Volume= 0.064 af, Depth= 3.57"
Routed to Reach DP3 : CATCHBASIN (FIRE STATION)

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

[49] Hint: Tc<2dt may require smaller dt

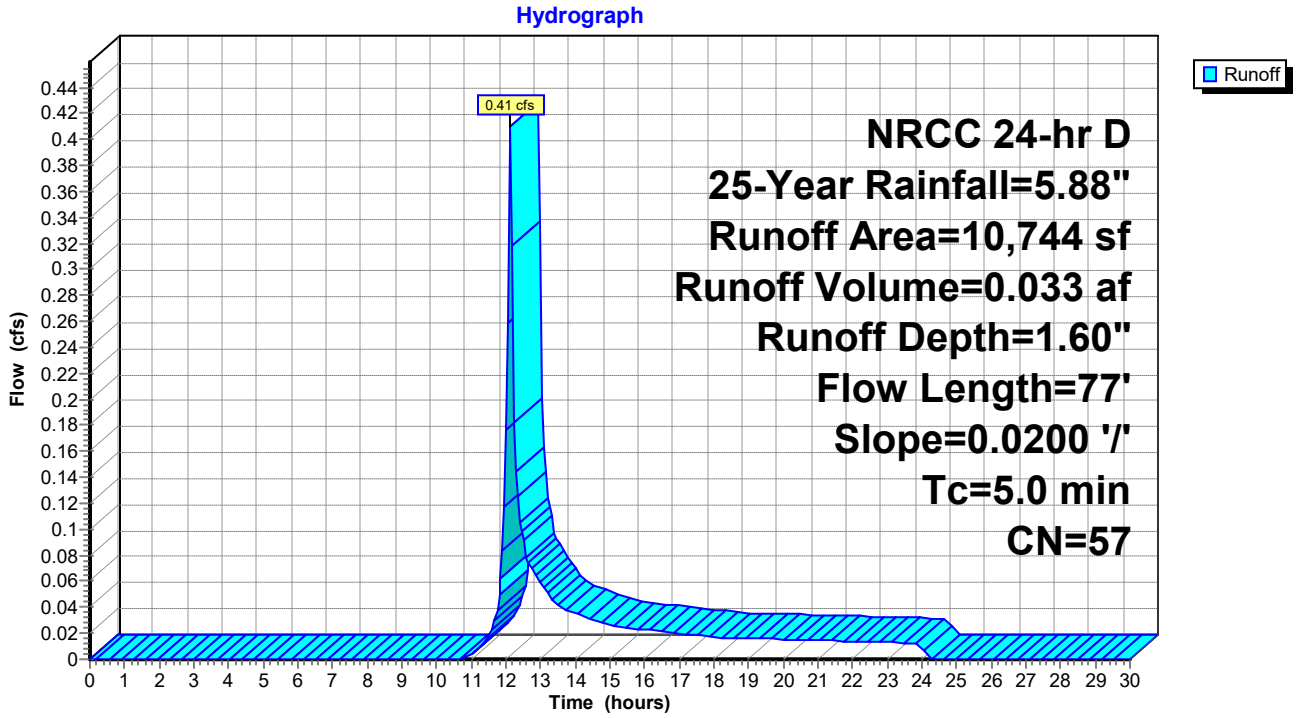
Runoff = 0.41 cfs @ 12.12 hrs, Volume= 0.033 af, Depth= 1.60"
Routed to Reach EX DCB : EX DCB

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

[49] Hint: Tc<2dt may require smaller dt

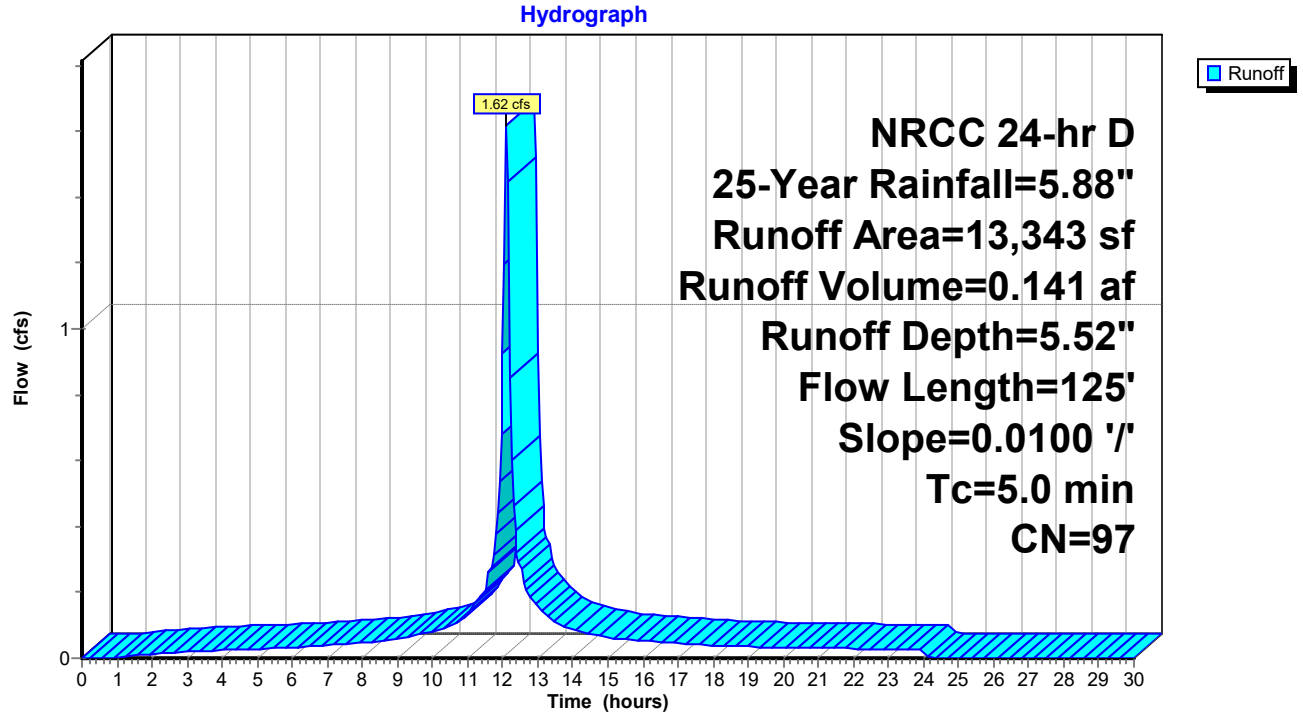
Runoff = 1.62 cfs @ 12.11 hrs, Volume= 0.141 af, Depth= 5.52"
Routed to Reach YDA : (new Reach)

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

[49] Hint: Tc<2dt may require smaller dt

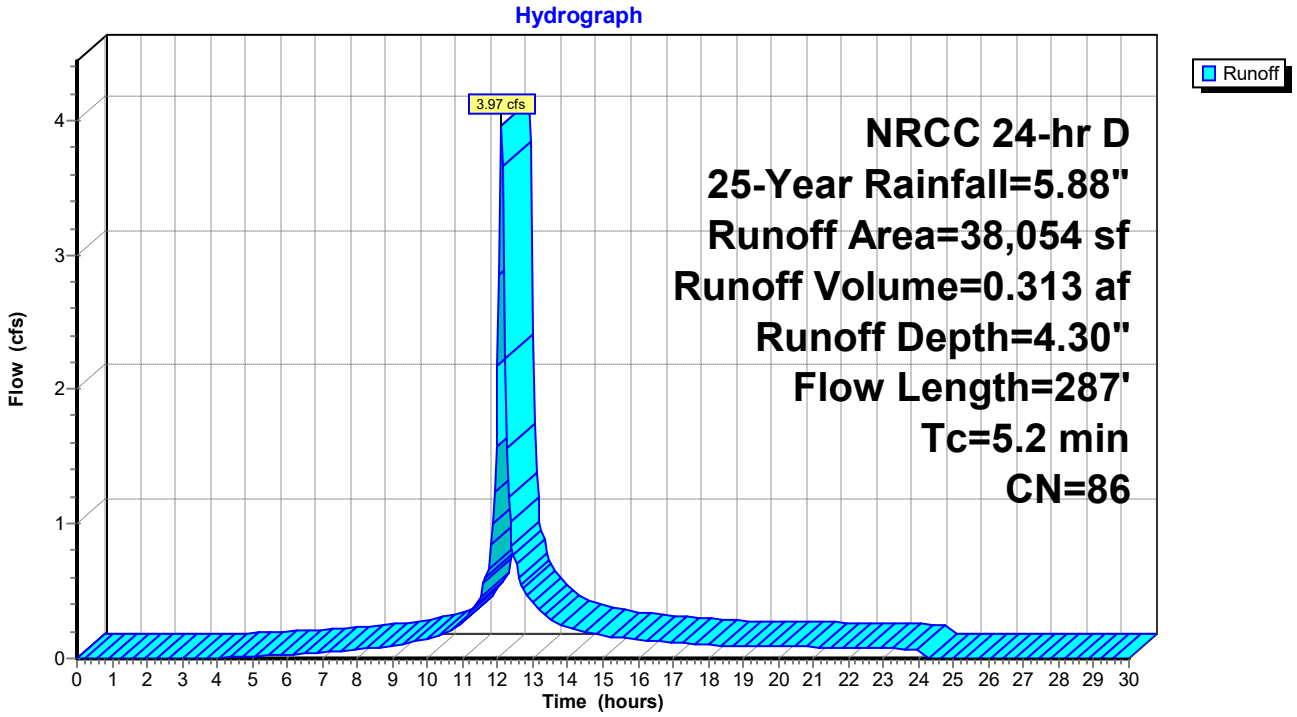
Runoff = 3.97 cfs @ 12.12 hrs, Volume= 0.313 af, Depth= 4.30"
Routed to Reach DCB-F : (new Reach)

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 LOW POINT #2 (LP2)

[49] Hint: Tc<2dt may require smaller dt

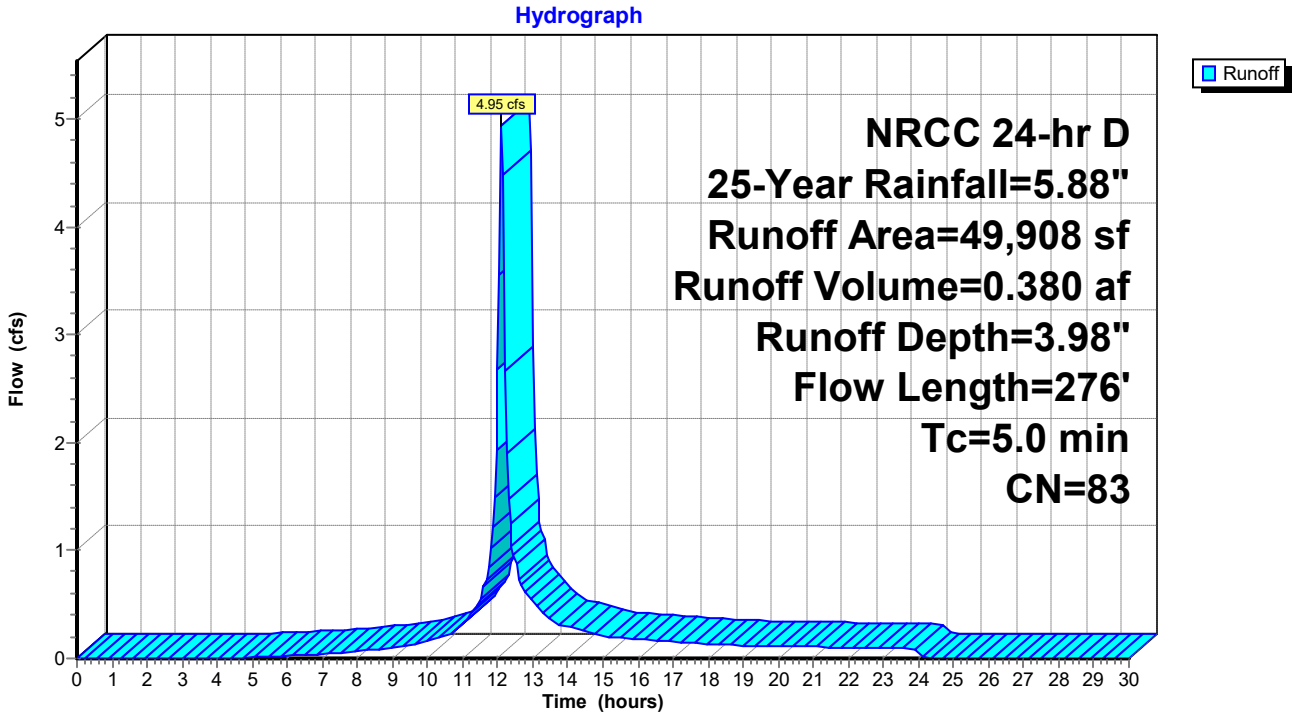
Runoff = 4.95 cfs @ 12.11 hrs, Volume= 0.380 af, Depth= 3.98"
Routed to Reach LP2 : TO DMH-K1

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
11,774	39	>75% Grass cover, Good, HSG A
37,475	98	Paved parking, HSG A
659	48	Brush, Poor, HSG A
49,908	83	Weighted Average
12,433		24.91% Pervious Area
37,475		75.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	45	0.0600	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	5	0.0380	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.0	226	0.0380	3.96		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	276	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E24: TO LOW POINT #2 (LP2)



Summary for Subcatchment E25: TO LOW POINT #3 (LP#3)

[49] Hint: Tc<2dt may require smaller dt

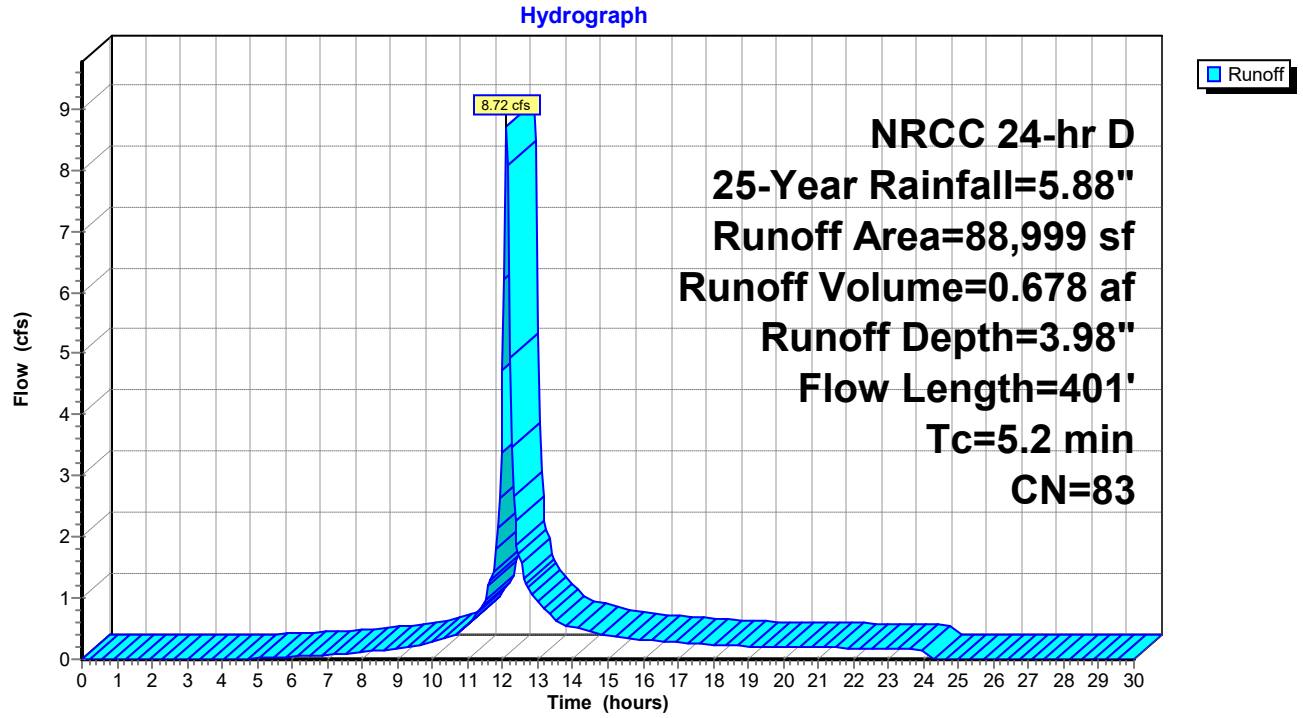
Runoff = 8.72 cfs @ 12.12 hrs, Volume= 0.678 af, Depth= 3.98"
Routed to Pond LP3 : OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2

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
22,346	39	>75% Grass cover, Good, HSG A
66,653	98	Paved parking, HSG A
88,999	83	Weighted Average
22,346		25.11% Pervious Area
66,653		74.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	75	0.1300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.0	10	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.5	316	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.2	401	Total			

Subcatchment E25: TO LOW POINT #3 (LP#3)



Summary for Subcatchment E26: TO DCB-H

[49] Hint: Tc<2dt may require smaller dt

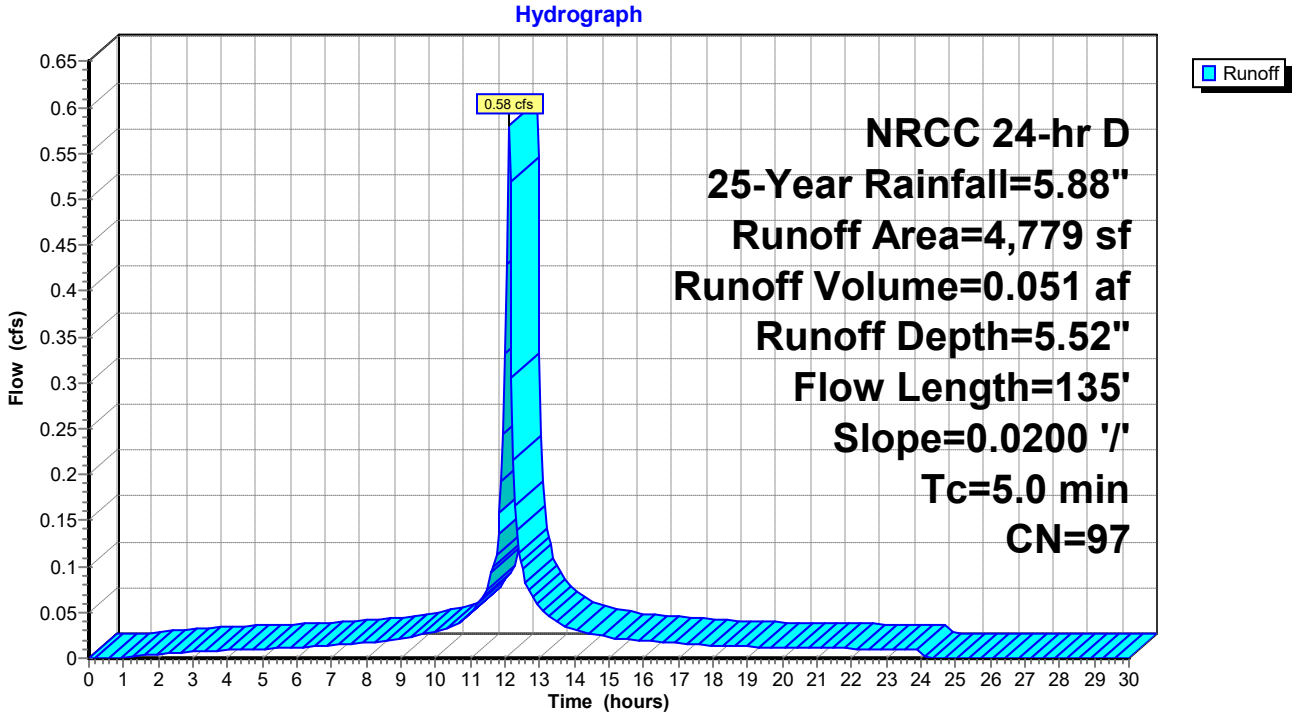
Runoff = 0.58 cfs @ 12.11 hrs, Volume= 0.051 af, Depth= 5.52"
Routed to Reach DP5 : DCB-H

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 Subcatchment e27: TO OFF SITE POINT (DP#6)

[49] Hint: Tc<2dt may require smaller dt

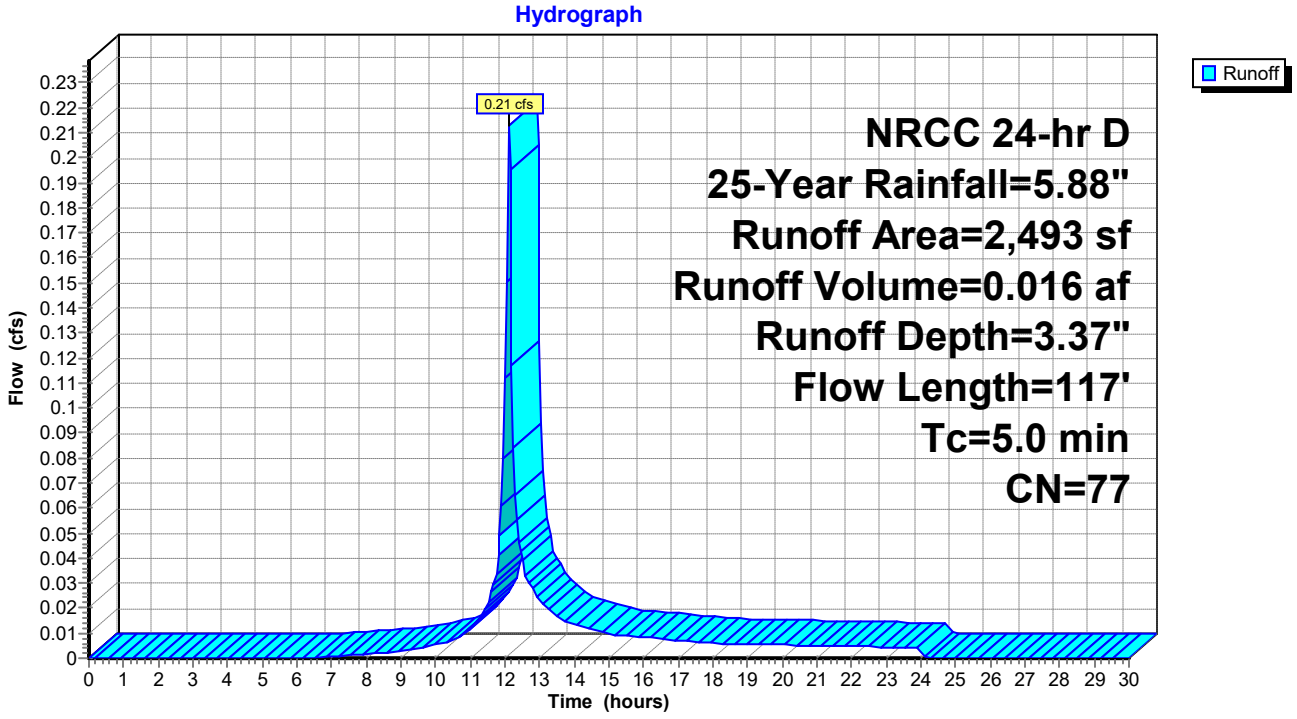
Runoff = 0.21 cfs @ 12.12 hrs, Volume= 0.016 af, Depth= 3.37"
Routed to Reach DP#6 : OFFSITE LOW POINT

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
907	39	>75% Grass cover, Good, HSG A
1,586	98	Paved parking, HSG A
2,493	77	Weighted Average
907		36.38% Pervious Area
1,586		63.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	75	0.1000	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	42	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.3	117	Total, Increased to minimum Tc = 5.0 min			

Subcatchment e27: TO OFF SITE POINT (DP#6)



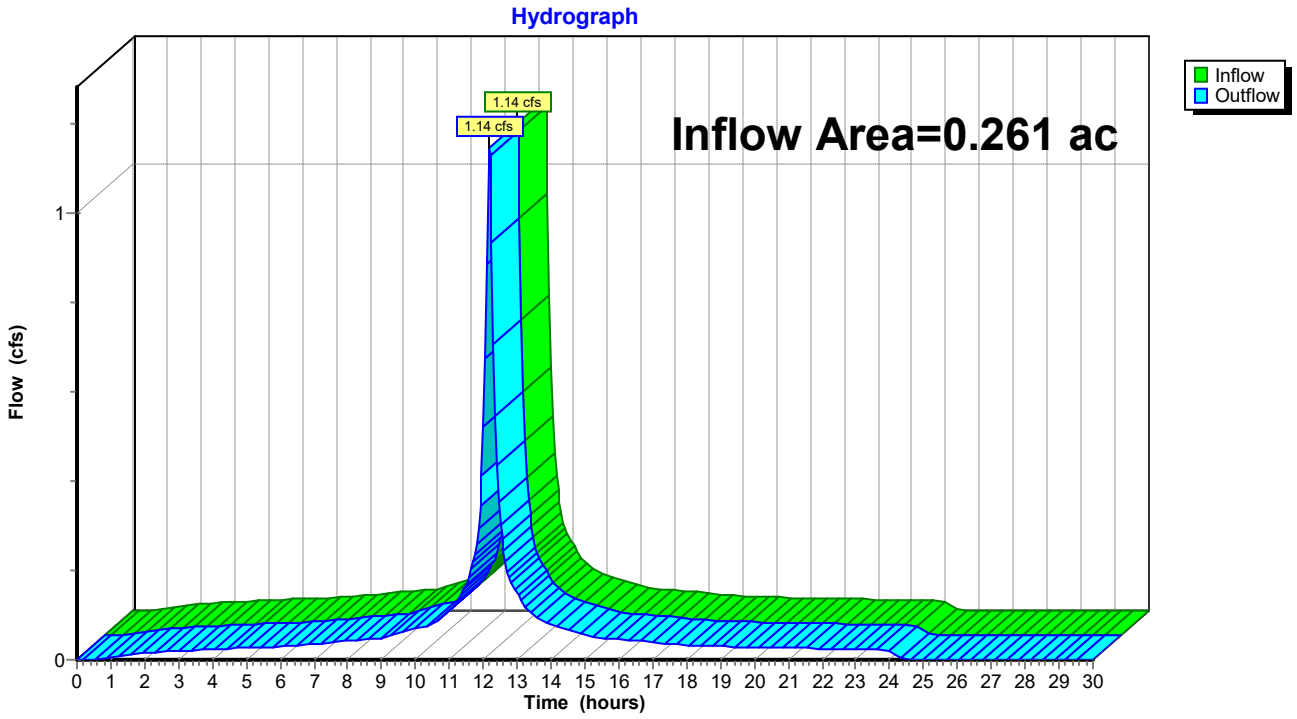
Summary for Reach DCB-A: TO DMH-D

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-D : TO DMH-C

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

Reach DCB-A: TO DMH-D



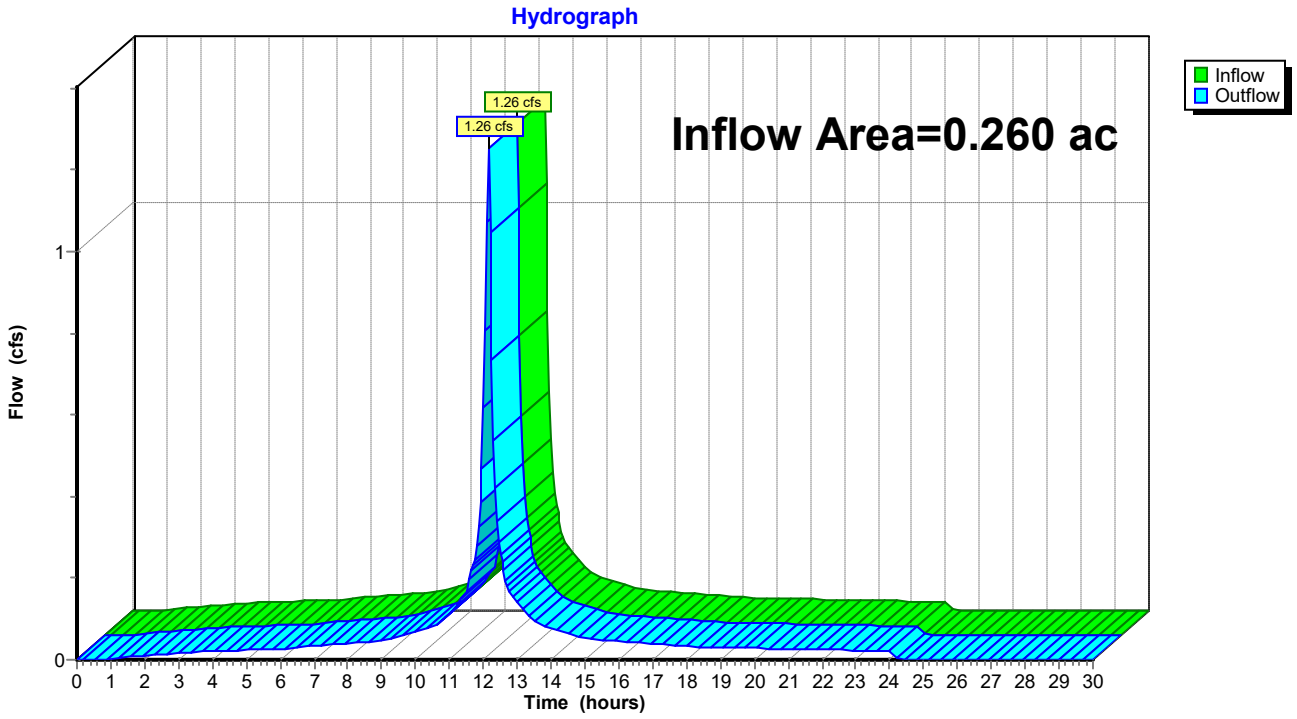
Summary for Reach DCB-B: TO DMH-E

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-E : TO DMH-D

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

Reach DCB-B: TO DMH-E



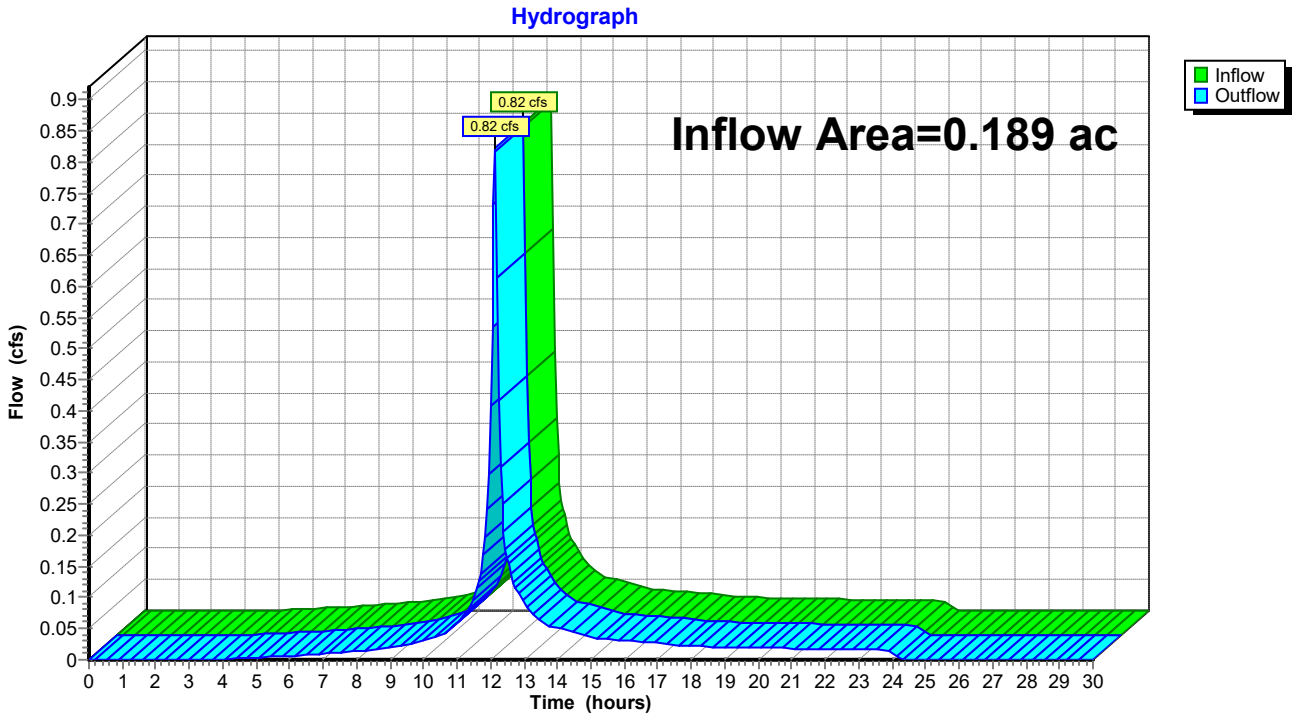
Summary for Reach DCB-C: TO TRUNKLINE

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-E : TO DMH-D

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

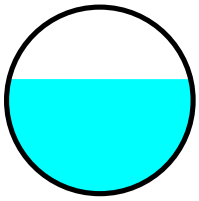
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 2.367 ac, 77.91% Impervious, Inflow Depth = 5.33" for 25-Year event
Inflow = 11.85 cfs @ 12.13 hrs, Volume= 1.052 af
Outflow = 11.85 cfs @ 12.13 hrs, Volume= 1.052 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-A : TO DMH-B

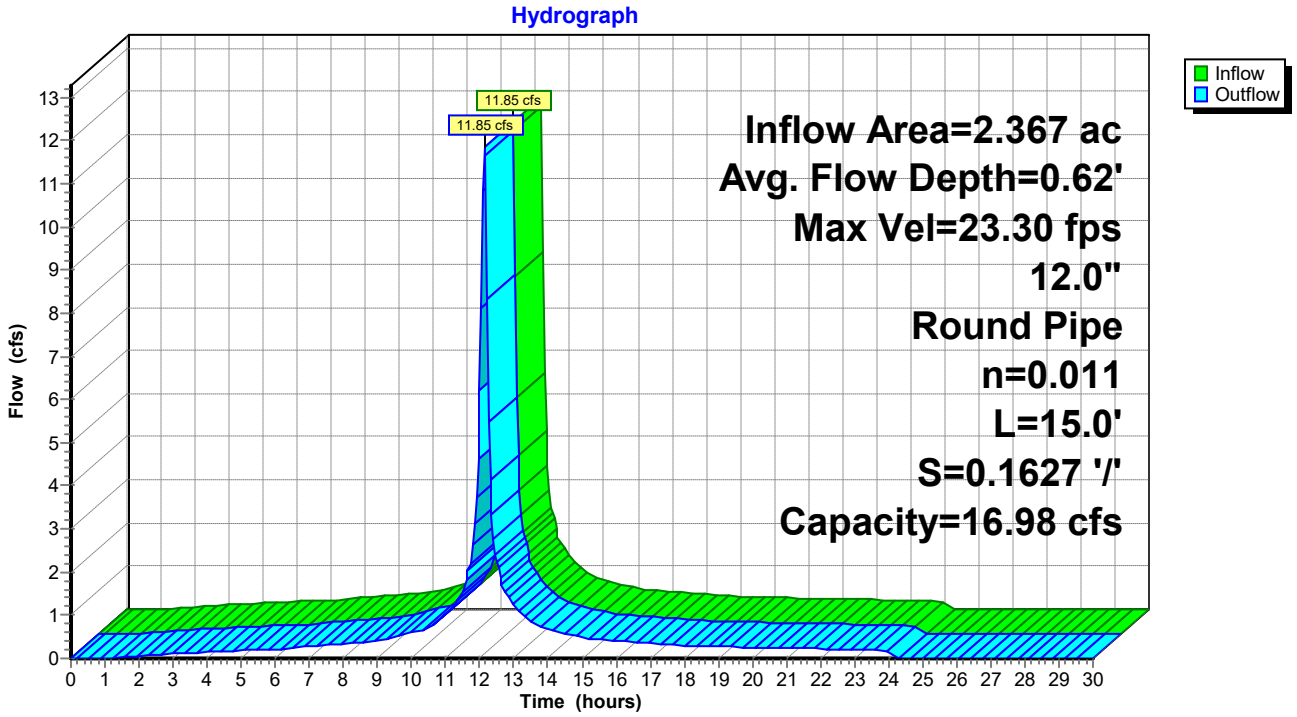
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 23.30 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 8.62 fps, Avg. Travel Time= 0.0 min

Peak Storage= 8 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.62' , Surface Width= 0.97'
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

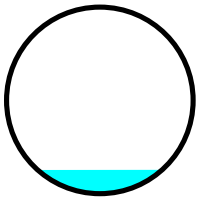
[52] Hint: Inlet/Outlet conditions not evaluated

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
Routed to Reach DMH-A : TO DMH-B

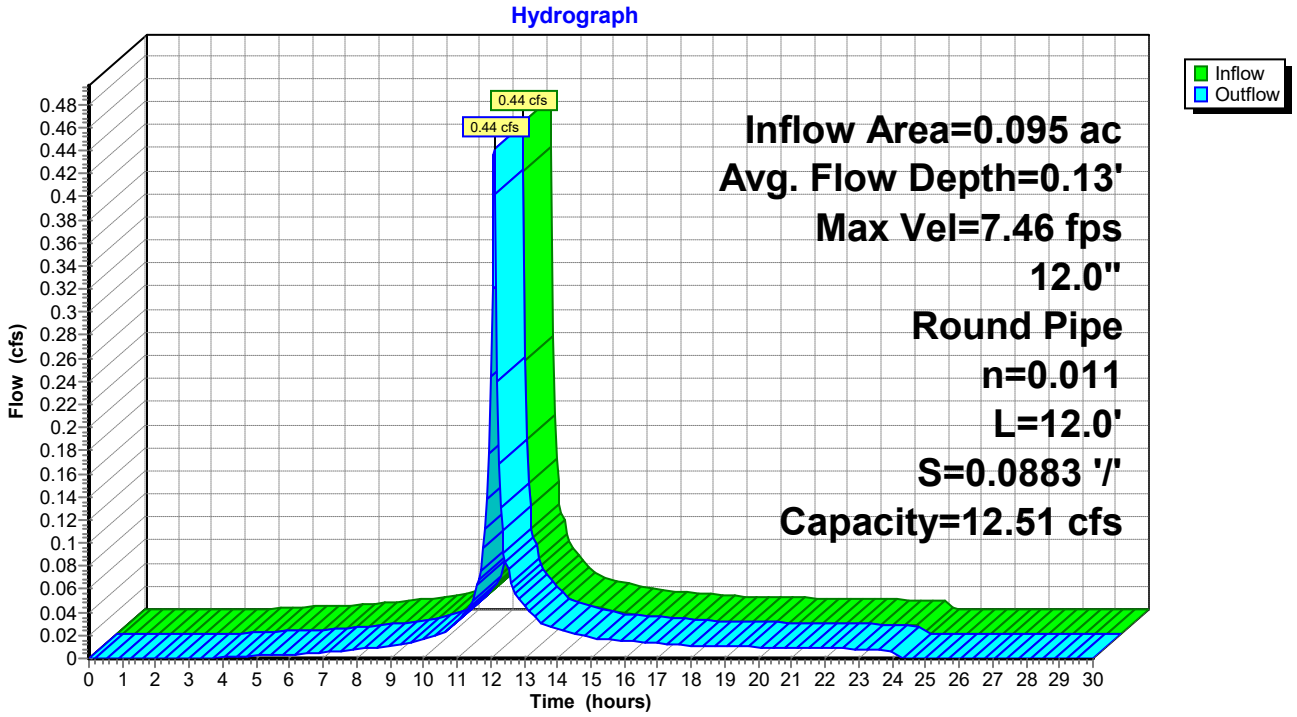
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.46 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.59 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 0.67'
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



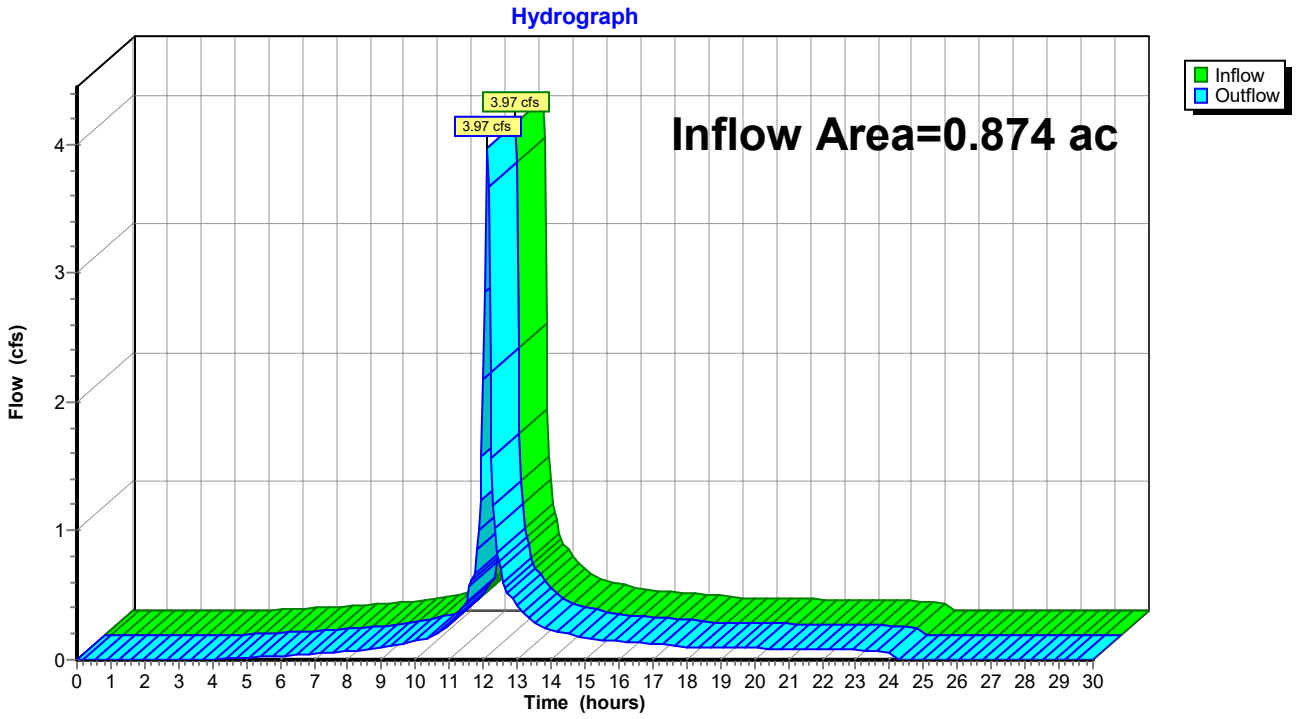
Summary for Reach DCB-F: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

Reach DCB-F: (new Reach)



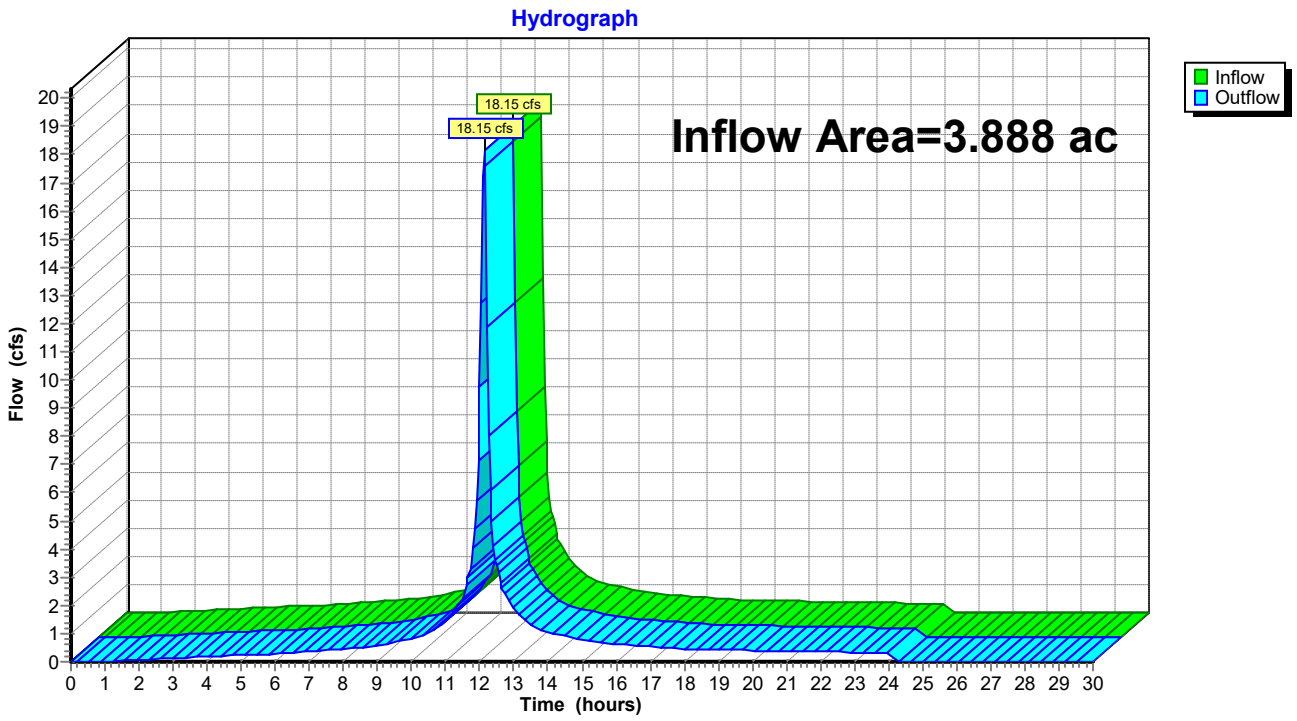
Summary for Reach DMH-A: TO DMH-B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 4.86" for 25-Year event
Inflow = 18.15 cfs @ 12.13 hrs, Volume= 1.573 af
Outflow = 18.15 cfs @ 12.13 hrs, Volume= 1.573 af, Atten= 0%, Lag= 0.0 min
Routed to Pond DMH-B : TO DMH-D

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

Reach DMH-A: TO DMH-B



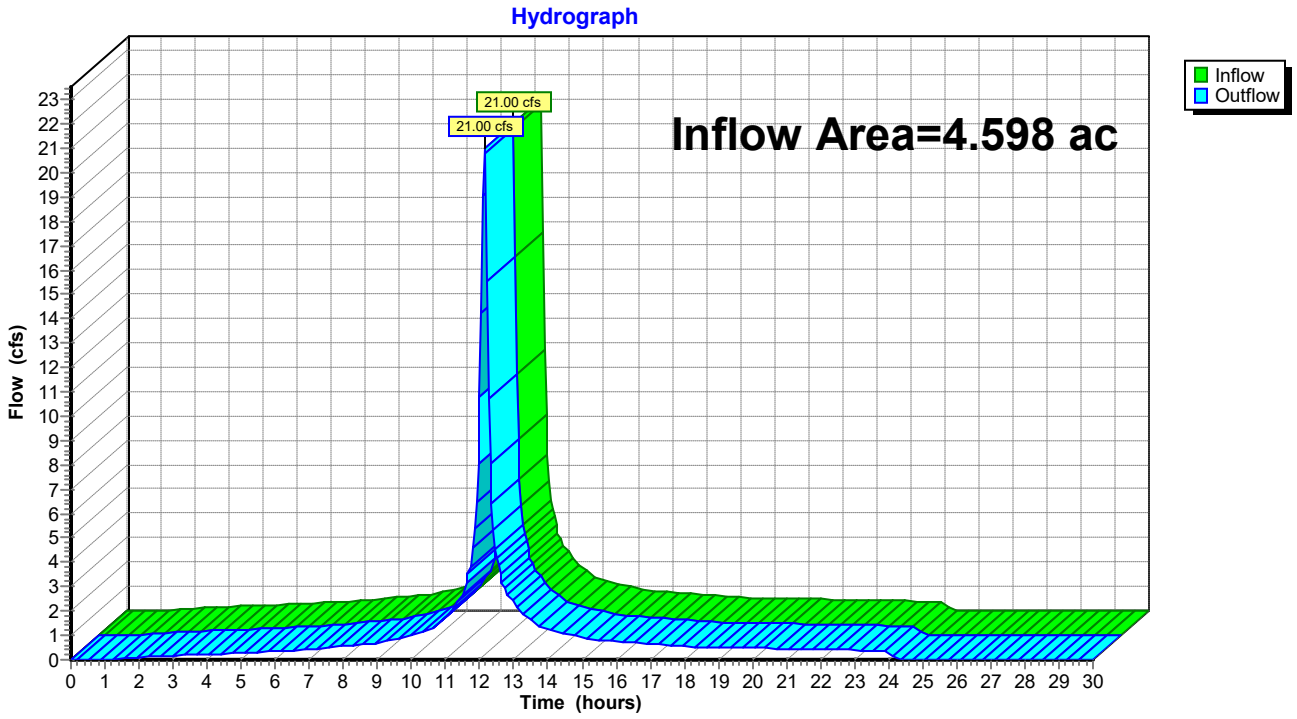
Summary for Reach DMH-C: TO DP#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 4.91" for 25-Year event
Inflow = 21.00 cfs @ 12.14 hrs, Volume= 1.883 af
Outflow = 21.00 cfs @ 12.14 hrs, Volume= 1.883 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

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

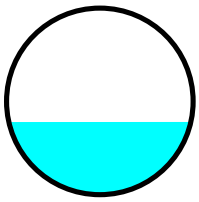
[52] Hint: Inlet/Outlet conditions not evaluated
[63] Warning: Exceeded Reach DMH-E INLET depth by 0.11' @ 12.15 hrs
[79] Warning: Submerged Pond DMH-B Primary device # 1 INLET by 0.26'

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 4.91" for 25-Year event
Inflow = 21.12 cfs @ 12.13 hrs, Volume= 1.883 af
Outflow = 21.00 cfs @ 12.14 hrs, Volume= 1.883 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH-C : TO DP#1

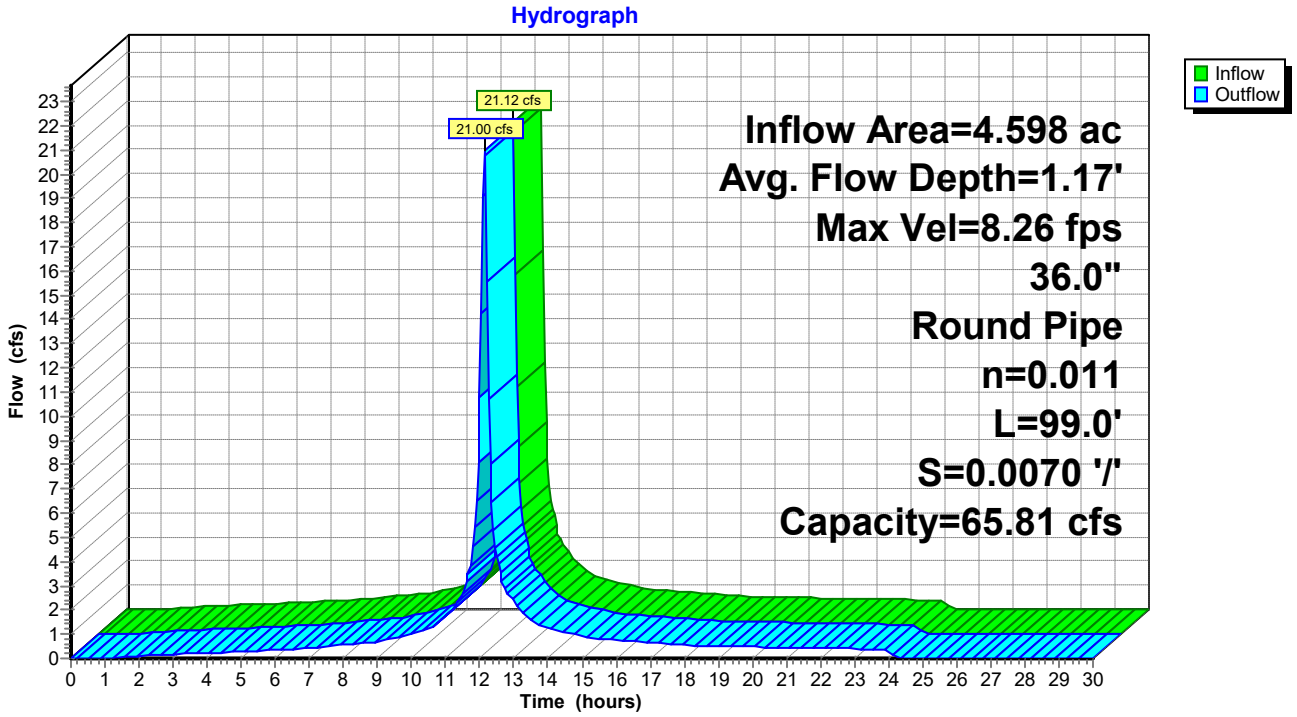
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.26 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.89 fps, Avg. Travel Time= 0.6 min

Peak Storage= 253 cf @ 12.14 hrs
Average Depth at Peak Storage= 1.17' , Surface Width= 2.93'
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

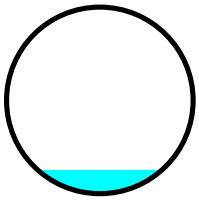
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-F outlet invert by 0.38' @ 12.15 hrs

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
Routed to Reach DMH-D : TO DMH-C

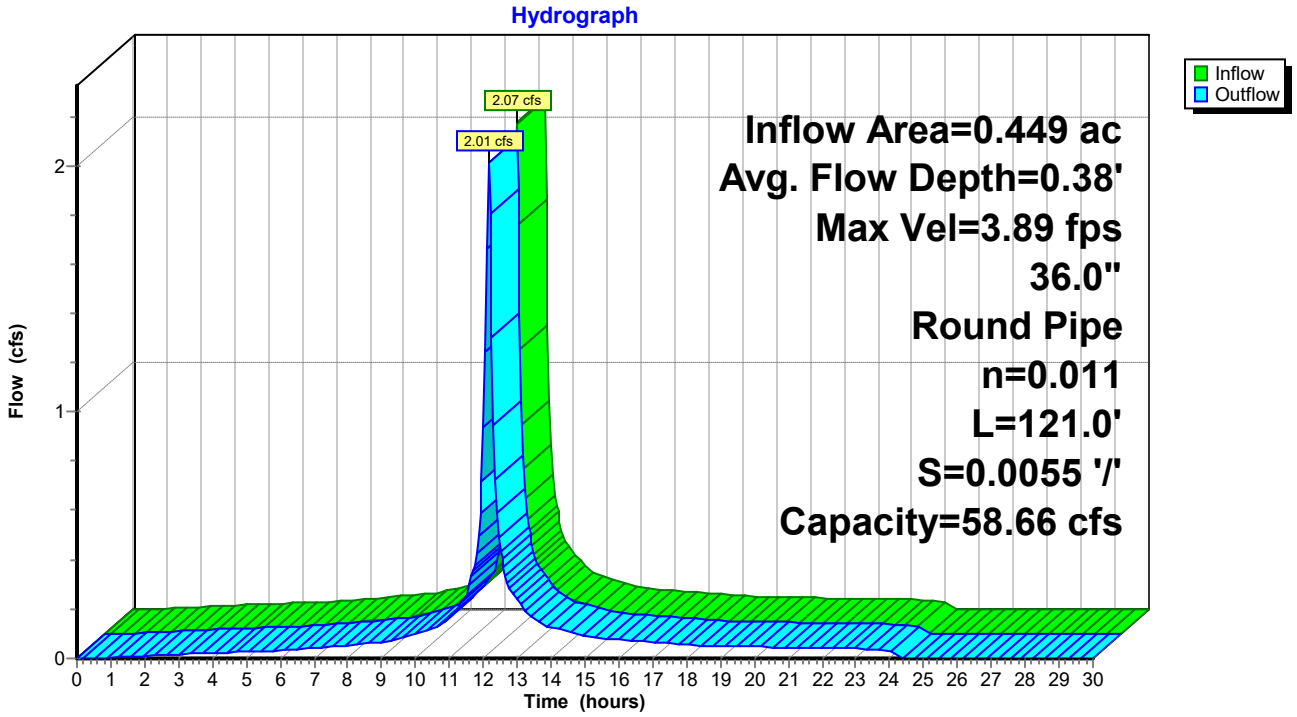
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.89 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 1.5 min

Peak Storage= 64 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.38' , Surface Width= 2.01'
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

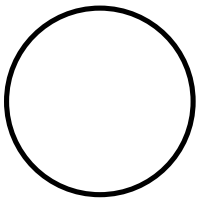


Summary for Reach DMH-F: TO DMH-E

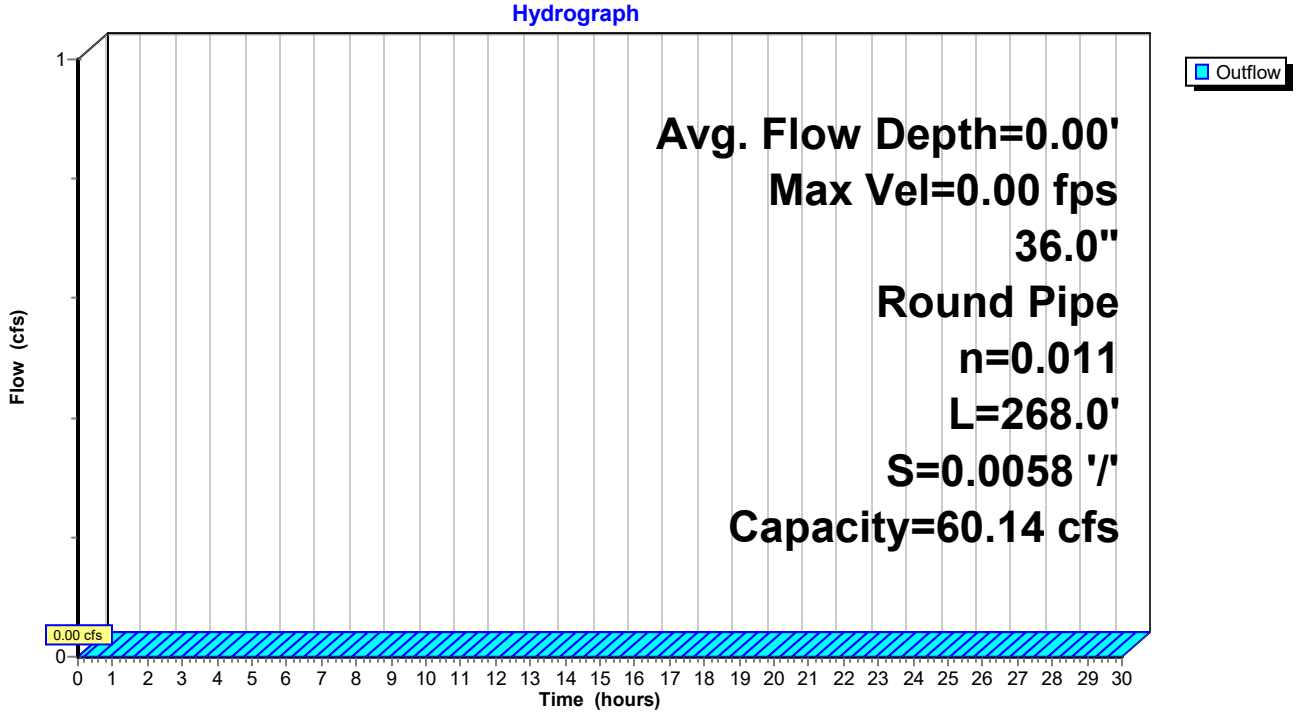
[43] Hint: Has no inflow (Outflow=Zero)

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



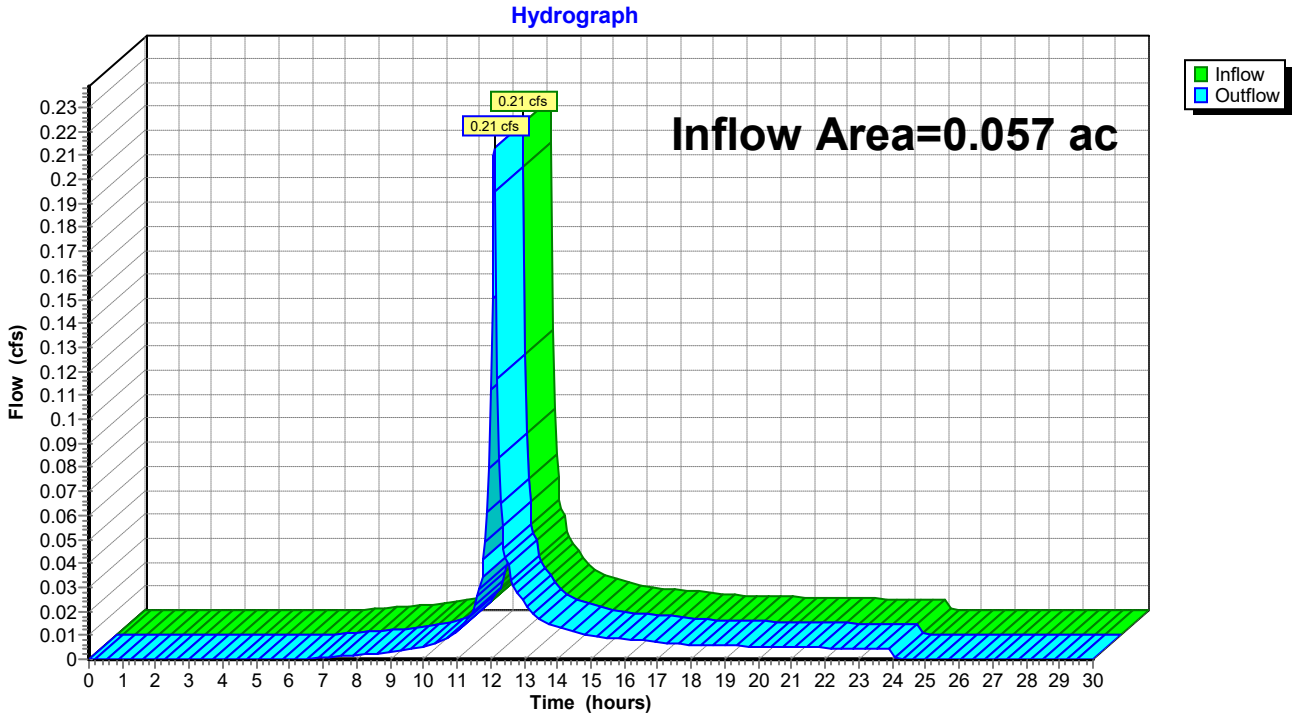
Summary for Reach DP#6: OFFSITE LOW POINT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.057 ac, 63.62% Impervious, Inflow Depth = 3.37" for 25-Year event
Inflow = 0.21 cfs @ 12.12 hrs, Volume= 0.016 af
Outflow = 0.21 cfs @ 12.12 hrs, Volume= 0.016 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 DP#6: OFFSITE LOW POINT



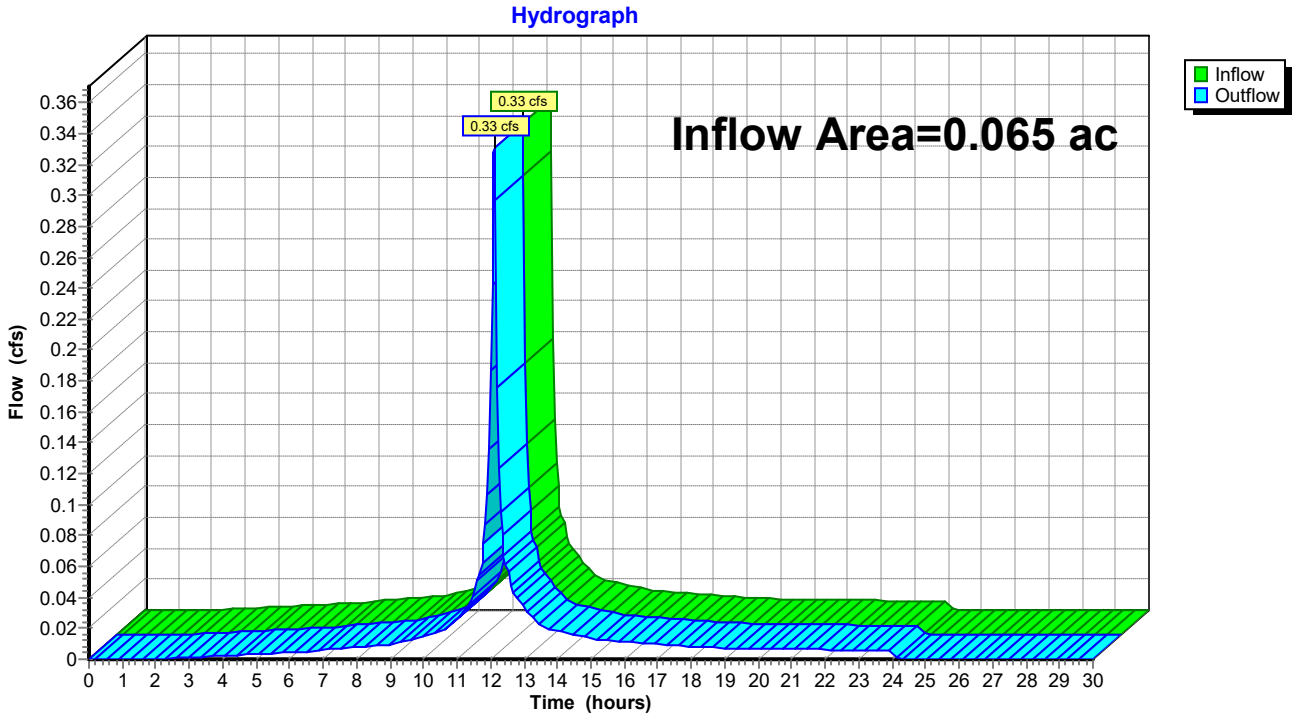
Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

[40] Hint: Not Described (Outflow=Inflow)

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)



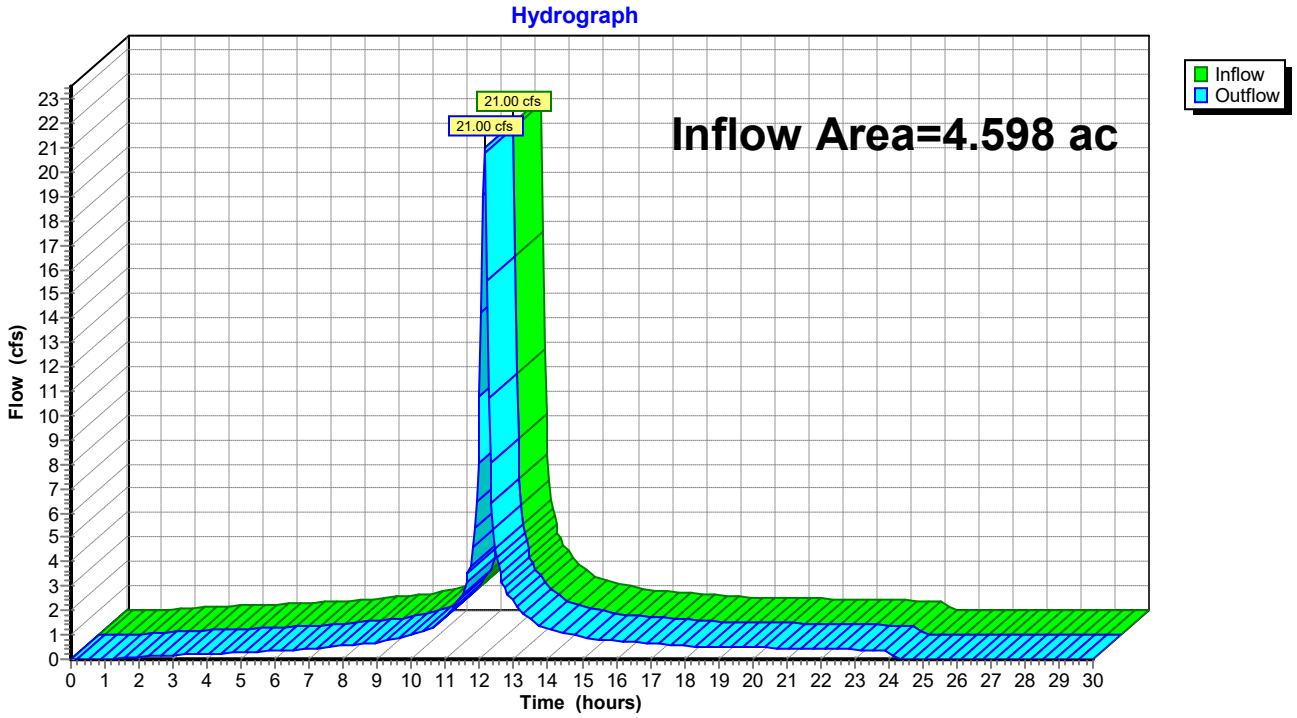
Summary for Reach DP2: MUNICIPAL SYSTEM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 4.91" for 25-Year event
Inflow = 21.00 cfs @ 12.14 hrs, Volume= 1.883 af
Outflow = 21.00 cfs @ 12.14 hrs, Volume= 1.883 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



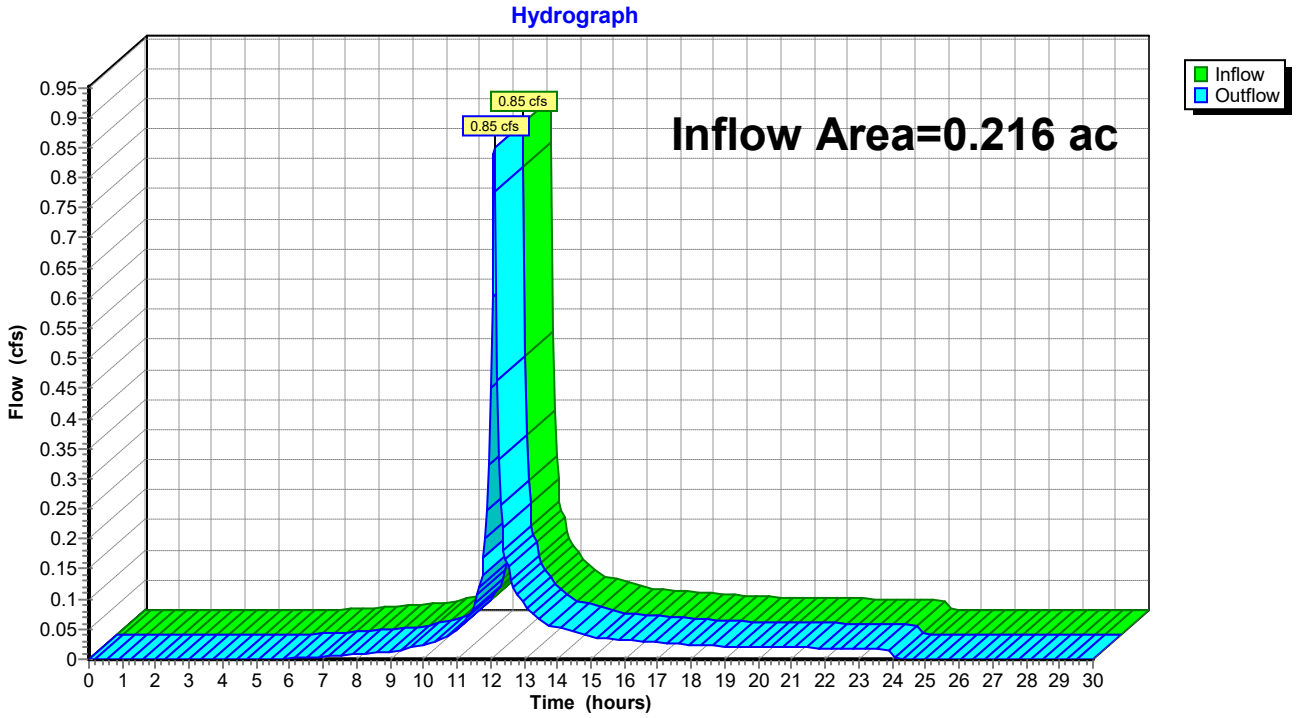
Summary for Reach DP3: CATCHBASIN (FIRE STATION)

[40] Hint: Not Described (Outflow=Inflow)

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)



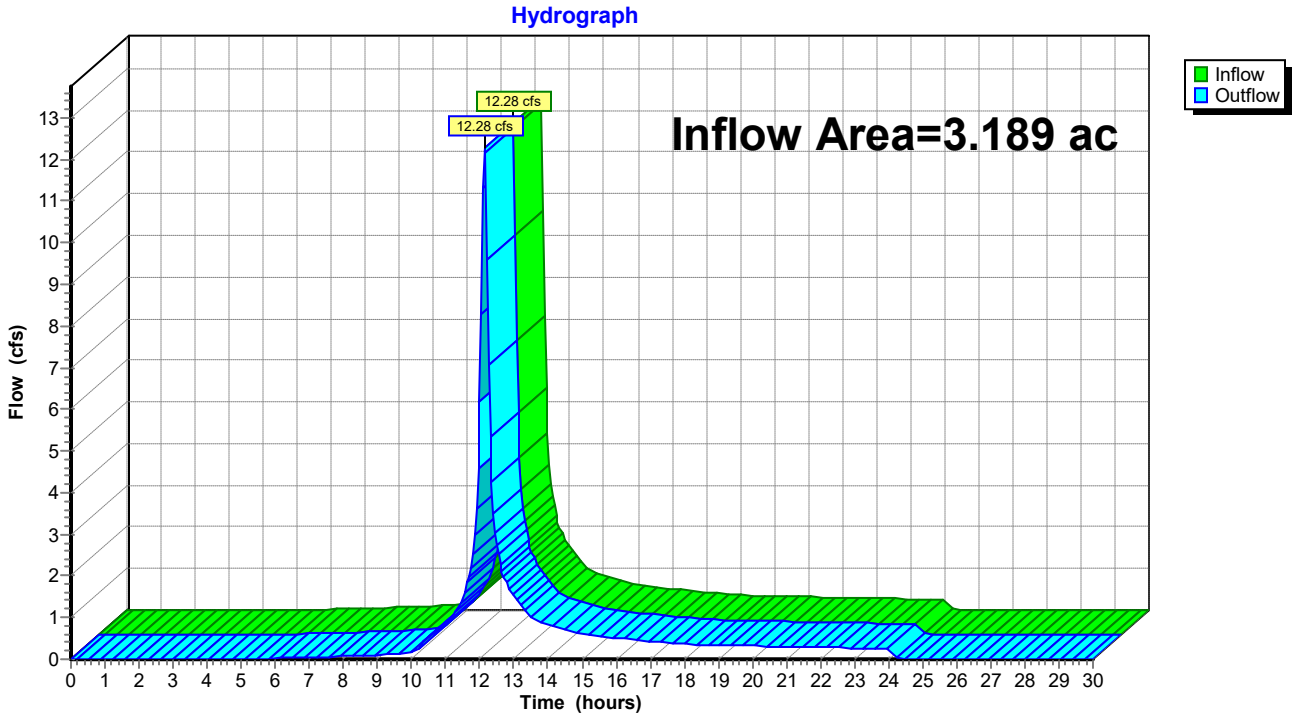
Summary for Reach DP4: DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.189 ac, 74.96% Impervious, Inflow Depth = 3.79" for 25-Year event
Inflow = 12.28 cfs @ 12.14 hrs, Volume= 1.007 af
Outflow = 12.28 cfs @ 12.14 hrs, Volume= 1.007 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: DMH-K1



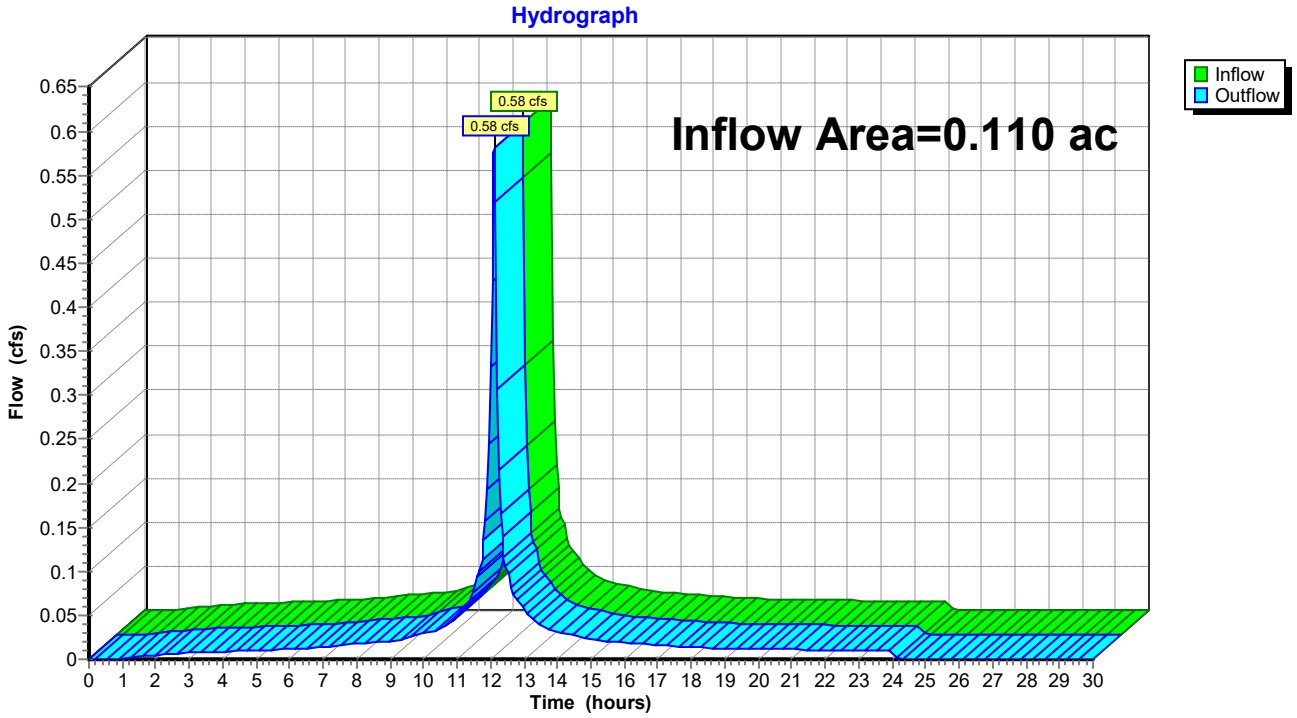
Summary for Reach DP5: DCB-H

[40] Hint: Not Described (Outflow=Inflow)

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



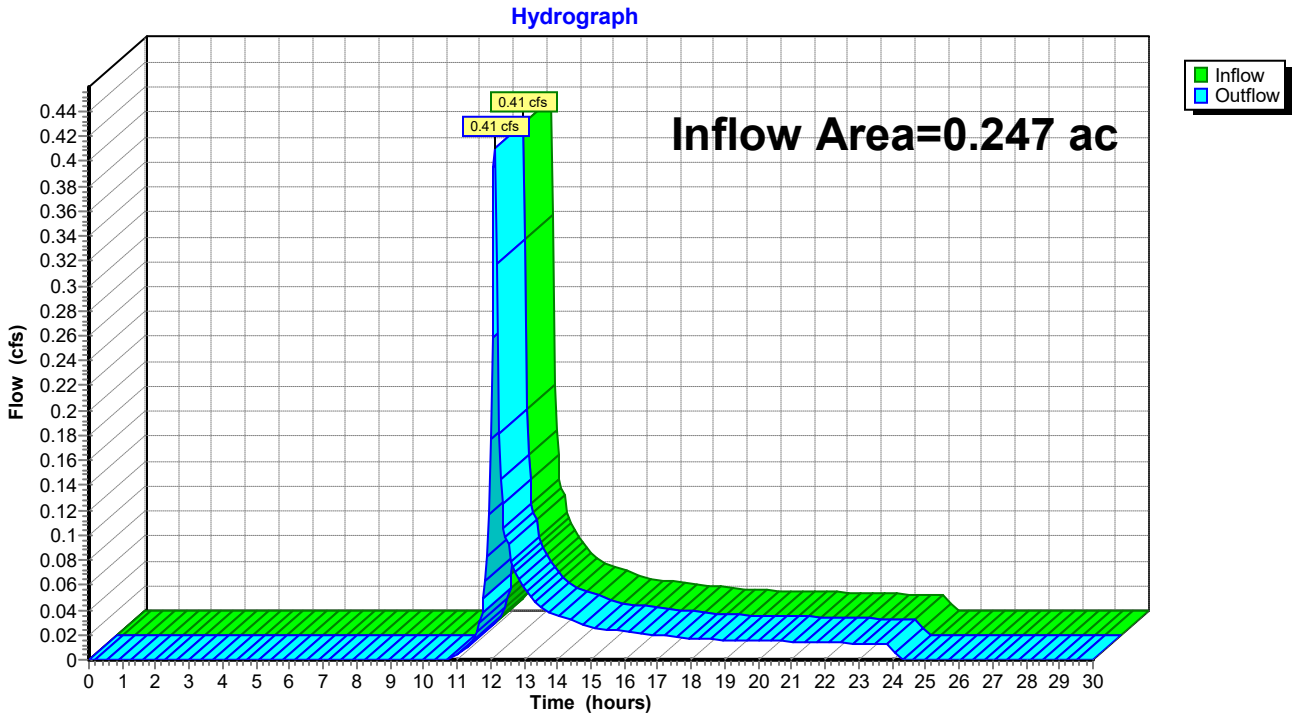
Summary for Reach EX DCB: EX DCB

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

Reach EX DCB: EX DCB



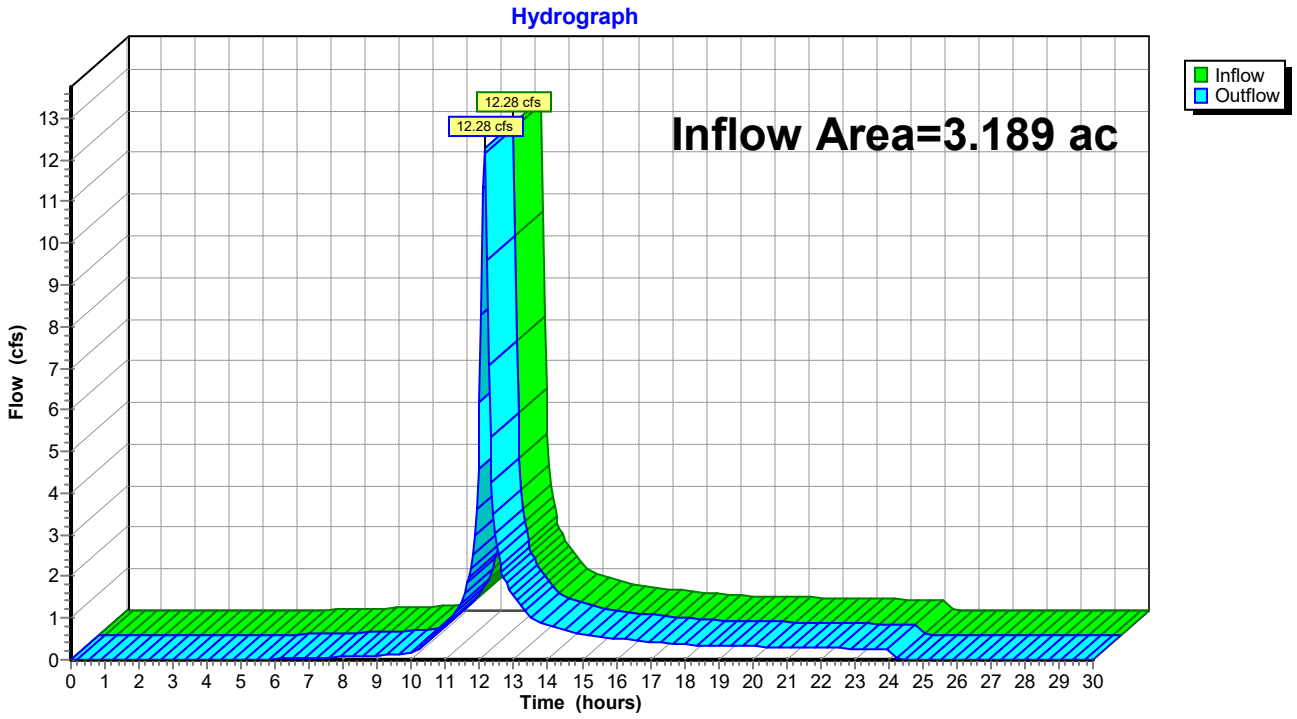
Summary for Reach LP2: TO DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.189 ac, 74.96% Impervious, Inflow Depth = 3.79" for 25-Year event
Inflow = 12.28 cfs @ 12.14 hrs, Volume= 1.007 af
Outflow = 12.28 cfs @ 12.14 hrs, Volume= 1.007 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

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

Reach LP2: TO DMH-K1



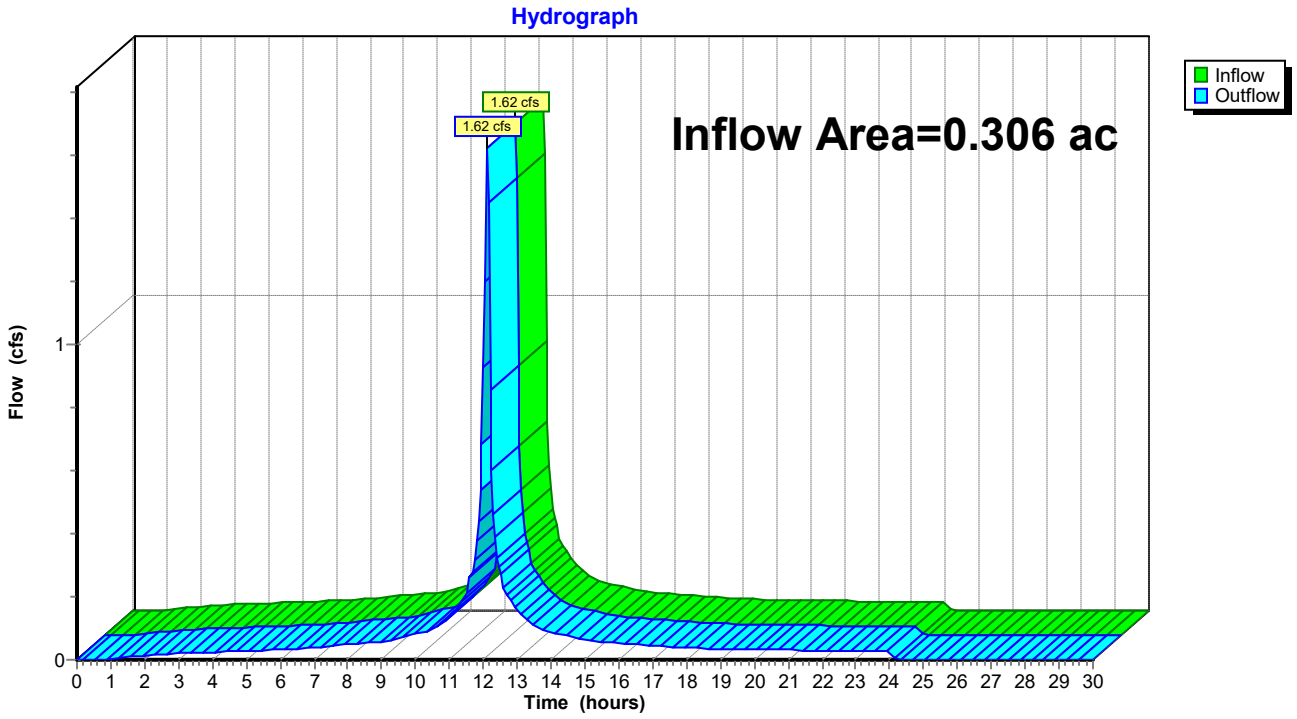
Summary for Reach YDA: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

[57] Hint: Peaked at 466.74' (Flood elevation advised)

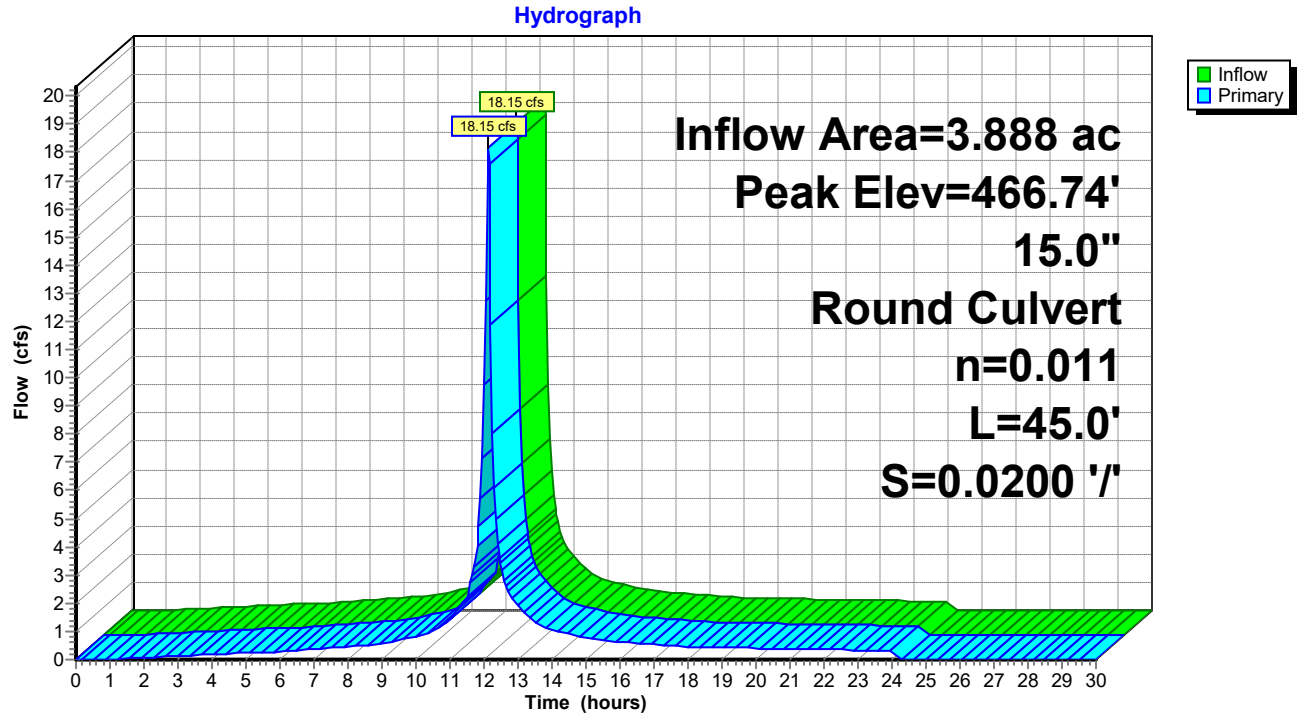
Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 4.86" for 25-Year event
Inflow = 18.15 cfs @ 12.13 hrs, Volume= 1.573 af
Outflow = 18.15 cfs @ 12.13 hrs, Volume= 1.573 af, Atten= 0%, Lag= 0.0 min
Primary = 18.15 cfs @ 12.13 hrs, Volume= 1.573 af
Routed to Reach DMH-D : TO DMH-C

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 466.74' @ 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=17.40 cfs @ 12.13 hrs HW=466.10' (Free Discharge)
1=Culvert (Inlet Controls 17.40 cfs @ 14.18 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 = 3.89 cfs @ 12.13 hrs, Volume= 0.329 af, Atten= 1%, Lag= 0.9 min
Primary = 3.89 cfs @ 12.13 hrs, Volume= 0.329 af
Routed to Reach DCB-D : TO DMH-A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 473.95' @ 12.13 hrs Surf.Area= 1,406 sf Storage= 153 cf

Plug-Flow detention time= 2.2 min calculated for 0.329 af (100% of inflow)
Center-of-Mass det. time= 1.5 min (776.4 - 775.0)

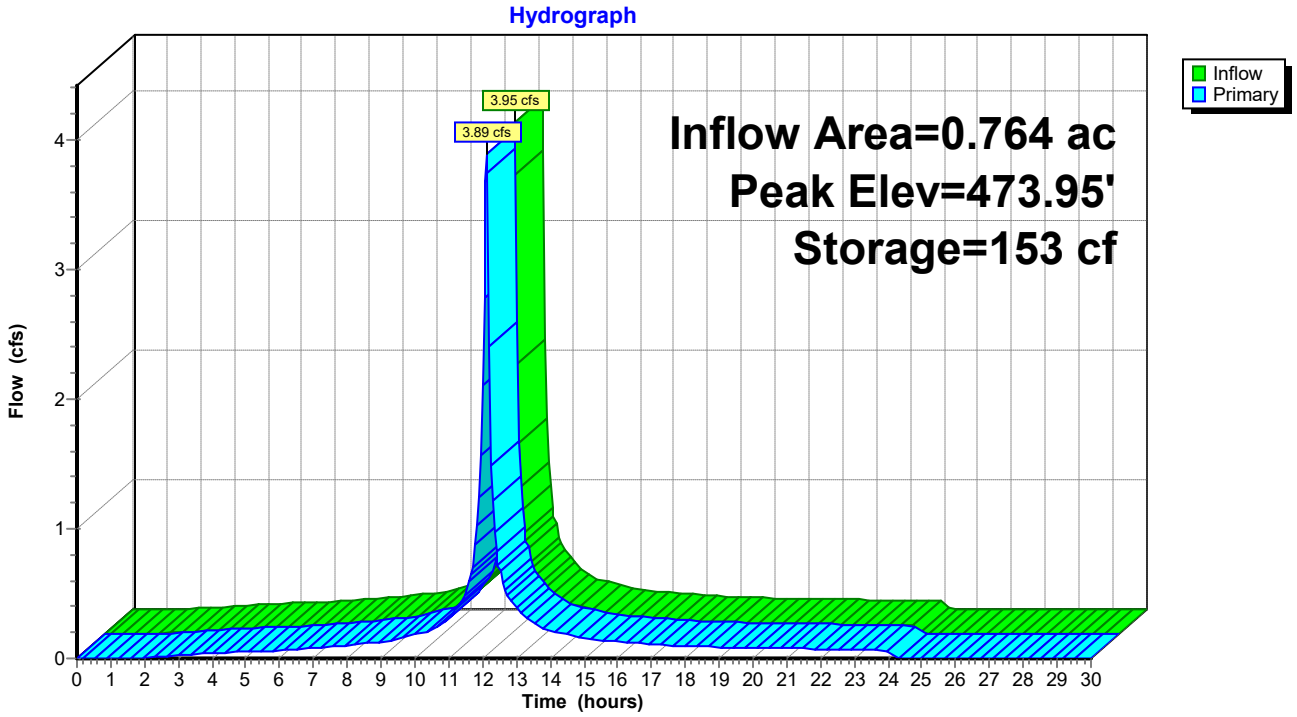
Volume	Invert	Avail.Storage	Storage Description
#1	473.75'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

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	473.80'	**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=3.72 cfs @ 12.13 hrs HW=473.95' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 3.72 cfs @ 1.02 fps)

Pond LP1: TO DCB-D



Summary for Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2

Inflow Area = 2.043 ac, 74.89% Impervious, Inflow Depth = 3.98" for 25-Year event
Inflow = 8.72 cfs @ 12.12 hrs, Volume= 0.678 af
Outflow = 7.69 cfs @ 12.16 hrs, Volume= 0.627 af, Atten= 12%, Lag= 2.4 min
Primary = 7.69 cfs @ 12.16 hrs, Volume= 0.627 af
Routed to Reach LP2 : TO DMH-K1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 464.71' @ 12.16 hrs Surf.Area= 10,214 sf Storage= 3,920 cf

Plug-Flow detention time= 71.5 min calculated for 0.626 af (92% of inflow)
Center-of-Mass det. time= 30.8 min (854.4 - 823.7)

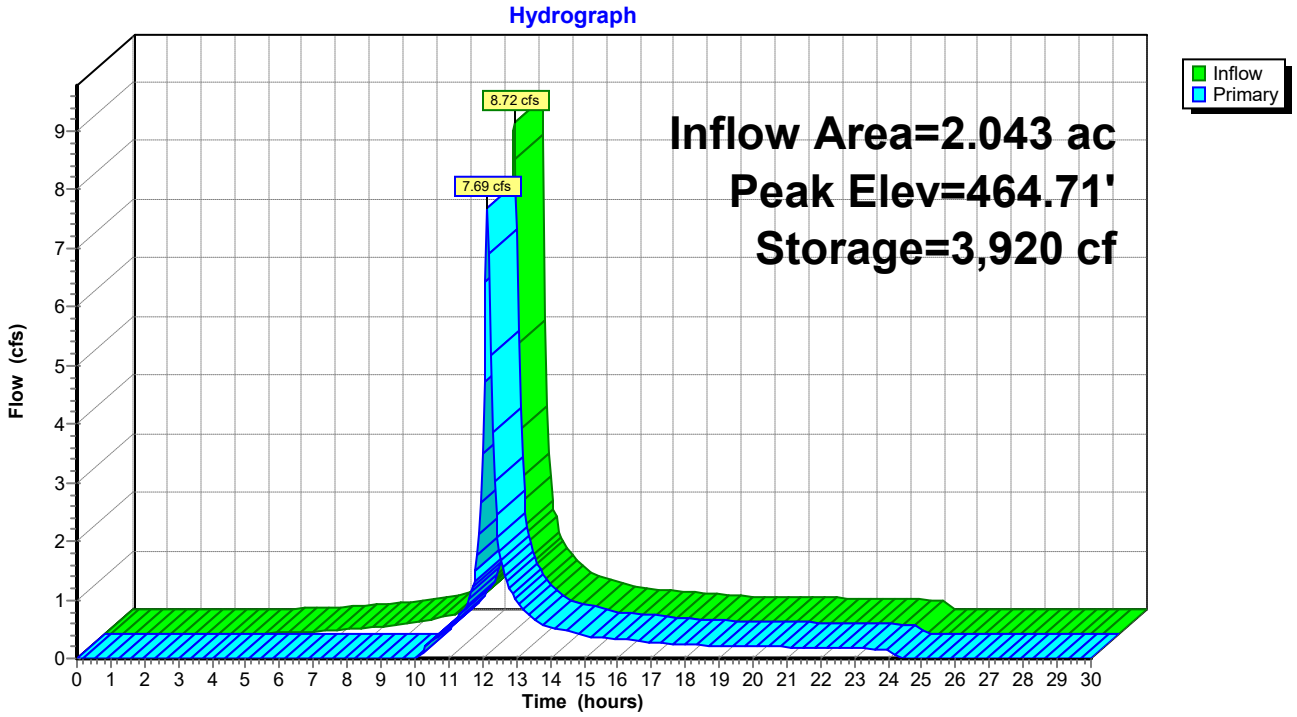
Volume	Invert	Avail.Storage	Storage Description
#1	461.50'	16,070 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
461.50	133	0	0
462.00	180	78	78
463.00	269	225	303
464.00	376	323	625
464.50	5,887	1,566	2,191
465.00	15,961	5,462	7,653
465.50	17,706	8,417	16,070

Device	Routing	Invert	Outlet Devices
#1	Primary	464.50'	**27.0' long + 10.0 '/' SideZ x 20.0' 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=7.56 cfs @ 12.16 hrs HW=464.71' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 7.56 cfs @ 1.22 fps)

Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2



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 LOW POINT #2 (LP2) Runoff Area=49,908 sf 75.09% Impervious Runoff Depth=6.30"
Flow Length=276' Tc=5.0 min CN=83 Runoff=7.65 cfs 0.602 af

Subcatchment E25: TO LOW POINT #3 (LP#3) Runoff Area=88,999 sf 74.89% Impervious Runoff Depth=6.30"
Flow Length=401' Tc=5.2 min CN=83 Runoff=13.49 cfs 1.073 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

Subcatchment e27: TO OFF SITE POINT (DP#6) Runoff Area=2,493 sf 63.62% Impervious Runoff Depth=5.59"
Flow Length=117' Tc=5.0 min CN=77 Runoff=0.35 cfs 0.027 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=0.81' Max Vel=24.65 fps Inflow=16.98 cfs 1.535 af
12.0" Round Pipe n=0.011 L=15.0' S=0.1627 '/' Capacity=16.98 cfs Outflow=16.97 cfs 1.535 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=26.59 cfs 2.344 af
Outflow=26.59 cfs 2.344 af

Reach DMH-C: TO DP#1 Inflow=30.75 cfs 2.797 af
Outflow=30.75 cfs 2.797 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.45' Max Vel=9.13 fps Inflow=30.91 cfs 2.797 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=30.75 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 DP#6: OFFSITE LOW POINT Inflow=0.35 cfs 0.027 af
Outflow=0.35 cfs 0.027 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=30.75 cfs 2.797 af
Outflow=30.75 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: DMH-K1 Inflow=19.13 cfs 1.625 af
Outflow=19.13 cfs 1.625 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 LP2: TO DMH-K1 Inflow=19.13 cfs 1.625 af
Outflow=19.13 cfs 1.625 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=477.41' Inflow=26.59 cfs 2.344 af
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Outflow=26.59 cfs 2.344 af

Pond LP1: TO DCB-D Peak Elev=473.99' Storage=216 cf Inflow=5.69 cfs 0.485 af
Outflow=5.60 cfs 0.485 af

Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS Peak Elev=464.79' Storage=4,691 cf Inflow=13.49 cfs 1.073 af
Outflow=12.01 cfs 1.023 af

Total Runoff Area = 8.235 ac Runoff Volume = 4.717 af Average Runoff Depth = 6.87"
26.88% Pervious = 2.214 ac 73.12% Impervious = 6.022 ac

Summary for Subcatchment E11: TO DP#1

[49] Hint: Tc<2dt may require smaller dt

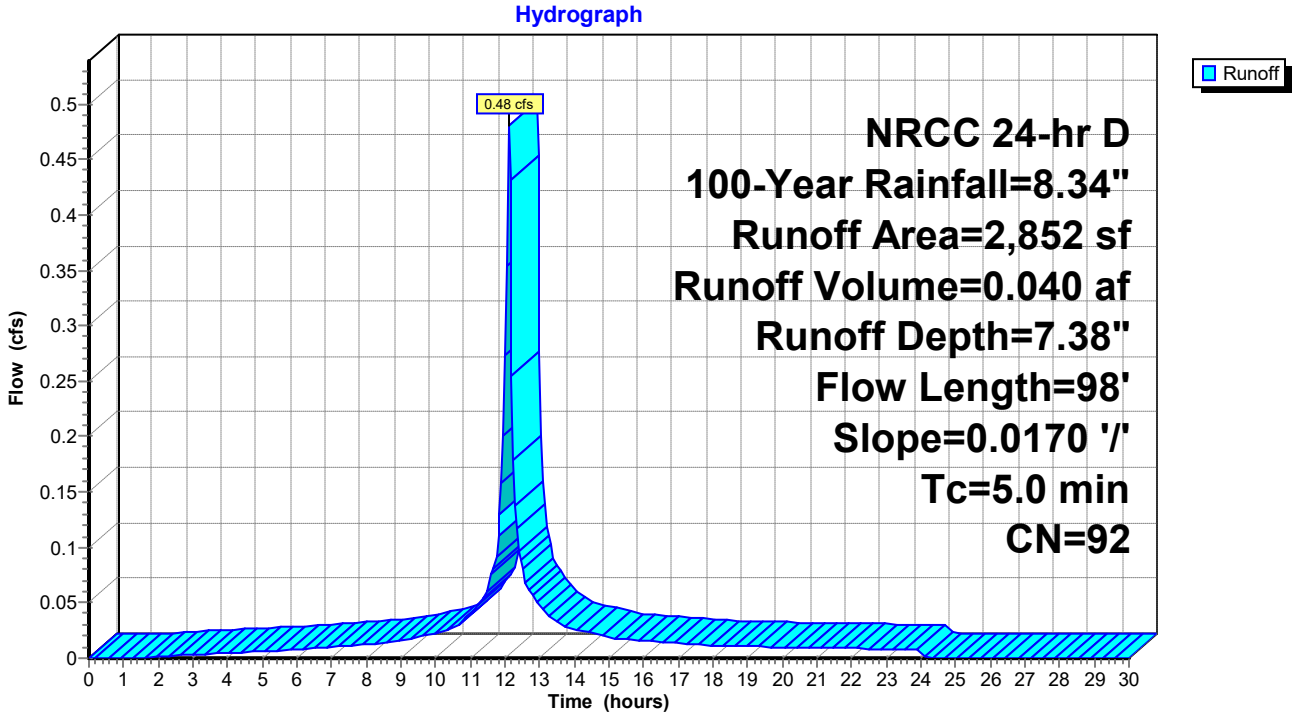
Runoff = 0.48 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 7.38"
Routed to Reach DP1 : GUTTER POINT FRANKLIN (WEST)

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

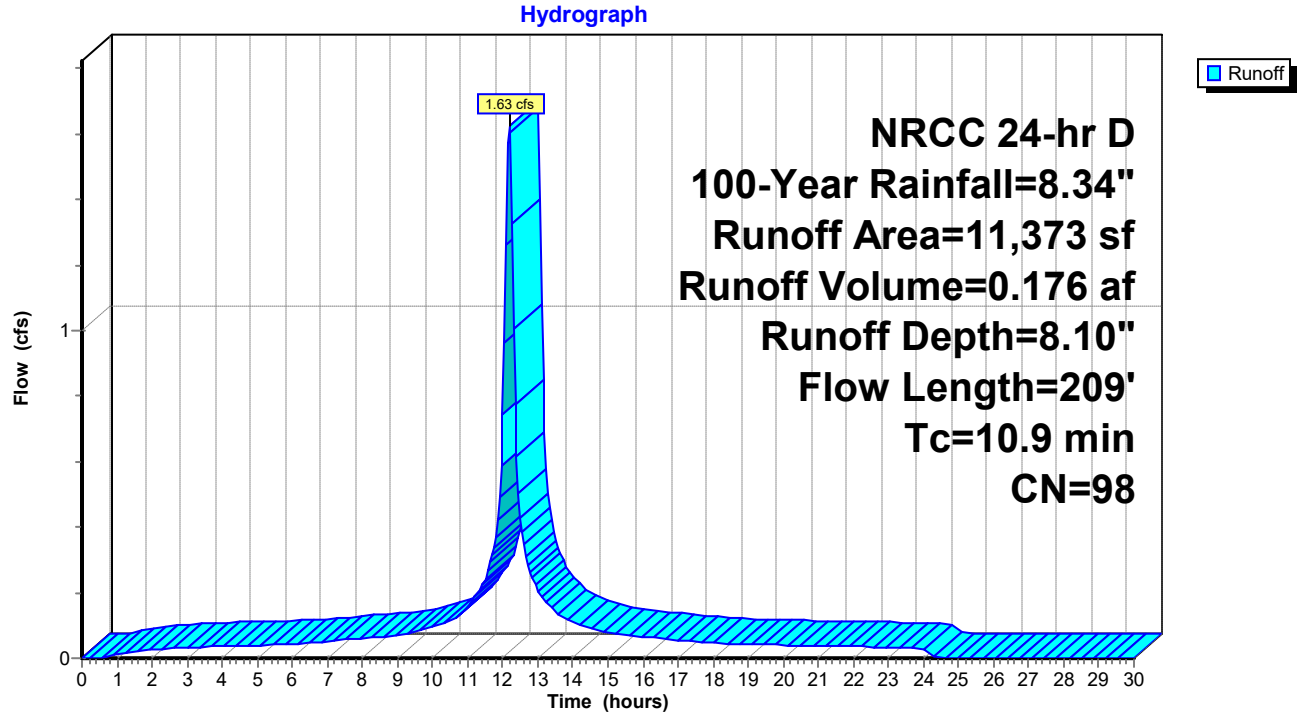
Runoff = 1.63 cfs @ 12.18 hrs, Volume= 0.176 af, Depth= 8.10"
Routed to Reach DCB-A : TO DMH-D

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

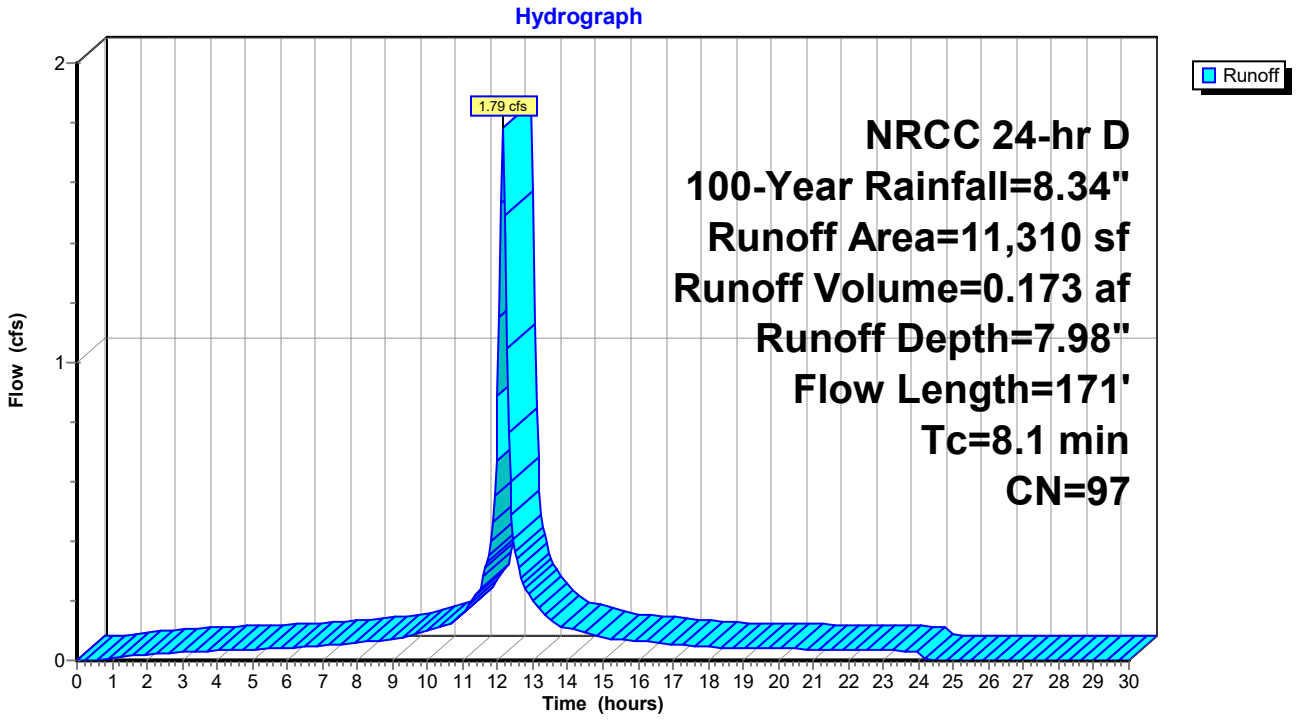
Runoff = 1.79 cfs @ 12.15 hrs, Volume= 0.173 af, Depth= 7.98"
Routed to Reach DCB-B : TO DMH-E

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

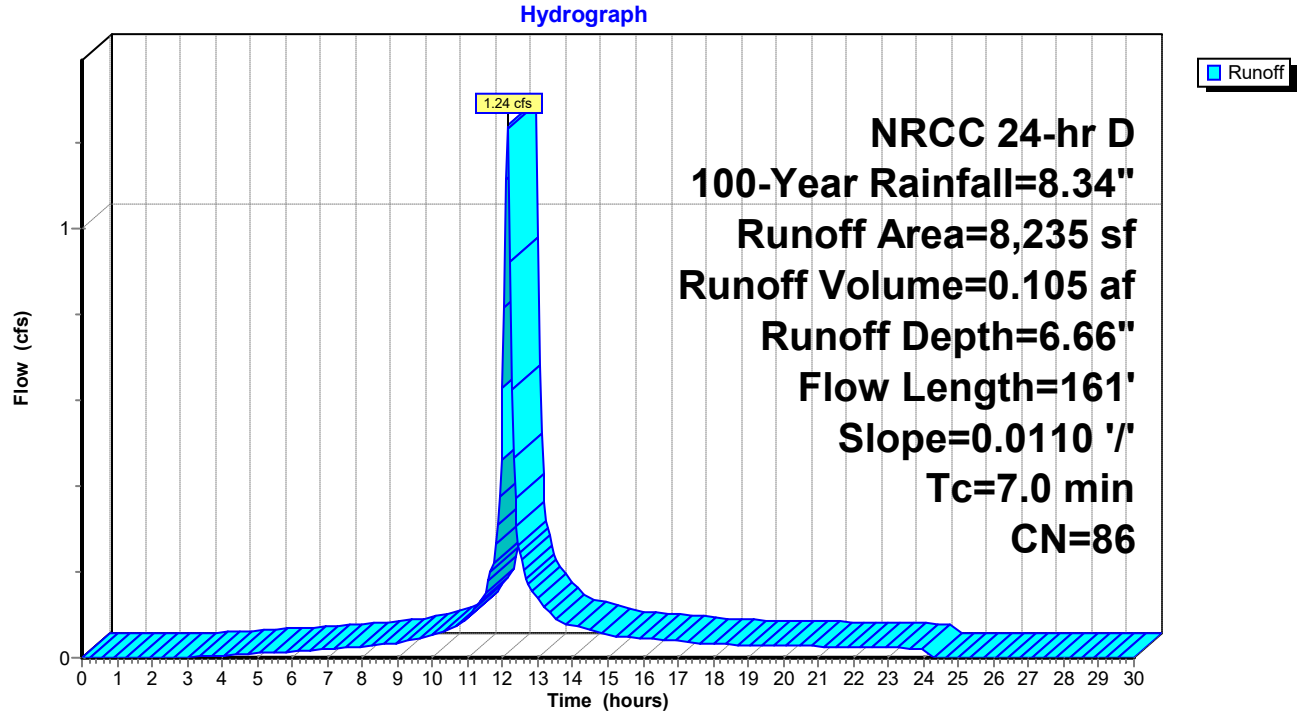
Runoff = 1.24 cfs @ 12.14 hrs, Volume= 0.105 af, Depth= 6.66"
Routed to Reach DCB-C : TO TRUNKLINE

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

[49] Hint: Tc<2dt may require smaller dt

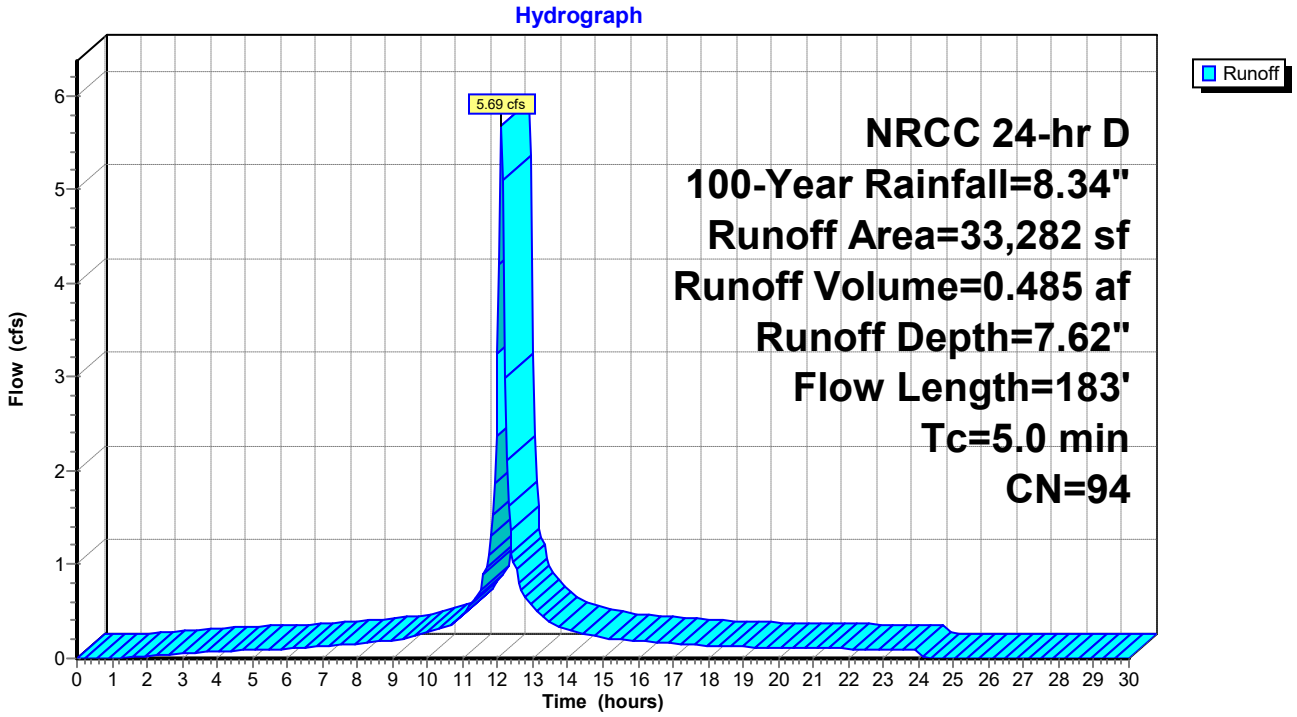
Runoff = 5.69 cfs @ 12.11 hrs, Volume= 0.485 af, Depth= 7.62"
Routed to Pond LP1 : TO DCB-D

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

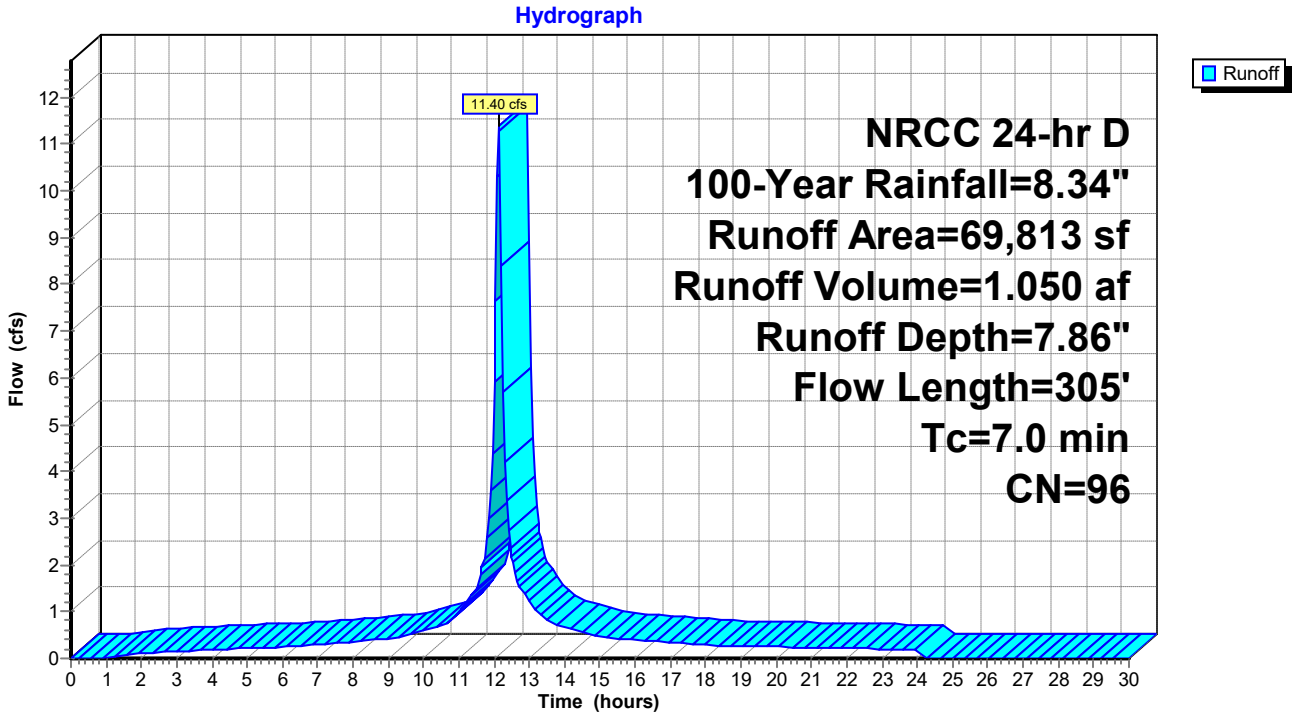
Runoff = 11.40 cfs @ 12.14 hrs, Volume= 1.050 af, Depth= 7.86"
Routed to Reach DCB-D : TO DMH-A

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

[49] Hint: Tc<2dt may require smaller dt

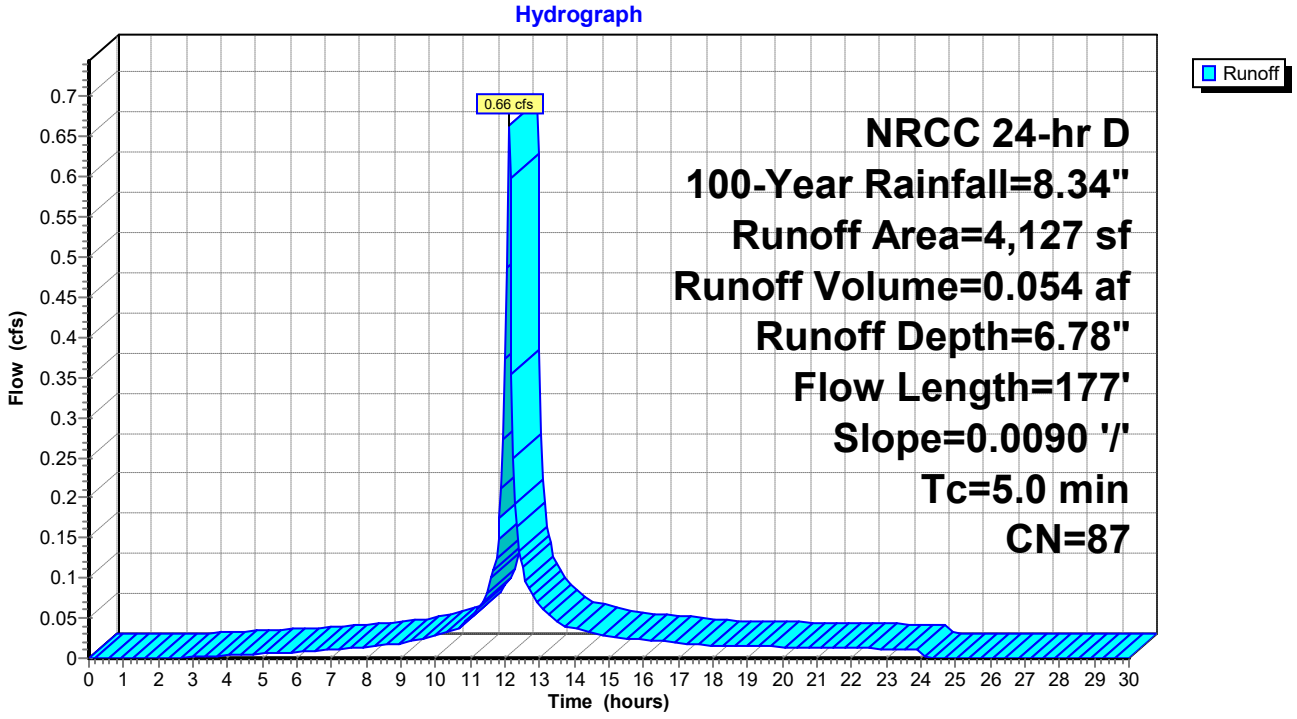
Runoff = 0.66 cfs @ 12.11 hrs, Volume= 0.054 af, Depth= 6.78"
Routed to Reach DCB-E : TO DMH-A

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

[49] Hint: Tc<2dt may require smaller dt

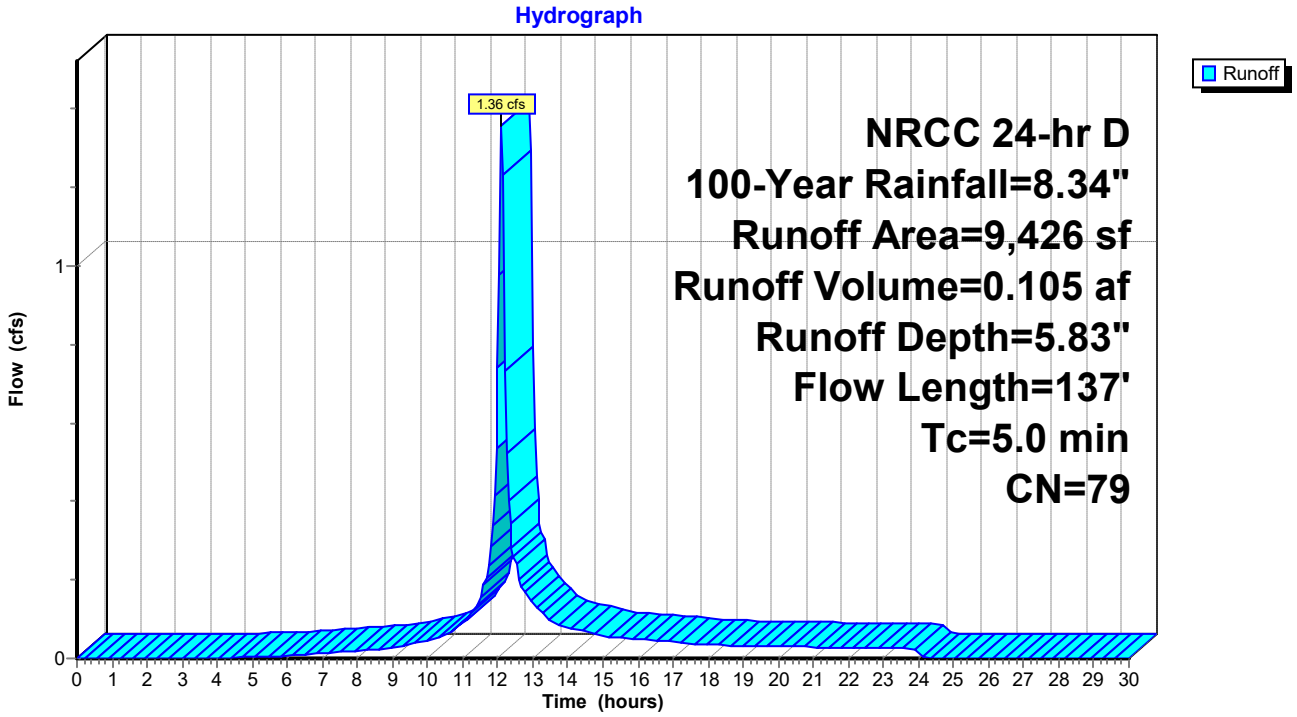
Runoff = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af, Depth= 5.83"
Routed to Reach DP3 : CATCHBASIN (FIRE STATION)

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

[49] Hint: Tc<2dt may require smaller dt

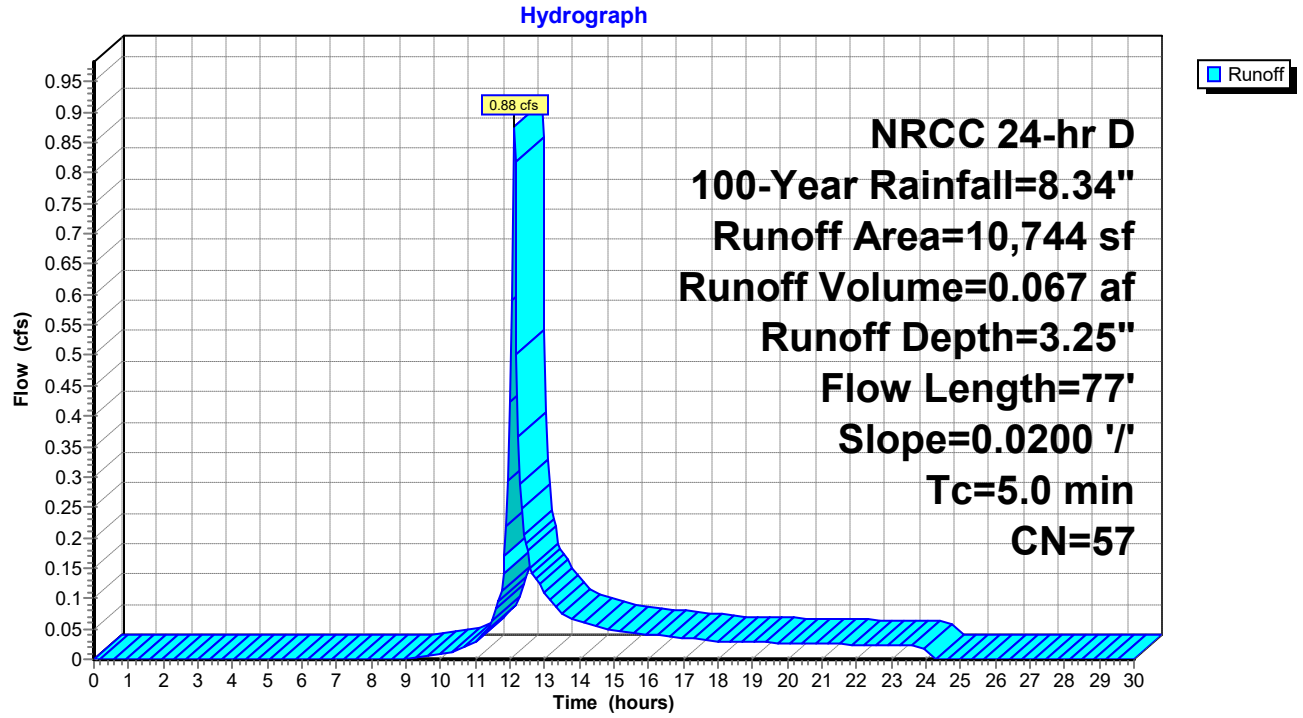
Runoff = 0.88 cfs @ 12.12 hrs, Volume= 0.067 af, Depth= 3.25"
Routed to Reach EX DCB : EX DCB

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

[49] Hint: Tc<2dt may require smaller dt

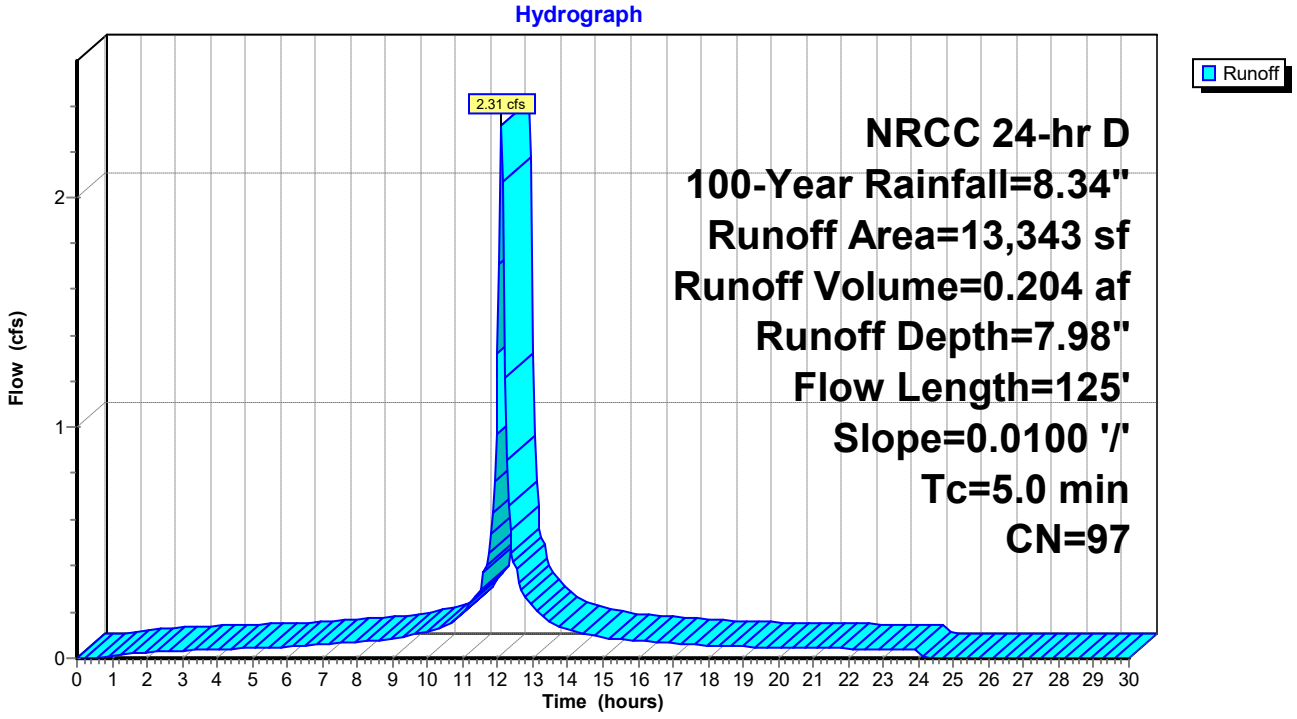
Runoff = 2.31 cfs @ 12.11 hrs, Volume= 0.204 af, Depth= 7.98"
Routed to Reach YDA : (new Reach)

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

[49] Hint: Tc<2dt may require smaller dt

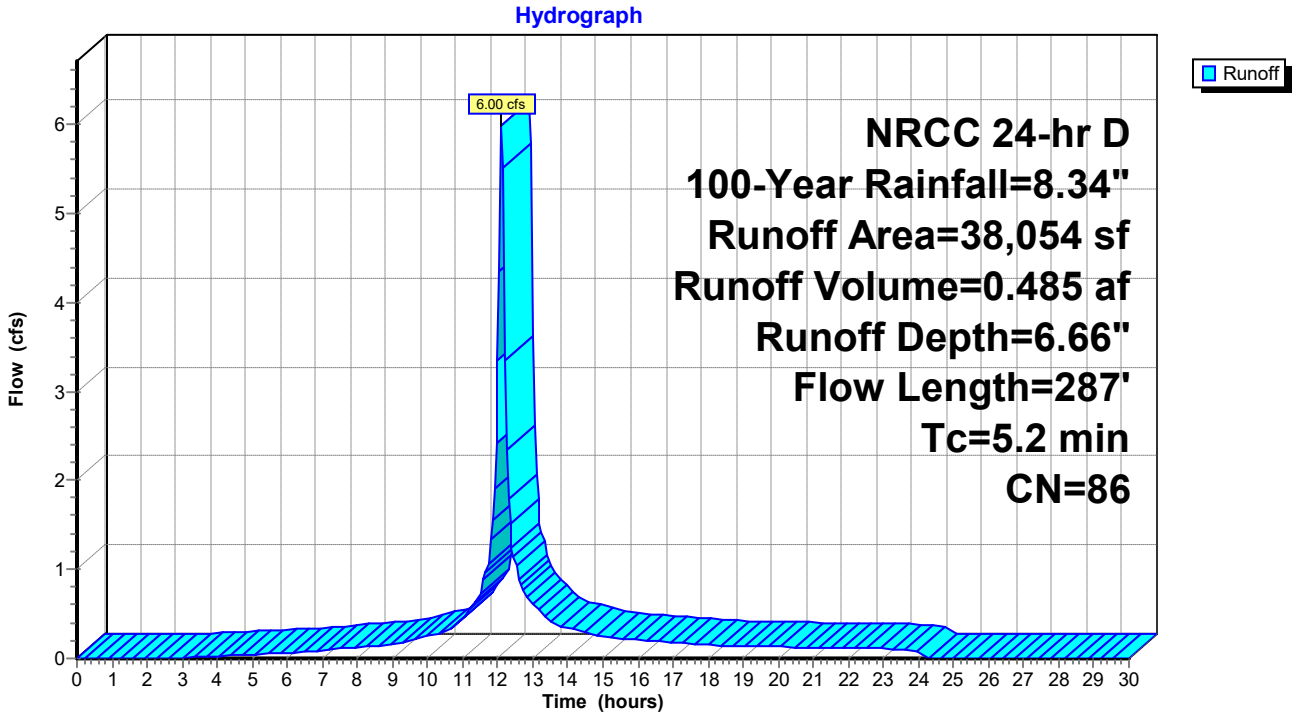
Runoff = 6.00 cfs @ 12.11 hrs, Volume= 0.485 af, Depth= 6.66"
Routed to Reach DCB-F : (new Reach)

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 LOW POINT #2 (LP2)

[49] Hint: Tc<2dt may require smaller dt

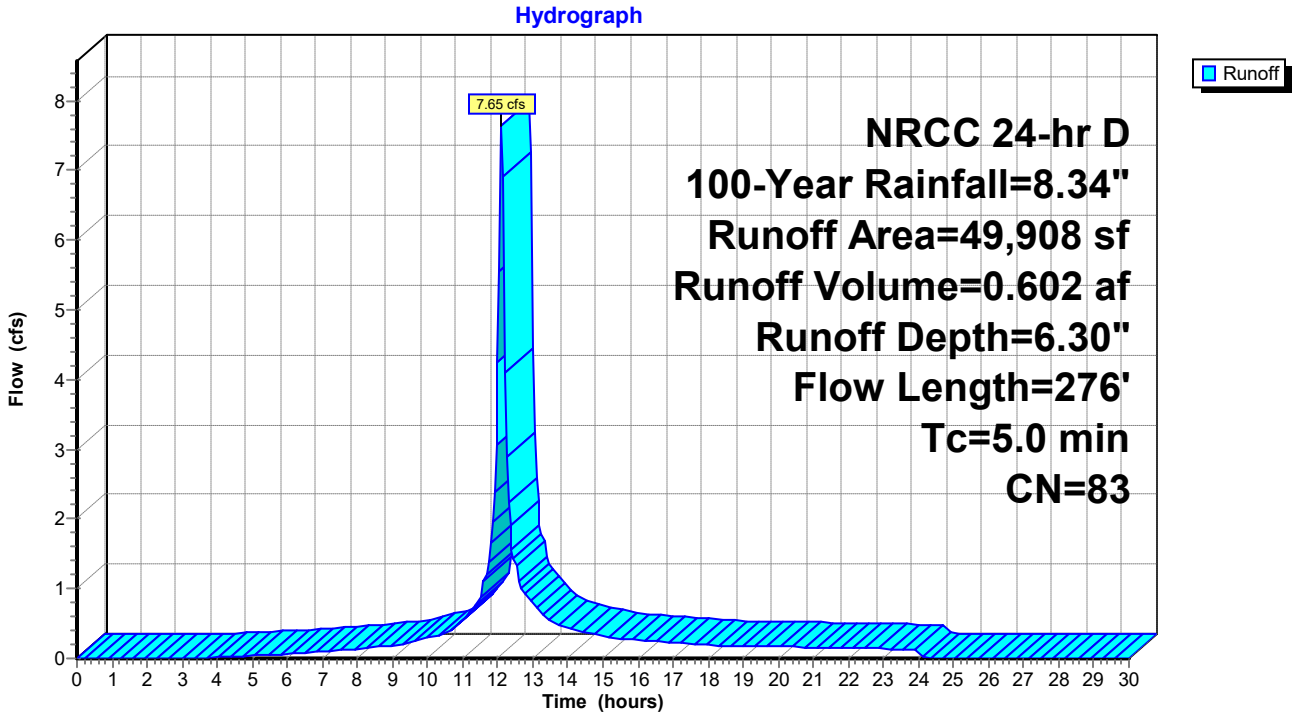
Runoff = 7.65 cfs @ 12.11 hrs, Volume= 0.602 af, Depth= 6.30"
Routed to Reach LP2 : TO DMH-K1

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
11,774	39	>75% Grass cover, Good, HSG A
37,475	98	Paved parking, HSG A
659	48	Brush, Poor, HSG A
49,908	83	Weighted Average
12,433		24.91% Pervious Area
37,475		75.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	45	0.0600	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.1	5	0.0380	0.97		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.0	226	0.0380	3.96		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	276	Total, Increased to minimum Tc = 5.0 min			

Subcatchment E24: TO LOW POINT #2 (LP2)



Summary for Subcatchment E25: TO LOW POINT #3 (LP#3)

[49] Hint: Tc<2dt may require smaller dt

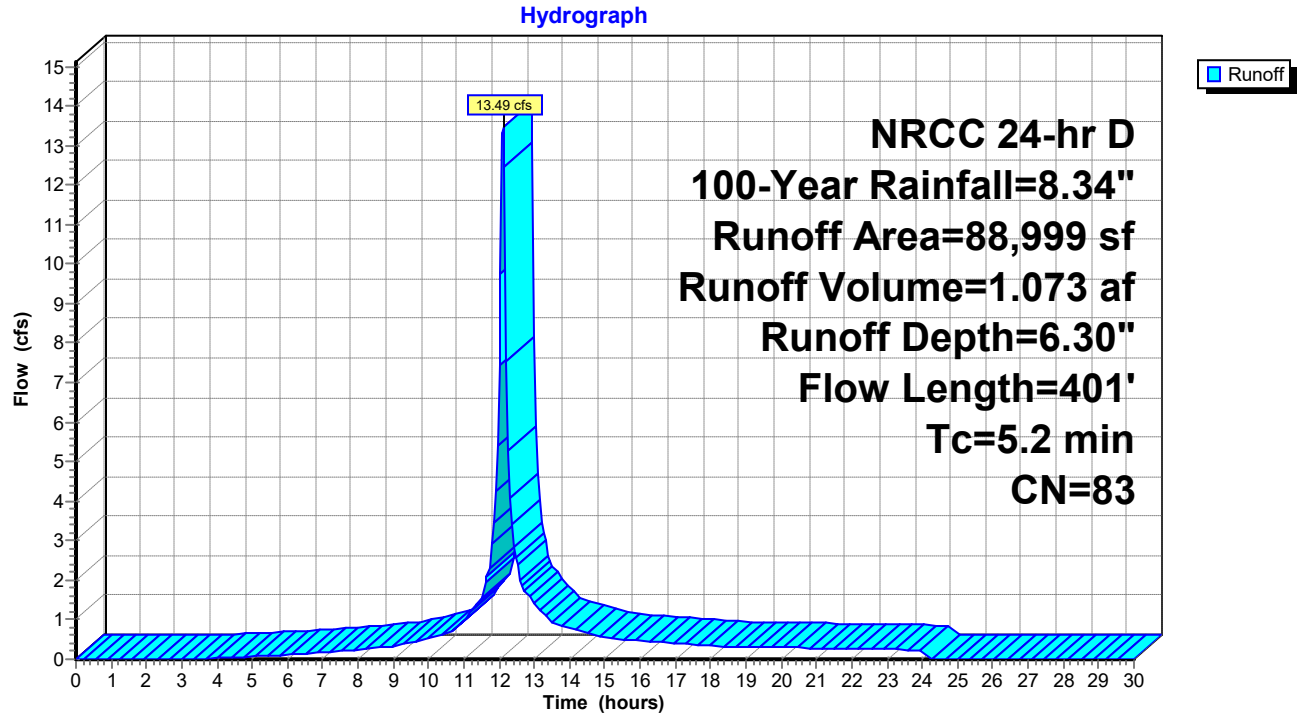
Runoff = 13.49 cfs @ 12.12 hrs, Volume= 1.073 af, Depth= 6.30"
Routed to Pond LP3 : OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2

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
22,346	39	>75% Grass cover, Good, HSG A
66,653	98	Paved parking, HSG A
88,999	83	Weighted Average
22,346		25.11% Pervious Area
66,653		74.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	75	0.1300	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.0	10	0.1300	5.80		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.5	316	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.2	401	Total			

Subcatchment E25: TO LOW POINT #3 (LP#3)



Summary for Subcatchment E26: TO DCB-H

[49] Hint: Tc<2dt may require smaller dt

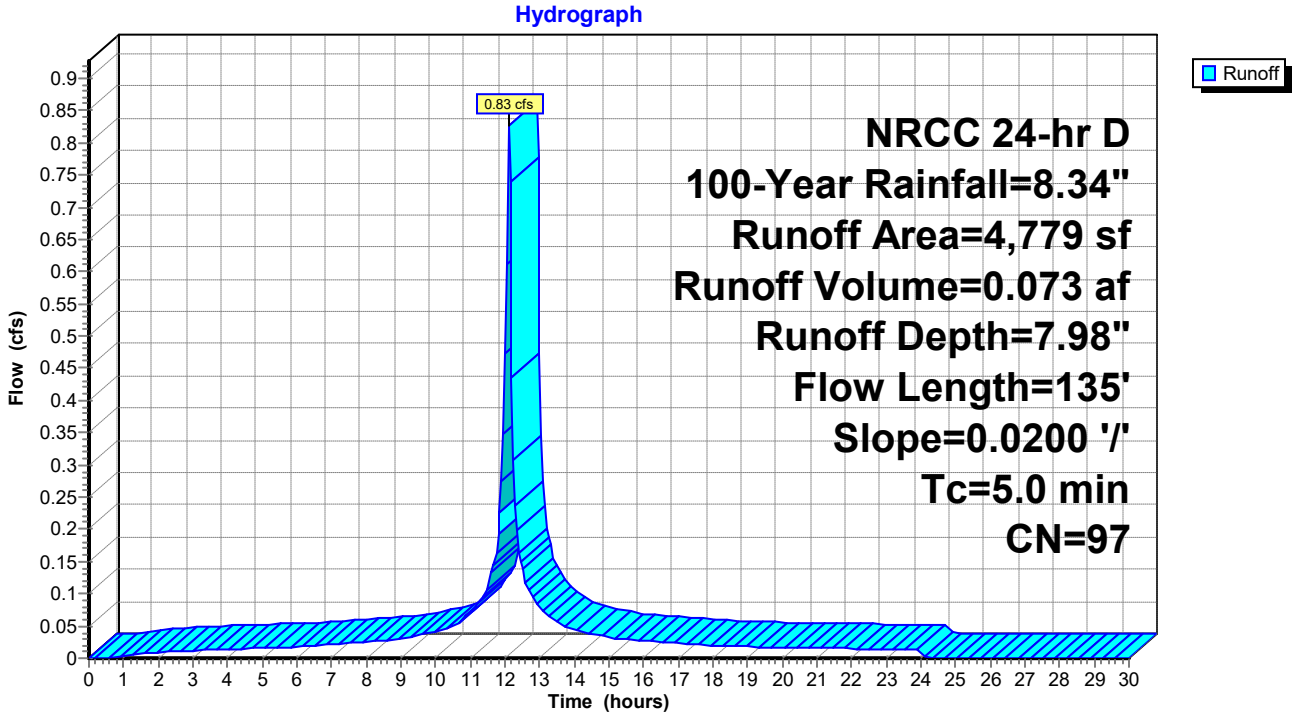
Runoff = 0.83 cfs @ 12.11 hrs, Volume= 0.073 af, Depth= 7.98"
Routed to Reach DP5 : DCB-H

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 Subcatchment e27: TO OFF SITE POINT (DP#6)

[49] Hint: Tc<2dt may require smaller dt

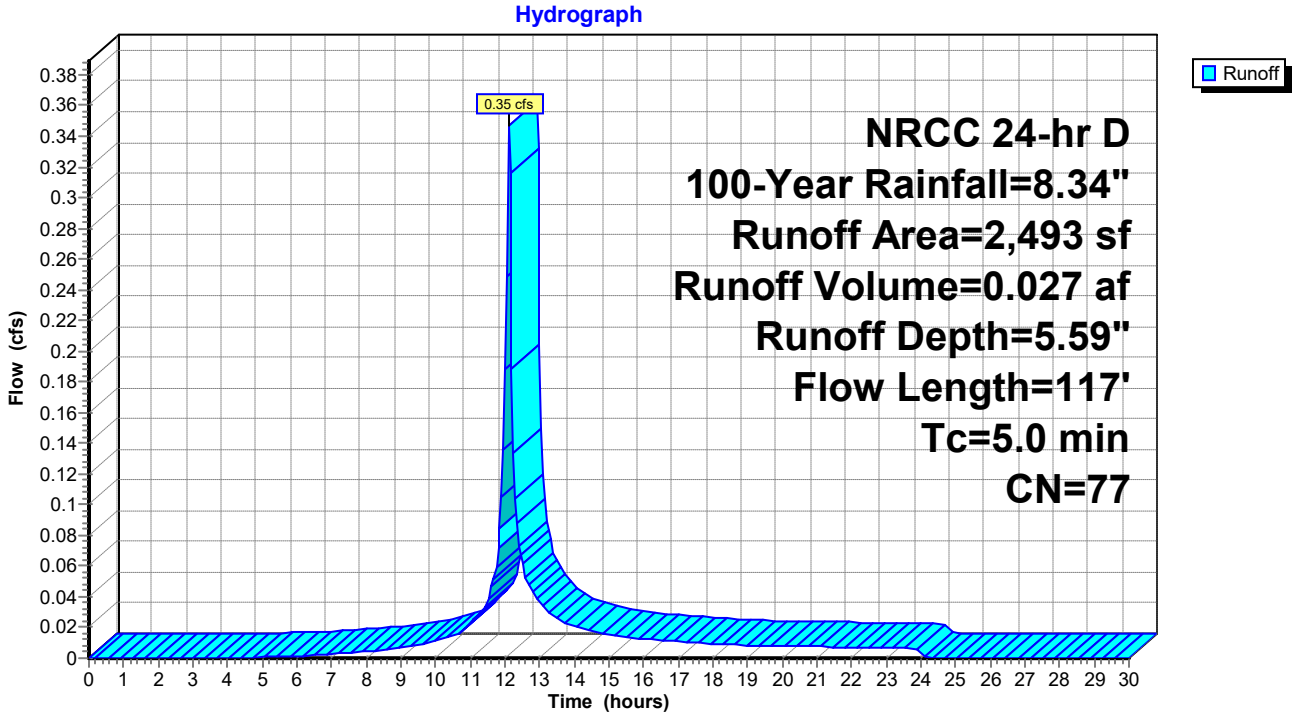
Runoff = 0.35 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 5.59"
Routed to Reach DP#6 : OFFSITE LOW POINT

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
907	39	>75% Grass cover, Good, HSG A
1,586	98	Paved parking, HSG A
2,493	77	Weighted Average
907		36.38% Pervious Area
1,586		63.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	75	0.1000	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	42	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.3	117	Total, Increased to minimum Tc = 5.0 min			

Subcatchment e27: TO OFF SITE POINT (DP#6)



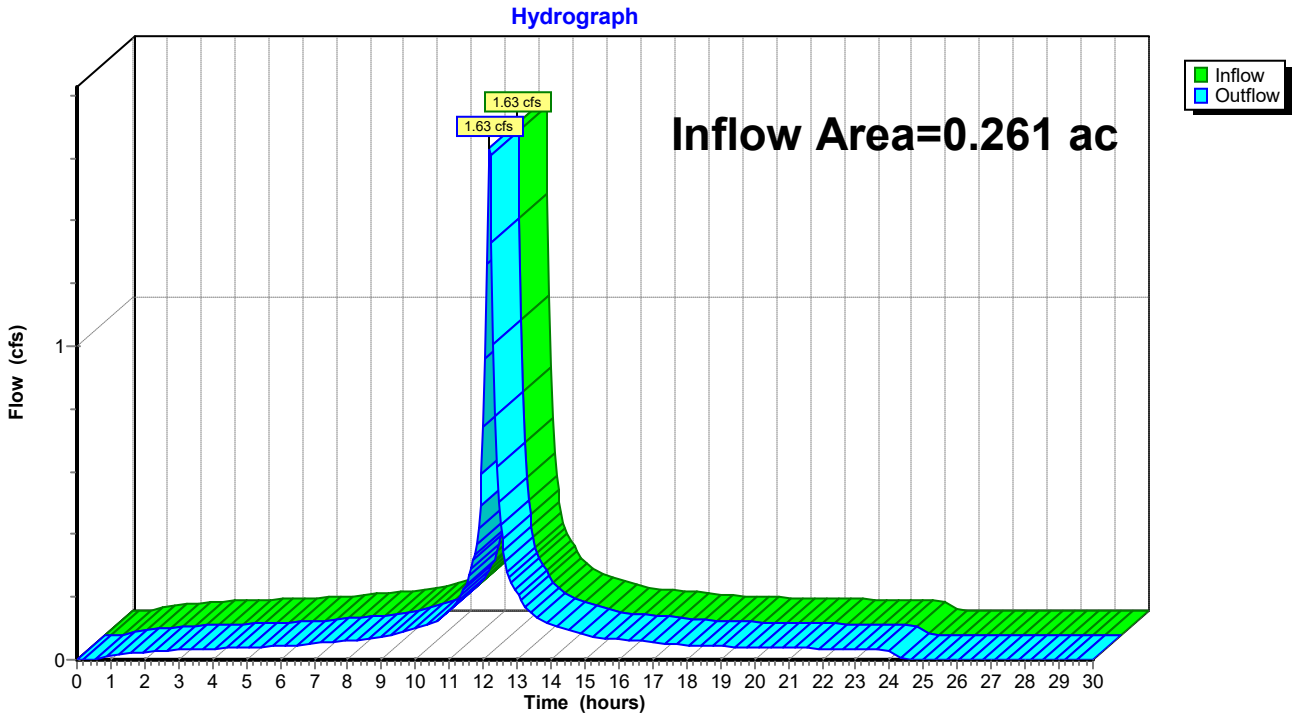
Summary for Reach DCB-A: TO DMH-D

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-D : TO DMH-C

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

Reach DCB-A: TO DMH-D



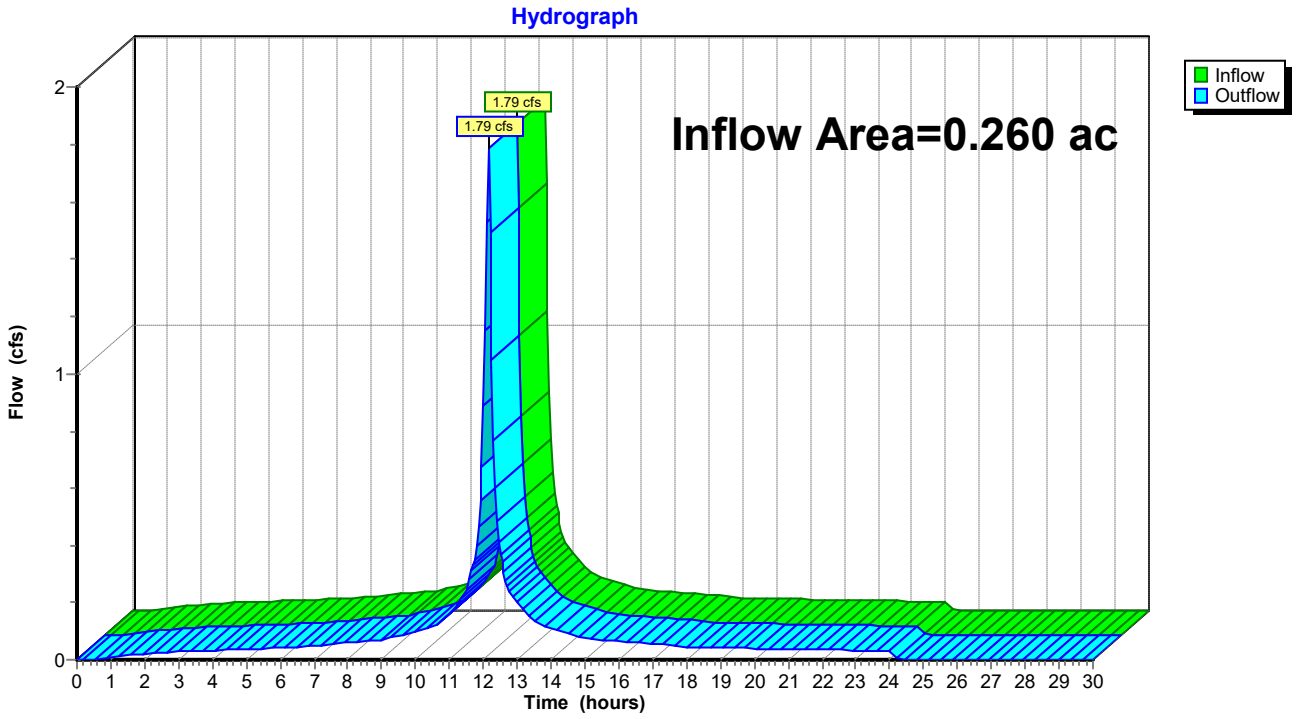
Summary for Reach DCB-B: TO DMH-E

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-E : TO DMH-D

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

Reach DCB-B: TO DMH-E



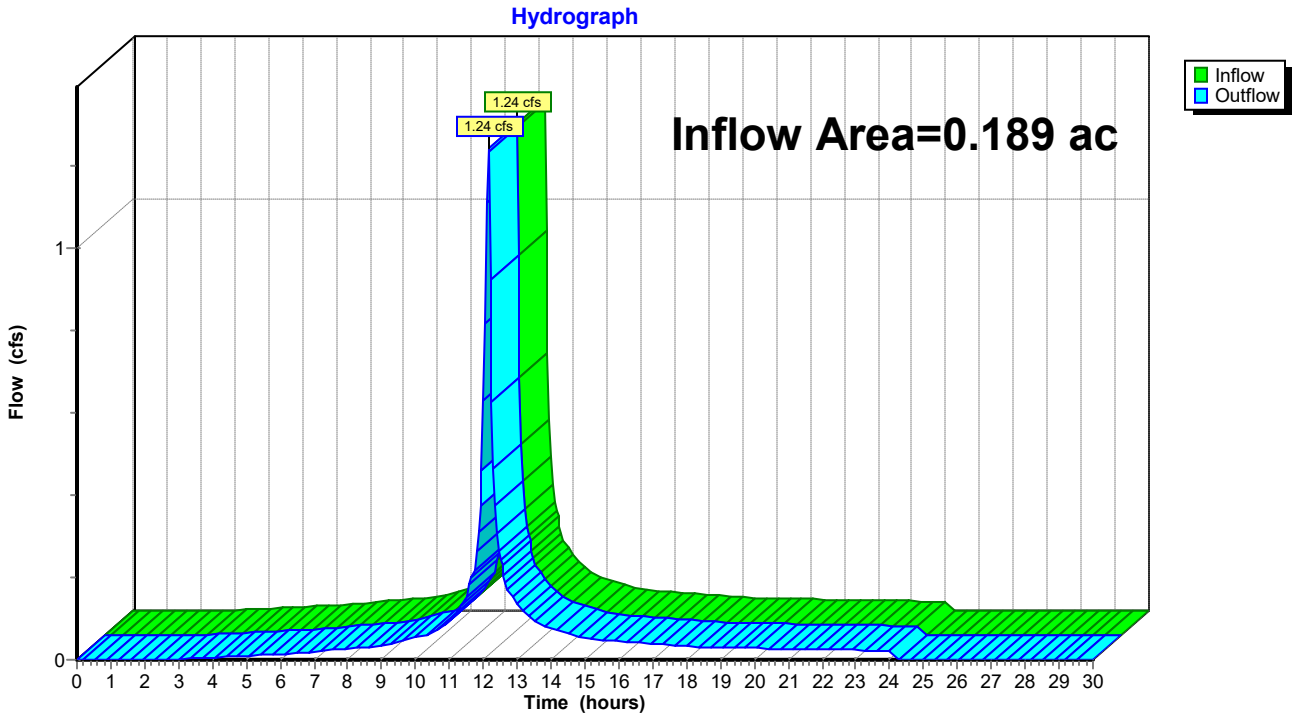
Summary for Reach DCB-C: TO TRUNKLINE

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-E : TO DMH-D

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

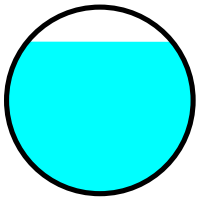
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 2.367 ac, 77.91% Impervious, Inflow Depth = 7.78" for 100-Year event
Inflow = 16.98 cfs @ 12.13 hrs, Volume= 1.535 af
Outflow = 16.97 cfs @ 12.13 hrs, Volume= 1.535 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-A : TO DMH-B

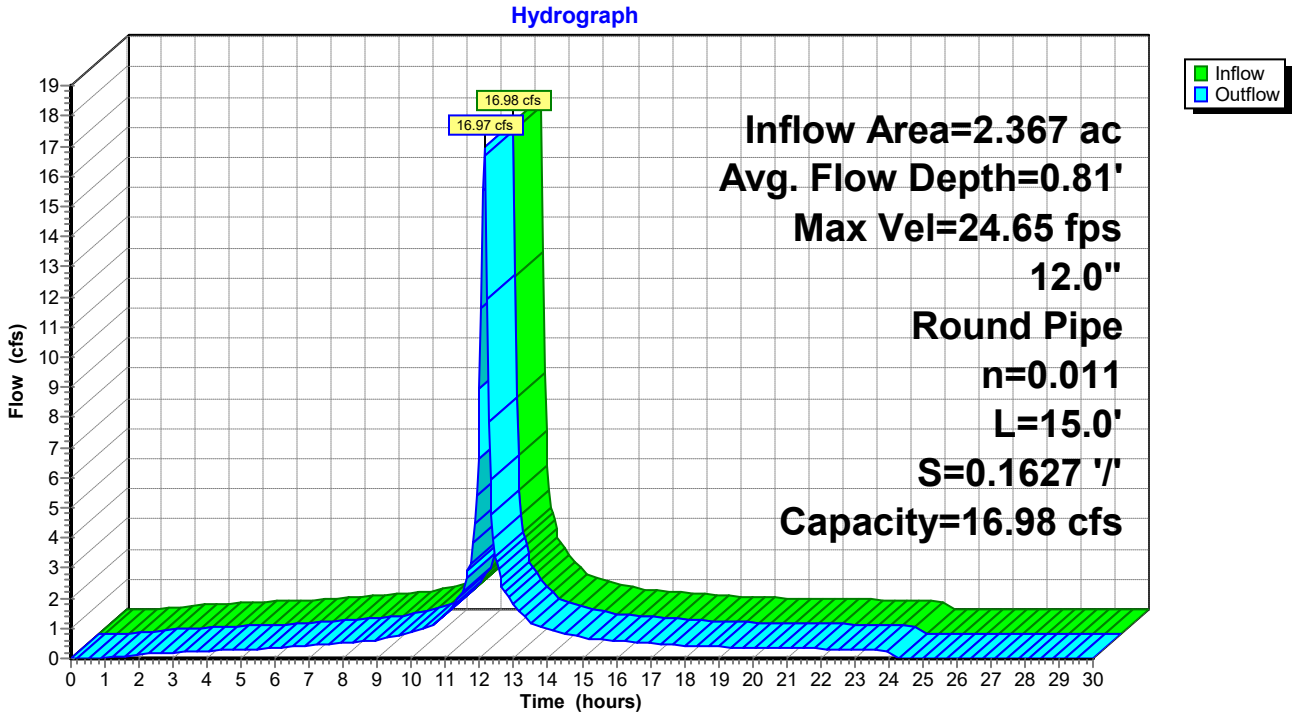
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 24.65 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.66 fps, Avg. Travel Time= 0.0 min

Peak Storage= 10 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.81' , Surface Width= 0.78'
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

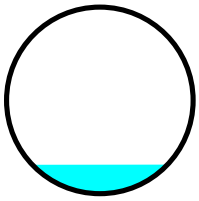
[52] Hint: Inlet/Outlet conditions not evaluated

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
Routed to Reach DMH-A : TO DMH-B

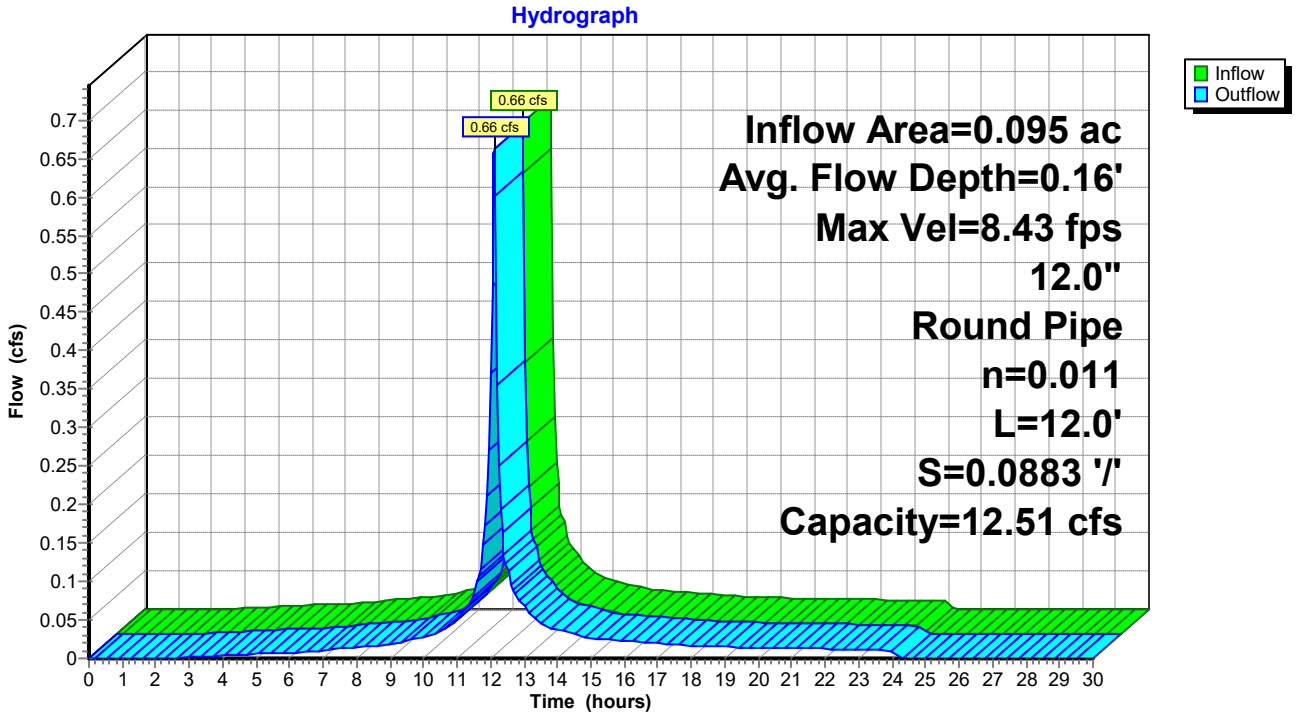
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.43 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.91 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 0.73'
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



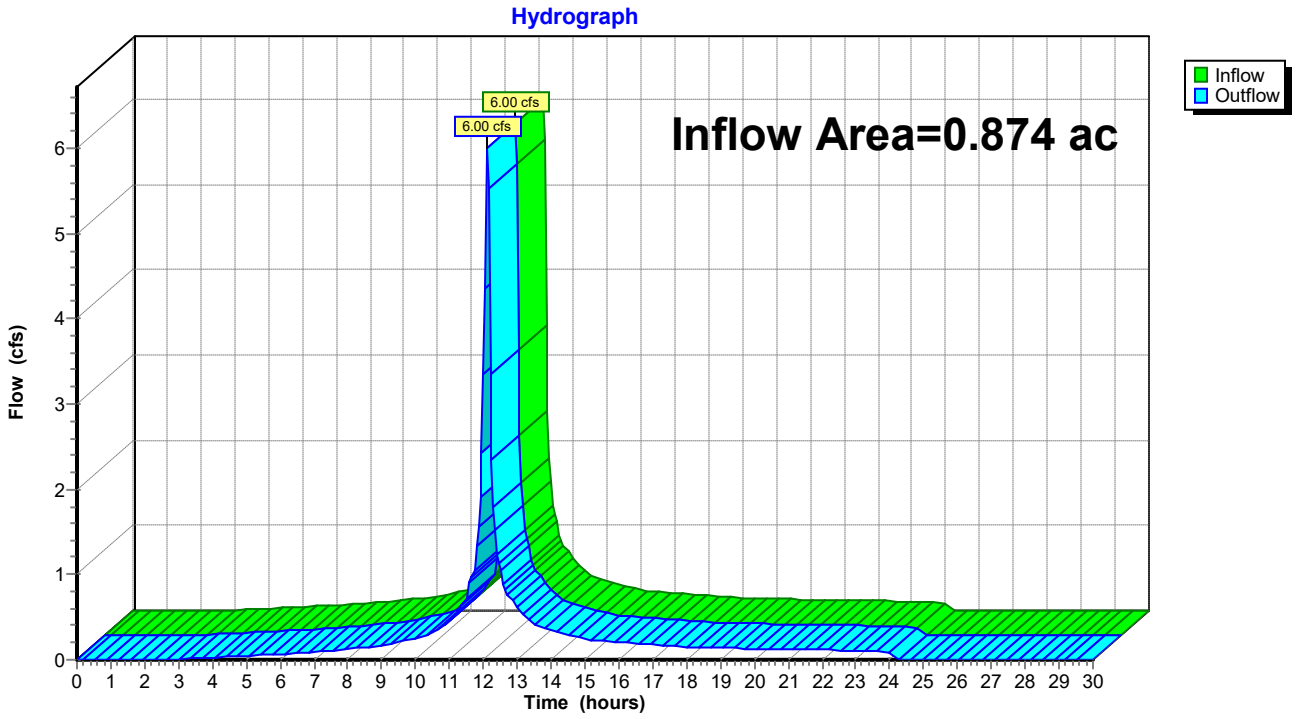
Summary for Reach DCB-F: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

Reach DCB-F: (new Reach)



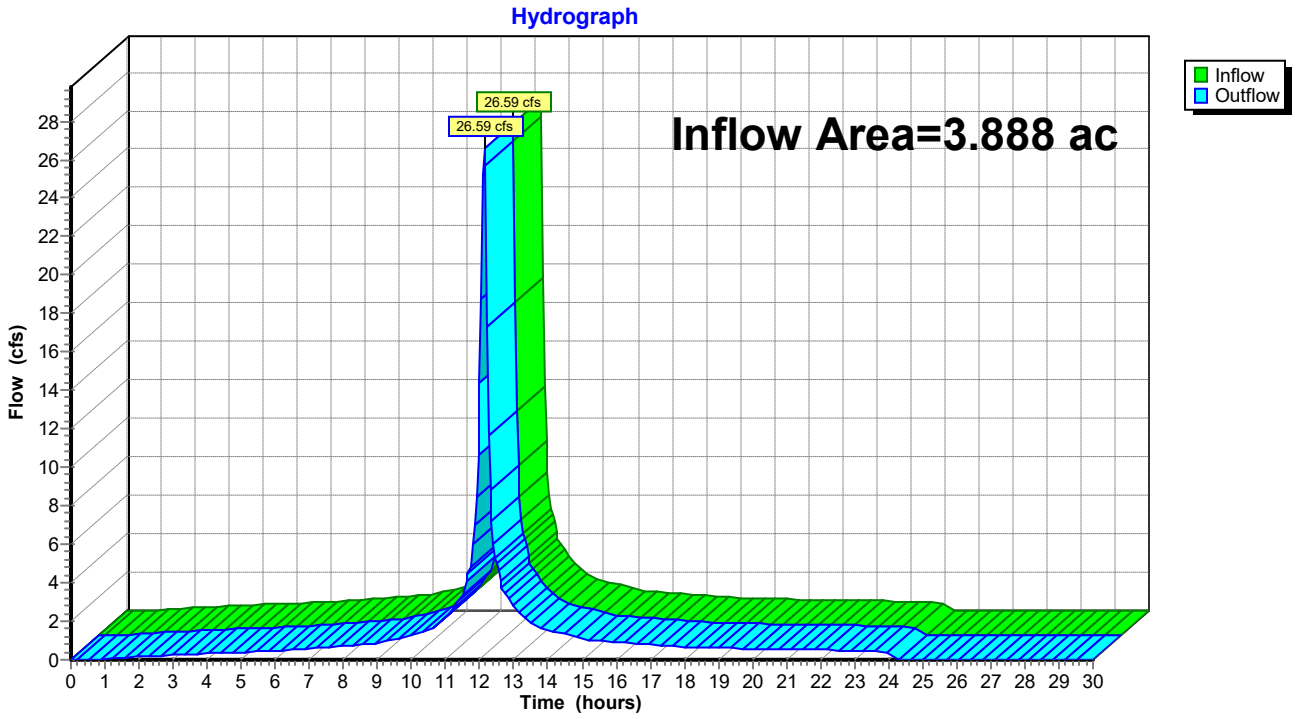
Summary for Reach DMH-A: TO DMH-B

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 7.23" for 100-Year event
Inflow = 26.59 cfs @ 12.13 hrs, Volume= 2.344 af
Outflow = 26.59 cfs @ 12.13 hrs, Volume= 2.344 af, Atten= 0%, Lag= 0.0 min
Routed to Pond DMH-B : TO DMH-D

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

Reach DMH-A: TO DMH-B



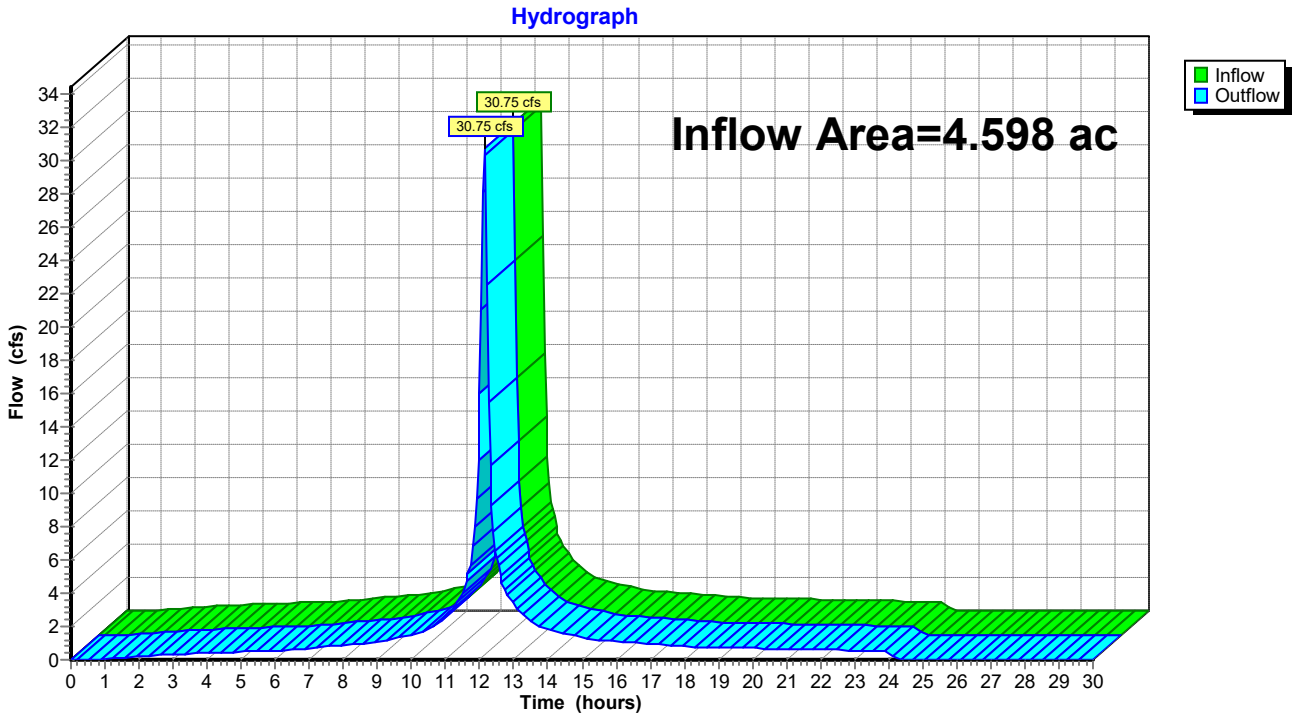
Summary for Reach DMH-C: TO DP#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 7.30" for 100-Year event
Inflow = 30.75 cfs @ 12.14 hrs, Volume= 2.797 af
Outflow = 30.75 cfs @ 12.14 hrs, Volume= 2.797 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

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

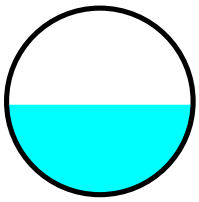
[52] Hint: Inlet/Outlet conditions not evaluated
[63] Warning: Exceeded Reach DMH-E INLET depth by 0.30' @ 12.15 hrs
[79] Warning: Submerged Pond DMH-B Primary device # 1 INLET by 0.53'

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 7.30" for 100-Year event
Inflow = 30.91 cfs @ 12.13 hrs, Volume= 2.797 af
Outflow = 30.75 cfs @ 12.14 hrs, Volume= 2.797 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH-C : TO DP#1

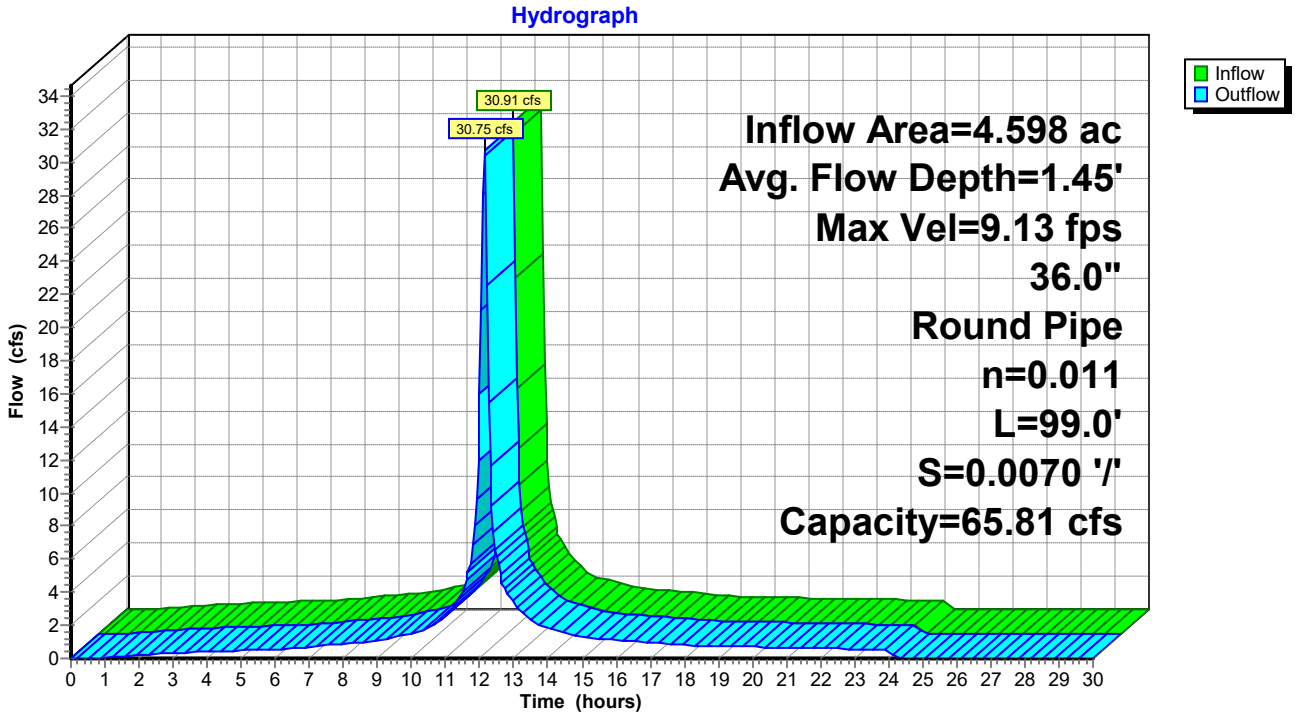
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.13 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.26 fps, Avg. Travel Time= 0.5 min

Peak Storage= 335 cf @ 12.13 hrs
Average Depth at Peak Storage= 1.45' , Surface Width= 3.00'
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

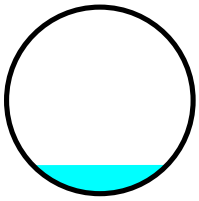
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-F outlet invert by 0.46' @ 12.15 hrs

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
Routed to Reach DMH-D : TO DMH-C

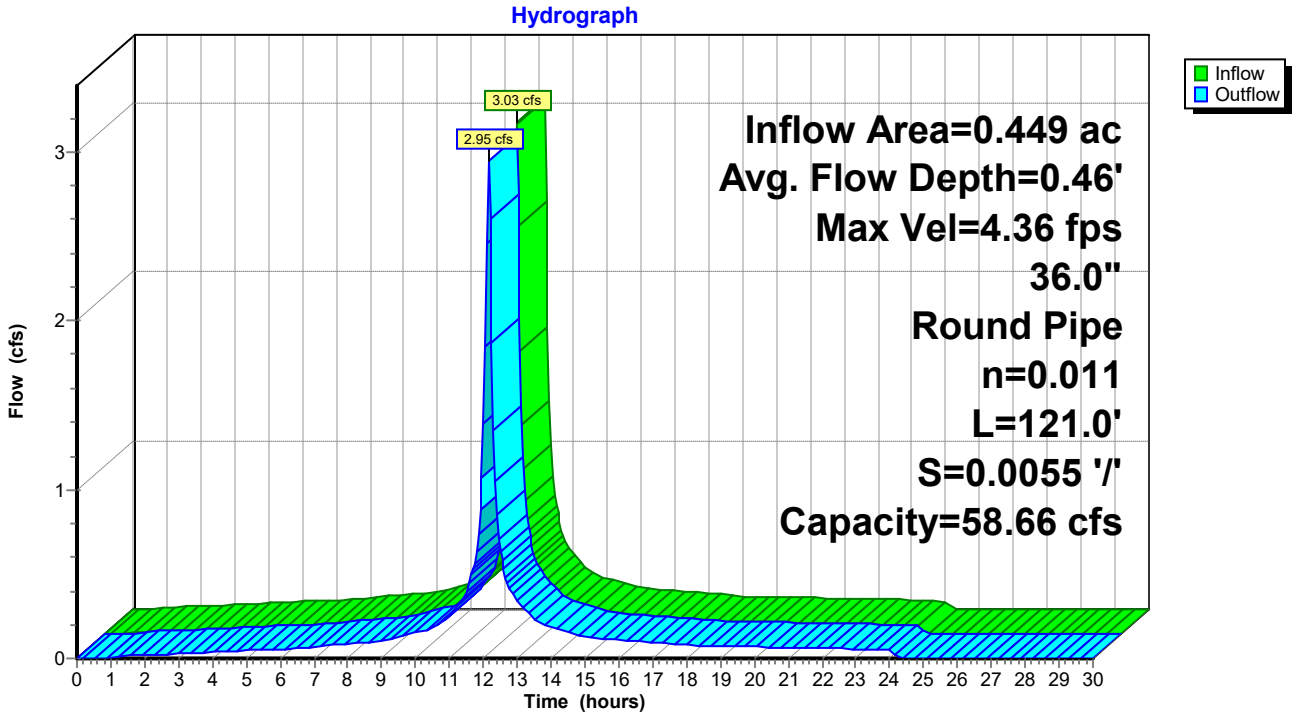
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.36 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 1.3 min

Peak Storage= 84 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.46' , Surface Width= 2.17'
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

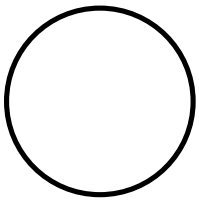


Summary for Reach DMH-F: TO DMH-E

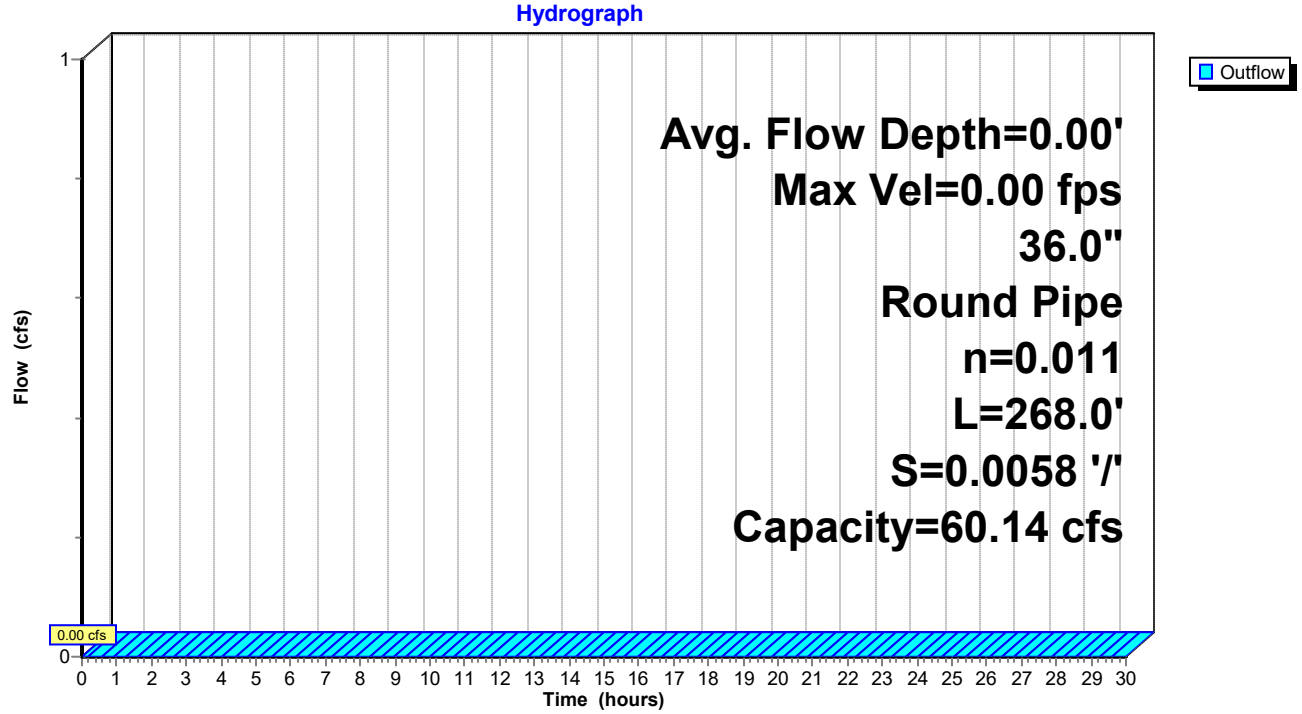
[43] Hint: Has no inflow (Outflow=Zero)

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



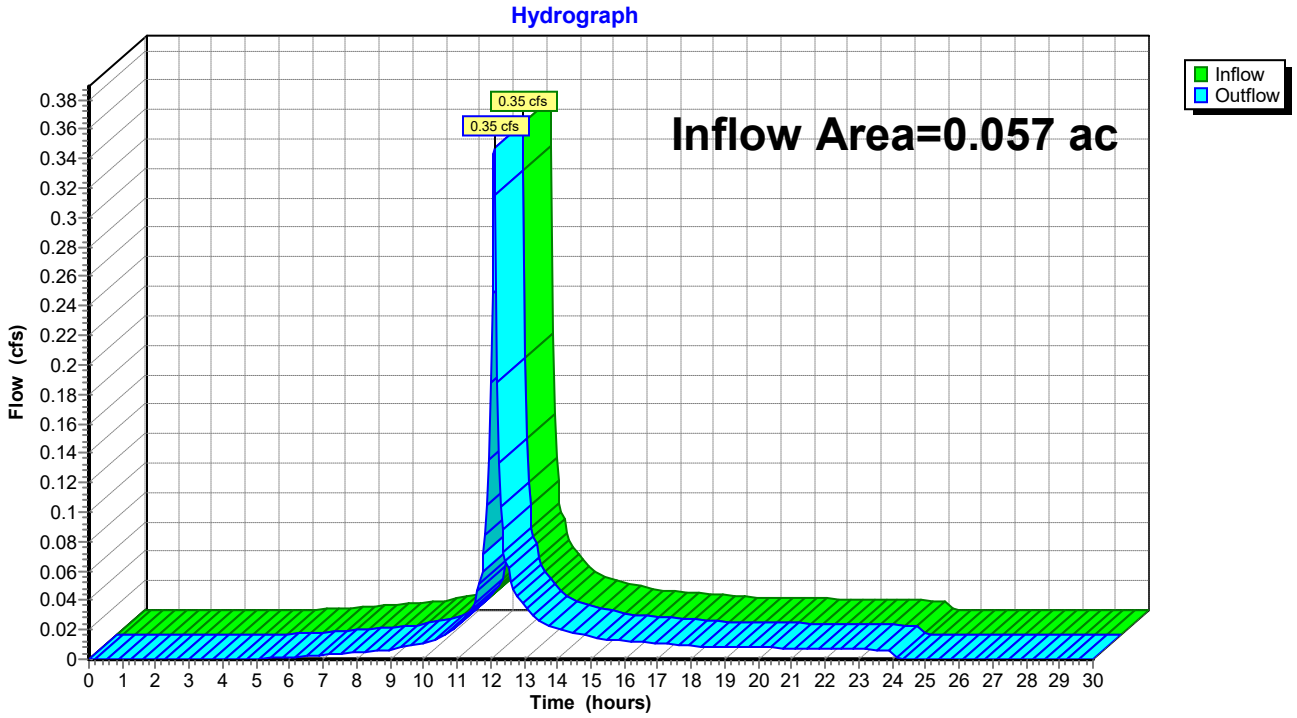
Summary for Reach DP#6: OFFSITE LOW POINT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.057 ac, 63.62% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 0.35 cfs @ 12.11 hrs, Volume= 0.027 af
Outflow = 0.35 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 DP#6: OFFSITE LOW POINT



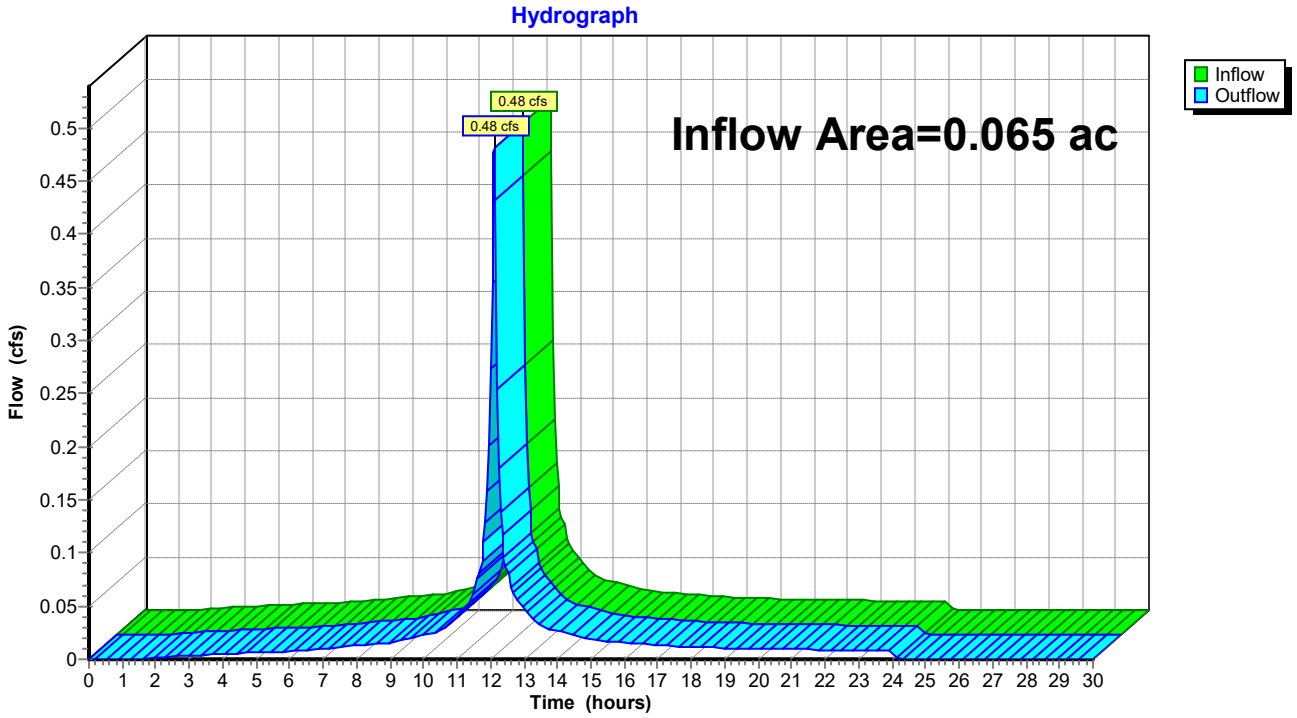
Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

[40] Hint: Not Described (Outflow=Inflow)

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)



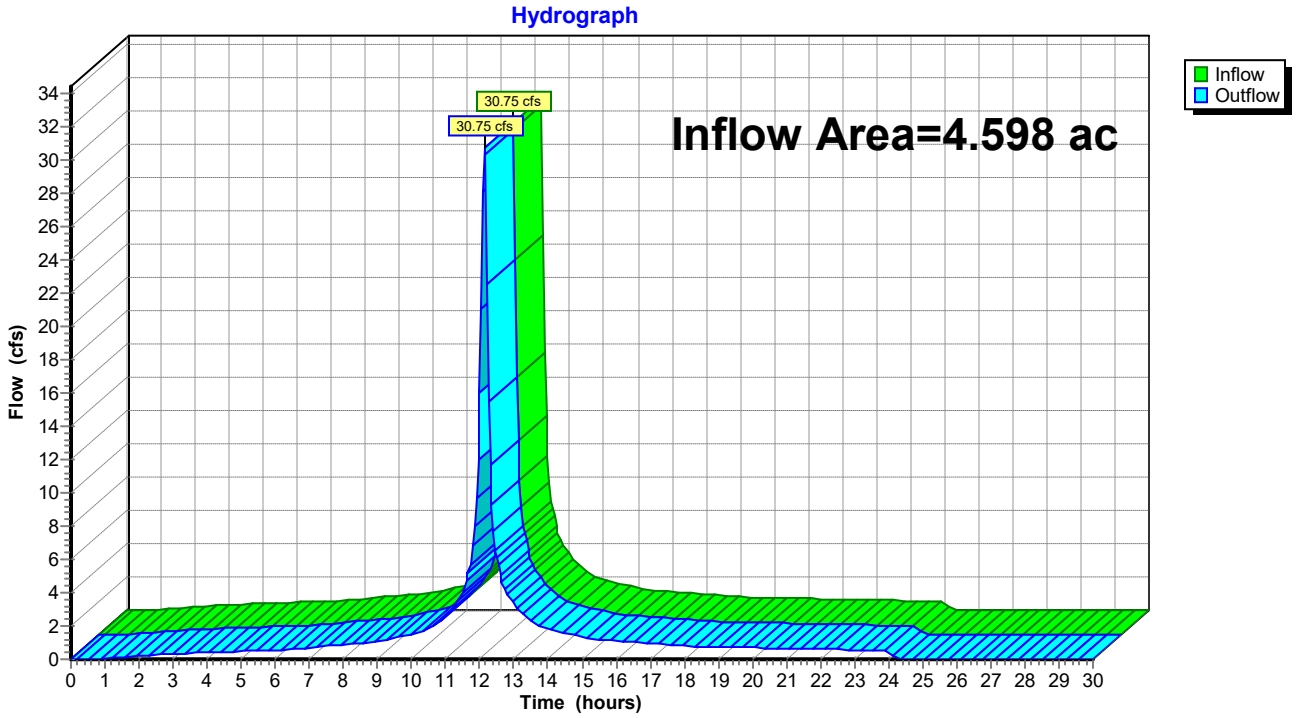
Summary for Reach DP2: MUNICIPAL SYSTEM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.598 ac, 72.81% Impervious, Inflow Depth = 7.30" for 100-Year event
Inflow = 30.75 cfs @ 12.14 hrs, Volume= 2.797 af
Outflow = 30.75 cfs @ 12.14 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



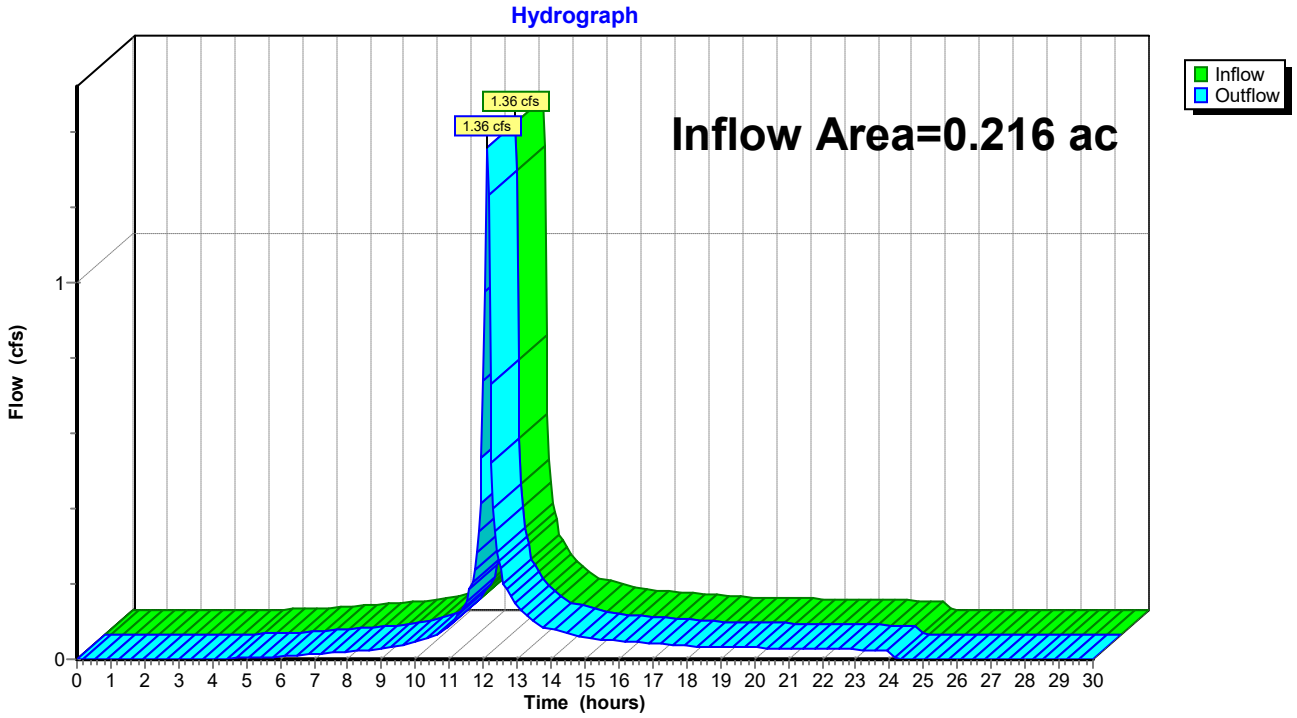
Summary for Reach DP3: CATCHBASIN (FIRE STATION)

[40] Hint: Not Described (Outflow=Inflow)

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)



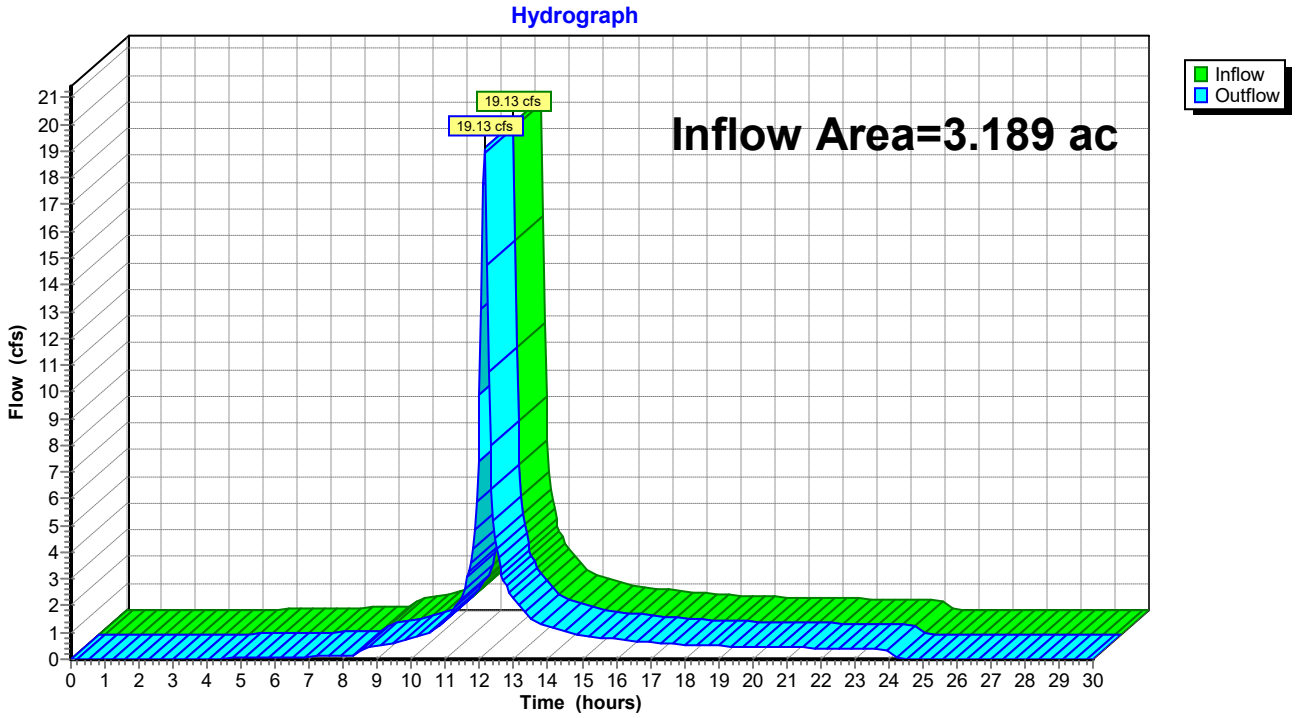
Summary for Reach DP4: DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.189 ac, 74.96% Impervious, Inflow Depth = 6.11" for 100-Year event
Inflow = 19.13 cfs @ 12.14 hrs, Volume= 1.625 af
Outflow = 19.13 cfs @ 12.14 hrs, Volume= 1.625 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: DMH-K1



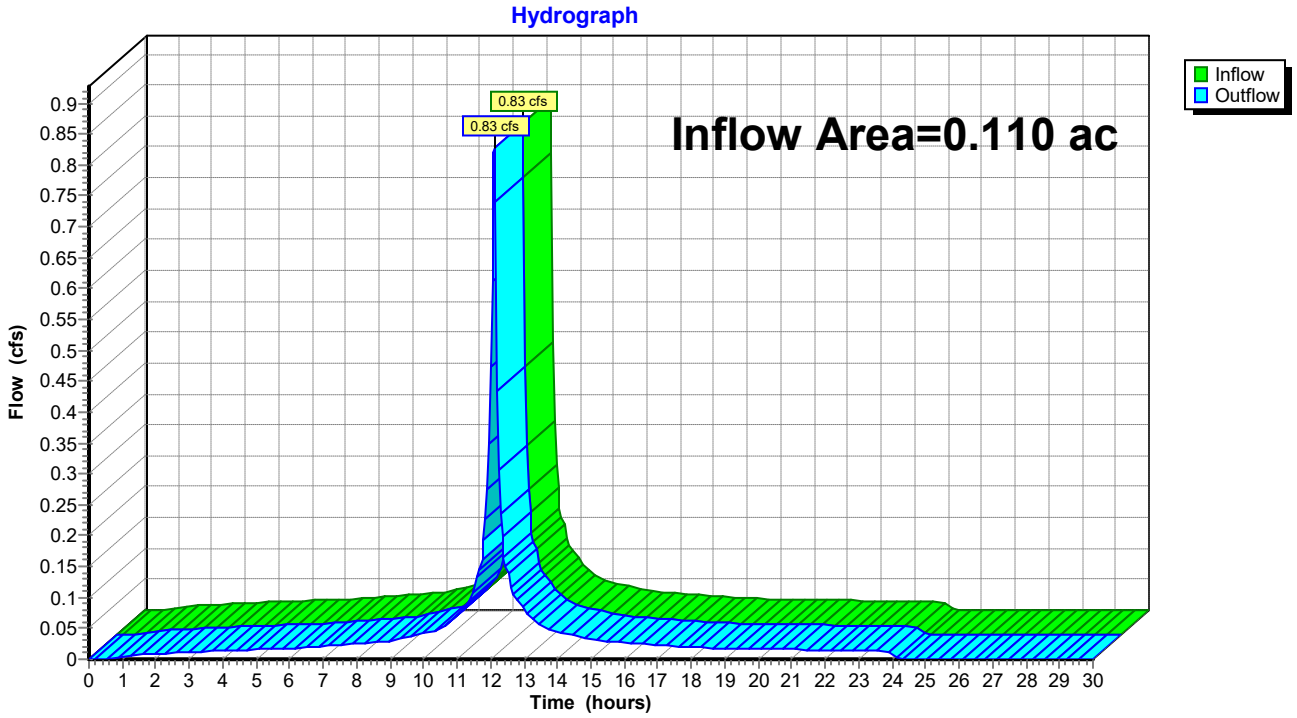
Summary for Reach DP5: DCB-H

[40] Hint: Not Described (Outflow=Inflow)

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



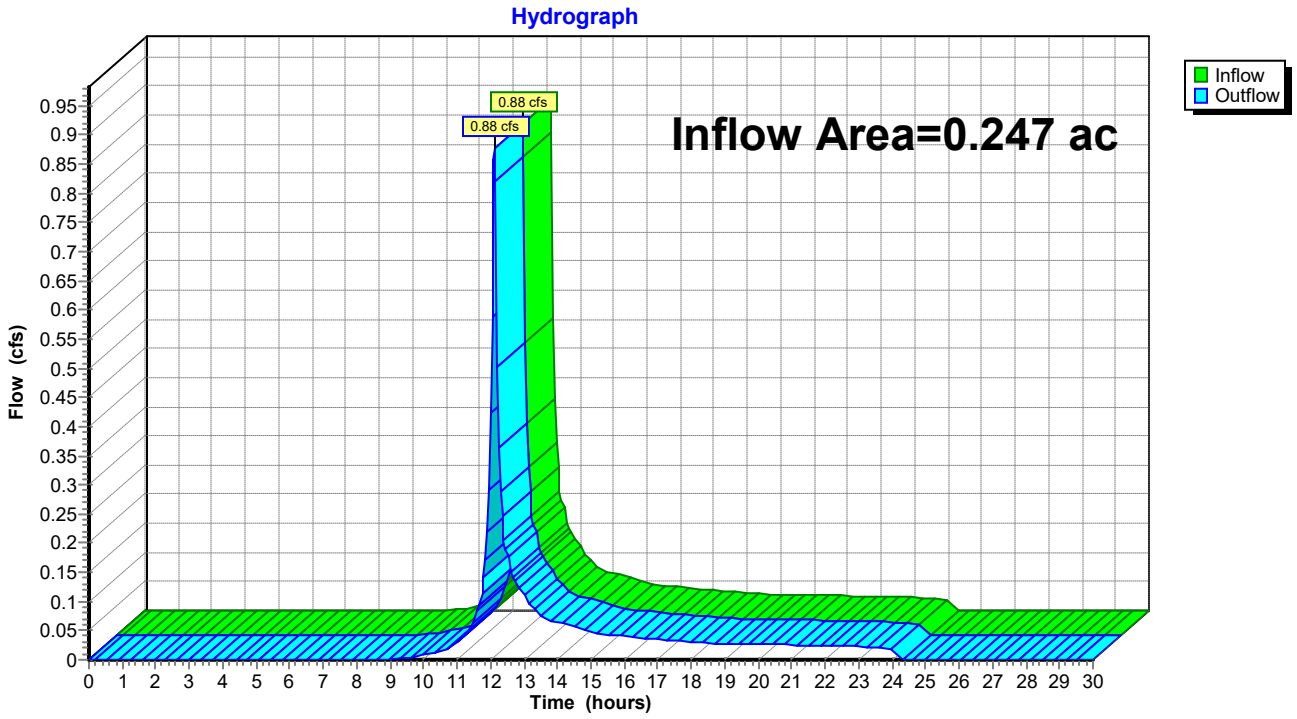
Summary for Reach EX DCB: EX DCB

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

Reach EX DCB: EX DCB



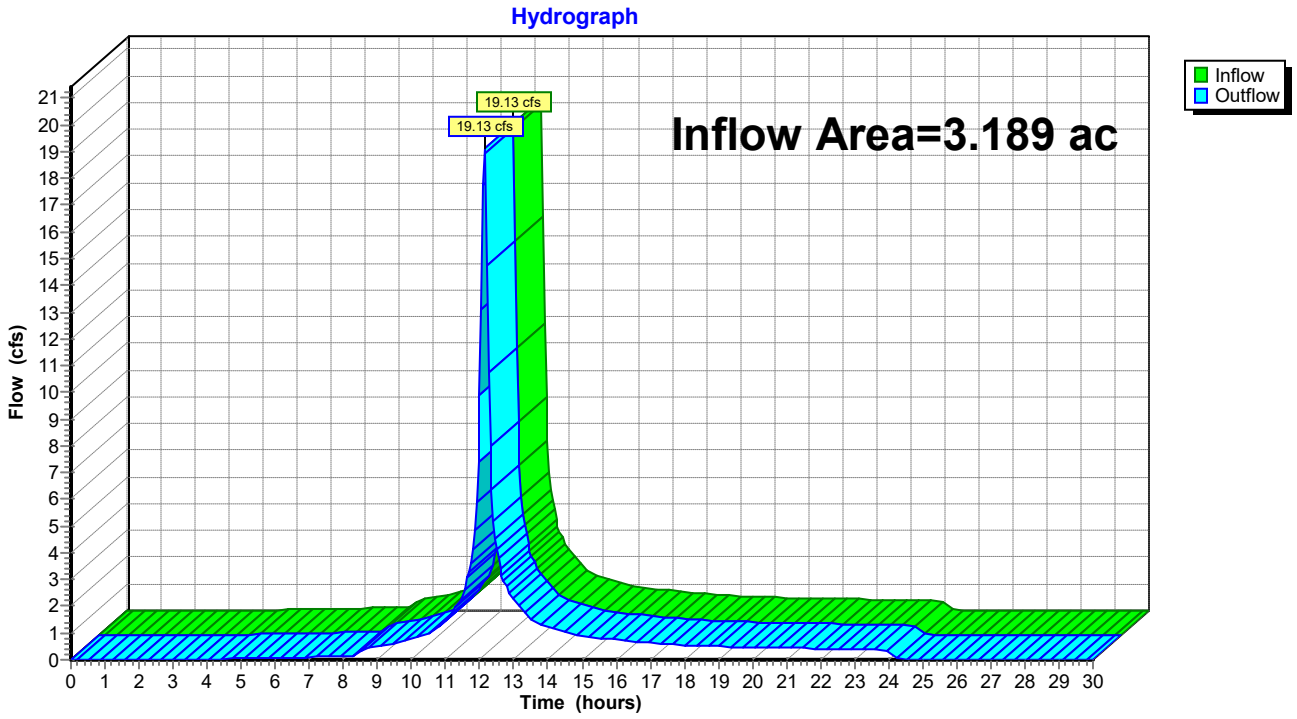
Summary for Reach LP2: TO DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.189 ac, 74.96% Impervious, Inflow Depth = 6.11" for 100-Year event
Inflow = 19.13 cfs @ 12.14 hrs, Volume= 1.625 af
Outflow = 19.13 cfs @ 12.14 hrs, Volume= 1.625 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

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

Reach LP2: TO DMH-K1



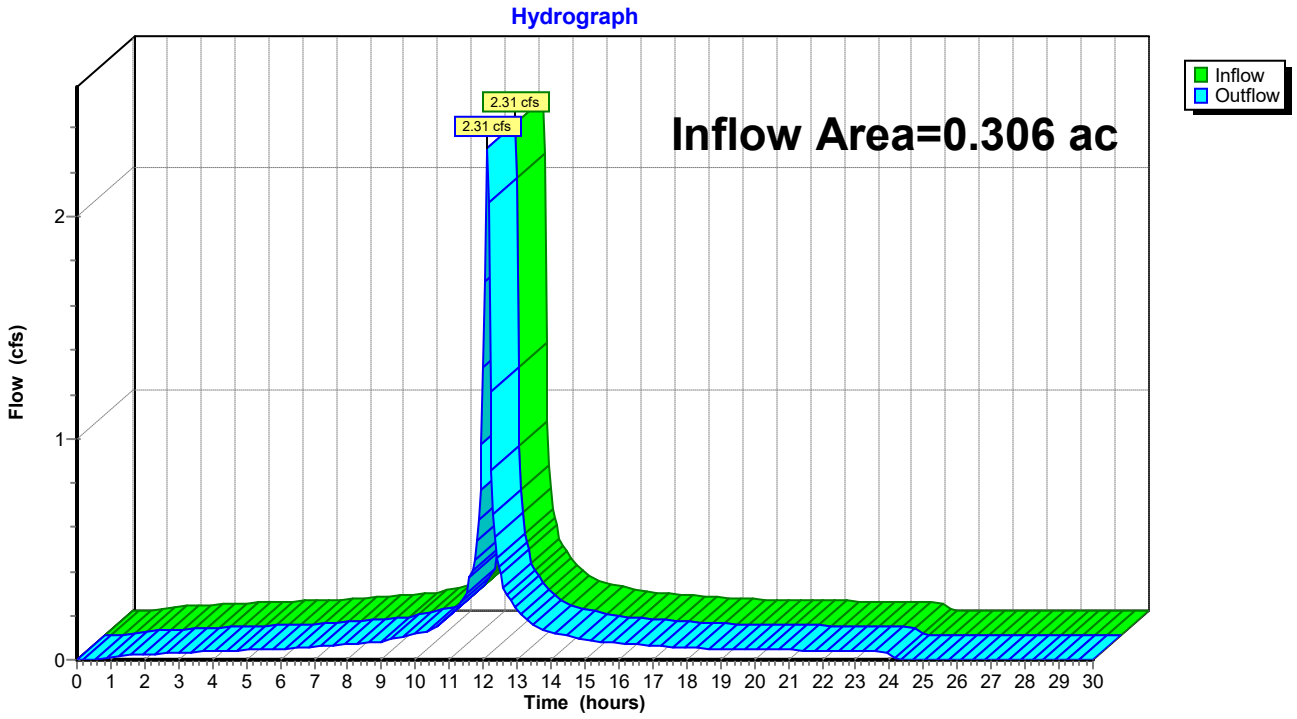
Summary for Reach YDA: (new Reach)

[40] Hint: Not Described (Outflow=Inflow)

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
Routed to Reach DMH-A : TO DMH-B

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

[57] Hint: Peaked at 477.41' (Flood elevation advised)

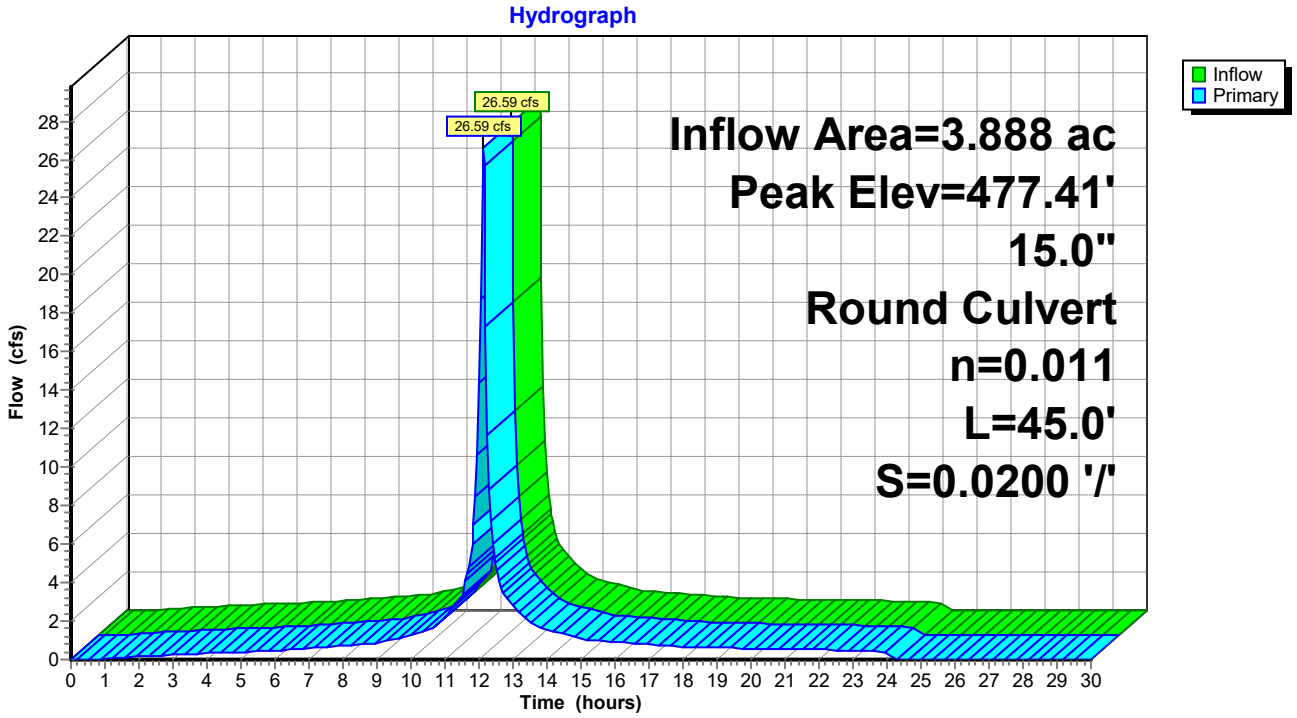
Inflow Area = 3.888 ac, 73.60% Impervious, Inflow Depth = 7.23" for 100-Year event
Inflow = 26.59 cfs @ 12.13 hrs, Volume= 2.344 af
Outflow = 26.59 cfs @ 12.13 hrs, Volume= 2.344 af, Atten= 0%, Lag= 0.0 min
Primary = 26.59 cfs @ 12.13 hrs, Volume= 2.344 af
Routed to Reach DMH-D : TO DMH-C

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 477.41' @ 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=25.50 cfs @ 12.13 hrs HW=476.05' (Free Discharge)
1=Culvert (Inlet Controls 25.50 cfs @ 20.78 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 = 5.60 cfs @ 12.13 hrs, Volume= 0.485 af, Atten= 2%, Lag= 1.0 min
Primary = 5.60 cfs @ 12.13 hrs, Volume= 0.485 af
Routed to Reach DCB-D : TO DMH-A

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 473.99' @ 12.13 hrs Surf.Area= 1,671 sf Storage= 216 cf

Plug-Flow detention time= 1.7 min calculated for 0.484 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (765.6 - 764.3)

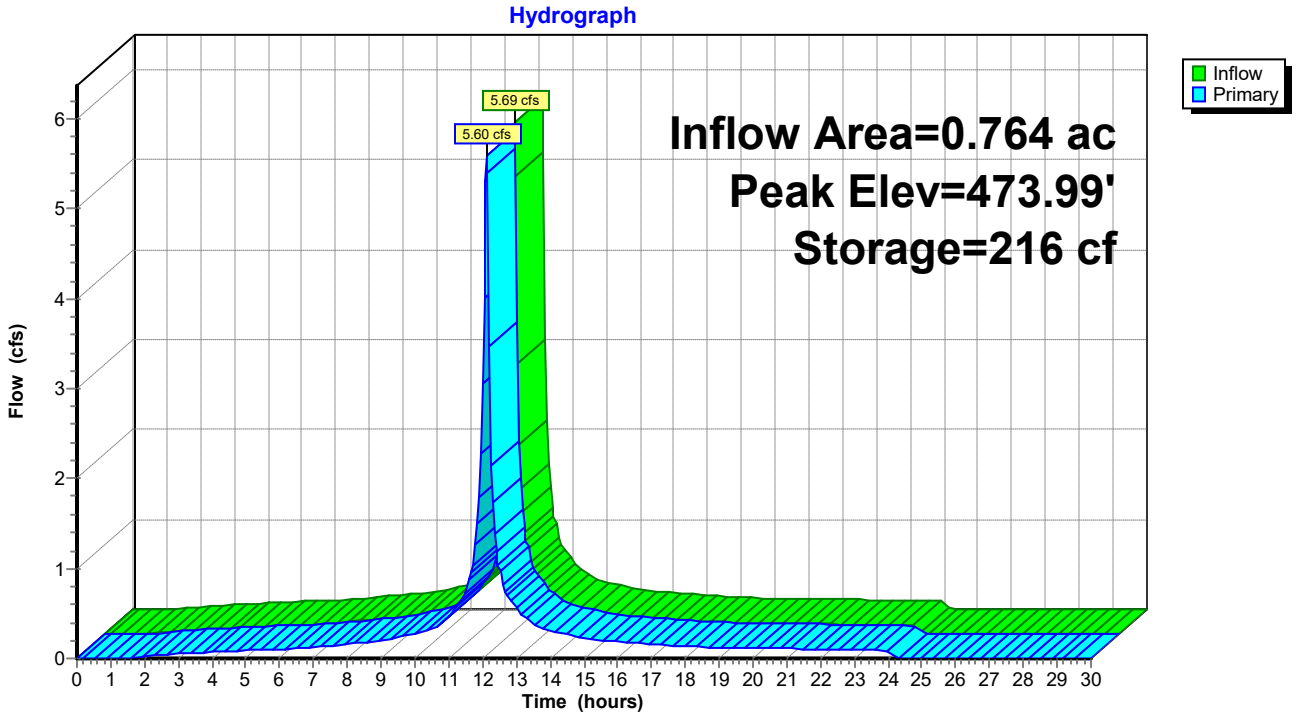
Volume	Invert	Avail.Storage	Storage Description
#1	473.75'	231 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

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	473.80'	**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=5.35 cfs @ 12.13 hrs HW=473.99' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 5.35 cfs @ 1.15 fps)

Pond LP1: TO DCB-D



Summary for Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2

Inflow Area = 2.043 ac, 74.89% Impervious, Inflow Depth = 6.30" for 100-Year event
Inflow = 13.49 cfs @ 12.12 hrs, Volume= 1.073 af
Outflow = 12.01 cfs @ 12.15 hrs, Volume= 1.023 af, Atten= 11%, Lag= 2.3 min
Primary = 12.01 cfs @ 12.15 hrs, Volume= 1.023 af
Routed to Reach LP2 : TO DMH-K1

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 464.79' @ 12.15 hrs Surf.Area= 11,636 sf Storage= 4,691 cf

Plug-Flow detention time= 52.6 min calculated for 1.021 af (95% of inflow)
Center-of-Mass det. time= 25.3 min (832.3 - 807.0)

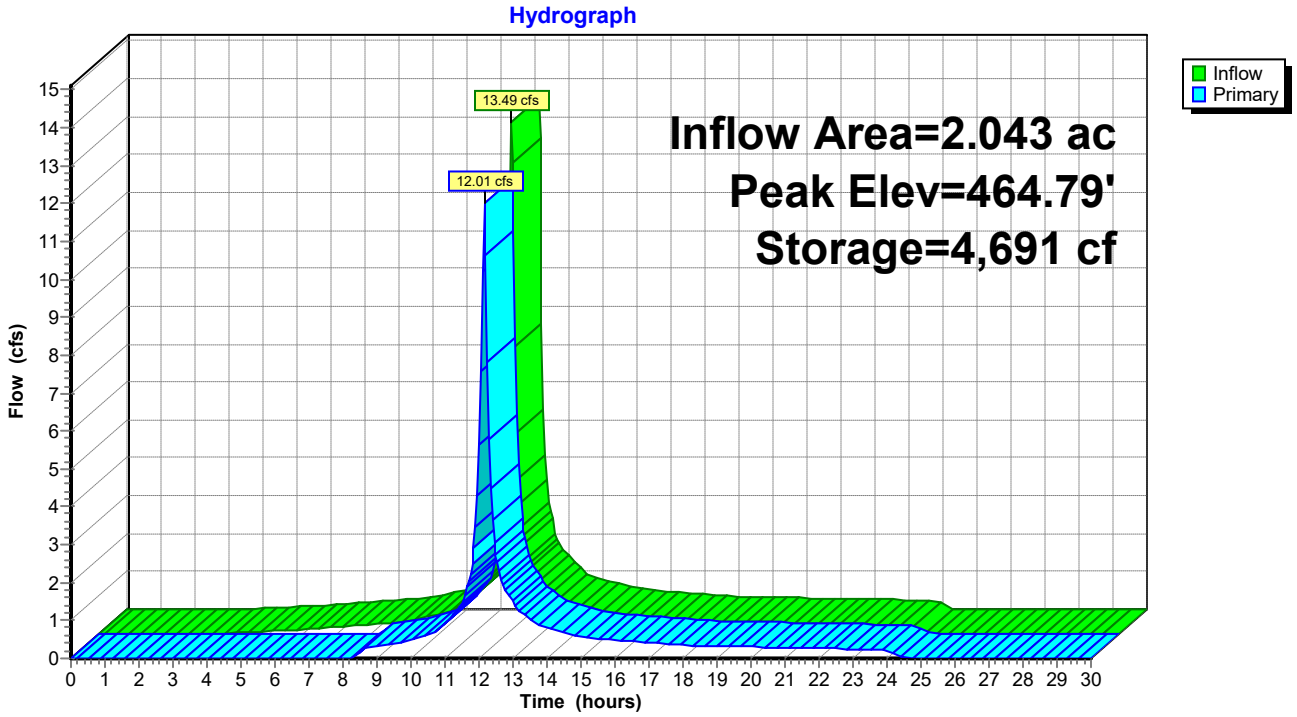
Volume	Invert	Avail.Storage	Storage Description
#1	461.50'	16,070 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
461.50	133	0	0
462.00	180	78	78
463.00	269	225	303
464.00	376	323	625
464.50	5,887	1,566	2,191
465.00	15,961	5,462	7,653
465.50	17,706	8,417	16,070

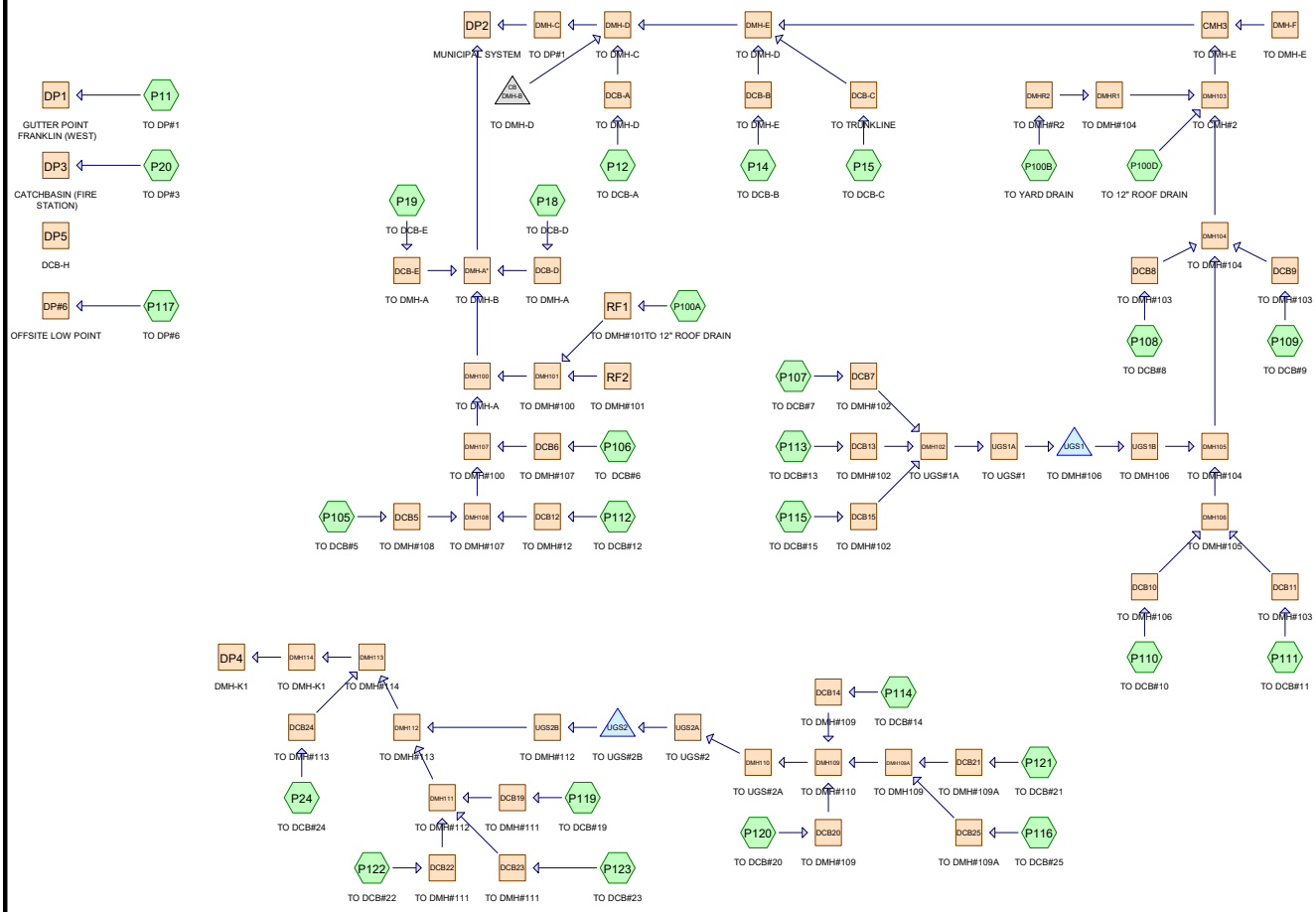
Device	Routing	Invert	Outlet Devices
#1	Primary	464.50'	**27.0' long + 10.0 '/' SideZ x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.89 cfs @ 12.15 hrs HW=464.78' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 11.89 cfs @ 1.40 fps)

Pond LP3: OLD LOADING BAY, FLOODS AND DIRECTED TOWARDS LP2



2.2
POST DEVELOPMENT CALCULATIONS



Routing Diagram for 3030-Post-R9

Prepared by Hannigan Engineering Inc, Printed 10/16/2024

HydroCAD® 10.20-3g s/n 00840 © 2023 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "Atlas-14-Rain.txt" for 449 MA Worcester North

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NRCC 24-hr	D	Default	24.00	1	3.13	2
2	10-Year	NRCC 24-hr	D	Default	24.00	1	4.68	2
3	25-Year	NRCC 24-hr	D	Default	24.00	1	5.88	2
4	100-Year	NRCC 24-hr	D	Default	24.00	1	8.34	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.739	77	1/8 acre lots, 65% imp, HSG A (P100B)
2.134	39	>75% Grass cover, Good, HSG A (P105, P106, P107, P108, P109, P11, P110, P111, P112, P113, P114, P115, P116, P117, P119, P12, P120, P121, P122, P123, P14, P15, P18, P19, P20, P24)
5.361	98	Paved parking, HSG A (P100A, P100D, P105, P106, P107, P108, P109, P11, P110, P111, P112, P113, P114, P115, P116, P117, P119, P12, P120, P121, P122, P123, P14, P15, P18, P19, P20, P24)
8.235	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
8.235	HSG A	P100A, P100B, P100D, P105, P106, P107, P108, P109, P11, P110, P111, P112, P113, P114, P115, P116, P117, P119, P12, P120, P121, P122, P123, P14, P15, P18, P19, P20, P24
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
8.235		**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
0.739	0.000	0.000	0.000	0.000	0.739	1/8 acre lots, 65% imp	P100B
2.134	0.000	0.000	0.000	0.000	2.134	>75% Grass cover, Good	P105, P106, P107, P108, P109, P11, P110, P111, P112, P113, P114, P115, P116, P117, P119, P12, P120, P121, P122, P123, P14, P15, P18, P19, P20, P24
5.361	0.000	0.000	0.000	0.000	5.361	Paved parking	P100A, P100D, P105, P106, P107, P108, P109, P11, P110, P111, P112, P113, P114, P115, P116, P117, P119, P12, P120, P121, P122, P123, P14, P15, P18, P19, P20, P24
8.235	**0.000**	**0.000**	**0.000**	**0.000**	**8.235**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	CMH3	457.71	456.57	196.0	0.0058	0.011	0.0	36.0	0.0	TO DMH-E
2	DCB-D	468.00	467.50	15.0	0.0333	0.010	0.0	8.0	0.0	TO DMH-A
3	DCB-E	468.00	467.50	16.0	0.0313	0.010	0.0	8.0	0.0	TO DMH-A
4	DCB10	470.30	470.10	7.0	0.0286	0.010	0.0	8.0	0.0	TO DMH#106
5	DCB11	470.30	470.10	15.0	0.0133	0.010	0.0	8.0	0.0	TO DMH#103
6	DCB12	467.80	467.50	28.0	0.0107	0.010	0.0	8.0	0.0	TO DMH#12
7	DCB13	467.90	467.70	5.0	0.0400	0.013	0.0	12.0	0.0	TO DMH#102
8	DCB14	467.10	466.40	19.0	0.0368	0.013	0.0	12.0	0.0	TO DMH#109
9	DCB15	467.00	466.30	70.0	0.0100	0.013	0.0	12.0	0.0	TO DMH#102
10	DCB19	463.80	463.60	5.0	0.0400	0.013	0.0	12.0	0.0	TO DMH#111
11	DCB20	466.50	466.40	9.0	0.0111	0.013	0.0	12.0	0.0	TO DMH#109
12	DCB21	467.10	467.00	5.0	0.0200	0.013	0.0	8.0	0.0	TO DMH#109A
13	DCB22	464.20	463.60	20.0	0.0300	0.013	0.0	12.0	0.0	TO DMH#111
14	DCB23	466.70	463.60	250.0	0.0124	0.013	0.0	12.0	0.0	TO DMH#111
15	DCB24	460.50	460.30	9.0	0.0222	0.013	0.0	12.0	0.0	TO DMH#113
16	DCB25	467.50	467.00	29.0	0.0172	0.010	0.0	8.0	0.0	TO DMH#109A
17	DCB5	468.20	468.00	7.0	0.0286	0.010	0.0	8.0	0.0	TO DMH#108
18	DCB6	469.80	466.90	46.0	0.0630	0.010	0.0	8.0	0.0	TO DMH#107
19	DCB7	468.40	466.70	54.0	0.0315	0.013	0.0	12.0	0.0	TO DMH#102
20	DCB8	470.00	469.80	4.0	0.0500	0.010	0.0	8.0	0.0	TO DMH#103
21	DCB9	470.00	469.80	12.0	0.0167	0.010	0.0	8.0	0.0	TO DMH#103
22	DMH-A*	463.70	459.50	267.0	0.0157	0.011	0.0	24.0	0.0	TO DMH-B
23	DMH-D	455.90	455.21	99.0	0.0070	0.011	0.0	36.0	0.0	TO DMH-C
24	DMH-E	456.57	455.90	121.0	0.0055	0.011	0.0	36.0	0.0	TO DMH-D
25	DMH-F	458.13	457.71	72.0	0.0058	0.011	0.0	36.0	0.0	TO DMH-E
26	DMH100	465.20	463.80	70.0	0.0200	0.011	0.0	18.0	0.0	TO DMH-A
27	DMH101	465.40	465.30	5.0	0.0200	0.011	0.0	15.0	0.0	TO DMH#100
28	DMH102	466.10	466.00	5.0	0.0200	0.013	0.0	15.0	0.0	TO UGS#1A
29	DMH103	464.10	462.00	154.0	0.0136	0.011	0.0	18.0	0.0	TO CMH#2
30	DMH104	465.40	464.20	120.0	0.0100	0.011	0.0	15.0	0.0	TO DMH#104
31	DMH105	467.30	465.50	187.0	0.0096	0.011	0.0	15.0	0.0	TO DMH#104
32	DMH106	470.00	468.80	57.0	0.0211	0.011	0.0	12.0	0.0	TO DMH#105
33	DMH107	466.70	465.30	78.0	0.0179	0.011	0.0	12.0	0.0	TO DMH#100
34	DMH108	467.40	466.90	45.0	0.0111	0.011	0.0	12.0	0.0	TO DMH#107
35	DMH109	466.20	466.00	5.0	0.0400	0.013	0.0	12.0	0.0	TO DMH#110
36	DMH109A	466.90	466.40	35.0	0.0143	0.013	0.0	12.0	0.0	TO DMH109
37	DMH110	465.75	465.00	24.0	0.0313	0.013	0.0	12.0	0.0	TO UGS#2A
38	DMH111	463.50	462.00	66.0	0.0227	0.013	0.0	12.0	0.0	TO DMH#112
39	DMH112	460.20	459.80	35.0	0.0114	0.013	0.0	18.0	0.0	TO DMH#113
40	DMH113	459.70	459.25	28.0	0.0161	0.013	0.0	18.0	0.0	TO DMH#114
41	DMH114	459.00	458.75	8.0	0.0313	0.013	0.0	18.0	0.0	TO DMH-K1
42	DMHR1	467.00	465.00	94.0	0.0213	0.012	0.0	12.0	0.0	TO DMH#104
43	DMHR2	468.40	467.10	131.0	0.0099	0.010	0.0	12.0	0.0	TO DMH#R2

Pipe Listing (all nodes) (continued)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
44	RF1	466.20	465.70	24.0	0.0208	0.012	0.0	12.0	0.0	TO DMH#101
45	RF2	466.20	465.70	24.0	0.0208	0.012	0.0	10.0	0.0	TO DMH#101
46	UGS1B	467.60	467.40	17.0	0.0118	0.011	0.0	12.0	0.0	TO DMH106
47	UGS2B	461.10	460.30	84.0	0.0095	0.013	0.0	15.0	0.0	TO DMH#112
48	DMH-B	456.80	455.90	45.0	0.0200	0.011	0.0	15.0	0.0	TO DMH-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 P100A: TO 12" ROOF DRAIN Runoff Area=33,077 sf 100.00% Impervious Runoff Depth=2.90"
Tc=5.0 min CN=98 Runoff=2.13 cfs 0.183 af

Subcatchment P100B: TO YARD DRAIN Runoff Area=32,189 sf 65.00% Impervious Runoff Depth=1.16"
Tc=5.0 min CN=77 Runoff=0.94 cfs 0.072 af

Subcatchment P100D: TO 12" ROOF DRAIN Runoff Area=32,189 sf 100.00% Impervious Runoff Depth=2.90"
Tc=5.0 min CN=98 Runoff=2.07 cfs 0.178 af

Subcatchment P105: TO DCB#5 Runoff Area=12,319 sf 35.47% Impervious Runoff Depth=0.38"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=60 Runoff=0.07 cfs 0.009 af

Subcatchment P106: TO DCB#6 Runoff Area=6,540 sf 94.27% Impervious Runoff Depth=2.58"
Flow Length=101' Slope=0.0150 '/' Tc=5.0 min CN=95 Runoff=0.40 cfs 0.032 af

Subcatchment P107: TO DCB#7 Runoff Area=14,453 sf 83.32% Impervious Runoff Depth=1.93"
Flow Length=126' Slope=0.0150 '/' Tc=5.0 min CN=88 Runoff=0.70 cfs 0.053 af

Subcatchment P108: TO DCB#8 Runoff Area=7,623 sf 76.33% Impervious Runoff Depth=1.62"
Flow Length=156' Tc=5.0 min CN=84 Runoff=0.31 cfs 0.024 af

Subcatchment P109: TO DCB#9 Runoff Area=9,811 sf 39.59% Impervious Runoff Depth=0.45"
Flow Length=156' Tc=5.1 min CN=62 Runoff=0.08 cfs 0.008 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 P110: TO DCB#10 Runoff Area=2,827 sf 67.92% Impervious Runoff Depth=1.28"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=79 Runoff=0.09 cfs 0.007 af

Subcatchment P111: TO DCB#11 Runoff Area=4,144 sf 28.74% Impervious Runoff Depth=0.26"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=56 Runoff=0.01 cfs 0.002 af

Subcatchment P112: TO DCB#12 Runoff Area=9,054 sf 93.65% Impervious Runoff Depth=2.48"
Flow Length=150' Slope=0.0130 '/' Tc=5.0 min CN=94 Runoff=0.54 cfs 0.043 af

Subcatchment P113: TO DCB#13 Runoff Area=11,898 sf 94.49% Impervious Runoff Depth=2.58"
Flow Length=122' Slope=0.0200 '/' Tc=5.0 min CN=95 Runoff=0.72 cfs 0.059 af

Subcatchment P114: TO DCB#14 Runoff Area=5,484 sf 94.42% Impervious Runoff Depth=2.58"
Flow Length=126' Slope=0.0160 '/' Tc=5.0 min CN=95 Runoff=0.33 cfs 0.027 af

Subcatchment P115: TO DCB#15 Runoff Area=16,100 sf 70.06% Impervious Runoff Depth=1.35"
Flow Length=122' Slope=0.0170 '/' Tc=5.0 min CN=80 Runoff=0.55 cfs 0.042 af

Subcatchment P116: TO DCB#25 Runoff Area=2,780 sf 89.32% Impervious Runoff Depth=2.28"
Flow Length=80' Slope=0.0200 '/' Tc=5.0 min CN=92 Runoff=0.16 cfs 0.012 af

Subcatchment P117: TO DP#6 Runoff Area=3,839 sf 33.45% Impervious Runoff Depth=0.35"
Flow Length=74' Slope=0.0200 '/' Tc=5.0 min CN=59 Runoff=0.02 cfs 0.003 af

Subcatchment P119: TO DCB#19 Runoff Area=7,440 sf 78.16% Impervious Runoff Depth=1.70"
Flow Length=213' Slope=0.0250 '/' Tc=5.0 min CN=85 Runoff=0.32 cfs 0.024 af

Subcatchment P12: TO DCB-A Runoff Area=6,197 sf 94.61% Impervious Runoff Depth=2.58"
Flow Length=147' Tc=5.0 min CN=95 Runoff=0.38 cfs 0.031 af

Subcatchment P120: TO DCB#20 Runoff Area=10,195 sf 85.75% Impervious Runoff Depth=2.10"
Flow Length=146' Tc=5.0 min CN=90 Runoff=0.53 cfs 0.041 af

Subcatchment P121: TO DCB#21 Runoff Area=7,628 sf 71.01% Impervious Runoff Depth=1.41"
Flow Length=153' Tc=5.0 min CN=81 Runoff=0.27 cfs 0.021 af

Subcatchment P122: TO DCB#22 Runoff Area=10,232 sf 44.85% Impervious Runoff Depth=0.57"
Flow Length=189' Tc=5.0 min CN=65 Runoff=0.12 cfs 0.011 af

Subcatchment P123: TO DCB#23 Runoff Area=33,346 sf 40.00% Impervious Runoff Depth=0.49"
Flow Length=171' Tc=5.0 min CN=63 Runoff=0.31 cfs 0.031 af

Subcatchment P14: TO DCB-B Runoff Area=5,424 sf 87.24% Impervious Runoff Depth=2.10"
Flow Length=169' Tc=5.0 min CN=90 Runoff=0.28 cfs 0.022 af

Subcatchment P15: TO DCB-C Runoff Area=8,397 sf 71.34% Impervious Runoff Depth=1.41"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=81 Runoff=0.29 cfs 0.023 af

Subcatchment P18: TO DCB-D Runoff Area=10,287 sf 76.50% Impervious Runoff Depth=1.62"
Flow Length=222' Tc=5.0 min CN=84 Runoff=0.42 cfs 0.032 af

Subcatchment P19: TO DCB-E Runoff Area=8,240 sf 64.27% Impervious Runoff Depth=1.16"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=77 Runoff=0.24 cfs 0.018 af

Subcatchment P20: 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 P24: TO DCB#24 Runoff Area=34,704 sf 47.02% Impervious Runoff Depth=0.65"
Flow Length=247' Slope=0.0250 '/' Tc=5.0 min CN=67 Runoff=0.50 cfs 0.043 af

Reach CMH3: TO DMH-E Avg. Flow Depth=0.48' Max Vel=4.55 fps Inflow=3.31 cfs 0.291 af
36.0" Round Pipe n=0.011 L=196.0' S=0.0058 '/' Capacity=60.12 cfs Outflow=3.18 cfs 0.291 af

Reach DCB-A: TO DMH-D Inflow=0.38 cfs 0.031 af
Outflow=0.38 cfs 0.031 af

Reach DCB-B: TO DMH-E Inflow=0.28 cfs 0.022 af
Outflow=0.28 cfs 0.022 af

Reach DCB-C: TO TRUNKLINE Inflow=0.29 cfs 0.023 af
Outflow=0.29 cfs 0.023 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.17' Max Vel=5.85 fps Inflow=0.42 cfs 0.032 af
8.0" Round Pipe n=0.010 L=15.0' S=0.0333 '/' Capacity=2.87 cfs Outflow=0.42 cfs 0.032 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.13' Max Vel=4.83 fps Inflow=0.24 cfs 0.018 af
8.0" Round Pipe n=0.010 L=16.0' S=0.0313 '/' Capacity=2.78 cfs Outflow=0.24 cfs 0.018 af

Reach DCB10: TO DMH#106 Avg. Flow Depth=0.08' Max Vel=3.52 fps Inflow=0.09 cfs 0.007 af
8.0" Round Pipe n=0.010 L=7.0' S=0.0286 '/' Capacity=2.66 cfs Outflow=0.09 cfs 0.007 af

Reach DCB11: TO DMH#103 Avg. Flow Depth=0.03' Max Vel=1.32 fps Inflow=0.01 cfs 0.002 af
8.0" Round Pipe n=0.010 L=15.0' S=0.0133 '/' Capacity=1.81 cfs Outflow=0.01 cfs 0.002 af

Reach DCB12: TO DMH#12 Avg. Flow Depth=0.26' Max Vel=4.16 fps Inflow=0.54 cfs 0.043 af
8.0" Round Pipe n=0.010 L=28.0' S=0.0107 '/' Capacity=1.63 cfs Outflow=0.53 cfs 0.043 af

Reach DCB13: TO DMH#102 Avg. Flow Depth=0.22' Max Vel=5.81 fps Inflow=0.72 cfs 0.059 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=0.72 cfs 0.059 af

Reach DCB14: TO DMH#109 Avg. Flow Depth=0.15' Max Vel=4.48 fps Inflow=0.33 cfs 0.027 af
12.0" Round Pipe n=0.013 L=19.0' S=0.0368 '/' Capacity=6.84 cfs Outflow=0.33 cfs 0.027 af

Reach DCB15: TO DMH#102 Avg. Flow Depth=0.27' Max Vel=3.25 fps Inflow=0.55 cfs 0.042 af
12.0" Round Pipe n=0.013 L=70.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=0.54 cfs 0.042 af

Reach DCB19: TO DMH#111 Avg. Flow Depth=0.14' Max Vel=4.56 fps Inflow=0.32 cfs 0.024 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=0.32 cfs 0.024 af

Reach DCB20: TO DMH#109 Avg. Flow Depth=0.25' Max Vel=3.37 fps Inflow=0.53 cfs 0.041 af
12.0" Round Pipe n=0.013 L=9.0' S=0.0111 '/' Capacity=3.76 cfs Outflow=0.53 cfs 0.041 af

Reach DCB21: TO DMH#109A Avg. Flow Depth=0.18' Max Vel=3.56 fps Inflow=0.27 cfs 0.021 af
8.0" Round Pipe n=0.013 L=5.0' S=0.0200 '/' Capacity=1.71 cfs Outflow=0.27 cfs 0.021 af

Reach DCB22: TO DMH#111 Avg. Flow Depth=0.10' Max Vel=3.08 fps Inflow=0.12 cfs 0.011 af
12.0" Round Pipe n=0.013 L=20.0' S=0.0300 '/' Capacity=6.17 cfs Outflow=0.12 cfs 0.011 af

Reach DCB23: TO DMH#111 Avg. Flow Depth=0.19' Max Vel=2.99 fps Inflow=0.31 cfs 0.031 af
12.0" Round Pipe n=0.013 L=250.0' S=0.0124 '/' Capacity=3.97 cfs Outflow=0.28 cfs 0.031 af

Reach DCB24: TO DMH#113 Avg. Flow Depth=0.21' Max Vel=4.21 fps Inflow=0.50 cfs 0.043 af
12.0" Round Pipe n=0.013 L=9.0' S=0.0222 '/' Capacity=5.31 cfs Outflow=0.50 cfs 0.043 af

Reach DCB25: TO DMH#109A Avg. Flow Depth=0.12' Max Vel=3.46 fps Inflow=0.16 cfs 0.012 af
8.0" Round Pipe n=0.010 L=29.0' S=0.0172 '/' Capacity=2.06 cfs Outflow=0.15 cfs 0.012 af

Reach DCB5: TO DMH#108 Avg. Flow Depth=0.08' Max Vel=3.33 fps Inflow=0.07 cfs 0.009 af
8.0" Round Pipe n=0.010 L=7.0' S=0.0286 '/' Capacity=2.66 cfs Outflow=0.07 cfs 0.009 af

Reach DCB6: TO DMH#107 Avg. Flow Depth=0.14' Max Vel=7.21 fps Inflow=0.40 cfs 0.032 af
8.0" Round Pipe n=0.010 L=46.0' S=0.0630 '/' Capacity=3.94 cfs Outflow=0.39 cfs 0.032 af

Reach DCB7: TO DMH#102 Avg. Flow Depth=0.22' Max Vel=5.27 fps Inflow=0.70 cfs 0.053 af
12.0" Round Pipe n=0.013 L=54.0' S=0.0315 '/' Capacity=6.32 cfs Outflow=0.69 cfs 0.053 af

Reach DCB8: TO DMH#103 Avg. Flow Depth=0.13' Max Vel=6.20 fps Inflow=0.31 cfs 0.024 af
8.0" Round Pipe n=0.010 L=4.0' S=0.0500 '/' Capacity=3.51 cfs Outflow=0.31 cfs 0.024 af

Reach DCB9: TO DMH#103 Avg. Flow Depth=0.09' Max Vel=2.82 fps Inflow=0.08 cfs 0.008 af
8.0" Round Pipe n=0.010 L=12.0' S=0.0167 '/' Capacity=2.03 cfs Outflow=0.08 cfs 0.008 af

Reach DMH-A*: TO DMH-B Avg. Flow Depth=0.45' Max Vel=6.99 fps Inflow=3.67 cfs 0.318 af
24.0" Round Pipe n=0.011 L=267.0' S=0.0157 '/' Capacity=33.53 cfs Outflow=3.61 cfs 0.318 af

Reach DMH-C: TO DP#1 Inflow=3.89 cfs 0.366 af
Outflow=3.89 cfs 0.366 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=0.50' Max Vel=5.12 fps Inflow=3.95 cfs 0.366 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=3.89 cfs 0.366 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.51' Max Vel=4.63 fps Inflow=3.72 cfs 0.336 af
36.0" Round Pipe n=0.011 L=121.0' S=0.0055 '/' Capacity=58.66 cfs Outflow=3.63 cfs 0.336 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=72.0' S=0.0058 '/' Capacity=60.20 cfs Outflow=0.00 cfs 0.000 af

Reach DMH100: TO DMH-A Avg. Flow Depth=0.42' Max Vel=7.38 fps Inflow=3.05 cfs 0.267 af
18.0" Round Pipe n=0.011 L=70.0' S=0.0200 '/' Capacity=17.56 cfs Outflow=3.05 cfs 0.267 af

Reach DMH101: TO DMH#100 Avg. Flow Depth=0.38' Max Vel=6.80 fps Inflow=2.11 cfs 0.183 af
15.0" Round Pipe n=0.011 L=5.0' S=0.0200 '/' Capacity=10.80 cfs Outflow=2.11 cfs 0.183 af

Reach DMH102: TO UGS#1A Avg. Flow Depth=0.39' Max Vel=5.87 fps Inflow=1.94 cfs 0.154 af
15.0" Round Pipe n=0.013 L=5.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=1.93 cfs 0.154 af

Reach DMH103: TO CMH#2 Avg. Flow Depth=0.49' Max Vel=6.64 fps Inflow=3.33 cfs 0.291 af
18.0" Round Pipe n=0.011 L=154.0' S=0.0136 '/' Capacity=14.50 cfs Outflow=3.31 cfs 0.291 af

Reach DMH104: TO DMH#104 Avg. Flow Depth=0.21' Max Vel=3.44 fps Inflow=0.47 cfs 0.041 af
15.0" Round Pipe n=0.011 L=120.0' S=0.0100 '/' Capacity=7.63 cfs Outflow=0.45 cfs 0.041 af

Reach DMH105: TO DMH#104 Avg. Flow Depth=0.10' Max Vel=2.09 fps Inflow=0.10 cfs 0.009 af
15.0" Round Pipe n=0.011 L=187.0' S=0.0096 '/' Capacity=7.49 cfs Outflow=0.09 cfs 0.009 af

Reach DMH106: TO DMH#105 Avg. Flow Depth=0.09' Max Vel=2.87 fps Inflow=0.10 cfs 0.009 af
12.0" Round Pipe n=0.011 L=57.0' S=0.0211 '/' Capacity=6.11 cfs Outflow=0.10 cfs 0.009 af

Reach DMH107: TO DMH#100 Avg. Flow Depth=0.28' Max Vel=5.35 fps Inflow=0.98 cfs 0.084 af
12.0" Round Pipe n=0.011 L=78.0' S=0.0179 '/' Capacity=5.64 cfs Outflow=0.98 cfs 0.084 af

Reach DMH108: TO DMH#107 Avg. Flow Depth=0.25' Max Vel=3.90 fps Inflow=0.60 cfs 0.052 af
12.0" Round Pipe n=0.011 L=45.0' S=0.0111 '/' Capacity=4.44 cfs Outflow=0.60 cfs 0.052 af

Reach DMH109: TO DMH#110 Avg. Flow Depth=0.29' Max Vel=6.83 fps Inflow=1.28 cfs 0.101 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=1.28 cfs 0.101 af

Reach DMH109A: TO DMH109 Avg. Flow Depth=0.21' Max Vel=3.43 fps Inflow=0.43 cfs 0.033 af
12.0" Round Pipe n=0.013 L=35.0' S=0.0143 '/' Capacity=4.26 cfs Outflow=0.42 cfs 0.033 af

Reach DMH110: TO UGS#2A Avg. Flow Depth=0.31' Max Vel=6.24 fps Inflow=1.28 cfs 0.101 af
12.0" Round Pipe n=0.013 L=24.0' S=0.0313 '/' Capacity=6.30 cfs Outflow=1.27 cfs 0.101 af

Reach DMH111: TO DMH#112 Avg. Flow Depth=0.24' Max Vel=4.70 fps Inflow=0.69 cfs 0.066 af
12.0" Round Pipe n=0.013 L=66.0' S=0.0227 '/' Capacity=5.37 cfs Outflow=0.68 cfs 0.066 af

Reach DMH112: TO DMH#113 Avg. Flow Depth=0.28' Max Vel=3.75 fps Inflow=0.85 cfs 0.165 af
18.0" Round Pipe n=0.013 L=35.0' S=0.0114 '/' Capacity=11.23 cfs Outflow=0.84 cfs 0.165 af

Reach DMH113: TO DMH#114 Avg. Flow Depth=0.32' Max Vel=4.82 fps Inflow=1.33 cfs 0.208 af
18.0" Round Pipe n=0.013 L=28.0' S=0.0161 '/' Capacity=13.32 cfs Outflow=1.33 cfs 0.208 af

Reach DMH114: TO DMH-K1 Avg. Flow Depth=0.27' Max Vel=6.09 fps Inflow=1.33 cfs 0.208 af
18.0" Round Pipe n=0.013 L=8.0' S=0.0313 '/' Capacity=18.57 cfs Outflow=1.33 cfs 0.208 af

Reach DMHR1: TO DMH#104 Avg. Flow Depth=0.27' Max Vel=5.27 fps Inflow=0.92 cfs 0.072 af
12.0" Round Pipe n=0.012 L=94.0' S=0.0213 '/' Capacity=5.63 cfs Outflow=0.90 cfs 0.072 af

Reach DMHR2: TO DMH#R2 Avg. Flow Depth=0.31' Max Vel=4.57 fps Inflow=0.94 cfs 0.072 af
12.0" Round Pipe n=0.010 L=131.0' S=0.0099 '/' Capacity=4.61 cfs Outflow=0.92 cfs 0.072 af

Reach DP#6: OFFSITE LOW POINT Inflow=0.02 cfs 0.003 af
Outflow=0.02 cfs 0.003 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=7.44 cfs 0.684 af
Outflow=7.44 cfs 0.684 af

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

Reach DP4: DMH-K1 Inflow=1.33 cfs 0.208 af
Outflow=1.33 cfs 0.208 af

Reach DP5: DCB-H

Reach RF1: TO DMH#101 Avg. Flow Depth=0.43' Max Vel=6.59 fps Inflow=2.13 cfs 0.183 af
12.0" Round Pipe n=0.012 L=24.0' S=0.0208 '/' Capacity=5.57 cfs Outflow=2.11 cfs 0.183 af

Reach RF2: TO DMH#101 Avg. Flow Depth=0.00' Max Vel=0.00 fps
10.0" Round Pipe n=0.012 L=24.0' S=0.0208 '/' Capacity=3.43 cfs Outflow=0.00 cfs 0.000 af

Reach UGS1A: TO UGS#1 Inflow=1.93 cfs 0.154 af
Outflow=1.93 cfs 0.154 af

Reach UGS1B: TO DMH106 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=17.0' S=0.0118 '/' Capacity=4.57 cfs Outflow=0.00 cfs 0.000 af

Reach UGS2A: TO UGS#2 Inflow=1.27 cfs 0.101 af
Outflow=1.27 cfs 0.101 af

Reach UGS2B: TO DMH#112 Avg. Flow Depth=0.14' Max Vel=2.24 fps Inflow=0.17 cfs 0.098 af
15.0" Round Pipe n=0.013 L=84.0' S=0.0095 '/' Capacity=6.30 cfs Outflow=0.17 cfs 0.098 af

Pond DMH-B: TO DMH-D Peak Elev=0.00'
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Primary=0.00 cfs 0.000 af

Pond UGS1: TO DMH#106 Peak Elev=466.09' Storage=0.047 af Inflow=1.93 cfs 0.154 af
Discarded=0.20 cfs 0.154 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.154 af

Pond UGS2: TO UGS#2B Peak Elev=462.90' Storage=0.036 af Inflow=1.27 cfs 0.101 af
Outflow=0.17 cfs 0.098 af

Total Runoff Area = 8.235 ac Runoff Volume = 1.086 af Average Runoff Depth = 1.58"
29.06% Pervious = 2.393 ac 70.94% Impervious = 5.842 ac

Summary for Subcatchment P100A: TO 12" ROOF DRAIN

[49] Hint: Tc<2dt may require smaller dt

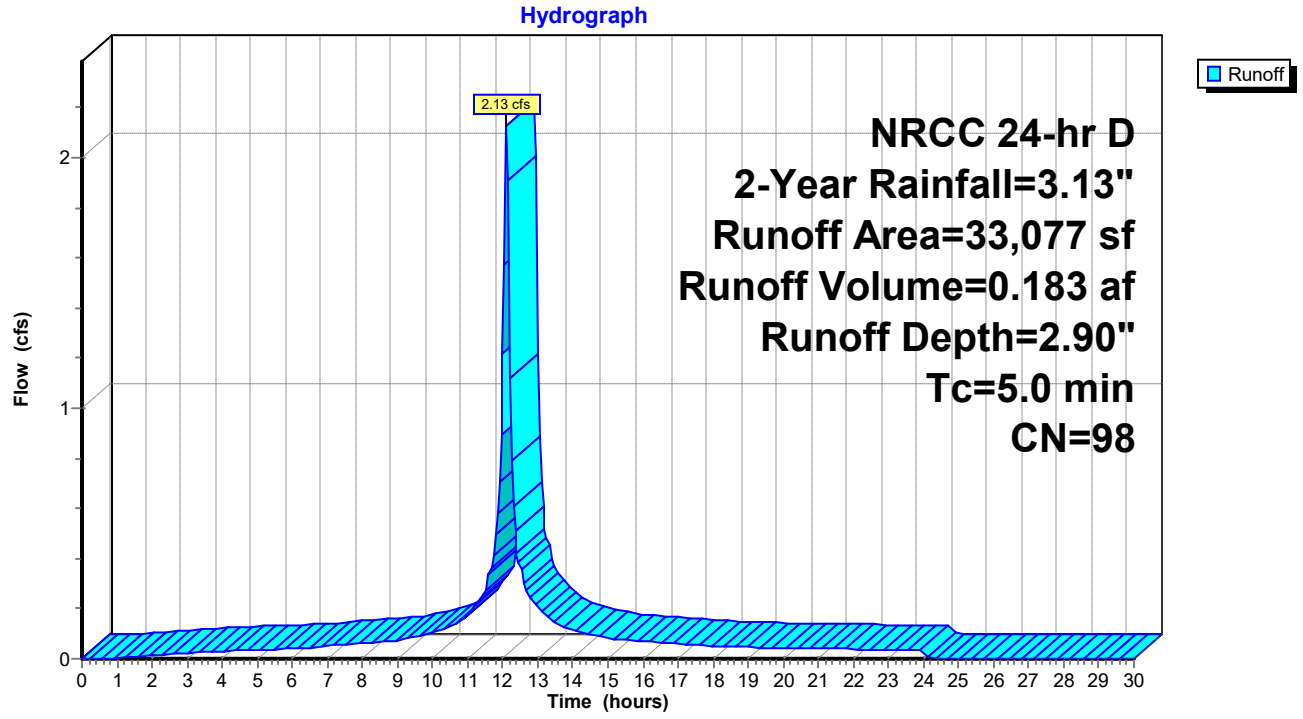
Runoff = 2.13 cfs @ 12.11 hrs, Volume= 0.183 af, Depth= 2.90"
Routed to Reach RF1 : TO DMH#101

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
33,077	98	Paved parking, HSG A
33,077		100.00% Impervious Area

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

Subcatchment P100A: TO 12" ROOF DRAIN



Summary for Subcatchment P100B: TO YARD DRAIN

[49] Hint: Tc<2dt may require smaller dt

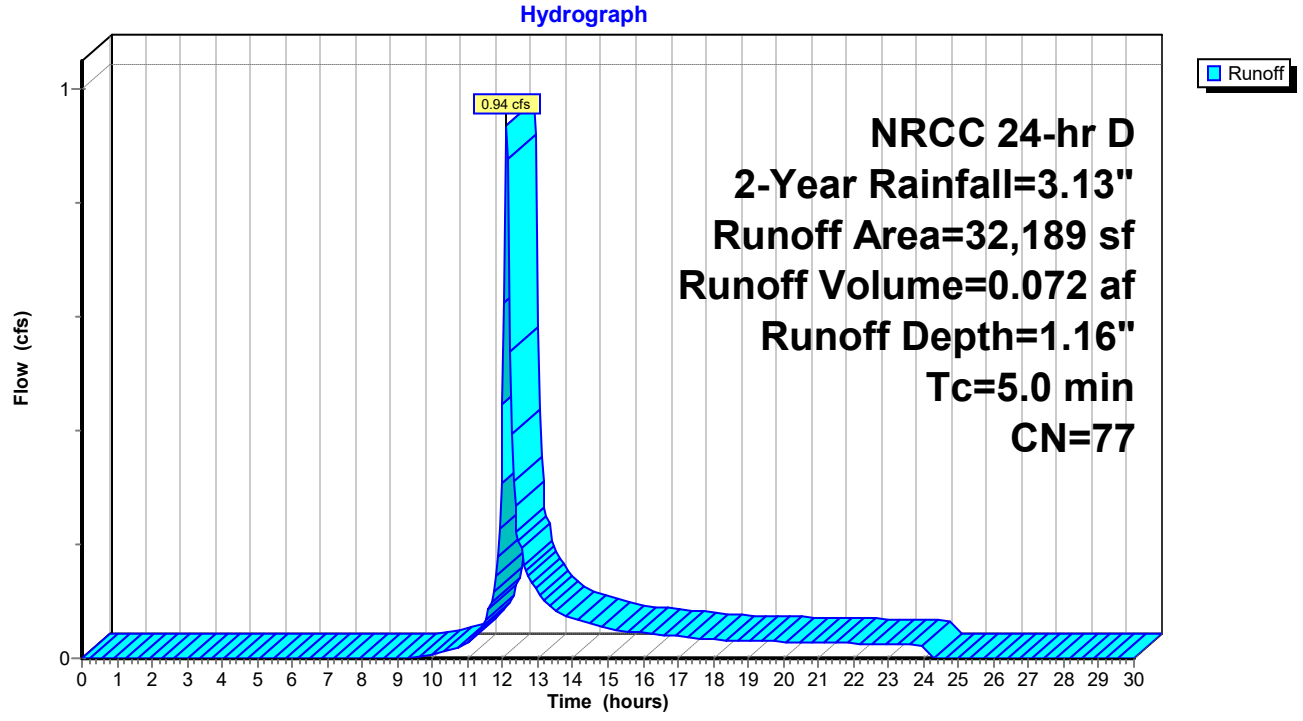
Runoff = 0.94 cfs @ 12.12 hrs, Volume= 0.072 af, Depth= 1.16"
Routed to Reach DMHR2 : TO DMH#R2

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
32,189	77	1/8 acre lots, 65% imp, HSG A
11,266		35.00% Pervious Area
20,923		65.00% Impervious Area

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

Subcatchment P100B: TO YARD DRAIN



Summary for Subcatchment P100D: TO 12" ROOF DRAIN

[49] Hint: Tc<2dt may require smaller dt

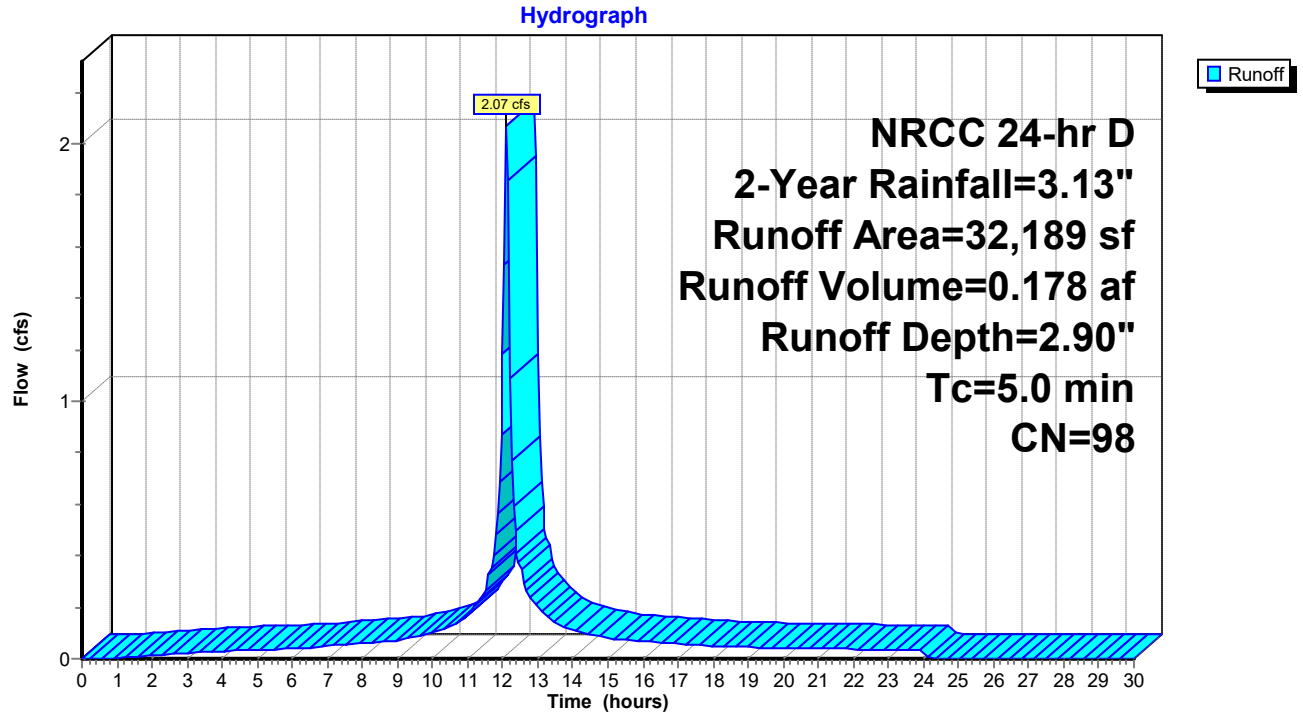
Runoff = 2.07 cfs @ 12.11 hrs, Volume= 0.178 af, Depth= 2.90"
Routed to Reach DMH103 : TO CMH#2

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
32,189	98	Paved parking, HSG A
32,189		100.00% Impervious Area

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

Subcatchment P100D: TO 12" ROOF DRAIN



Summary for Subcatchment P105: TO DCB#5

[49] Hint: Tc<2dt may require smaller dt

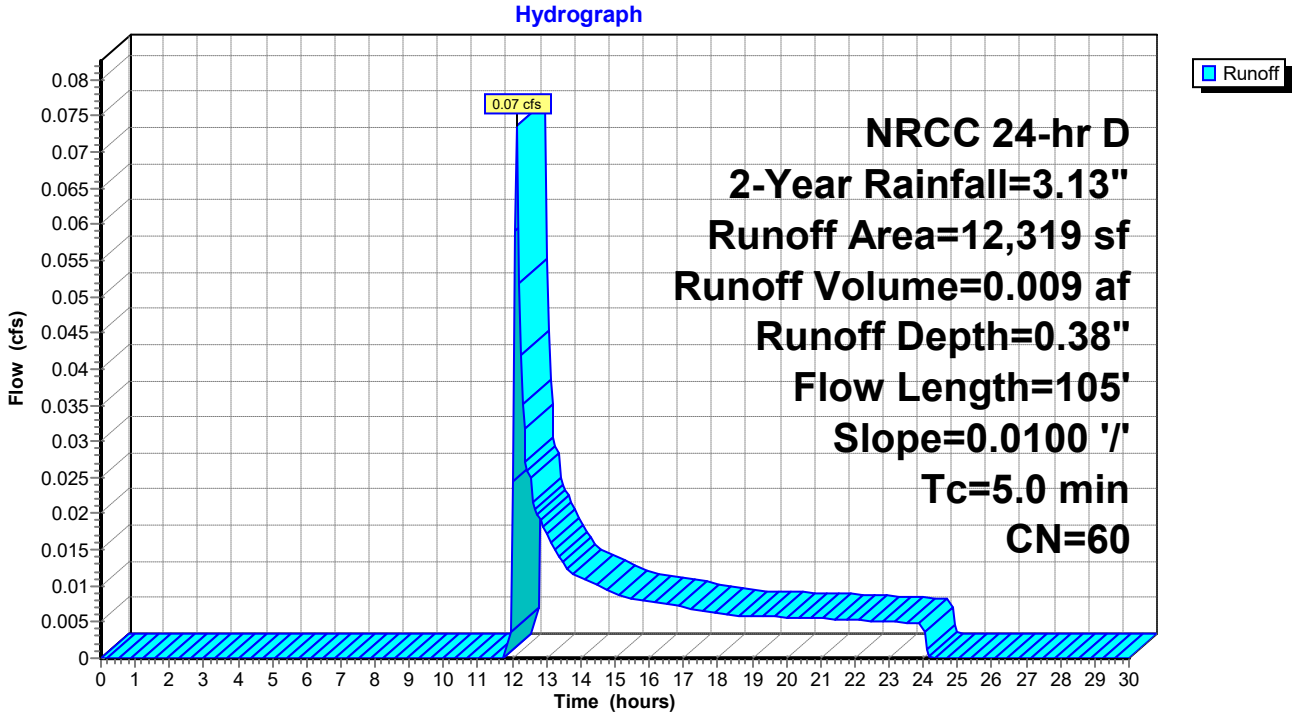
Runoff = 0.07 cfs @ 12.15 hrs, Volume= 0.009 af, Depth= 0.38"
Routed to Reach DCB5 : TO DMH#108

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
7,950	39	>75% Grass cover, Good, HSG A
4,369	98	Paved parking, HSG A
12,319	60	Weighted Average
7,950		64.53% Pervious Area
4,369		35.47% 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 P105: TO DCB#5



Summary for Subcatchment P106: TO DCB#6

[49] Hint: Tc<2dt may require smaller dt

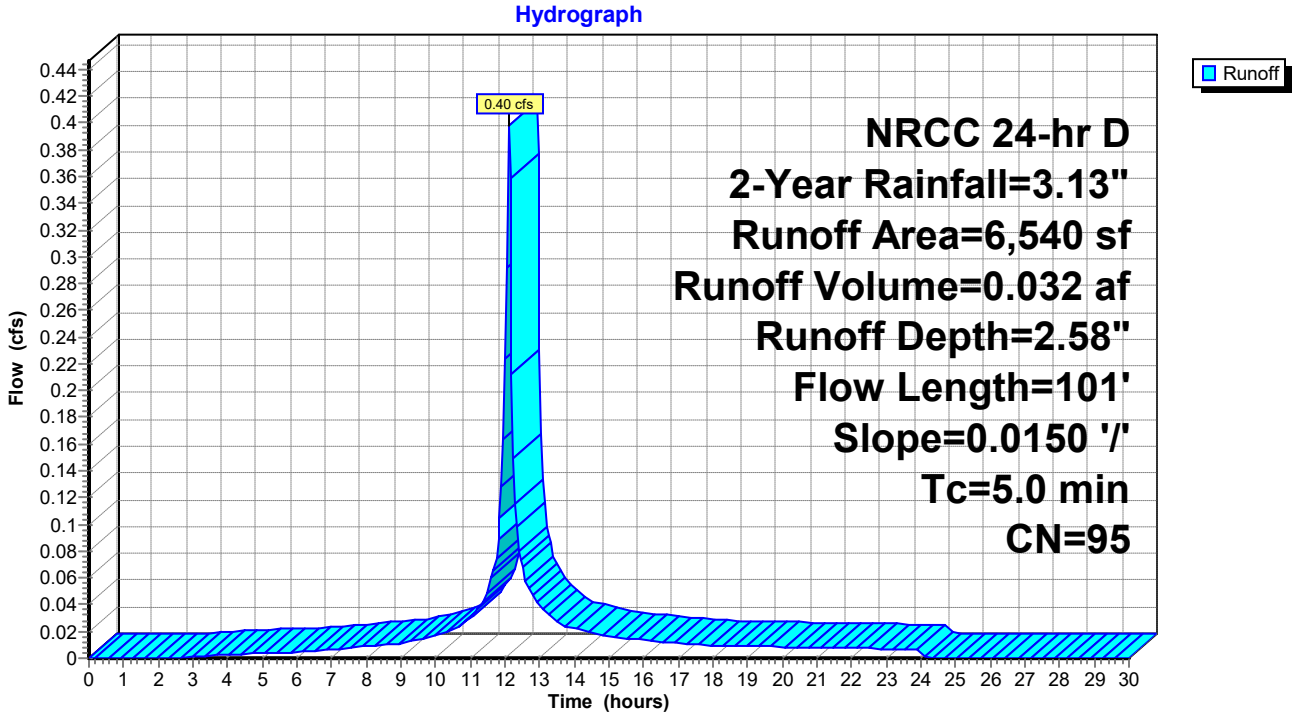
Runoff = 0.40 cfs @ 12.11 hrs, Volume= 0.032 af, Depth= 2.58"
Routed to Reach DCB6 : TO DMH#107

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
375	39	>75% Grass cover, Good, HSG A
6,165	98	Paved parking, HSG A
6,540	95	Weighted Average
375		5.73% Pervious Area
6,165		94.27% 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"
0.3	51	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	101	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P106: TO DCB#6



Summary for Subcatchment P107: TO DCB#7

[49] Hint: Tc<2dt may require smaller dt

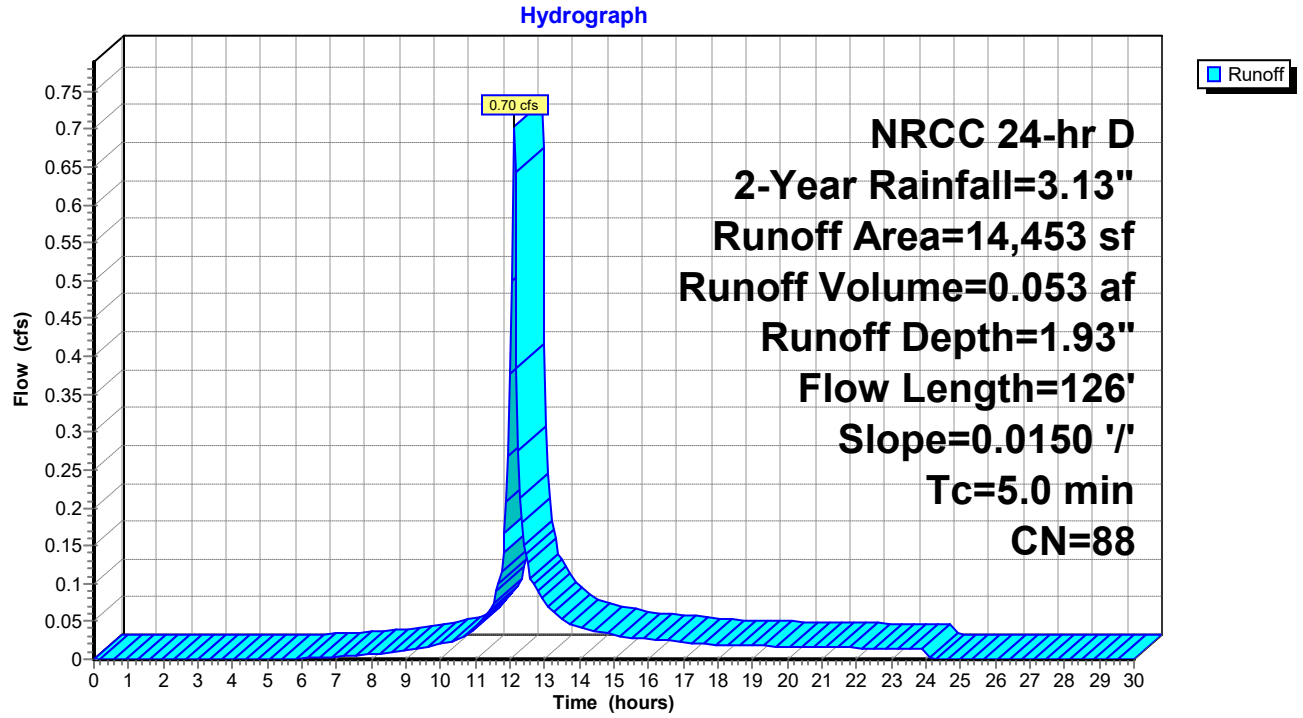
Runoff = 0.70 cfs @ 12.11 hrs, Volume= 0.053 af, Depth= 1.93"
Routed to Reach DCB7 : TO DMH#102

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
2,411	39	>75% Grass cover, Good, HSG A
12,042	98	Paved parking, HSG A
14,453	88	Weighted Average
2,411		16.68% Pervious Area
12,042		83.32% 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"
0.7	42	0.0150	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	76	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.7	126	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P107: TO DCB#7



Summary for Subcatchment P108: TO DCB#8

[49] Hint: Tc<2dt may require smaller dt

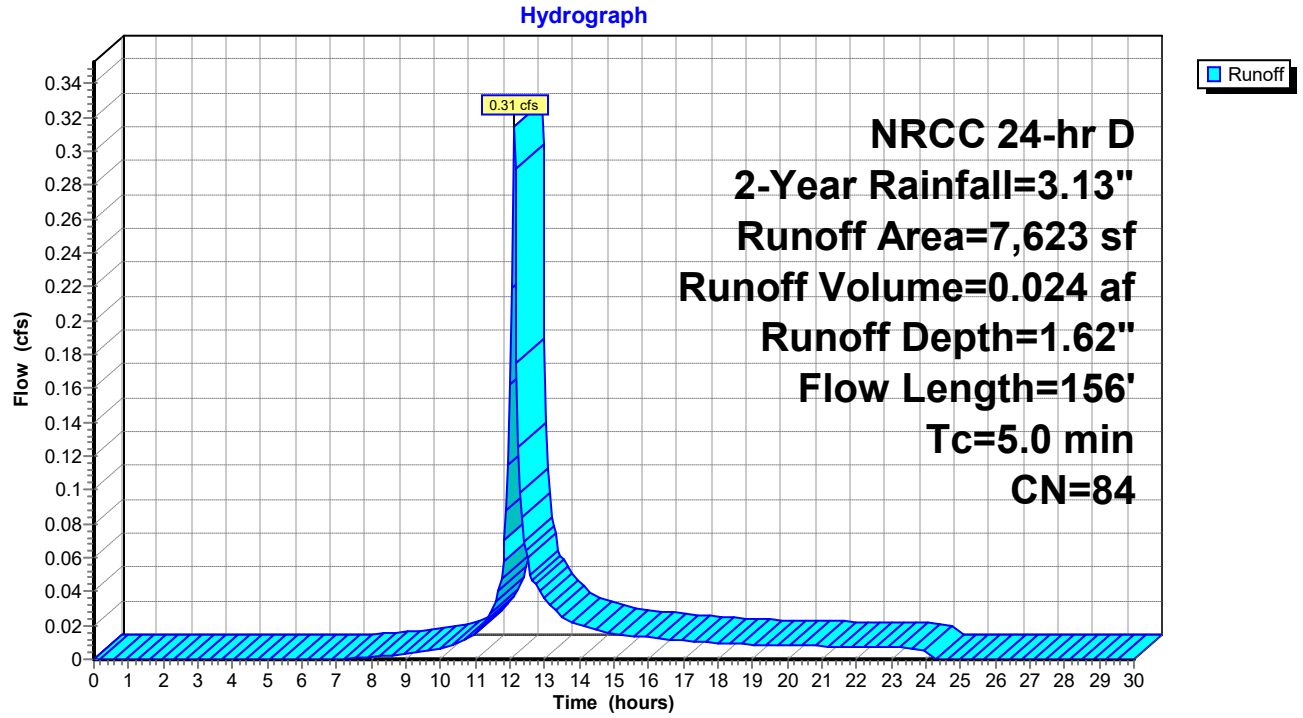
Runoff = 0.31 cfs @ 12.12 hrs, Volume= 0.024 af, Depth= 1.62"
Routed to Reach DCB8 : TO DMH#103

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
1,804	39	>75% Grass cover, Good, HSG A
5,819	98	Paved parking, HSG A
7,623	84	Weighted Average
1,804		23.67% Pervious Area
5,819		76.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	16	0.0150	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	34	0.0100	0.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	106	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.2	156	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P108: TO DCB#8



Summary for Subcatchment P109: TO DCB#9

[49] Hint: Tc<2dt may require smaller dt

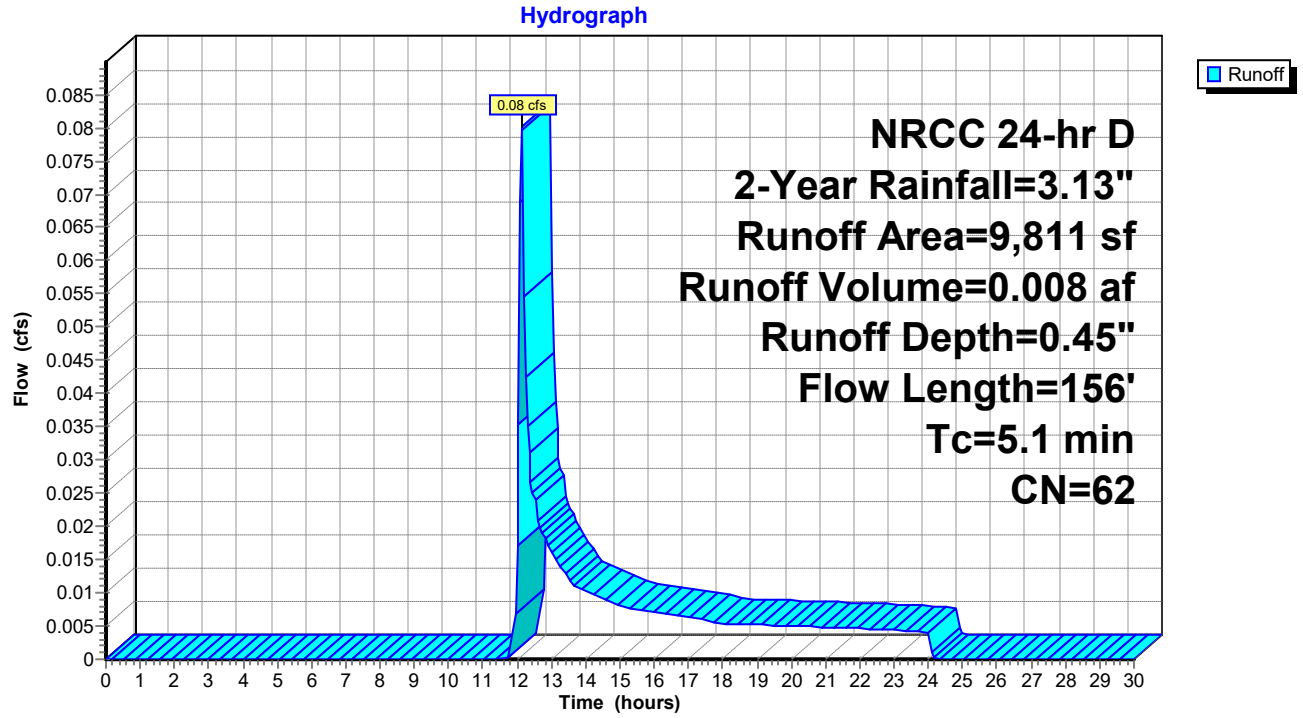
Runoff = 0.08 cfs @ 12.14 hrs, Volume= 0.008 af, Depth= 0.45"
Routed to Reach DCB9 : TO DMH#103

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
5,927	39	>75% Grass cover, Good, HSG A
3,884	98	Paved parking, HSG A
9,811	62	Weighted Average
5,927		60.41% Pervious Area
3,884		39.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	25	0.0150	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.5	25	0.0100	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	106	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.1	156	Total			

Subcatchment P109: TO DCB#9



Summary for Subcatchment P11: TO DP#1

[49] Hint: Tc<2dt may require smaller dt

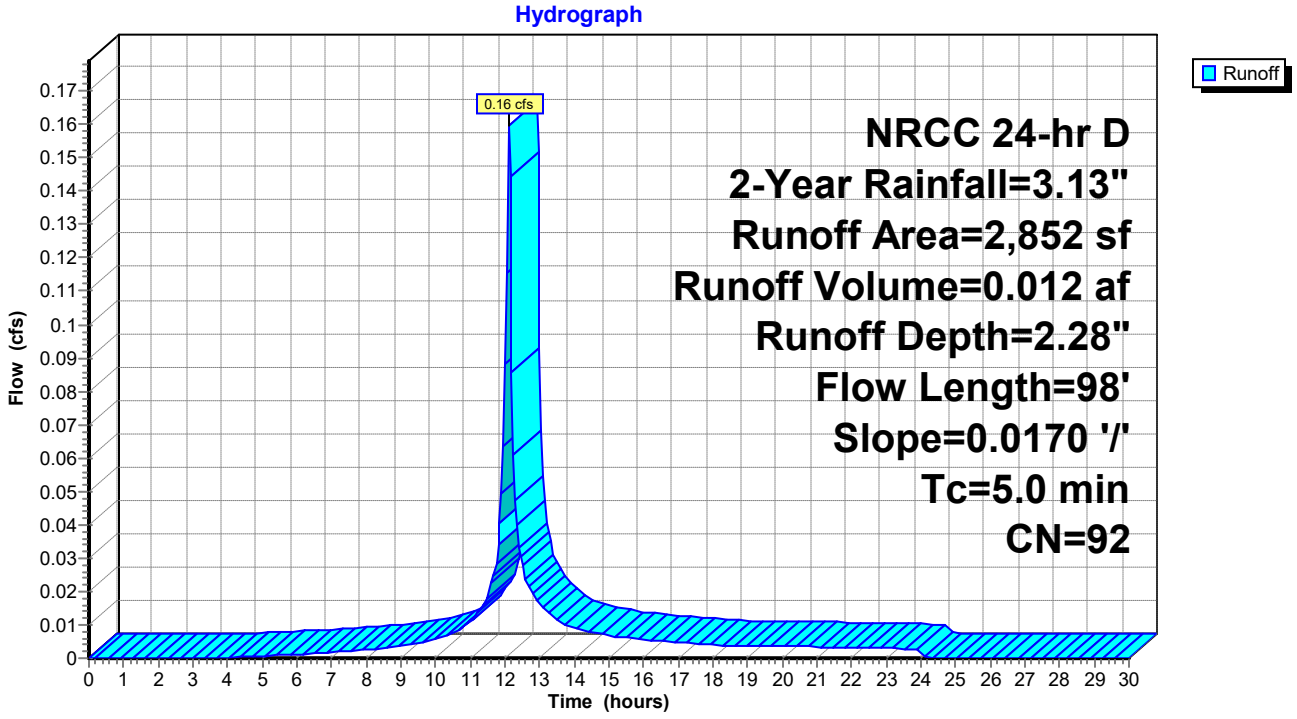
Runoff = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 2.28"
Routed to Reach DP1 : GUTTER POINT FRANKLIN (WEST)

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 P110: TO DCB#10

[49] Hint: Tc<2dt may require smaller dt

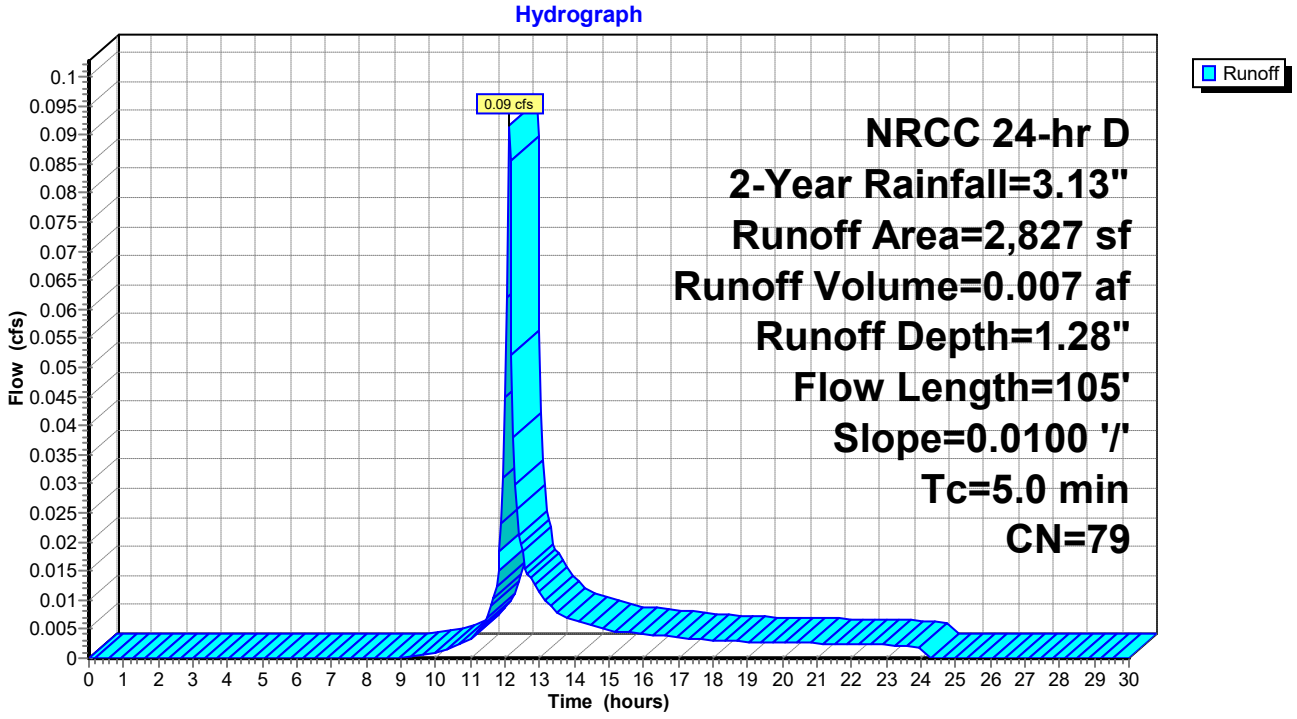
Runoff = 0.09 cfs @ 12.12 hrs, Volume= 0.007 af, Depth= 1.28"
Routed to Reach DCB10 : TO DMH#106

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
907	39	>75% Grass cover, Good, HSG A
1,920	98	Paved parking, HSG A
2,827	79	Weighted Average
907		32.08% Pervious Area
1,920		67.92% 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 P110: TO DCB#10



Summary for Subcatchment P111: TO DCB#11

[49] Hint: Tc<2dt may require smaller dt

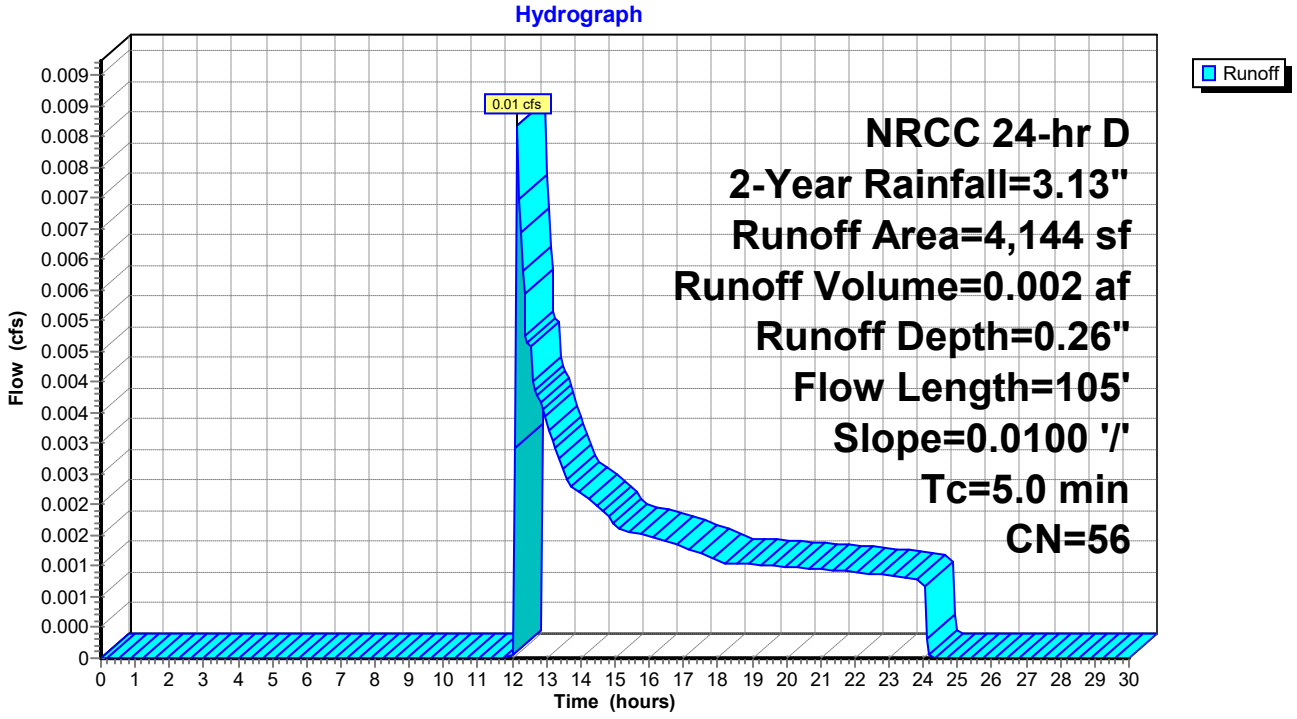
Runoff = 0.01 cfs @ 12.17 hrs, Volume= 0.002 af, Depth= 0.26"
Routed to Reach DCB11 : TO DMH#103

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
2,953	39	>75% Grass cover, Good, HSG A
1,191	98	Paved parking, HSG A
4,144	56	Weighted Average
2,953		71.26% Pervious Area
1,191		28.74% 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 P111: TO DCB#11



Summary for Subcatchment P112: TO DCB#12

[49] Hint: Tc<2dt may require smaller dt

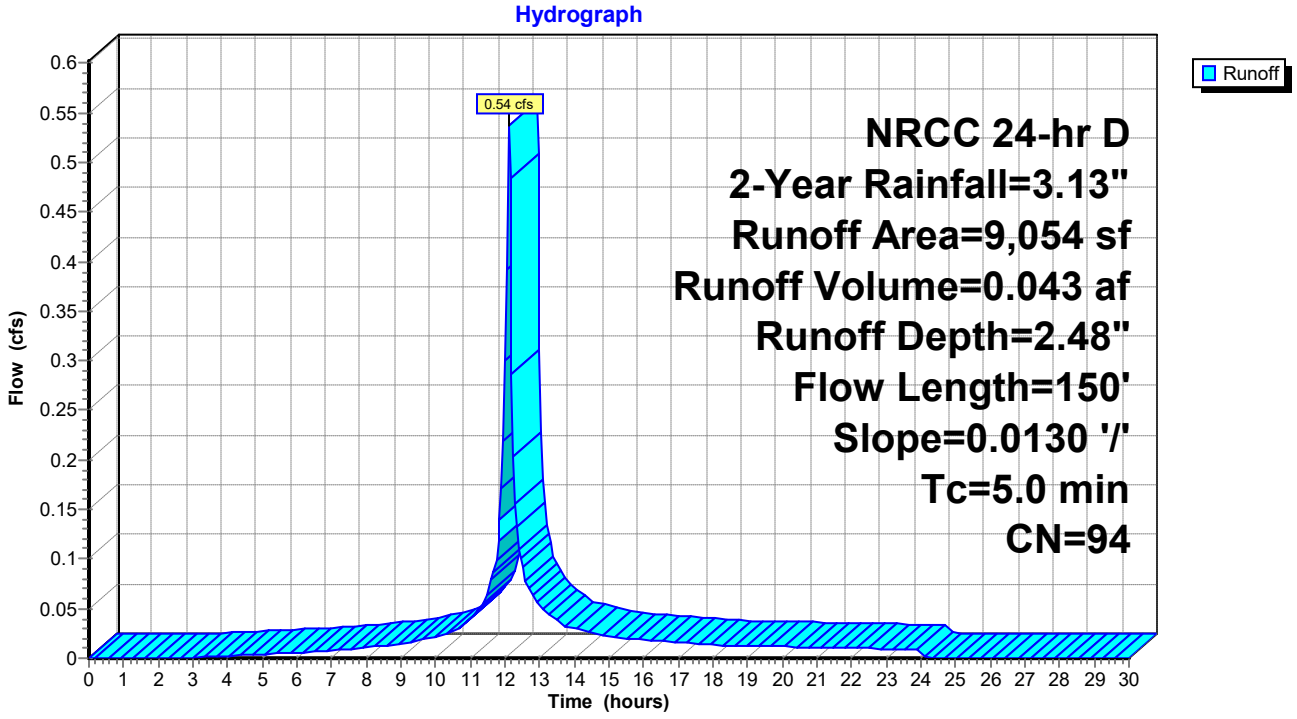
Runoff = 0.54 cfs @ 12.11 hrs, Volume= 0.043 af, Depth= 2.48"
Routed to Reach DCB12 : TO DMH#12

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
575	39	>75% Grass cover, Good, HSG A
8,479	98	Paved parking, HSG A
9,054	94	Weighted Average
575		6.35% Pervious Area
8,479		93.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0130	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	100	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P112: TO DCB#12



Summary for Subcatchment P113: TO DCB#13

[49] Hint: Tc<2dt may require smaller dt

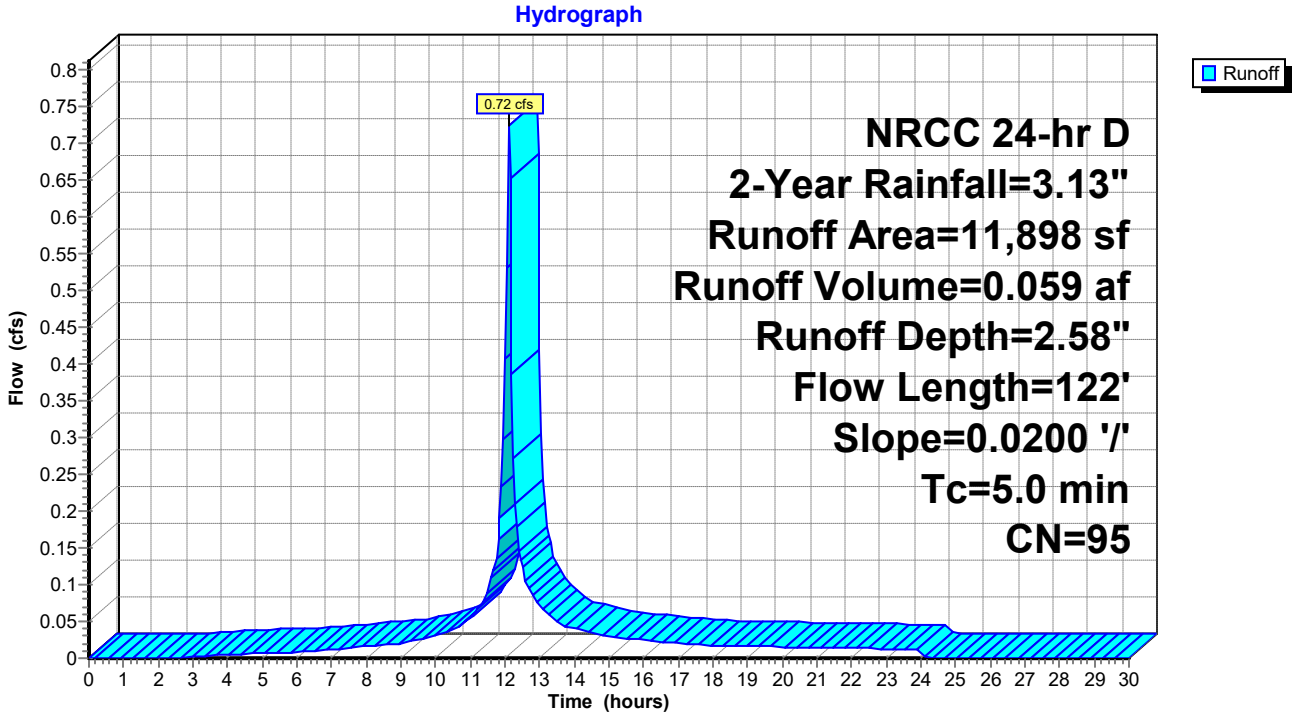
Runoff = 0.72 cfs @ 12.11 hrs, Volume= 0.059 af, Depth= 2.58"
Routed to Reach DCB13 : TO DMH#102

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
656	39	>75% Grass cover, Good, HSG A
11,242	98	Paved parking, HSG A
11,898	95	Weighted Average
656		5.51% Pervious Area
11,242		94.49% 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"
0.4	72	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	122	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P113: TO DCB#13



Summary for Subcatchment P114: TO DCB#14

[49] Hint: Tc<2dt may require smaller dt

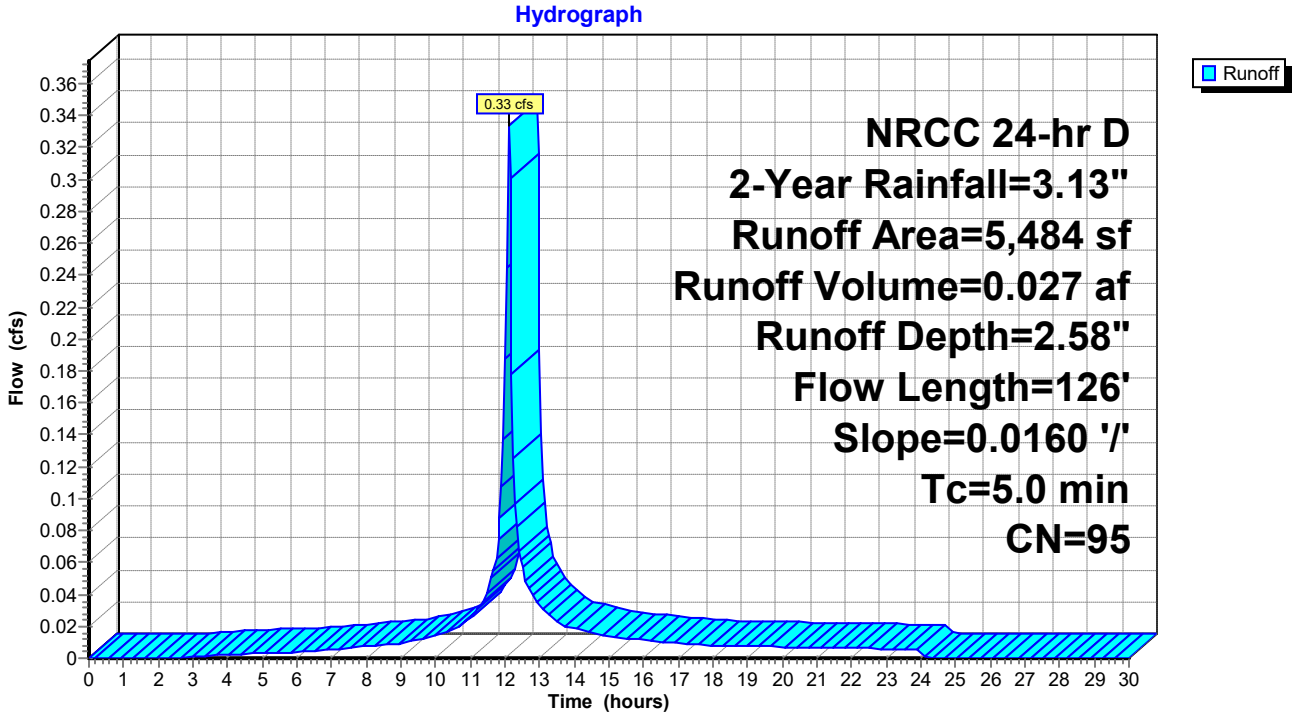
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 2.58"
Routed to Reach DCB14 : TO DMH#109

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
306	39	>75% Grass cover, Good, HSG A
5,178	98	Paved parking, HSG A
5,484	95	Weighted Average
306		5.58% Pervious Area
5,178		94.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0160	1.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	76	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	126	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P114: TO DCB#14



Summary for Subcatchment P115: TO DCB#15

[49] Hint: Tc<2dt may require smaller dt

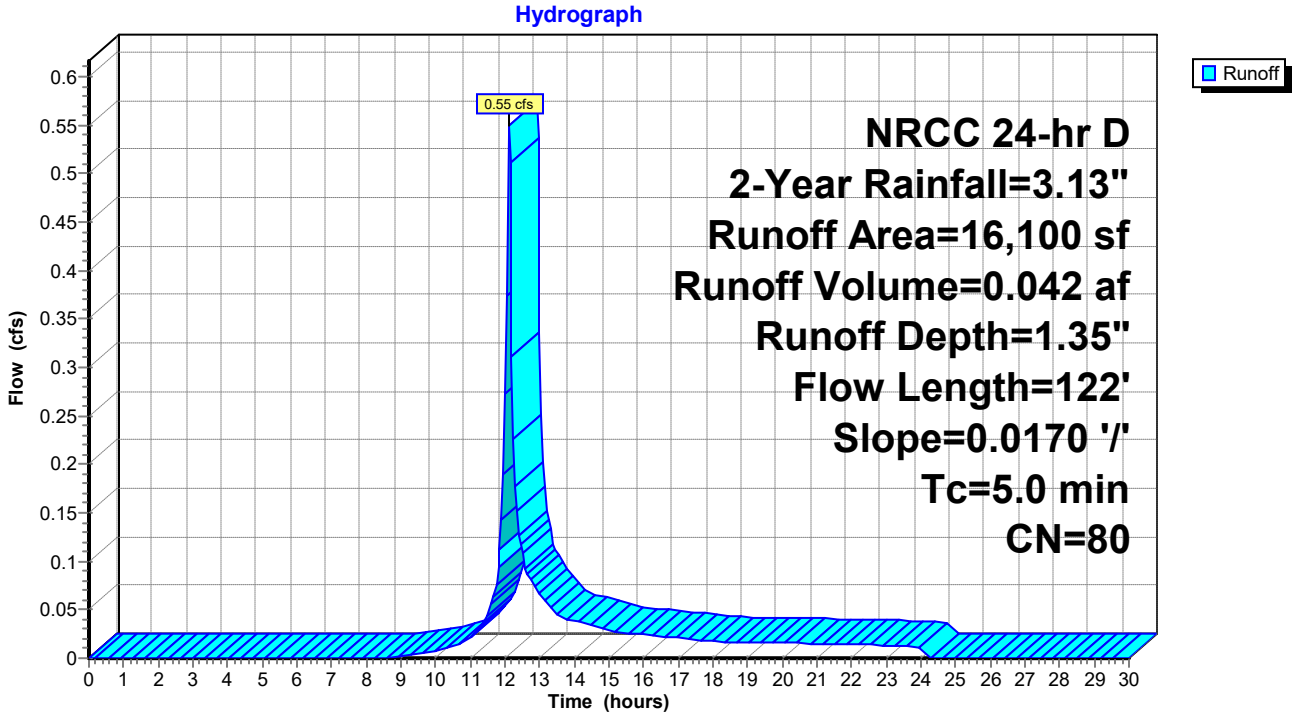
Runoff = 0.55 cfs @ 12.12 hrs, Volume= 0.042 af, Depth= 1.35"
Routed to Reach DCB15 : TO DMH#102

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
4,821	39	>75% Grass cover, Good, HSG A
11,279	98	Paved parking, HSG A
16,100	80	Weighted Average
4,821		29.94% Pervious Area
11,279		70.06% 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"
0.5	72	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	122	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P115: TO DCB#15



Summary for Subcatchment P116: TO DCB#25

[49] Hint: Tc<2dt may require smaller dt

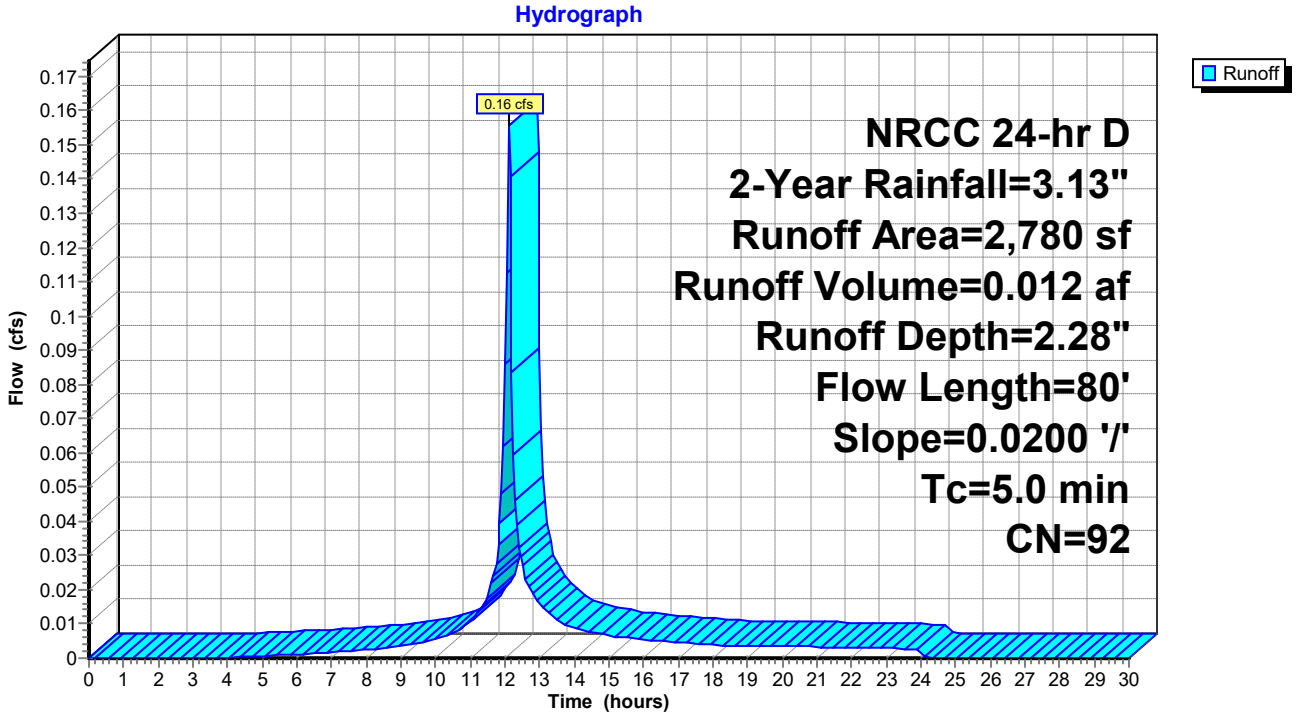
Runoff = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 2.28"
Routed to Reach DCB25 : TO DMH#109A

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
297	39	>75% Grass cover, Good, HSG A
2,483	98	Paved parking, HSG A
2,780	92	Weighted Average
297		10.68% Pervious Area
2,483		89.32% 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"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	80	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P116: TO DCB#25



Summary for Subcatchment P117: TO DP#6

[49] Hint: Tc<2dt may require smaller dt

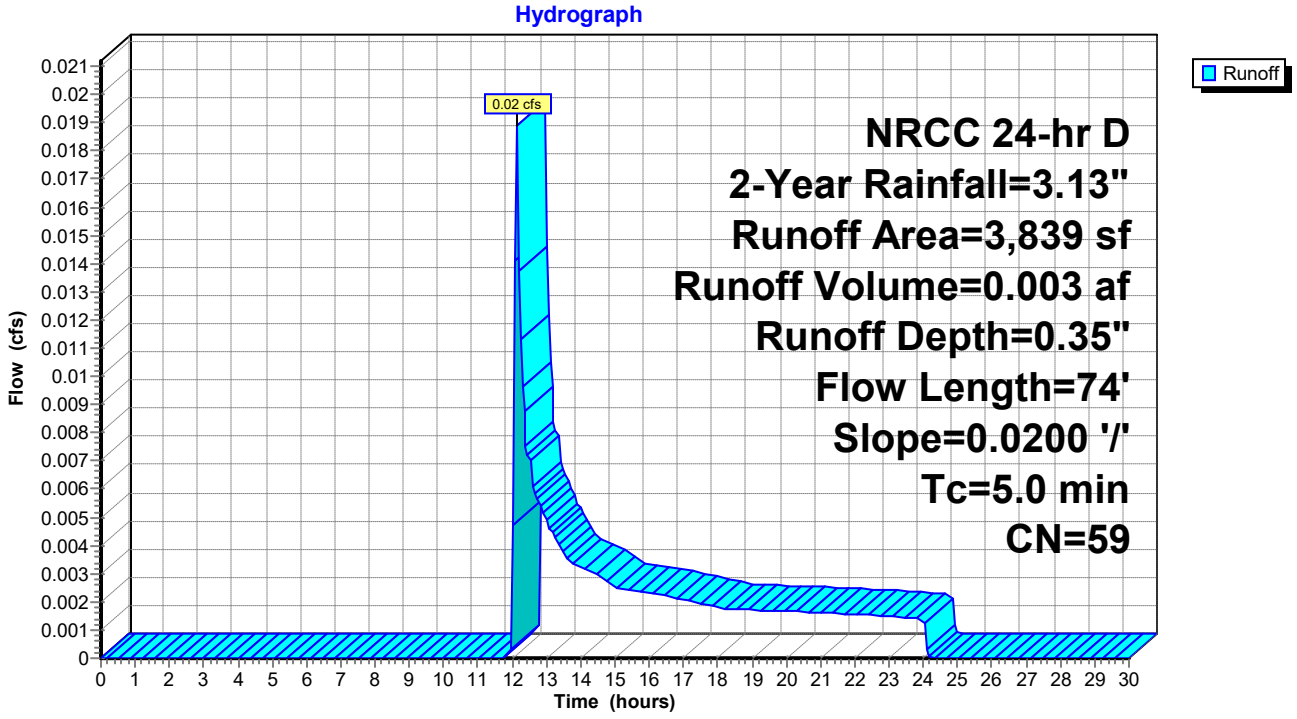
Runoff = 0.02 cfs @ 12.15 hrs, Volume= 0.003 af, Depth= 0.35"
Routed to Reach DP#6 : OFFSITE LOW POINT

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
2,555	39	>75% Grass cover, Good, HSG A
1,284	98	Paved parking, HSG A
3,839	59	Weighted Average
2,555		66.55% Pervious Area
1,284		33.45% 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 P117: TO DP#6



Summary for Subcatchment P119: TO DCB#19

[49] Hint: Tc<2dt may require smaller dt

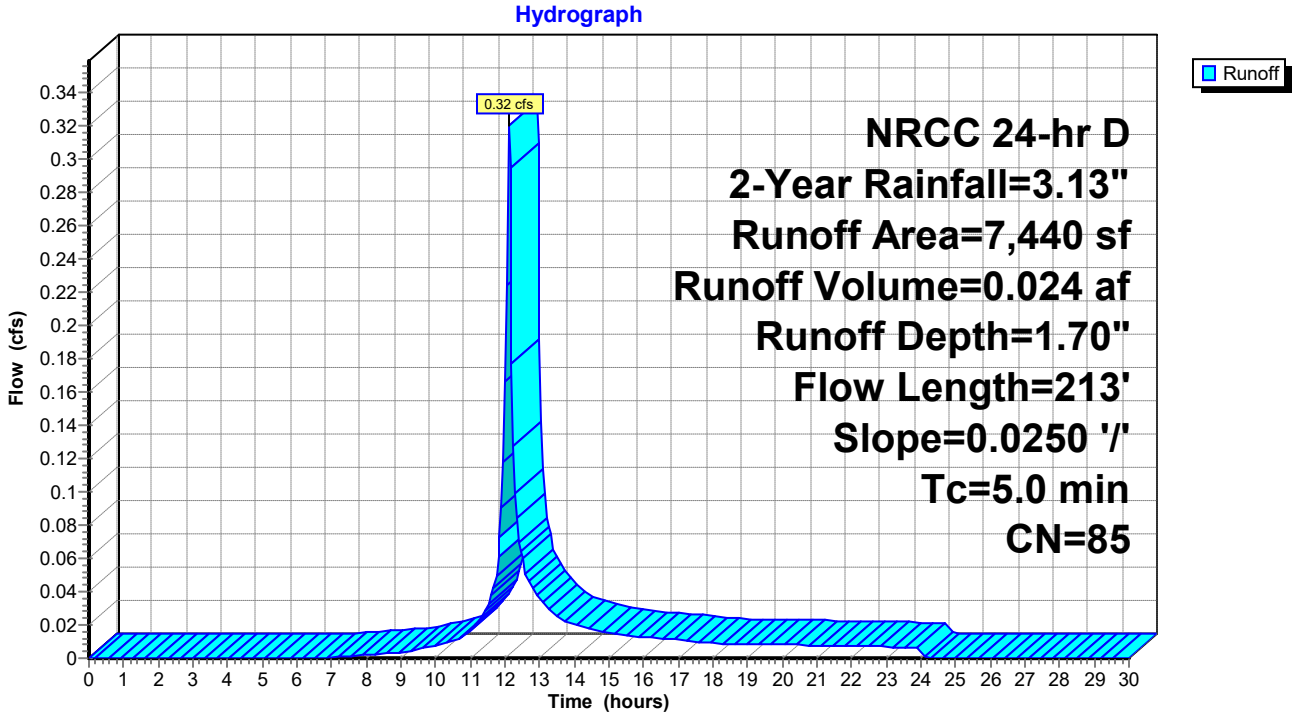
Runoff = 0.32 cfs @ 12.12 hrs, Volume= 0.024 af, Depth= 1.70"
Routed to Reach DCB19 : TO DMH#111

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
1,625	39	>75% Grass cover, Good, HSG A
5,815	98	Paved parking, HSG A
7,440	85	Weighted Average
1,625		21.84% Pervious Area
5,815		78.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	163	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	213	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P119: TO DCB#19



Summary for Subcatchment P12: TO DCB-A

[49] Hint: Tc<2dt may require smaller dt

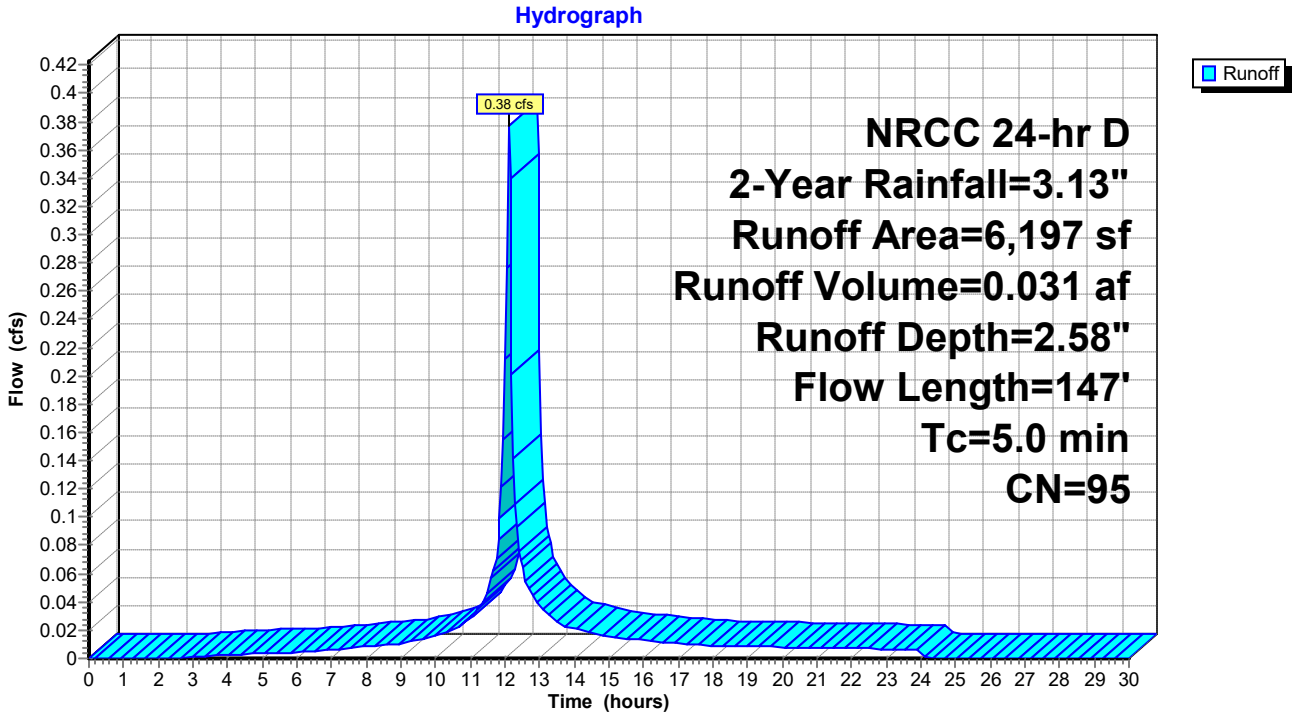
Runoff = 0.38 cfs @ 12.11 hrs, Volume= 0.031 af, Depth= 2.58"
Routed to Reach DCB-A : TO DMH-D

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
334	39	>75% Grass cover, Good, HSG A
5,863	98	Paved parking, HSG A
6,197	95	Weighted Average
334		5.39% Pervious Area
5,863		94.61% 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 P120: TO DCB#20

[49] Hint: Tc<2dt may require smaller dt

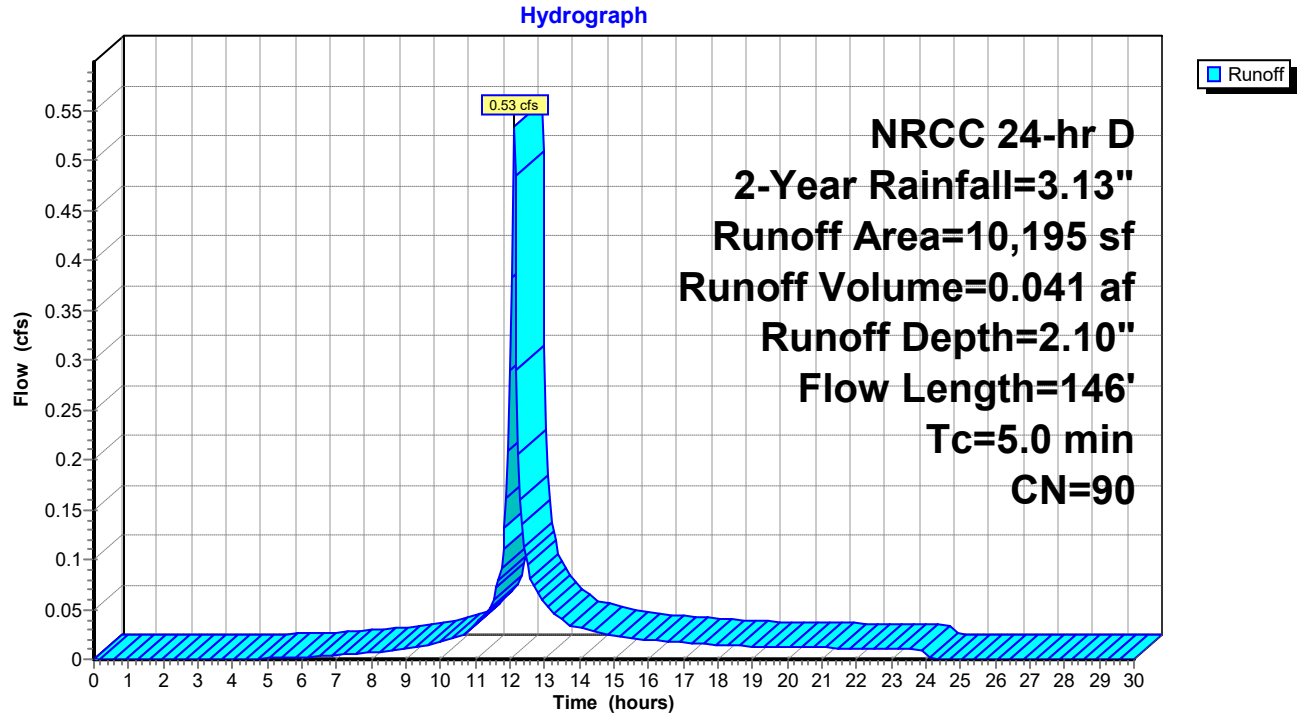
Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af, Depth= 2.10"
Routed to Reach DCB20 : TO DMH#109

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
1,453	39	>75% Grass cover, Good, HSG A
8,742	98	Paved parking, HSG A
10,195	90	Weighted Average
1,453		14.25% Pervious Area
8,742		85.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	5	0.0200	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	45	0.0150	1.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	96	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.2	146	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P120: TO DCB#20



Summary for Subcatchment P121: TO DCB#21

[49] Hint: Tc<2dt may require smaller dt

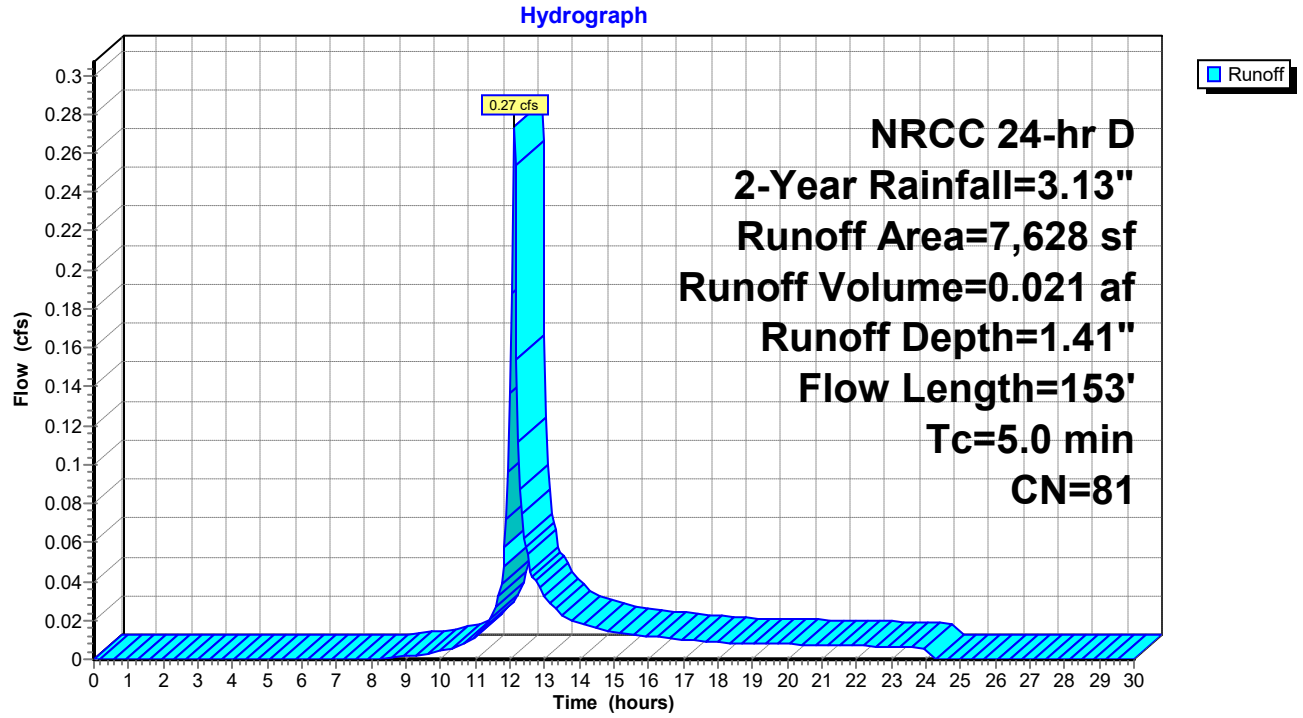
Runoff = 0.27 cfs @ 12.12 hrs, Volume= 0.021 af, Depth= 1.41"
Routed to Reach DCB21 : TO DMH#109A

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
2,211	39	>75% Grass cover, Good, HSG A
5,417	98	Paved parking, HSG A
7,628	81	Weighted Average
2,211		28.99% Pervious Area
5,417		71.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.1000	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	38	0.0100	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	103	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.5	153	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P121: TO DCB#21



Summary for Subcatchment P122: TO DCB#22

[49] Hint: Tc<2dt may require smaller dt

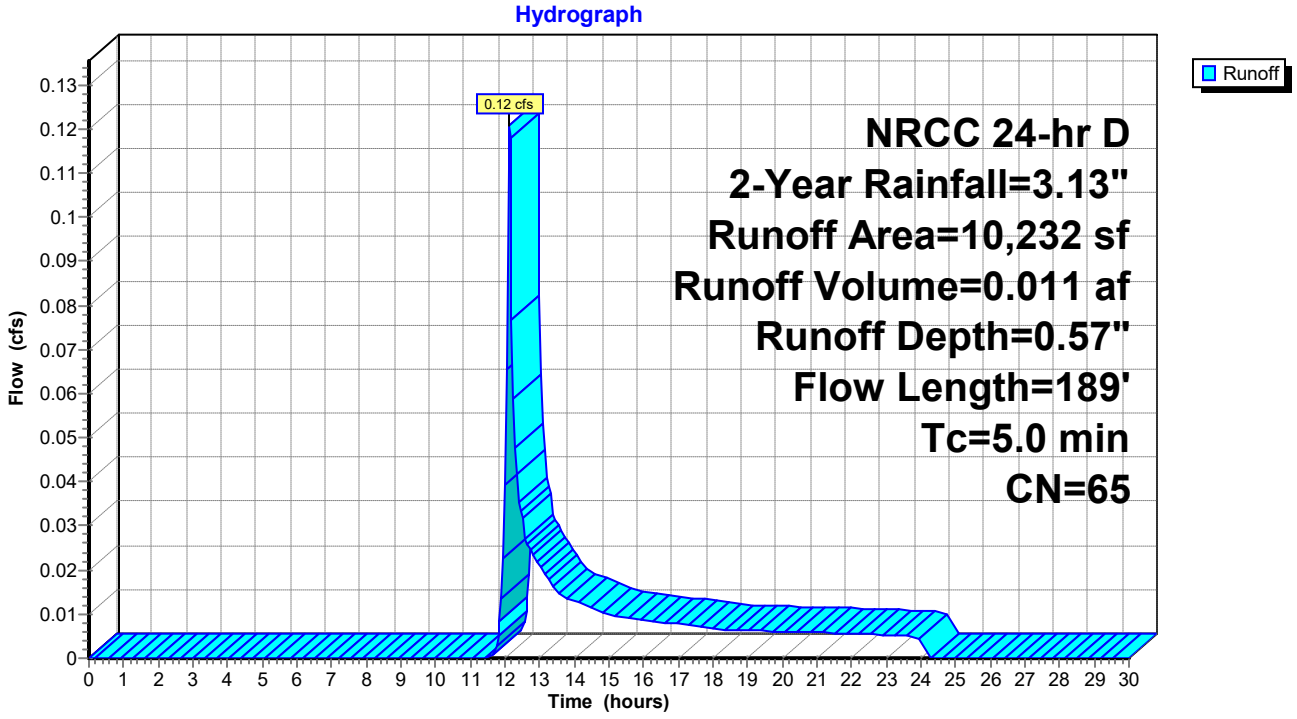
Runoff = 0.12 cfs @ 12.13 hrs, Volume= 0.011 af, Depth= 0.57"
Routed to Reach DCB22 : TO DMH#111

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
5,643	39	>75% Grass cover, Good, HSG A
4,589	98	Paved parking, HSG A
10,232	65	Weighted Average
5,643		55.15% Pervious Area
4,589		44.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	50	0.1000	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	139	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	189	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P122: TO DCB#22



Summary for Subcatchment P123: TO DCB#23

[49] Hint: Tc<2dt may require smaller dt

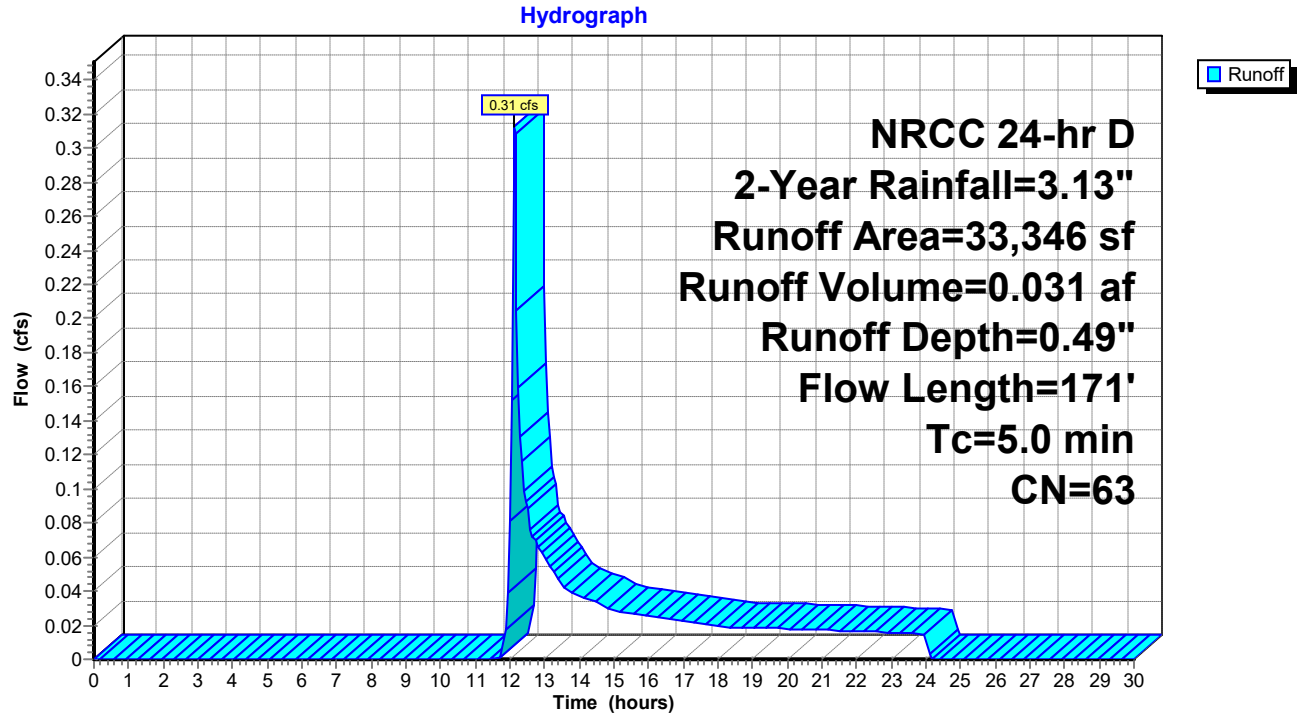
Runoff = 0.31 cfs @ 12.14 hrs, Volume= 0.031 af, Depth= 0.49"
Routed to Reach DCB23 : TO DMH#111

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
20,008	39	>75% Grass cover, Good, HSG A
13,338	98	Paved parking, HSG A
33,346	63	Weighted Average
20,008		60.00% Pervious Area
13,338		40.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	40	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	10	0.0200	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	121	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	171	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P123: TO DCB#23



Summary for Subcatchment P14: TO DCB-B

[49] Hint: Tc<2dt may require smaller dt

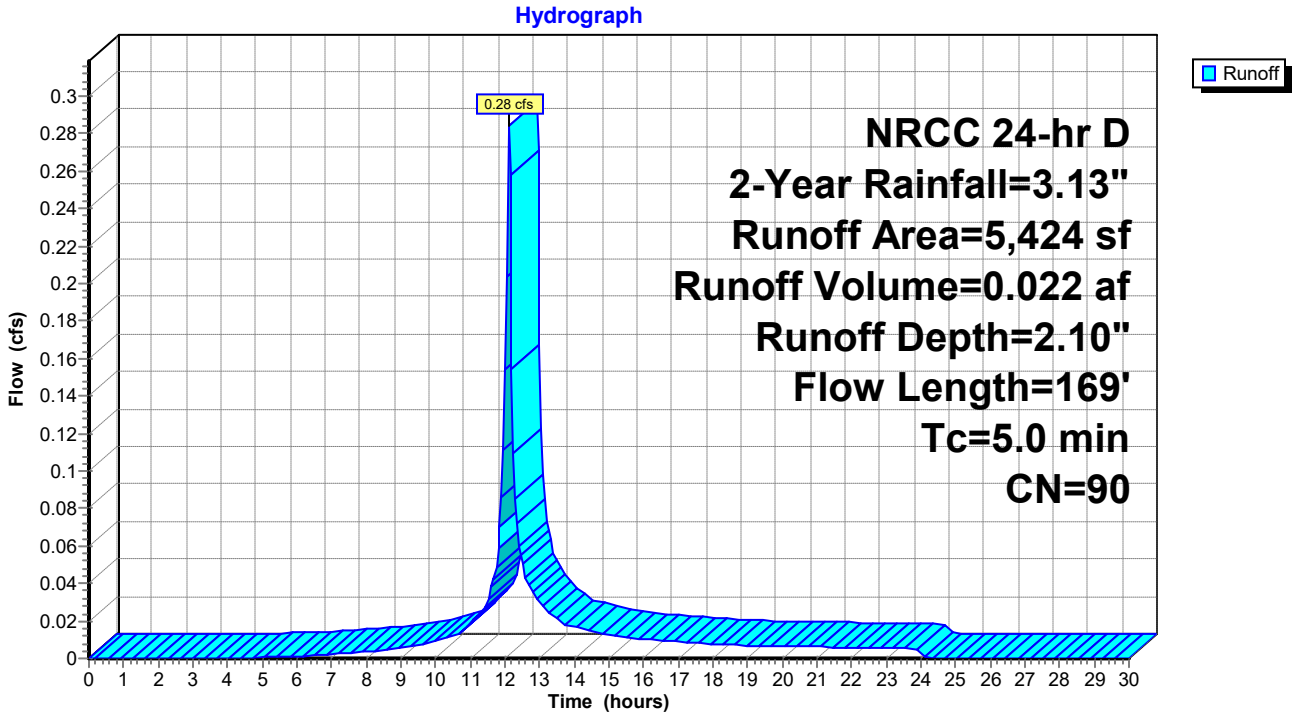
Runoff = 0.28 cfs @ 12.11 hrs, Volume= 0.022 af, Depth= 2.10"
Routed to Reach DCB-B : TO DMH-E

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
692	39	>75% Grass cover, Good, HSG A
4,732	98	Paved parking, HSG A
5,424	90	Weighted Average
692		12.76% Pervious Area
4,732		87.24% 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

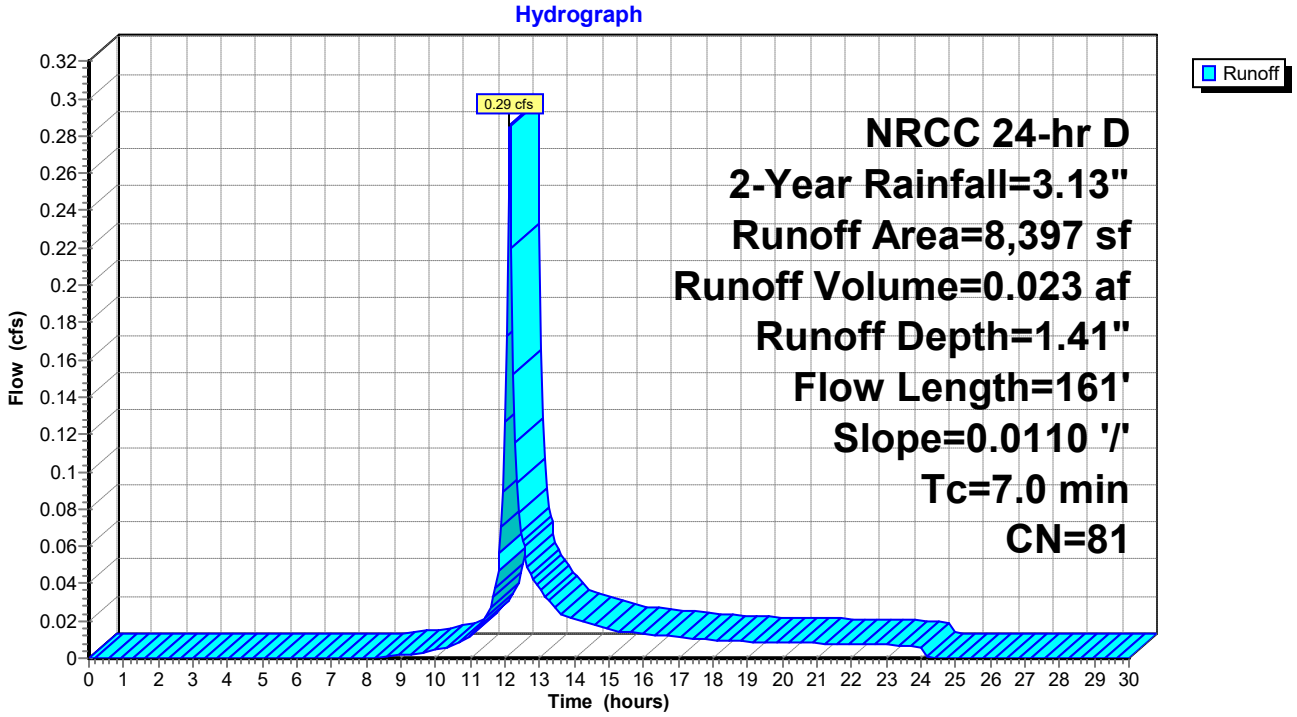
Runoff = 0.29 cfs @ 12.14 hrs, Volume= 0.023 af, Depth= 1.41"
Routed to Reach DCB-C : TO TRUNKLINE

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
2,407	39	>75% Grass cover, Good, HSG A
5,990	98	Paved parking, HSG A
8,397	81	Weighted Average
2,407		28.66% Pervious Area
5,990		71.34% 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 P18: TO DCB-D

[49] Hint: Tc<2dt may require smaller dt

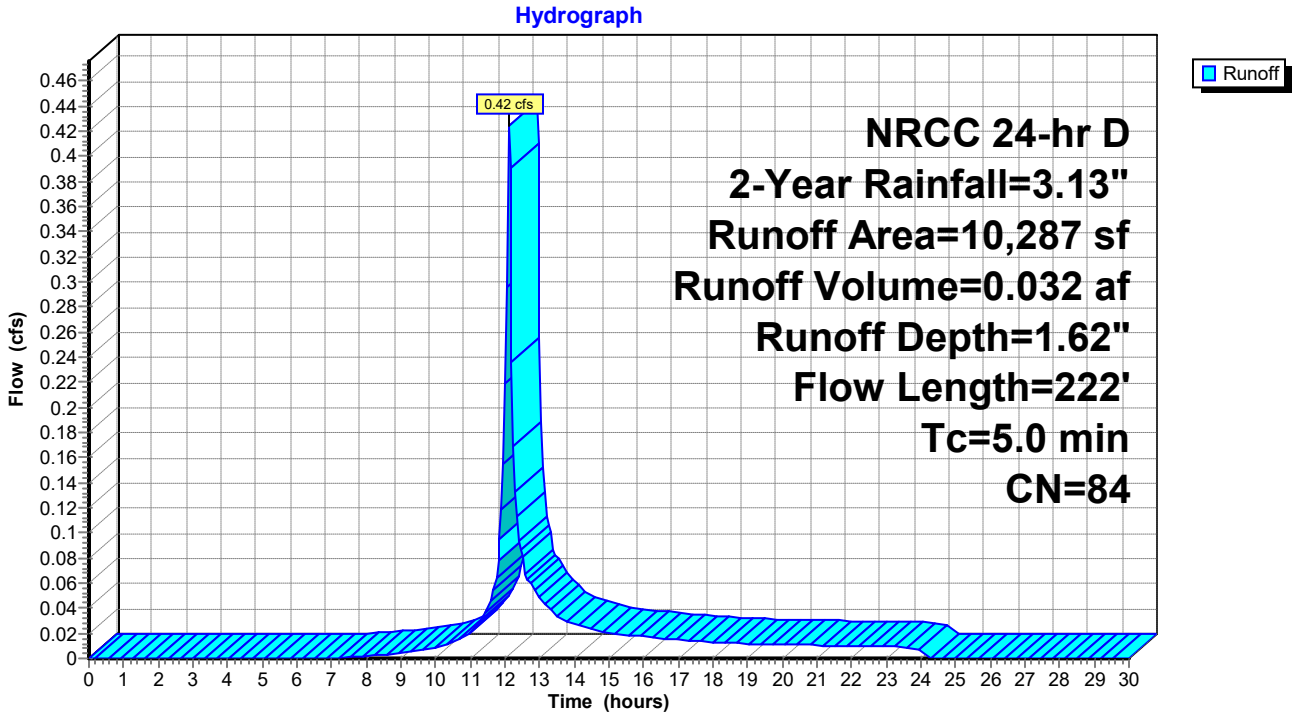
Runoff = 0.42 cfs @ 12.12 hrs, Volume= 0.032 af, Depth= 1.62"
Routed to Reach DCB-D : TO DMH-A

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
2,417	39	>75% Grass cover, Good, HSG A
7,870	98	Paved parking, HSG A
10,287	84	Weighted Average
2,417		23.50% Pervious Area
7,870		76.50% 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

[49] Hint: Tc<2dt may require smaller dt

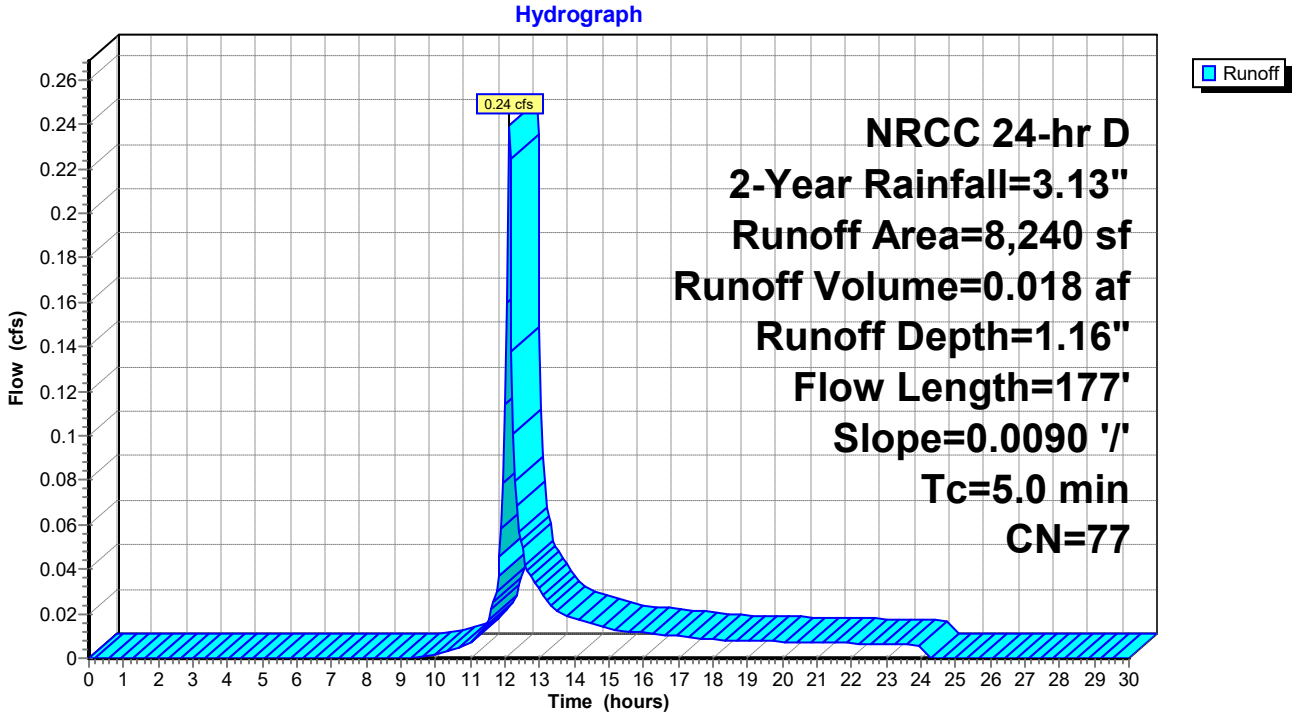
Runoff = 0.24 cfs @ 12.12 hrs, Volume= 0.018 af, Depth= 1.16"
Routed to Reach DCB-E : TO DMH-A

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
2,944	39	>75% Grass cover, Good, HSG A
5,296	98	Paved parking, HSG A
8,240	77	Weighted Average
2,944		35.73% Pervious Area
5,296		64.27% 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

[49] Hint: Tc<2dt may require smaller dt

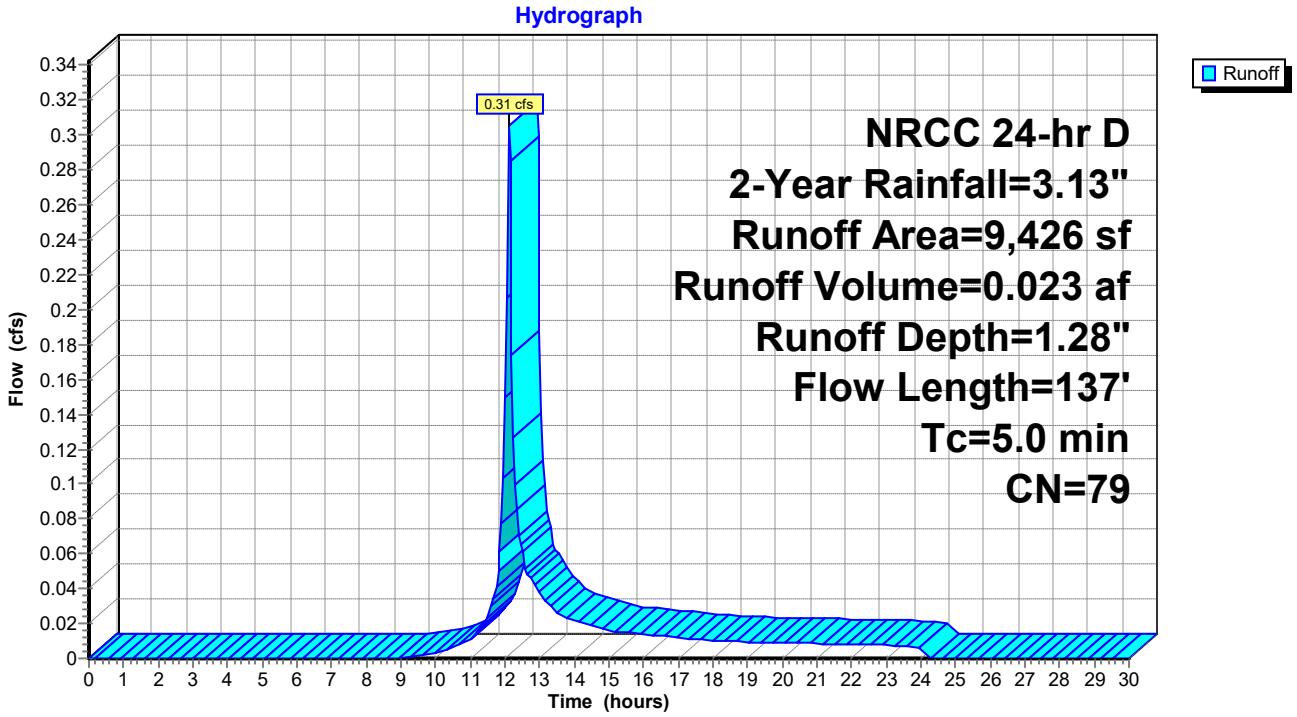
Runoff = 0.31 cfs @ 12.12 hrs, Volume= 0.023 af, Depth= 1.28"
Routed to Reach DP3 : CATCHBASIN (FIRE STATION)

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 P20: TO DP#3



Summary for Subcatchment P24: TO DCB#24

[49] Hint: Tc<2dt may require smaller dt

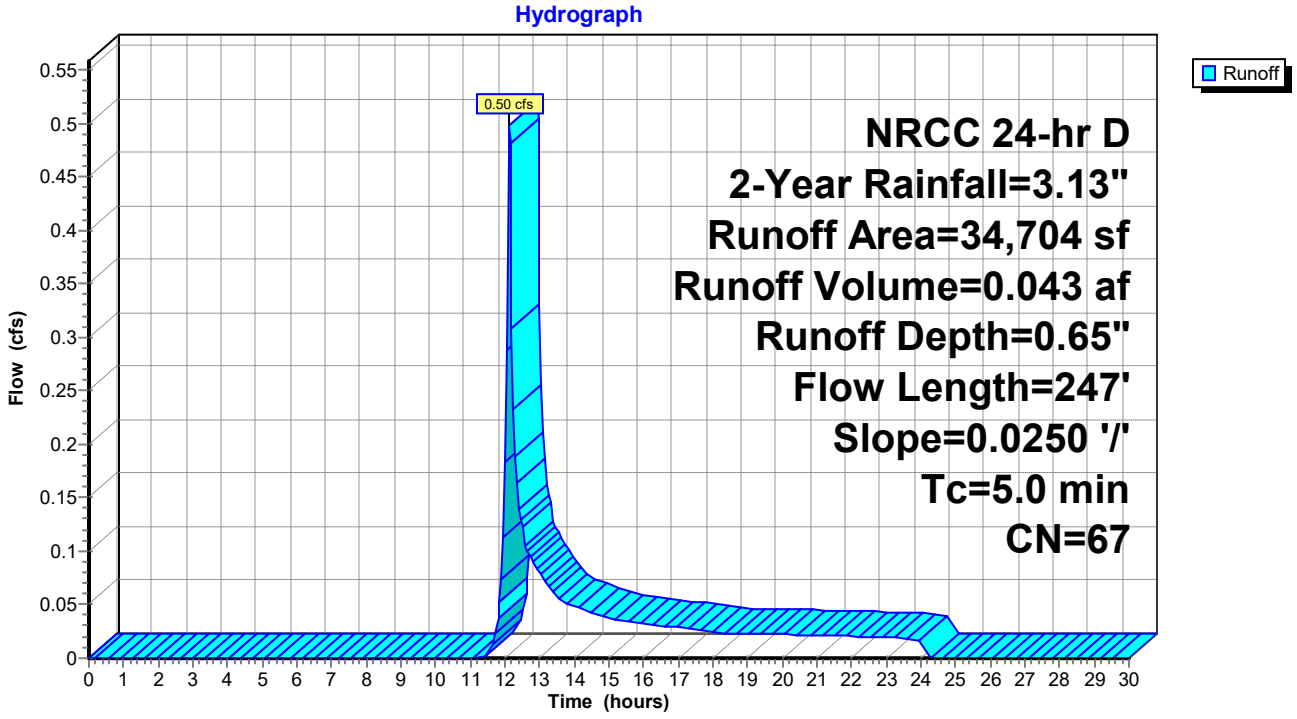
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 0.043 af, Depth= 0.65"
Routed to Reach DCB24 : TO DMH#113

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
18,387	39	>75% Grass cover, Good, HSG A
16,317	98	Paved parking, HSG A
34,704	67	Weighted Average
18,387		52.98% Pervious Area
16,317		47.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.0	197	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	247	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P24: TO DCB#24



Summary for Reach CMH3: TO DMH-E

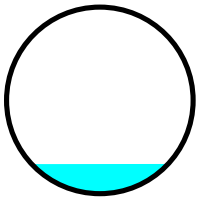
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-F outlet invert by 0.48' @ 12.15 hrs

Inflow Area = 3.013 ac, 76.57% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 3.31 cfs @ 12.14 hrs, Volume= 0.291 af
Outflow = 3.18 cfs @ 12.15 hrs, Volume= 0.291 af, Atten= 4%, Lag= 1.0 min
Routed to Reach DMH-E : TO DMH-D

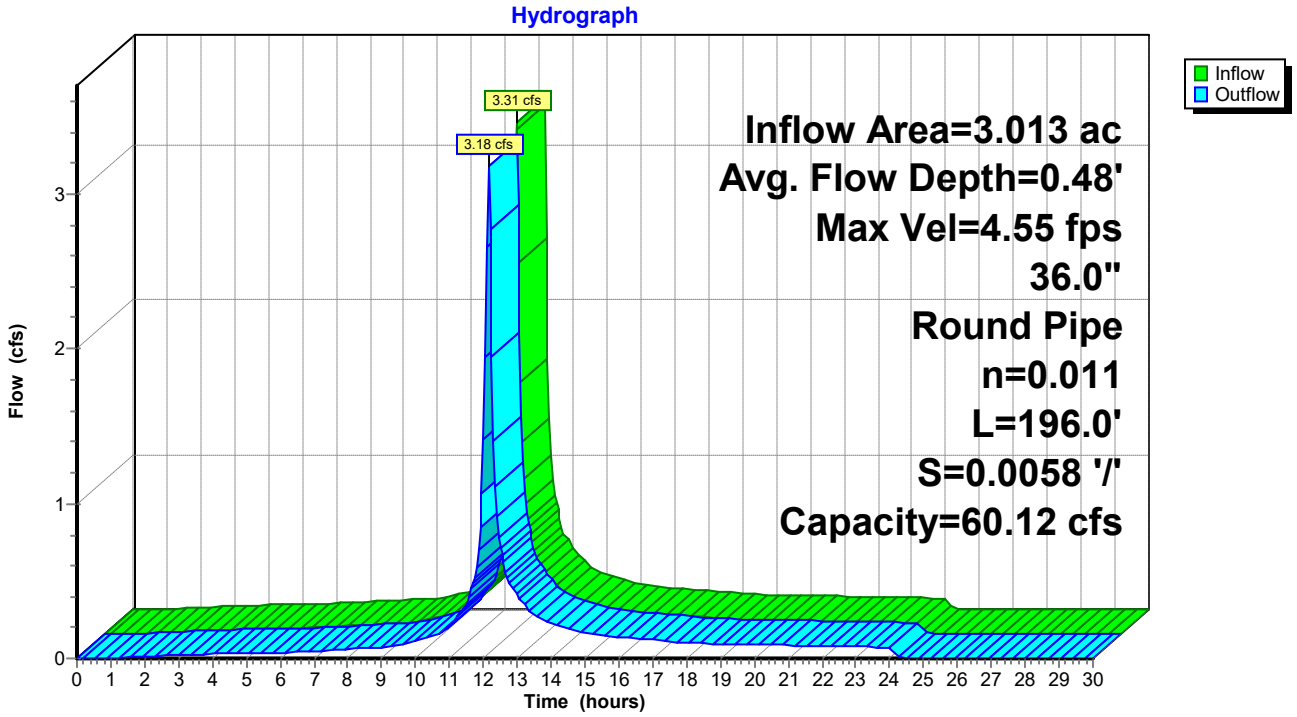
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.55 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 2.1 min

Peak Storage= 141 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.48' , Surface Width= 2.19'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.12 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 196.0' Slope= 0.0058 '/'
Inlet Invert= 457.71', Outlet Invert= 456.57'



Reach CMH3: TO DMH-E



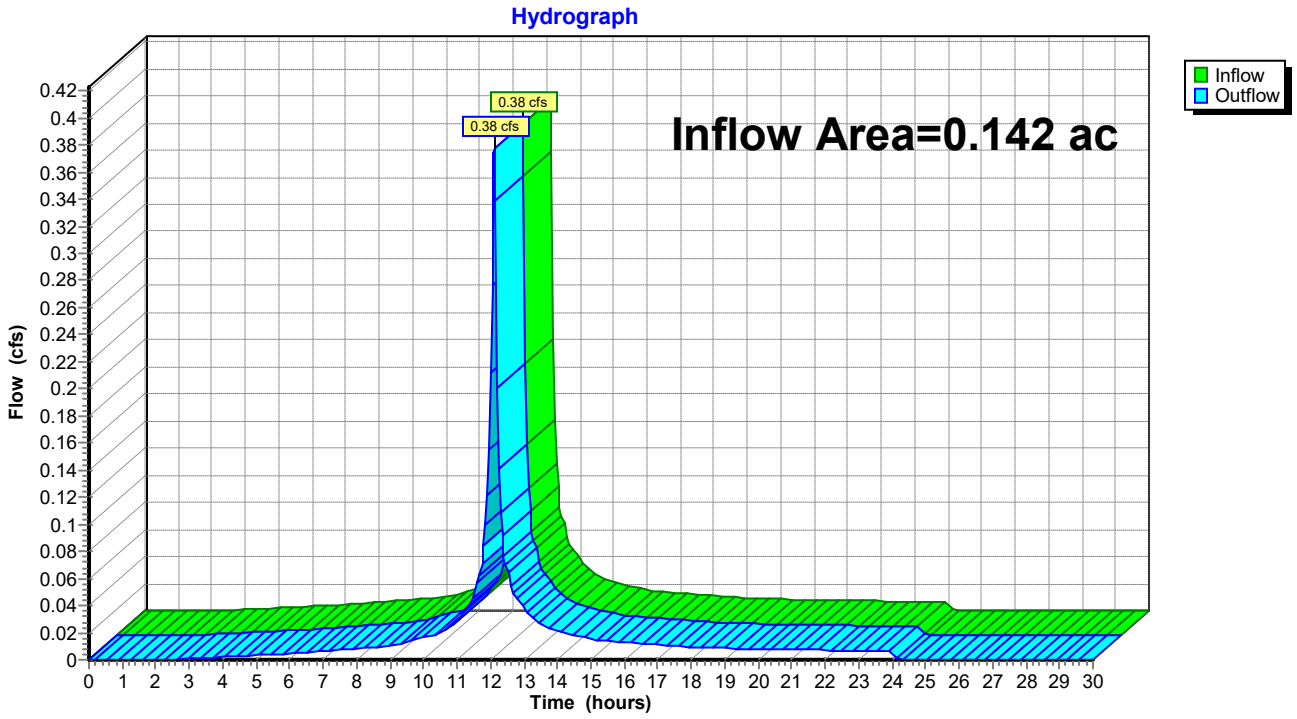
Summary for Reach DCB-A: TO DMH-D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.142 ac, 94.61% Impervious, Inflow Depth = 2.58" for 2-Year event
Inflow = 0.38 cfs @ 12.11 hrs, Volume= 0.031 af
Outflow = 0.38 cfs @ 12.11 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-D : TO DMH-C

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

Reach DCB-A: TO DMH-D



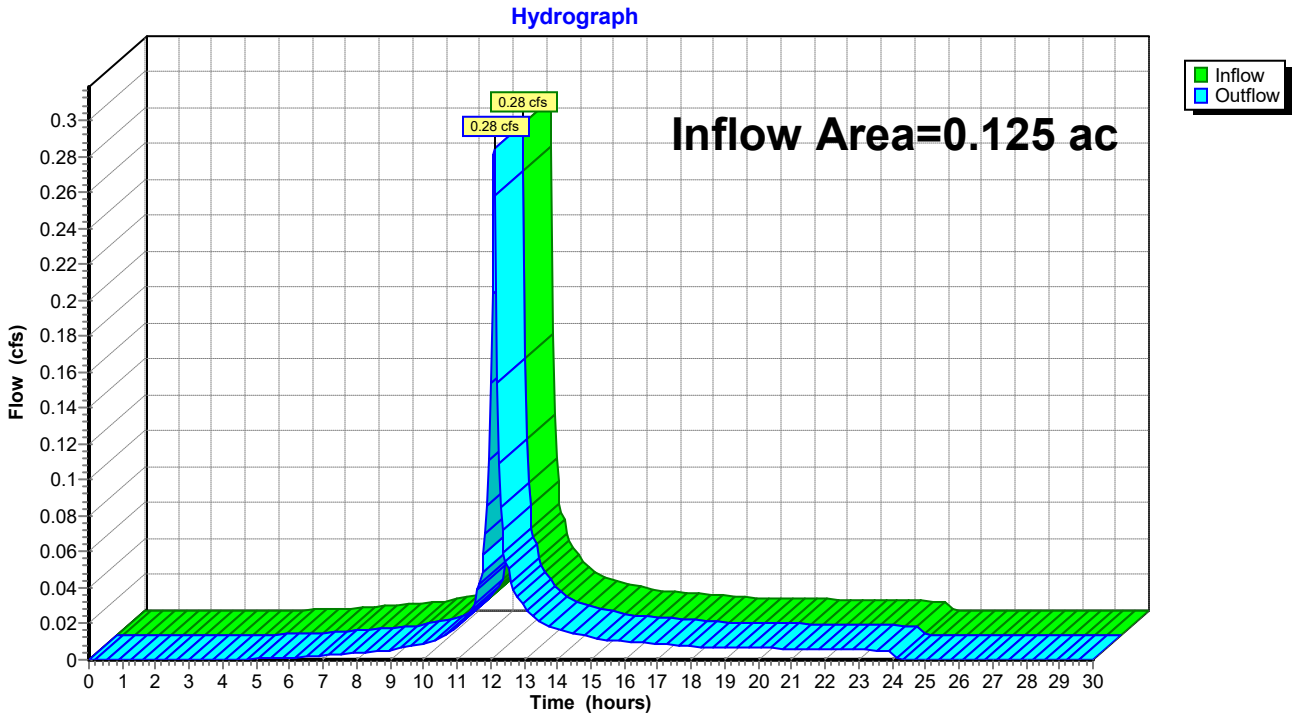
Summary for Reach DCB-B: TO DMH-E

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.125 ac, 87.24% Impervious, Inflow Depth = 2.10" for 2-Year event
Inflow = 0.28 cfs @ 12.11 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.11 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-E : TO DMH-D

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

Reach DCB-B: TO DMH-E



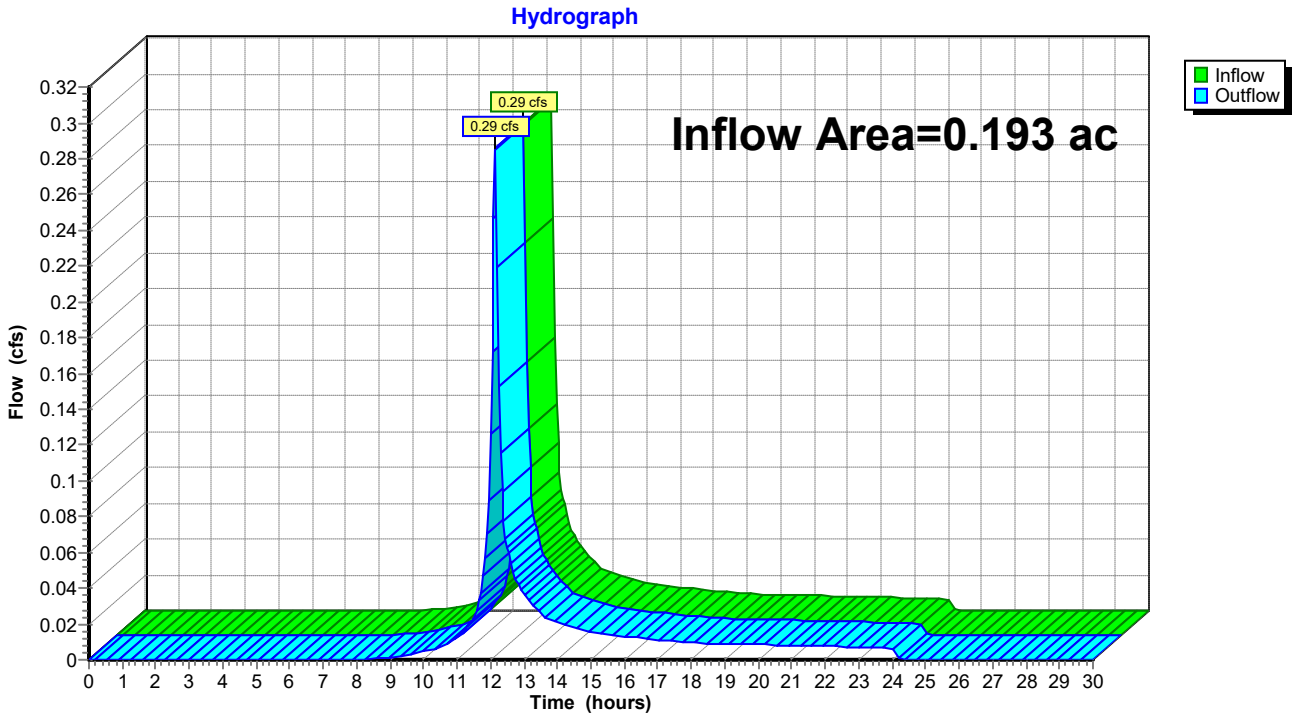
Summary for Reach DCB-C: TO TRUNKLINE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.193 ac, 71.34% Impervious, Inflow Depth = 1.41" for 2-Year event
Inflow = 0.29 cfs @ 12.14 hrs, Volume= 0.023 af
Outflow = 0.29 cfs @ 12.14 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-E : TO DMH-D

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

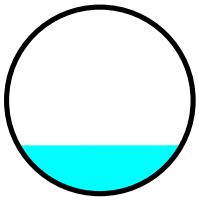
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.236 ac, 76.50% Impervious, Inflow Depth = 1.62" for 2-Year event
Inflow = 0.42 cfs @ 12.12 hrs, Volume= 0.032 af
Outflow = 0.42 cfs @ 12.12 hrs, Volume= 0.032 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH-A* : TO DMH-B

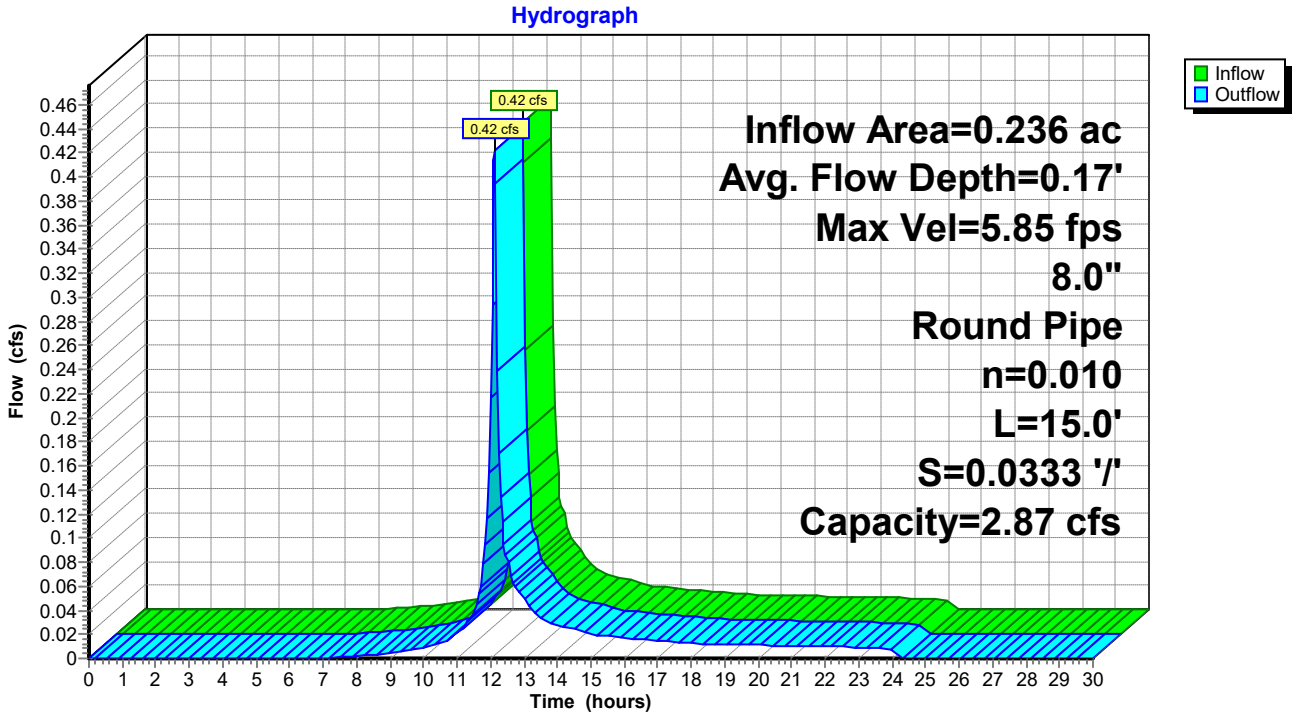
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.85 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 0.58'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.87 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 15.0' Slope= 0.0333 '/'
Inlet Invert= 468.00', Outlet Invert= 467.50'



Reach DCB-D: TO DMH-A



Summary for Reach DCB-E: TO DMH-A

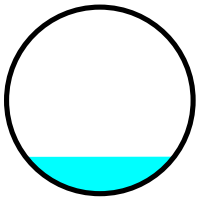
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.189 ac, 64.27% Impervious, Inflow Depth = 1.16" 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= 1%, Lag= 0.1 min
Routed to Reach DMH-A* : TO DMH-B

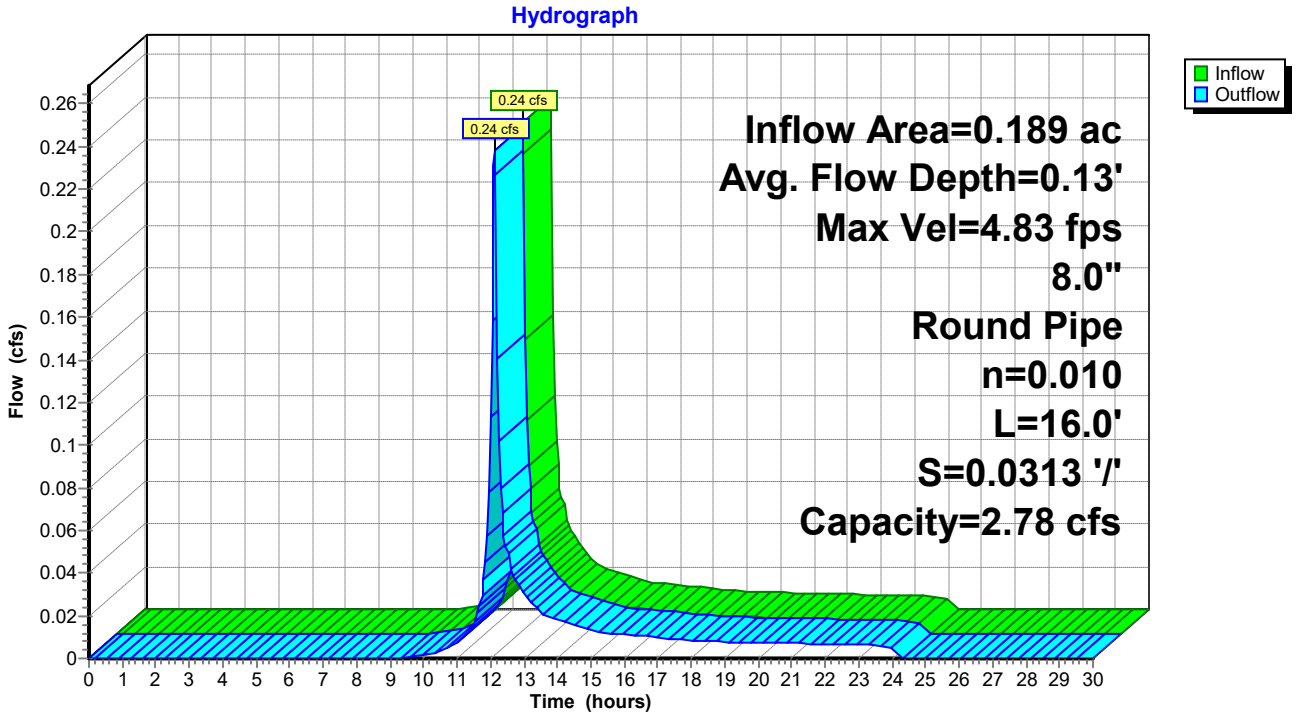
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.83 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.90 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 0.53'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.78 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 16.0' Slope= 0.0313 '/'
Inlet Invert= 468.00', Outlet Invert= 467.50'



Reach DCB-E: TO DMH-A



Summary for Reach DCB10: TO DMH#106

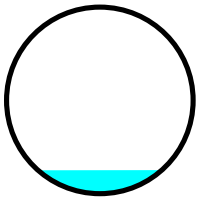
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.065 ac, 67.92% Impervious, Inflow Depth = 1.28" for 2-Year event
Inflow = 0.09 cfs @ 12.12 hrs, Volume= 0.007 af
Outflow = 0.09 cfs @ 12.12 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH106 : TO DMH#105

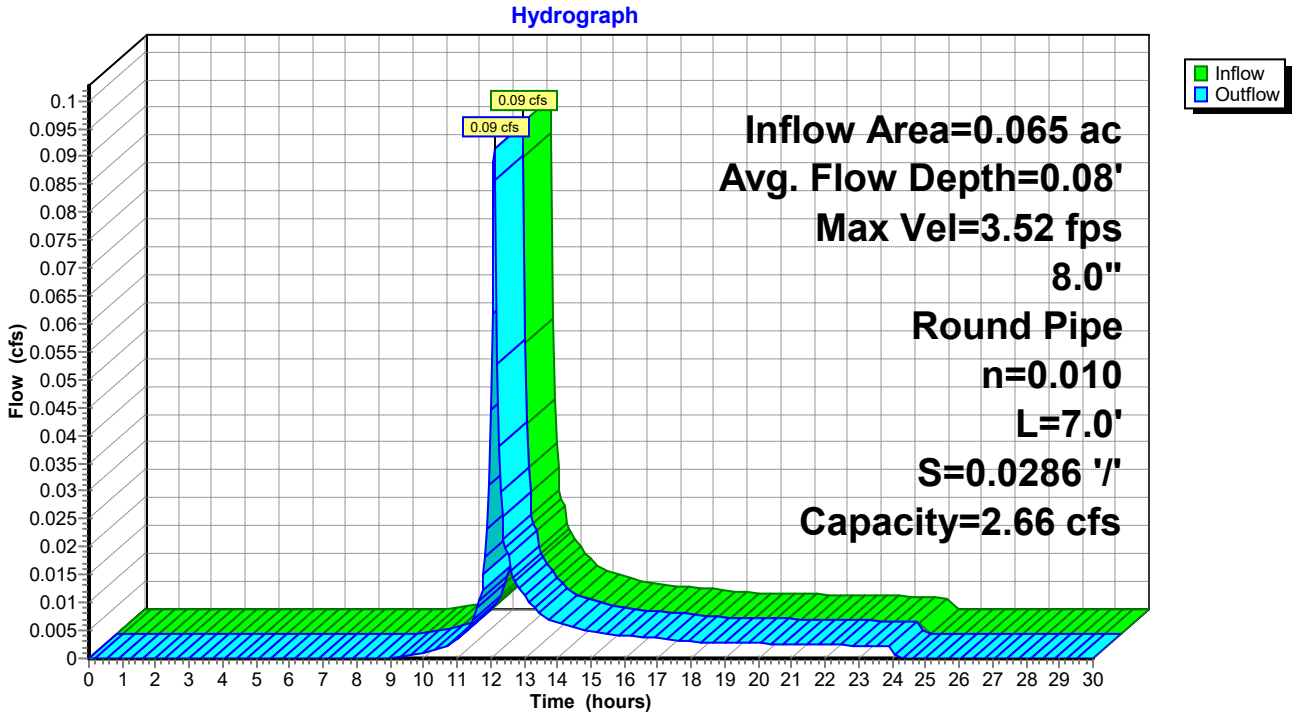
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.52 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.08' , Surface Width= 0.44'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.66 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 7.0' Slope= 0.0286 '/'
Inlet Invert= 470.30', Outlet Invert= 470.10'



Reach DCB10: TO DMH#106



Summary for Reach DCB11: TO DMH#103

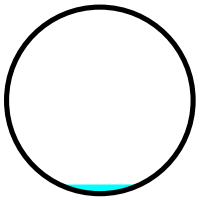
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.095 ac, 28.74% Impervious, Inflow Depth = 0.26" for 2-Year event
Inflow = 0.01 cfs @ 12.17 hrs, Volume= 0.002 af
Outflow = 0.01 cfs @ 12.17 hrs, Volume= 0.002 af, Atten= 3%, Lag= 0.3 min
Routed to Reach DMH106 : TO DMH#105

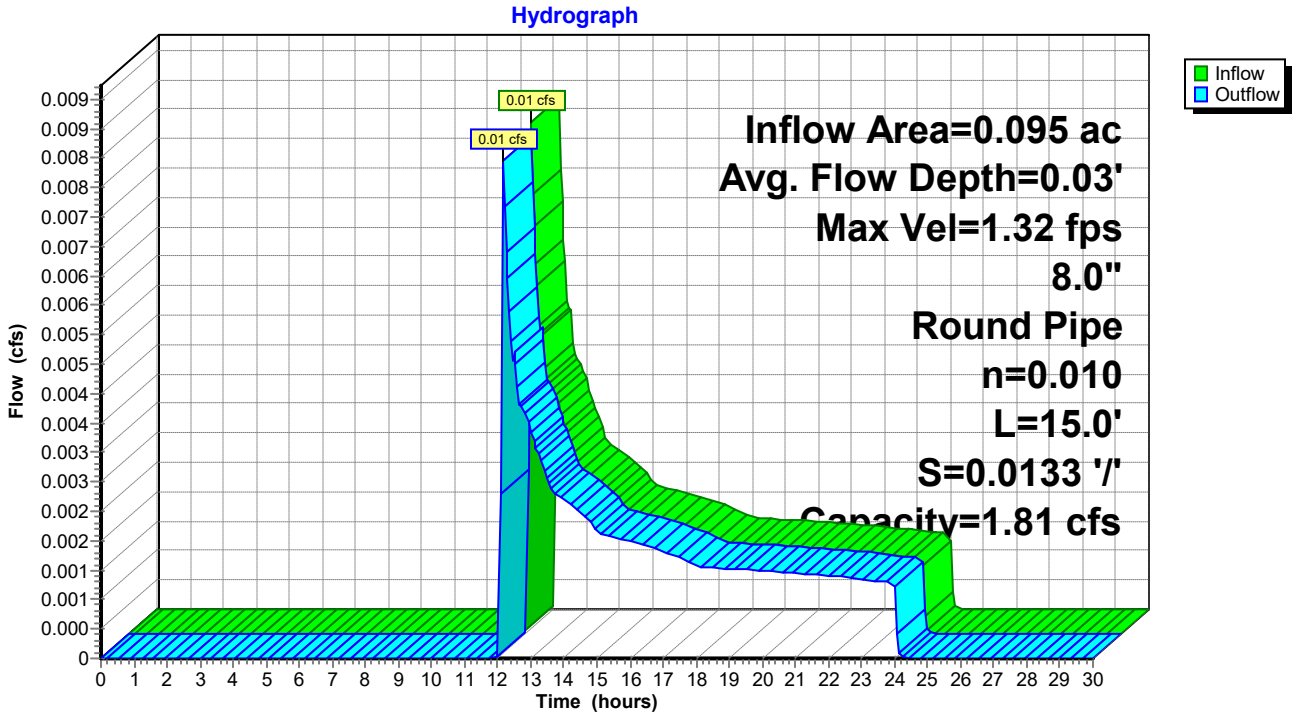
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.32 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 0.3 min

Peak Storage= 0 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 0.29'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.81 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 15.0' Slope= 0.0133 '/'
Inlet Invert= 470.30', Outlet Invert= 470.10'



Reach DCB11: TO DMH#103



Summary for Reach DCB12: TO DMH#12

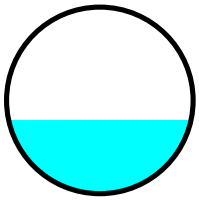
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.208 ac, 93.65% Impervious, Inflow Depth = 2.48" for 2-Year event
Inflow = 0.54 cfs @ 12.11 hrs, Volume= 0.043 af
Outflow = 0.53 cfs @ 12.12 hrs, Volume= 0.043 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH108 : TO DMH#107

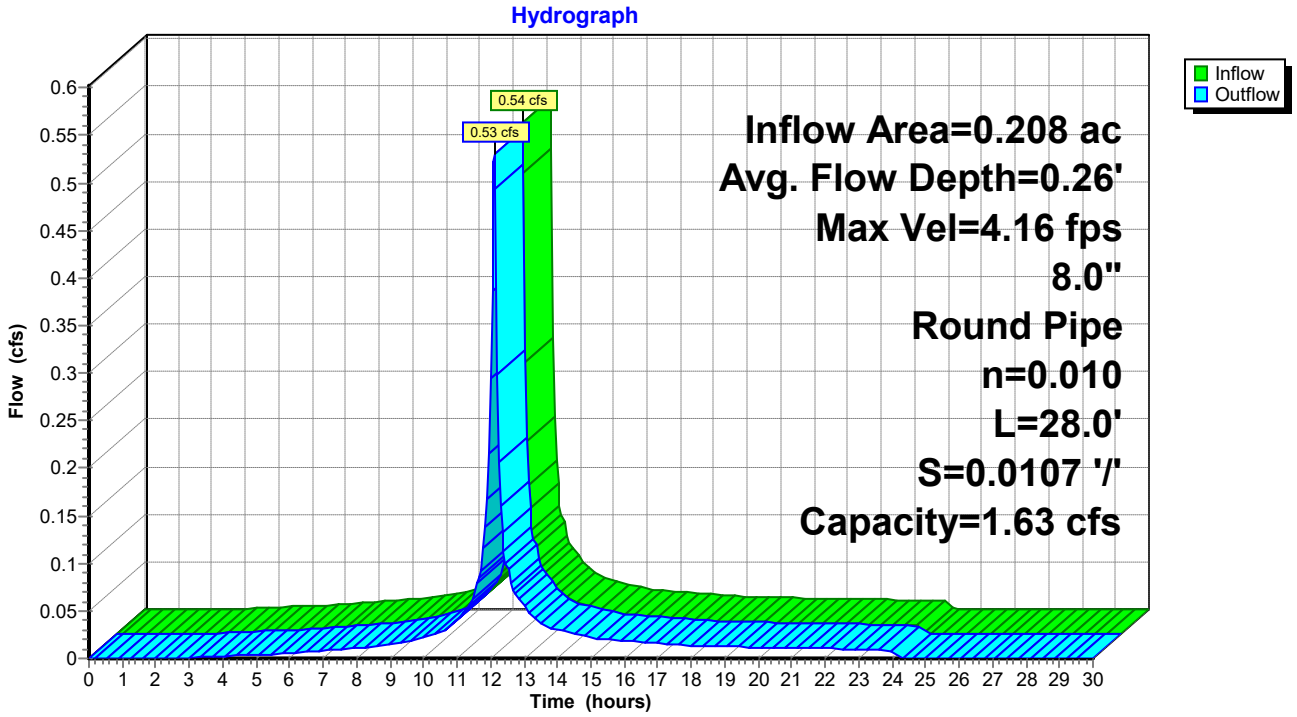
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.16 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.26' , Surface Width= 0.65'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.63 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 28.0' Slope= 0.0107 '/'
Inlet Invert= 467.80', Outlet Invert= 467.50'



Reach DCB12: TO DMH#12



Summary for Reach DCB13: TO DMH#102

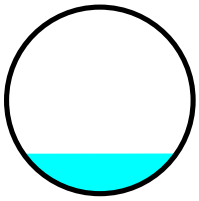
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.273 ac, 94.49% Impervious, Inflow Depth = 2.58" for 2-Year event
Inflow = 0.72 cfs @ 12.11 hrs, Volume= 0.059 af
Outflow = 0.72 cfs @ 12.11 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH102 : TO UGS#1A

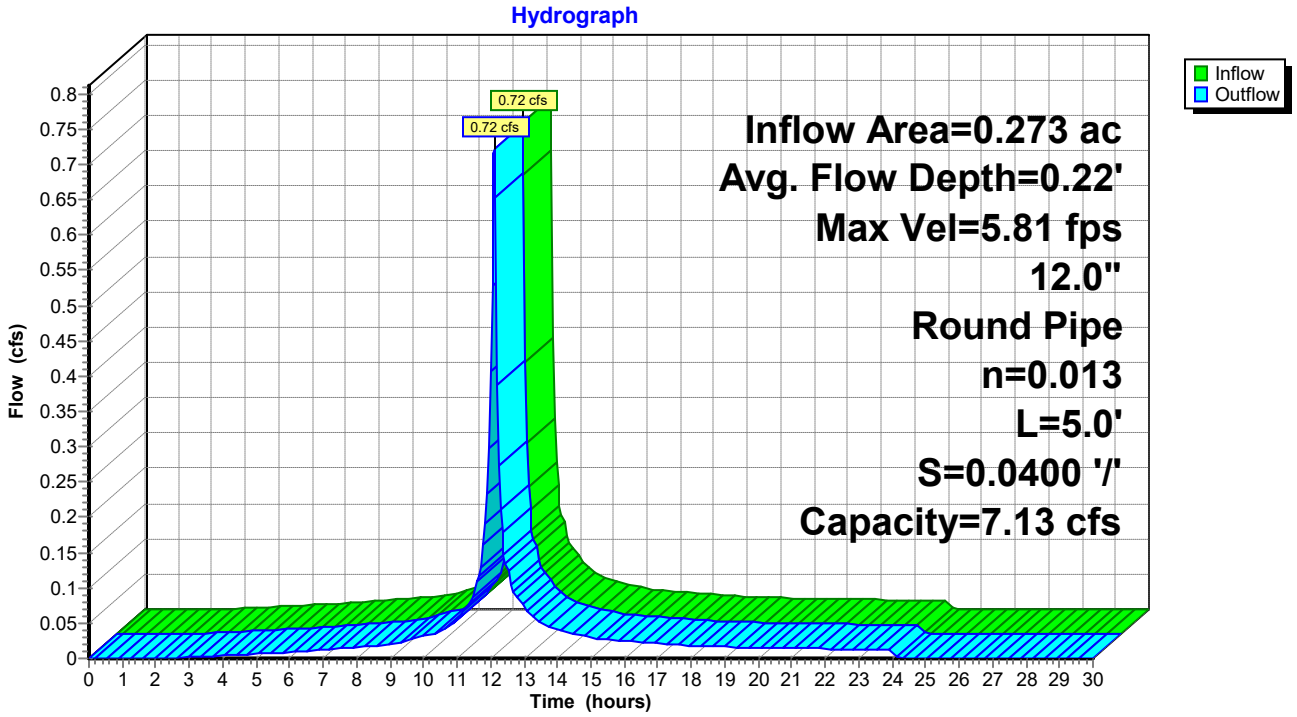
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.81 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.01 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 0.82'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 467.90', Outlet Invert= 467.70'



Reach DCB13: TO DMH#102



Summary for Reach DCB14: TO DMH#109

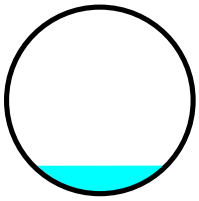
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.126 ac, 94.42% Impervious, Inflow Depth = 2.58" for 2-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= 1%, Lag= 0.1 min
Routed to Reach DMH109 : TO DMH#110

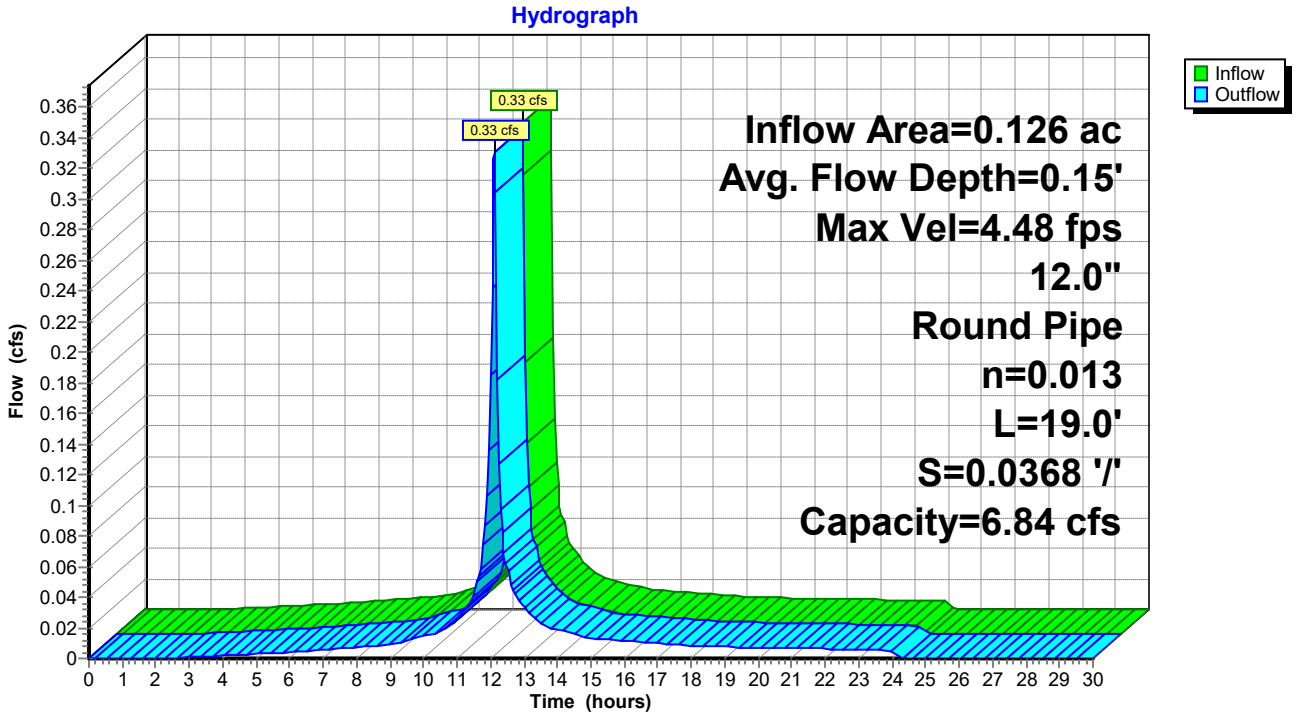
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.48 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 0.71'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.84 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 19.0' Slope= 0.0368 '/'
Inlet Invert= 467.10', Outlet Invert= 466.40'



Reach DCB14: TO DMH#109



Summary for Reach DCB15: TO DMH#102

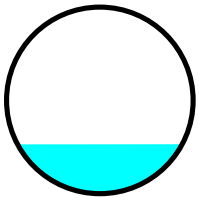
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.370 ac, 70.06% Impervious, Inflow Depth = 1.35" for 2-Year event
Inflow = 0.55 cfs @ 12.12 hrs, Volume= 0.042 af
Outflow = 0.54 cfs @ 12.13 hrs, Volume= 0.042 af, Atten= 2%, Lag= 0.8 min
Routed to Reach DMH102 : TO UGS#1A

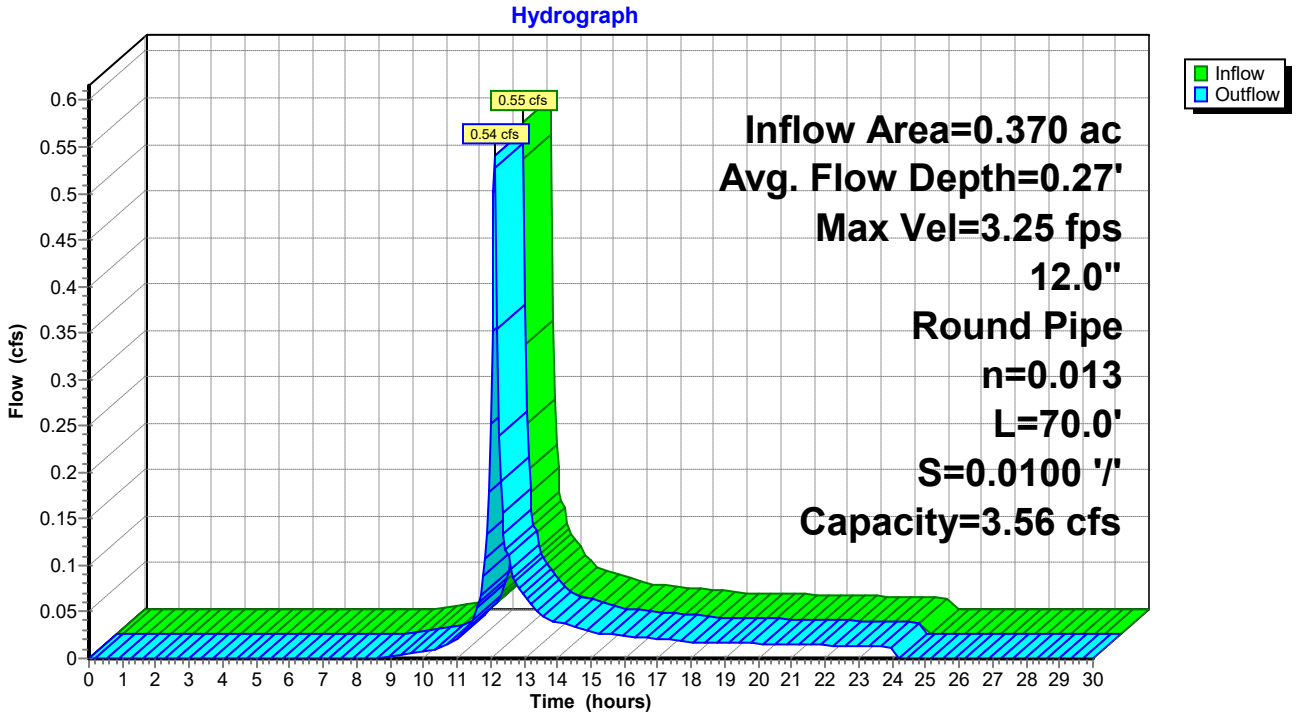
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.25 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 0.9 min

Peak Storage= 12 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.88'
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= 70.0' Slope= 0.0100 '/'
Inlet Invert= 467.00', Outlet Invert= 466.30'



Reach DCB15: TO DMH#102



Summary for Reach DCB19: TO DMH#111

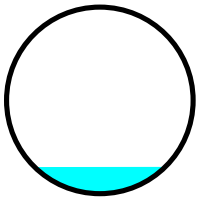
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.171 ac, 78.16% Impervious, Inflow Depth = 1.70" for 2-Year event
Inflow = 0.32 cfs @ 12.12 hrs, Volume= 0.024 af
Outflow = 0.32 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH111 : TO DMH#112

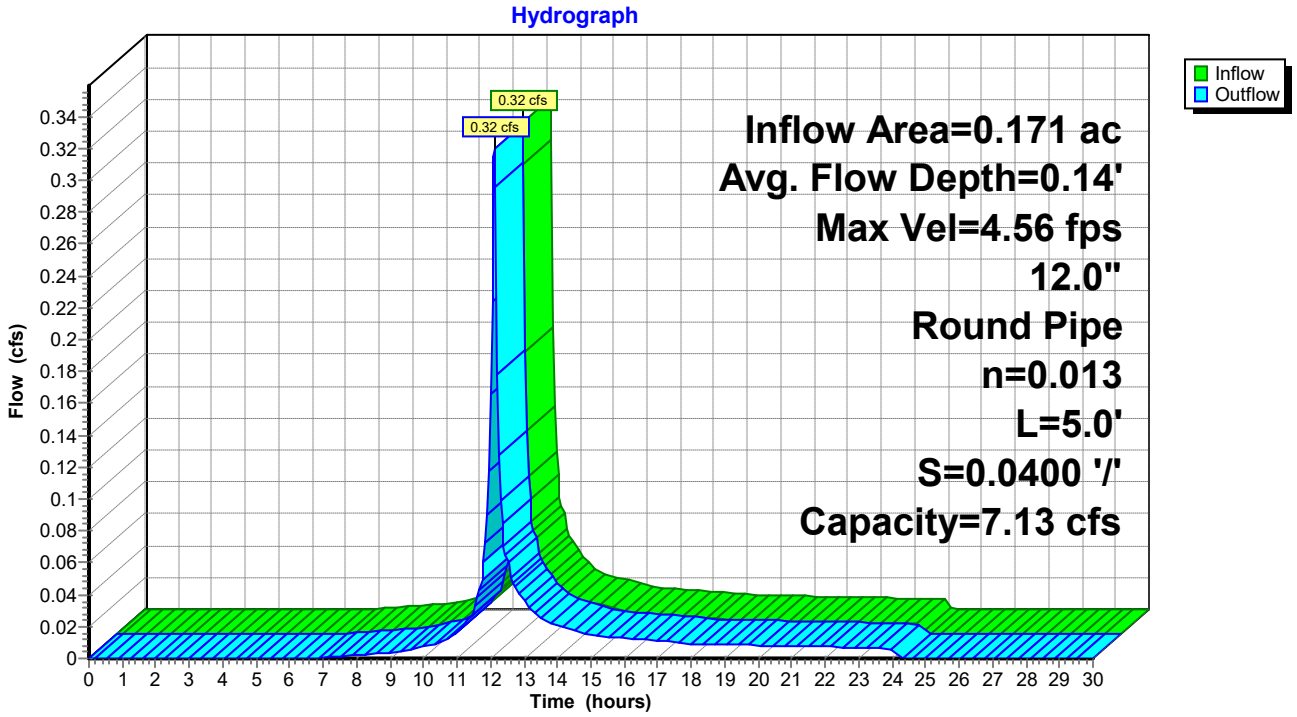
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 0.70'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 463.80', Outlet Invert= 463.60'



Reach DCB19: TO DMH#111



Summary for Reach DCB20: TO DMH#109

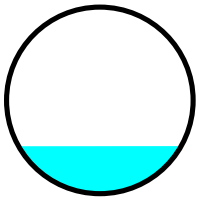
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.234 ac, 85.75% Impervious, Inflow Depth = 2.10" for 2-Year event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.041 af
Outflow = 0.53 cfs @ 12.12 hrs, Volume= 0.041 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH109 : TO DMH#110

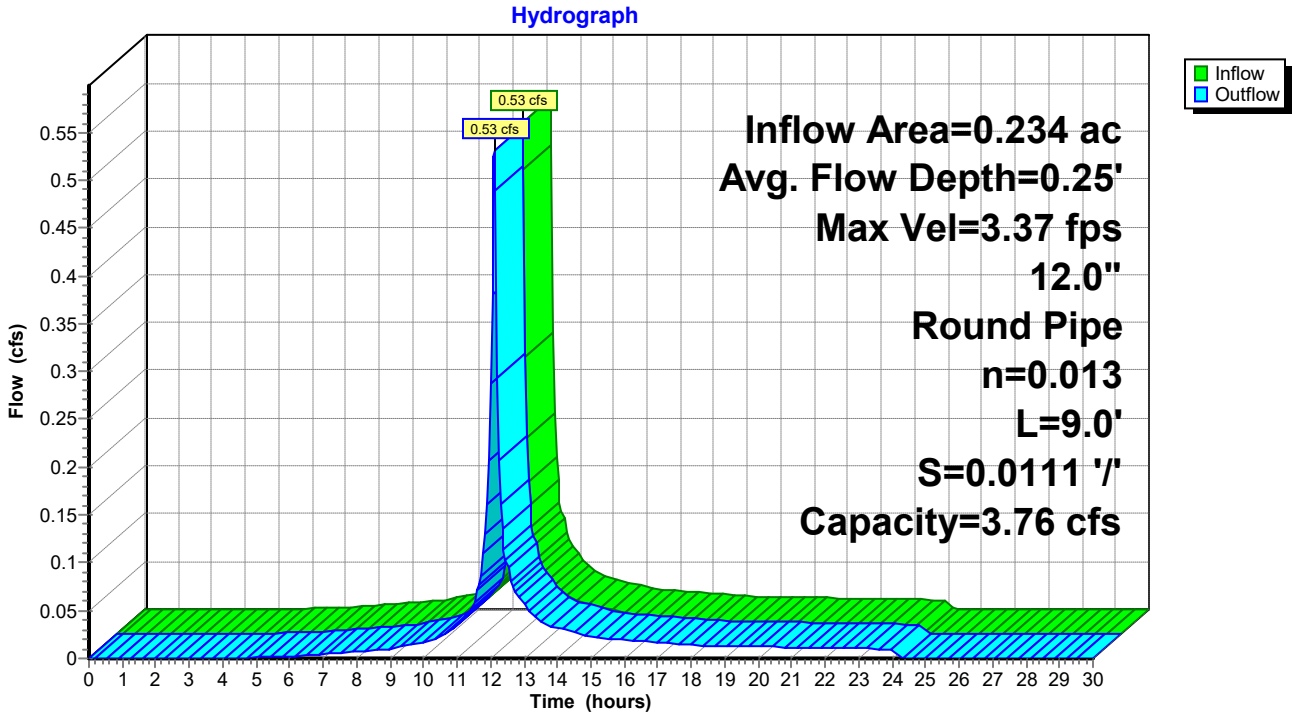
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.37 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 9.0' Slope= 0.0111 '/'
Inlet Invert= 466.50', Outlet Invert= 466.40'



Reach DCB20: TO DMH#109



Summary for Reach DCB21: TO DMH#109A

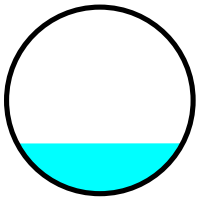
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.175 ac, 71.01% Impervious, Inflow Depth = 1.41" for 2-Year event
Inflow = 0.27 cfs @ 12.12 hrs, Volume= 0.021 af
Outflow = 0.27 cfs @ 12.12 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH109A : TO DMH109

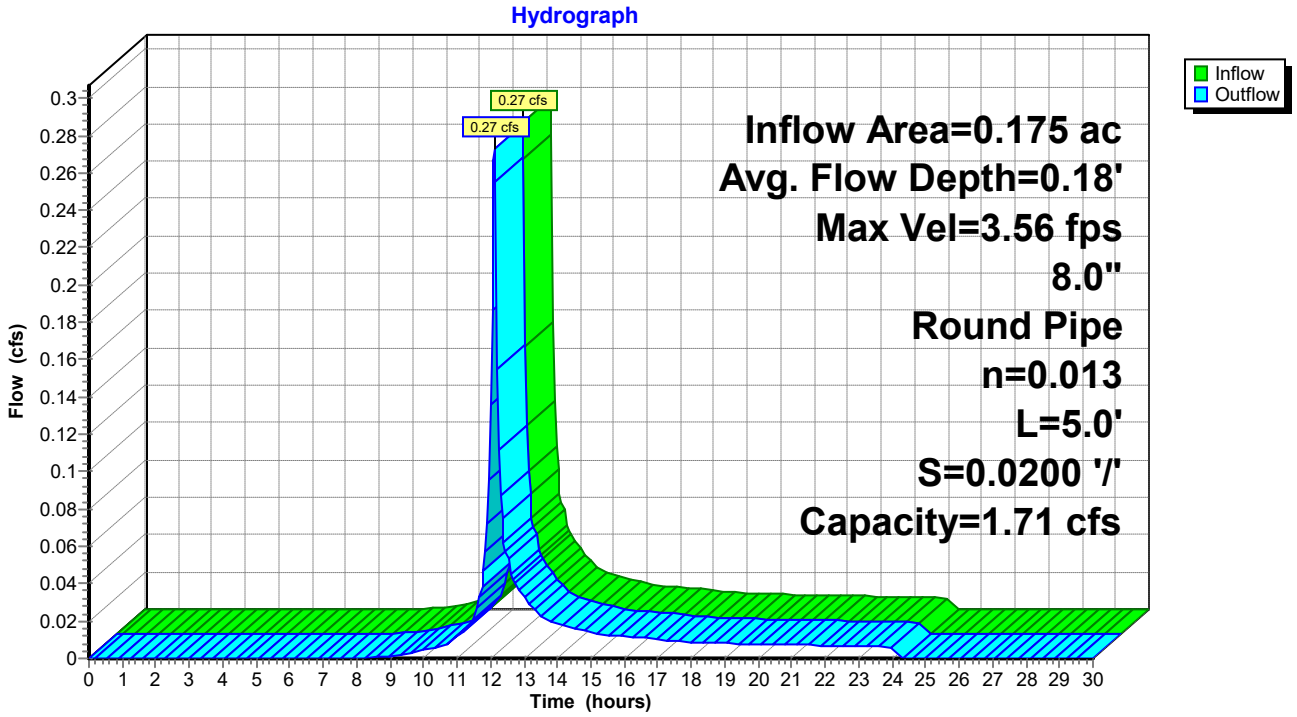
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.56 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 0.59'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.71 cfs

8.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 467.10', Outlet Invert= 467.00'



Reach DCB21: TO DMH#109A



Summary for Reach DCB22: TO DMH#111

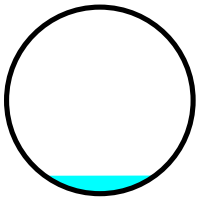
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.235 ac, 44.85% Impervious, Inflow Depth = 0.57" for 2-Year event
Inflow = 0.12 cfs @ 12.13 hrs, Volume= 0.011 af
Outflow = 0.12 cfs @ 12.14 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.2 min
Routed to Reach DMH111 : TO DMH#112

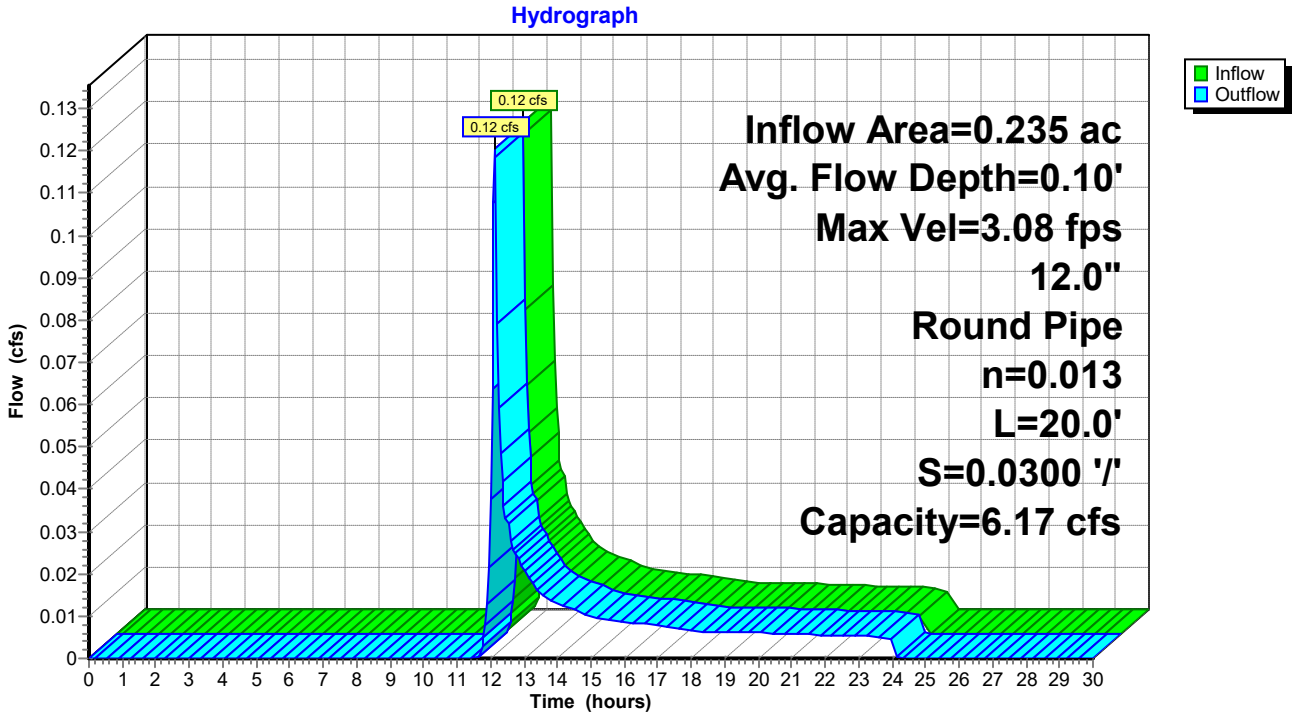
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.08 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 0.59'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.17 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 20.0' Slope= 0.0300 '/'
Inlet Invert= 464.20', Outlet Invert= 463.60'



Reach DCB22: TO DMH#111



Summary for Reach DCB23: TO DMH#111

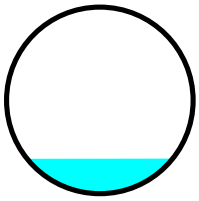
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.766 ac, 40.00% Impervious, Inflow Depth = 0.49" for 2-Year event
Inflow = 0.31 cfs @ 12.14 hrs, Volume= 0.031 af
Outflow = 0.28 cfs @ 12.18 hrs, Volume= 0.031 af, Atten= 10%, Lag= 2.5 min
Routed to Reach DMH111 : TO DMH#112

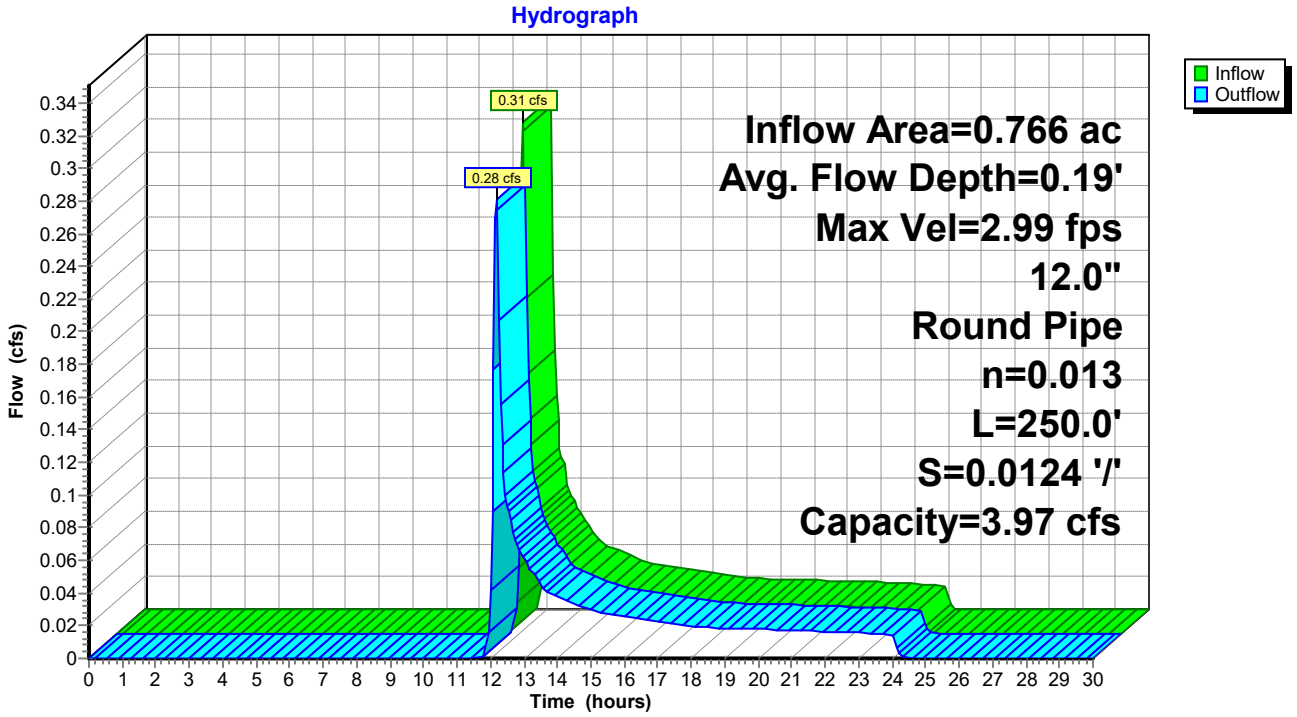
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.99 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 3.0 min

Peak Storage= 26 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 0.78'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.97 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 250.0' Slope= 0.0124 '/'
Inlet Invert= 466.70', Outlet Invert= 463.60'



Reach DCB23: TO DMH#111



Summary for Reach DCB24: TO DMH#113

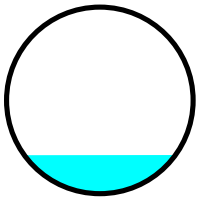
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.797 ac, 47.02% Impervious, Inflow Depth = 0.65" for 2-Year event
Inflow = 0.50 cfs @ 12.13 hrs, Volume= 0.043 af
Outflow = 0.50 cfs @ 12.13 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH113 : TO DMH#114

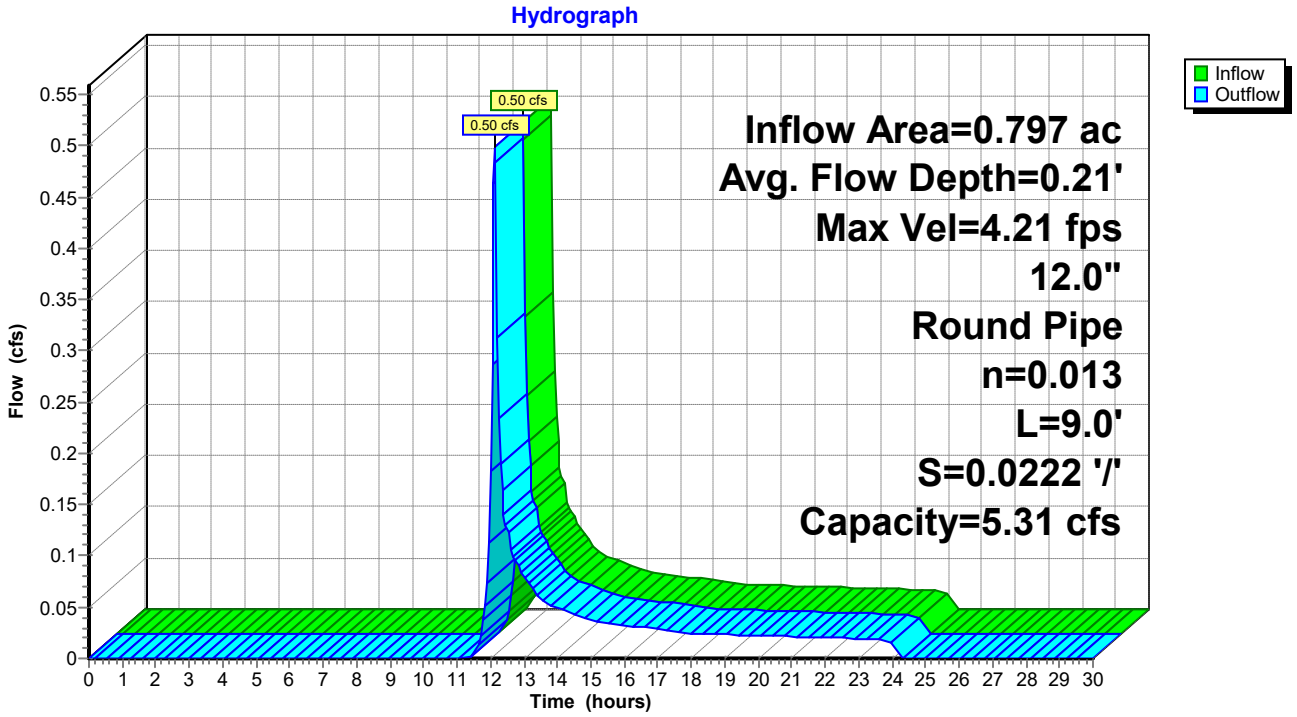
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.21 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.87 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.81'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.31 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 9.0' Slope= 0.0222 '/'
Inlet Invert= 460.50', Outlet Invert= 460.30'



Reach DCB24: TO DMH#113



Summary for Reach DCB25: TO DMH#109A

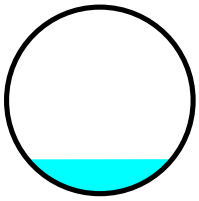
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.064 ac, 89.32% Impervious, Inflow Depth = 2.28" for 2-Year event
Inflow = 0.16 cfs @ 12.11 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.12 hrs, Volume= 0.012 af, Atten= 2%, Lag= 0.3 min
Routed to Reach DMH109A : TO DMH109

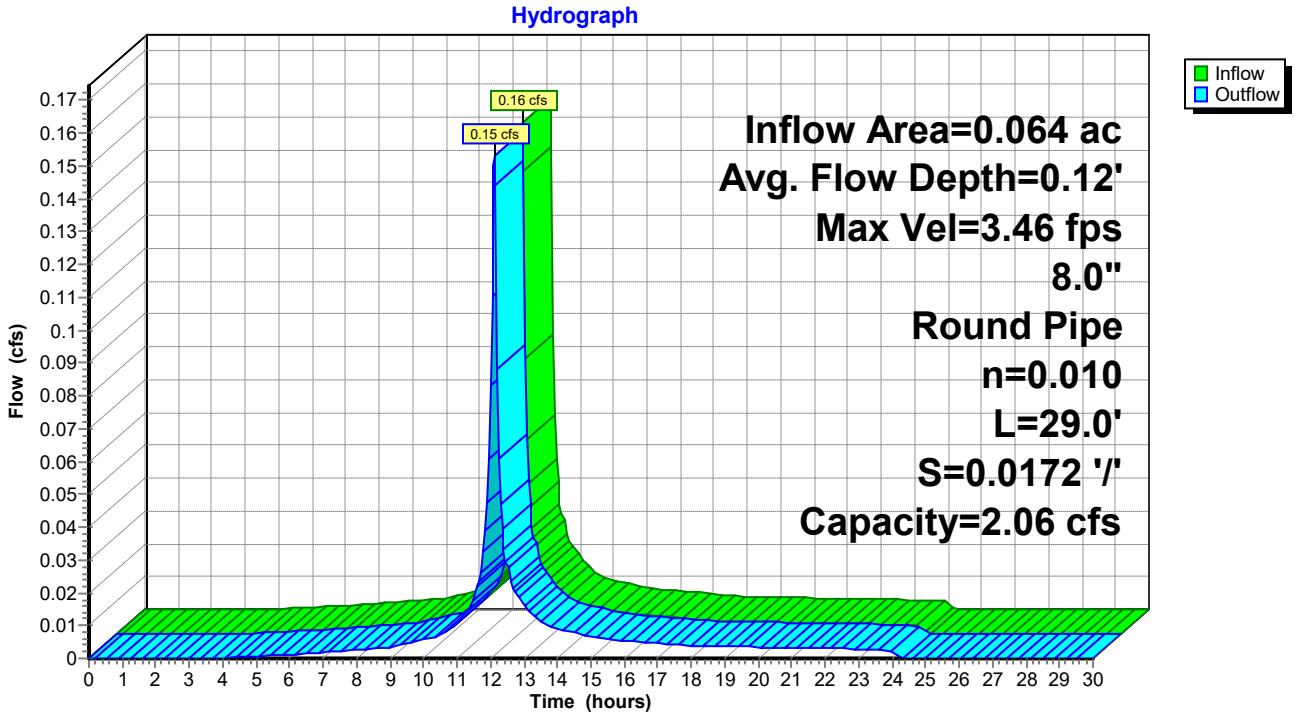
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 0.4 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 0.52'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.06 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 29.0' Slope= 0.0172 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Reach DCB25: TO DMH#109A



Summary for Reach DCB5: TO DMH#108

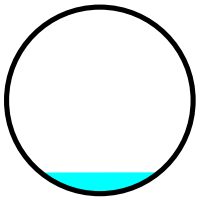
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.283 ac, 35.47% Impervious, Inflow Depth = 0.38" for 2-Year event
Inflow = 0.07 cfs @ 12.15 hrs, Volume= 0.009 af
Outflow = 0.07 cfs @ 12.15 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH108 : TO DMH#107

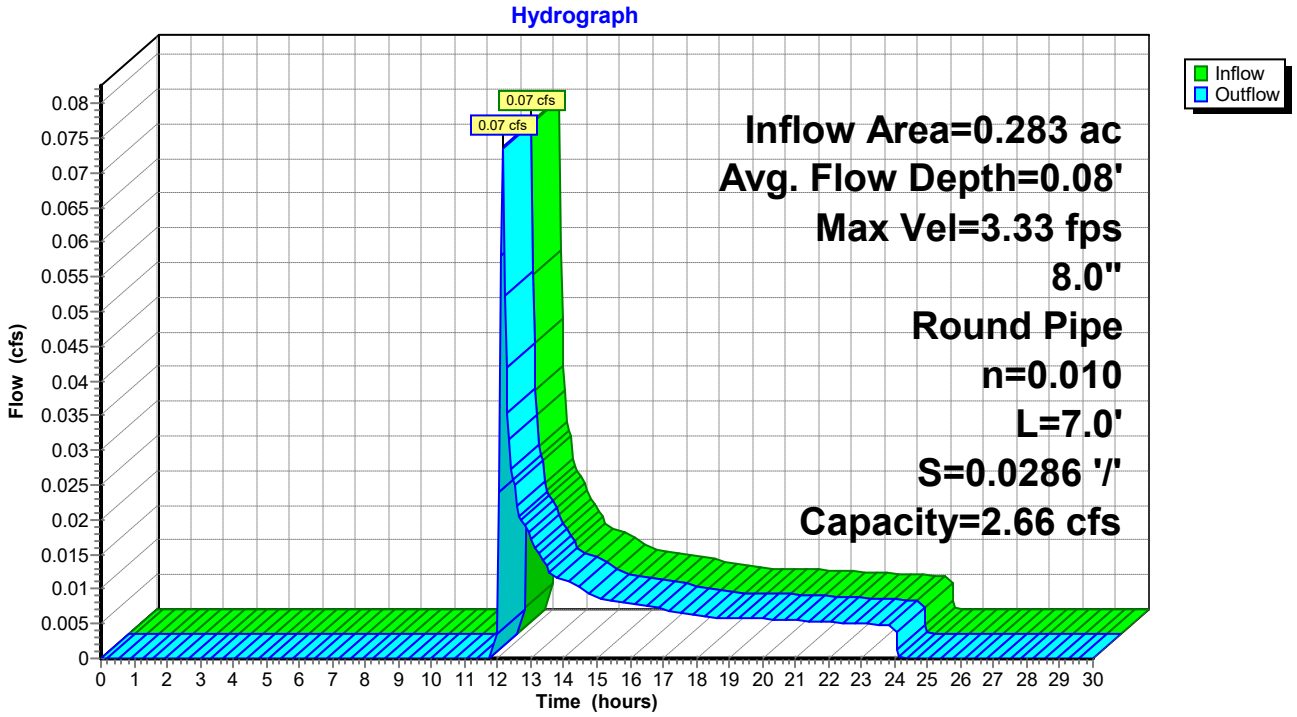
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.33 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.08' , Surface Width= 0.42'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.66 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 7.0' Slope= 0.0286 '/'
Inlet Invert= 468.20', Outlet Invert= 468.00'



Reach DCB5: TO DMH#108



Summary for Reach DCB6: TO DMH#107

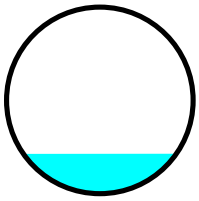
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.150 ac, 94.27% Impervious, Inflow Depth = 2.58" for 2-Year event
Inflow = 0.40 cfs @ 12.11 hrs, Volume= 0.032 af
Outflow = 0.39 cfs @ 12.12 hrs, Volume= 0.032 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH107 : TO DMH#100

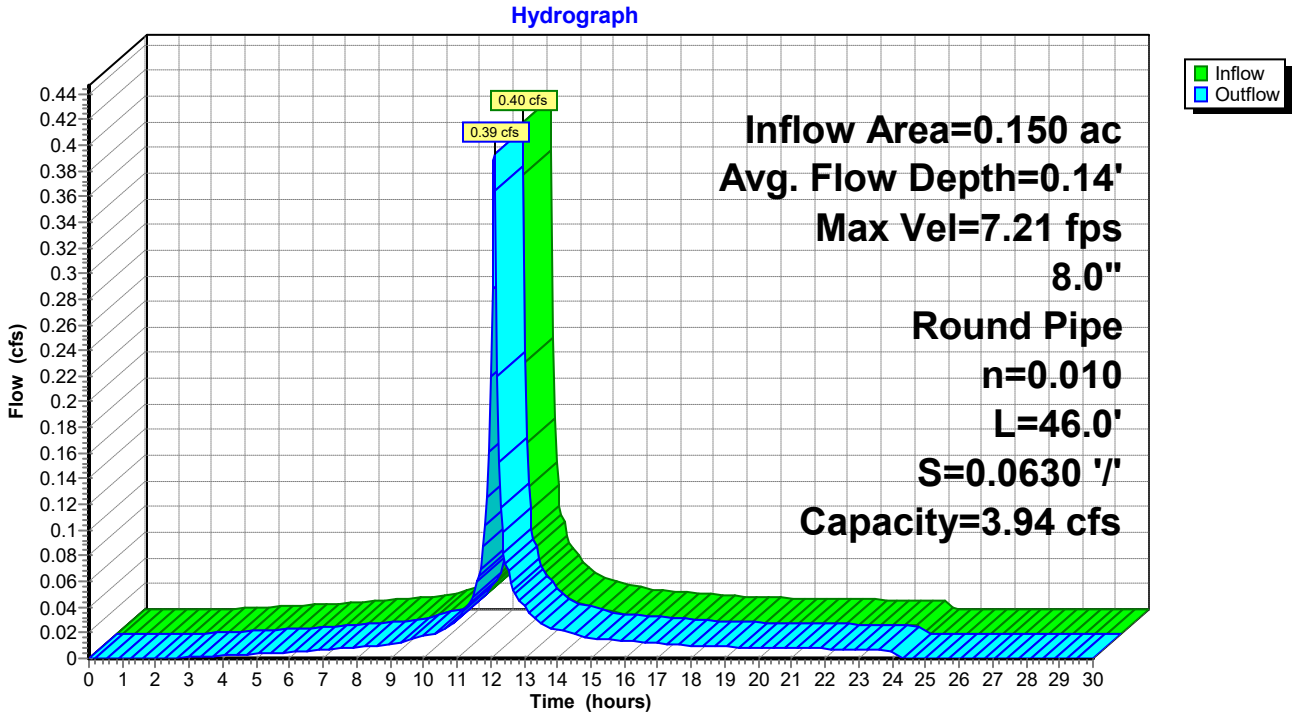
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 0.3 min

Peak Storage= 3 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 0.55'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.94 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 46.0' Slope= 0.0630 '/'
Inlet Invert= 469.80', Outlet Invert= 466.90'



Reach DCB6: TO DMH#107



Summary for Reach DCB7: TO DMH#102

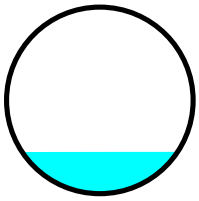
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.332 ac, 83.32% Impervious, Inflow Depth = 1.93" for 2-Year event
Inflow = 0.70 cfs @ 12.11 hrs, Volume= 0.053 af
Outflow = 0.69 cfs @ 12.12 hrs, Volume= 0.053 af, Atten= 2%, Lag= 0.4 min
Routed to Reach DMH102 : TO UGS#1A

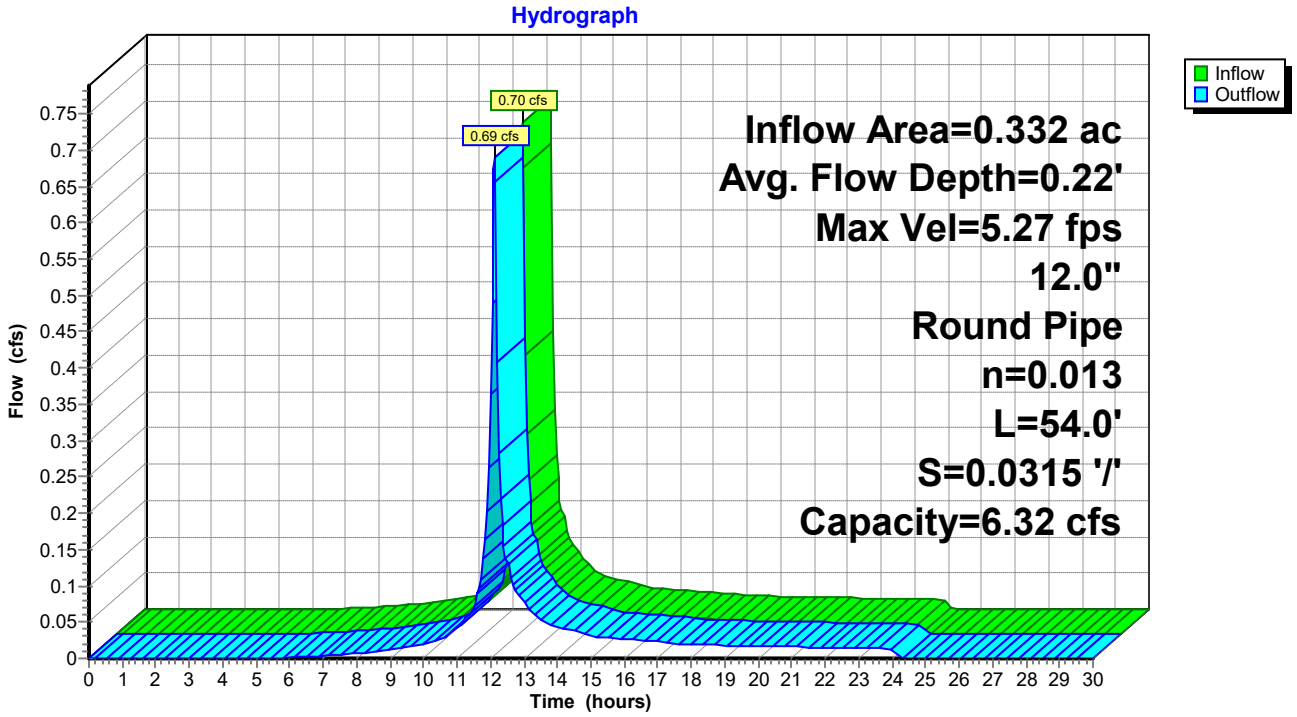
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.27 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.87 fps, Avg. Travel Time= 0.5 min

Peak Storage= 7 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 0.83'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.32 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 54.0' Slope= 0.0315 '/'
Inlet Invert= 468.40', Outlet Invert= 466.70'



Reach DCB7: TO DMH#102



Summary for Reach DCB8: TO DMH#103

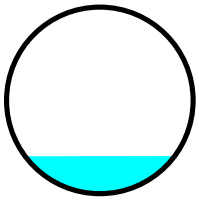
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.175 ac, 76.33% Impervious, Inflow Depth = 1.62" for 2-Year event
Inflow = 0.31 cfs @ 12.12 hrs, Volume= 0.024 af
Outflow = 0.31 cfs @ 12.12 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH104 : TO DMH#104

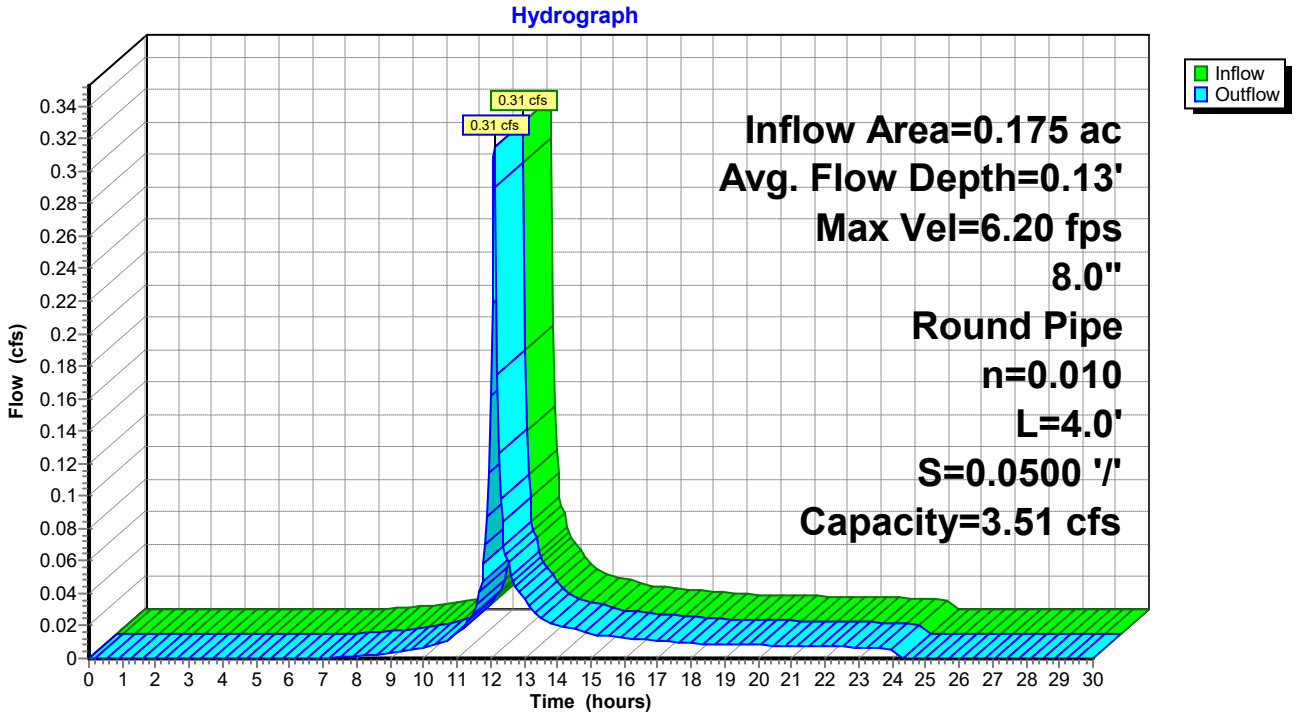
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.20 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 0.54'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.51 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 4.0' Slope= 0.0500 '/'
Inlet Invert= 470.00', Outlet Invert= 469.80'



Reach DCB8: TO DMH#103



Summary for Reach DCB9: TO DMH#103

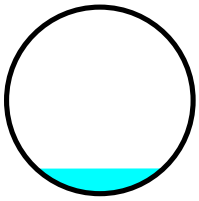
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.225 ac, 39.59% Impervious, Inflow Depth = 0.45" for 2-Year event
Inflow = 0.08 cfs @ 12.14 hrs, Volume= 0.008 af
Outflow = 0.08 cfs @ 12.14 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH104 : TO DMH#104

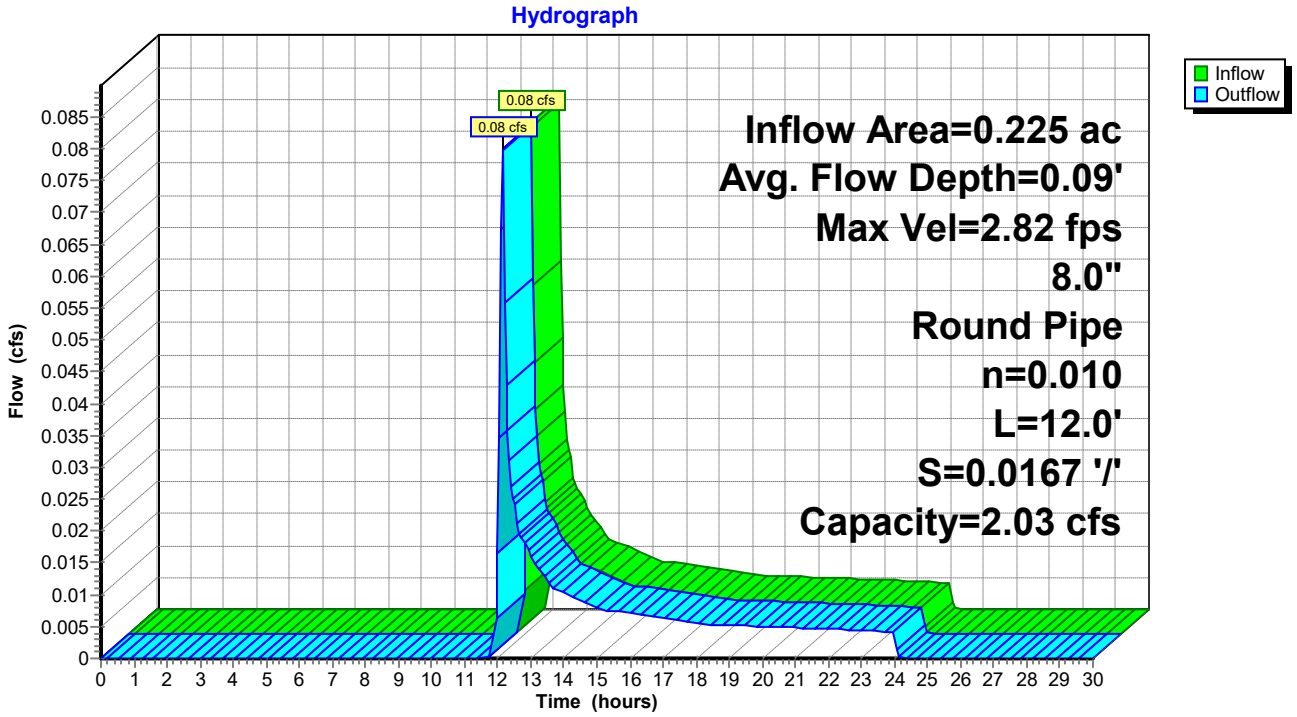
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.82 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 0.46'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.03 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 12.0' Slope= 0.0167 '/'
Inlet Invert= 470.00', Outlet Invert= 469.80'



Reach DCB9: TO DMH#103



Summary for Reach DMH-A*: TO DMH-B

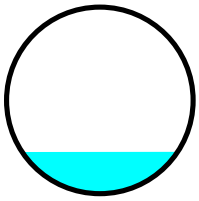
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH100 outlet invert by 0.34' @ 12.15 hrs

Inflow Area = 1.825 ac, 82.07% Impervious, Inflow Depth = 2.09" for 2-Year event
Inflow = 3.67 cfs @ 12.12 hrs, Volume= 0.318 af
Outflow = 3.61 cfs @ 12.14 hrs, Volume= 0.318 af, Atten= 2%, Lag= 1.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

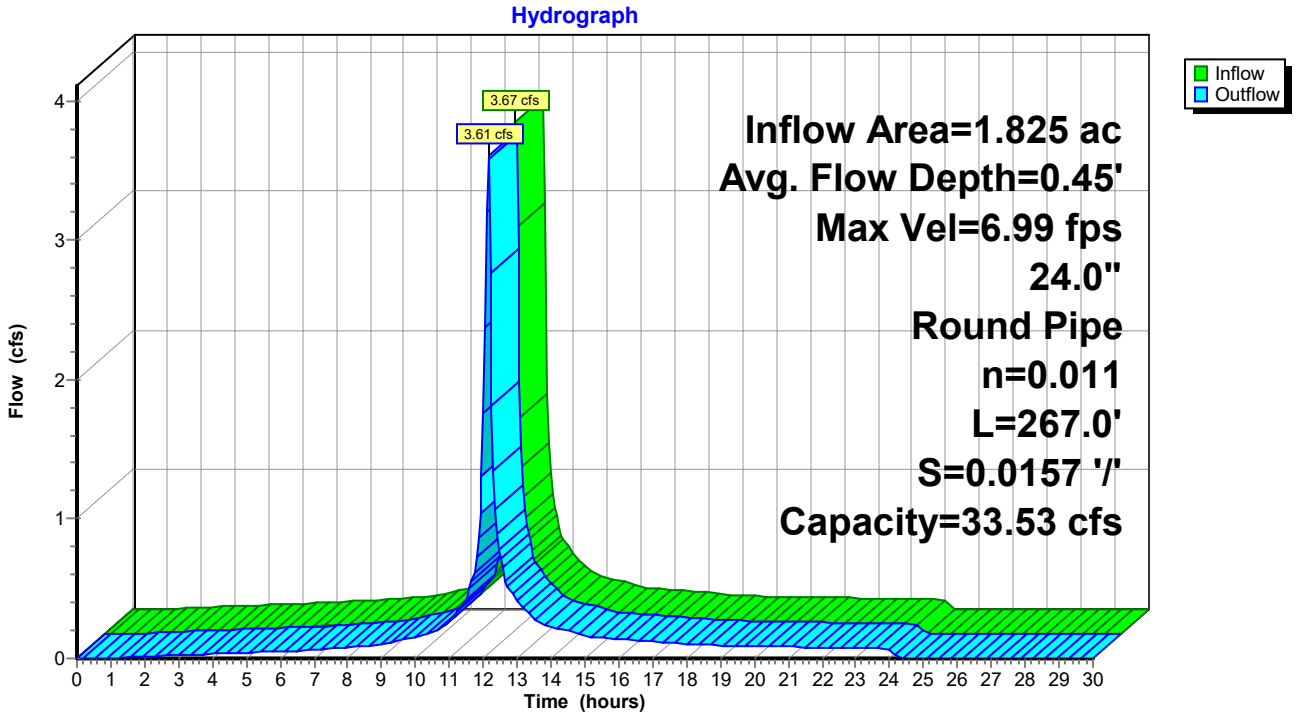
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.99 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 1.9 min

Peak Storage= 141 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 1.67'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 33.53 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 267.0' Slope= 0.0157 '/'
Inlet Invert= 463.70', Outlet Invert= 459.50'



Reach DMH-A*: TO DMH-B



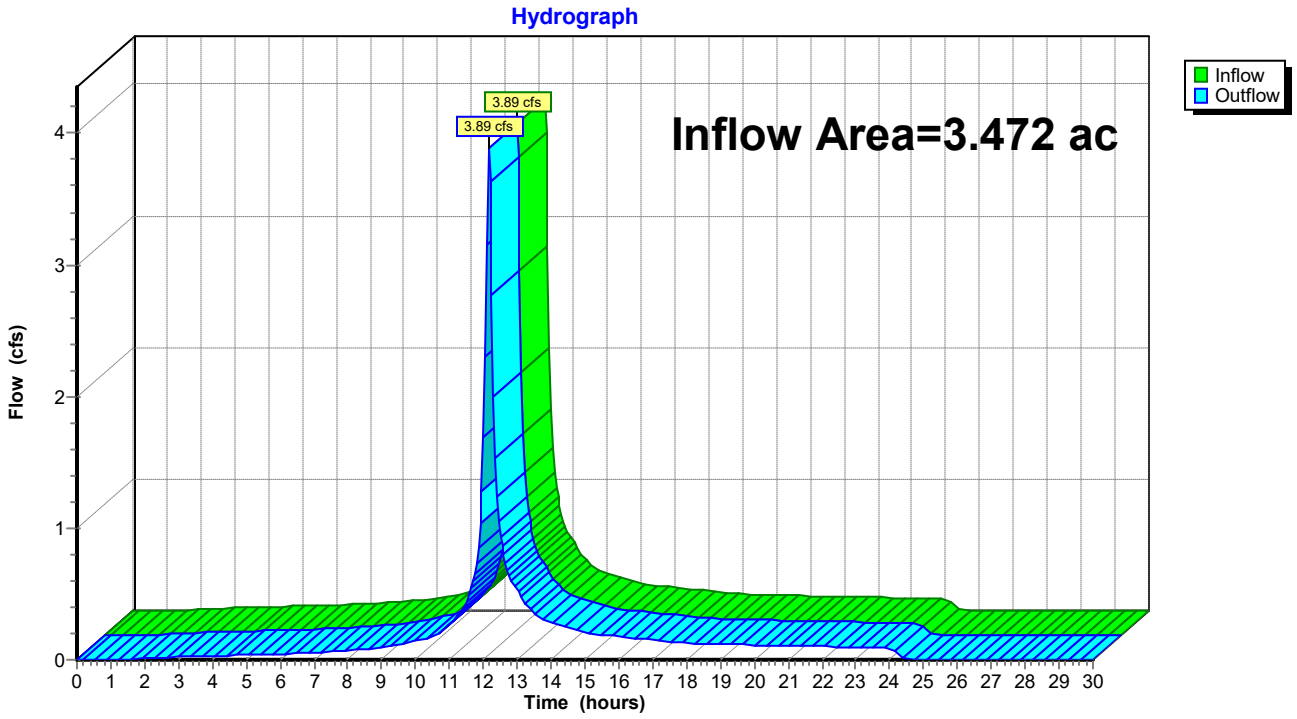
Summary for Reach DMH-C: TO DP#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.472 ac, 77.40% Impervious, Inflow Depth = 1.27" for 2-Year event
Inflow = 3.89 cfs @ 12.16 hrs, Volume= 0.366 af
Outflow = 3.89 cfs @ 12.16 hrs, Volume= 0.366 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

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

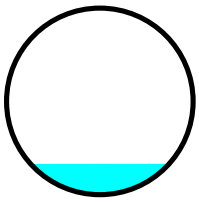
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH-E OUTLET depth by 0.01' @ 12.25 hrs
[79] Warning: Submerged Pond DMH-B Primary device # 1 OUTLET by 0.50'

Inflow Area = 3.472 ac, 77.40% Impervious, Inflow Depth = 1.27" for 2-Year event
Inflow = 3.95 cfs @ 12.15 hrs, Volume= 0.366 af
Outflow = 3.89 cfs @ 12.16 hrs, Volume= 0.366 af, Atten= 2%, Lag= 0.5 min
Routed to Reach DMH-C : TO DP#1

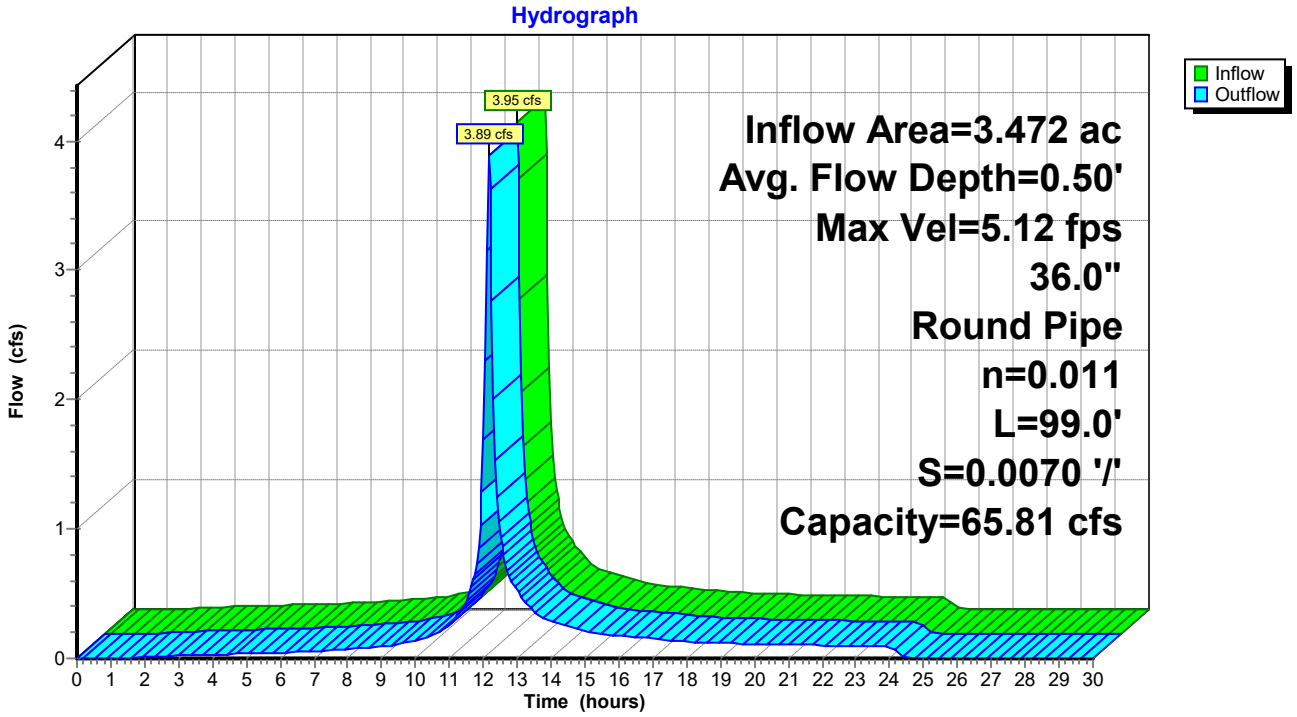
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.12 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 0.9 min

Peak Storage= 76 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.50' , Surface Width= 2.23'
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

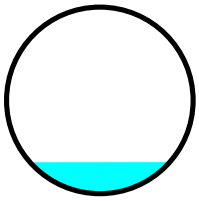
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach CMH3 OUTLET depth by 0.06' @ 12.25 hrs

Inflow Area = 3.330 ac, 76.67% Impervious, Inflow Depth = 1.21" for 2-Year event
Inflow = 3.72 cfs @ 12.15 hrs, Volume= 0.336 af
Outflow = 3.63 cfs @ 12.16 hrs, Volume= 0.336 af, Atten= 2%, Lag= 0.6 min
Routed to Reach DMH-D : TO DMH-C

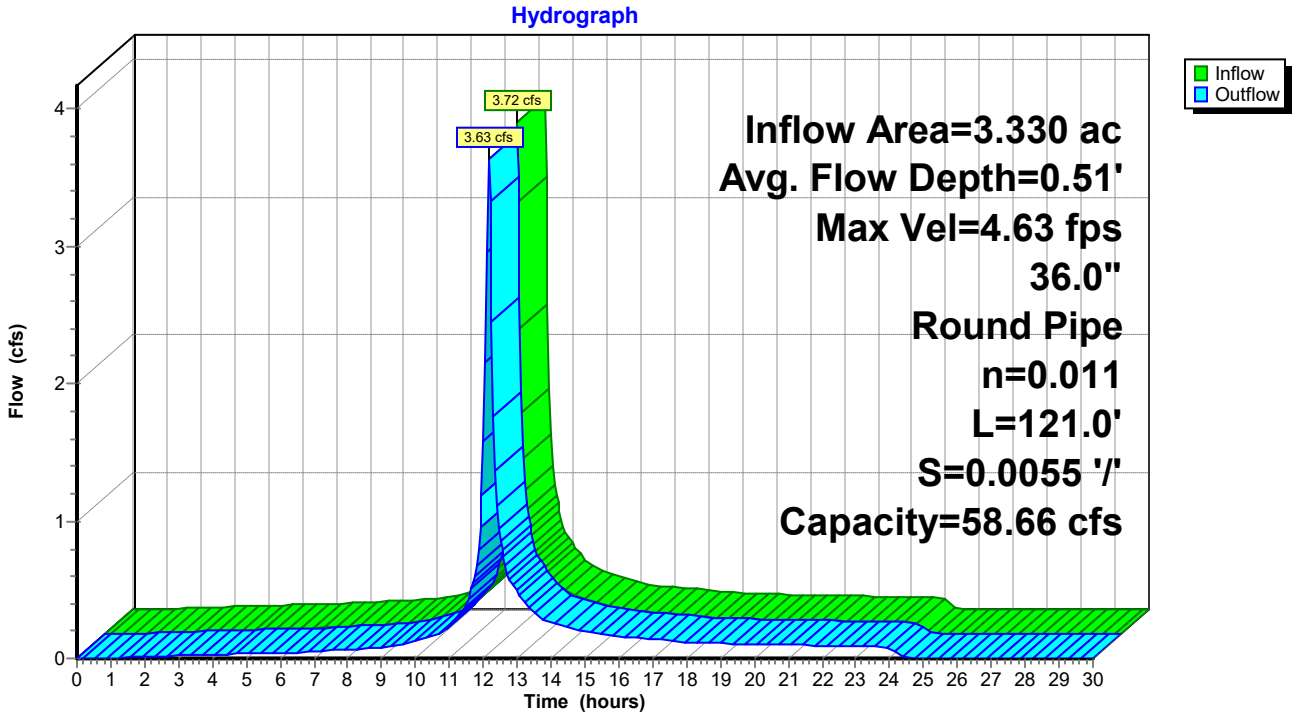
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.63 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 1.3 min

Peak Storage= 97 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.51' , Surface Width= 2.26'
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

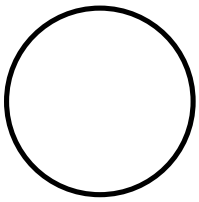


Summary for Reach DMH-F: TO DMH-E

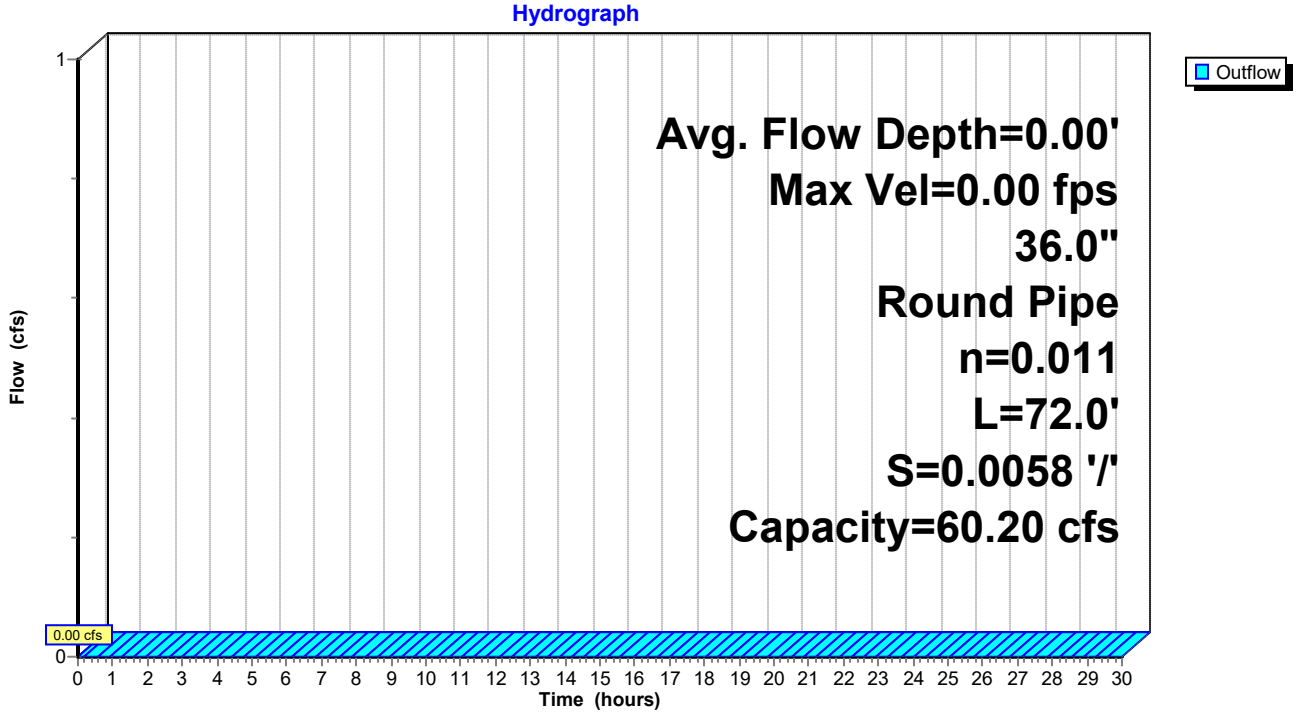
[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.20 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 72.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 457.71'



Reach DMH-F: TO DMH-E



Summary for Reach DMH100: TO DMH-A

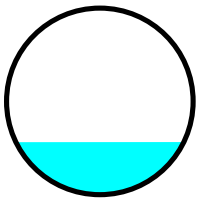
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH101 outlet invert by 0.32' @ 12.10 hrs
[62] Hint: Exceeded Reach DMH107 OUTLET depth by 0.04' @ 12.10 hrs

Inflow Area = 1.400 ac, 85.41% Impervious, Inflow Depth = 2.29" for 2-Year event
Inflow = 3.05 cfs @ 12.12 hrs, Volume= 0.267 af
Outflow = 3.05 cfs @ 12.13 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.4 min
Routed to Reach DMH-A* : TO DMH-B

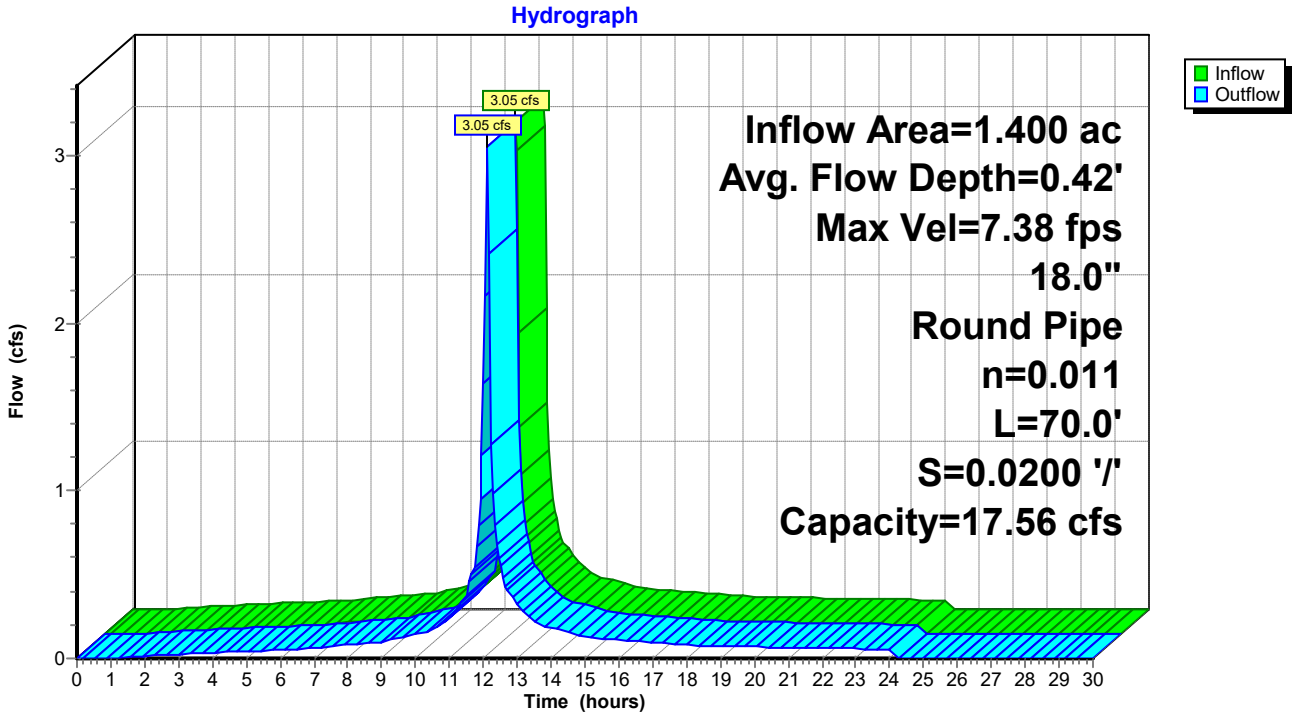
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.38 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.60 fps, Avg. Travel Time= 0.4 min

Peak Storage= 29 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 1.35'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 17.56 cfs

18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 70.0' Slope= 0.0200 '/'
Inlet Invert= 465.20', Outlet Invert= 463.80'



Reach DMH100: TO DMH-A



Summary for Reach DMH101: TO DMH#100

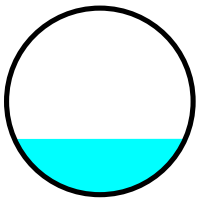
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach RF1 outlet invert by 0.07' @ 12.10 hrs
[61] Hint: Exceeded Reach RF2 outlet invert by 0.07' @ 12.10 hrs

Inflow Area = 0.759 ac,100.00% Impervious, Inflow Depth = 2.90" for 2-Year event
Inflow = 2.11 cfs @ 12.11 hrs, Volume= 0.183 af
Outflow = 2.11 cfs @ 12.11 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH100 : TO DMH-A

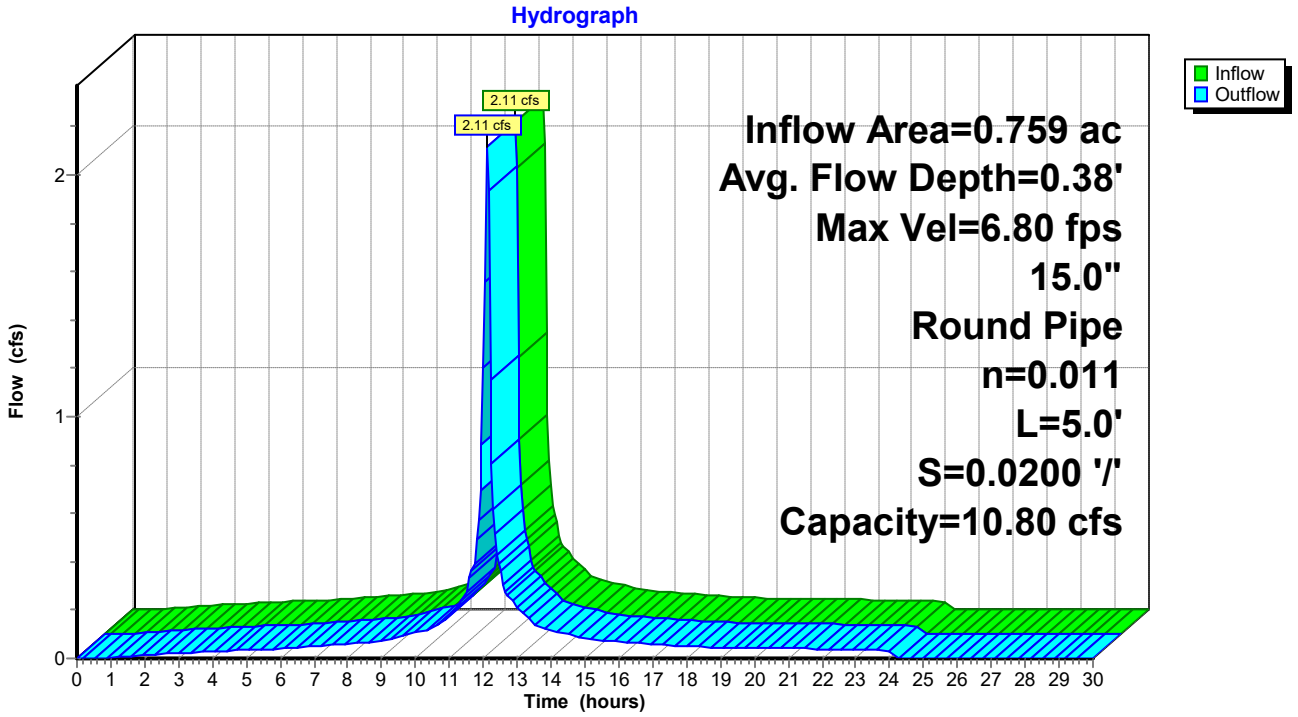
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.80 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.38' , Surface Width= 1.15'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 10.80 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 465.40', Outlet Invert= 465.30'



Reach DMH101: TO DMH#100



Summary for Reach DMH102: TO UGS#1A

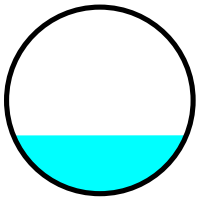
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB15 outlet invert by 0.19' @ 12.10 hrs

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 1.89" for 2-Year event
Inflow = 1.94 cfs @ 12.12 hrs, Volume= 0.154 af
Outflow = 1.93 cfs @ 12.12 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min
Routed to Reach UGS1A : TO UGS#1

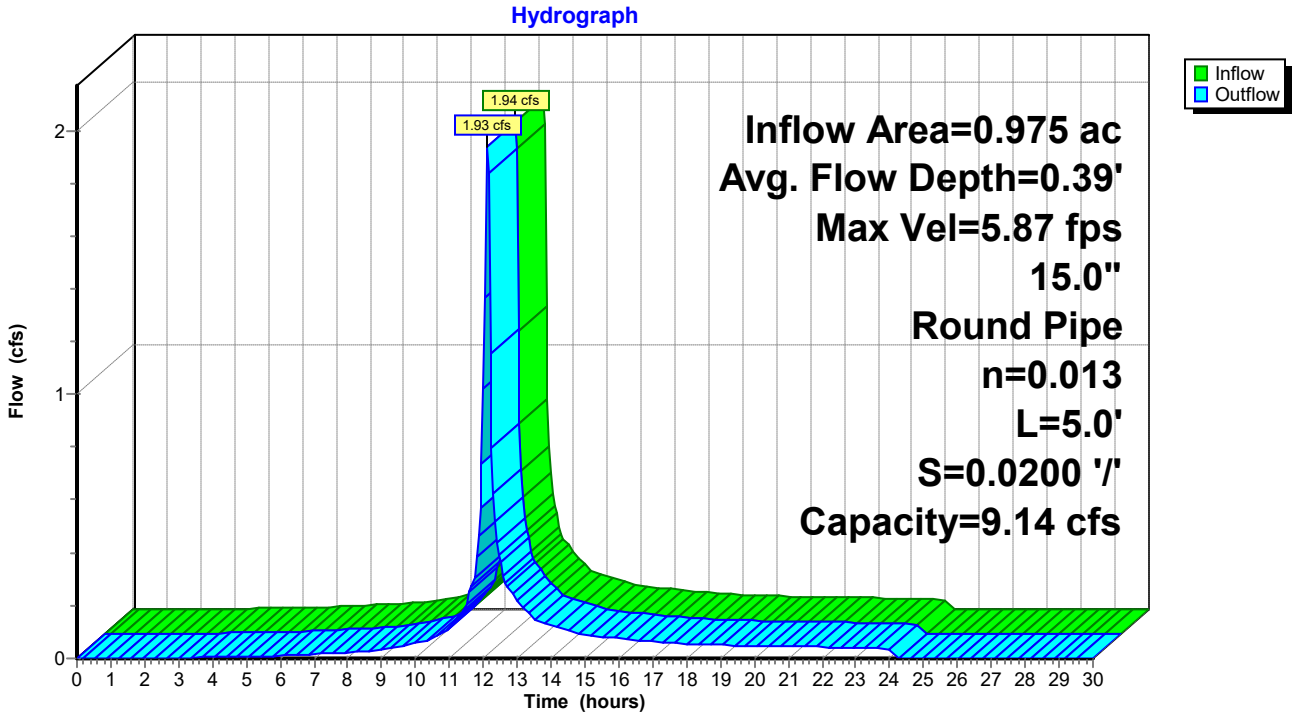
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.87 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 1.16'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.14 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 466.10', Outlet Invert= 466.00'



Reach DMH102: TO UGS#1A



Summary for Reach DMH103: TO CMH#2

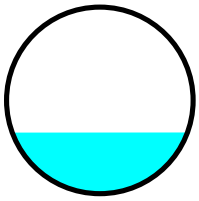
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH104 OUTLET depth by 0.18' @ 12.15 hrs

Inflow Area = 3.013 ac, 76.57% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 3.33 cfs @ 12.12 hrs, Volume= 0.291 af
Outflow = 3.31 cfs @ 12.14 hrs, Volume= 0.291 af, Atten= 1%, Lag= 0.7 min
Routed to Reach CMH3 : TO DMH-E

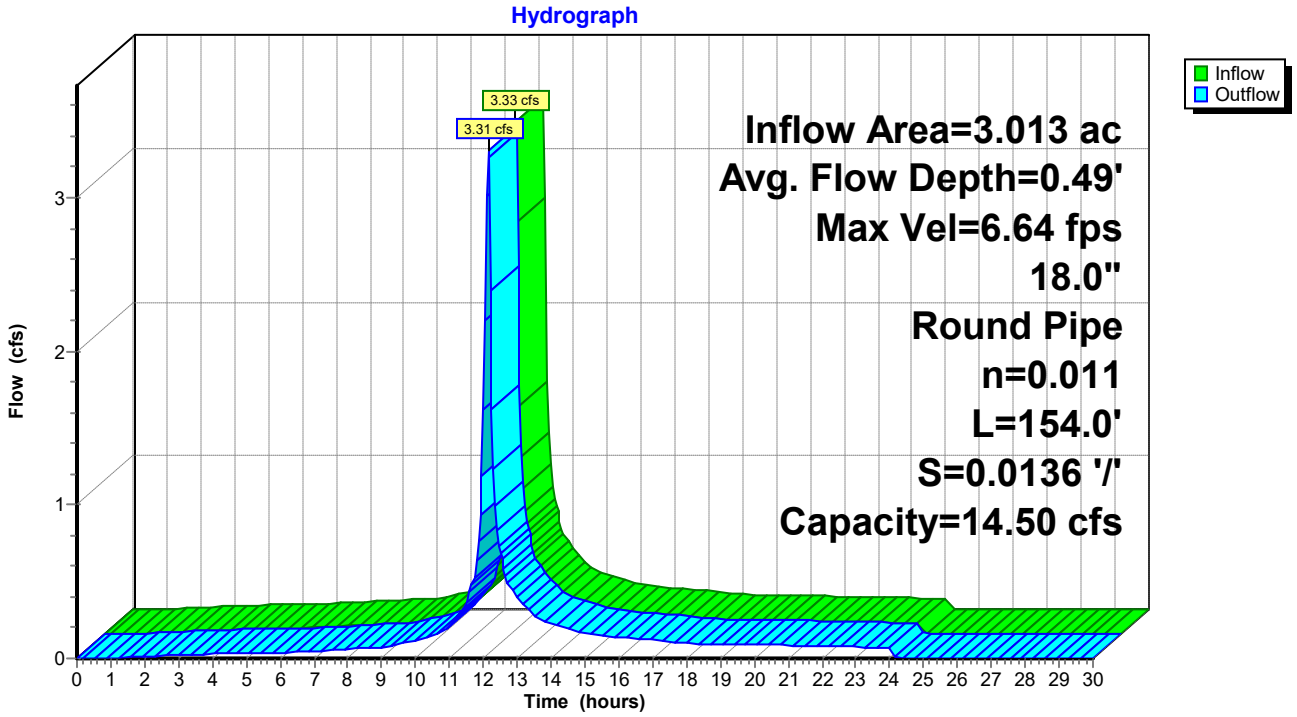
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.64 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.30 fps, Avg. Travel Time= 1.1 min

Peak Storage= 78 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.49' , Surface Width= 1.41'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.50 cfs

18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 154.0' Slope= 0.0136 '/'
Inlet Invert= 464.10', Outlet Invert= 462.00'



Reach DMH103: TO CMH#2



Summary for Reach DMH104: TO DMH#104

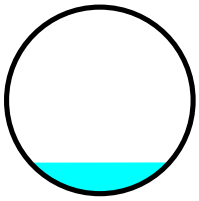
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH105 OUTLET depth by 0.01' @ 12.15 hrs

Inflow Area = 1.535 ac, 70.86% Impervious, Inflow Depth = 0.32" for 2-Year event
Inflow = 0.47 cfs @ 12.13 hrs, Volume= 0.041 af
Outflow = 0.45 cfs @ 12.15 hrs, Volume= 0.041 af, Atten= 2%, Lag= 1.0 min
Routed to Reach DMH103 : TO CMH#2

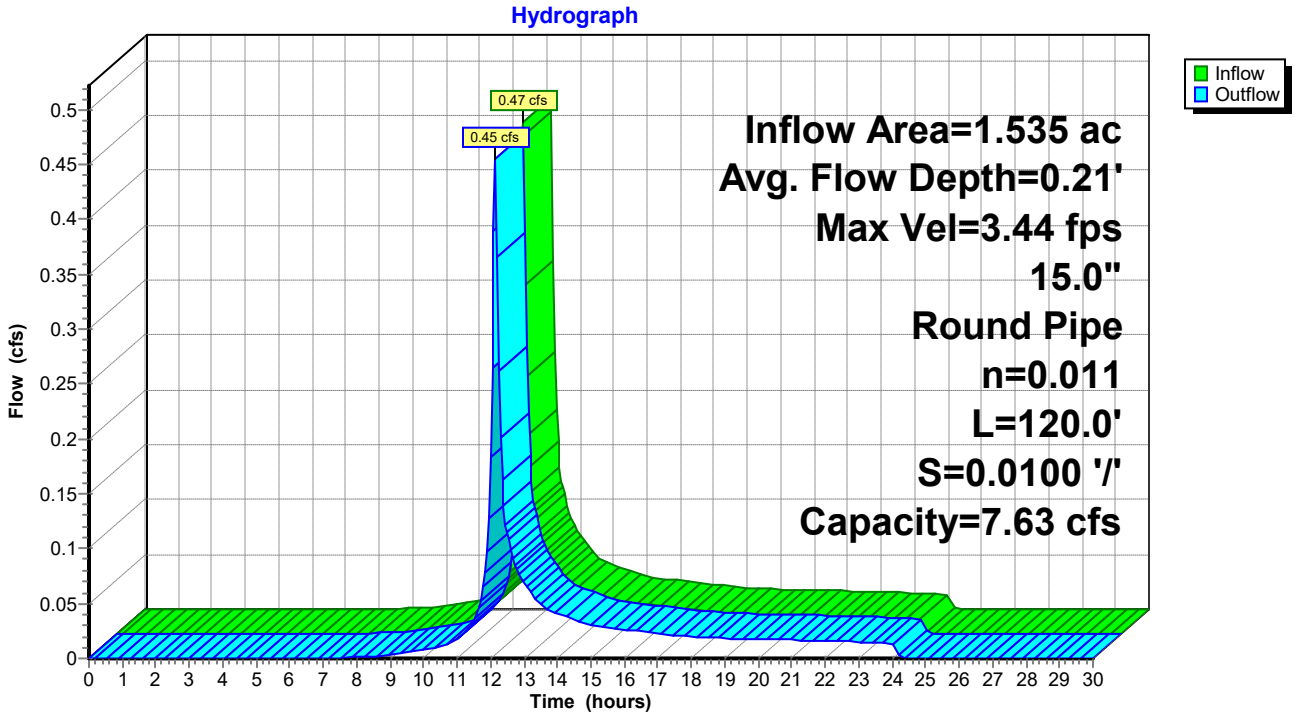
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.44 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 1.5 min

Peak Storage= 16 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.93'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.63 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 120.0' Slope= 0.0100 '/'
Inlet Invert= 465.40', Outlet Invert= 464.20'



Reach DMH104: TO DMH#104



Summary for Reach DMH105: TO DMH#104

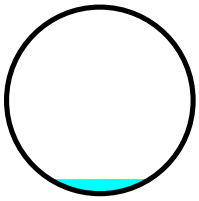
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.135 ac, 76.23% Impervious, Inflow Depth = 0.10" for 2-Year event
Inflow = 0.10 cfs @ 12.14 hrs, Volume= 0.009 af
Outflow = 0.09 cfs @ 12.18 hrs, Volume= 0.009 af, Atten= 9%, Lag= 2.5 min
Routed to Reach DMH104 : TO DMH#104

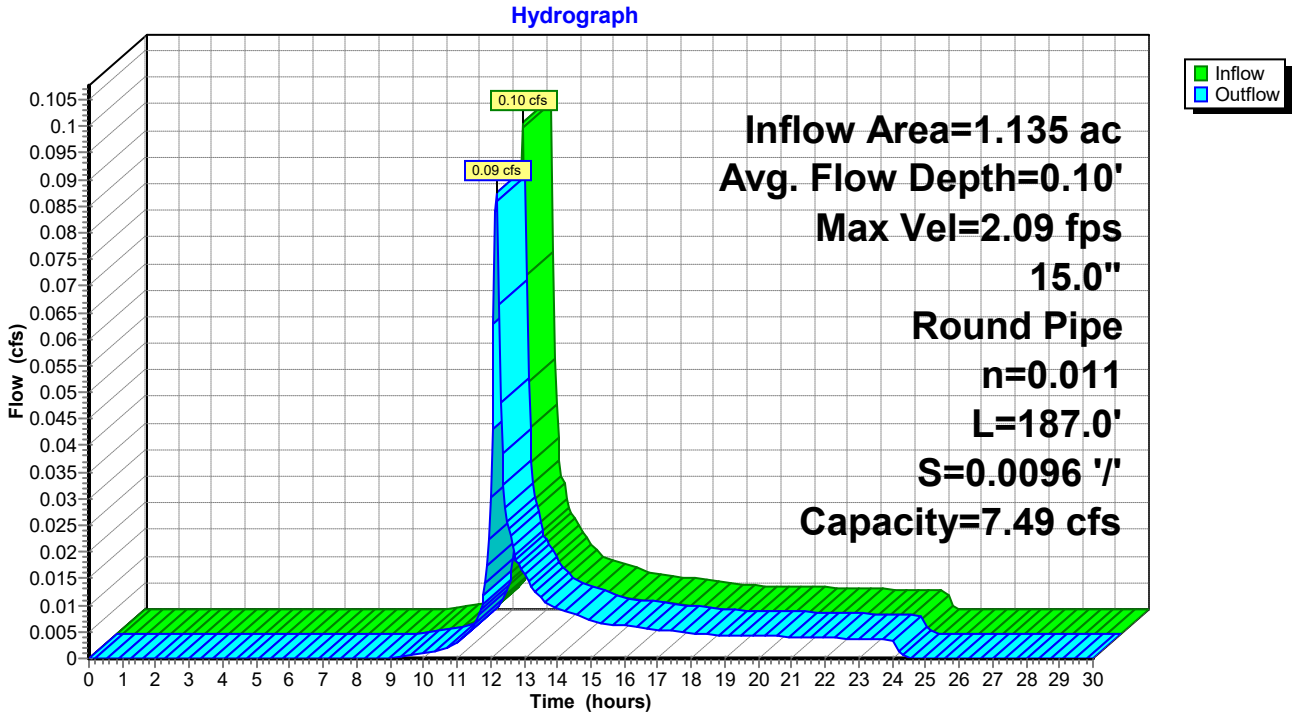
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.09 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 3.5 min

Peak Storage= 8 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 0.67'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.49 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 187.0' Slope= 0.0096 '/'
Inlet Invert= 467.30', Outlet Invert= 465.50'



Reach DMH105: TO DMH#104



Summary for Reach DMH106: TO DMH#105

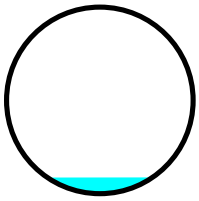
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.160 ac, 44.63% Impervious, Inflow Depth = 0.67" for 2-Year event
Inflow = 0.10 cfs @ 12.13 hrs, Volume= 0.009 af
Outflow = 0.10 cfs @ 12.14 hrs, Volume= 0.009 af, Atten= 1%, Lag= 0.6 min
Routed to Reach DMH105 : TO DMH#104

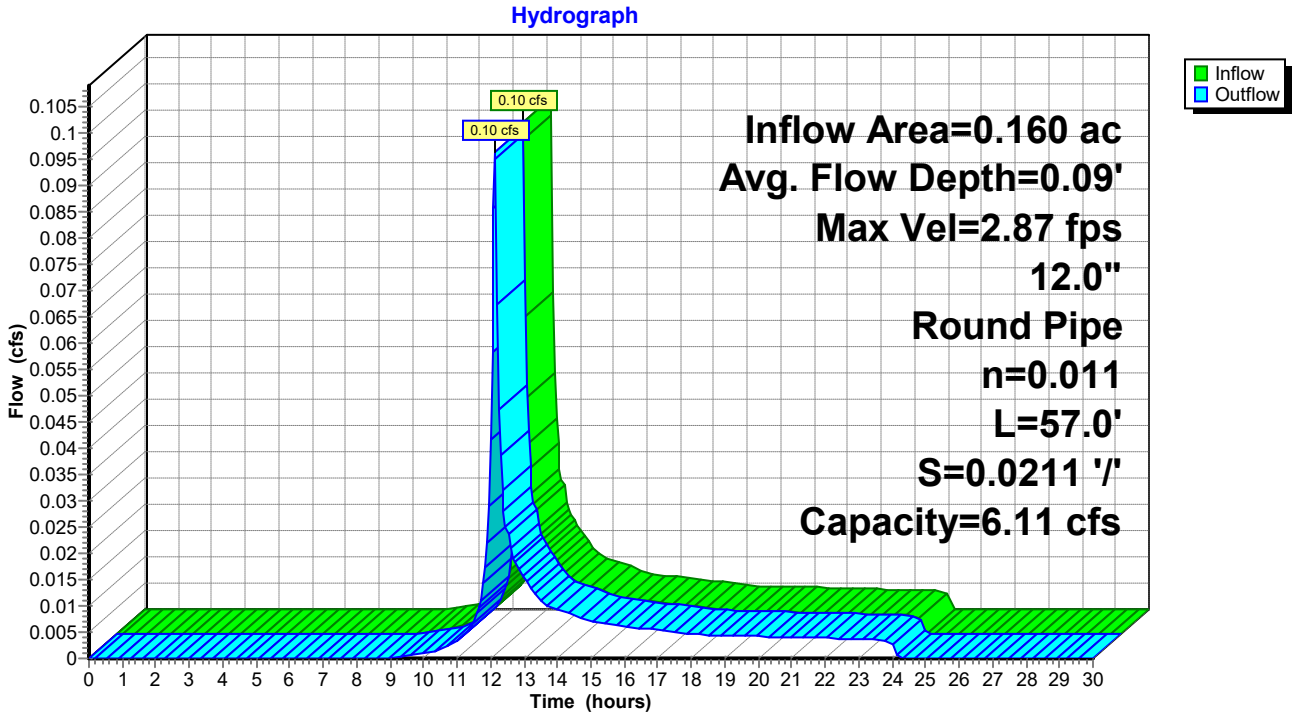
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.87 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 0.8 min

Peak Storage= 2 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 0.57'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.11 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 57.0' Slope= 0.0211 '/'
Inlet Invert= 470.00', Outlet Invert= 468.80'



Reach DMH106: TO DMH#105



Summary for Reach DMH107: TO DMH#100

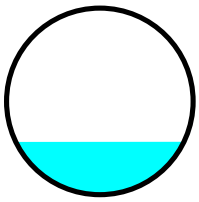
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB6 outlet invert by 0.08' @ 12.15 hrs
[61] Hint: Exceeded Reach DMH108 outlet invert by 0.08' @ 12.15 hrs

Inflow Area = 0.641 ac, 68.12% Impervious, Inflow Depth = 1.58" for 2-Year event
Inflow = 0.98 cfs @ 12.12 hrs, Volume= 0.084 af
Outflow = 0.98 cfs @ 12.13 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.5 min
Routed to Reach DMH100 : TO DMH-A

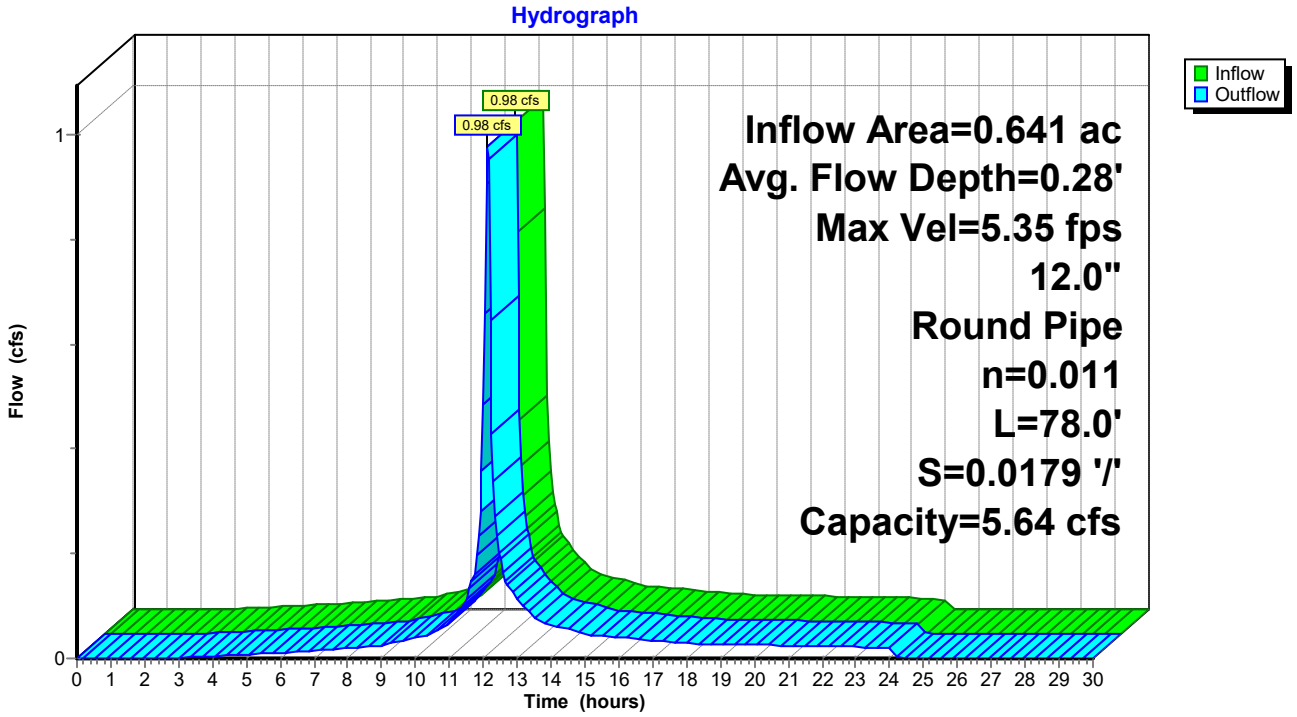
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.35 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 0.7 min

Peak Storage= 14 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 0.90'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.64 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 78.0' Slope= 0.0179 '/'
Inlet Invert= 466.70', Outlet Invert= 465.30'



Reach DMH107: TO DMH#100



Summary for Reach DMH108: TO DMH#107

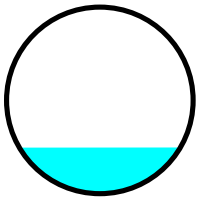
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB12 outlet invert by 0.14' @ 12.15 hrs

Inflow Area = 0.491 ac, 60.11% Impervious, Inflow Depth = 1.27" for 2-Year event
Inflow = 0.60 cfs @ 12.12 hrs, Volume= 0.052 af
Outflow = 0.60 cfs @ 12.13 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.4 min
Routed to Reach DMH107 : TO DMH#100

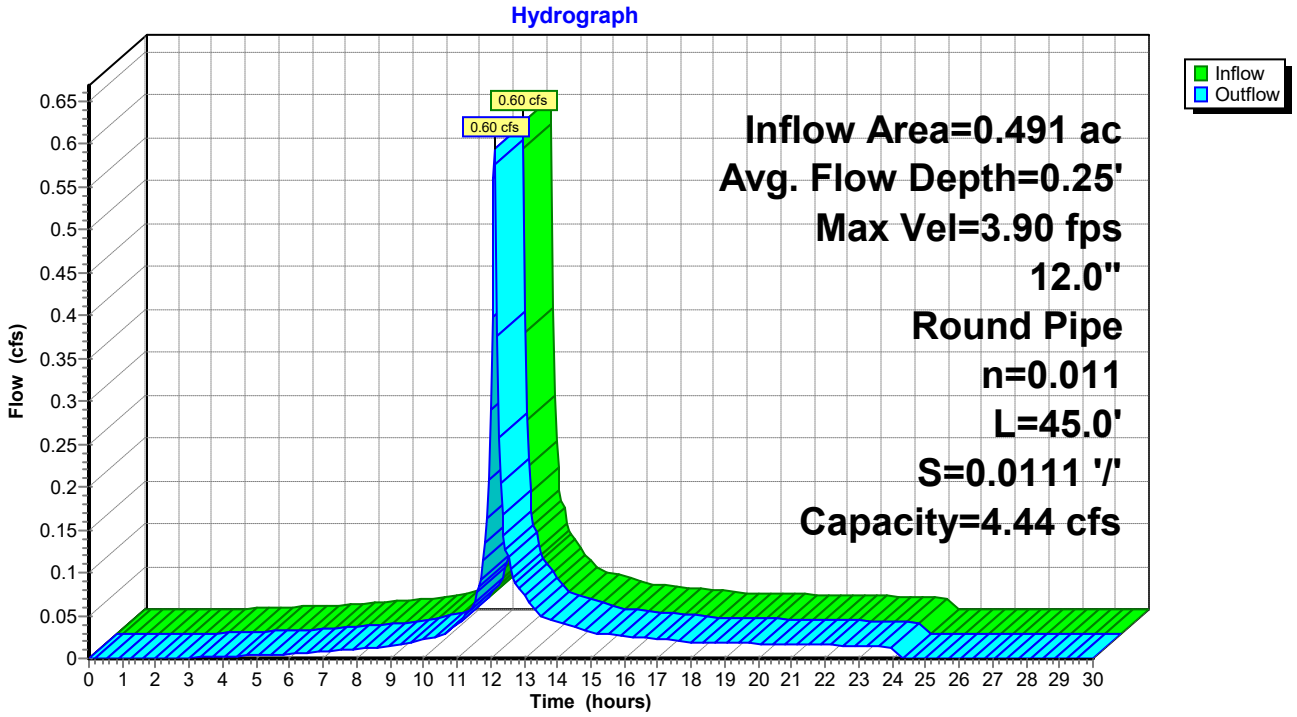
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.90 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 0.5 min

Peak Storage= 7 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 0.86'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0111 '/'
Inlet Invert= 467.40', Outlet Invert= 466.90'



Reach DMH108: TO DMH#107



Summary for Reach DMH109: TO DMH#110

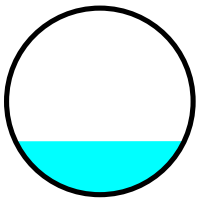
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB14 outlet invert by 0.08' @ 12.10 hrs
[61] Hint: Exceeded Reach DCB20 outlet invert by 0.08' @ 12.10 hrs
[61] Hint: Exceeded Reach DMH109A outlet invert by 0.08' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 2.02" for 2-Year event
Inflow = 1.28 cfs @ 12.12 hrs, Volume= 0.101 af
Outflow = 1.28 cfs @ 12.12 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH110 : TO UGS#2A

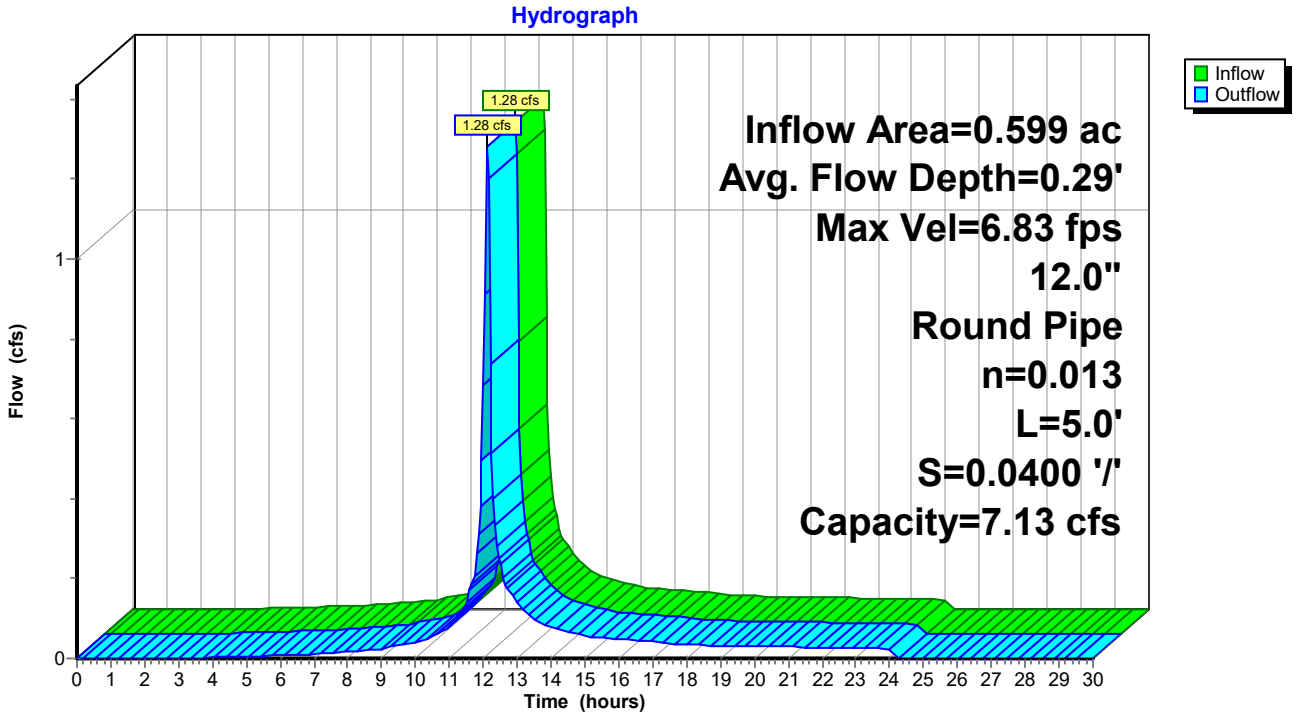
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.83 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.29' , Surface Width= 0.90'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 466.20', Outlet Invert= 466.00'



Reach DMH109: TO DMH#110



Summary for Reach DMH109A: TO DMH109

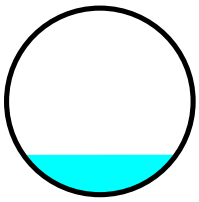
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB21 outlet invert by 0.11' @ 12.10 hrs
[61] Hint: Exceeded Reach DCB25 outlet invert by 0.11' @ 12.10 hrs

Inflow Area = 0.239 ac, 75.90% Impervious, Inflow Depth = 1.65" for 2-Year event
Inflow = 0.43 cfs @ 12.12 hrs, Volume= 0.033 af
Outflow = 0.42 cfs @ 12.13 hrs, Volume= 0.033 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH109 : TO DMH#110

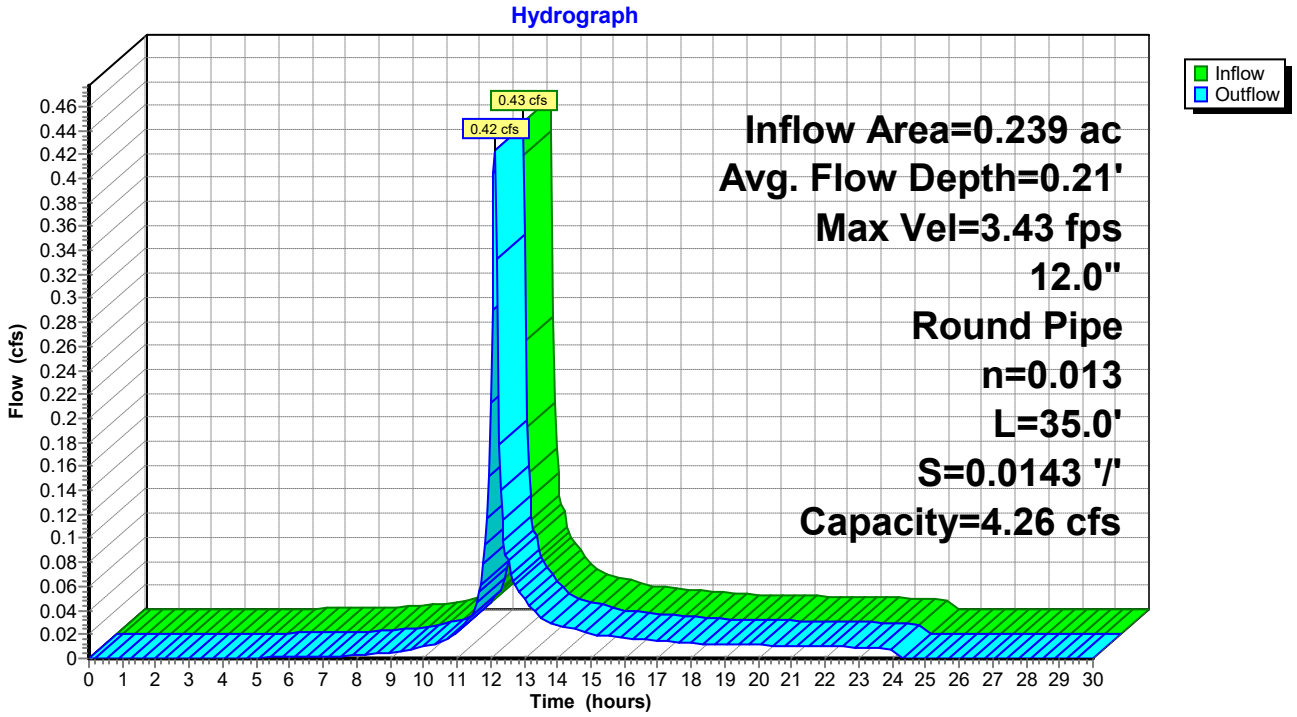
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.43 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.5 min

Peak Storage= 4 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.82'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0143 '/'
Inlet Invert= 466.90', Outlet Invert= 466.40'



Reach DMH109A: TO DMH109



Summary for Reach DMH110: TO UGS#2A

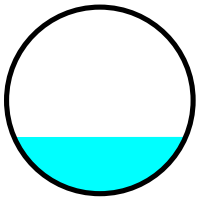
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH109 outlet invert by 0.05' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 2.02" for 2-Year event
Inflow = 1.28 cfs @ 12.12 hrs, Volume= 0.101 af
Outflow = 1.27 cfs @ 12.12 hrs, Volume= 0.101 af, Atten= 1%, Lag= 0.2 min
Routed to Reach UGS2A : TO UGS#2

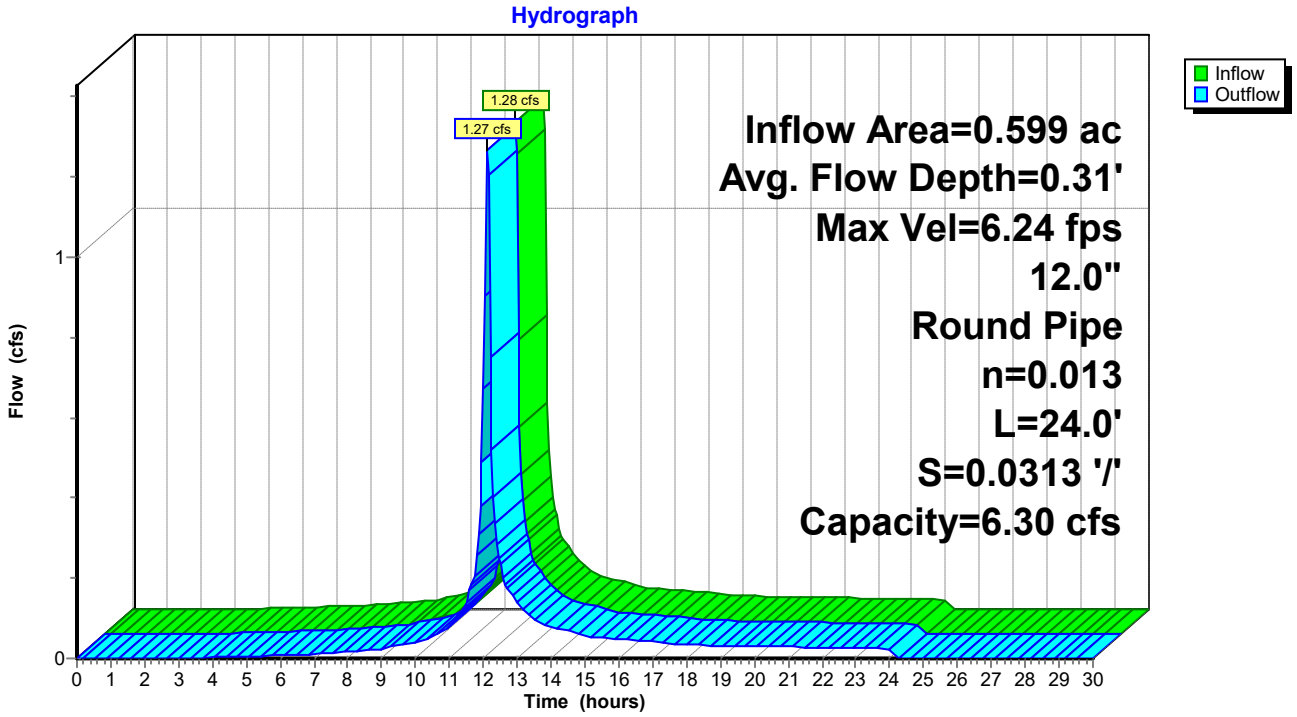
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.24 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 0.92'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.30 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0313 '/'
Inlet Invert= 465.75', Outlet Invert= 465.00'



Reach DMH110: TO UGS#2A



Summary for Reach DMH111: TO DMH#112

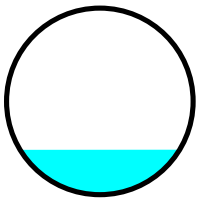
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DCB19 OUTLET depth by 0.01' @ 12.20 hrs
[62] Hint: Exceeded Reach DCB22 OUTLET depth by 0.05' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB23 outlet invert by 0.14' @ 12.15 hrs

Inflow Area = 1.171 ac, 46.54% Impervious, Inflow Depth = 0.68" for 2-Year event
Inflow = 0.69 cfs @ 12.14 hrs, Volume= 0.066 af
Outflow = 0.68 cfs @ 12.15 hrs, Volume= 0.066 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH112 : TO DMH#113

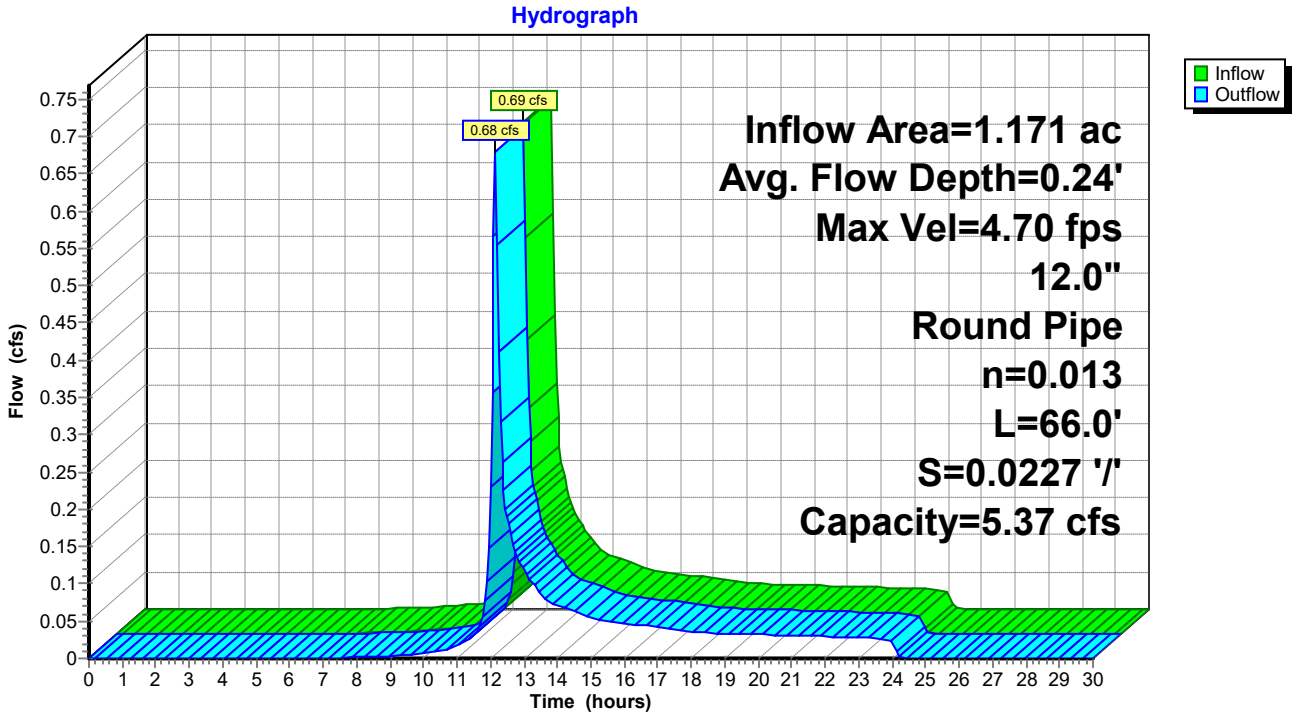
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.70 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 0.6 min

Peak Storage= 10 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 0.86'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.37 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 66.0' Slope= 0.0227 '/'
Inlet Invert= 463.50', Outlet Invert= 462.00'



Reach DMH111: TO DMH#112



Summary for Reach DMH112: TO DMH#113

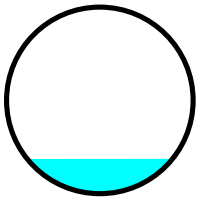
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach UGS2B OUTLET depth by 0.04' @ 12.15 hrs

Inflow Area = 1.770 ac, 59.09% Impervious, Inflow Depth > 1.12" for 2-Year event
Inflow = 0.85 cfs @ 12.15 hrs, Volume= 0.165 af
Outflow = 0.84 cfs @ 12.15 hrs, Volume= 0.165 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH113 : TO DMH#114

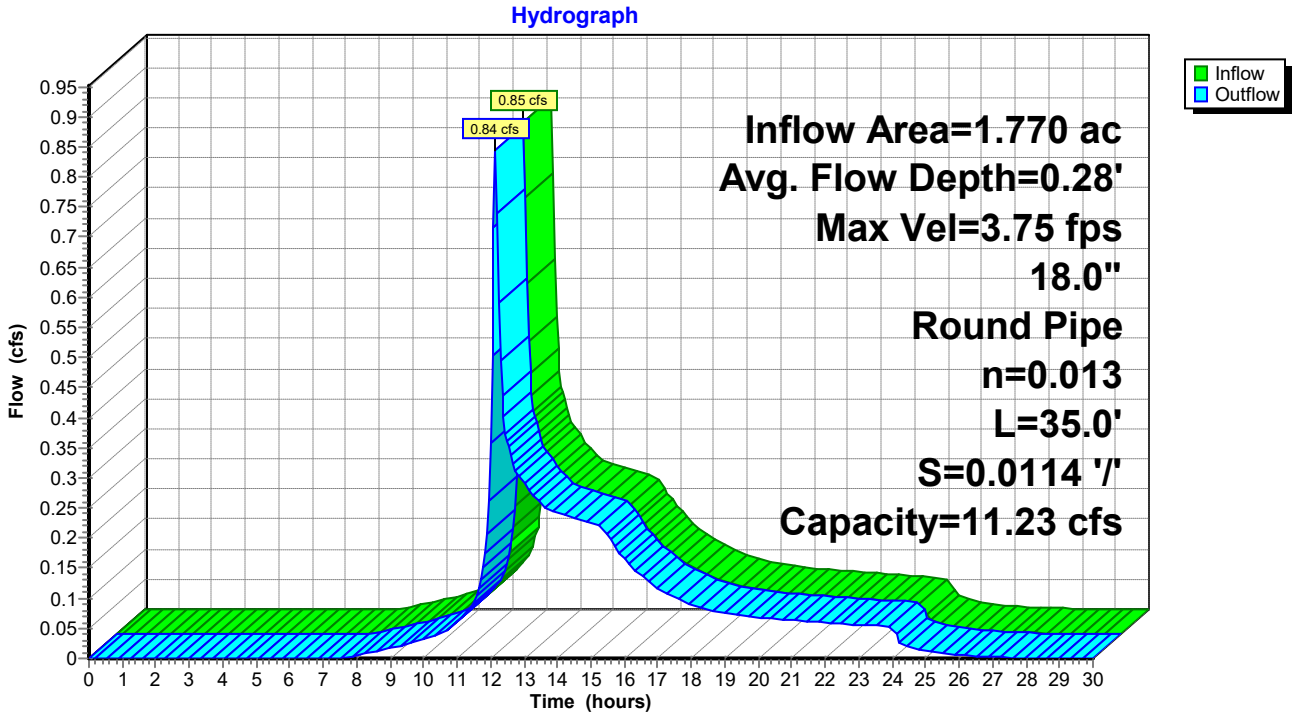
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 0.4 min

Peak Storage= 8 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 1.17'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.23 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0114 '/'
Inlet Invert= 460.20', Outlet Invert= 459.80'



Reach DMH112: TO DMH#113



Summary for Reach DMH113: TO DMH#114

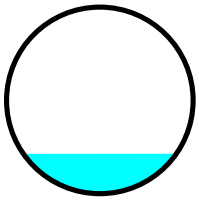
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH112 outlet invert by 0.22' @ 12.15 hrs

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 0.97" for 2-Year event
Inflow = 1.33 cfs @ 12.14 hrs, Volume= 0.208 af
Outflow = 1.33 cfs @ 12.15 hrs, Volume= 0.208 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH114 : TO DMH-K1

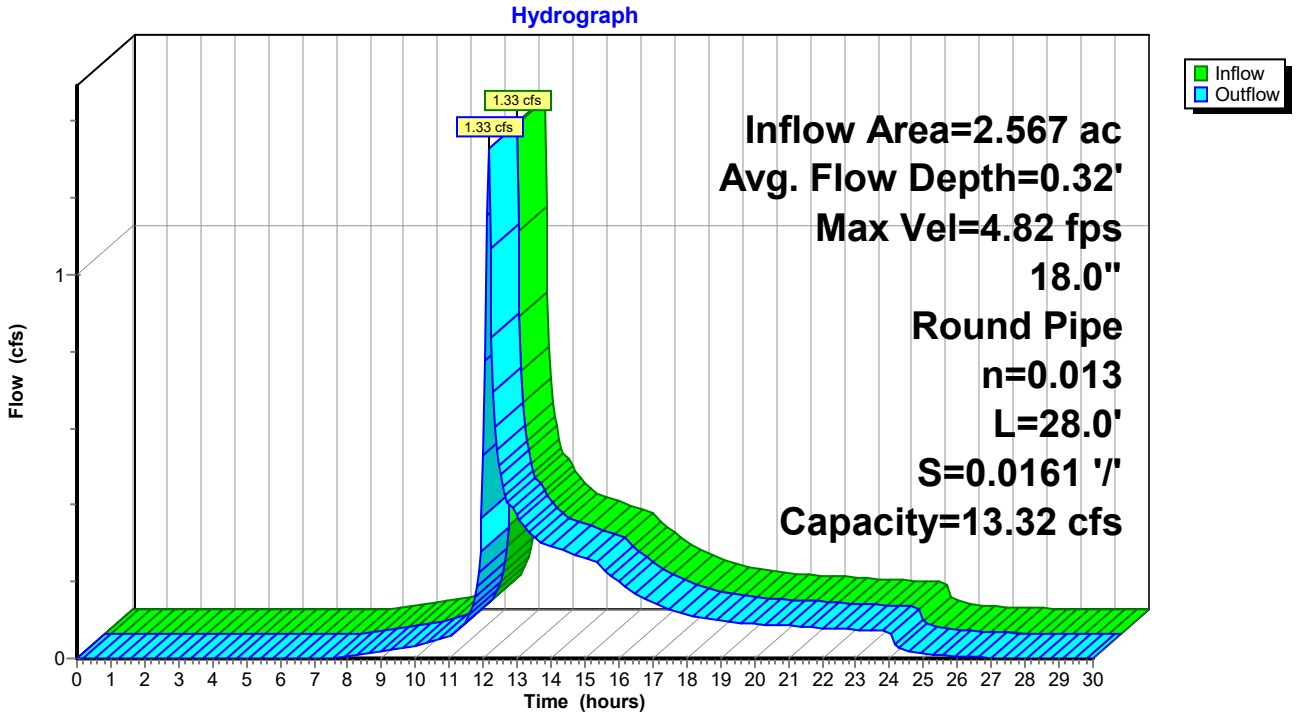
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.82 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 0.3 min

Peak Storage= 8 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 1.23'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 13.32 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 28.0' Slope= 0.0161 '/'
Inlet Invert= 459.70', Outlet Invert= 459.25'



Reach DMH113: TO DMH#114



Summary for Reach DMH114: TO DMH-K1

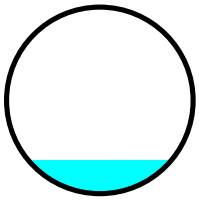
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH113 outlet invert by 0.02' @ 12.15 hrs

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 0.97" for 2-Year event
Inflow = 1.33 cfs @ 12.15 hrs, Volume= 0.208 af
Outflow = 1.33 cfs @ 12.15 hrs, Volume= 0.208 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

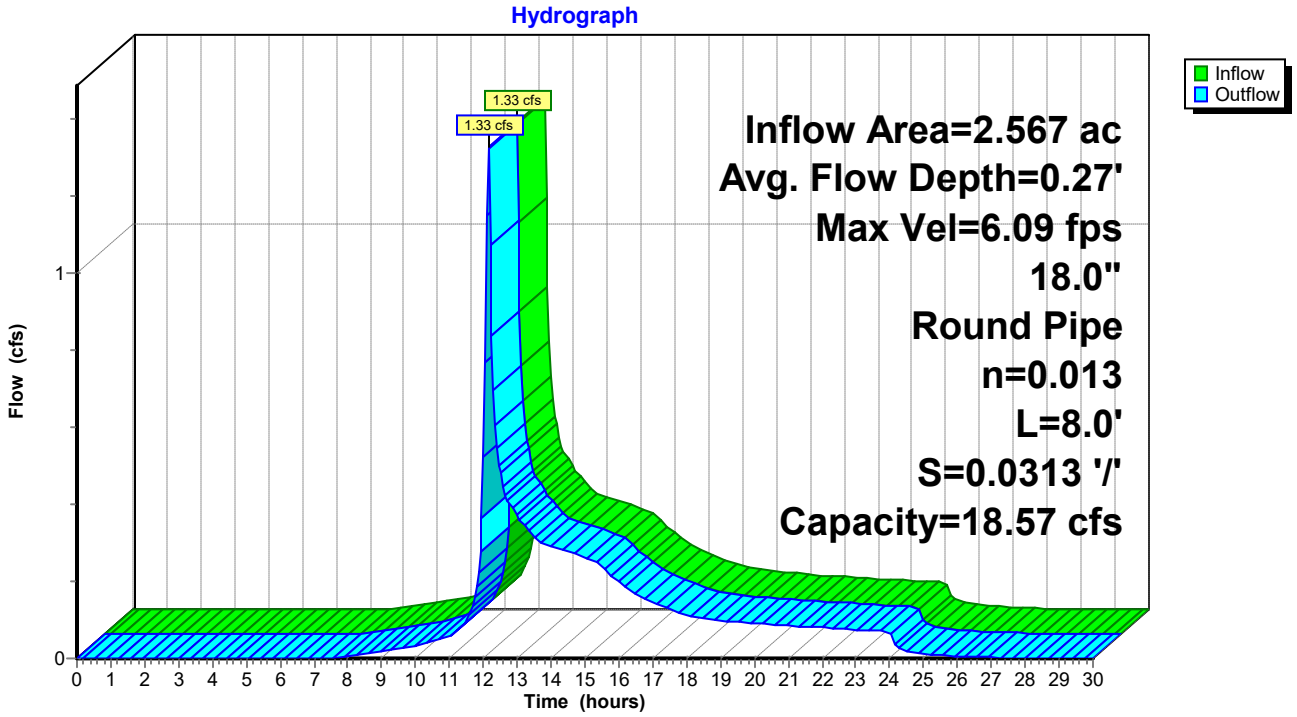
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.09 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.37 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 1.16'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.57 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 8.0' Slope= 0.0313 '/'
Inlet Invert= 459.00', Outlet Invert= 458.75'



Reach DMH114: TO DMH-K1



Summary for Reach DMHR1: TO DMH#104

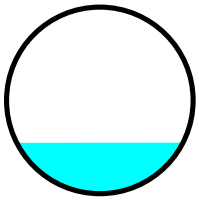
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMHR2 outlet invert by 0.17' @ 12.15 hrs

Inflow Area = 0.739 ac, 65.00% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 0.92 cfs @ 12.14 hrs, Volume= 0.072 af
Outflow = 0.90 cfs @ 12.14 hrs, Volume= 0.072 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH103 : TO CMH#2

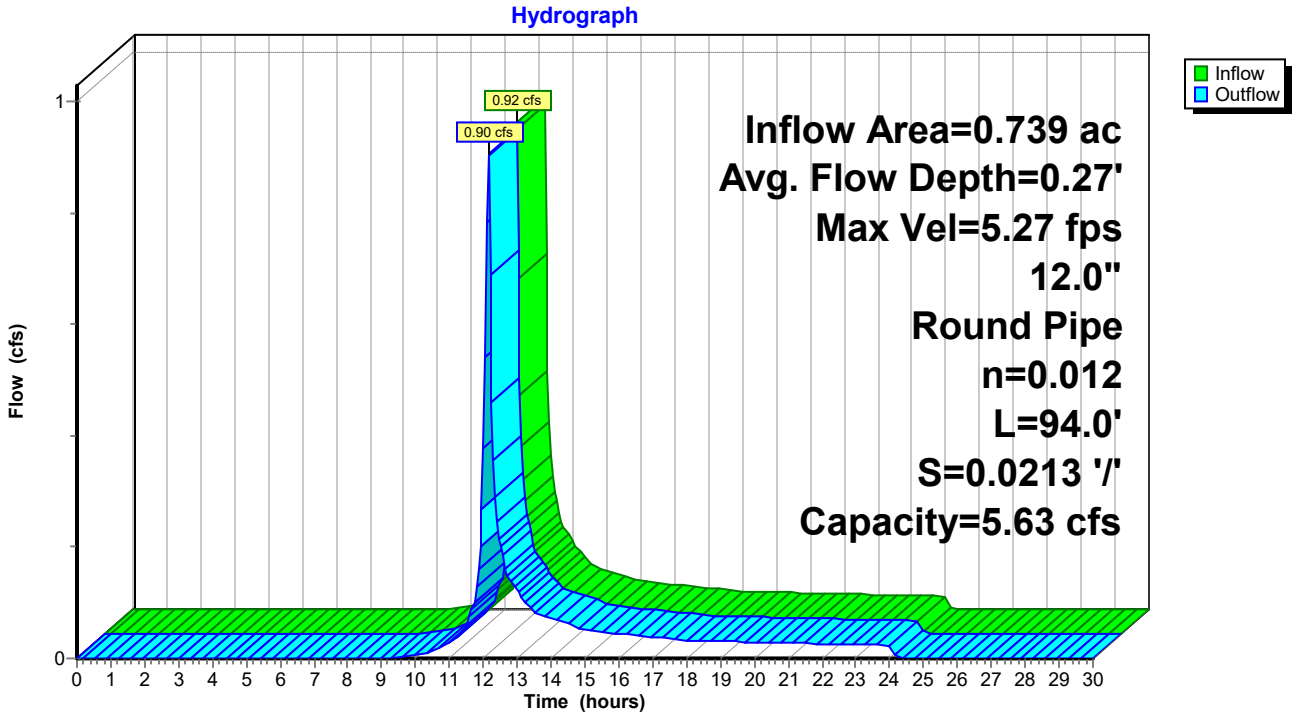
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.27 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 0.8 min

Peak Storage= 16 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.89'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.63 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 94.0' Slope= 0.0213 '/'
Inlet Invert= 467.00', Outlet Invert= 465.00'



Reach DMHR1: TO DMH#104



Summary for Reach DMHR2: TO DMH#R2

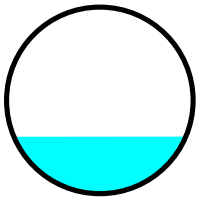
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.739 ac, 65.00% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 0.94 cfs @ 12.12 hrs, Volume= 0.072 af
Outflow = 0.92 cfs @ 12.14 hrs, Volume= 0.072 af, Atten= 2%, Lag= 1.0 min
Routed to Reach DMHR1 : TO DMH#104

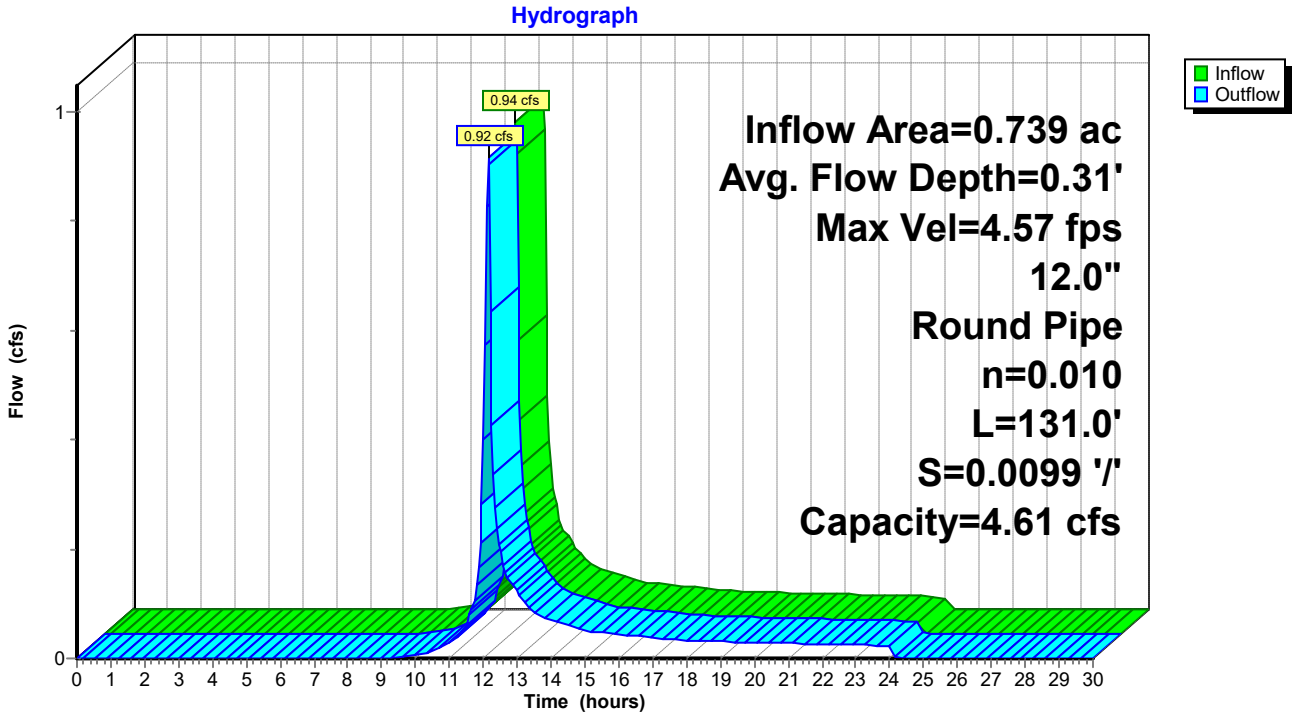
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.57 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 1.2 min

Peak Storage= 27 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 0.92'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 131.0' Slope= 0.0099 '/'
Inlet Invert= 468.40', Outlet Invert= 467.10'



Reach DMHR2: TO DMH#R2



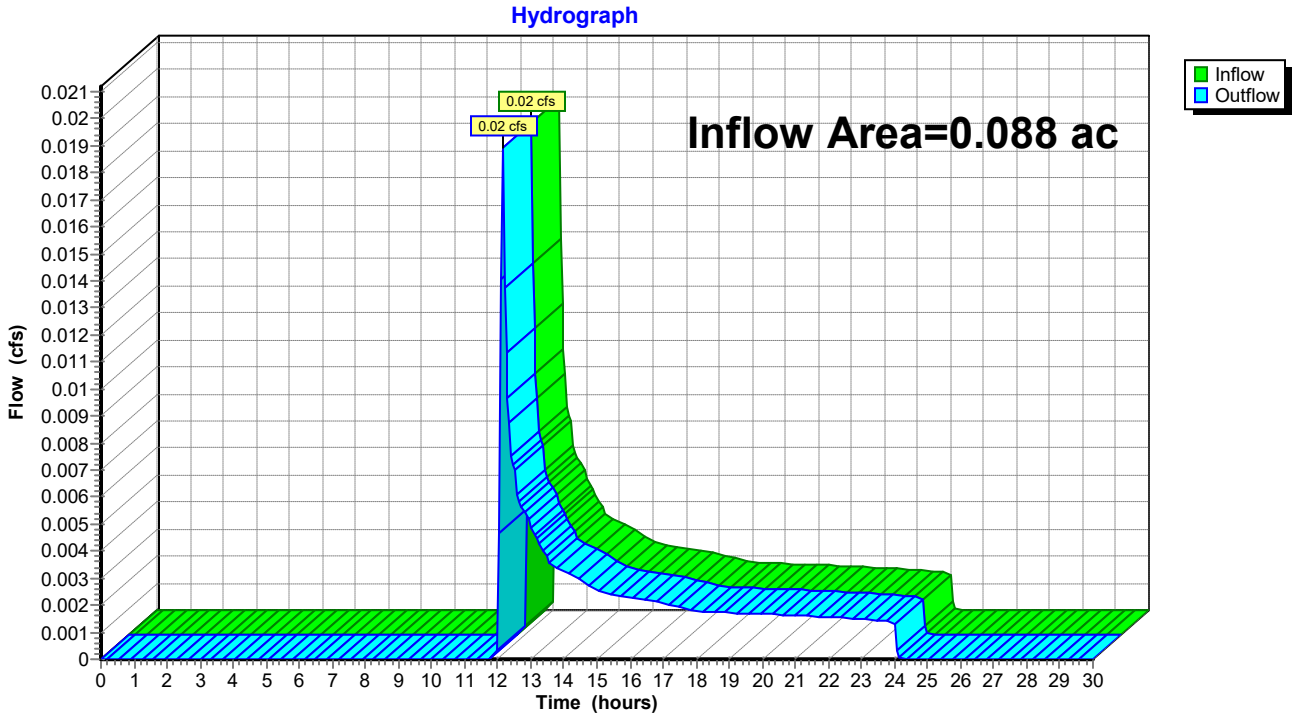
Summary for Reach DP#6: OFFSITE LOW POINT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.088 ac, 33.45% Impervious, Inflow Depth = 0.35" for 2-Year event
Inflow = 0.02 cfs @ 12.15 hrs, Volume= 0.003 af
Outflow = 0.02 cfs @ 12.15 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 DP#6: OFFSITE LOW POINT



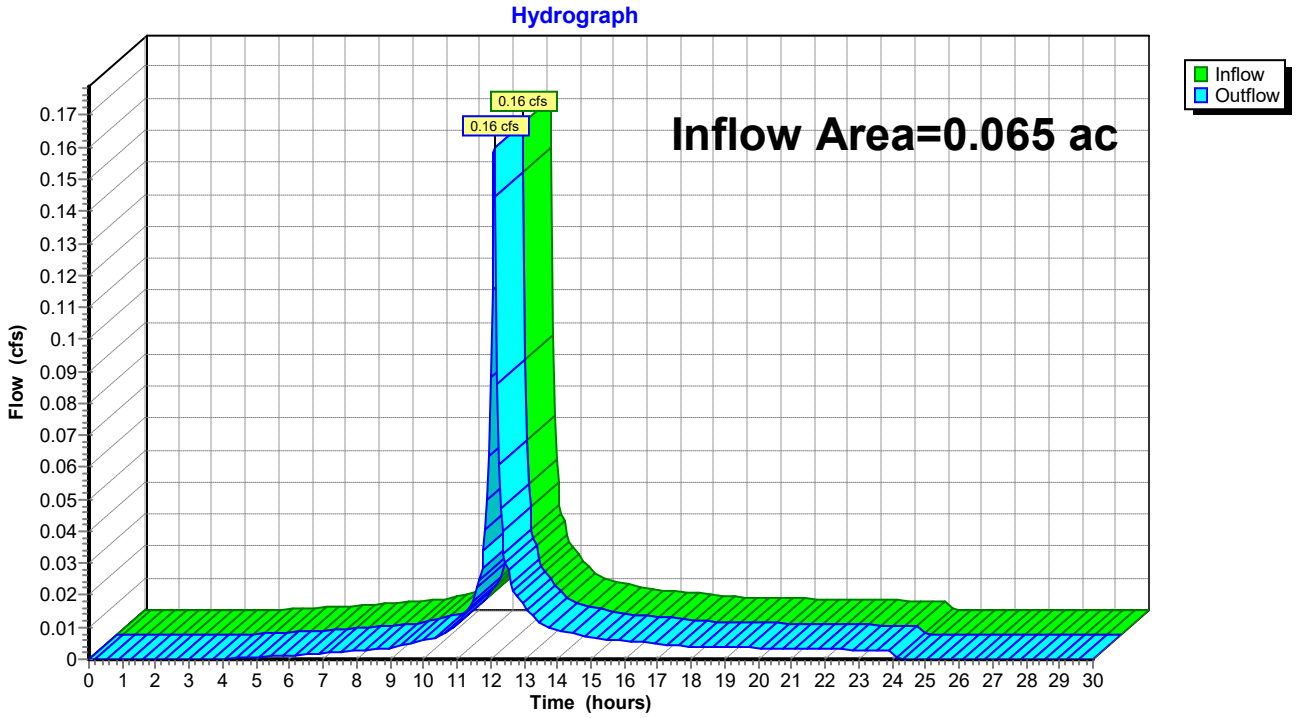
Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

[40] Hint: Not Described (Outflow=Inflow)

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)



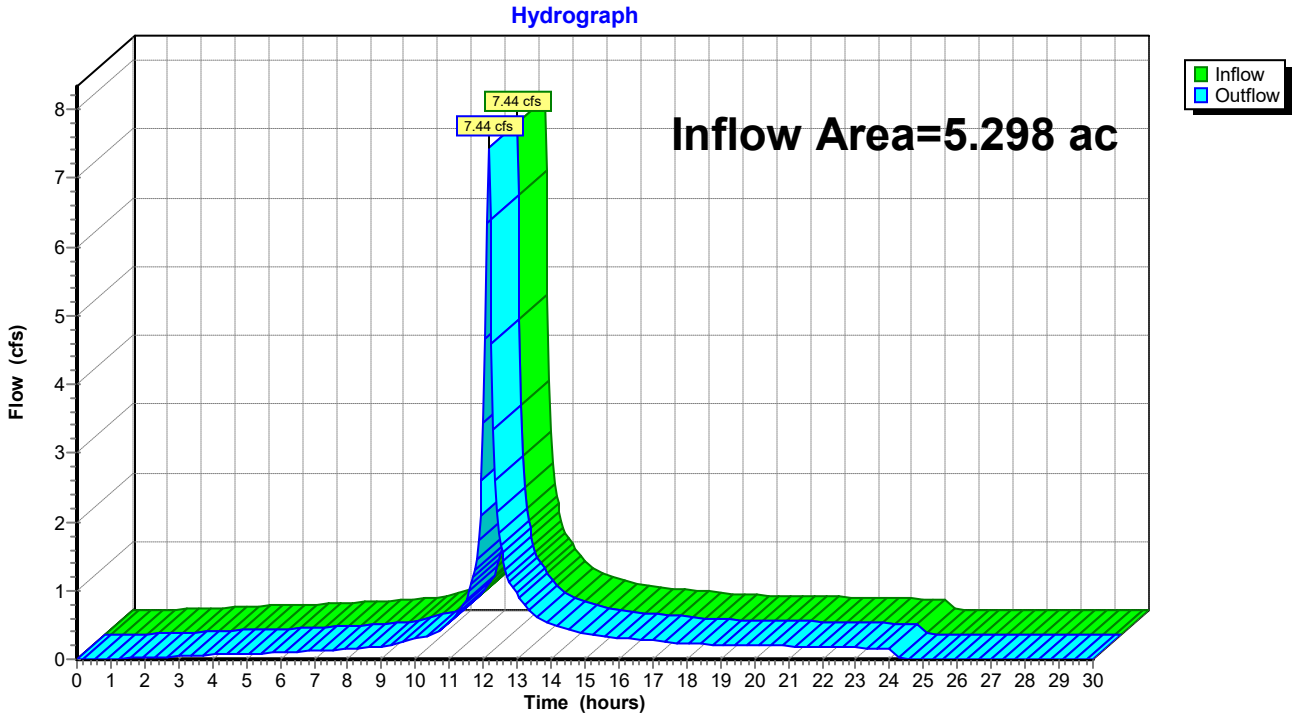
Summary for Reach DP2: MUNICIPAL SYSTEM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.298 ac, 79.01% Impervious, Inflow Depth = 1.55" for 2-Year event
Inflow = 7.44 cfs @ 12.15 hrs, Volume= 0.684 af
Outflow = 7.44 cfs @ 12.15 hrs, Volume= 0.684 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



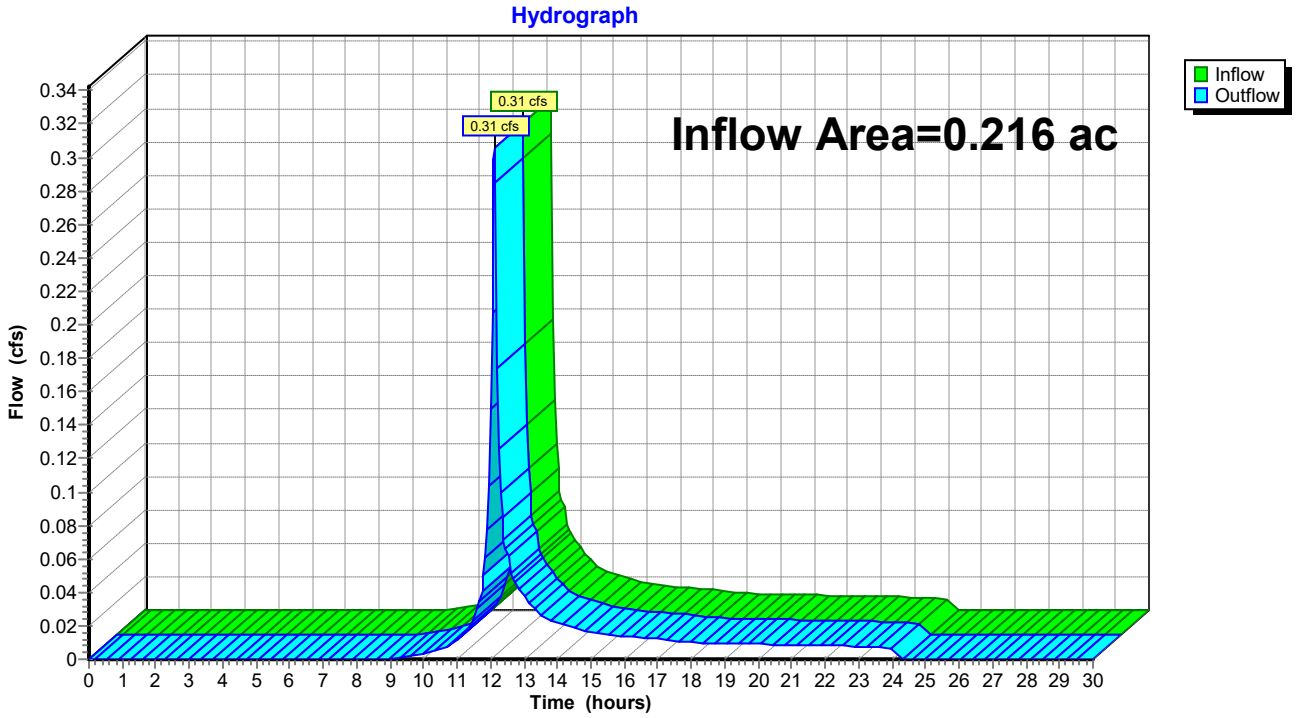
Summary for Reach DP3: CATCHBASIN (FIRE STATION)

[40] Hint: Not Described (Outflow=Inflow)

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)



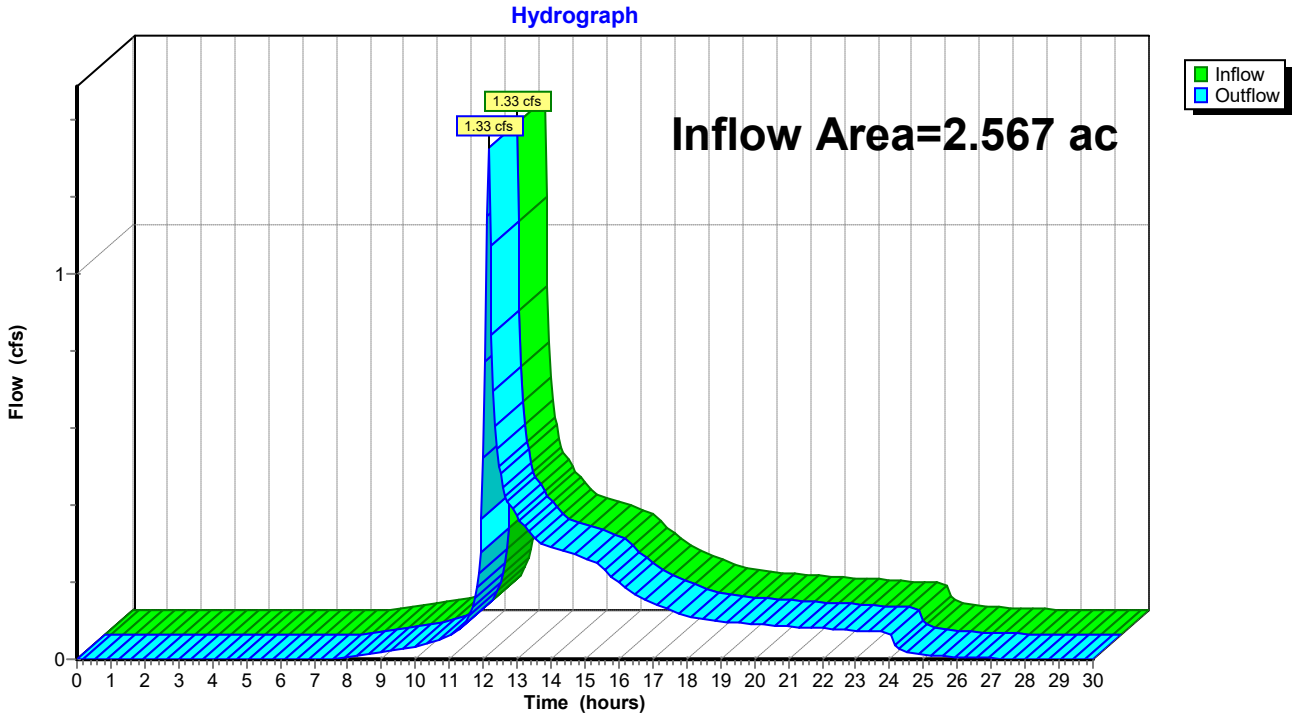
Summary for Reach DP4: DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 0.97" for 2-Year event
Inflow = 1.33 cfs @ 12.15 hrs, Volume= 0.208 af
Outflow = 1.33 cfs @ 12.15 hrs, Volume= 0.208 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: DMH-K1



Summary for Reach DP5: DCB-H

[40] Hint: Not Described (Outflow=Inflow)

Summary for Reach RF1: TO DMH#101

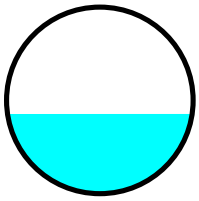
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.759 ac,100.00% Impervious, Inflow Depth = 2.90" for 2-Year event
Inflow = 2.13 cfs @ 12.11 hrs, Volume= 0.183 af
Outflow = 2.11 cfs @ 12.11 hrs, Volume= 0.183 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH101 : TO DMH#100

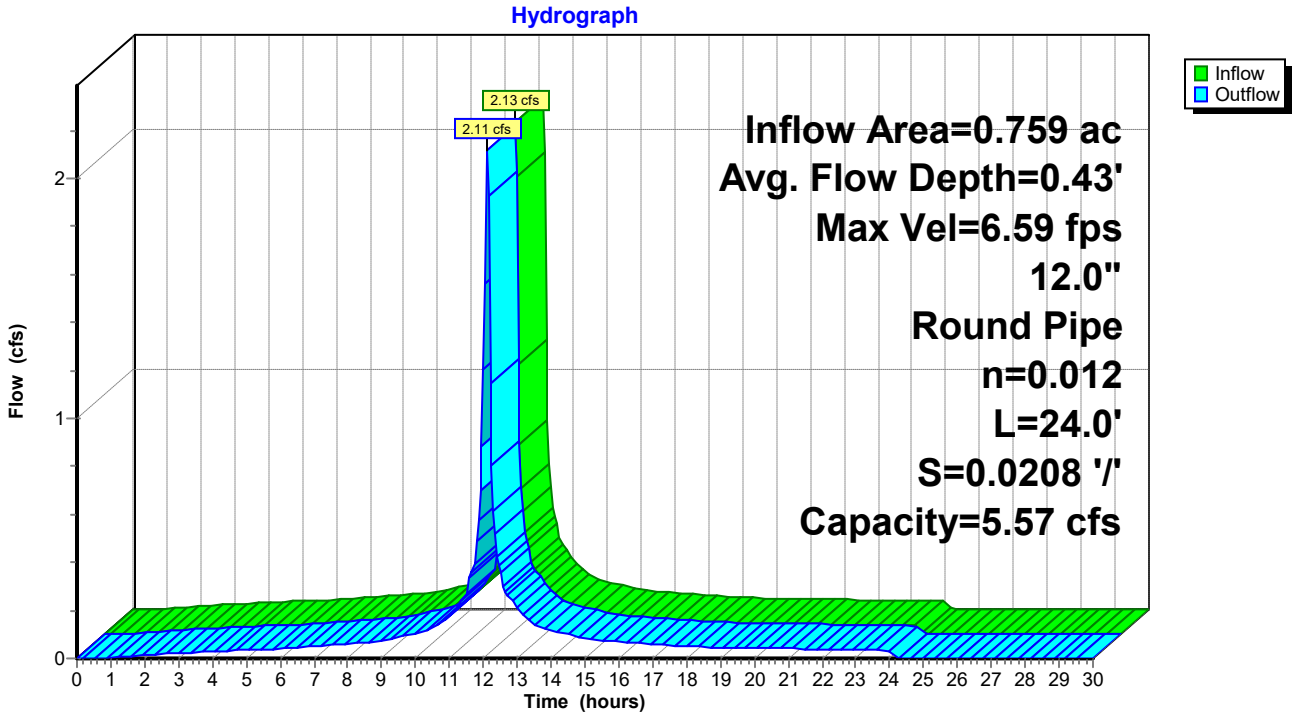
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.59 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.37 fps, Avg. Travel Time= 0.2 min

Peak Storage= 8 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.57 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 24.0' Slope= 0.0208 '/'
Inlet Invert= 466.20', Outlet Invert= 465.70'



Reach RF1: TO DMH#101

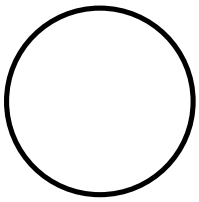


Summary for Reach RF2: TO DMH#101

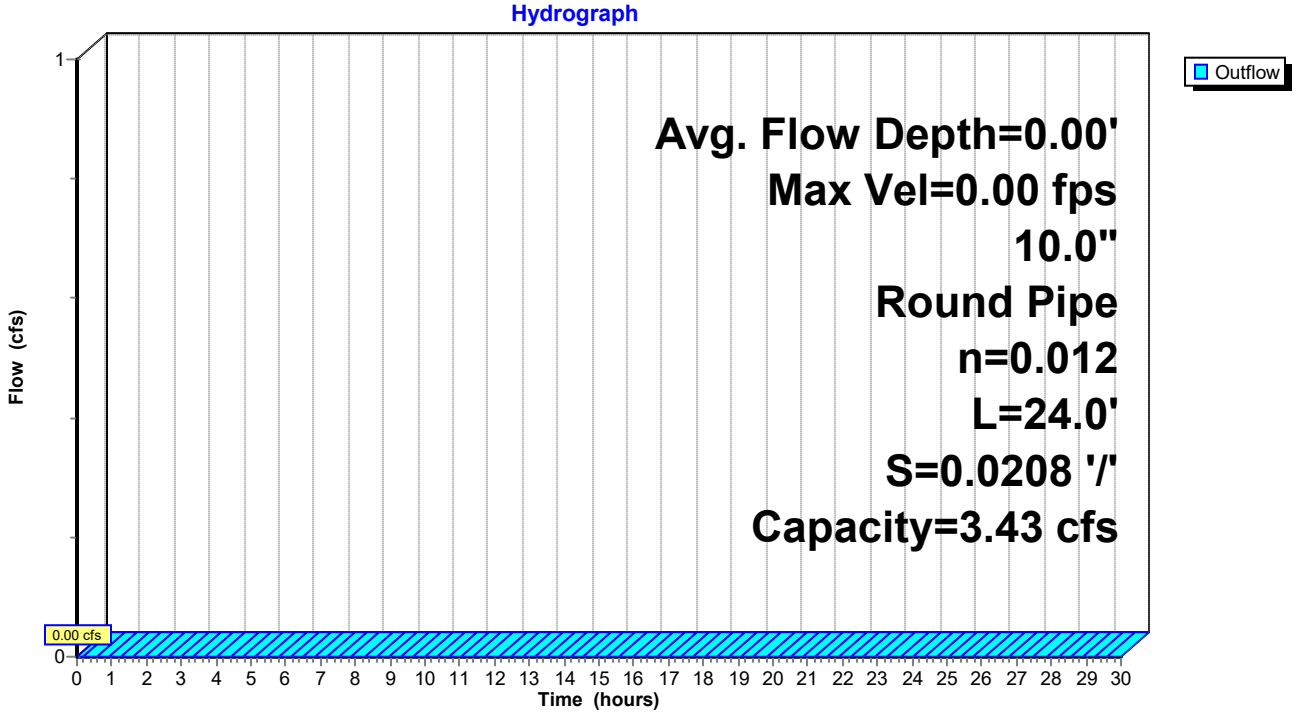
[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 0.83' Flow Area= 0.5 sf, Capacity= 3.43 cfs

10.0" Round Pipe
n= 0.012 Steel, smooth
Length= 24.0' Slope= 0.0208 '/'
Inlet Invert= 466.20', Outlet Invert= 465.70'



Reach RF2: TO DMH#101



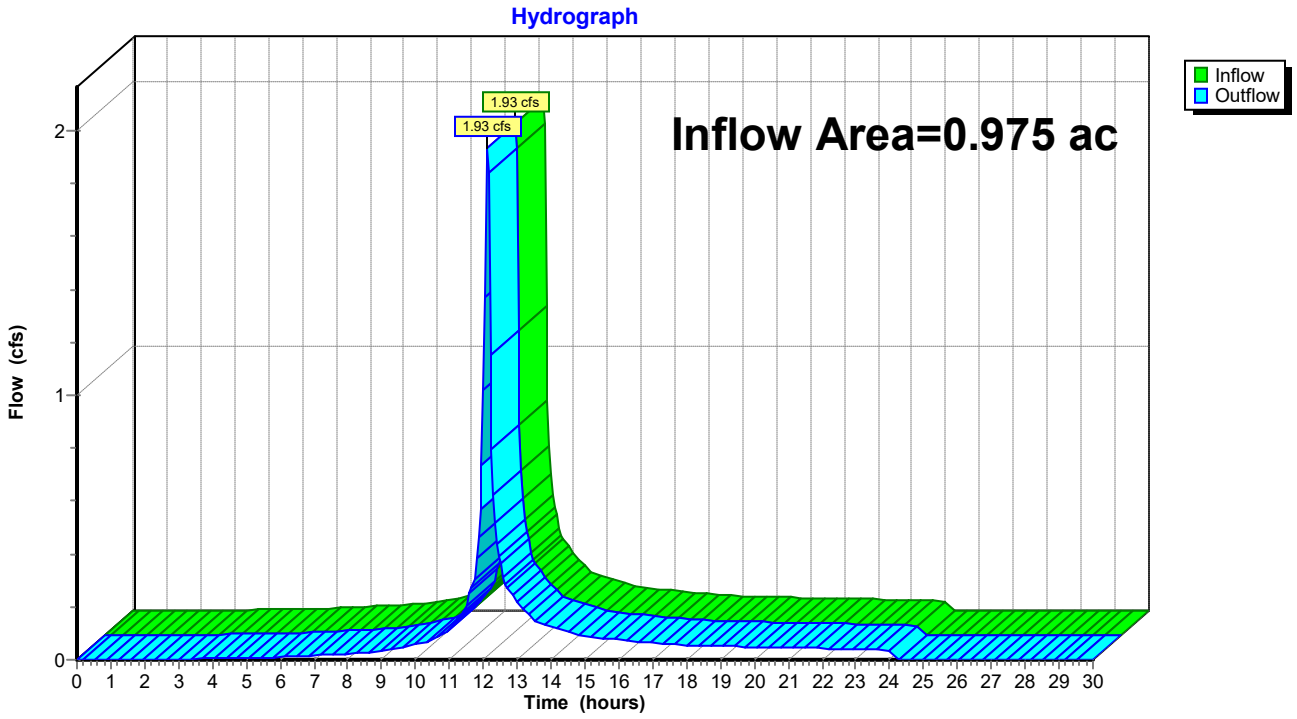
Summary for Reach UGS1A: TO UGS#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 1.89" for 2-Year event
Inflow = 1.93 cfs @ 12.12 hrs, Volume= 0.154 af
Outflow = 1.93 cfs @ 12.12 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min
Routed to Pond UGS1 : TO DMH#106

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

Reach UGS1A: TO UGS#1



Summary for Reach UGS1B: TO DMH106

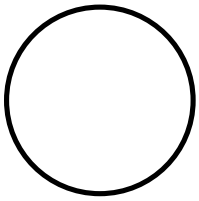
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.975 ac, 81.42% 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
Routed to Reach DMH105 : TO DMH#104

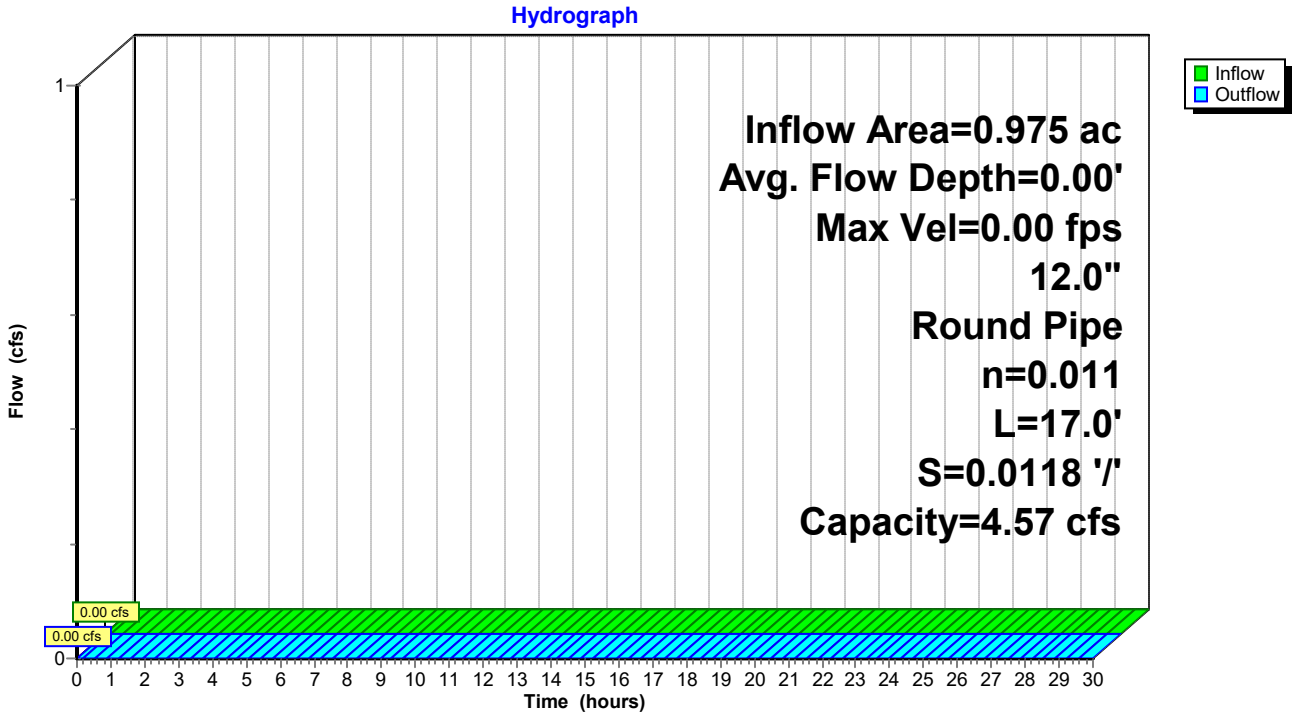
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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= 4.57 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 17.0' Slope= 0.0118 '/'
Inlet Invert= 467.60', Outlet Invert= 467.40'



Reach UGS1B: TO DMH106



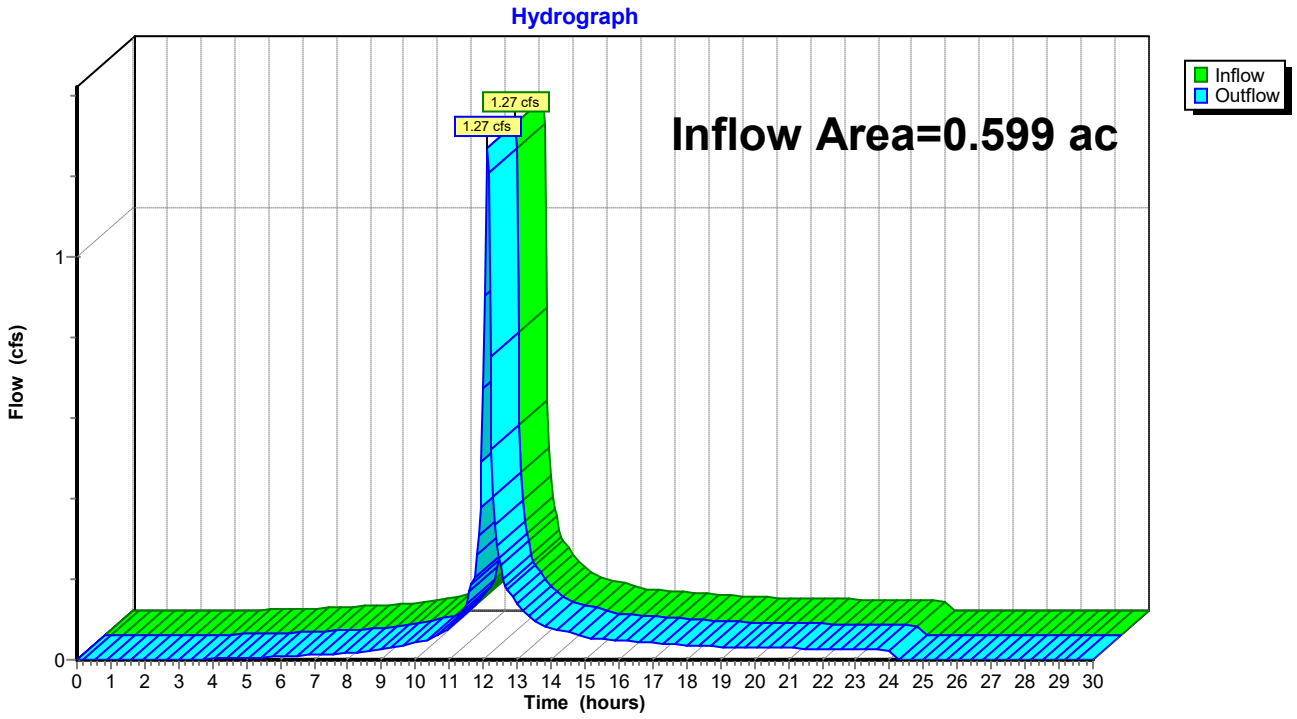
Summary for Reach UGS2A: TO UGS#2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 2.02" for 2-Year event
Inflow = 1.27 cfs @ 12.12 hrs, Volume= 0.101 af
Outflow = 1.27 cfs @ 12.12 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min
Routed to Pond UGS2 : TO UGS#2B

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

Reach UGS2A: TO UGS#2



Summary for Reach UGS2B: TO DMH#112

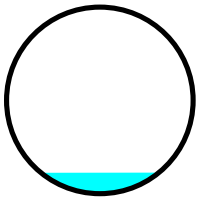
[52] Hint: Inlet/Outlet conditions not evaluated
[78] Warning: Submerged Pond UGS2 Primary device # 2 by 0.09'

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth > 1.97" for 2-Year event
Inflow = 0.17 cfs @ 12.05 hrs, Volume= 0.098 af
Outflow = 0.17 cfs @ 12.10 hrs, Volume= 0.098 af, Atten= 0%, Lag= 3.0 min
Routed to Reach DMH112 : TO DMH#113

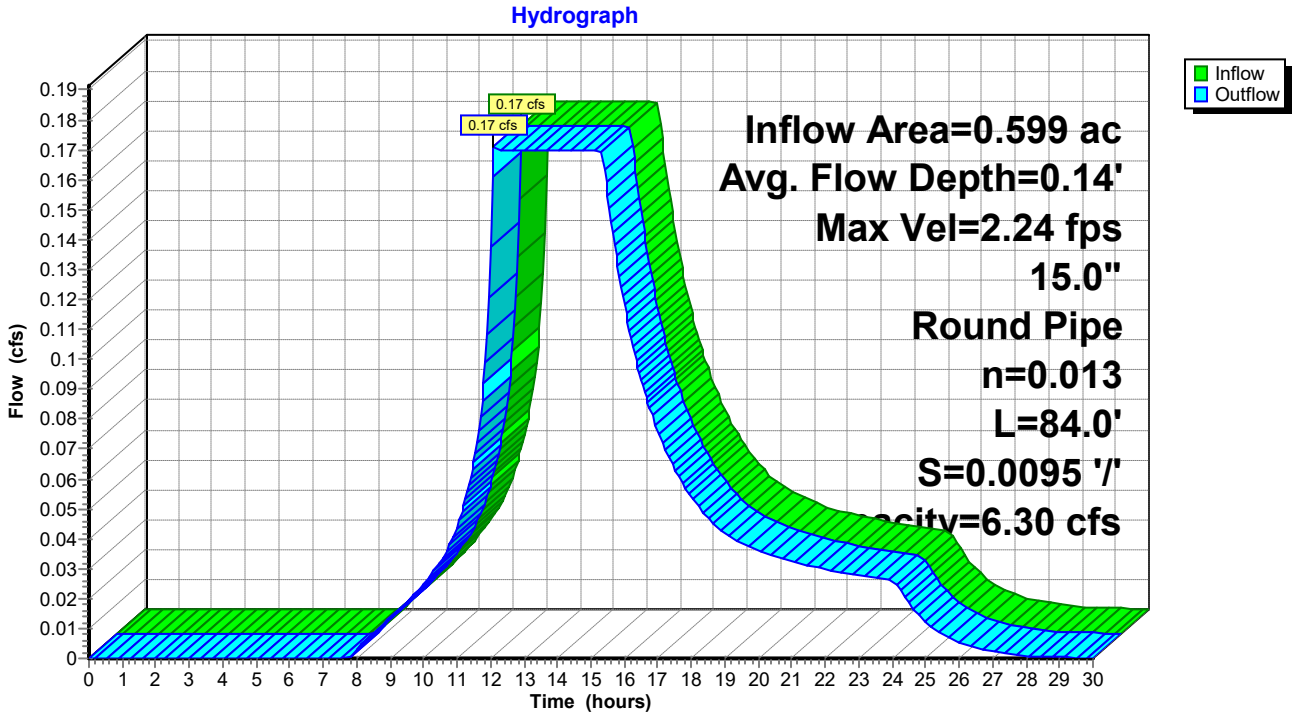
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.24 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.0 min

Peak Storage= 6 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 0.79'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.30 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 84.0' Slope= 0.0095 '/'
Inlet Invert= 461.10', Outlet Invert= 460.30'



Reach UGS2B: TO DMH#112



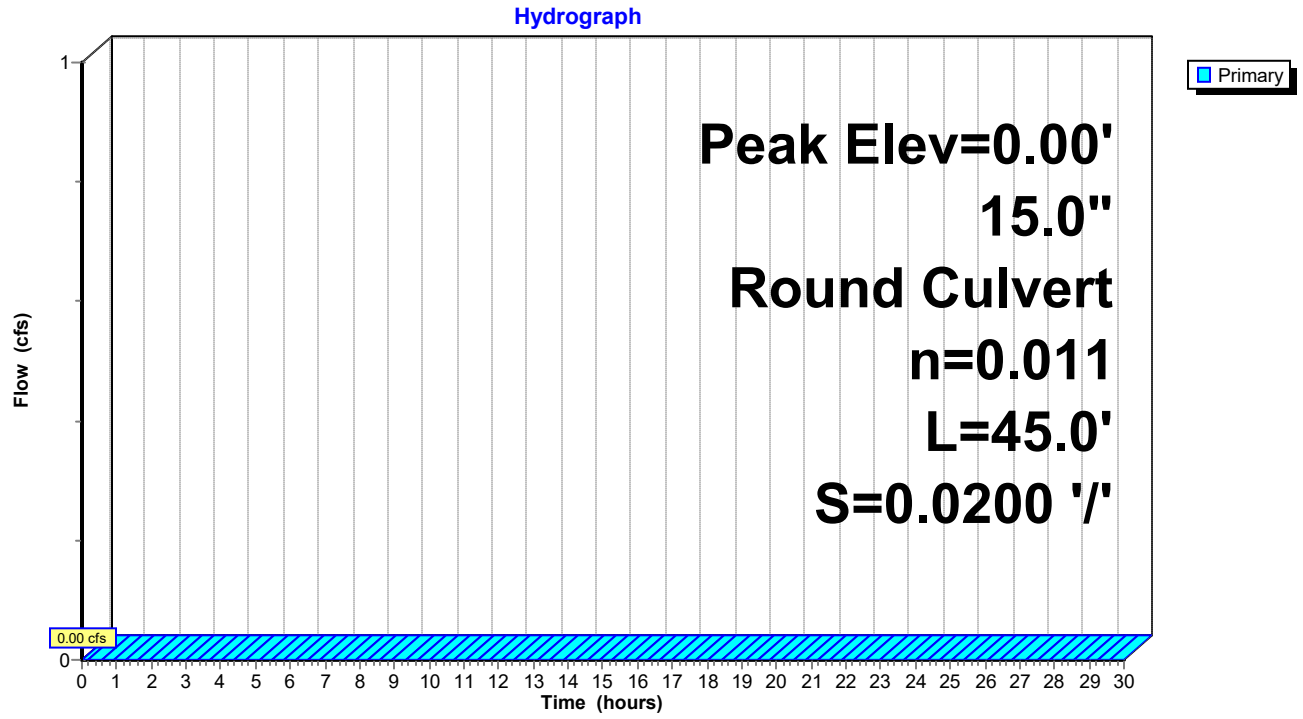
Summary for Pond DMH-B: TO DMH-D

[43] Hint: Has no inflow (Outflow=Zero)

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=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

Pond DMH-B: TO DMH-D



Summary for Pond UGS1: TO DMH#106

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 1.89" for 2-Year event
Inflow = 1.93 cfs @ 12.12 hrs, Volume= 0.154 af
Outflow = 0.20 cfs @ 13.09 hrs, Volume= 0.154 af, Atten= 90%, Lag= 58.2 min
Discarded = 0.20 cfs @ 13.09 hrs, Volume= 0.154 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach UGS1B : TO DMH106

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 466.09' @ 13.09 hrs Surf.Area= 0.065 ac Storage= 0.047 af

Plug-Flow detention time= 80.1 min calculated for 0.153 af (100% of inflow)
Center-of-Mass det. time= 80.0 min (908.5 - 828.5)

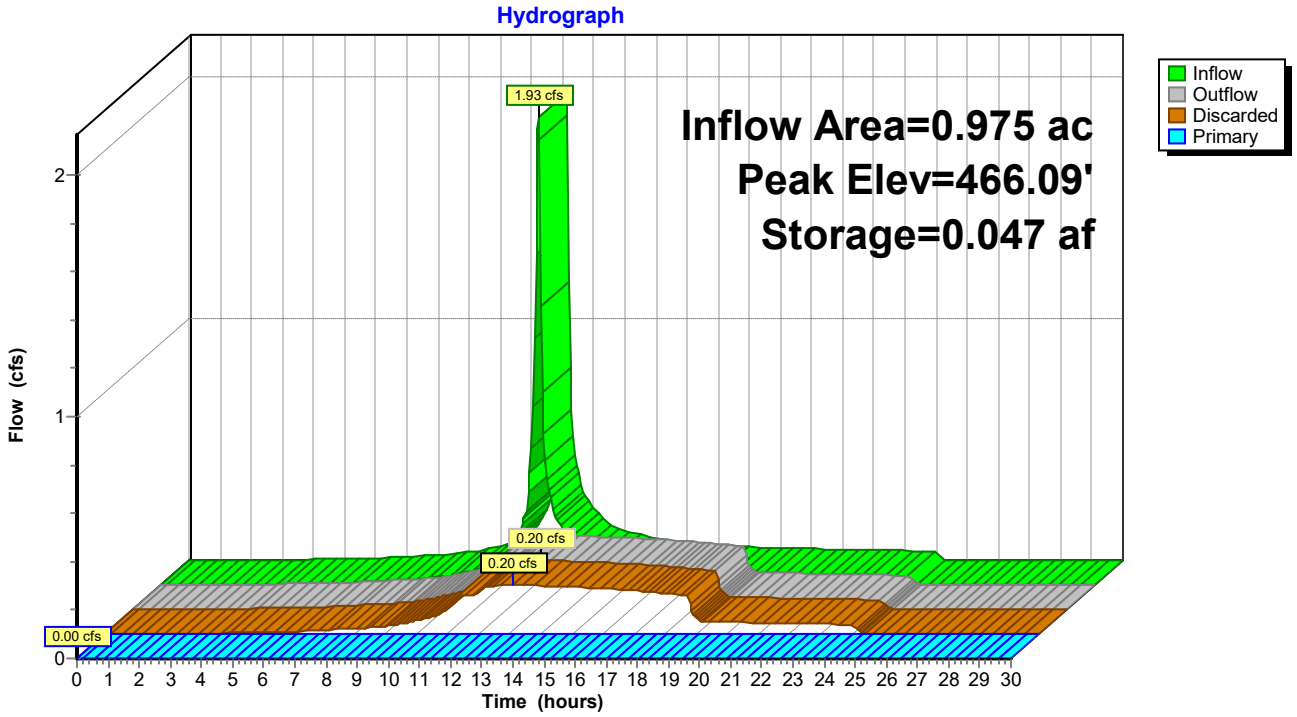
Volume	Invert	Avail.Storage	Storage Description
#1	464.75'	0.073 af	**38.00'W x 74.00'L x 6.00'H Prismatoid** 0.387 af Overall - 0.206 af Embedded = 0.181 af x 40.0% Voids
#2	465.50'	0.153 af	**Shea Leaching Chamber 4x4x4** x 144 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		0.226 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	467.75'	**12.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	464.75'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'

Discarded OutFlow Max=0.20 cfs @ 13.09 hrs HW=466.09' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=464.75' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond UGS1: TO DMH#106



Summary for Pond UGS2: TO UGS#2B

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 2.02" for 2-Year event
Inflow = 1.27 cfs @ 12.12 hrs, Volume= 0.101 af
Outflow = 0.17 cfs @ 12.05 hrs, Volume= 0.098 af, Atten= 87%, Lag= 0.0 min
Primary = 0.17 cfs @ 12.05 hrs, Volume= 0.098 af
Routed to Reach UGS2B : TO DMH#112

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 462.90' @ 12.75 hrs Surf.Area= 0.041 ac Storage= 0.036 af

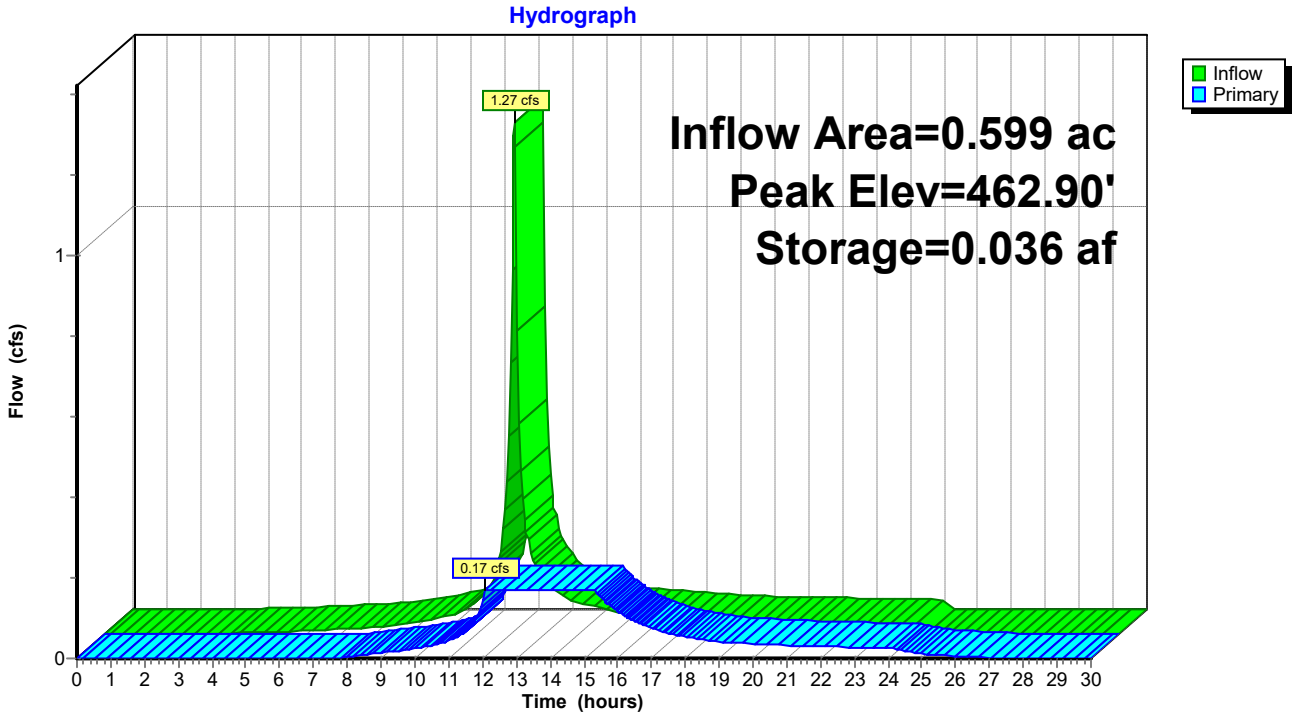
Plug-Flow detention time= 118.1 min calculated for 0.098 af (98% of inflow)
Center-of-Mass det. time= 103.6 min (926.8 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	461.00'	0.052 af	**38.00'W x 47.00'L x 6.30'H Prismatoid** 0.258 af Overall - 0.129 af Embedded = 0.130 af x 40.0% Voids
#2	462.50'	0.096 af	**Shea Leaching Chamber 4x4x4** x 90 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 90 Chambers in 10 Rows
		0.148 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	464.25'	**12.0" Vert. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#2	Primary	461.15'	**Special & User-Defined** Head (feet) 0.00 1.00 15.00 Disch. (cfs) 0.000 0.170 0.170

Primary OutFlow Max=0.17 cfs @ 12.05 hrs HW=462.16' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Special & User-Defined (Custom Controls 0.17 cfs)

Pond UGS2: TO UGS#2B



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 P100A: TO 12" ROOF DRAIN Runoff Area=33,077 sf 100.00% Impervious Runoff Depth=4.44"
Tc=5.0 min CN=98 Runoff=3.21 cfs 0.281 af

Subcatchment P100B: TO YARD DRAIN Runoff Area=32,189 sf 65.00% Impervious Runoff Depth=2.36"
Tc=5.0 min CN=77 Runoff=1.93 cfs 0.145 af

Subcatchment P100D: TO 12" ROOF DRAIN Runoff Area=32,189 sf 100.00% Impervious Runoff Depth=4.44"
Tc=5.0 min CN=98 Runoff=3.12 cfs 0.274 af

Subcatchment P105: TO DCB#5 Runoff Area=12,319 sf 35.47% Impervious Runoff Depth=1.12"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=60 Runoff=0.32 cfs 0.026 af

Subcatchment P106: TO DCB#6 Runoff Area=6,540 sf 94.27% Impervious Runoff Depth=4.10"
Flow Length=101' Slope=0.0150 '/' Tc=5.0 min CN=95 Runoff=0.62 cfs 0.051 af

Subcatchment P107: TO DCB#7 Runoff Area=14,453 sf 83.32% Impervious Runoff Depth=3.37"
Flow Length=126' Slope=0.0150 '/' Tc=5.0 min CN=88 Runoff=1.20 cfs 0.093 af

Subcatchment P108: TO DCB#8 Runoff Area=7,623 sf 76.33% Impervious Runoff Depth=2.98"
Flow Length=156' Tc=5.0 min CN=84 Runoff=0.57 cfs 0.043 af

Subcatchment P109: TO DCB#9 Runoff Area=9,811 sf 39.59% Impervious Runoff Depth=1.25"
Flow Length=156' Tc=5.1 min CN=62 Runoff=0.29 cfs 0.023 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 P110: TO DCB#10 Runoff Area=2,827 sf 67.92% Impervious Runoff Depth=2.53"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=79 Runoff=0.18 cfs 0.014 af

Subcatchment P111: TO DCB#11 Runoff Area=4,144 sf 28.74% Impervious Runoff Depth=0.88"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=56 Runoff=0.08 cfs 0.007 af

Subcatchment P112: TO DCB#12 Runoff Area=9,054 sf 93.65% Impervious Runoff Depth=3.99"
Flow Length=150' Slope=0.0130 '/' Tc=5.0 min CN=94 Runoff=0.84 cfs 0.069 af

Subcatchment P113: TO DCB#13 Runoff Area=11,898 sf 94.49% Impervious Runoff Depth=4.10"
Flow Length=122' Slope=0.0200 '/' Tc=5.0 min CN=95 Runoff=1.12 cfs 0.093 af

Subcatchment P114: TO DCB#14 Runoff Area=5,484 sf 94.42% Impervious Runoff Depth=4.10"
Flow Length=126' Slope=0.0160 '/' Tc=5.0 min CN=95 Runoff=0.52 cfs 0.043 af

Subcatchment P115: TO DCB#15 Runoff Area=16,100 sf 70.06% Impervious Runoff Depth=2.62"
Flow Length=122' Slope=0.0170 '/' Tc=5.0 min CN=80 Runoff=1.07 cfs 0.081 af

Subcatchment P116: TO DCB#25 Runoff Area=2,780 sf 89.32% Impervious Runoff Depth=3.78"
Flow Length=80' Slope=0.0200 '/' Tc=5.0 min CN=92 Runoff=0.25 cfs 0.020 af

Subcatchment P117: TO DP#6 Runoff Area=3,839 sf 33.45% Impervious Runoff Depth=1.06"
Flow Length=74' Slope=0.0200 '/' Tc=5.0 min CN=59 Runoff=0.09 cfs 0.008 af

Subcatchment P119: TO DCB#19 Runoff Area=7,440 sf 78.16% Impervious Runoff Depth=3.07"
Flow Length=213' Slope=0.0250 '/' Tc=5.0 min CN=85 Runoff=0.57 cfs 0.044 af

Subcatchment P12: TO DCB-A Runoff Area=6,197 sf 94.61% Impervious Runoff Depth=4.10"
Flow Length=147' Tc=5.0 min CN=95 Runoff=0.58 cfs 0.049 af

Subcatchment P120: TO DCB#20 Runoff Area=10,195 sf 85.75% Impervious Runoff Depth=3.57"
Flow Length=146' Tc=5.0 min CN=90 Runoff=0.88 cfs 0.070 af

Subcatchment P121: TO DCB#21 Runoff Area=7,628 sf 71.01% Impervious Runoff Depth=2.70"
Flow Length=153' Tc=5.0 min CN=81 Runoff=0.52 cfs 0.039 af

Subcatchment P122: TO DCB#22 Runoff Area=10,232 sf 44.85% Impervious Runoff Depth=1.44"
Flow Length=189' Tc=5.0 min CN=65 Runoff=0.36 cfs 0.028 af

Subcatchment P123: TO DCB#23 Runoff Area=33,346 sf 40.00% Impervious Runoff Depth=1.31"
Flow Length=171' Tc=5.0 min CN=63 Runoff=1.05 cfs 0.084 af

Subcatchment P14: TO DCB-B Runoff Area=5,424 sf 87.24% Impervious Runoff Depth=3.57"
Flow Length=169' Tc=5.0 min CN=90 Runoff=0.47 cfs 0.037 af

Subcatchment P15: TO DCB-C Runoff Area=8,397 sf 71.34% Impervious Runoff Depth=2.70"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=81 Runoff=0.55 cfs 0.043 af

Subcatchment P18: TO DCB-D Runoff Area=10,287 sf 76.50% Impervious Runoff Depth=2.98"
Flow Length=222' Tc=5.0 min CN=84 Runoff=0.77 cfs 0.059 af

Subcatchment P19: TO DCB-E Runoff Area=8,240 sf 64.27% Impervious Runoff Depth=2.36"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=77 Runoff=0.49 cfs 0.037 af

Subcatchment P20: 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 P24: TO DCB#24 Runoff Area=34,704 sf 47.02% Impervious Runoff Depth=1.58"
Flow Length=247' Slope=0.0250 '/' Tc=5.0 min CN=67 Runoff=1.36 cfs 0.105 af

Reach CMH3: TO DMH-E Avg. Flow Depth=0.63' Max Vel=5.39 fps Inflow=5.87 cfs 0.506 af
36.0" Round Pipe n=0.011 L=196.0' S=0.0058 '/' Capacity=60.12 cfs Outflow=5.69 cfs 0.506 af

Reach DCB-A: TO DMH-D Inflow=0.58 cfs 0.049 af
Outflow=0.58 cfs 0.049 af

Reach DCB-B: TO DMH-E Inflow=0.47 cfs 0.037 af
Outflow=0.47 cfs 0.037 af

Reach DCB-C: TO TRUNKLINE Inflow=0.55 cfs 0.043 af
Outflow=0.55 cfs 0.043 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.24' Max Vel=6.93 fps Inflow=0.77 cfs 0.059 af
8.0" Round Pipe n=0.010 L=15.0' S=0.0333 '/' Capacity=2.87 cfs Outflow=0.77 cfs 0.059 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.19' Max Vel=5.97 fps Inflow=0.49 cfs 0.037 af
8.0" Round Pipe n=0.010 L=16.0' S=0.0313 '/' Capacity=2.78 cfs Outflow=0.49 cfs 0.037 af

Reach DCB10: TO DMH#106 Avg. Flow Depth=0.12' Max Vel=4.33 fps Inflow=0.18 cfs 0.014 af
8.0" Round Pipe n=0.010 L=7.0' S=0.0286 '/' Capacity=2.66 cfs Outflow=0.18 cfs 0.014 af

Reach DCB11: TO DMH#103 Avg. Flow Depth=0.09' Max Vel=2.57 fps Inflow=0.08 cfs 0.007 af
8.0" Round Pipe n=0.010 L=15.0' S=0.0133 '/' Capacity=1.81 cfs Outflow=0.08 cfs 0.007 af

Reach DCB12: TO DMH#12 Avg. Flow Depth=0.34' Max Vel=4.68 fps Inflow=0.84 cfs 0.069 af
8.0" Round Pipe n=0.010 L=28.0' S=0.0107 '/' Capacity=1.63 cfs Outflow=0.83 cfs 0.069 af

Reach DCB13: TO DMH#102 Avg. Flow Depth=0.27' Max Vel=6.60 fps Inflow=1.12 cfs 0.093 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=1.12 cfs 0.093 af

Reach DCB14: TO DMH#109 Avg. Flow Depth=0.19' Max Vel=5.11 fps Inflow=0.52 cfs 0.043 af
12.0" Round Pipe n=0.013 L=19.0' S=0.0368 '/' Capacity=6.84 cfs Outflow=0.51 cfs 0.043 af

Reach DCB15: TO DMH#102 Avg. Flow Depth=0.37' Max Vel=3.92 fps Inflow=1.07 cfs 0.081 af
12.0" Round Pipe n=0.013 L=70.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=1.05 cfs 0.081 af

Reach DCB19: TO DMH#111 Avg. Flow Depth=0.19' Max Vel=5.41 fps Inflow=0.57 cfs 0.044 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=0.57 cfs 0.044 af

Reach DCB20: TO DMH#109 Avg. Flow Depth=0.33' Max Vel=3.89 fps Inflow=0.88 cfs 0.070 af
12.0" Round Pipe n=0.013 L=9.0' S=0.0111 '/' Capacity=3.76 cfs Outflow=0.88 cfs 0.070 af

Reach DCB21: TO DMH#109A Avg. Flow Depth=0.25' Max Vel=4.28 fps Inflow=0.52 cfs 0.039 af
8.0" Round Pipe n=0.013 L=5.0' S=0.0200 '/' Capacity=1.71 cfs Outflow=0.52 cfs 0.039 af

Reach DCB22: TO DMH#111 Avg. Flow Depth=0.16' Max Vel=4.24 fps Inflow=0.36 cfs 0.028 af
12.0" Round Pipe n=0.013 L=20.0' S=0.0300 '/' Capacity=6.17 cfs Outflow=0.36 cfs 0.028 af

Reach DCB23: TO DMH#111 Avg. Flow Depth=0.35' Max Vel=4.25 fps Inflow=1.05 cfs 0.084 af
12.0" Round Pipe n=0.013 L=250.0' S=0.0124 '/' Capacity=3.97 cfs Outflow=0.99 cfs 0.084 af

Reach DCB24: TO DMH#113 Avg. Flow Depth=0.35' Max Vel=5.61 fps Inflow=1.36 cfs 0.105 af
12.0" Round Pipe n=0.013 L=9.0' S=0.0222 '/' Capacity=5.31 cfs Outflow=1.36 cfs 0.105 af

Reach DCB25: TO DMH#109A Avg. Flow Depth=0.16' Max Vel=3.97 fps Inflow=0.25 cfs 0.020 af
8.0" Round Pipe n=0.010 L=29.0' S=0.0172 '/' Capacity=2.06 cfs Outflow=0.25 cfs 0.020 af

Reach DCB5: TO DMH#108 Avg. Flow Depth=0.16' Max Vel=5.07 fps Inflow=0.32 cfs 0.026 af
8.0" Round Pipe n=0.010 L=7.0' S=0.0286 '/' Capacity=2.66 cfs Outflow=0.32 cfs 0.026 af

Reach DCB6: TO DMH#107 Avg. Flow Depth=0.18' Max Vel=8.18 fps Inflow=0.62 cfs 0.051 af
8.0" Round Pipe n=0.010 L=46.0' S=0.0630 '/' Capacity=3.94 cfs Outflow=0.61 cfs 0.051 af

Reach DCB7: TO DMH#102 Avg. Flow Depth=0.29' Max Vel=6.14 fps Inflow=1.20 cfs 0.093 af
12.0" Round Pipe n=0.013 L=54.0' S=0.0315 '/' Capacity=6.32 cfs Outflow=1.18 cfs 0.093 af

Reach DCB8: TO DMH#103 Avg. Flow Depth=0.18' Max Vel=7.37 fps Inflow=0.57 cfs 0.043 af
8.0" Round Pipe n=0.010 L=4.0' S=0.0500 '/' Capacity=3.51 cfs Outflow=0.57 cfs 0.043 af

Reach DCB9: TO DMH#103 Avg. Flow Depth=0.17' Max Vel=4.07 fps Inflow=0.29 cfs 0.023 af
8.0" Round Pipe n=0.010 L=12.0' S=0.0167 '/' Capacity=2.03 cfs Outflow=0.29 cfs 0.023 af

Reach DMH-A*: TO DMH-B Avg. Flow Depth=0.58' Max Vel=8.06 fps Inflow=6.06 cfs 0.524 af
24.0" Round Pipe n=0.011 L=267.0' S=0.0157 '/' Capacity=33.53 cfs Outflow=5.97 cfs 0.524 af

Reach DMH-C: TO DP#1 Inflow=6.94 cfs 0.635 af
Outflow=6.94 cfs 0.635 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=0.66' Max Vel=6.07 fps Inflow=7.05 cfs 0.635 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=6.94 cfs 0.635 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.68' Max Vel=5.50 fps Inflow=6.66 cfs 0.587 af
36.0" Round Pipe n=0.011 L=121.0' S=0.0055 '/' Capacity=58.66 cfs Outflow=6.53 cfs 0.587 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=72.0' S=0.0058 '/' Capacity=60.20 cfs Outflow=0.00 cfs 0.000 af

Reach DMH100: TO DMH-A Avg. Flow Depth=0.54' Max Vel=8.43 fps Inflow=4.87 cfs 0.428 af
18.0" Round Pipe n=0.011 L=70.0' S=0.0200 '/' Capacity=17.56 cfs Outflow=4.80 cfs 0.428 af

Reach DMH101: TO DMH#100 Avg. Flow Depth=0.47' Max Vel=7.63 fps Inflow=3.19 cfs 0.281 af
15.0" Round Pipe n=0.011 L=5.0' S=0.0200 '/' Capacity=10.80 cfs Outflow=3.18 cfs 0.281 af

Reach DMH102: TO UGS#1A Avg. Flow Depth=0.52' Max Vel=6.82 fps Inflow=3.32 cfs 0.267 af
15.0" Round Pipe n=0.013 L=5.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=3.32 cfs 0.267 af

Reach DMH103: TO CMH#2 Avg. Flow Depth=0.67' Max Vel=7.75 fps Inflow=5.90 cfs 0.506 af
18.0" Round Pipe n=0.011 L=154.0' S=0.0136 '/' Capacity=14.50 cfs Outflow=5.87 cfs 0.506 af

Reach DMH104: TO DMH#104 Avg. Flow Depth=0.32' Max Vel=4.38 fps Inflow=1.07 cfs 0.087 af
15.0" Round Pipe n=0.011 L=120.0' S=0.0100 '/' Capacity=7.63 cfs Outflow=1.05 cfs 0.087 af

Reach DMH105: TO DMH#104 Avg. Flow Depth=0.16' Max Vel=2.82 fps Inflow=0.25 cfs 0.021 af
15.0" Round Pipe n=0.011 L=187.0' S=0.0096 '/' Capacity=7.49 cfs Outflow=0.24 cfs 0.021 af

Reach DMH106: TO DMH#105 Avg. Flow Depth=0.14' Max Vel=3.81 fps Inflow=0.26 cfs 0.021 af
12.0" Round Pipe n=0.011 L=57.0' S=0.0211 '/' Capacity=6.11 cfs Outflow=0.25 cfs 0.021 af

Reach DMH107: TO DMH#100 Avg. Flow Depth=0.38' Max Vel=6.27 fps Inflow=1.73 cfs 0.147 af
12.0" Round Pipe n=0.011 L=78.0' S=0.0179 '/' Capacity=5.64 cfs Outflow=1.73 cfs 0.147 af

Reach DMH108: TO DMH#107 Avg. Flow Depth=0.35' Max Vel=4.69 fps Inflow=1.15 cfs 0.096 af
12.0" Round Pipe n=0.011 L=45.0' S=0.0111 '/' Capacity=4.44 cfs Outflow=1.14 cfs 0.096 af

Reach DMH109: TO DMH#110 Avg. Flow Depth=0.38' Max Vel=7.90 fps Inflow=2.14 cfs 0.172 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=2.14 cfs 0.172 af

Reach DMH109A: TO DMH109 Avg. Flow Depth=0.29' Max Vel=4.08 fps Inflow=0.77 cfs 0.060 af
12.0" Round Pipe n=0.013 L=35.0' S=0.0143 '/' Capacity=4.26 cfs Outflow=0.76 cfs 0.060 af

Reach DMH110: TO UGS#2A Avg. Flow Depth=0.40' Max Vel=7.21 fps Inflow=2.14 cfs 0.172 af
12.0" Round Pipe n=0.013 L=24.0' S=0.0313 '/' Capacity=6.30 cfs Outflow=2.13 cfs 0.172 af

Reach DMH111: TO DMH#112 Avg. Flow Depth=0.41' Max Vel=6.23 fps Inflow=1.88 cfs 0.156 af
12.0" Round Pipe n=0.013 L=66.0' S=0.0227 '/' Capacity=5.37 cfs Outflow=1.87 cfs 0.156 af

Reach DMH112: TO DMH#113 Avg. Flow Depth=0.43' Max Vel=4.83 fps Inflow=2.04 cfs 0.325 af
18.0" Round Pipe n=0.013 L=35.0' S=0.0114 '/' Capacity=11.23 cfs Outflow=2.03 cfs 0.325 af

Reach DMH113: TO DMH#114 Avg. Flow Depth=0.52' Max Vel=6.26 fps Inflow=3.37 cfs 0.430 af
18.0" Round Pipe n=0.013 L=28.0' S=0.0161 '/' Capacity=13.32 cfs Outflow=3.36 cfs 0.430 af

Reach DMH114: TO DMH-K1 Avg. Flow Depth=0.43' Max Vel=7.95 fps Inflow=3.36 cfs 0.430 af
18.0" Round Pipe n=0.013 L=8.0' S=0.0313 '/' Capacity=18.57 cfs Outflow=3.36 cfs 0.430 af

Reach DMHR1: TO DMH#104 Avg. Flow Depth=0.40' Max Vel=6.43 fps Inflow=1.89 cfs 0.145 af
12.0" Round Pipe n=0.012 L=94.0' S=0.0213 '/' Capacity=5.63 cfs Outflow=1.87 cfs 0.145 af

Reach DMHR2: TO DMH#R2 Avg. Flow Depth=0.45' Max Vel=5.55 fps Inflow=1.93 cfs 0.145 af
12.0" Round Pipe n=0.010 L=131.0' S=0.0099 '/' Capacity=4.61 cfs Outflow=1.89 cfs 0.145 af

Reach DP#6: OFFSITE LOW POINT Inflow=0.09 cfs 0.008 af
Outflow=0.09 cfs 0.008 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=12.85 cfs 1.159 af
Outflow=12.85 cfs 1.159 af

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

Reach DP4: DMH-K1 Inflow=3.36 cfs 0.430 af
Outflow=3.36 cfs 0.430 af

Reach DP5: DCB-H

Reach RF1: TO DMH#101 Avg. Flow Depth=0.54' Max Vel=7.32 fps Inflow=3.21 cfs 0.281 af
12.0" Round Pipe n=0.012 L=24.0' S=0.0208 '/' Capacity=5.57 cfs Outflow=3.19 cfs 0.281 af

Reach RF2: TO DMH#101 Avg. Flow Depth=0.00' Max Vel=0.00 fps
10.0" Round Pipe n=0.012 L=24.0' S=0.0208 '/' Capacity=3.43 cfs Outflow=0.00 cfs 0.000 af

Reach UGS1A: TO UGS#1 Inflow=3.32 cfs 0.267 af
Outflow=3.32 cfs 0.267 af

Reach UGS1B: TO DMH106 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=17.0' S=0.0118 '/' Capacity=4.57 cfs Outflow=0.00 cfs 0.000 af

Reach UGS2A: TO UGS#2 Inflow=2.13 cfs 0.172 af
Outflow=2.13 cfs 0.172 af

Reach UGS2B: TO DMH#112 Avg. Flow Depth=0.14' Max Vel=2.23 fps Inflow=0.17 cfs 0.170 af
15.0" Round Pipe n=0.013 L=84.0' S=0.0095 '/' Capacity=6.30 cfs Outflow=0.17 cfs 0.170 af

Pond DMH-B: TO DMH-D Peak Elev=0.00'
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Primary=0.00 cfs 0.000 af

Pond UGS1: TO DMH#106 Peak Elev=467.24' Storage=0.102 af Inflow=3.32 cfs 0.267 af
Discarded=0.24 cfs 0.267 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.267 af

Pond UGS2: TO UGS#2B Peak Elev=464.03' Storage=0.071 af Inflow=2.13 cfs 0.172 af
Outflow=0.17 cfs 0.170 af

Total Runoff Area = 8.235 ac Runoff Volume = 1.933 af Average Runoff Depth = 2.82"
29.06% Pervious = 2.393 ac 70.94% Impervious = 5.842 ac

Summary for Subcatchment P100A: TO 12" ROOF DRAIN

[49] Hint: Tc<2dt may require smaller dt

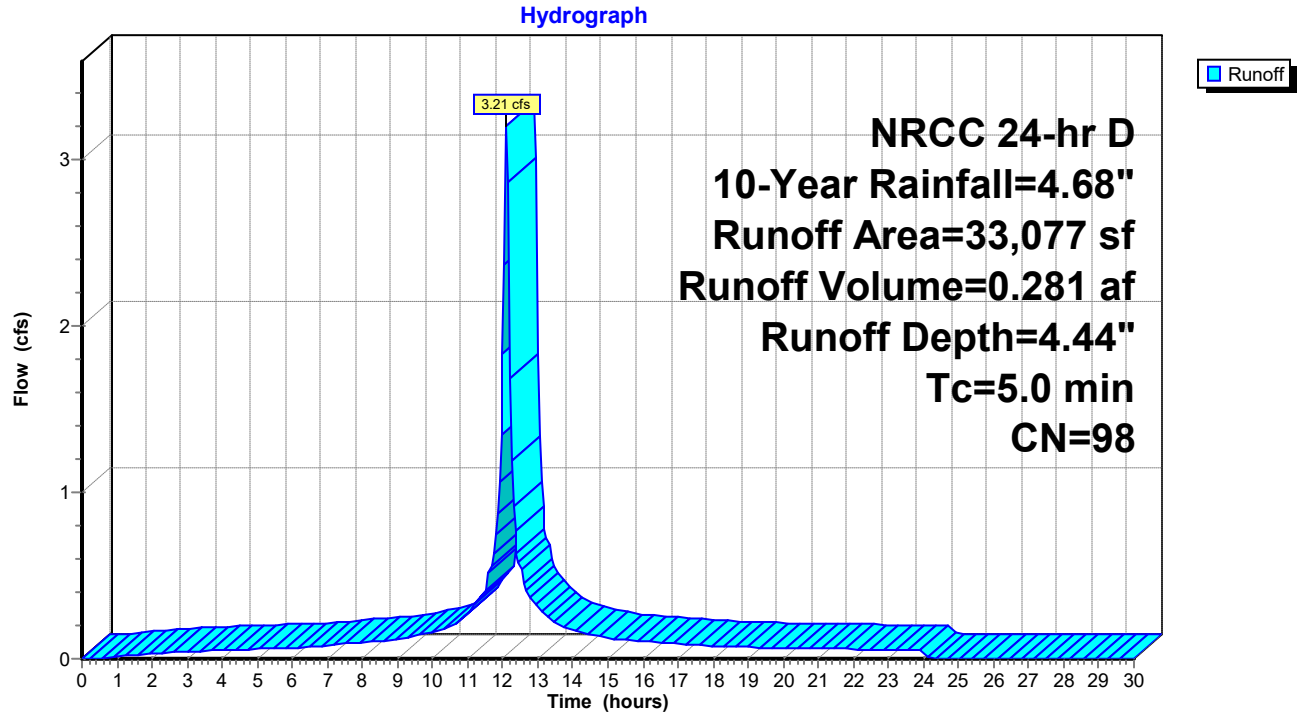
Runoff = 3.21 cfs @ 12.11 hrs, Volume= 0.281 af, Depth= 4.44"
Routed to Reach RF1 : TO DMH#101

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
33,077	98	Paved parking, HSG A
33,077		100.00% Impervious Area

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

Subcatchment P100A: TO 12" ROOF DRAIN



Summary for Subcatchment P100B: TO YARD DRAIN

[49] Hint: Tc<2dt may require smaller dt

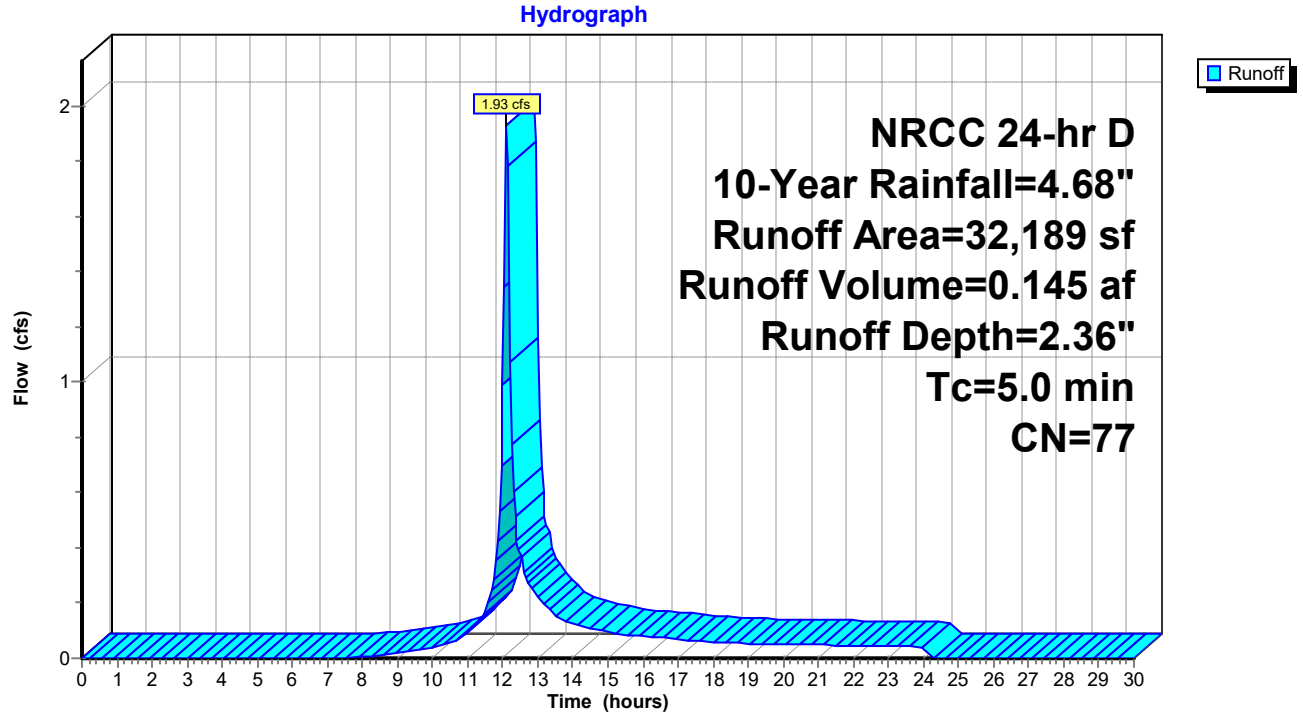
Runoff = 1.93 cfs @ 12.12 hrs, Volume= 0.145 af, Depth= 2.36"
Routed to Reach DMHR2 : TO DMH#R2

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
32,189	77	1/8 acre lots, 65% imp, HSG A
11,266		35.00% Pervious Area
20,923		65.00% Impervious Area

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

Subcatchment P100B: TO YARD DRAIN



Summary for Subcatchment P100D: TO 12" ROOF DRAIN

[49] Hint: Tc<2dt may require smaller dt

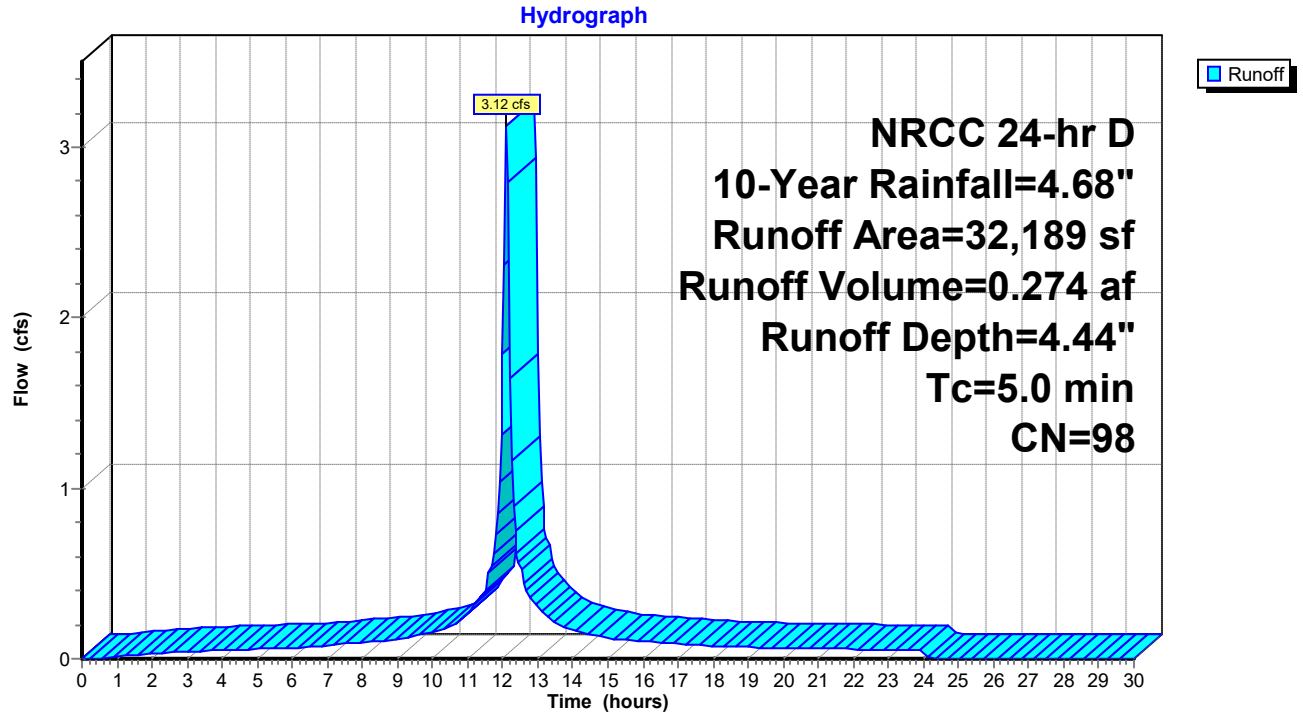
Runoff = 3.12 cfs @ 12.11 hrs, Volume= 0.274 af, Depth= 4.44"
Routed to Reach DMH103 : TO CMH#2

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
32,189	98	Paved parking, HSG A
32,189		100.00% Impervious Area

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

Subcatchment P100D: TO 12" ROOF DRAIN



Summary for Subcatchment P105: TO DCB#5

[49] Hint: Tc<2dt may require smaller dt

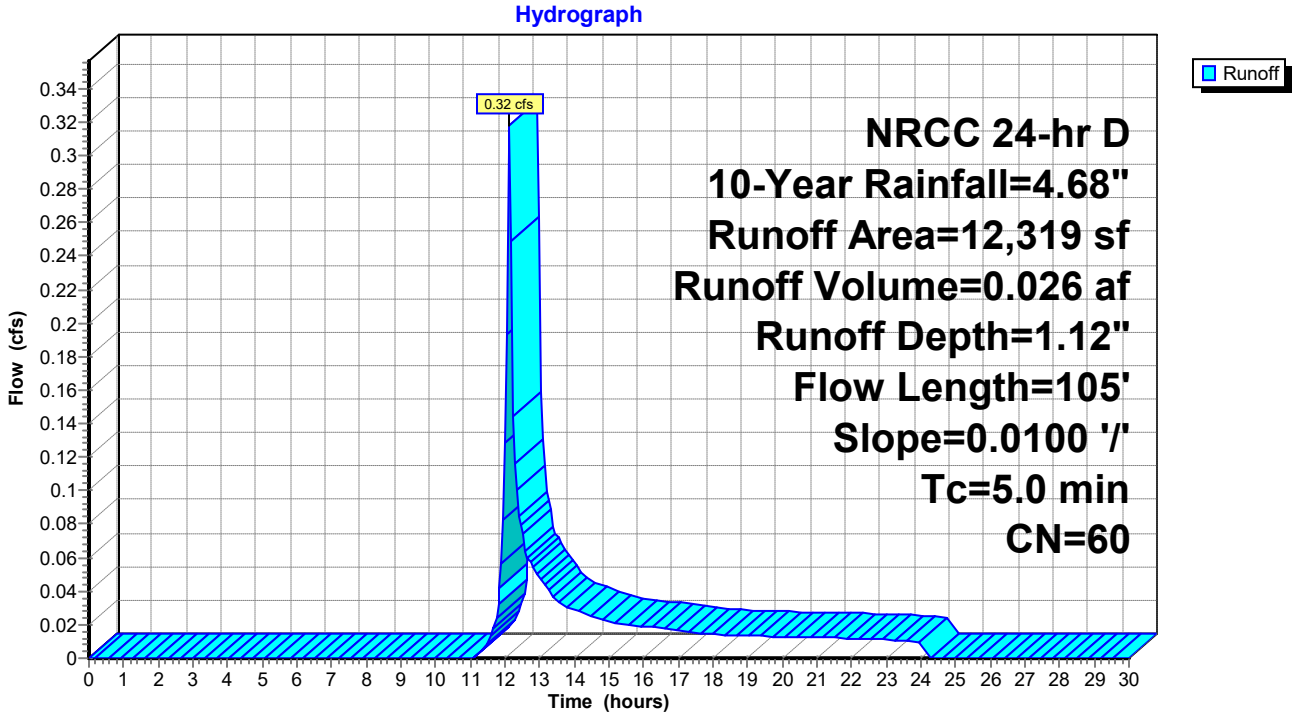
Runoff = 0.32 cfs @ 12.13 hrs, Volume= 0.026 af, Depth= 1.12"
Routed to Reach DCB5 : TO DMH#108

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
7,950	39	>75% Grass cover, Good, HSG A
4,369	98	Paved parking, HSG A
12,319	60	Weighted Average
7,950		64.53% Pervious Area
4,369		35.47% 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 P105: TO DCB#5



Summary for Subcatchment P106: TO DCB#6

[49] Hint: Tc<2dt may require smaller dt

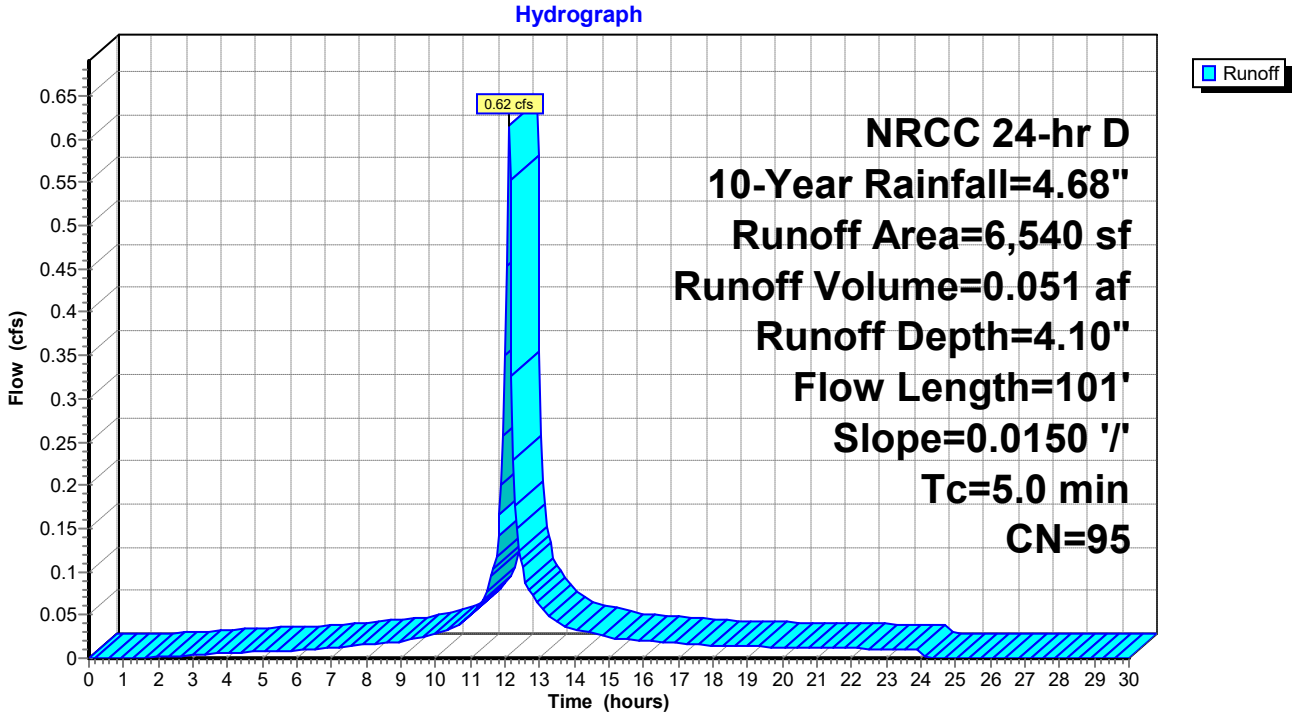
Runoff = 0.62 cfs @ 12.11 hrs, Volume= 0.051 af, Depth= 4.10"
Routed to Reach DCB6 : TO DMH#107

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
375	39	>75% Grass cover, Good, HSG A
6,165	98	Paved parking, HSG A
6,540	95	Weighted Average
375		5.73% Pervious Area
6,165		94.27% 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"
0.3	51	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	101	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P106: TO DCB#6



Summary for Subcatchment P107: TO DCB#7

[49] Hint: Tc<2dt may require smaller dt

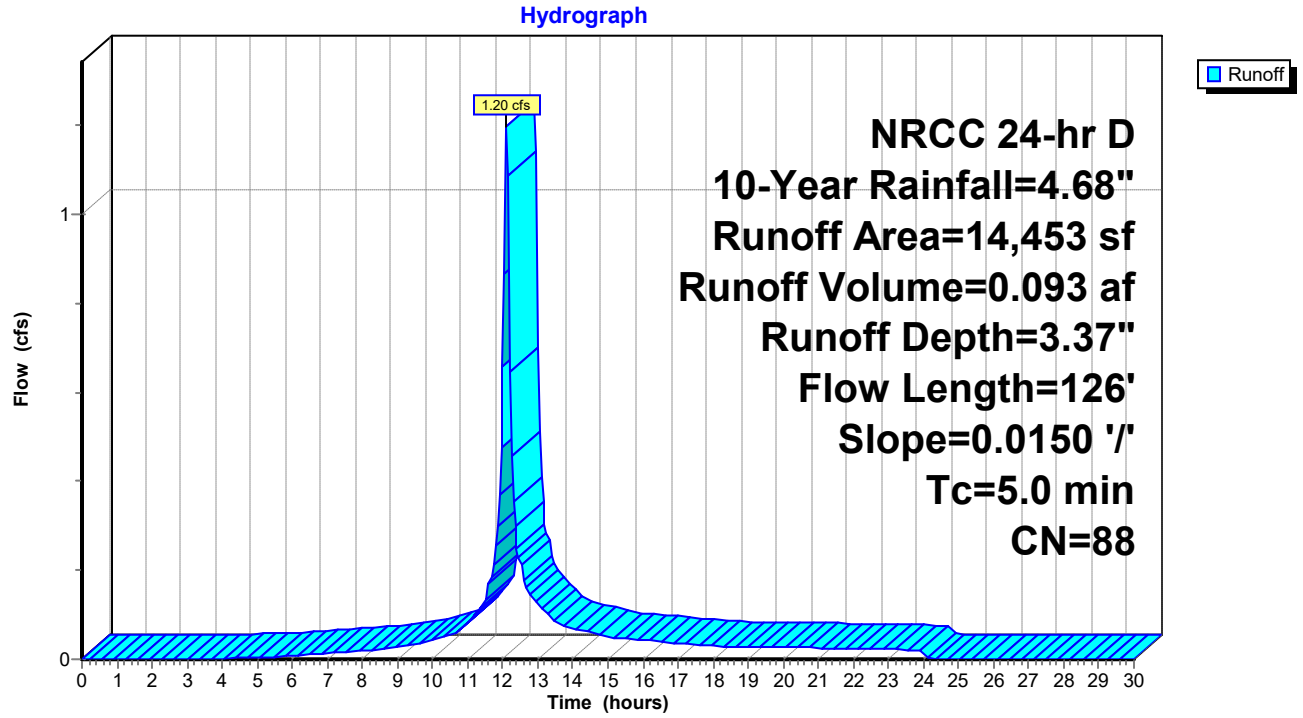
Runoff = 1.20 cfs @ 12.11 hrs, Volume= 0.093 af, Depth= 3.37"
Routed to Reach DCB7 : TO DMH#102

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
2,411	39	>75% Grass cover, Good, HSG A
12,042	98	Paved parking, HSG A
14,453	88	Weighted Average
2,411		16.68% Pervious Area
12,042		83.32% 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"
0.7	42	0.0150	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	76	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.7	126	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P107: TO DCB#7



Summary for Subcatchment P108: TO DCB#8

[49] Hint: Tc<2dt may require smaller dt

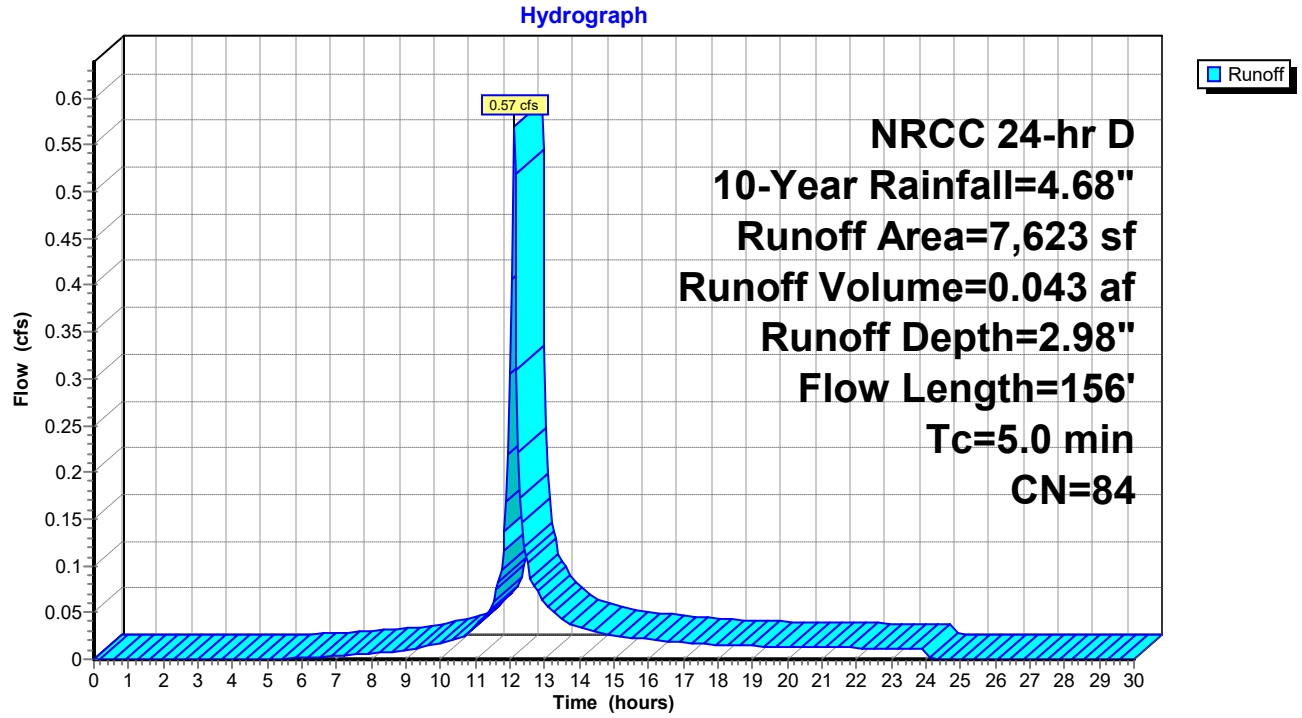
Runoff = 0.57 cfs @ 12.11 hrs, Volume= 0.043 af, Depth= 2.98"
Routed to Reach DCB8 : TO DMH#103

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
1,804	39	>75% Grass cover, Good, HSG A
5,819	98	Paved parking, HSG A
7,623	84	Weighted Average
1,804		23.67% Pervious Area
5,819		76.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	16	0.0150	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	34	0.0100	0.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	106	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.2	156	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P108: TO DCB#8



Summary for Subcatchment P109: TO DCB#9

[49] Hint: Tc<2dt may require smaller dt

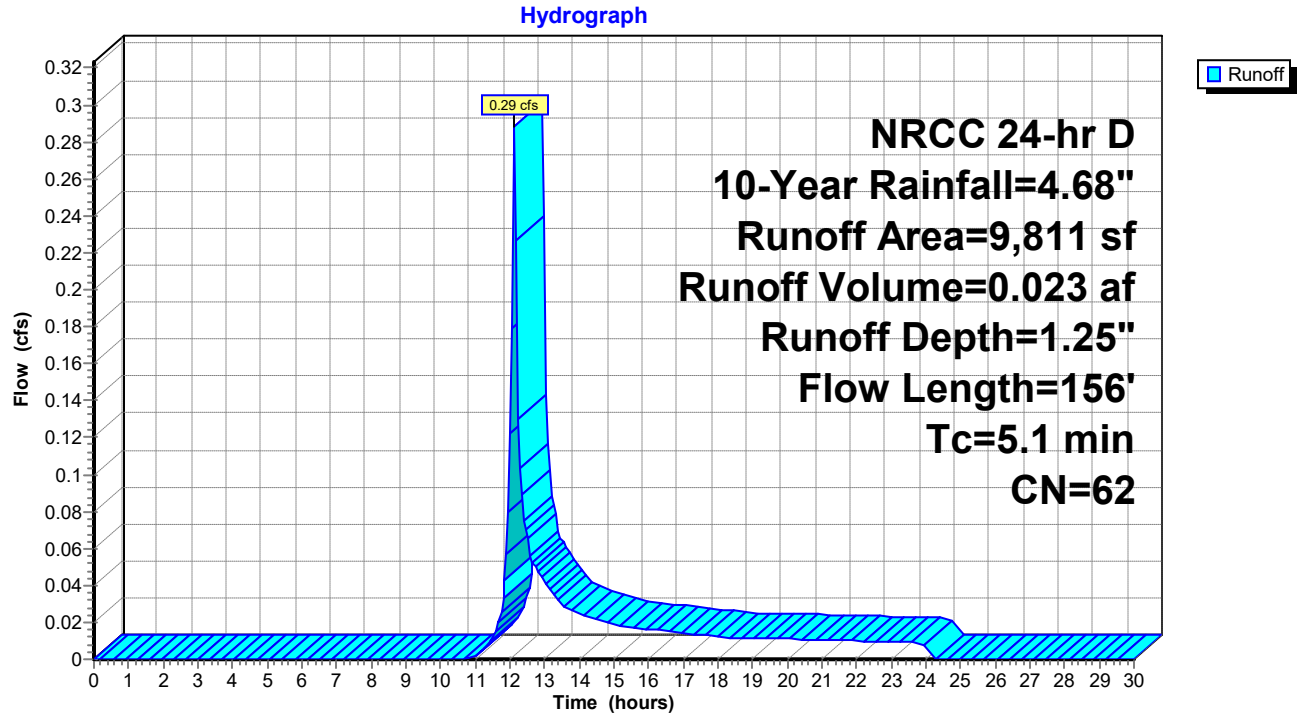
Runoff = 0.29 cfs @ 12.13 hrs, Volume= 0.023 af, Depth= 1.25"
Routed to Reach DCB9 : TO DMH#103

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
5,927	39	>75% Grass cover, Good, HSG A
3,884	98	Paved parking, HSG A
9,811	62	Weighted Average
5,927		60.41% Pervious Area
3,884		39.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	25	0.0150	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.5	25	0.0100	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	106	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.1	156	Total			

Subcatchment P109: TO DCB#9



Summary for Subcatchment P11: TO DP#1

[49] Hint: Tc<2dt may require smaller dt

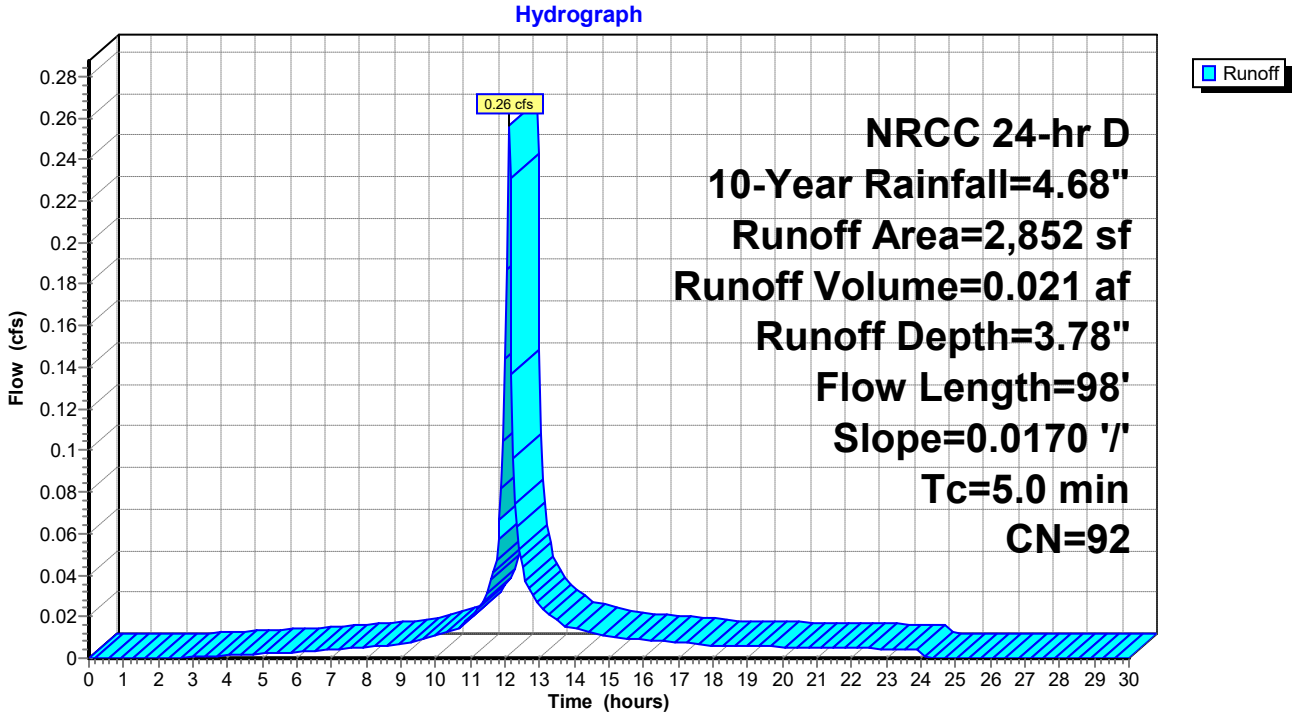
Runoff = 0.26 cfs @ 12.11 hrs, Volume= 0.021 af, Depth= 3.78"
Routed to Reach DP1 : GUTTER POINT FRANKLIN (WEST)

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 P110: TO DCB#10

[49] Hint: Tc<2dt may require smaller dt

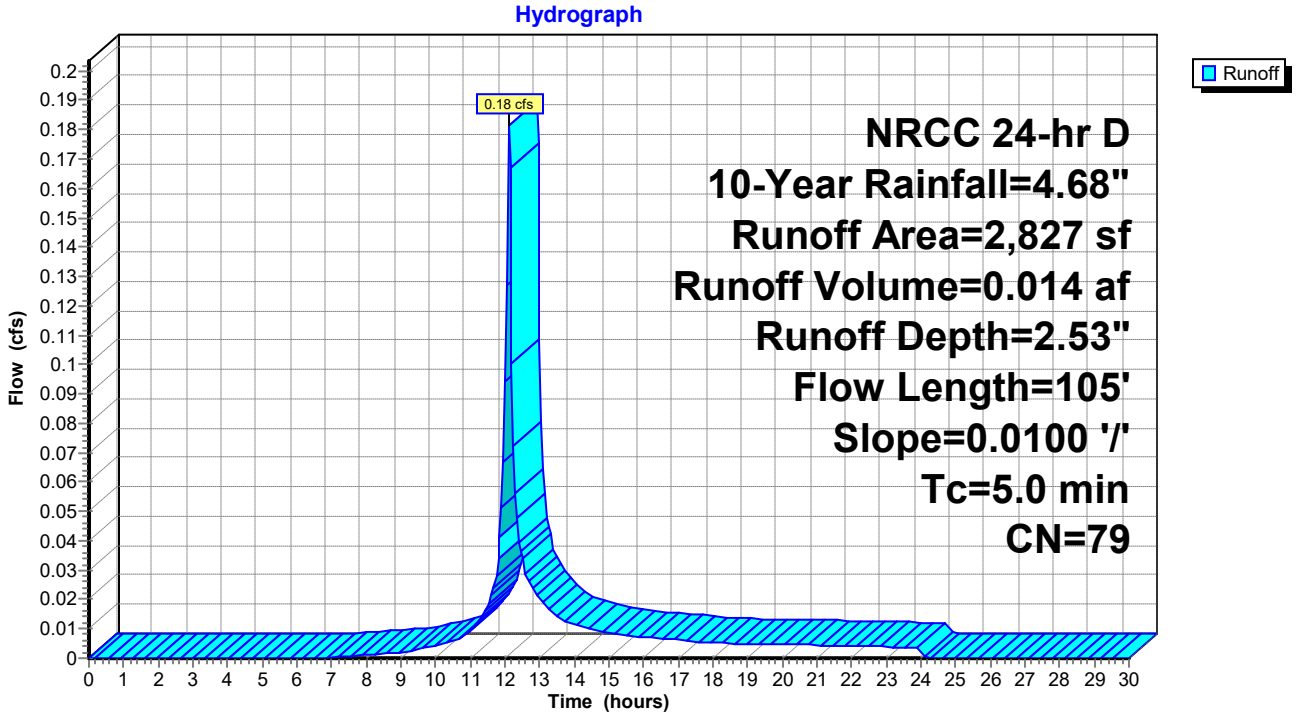
Runoff = 0.18 cfs @ 12.12 hrs, Volume= 0.014 af, Depth= 2.53"
Routed to Reach DCB10 : TO DMH#106

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
907	39	>75% Grass cover, Good, HSG A
1,920	98	Paved parking, HSG A
2,827	79	Weighted Average
907		32.08% Pervious Area
1,920		67.92% 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 P110: TO DCB#10



Summary for Subcatchment P111: TO DCB#11

[49] Hint: Tc<2dt may require smaller dt

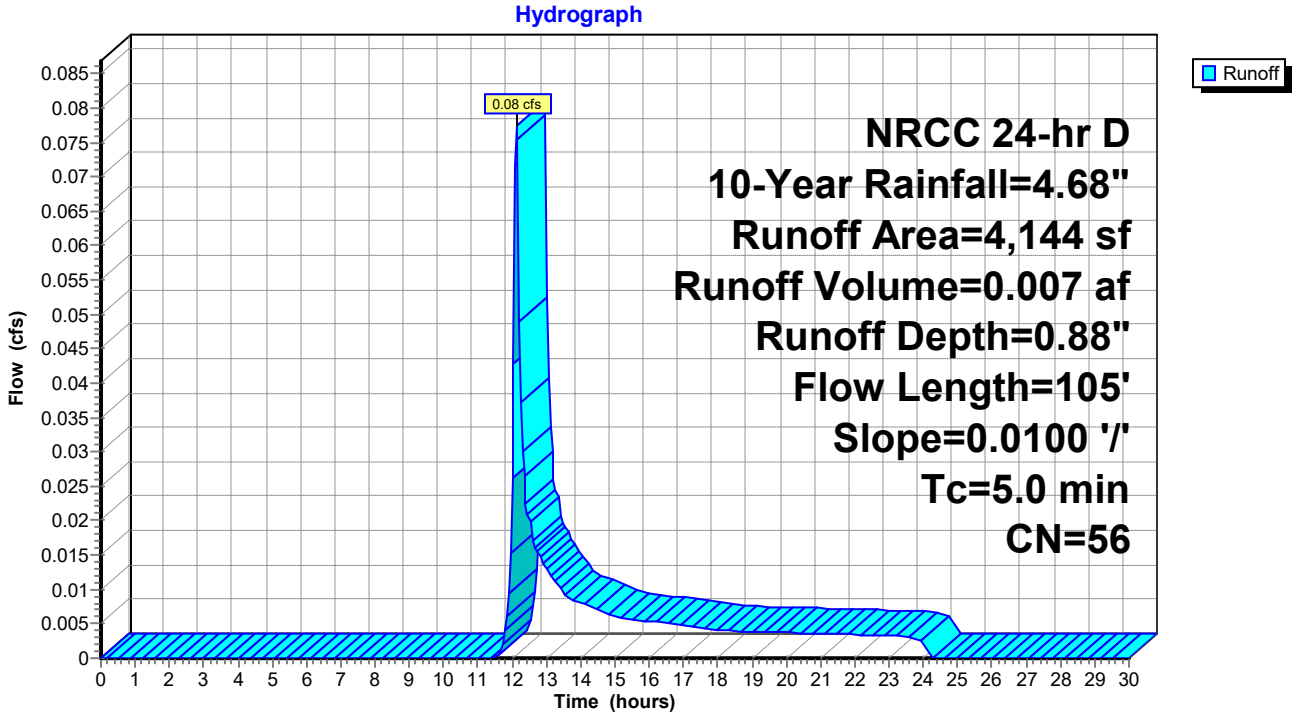
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 0.007 af, Depth= 0.88"
Routed to Reach DCB11 : TO DMH#103

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
2,953	39	>75% Grass cover, Good, HSG A
1,191	98	Paved parking, HSG A
4,144	56	Weighted Average
2,953		71.26% Pervious Area
1,191		28.74% 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 P111: TO DCB#11



Summary for Subcatchment P112: TO DCB#12

[49] Hint: Tc<2dt may require smaller dt

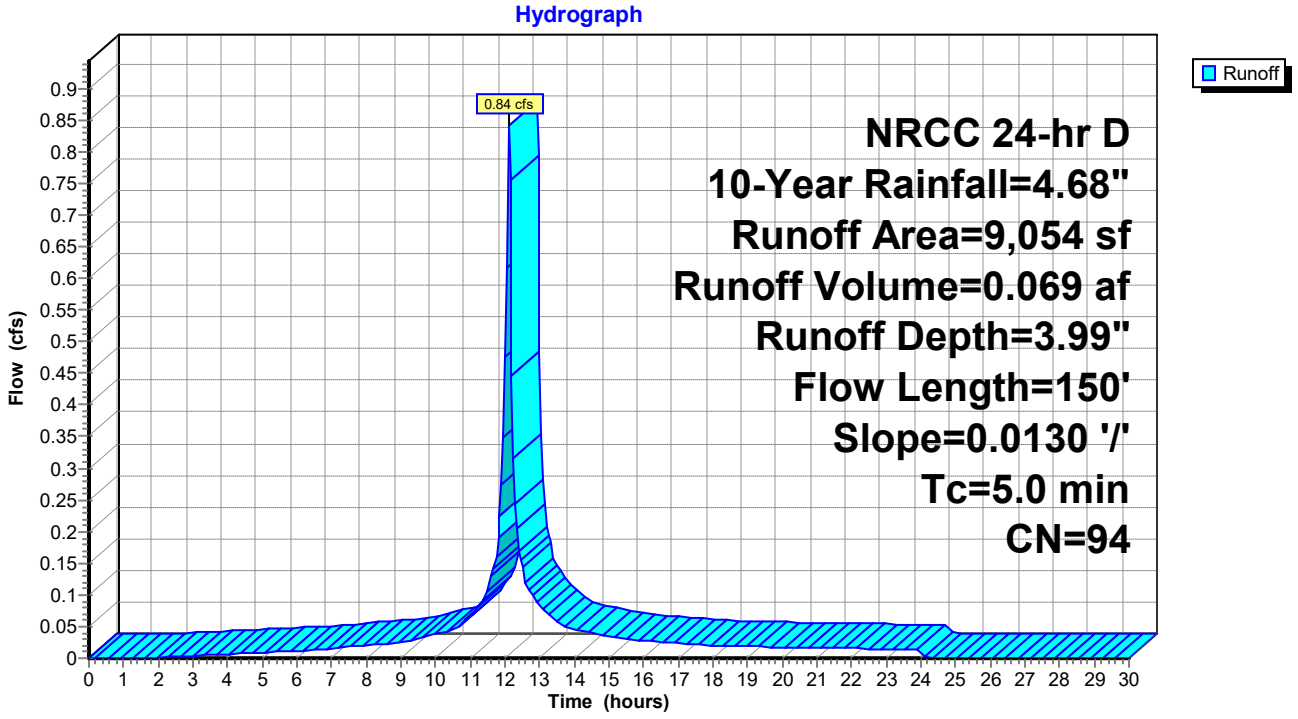
Runoff = 0.84 cfs @ 12.11 hrs, Volume= 0.069 af, Depth= 3.99"
Routed to Reach DCB12 : TO DMH#12

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
575	39	>75% Grass cover, Good, HSG A
8,479	98	Paved parking, HSG A
9,054	94	Weighted Average
575		6.35% Pervious Area
8,479		93.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0130	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	100	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P112: TO DCB#12



Summary for Subcatchment P113: TO DCB#13

[49] Hint: Tc<2dt may require smaller dt

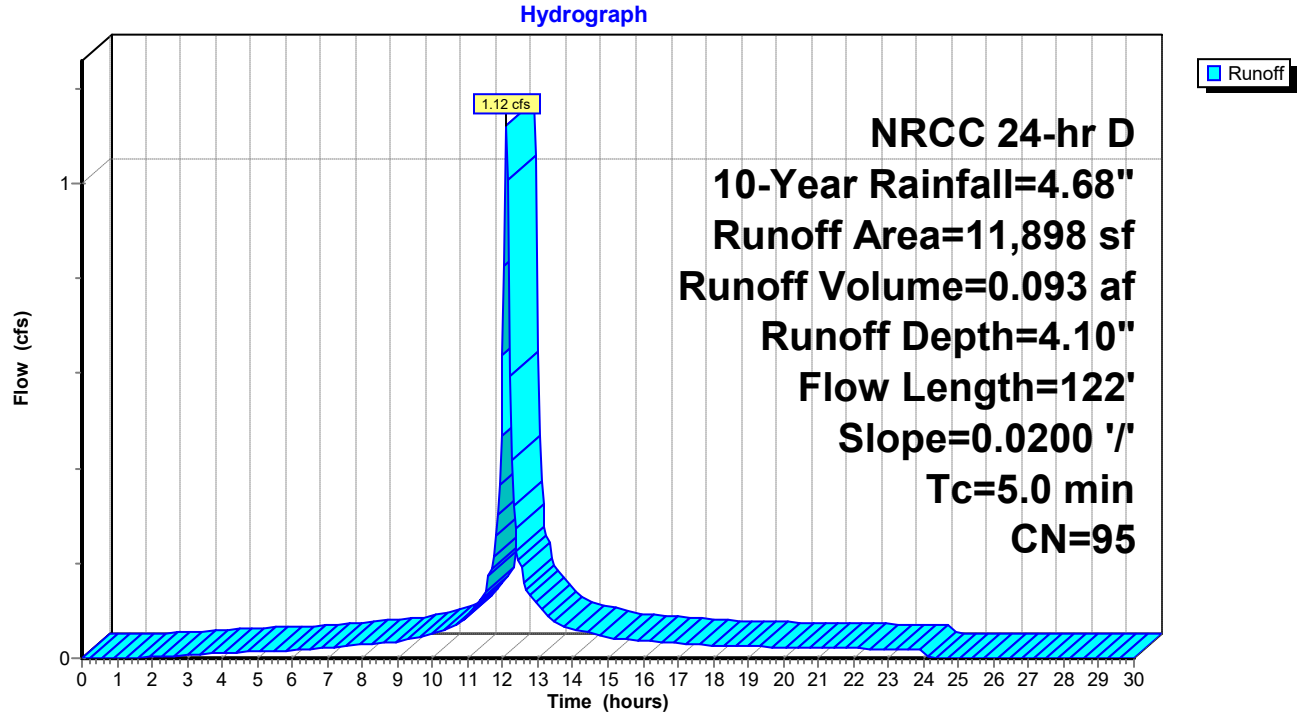
Runoff = 1.12 cfs @ 12.11 hrs, Volume= 0.093 af, Depth= 4.10"
Routed to Reach DCB13 : TO DMH#102

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
656	39	>75% Grass cover, Good, HSG A
11,242	98	Paved parking, HSG A
11,898	95	Weighted Average
656		5.51% Pervious Area
11,242		94.49% 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"
0.4	72	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	122	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P113: TO DCB#13



Summary for Subcatchment P114: TO DCB#14

[49] Hint: Tc<2dt may require smaller dt

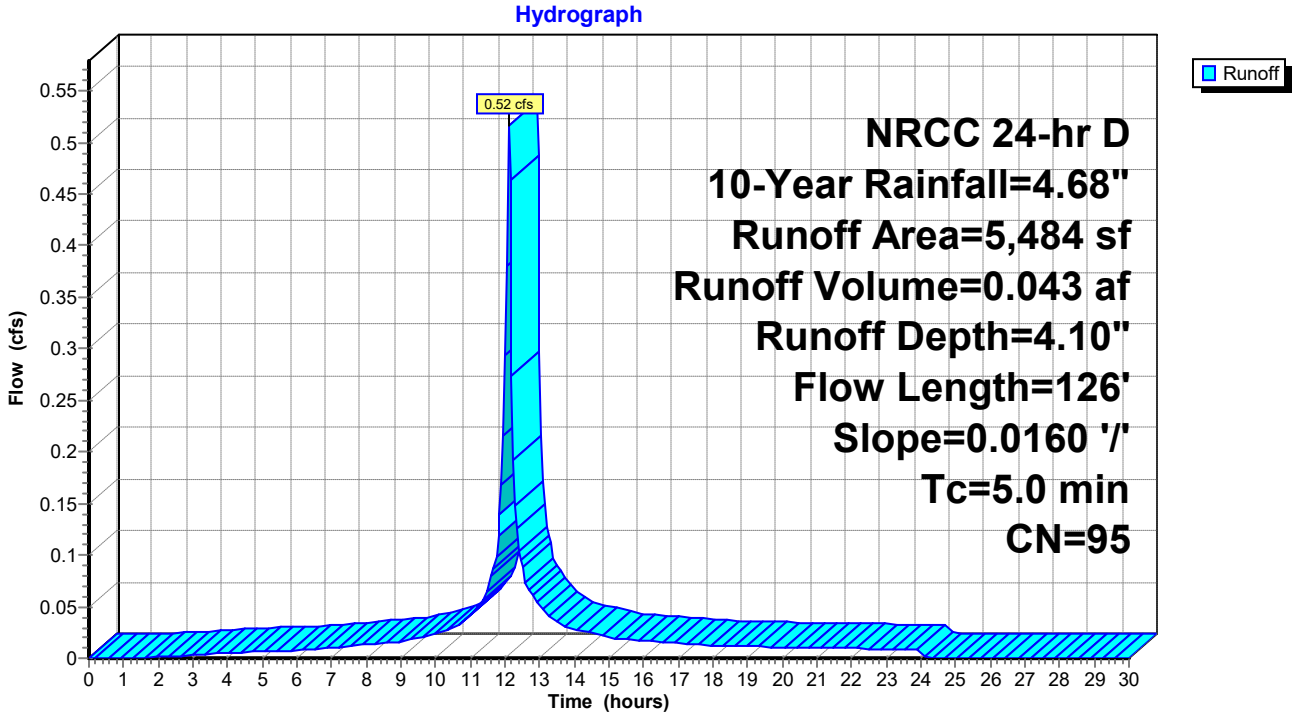
Runoff = 0.52 cfs @ 12.11 hrs, Volume= 0.043 af, Depth= 4.10"
Routed to Reach DCB14 : TO DMH#109

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
306	39	>75% Grass cover, Good, HSG A
5,178	98	Paved parking, HSG A
5,484	95	Weighted Average
306		5.58% Pervious Area
5,178		94.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0160	1.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	76	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	126	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P114: TO DCB#14



Summary for Subcatchment P115: TO DCB#15

[49] Hint: Tc<2dt may require smaller dt

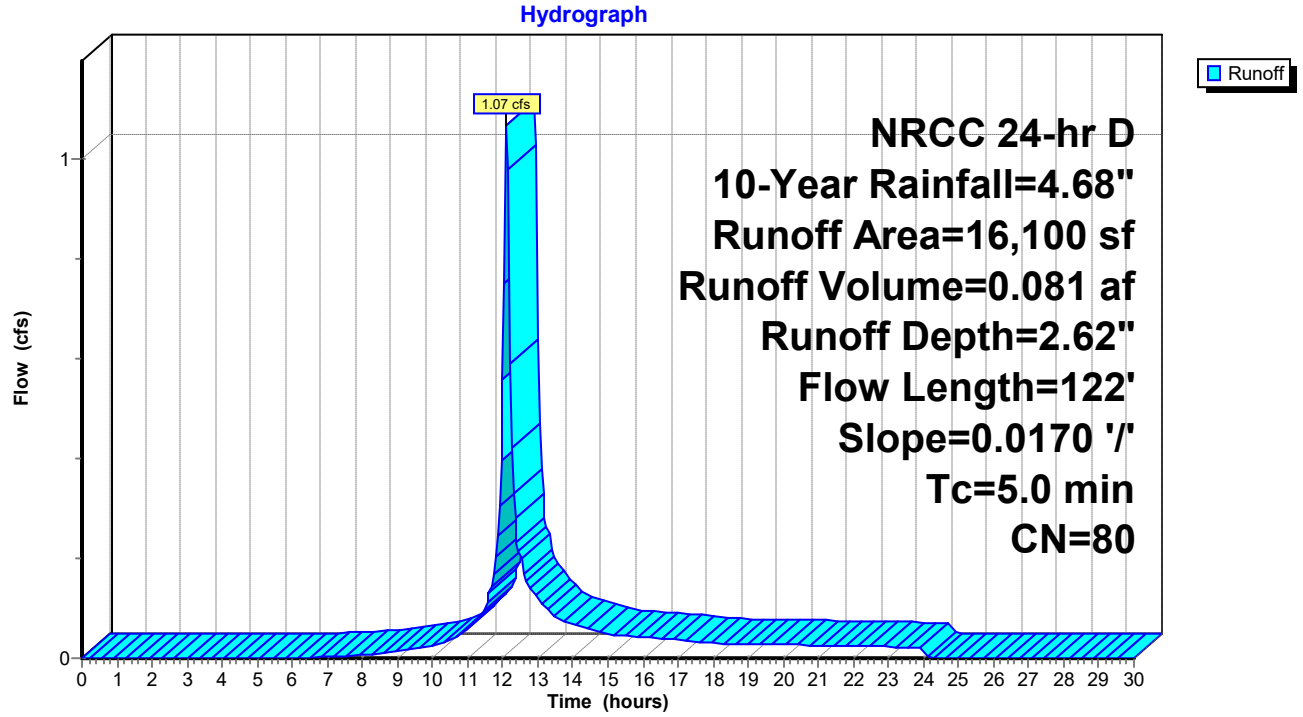
Runoff = 1.07 cfs @ 12.12 hrs, Volume= 0.081 af, Depth= 2.62"
Routed to Reach DCB15 : TO DMH#102

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
4,821	39	>75% Grass cover, Good, HSG A
11,279	98	Paved parking, HSG A
16,100	80	Weighted Average
4,821		29.94% Pervious Area
11,279		70.06% 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"
0.5	72	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	122	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P115: TO DCB#15



Summary for Subcatchment P116: TO DCB#25

[49] Hint: Tc<2dt may require smaller dt

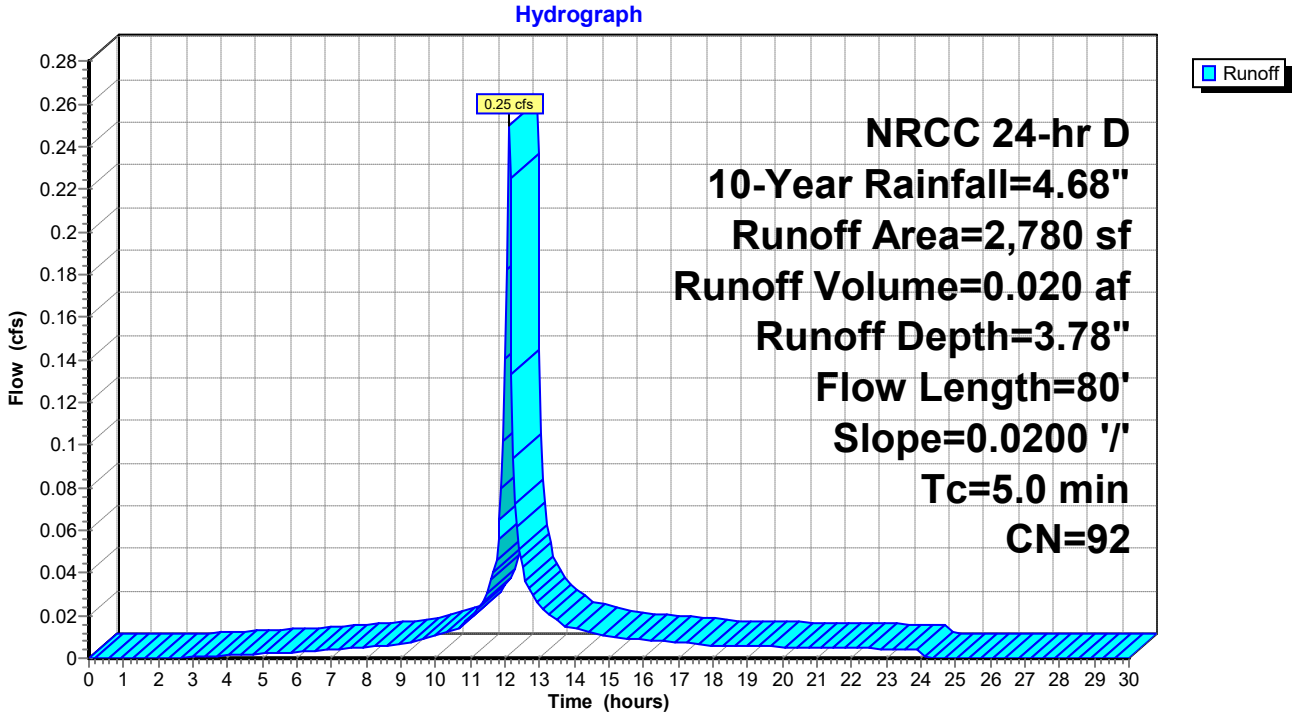
Runoff = 0.25 cfs @ 12.11 hrs, Volume= 0.020 af, Depth= 3.78"
Routed to Reach DCB25 : TO DMH#109A

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
297	39	>75% Grass cover, Good, HSG A
2,483	98	Paved parking, HSG A
2,780	92	Weighted Average
297		10.68% Pervious Area
2,483		89.32% 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"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	80	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P116: TO DCB#25



Summary for Subcatchment P117: TO DP#6

[49] Hint: Tc<2dt may require smaller dt

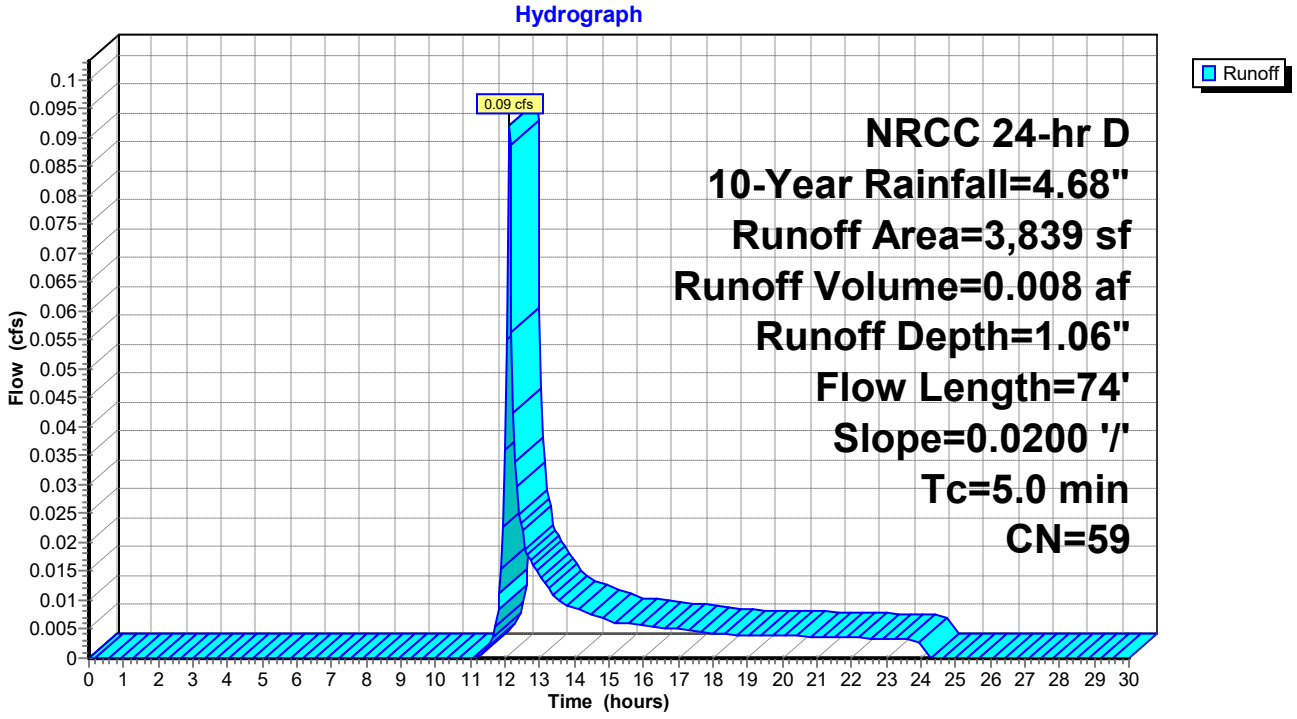
Runoff = 0.09 cfs @ 12.13 hrs, Volume= 0.008 af, Depth= 1.06"
Routed to Reach DP#6 : OFFSITE LOW POINT

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
2,555	39	>75% Grass cover, Good, HSG A
1,284	98	Paved parking, HSG A
3,839	59	Weighted Average
2,555		66.55% Pervious Area
1,284		33.45% 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 P117: TO DP#6



Summary for Subcatchment P119: TO DCB#19

[49] Hint: Tc<2dt may require smaller dt

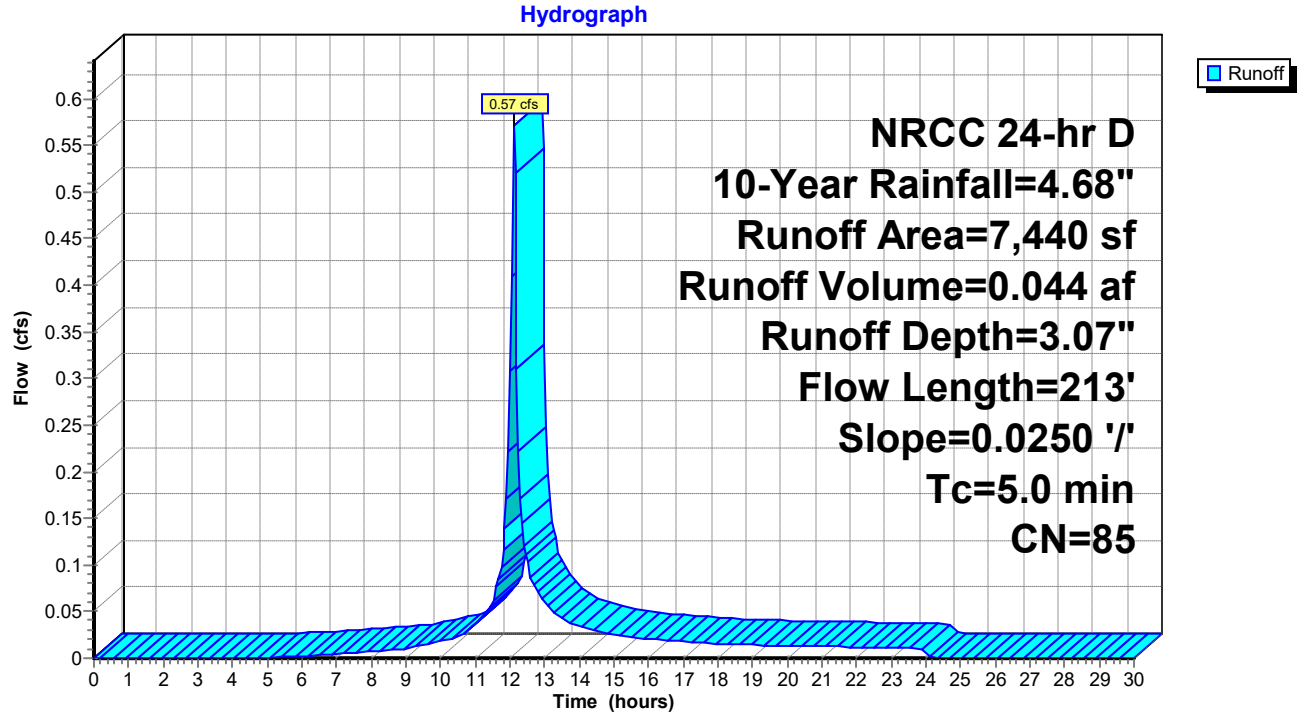
Runoff = 0.57 cfs @ 12.11 hrs, Volume= 0.044 af, Depth= 3.07"
Routed to Reach DCB19 : TO DMH#111

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
1,625	39	>75% Grass cover, Good, HSG A
5,815	98	Paved parking, HSG A
7,440	85	Weighted Average
1,625		21.84% Pervious Area
5,815		78.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	163	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	213	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P119: TO DCB#19



Summary for Subcatchment P12: TO DCB-A

[49] Hint: Tc<2dt may require smaller dt

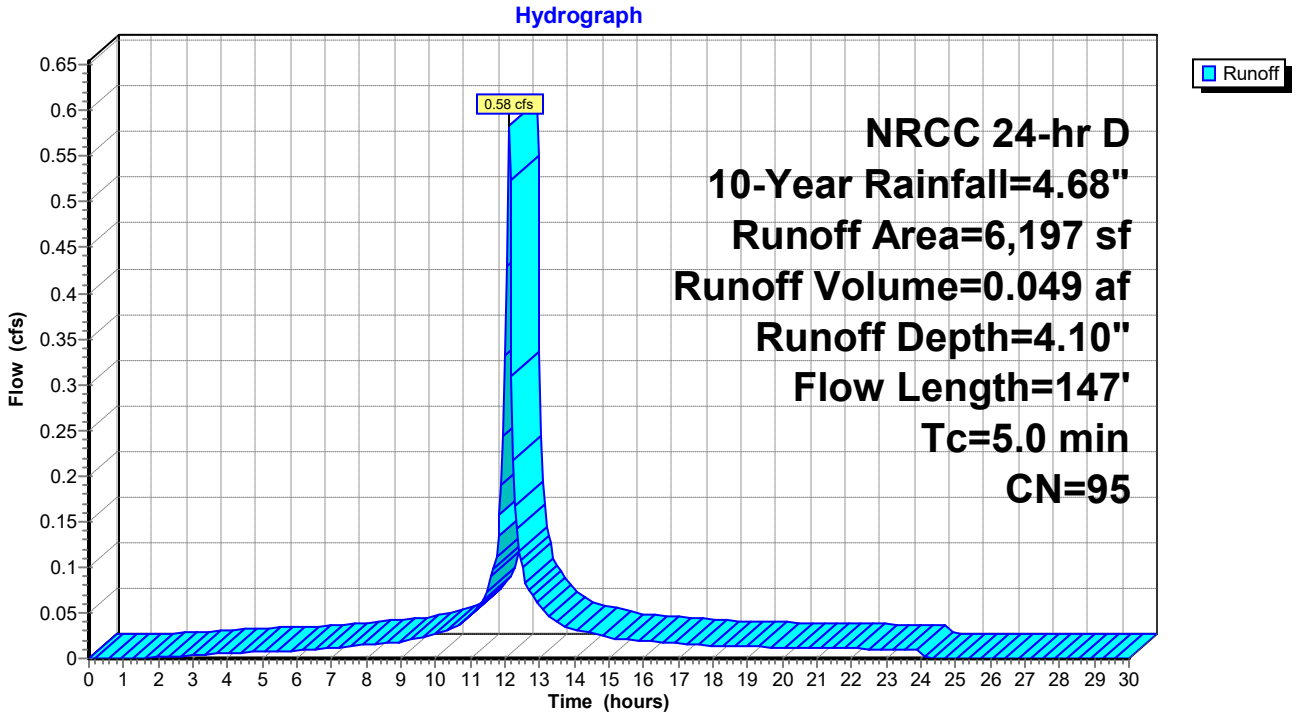
Runoff = 0.58 cfs @ 12.11 hrs, Volume= 0.049 af, Depth= 4.10"
Routed to Reach DCB-A : TO DMH-D

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
334	39	>75% Grass cover, Good, HSG A
5,863	98	Paved parking, HSG A
6,197	95	Weighted Average
334		5.39% Pervious Area
5,863		94.61% 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 P120: TO DCB#20

[49] Hint: Tc<2dt may require smaller dt

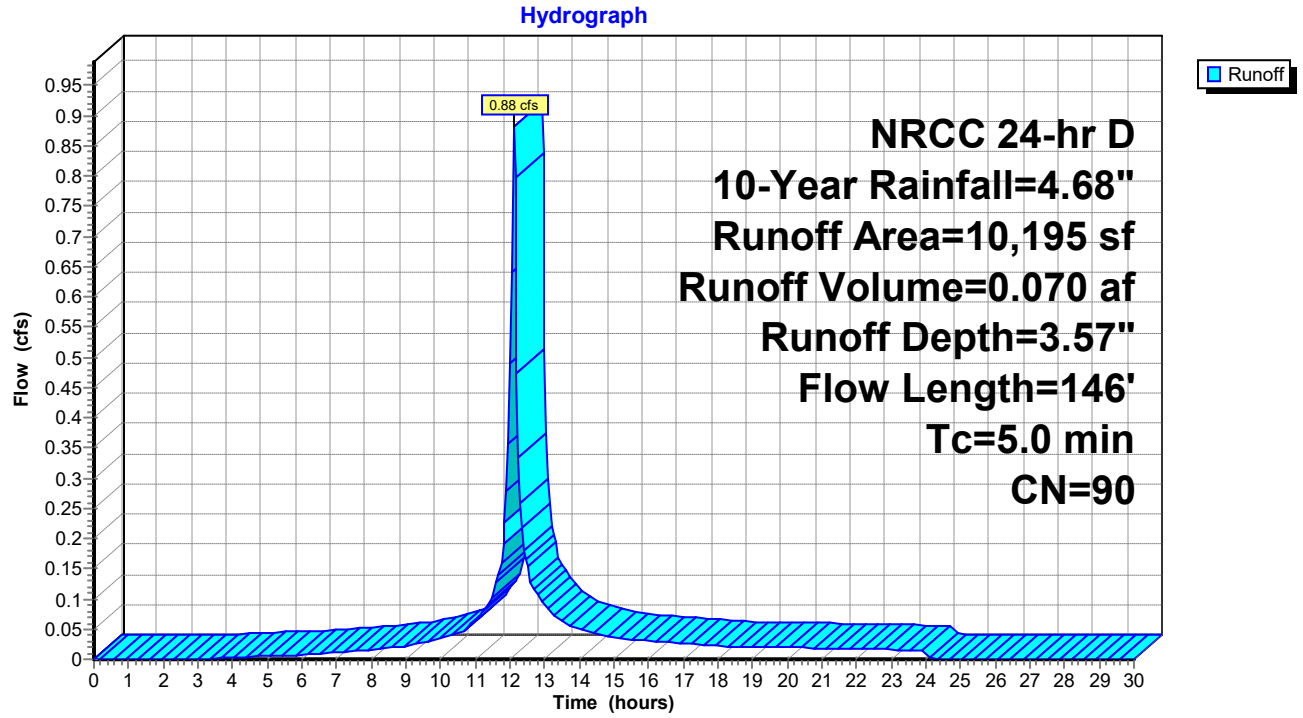
Runoff = 0.88 cfs @ 12.11 hrs, Volume= 0.070 af, Depth= 3.57"
Routed to Reach DCB20 : TO DMH#109

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
1,453	39	>75% Grass cover, Good, HSG A
8,742	98	Paved parking, HSG A
10,195	90	Weighted Average
1,453		14.25% Pervious Area
8,742		85.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	5	0.0200	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	45	0.0150	1.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	96	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.2	146	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P120: TO DCB#20



Summary for Subcatchment P121: TO DCB#21

[49] Hint: Tc<2dt may require smaller dt

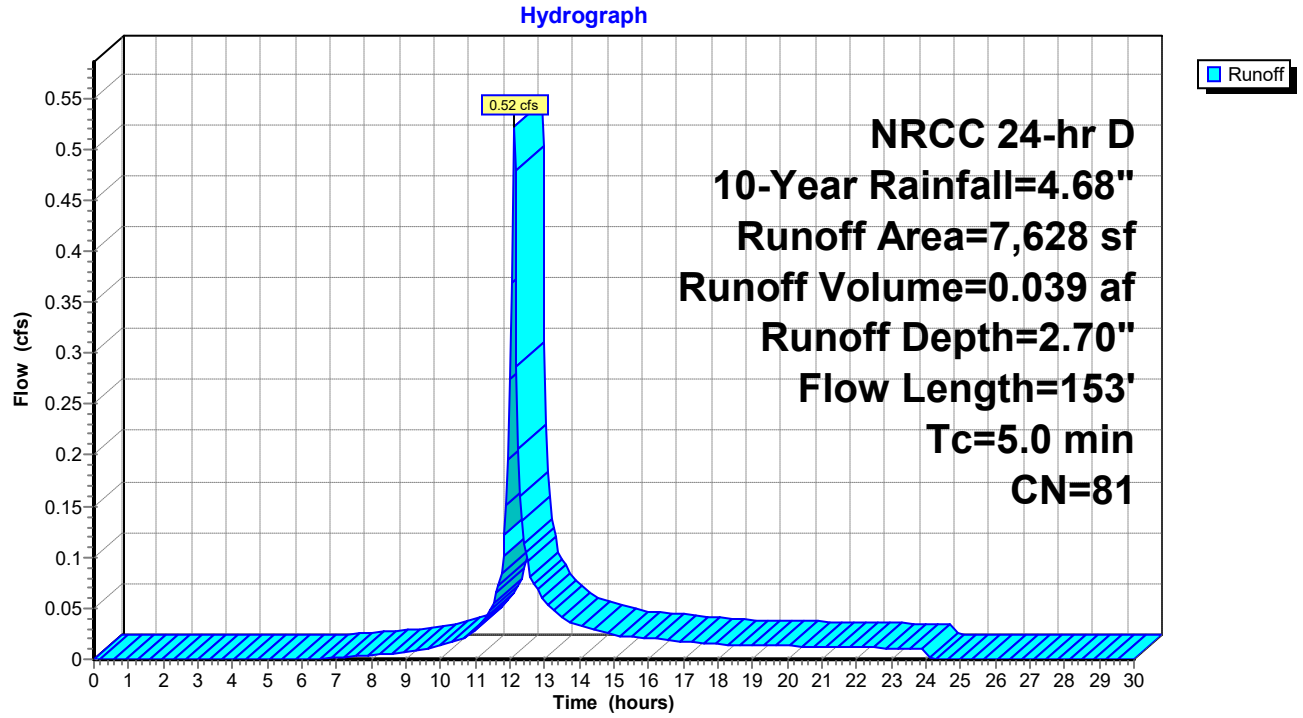
Runoff = 0.52 cfs @ 12.12 hrs, Volume= 0.039 af, Depth= 2.70"
Routed to Reach DCB21 : TO DMH#109A

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
2,211	39	>75% Grass cover, Good, HSG A
5,417	98	Paved parking, HSG A
7,628	81	Weighted Average
2,211		28.99% Pervious Area
5,417		71.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.1000	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	38	0.0100	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	103	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.5	153	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P121: TO DCB#21



Summary for Subcatchment P122: TO DCB#22

[49] Hint: Tc<2dt may require smaller dt

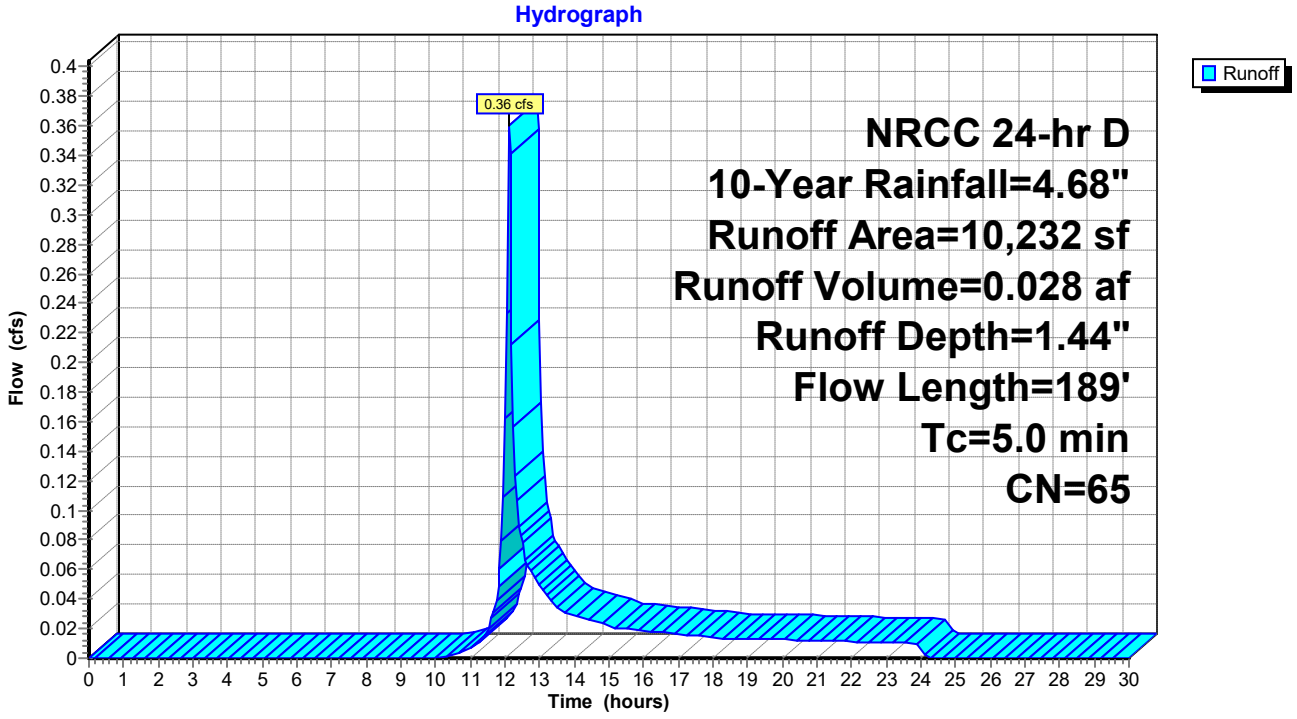
Runoff = 0.36 cfs @ 12.12 hrs, Volume= 0.028 af, Depth= 1.44"
Routed to Reach DCB22 : TO DMH#111

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
5,643	39	>75% Grass cover, Good, HSG A
4,589	98	Paved parking, HSG A
10,232	65	Weighted Average
5,643		55.15% Pervious Area
4,589		44.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	50	0.1000	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	139	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	189	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P122: TO DCB#22



Summary for Subcatchment P123: TO DCB#23

[49] Hint: Tc<2dt may require smaller dt

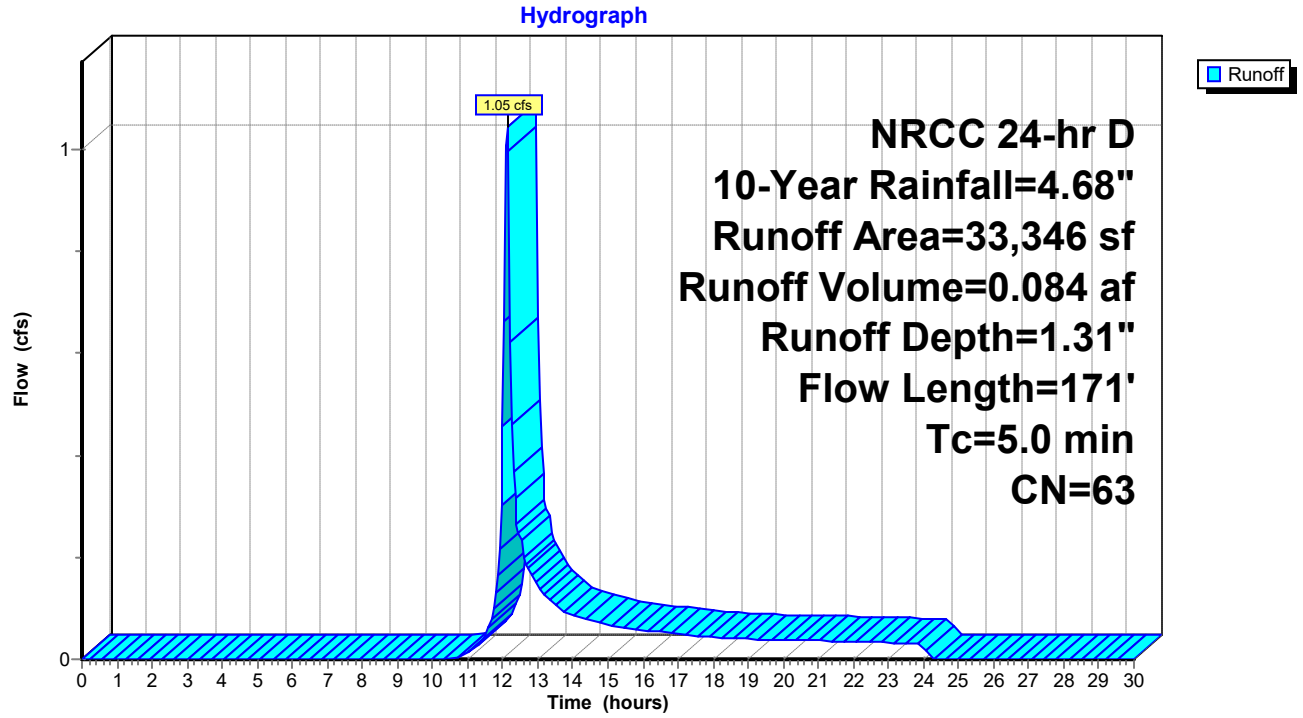
Runoff = 1.05 cfs @ 12.12 hrs, Volume= 0.084 af, Depth= 1.31"
Routed to Reach DCB23 : TO DMH#111

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
20,008	39	>75% Grass cover, Good, HSG A
13,338	98	Paved parking, HSG A
33,346	63	Weighted Average
20,008		60.00% Pervious Area
13,338		40.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	40	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	10	0.0200	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	121	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	171	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P123: TO DCB#23



Summary for Subcatchment P14: TO DCB-B

[49] Hint: Tc<2dt may require smaller dt

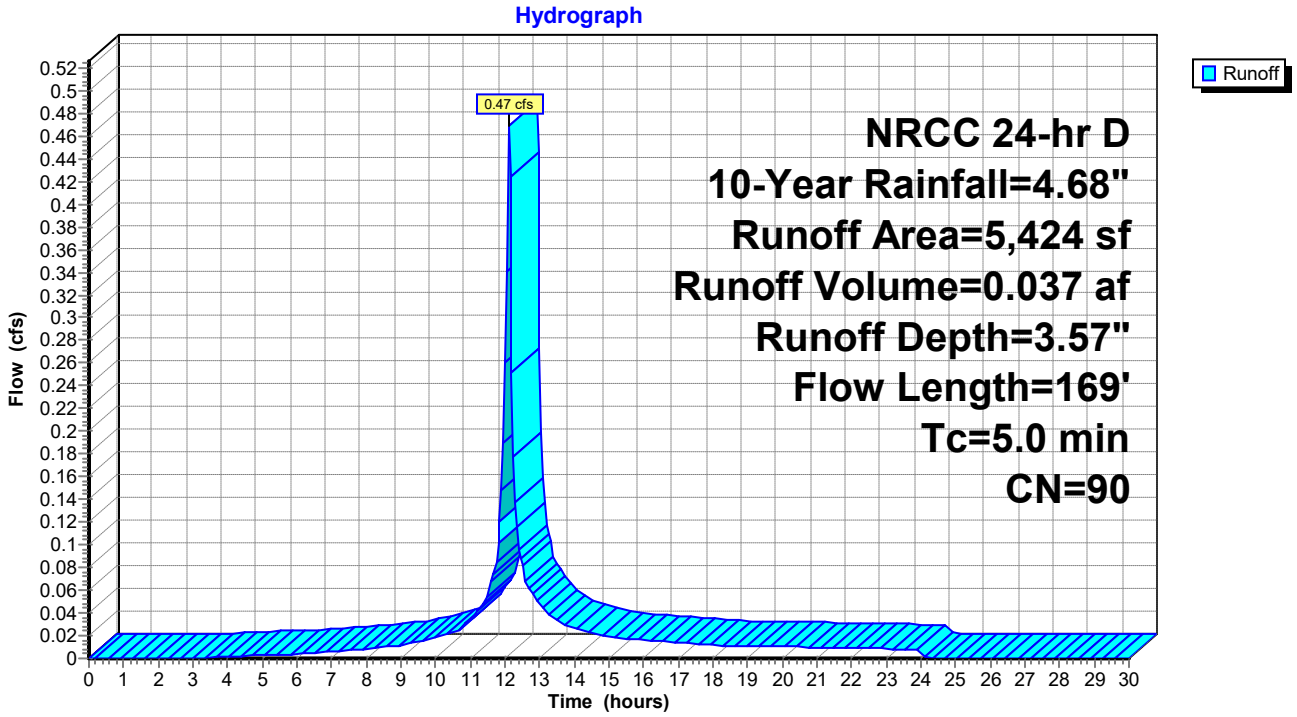
Runoff = 0.47 cfs @ 12.11 hrs, Volume= 0.037 af, Depth= 3.57"
Routed to Reach DCB-B : TO DMH-E

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
692	39	>75% Grass cover, Good, HSG A
4,732	98	Paved parking, HSG A
5,424	90	Weighted Average
692		12.76% Pervious Area
4,732		87.24% 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

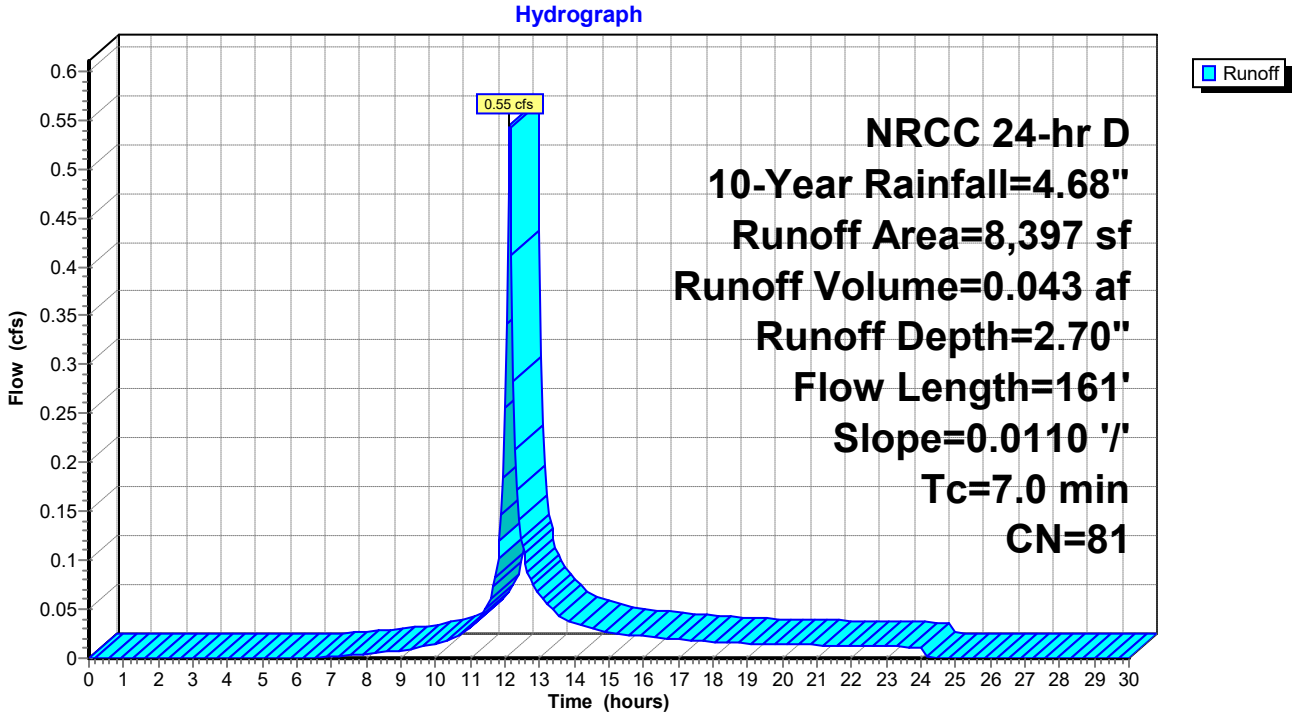
Runoff = 0.55 cfs @ 12.14 hrs, Volume= 0.043 af, Depth= 2.70"
Routed to Reach DCB-C : TO TRUNKLINE

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
2,407	39	>75% Grass cover, Good, HSG A
5,990	98	Paved parking, HSG A
8,397	81	Weighted Average
2,407		28.66% Pervious Area
5,990		71.34% 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 P18: TO DCB-D

[49] Hint: Tc<2dt may require smaller dt

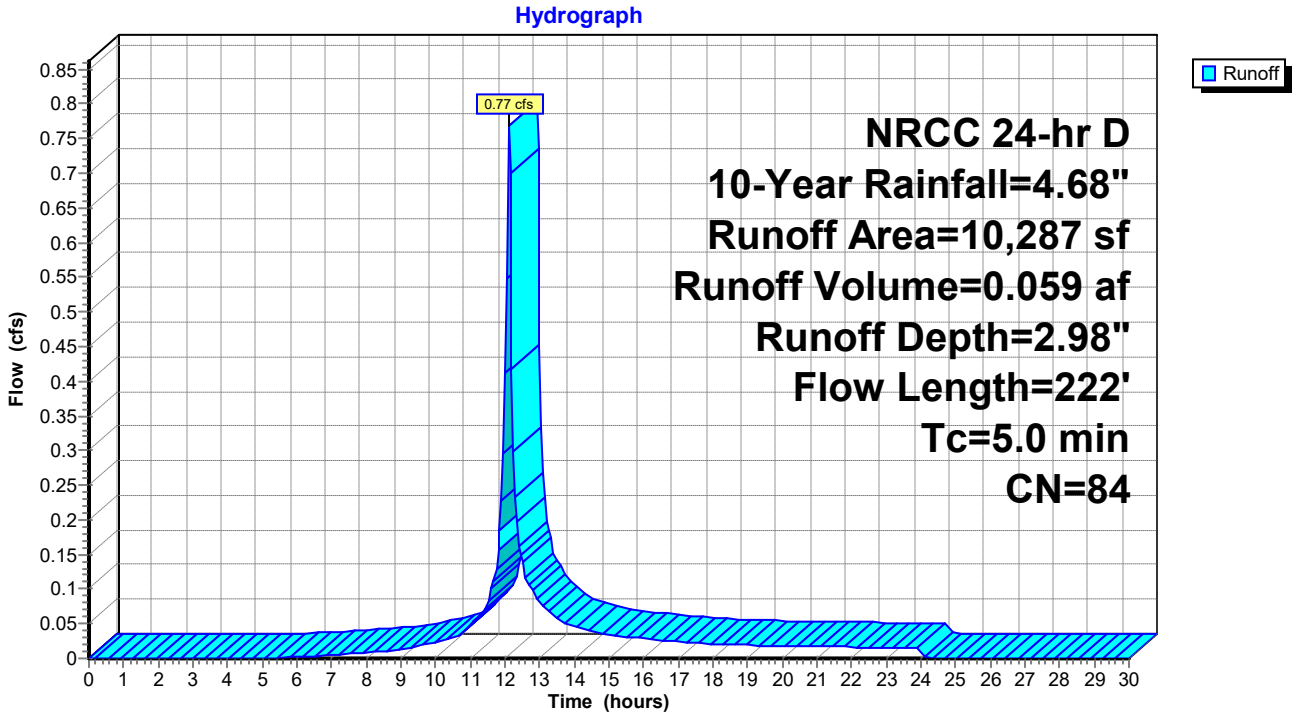
Runoff = 0.77 cfs @ 12.11 hrs, Volume= 0.059 af, Depth= 2.98"
Routed to Reach DCB-D : TO DMH-A

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
2,417	39	>75% Grass cover, Good, HSG A
7,870	98	Paved parking, HSG A
10,287	84	Weighted Average
2,417		23.50% Pervious Area
7,870		76.50% 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

[49] Hint: Tc<2dt may require smaller dt

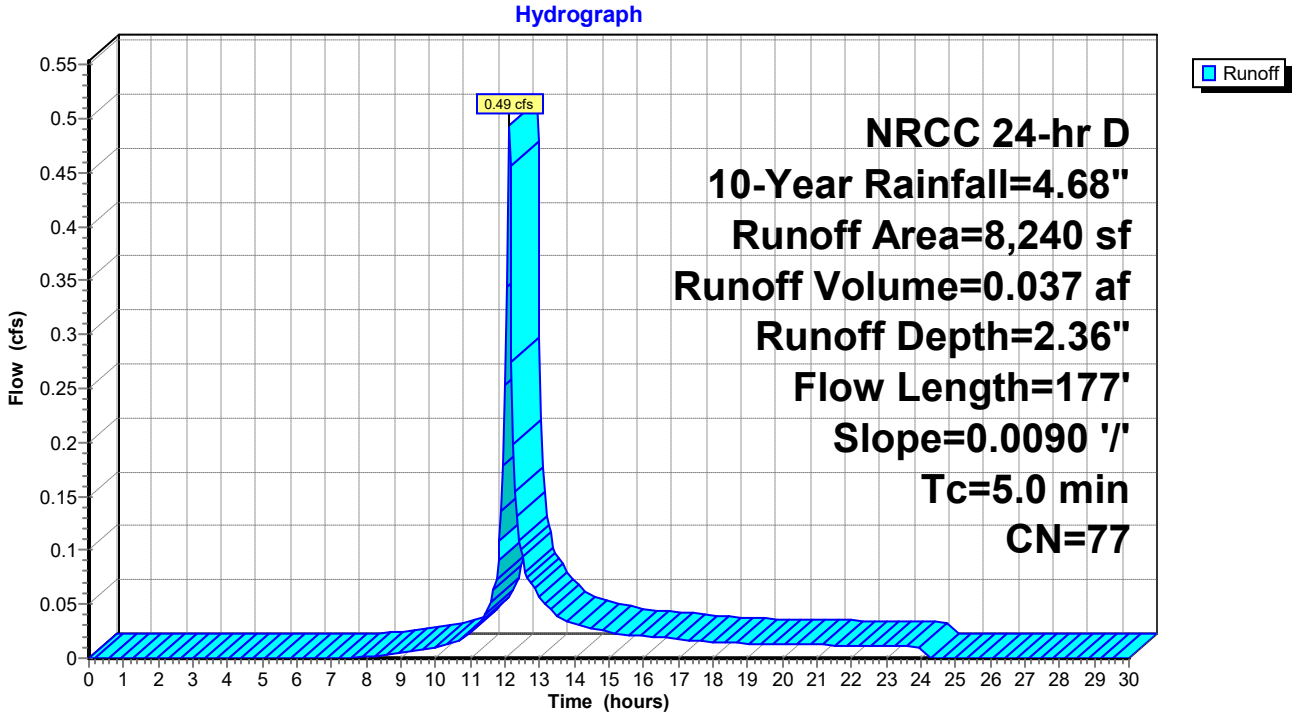
Runoff = 0.49 cfs @ 12.12 hrs, Volume= 0.037 af, Depth= 2.36"
Routed to Reach DCB-E : TO DMH-A

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
2,944	39	>75% Grass cover, Good, HSG A
5,296	98	Paved parking, HSG A
8,240	77	Weighted Average
2,944		35.73% Pervious Area
5,296		64.27% 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

[49] Hint: Tc<2dt may require smaller dt

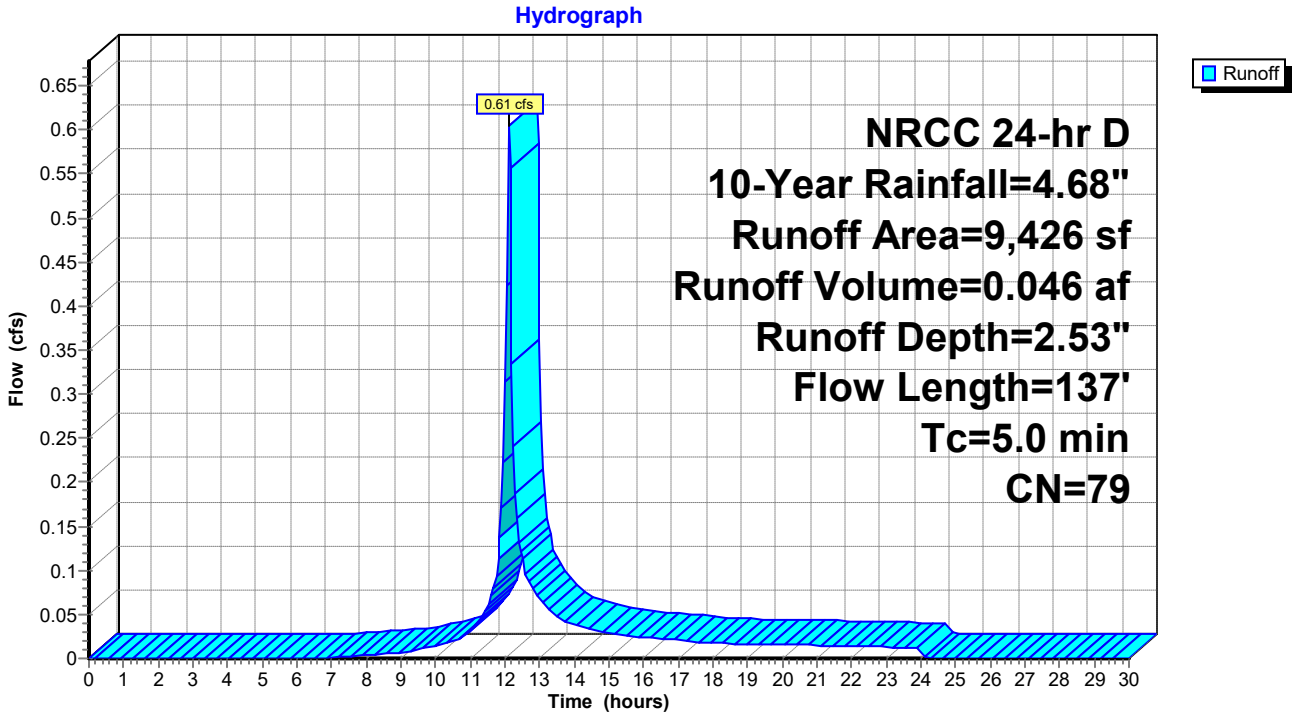
Runoff = 0.61 cfs @ 12.12 hrs, Volume= 0.046 af, Depth= 2.53"
Routed to Reach DP3 : CATCHBASIN (FIRE STATION)

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 P20: TO DP#3



Summary for Subcatchment P24: TO DCB#24

[49] Hint: Tc<2dt may require smaller dt

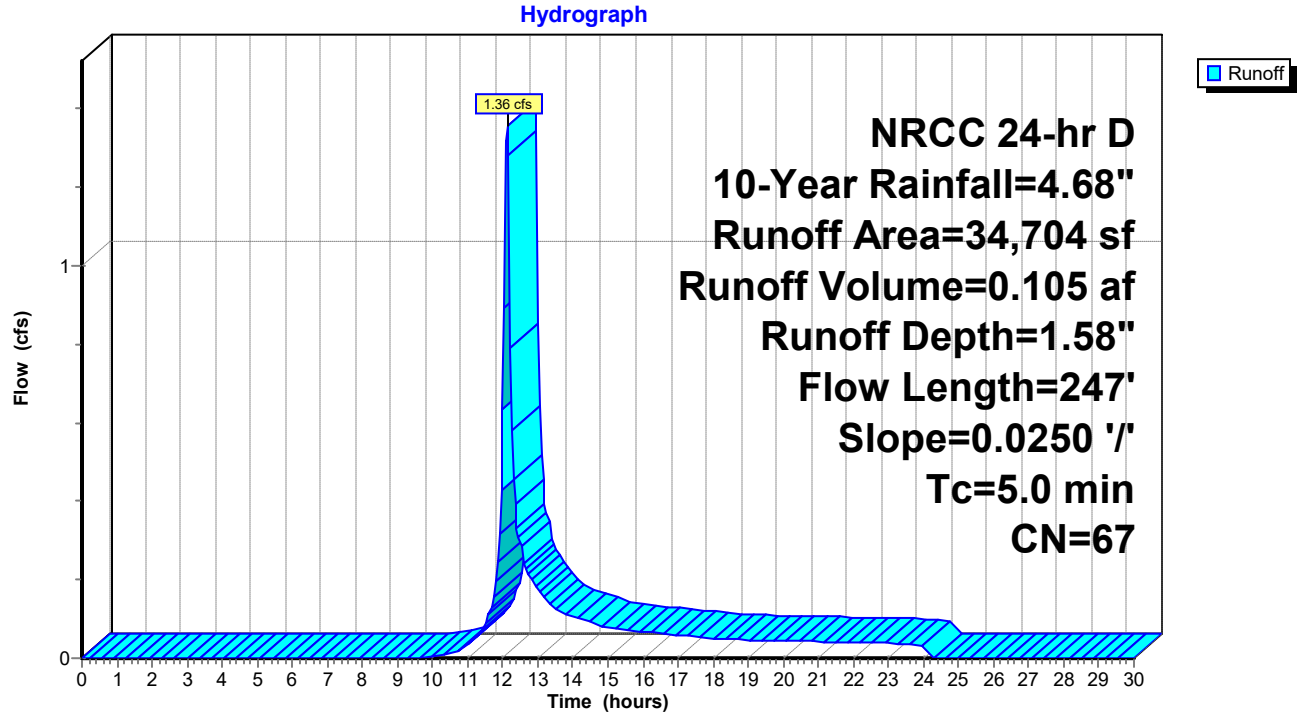
Runoff = 1.36 cfs @ 12.12 hrs, Volume= 0.105 af, Depth= 1.58"
Routed to Reach DCB24 : TO DMH#113

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
18,387	39	>75% Grass cover, Good, HSG A
16,317	98	Paved parking, HSG A
34,704	67	Weighted Average
18,387		52.98% Pervious Area
16,317		47.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.0	197	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	247	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P24: TO DCB#24



Summary for Reach CMH3: TO DMH-E

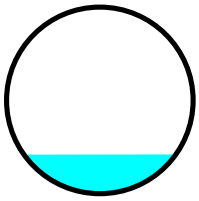
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-F outlet invert by 0.63' @ 12.15 hrs

Inflow Area = 3.013 ac, 76.57% Impervious, Inflow Depth = 2.02" for 10-Year event
Inflow = 5.87 cfs @ 12.13 hrs, Volume= 0.506 af
Outflow = 5.69 cfs @ 12.15 hrs, Volume= 0.506 af, Atten= 3%, Lag= 0.8 min
Routed to Reach DMH-E : TO DMH-D

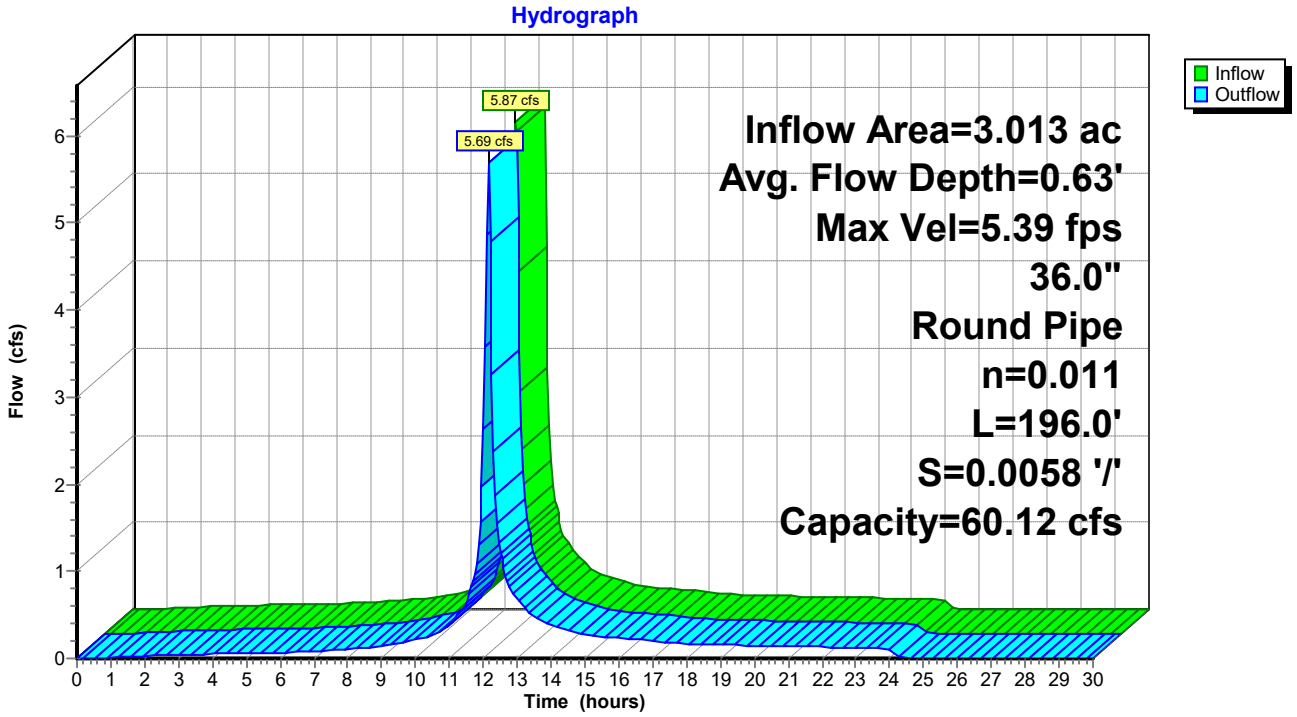
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.39 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 1.8 min

Peak Storage= 213 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 2.45'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.12 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 196.0' Slope= 0.0058 '/'
Inlet Invert= 457.71', Outlet Invert= 456.57'



Reach CMH3: TO DMH-E



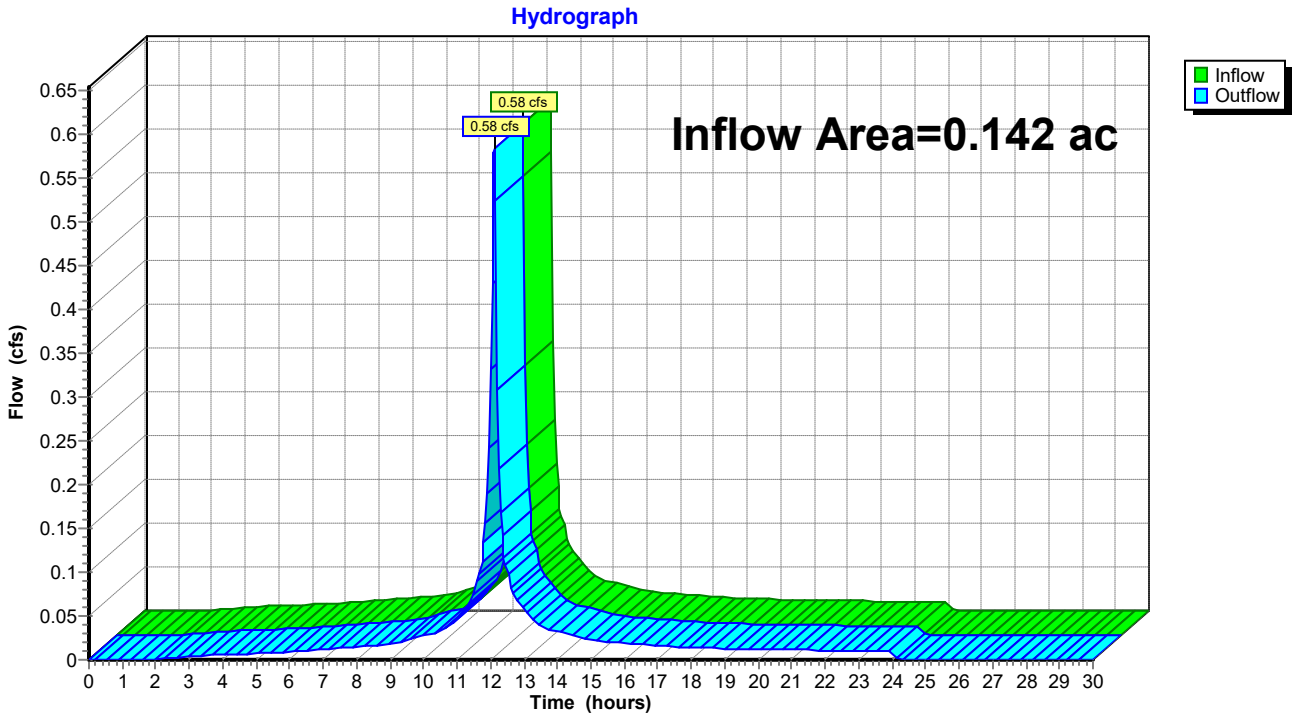
Summary for Reach DCB-A: TO DMH-D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.142 ac, 94.61% Impervious, Inflow Depth = 4.10" for 10-Year event
Inflow = 0.58 cfs @ 12.11 hrs, Volume= 0.049 af
Outflow = 0.58 cfs @ 12.11 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-D : TO DMH-C

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

Reach DCB-A: TO DMH-D



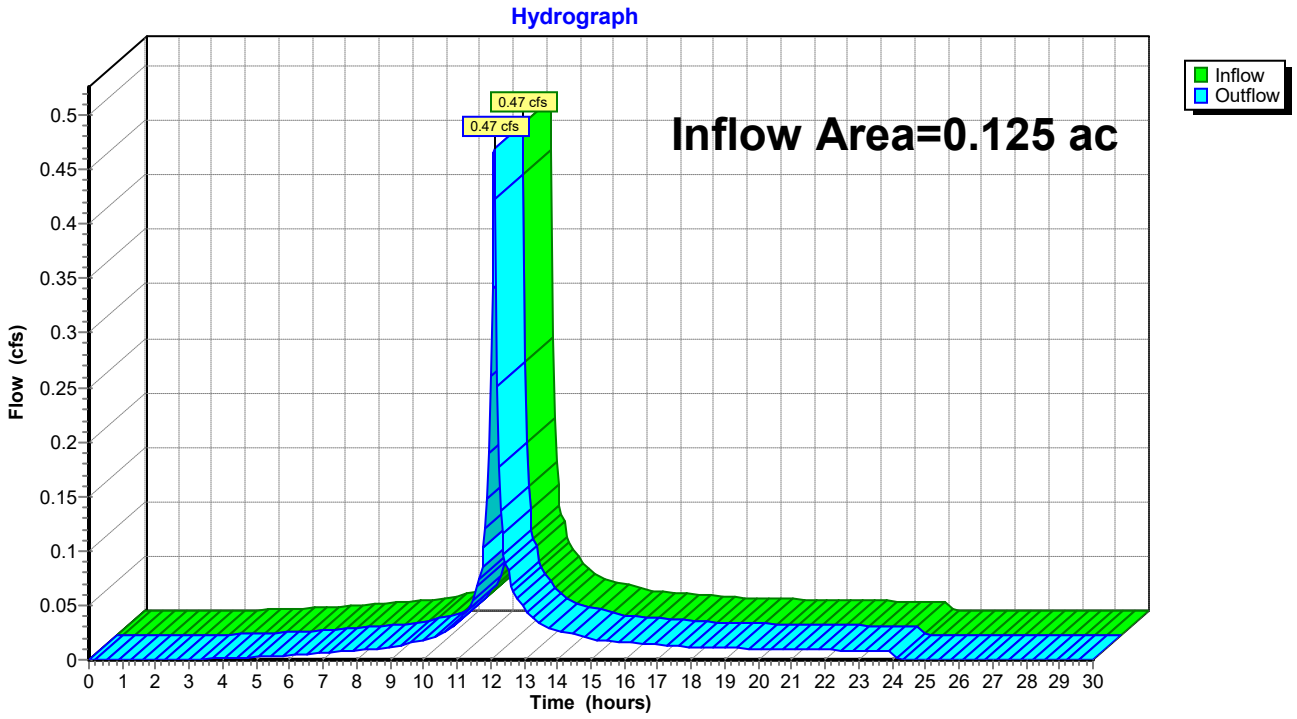
Summary for Reach DCB-B: TO DMH-E

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.125 ac, 87.24% Impervious, Inflow Depth = 3.57" for 10-Year event
Inflow = 0.47 cfs @ 12.11 hrs, Volume= 0.037 af
Outflow = 0.47 cfs @ 12.11 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-E : TO DMH-D

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

Reach DCB-B: TO DMH-E



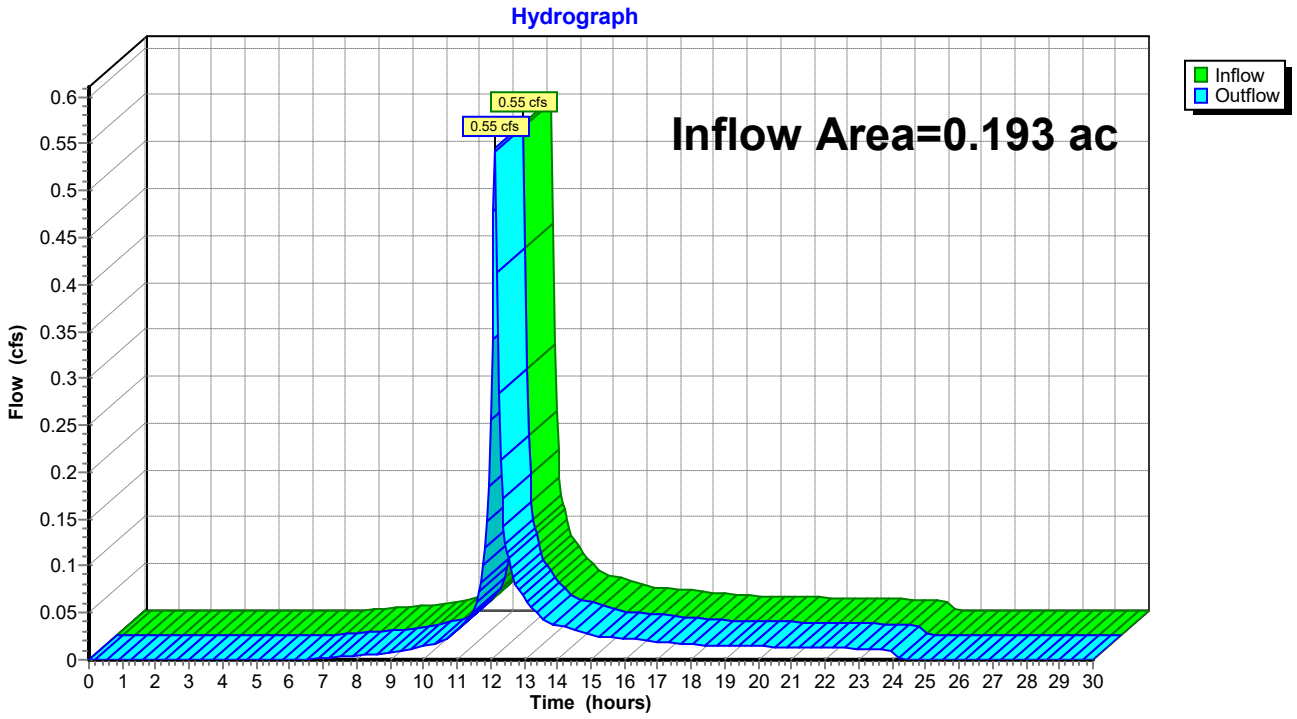
Summary for Reach DCB-C: TO TRUNKLINE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.193 ac, 71.34% Impervious, Inflow Depth = 2.70" for 10-Year event
Inflow = 0.55 cfs @ 12.14 hrs, Volume= 0.043 af
Outflow = 0.55 cfs @ 12.14 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-E : TO DMH-D

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

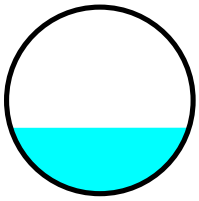
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.236 ac, 76.50% Impervious, Inflow Depth = 2.98" for 10-Year event
Inflow = 0.77 cfs @ 12.11 hrs, Volume= 0.059 af
Outflow = 0.77 cfs @ 12.12 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH-A* : TO DMH-B

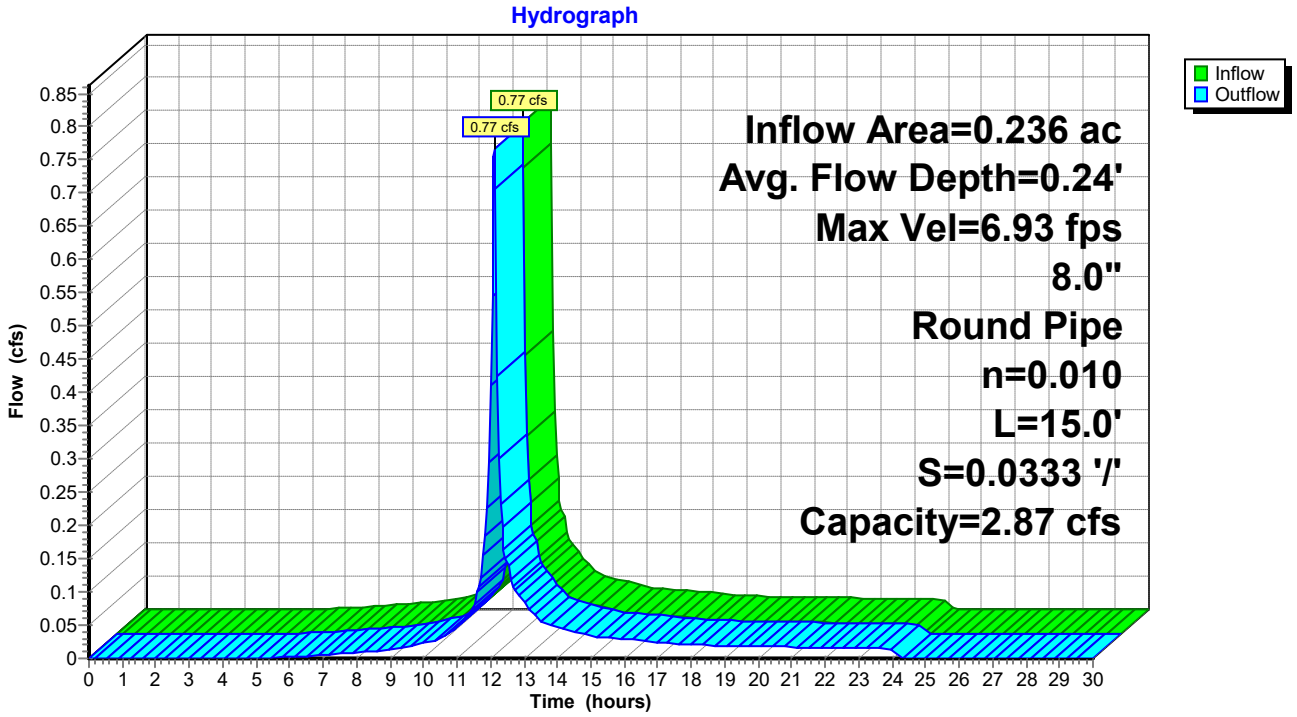
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.93 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.47 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 0.64'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.87 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 15.0' Slope= 0.0333 '/'
Inlet Invert= 468.00', Outlet Invert= 467.50'



Reach DCB-D: TO DMH-A



Summary for Reach DCB-E: TO DMH-A

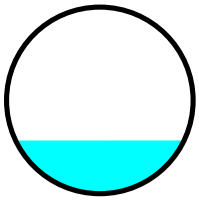
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.189 ac, 64.27% Impervious, Inflow Depth = 2.36" for 10-Year event
Inflow = 0.49 cfs @ 12.12 hrs, Volume= 0.037 af
Outflow = 0.49 cfs @ 12.12 hrs, Volume= 0.037 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH-A* : TO DMH-B

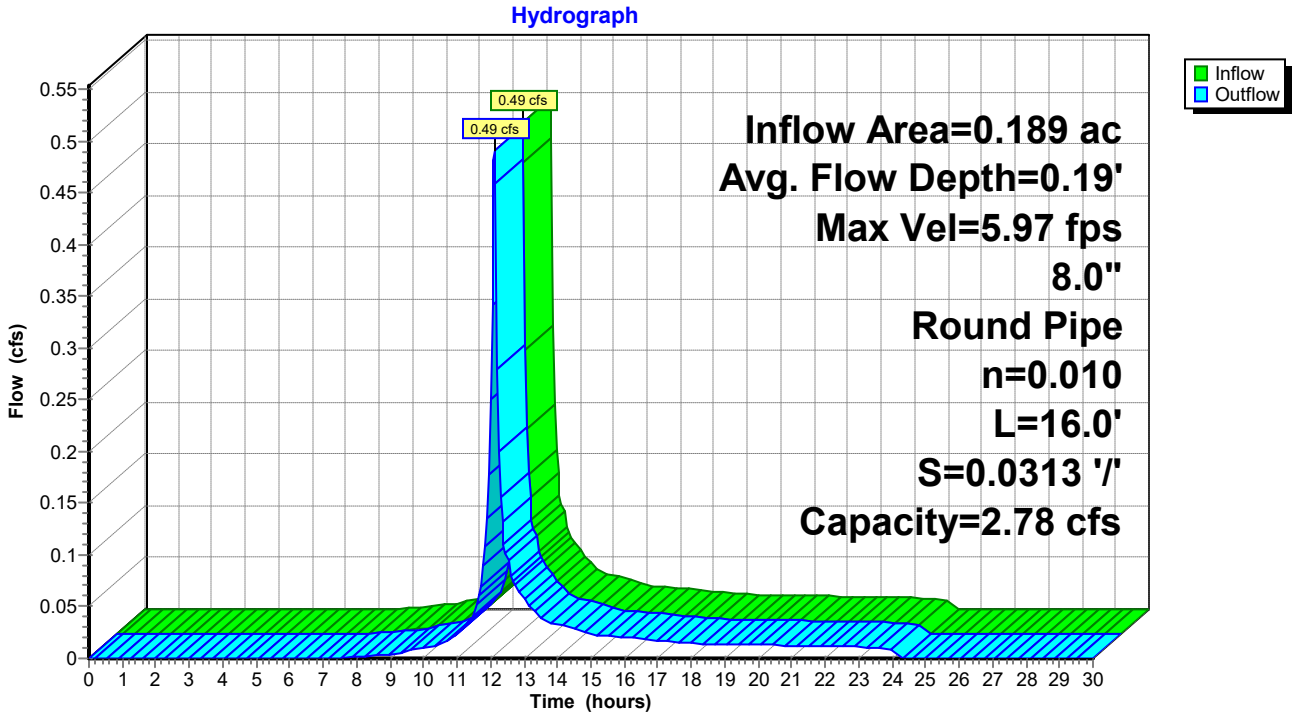
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.97 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.21 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 0.60'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.78 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 16.0' Slope= 0.0313 '/'
Inlet Invert= 468.00', Outlet Invert= 467.50'



Reach DCB-E: TO DMH-A



Summary for Reach DCB10: TO DMH#106

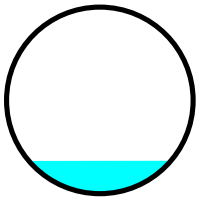
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.065 ac, 67.92% Impervious, Inflow Depth = 2.53" for 10-Year event
Inflow = 0.18 cfs @ 12.12 hrs, Volume= 0.014 af
Outflow = 0.18 cfs @ 12.12 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH106 : TO DMH#105

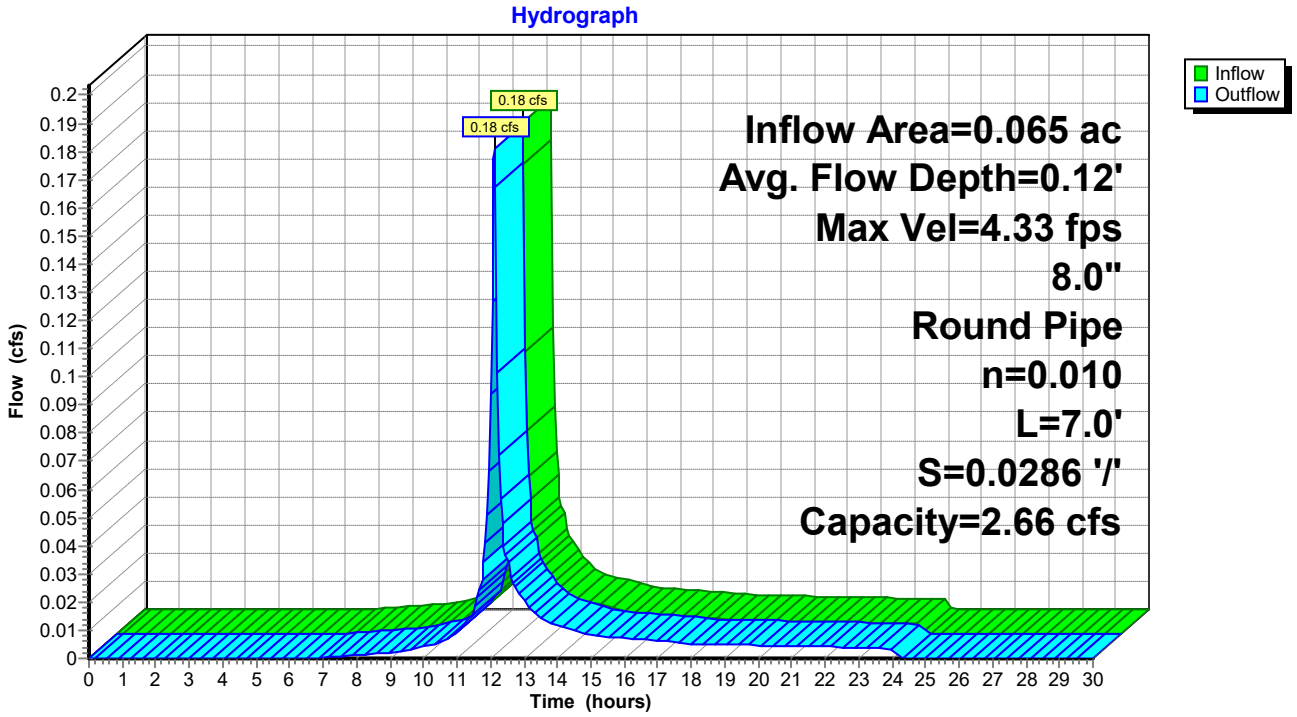
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.33 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 0.51'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.66 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 7.0' Slope= 0.0286 '/'
Inlet Invert= 470.30', Outlet Invert= 470.10'



Reach DCB10: TO DMH#106



Summary for Reach DCB11: TO DMH#103

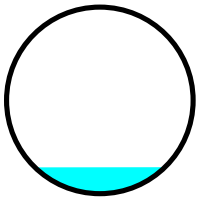
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.095 ac, 28.74% Impervious, Inflow Depth = 0.88" for 10-Year event
Inflow = 0.08 cfs @ 12.13 hrs, Volume= 0.007 af
Outflow = 0.08 cfs @ 12.13 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.2 min
Routed to Reach DMH106 : TO DMH#105

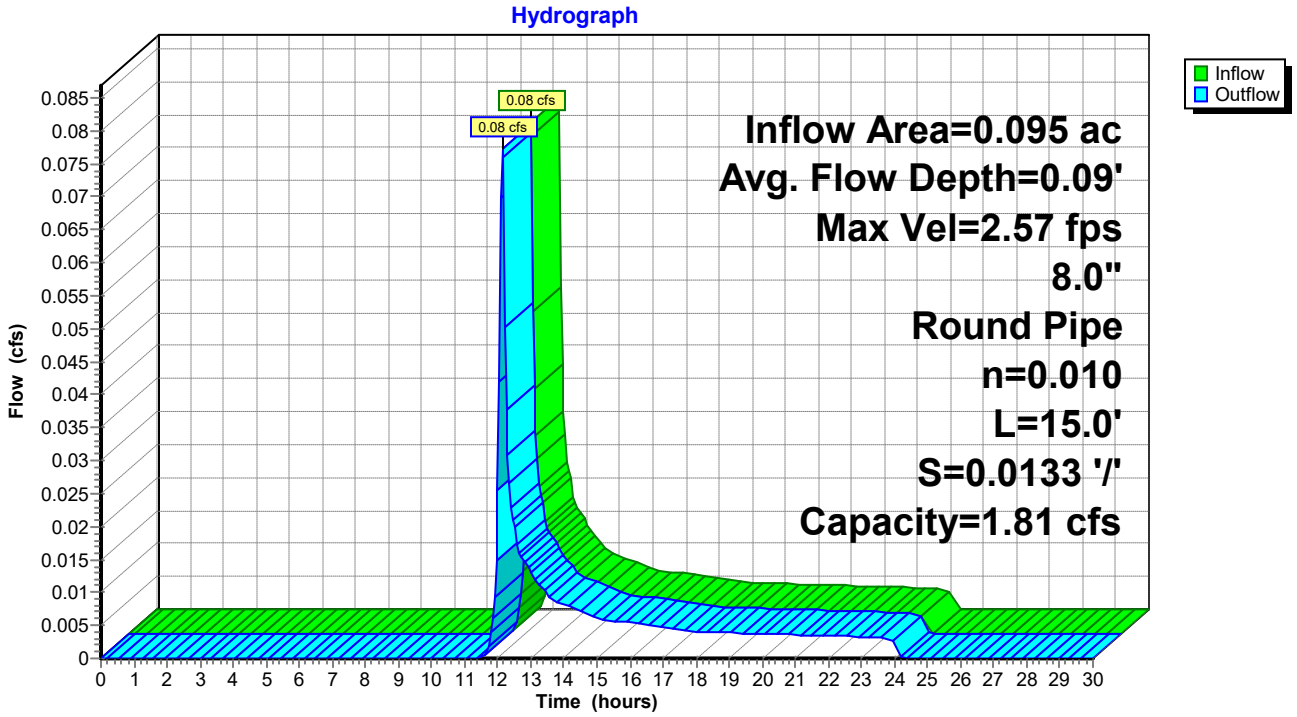
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.57 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.2 min

Peak Storage= 0 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 0.46'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.81 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 15.0' Slope= 0.0133 '/'
Inlet Invert= 470.30', Outlet Invert= 470.10'



Reach DCB11: TO DMH#103



Summary for Reach DCB12: TO DMH#12

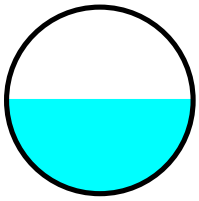
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.208 ac, 93.65% Impervious, Inflow Depth = 3.99" for 10-Year event
Inflow = 0.84 cfs @ 12.11 hrs, Volume= 0.069 af
Outflow = 0.83 cfs @ 12.12 hrs, Volume= 0.069 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH108 : TO DMH#107

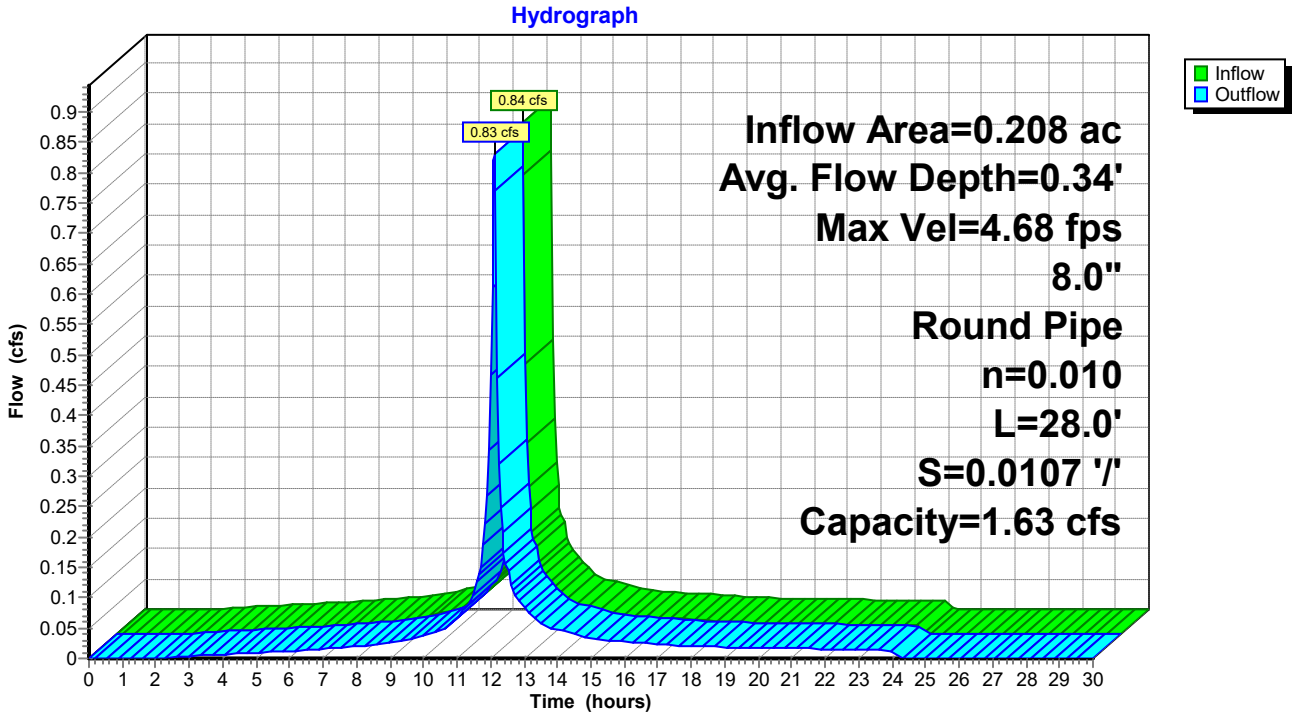
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.68 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 0.3 min

Peak Storage= 5 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 0.67'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.63 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 28.0' Slope= 0.0107 '/'
Inlet Invert= 467.80', Outlet Invert= 467.50'



Reach DCB12: TO DMH#12



Summary for Reach DCB13: TO DMH#102

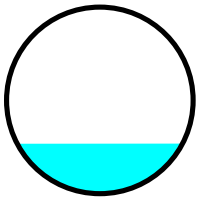
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.273 ac, 94.49% Impervious, Inflow Depth = 4.10" for 10-Year event
Inflow = 1.12 cfs @ 12.11 hrs, Volume= 0.093 af
Outflow = 1.12 cfs @ 12.11 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH102 : TO UGS#1A

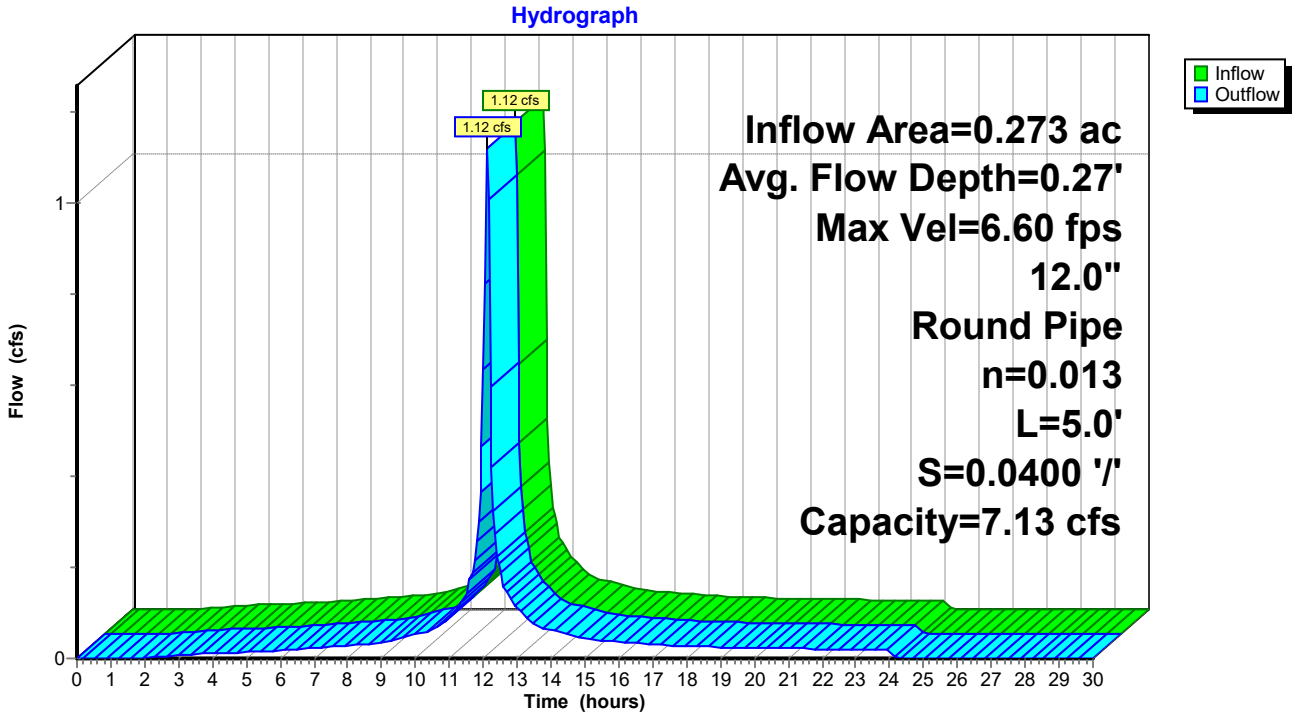
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.60 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.89'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 467.90', Outlet Invert= 467.70'



Reach DCB13: TO DMH#102



Summary for Reach DCB14: TO DMH#109

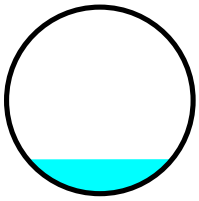
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.126 ac, 94.42% Impervious, Inflow Depth = 4.10" for 10-Year event
Inflow = 0.52 cfs @ 12.11 hrs, Volume= 0.043 af
Outflow = 0.51 cfs @ 12.11 hrs, Volume= 0.043 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH109 : TO DMH#110

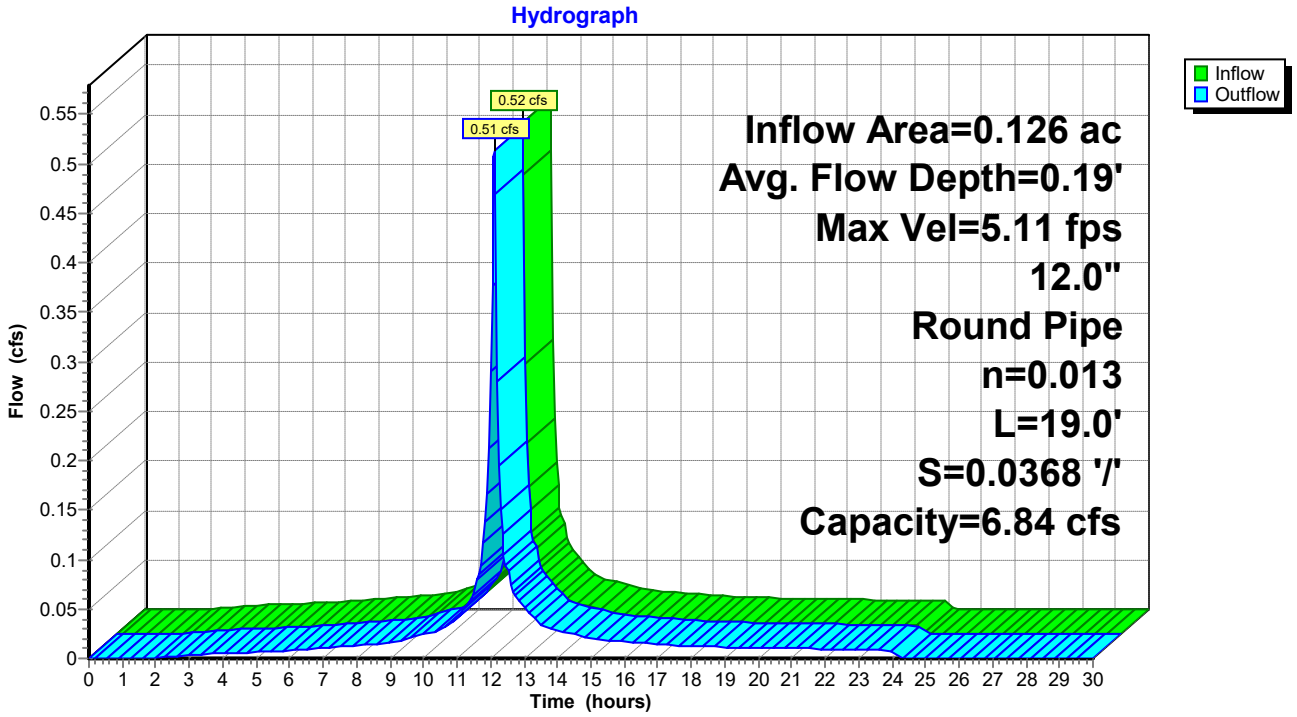
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.11 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 0.78'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.84 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 19.0' Slope= 0.0368 '/'
Inlet Invert= 467.10', Outlet Invert= 466.40'



Reach DCB14: TO DMH#109



Summary for Reach DCB15: TO DMH#102

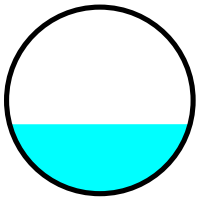
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.370 ac, 70.06% Impervious, Inflow Depth = 2.62" for 10-Year event
Inflow = 1.07 cfs @ 12.12 hrs, Volume= 0.081 af
Outflow = 1.05 cfs @ 12.13 hrs, Volume= 0.081 af, Atten= 2%, Lag= 0.7 min
Routed to Reach DMH102 : TO UGS#1A

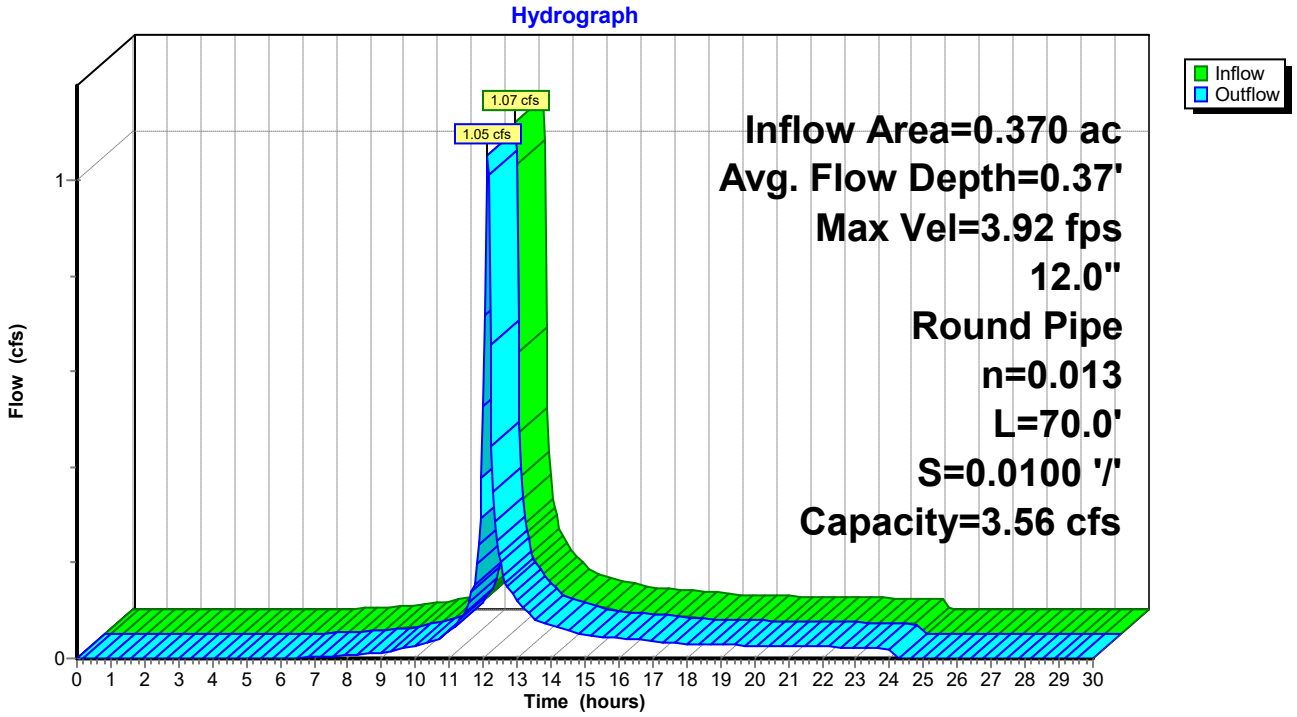
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.92 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.8 min

Peak Storage= 19 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 0.97'
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= 70.0' Slope= 0.0100 '/'
Inlet Invert= 467.00', Outlet Invert= 466.30'



Reach DCB15: TO DMH#102



Summary for Reach DCB19: TO DMH#111

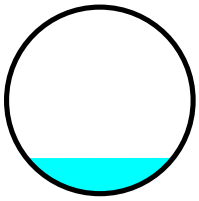
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.171 ac, 78.16% Impervious, Inflow Depth = 3.07" for 10-Year event
Inflow = 0.57 cfs @ 12.11 hrs, Volume= 0.044 af
Outflow = 0.57 cfs @ 12.11 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH111 : TO DMH#112

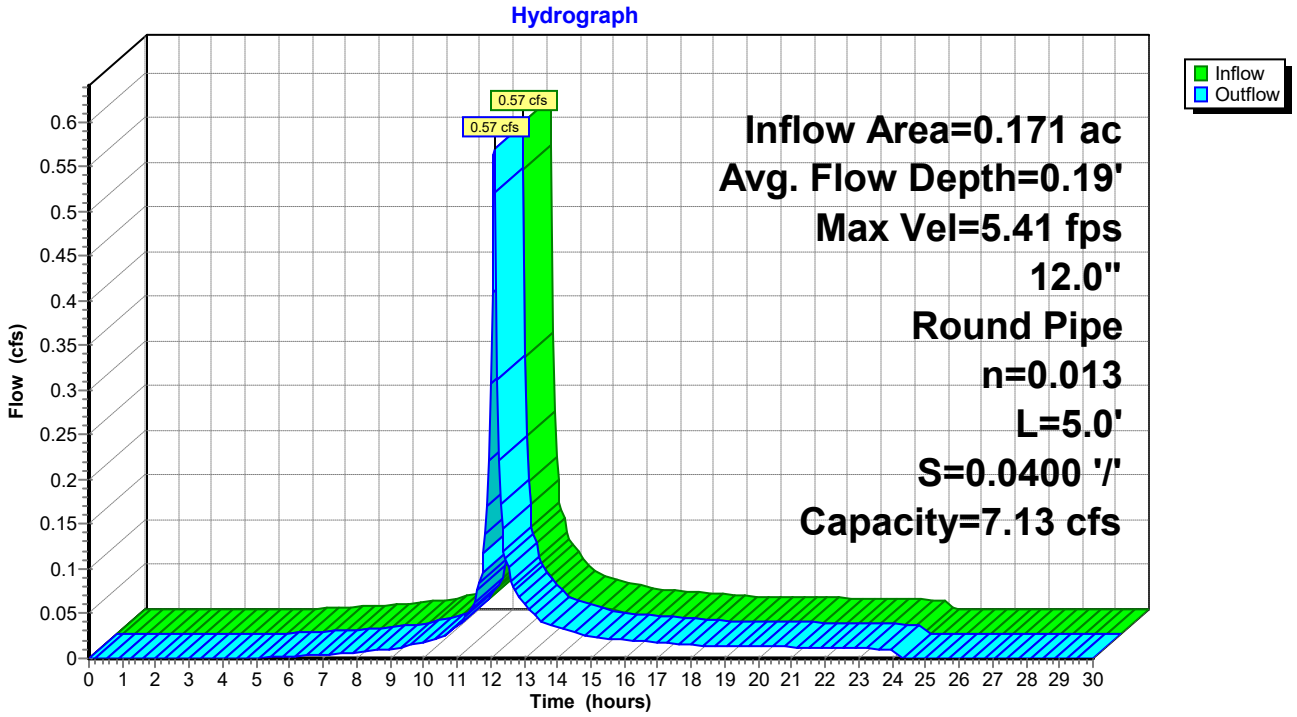
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.41 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 0.79'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 463.80', Outlet Invert= 463.60'



Reach DCB19: TO DMH#111



Summary for Reach DCB20: TO DMH#109

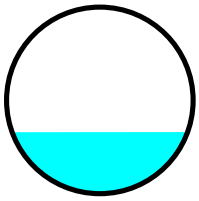
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.234 ac, 85.75% Impervious, Inflow Depth = 3.57" for 10-Year event
Inflow = 0.88 cfs @ 12.11 hrs, Volume= 0.070 af
Outflow = 0.88 cfs @ 12.11 hrs, Volume= 0.070 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH109 : TO DMH#110

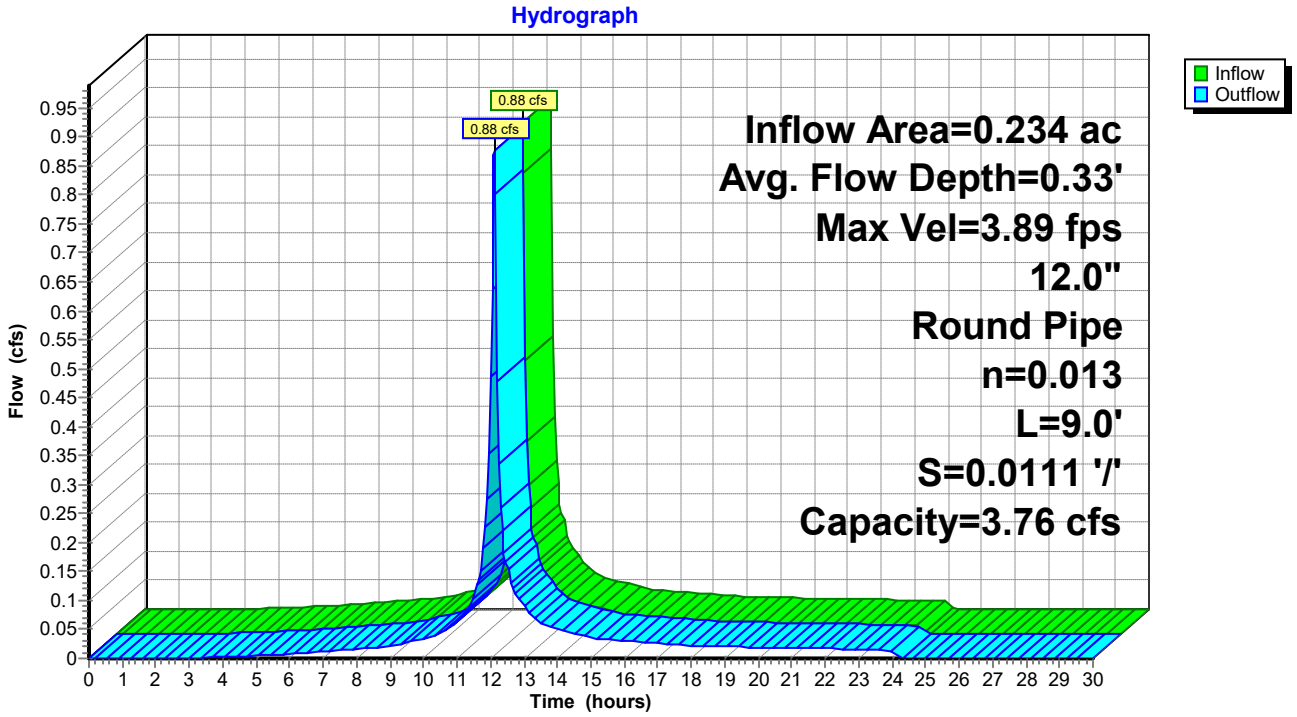
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.89 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 0.94'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 9.0' Slope= 0.0111 '/'
Inlet Invert= 466.50', Outlet Invert= 466.40'



Reach DCB20: TO DMH#109



Summary for Reach DCB21: TO DMH#109A

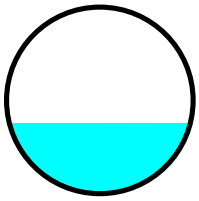
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.175 ac, 71.01% Impervious, Inflow Depth = 2.70" for 10-Year event
Inflow = 0.52 cfs @ 12.12 hrs, Volume= 0.039 af
Outflow = 0.52 cfs @ 12.12 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH109A : TO DMH109

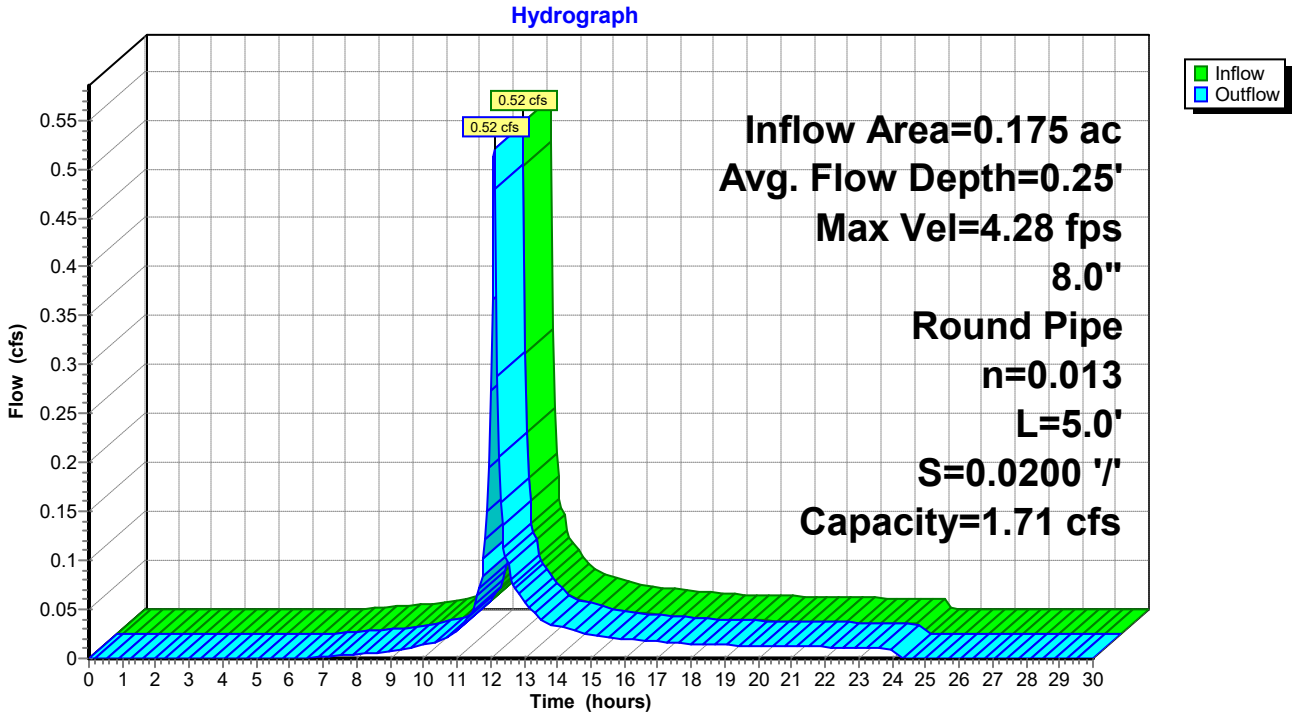
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.28 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 0.65'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.71 cfs

8.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 467.10', Outlet Invert= 467.00'



Reach DCB21: TO DMH#109A



Summary for Reach DCB22: TO DMH#111

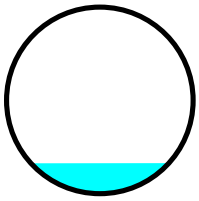
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.235 ac, 44.85% Impervious, Inflow Depth = 1.44" for 10-Year event
Inflow = 0.36 cfs @ 12.12 hrs, Volume= 0.028 af
Outflow = 0.36 cfs @ 12.13 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.2 min
Routed to Reach DMH111 : TO DMH#112

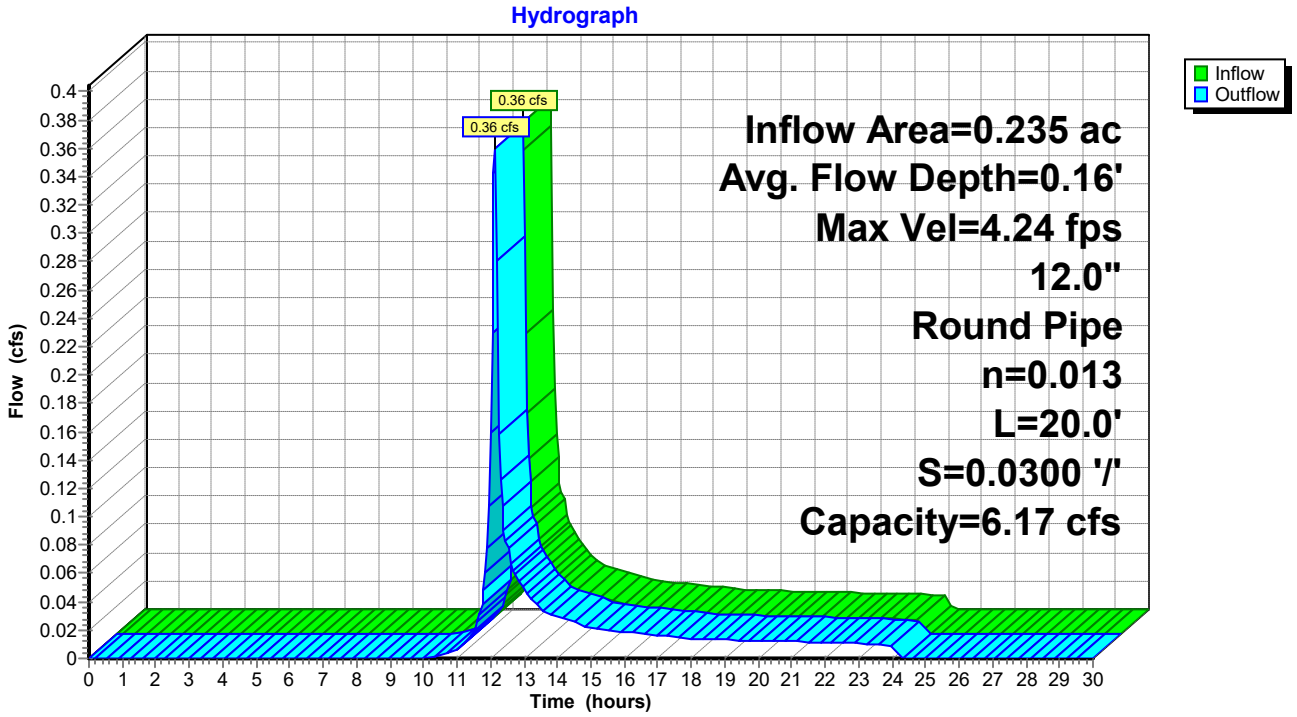
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.24 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 0.74'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.17 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 20.0' Slope= 0.0300 '/'
Inlet Invert= 464.20', Outlet Invert= 463.60'



Reach DCB22: TO DMH#111



Summary for Reach DCB23: TO DMH#111

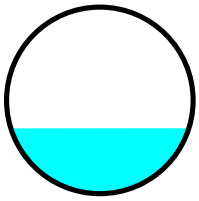
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.766 ac, 40.00% Impervious, Inflow Depth = 1.31" for 10-Year event
Inflow = 1.05 cfs @ 12.12 hrs, Volume= 0.084 af
Outflow = 0.99 cfs @ 12.15 hrs, Volume= 0.084 af, Atten= 5%, Lag= 1.7 min
Routed to Reach DMH111 : TO DMH#112

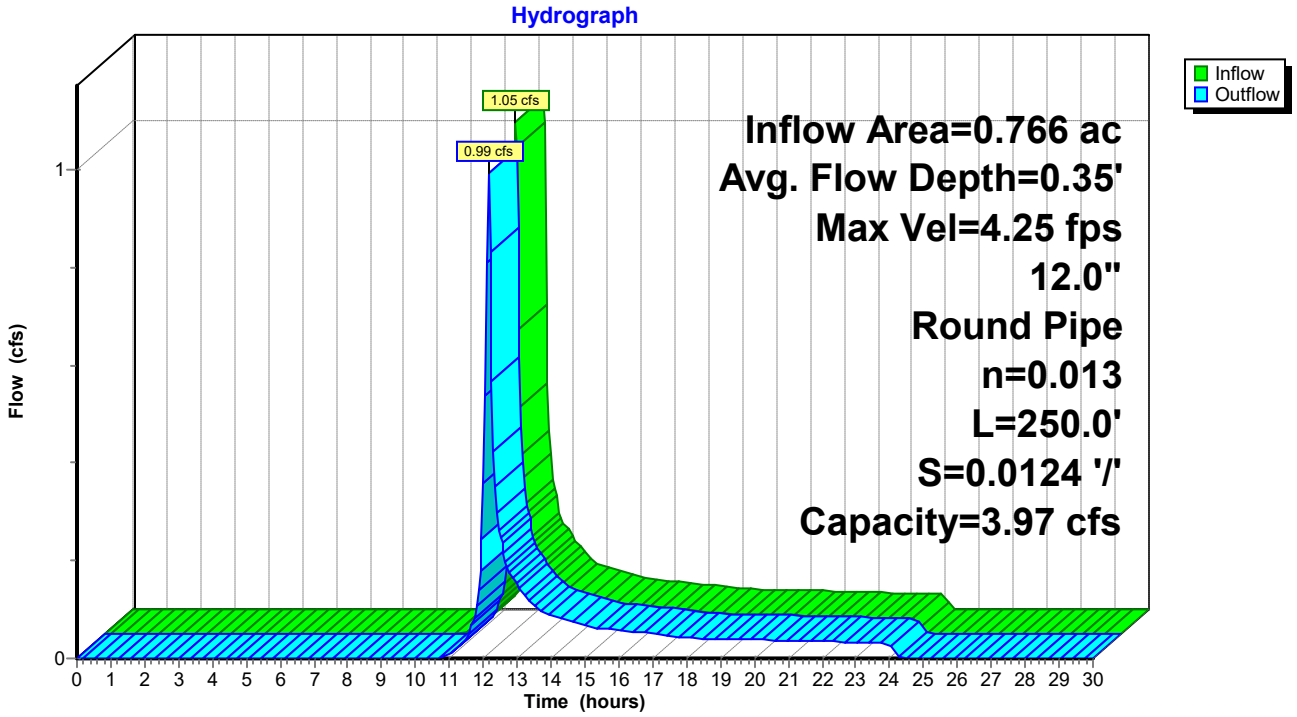
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.25 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 2.4 min

Peak Storage= 61 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 0.95'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.97 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 250.0' Slope= 0.0124 '/'
Inlet Invert= 466.70', Outlet Invert= 463.60'



Reach DCB23: TO DMH#111



Summary for Reach DCB24: TO DMH#113

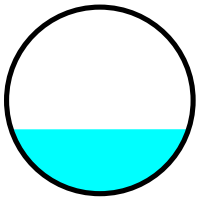
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.797 ac, 47.02% Impervious, Inflow Depth = 1.58" for 10-Year event
Inflow = 1.36 cfs @ 12.12 hrs, Volume= 0.105 af
Outflow = 1.36 cfs @ 12.12 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH113 : TO DMH#114

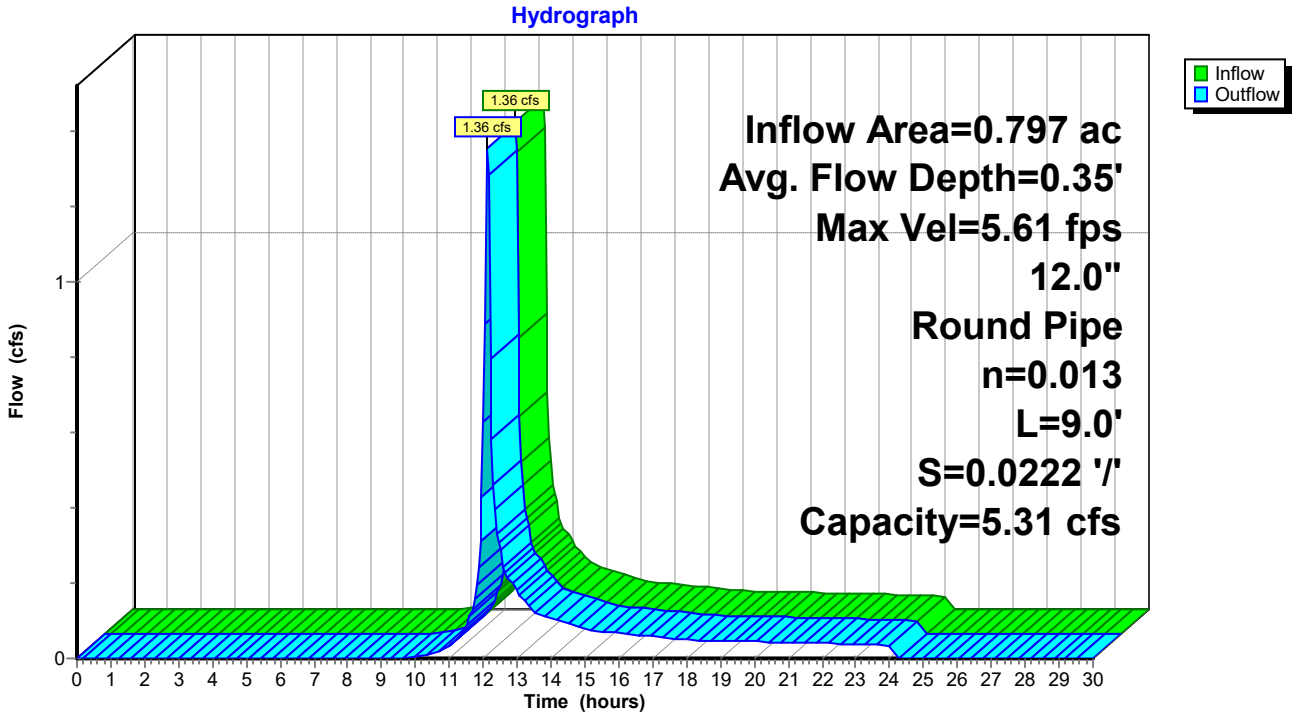
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.61 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 0.95'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.31 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 9.0' Slope= 0.0222 '/'
Inlet Invert= 460.50', Outlet Invert= 460.30'



Reach DCB24: TO DMH#113



Summary for Reach DCB25: TO DMH#109A

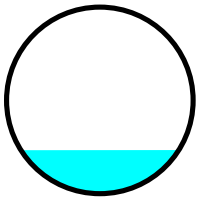
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.064 ac, 89.32% Impervious, Inflow Depth = 3.78" for 10-Year event
Inflow = 0.25 cfs @ 12.11 hrs, Volume= 0.020 af
Outflow = 0.25 cfs @ 12.12 hrs, Volume= 0.020 af, Atten= 2%, Lag= 0.3 min
Routed to Reach DMH109A : TO DMH109

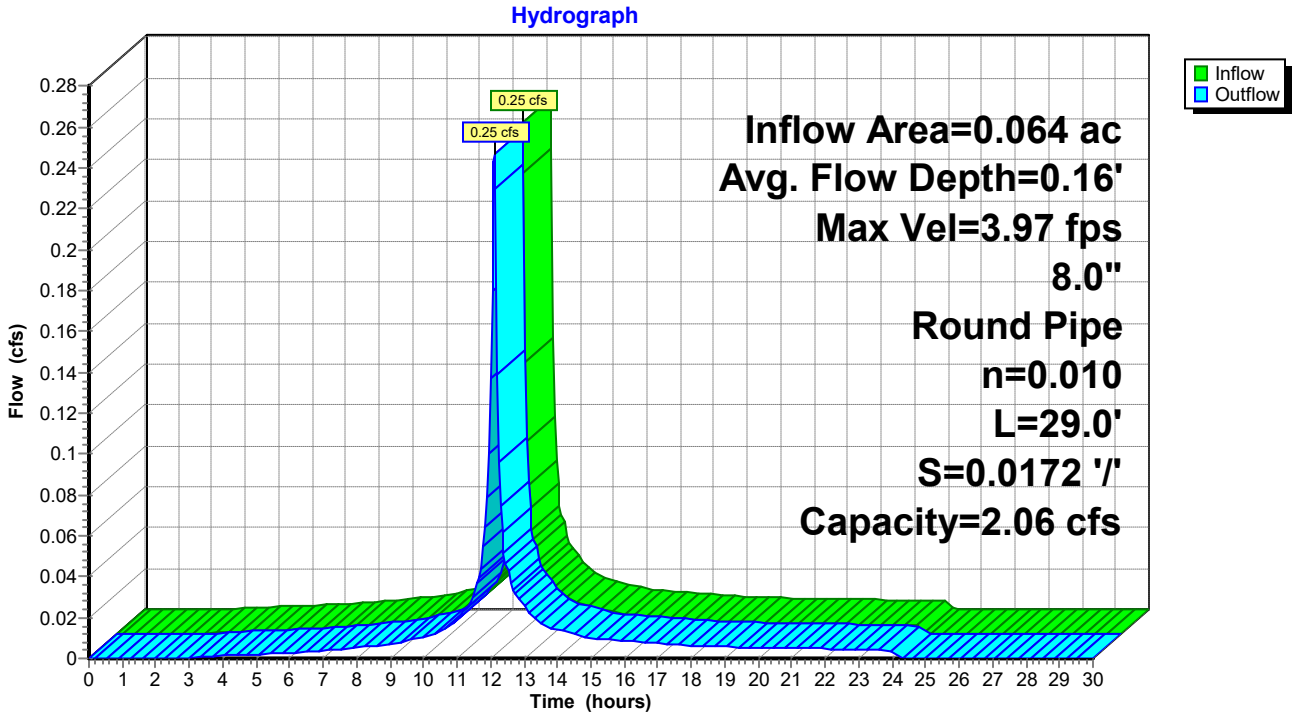
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.97 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 0.4 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 0.56'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.06 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 29.0' Slope= 0.0172 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Reach DCB25: TO DMH#109A



Summary for Reach DCB5: TO DMH#108

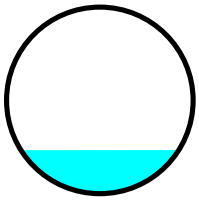
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.283 ac, 35.47% Impervious, Inflow Depth = 1.12" for 10-Year event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 0.026 af
Outflow = 0.32 cfs @ 12.13 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH108 : TO DMH#107

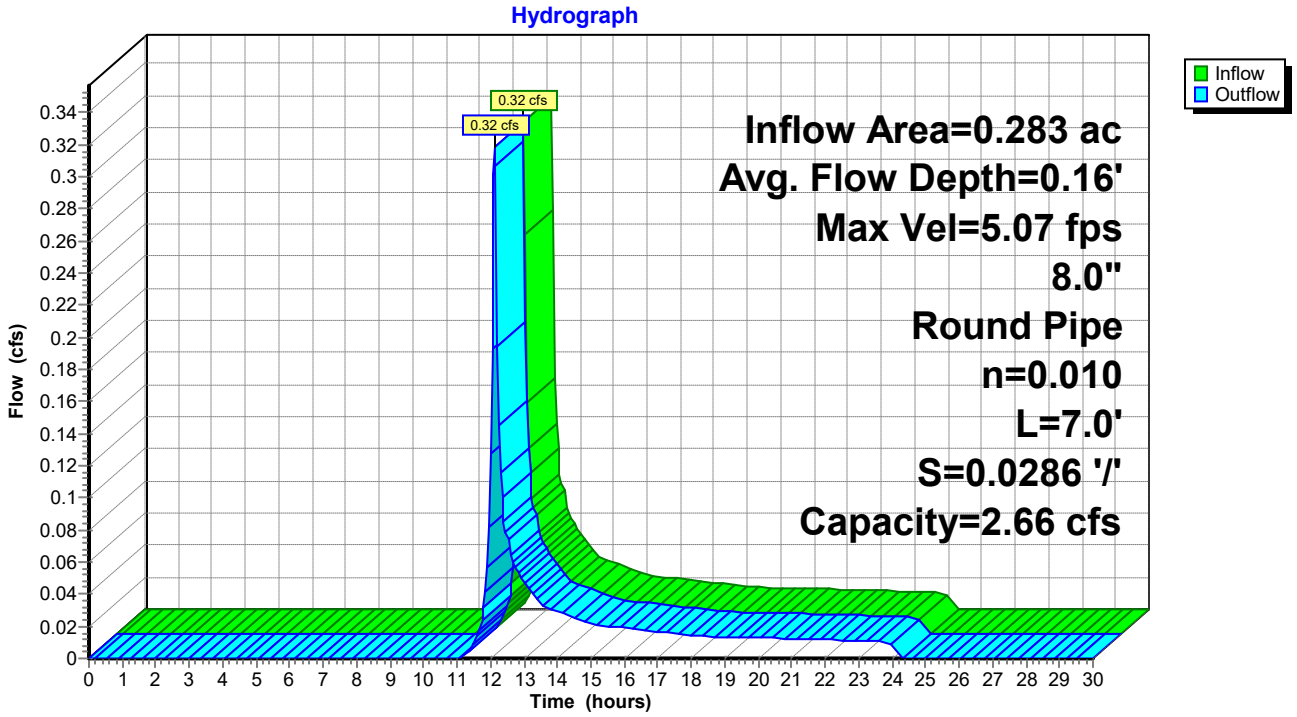
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.07 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.19 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 0.56'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.66 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 7.0' Slope= 0.0286 '/'
Inlet Invert= 468.20', Outlet Invert= 468.00'



Reach DCB5: TO DMH#108



Summary for Reach DCB6: TO DMH#107

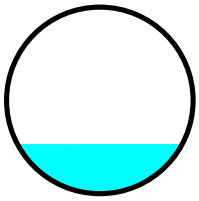
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.150 ac, 94.27% Impervious, Inflow Depth = 4.10" for 10-Year event
Inflow = 0.62 cfs @ 12.11 hrs, Volume= 0.051 af
Outflow = 0.61 cfs @ 12.11 hrs, Volume= 0.051 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH107 : TO DMH#100

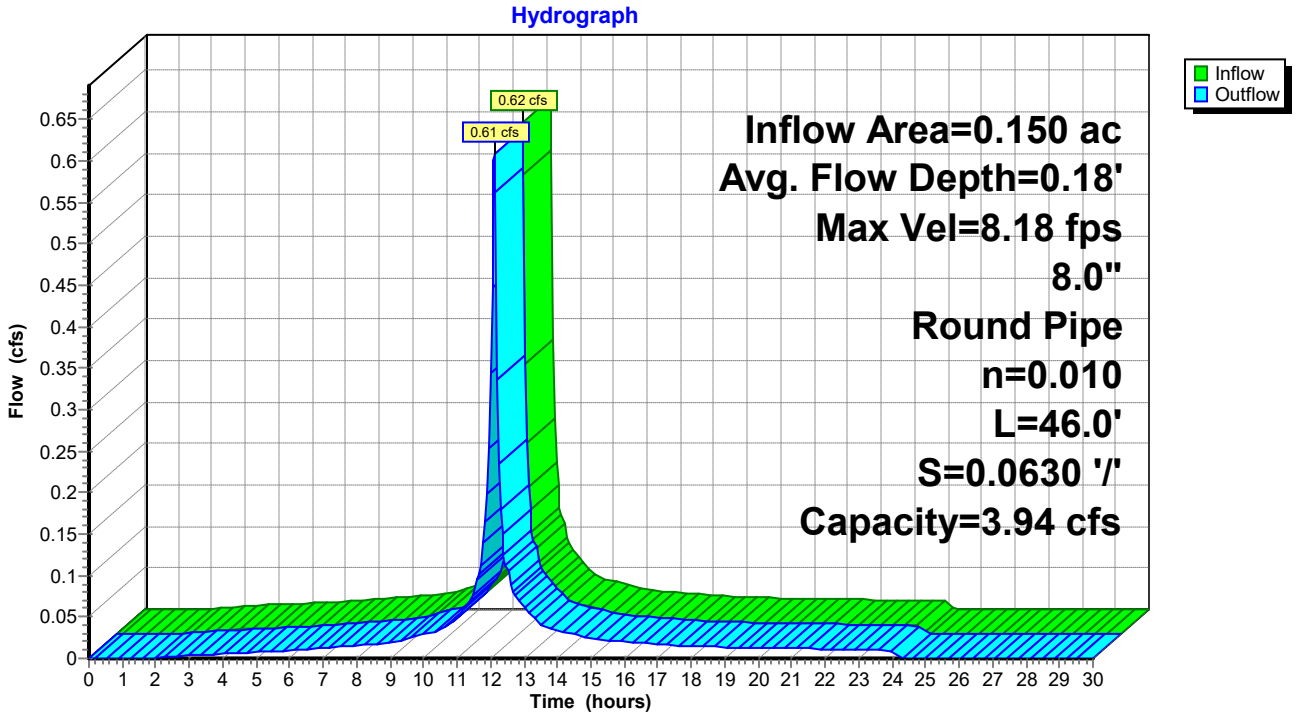
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.18 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.85 fps, Avg. Travel Time= 0.3 min

Peak Storage= 3 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 0.59'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.94 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 46.0' Slope= 0.0630 '/'
Inlet Invert= 469.80', Outlet Invert= 466.90'



Reach DCB6: TO DMH#107



Summary for Reach DCB7: TO DMH#102

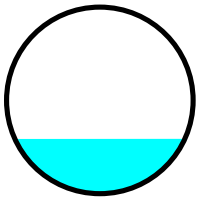
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.332 ac, 83.32% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 1.20 cfs @ 12.11 hrs, Volume= 0.093 af
Outflow = 1.18 cfs @ 12.12 hrs, Volume= 0.093 af, Atten= 2%, Lag= 0.3 min
Routed to Reach DMH102 : TO UGS#1A

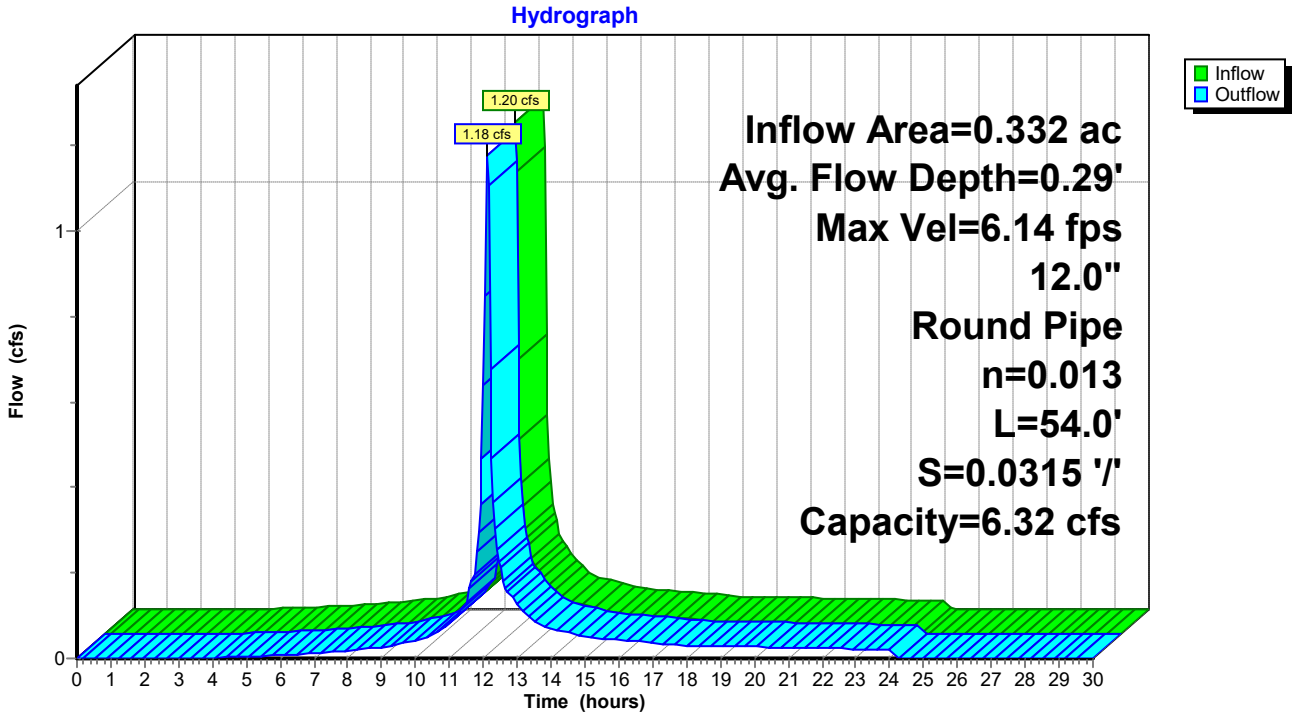
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.14 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.14 fps, Avg. Travel Time= 0.4 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.29' , Surface Width= 0.91'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.32 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 54.0' Slope= 0.0315 '/'
Inlet Invert= 468.40', Outlet Invert= 466.70'



Reach DCB7: TO DMH#102



Summary for Reach DCB8: TO DMH#103

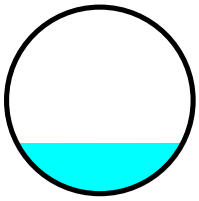
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.175 ac, 76.33% Impervious, Inflow Depth = 2.98" for 10-Year event
Inflow = 0.57 cfs @ 12.11 hrs, Volume= 0.043 af
Outflow = 0.57 cfs @ 12.11 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH104 : TO DMH#104

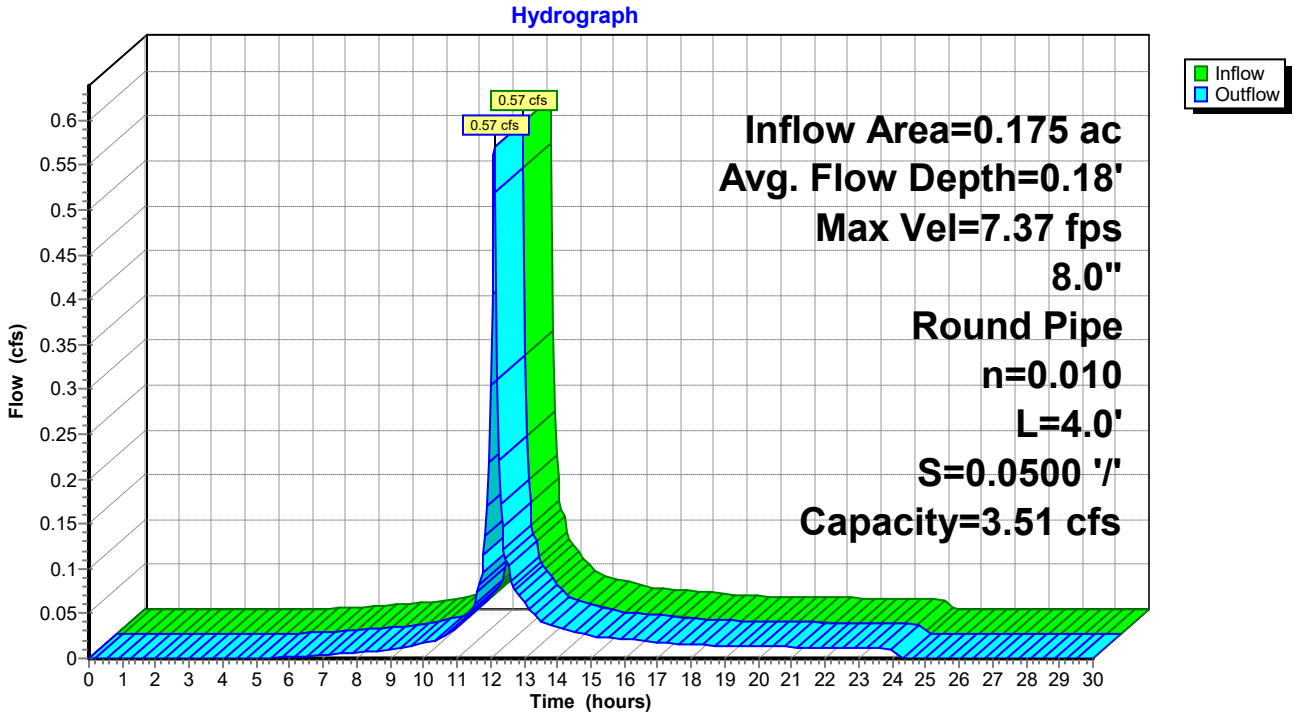
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.37 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.60 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 0.59'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.51 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 4.0' Slope= 0.0500 '/'
Inlet Invert= 470.00', Outlet Invert= 469.80'



Reach DCB8: TO DMH#103



Summary for Reach DCB9: TO DMH#103

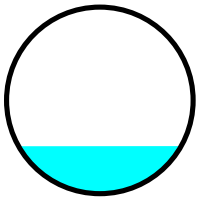
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.225 ac, 39.59% Impervious, Inflow Depth = 1.25" for 10-Year event
Inflow = 0.29 cfs @ 12.13 hrs, Volume= 0.023 af
Outflow = 0.29 cfs @ 12.13 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH104 : TO DMH#104

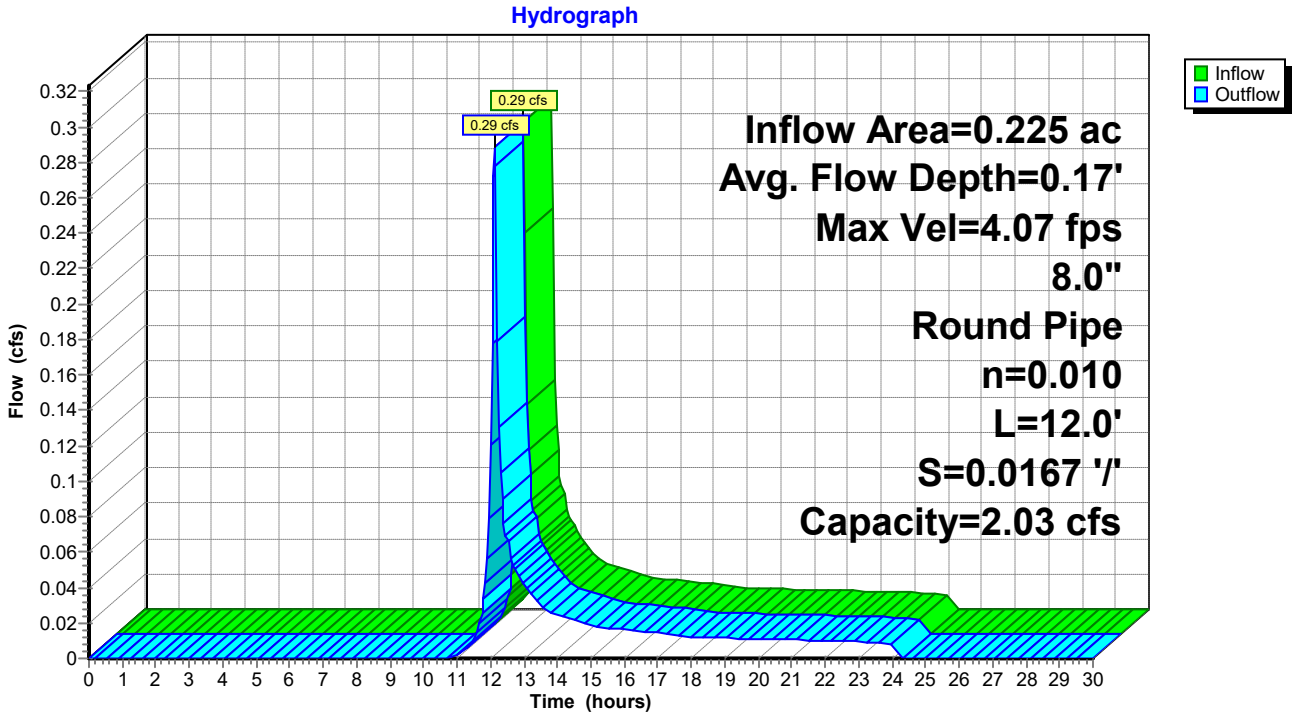
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.07 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.73 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 0.58'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.03 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 12.0' Slope= 0.0167 '/'
Inlet Invert= 470.00', Outlet Invert= 469.80'



Reach DCB9: TO DMH#103



Summary for Reach DMH-A*: TO DMH-B

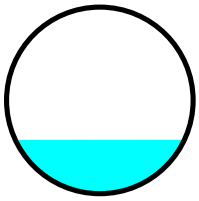
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH100 outlet invert by 0.47' @ 12.15 hrs

Inflow Area = 1.825 ac, 82.07% Impervious, Inflow Depth = 3.44" for 10-Year event
Inflow = 6.06 cfs @ 12.12 hrs, Volume= 0.524 af
Outflow = 5.97 cfs @ 12.14 hrs, Volume= 0.524 af, Atten= 1%, Lag= 0.9 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

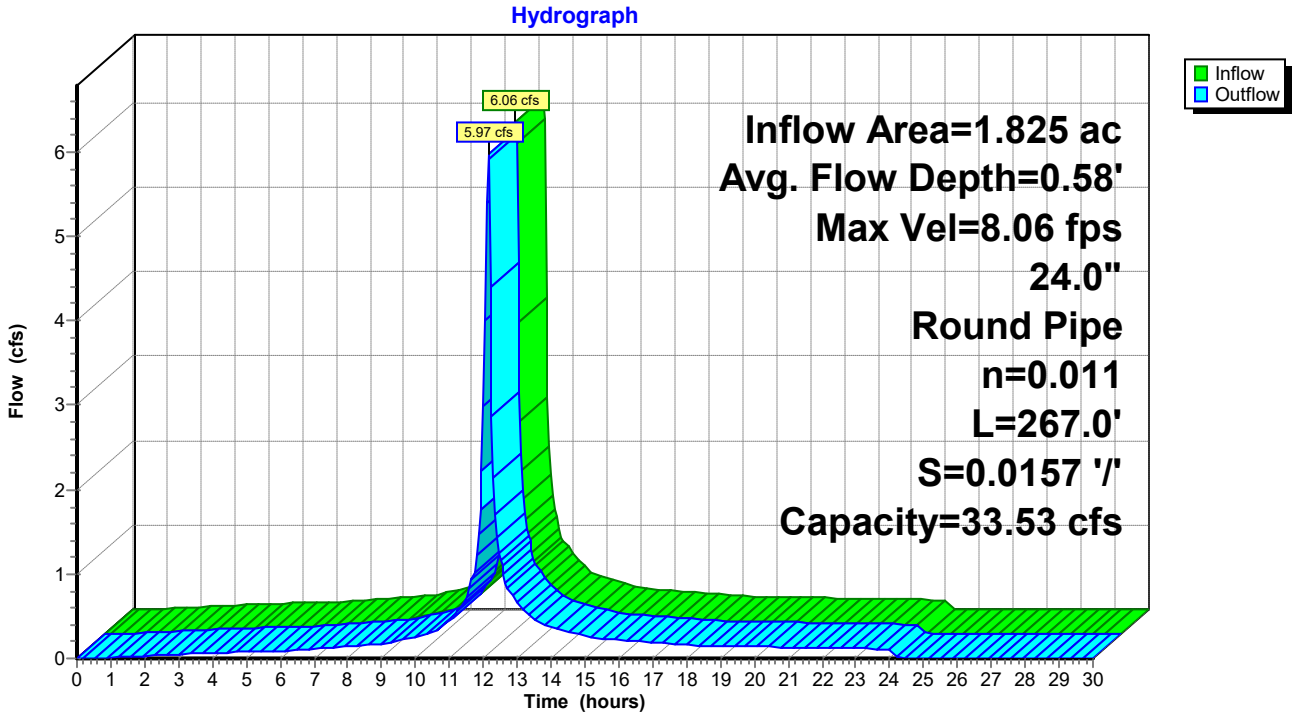
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.06 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.78 fps, Avg. Travel Time= 1.6 min

Peak Storage= 201 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.58' , Surface Width= 1.81'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 33.53 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 267.0' Slope= 0.0157 '/'
Inlet Invert= 463.70', Outlet Invert= 459.50'



Reach DMH-A*: TO DMH-B



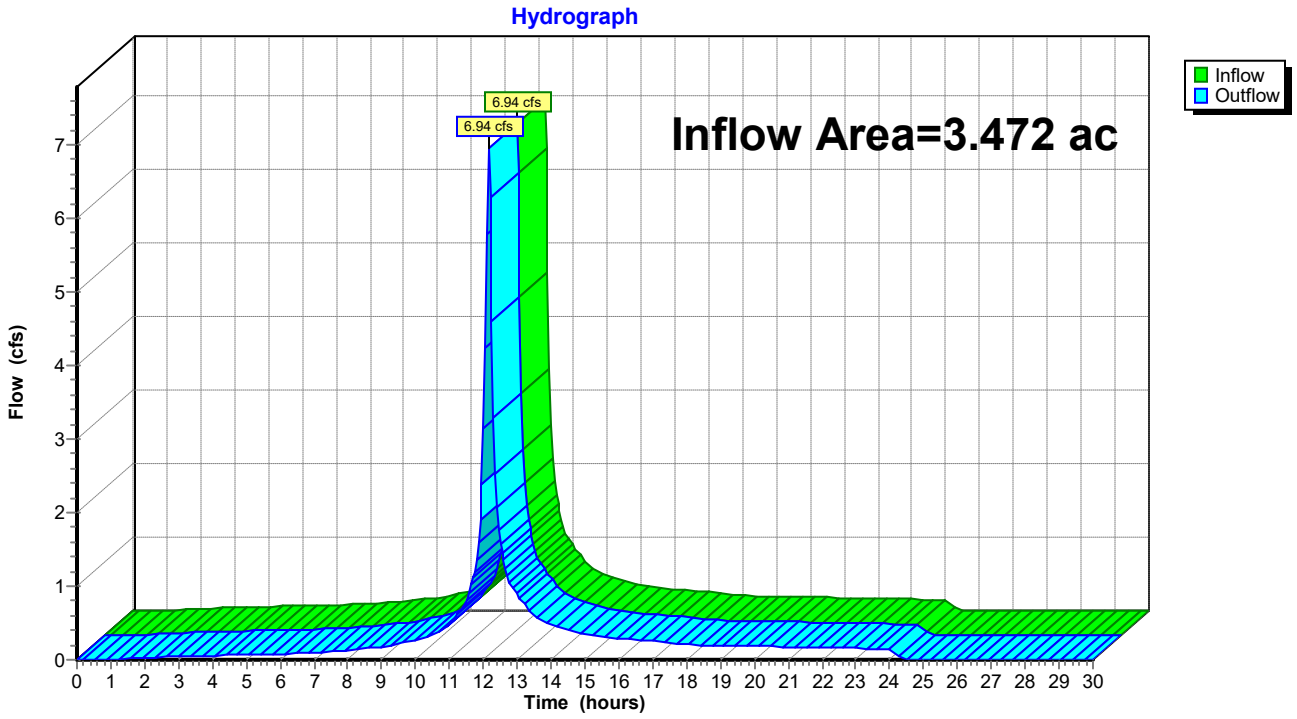
Summary for Reach DMH-C: TO DP#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.472 ac, 77.40% Impervious, Inflow Depth = 2.20" for 10-Year event
Inflow = 6.94 cfs @ 12.16 hrs, Volume= 0.635 af
Outflow = 6.94 cfs @ 12.16 hrs, Volume= 0.635 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

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

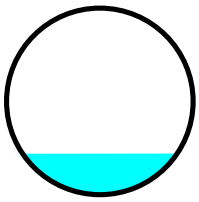
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-E outlet invert by 0.66' @ 12.15 hrs
[79] Warning: Submerged Pond DMH-B Primary device # 1 OUTLET by 0.66'

Inflow Area = 3.472 ac, 77.40% Impervious, Inflow Depth = 2.20" for 10-Year event
Inflow = 7.05 cfs @ 12.15 hrs, Volume= 0.635 af
Outflow = 6.94 cfs @ 12.16 hrs, Volume= 0.635 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH-C : TO DP#1

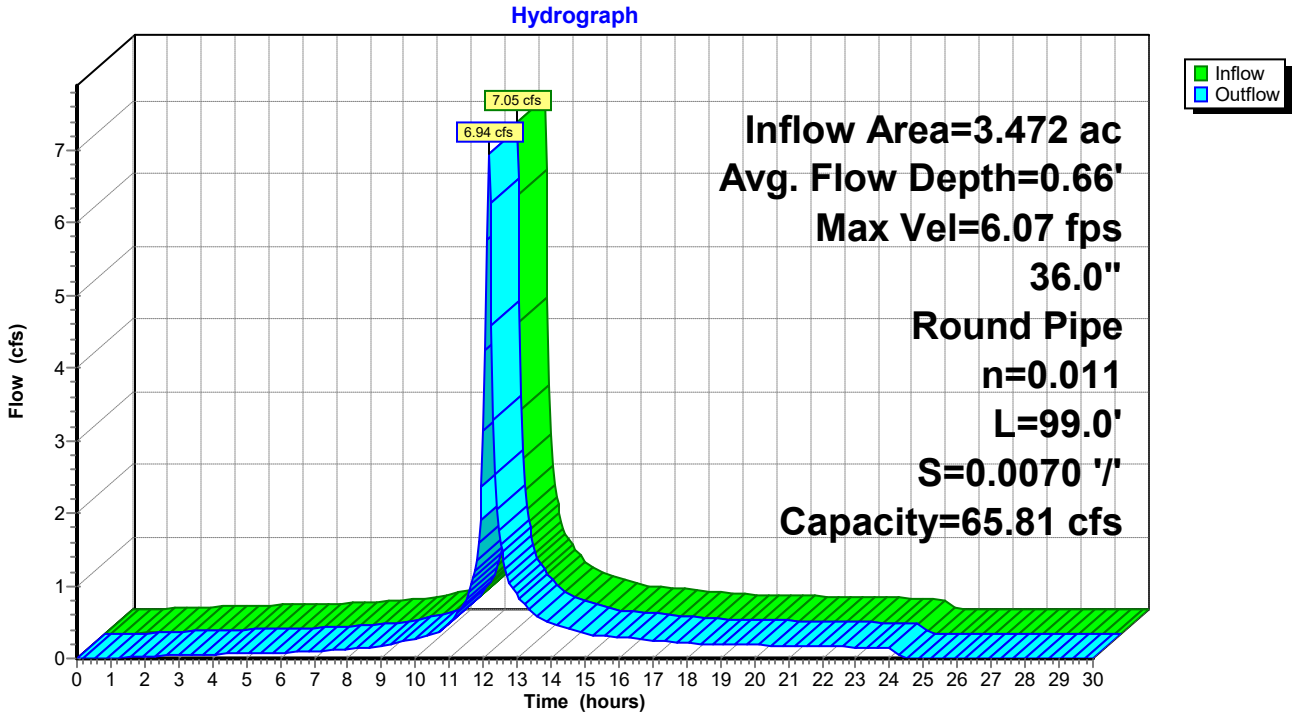
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.07 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 0.8 min

Peak Storage= 115 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.66' , Surface Width= 2.49'
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

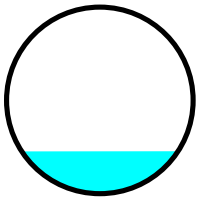
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach CMH3 OUTLET depth by 0.07' @ 12.20 hrs

Inflow Area = 3.330 ac, 76.67% Impervious, Inflow Depth = 2.11" for 10-Year event
Inflow = 6.66 cfs @ 12.15 hrs, Volume= 0.587 af
Outflow = 6.53 cfs @ 12.15 hrs, Volume= 0.587 af, Atten= 2%, Lag= 0.5 min
Routed to Reach DMH-D : TO DMH-C

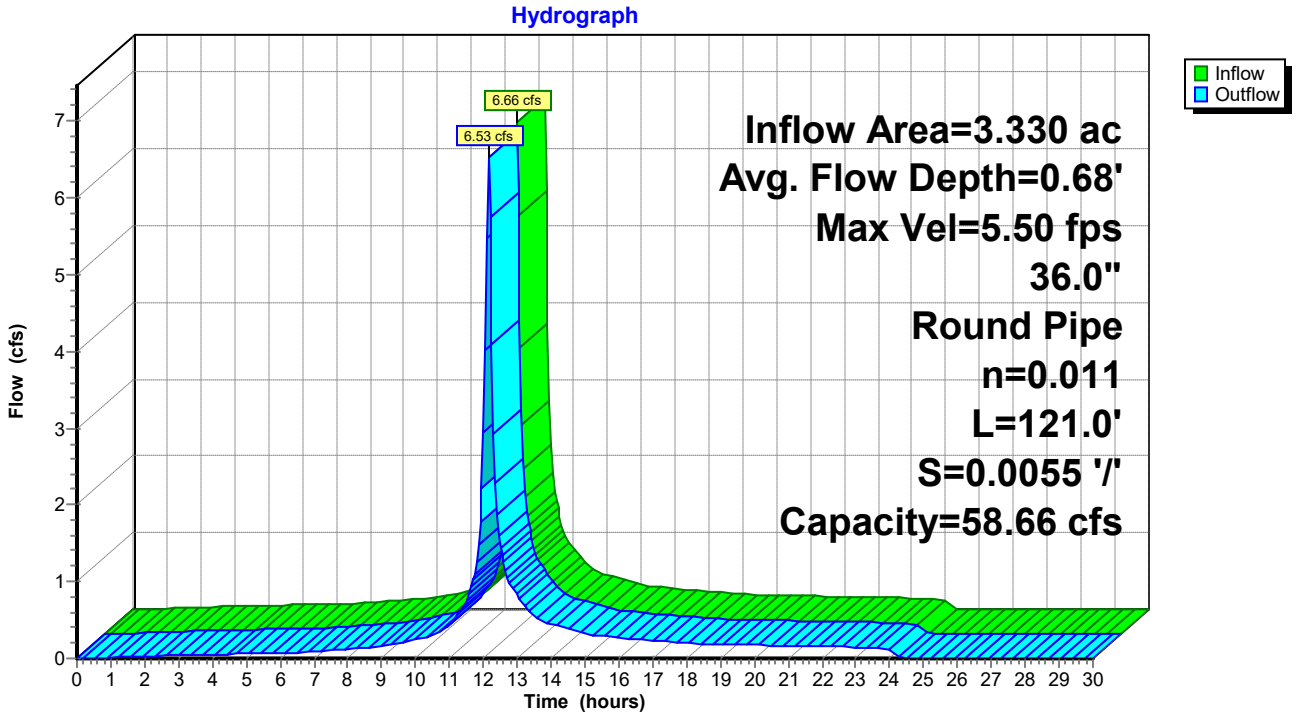
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.50 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 1.1 min

Peak Storage= 146 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.68' , Surface Width= 2.51'
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

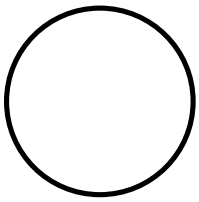


Summary for Reach DMH-F: TO DMH-E

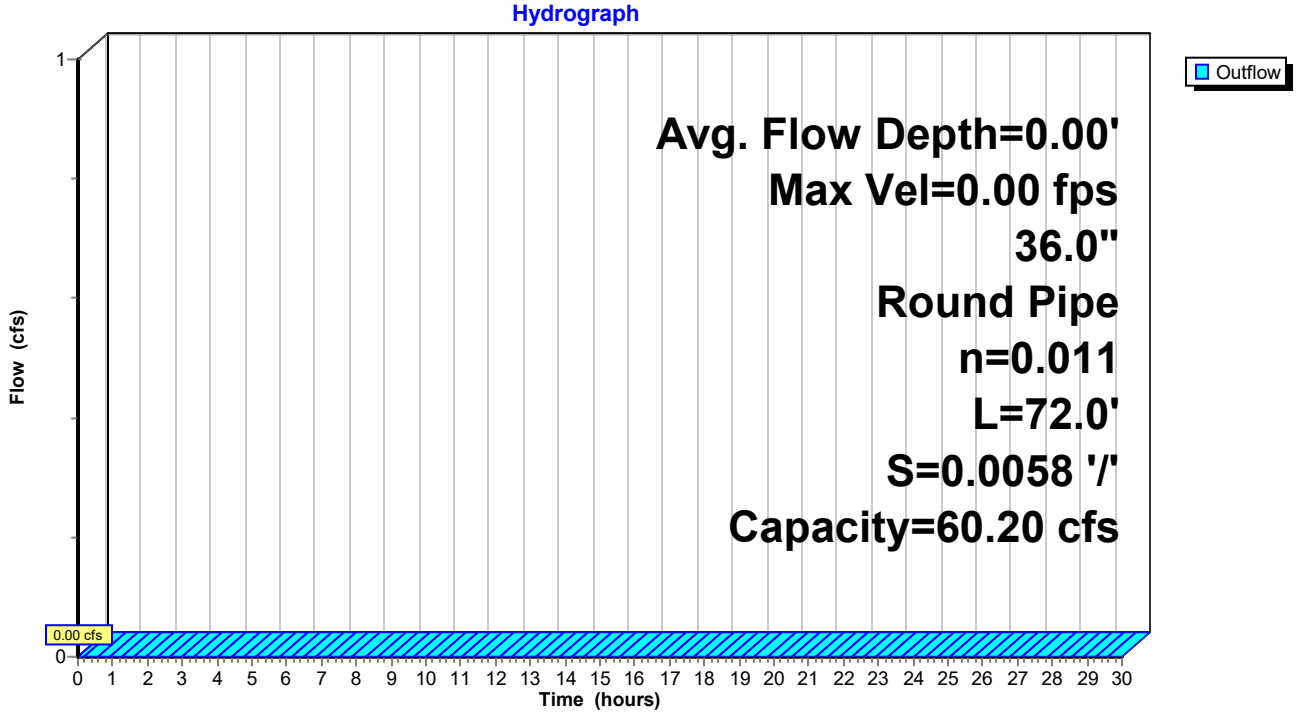
[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.20 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 72.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 457.71'



Reach DMH-F: TO DMH-E



Summary for Reach DMH100: TO DMH-A

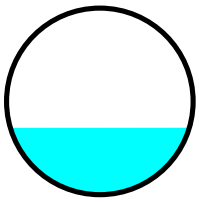
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH101 outlet invert by 0.43' @ 12.10 hrs
[62] Hint: Exceeded Reach DMH107 OUTLET depth by 0.06' @ 12.10 hrs

Inflow Area = 1.400 ac, 85.41% Impervious, Inflow Depth = 3.67" for 10-Year event
Inflow = 4.87 cfs @ 12.12 hrs, Volume= 0.428 af
Outflow = 4.80 cfs @ 12.12 hrs, Volume= 0.428 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH-A* : TO DMH-B

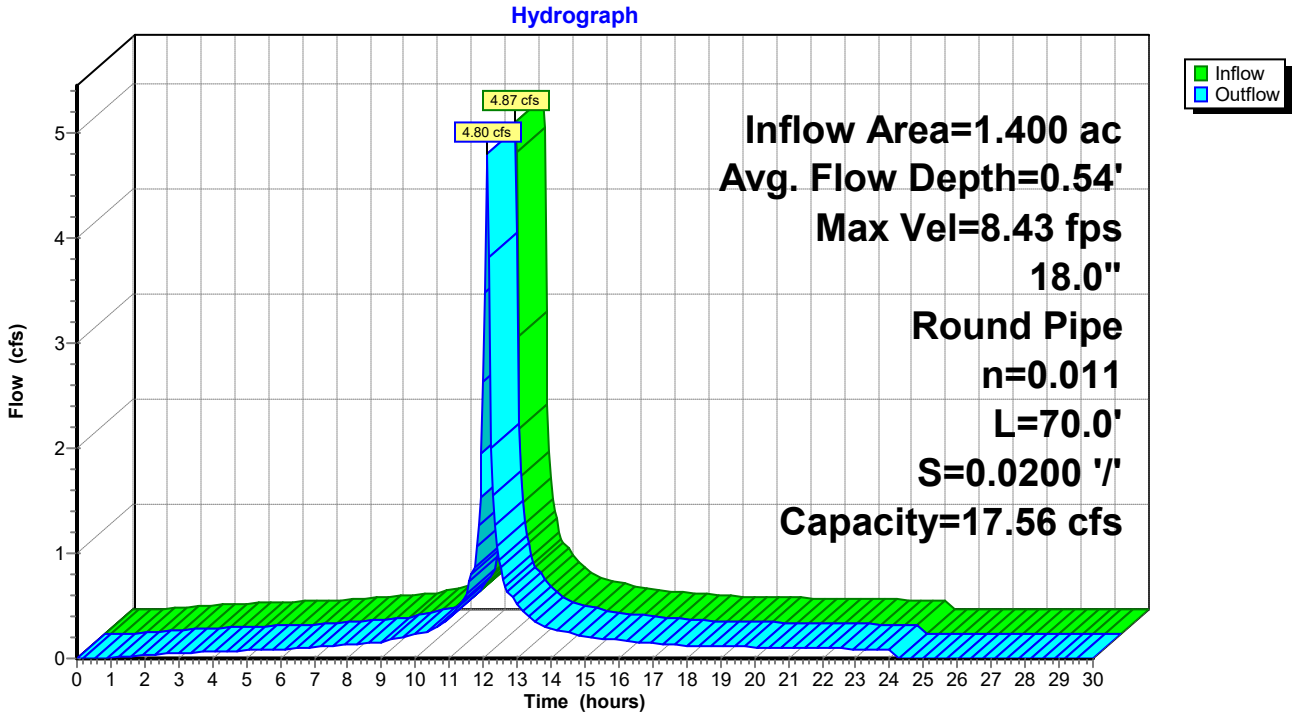
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.43 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.00 fps, Avg. Travel Time= 0.4 min

Peak Storage= 40 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 1.44'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 17.56 cfs

18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 70.0' Slope= 0.0200 '/'
Inlet Invert= 465.20', Outlet Invert= 463.80'



Reach DMH100: TO DMH-A



Summary for Reach DMH101: TO DMH#100

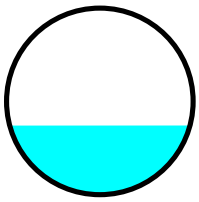
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach RF1 outlet invert by 0.16' @ 12.10 hrs
[61] Hint: Exceeded Reach RF2 outlet invert by 0.16' @ 12.10 hrs

Inflow Area = 0.759 ac,100.00% Impervious, Inflow Depth = 4.44" for 10-Year event
Inflow = 3.19 cfs @ 12.11 hrs, Volume= 0.281 af
Outflow = 3.18 cfs @ 12.11 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH100 : TO DMH-A

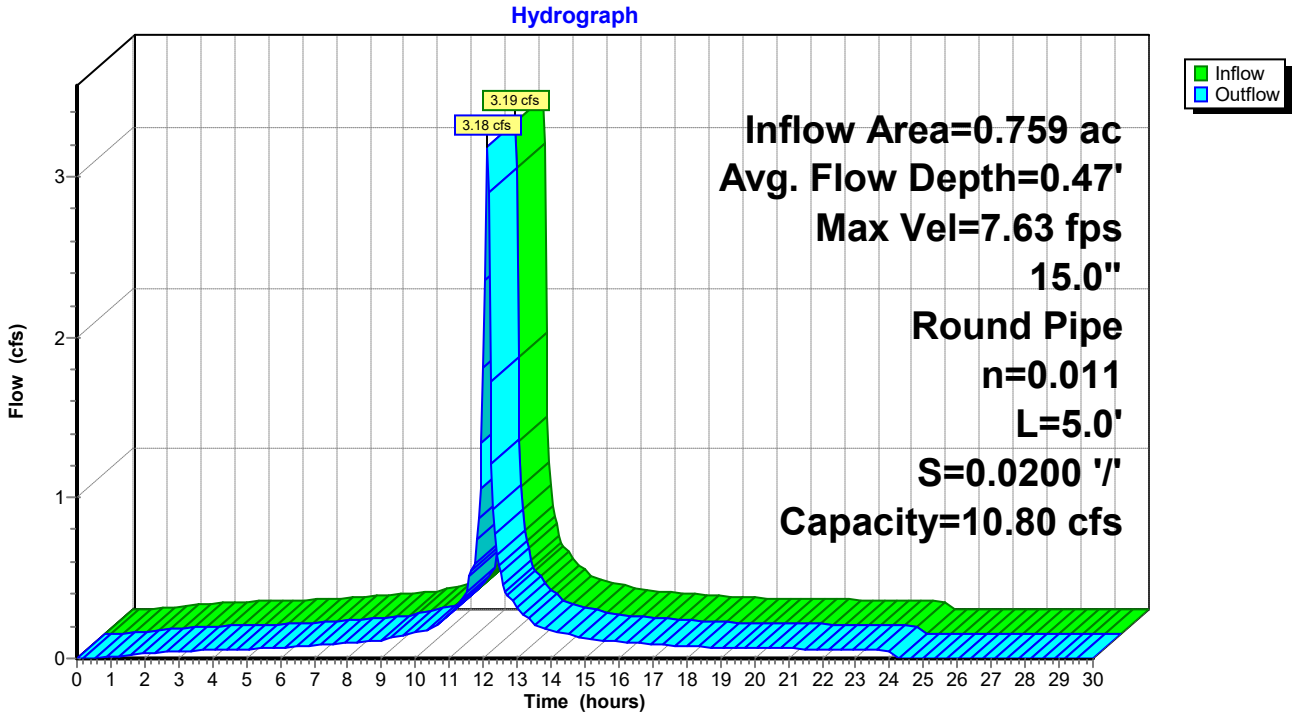
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.63 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.74 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.47' , Surface Width= 1.21'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 10.80 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 465.40', Outlet Invert= 465.30'



Reach DMH101: TO DMH#100



Summary for Reach DMH102: TO UGS#1A

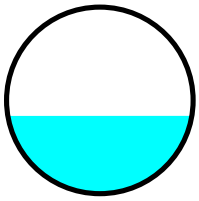
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB15 outlet invert by 0.32' @ 12.10 hrs

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 3.29" for 10-Year event
Inflow = 3.32 cfs @ 12.12 hrs, Volume= 0.267 af
Outflow = 3.32 cfs @ 12.12 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.0 min
Routed to Reach UGS1A : TO UGS#1

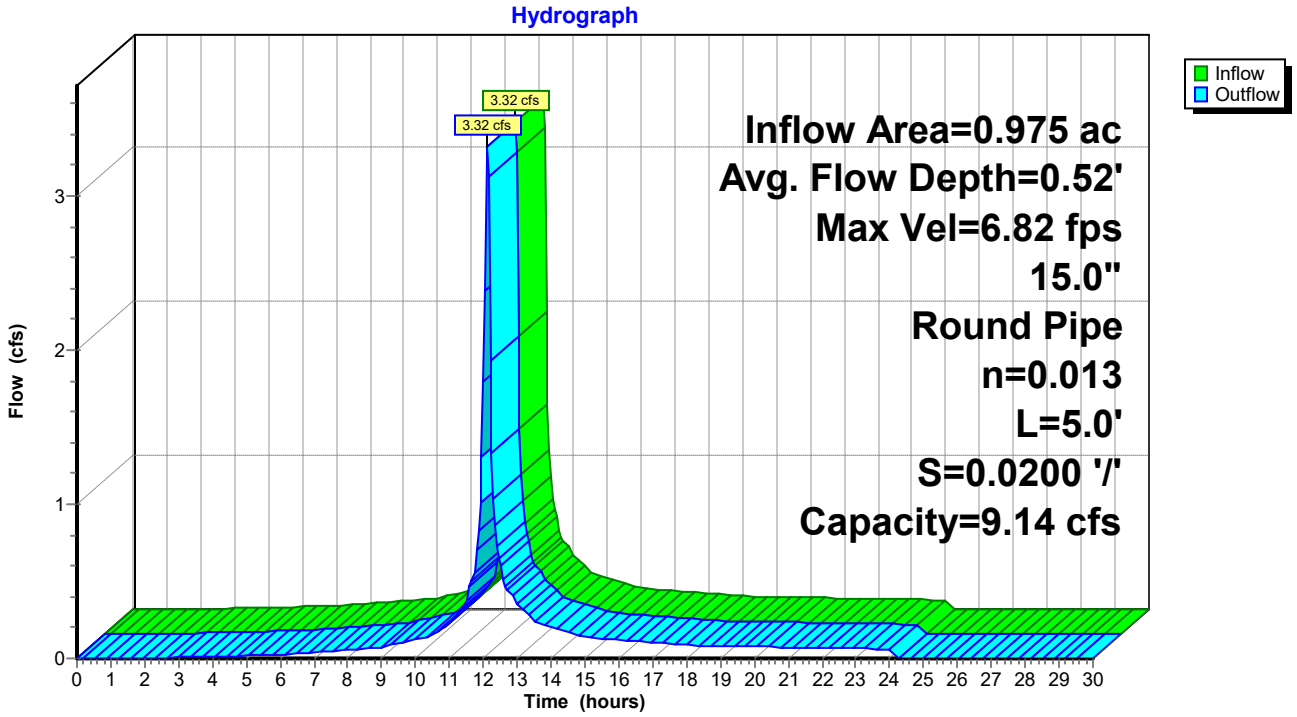
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.82 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.31 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 1.23'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.14 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 466.10', Outlet Invert= 466.00'



Reach DMH102: TO UGS#1A



Summary for Reach DMH103: TO CMH#2

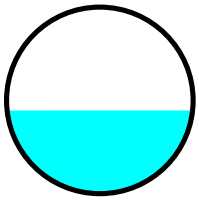
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH104 OUTLET depth by 0.25' @ 12.15 hrs

Inflow Area = 3.013 ac, 76.57% Impervious, Inflow Depth = 2.02" for 10-Year event
Inflow = 5.90 cfs @ 12.12 hrs, Volume= 0.506 af
Outflow = 5.87 cfs @ 12.13 hrs, Volume= 0.506 af, Atten= 0%, Lag= 0.6 min
Routed to Reach CMH3 : TO DMH-E

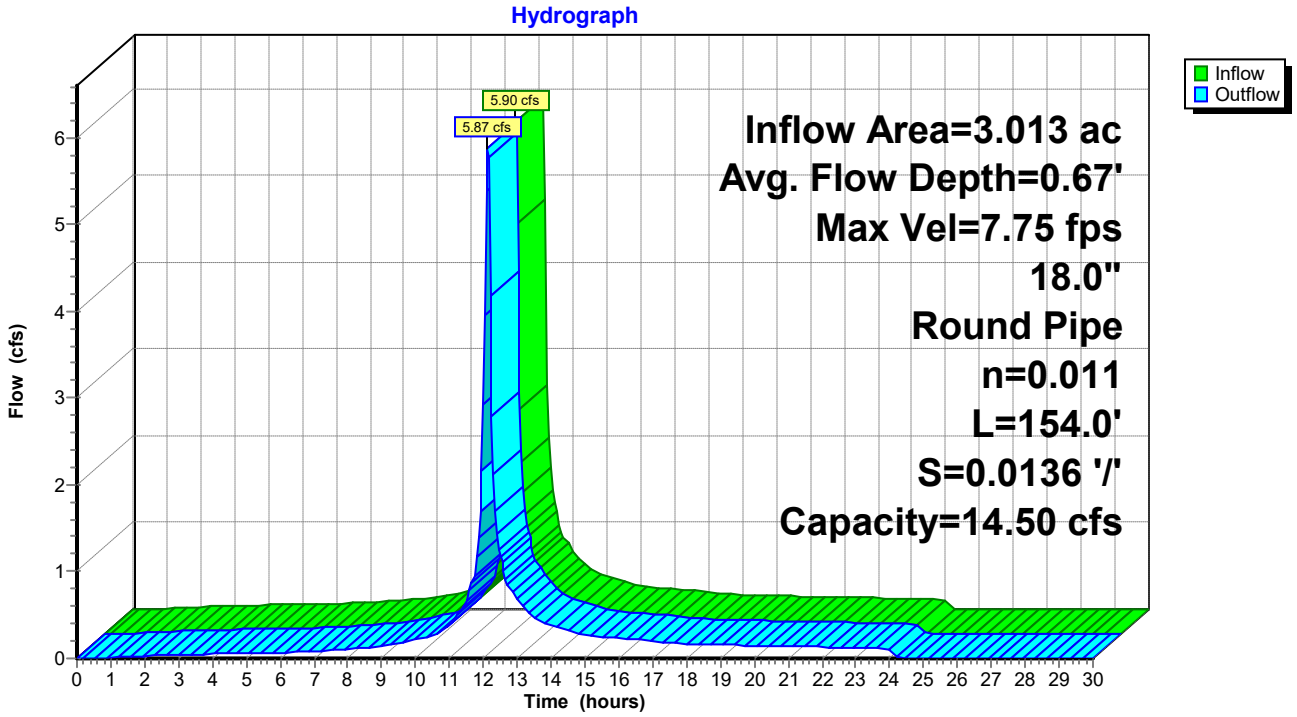
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.75 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.69 fps, Avg. Travel Time= 1.0 min

Peak Storage= 118 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.67' , Surface Width= 1.49'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.50 cfs

18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 154.0' Slope= 0.0136 '/'
Inlet Invert= 464.10', Outlet Invert= 462.00'



Reach DMH103: TO CMH#2



Summary for Reach DMH104: TO DMH#104

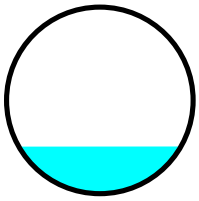
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH105 OUTLET depth by 0.06' @ 12.15 hrs

Inflow Area = 1.535 ac, 70.86% Impervious, Inflow Depth = 0.68" for 10-Year event
Inflow = 1.07 cfs @ 12.13 hrs, Volume= 0.087 af
Outflow = 1.05 cfs @ 12.14 hrs, Volume= 0.087 af, Atten= 2%, Lag= 0.8 min
Routed to Reach DMH103 : TO CMH#2

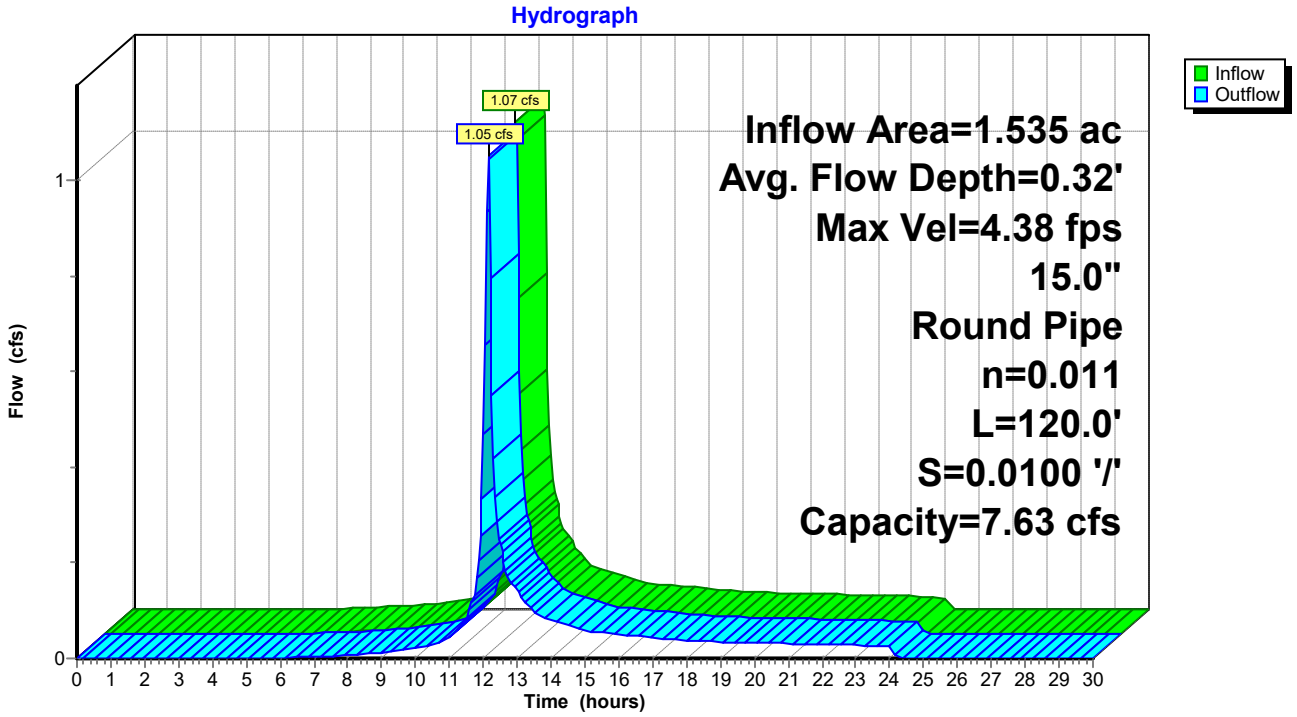
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.38 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 1.3 min

Peak Storage= 29 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 1.09'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.63 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 120.0' Slope= 0.0100 '/'
Inlet Invert= 465.40', Outlet Invert= 464.20'



Reach DMH104: TO DMH#104



Summary for Reach DMH105: TO DMH#104

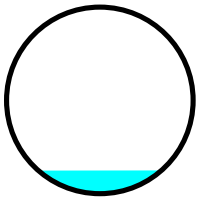
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach UGS1B OUTLET depth by 0.06' @ 12.15 hrs

Inflow Area = 1.135 ac, 76.23% Impervious, Inflow Depth = 0.22" for 10-Year event
Inflow = 0.25 cfs @ 12.13 hrs, Volume= 0.021 af
Outflow = 0.24 cfs @ 12.16 hrs, Volume= 0.021 af, Atten= 7%, Lag= 1.7 min
Routed to Reach DMH104 : TO DMH#104

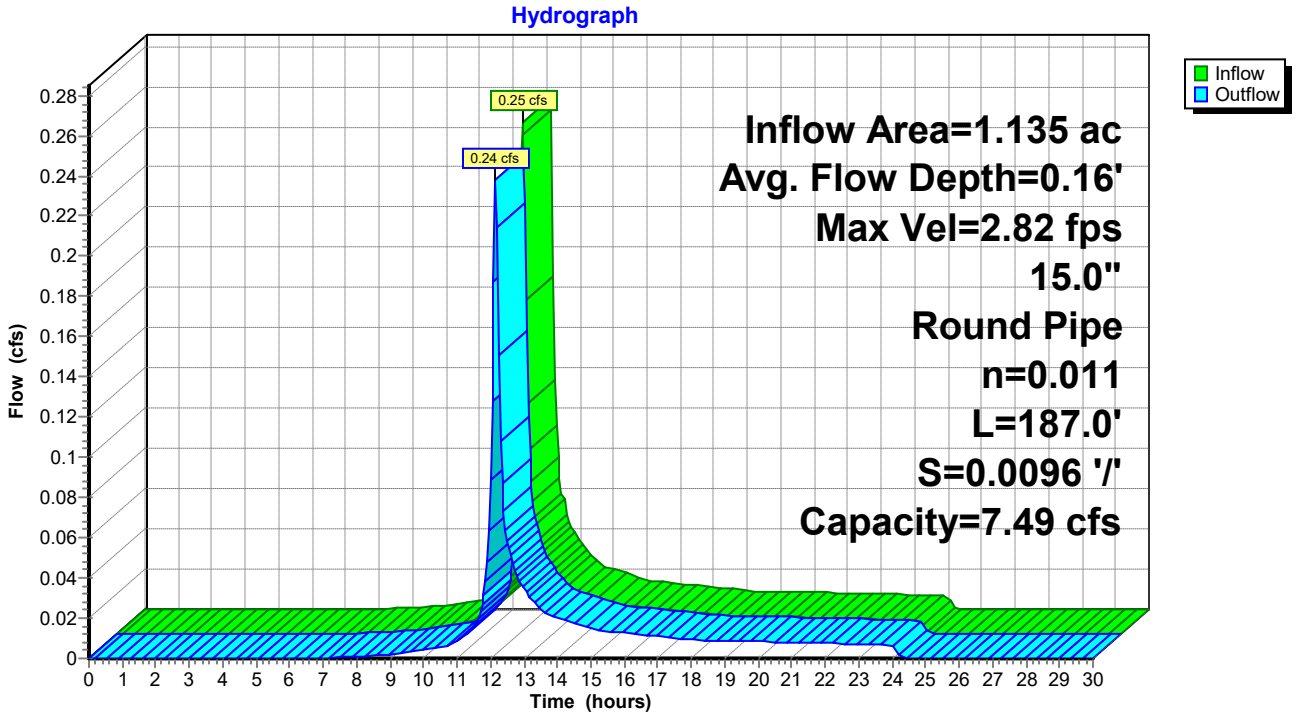
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.82 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 3.0 min

Peak Storage= 17 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 0.83'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.49 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 187.0' Slope= 0.0096 '/'
Inlet Invert= 467.30', Outlet Invert= 465.50'



Reach DMH105: TO DMH#104



Summary for Reach DMH106: TO DMH#105

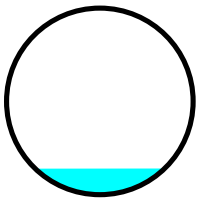
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB10 outlet invert by 0.04' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB11 outlet invert by 0.04' @ 12.15 hrs

Inflow Area = 0.160 ac, 44.63% Impervious, Inflow Depth = 1.55" for 10-Year event
Inflow = 0.26 cfs @ 12.12 hrs, Volume= 0.021 af
Outflow = 0.25 cfs @ 12.13 hrs, Volume= 0.021 af, Atten= 1%, Lag= 0.5 min
Routed to Reach DMH105 : TO DMH#104

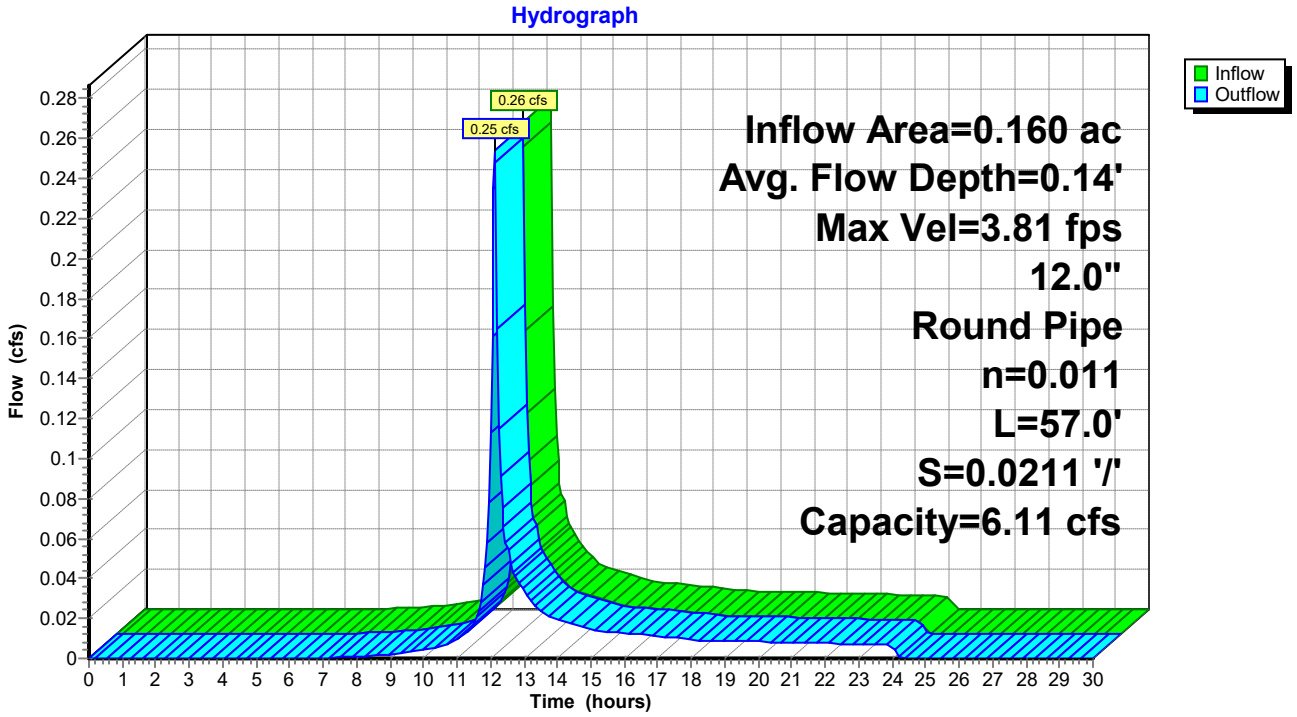
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.81 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.7 min

Peak Storage= 4 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 0.69'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.11 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 57.0' Slope= 0.0211 '/'
Inlet Invert= 470.00', Outlet Invert= 468.80'



Reach DMH106: TO DMH#105



Summary for Reach DMH107: TO DMH#100

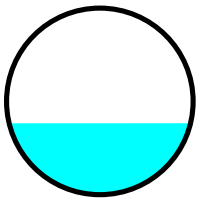
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB6 outlet invert by 0.17' @ 12.15 hrs
[61] Hint: Exceeded Reach DMH108 outlet invert by 0.17' @ 12.15 hrs

Inflow Area = 0.641 ac, 68.12% Impervious, Inflow Depth = 2.75" for 10-Year event
Inflow = 1.73 cfs @ 12.12 hrs, Volume= 0.147 af
Outflow = 1.73 cfs @ 12.13 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.5 min
Routed to Reach DMH100 : TO DMH-A

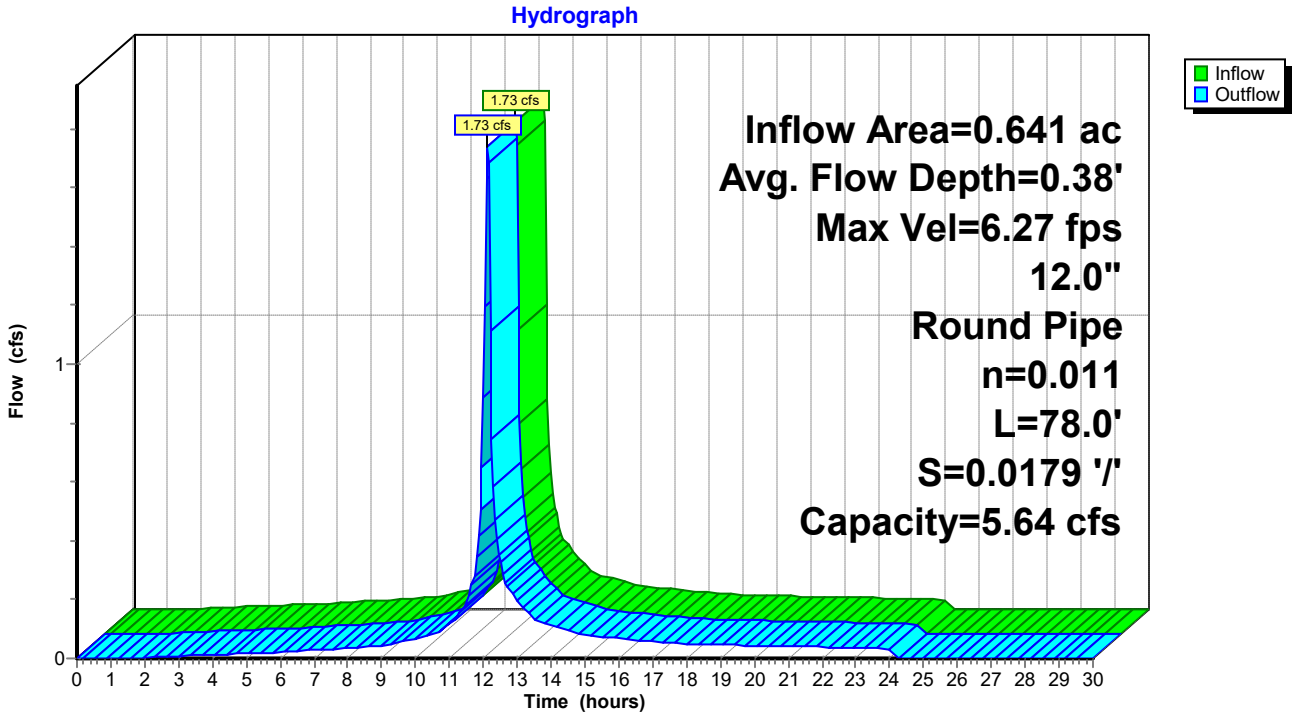
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.27 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.21 fps, Avg. Travel Time= 0.6 min

Peak Storage= 22 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.38' , Surface Width= 0.97'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.64 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 78.0' Slope= 0.0179 '/'
Inlet Invert= 466.70', Outlet Invert= 465.30'



Reach DMH107: TO DMH#100



Summary for Reach DMH108: TO DMH#107

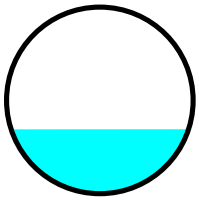
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB12 outlet invert by 0.24' @ 12.10 hrs

Inflow Area = 0.491 ac, 60.11% Impervious, Inflow Depth = 2.34" for 10-Year event
Inflow = 1.15 cfs @ 12.12 hrs, Volume= 0.096 af
Outflow = 1.14 cfs @ 12.13 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.4 min
Routed to Reach DMH107 : TO DMH#100

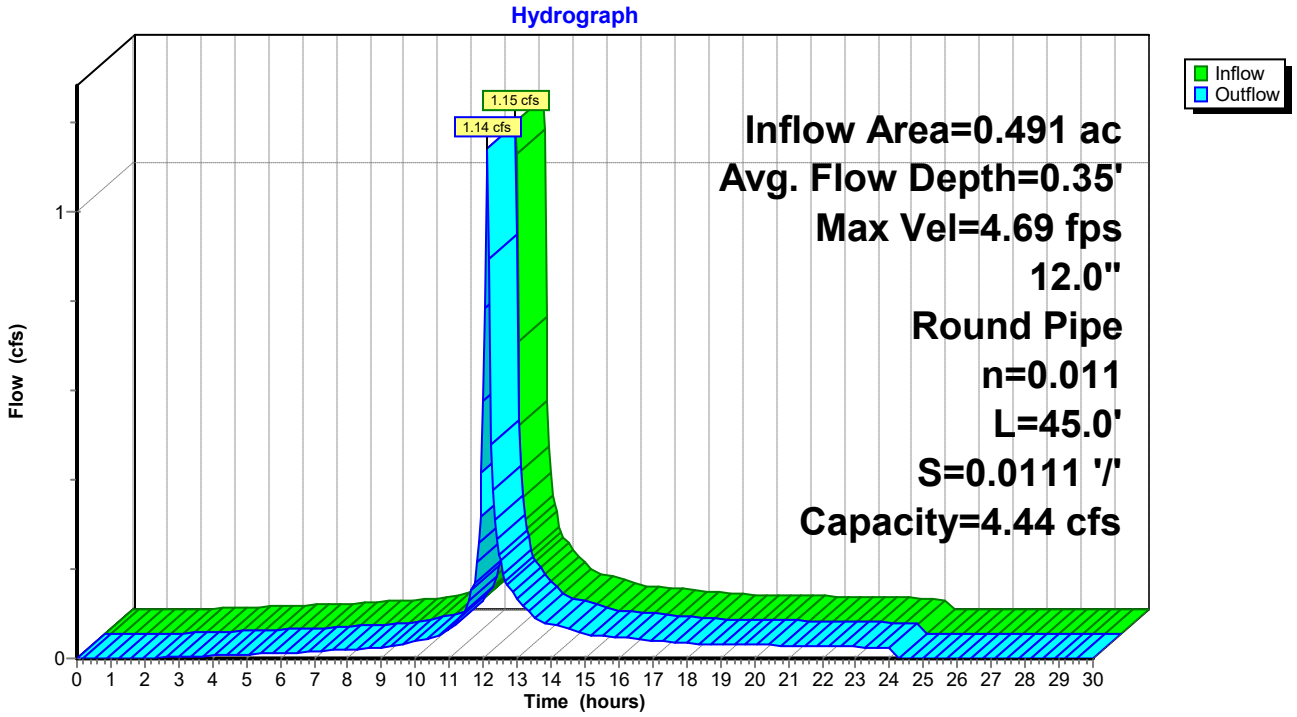
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.69 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 0.5 min

Peak Storage= 11 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 0.95'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0111 '/'
Inlet Invert= 467.40', Outlet Invert= 466.90'



Reach DMH108: TO DMH#107



Summary for Reach DMH109: TO DMH#110

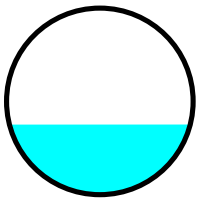
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB14 outlet invert by 0.17' @ 12.10 hrs
[61] Hint: Exceeded Reach DCB20 outlet invert by 0.17' @ 12.10 hrs
[61] Hint: Exceeded Reach DMH109A outlet invert by 0.17' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 3.45" for 10-Year event
Inflow = 2.14 cfs @ 12.12 hrs, Volume= 0.172 af
Outflow = 2.14 cfs @ 12.12 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH110 : TO UGS#2A

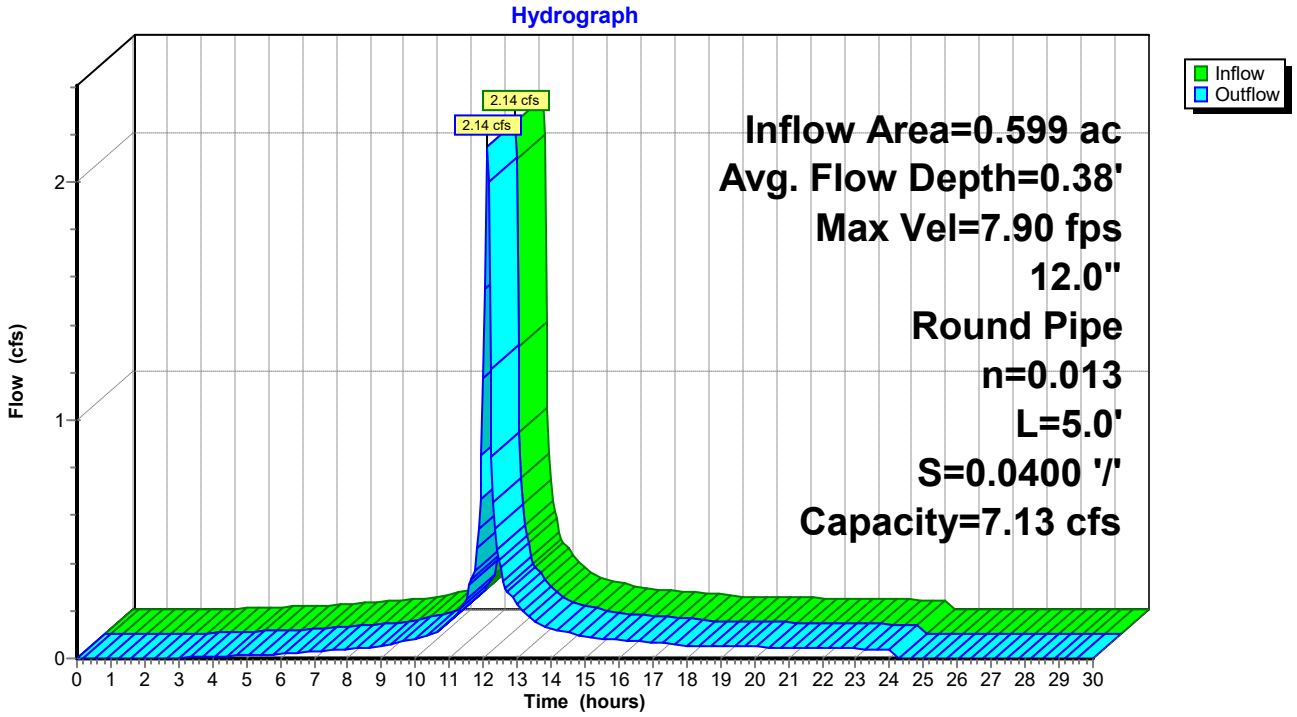
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.90 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.68 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.38' , Surface Width= 0.97'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 466.20', Outlet Invert= 466.00'



Reach DMH109: TO DMH#110



Summary for Reach DMH109A: TO DMH109

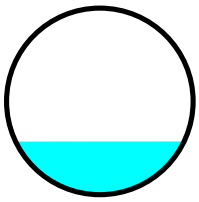
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB21 outlet invert by 0.18' @ 12.10 hrs
[62] Hint: Exceeded Reach DCB25 OUTLET depth by 0.03' @ 12.15 hrs

Inflow Area = 0.239 ac, 75.90% Impervious, Inflow Depth = 2.99" for 10-Year event
Inflow = 0.77 cfs @ 12.12 hrs, Volume= 0.060 af
Outflow = 0.76 cfs @ 12.12 hrs, Volume= 0.060 af, Atten= 2%, Lag= 0.3 min
Routed to Reach DMH109 : TO DMH#110

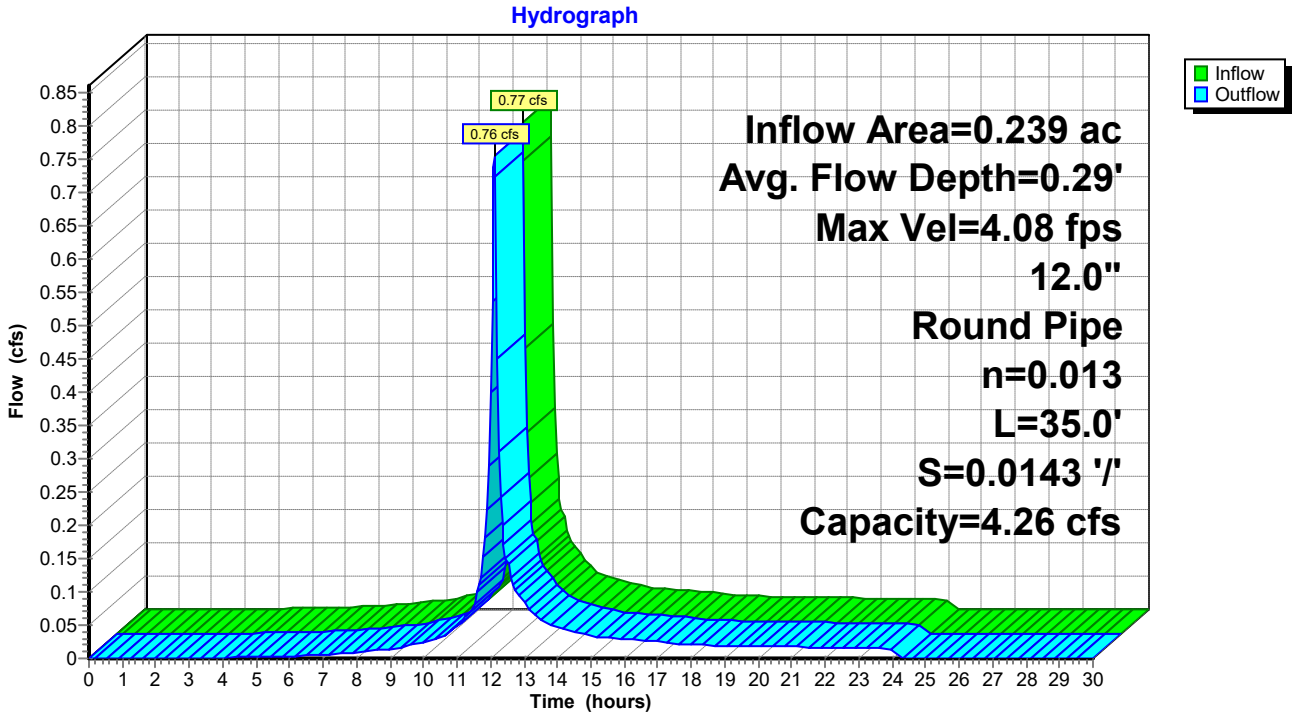
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.08 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 0.4 min

Peak Storage= 7 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.29' , Surface Width= 0.90'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0143 '/'
Inlet Invert= 466.90', Outlet Invert= 466.40'



Reach DMH109A: TO DMH109



Summary for Reach DMH110: TO UGS#2A

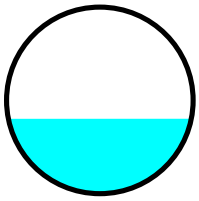
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH109 outlet invert by 0.15' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 3.45" for 10-Year event
Inflow = 2.14 cfs @ 12.12 hrs, Volume= 0.172 af
Outflow = 2.13 cfs @ 12.12 hrs, Volume= 0.172 af, Atten= 1%, Lag= 0.1 min
Routed to Reach UGS2A : TO UGS#2

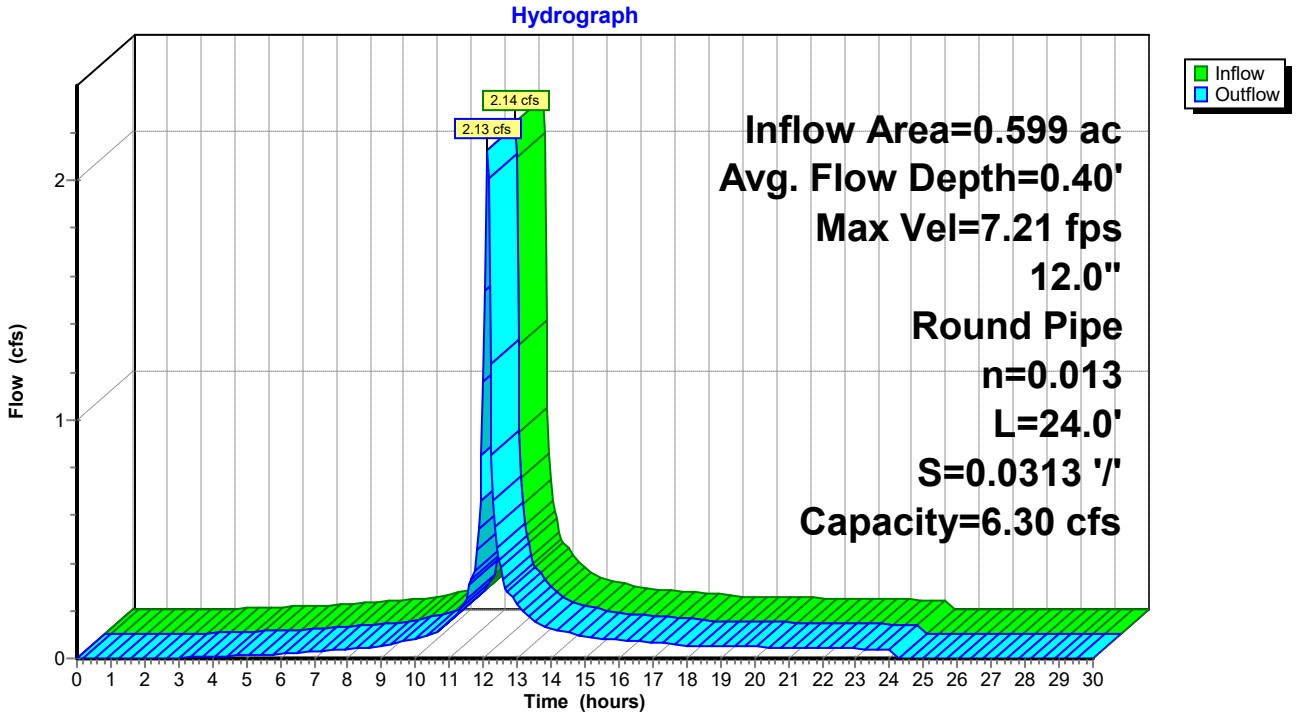
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.45 fps, Avg. Travel Time= 0.2 min

Peak Storage= 7 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.30 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0313 '/'
Inlet Invert= 465.75', Outlet Invert= 465.00'



Reach DMH110: TO UGS#2A



Summary for Reach DMH111: TO DMH#112

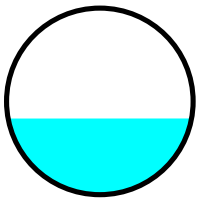
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DCB19 OUTLET depth by 0.12' @ 12.15 hrs
[62] Hint: Exceeded Reach DCB22 OUTLET depth by 0.15' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB23 outlet invert by 0.31' @ 12.15 hrs

Inflow Area = 1.171 ac, 46.54% Impervious, Inflow Depth = 1.59" for 10-Year event
Inflow = 1.88 cfs @ 12.14 hrs, Volume= 0.156 af
Outflow = 1.87 cfs @ 12.14 hrs, Volume= 0.156 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH112 : TO DMH#113

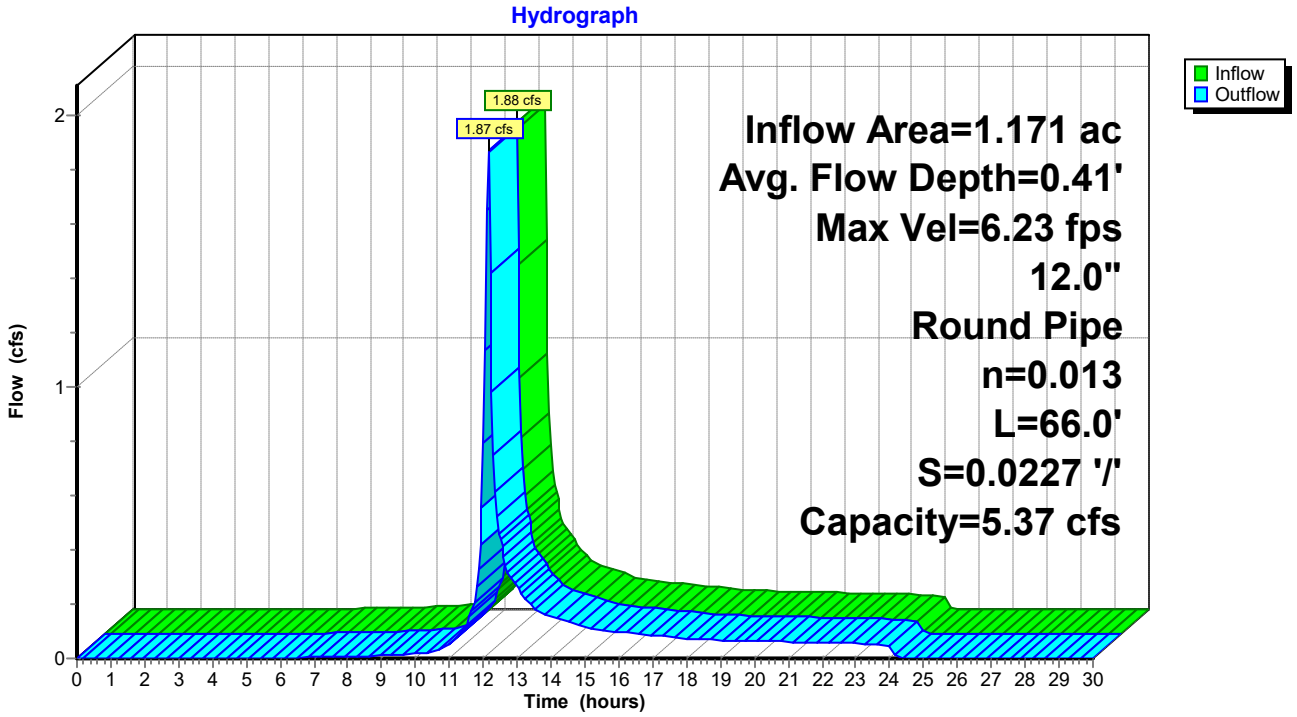
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.23 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.16 fps, Avg. Travel Time= 0.5 min

Peak Storage= 20 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.41' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.37 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 66.0' Slope= 0.0227 '/'
Inlet Invert= 463.50', Outlet Invert= 462.00'



Reach DMH111: TO DMH#112



Summary for Reach DMH112: TO DMH#113

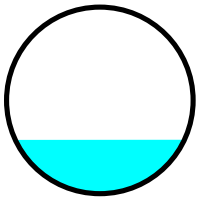
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach UGS2B OUTLET depth by 0.19' @ 12.15 hrs

Inflow Area = 1.770 ac, 59.09% Impervious, Inflow Depth > 2.21" for 10-Year event
Inflow = 2.04 cfs @ 12.14 hrs, Volume= 0.325 af
Outflow = 2.03 cfs @ 12.14 hrs, Volume= 0.325 af, Atten= 0%, Lag= 0.2 min
Routed to Reach DMH113 : TO DMH#114

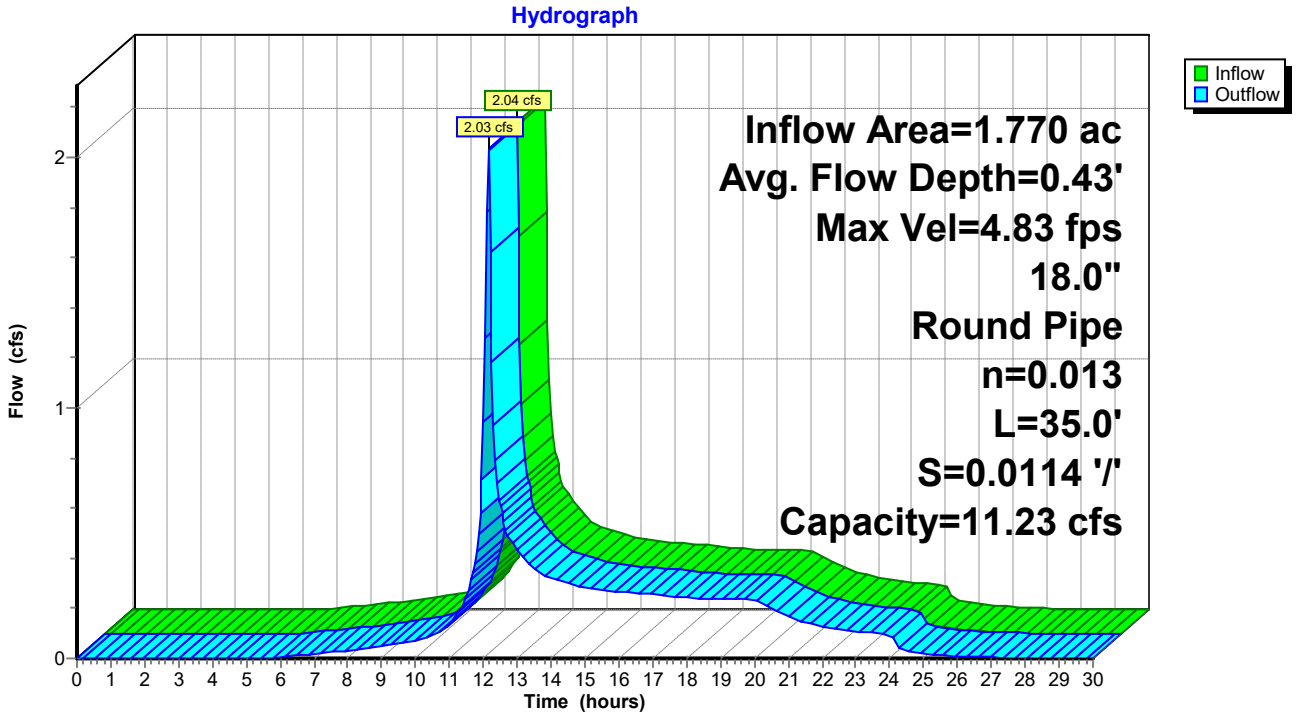
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.83 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 0.3 min

Peak Storage= 15 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 1.36'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.23 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0114 '/'
Inlet Invert= 460.20', Outlet Invert= 459.80'



Reach DMH112: TO DMH#113



Summary for Reach DMH113: TO DMH#114

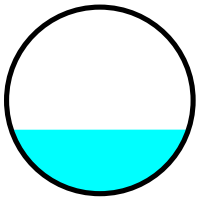
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH112 outlet invert by 0.41' @ 12.15 hrs

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth = 2.01" for 10-Year event
Inflow = 3.37 cfs @ 12.13 hrs, Volume= 0.430 af
Outflow = 3.36 cfs @ 12.14 hrs, Volume= 0.430 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH114 : TO DMH-K1

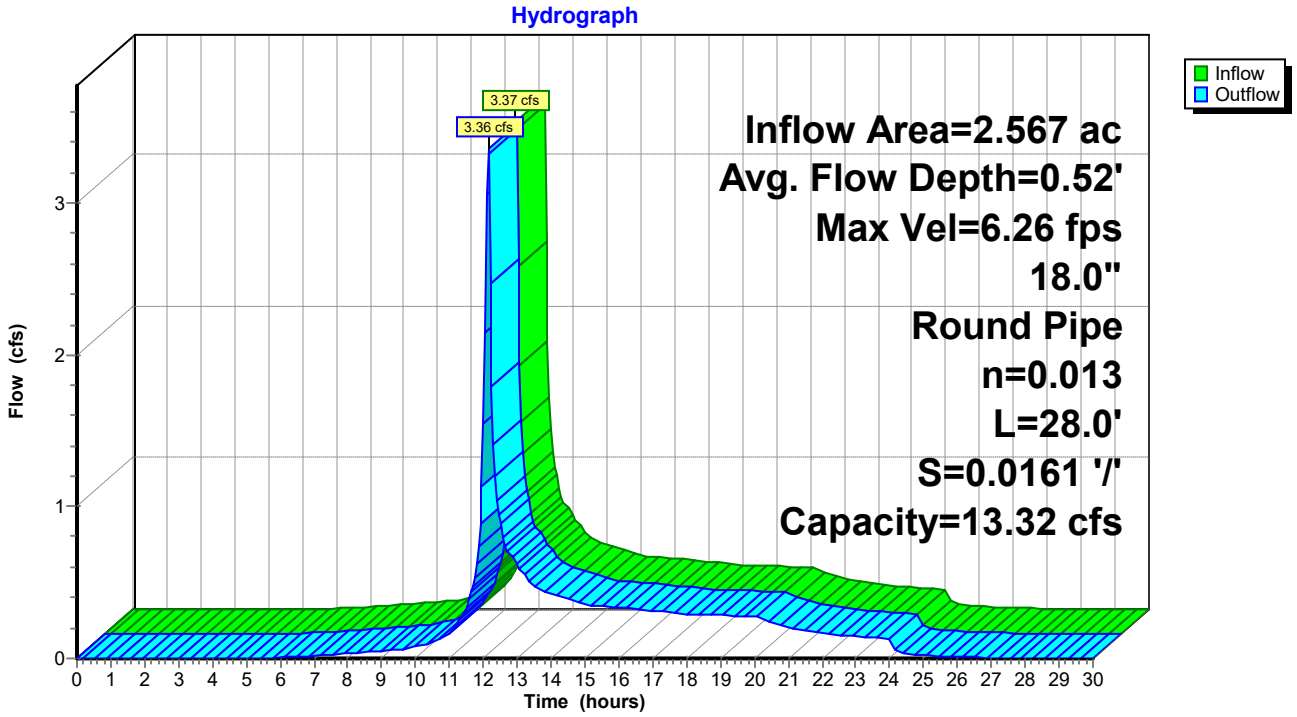
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.26 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.23 fps, Avg. Travel Time= 0.2 min

Peak Storage= 15 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 1.42'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 13.32 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 28.0' Slope= 0.0161 '/'
Inlet Invert= 459.70', Outlet Invert= 459.25'



Reach DMH113: TO DMH#114



Summary for Reach DMH114: TO DMH-K1

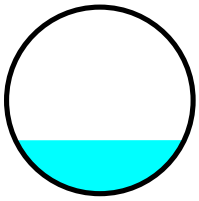
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH113 outlet invert by 0.18' @ 12.15 hrs

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 2.01" for 10-Year event
Inflow = 3.36 cfs @ 12.14 hrs, Volume= 0.430 af
Outflow = 3.36 cfs @ 12.14 hrs, Volume= 0.430 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

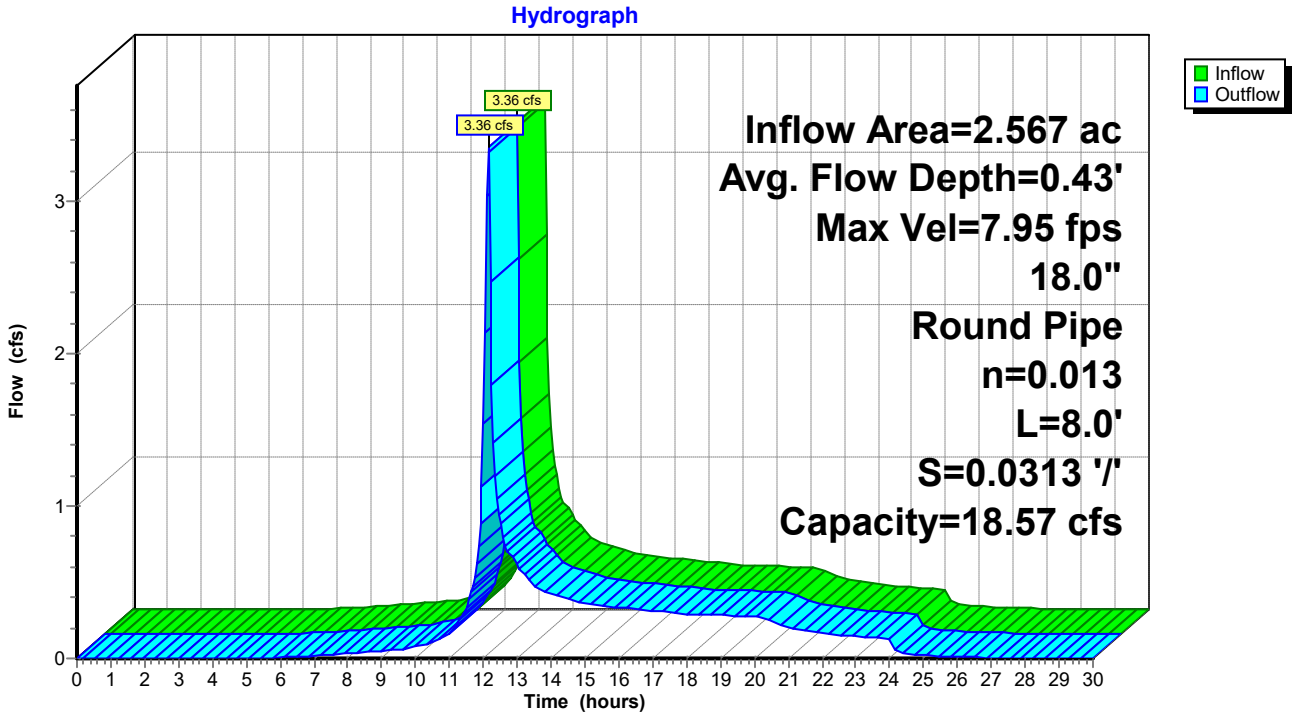
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.95 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.83 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 1.36'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.57 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 8.0' Slope= 0.0313 '/'
Inlet Invert= 459.00', Outlet Invert= 458.75'



Reach DMH114: TO DMH-K1



Summary for Reach DMHR1: TO DMH#104

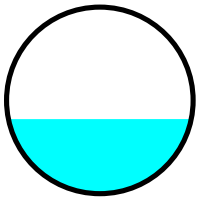
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMHR2 outlet invert by 0.30' @ 12.15 hrs

Inflow Area = 0.739 ac, 65.00% Impervious, Inflow Depth = 2.36" for 10-Year event
Inflow = 1.89 cfs @ 12.13 hrs, Volume= 0.145 af
Outflow = 1.87 cfs @ 12.14 hrs, Volume= 0.145 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH103 : TO CMH#2

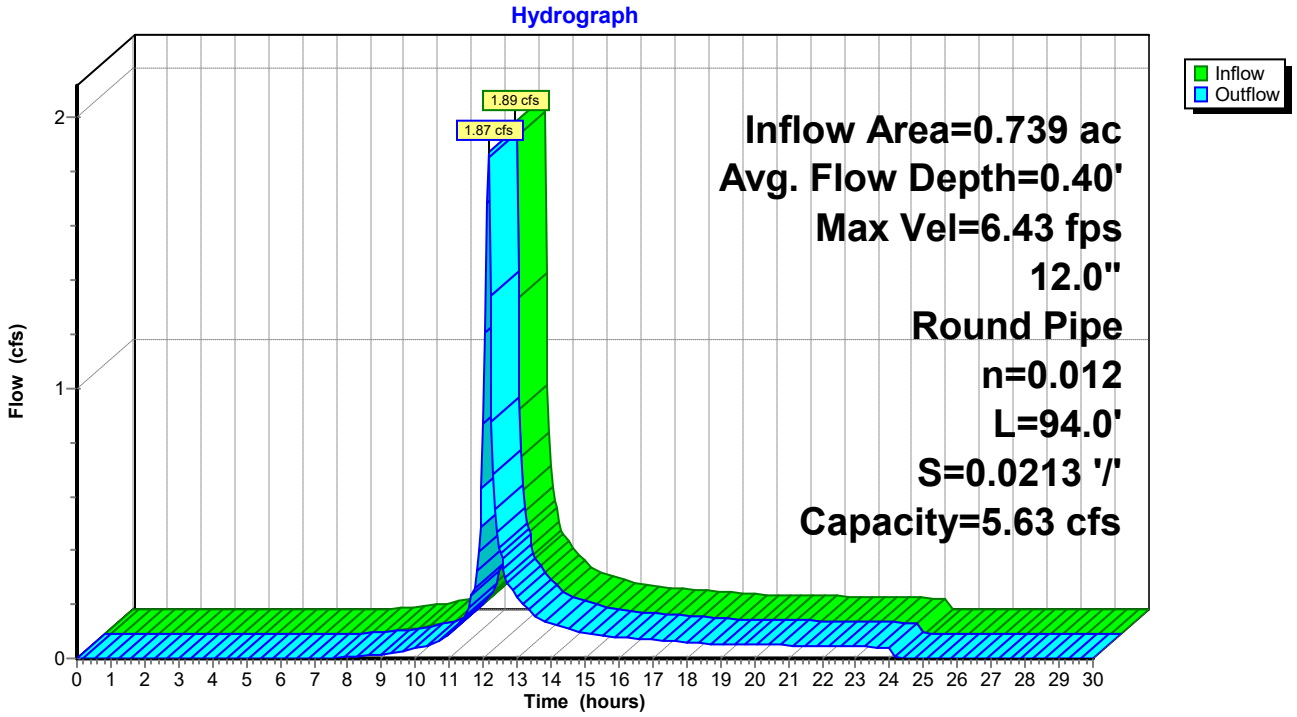
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.43 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 0.7 min

Peak Storage= 28 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.63 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 94.0' Slope= 0.0213 '/'
Inlet Invert= 467.00', Outlet Invert= 465.00'



Reach DMHR1: TO DMH#104



Summary for Reach DMHR2: TO DMH#R2

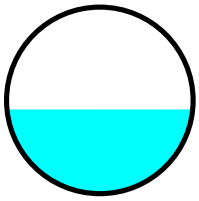
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.739 ac, 65.00% Impervious, Inflow Depth = 2.36" for 10-Year event
Inflow = 1.93 cfs @ 12.12 hrs, Volume= 0.145 af
Outflow = 1.89 cfs @ 12.13 hrs, Volume= 0.145 af, Atten= 2%, Lag= 0.9 min
Routed to Reach DMHR1 : TO DMH#104

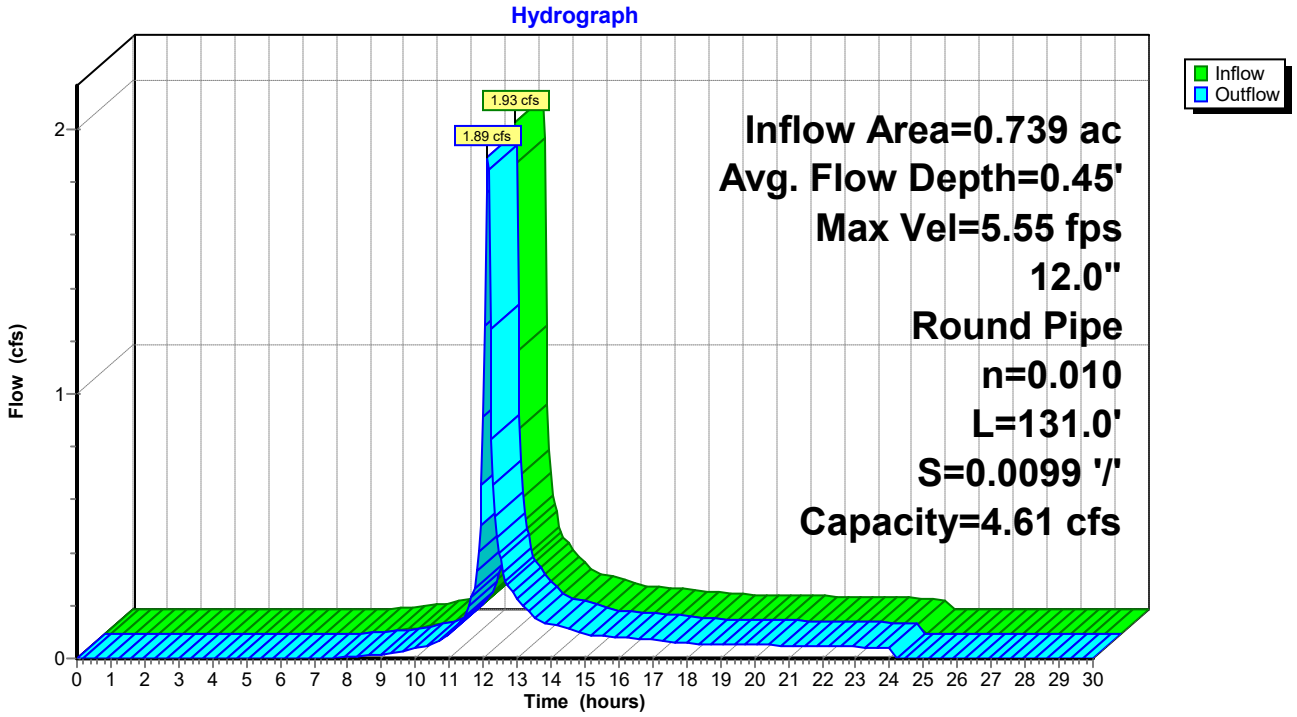
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.55 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.09 fps, Avg. Travel Time= 1.0 min

Peak Storage= 45 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 131.0' Slope= 0.0099 '/'
Inlet Invert= 468.40', Outlet Invert= 467.10'



Reach DMHR2: TO DMH#R2



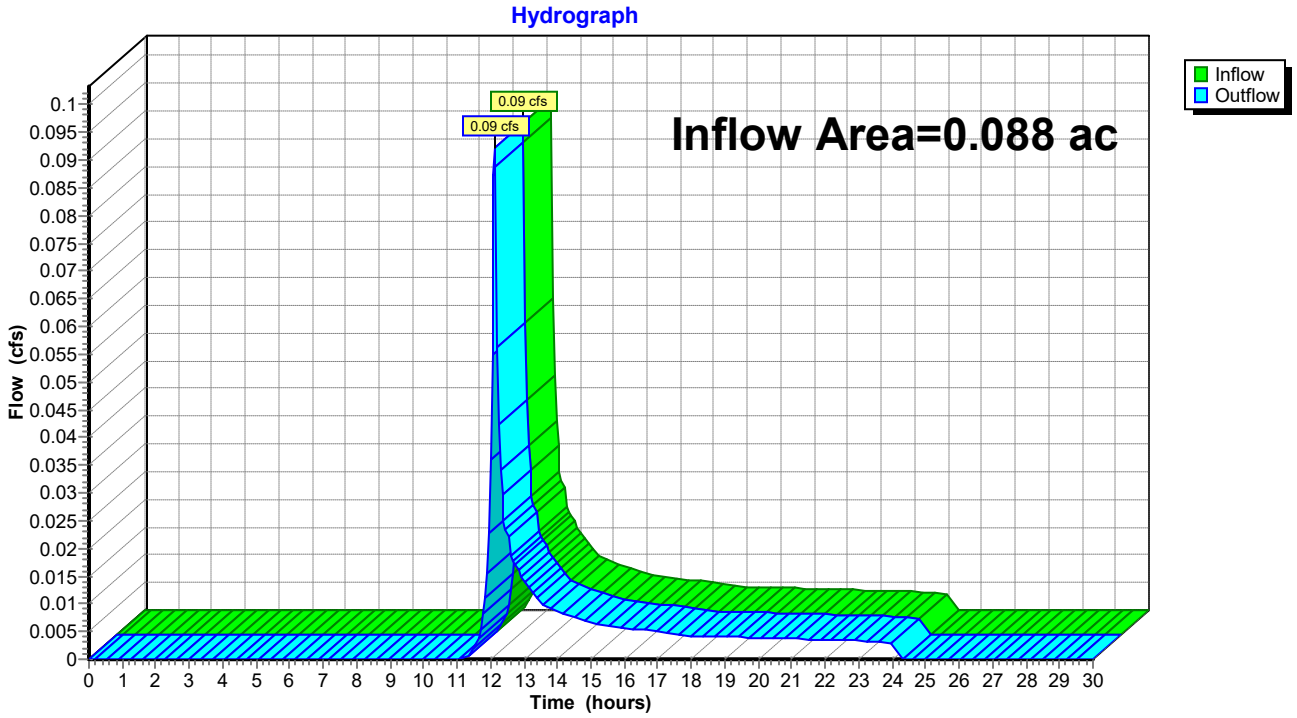
Summary for Reach DP#6: OFFSITE LOW POINT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.088 ac, 33.45% Impervious, Inflow Depth = 1.06" for 10-Year event
Inflow = 0.09 cfs @ 12.13 hrs, Volume= 0.008 af
Outflow = 0.09 cfs @ 12.13 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 DP#6: OFFSITE LOW POINT



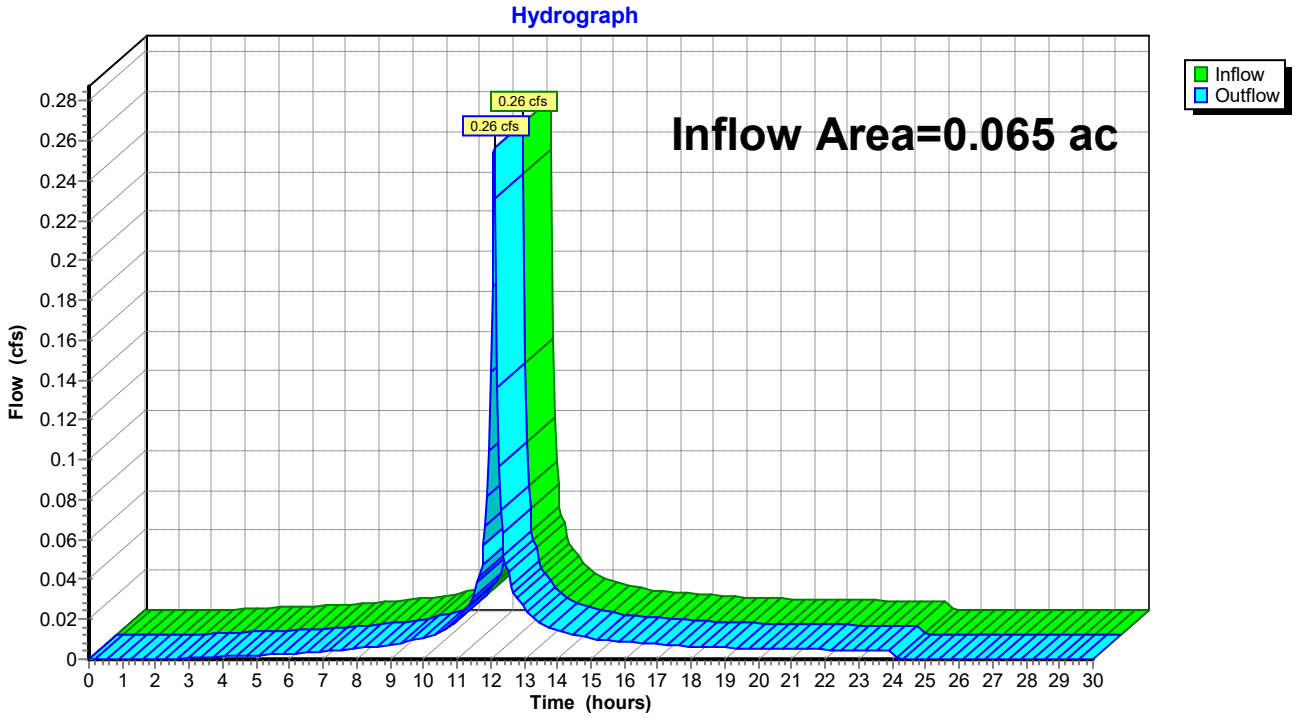
Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

[40] Hint: Not Described (Outflow=Inflow)

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)



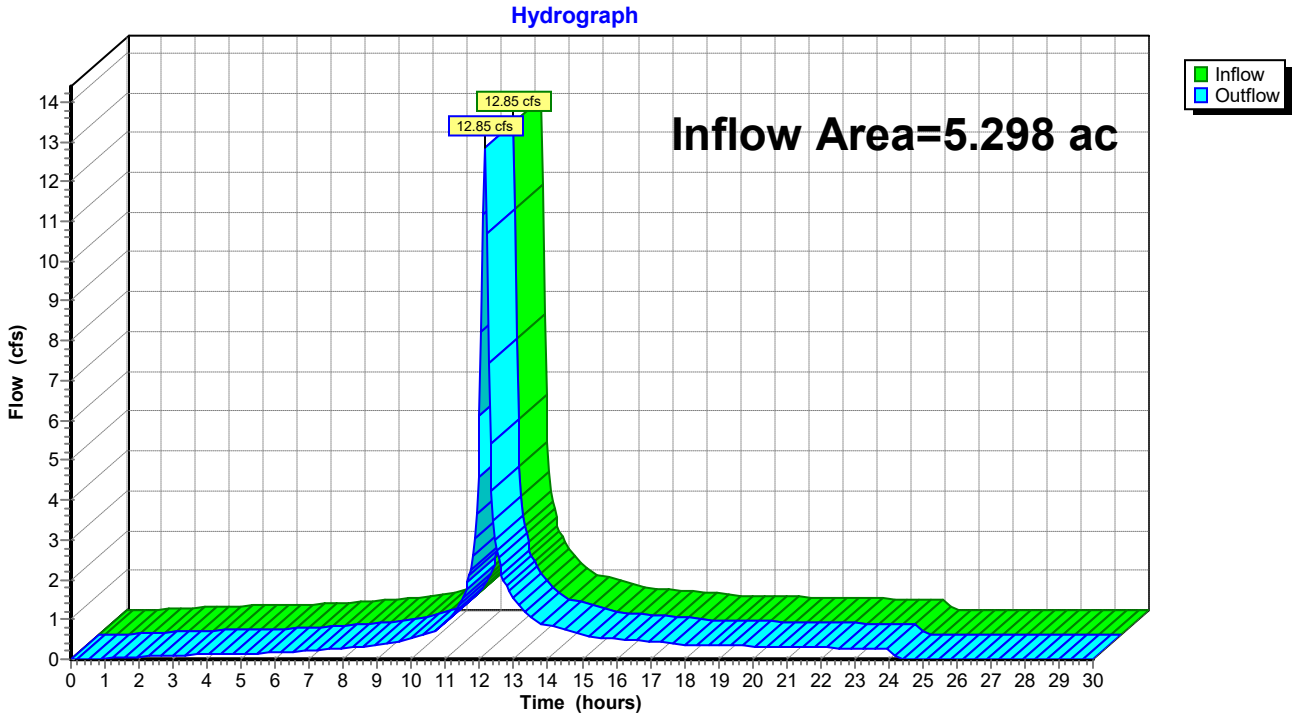
Summary for Reach DP2: MUNICIPAL SYSTEM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.298 ac, 79.01% Impervious, Inflow Depth = 2.63" for 10-Year event
Inflow = 12.85 cfs @ 12.15 hrs, Volume= 1.159 af
Outflow = 12.85 cfs @ 12.15 hrs, Volume= 1.159 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



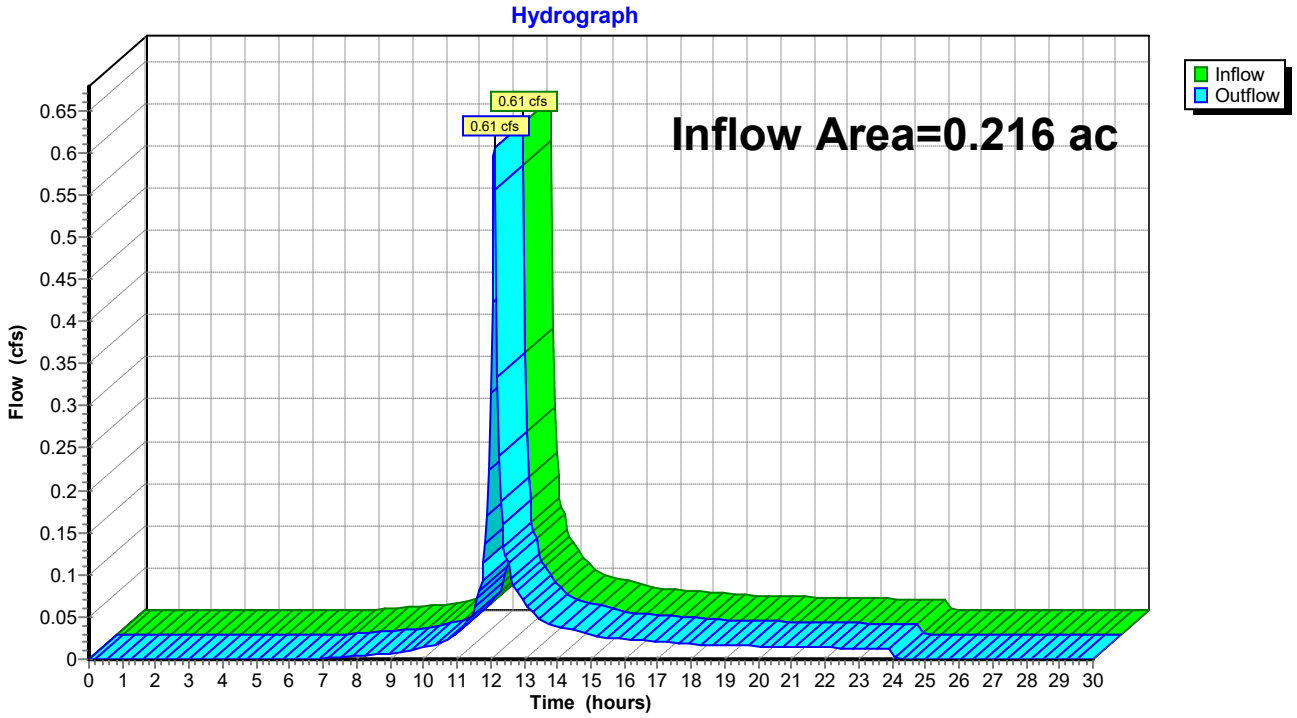
Summary for Reach DP3: CATCHBASIN (FIRE STATION)

[40] Hint: Not Described (Outflow=Inflow)

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)



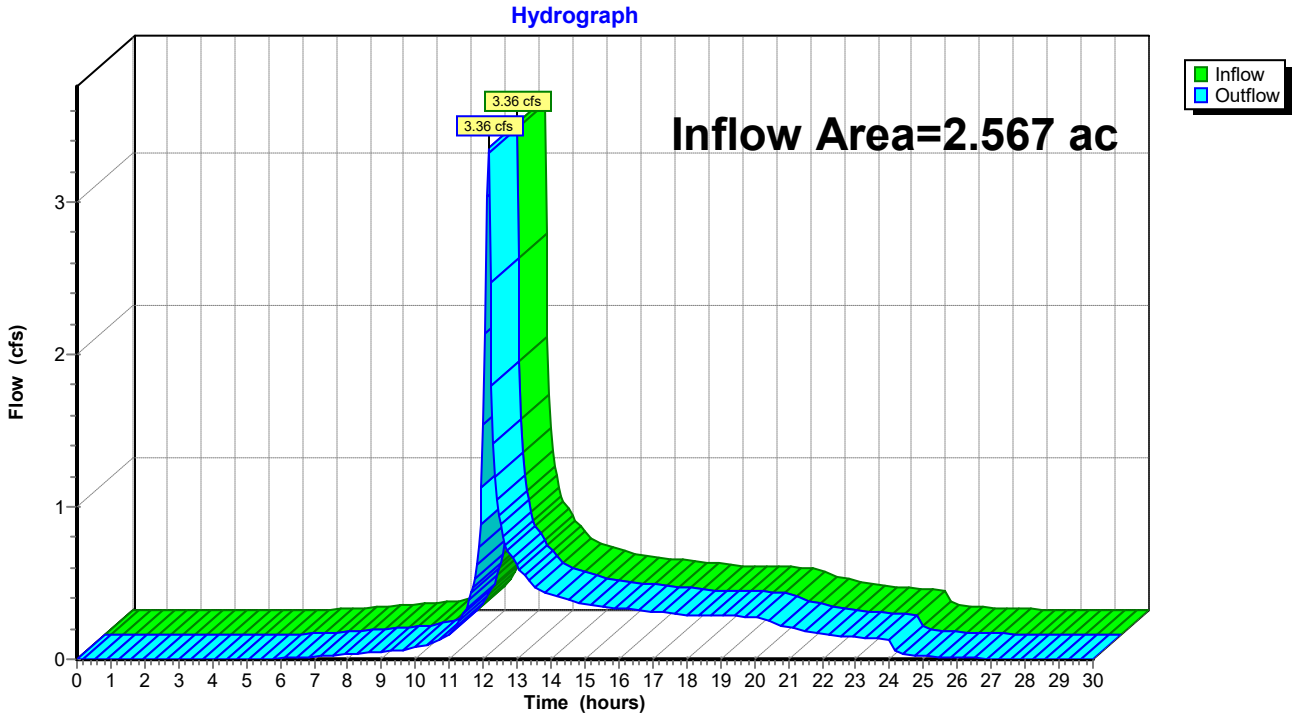
Summary for Reach DP4: DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 2.01" for 10-Year event
Inflow = 3.36 cfs @ 12.14 hrs, Volume= 0.430 af
Outflow = 3.36 cfs @ 12.14 hrs, Volume= 0.430 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: DMH-K1



Summary for Reach DP5: DCB-H

[40] Hint: Not Described (Outflow=Inflow)

Summary for Reach RF1: TO DMH#101

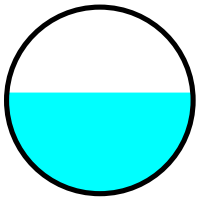
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.759 ac,100.00% Impervious, Inflow Depth = 4.44" for 10-Year event
Inflow = 3.21 cfs @ 12.11 hrs, Volume= 0.281 af
Outflow = 3.19 cfs @ 12.11 hrs, Volume= 0.281 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH101 : TO DMH#100

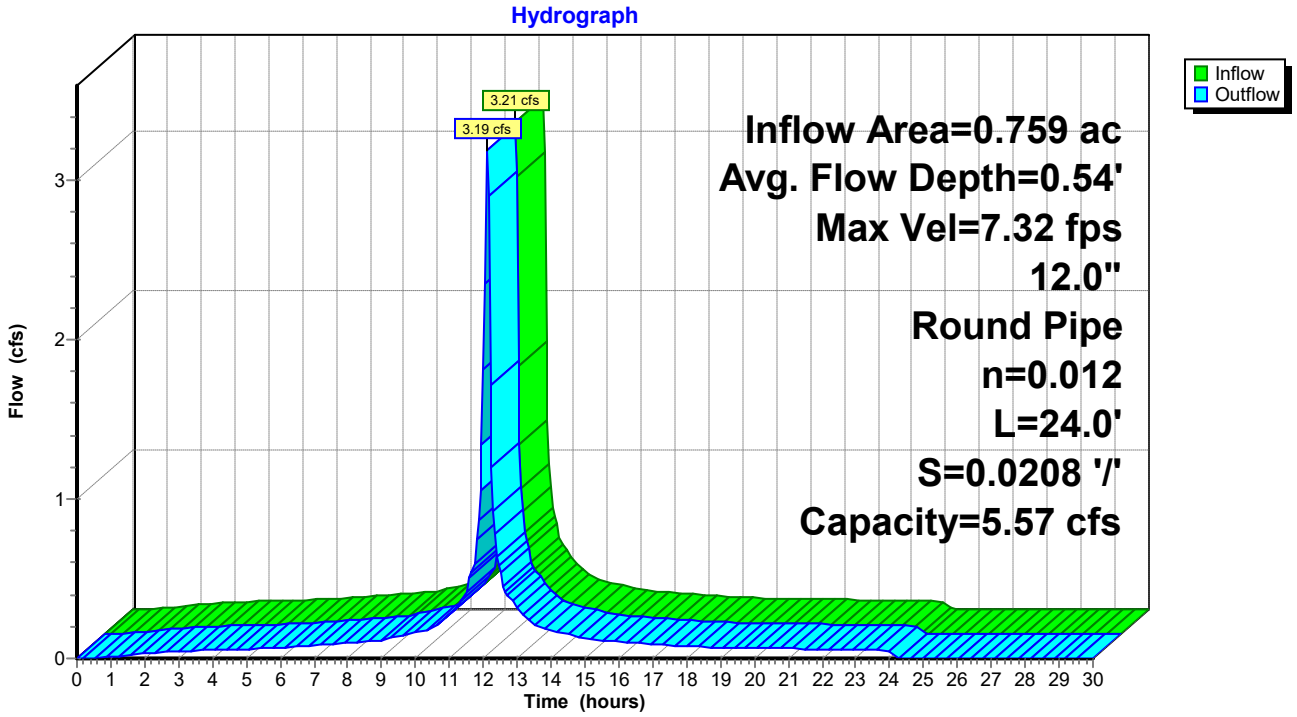
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.32 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.69 fps, Avg. Travel Time= 0.1 min

Peak Storage= 10 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.57 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 24.0' Slope= 0.0208 '/'
Inlet Invert= 466.20', Outlet Invert= 465.70'



Reach RF1: TO DMH#101

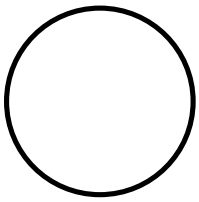


Summary for Reach RF2: TO DMH#101

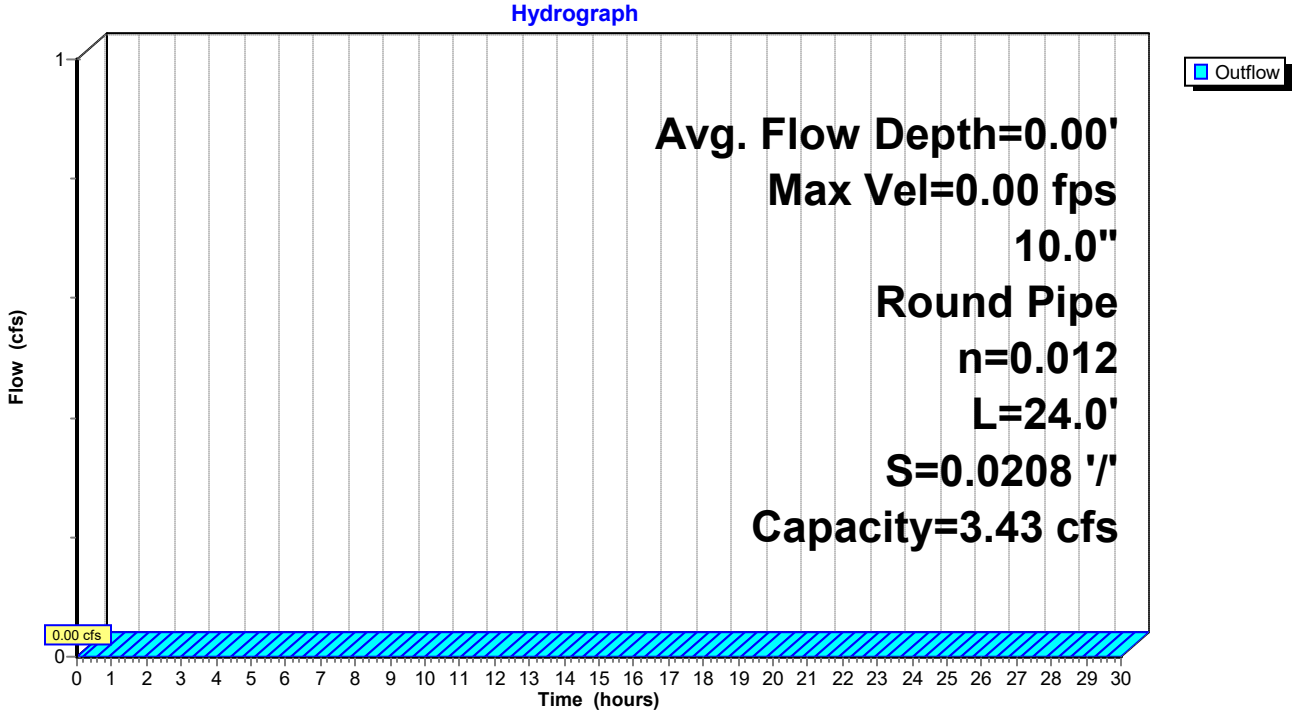
[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 0.83' Flow Area= 0.5 sf, Capacity= 3.43 cfs

10.0" Round Pipe
n= 0.012 Steel, smooth
Length= 24.0' Slope= 0.0208 '/'
Inlet Invert= 466.20', Outlet Invert= 465.70'



Reach RF2: TO DMH#101



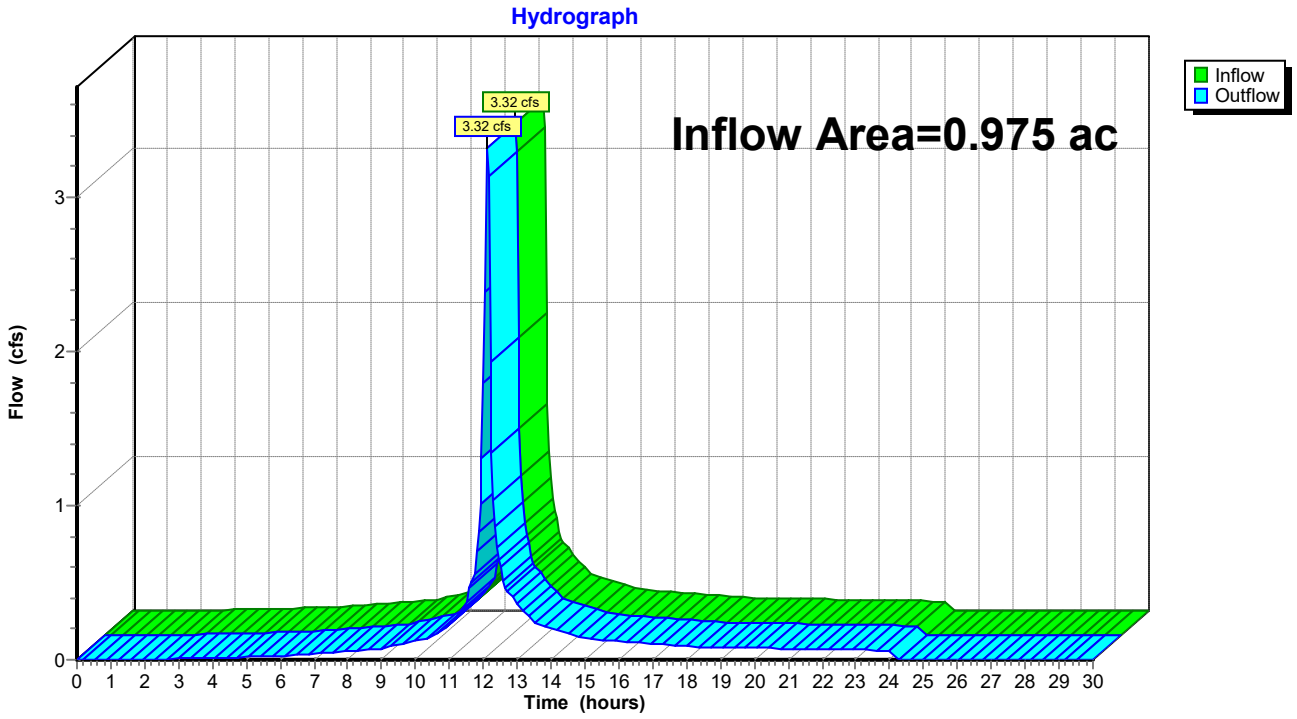
Summary for Reach UGS1A: TO UGS#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 3.29" for 10-Year event
Inflow = 3.32 cfs @ 12.12 hrs, Volume= 0.267 af
Outflow = 3.32 cfs @ 12.12 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.0 min
Routed to Pond UGS1 : TO DMH#106

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

Reach UGS1A: TO UGS#1



Summary for Reach UGS1B: TO DMH106

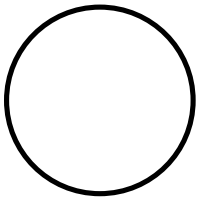
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.975 ac, 81.42% 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
Routed to Reach DMH105 : TO DMH#104

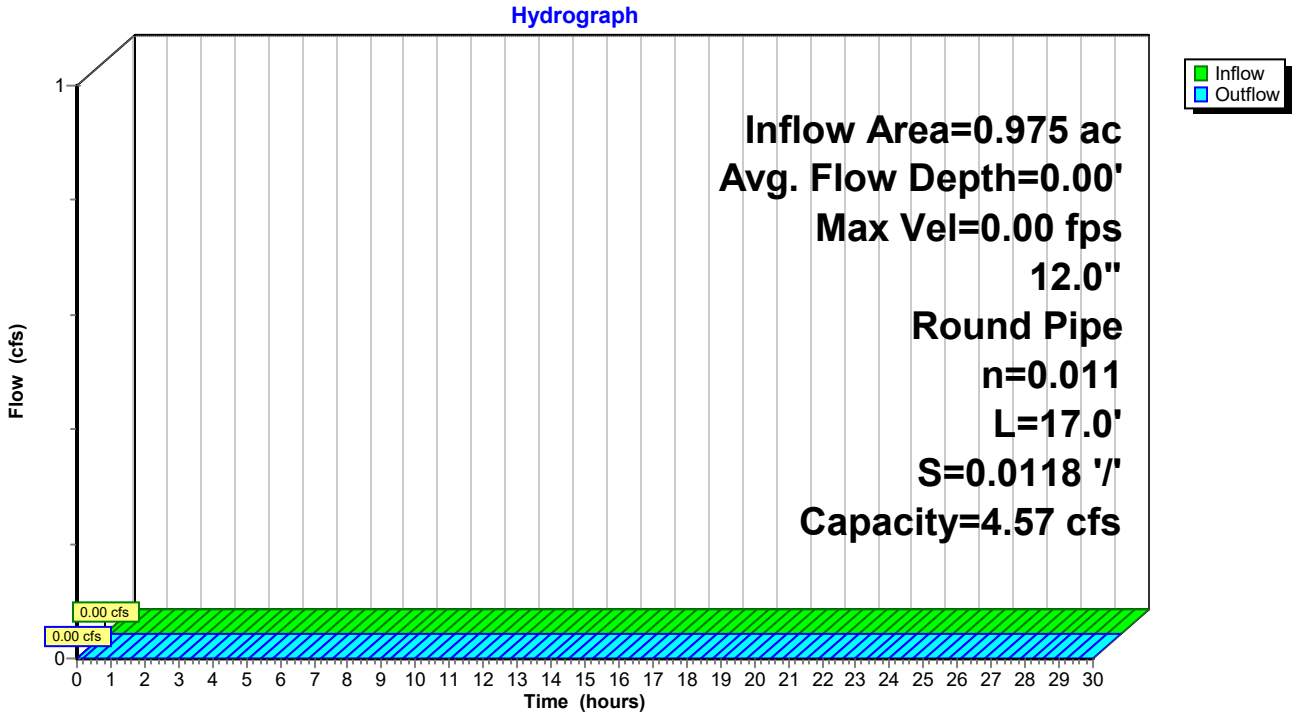
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

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= 4.57 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 17.0' Slope= 0.0118 '/'
Inlet Invert= 467.60', Outlet Invert= 467.40'



Reach UGS1B: TO DMH106



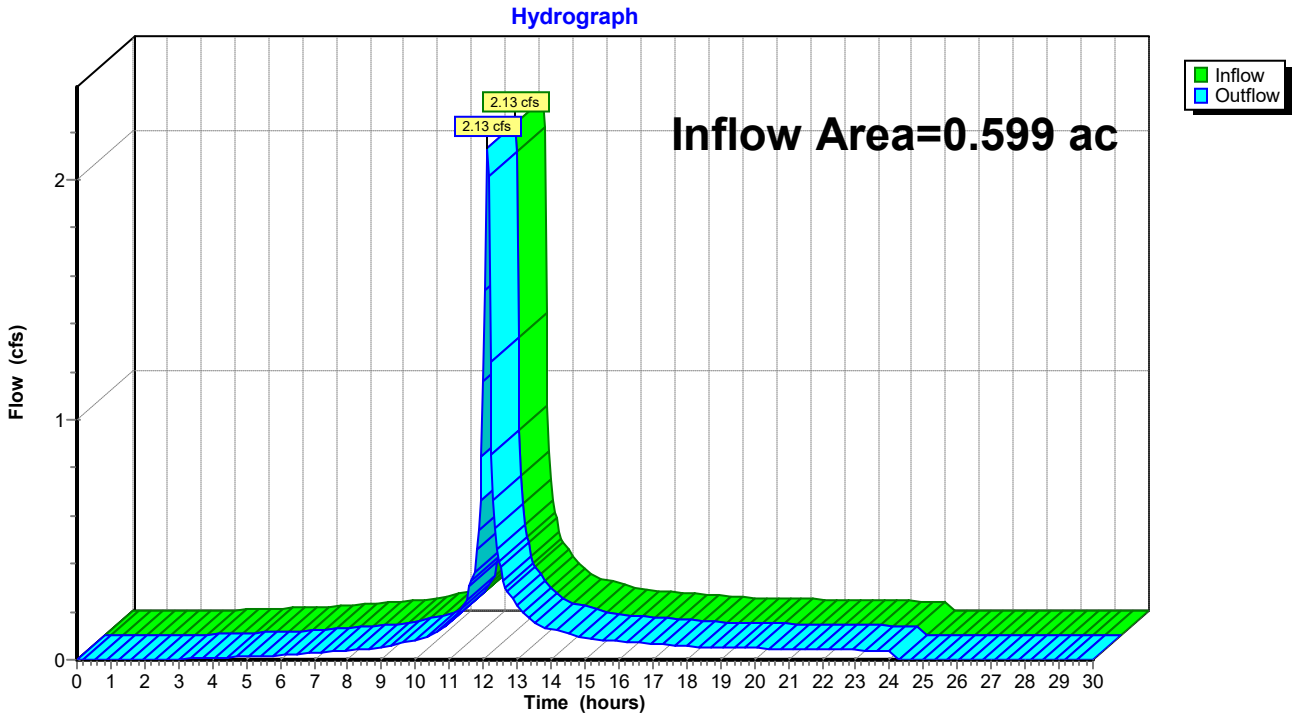
Summary for Reach UGS2A: TO UGS#2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 3.45" for 10-Year event
Inflow = 2.13 cfs @ 12.12 hrs, Volume= 0.172 af
Outflow = 2.13 cfs @ 12.12 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min
Routed to Pond UGS2 : TO UGS#2B

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

Reach UGS2A: TO UGS#2



Summary for Reach UGS2B: TO DMH#112

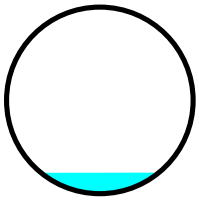
[52] Hint: Inlet/Outlet conditions not evaluated
[78] Warning: Submerged Pond UGS2 Primary device # 2 by 0.09'

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth > 3.40" for 10-Year event
Inflow = 0.17 cfs @ 11.80 hrs, Volume= 0.170 af
Outflow = 0.17 cfs @ 11.85 hrs, Volume= 0.170 af, Atten= 0%, Lag= 3.0 min
Routed to Reach DMH112 : TO DMH#113

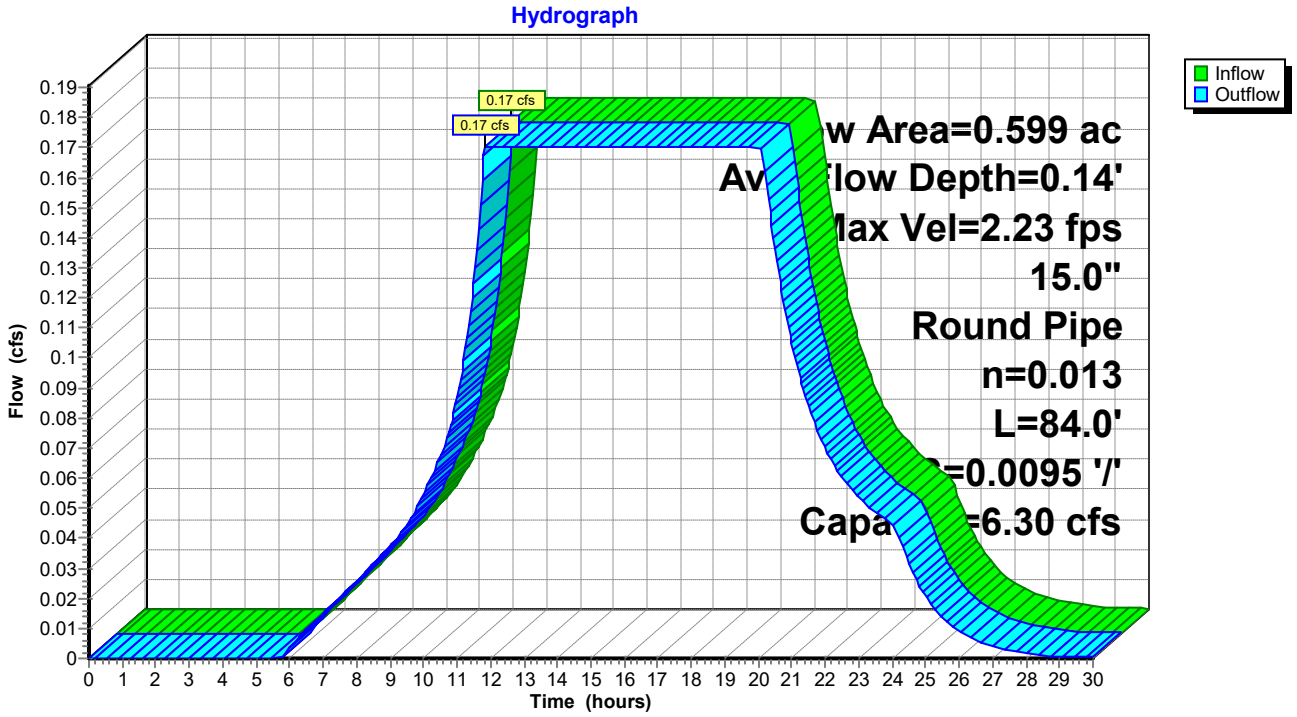
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.23 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 0.9 min

Peak Storage= 6 cf @ 11.85 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 0.79'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.30 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 84.0' Slope= 0.0095 '/'
Inlet Invert= 461.10', Outlet Invert= 460.30'



Reach UGS2B: TO DMH#112



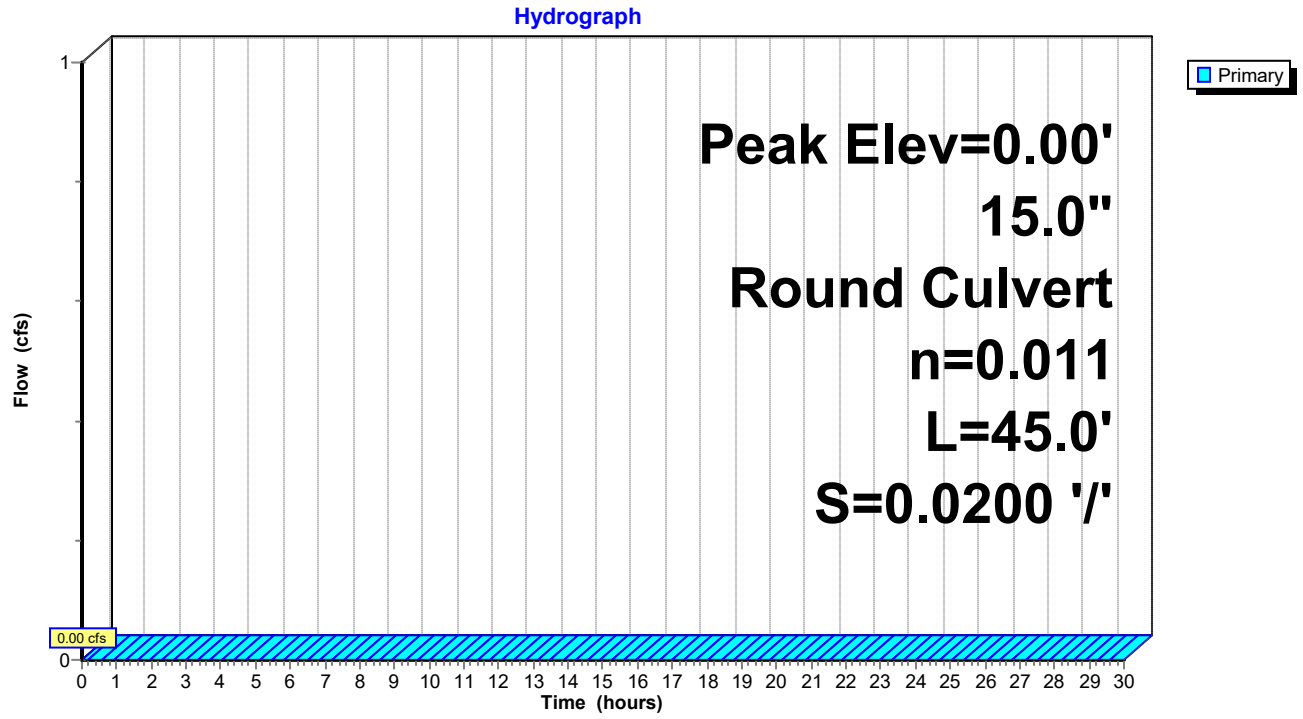
Summary for Pond DMH-B: TO DMH-D

[43] Hint: Has no inflow (Outflow=Zero)

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=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

Pond DMH-B: TO DMH-D



Summary for Pond UGS1: TO DMH#106

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 3.29" for 10-Year event
Inflow = 3.32 cfs @ 12.12 hrs, Volume= 0.267 af
Outflow = 0.24 cfs @ 13.54 hrs, Volume= 0.267 af, Atten= 93%, Lag= 85.1 min
Discarded = 0.24 cfs @ 13.54 hrs, Volume= 0.267 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach UGS1B : TO DMH106

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 467.24' @ 13.54 hrs Surf.Area= 0.065 ac Storage= 0.102 af

Plug-Flow detention time= 174.0 min calculated for 0.267 af (100% of inflow)
Center-of-Mass det. time= 173.8 min (985.1 - 811.3)

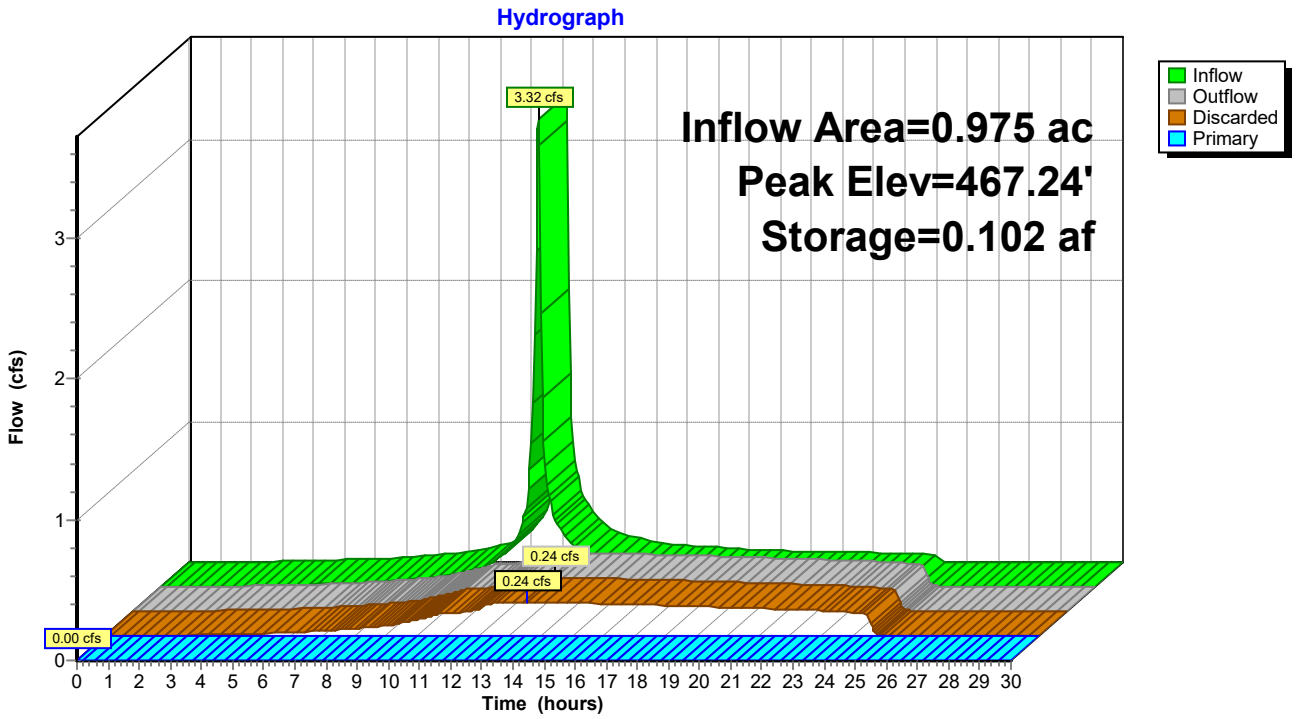
Volume	Invert	Avail.Storage	Storage Description
#1	464.75'	0.073 af	**38.00'W x 74.00'L x 6.00'H Prismatoid** 0.387 af Overall - 0.206 af Embedded = 0.181 af x 40.0% Voids
#2	465.50'	0.153 af	**Shea Leaching Chamber 4x4x4** x 144 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		0.226 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	467.75'	**12.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	464.75'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'

Discarded OutFlow Max=0.24 cfs @ 13.54 hrs HW=467.24' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=464.75' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond UGS1: TO DMH#106



Summary for Pond UGS2: TO UGS#2B

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 3.45" for 10-Year event
Inflow = 2.13 cfs @ 12.12 hrs, Volume= 0.172 af
Outflow = 0.17 cfs @ 11.80 hrs, Volume= 0.170 af, Atten= 92%, Lag= 0.0 min
Primary = 0.17 cfs @ 11.80 hrs, Volume= 0.170 af
Routed to Reach UGS2B : TO DMH#112

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 464.03' @ 13.38 hrs Surf.Area= 0.041 ac Storage= 0.071 af

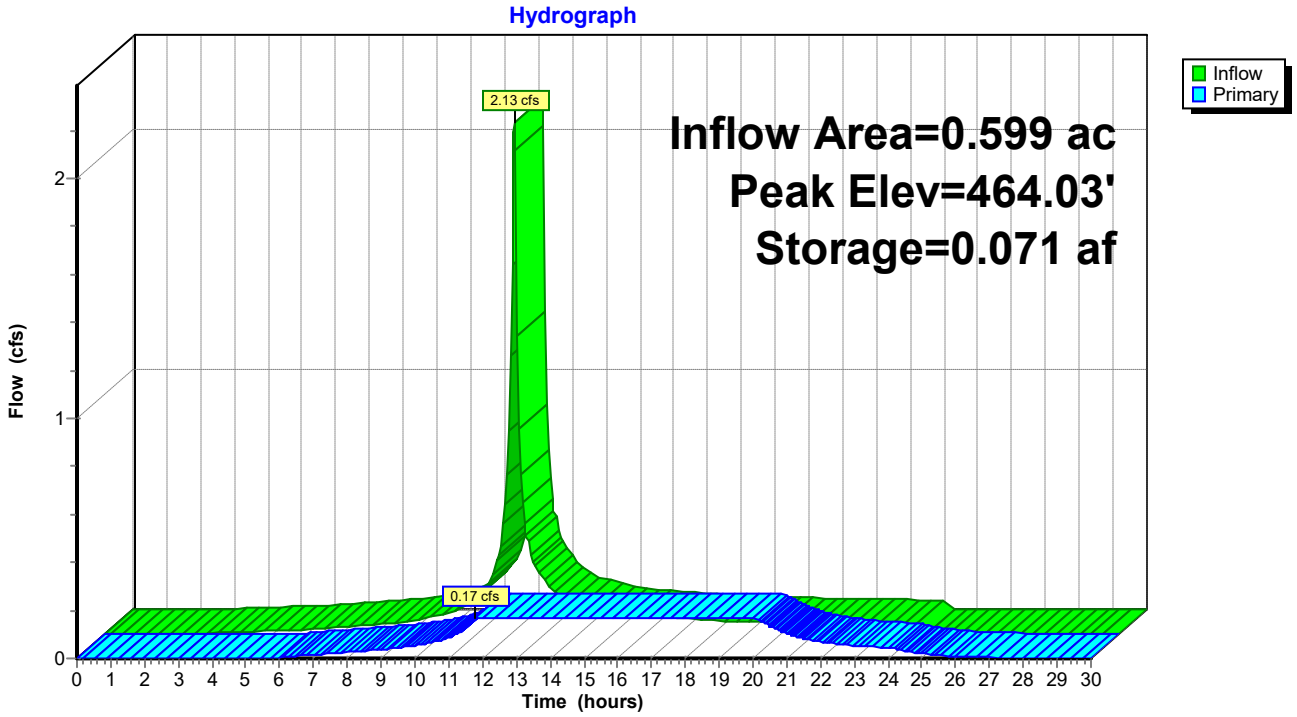
Plug-Flow detention time= 180.0 min calculated for 0.170 af (99% of inflow)
Center-of-Mass det. time= 171.1 min (977.0 - 805.9)

Volume	Invert	Avail.Storage	Storage Description
#1	461.00'	0.052 af	**38.00'W x 47.00'L x 6.30'H Prismatoid** 0.258 af Overall - 0.129 af Embedded = 0.130 af x 40.0% Voids
#2	462.50'	0.096 af	**Shea Leaching Chamber 4x4x4** x 90 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 90 Chambers in 10 Rows
		0.148 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	464.25'	**12.0" Vert. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#2	Primary	461.15'	**Special & User-Defined** Head (feet) 0.00 1.00 15.00 Disch. (cfs) 0.000 0.170 0.170

Primary OutFlow Max=0.17 cfs @ 11.80 hrs HW=462.17' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Special & User-Defined (Custom Controls 0.17 cfs)

Pond UGS2: TO UGS#2B



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 P100A: TO 12" ROOF DRAIN Runoff Area=33,077 sf 100.00% Impervious Runoff Depth=5.64"
Tc=5.0 min CN=98 Runoff=4.04 cfs 0.357 af

Subcatchment P100B: TO YARD DRAIN Runoff Area=32,189 sf 65.00% Impervious Runoff Depth=3.37"
Tc=5.0 min CN=77 Runoff=2.75 cfs 0.208 af

Subcatchment P100D: TO 12" ROOF DRAIN Runoff Area=32,189 sf 100.00% Impervious Runoff Depth=5.64"
Tc=5.0 min CN=98 Runoff=3.93 cfs 0.347 af

Subcatchment P105: TO DCB#5 Runoff Area=12,319 sf 35.47% Impervious Runoff Depth=1.84"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=60 Runoff=0.56 cfs 0.043 af

Subcatchment P106: TO DCB#6 Runoff Area=6,540 sf 94.27% Impervious Runoff Depth=5.29"
Flow Length=101' Slope=0.0150 '/' Tc=5.0 min CN=95 Runoff=0.78 cfs 0.066 af

Subcatchment P107: TO DCB#7 Runoff Area=14,453 sf 83.32% Impervious Runoff Depth=4.51"
Flow Length=126' Slope=0.0150 '/' Tc=5.0 min CN=88 Runoff=1.58 cfs 0.125 af

Subcatchment P108: TO DCB#8 Runoff Area=7,623 sf 76.33% Impervious Runoff Depth=4.08"
Flow Length=156' Tc=5.0 min CN=84 Runoff=0.77 cfs 0.060 af

Subcatchment P109: TO DCB#9 Runoff Area=9,811 sf 39.59% Impervious Runoff Depth=2.01"
Flow Length=156' Tc=5.1 min CN=62 Runoff=0.49 cfs 0.038 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 P110: TO DCB#10 Runoff Area=2,827 sf 67.92% Impervious Runoff Depth=3.57"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=79 Runoff=0.25 cfs 0.019 af

Subcatchment P111: TO DCB#11 Runoff Area=4,144 sf 28.74% Impervious Runoff Depth=1.53"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=56 Runoff=0.15 cfs 0.012 af

Subcatchment P112: TO DCB#12 Runoff Area=9,054 sf 93.65% Impervious Runoff Depth=5.18"
Flow Length=150' Slope=0.0130 '/' Tc=5.0 min CN=94 Runoff=1.07 cfs 0.090 af

Subcatchment P113: TO DCB#13 Runoff Area=11,898 sf 94.49% Impervious Runoff Depth=5.29"
Flow Length=122' Slope=0.0200 '/' Tc=5.0 min CN=95 Runoff=1.43 cfs 0.120 af

Subcatchment P114: TO DCB#14 Runoff Area=5,484 sf 94.42% Impervious Runoff Depth=5.29"
Flow Length=126' Slope=0.0160 '/' Tc=5.0 min CN=95 Runoff=0.66 cfs 0.056 af

Subcatchment P115: TO DCB#15 Runoff Area=16,100 sf 70.06% Impervious Runoff Depth=3.67"
Flow Length=122' Slope=0.0170 '/' Tc=5.0 min CN=80 Runoff=1.49 cfs 0.113 af

Subcatchment P116: TO DCB#25 Runoff Area=2,780 sf 89.32% Impervious Runoff Depth=4.95"
Flow Length=80' Slope=0.0200 '/' Tc=5.0 min CN=92 Runoff=0.32 cfs 0.026 af

Subcatchment P117: TO DP#6 Runoff Area=3,839 sf 33.45% Impervious Runoff Depth=1.76"
Flow Length=74' Slope=0.0200 '/' Tc=5.0 min CN=59 Runoff=0.16 cfs 0.013 af

Subcatchment P119: TO DCB#19 Runoff Area=7,440 sf 78.16% Impervious Runoff Depth=4.19"
Flow Length=213' Slope=0.0250 '/' Tc=5.0 min CN=85 Runoff=0.77 cfs 0.060 af

Subcatchment P12: TO DCB-A Runoff Area=6,197 sf 94.61% Impervious Runoff Depth=5.29"
Flow Length=147' Tc=5.0 min CN=95 Runoff=0.74 cfs 0.063 af

Subcatchment P120: TO DCB#20 Runoff Area=10,195 sf 85.75% Impervious Runoff Depth=4.73"
Flow Length=146' Tc=5.0 min CN=90 Runoff=1.15 cfs 0.092 af

Subcatchment P121: TO DCB#21 Runoff Area=7,628 sf 71.01% Impervious Runoff Depth=3.77"
Flow Length=153' Tc=5.0 min CN=81 Runoff=0.72 cfs 0.055 af

Subcatchment P122: TO DCB#22 Runoff Area=10,232 sf 44.85% Impervious Runoff Depth=2.26"
Flow Length=189' Tc=5.0 min CN=65 Runoff=0.58 cfs 0.044 af

Subcatchment P123: TO DCB#23 Runoff Area=33,346 sf 40.00% Impervious Runoff Depth=2.09"
Flow Length=171' Tc=5.0 min CN=63 Runoff=1.74 cfs 0.134 af

Subcatchment P14: TO DCB-B Runoff Area=5,424 sf 87.24% Impervious Runoff Depth=4.73"
Flow Length=169' Tc=5.0 min CN=90 Runoff=0.61 cfs 0.049 af

Subcatchment P15: TO DCB-C Runoff Area=8,397 sf 71.34% Impervious Runoff Depth=3.77"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=81 Runoff=0.75 cfs 0.061 af

Subcatchment P18: TO DCB-D Runoff Area=10,287 sf 76.50% Impervious Runoff Depth=4.08"
Flow Length=222' Tc=5.0 min CN=84 Runoff=1.04 cfs 0.080 af

Subcatchment P19: TO DCB-E Runoff Area=8,240 sf 64.27% Impervious Runoff Depth=3.37"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=77 Runoff=0.70 cfs 0.053 af

Subcatchment P20: 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 P24: TO DCB#24 Runoff Area=34,704 sf 47.02% Impervious Runoff Depth=2.44"
Flow Length=247' Slope=0.0250 '/' Tc=5.0 min CN=67 Runoff=2.14 cfs 0.162 af

Reach CMH3: TO DMH-E Avg. Flow Depth=0.74' Max Vel=5.89 fps Inflow=7.98 cfs 0.707 af
36.0" Round Pipe n=0.011 L=196.0' S=0.0058 '/' Capacity=60.12 cfs Outflow=7.75 cfs 0.707 af

Reach DCB-A: TO DMH-D Inflow=0.74 cfs 0.063 af
Outflow=0.74 cfs 0.063 af

Reach DCB-B: TO DMH-E Inflow=0.61 cfs 0.049 af
Outflow=0.61 cfs 0.049 af

Reach DCB-C: TO TRUNKLINE Inflow=0.75 cfs 0.061 af
Outflow=0.75 cfs 0.061 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.28' Max Vel=7.53 fps Inflow=1.04 cfs 0.080 af
8.0" Round Pipe n=0.010 L=15.0' S=0.0333 '/' Capacity=2.87 cfs Outflow=1.04 cfs 0.080 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.23' Max Vel=6.60 fps Inflow=0.70 cfs 0.053 af
8.0" Round Pipe n=0.010 L=16.0' S=0.0313 '/' Capacity=2.78 cfs Outflow=0.70 cfs 0.053 af

Reach DCB10: TO DMH#106 Avg. Flow Depth=0.14' Max Vel=4.78 fps Inflow=0.25 cfs 0.019 af
8.0" Round Pipe n=0.010 L=7.0' S=0.0286 '/' Capacity=2.66 cfs Outflow=0.25 cfs 0.019 af

Reach DCB11: TO DMH#103 Avg. Flow Depth=0.13' Max Vel=3.10 fps Inflow=0.15 cfs 0.012 af
8.0" Round Pipe n=0.010 L=15.0' S=0.0133 '/' Capacity=1.81 cfs Outflow=0.15 cfs 0.012 af

Reach DCB12: TO DMH#12 Avg. Flow Depth=0.39' Max Vel=4.96 fps Inflow=1.07 cfs 0.090 af
8.0" Round Pipe n=0.010 L=28.0' S=0.0107 '/' Capacity=1.63 cfs Outflow=1.06 cfs 0.090 af

Reach DCB13: TO DMH#102 Avg. Flow Depth=0.30' Max Vel=7.06 fps Inflow=1.43 cfs 0.120 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=1.42 cfs 0.120 af

Reach DCB14: TO DMH#109 Avg. Flow Depth=0.21' Max Vel=5.48 fps Inflow=0.66 cfs 0.056 af
12.0" Round Pipe n=0.013 L=19.0' S=0.0368 '/' Capacity=6.84 cfs Outflow=0.65 cfs 0.056 af

Reach DCB15: TO DMH#102 Avg. Flow Depth=0.45' Max Vel=4.29 fps Inflow=1.49 cfs 0.113 af
12.0" Round Pipe n=0.013 L=70.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=1.46 cfs 0.113 af

Reach DCB19: TO DMH#111 Avg. Flow Depth=0.22' Max Vel=5.91 fps Inflow=0.77 cfs 0.060 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=0.77 cfs 0.060 af

Reach DCB20: TO DMH#109 Avg. Flow Depth=0.38' Max Vel=4.19 fps Inflow=1.15 cfs 0.092 af
12.0" Round Pipe n=0.013 L=9.0' S=0.0111 '/' Capacity=3.76 cfs Outflow=1.14 cfs 0.092 af

Reach DCB21: TO DMH#109A Avg. Flow Depth=0.30' Max Vel=4.67 fps Inflow=0.72 cfs 0.055 af
8.0" Round Pipe n=0.013 L=5.0' S=0.0200 '/' Capacity=1.71 cfs Outflow=0.72 cfs 0.055 af

Reach DCB22: TO DMH#111 Avg. Flow Depth=0.21' Max Vel=4.89 fps Inflow=0.58 cfs 0.044 af
12.0" Round Pipe n=0.013 L=20.0' S=0.0300 '/' Capacity=6.17 cfs Outflow=0.58 cfs 0.044 af

Reach DCB23: TO DMH#111 Avg. Flow Depth=0.46' Max Vel=4.86 fps Inflow=1.74 cfs 0.134 af
12.0" Round Pipe n=0.013 L=250.0' S=0.0124 '/' Capacity=3.97 cfs Outflow=1.66 cfs 0.134 af

Reach DCB24: TO DMH#113 Avg. Flow Depth=0.44' Max Vel=6.35 fps Inflow=2.14 cfs 0.162 af
12.0" Round Pipe n=0.013 L=9.0' S=0.0222 '/' Capacity=5.31 cfs Outflow=2.13 cfs 0.162 af

Reach DCB25: TO DMH#109A Avg. Flow Depth=0.18' Max Vel=4.28 fps Inflow=0.32 cfs 0.026 af
8.0" Round Pipe n=0.010 L=29.0' S=0.0172 '/' Capacity=2.06 cfs Outflow=0.32 cfs 0.026 af

Reach DCB5: TO DMH#108 Avg. Flow Depth=0.21' Max Vel=5.96 fps Inflow=0.56 cfs 0.043 af
8.0" Round Pipe n=0.010 L=7.0' S=0.0286 '/' Capacity=2.66 cfs Outflow=0.55 cfs 0.043 af

Reach DCB6: TO DMH#107 Avg. Flow Depth=0.20' Max Vel=8.76 fps Inflow=0.78 cfs 0.066 af
8.0" Round Pipe n=0.010 L=46.0' S=0.0630 '/' Capacity=3.94 cfs Outflow=0.77 cfs 0.066 af

Reach DCB7: TO DMH#102 Avg. Flow Depth=0.34' Max Vel=6.65 fps Inflow=1.58 cfs 0.125 af
12.0" Round Pipe n=0.013 L=54.0' S=0.0315 '/' Capacity=6.32 cfs Outflow=1.55 cfs 0.125 af

Reach DCB8: TO DMH#103 Avg. Flow Depth=0.21' Max Vel=8.04 fps Inflow=0.77 cfs 0.060 af
8.0" Round Pipe n=0.010 L=4.0' S=0.0500 '/' Capacity=3.51 cfs Outflow=0.77 cfs 0.060 af

Reach DCB9: TO DMH#103 Avg. Flow Depth=0.22' Max Vel=4.72 fps Inflow=0.49 cfs 0.038 af
8.0" Round Pipe n=0.010 L=12.0' S=0.0167 '/' Capacity=2.03 cfs Outflow=0.48 cfs 0.038 af

Reach DMH-A*: TO DMH-B Avg. Flow Depth=0.67' Max Vel=8.70 fps Inflow=7.96 cfs 0.690 af
24.0" Round Pipe n=0.011 L=267.0' S=0.0157 '/' Capacity=33.53 cfs Outflow=7.86 cfs 0.690 af

Reach DMH-C: TO DP#1 Inflow=9.45 cfs 0.879 af
Outflow=9.45 cfs 0.879 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=0.77' Max Vel=6.63 fps Inflow=9.57 cfs 0.879 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=9.45 cfs 0.879 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=0.80' Max Vel=6.02 fps Inflow=9.07 cfs 0.816 af
36.0" Round Pipe n=0.011 L=121.0' S=0.0055 '/' Capacity=58.66 cfs Outflow=8.91 cfs 0.816 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=72.0' S=0.0058 '/' Capacity=60.20 cfs Outflow=0.00 cfs 0.000 af

Reach DMH100: TO DMH-A Avg. Flow Depth=0.62' Max Vel=9.05 fps Inflow=6.31 cfs 0.556 af
18.0" Round Pipe n=0.011 L=70.0' S=0.0200 '/' Capacity=17.56 cfs Outflow=6.23 cfs 0.556 af

Reach DMH101: TO DMH#100 Avg. Flow Depth=0.53' Max Vel=8.12 fps Inflow=4.01 cfs 0.357 af
15.0" Round Pipe n=0.011 L=5.0' S=0.0200 '/' Capacity=10.80 cfs Outflow=4.01 cfs 0.357 af

Reach DMH102: TO UGS#1A Avg. Flow Depth=0.61' Max Vel=7.34 fps Inflow=4.41 cfs 0.358 af
15.0" Round Pipe n=0.013 L=5.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=4.41 cfs 0.358 af

Reach DMH103: TO CMH#2 Avg. Flow Depth=0.80' Max Vel=8.37 fps Inflow=8.00 cfs 0.707 af
18.0" Round Pipe n=0.011 L=154.0' S=0.0136 '/' Capacity=14.50 cfs Outflow=7.98 cfs 0.707 af

Reach DMH104: TO DMH#104 Avg. Flow Depth=0.39' Max Vel=4.90 fps Inflow=1.60 cfs 0.151 af
15.0" Round Pipe n=0.011 L=120.0' S=0.0100 '/' Capacity=7.63 cfs Outflow=1.58 cfs 0.151 af

Reach DMH105: TO DMH#104 Avg. Flow Depth=0.19' Max Vel=3.23 fps Inflow=0.40 cfs 0.054 af
15.0" Round Pipe n=0.011 L=187.0' S=0.0096 '/' Capacity=7.49 cfs Outflow=0.38 cfs 0.054 af

Reach DMH106: TO DMH#105 Avg. Flow Depth=0.17' Max Vel=4.34 fps Inflow=0.40 cfs 0.031 af
12.0" Round Pipe n=0.011 L=57.0' S=0.0211 '/' Capacity=6.11 cfs Outflow=0.40 cfs 0.031 af

Reach DMH107: TO DMH#100 Avg. Flow Depth=0.45' Max Vel=6.80 fps Inflow=2.36 cfs 0.199 af
12.0" Round Pipe n=0.011 L=78.0' S=0.0179 '/' Capacity=5.64 cfs Outflow=2.36 cfs 0.199 af

Reach DMH108: TO DMH#107 Avg. Flow Depth=0.42' Max Vel=5.16 fps Inflow=1.61 cfs 0.133 af
12.0" Round Pipe n=0.011 L=45.0' S=0.0111 '/' Capacity=4.44 cfs Outflow=1.59 cfs 0.133 af

Reach DMH109: TO DMH#110 Avg. Flow Depth=0.44' Max Vel=8.50 fps Inflow=2.82 cfs 0.229 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=2.81 cfs 0.229 af

Reach DMH109A: TO DMH109 Avg. Flow Depth=0.34' Max Vel=4.44 fps Inflow=1.04 cfs 0.081 af
12.0" Round Pipe n=0.013 L=35.0' S=0.0143 '/' Capacity=4.26 cfs Outflow=1.02 cfs 0.081 af

Reach DMH110: TO UGS#2A Avg. Flow Depth=0.47' Max Vel=7.75 fps Inflow=2.81 cfs 0.229 af
12.0" Round Pipe n=0.013 L=24.0' S=0.0313 '/' Capacity=6.30 cfs Outflow=2.80 cfs 0.229 af

Reach DMH111: TO DMH#112 Avg. Flow Depth=0.53' Max Vel=6.99 fps Inflow=2.96 cfs 0.237 af
12.0" Round Pipe n=0.013 L=66.0' S=0.0227 '/' Capacity=5.37 cfs Outflow=2.95 cfs 0.237 af

Reach DMH112: TO DMH#113 Avg. Flow Depth=0.54' Max Vel=5.43 fps Inflow=3.12 cfs 0.464 af
18.0" Round Pipe n=0.013 L=35.0' S=0.0114 '/' Capacity=11.23 cfs Outflow=3.11 cfs 0.464 af

Reach DMH113: TO DMH#114 Avg. Flow Depth=0.65' Max Vel=7.04 fps Inflow=5.20 cfs 0.626 af
18.0" Round Pipe n=0.013 L=28.0' S=0.0161 '/' Capacity=13.32 cfs Outflow=5.19 cfs 0.626 af

Reach DMH114: TO DMH-K1 Avg. Flow Depth=0.54' Max Vel=8.97 fps Inflow=5.19 cfs 0.626 af
18.0" Round Pipe n=0.013 L=8.0' S=0.0313 '/' Capacity=18.57 cfs Outflow=5.19 cfs 0.626 af

Reach DMHR1: TO DMH#104 Avg. Flow Depth=0.49' Max Vel=7.05 fps Inflow=2.70 cfs 0.208 af
12.0" Round Pipe n=0.012 L=94.0' S=0.0213 '/' Capacity=5.63 cfs Outflow=2.67 cfs 0.208 af

Reach DMHR2: TO DMH#R2 Avg. Flow Depth=0.55' Max Vel=6.06 fps Inflow=2.75 cfs 0.208 af
12.0" Round Pipe n=0.010 L=131.0' S=0.0099 '/' Capacity=4.61 cfs Outflow=2.70 cfs 0.208 af

Reach DP#6: OFFSITE LOW POINT Inflow=0.16 cfs 0.013 af
Outflow=0.16 cfs 0.013 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=17.23 cfs 1.569 af
Outflow=17.23 cfs 1.569 af

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

Reach DP4: DMH-K1 Inflow=5.19 cfs 0.626 af
Outflow=5.19 cfs 0.626 af

Reach DP5: DCB-H

Reach RF1: TO DMH#101 Avg. Flow Depth=0.63' Max Vel=7.71 fps Inflow=4.04 cfs 0.357 af
12.0" Round Pipe n=0.012 L=24.0' S=0.0208 '/' Capacity=5.57 cfs Outflow=4.01 cfs 0.357 af

Reach RF2: TO DMH#101 Avg. Flow Depth=0.00' Max Vel=0.00 fps
10.0" Round Pipe n=0.012 L=24.0' S=0.0208 '/' Capacity=3.43 cfs Outflow=0.00 cfs 0.000 af

Reach UGS1A: TO UGS#1 Inflow=4.41 cfs 0.358 af
Outflow=4.41 cfs 0.358 af

Reach UGS1B: TO DMH106 Avg. Flow Depth=0.17' Max Vel=3.22 fps Inflow=0.28 cfs 0.023 af
12.0" Round Pipe n=0.011 L=17.0' S=0.0118 '/' Capacity=4.57 cfs Outflow=0.28 cfs 0.023 af

Reach UGS2A: TO UGS#2 Inflow=2.80 cfs 0.229 af
Outflow=2.80 cfs 0.229 af

Reach UGS2B: TO DMH#112 Avg. Flow Depth=0.26' Max Vel=3.26 fps Inflow=0.62 cfs 0.227 af
15.0" Round Pipe n=0.013 L=84.0' S=0.0095 '/' Capacity=6.30 cfs Outflow=0.61 cfs 0.227 af

Pond DMH-B: TO DMH-D Peak Elev=0.00'
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Primary=0.00 cfs 0.000 af

Pond UGS1: TO DMH#106 Peak Elev=467.93' Storage=0.135 af Inflow=4.41 cfs 0.358 af
Discarded=0.26 cfs 0.336 af Primary=0.28 cfs 0.023 af Outflow=0.54 cfs 0.358 af

Pond UGS2: TO UGS#2B Peak Elev=464.42' Storage=0.082 af Inflow=2.80 cfs 0.229 af
Outflow=0.62 cfs 0.227 af

Total Runoff Area = 8.235 ac Runoff Volume = 2.638 af Average Runoff Depth = 3.84"
29.06% Pervious = 2.393 ac 70.94% Impervious = 5.842 ac

Summary for Subcatchment P100A: TO 12" ROOF DRAIN

[49] Hint: Tc<2dt may require smaller dt

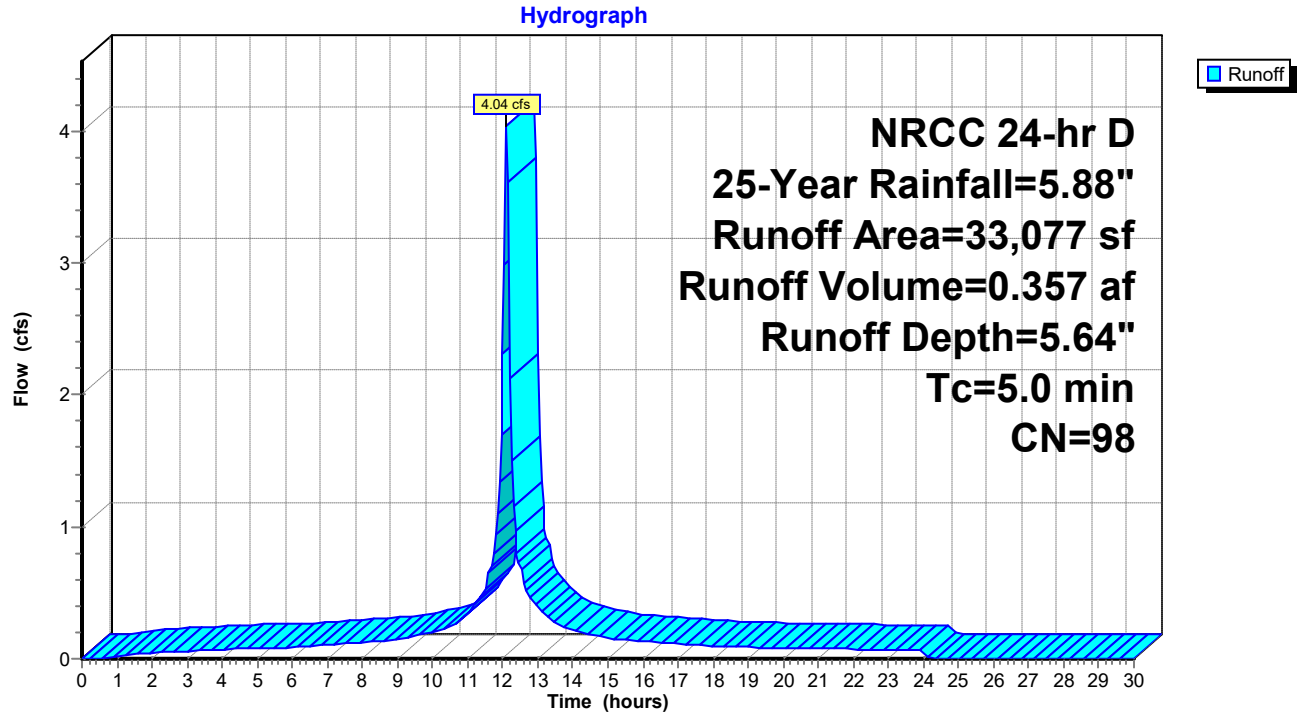
Runoff = 4.04 cfs @ 12.11 hrs, Volume= 0.357 af, Depth= 5.64"
Routed to Reach RF1 : TO DMH#101

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
33,077	98	Paved parking, HSG A
33,077		100.00% Impervious Area

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

Subcatchment P100A: TO 12" ROOF DRAIN



Summary for Subcatchment P100B: TO YARD DRAIN

[49] Hint: Tc<2dt may require smaller dt

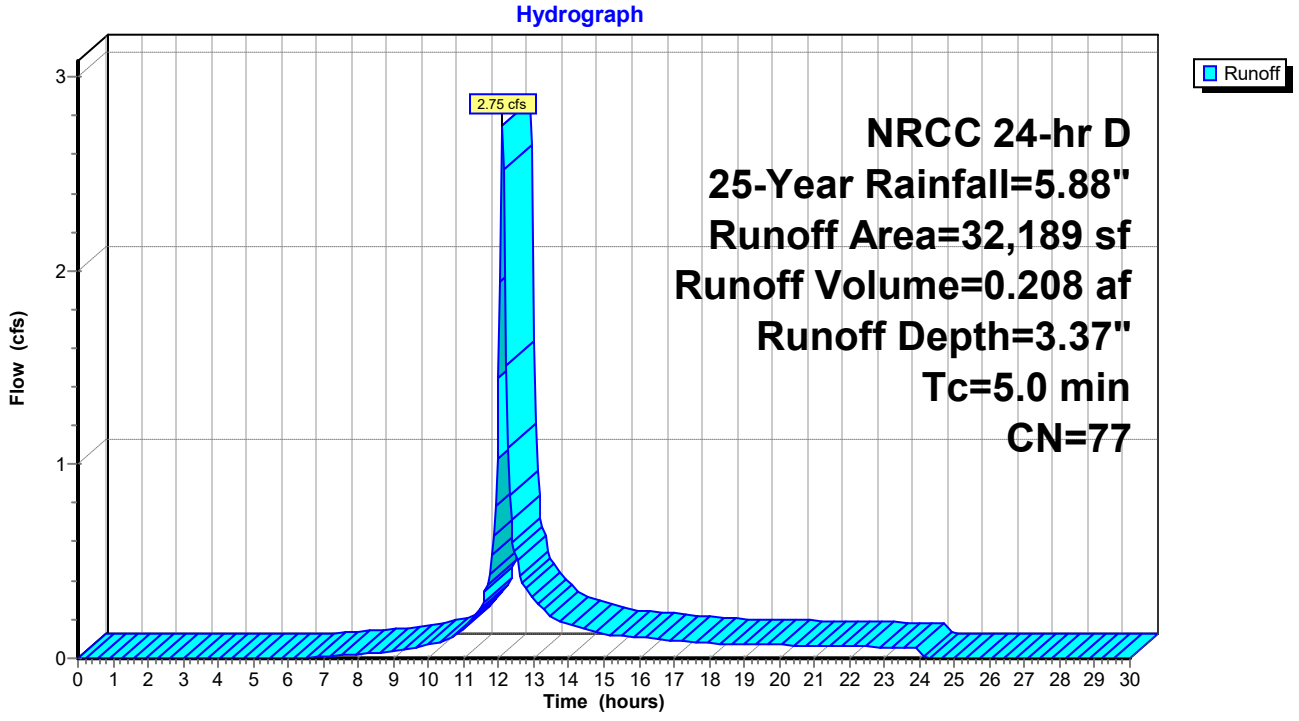
Runoff = 2.75 cfs @ 12.12 hrs, Volume= 0.208 af, Depth= 3.37"
Routed to Reach DMHR2 : TO DMH#R2

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
32,189	77	1/8 acre lots, 65% imp, HSG A
11,266		35.00% Pervious Area
20,923		65.00% Impervious Area

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

Subcatchment P100B: TO YARD DRAIN



Summary for Subcatchment P100D: TO 12" ROOF DRAIN

[49] Hint: Tc<2dt may require smaller dt

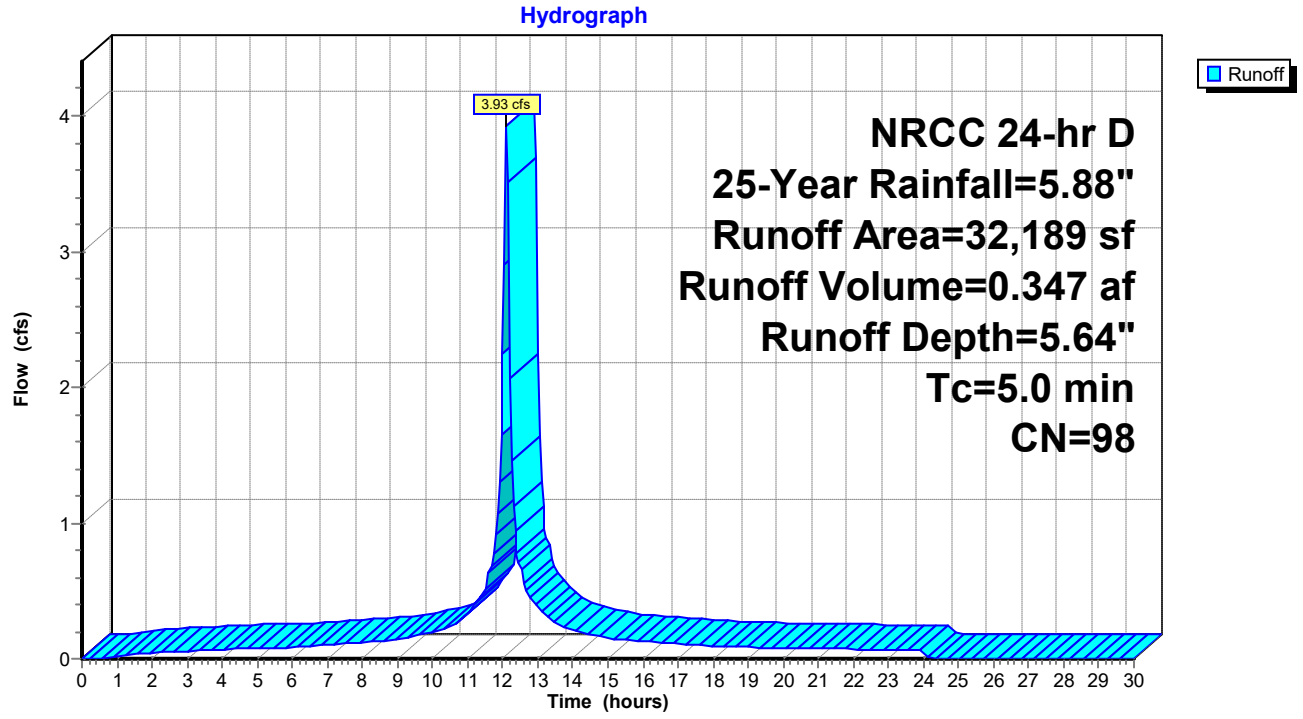
Runoff = 3.93 cfs @ 12.11 hrs, Volume= 0.347 af, Depth= 5.64"
Routed to Reach DMH103 : TO CMH#2

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
32,189	98	Paved parking, HSG A
32,189		100.00% Impervious Area

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

Subcatchment P100D: TO 12" ROOF DRAIN



Summary for Subcatchment P105: TO DCB#5

[49] Hint: Tc<2dt may require smaller dt

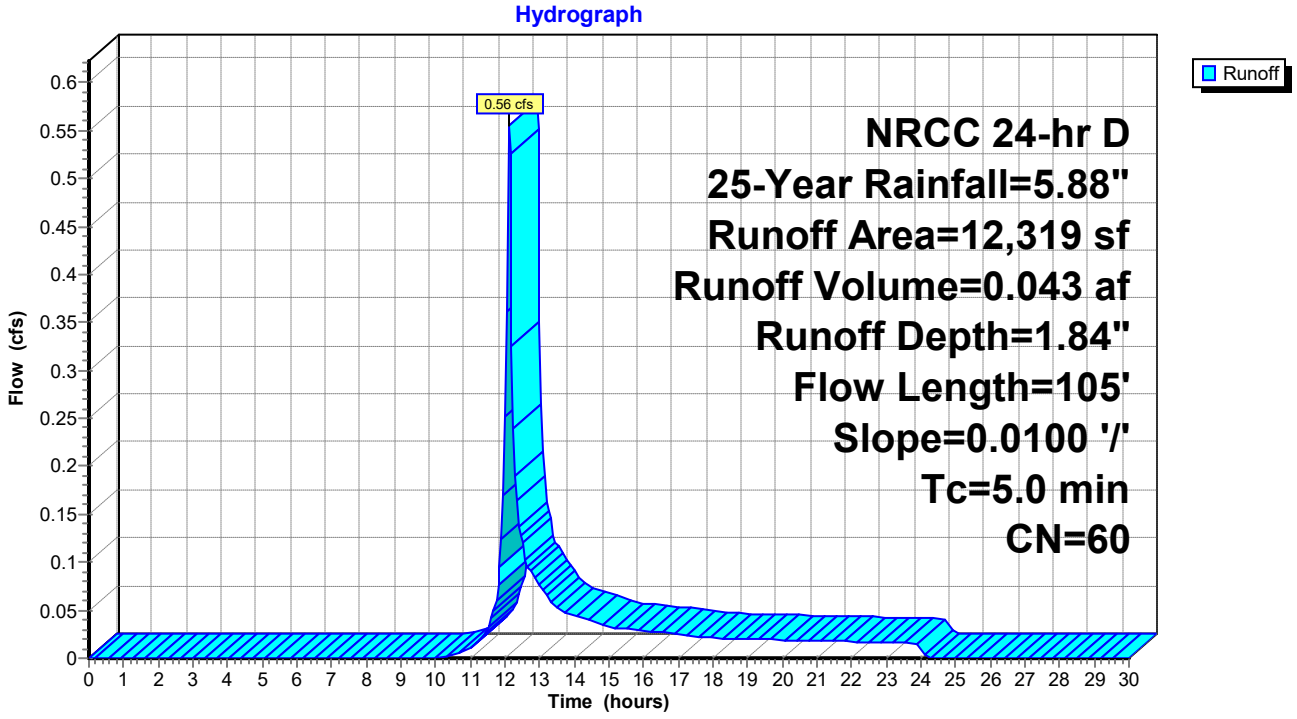
Runoff = 0.56 cfs @ 12.12 hrs, Volume= 0.043 af, Depth= 1.84"
Routed to Reach DCB5 : TO DMH#108

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
7,950	39	>75% Grass cover, Good, HSG A
4,369	98	Paved parking, HSG A
12,319	60	Weighted Average
7,950		64.53% Pervious Area
4,369		35.47% 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 P105: TO DCB#5



Summary for Subcatchment P106: TO DCB#6

[49] Hint: Tc<2dt may require smaller dt

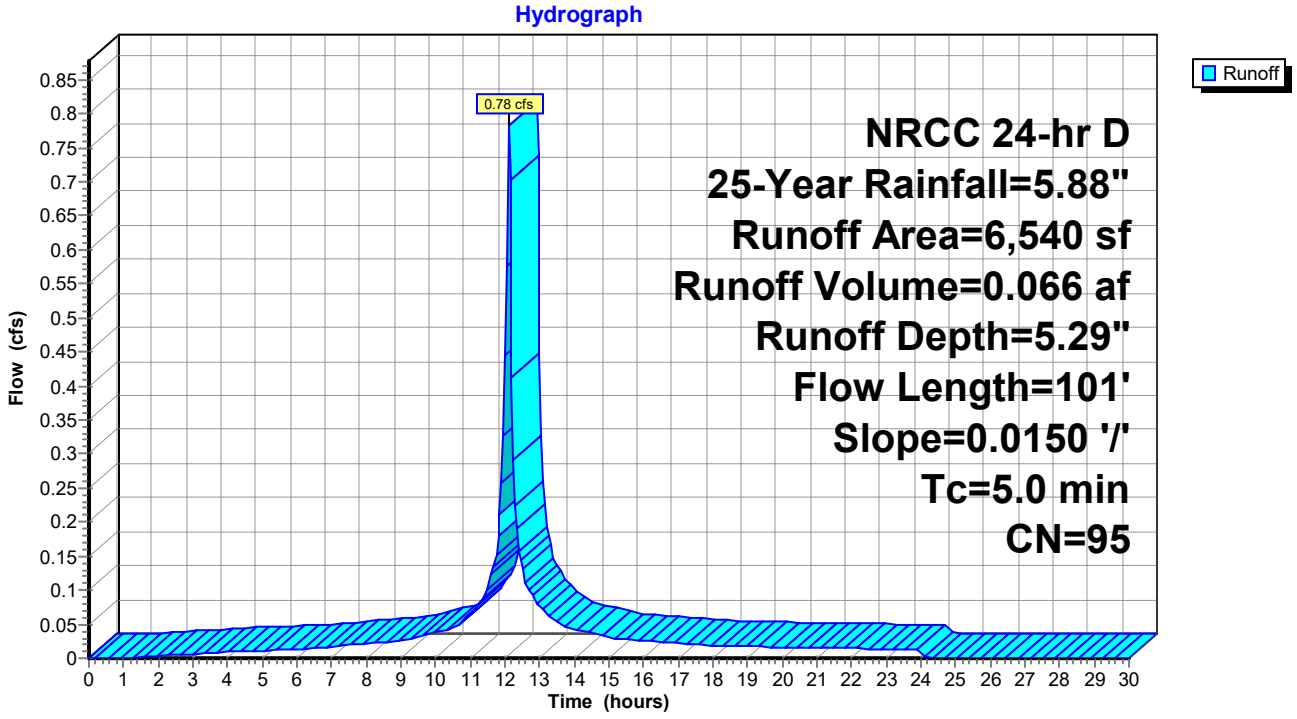
Runoff = 0.78 cfs @ 12.11 hrs, Volume= 0.066 af, Depth= 5.29"
Routed to Reach DCB6 : TO DMH#107

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
375	39	>75% Grass cover, Good, HSG A
6,165	98	Paved parking, HSG A
6,540	95	Weighted Average
375		5.73% Pervious Area
6,165		94.27% 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"
0.3	51	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	101	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P106: TO DCB#6



Summary for Subcatchment P107: TO DCB#7

[49] Hint: Tc<2dt may require smaller dt

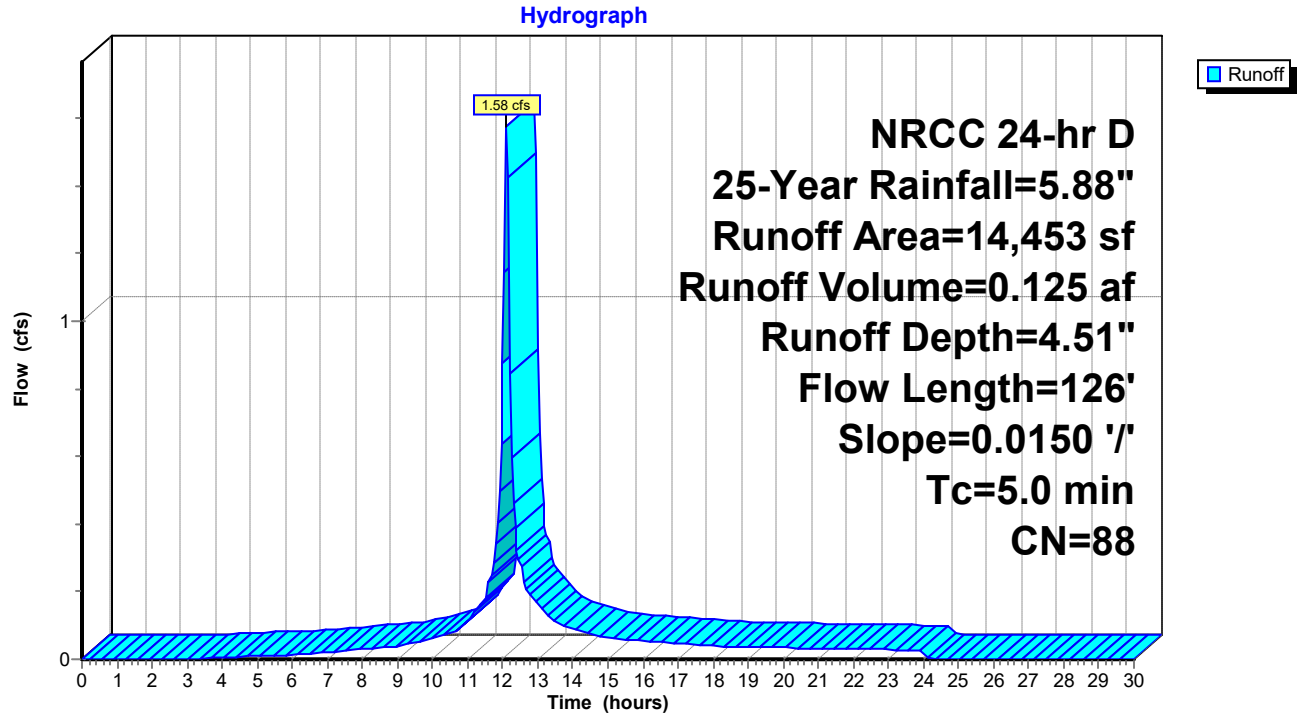
Runoff = 1.58 cfs @ 12.11 hrs, Volume= 0.125 af, Depth= 4.51"
Routed to Reach DCB7 : TO DMH#102

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
2,411	39	>75% Grass cover, Good, HSG A
12,042	98	Paved parking, HSG A
14,453	88	Weighted Average
2,411		16.68% Pervious Area
12,042		83.32% 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"
0.7	42	0.0150	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	76	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.7	126	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P107: TO DCB#7



Summary for Subcatchment P108: TO DCB#8

[49] Hint: Tc<2dt may require smaller dt

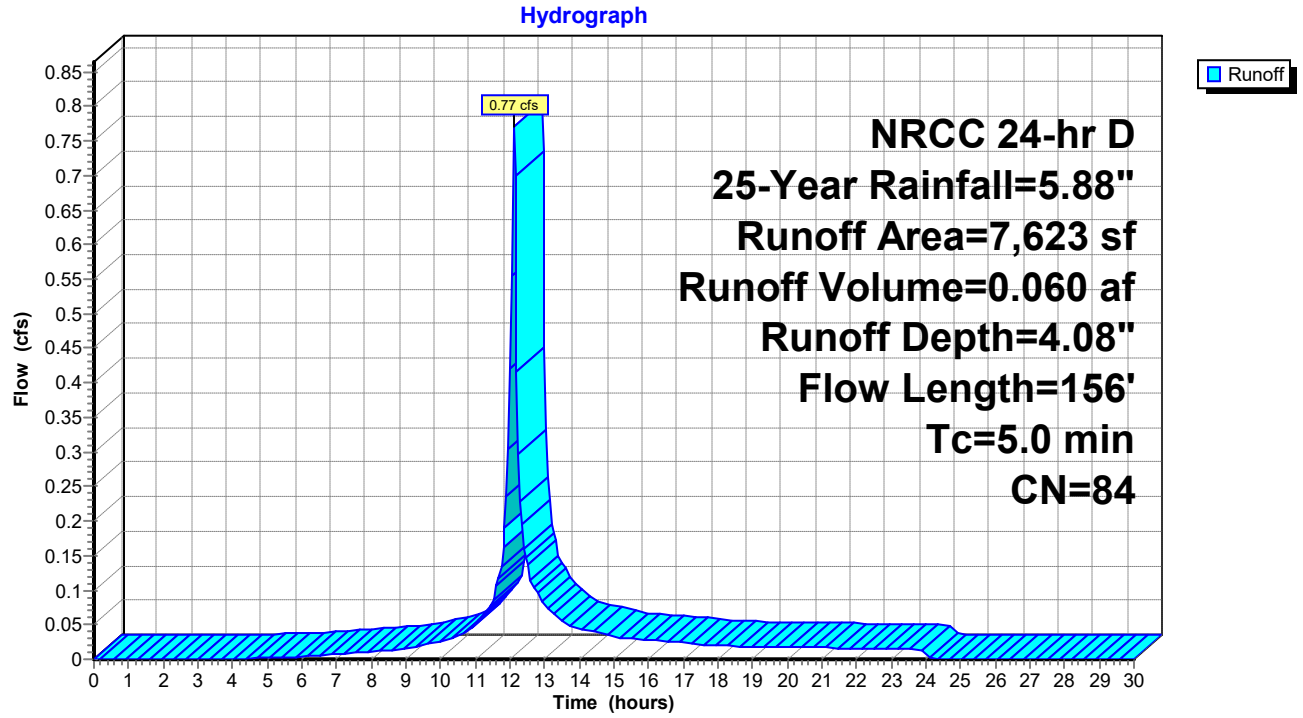
Runoff = 0.77 cfs @ 12.11 hrs, Volume= 0.060 af, Depth= 4.08"
Routed to Reach DCB8 : TO DMH#103

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
1,804	39	>75% Grass cover, Good, HSG A
5,819	98	Paved parking, HSG A
7,623	84	Weighted Average
1,804		23.67% Pervious Area
5,819		76.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	16	0.0150	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	34	0.0100	0.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	106	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.2	156	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P108: TO DCB#8



Summary for Subcatchment P109: TO DCB#9

[49] Hint: Tc<2dt may require smaller dt

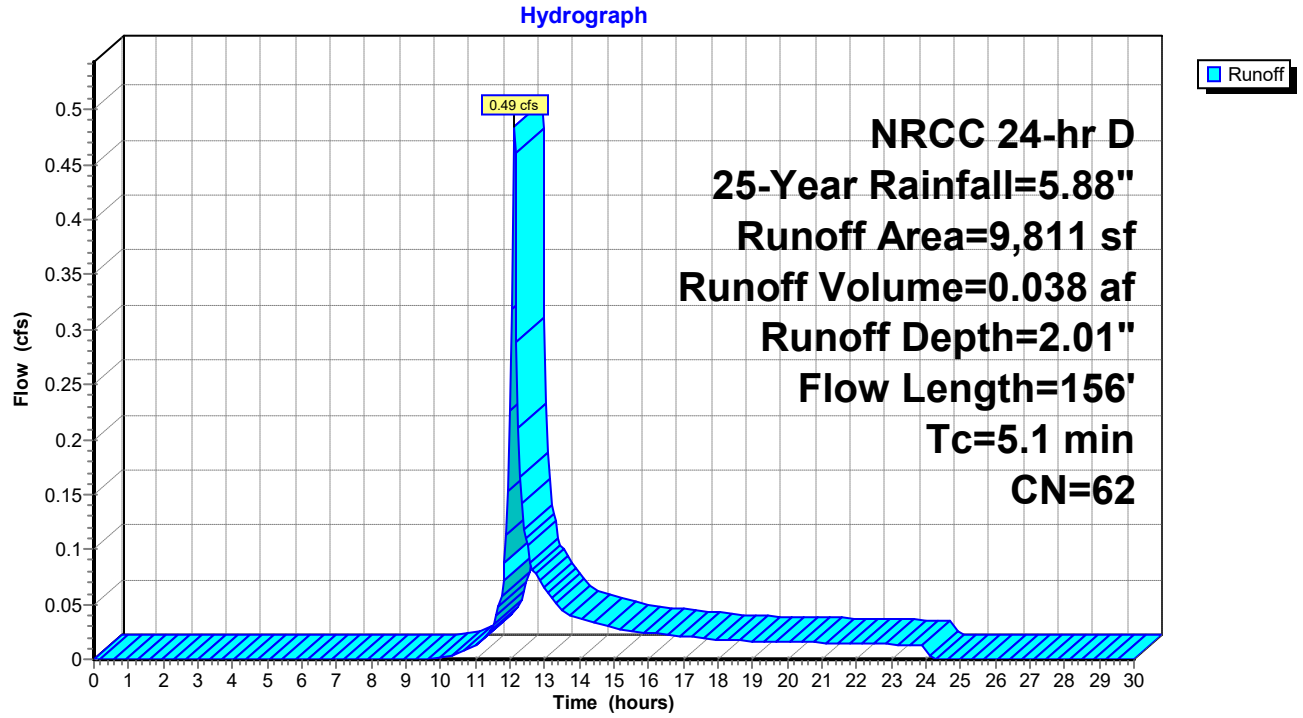
Runoff = 0.49 cfs @ 12.12 hrs, Volume= 0.038 af, Depth= 2.01"
Routed to Reach DCB9 : TO DMH#103

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
5,927	39	>75% Grass cover, Good, HSG A
3,884	98	Paved parking, HSG A
9,811	62	Weighted Average
5,927		60.41% Pervious Area
3,884		39.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	25	0.0150	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.5	25	0.0100	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	106	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.1	156	Total			

Subcatchment P109: TO DCB#9



Summary for Subcatchment P11: TO DP#1

[49] Hint: Tc<2dt may require smaller dt

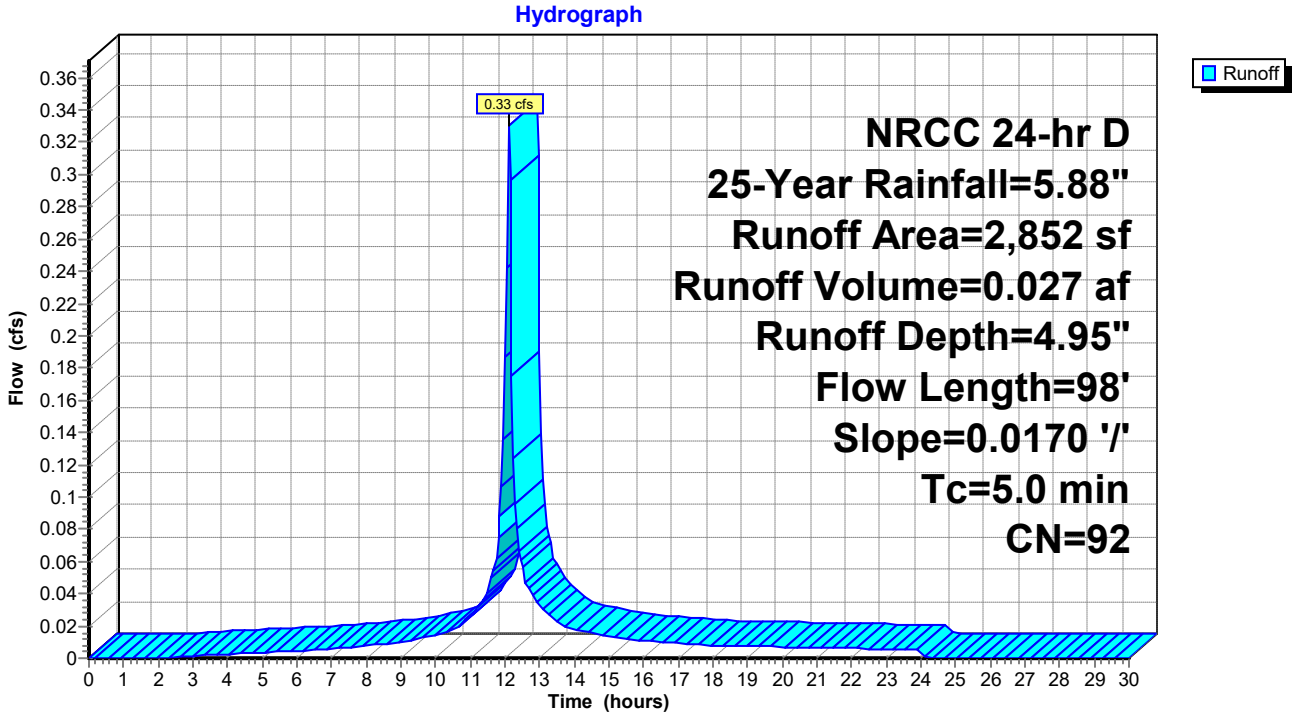
Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.027 af, Depth= 4.95"
Routed to Reach DP1 : GUTTER POINT FRANKLIN (WEST)

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 P110: TO DCB#10

[49] Hint: Tc<2dt may require smaller dt

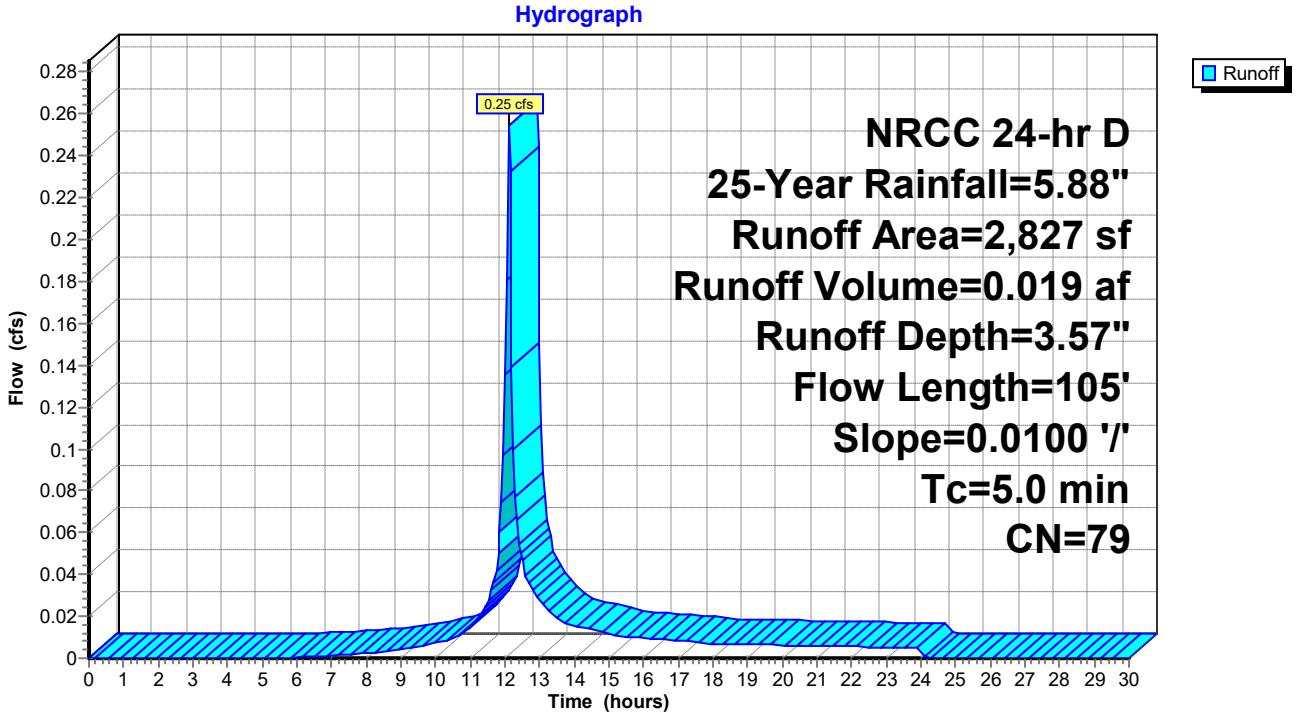
Runoff = 0.25 cfs @ 12.11 hrs, Volume= 0.019 af, Depth= 3.57"
Routed to Reach DCB10 : TO DMH#106

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
907	39	>75% Grass cover, Good, HSG A
1,920	98	Paved parking, HSG A
2,827	79	Weighted Average
907		32.08% Pervious Area
1,920		67.92% 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 P110: TO DCB#10



Summary for Subcatchment P111: TO DCB#11

[49] Hint: Tc<2dt may require smaller dt

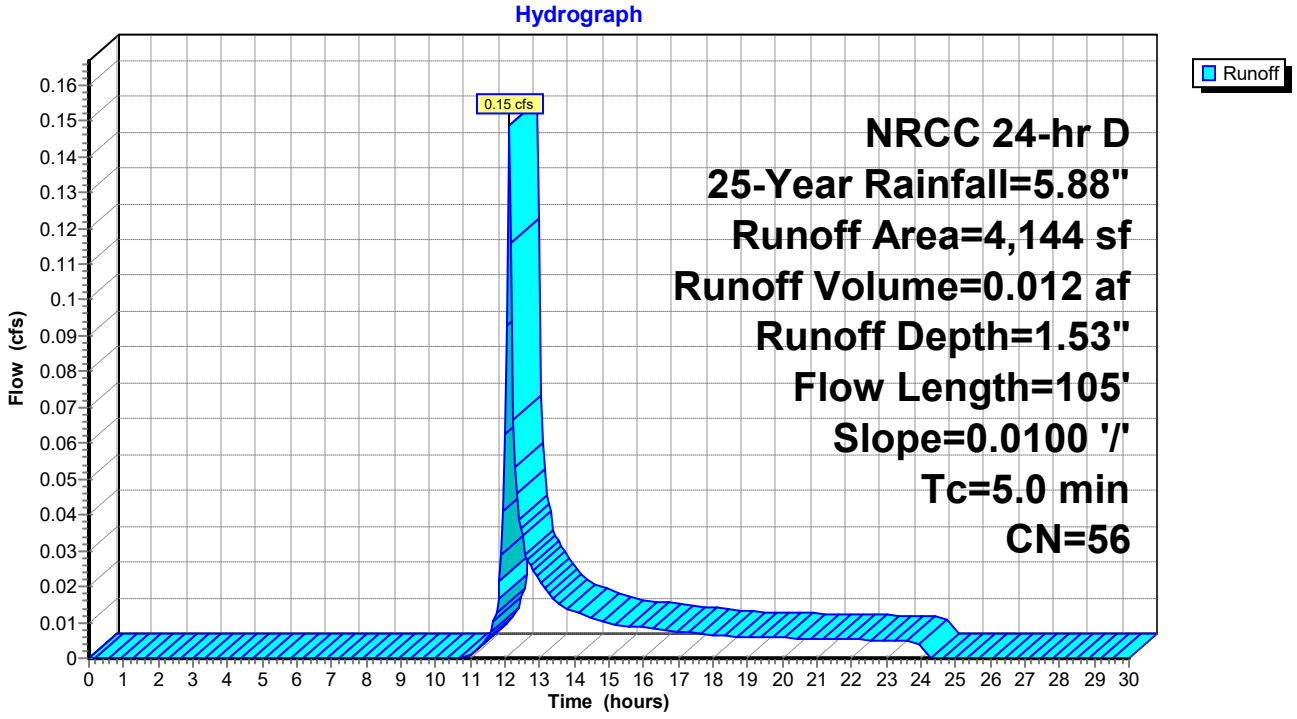
Runoff = 0.15 cfs @ 12.12 hrs, Volume= 0.012 af, Depth= 1.53"
Routed to Reach DCB11 : TO DMH#103

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
2,953	39	>75% Grass cover, Good, HSG A
1,191	98	Paved parking, HSG A
4,144	56	Weighted Average
2,953		71.26% Pervious Area
1,191		28.74% 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 P111: TO DCB#11



Summary for Subcatchment P112: TO DCB#12

[49] Hint: Tc<2dt may require smaller dt

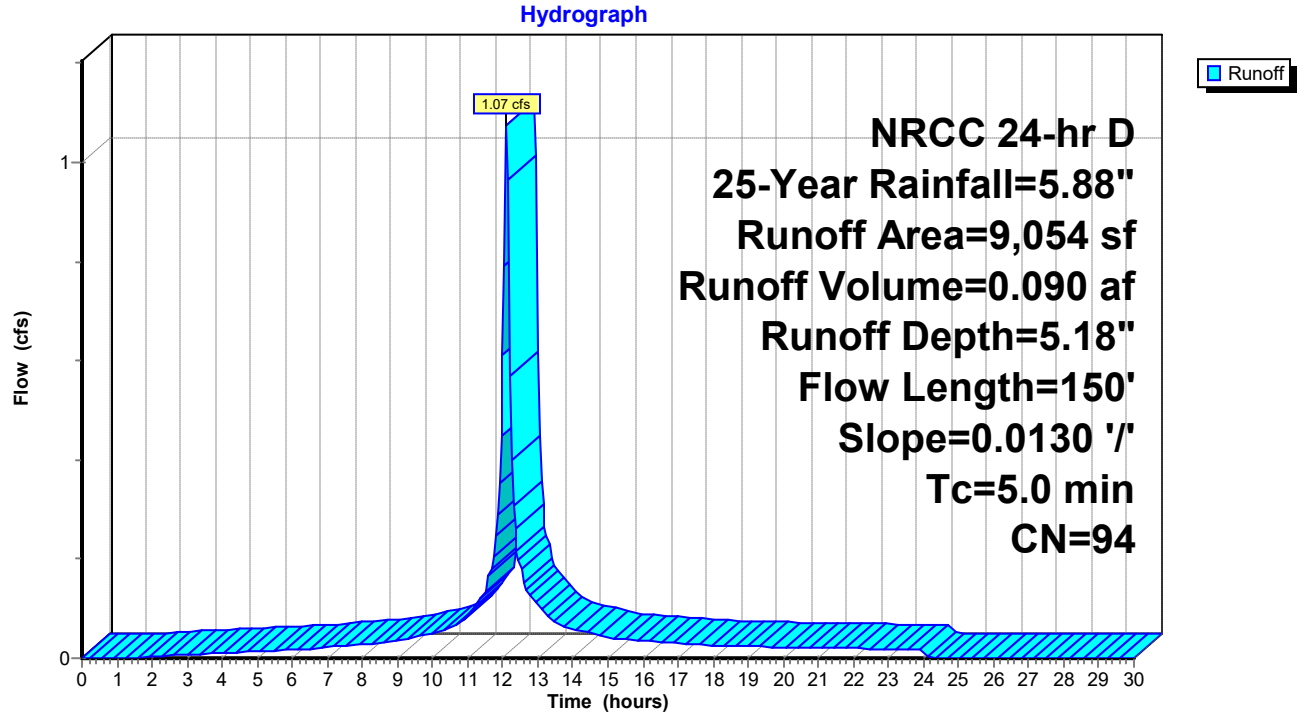
Runoff = 1.07 cfs @ 12.11 hrs, Volume= 0.090 af, Depth= 5.18"
Routed to Reach DCB12 : TO DMH#12

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
575	39	>75% Grass cover, Good, HSG A
8,479	98	Paved parking, HSG A
9,054	94	Weighted Average
575		6.35% Pervious Area
8,479		93.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0130	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	100	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P112: TO DCB#12



Summary for Subcatchment P113: TO DCB#13

[49] Hint: Tc<2dt may require smaller dt

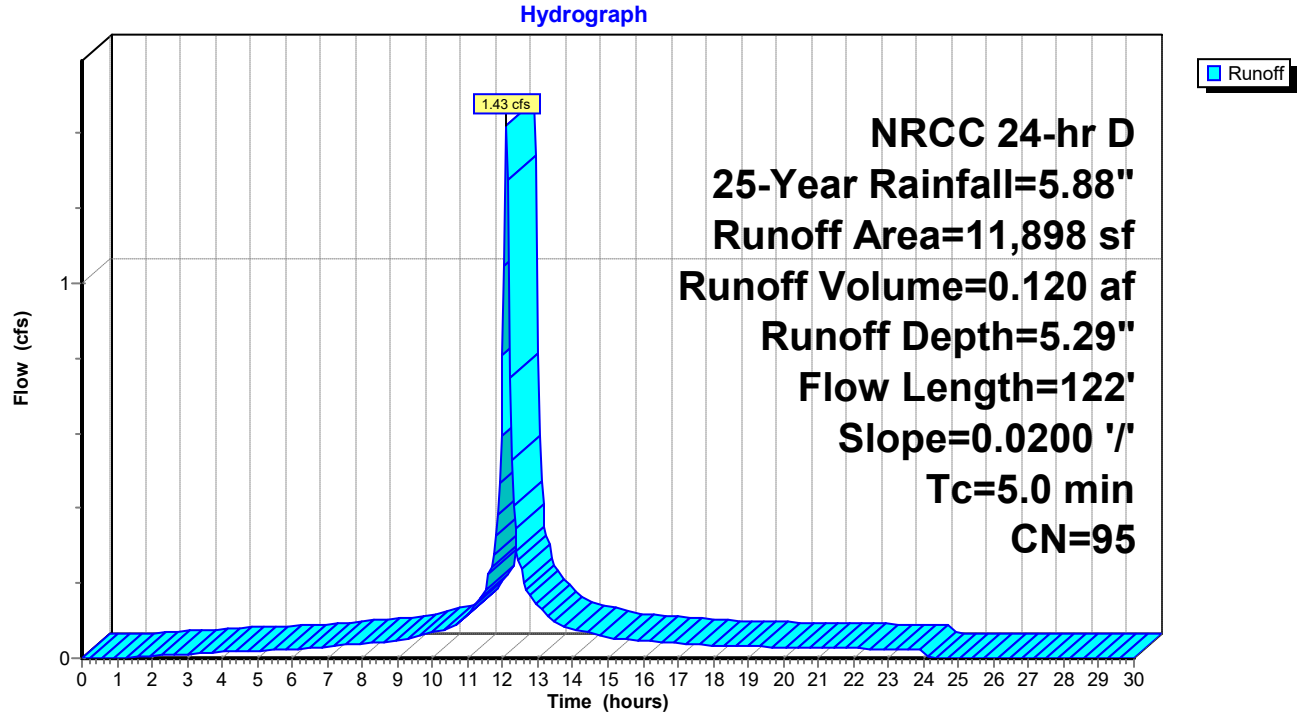
Runoff = 1.43 cfs @ 12.11 hrs, Volume= 0.120 af, Depth= 5.29"
Routed to Reach DCB13 : TO DMH#102

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
656	39	>75% Grass cover, Good, HSG A
11,242	98	Paved parking, HSG A
11,898	95	Weighted Average
656		5.51% Pervious Area
11,242		94.49% 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"
0.4	72	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	122	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P113: TO DCB#13



Summary for Subcatchment P114: TO DCB#14

[49] Hint: Tc<2dt may require smaller dt

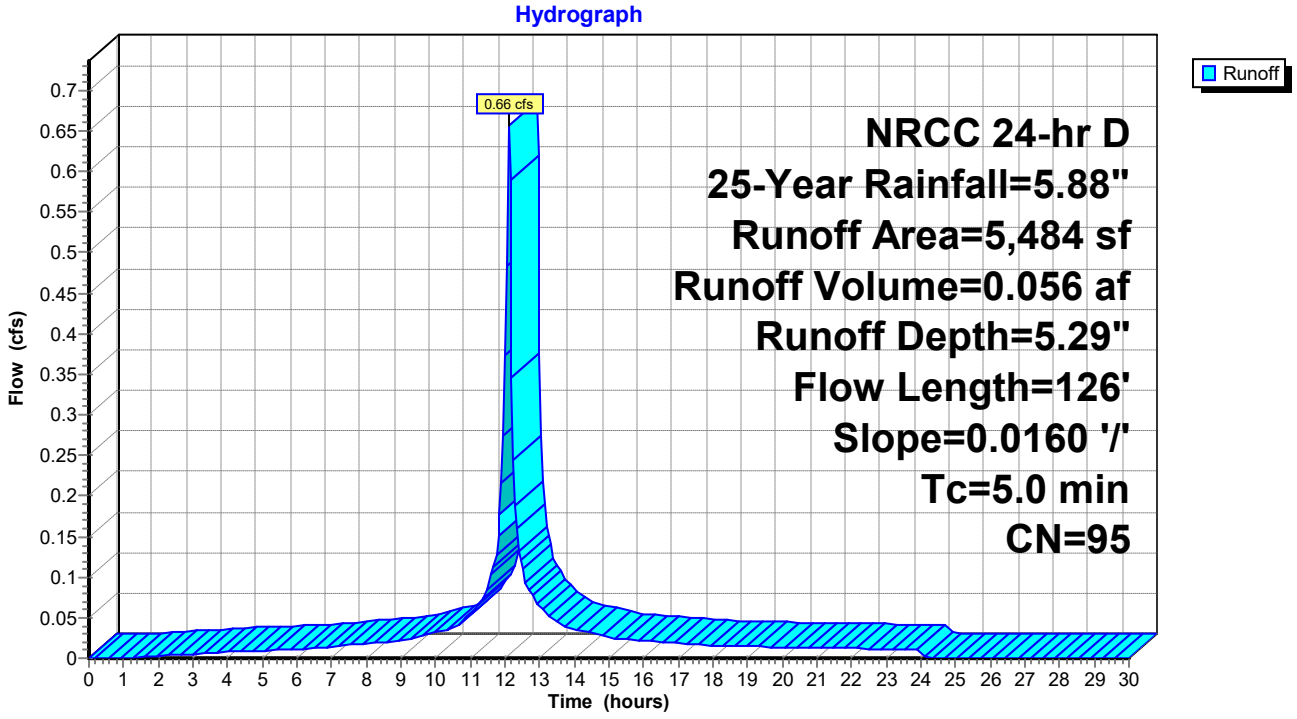
Runoff = 0.66 cfs @ 12.11 hrs, Volume= 0.056 af, Depth= 5.29"
Routed to Reach DCB14 : TO DMH#109

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
306	39	>75% Grass cover, Good, HSG A
5,178	98	Paved parking, HSG A
5,484	95	Weighted Average
306		5.58% Pervious Area
5,178		94.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0160	1.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	76	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	126	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P114: TO DCB#14



Summary for Subcatchment P115: TO DCB#15

[49] Hint: Tc<2dt may require smaller dt

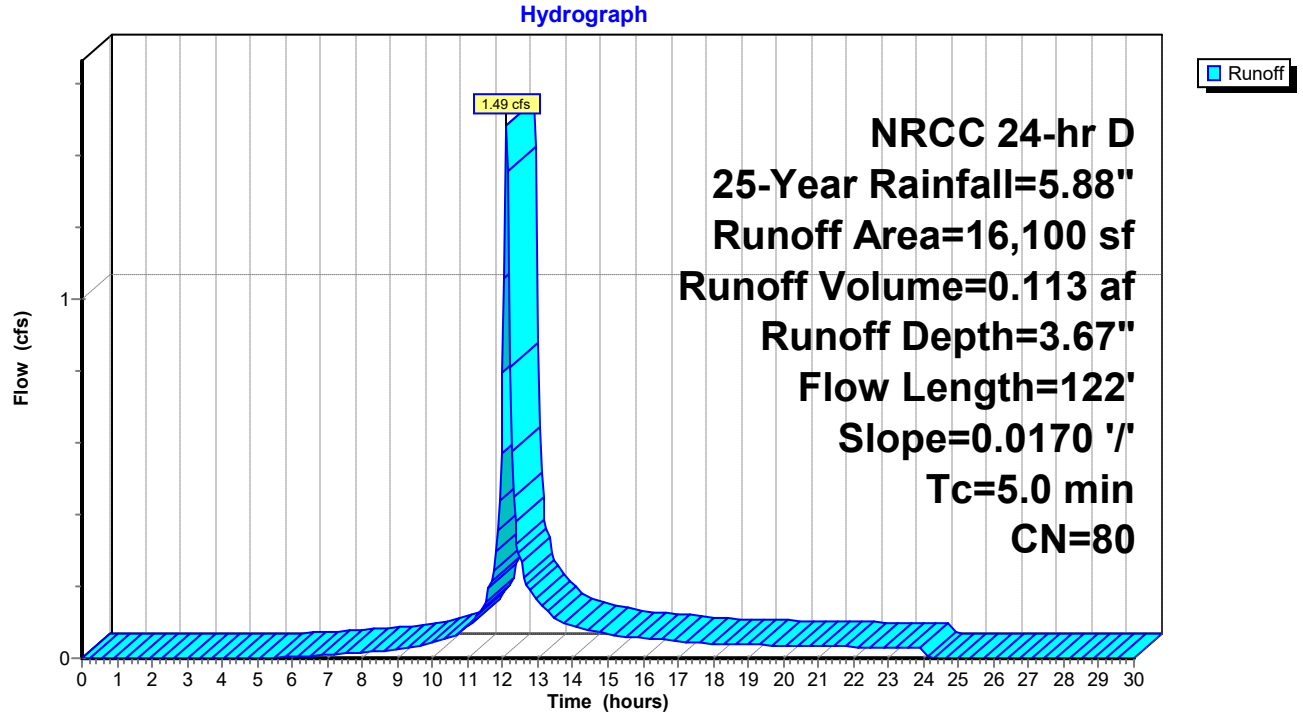
Runoff = 1.49 cfs @ 12.11 hrs, Volume= 0.113 af, Depth= 3.67"
Routed to Reach DCB15 : TO DMH#102

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
4,821	39	>75% Grass cover, Good, HSG A
11,279	98	Paved parking, HSG A
16,100	80	Weighted Average
4,821		29.94% Pervious Area
11,279		70.06% 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"
0.5	72	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	122	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P115: TO DCB#15



Summary for Subcatchment P116: TO DCB#25

[49] Hint: Tc<2dt may require smaller dt

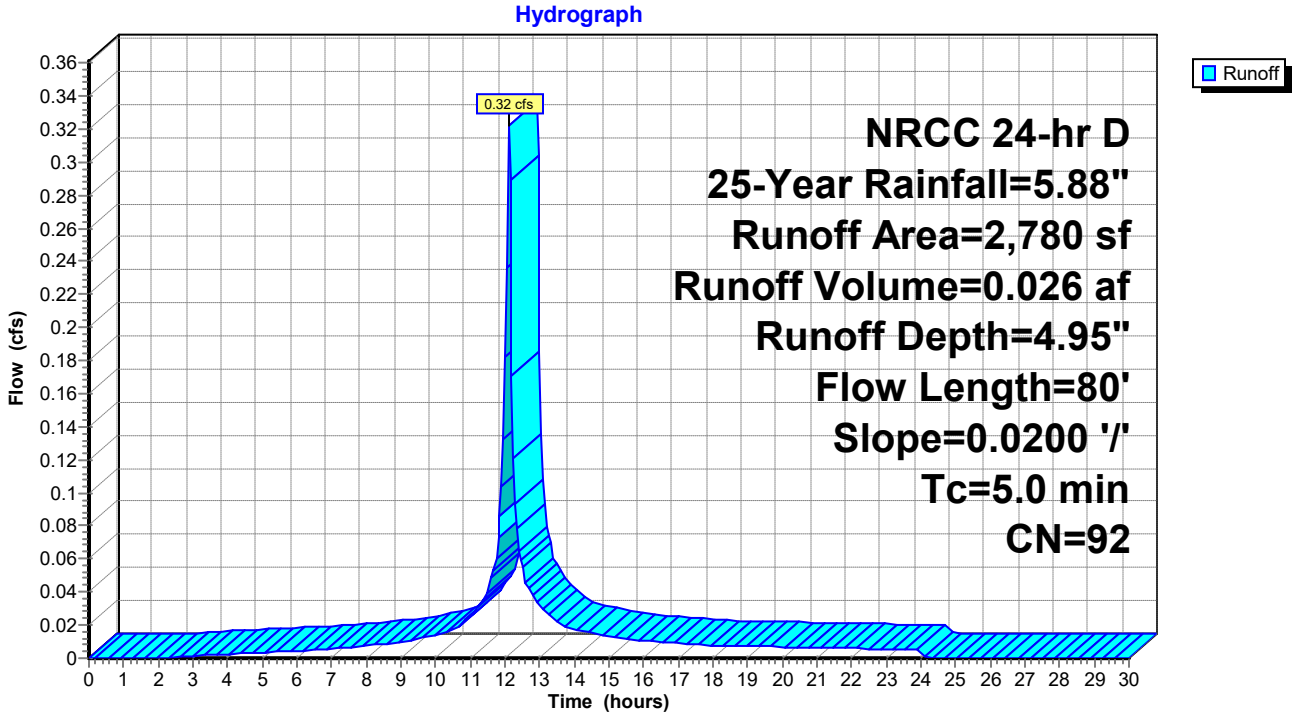
Runoff = 0.32 cfs @ 12.11 hrs, Volume= 0.026 af, Depth= 4.95"
Routed to Reach DCB25 : TO DMH#109A

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
297	39	>75% Grass cover, Good, HSG A
2,483	98	Paved parking, HSG A
2,780	92	Weighted Average
297		10.68% Pervious Area
2,483		89.32% 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"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	80	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P116: TO DCB#25



Summary for Subcatchment P117: TO DP#6

[49] Hint: Tc<2dt may require smaller dt

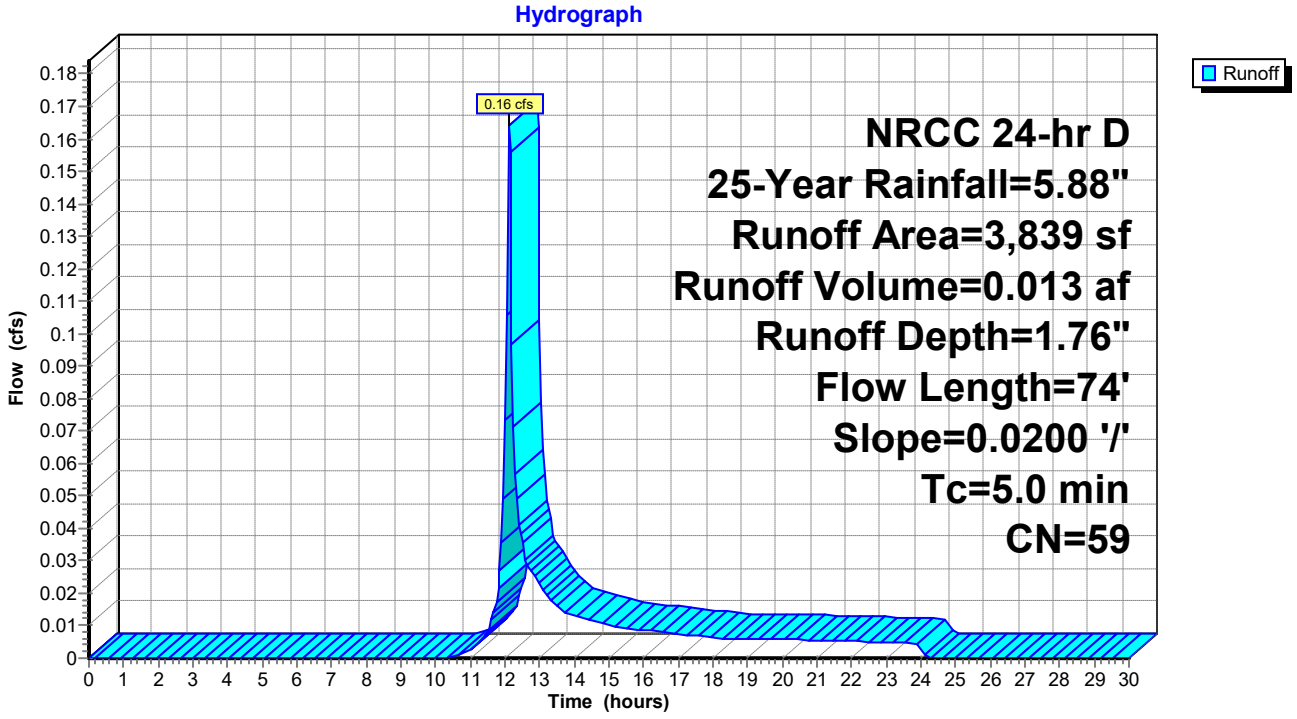
Runoff = 0.16 cfs @ 12.12 hrs, Volume= 0.013 af, Depth= 1.76"
Routed to Reach DP#6 : OFFSITE LOW POINT

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
2,555	39	>75% Grass cover, Good, HSG A
1,284	98	Paved parking, HSG A
3,839	59	Weighted Average
2,555		66.55% Pervious Area
1,284		33.45% 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 P117: TO DP#6



Summary for Subcatchment P119: TO DCB#19

[49] Hint: Tc<2dt may require smaller dt

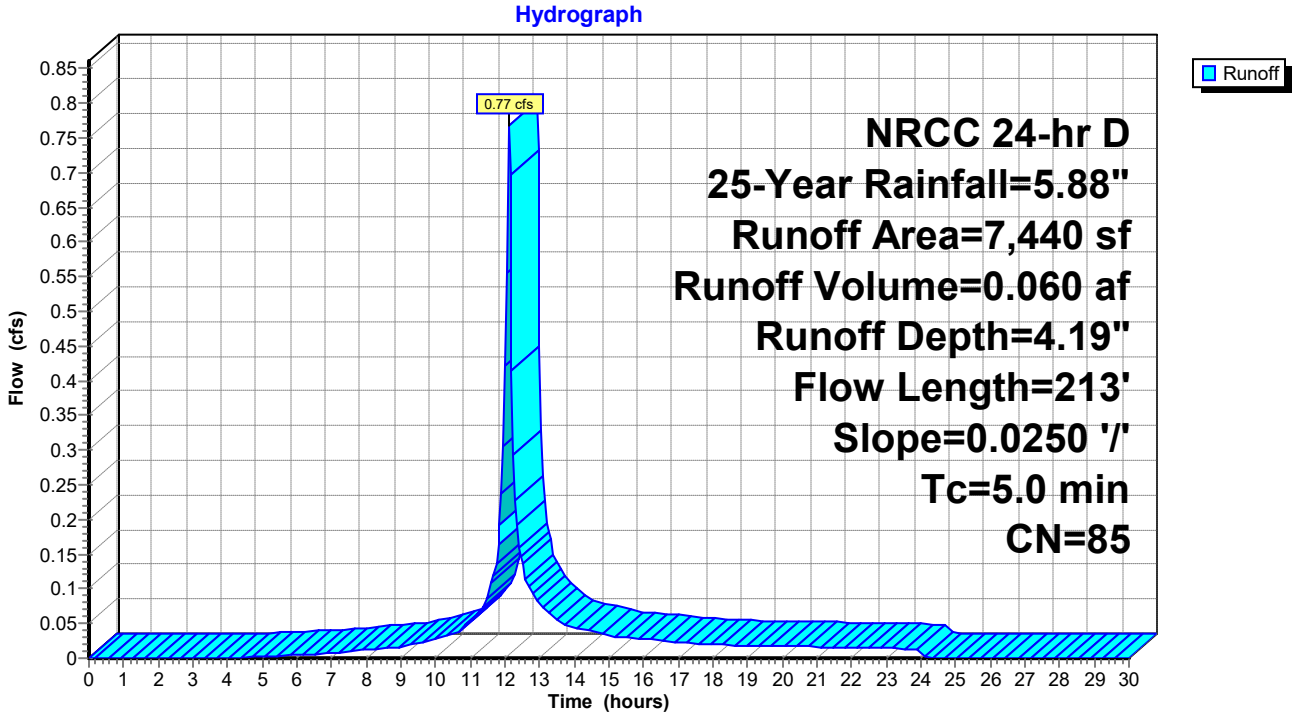
Runoff = 0.77 cfs @ 12.11 hrs, Volume= 0.060 af, Depth= 4.19"
Routed to Reach DCB19 : TO DMH#111

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
1,625	39	>75% Grass cover, Good, HSG A
5,815	98	Paved parking, HSG A
7,440	85	Weighted Average
1,625		21.84% Pervious Area
5,815		78.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	163	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	213	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P119: TO DCB#19



Summary for Subcatchment P12: TO DCB-A

[49] Hint: Tc<2dt may require smaller dt

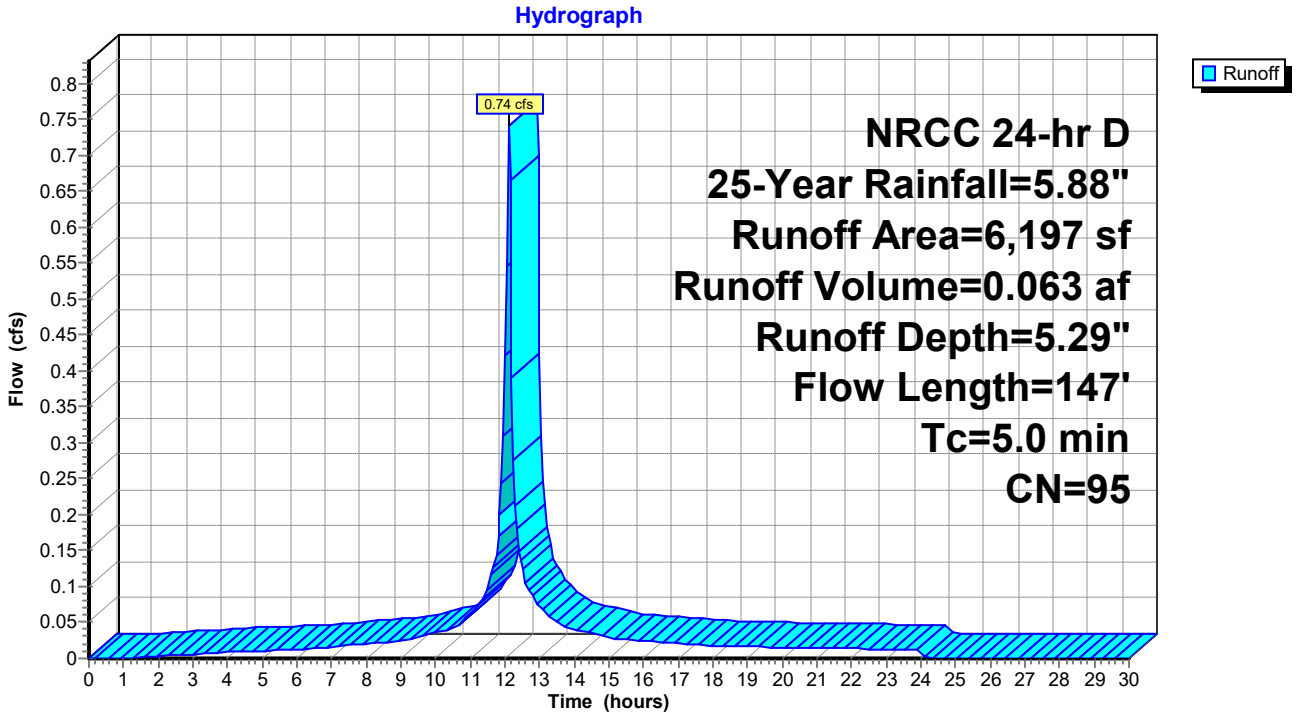
Runoff = 0.74 cfs @ 12.11 hrs, Volume= 0.063 af, Depth= 5.29"
Routed to Reach DCB-A : TO DMH-D

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
334	39	>75% Grass cover, Good, HSG A
5,863	98	Paved parking, HSG A
6,197	95	Weighted Average
334		5.39% Pervious Area
5,863		94.61% 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 P120: TO DCB#20

[49] Hint: Tc<2dt may require smaller dt

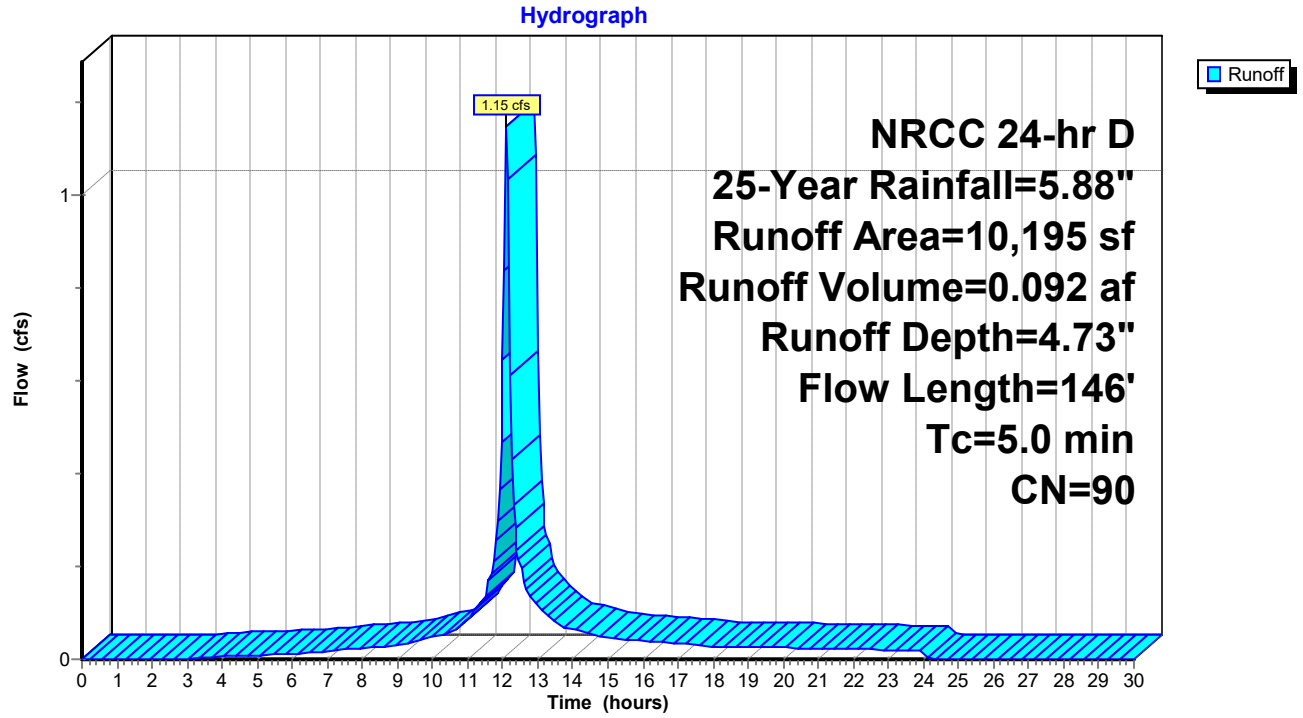
Runoff = 1.15 cfs @ 12.11 hrs, Volume= 0.092 af, Depth= 4.73"
Routed to Reach DCB20 : TO DMH#109

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
1,453	39	>75% Grass cover, Good, HSG A
8,742	98	Paved parking, HSG A
10,195	90	Weighted Average
1,453		14.25% Pervious Area
8,742		85.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	5	0.0200	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	45	0.0150	1.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	96	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.2	146	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P120: TO DCB#20



Summary for Subcatchment P121: TO DCB#21

[49] Hint: Tc<2dt may require smaller dt

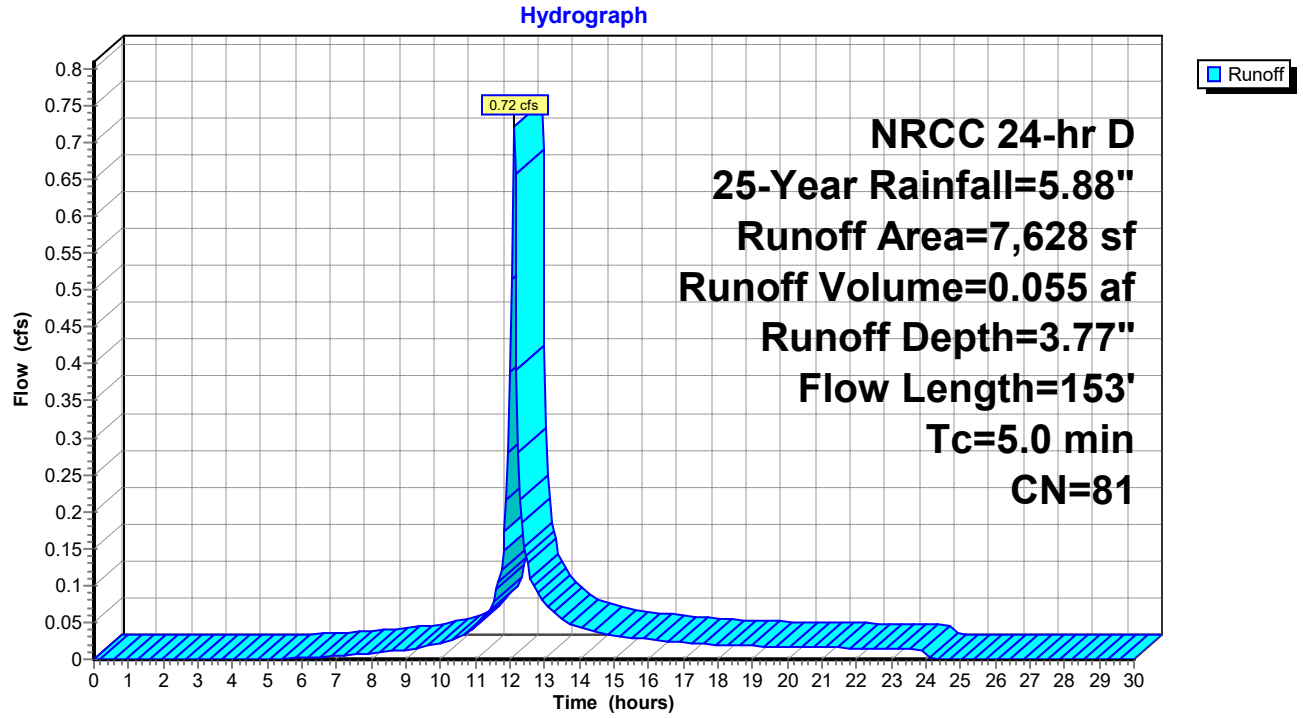
Runoff = 0.72 cfs @ 12.11 hrs, Volume= 0.055 af, Depth= 3.77"
Routed to Reach DCB21 : TO DMH#109A

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
2,211	39	>75% Grass cover, Good, HSG A
5,417	98	Paved parking, HSG A
7,628	81	Weighted Average
2,211		28.99% Pervious Area
5,417		71.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.1000	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	38	0.0100	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	103	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.5	153	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P121: TO DCB#21



Summary for Subcatchment P122: TO DCB#22

[49] Hint: Tc<2dt may require smaller dt

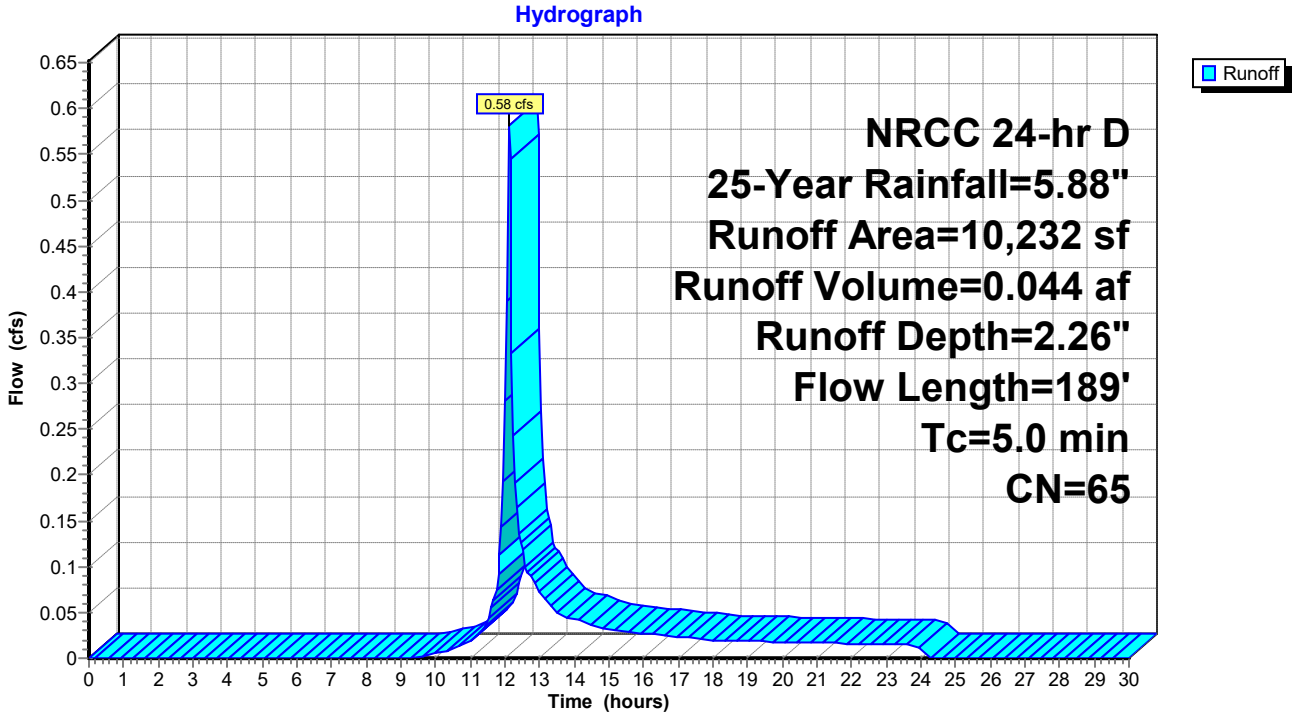
Runoff = 0.58 cfs @ 12.12 hrs, Volume= 0.044 af, Depth= 2.26"
Routed to Reach DCB22 : TO DMH#111

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
5,643	39	>75% Grass cover, Good, HSG A
4,589	98	Paved parking, HSG A
10,232	65	Weighted Average
5,643		55.15% Pervious Area
4,589		44.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	50	0.1000	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	139	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	189	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P122: TO DCB#22



Summary for Subcatchment P123: TO DCB#23

[49] Hint: Tc<2dt may require smaller dt

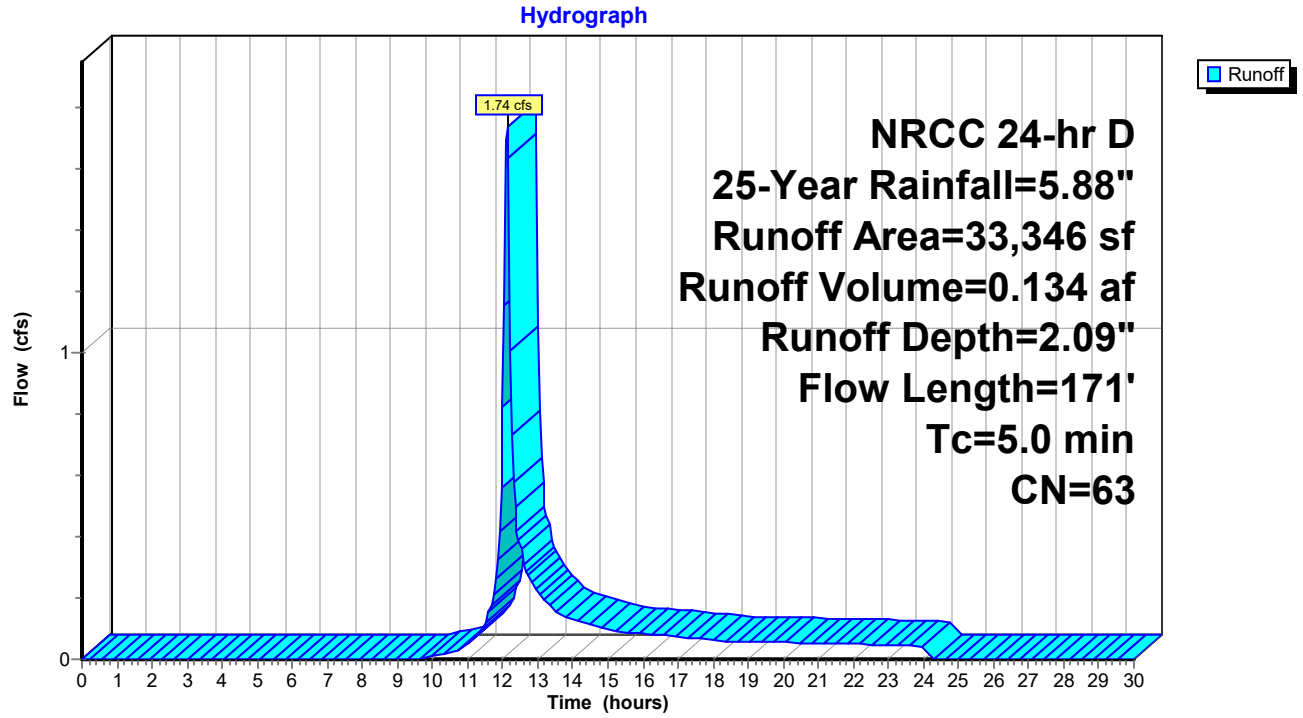
Runoff = 1.74 cfs @ 12.12 hrs, Volume= 0.134 af, Depth= 2.09"
Routed to Reach DCB23 : TO DMH#111

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
20,008	39	>75% Grass cover, Good, HSG A
13,338	98	Paved parking, HSG A
33,346	63	Weighted Average
20,008		60.00% Pervious Area
13,338		40.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	40	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	10	0.0200	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	121	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	171	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P123: TO DCB#23



Summary for Subcatchment P14: TO DCB-B

[49] Hint: Tc<2dt may require smaller dt

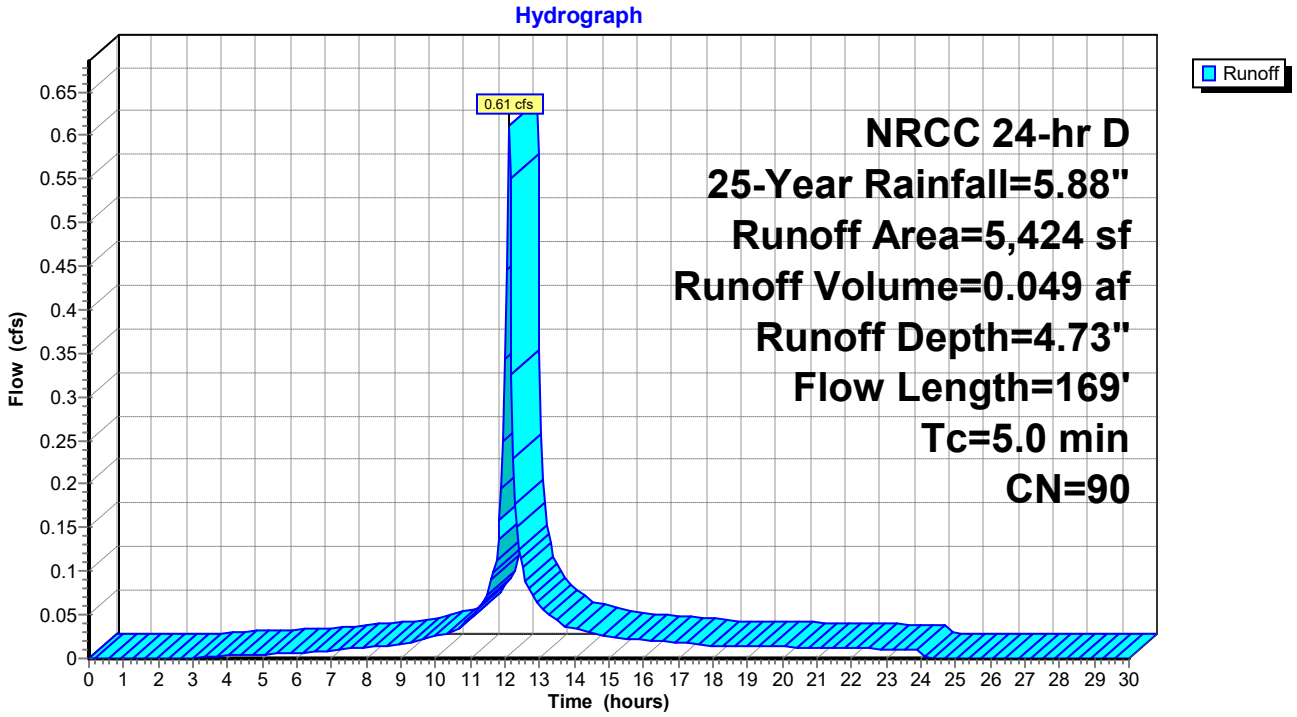
Runoff = 0.61 cfs @ 12.11 hrs, Volume= 0.049 af, Depth= 4.73"
Routed to Reach DCB-B : TO DMH-E

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
692	39	>75% Grass cover, Good, HSG A
4,732	98	Paved parking, HSG A
5,424	90	Weighted Average
692		12.76% Pervious Area
4,732		87.24% 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

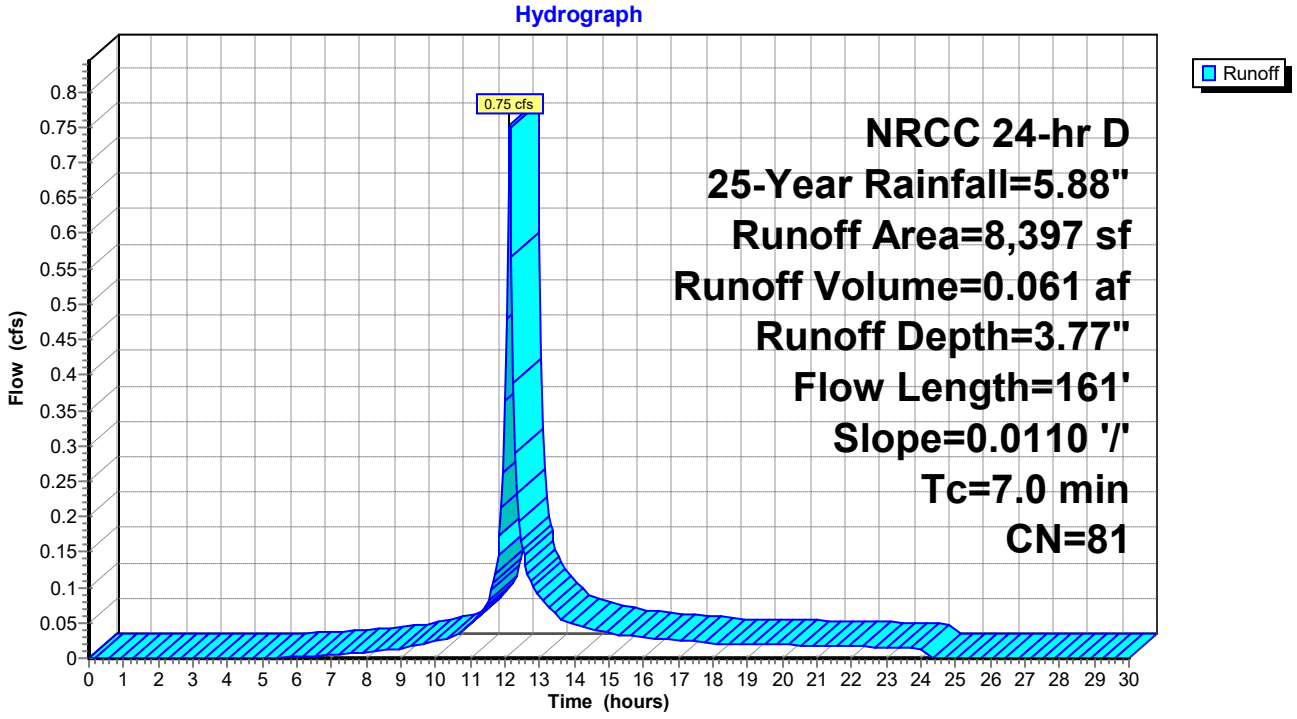
Runoff = 0.75 cfs @ 12.14 hrs, Volume= 0.061 af, Depth= 3.77"
Routed to Reach DCB-C : TO TRUNKLINE

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
2,407	39	>75% Grass cover, Good, HSG A
5,990	98	Paved parking, HSG A
8,397	81	Weighted Average
2,407		28.66% Pervious Area
5,990		71.34% 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 P18: TO DCB-D

[49] Hint: Tc<2dt may require smaller dt

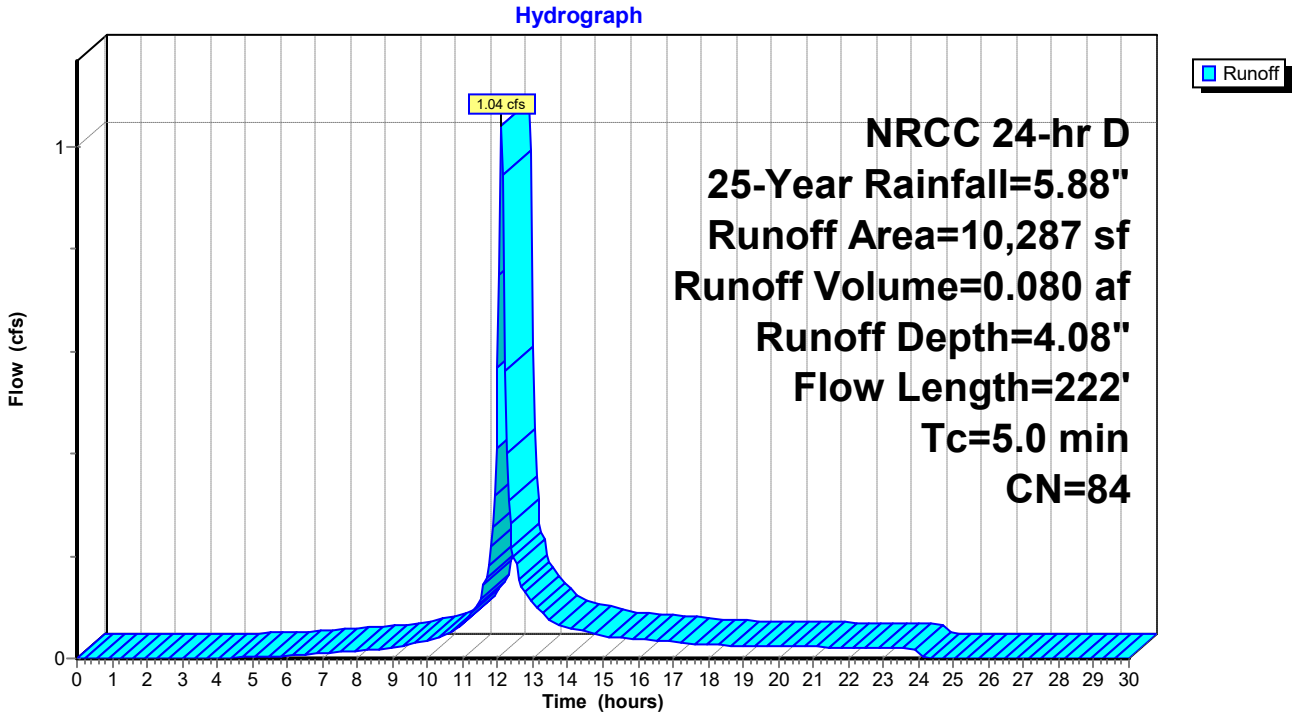
Runoff = 1.04 cfs @ 12.11 hrs, Volume= 0.080 af, Depth= 4.08"
Routed to Reach DCB-D : TO DMH-A

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
2,417	39	>75% Grass cover, Good, HSG A
7,870	98	Paved parking, HSG A
10,287	84	Weighted Average
2,417		23.50% Pervious Area
7,870		76.50% 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

[49] Hint: Tc<2dt may require smaller dt

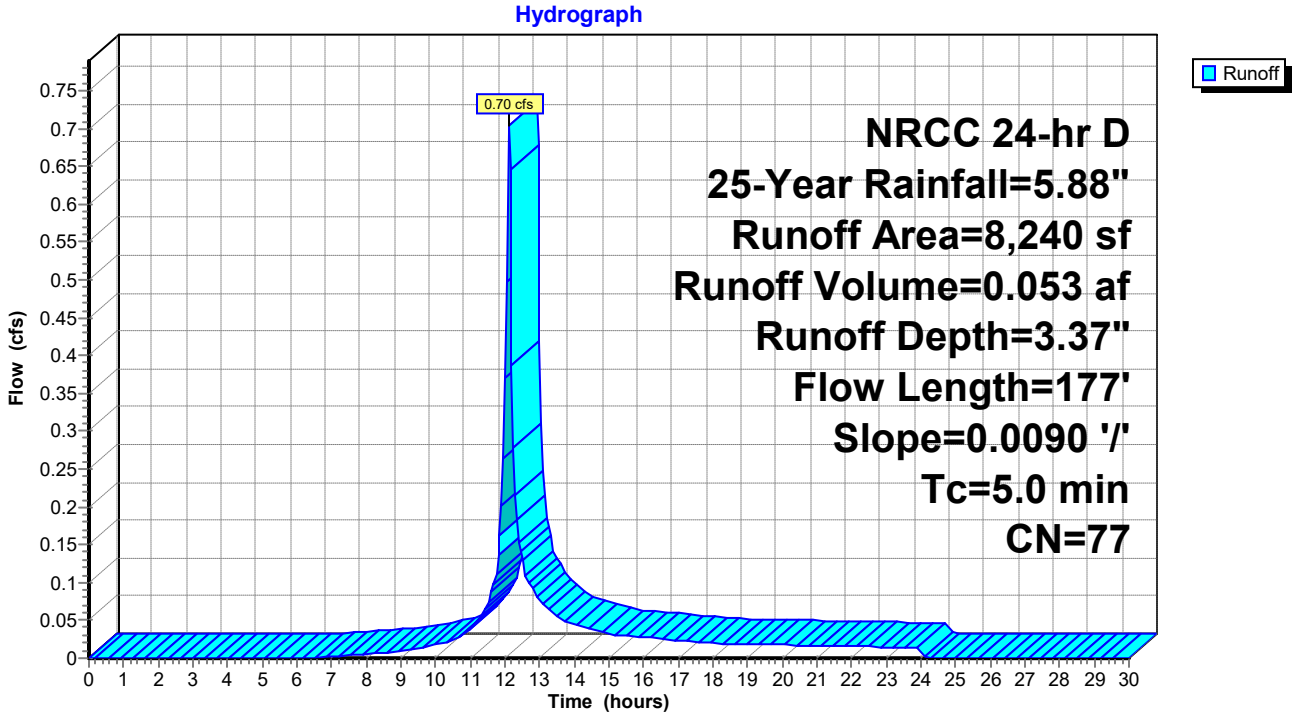
Runoff = 0.70 cfs @ 12.12 hrs, Volume= 0.053 af, Depth= 3.37"
Routed to Reach DCB-E : TO DMH-A

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
2,944	39	>75% Grass cover, Good, HSG A
5,296	98	Paved parking, HSG A
8,240	77	Weighted Average
2,944		35.73% Pervious Area
5,296		64.27% 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

[49] Hint: Tc<2dt may require smaller dt

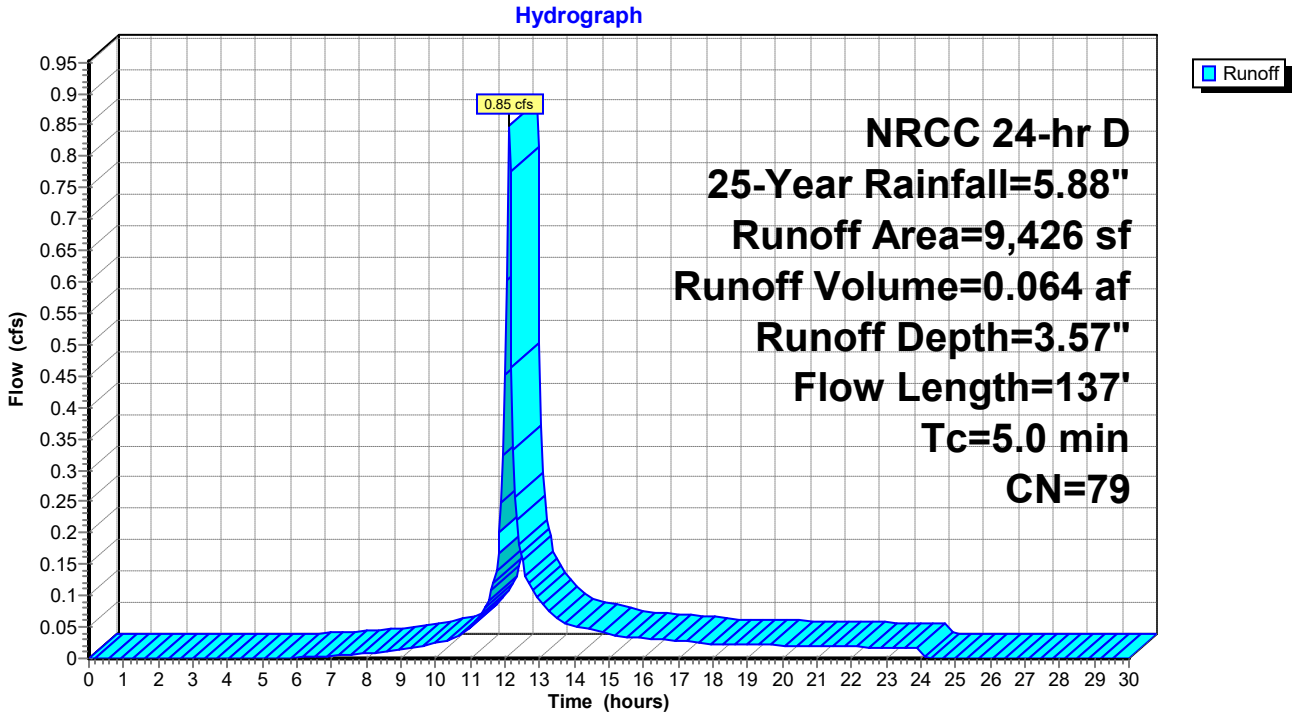
Runoff = 0.85 cfs @ 12.11 hrs, Volume= 0.064 af, Depth= 3.57"
Routed to Reach DP3 : CATCHBASIN (FIRE STATION)

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 P20: TO DP#3



Summary for Subcatchment P24: TO DCB#24

[49] Hint: Tc<2dt may require smaller dt

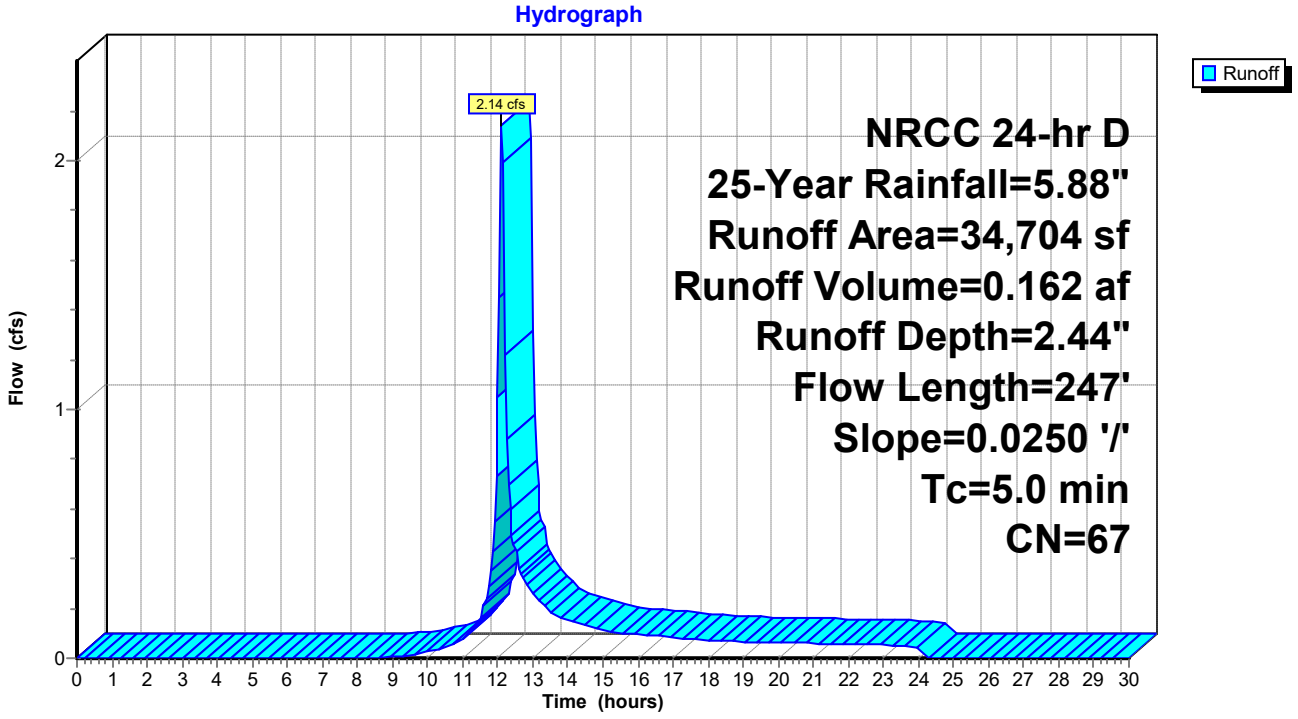
Runoff = 2.14 cfs @ 12.12 hrs, Volume= 0.162 af, Depth= 2.44"
Routed to Reach DCB24 : TO DMH#113

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
18,387	39	>75% Grass cover, Good, HSG A
16,317	98	Paved parking, HSG A
34,704	67	Weighted Average
18,387		52.98% Pervious Area
16,317		47.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.0	197	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	247	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P24: TO DCB#24



Summary for Reach CMH3: TO DMH-E

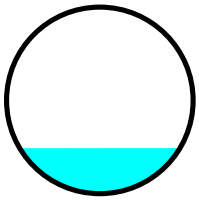
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-F outlet invert by 0.73' @ 12.15 hrs

Inflow Area = 3.013 ac, 76.57% Impervious, Inflow Depth = 2.81" for 25-Year event
Inflow = 7.98 cfs @ 12.13 hrs, Volume= 0.707 af
Outflow = 7.75 cfs @ 12.15 hrs, Volume= 0.707 af, Atten= 3%, Lag= 0.8 min
Routed to Reach DMH-E : TO DMH-D

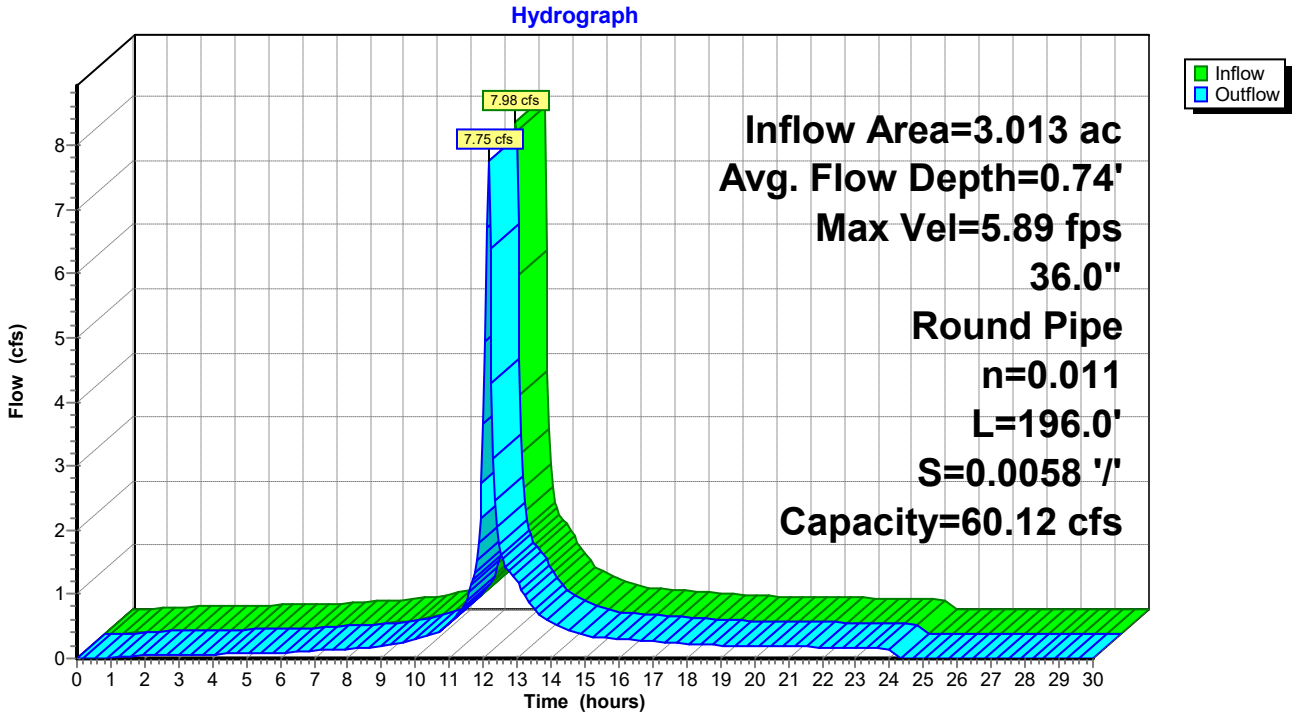
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.89 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.00 fps, Avg. Travel Time= 1.6 min

Peak Storage= 264 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.74' , Surface Width= 2.58'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.12 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 196.0' Slope= 0.0058 '/'
Inlet Invert= 457.71', Outlet Invert= 456.57'



Reach CMH3: TO DMH-E



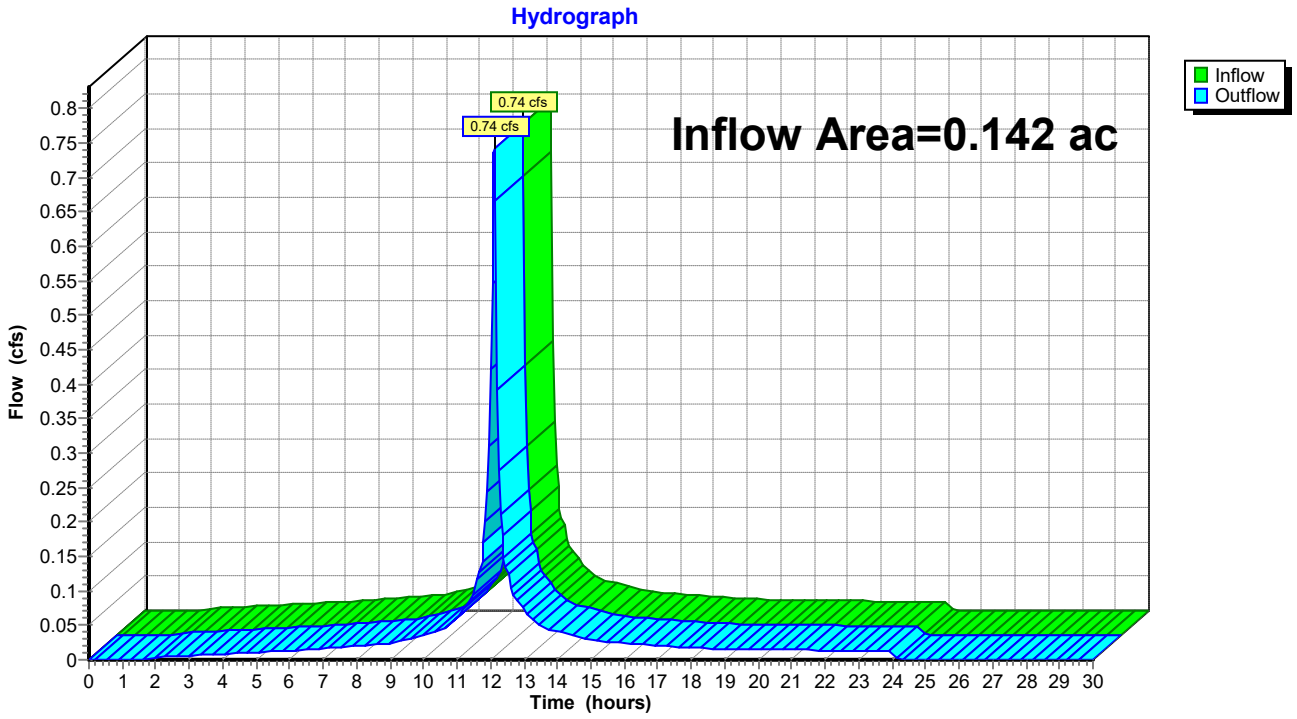
Summary for Reach DCB-A: TO DMH-D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.142 ac, 94.61% Impervious, Inflow Depth = 5.29" for 25-Year event
Inflow = 0.74 cfs @ 12.11 hrs, Volume= 0.063 af
Outflow = 0.74 cfs @ 12.11 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-D : TO DMH-C

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

Reach DCB-A: TO DMH-D



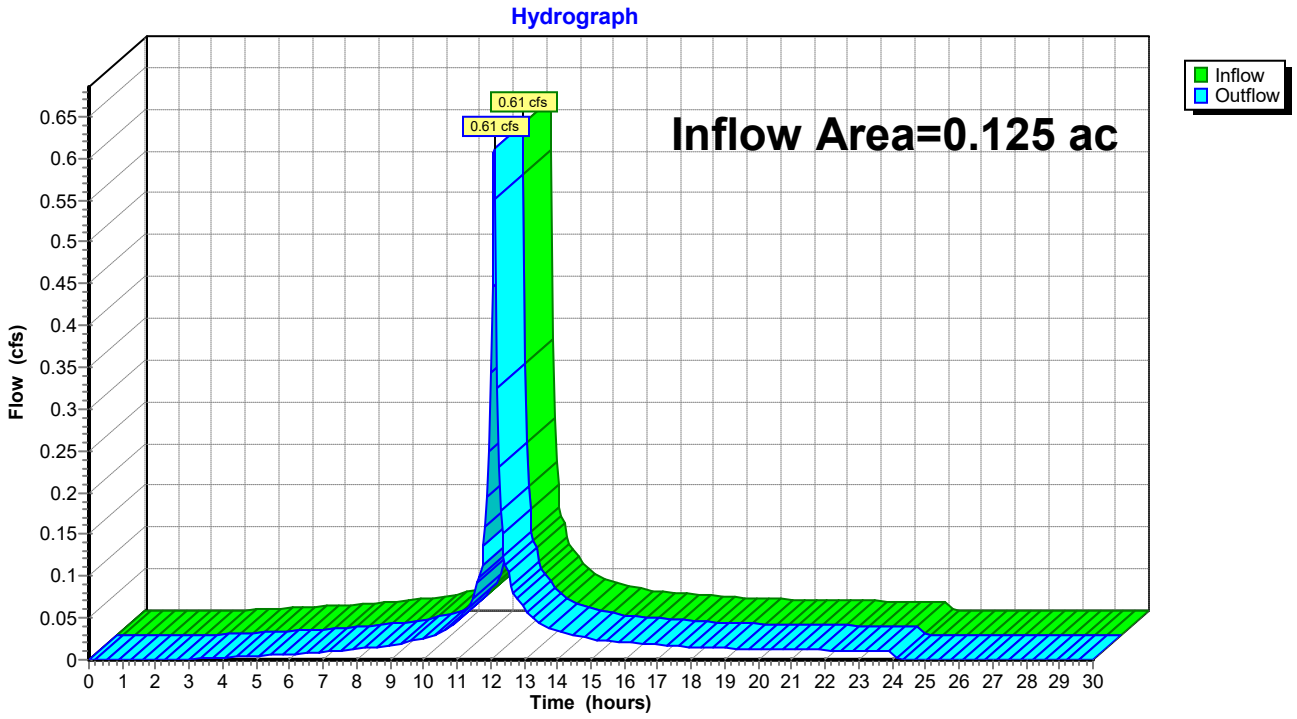
Summary for Reach DCB-B: TO DMH-E

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.125 ac, 87.24% Impervious, Inflow Depth = 4.73" for 25-Year event
Inflow = 0.61 cfs @ 12.11 hrs, Volume= 0.049 af
Outflow = 0.61 cfs @ 12.11 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-E : TO DMH-D

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

Reach DCB-B: TO DMH-E



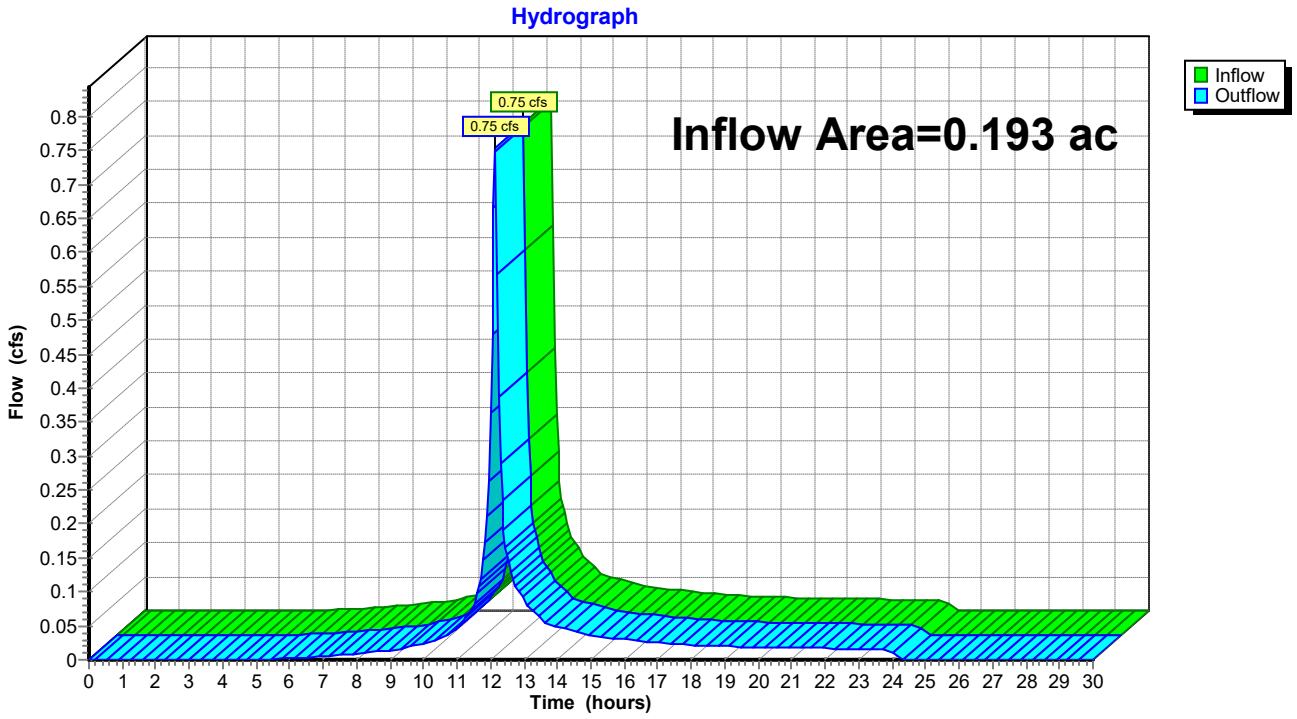
Summary for Reach DCB-C: TO TRUNKLINE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.193 ac, 71.34% Impervious, Inflow Depth = 3.77" for 25-Year event
Inflow = 0.75 cfs @ 12.14 hrs, Volume= 0.061 af
Outflow = 0.75 cfs @ 12.14 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-E : TO DMH-D

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

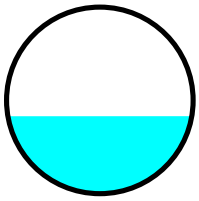
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.236 ac, 76.50% Impervious, Inflow Depth = 4.08" for 25-Year event
Inflow = 1.04 cfs @ 12.11 hrs, Volume= 0.080 af
Outflow = 1.04 cfs @ 12.11 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH-A* : TO DMH-B

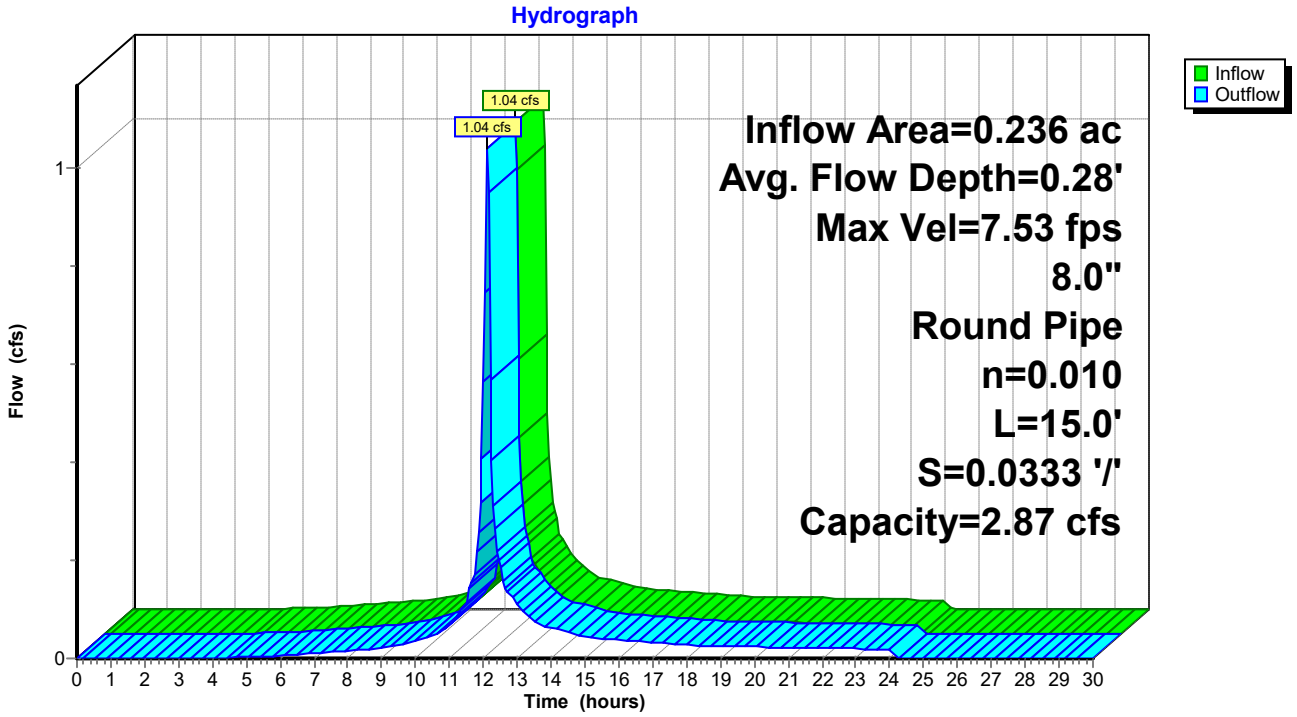
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.53 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 0.66'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.87 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 15.0' Slope= 0.0333 '/'
Inlet Invert= 468.00', Outlet Invert= 467.50'



Reach DCB-D: TO DMH-A



Summary for Reach DCB-E: TO DMH-A

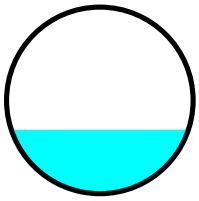
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.189 ac, 64.27% Impervious, Inflow Depth = 3.37" for 25-Year event
Inflow = 0.70 cfs @ 12.12 hrs, Volume= 0.053 af
Outflow = 0.70 cfs @ 12.12 hrs, Volume= 0.053 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH-A* : TO DMH-B

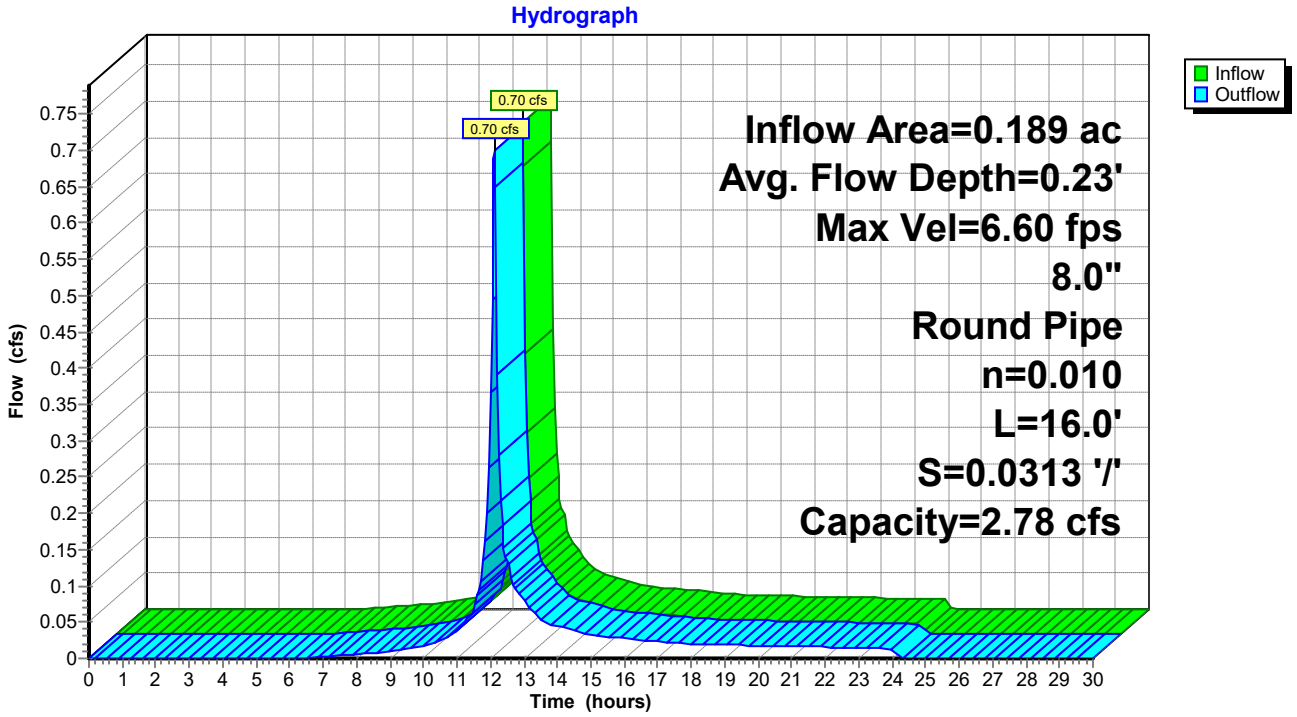
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.60 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.39 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 0.63'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.78 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 16.0' Slope= 0.0313 '/'
Inlet Invert= 468.00', Outlet Invert= 467.50'



Reach DCB-E: TO DMH-A



Summary for Reach DCB10: TO DMH#106

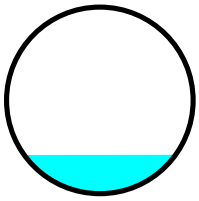
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.065 ac, 67.92% Impervious, Inflow Depth = 3.57" for 25-Year event
Inflow = 0.25 cfs @ 12.11 hrs, Volume= 0.019 af
Outflow = 0.25 cfs @ 12.12 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH106 : TO DMH#105

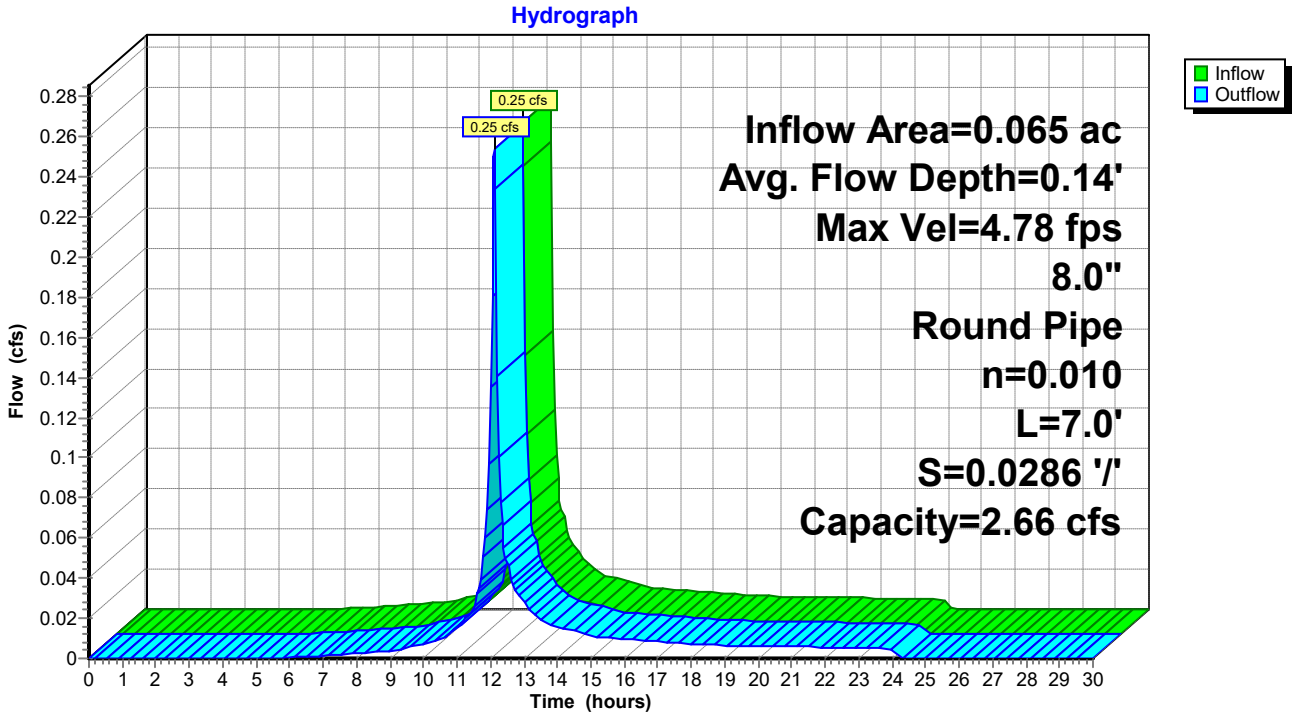
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.78 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.14' , Surface Width= 0.54'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.66 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 7.0' Slope= 0.0286 '/'
Inlet Invert= 470.30', Outlet Invert= 470.10'



Reach DCB10: TO DMH#106



Summary for Reach DCB11: TO DMH#103

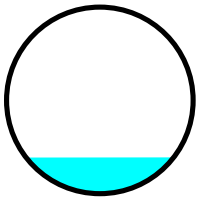
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.095 ac, 28.74% Impervious, Inflow Depth = 1.53" for 25-Year event
Inflow = 0.15 cfs @ 12.12 hrs, Volume= 0.012 af
Outflow = 0.15 cfs @ 12.13 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.2 min
Routed to Reach DMH106 : TO DMH#105

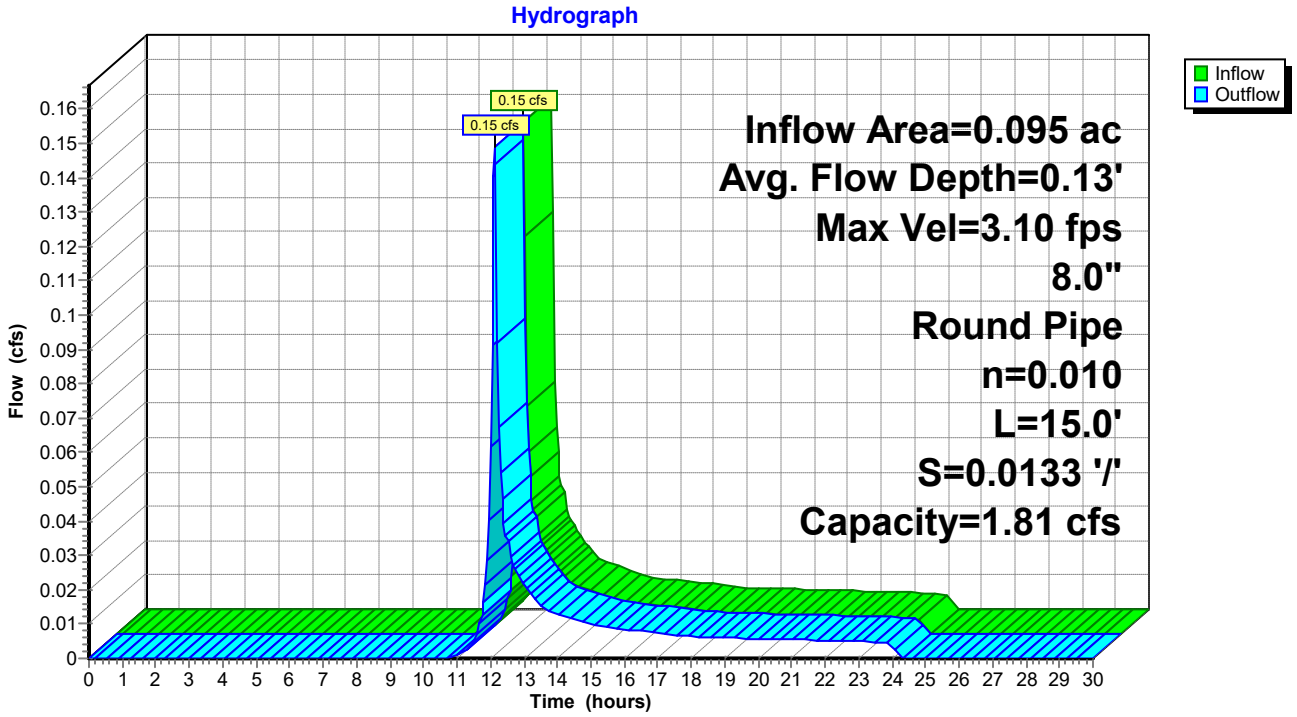
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.10 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 0.53'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.81 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 15.0' Slope= 0.0133 '/'
Inlet Invert= 470.30', Outlet Invert= 470.10'



Reach DCB11: TO DMH#103



Summary for Reach DCB12: TO DMH#12

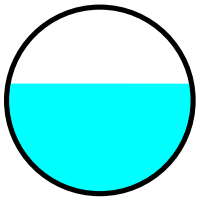
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.208 ac, 93.65% Impervious, Inflow Depth = 5.18" for 25-Year event
Inflow = 1.07 cfs @ 12.11 hrs, Volume= 0.090 af
Outflow = 1.06 cfs @ 12.11 hrs, Volume= 0.090 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH108 : TO DMH#107

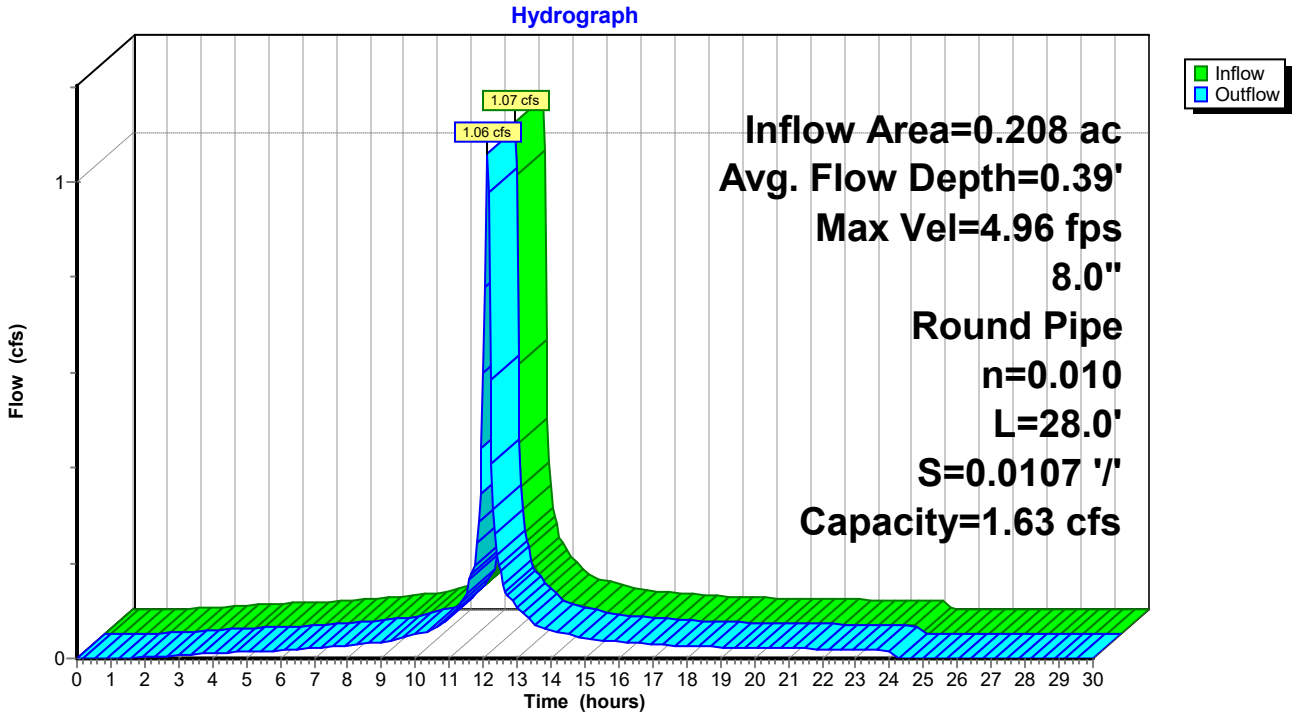
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.96 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 0.3 min

Peak Storage= 6 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 0.66'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.63 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 28.0' Slope= 0.0107 '/'
Inlet Invert= 467.80', Outlet Invert= 467.50'



Reach DCB12: TO DMH#12



Summary for Reach DCB13: TO DMH#102

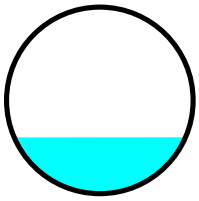
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.273 ac, 94.49% Impervious, Inflow Depth = 5.29" for 25-Year event
Inflow = 1.43 cfs @ 12.11 hrs, Volume= 0.120 af
Outflow = 1.42 cfs @ 12.11 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH102 : TO UGS#1A

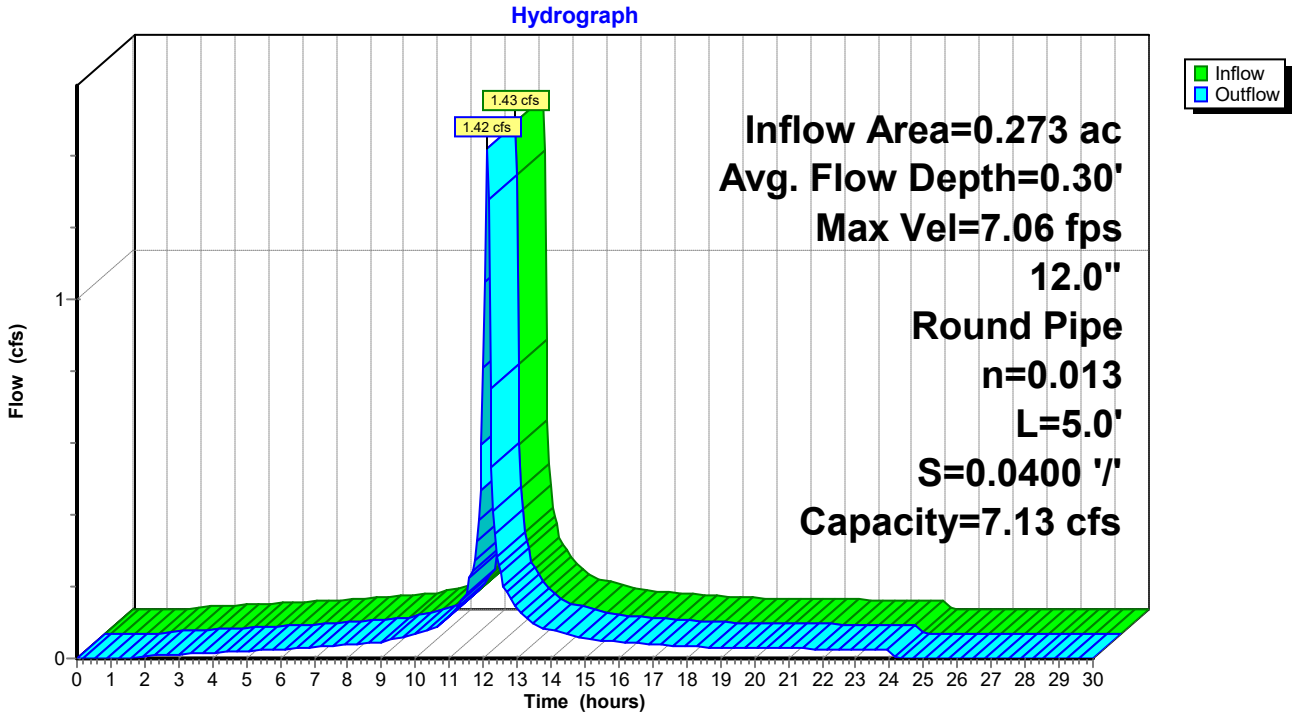
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.06 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.48 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.30' , Surface Width= 0.92'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 467.90', Outlet Invert= 467.70'



Reach DCB13: TO DMH#102



Summary for Reach DCB14: TO DMH#109

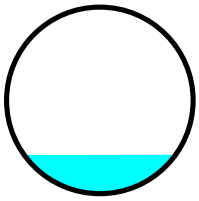
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.126 ac, 94.42% Impervious, Inflow Depth = 5.29" for 25-Year event
Inflow = 0.66 cfs @ 12.11 hrs, Volume= 0.056 af
Outflow = 0.65 cfs @ 12.11 hrs, Volume= 0.056 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH109 : TO DMH#110

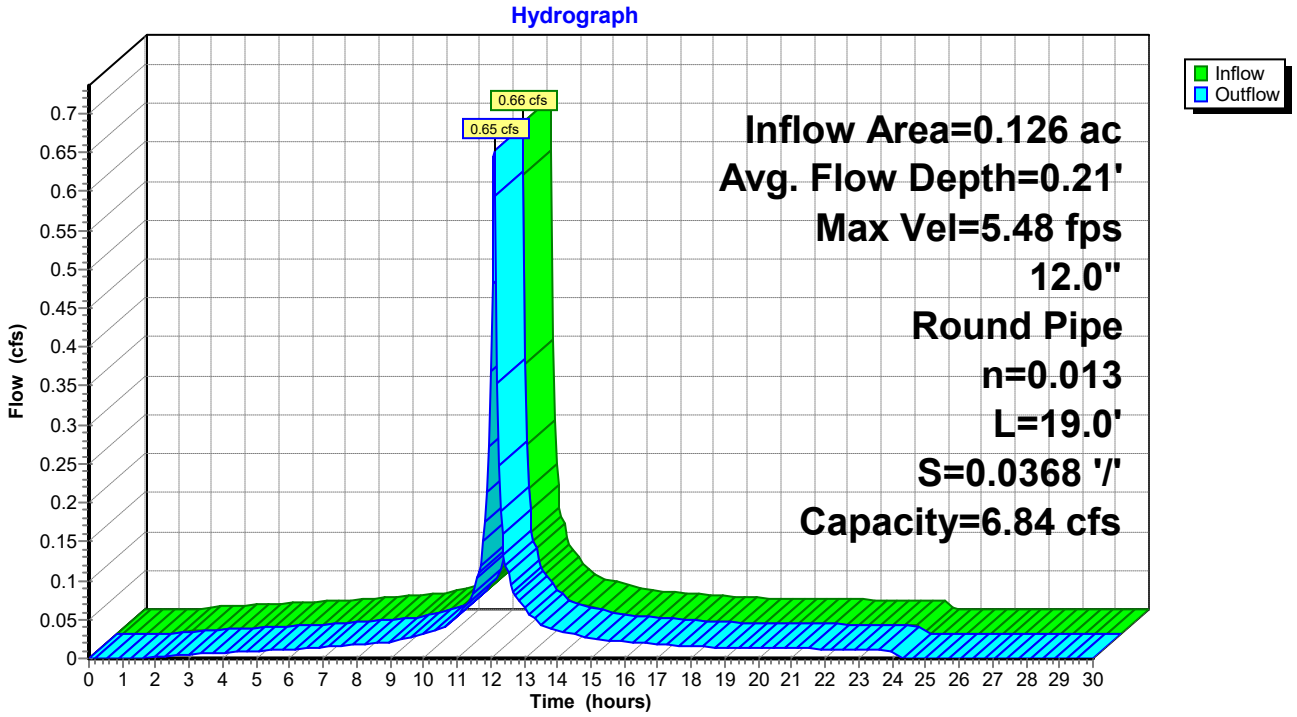
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.48 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.81'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.84 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 19.0' Slope= 0.0368 '/'
Inlet Invert= 467.10', Outlet Invert= 466.40'



Reach DCB14: TO DMH#109



Summary for Reach DCB15: TO DMH#102

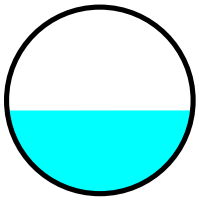
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.370 ac, 70.06% Impervious, Inflow Depth = 3.67" for 25-Year event
Inflow = 1.49 cfs @ 12.11 hrs, Volume= 0.113 af
Outflow = 1.46 cfs @ 12.13 hrs, Volume= 0.113 af, Atten= 2%, Lag= 0.7 min
Routed to Reach DMH102 : TO UGS#1A

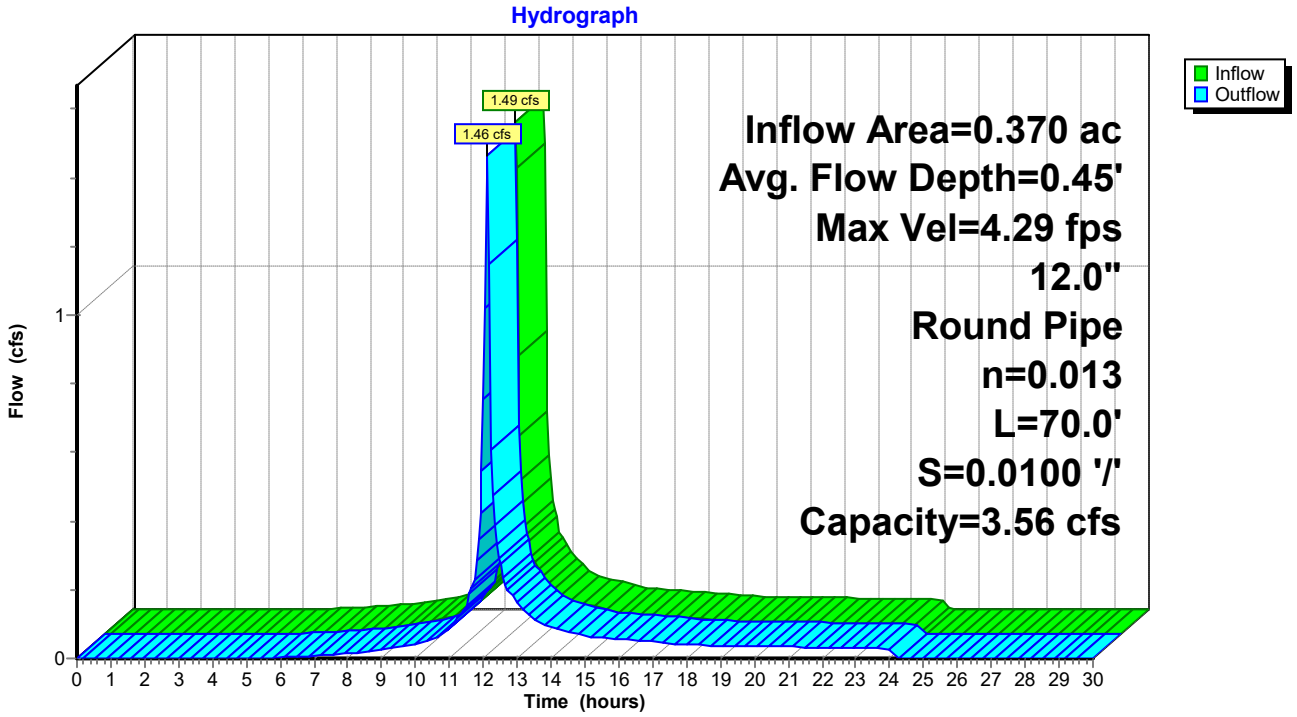
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.29 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.8 min

Peak Storage= 24 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 0.99'
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= 70.0' Slope= 0.0100 '/'
Inlet Invert= 467.00', Outlet Invert= 466.30'



Reach DCB15: TO DMH#102



Summary for Reach DCB19: TO DMH#111

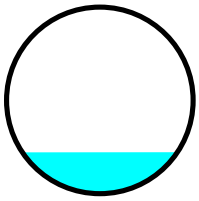
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.171 ac, 78.16% Impervious, Inflow Depth = 4.19" for 25-Year event
Inflow = 0.77 cfs @ 12.11 hrs, Volume= 0.060 af
Outflow = 0.77 cfs @ 12.11 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH111 : TO DMH#112

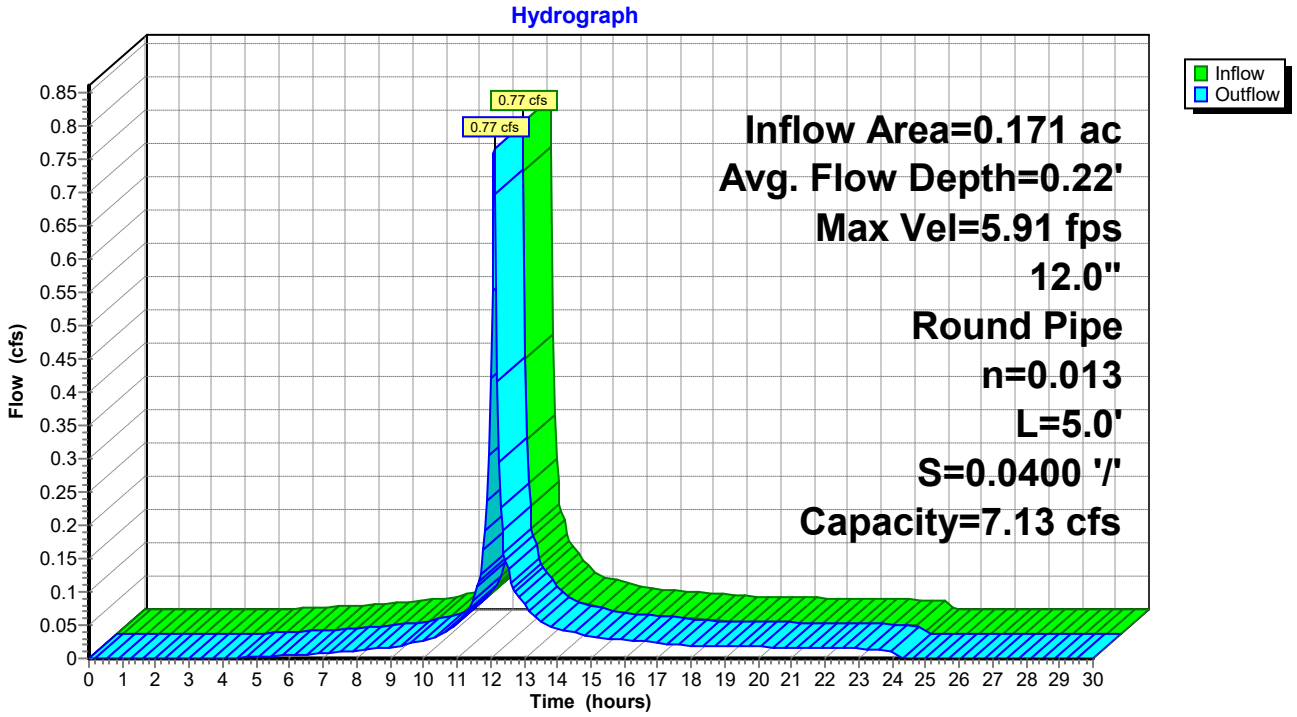
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.91 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 0.83'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 463.80', Outlet Invert= 463.60'



Reach DCB19: TO DMH#111



Summary for Reach DCB20: TO DMH#109

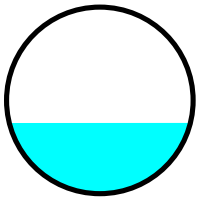
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.234 ac, 85.75% Impervious, Inflow Depth = 4.73" for 25-Year event
Inflow = 1.15 cfs @ 12.11 hrs, Volume= 0.092 af
Outflow = 1.14 cfs @ 12.11 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH109 : TO DMH#110

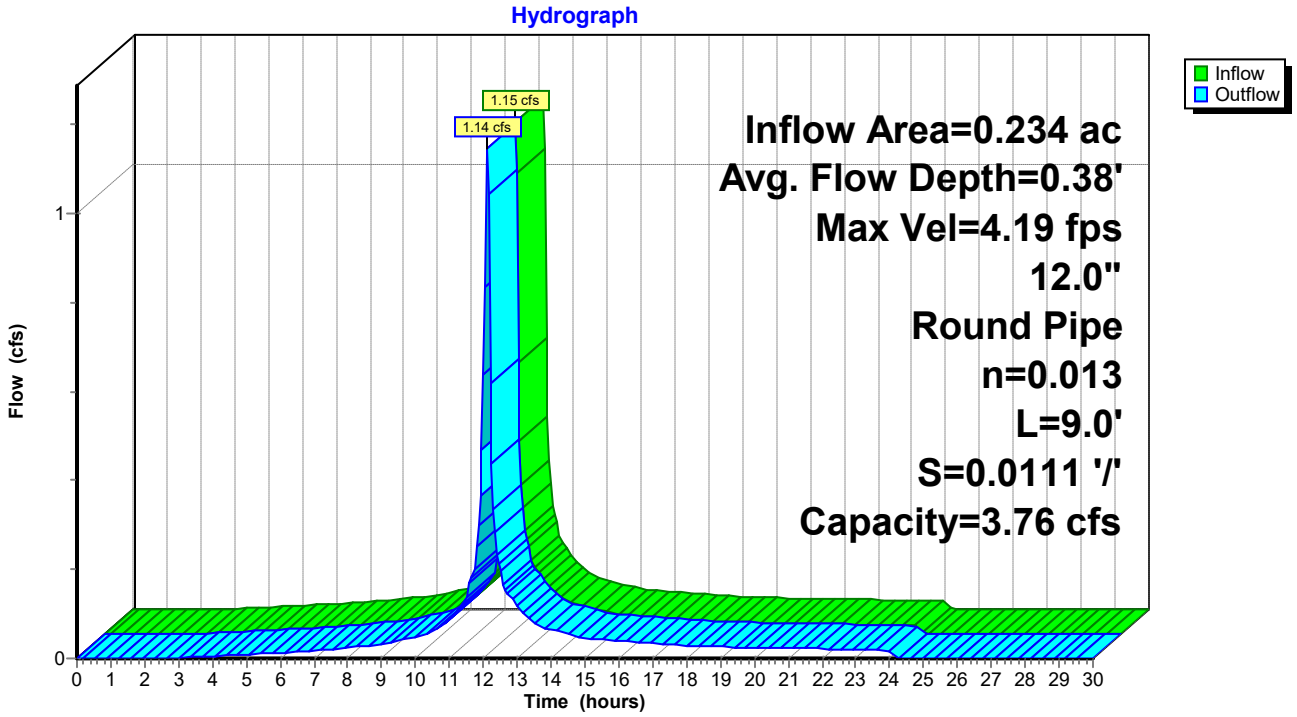
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.19 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.38' , Surface Width= 0.97'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 9.0' Slope= 0.0111 '/'
Inlet Invert= 466.50', Outlet Invert= 466.40'



Reach DCB20: TO DMH#109



Summary for Reach DCB21: TO DMH#109A

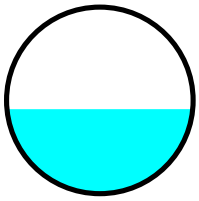
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.175 ac, 71.01% Impervious, Inflow Depth = 3.77" for 25-Year event
Inflow = 0.72 cfs @ 12.11 hrs, Volume= 0.055 af
Outflow = 0.72 cfs @ 12.11 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH109A : TO DMH109

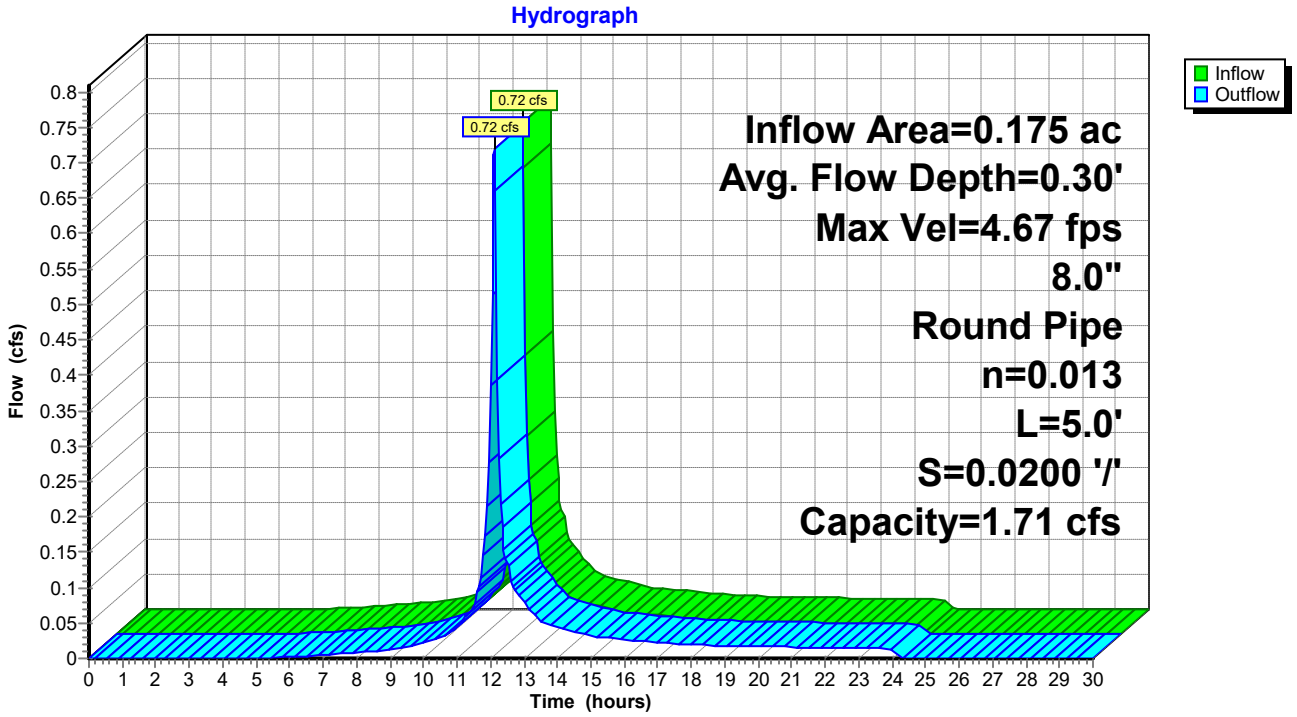
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.67 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.30' , Surface Width= 0.66'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.71 cfs

8.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 467.10', Outlet Invert= 467.00'



Reach DCB21: TO DMH#109A



Summary for Reach DCB22: TO DMH#111

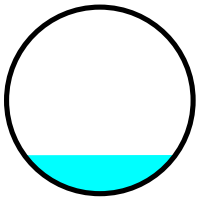
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.235 ac, 44.85% Impervious, Inflow Depth = 2.26" for 25-Year event
Inflow = 0.58 cfs @ 12.12 hrs, Volume= 0.044 af
Outflow = 0.58 cfs @ 12.12 hrs, Volume= 0.044 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH111 : TO DMH#112

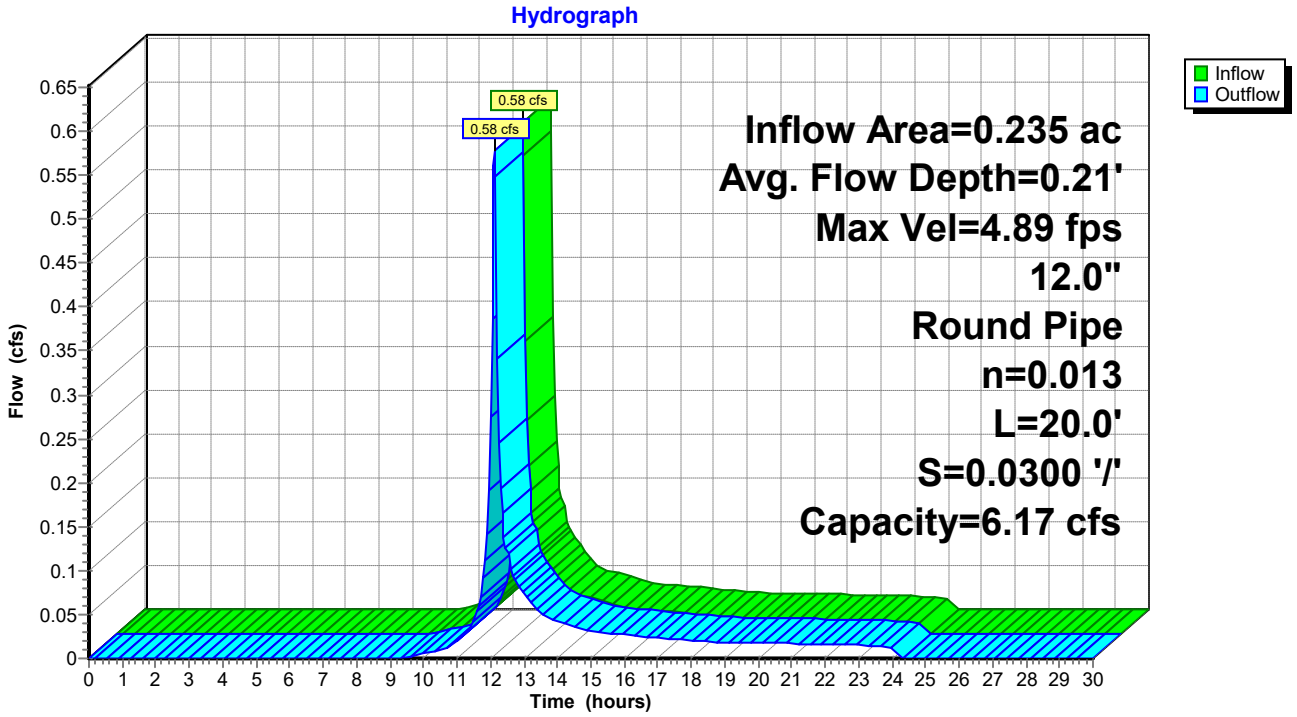
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.89 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.81'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.17 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 20.0' Slope= 0.0300 '/'
Inlet Invert= 464.20', Outlet Invert= 463.60'



Reach DCB22: TO DMH#111



Summary for Reach DCB23: TO DMH#111

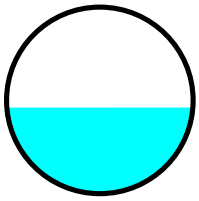
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.766 ac, 40.00% Impervious, Inflow Depth = 2.09" for 25-Year event
Inflow = 1.74 cfs @ 12.12 hrs, Volume= 0.134 af
Outflow = 1.66 cfs @ 12.15 hrs, Volume= 0.134 af, Atten= 4%, Lag= 1.5 min
Routed to Reach DMH111 : TO DMH#112

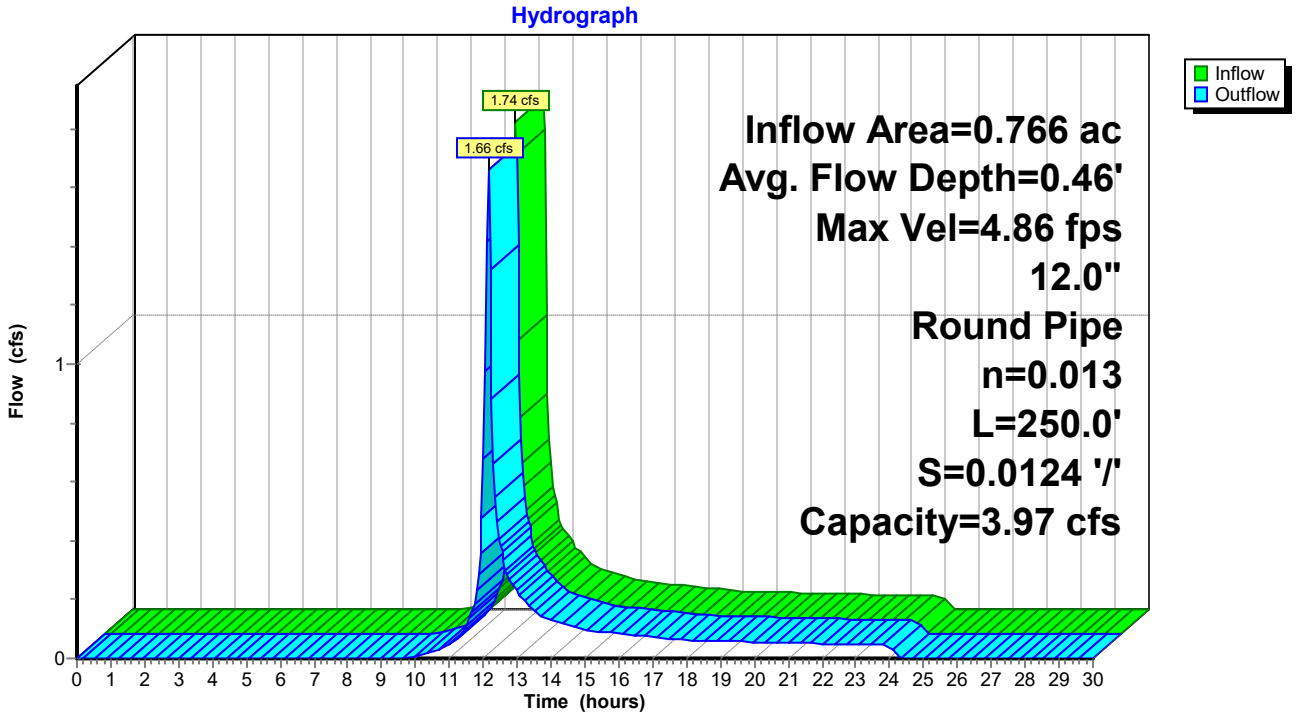
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.86 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.93 fps, Avg. Travel Time= 2.2 min

Peak Storage= 89 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.46' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.97 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 250.0' Slope= 0.0124 '/'
Inlet Invert= 466.70', Outlet Invert= 463.60'



Reach DCB23: TO DMH#111



Summary for Reach DCB24: TO DMH#113

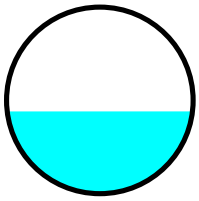
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.797 ac, 47.02% Impervious, Inflow Depth = 2.44" for 25-Year event
Inflow = 2.14 cfs @ 12.12 hrs, Volume= 0.162 af
Outflow = 2.13 cfs @ 12.12 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH113 : TO DMH#114

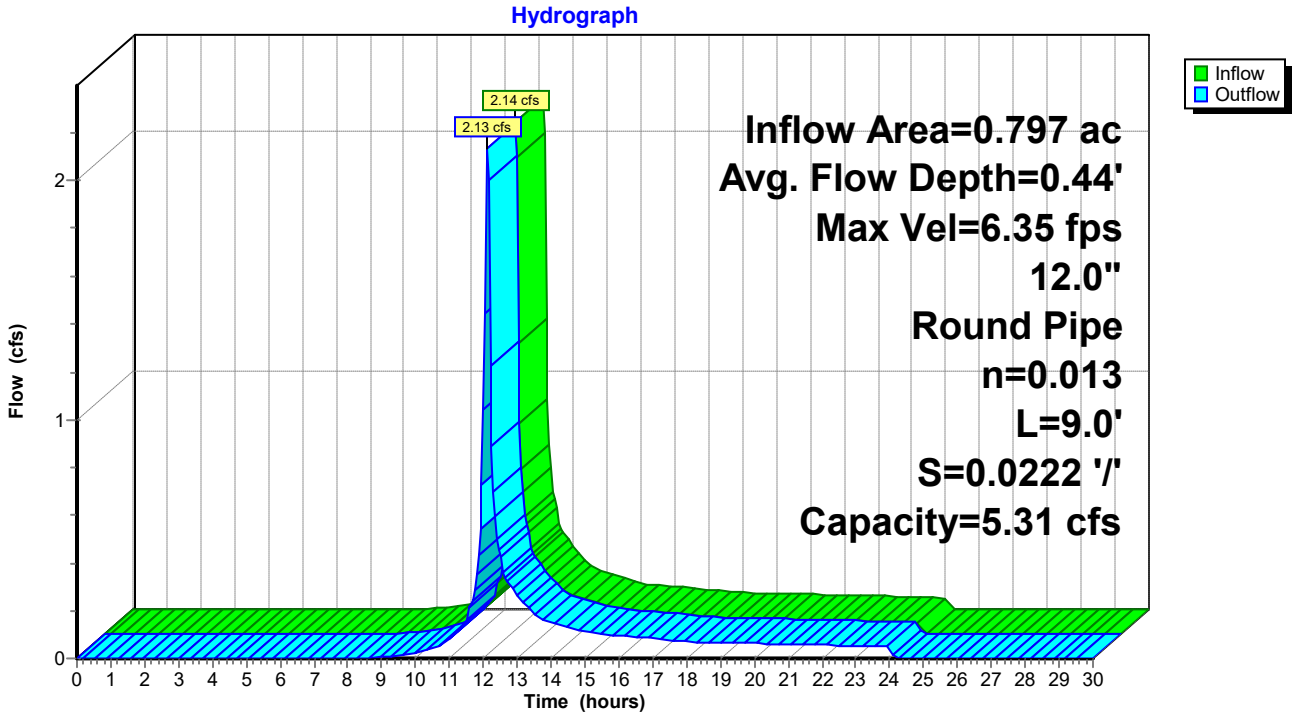
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.35 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.49 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.44' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.31 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 9.0' Slope= 0.0222 '/'
Inlet Invert= 460.50', Outlet Invert= 460.30'



Reach DCB24: TO DMH#113



Summary for Reach DCB25: TO DMH#109A

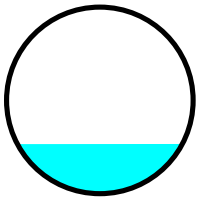
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.064 ac, 89.32% Impervious, Inflow Depth = 4.95" for 25-Year event
Inflow = 0.32 cfs @ 12.11 hrs, Volume= 0.026 af
Outflow = 0.32 cfs @ 12.12 hrs, Volume= 0.026 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH109A : TO DMH109

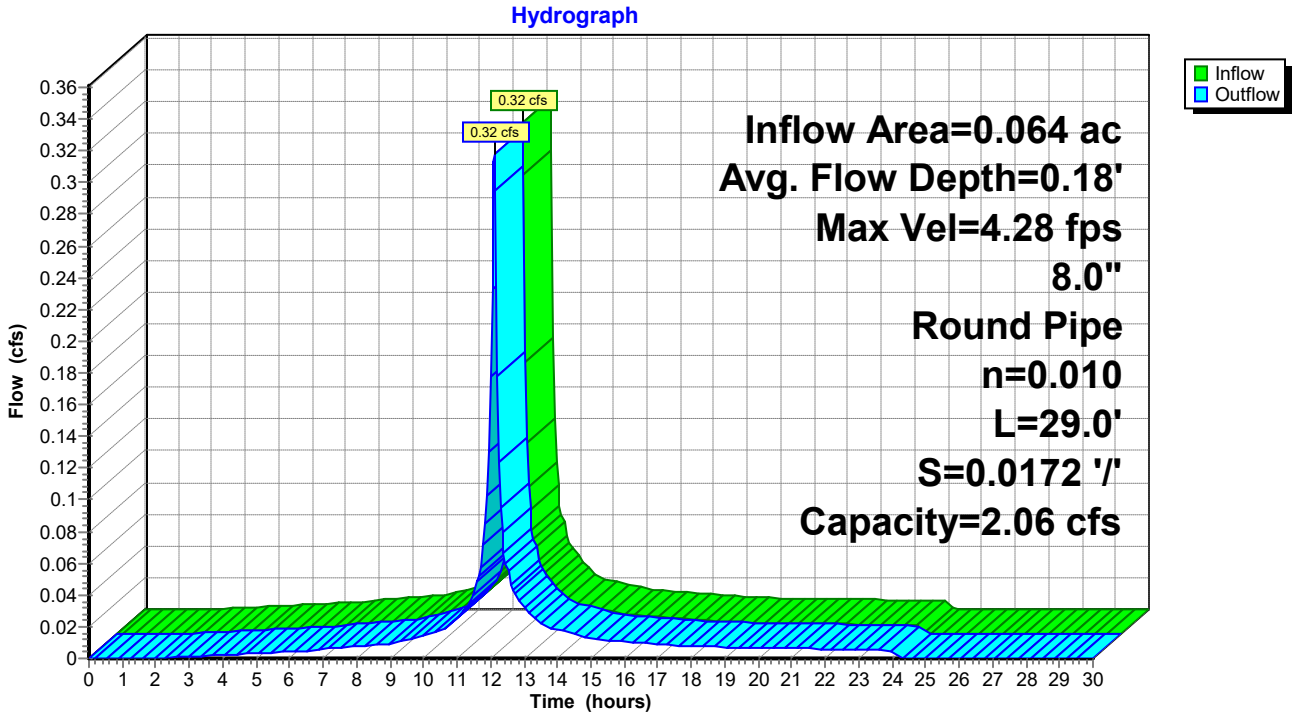
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.28 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 0.3 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 0.59'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.06 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 29.0' Slope= 0.0172 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Reach DCB25: TO DMH#109A



Summary for Reach DCB5: TO DMH#108

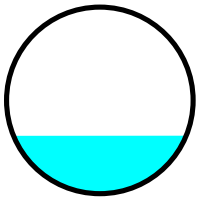
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.283 ac, 35.47% Impervious, Inflow Depth = 1.84" for 25-Year event
Inflow = 0.56 cfs @ 12.12 hrs, Volume= 0.043 af
Outflow = 0.55 cfs @ 12.12 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH108 : TO DMH#107

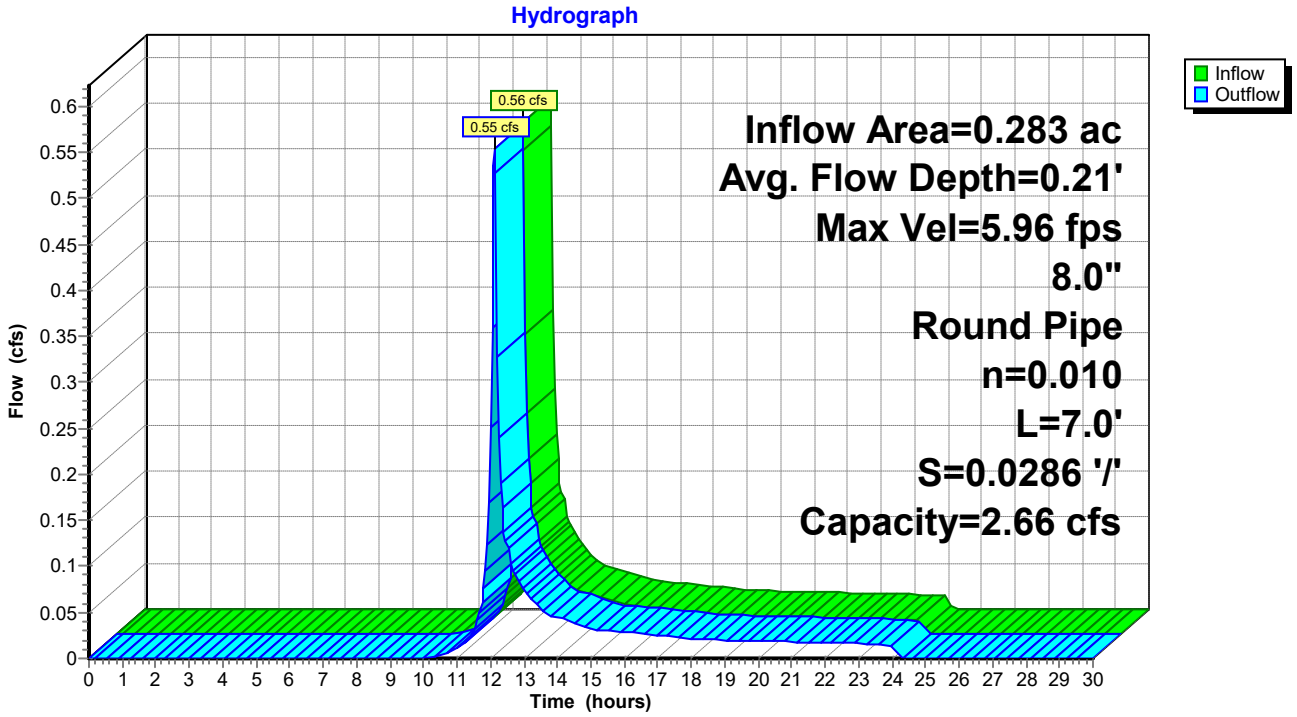
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.96 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.45 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.62'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.66 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 7.0' Slope= 0.0286 '/'
Inlet Invert= 468.20', Outlet Invert= 468.00'



Reach DCB5: TO DMH#108



Summary for Reach DCB6: TO DMH#107

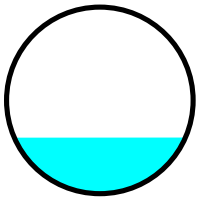
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.150 ac, 94.27% Impervious, Inflow Depth = 5.29" for 25-Year event
Inflow = 0.78 cfs @ 12.11 hrs, Volume= 0.066 af
Outflow = 0.77 cfs @ 12.11 hrs, Volume= 0.066 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH107 : TO DMH#100

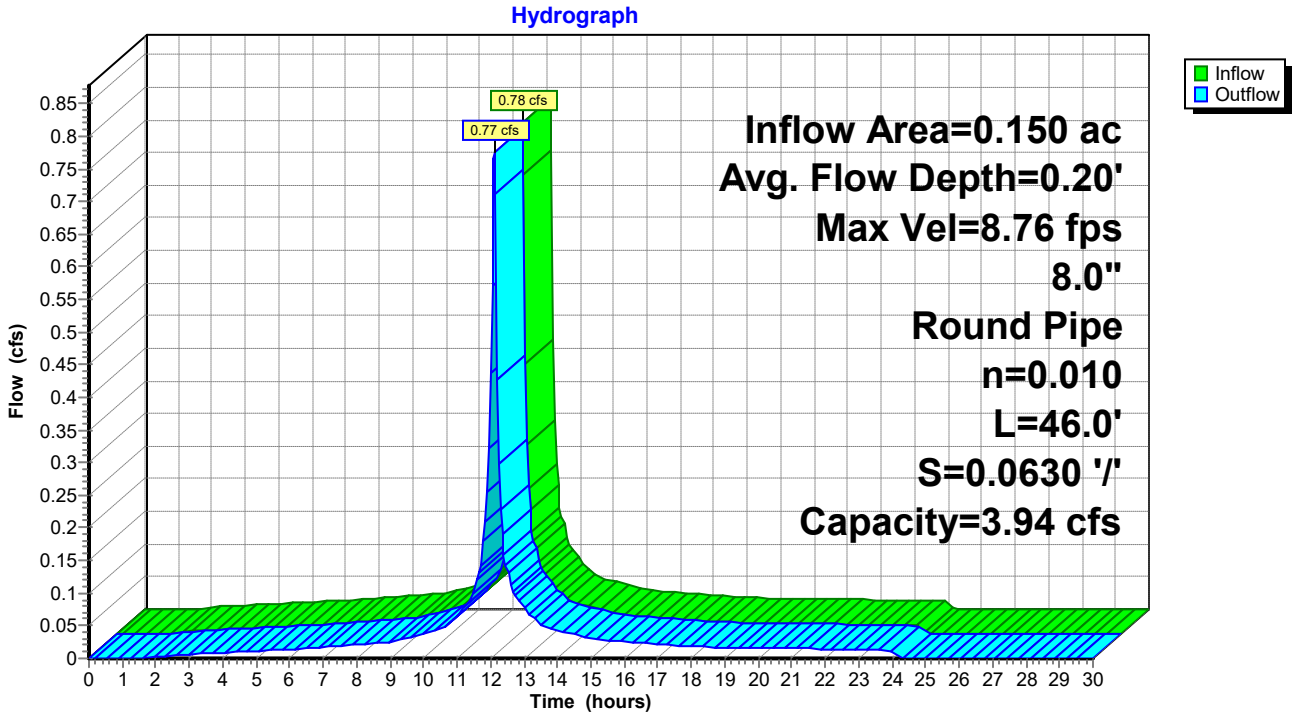
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.76 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.08 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 0.61'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.94 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 46.0' Slope= 0.0630 '/'
Inlet Invert= 469.80', Outlet Invert= 466.90'



Reach DCB6: TO DMH#107



Summary for Reach DCB7: TO DMH#102

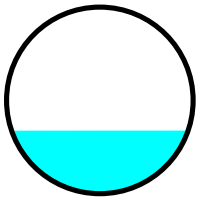
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.332 ac, 83.32% Impervious, Inflow Depth = 4.51" for 25-Year event
Inflow = 1.58 cfs @ 12.11 hrs, Volume= 0.125 af
Outflow = 1.55 cfs @ 12.12 hrs, Volume= 0.125 af, Atten= 2%, Lag= 0.3 min
Routed to Reach DMH102 : TO UGS#1A

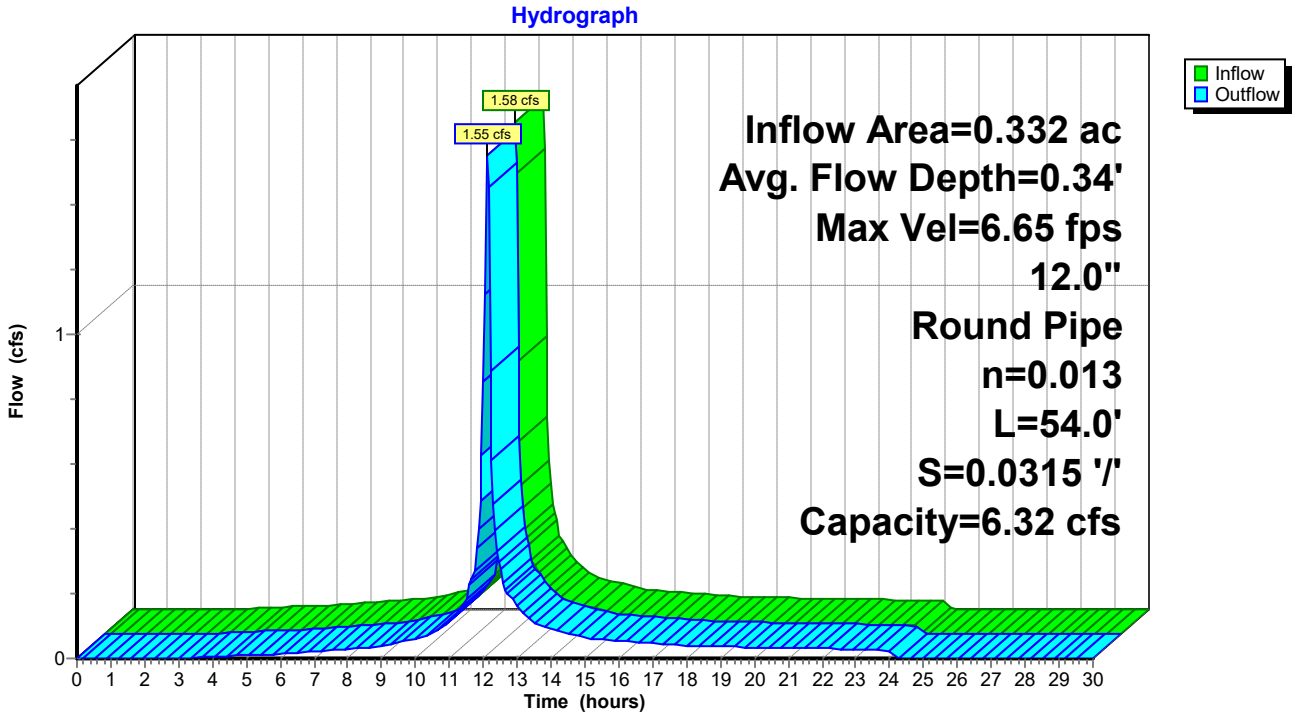
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.65 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 0.4 min

Peak Storage= 13 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 0.95'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.32 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 54.0' Slope= 0.0315 '/'
Inlet Invert= 468.40', Outlet Invert= 466.70'



Reach DCB7: TO DMH#102



Summary for Reach DCB8: TO DMH#103

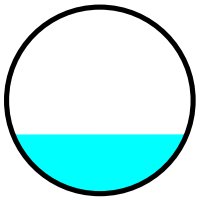
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.175 ac, 76.33% Impervious, Inflow Depth = 4.08" for 25-Year event
Inflow = 0.77 cfs @ 12.11 hrs, Volume= 0.060 af
Outflow = 0.77 cfs @ 12.11 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH104 : TO DMH#104

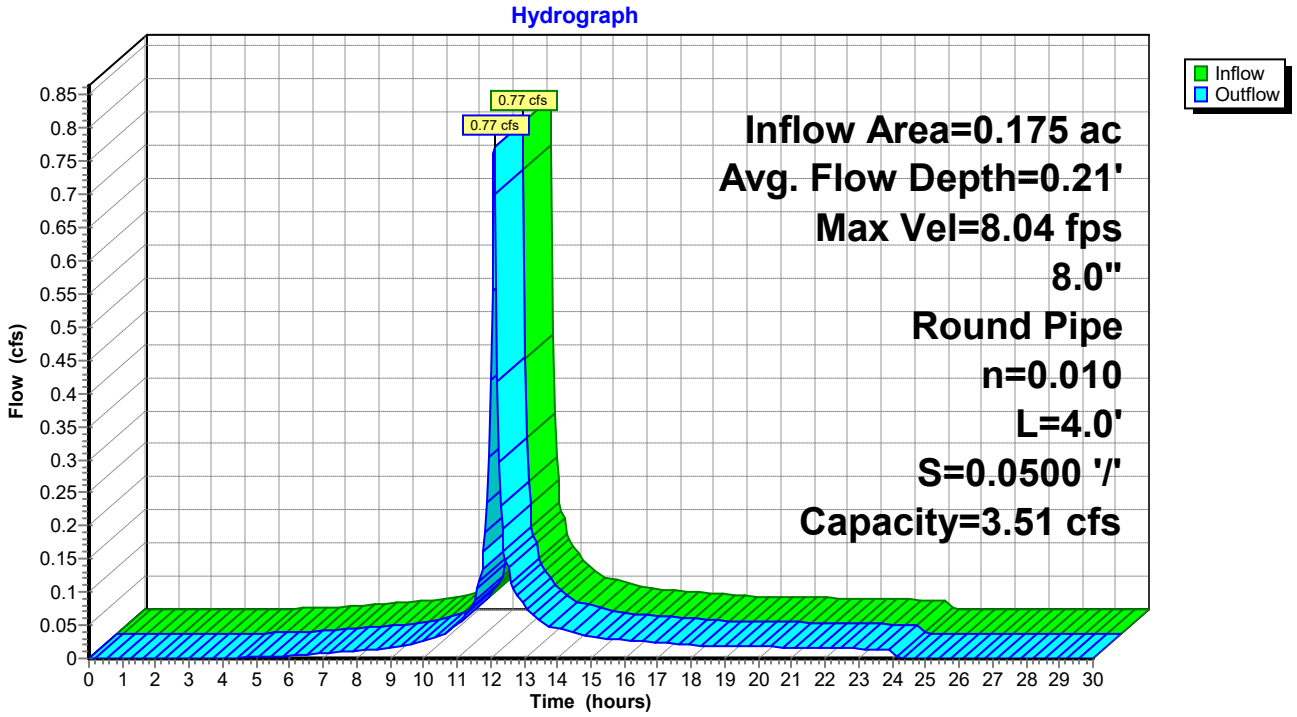
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.04 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.81 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.62'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.51 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 4.0' Slope= 0.0500 '/'
Inlet Invert= 470.00', Outlet Invert= 469.80'



Reach DCB8: TO DMH#103



Summary for Reach DCB9: TO DMH#103

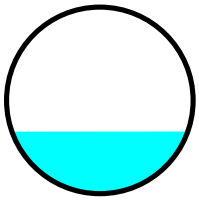
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.225 ac, 39.59% Impervious, Inflow Depth = 2.01" for 25-Year event
Inflow = 0.49 cfs @ 12.12 hrs, Volume= 0.038 af
Outflow = 0.48 cfs @ 12.12 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH104 : TO DMH#104

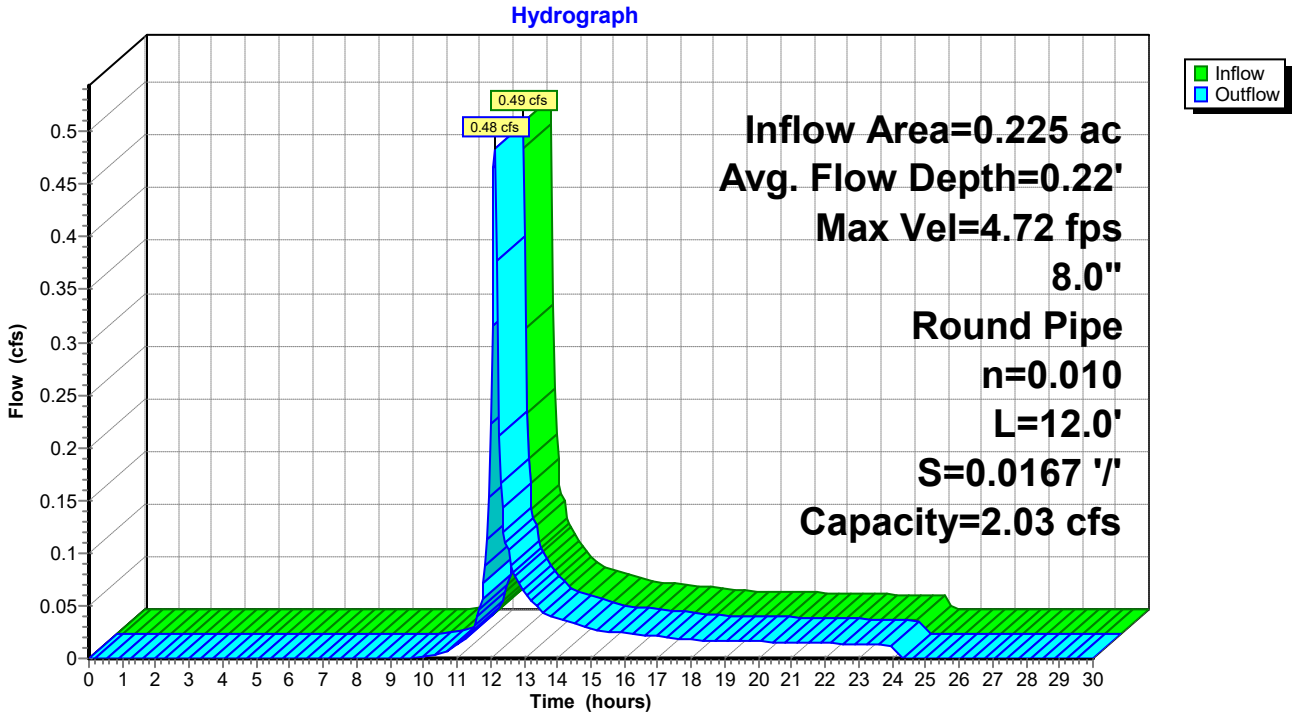
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.72 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 0.63'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.03 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 12.0' Slope= 0.0167 '/'
Inlet Invert= 470.00', Outlet Invert= 469.80'



Reach DCB9: TO DMH#103



Summary for Reach DMH-A*: TO DMH-B

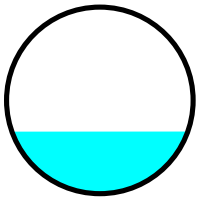
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH100 outlet invert by 0.56' @ 12.15 hrs

Inflow Area = 1.825 ac, 82.07% Impervious, Inflow Depth = 4.54" for 25-Year event
Inflow = 7.96 cfs @ 12.12 hrs, Volume= 0.690 af
Outflow = 7.86 cfs @ 12.14 hrs, Volume= 0.690 af, Atten= 1%, Lag= 0.9 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

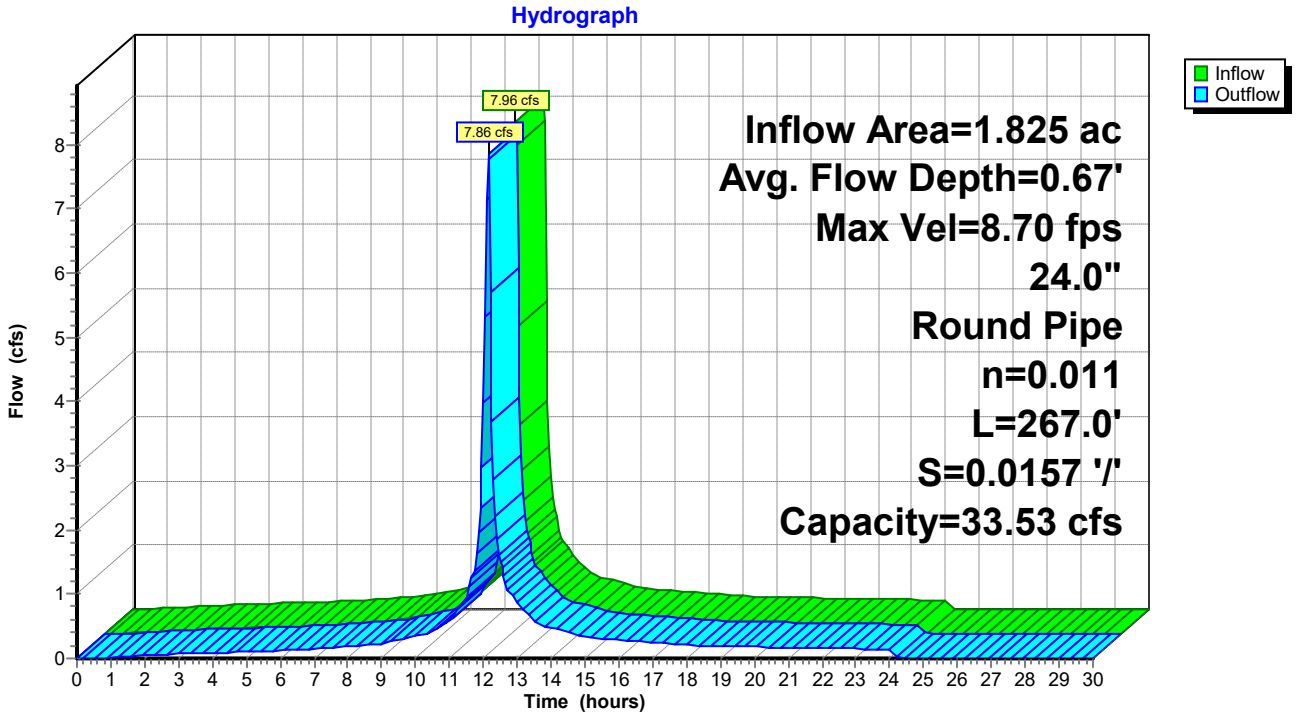
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.70 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.02 fps, Avg. Travel Time= 1.5 min

Peak Storage= 245 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.67' , Surface Width= 1.89'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 33.53 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 267.0' Slope= 0.0157 '/'
Inlet Invert= 463.70', Outlet Invert= 459.50'



Reach DMH-A*: TO DMH-B



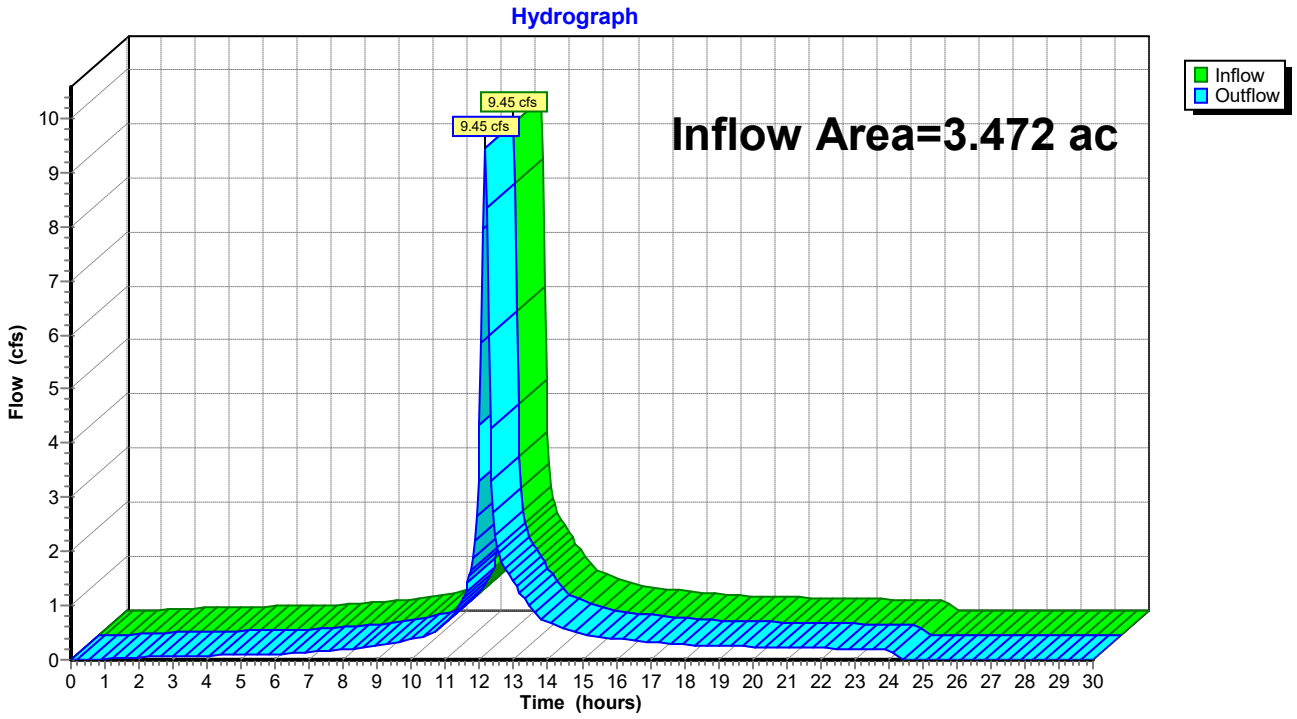
Summary for Reach DMH-C: TO DP#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.472 ac, 77.40% Impervious, Inflow Depth = 3.04" for 25-Year event
Inflow = 9.45 cfs @ 12.15 hrs, Volume= 0.879 af
Outflow = 9.45 cfs @ 12.15 hrs, Volume= 0.879 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

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

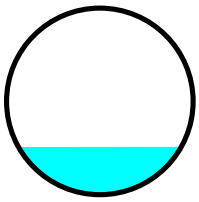
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH-E OUTLET depth by 0.01' @ 24.25 hrs
[79] Warning: Submerged Pond DMH-B Primary device # 1 OUTLET by 0.77'

Inflow Area = 3.472 ac, 77.40% Impervious, Inflow Depth = 3.04" for 25-Year event
Inflow = 9.57 cfs @ 12.15 hrs, Volume= 0.879 af
Outflow = 9.45 cfs @ 12.15 hrs, Volume= 0.879 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH-C : TO DP#1

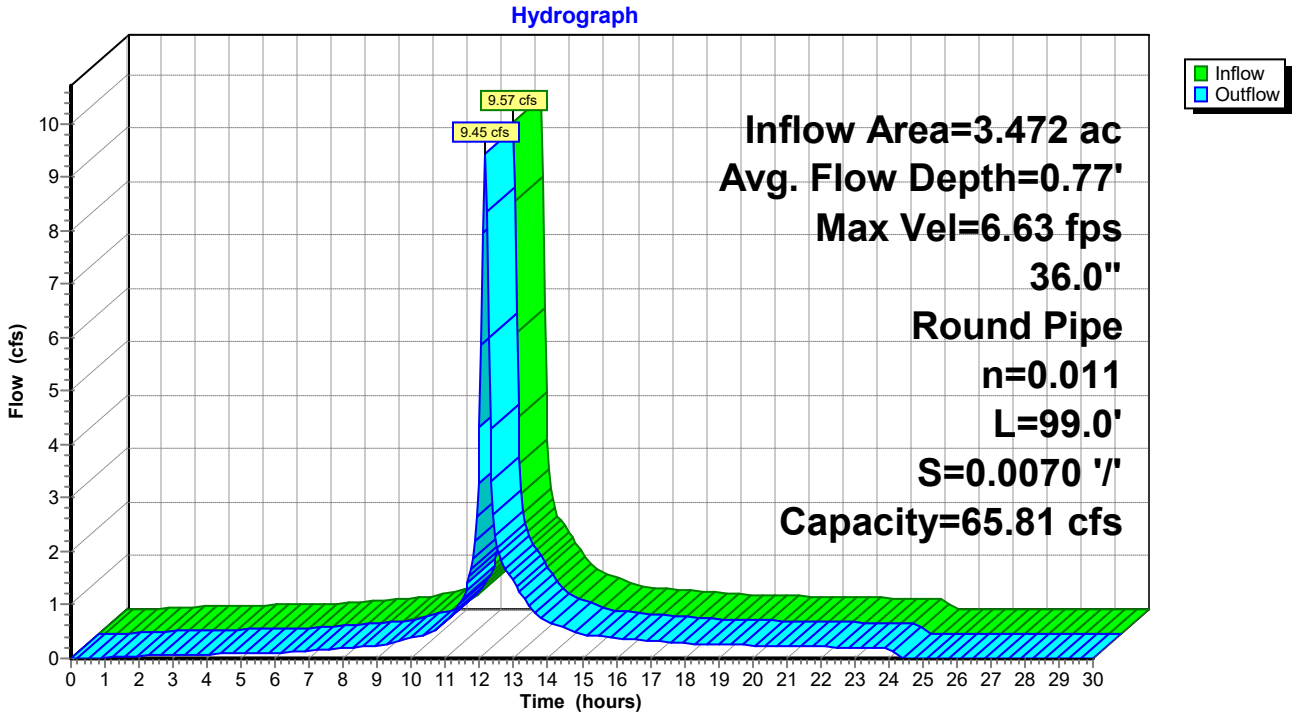
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.63 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 0.7 min

Peak Storage= 143 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.77' , Surface Width= 2.62'
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

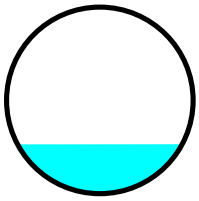
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach CMH3 OUTLET depth by 0.08' @ 12.20 hrs

Inflow Area = 3.330 ac, 76.67% Impervious, Inflow Depth = 2.94" for 25-Year event
Inflow = 9.07 cfs @ 12.14 hrs, Volume= 0.816 af
Outflow = 8.91 cfs @ 12.15 hrs, Volume= 0.816 af, Atten= 2%, Lag= 0.5 min
Routed to Reach DMH-D : TO DMH-C

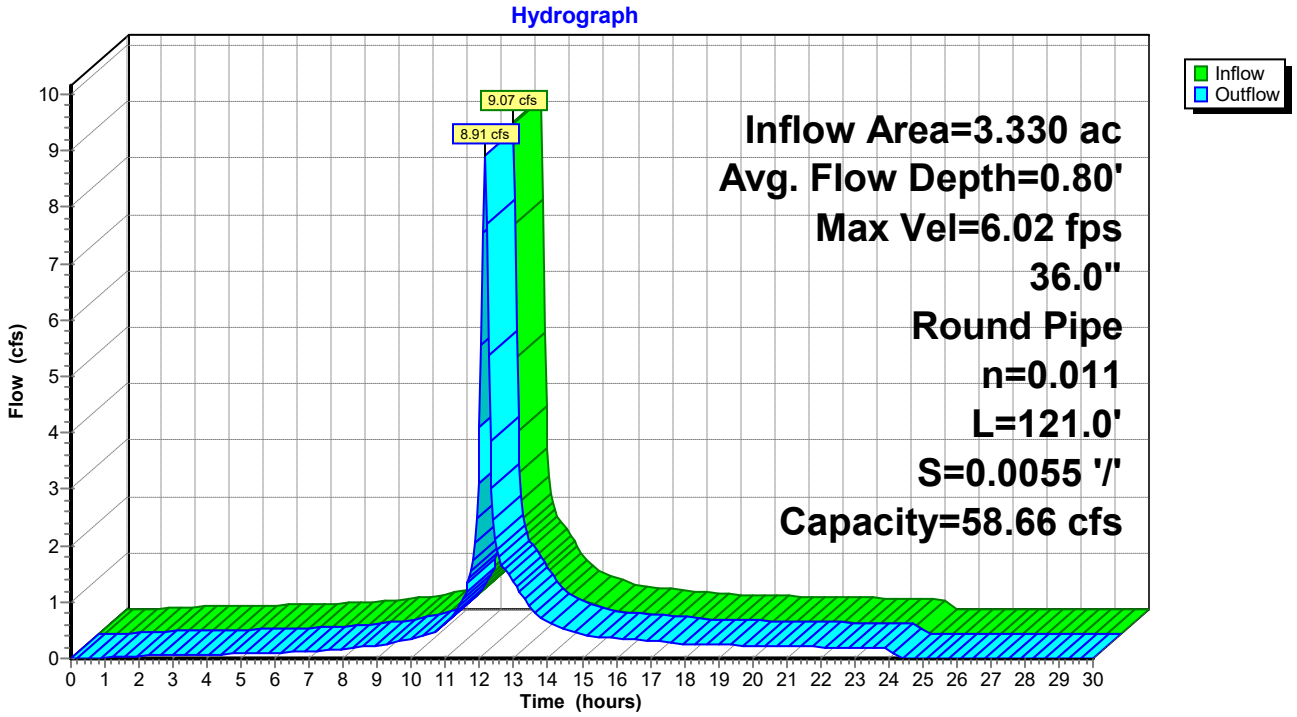
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.02 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.04 fps, Avg. Travel Time= 1.0 min

Peak Storage= 182 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.80' , Surface Width= 2.65'
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

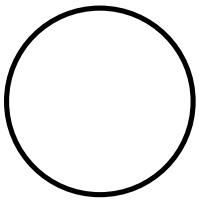


Summary for Reach DMH-F: TO DMH-E

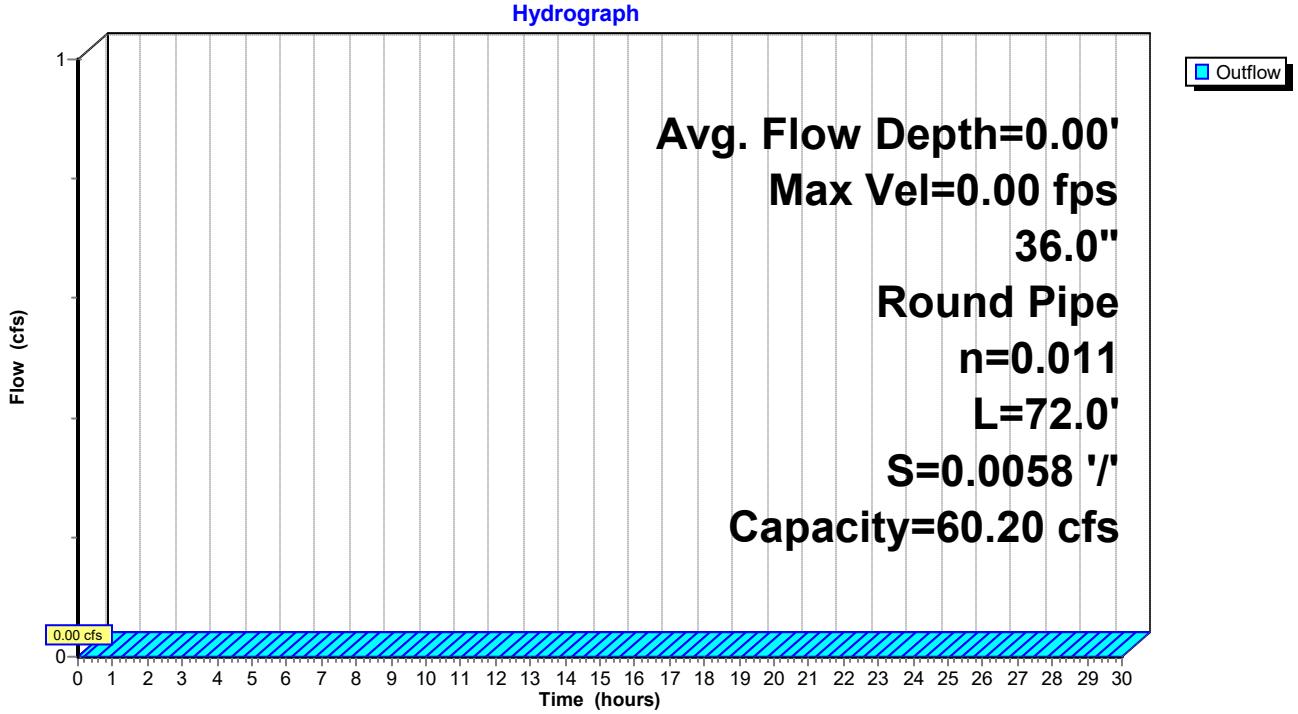
[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.20 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 72.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 457.71'



Reach DMH-F: TO DMH-E



Summary for Reach DMH100: TO DMH-A

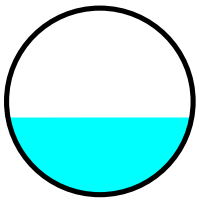
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH101 outlet invert by 0.51' @ 12.10 hrs
[62] Hint: Exceeded Reach DMH107 OUTLET depth by 0.07' @ 12.10 hrs

Inflow Area = 1.400 ac, 85.41% Impervious, Inflow Depth = 4.77" for 25-Year event
Inflow = 6.31 cfs @ 12.12 hrs, Volume= 0.556 af
Outflow = 6.23 cfs @ 12.12 hrs, Volume= 0.556 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH-A* : TO DMH-B

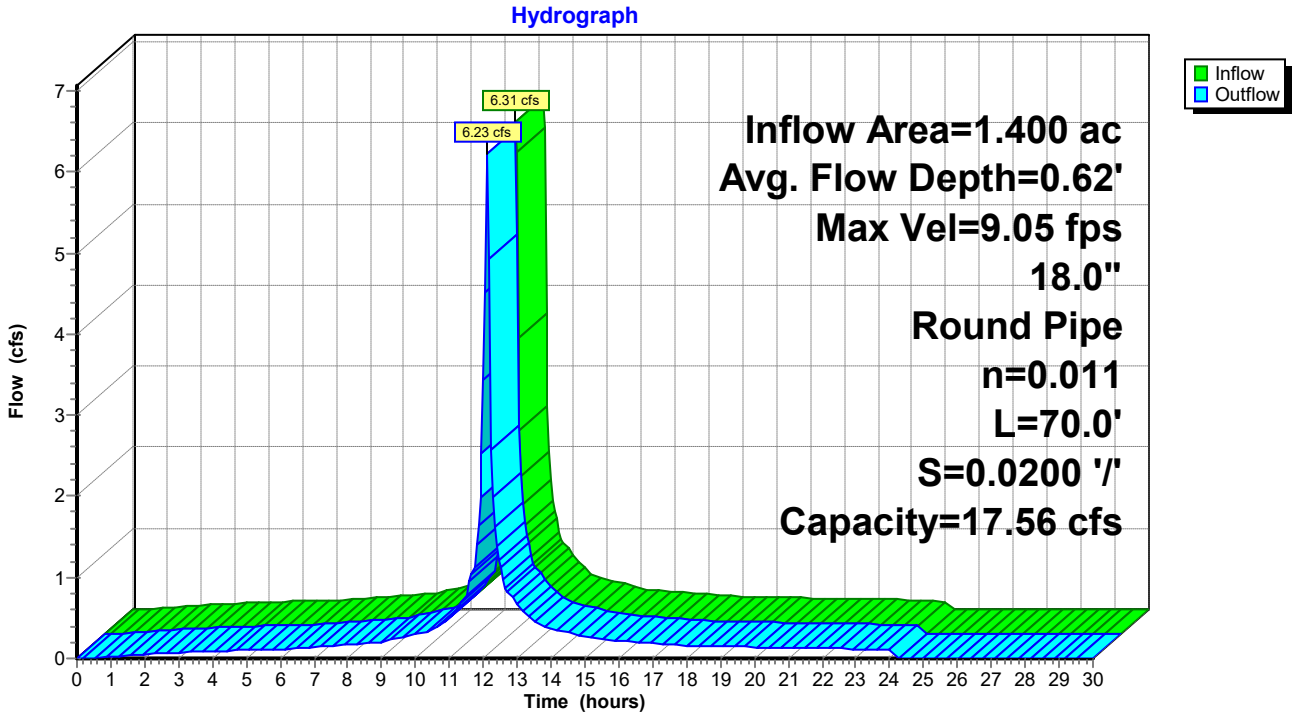
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.05 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.24 fps, Avg. Travel Time= 0.4 min

Peak Storage= 48 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.62' , Surface Width= 1.48'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 17.56 cfs

18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 70.0' Slope= 0.0200 '/'
Inlet Invert= 465.20', Outlet Invert= 463.80'



Reach DMH100: TO DMH-A



Summary for Reach DMH101: TO DMH#100

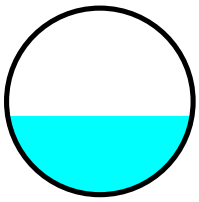
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach RF1 outlet invert by 0.22' @ 12.10 hrs
[61] Hint: Exceeded Reach RF2 outlet invert by 0.22' @ 12.10 hrs

Inflow Area = 0.759 ac,100.00% Impervious, Inflow Depth = 5.64" for 25-Year event
Inflow = 4.01 cfs @ 12.11 hrs, Volume= 0.357 af
Outflow = 4.01 cfs @ 12.11 hrs, Volume= 0.357 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH100 : TO DMH-A

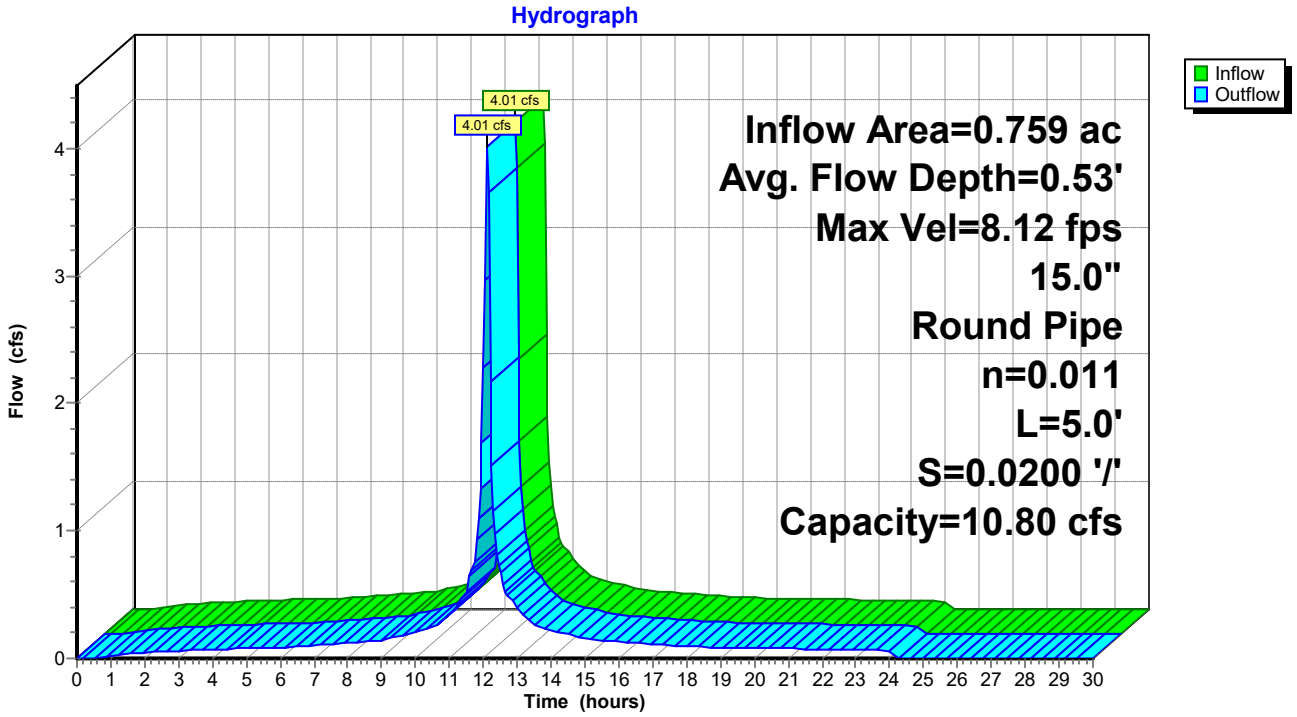
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.12 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.95 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 1.23'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 10.80 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 465.40', Outlet Invert= 465.30'



Reach DMH101: TO DMH#100



Summary for Reach DMH102: TO UGS#1A

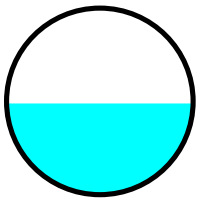
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB15 outlet invert by 0.41' @ 12.10 hrs
[61] Hint: Exceeded Reach DCB7 outlet invert by 0.01' @ 12.10 hrs

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 4.41" for 25-Year event
Inflow = 4.41 cfs @ 12.12 hrs, Volume= 0.358 af
Outflow = 4.41 cfs @ 12.12 hrs, Volume= 0.358 af, Atten= 0%, Lag= 0.0 min
Routed to Reach UGS1A : TO UGS#1

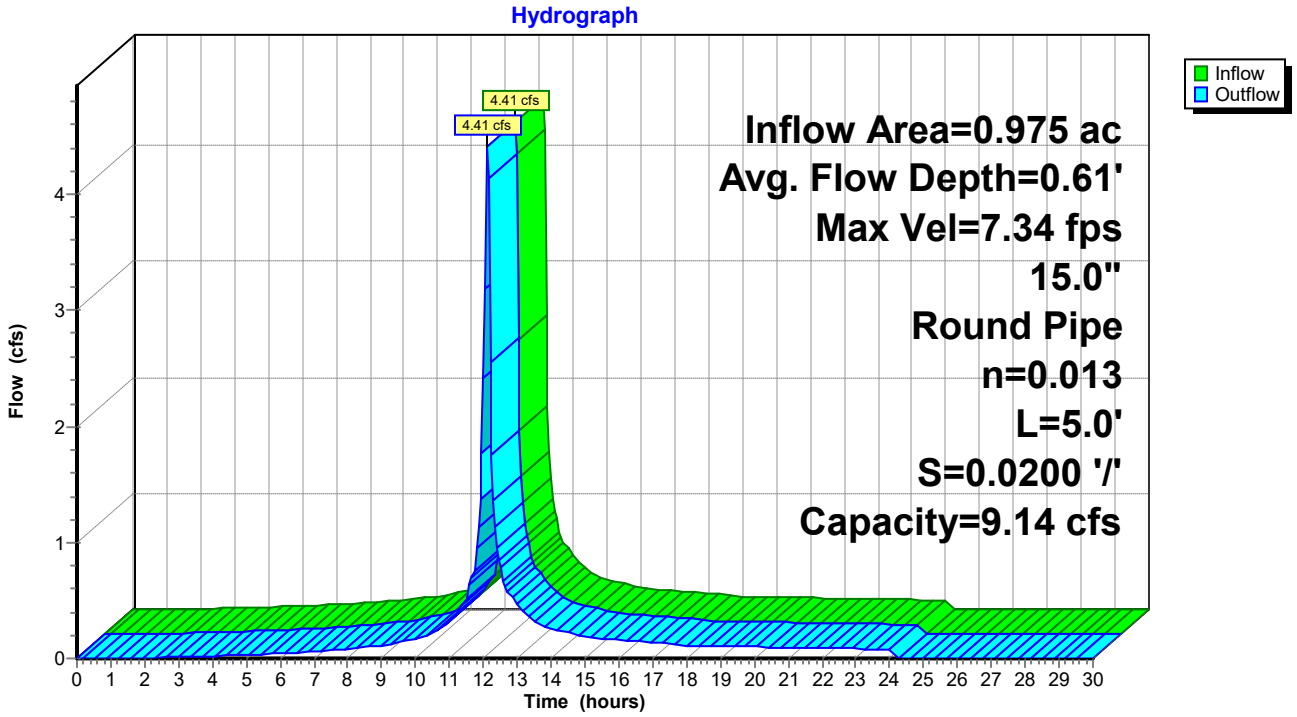
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.34 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.53 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.61' , Surface Width= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.14 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 466.10', Outlet Invert= 466.00'



Reach DMH102: TO UGS#1A



Summary for Reach DMH103: TO CMH#2

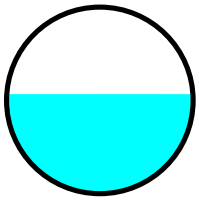
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH104 OUTLET depth by 0.30' @ 12.15 hrs

Inflow Area = 3.013 ac, 76.57% Impervious, Inflow Depth = 2.81" for 25-Year event
Inflow = 8.00 cfs @ 12.12 hrs, Volume= 0.707 af
Outflow = 7.98 cfs @ 12.13 hrs, Volume= 0.707 af, Atten= 0%, Lag= 0.6 min
Routed to Reach CMH3 : TO DMH-E

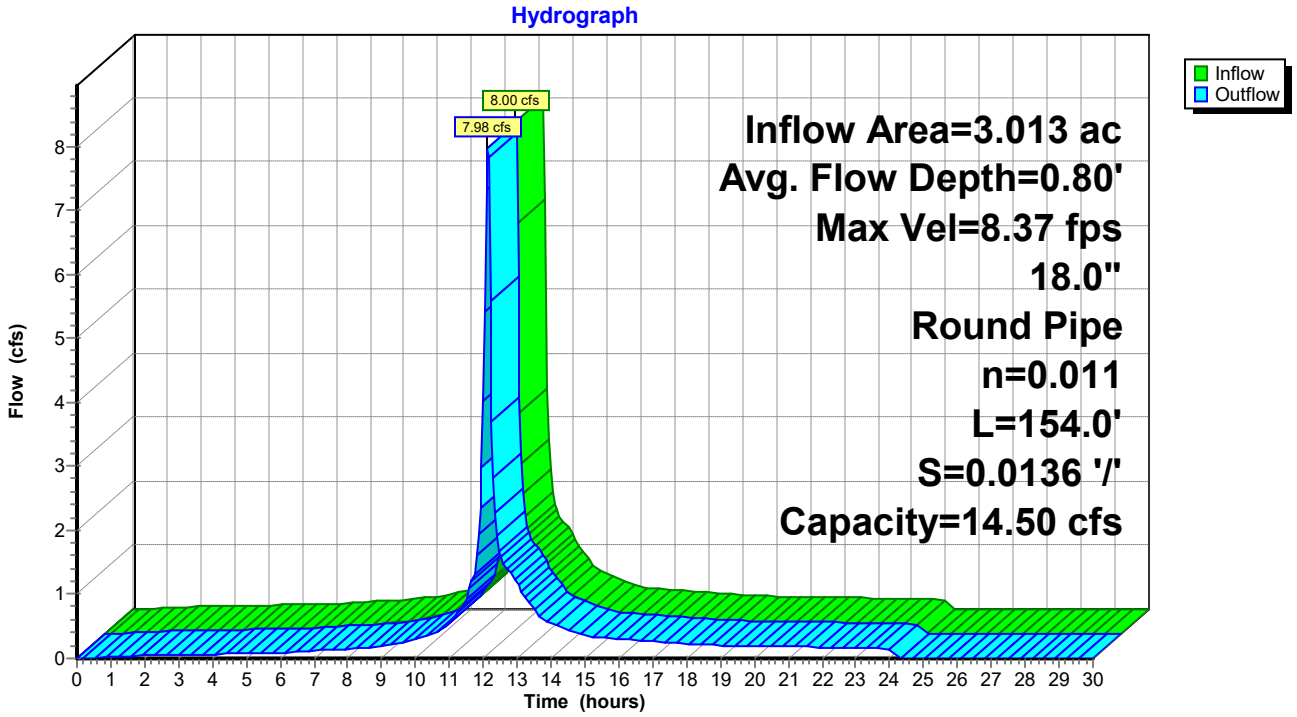
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.37 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.95 fps, Avg. Travel Time= 0.9 min

Peak Storage= 148 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.80' , Surface Width= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.50 cfs

18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 154.0' Slope= 0.0136 '/'
Inlet Invert= 464.10', Outlet Invert= 462.00'



Reach DMH103: TO CMH#2



Summary for Reach DMH104: TO DMH#104

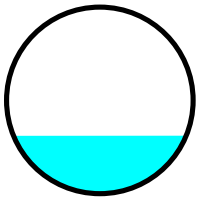
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH105 OUTLET depth by 0.09' @ 12.15 hrs

Inflow Area = 1.535 ac, 70.86% Impervious, Inflow Depth = 1.18" for 25-Year event
Inflow = 1.60 cfs @ 12.13 hrs, Volume= 0.151 af
Outflow = 1.58 cfs @ 12.14 hrs, Volume= 0.151 af, Atten= 1%, Lag= 0.8 min
Routed to Reach DMH103 : TO CMH#2

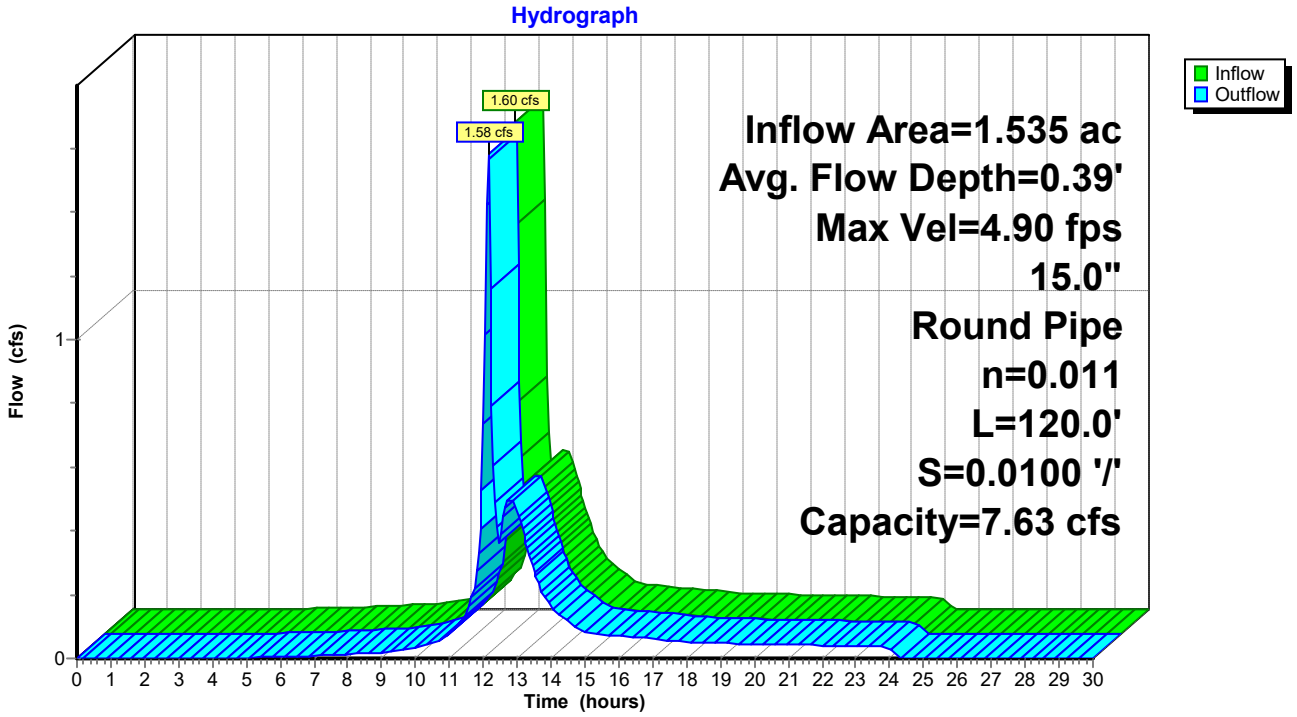
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.90 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 1.2 min

Peak Storage= 39 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 1.16'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.63 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 120.0' Slope= 0.0100 '/'
Inlet Invert= 465.40', Outlet Invert= 464.20'



Reach DMH104: TO DMH#104



Summary for Reach DMH105: TO DMH#104

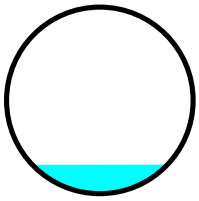
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach UGS1B OUTLET depth by 0.09' @ 12.15 hrs

Inflow Area = 1.135 ac, 76.23% Impervious, Inflow Depth = 0.57" for 25-Year event
Inflow = 0.40 cfs @ 12.13 hrs, Volume= 0.054 af
Outflow = 0.38 cfs @ 12.15 hrs, Volume= 0.054 af, Atten= 5%, Lag= 1.4 min
Routed to Reach DMH104 : TO DMH#104

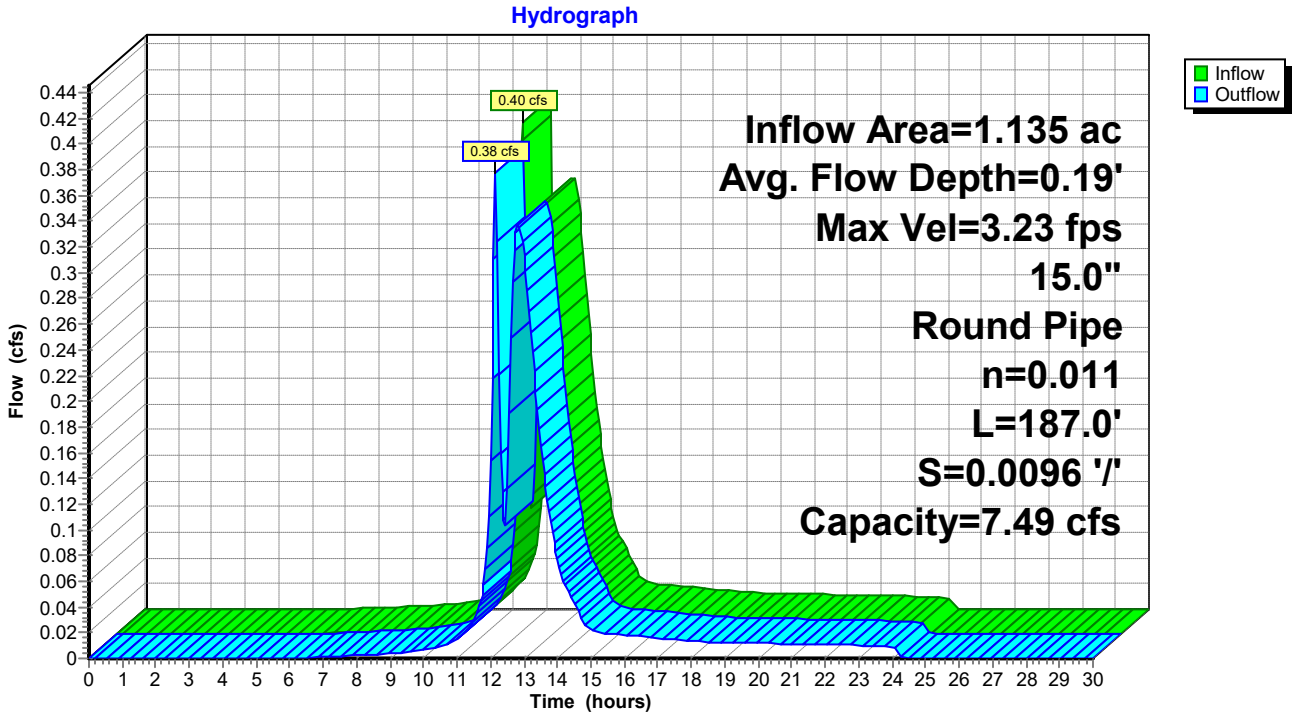
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 2.5 min

Peak Storage= 23 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 0.91'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.49 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 187.0' Slope= 0.0096 '/'
Inlet Invert= 467.30', Outlet Invert= 465.50'



Reach DMH105: TO DMH#104



Summary for Reach DMH106: TO DMH#105

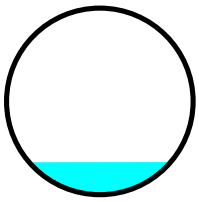
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB10 outlet invert by 0.07' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB11 outlet invert by 0.07' @ 12.15 hrs

Inflow Area = 0.160 ac, 44.63% Impervious, Inflow Depth = 2.36" for 25-Year event
Inflow = 0.40 cfs @ 12.12 hrs, Volume= 0.031 af
Outflow = 0.40 cfs @ 12.13 hrs, Volume= 0.031 af, Atten= 1%, Lag= 0.5 min
Routed to Reach DMH105 : TO DMH#104

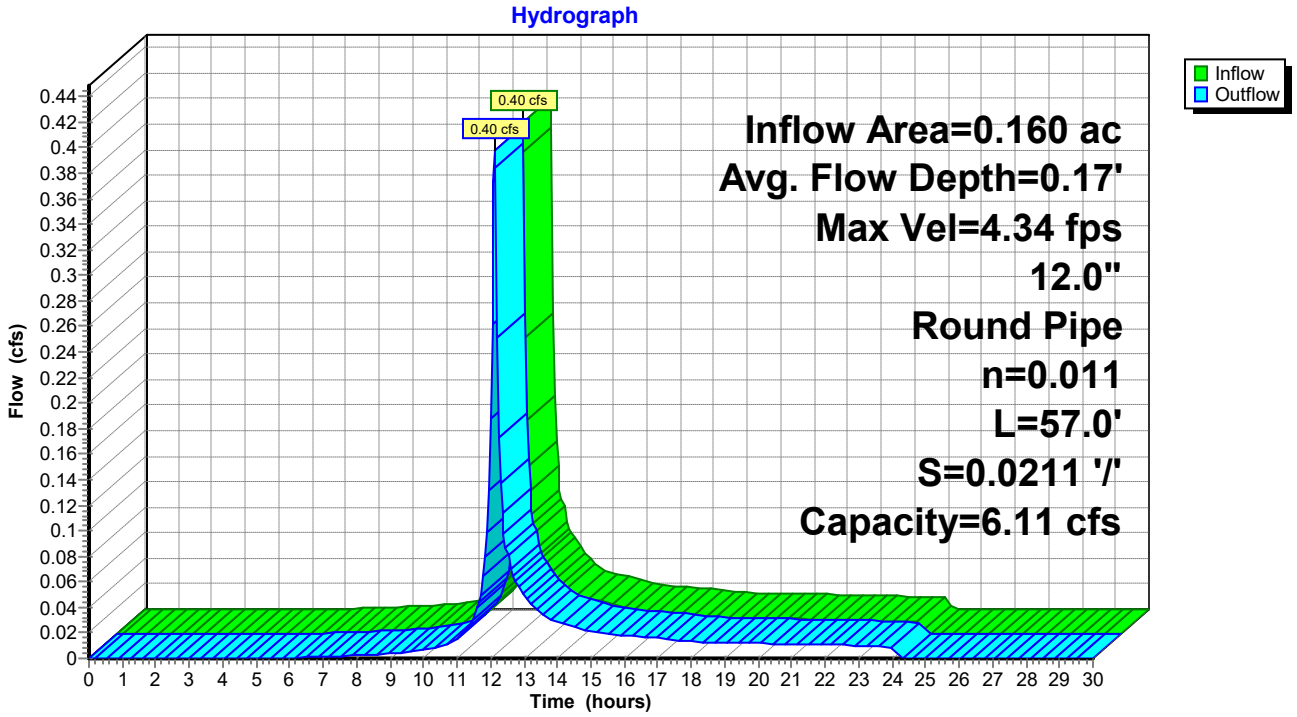
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 0.6 min

Peak Storage= 5 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 0.76'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.11 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 57.0' Slope= 0.0211 '/'
Inlet Invert= 470.00', Outlet Invert= 468.80'



Reach DMH106: TO DMH#105



Summary for Reach DMH107: TO DMH#100

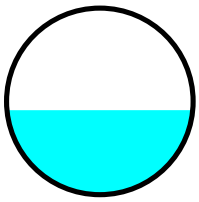
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DCB6 OUTLET depth by 0.05' @ 12.15 hrs
[61] Hint: Exceeded Reach DMH108 outlet invert by 0.24' @ 12.15 hrs

Inflow Area = 0.641 ac, 68.12% Impervious, Inflow Depth = 3.73" for 25-Year event
Inflow = 2.36 cfs @ 12.12 hrs, Volume= 0.199 af
Outflow = 2.36 cfs @ 12.13 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.4 min
Routed to Reach DMH100 : TO DMH-A

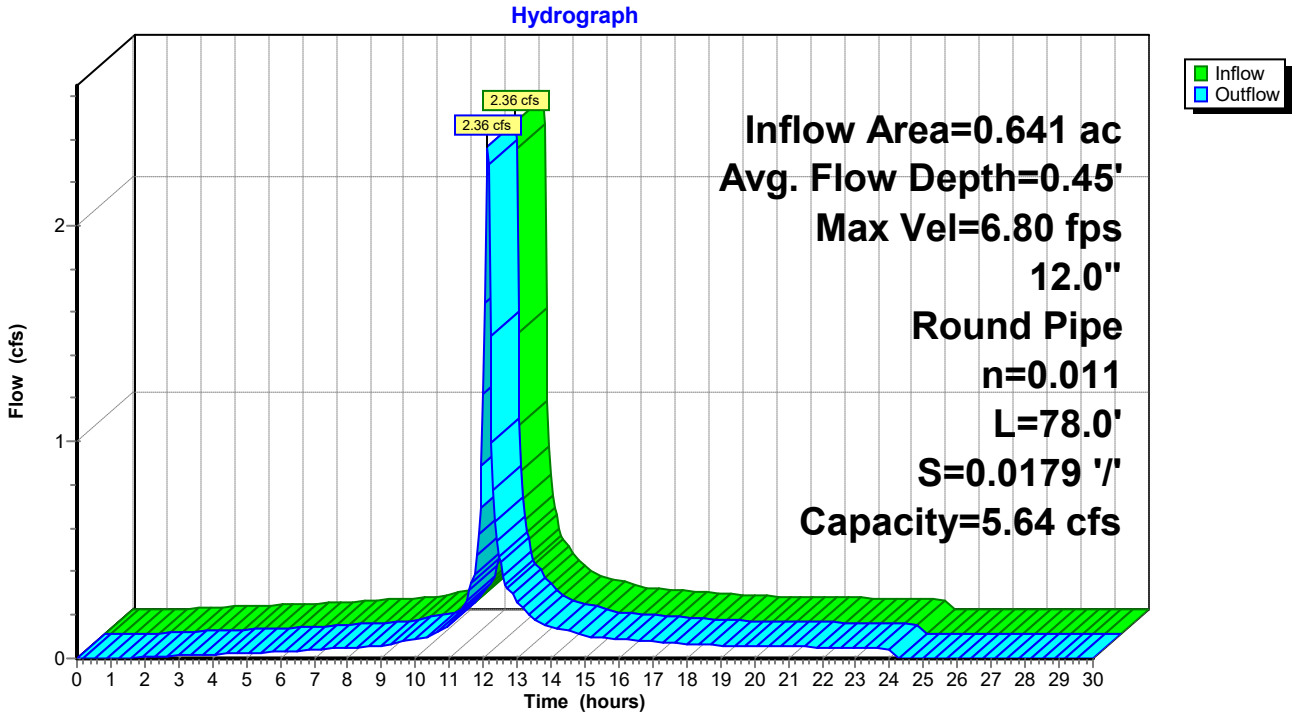
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.80 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 0.5 min

Peak Storage= 27 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.64 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 78.0' Slope= 0.0179 '/'
Inlet Invert= 466.70', Outlet Invert= 465.30'



Reach DMH107: TO DMH#100



Summary for Reach DMH108: TO DMH#107

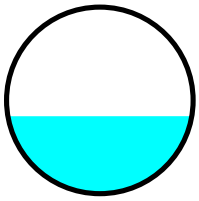
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB12 outlet invert by 0.31' @ 12.10 hrs

Inflow Area = 0.491 ac, 60.11% Impervious, Inflow Depth = 3.26" for 25-Year event
Inflow = 1.61 cfs @ 12.12 hrs, Volume= 0.133 af
Outflow = 1.59 cfs @ 12.12 hrs, Volume= 0.133 af, Atten= 2%, Lag= 0.4 min
Routed to Reach DMH107 : TO DMH#100

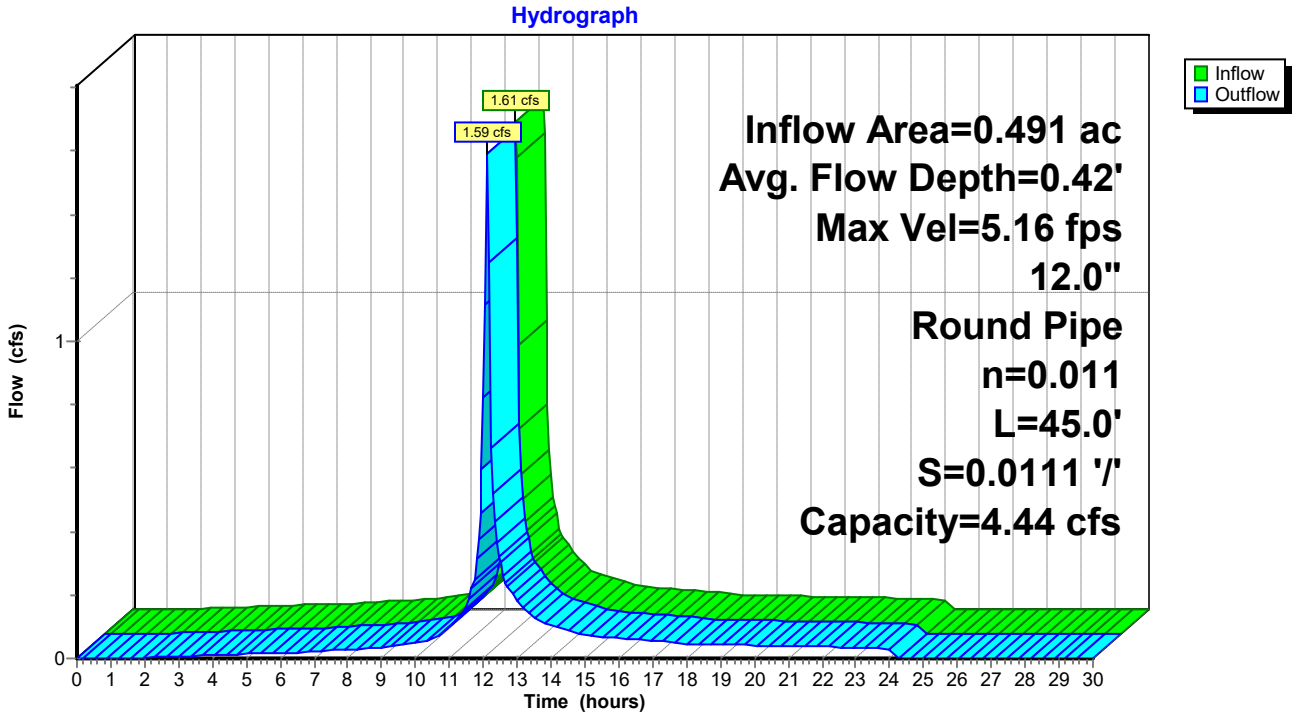
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.16 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 0.4 min

Peak Storage= 14 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0111 '/'
Inlet Invert= 467.40', Outlet Invert= 466.90'



Reach DMH108: TO DMH#107



Summary for Reach DMH109: TO DMH#110

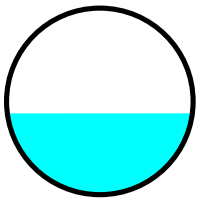
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DCB14 OUTLET depth by 0.03' @ 12.10 hrs
[61] Hint: Exceeded Reach DCB20 outlet invert by 0.23' @ 12.10 hrs
[61] Hint: Exceeded Reach DMH109A outlet invert by 0.23' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 4.59" for 25-Year event
Inflow = 2.82 cfs @ 12.12 hrs, Volume= 0.229 af
Outflow = 2.81 cfs @ 12.12 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH110 : TO UGS#2A

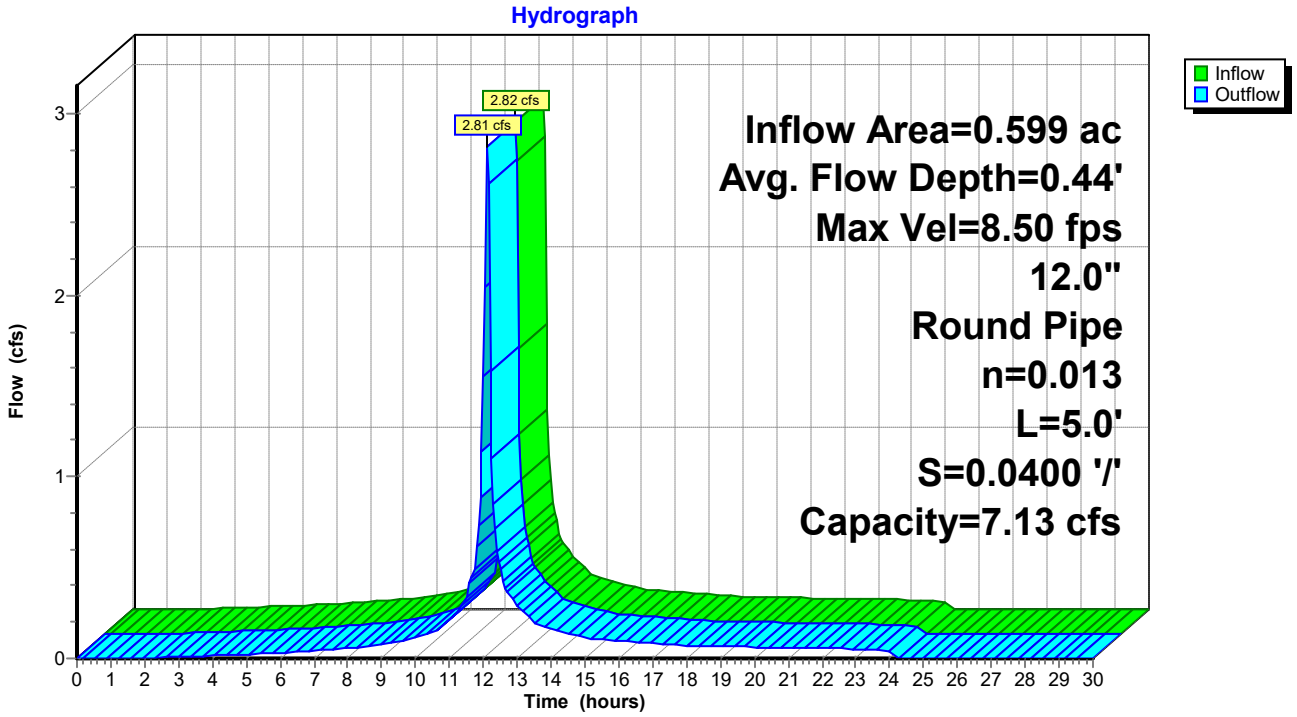
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.50 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.92 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.44' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 466.20', Outlet Invert= 466.00'



Reach DMH109: TO DMH#110



Summary for Reach DMH109A: TO DMH109

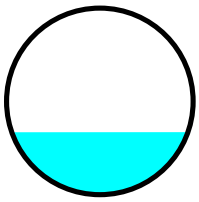
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB21 outlet invert by 0.23' @ 12.10 hrs
[62] Hint: Exceeded Reach DCB25 OUTLET depth by 0.06' @ 12.10 hrs

Inflow Area = 0.239 ac, 75.90% Impervious, Inflow Depth = 4.09" for 25-Year event
Inflow = 1.04 cfs @ 12.12 hrs, Volume= 0.081 af
Outflow = 1.02 cfs @ 12.12 hrs, Volume= 0.081 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH109 : TO DMH#110

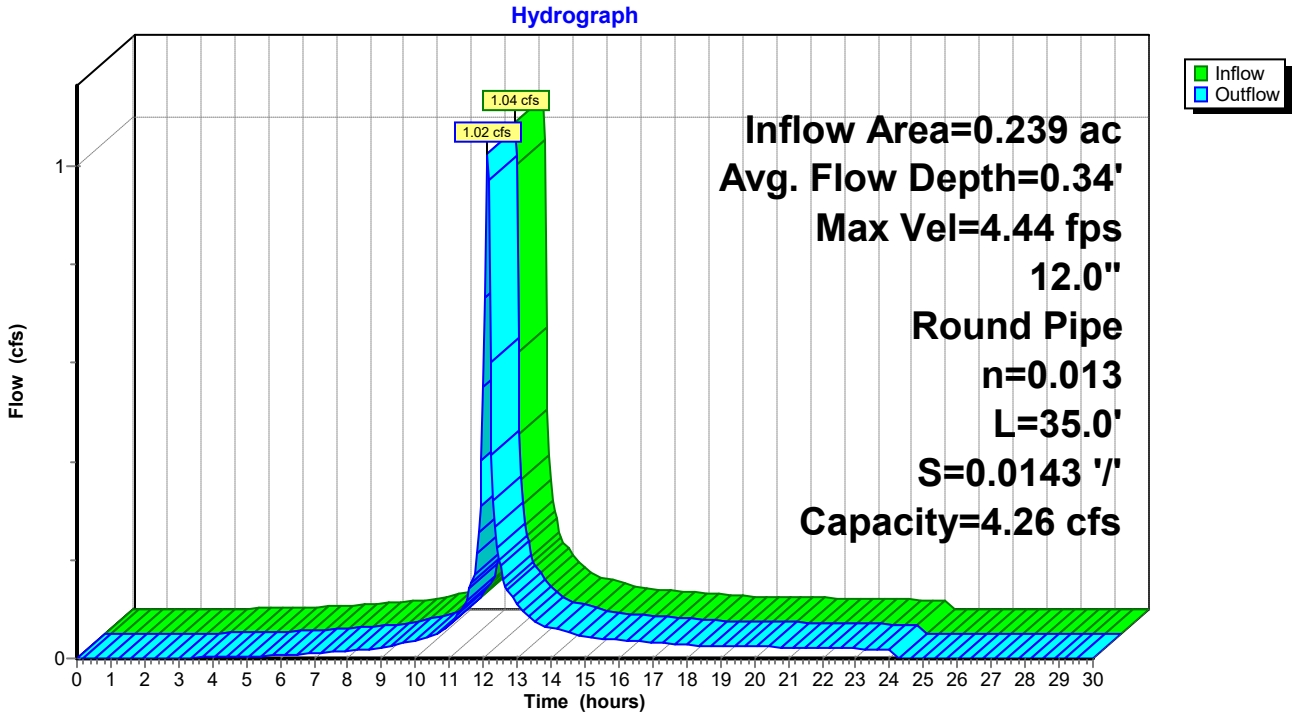
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.44 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 0.4 min

Peak Storage= 8 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 0.94'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0143 '/'
Inlet Invert= 466.90', Outlet Invert= 466.40'



Reach DMH109A: TO DMH109



Summary for Reach DMH110: TO UGS#2A

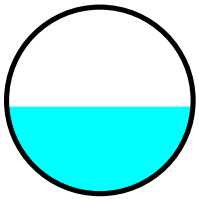
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH109 outlet invert by 0.21' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 4.59" for 25-Year event
Inflow = 2.81 cfs @ 12.12 hrs, Volume= 0.229 af
Outflow = 2.80 cfs @ 12.12 hrs, Volume= 0.229 af, Atten= 1%, Lag= 0.1 min
Routed to Reach UGS2A : TO UGS#2

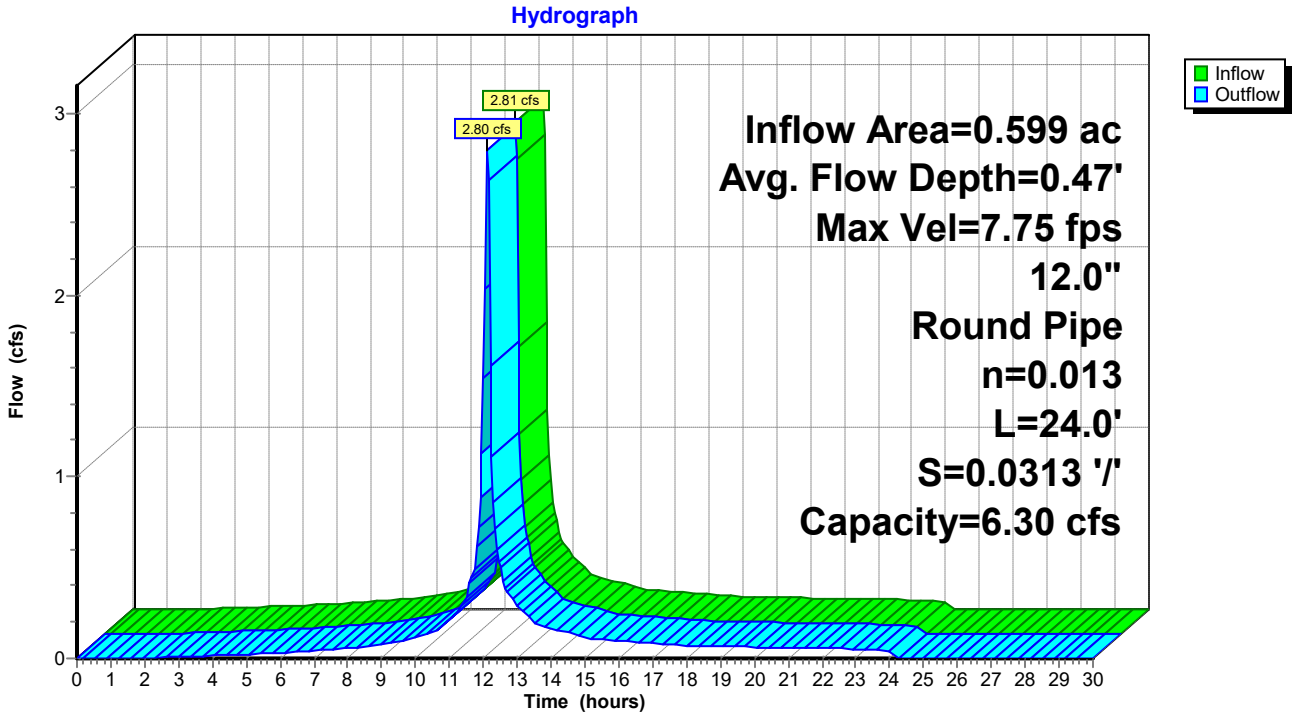
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.75 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.68 fps, Avg. Travel Time= 0.1 min

Peak Storage= 9 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.47' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.30 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0313 '/'
Inlet Invert= 465.75', Outlet Invert= 465.00'



Reach DMH110: TO UGS#2A



Summary for Reach DMH111: TO DMH#112

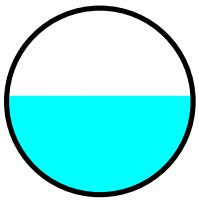
[52] Hint: Inlet/Outlet conditions not evaluated
[63] Warning: Exceeded Reach DCB19 INLET depth by 0.02' @ 12.15 hrs
[62] Hint: Exceeded Reach DCB22 OUTLET depth by 0.23' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB23 outlet invert by 0.43' @ 12.15 hrs

Inflow Area = 1.171 ac, 46.54% Impervious, Inflow Depth = 2.43" for 25-Year event
Inflow = 2.96 cfs @ 12.13 hrs, Volume= 0.237 af
Outflow = 2.95 cfs @ 12.14 hrs, Volume= 0.237 af, Atten= 0%, Lag= 0.3 min
Routed to Reach DMH112 : TO DMH#113

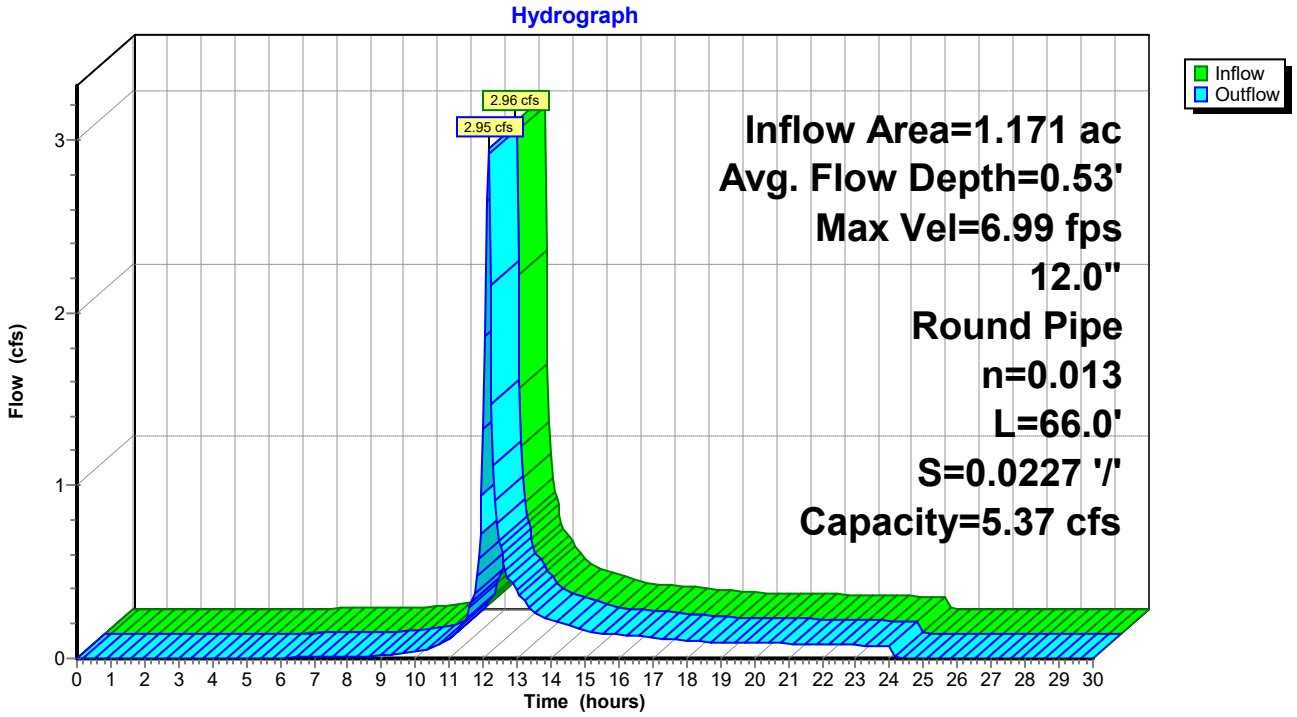
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.99 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.39 fps, Avg. Travel Time= 0.5 min

Peak Storage= 28 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.37 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 66.0' Slope= 0.0227 '/'
Inlet Invert= 463.50', Outlet Invert= 462.00'



Reach DMH111: TO DMH#112



Summary for Reach DMH112: TO DMH#113

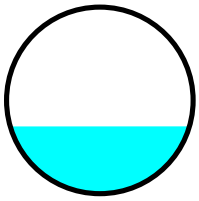
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach UGS2B OUTLET depth by 0.30' @ 12.15 hrs

Inflow Area = 1.770 ac, 59.09% Impervious, Inflow Depth > 3.15" for 25-Year event
Inflow = 3.12 cfs @ 12.14 hrs, Volume= 0.464 af
Outflow = 3.11 cfs @ 12.14 hrs, Volume= 0.464 af, Atten= 0%, Lag= 0.2 min
Routed to Reach DMH113 : TO DMH#114

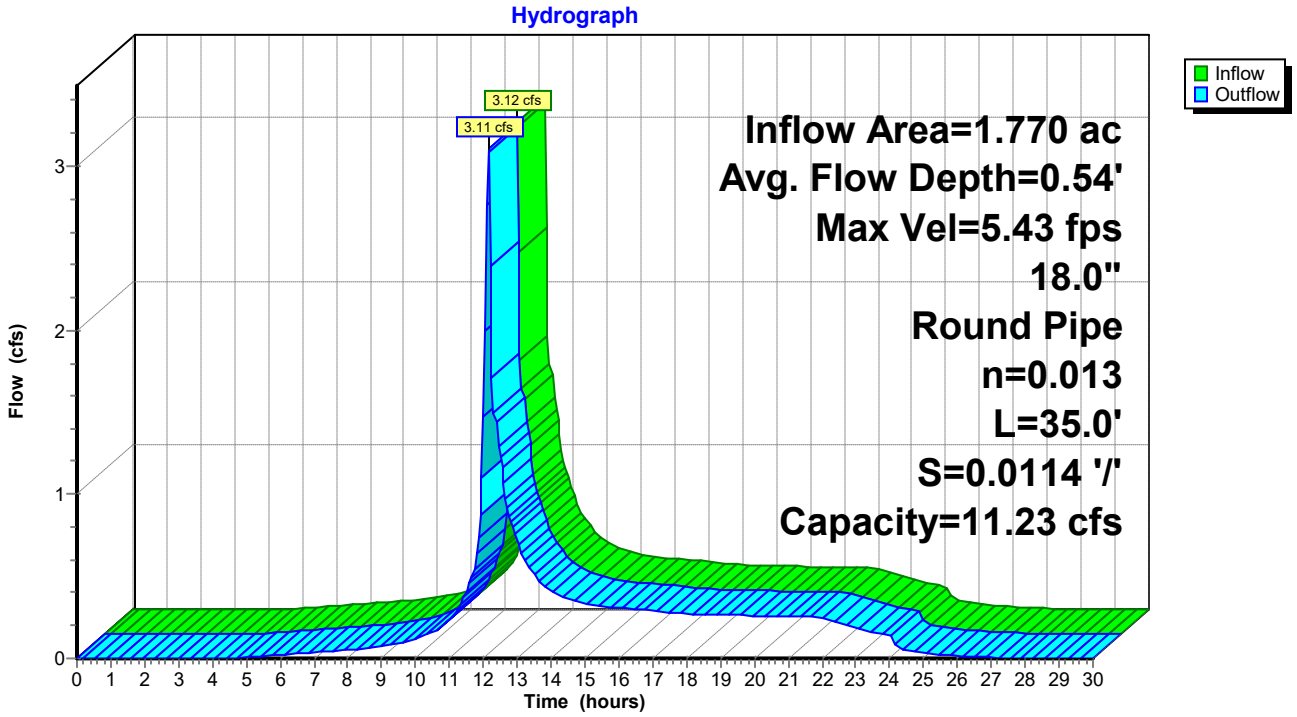
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.43 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 0.3 min

Peak Storage= 20 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 1.44'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.23 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0114 '/'
Inlet Invert= 460.20', Outlet Invert= 459.80'



Reach DMH112: TO DMH#113



Summary for Reach DMH113: TO DMH#114

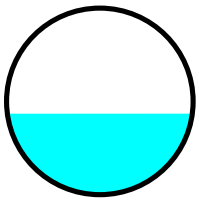
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB24 outlet invert by 0.04' @ 12.15 hrs
[62] Hint: Exceeded Reach DMH112 OUTLET depth by 0.01' @ 12.10 hrs

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 2.93" for 25-Year event
Inflow = 5.20 cfs @ 12.13 hrs, Volume= 0.626 af
Outflow = 5.19 cfs @ 12.13 hrs, Volume= 0.626 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH114 : TO DMH-K1

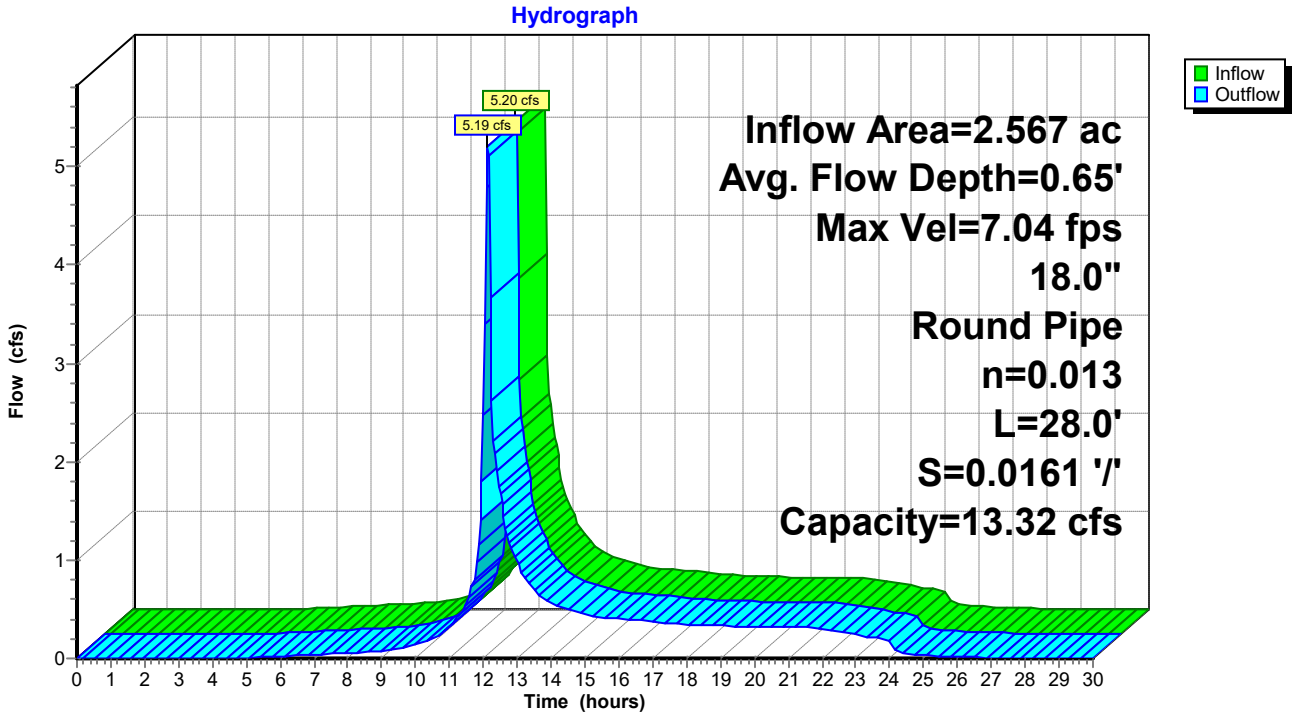
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.46 fps, Avg. Travel Time= 0.2 min

Peak Storage= 21 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.65' , Surface Width= 1.49'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 13.32 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 28.0' Slope= 0.0161 '/'
Inlet Invert= 459.70', Outlet Invert= 459.25'



Reach DMH113: TO DMH#114



Summary for Reach DMH114: TO DMH-K1

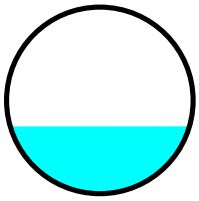
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH113 outlet invert by 0.29' @ 12.15 hrs

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 2.93" for 25-Year event
Inflow = 5.19 cfs @ 12.13 hrs, Volume= 0.626 af
Outflow = 5.19 cfs @ 12.13 hrs, Volume= 0.626 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

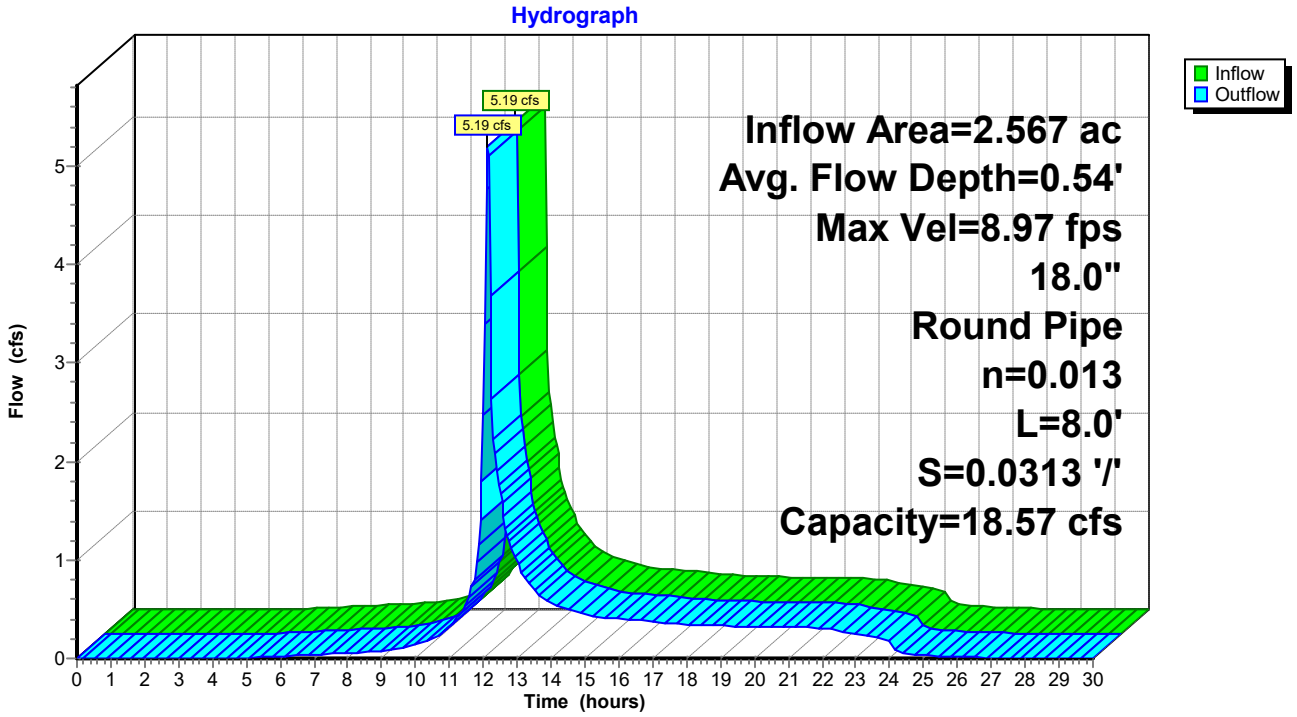
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.97 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.12 fps, Avg. Travel Time= 0.0 min

Peak Storage= 5 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.54' , Surface Width= 1.44'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.57 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 8.0' Slope= 0.0313 '/'
Inlet Invert= 459.00', Outlet Invert= 458.75'



Reach DMH114: TO DMH-K1



Summary for Reach DMHR1: TO DMH#104

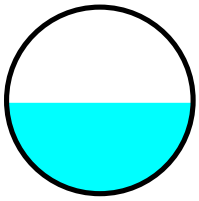
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMHR2 outlet invert by 0.38' @ 12.15 hrs

Inflow Area = 0.739 ac, 65.00% Impervious, Inflow Depth = 3.37" for 25-Year event
Inflow = 2.70 cfs @ 12.13 hrs, Volume= 0.208 af
Outflow = 2.67 cfs @ 12.14 hrs, Volume= 0.208 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH103 : TO CMH#2

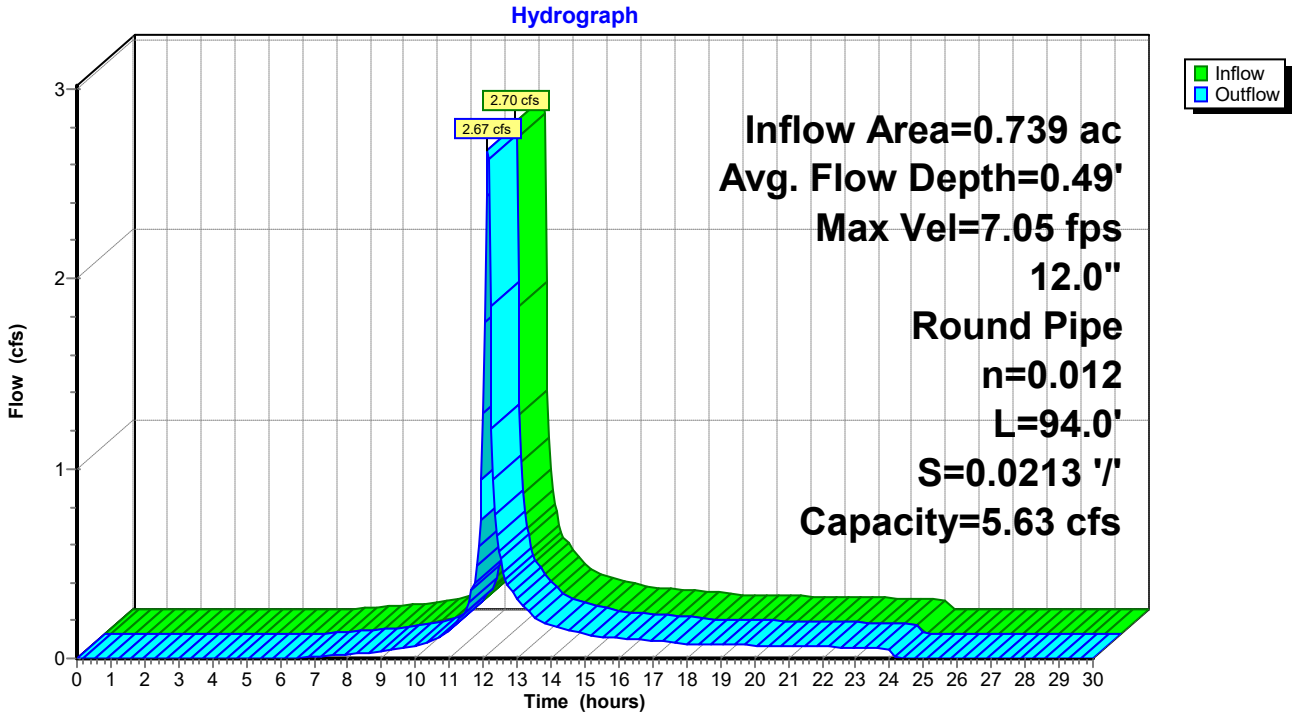
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.05 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.60 fps, Avg. Travel Time= 0.6 min

Peak Storage= 36 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.49' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.63 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 94.0' Slope= 0.0213 '/'
Inlet Invert= 467.00', Outlet Invert= 465.00'



Reach DMHR1: TO DMH#104



Summary for Reach DMHR2: TO DMH#R2

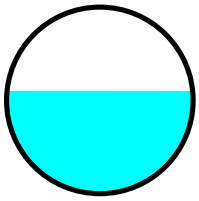
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.739 ac, 65.00% Impervious, Inflow Depth = 3.37" for 25-Year event
Inflow = 2.75 cfs @ 12.12 hrs, Volume= 0.208 af
Outflow = 2.70 cfs @ 12.13 hrs, Volume= 0.208 af, Atten= 2%, Lag= 0.8 min
Routed to Reach DMHR1 : TO DMH#104

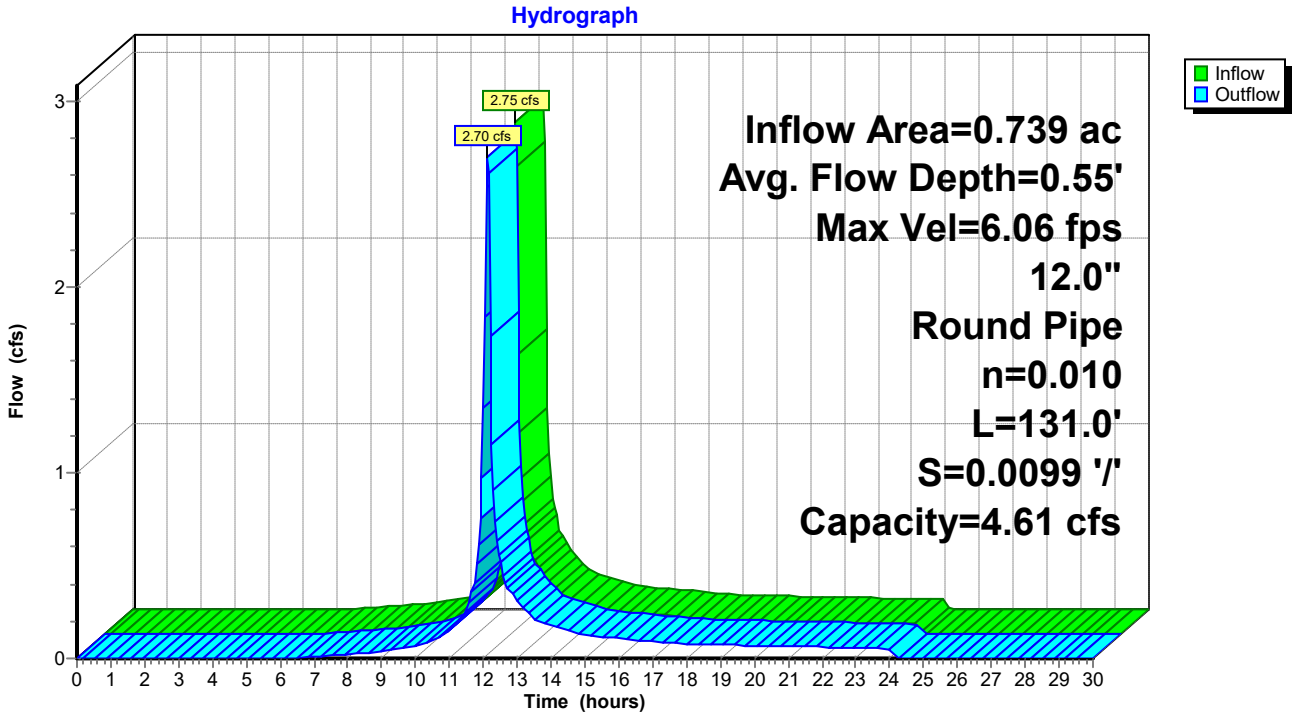
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.06 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 1.0 min

Peak Storage= 58 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.55' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 131.0' Slope= 0.0099 '/'
Inlet Invert= 468.40', Outlet Invert= 467.10'



Reach DMHR2: TO DMH#R2



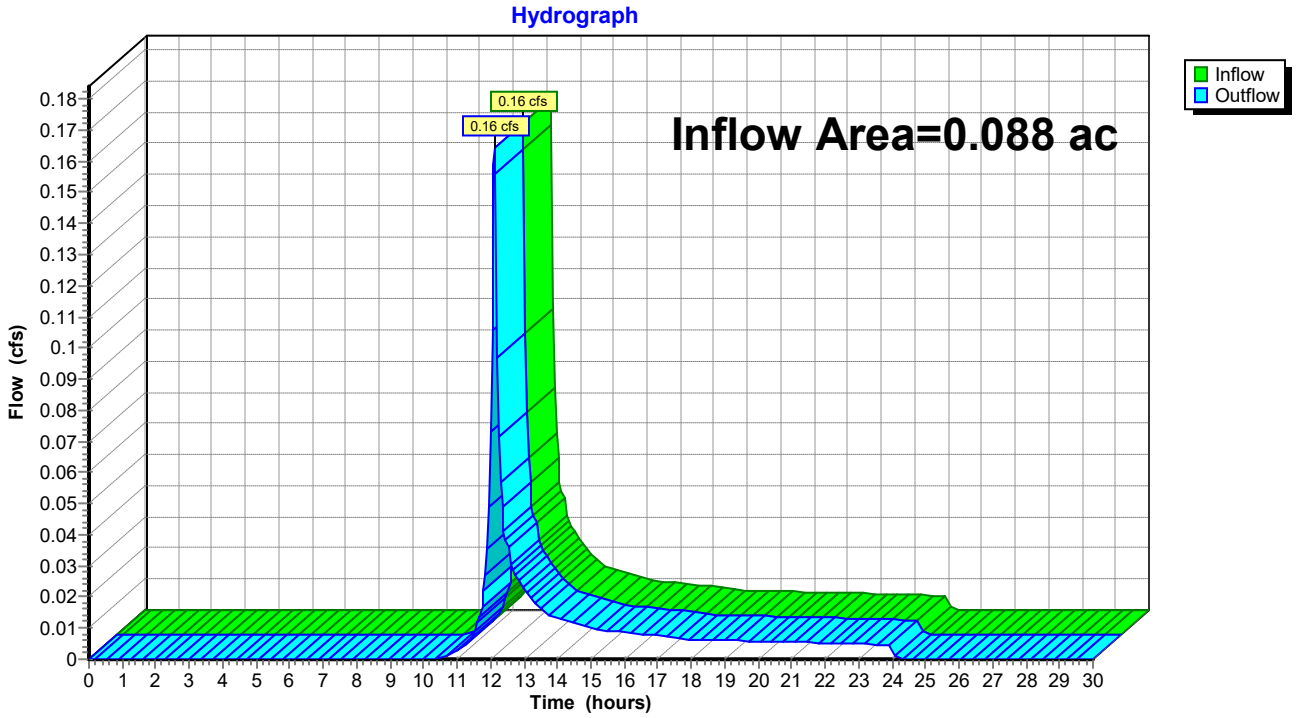
Summary for Reach DP#6: OFFSITE LOW POINT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.088 ac, 33.45% Impervious, Inflow Depth = 1.76" for 25-Year event
Inflow = 0.16 cfs @ 12.12 hrs, Volume= 0.013 af
Outflow = 0.16 cfs @ 12.12 hrs, Volume= 0.013 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 DP#6: OFFSITE LOW POINT



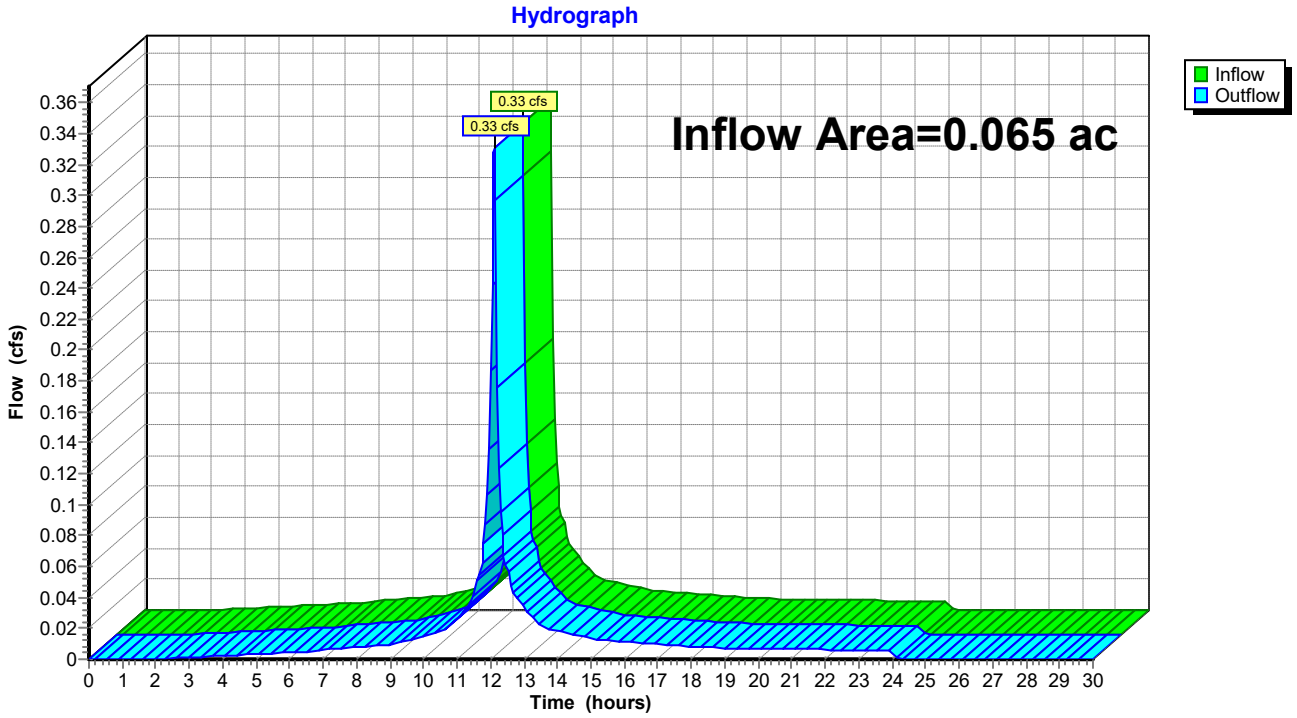
Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

[40] Hint: Not Described (Outflow=Inflow)

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)



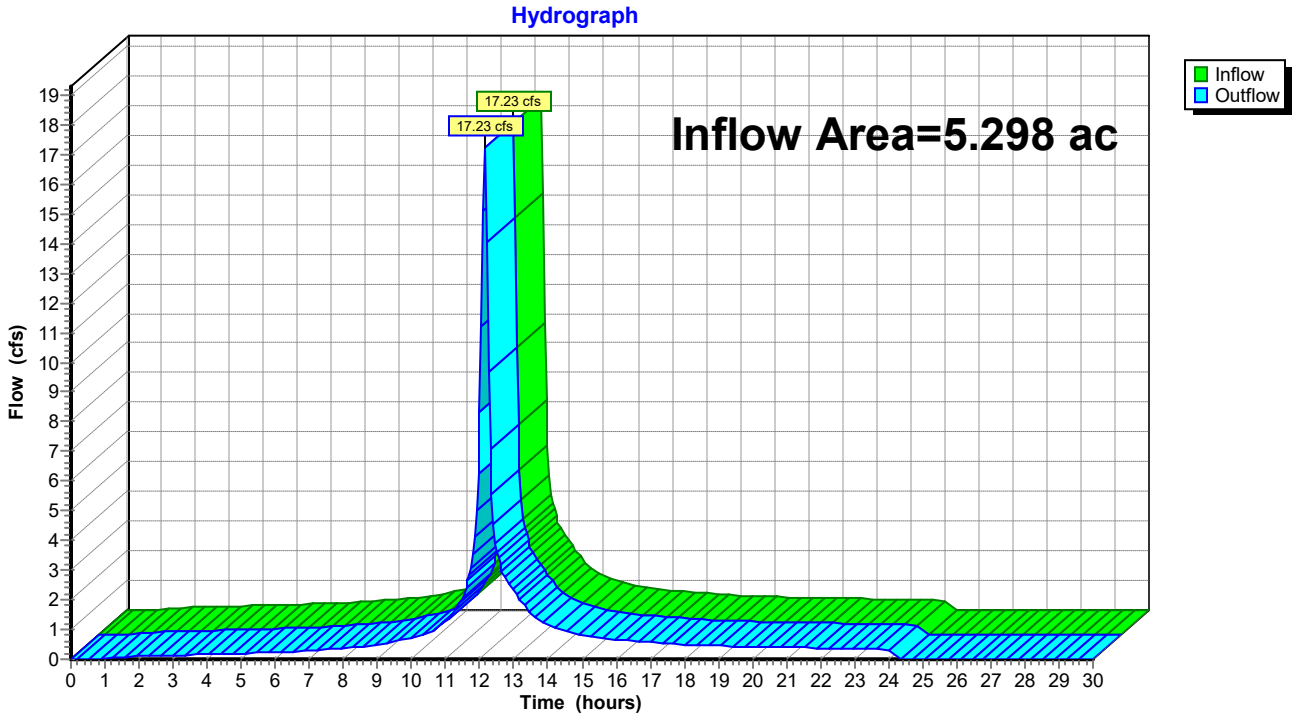
Summary for Reach DP2: MUNICIPAL SYSTEM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.298 ac, 79.01% Impervious, Inflow Depth = 3.55" for 25-Year event
Inflow = 17.23 cfs @ 12.14 hrs, Volume= 1.569 af
Outflow = 17.23 cfs @ 12.14 hrs, Volume= 1.569 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



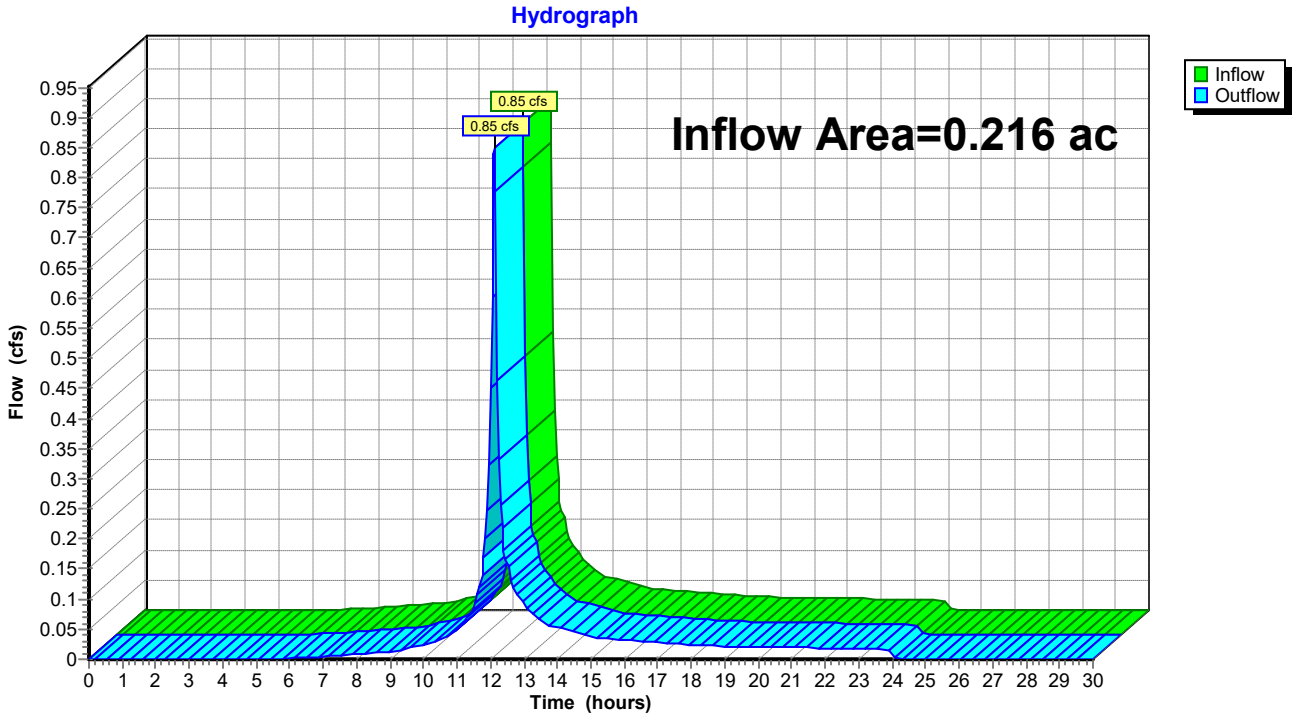
Summary for Reach DP3: CATCHBASIN (FIRE STATION)

[40] Hint: Not Described (Outflow=Inflow)

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)



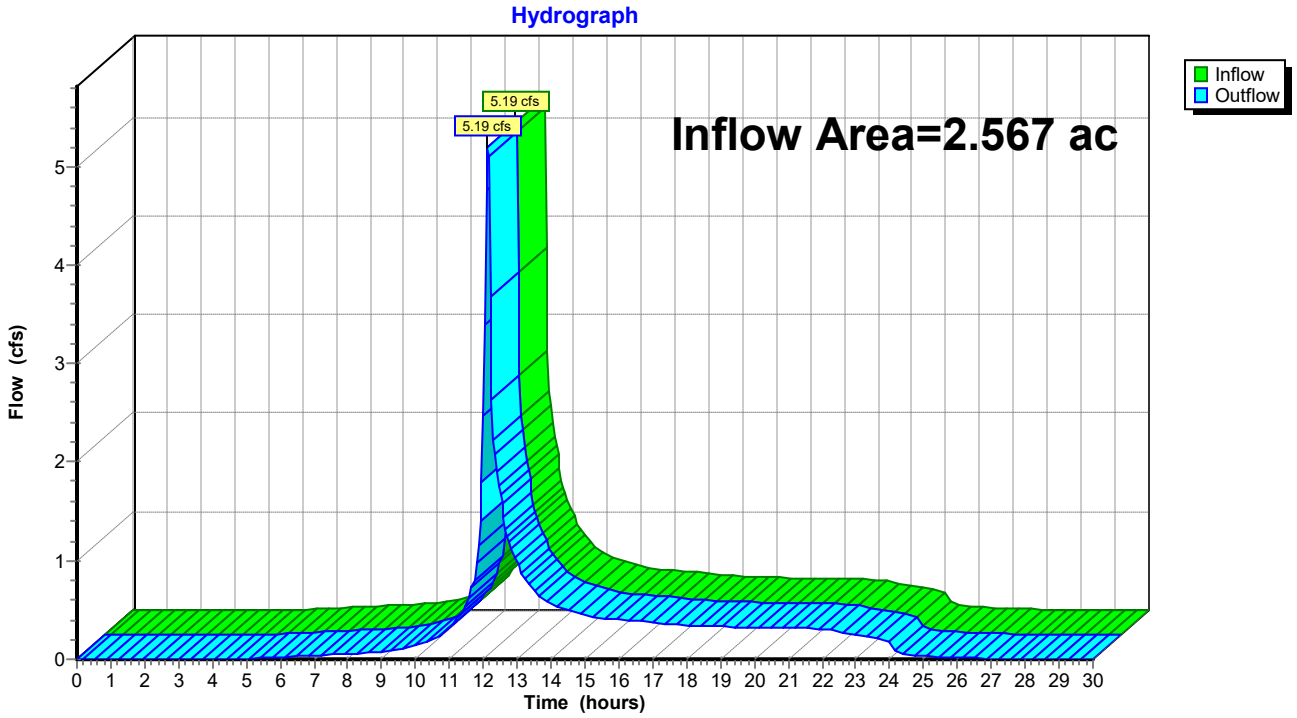
Summary for Reach DP4: DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 2.93" for 25-Year event
Inflow = 5.19 cfs @ 12.13 hrs, Volume= 0.626 af
Outflow = 5.19 cfs @ 12.13 hrs, Volume= 0.626 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: DMH-K1



Summary for Reach DP5: DCB-H

[40] Hint: Not Described (Outflow=Inflow)

Summary for Reach RF1: TO DMH#101

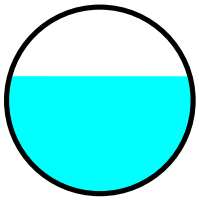
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.759 ac,100.00% Impervious, Inflow Depth = 5.64" for 25-Year event
Inflow = 4.04 cfs @ 12.11 hrs, Volume= 0.357 af
Outflow = 4.01 cfs @ 12.11 hrs, Volume= 0.357 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH101 : TO DMH#100

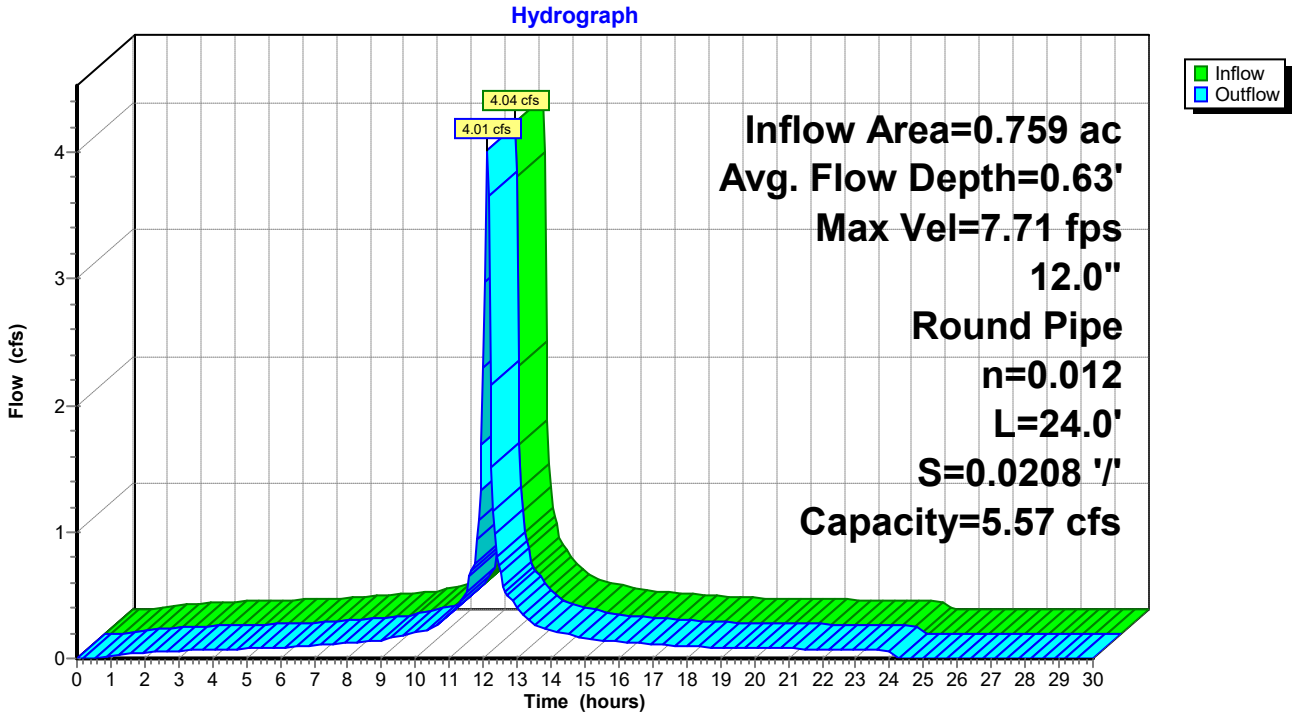
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.71 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.89 fps, Avg. Travel Time= 0.1 min

Peak Storage= 13 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 0.97'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.57 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 24.0' Slope= 0.0208 '/'
Inlet Invert= 466.20', Outlet Invert= 465.70'



Reach RF1: TO DMH#101

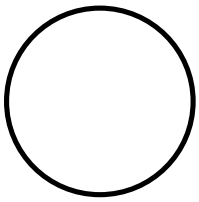


Summary for Reach RF2: TO DMH#101

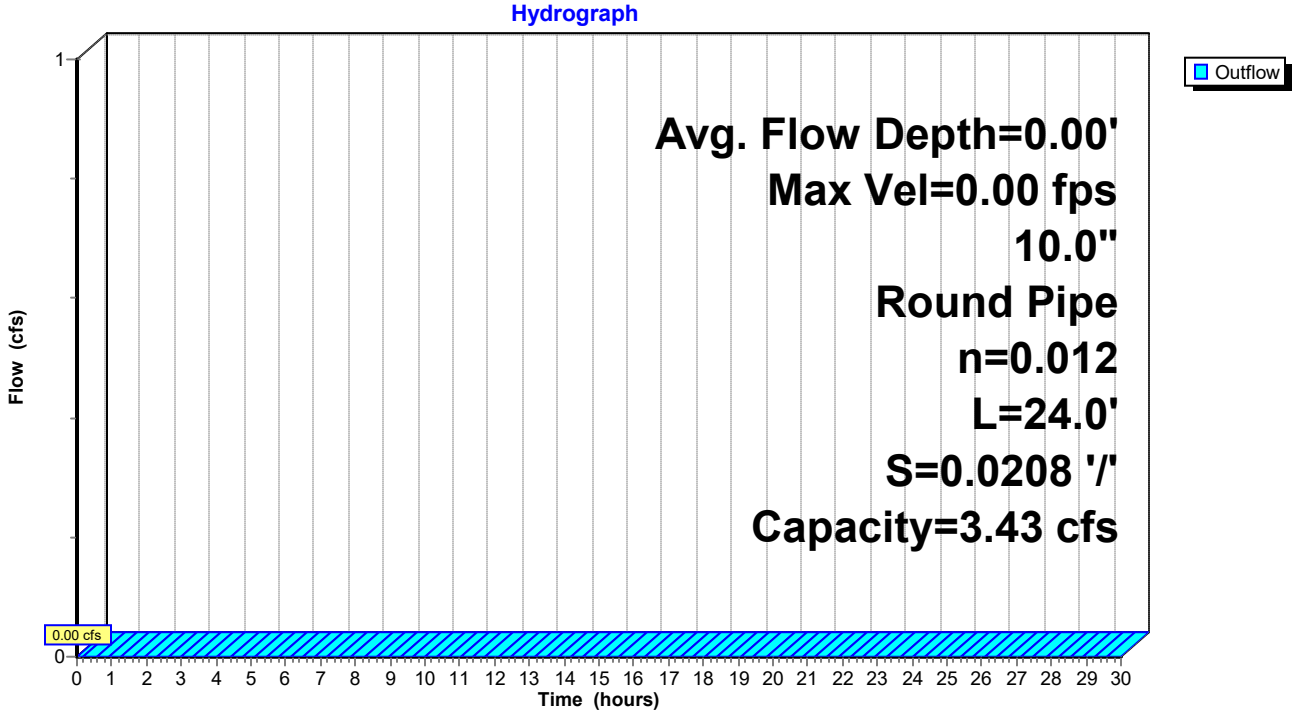
[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 0.83' Flow Area= 0.5 sf, Capacity= 3.43 cfs

10.0" Round Pipe
n= 0.012 Steel, smooth
Length= 24.0' Slope= 0.0208 '/'
Inlet Invert= 466.20', Outlet Invert= 465.70'



Reach RF2: TO DMH#101



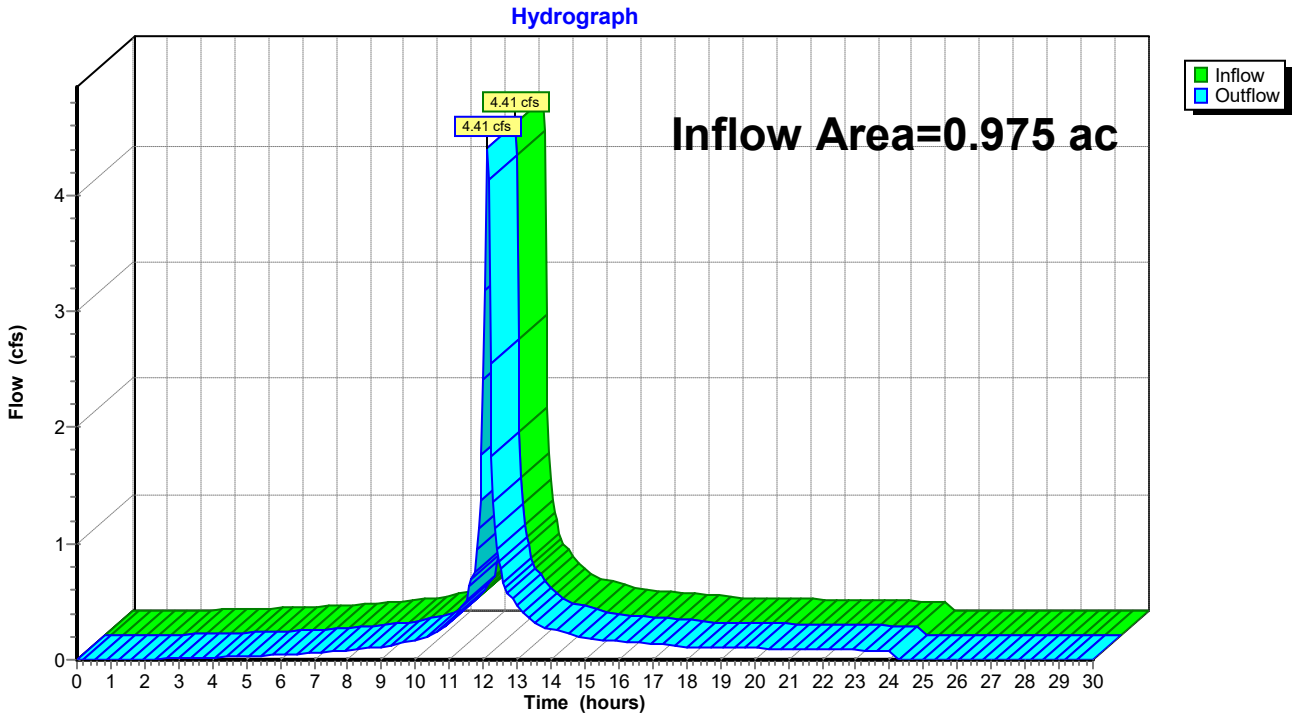
Summary for Reach UGS1A: TO UGS#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 4.41" for 25-Year event
Inflow = 4.41 cfs @ 12.12 hrs, Volume= 0.358 af
Outflow = 4.41 cfs @ 12.12 hrs, Volume= 0.358 af, Atten= 0%, Lag= 0.0 min
Routed to Pond UGS1 : TO DMH#106

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

Reach UGS1A: TO UGS#1



Summary for Reach UGS1B: TO DMH106

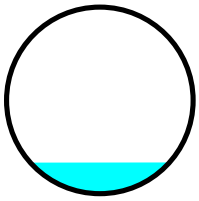
[52] Hint: Inlet/Outlet conditions not evaluated
[79] Warning: Submerged Pond UGS1 Primary device # 1 by 0.02'

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 0.28" for 25-Year event
Inflow = 0.28 cfs @ 12.82 hrs, Volume= 0.023 af
Outflow = 0.28 cfs @ 12.82 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH105 : TO DMH#104

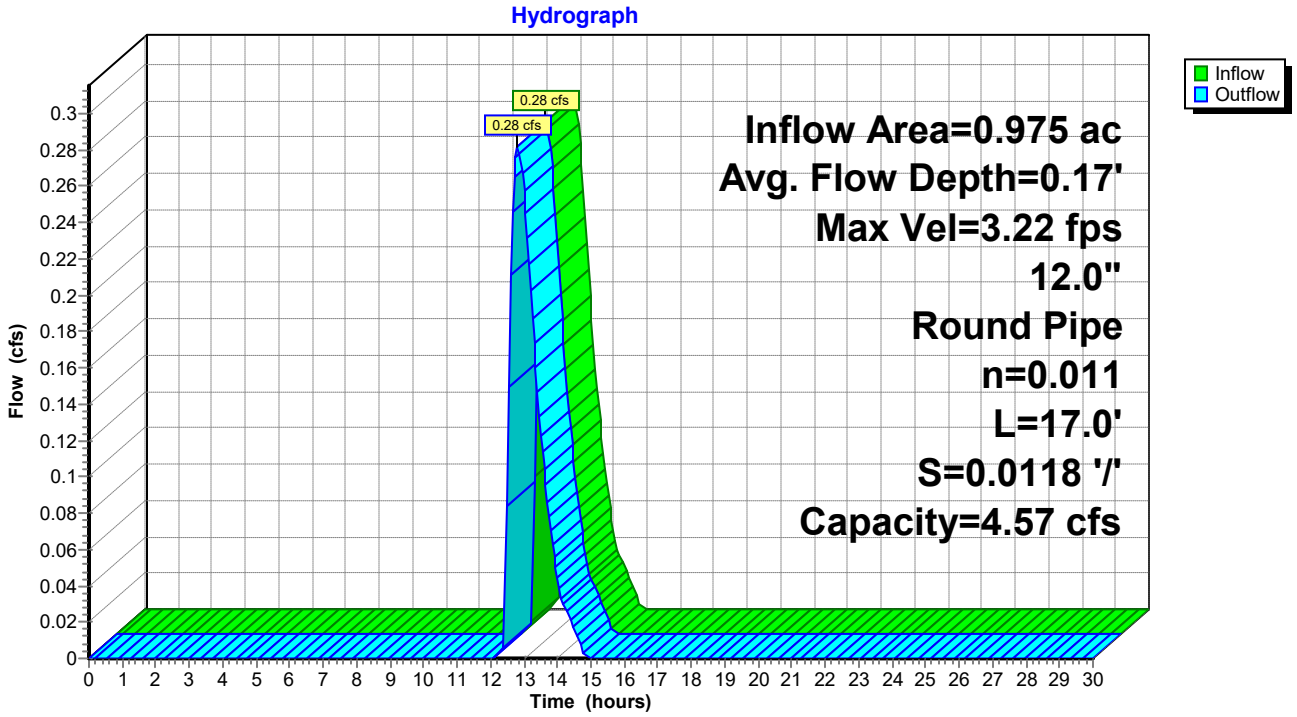
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.22 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.19 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.81 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 0.75'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.57 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 17.0' Slope= 0.0118 '/'
Inlet Invert= 467.60', Outlet Invert= 467.40'



Reach UGS1B: TO DMH106



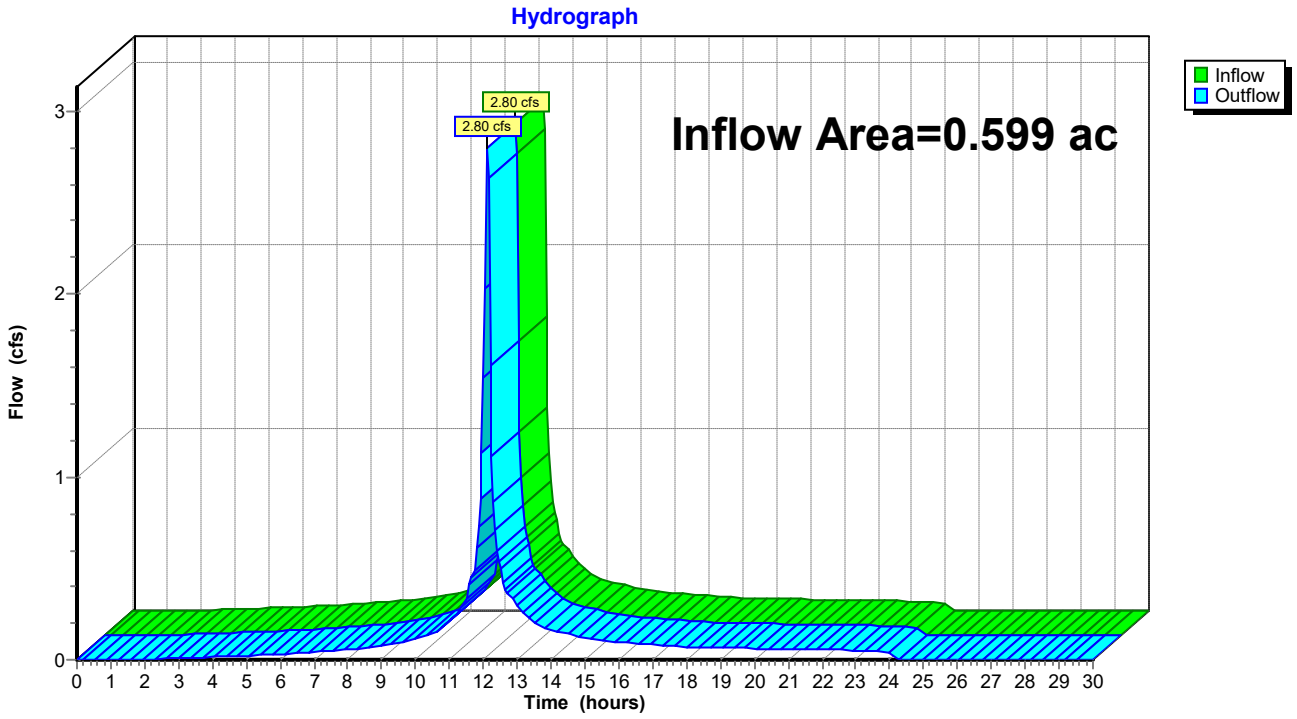
Summary for Reach UGS2A: TO UGS#2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 4.59" for 25-Year event
Inflow = 2.80 cfs @ 12.12 hrs, Volume= 0.229 af
Outflow = 2.80 cfs @ 12.12 hrs, Volume= 0.229 af, Atten= 0%, Lag= 0.0 min
Routed to Pond UGS2 : TO UGS#2B

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

Reach UGS2A: TO UGS#2



Summary for Reach UGS2B: TO DMH#112

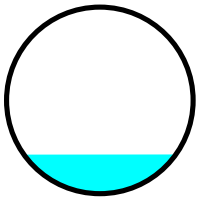
[52] Hint: Inlet/Outlet conditions not evaluated
[78] Warning: Submerged Pond UGS2 Primary device # 2 by 0.21'

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth > 4.54" for 25-Year event
Inflow = 0.62 cfs @ 12.40 hrs, Volume= 0.227 af
Outflow = 0.61 cfs @ 12.42 hrs, Volume= 0.227 af, Atten= 1%, Lag= 1.0 min
Routed to Reach DMH112 : TO DMH#113

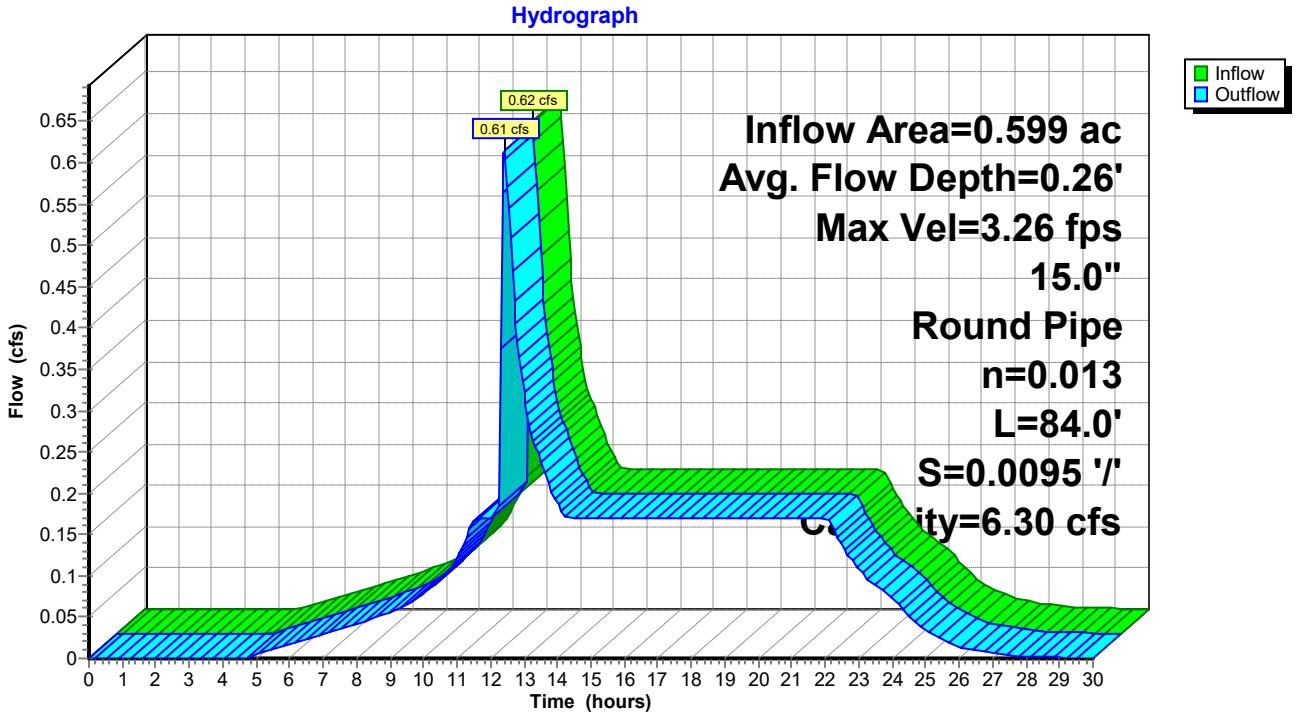
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 0.8 min

Peak Storage= 16 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.26' , Surface Width= 1.02'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.30 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 84.0' Slope= 0.0095 '/'
Inlet Invert= 461.10', Outlet Invert= 460.30'



Reach UGS2B: TO DMH#112



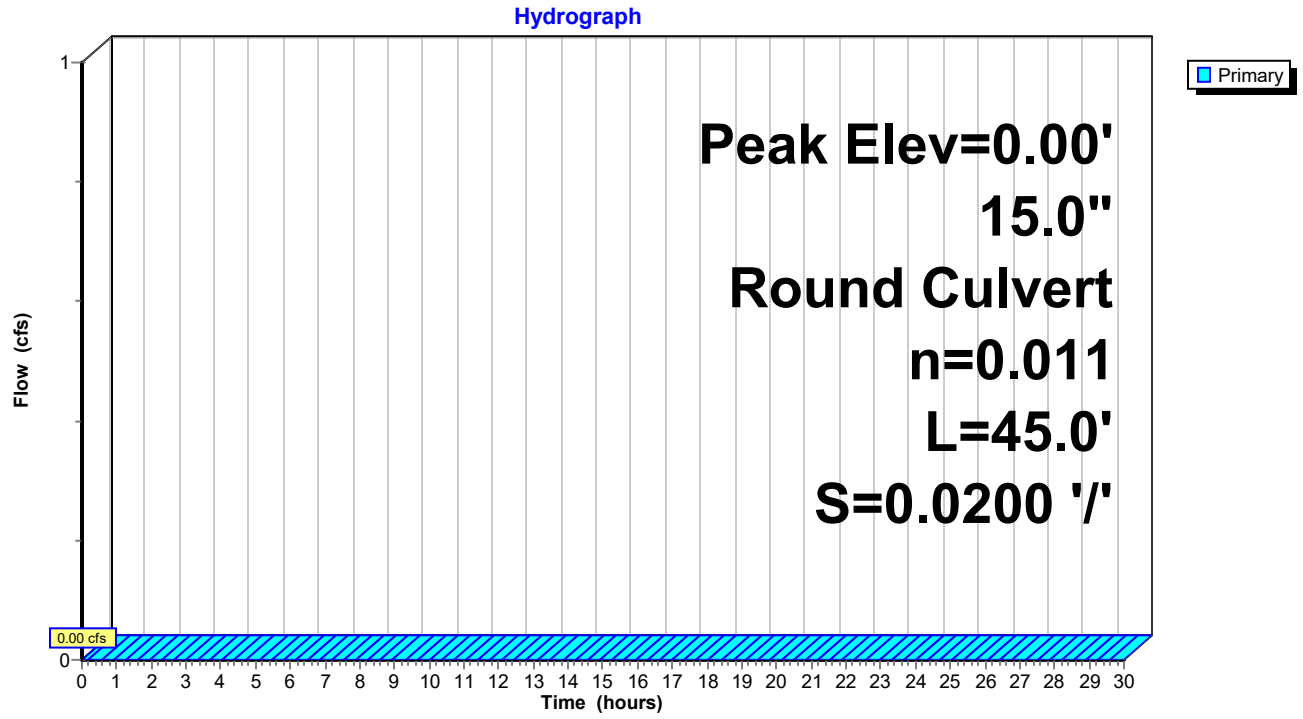
Summary for Pond DMH-B: TO DMH-D

[43] Hint: Has no inflow (Outflow=Zero)

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=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

Pond DMH-B: TO DMH-D



Summary for Pond UGS1: TO DMH#106

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 4.41" for 25-Year event
Inflow = 4.41 cfs @ 12.12 hrs, Volume= 0.358 af
Outflow = 0.54 cfs @ 12.82 hrs, Volume= 0.358 af, Atten= 88%, Lag= 41.8 min
Discarded = 0.26 cfs @ 12.82 hrs, Volume= 0.336 af
Primary = 0.28 cfs @ 12.82 hrs, Volume= 0.023 af
Routed to Reach UGS1B : TO DMH106

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 467.93' @ 12.82 hrs Surf.Area= 0.065 ac Storage= 0.135 af

Plug-Flow detention time= 203.9 min calculated for 0.358 af (100% of inflow)
Center-of-Mass det. time= 203.8 min (1,006.0 - 802.1)

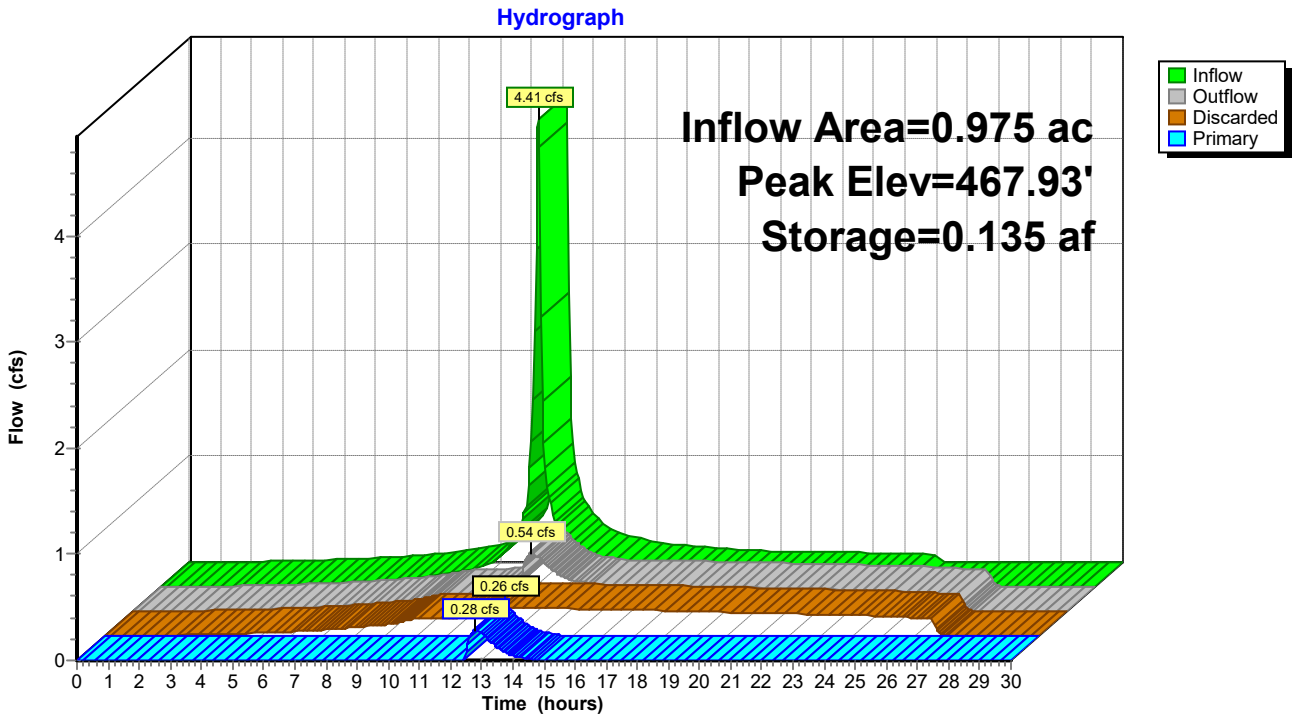
Volume	Invert	Avail.Storage	Storage Description
#1	464.75'	0.073 af	**38.00'W x 74.00'L x 6.00'H Prismatoid** 0.387 af Overall - 0.206 af Embedded = 0.181 af x 40.0% Voids
#2	465.50'	0.153 af	**Shea Leaching Chamber 4x4x4** x 144 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		0.226 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	467.75'	**12.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	464.75'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'

Discarded OutFlow Max=0.26 cfs @ 12.82 hrs HW=467.93' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.26 cfs)

Primary OutFlow Max=0.28 cfs @ 12.82 hrs HW=467.93' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.28 cfs @ 1.45 fps)

Pond UGS1: TO DMH#106



Summary for Pond UGS2: TO UGS#2B

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 4.59" for 25-Year event
Inflow = 2.80 cfs @ 12.12 hrs, Volume= 0.229 af
Outflow = 0.62 cfs @ 12.40 hrs, Volume= 0.227 af, Atten= 78%, Lag= 17.0 min
Primary = 0.62 cfs @ 12.40 hrs, Volume= 0.227 af
Routed to Reach UGS2B : TO DMH#112

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 464.42' @ 12.40 hrs Surf.Area= 0.041 ac Storage= 0.082 af

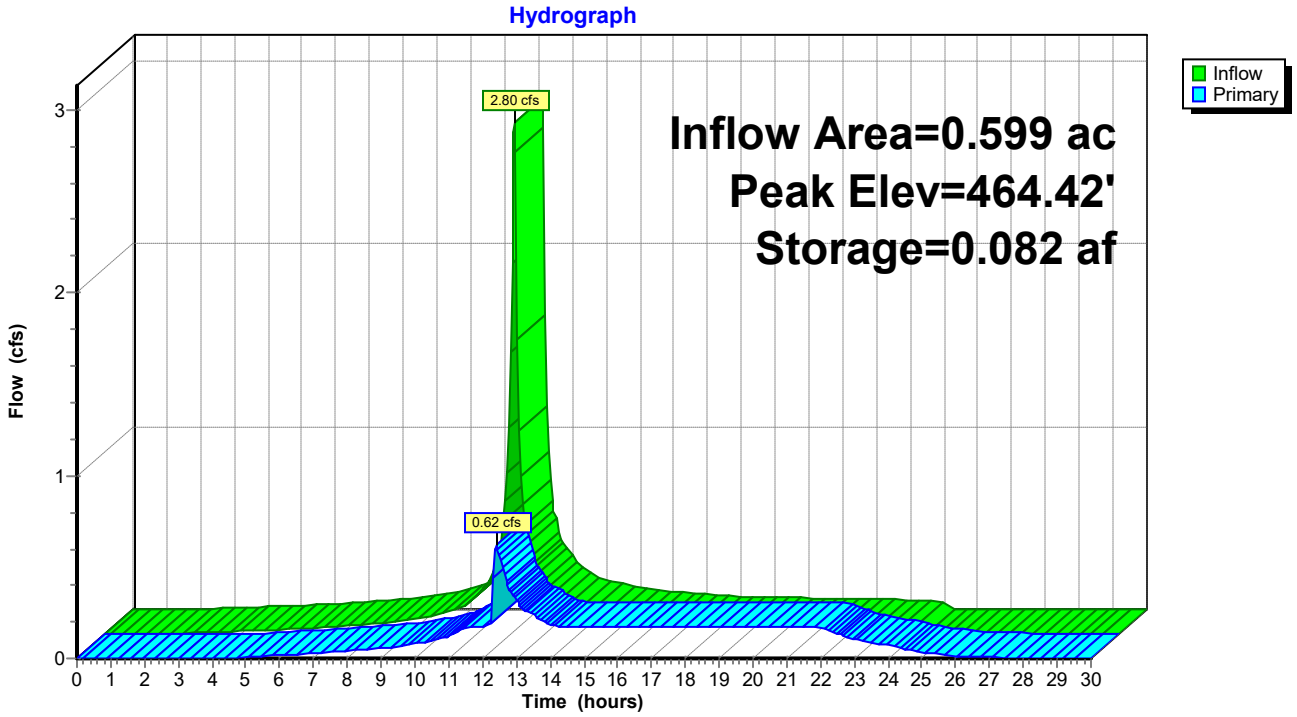
Plug-Flow detention time= 180.3 min calculated for 0.226 af (99% of inflow)
Center-of-Mass det. time= 173.6 min (970.4 - 796.8)

Volume	Invert	Avail.Storage	Storage Description
#1	461.00'	0.052 af	**38.00'W x 47.00'L x 6.30'H Prismatoid** 0.258 af Overall - 0.129 af Embedded = 0.130 af x 40.0% Voids
#2	462.50'	0.096 af	**Shea Leaching Chamber 4x4x4** x 90 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 90 Chambers in 10 Rows
		0.148 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	464.25'	**12.0" Vert. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#2	Primary	461.15'	**Special & User-Defined** Head (feet) 0.00 1.00 15.00 Disch. (cfs) 0.000 0.170 0.170

Primary OutFlow Max=0.55 cfs @ 12.40 hrs HW=464.42' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.38 cfs @ 1.41 fps)
2=Special & User-Defined (Custom Controls 0.17 cfs)

Pond UGS2: TO UGS#2B



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 P100A: TO 12" ROOF DRAIN Runoff Area=33,077 sf 100.00% Impervious Runoff Depth=8.10"
Tc=5.0 min CN=98 Runoff=5.74 cfs 0.513 af

Subcatchment P100B: TO YARD DRAIN Runoff Area=32,189 sf 65.00% Impervious Runoff Depth=5.59"
Tc=5.0 min CN=77 Runoff=4.49 cfs 0.344 af

Subcatchment P100D: TO 12" ROOF DRAIN Runoff Area=32,189 sf 100.00% Impervious Runoff Depth=8.10"
Tc=5.0 min CN=98 Runoff=5.59 cfs 0.499 af

Subcatchment P105: TO DCB#5 Runoff Area=12,319 sf 35.47% Impervious Runoff Depth=3.59"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=60 Runoff=1.12 cfs 0.085 af

Subcatchment P106: TO DCB#6 Runoff Area=6,540 sf 94.27% Impervious Runoff Depth=7.74"
Flow Length=101' Slope=0.0150 '/' Tc=5.0 min CN=95 Runoff=1.12 cfs 0.097 af

Subcatchment P107: TO DCB#7 Runoff Area=14,453 sf 83.32% Impervious Runoff Depth=6.90"
Flow Length=126' Slope=0.0150 '/' Tc=5.0 min CN=88 Runoff=2.35 cfs 0.191 af

Subcatchment P108: TO DCB#8 Runoff Area=7,623 sf 76.33% Impervious Runoff Depth=6.42"
Flow Length=156' Tc=5.0 min CN=84 Runoff=1.18 cfs 0.094 af

Subcatchment P109: TO DCB#9 Runoff Area=9,811 sf 39.59% Impervious Runoff Depth=3.82"
Flow Length=156' Tc=5.1 min CN=62 Runoff=0.95 cfs 0.072 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 P110: TO DCB#10 Runoff Area=2,827 sf 67.92% Impervious Runoff Depth=5.83"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=79 Runoff=0.41 cfs 0.032 af

Subcatchment P111: TO DCB#11 Runoff Area=4,144 sf 28.74% Impervious Runoff Depth=3.13"
Flow Length=105' Slope=0.0100 '/' Tc=5.0 min CN=56 Runoff=0.33 cfs 0.025 af

Subcatchment P112: TO DCB#12 Runoff Area=9,054 sf 93.65% Impervious Runoff Depth=7.62"
Flow Length=150' Slope=0.0130 '/' Tc=5.0 min CN=94 Runoff=1.55 cfs 0.132 af

Subcatchment P113: TO DCB#13 Runoff Area=11,898 sf 94.49% Impervious Runoff Depth=7.74"
Flow Length=122' Slope=0.0200 '/' Tc=5.0 min CN=95 Runoff=2.04 cfs 0.176 af

Subcatchment P114: TO DCB#14 Runoff Area=5,484 sf 94.42% Impervious Runoff Depth=7.74"
Flow Length=126' Slope=0.0160 '/' Tc=5.0 min CN=95 Runoff=0.94 cfs 0.081 af

Subcatchment P115: TO DCB#15 Runoff Area=16,100 sf 70.06% Impervious Runoff Depth=5.94"
Flow Length=122' Slope=0.0170 '/' Tc=5.0 min CN=80 Runoff=2.36 cfs 0.183 af

Subcatchment P116: TO DCB#25 Runoff Area=2,780 sf 89.32% Impervious Runoff Depth=7.38"
Flow Length=80' Slope=0.0200 '/' Tc=5.0 min CN=92 Runoff=0.47 cfs 0.039 af

Subcatchment P117: TO DP#6 Runoff Area=3,839 sf 33.45% Impervious Runoff Depth=3.48"
Flow Length=74' Slope=0.0200 '/' Tc=5.0 min CN=59 Runoff=0.34 cfs 0.026 af

Subcatchment P119: TO DCB#19 Runoff Area=7,440 sf 78.16% Impervious Runoff Depth=6.54"
Flow Length=213' Slope=0.0250 '/' Tc=5.0 min CN=85 Runoff=1.17 cfs 0.093 af

Subcatchment P12: TO DCB-A Runoff Area=6,197 sf 94.61% Impervious Runoff Depth=7.74"
Flow Length=147' Tc=5.0 min CN=95 Runoff=1.06 cfs 0.092 af

Subcatchment P120: TO DCB#20 Runoff Area=10,195 sf 85.75% Impervious Runoff Depth=7.14"
Flow Length=146' Tc=5.0 min CN=90 Runoff=1.69 cfs 0.139 af

Subcatchment P121: TO DCB#21 Runoff Area=7,628 sf 71.01% Impervious Runoff Depth=6.06"
Flow Length=153' Tc=5.0 min CN=81 Runoff=1.14 cfs 0.088 af

Subcatchment P122: TO DCB#22 Runoff Area=10,232 sf 44.85% Impervious Runoff Depth=4.17"
Flow Length=189' Tc=5.0 min CN=65 Runoff=1.09 cfs 0.082 af

Subcatchment P123: TO DCB#23 Runoff Area=33,346 sf 40.00% Impervious Runoff Depth=3.94"
Flow Length=171' Tc=5.0 min CN=63 Runoff=3.34 cfs 0.251 af

Subcatchment P14: TO DCB-B Runoff Area=5,424 sf 87.24% Impervious Runoff Depth=7.14"
Flow Length=169' Tc=5.0 min CN=90 Runoff=0.90 cfs 0.074 af

Subcatchment P15: TO DCB-C Runoff Area=8,397 sf 71.34% Impervious Runoff Depth=6.06"
Flow Length=161' Slope=0.0110 '/' Tc=7.0 min CN=81 Runoff=1.18 cfs 0.097 af

Subcatchment P18: TO DCB-D Runoff Area=10,287 sf 76.50% Impervious Runoff Depth=6.42"
Flow Length=222' Tc=5.0 min CN=84 Runoff=1.60 cfs 0.126 af

Subcatchment P19: TO DCB-E Runoff Area=8,240 sf 64.27% Impervious Runoff Depth=5.59"
Flow Length=177' Slope=0.0090 '/' Tc=5.0 min CN=77 Runoff=1.15 cfs 0.088 af

Subcatchment P20: 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 P24: TO DCB#24 Runoff Area=34,704 sf 47.02% Impervious Runoff Depth=4.41"
Flow Length=247' Slope=0.0250 '/' Tc=5.0 min CN=67 Runoff=3.89 cfs 0.292 af

Reach CMH3: TO DMH-E Avg. Flow Depth=0.96' Max Vel=6.84 fps Inflow=13.43 cfs 1.209 af
36.0" Round Pipe n=0.011 L=196.0' S=0.0058 '/' Capacity=60.12 cfs Outflow=13.10 cfs 1.209 af

Reach DCB-A: TO DMH-D Inflow=1.06 cfs 0.092 af
Outflow=1.06 cfs 0.092 af

Reach DCB-B: TO DMH-E Inflow=0.90 cfs 0.074 af
Outflow=0.90 cfs 0.074 af

Reach DCB-C: TO TRUNKLINE Inflow=1.18 cfs 0.097 af
Outflow=1.18 cfs 0.097 af

Reach DCB-D: TO DMH-A Avg. Flow Depth=0.36' Max Vel=8.41 fps Inflow=1.60 cfs 0.126 af
8.0" Round Pipe n=0.010 L=15.0' S=0.0333 '/' Capacity=2.87 cfs Outflow=1.59 cfs 0.126 af

Reach DCB-E: TO DMH-A Avg. Flow Depth=0.30' Max Vel=7.54 fps Inflow=1.15 cfs 0.088 af
8.0" Round Pipe n=0.010 L=16.0' S=0.0313 '/' Capacity=2.78 cfs Outflow=1.14 cfs 0.088 af

Reach DCB10: TO DMH#106 Avg. Flow Depth=0.18' Max Vel=5.49 fps Inflow=0.41 cfs 0.032 af
8.0" Round Pipe n=0.010 L=7.0' S=0.0286 '/' Capacity=2.66 cfs Outflow=0.41 cfs 0.032 af

Reach DCB11: TO DMH#103 Avg. Flow Depth=0.19' Max Vel=3.90 fps Inflow=0.33 cfs 0.025 af
8.0" Round Pipe n=0.010 L=15.0' S=0.0133 '/' Capacity=1.81 cfs Outflow=0.32 cfs 0.025 af

Reach DCB12: TO DMH#12 Avg. Flow Depth=0.52' Max Vel=5.29 fps Inflow=1.55 cfs 0.132 af
8.0" Round Pipe n=0.010 L=28.0' S=0.0107 '/' Capacity=1.63 cfs Outflow=1.53 cfs 0.132 af

Reach DCB13: TO DMH#102 Avg. Flow Depth=0.37' Max Vel=7.81 fps Inflow=2.04 cfs 0.176 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=2.04 cfs 0.176 af

Reach DCB14: TO DMH#109 Avg. Flow Depth=0.25' Max Vel=6.09 fps Inflow=0.94 cfs 0.081 af
12.0" Round Pipe n=0.013 L=19.0' S=0.0368 '/' Capacity=6.84 cfs Outflow=0.94 cfs 0.081 af

Reach DCB15: TO DMH#102 Avg. Flow Depth=0.59' Max Vel=4.81 fps Inflow=2.36 cfs 0.183 af
12.0" Round Pipe n=0.013 L=70.0' S=0.0100 '/' Capacity=3.56 cfs Outflow=2.30 cfs 0.183 af

Reach DCB19: TO DMH#111 Avg. Flow Depth=0.27' Max Vel=6.68 fps Inflow=1.17 cfs 0.093 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=1.17 cfs 0.093 af

Reach DCB20: TO DMH#109 Avg. Flow Depth=0.47' Max Vel=4.64 fps Inflow=1.69 cfs 0.139 af
12.0" Round Pipe n=0.013 L=9.0' S=0.0111 '/' Capacity=3.76 cfs Outflow=1.68 cfs 0.139 af

Reach DCB21: TO DMH#109A Avg. Flow Depth=0.40' Max Vel=5.22 fps Inflow=1.14 cfs 0.088 af
8.0" Round Pipe n=0.013 L=5.0' S=0.0200 '/' Capacity=1.71 cfs Outflow=1.13 cfs 0.088 af

Reach DCB22: TO DMH#111 Avg. Flow Depth=0.28' Max Vel=5.87 fps Inflow=1.09 cfs 0.082 af
12.0" Round Pipe n=0.013 L=20.0' S=0.0300 '/' Capacity=6.17 cfs Outflow=1.08 cfs 0.082 af

Reach DCB23: TO DMH#111 Avg. Flow Depth=0.70' Max Vel=5.63 fps Inflow=3.34 cfs 0.251 af
12.0" Round Pipe n=0.013 L=250.0' S=0.0124 '/' Capacity=3.97 cfs Outflow=3.21 cfs 0.251 af

Reach DCB24: TO DMH#113 Avg. Flow Depth=0.63' Max Vel=7.35 fps Inflow=3.89 cfs 0.292 af
12.0" Round Pipe n=0.013 L=9.0' S=0.0222 '/' Capacity=5.31 cfs Outflow=3.88 cfs 0.292 af

Reach DCB25: TO DMH#109A Avg. Flow Depth=0.22' Max Vel=4.76 fps Inflow=0.47 cfs 0.039 af
8.0" Round Pipe n=0.010 L=29.0' S=0.0172 '/' Capacity=2.06 cfs Outflow=0.46 cfs 0.039 af

Reach DCB5: TO DMH#108 Avg. Flow Depth=0.30' Max Vel=7.24 fps Inflow=1.12 cfs 0.085 af
8.0" Round Pipe n=0.010 L=7.0' S=0.0286 '/' Capacity=2.66 cfs Outflow=1.12 cfs 0.085 af

Reach DCB6: TO DMH#107 Avg. Flow Depth=0.24' Max Vel=9.70 fps Inflow=1.12 cfs 0.097 af
8.0" Round Pipe n=0.010 L=46.0' S=0.0630 '/' Capacity=3.94 cfs Outflow=1.11 cfs 0.097 af

Reach DCB7: TO DMH#102 Avg. Flow Depth=0.42' Max Vel=7.42 fps Inflow=2.35 cfs 0.191 af
12.0" Round Pipe n=0.013 L=54.0' S=0.0315 '/' Capacity=6.32 cfs Outflow=2.32 cfs 0.191 af

Reach DCB8: TO DMH#103 Avg. Flow Depth=0.27' Max Vel=9.05 fps Inflow=1.18 cfs 0.094 af
8.0" Round Pipe n=0.010 L=4.0' S=0.0500 '/' Capacity=3.51 cfs Outflow=1.18 cfs 0.094 af

Reach DCB9: TO DMH#103 Avg. Flow Depth=0.32' Max Vel=5.67 fps Inflow=0.95 cfs 0.072 af
8.0" Round Pipe n=0.010 L=12.0' S=0.0167 '/' Capacity=2.03 cfs Outflow=0.94 cfs 0.072 af

Reach DMH-A*: TO DMH-B Avg. Flow Depth=0.83' Max Vel=9.72 fps Inflow=11.95 cfs 1.040 af
24.0" Round Pipe n=0.011 L=267.0' S=0.0157 '/' Capacity=33.53 cfs Outflow=11.82 cfs 1.040 af

Reach DMH-C: TO DP#1 Inflow=15.54 cfs 1.473 af
Outflow=15.54 cfs 1.473 af

Reach DMH-D: TO DMH-C Avg. Flow Depth=1.00' Max Vel=7.62 fps Inflow=15.70 cfs 1.473 af
36.0" Round Pipe n=0.011 L=99.0' S=0.0070 '/' Capacity=65.81 cfs Outflow=15.54 cfs 1.473 af

Reach DMH-E: TO DMH-D Avg. Flow Depth=1.03' Max Vel=6.93 fps Inflow=15.03 cfs 1.381 af
36.0" Round Pipe n=0.011 L=121.0' S=0.0055 '/' Capacity=58.66 cfs Outflow=14.81 cfs 1.381 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=72.0' S=0.0058 '/' Capacity=60.20 cfs Outflow=0.00 cfs 0.000 af

Reach DMH100: TO DMH-A Avg. Flow Depth=0.78' Max Vel=10.02 fps Inflow=9.33 cfs 0.826 af
18.0" Round Pipe n=0.011 L=70.0' S=0.0200 '/' Capacity=17.56 cfs Outflow=9.23 cfs 0.826 af

Reach DMH101: TO DMH#100 Avg. Flow Depth=0.65' Max Vel=8.89 fps Inflow=5.70 cfs 0.513 af
15.0" Round Pipe n=0.011 L=5.0' S=0.0200 '/' Capacity=10.80 cfs Outflow=5.69 cfs 0.513 af

Reach DMH102: TO UGS#1A Avg. Flow Depth=0.79' Max Vel=8.09 fps Inflow=6.65 cfs 0.550 af
15.0" Round Pipe n=0.013 L=5.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=6.64 cfs 0.550 af

Reach DMH103: TO CMH#2 Avg. Flow Depth=1.15' Max Vel=9.32 fps Inflow=13.56 cfs 1.209 af
18.0" Round Pipe n=0.011 L=154.0' S=0.0136 '/' Capacity=14.50 cfs Outflow=13.43 cfs 1.209 af

Reach DMH104: TO DMH#104 Avg. Flow Depth=0.76' Max Vel=6.70 fps Inflow=5.22 cfs 0.367 af
15.0" Round Pipe n=0.011 L=120.0' S=0.0100 '/' Capacity=7.63 cfs Outflow=5.17 cfs 0.367 af

Reach DMH105: TO DMH#104 Avg. Flow Depth=0.68' Max Vel=6.30 fps Inflow=4.17 cfs 0.201 af
15.0" Round Pipe n=0.011 L=187.0' S=0.0096 '/' Capacity=7.49 cfs Outflow=4.14 cfs 0.201 af

Reach DMH106: TO DMH#105 Avg. Flow Depth=0.23' Max Vel=5.18 fps Inflow=0.73 cfs 0.056 af
12.0" Round Pipe n=0.011 L=57.0' S=0.0211 '/' Capacity=6.11 cfs Outflow=0.72 cfs 0.056 af

Reach DMH107: TO DMH#100 Avg. Flow Depth=0.59' Max Vel=7.61 fps Inflow=3.72 cfs 0.313 af
12.0" Round Pipe n=0.011 L=78.0' S=0.0179 '/' Capacity=5.64 cfs Outflow=3.71 cfs 0.313 af

Reach DMH108: TO DMH#107 Avg. Flow Depth=0.55' Max Vel=5.86 fps Inflow=2.65 cfs 0.217 af
12.0" Round Pipe n=0.011 L=45.0' S=0.0111 '/' Capacity=4.44 cfs Outflow=2.61 cfs 0.217 af

Reach DMH109: TO DMH#110 Avg. Flow Depth=0.55' Max Vel=9.41 fps Inflow=4.19 cfs 0.348 af
12.0" Round Pipe n=0.013 L=5.0' S=0.0400 '/' Capacity=7.13 cfs Outflow=4.19 cfs 0.348 af

Reach DMH109A: TO DMH109 Avg. Flow Depth=0.42' Max Vel=5.00 fps Inflow=1.60 cfs 0.128 af
12.0" Round Pipe n=0.013 L=35.0' S=0.0143 '/' Capacity=4.26 cfs Outflow=1.57 cfs 0.128 af

Reach DMH110: TO UGS#2A Avg. Flow Depth=0.60' Max Vel=8.54 fps Inflow=4.19 cfs 0.348 af
12.0" Round Pipe n=0.013 L=24.0' S=0.0313 '/' Capacity=6.30 cfs Outflow=4.17 cfs 0.348 af

Reach DMH111: TO DMH#112 Avg. Flow Depth=0.82' Max Vel=7.80 fps Inflow=5.39 cfs 0.426 af
12.0" Round Pipe n=0.013 L=66.0' S=0.0227 '/' Capacity=5.37 cfs Outflow=5.36 cfs 0.426 af

Reach DMH112: TO DMH#113 Avg. Flow Depth=0.98' Max Vel=6.98 fps Inflow=8.53 cfs 0.772 af
18.0" Round Pipe n=0.013 L=35.0' S=0.0114 '/' Capacity=11.23 cfs Outflow=8.46 cfs 0.772 af

Reach DMH113: TO DMH#114 Avg. Flow Depth=1.11' Max Vel=8.53 fps Inflow=12.00 cfs 1.064 af
18.0" Round Pipe n=0.013 L=28.0' S=0.0161 '/' Capacity=13.32 cfs Outflow=11.97 cfs 1.064 af

Reach DMH114: TO DMH-K1 Avg. Flow Depth=0.88' Max Vel=11.17 fps Inflow=11.97 cfs 1.064 af
18.0" Round Pipe n=0.013 L=8.0' S=0.0313 '/' Capacity=18.57 cfs Outflow=11.96 cfs 1.064 af

Reach DMHR1: TO DMH#104 Avg. Flow Depth=0.66' Max Vel=7.89 fps Inflow=4.39 cfs 0.344 af
12.0" Round Pipe n=0.012 L=94.0' S=0.0213 '/' Capacity=5.63 cfs Outflow=4.36 cfs 0.344 af

Reach DMHR2: TO DMH#R2 Avg. Flow Depth=0.78' Max Vel=6.67 fps Inflow=4.49 cfs 0.344 af
12.0" Round Pipe n=0.010 L=131.0' S=0.0099 '/' Capacity=4.61 cfs Outflow=4.39 cfs 0.344 af

Reach DP#6: OFFSITE LOW POINT Inflow=0.34 cfs 0.026 af
Outflow=0.34 cfs 0.026 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=27.03 cfs 2.513 af
Outflow=27.03 cfs 2.513 af

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

Reach DP4: DMH-K1 Inflow=11.96 cfs 1.064 af
Outflow=11.96 cfs 1.064 af

Reach DP5: DCB-H

Reach RF1: TO DMH#101 Avg. Flow Depth=0.84' Max Vel=8.08 fps Inflow=5.74 cfs 0.513 af
12.0" Round Pipe n=0.012 L=24.0' S=0.0208 '/' Capacity=5.57 cfs Outflow=5.70 cfs 0.513 af

Reach RF2: TO DMH#101 Avg. Flow Depth=0.00' Max Vel=0.00 fps
10.0" Round Pipe n=0.012 L=24.0' S=0.0208 '/' Capacity=3.43 cfs Outflow=0.00 cfs 0.000 af

Reach UGS1A: TO UGS#1 Inflow=6.64 cfs 0.550 af
Outflow=6.64 cfs 0.550 af

Reach UGS1B: TO DMH106 Avg. Flow Depth=0.69' Max Vel=6.49 fps Inflow=3.75 cfs 0.145 af
12.0" Round Pipe n=0.011 L=17.0' S=0.0118 '/' Capacity=4.57 cfs Outflow=3.76 cfs 0.145 af

Reach UGS2A: TO UGS#2 Inflow=4.17 cfs 0.348 af
Outflow=4.17 cfs 0.348 af

Reach UGS2B: TO DMH#112 Avg. Flow Depth=0.68' Max Vel=5.23 fps Inflow=3.60 cfs 0.346 af
15.0" Round Pipe n=0.013 L=84.0' S=0.0095 '/' Capacity=6.30 cfs Outflow=3.36 cfs 0.346 af

Pond DMH-B: TO DMH-D Peak Elev=0.00'
15.0" Round Culvert n=0.011 L=45.0' S=0.0200 '/' Primary=0.00 cfs 0.000 af

Pond UGS1: TO DMH#106 Peak Elev=468.50' Storage=0.162 af Inflow=6.64 cfs 0.550 af
Discarded=0.28 cfs 0.405 af Primary=3.75 cfs 0.145 af Outflow=4.03 cfs 0.550 af

Pond UGS2: TO UGS#2B Peak Elev=464.81' Storage=0.094 af Inflow=4.17 cfs 0.348 af
Outflow=3.60 cfs 0.346 af

Total Runoff Area = 8.235 ac Runoff Volume = 4.156 af Average Runoff Depth = 6.06"
29.06% Pervious = 2.393 ac 70.94% Impervious = 5.842 ac

Summary for Subcatchment P100A: TO 12" ROOF DRAIN

[49] Hint: Tc<2dt may require smaller dt

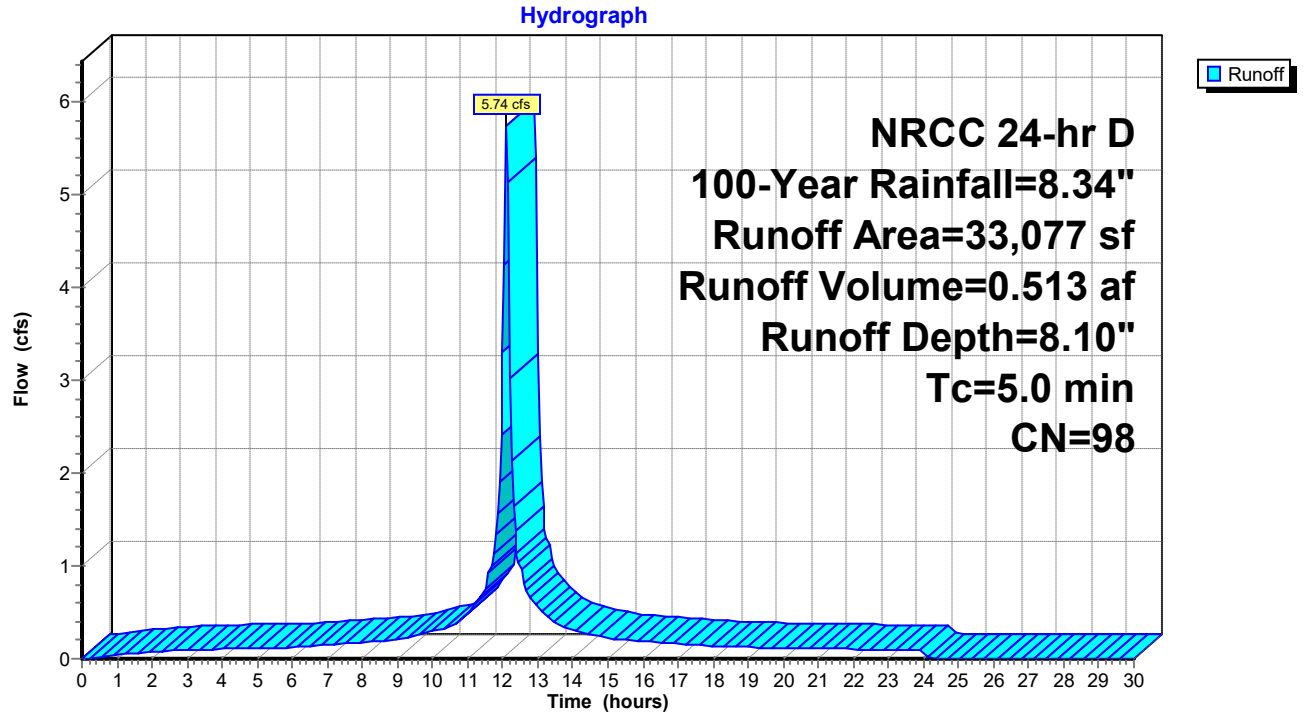
Runoff = 5.74 cfs @ 12.11 hrs, Volume= 0.513 af, Depth= 8.10"
Routed to Reach RF1 : TO DMH#101

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
33,077	98	Paved parking, HSG A
33,077		100.00% Impervious Area

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

Subcatchment P100A: TO 12" ROOF DRAIN



Summary for Subcatchment P100B: TO YARD DRAIN

[49] Hint: Tc<2dt may require smaller dt

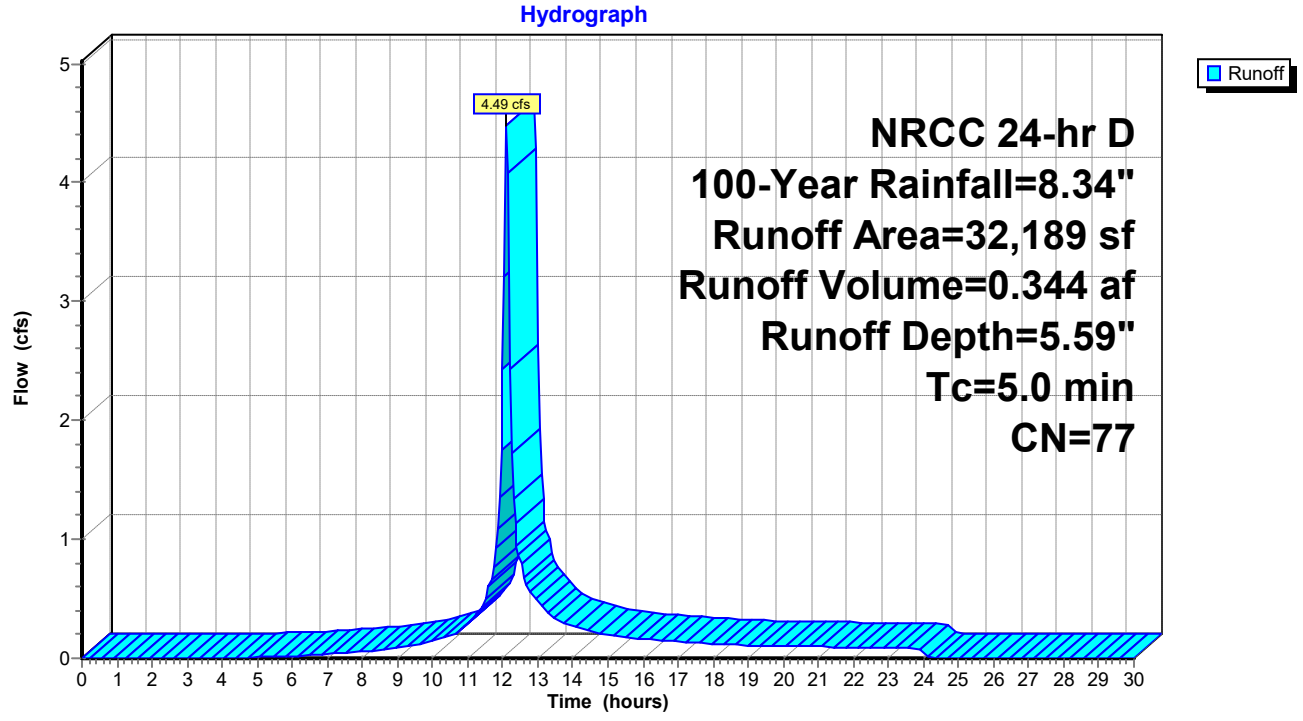
Runoff = 4.49 cfs @ 12.11 hrs, Volume= 0.344 af, Depth= 5.59"
Routed to Reach DMHR2 : TO DMH#R2

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
32,189	77	1/8 acre lots, 65% imp, HSG A
11,266		35.00% Pervious Area
20,923		65.00% Impervious Area

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

Subcatchment P100B: TO YARD DRAIN



Summary for Subcatchment P100D: TO 12" ROOF DRAIN

[49] Hint: Tc<2dt may require smaller dt

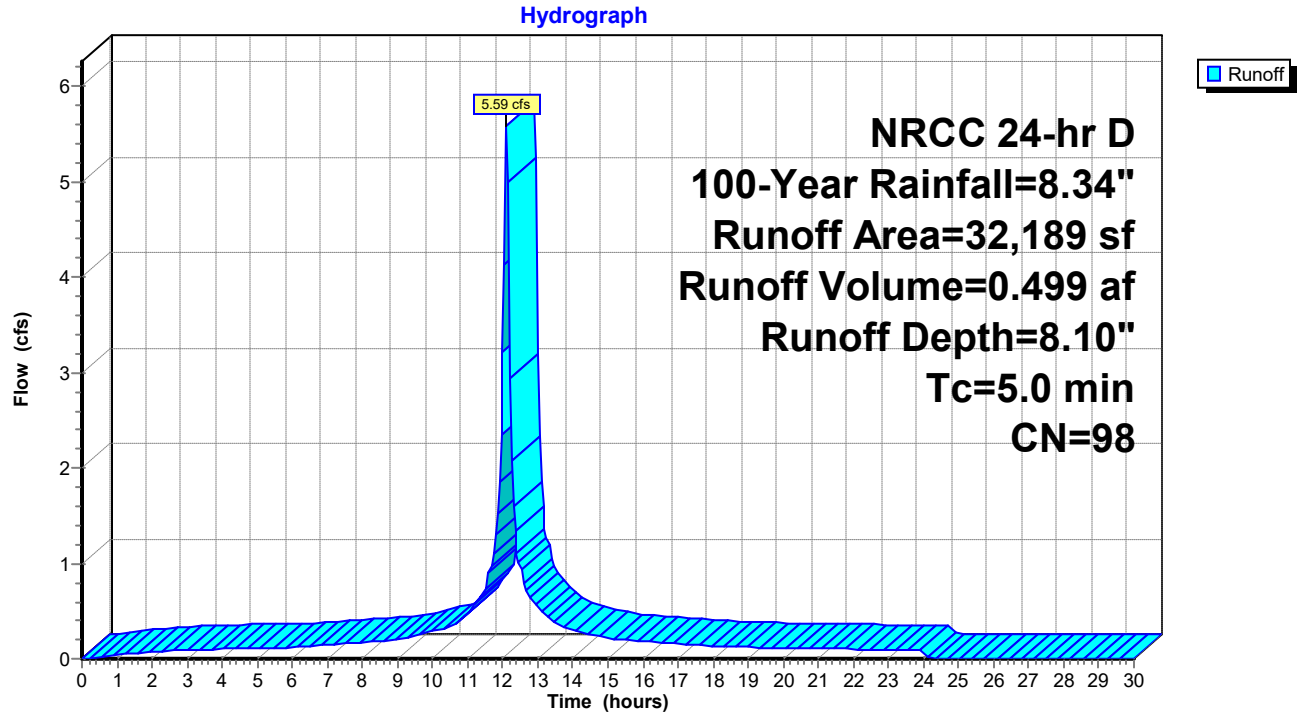
Runoff = 5.59 cfs @ 12.11 hrs, Volume= 0.499 af, Depth= 8.10"
Routed to Reach DMH103 : TO CMH#2

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
32,189	98	Paved parking, HSG A
32,189		100.00% Impervious Area

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

Subcatchment P100D: TO 12" ROOF DRAIN



Summary for Subcatchment P105: TO DCB#5

[49] Hint: Tc<2dt may require smaller dt

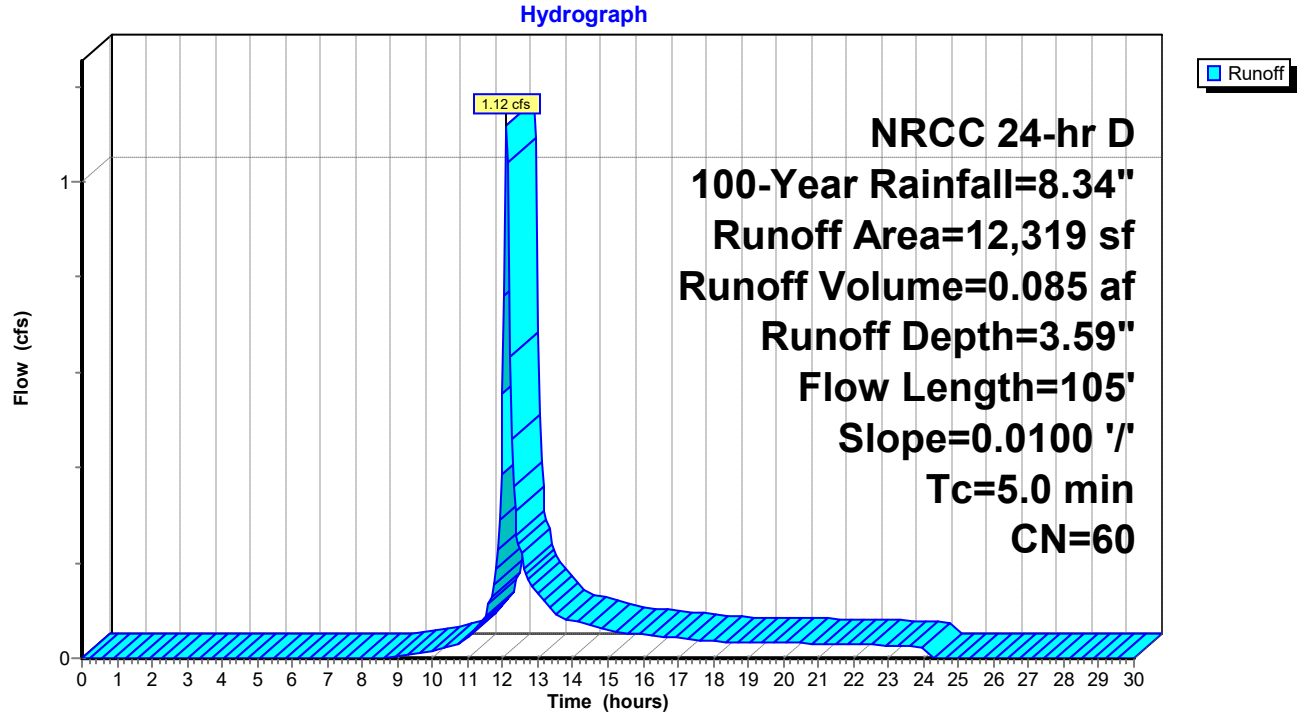
Runoff = 1.12 cfs @ 12.12 hrs, Volume= 0.085 af, Depth= 3.59"
Routed to Reach DCB5 : TO DMH#108

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
7,950	39	>75% Grass cover, Good, HSG A
4,369	98	Paved parking, HSG A
12,319	60	Weighted Average
7,950		64.53% Pervious Area
4,369		35.47% 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 P105: TO DCB#5



Summary for Subcatchment P106: TO DCB#6

[49] Hint: Tc<2dt may require smaller dt

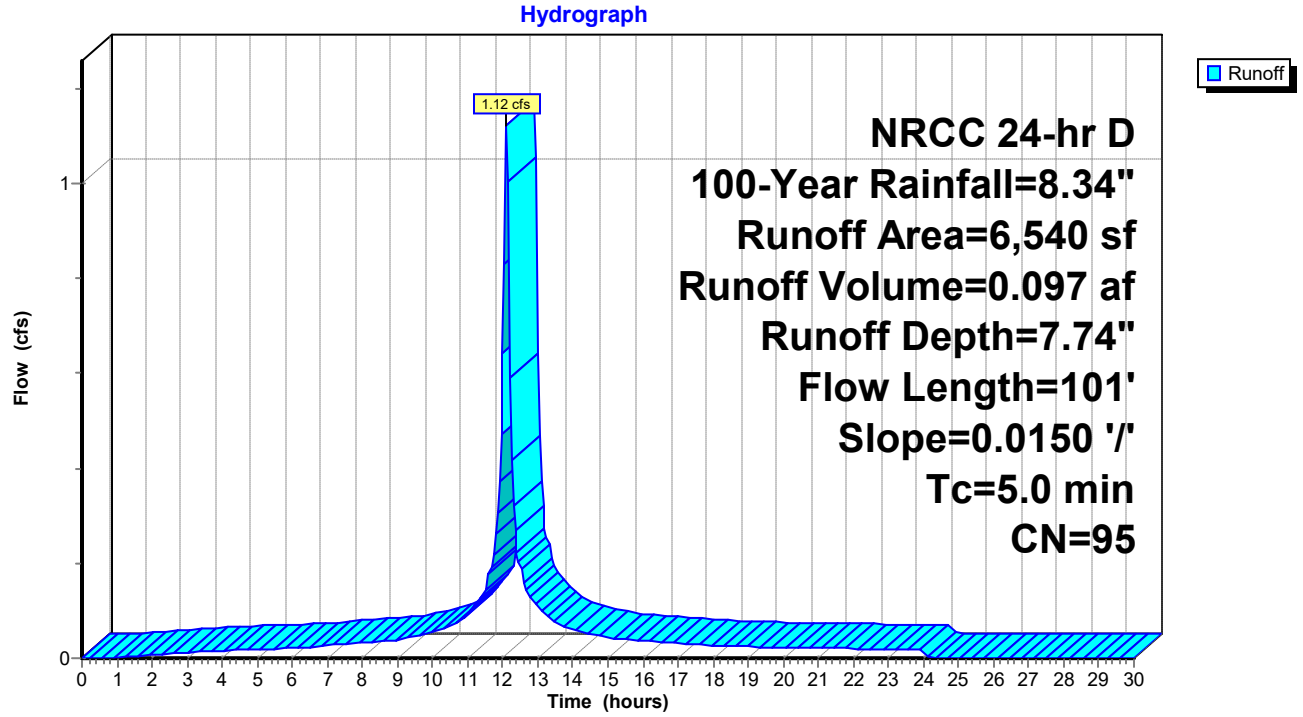
Runoff = 1.12 cfs @ 12.11 hrs, Volume= 0.097 af, Depth= 7.74"
Routed to Reach DCB6 : TO DMH#107

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
375	39	>75% Grass cover, Good, HSG A
6,165	98	Paved parking, HSG A
6,540	95	Weighted Average
375		5.73% Pervious Area
6,165		94.27% 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"
0.3	51	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	101	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P106: TO DCB#6



Summary for Subcatchment P107: TO DCB#7

[49] Hint: Tc<2dt may require smaller dt

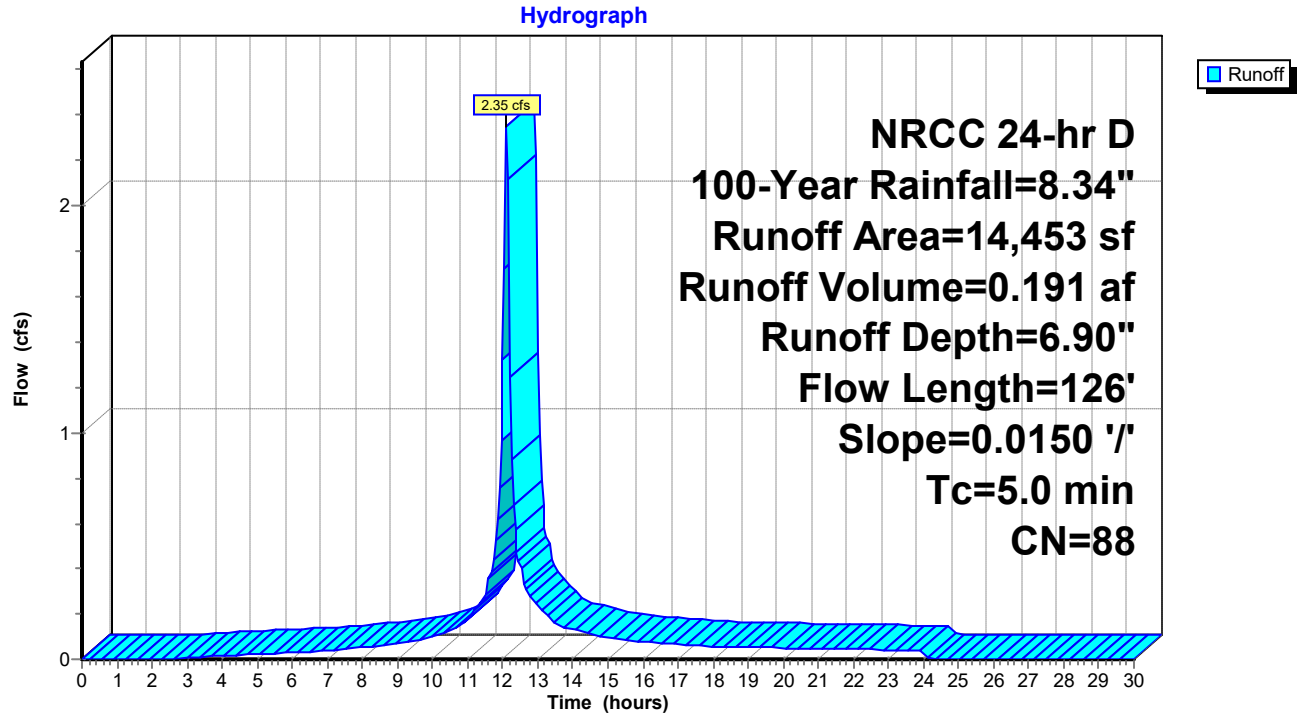
Runoff = 2.35 cfs @ 12.11 hrs, Volume= 0.191 af, Depth= 6.90"
Routed to Reach DCB7 : TO DMH#102

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
2,411	39	>75% Grass cover, Good, HSG A
12,042	98	Paved parking, HSG A
14,453	88	Weighted Average
2,411		16.68% Pervious Area
12,042		83.32% 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"
0.7	42	0.0150	1.02		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	76	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.7	126	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P107: TO DCB#7



Summary for Subcatchment P108: TO DCB#8

[49] Hint: Tc<2dt may require smaller dt

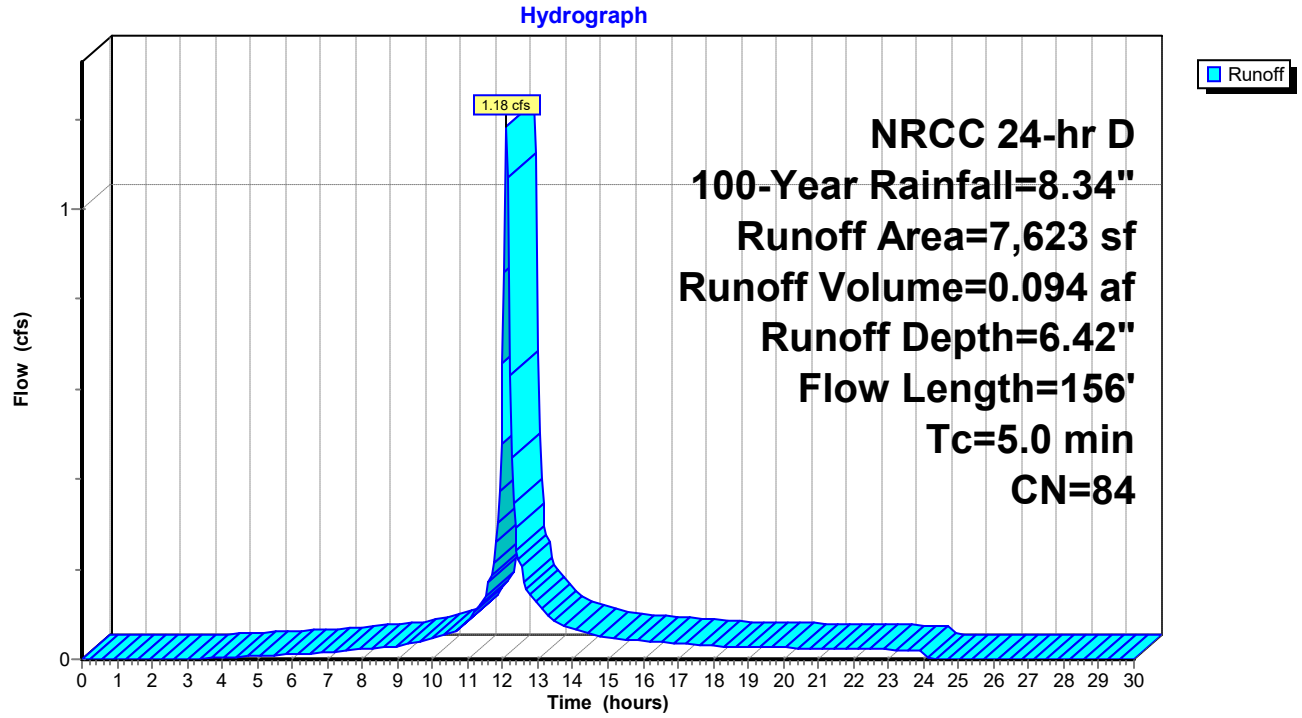
Runoff = 1.18 cfs @ 12.11 hrs, Volume= 0.094 af, Depth= 6.42"
Routed to Reach DCB8 : TO DMH#103

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
1,804	39	>75% Grass cover, Good, HSG A
5,819	98	Paved parking, HSG A
7,623	84	Weighted Average
1,804		23.67% Pervious Area
5,819		76.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	16	0.0150	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	34	0.0100	0.83		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	106	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.2	156	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P108: TO DCB#8



Summary for Subcatchment P109: TO DCB#9

[49] Hint: Tc<2dt may require smaller dt

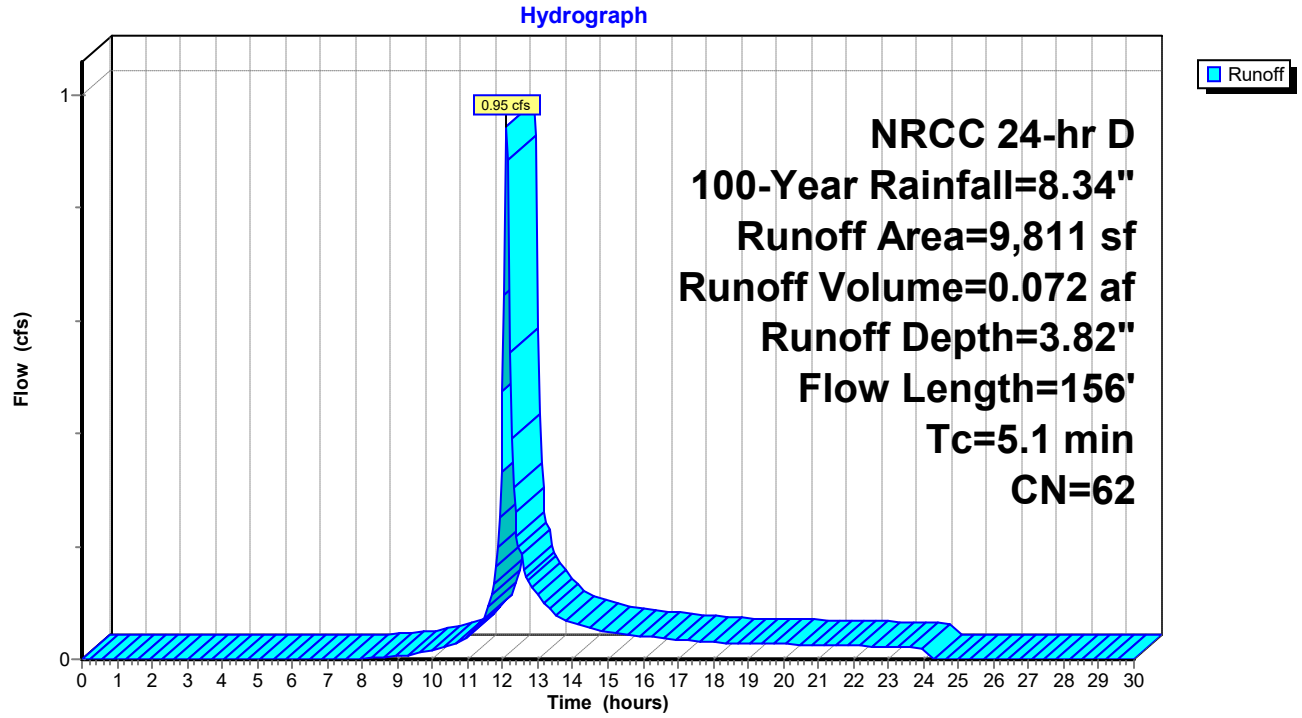
Runoff = 0.95 cfs @ 12.12 hrs, Volume= 0.072 af, Depth= 3.82"
Routed to Reach DCB9 : TO DMH#103

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
5,927	39	>75% Grass cover, Good, HSG A
3,884	98	Paved parking, HSG A
9,811	62	Weighted Average
5,927		60.41% Pervious Area
3,884		39.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	25	0.0150	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.5	25	0.0100	0.78		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.9	106	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.1	156	Total			

Subcatchment P109: TO DCB#9



Summary for Subcatchment P11: TO DP#1

[49] Hint: Tc<2dt may require smaller dt

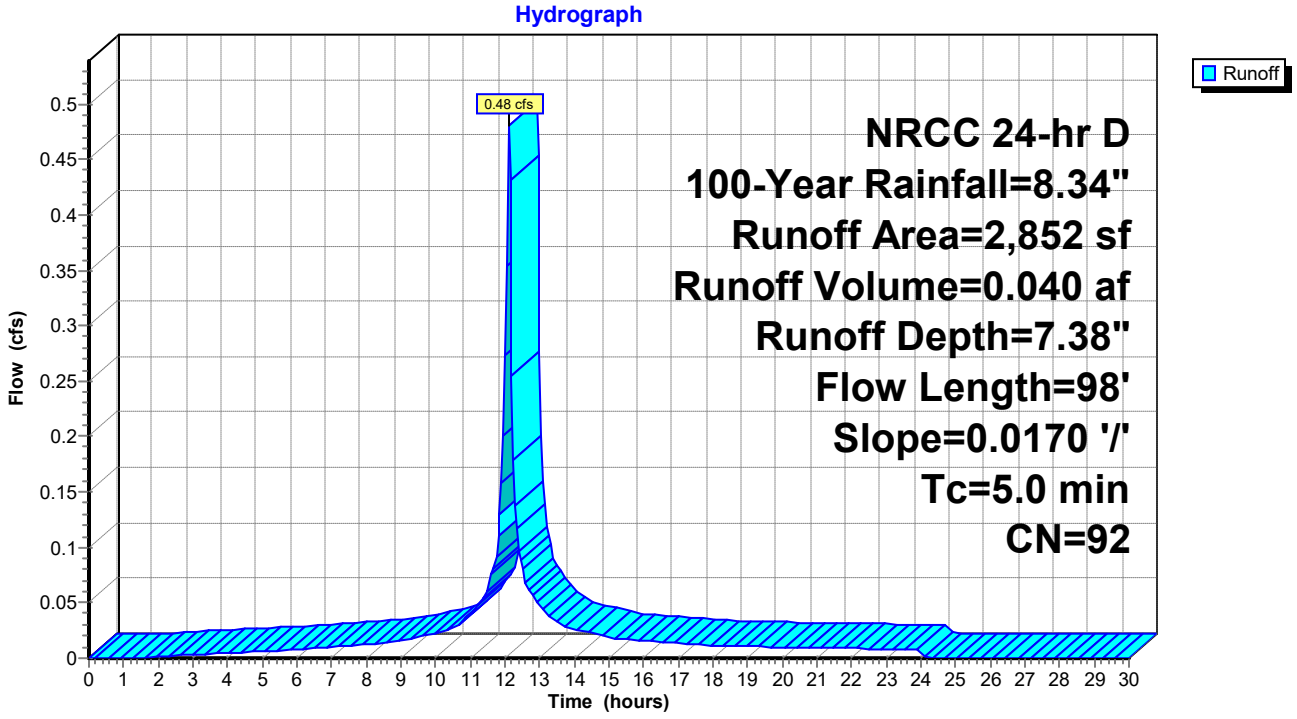
Runoff = 0.48 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 7.38"
Routed to Reach DP1 : GUTTER POINT FRANKLIN (WEST)

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 P110: TO DCB#10

[49] Hint: Tc<2dt may require smaller dt

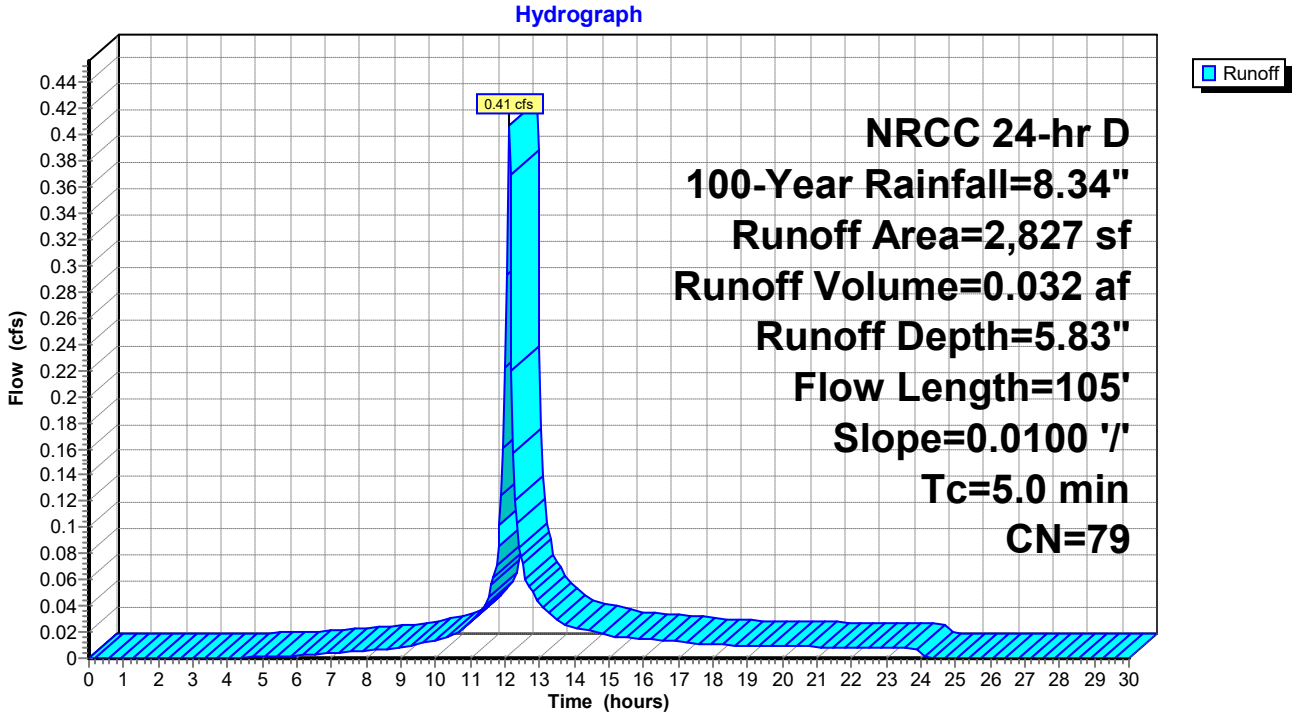
Runoff = 0.41 cfs @ 12.11 hrs, Volume= 0.032 af, Depth= 5.83"
Routed to Reach DCB10 : TO DMH#106

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
907	39	>75% Grass cover, Good, HSG A
1,920	98	Paved parking, HSG A
2,827	79	Weighted Average
907		32.08% Pervious Area
1,920		67.92% 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 P110: TO DCB#10



Summary for Subcatchment P111: TO DCB#11

[49] Hint: Tc<2dt may require smaller dt

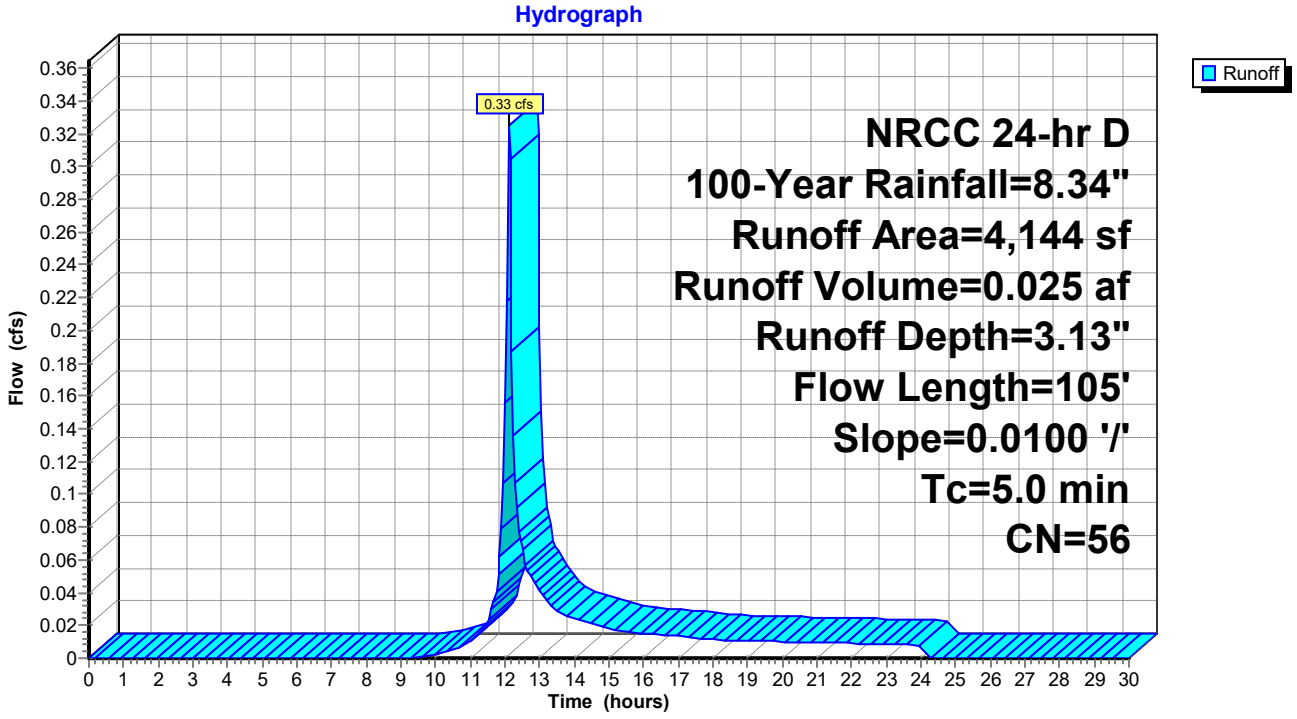
Runoff = 0.33 cfs @ 12.12 hrs, Volume= 0.025 af, Depth= 3.13"
Routed to Reach DCB11 : TO DMH#103

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
2,953	39	>75% Grass cover, Good, HSG A
1,191	98	Paved parking, HSG A
4,144	56	Weighted Average
2,953		71.26% Pervious Area
1,191		28.74% 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 P111: TO DCB#11



Summary for Subcatchment P112: TO DCB#12

[49] Hint: Tc<2dt may require smaller dt

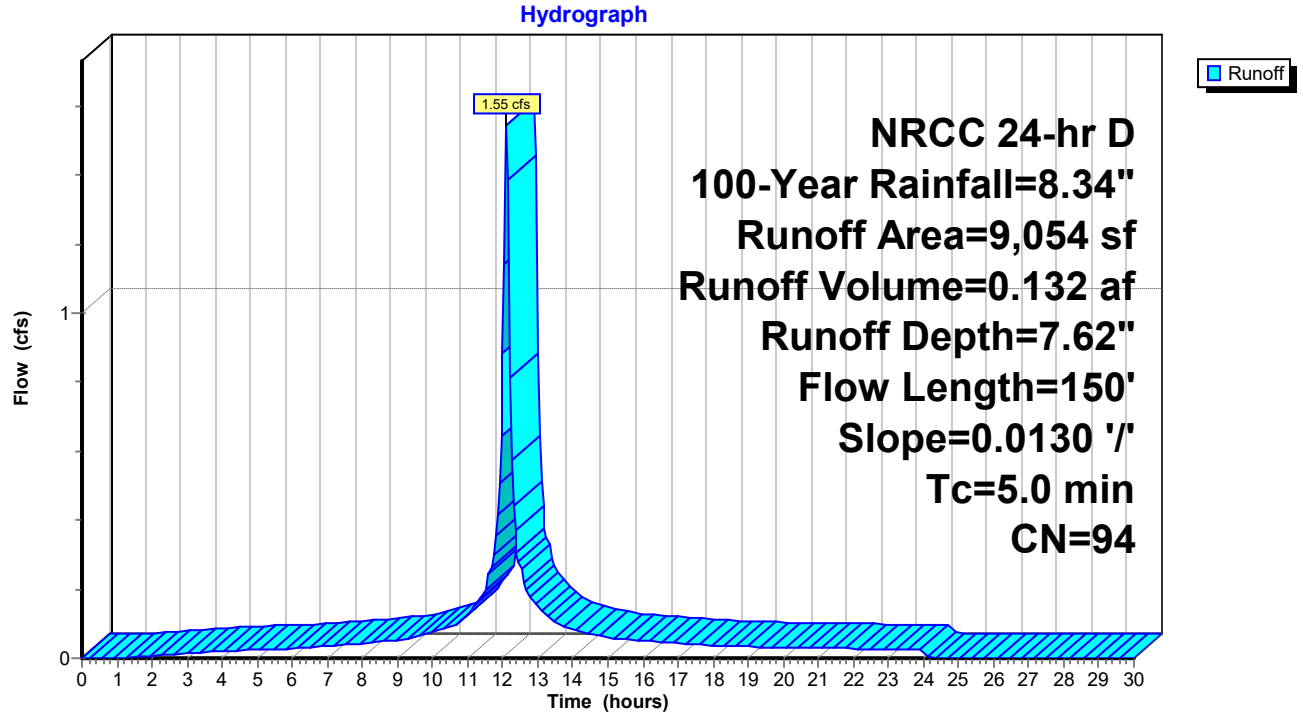
Runoff = 1.55 cfs @ 12.11 hrs, Volume= 0.132 af, Depth= 7.62"
Routed to Reach DCB12 : TO DMH#12

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
575	39	>75% Grass cover, Good, HSG A
8,479	98	Paved parking, HSG A
9,054	94	Weighted Average
575		6.35% Pervious Area
8,479		93.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0130	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	100	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	150	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P112: TO DCB#12



Summary for Subcatchment P113: TO DCB#13

[49] Hint: Tc<2dt may require smaller dt

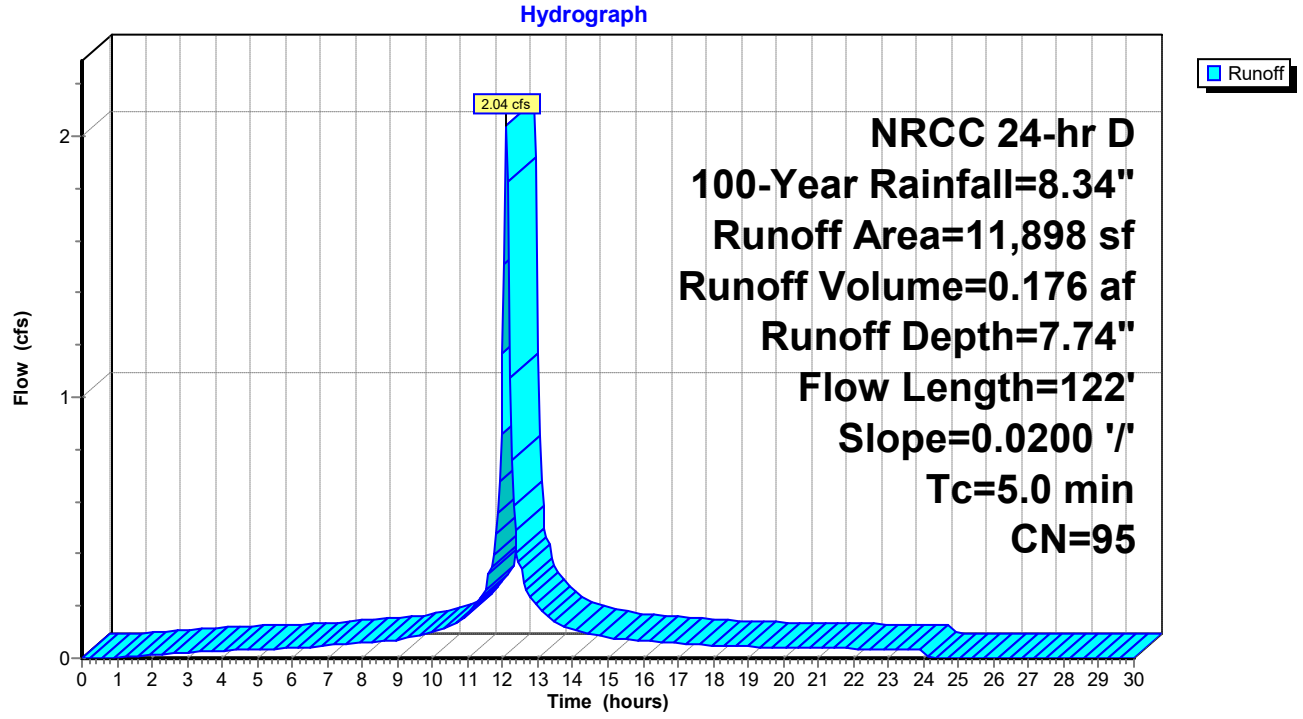
Runoff = 2.04 cfs @ 12.11 hrs, Volume= 0.176 af, Depth= 7.74"
Routed to Reach DCB13 : TO DMH#102

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
656	39	>75% Grass cover, Good, HSG A
11,242	98	Paved parking, HSG A
11,898	95	Weighted Average
656		5.51% Pervious Area
11,242		94.49% 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"
0.4	72	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	122	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P113: TO DCB#13



Summary for Subcatchment P114: TO DCB#14

[49] Hint: Tc<2dt may require smaller dt

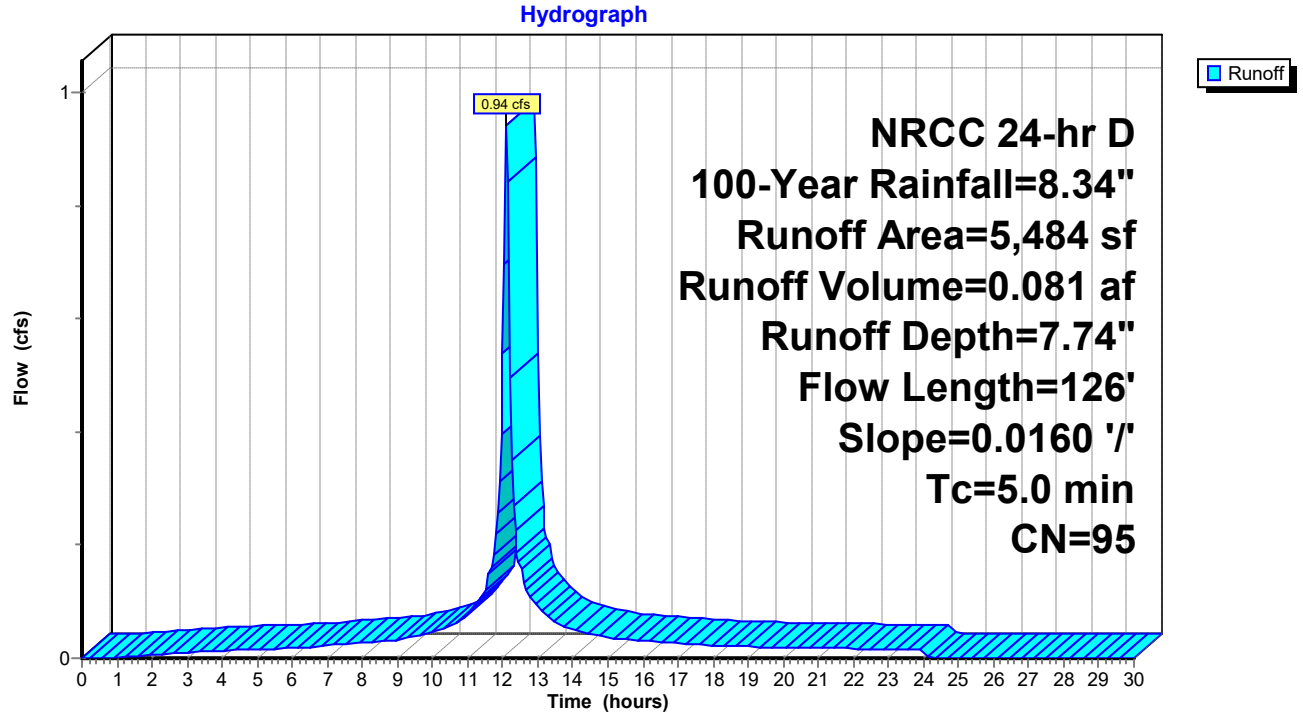
Runoff = 0.94 cfs @ 12.11 hrs, Volume= 0.081 af, Depth= 7.74"
Routed to Reach DCB14 : TO DMH#109

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
306	39	>75% Grass cover, Good, HSG A
5,178	98	Paved parking, HSG A
5,484	95	Weighted Average
306		5.58% Pervious Area
5,178		94.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0160	1.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.5	76	0.0160	2.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	126	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P114: TO DCB#14



Summary for Subcatchment P115: TO DCB#15

[49] Hint: Tc<2dt may require smaller dt

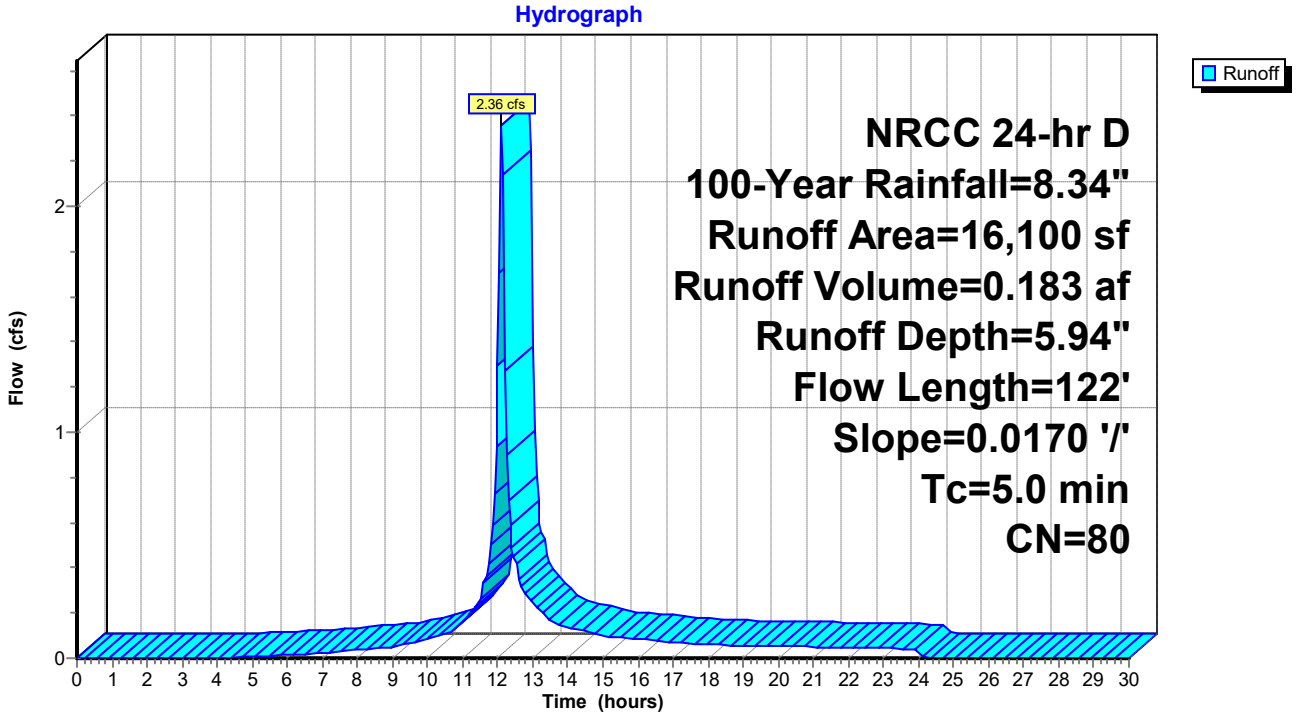
Runoff = 2.36 cfs @ 12.11 hrs, Volume= 0.183 af, Depth= 5.94"
Routed to Reach DCB15 : TO DMH#102

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
4,821	39	>75% Grass cover, Good, HSG A
11,279	98	Paved parking, HSG A
16,100	80	Weighted Average
4,821		29.94% Pervious Area
11,279		70.06% 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"
0.5	72	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	122	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P115: TO DCB#15



Summary for Subcatchment P116: TO DCB#25

[49] Hint: Tc<2dt may require smaller dt

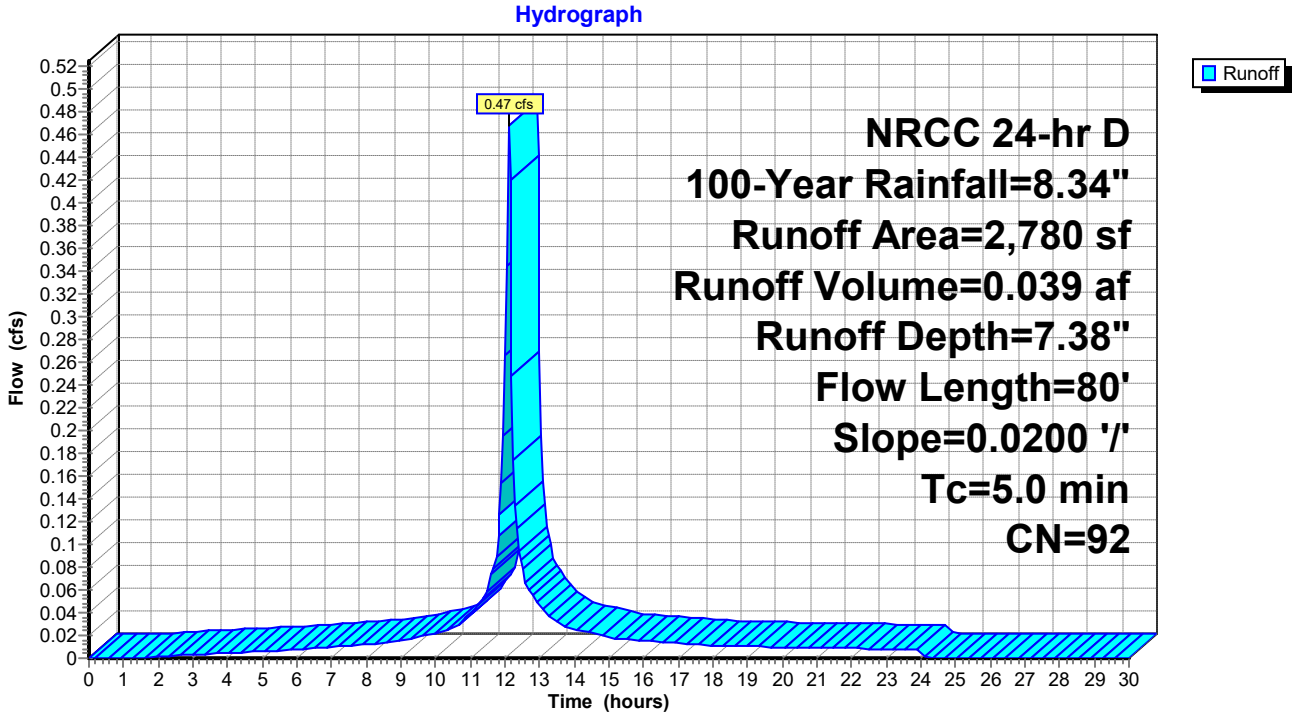
Runoff = 0.47 cfs @ 12.11 hrs, Volume= 0.039 af, Depth= 7.38"
Routed to Reach DCB25 : TO DMH#109A

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
297	39	>75% Grass cover, Good, HSG A
2,483	98	Paved parking, HSG A
2,780	92	Weighted Average
297		10.68% Pervious Area
2,483		89.32% 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"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	80	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P116: TO DCB#25



Summary for Subcatchment P117: TO DP#6

[49] Hint: Tc<2dt may require smaller dt

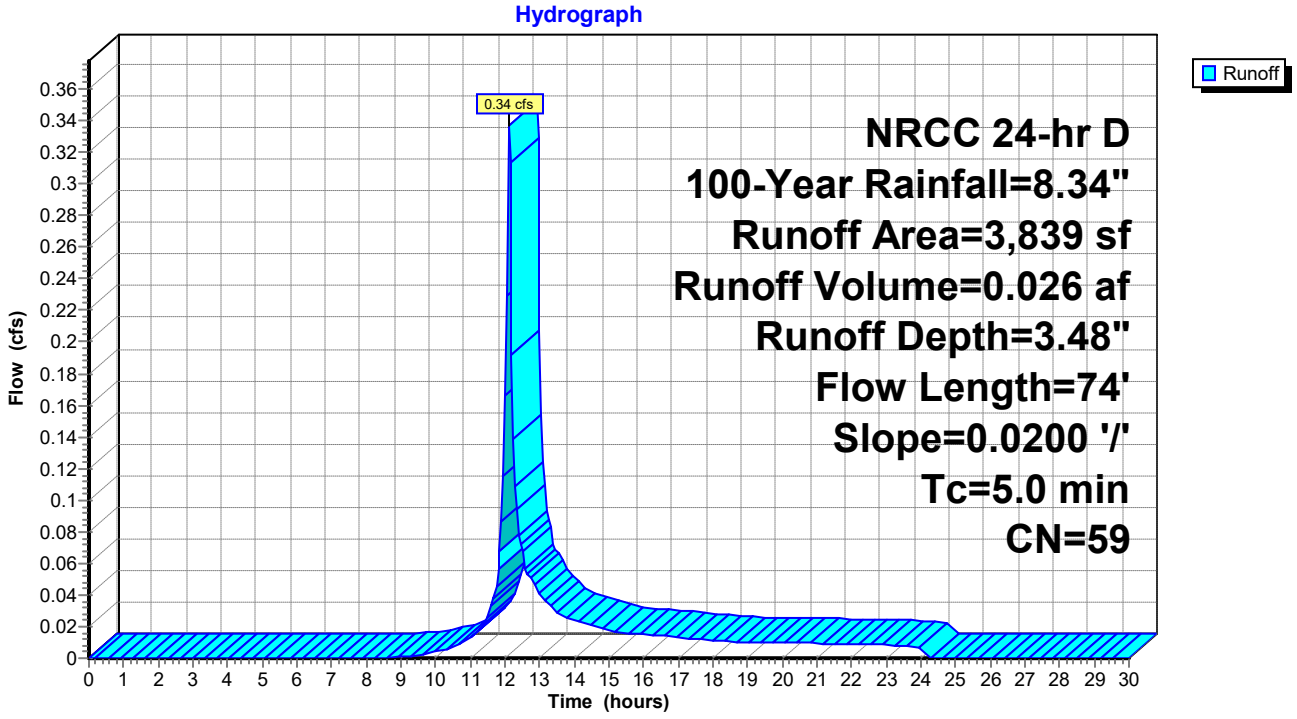
Runoff = 0.34 cfs @ 12.12 hrs, Volume= 0.026 af, Depth= 3.48"
Routed to Reach DP#6 : OFFSITE LOW POINT

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
2,555	39	>75% Grass cover, Good, HSG A
1,284	98	Paved parking, HSG A
3,839	59	Weighted Average
2,555		66.55% Pervious Area
1,284		33.45% 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 P117: TO DP#6



Summary for Subcatchment P119: TO DCB#19

[49] Hint: Tc<2dt may require smaller dt

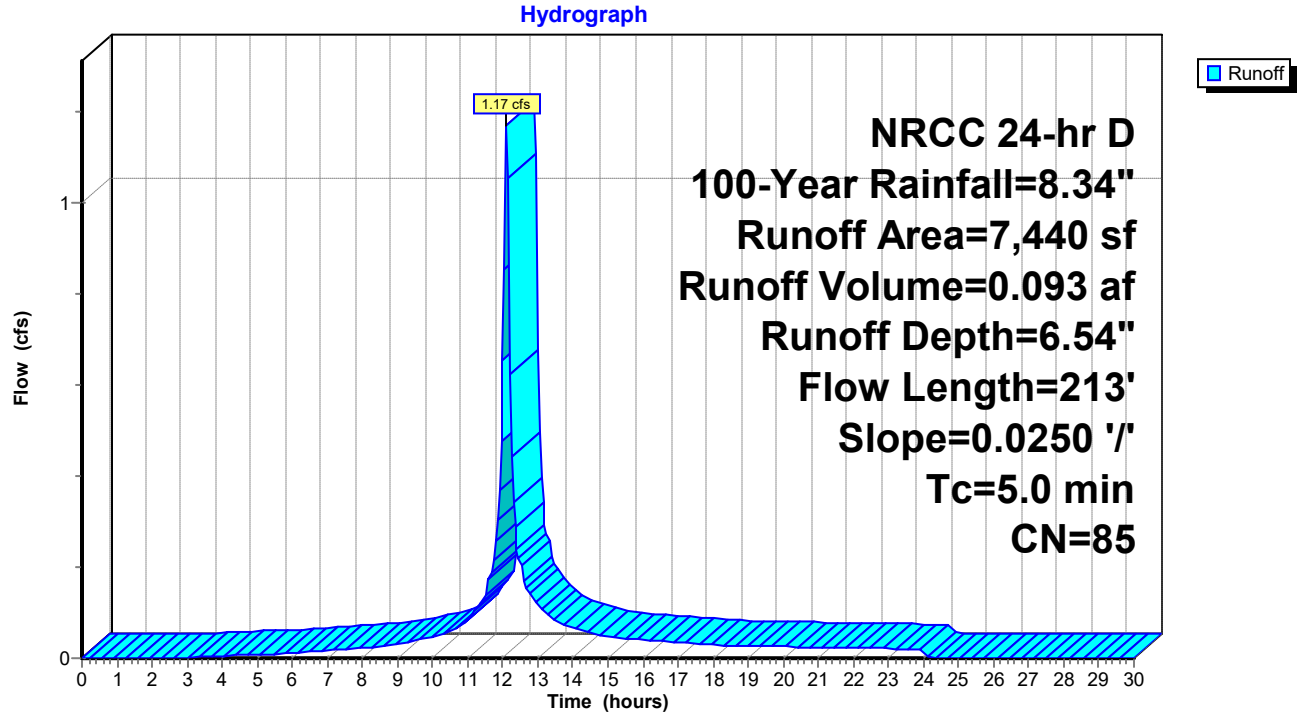
Runoff = 1.17 cfs @ 12.11 hrs, Volume= 0.093 af, Depth= 6.54"
Routed to Reach DCB19 : TO DMH#111

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
1,625	39	>75% Grass cover, Good, HSG A
5,815	98	Paved parking, HSG A
7,440	85	Weighted Average
1,625		21.84% Pervious Area
5,815		78.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	163	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.4	213	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P119: TO DCB#19



Summary for Subcatchment P12: TO DCB-A

[49] Hint: Tc<2dt may require smaller dt

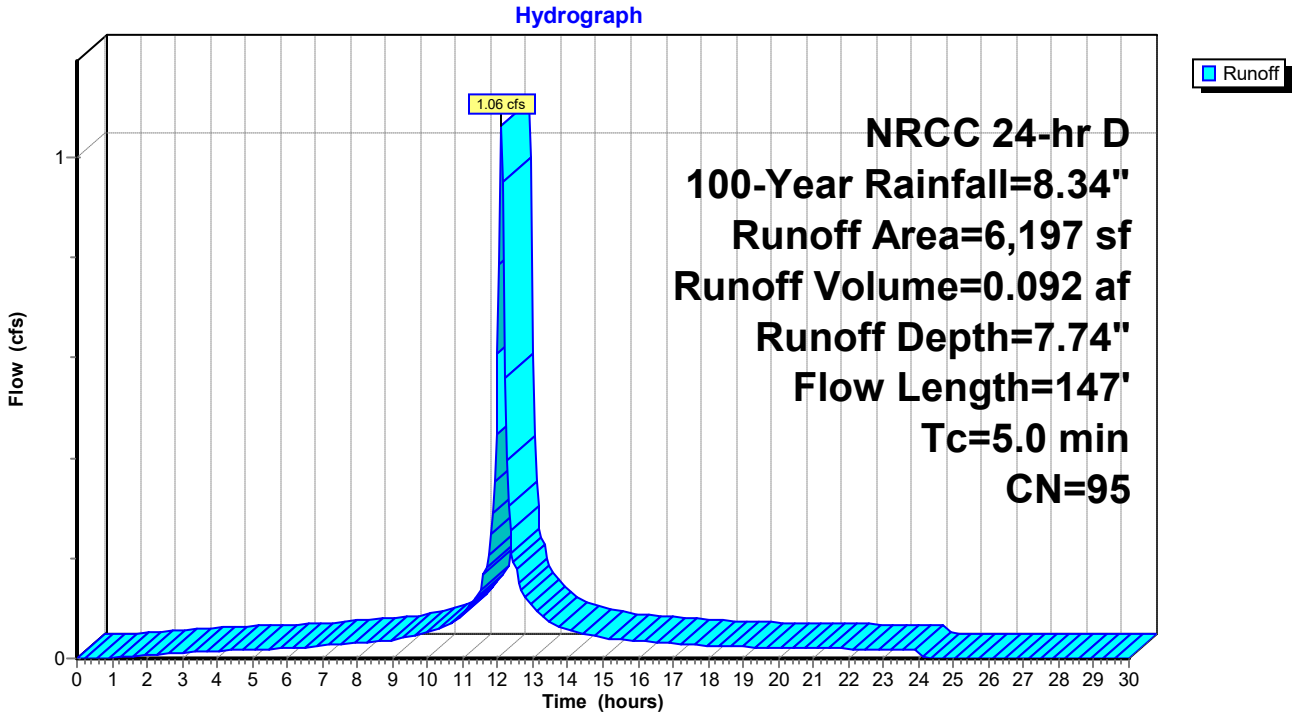
Runoff = 1.06 cfs @ 12.11 hrs, Volume= 0.092 af, Depth= 7.74"
Routed to Reach DCB-A : TO DMH-D

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
334	39	>75% Grass cover, Good, HSG A
5,863	98	Paved parking, HSG A
6,197	95	Weighted Average
334		5.39% Pervious Area
5,863		94.61% 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 P120: TO DCB#20

[49] Hint: Tc<2dt may require smaller dt

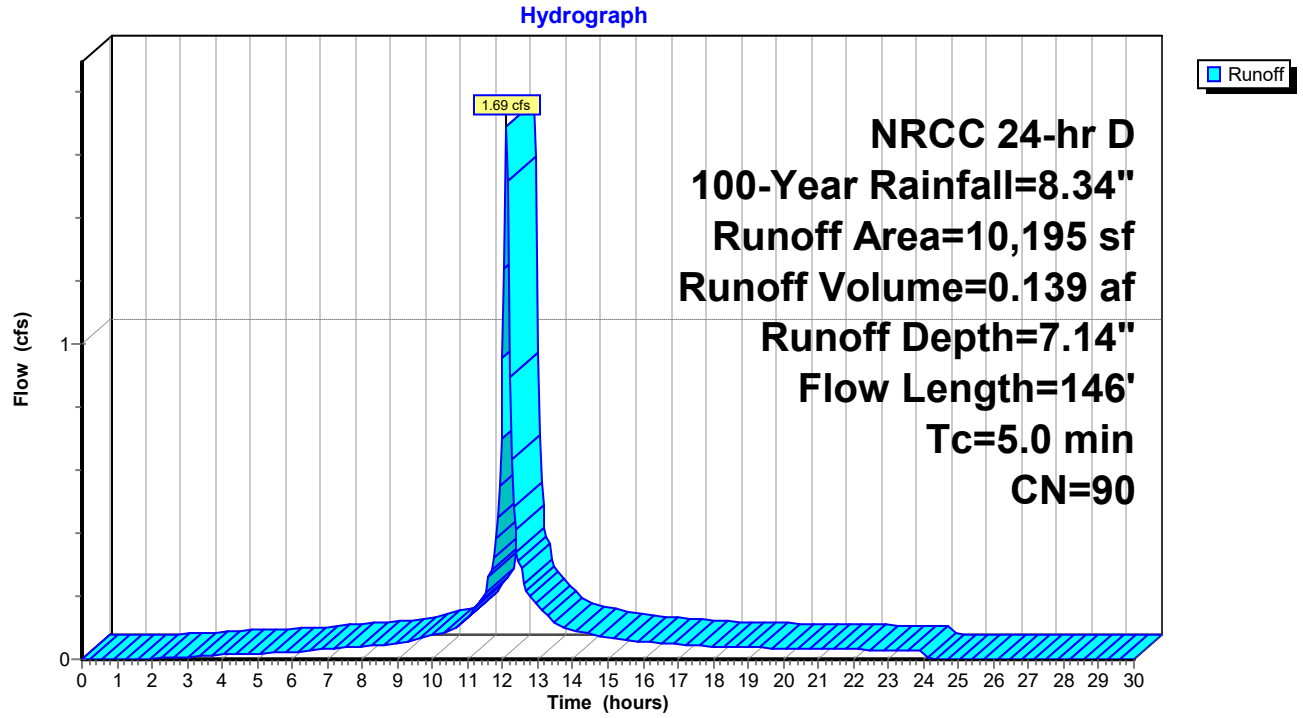
Runoff = 1.69 cfs @ 12.11 hrs, Volume= 0.139 af, Depth= 7.14"
Routed to Reach DCB20 : TO DMH#109

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
1,453	39	>75% Grass cover, Good, HSG A
8,742	98	Paved parking, HSG A
10,195	90	Weighted Average
1,453		14.25% Pervious Area
8,742		85.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	5	0.0200	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	45	0.0150	1.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.6	96	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.2	146	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P120: TO DCB#20



Summary for Subcatchment P121: TO DCB#21

[49] Hint: Tc<2dt may require smaller dt

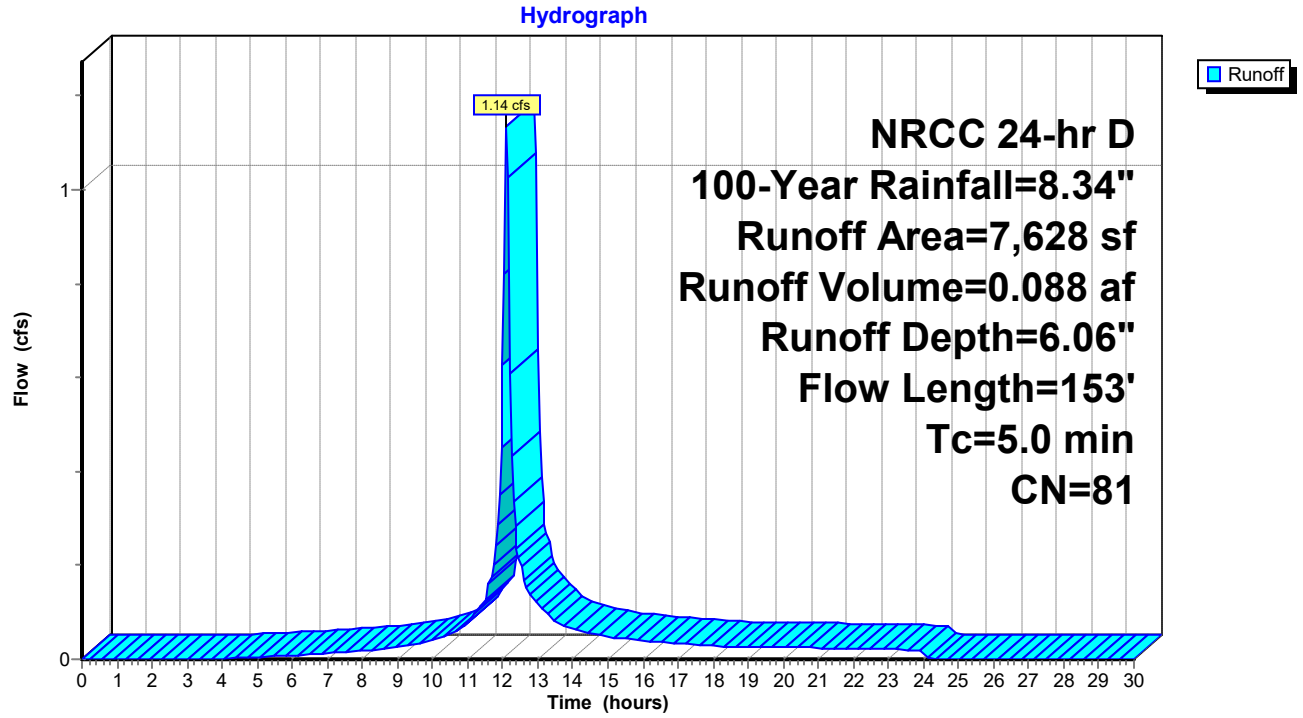
Runoff = 1.14 cfs @ 12.11 hrs, Volume= 0.088 af, Depth= 6.06"
Routed to Reach DCB21 : TO DMH#109A

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
2,211	39	>75% Grass cover, Good, HSG A
5,417	98	Paved parking, HSG A
7,628	81	Weighted Average
2,211		28.99% Pervious Area
5,417		71.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	12	0.1000	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	38	0.0100	0.85		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.8	103	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.5	153	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P121: TO DCB#21



Summary for Subcatchment P122: TO DCB#22

[49] Hint: Tc<2dt may require smaller dt

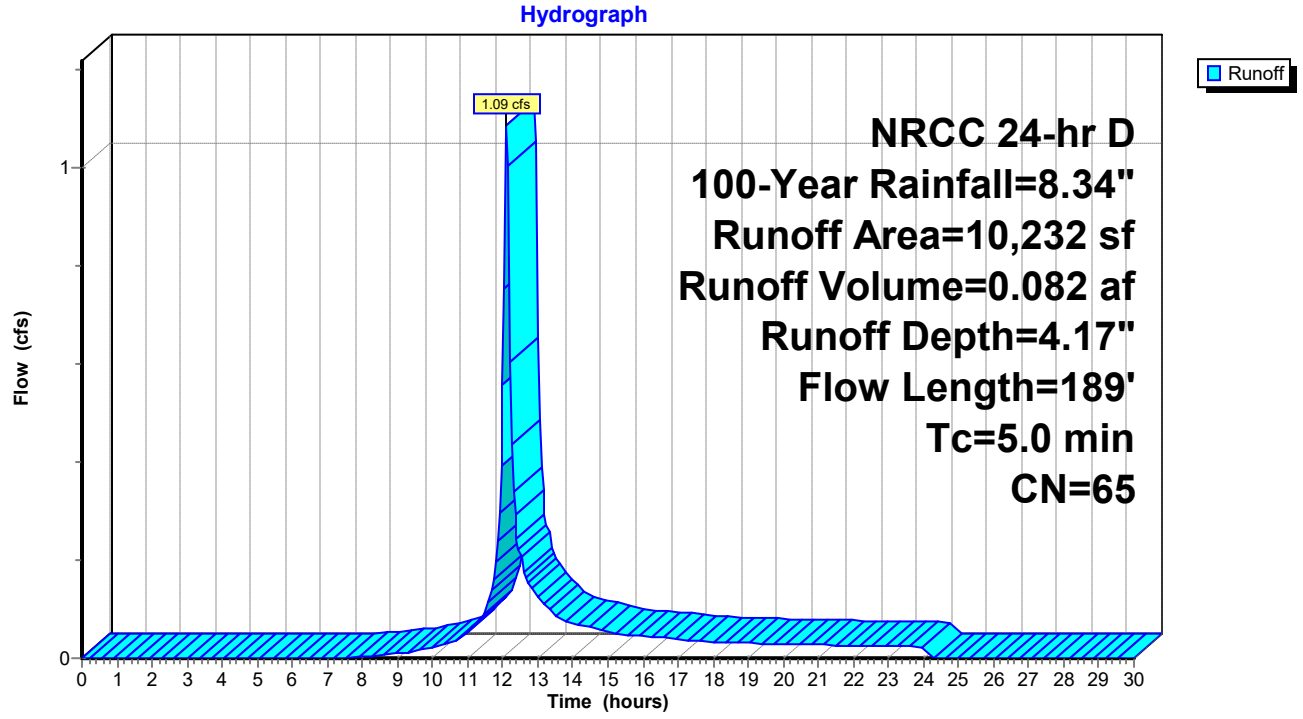
Runoff = 1.09 cfs @ 12.12 hrs, Volume= 0.082 af, Depth= 4.17"
Routed to Reach DCB22 : TO DMH#111

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
5,643	39	>75% Grass cover, Good, HSG A
4,589	98	Paved parking, HSG A
10,232	65	Weighted Average
5,643		55.15% Pervious Area
4,589		44.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	50	0.1000	0.28		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.7	139	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.7	189	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P122: TO DCB#22



Summary for Subcatchment P123: TO DCB#23

[49] Hint: Tc<2dt may require smaller dt

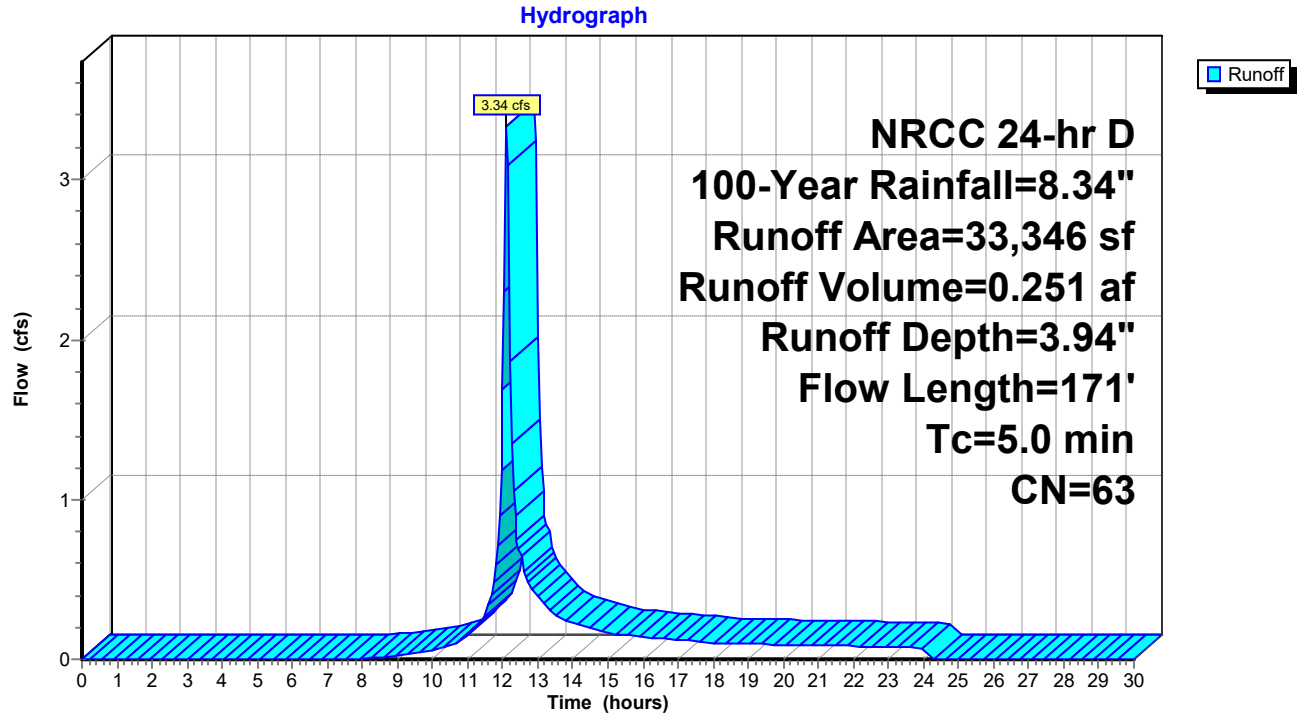
Runoff = 3.34 cfs @ 12.12 hrs, Volume= 0.251 af, Depth= 3.94"
Routed to Reach DCB23 : TO DMH#111

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
20,008	39	>75% Grass cover, Good, HSG A
13,338	98	Paved parking, HSG A
33,346	63	Weighted Average
20,008		60.00% Pervious Area
13,338		40.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	40	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	10	0.0200	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	121	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	171	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P123: TO DCB#23



Summary for Subcatchment P14: TO DCB-B

[49] Hint: Tc<2dt may require smaller dt

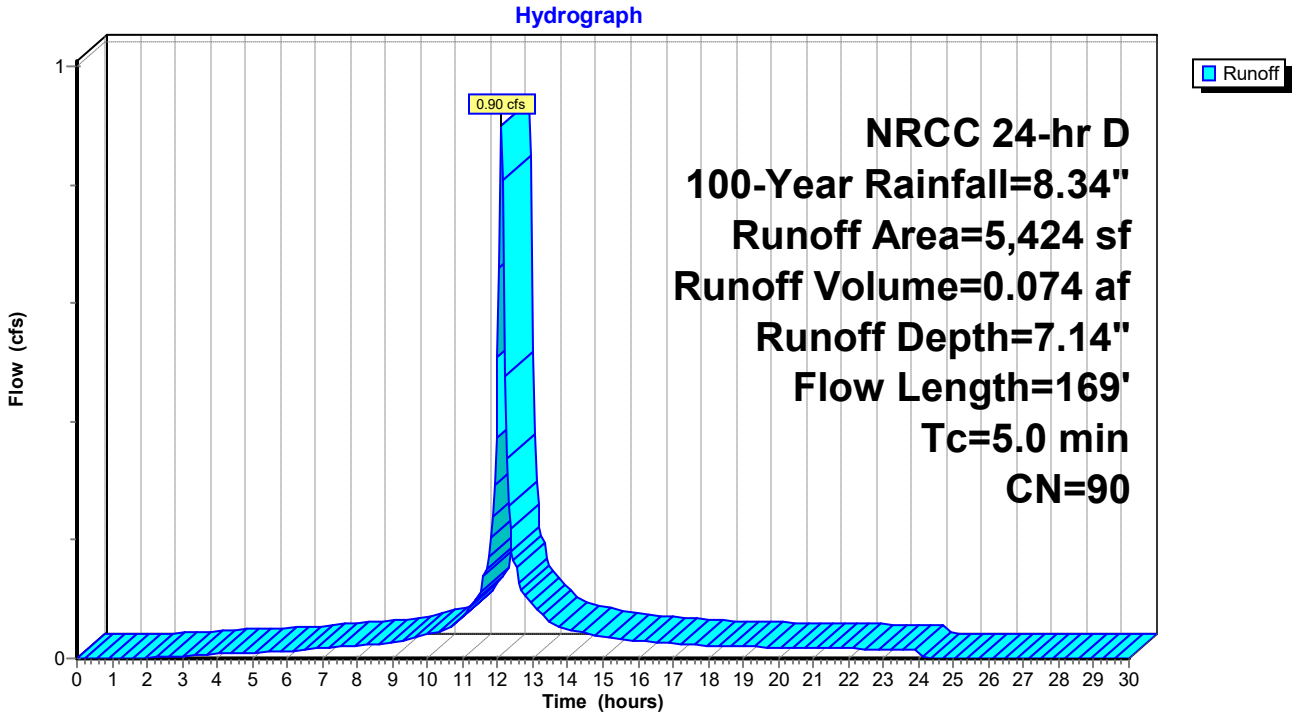
Runoff = 0.90 cfs @ 12.11 hrs, Volume= 0.074 af, Depth= 7.14"
Routed to Reach DCB-B : TO DMH-E

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
692	39	>75% Grass cover, Good, HSG A
4,732	98	Paved parking, HSG A
5,424	90	Weighted Average
692		12.76% Pervious Area
4,732		87.24% 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

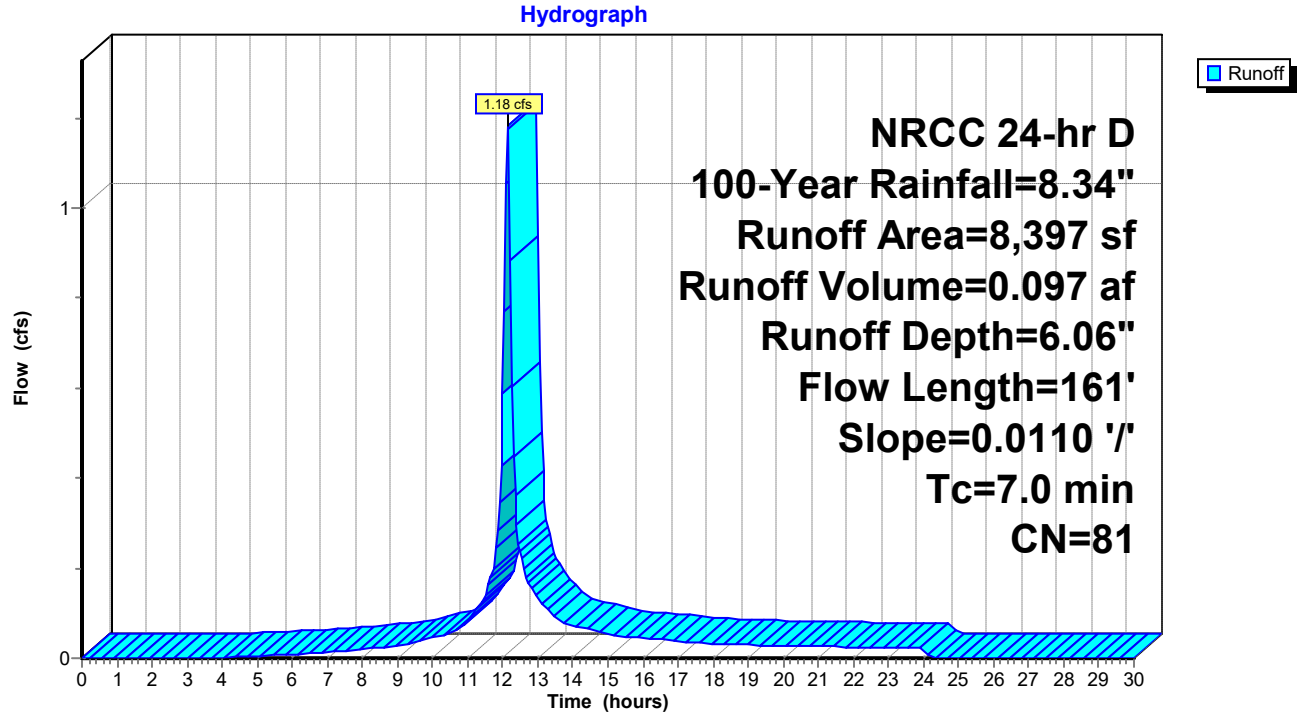
Runoff = 1.18 cfs @ 12.14 hrs, Volume= 0.097 af, Depth= 6.06"
Routed to Reach DCB-C : TO TRUNKLINE

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
2,407	39	>75% Grass cover, Good, HSG A
5,990	98	Paved parking, HSG A
8,397	81	Weighted Average
2,407		28.66% Pervious Area
5,990		71.34% 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 P18: TO DCB-D

[49] Hint: Tc<2dt may require smaller dt

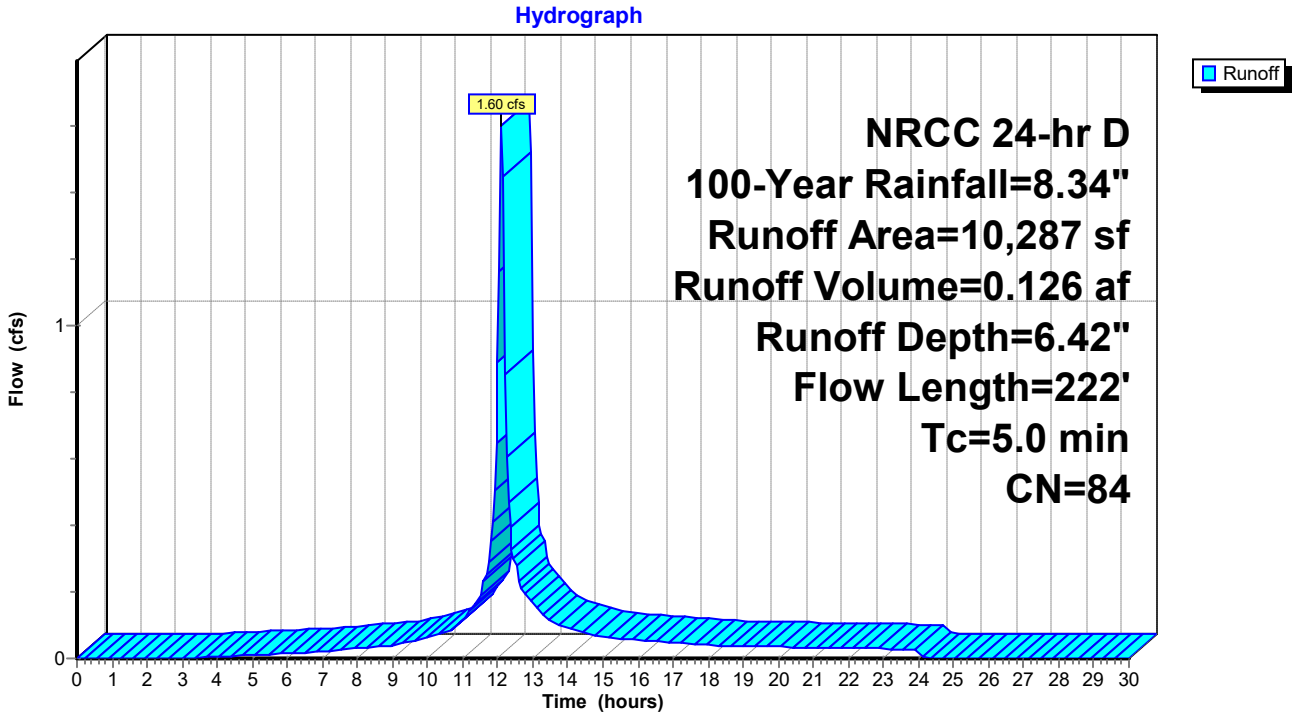
Runoff = 1.60 cfs @ 12.11 hrs, Volume= 0.126 af, Depth= 6.42"
Routed to Reach DCB-D : TO DMH-A

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
2,417	39	>75% Grass cover, Good, HSG A
7,870	98	Paved parking, HSG A
10,287	84	Weighted Average
2,417		23.50% Pervious Area
7,870		76.50% 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

[49] Hint: Tc<2dt may require smaller dt

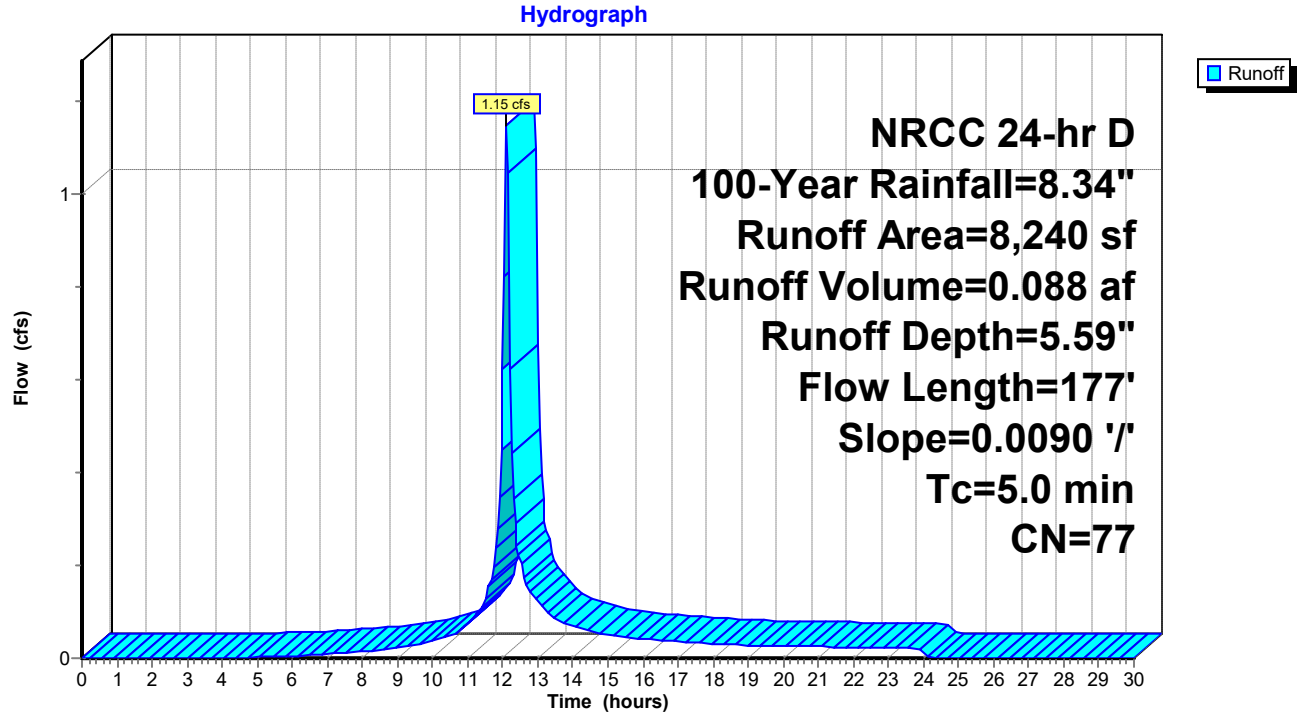
Runoff = 1.15 cfs @ 12.11 hrs, Volume= 0.088 af, Depth= 5.59"
Routed to Reach DCB-E : TO DMH-A

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
2,944	39	>75% Grass cover, Good, HSG A
5,296	98	Paved parking, HSG A
8,240	77	Weighted Average
2,944		35.73% Pervious Area
5,296		64.27% 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

[49] Hint: Tc<2dt may require smaller dt

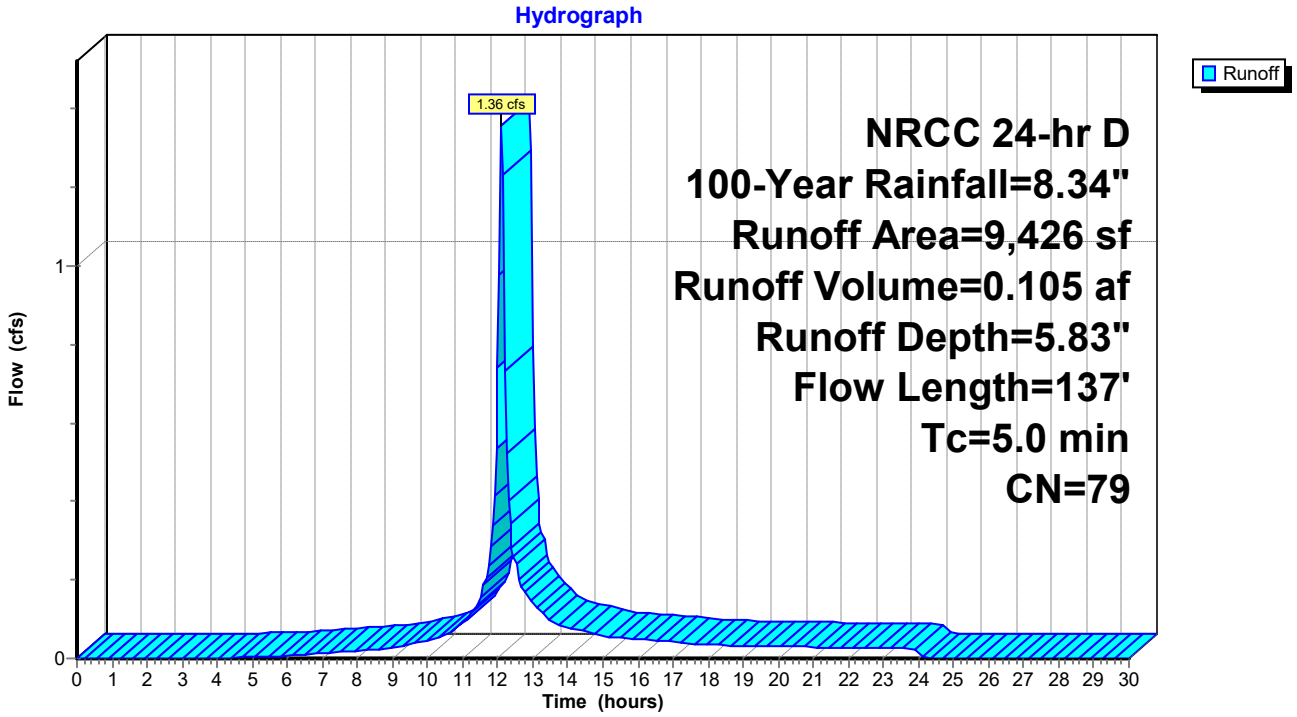
Runoff = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af, Depth= 5.83"
Routed to Reach DP3 : CATCHBASIN (FIRE STATION)

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 P20: TO DP#3



Summary for Subcatchment P24: TO DCB#24

[49] Hint: Tc<2dt may require smaller dt

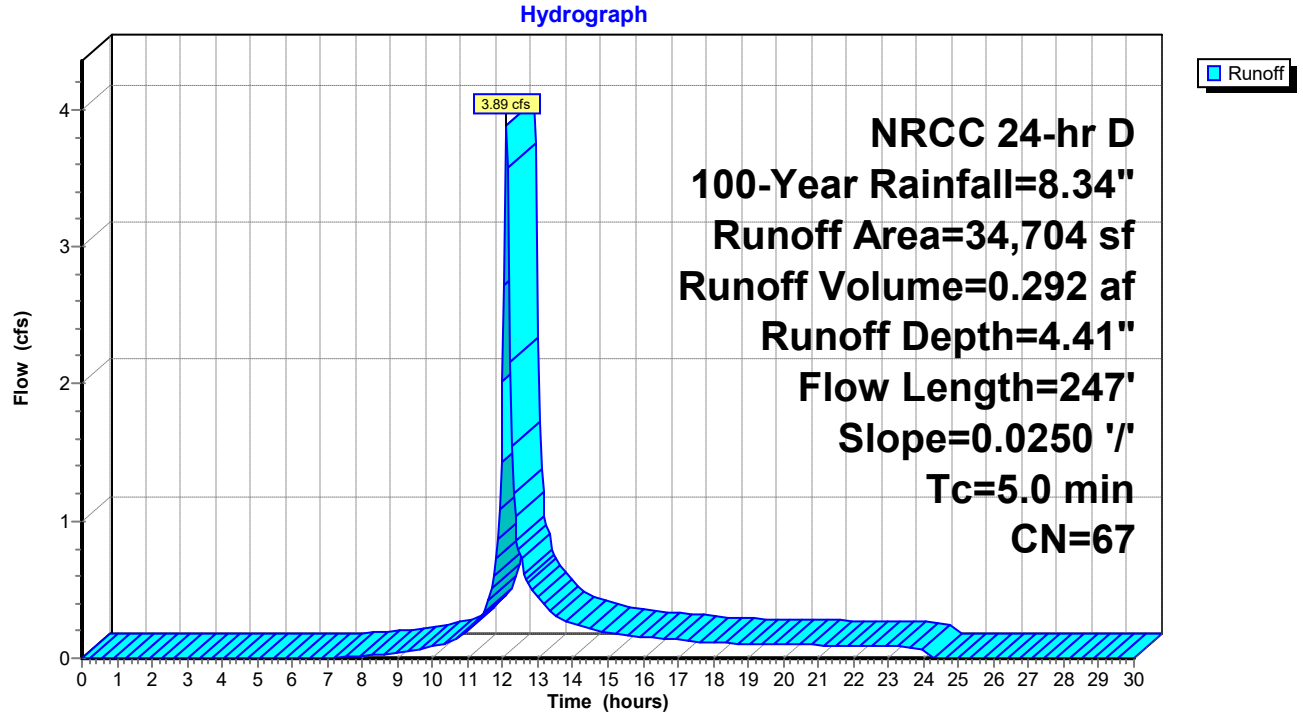
Runoff = 3.89 cfs @ 12.12 hrs, Volume= 0.292 af, Depth= 4.41"
Routed to Reach DCB24 : TO DMH#113

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
18,387	39	>75% Grass cover, Good, HSG A
16,317	98	Paved parking, HSG A
34,704	67	Weighted Average
18,387		52.98% Pervious Area
16,317		47.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0250	1.29		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
1.0	197	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	247	Total, Increased to minimum Tc = 5.0 min			

Subcatchment P24: TO DCB#24



Summary for Reach CMH3: TO DMH-E

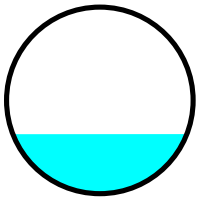
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH-F outlet invert by 0.96' @ 12.15 hrs

Inflow Area = 3.013 ac, 76.57% Impervious, Inflow Depth = 4.82" for 100-Year event
Inflow = 13.43 cfs @ 12.15 hrs, Volume= 1.209 af
Outflow = 13.10 cfs @ 12.16 hrs, Volume= 1.209 af, Atten= 2%, Lag= 0.7 min
Routed to Reach DMH-E : TO DMH-D

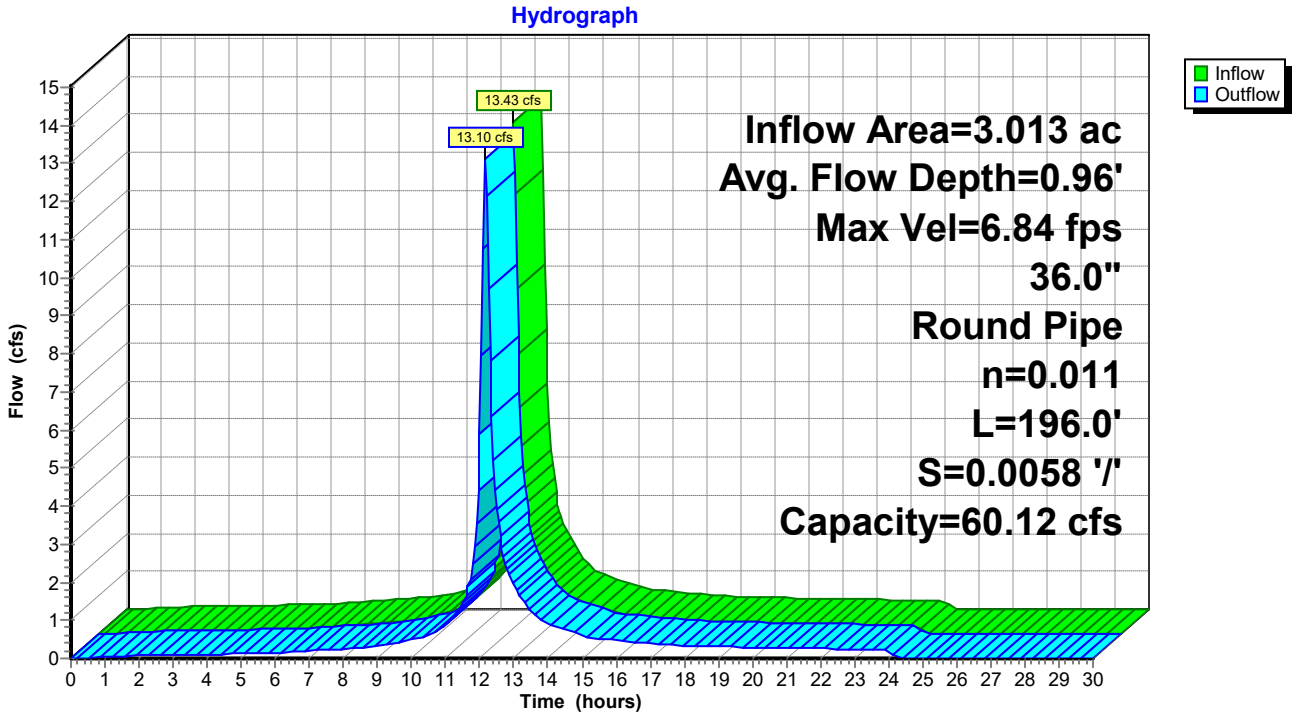
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.84 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.30 fps, Avg. Travel Time= 1.4 min

Peak Storage= 383 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.96' , Surface Width= 2.80'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.12 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 196.0' Slope= 0.0058 '/'
Inlet Invert= 457.71', Outlet Invert= 456.57'



Reach CMH3: TO DMH-E



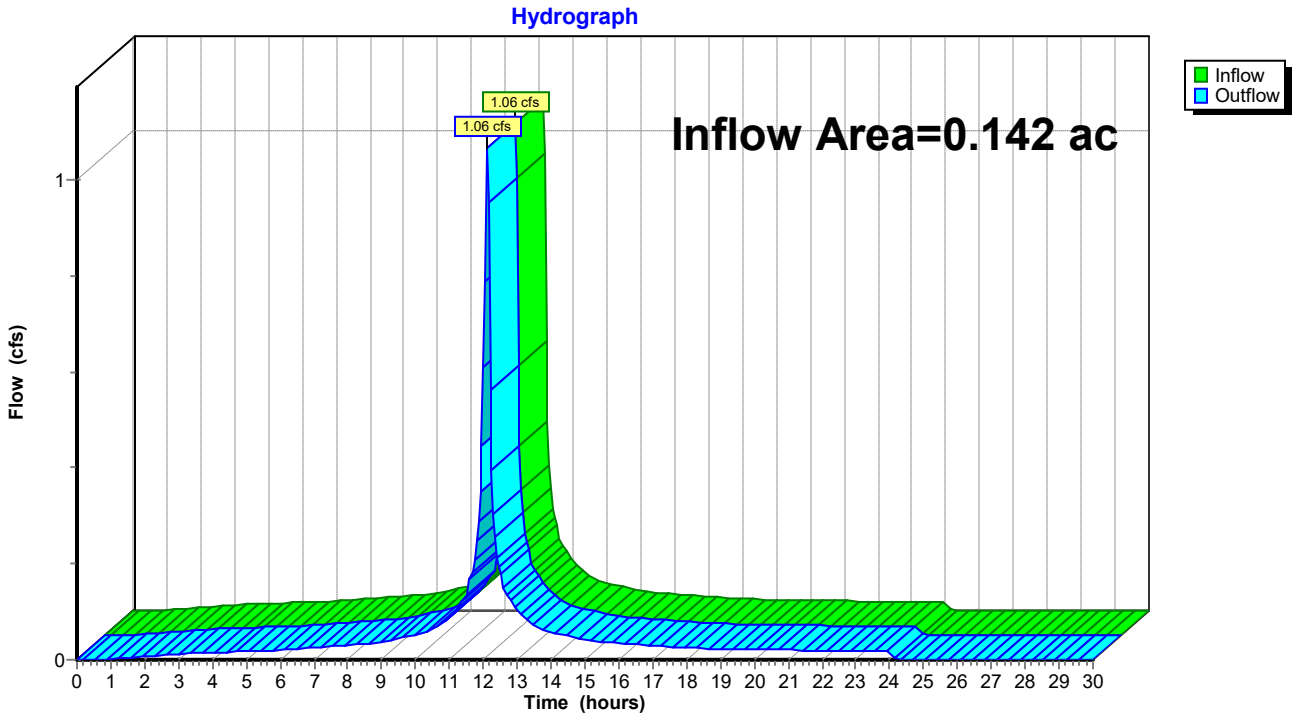
Summary for Reach DCB-A: TO DMH-D

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.142 ac, 94.61% Impervious, Inflow Depth = 7.74" for 100-Year event
Inflow = 1.06 cfs @ 12.11 hrs, Volume= 0.092 af
Outflow = 1.06 cfs @ 12.11 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-D : TO DMH-C

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

Reach DCB-A: TO DMH-D



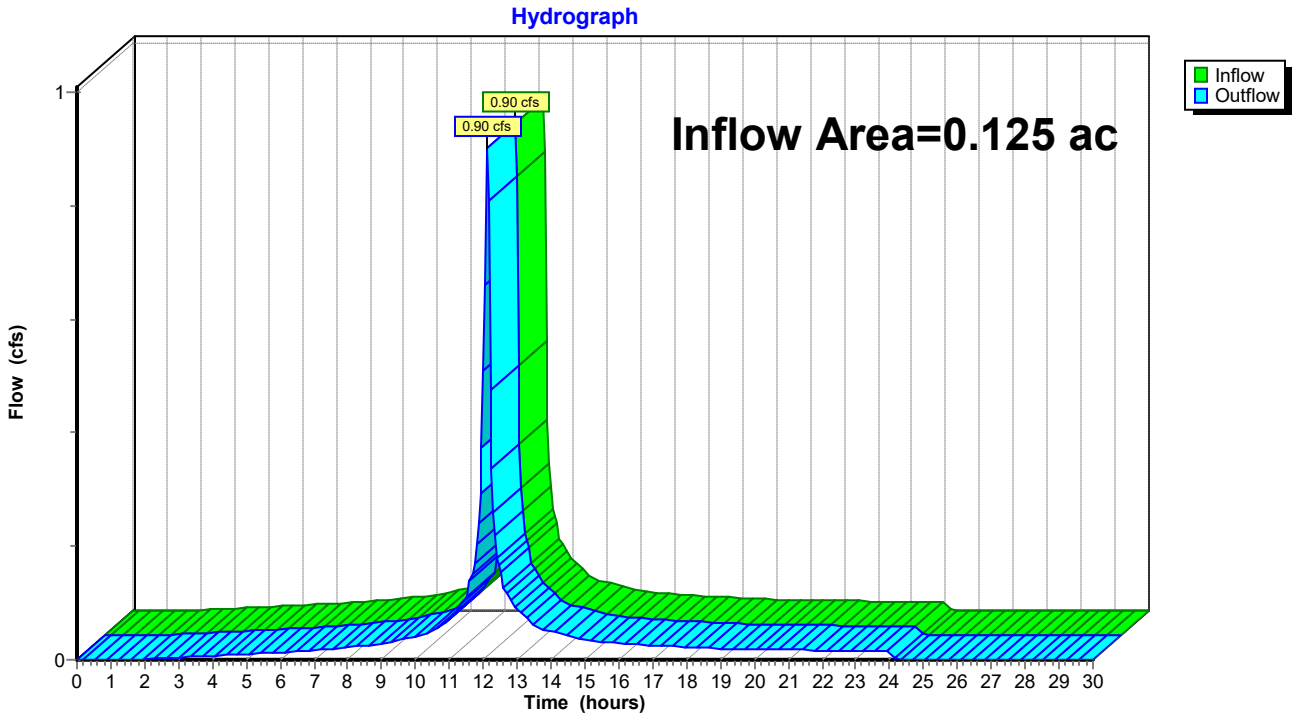
Summary for Reach DCB-B: TO DMH-E

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.125 ac, 87.24% Impervious, Inflow Depth = 7.14" for 100-Year event
Inflow = 0.90 cfs @ 12.11 hrs, Volume= 0.074 af
Outflow = 0.90 cfs @ 12.11 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-E : TO DMH-D

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

Reach DCB-B: TO DMH-E



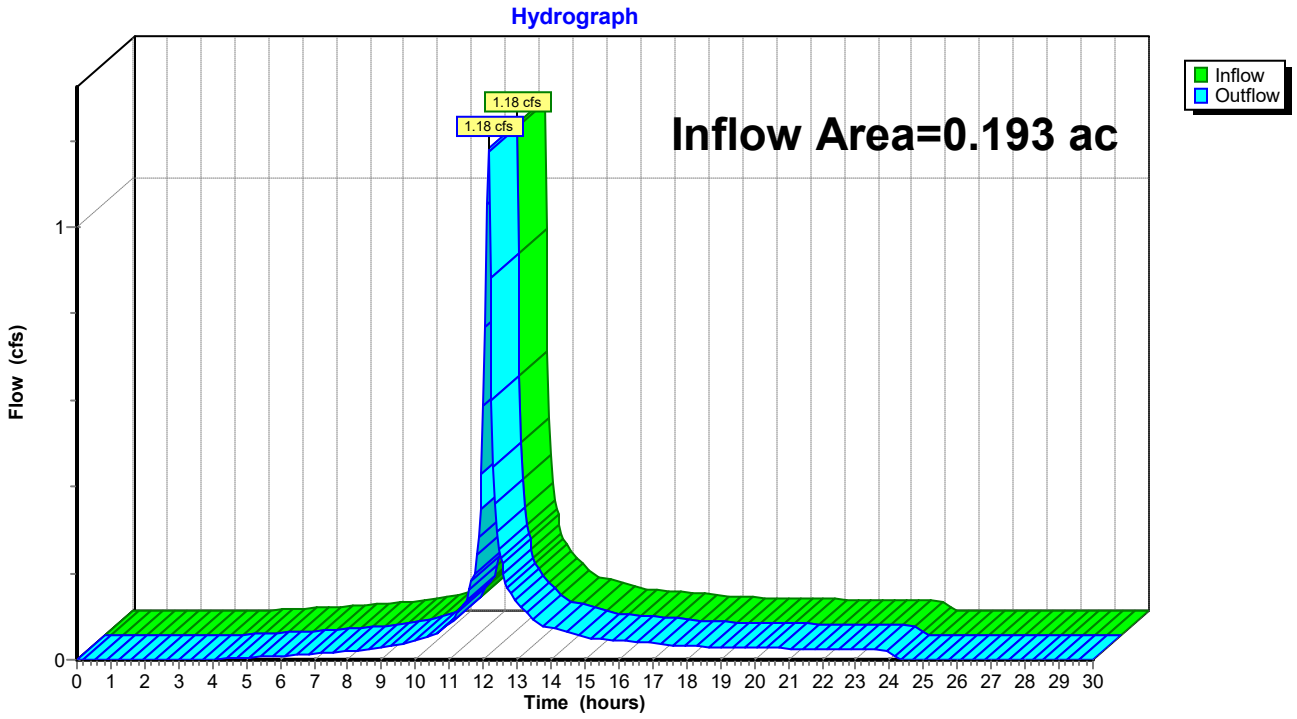
Summary for Reach DCB-C: TO TRUNKLINE

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.193 ac, 71.34% Impervious, Inflow Depth = 6.06" for 100-Year event
Inflow = 1.18 cfs @ 12.14 hrs, Volume= 0.097 af
Outflow = 1.18 cfs @ 12.14 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH-E : TO DMH-D

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

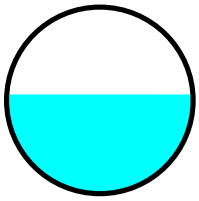
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.236 ac, 76.50% Impervious, Inflow Depth = 6.42" for 100-Year event
Inflow = 1.60 cfs @ 12.11 hrs, Volume= 0.126 af
Outflow = 1.59 cfs @ 12.11 hrs, Volume= 0.126 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH-A* : TO DMH-B

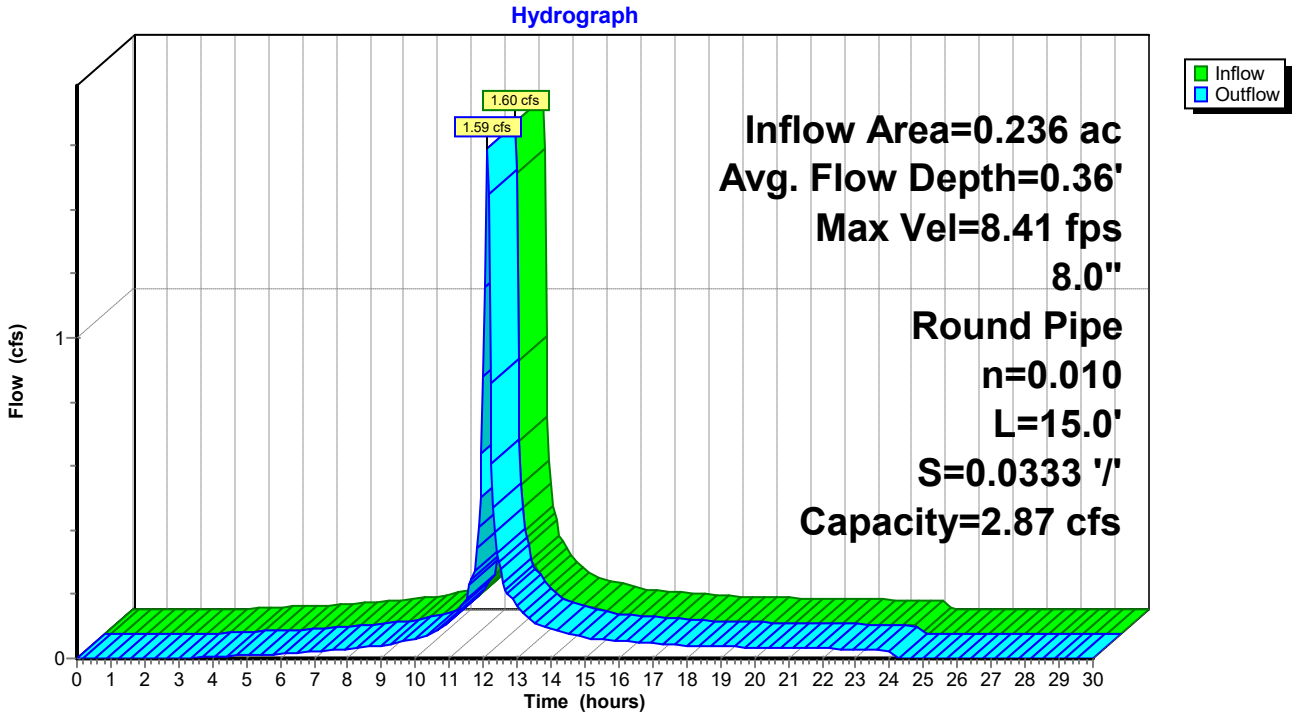
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.41 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.36' , Surface Width= 0.67'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.87 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 15.0' Slope= 0.0333 '/'
Inlet Invert= 468.00', Outlet Invert= 467.50'



Reach DCB-D: TO DMH-A



Summary for Reach DCB-E: TO DMH-A

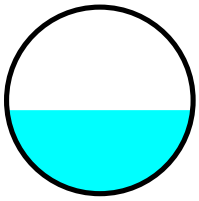
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.189 ac, 64.27% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 1.15 cfs @ 12.11 hrs, Volume= 0.088 af
Outflow = 1.14 cfs @ 12.12 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH-A* : TO DMH-B

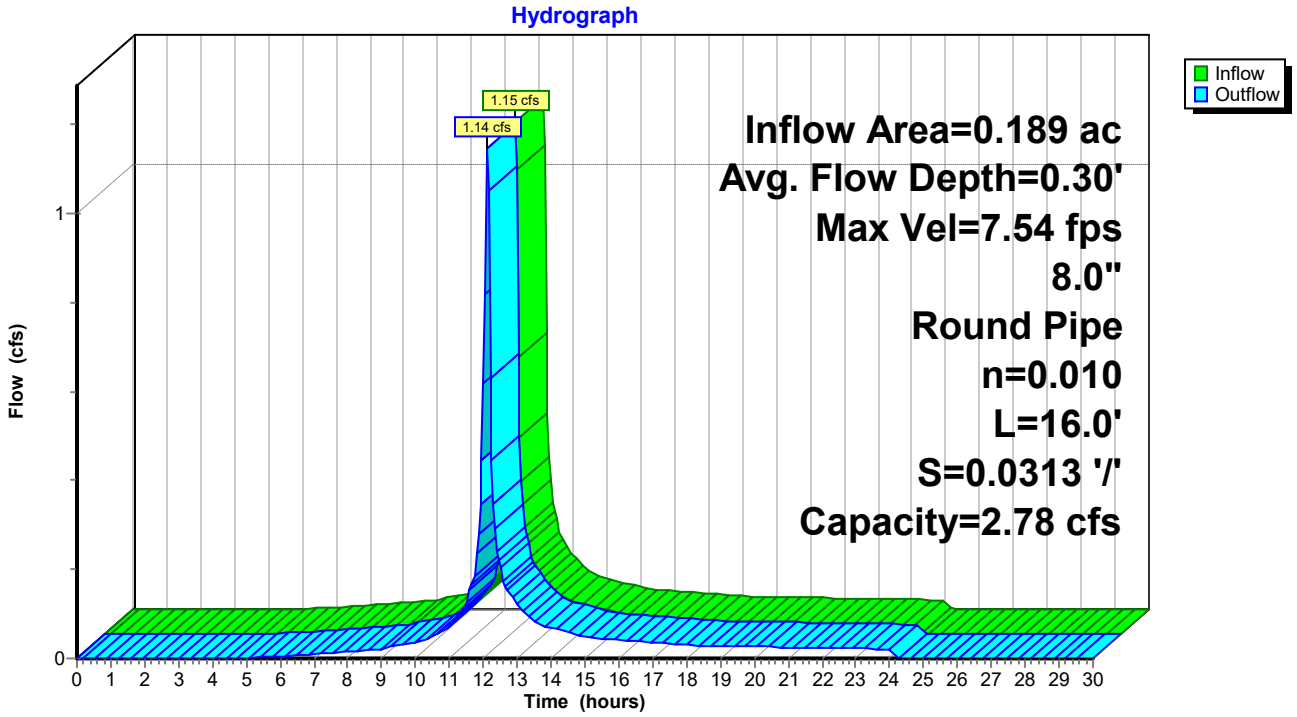
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.54 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.30' , Surface Width= 0.66'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.78 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 16.0' Slope= 0.0313 '/'
Inlet Invert= 468.00', Outlet Invert= 467.50'



Reach DCB-E: TO DMH-A



Summary for Reach DCB10: TO DMH#106

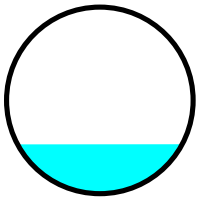
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.065 ac, 67.92% Impervious, Inflow Depth = 5.83" for 100-Year event
Inflow = 0.41 cfs @ 12.11 hrs, Volume= 0.032 af
Outflow = 0.41 cfs @ 12.11 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH106 : TO DMH#105

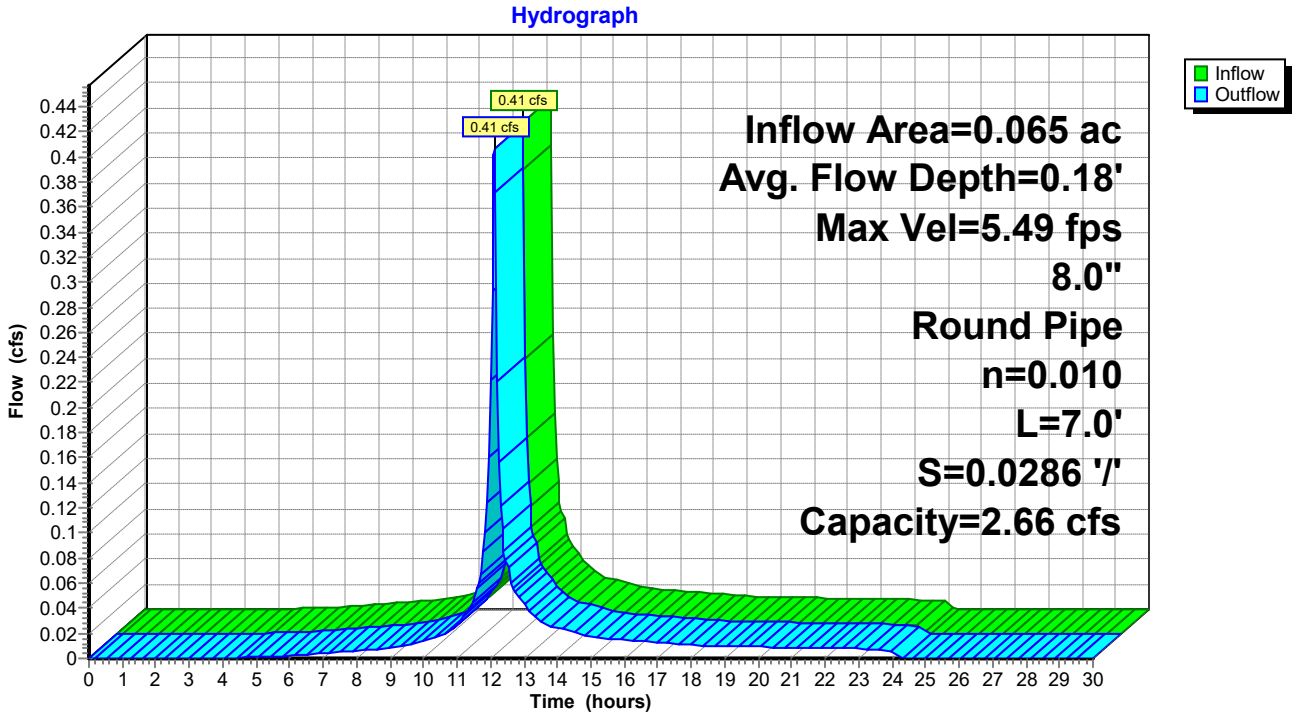
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.49 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 0.59'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.66 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 7.0' Slope= 0.0286 '/'
Inlet Invert= 470.30', Outlet Invert= 470.10'



Reach DCB10: TO DMH#106



Summary for Reach DCB11: TO DMH#103

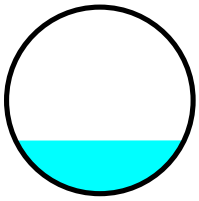
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.095 ac, 28.74% Impervious, Inflow Depth = 3.13" for 100-Year event
Inflow = 0.33 cfs @ 12.12 hrs, Volume= 0.025 af
Outflow = 0.32 cfs @ 12.12 hrs, Volume= 0.025 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH106 : TO DMH#105

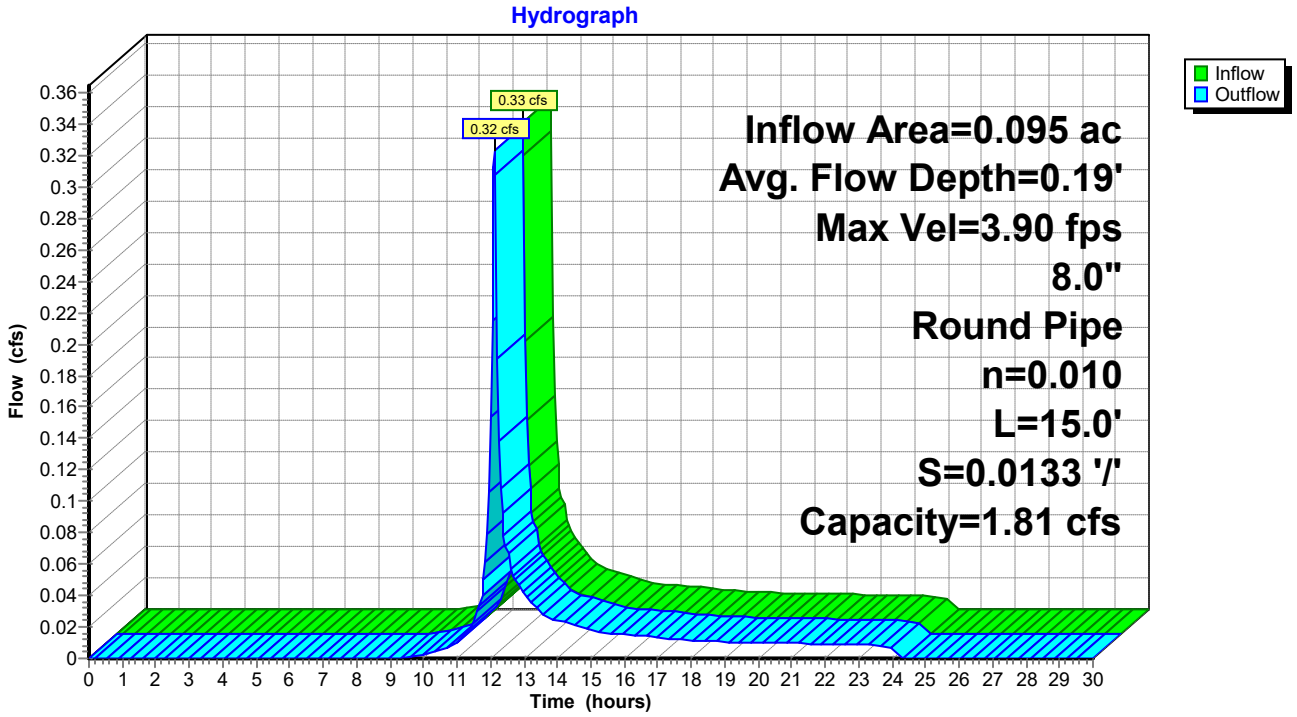
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.90 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 0.60'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.81 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 15.0' Slope= 0.0133 '/'
Inlet Invert= 470.30', Outlet Invert= 470.10'



Reach DCB11: TO DMH#103



Summary for Reach DCB12: TO DMH#12

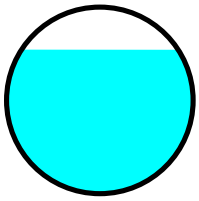
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.208 ac, 93.65% Impervious, Inflow Depth = 7.62" for 100-Year event
Inflow = 1.55 cfs @ 12.11 hrs, Volume= 0.132 af
Outflow = 1.53 cfs @ 12.11 hrs, Volume= 0.132 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH108 : TO DMH#107

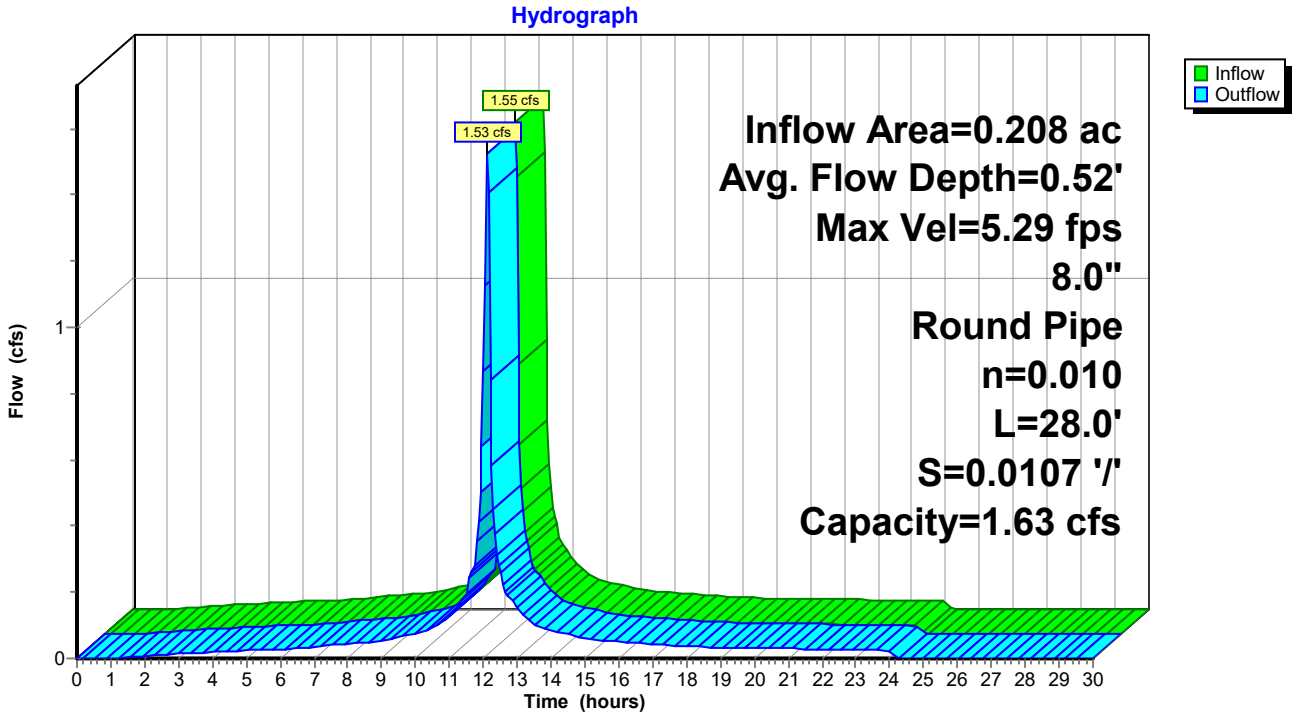
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.29 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.03 fps, Avg. Travel Time= 0.2 min

Peak Storage= 8 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 0.56'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.63 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 28.0' Slope= 0.0107 '/'
Inlet Invert= 467.80', Outlet Invert= 467.50'



Reach DCB12: TO DMH#12



Summary for Reach DCB13: TO DMH#102

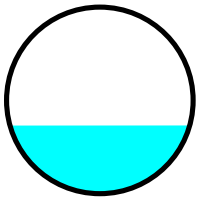
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.273 ac, 94.49% Impervious, Inflow Depth = 7.74" for 100-Year event
Inflow = 2.04 cfs @ 12.11 hrs, Volume= 0.176 af
Outflow = 2.04 cfs @ 12.11 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH102 : TO UGS#1A

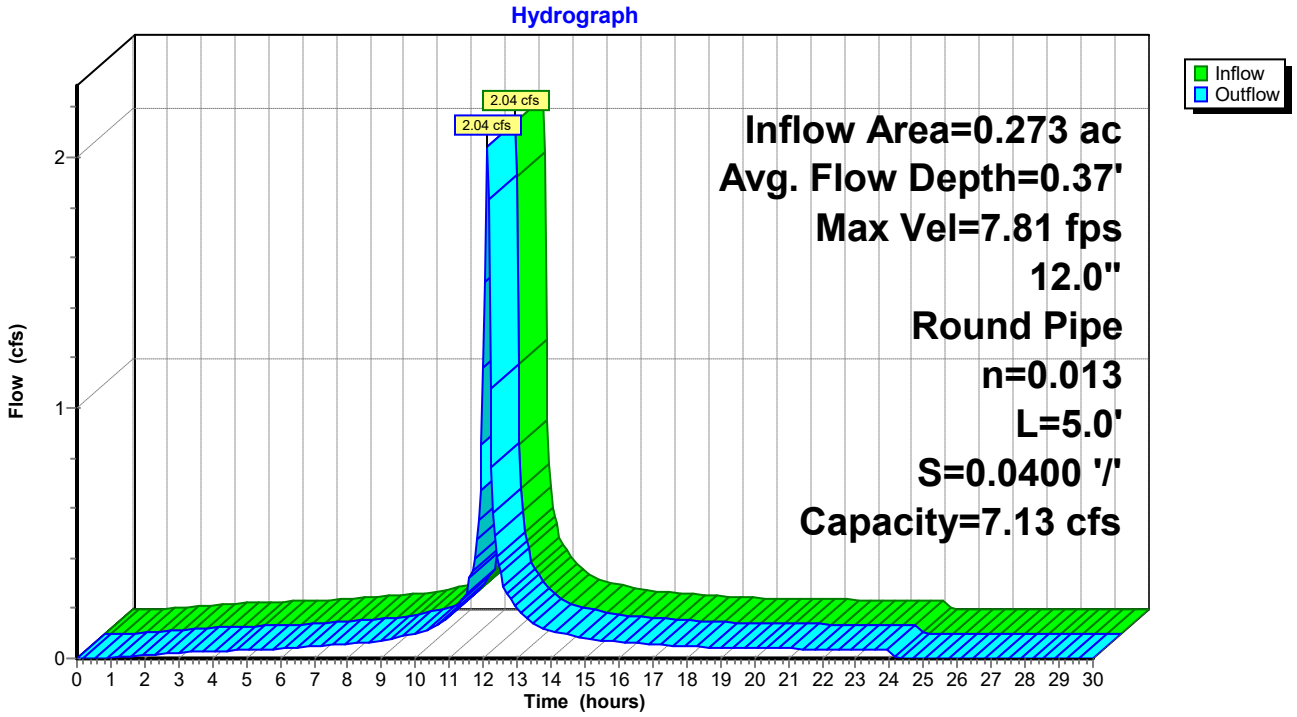
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.81 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.78 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 0.96'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 467.90', Outlet Invert= 467.70'



Reach DCB13: TO DMH#102



Summary for Reach DCB14: TO DMH#109

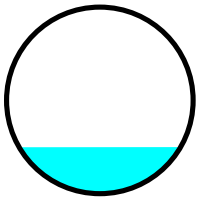
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.126 ac, 94.42% Impervious, Inflow Depth = 7.74" for 100-Year event
Inflow = 0.94 cfs @ 12.11 hrs, Volume= 0.081 af
Outflow = 0.94 cfs @ 12.11 hrs, Volume= 0.081 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH109 : TO DMH#110

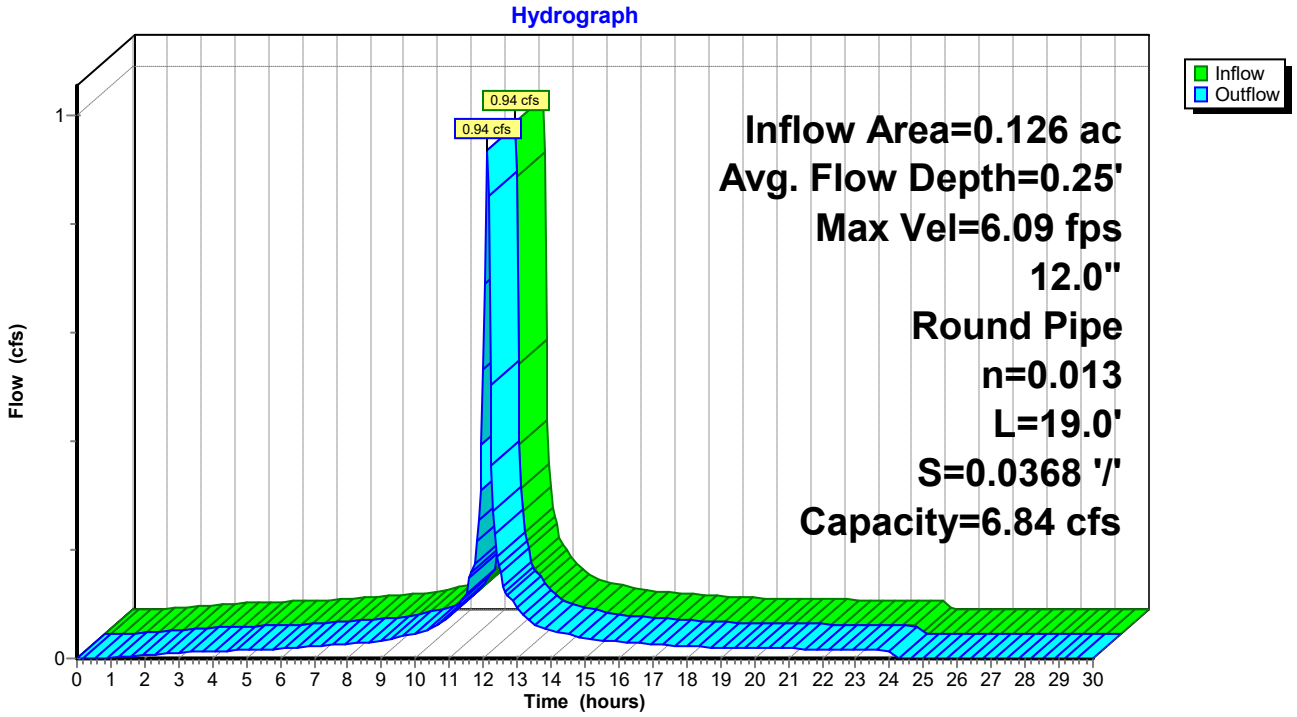
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.09 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.14 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.84 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 19.0' Slope= 0.0368 '/'
Inlet Invert= 467.10', Outlet Invert= 466.40'



Reach DCB14: TO DMH#109



Summary for Reach DCB15: TO DMH#102

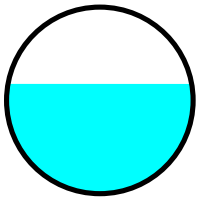
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.370 ac, 70.06% Impervious, Inflow Depth = 5.94" for 100-Year event
Inflow = 2.36 cfs @ 12.11 hrs, Volume= 0.183 af
Outflow = 2.30 cfs @ 12.12 hrs, Volume= 0.183 af, Atten= 3%, Lag= 0.6 min
Routed to Reach DMH102 : TO UGS#1A

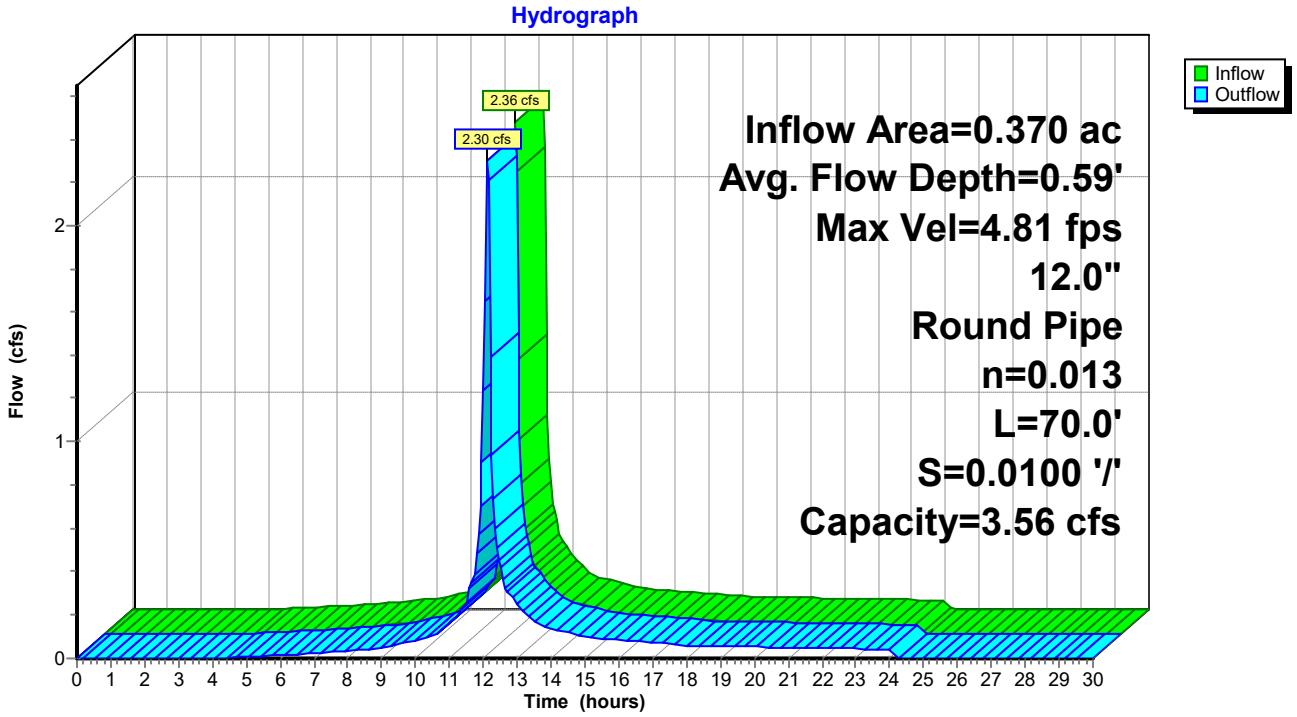
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.81 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.75 fps, Avg. Travel Time= 0.7 min

Peak Storage= 34 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 0.98'
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= 70.0' Slope= 0.0100 '/'
Inlet Invert= 467.00', Outlet Invert= 466.30'



Reach DCB15: TO DMH#102



Summary for Reach DCB19: TO DMH#111

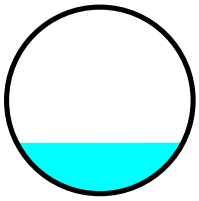
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.171 ac, 78.16% Impervious, Inflow Depth = 6.54" for 100-Year event
Inflow = 1.17 cfs @ 12.11 hrs, Volume= 0.093 af
Outflow = 1.17 cfs @ 12.11 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH111 : TO DMH#112

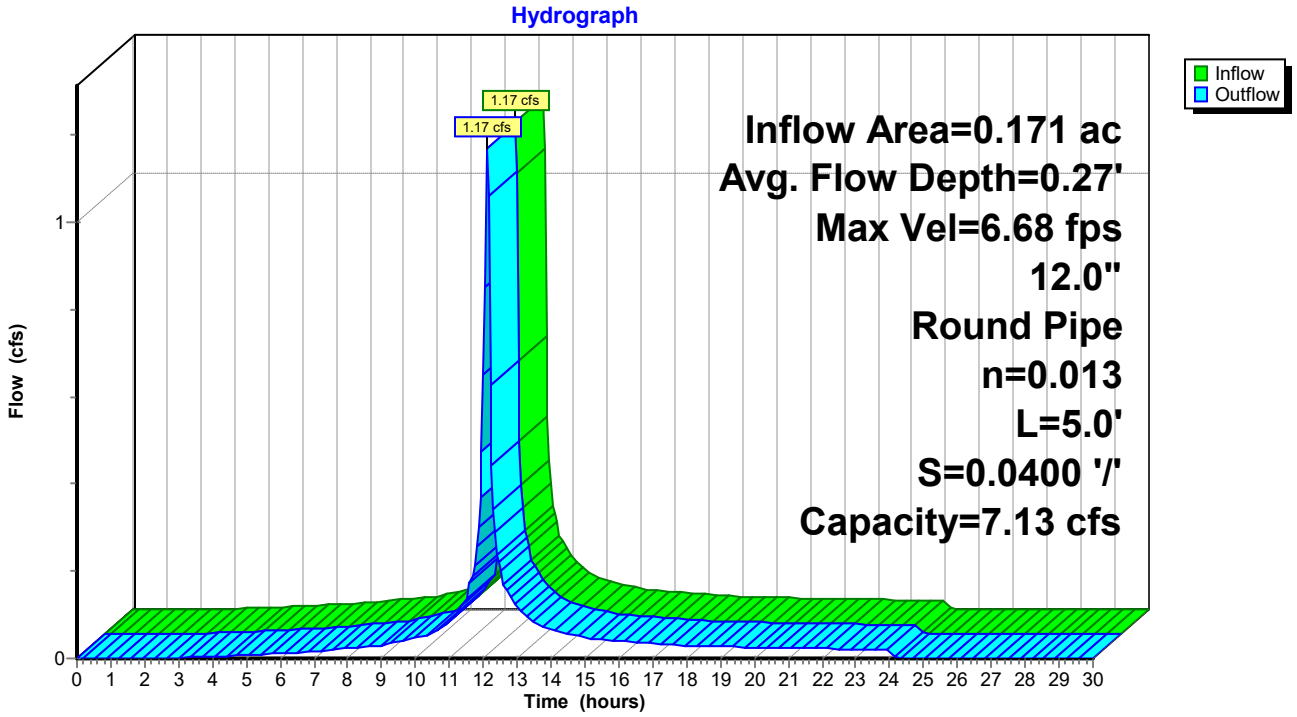
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.68 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.31 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.89'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 463.80', Outlet Invert= 463.60'



Reach DCB19: TO DMH#111



Summary for Reach DCB20: TO DMH#109

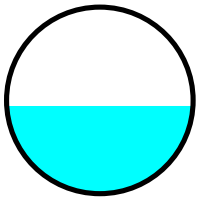
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.234 ac, 85.75% Impervious, Inflow Depth = 7.14" for 100-Year event
Inflow = 1.69 cfs @ 12.11 hrs, Volume= 0.139 af
Outflow = 1.68 cfs @ 12.11 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH109 : TO DMH#110

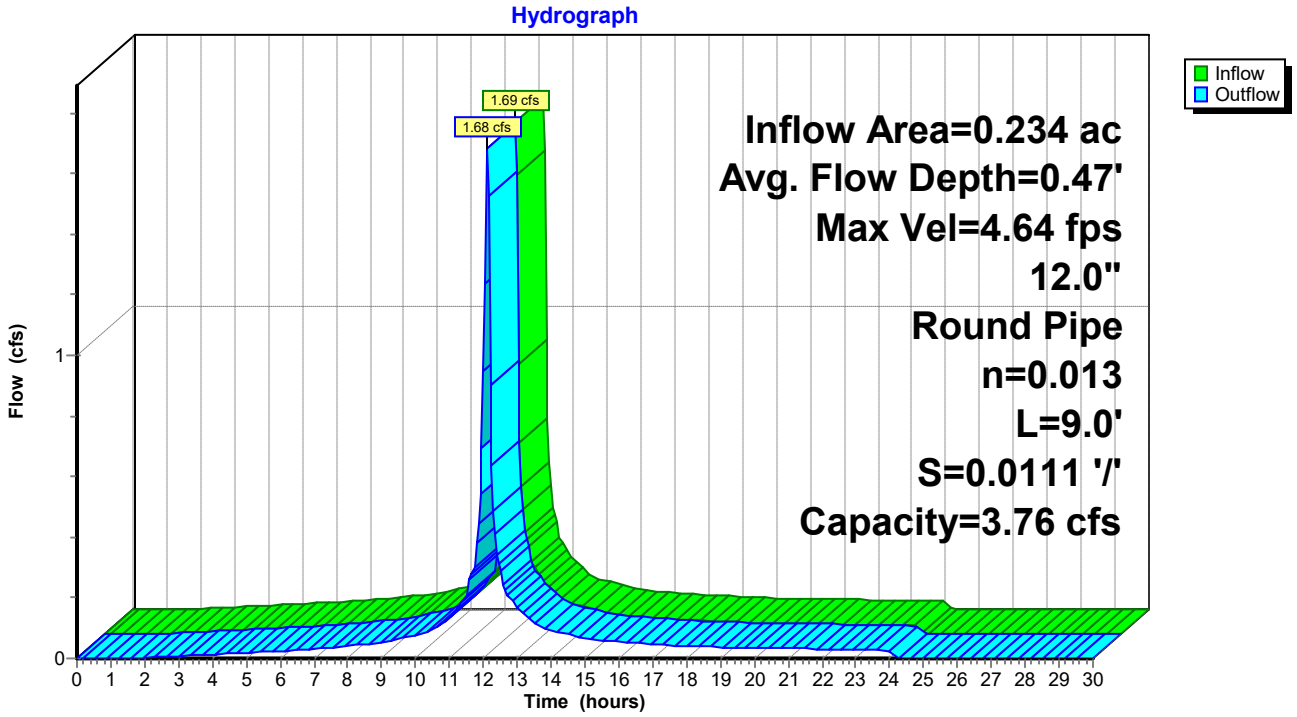
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.64 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.47' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.76 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 9.0' Slope= 0.0111 '/'
Inlet Invert= 466.50', Outlet Invert= 466.40'



Reach DCB20: TO DMH#109



Summary for Reach DCB21: TO DMH#109A

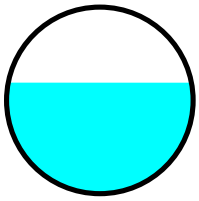
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.175 ac, 71.01% Impervious, Inflow Depth = 6.06" for 100-Year event
Inflow = 1.14 cfs @ 12.11 hrs, Volume= 0.088 af
Outflow = 1.13 cfs @ 12.11 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH109A : TO DMH109

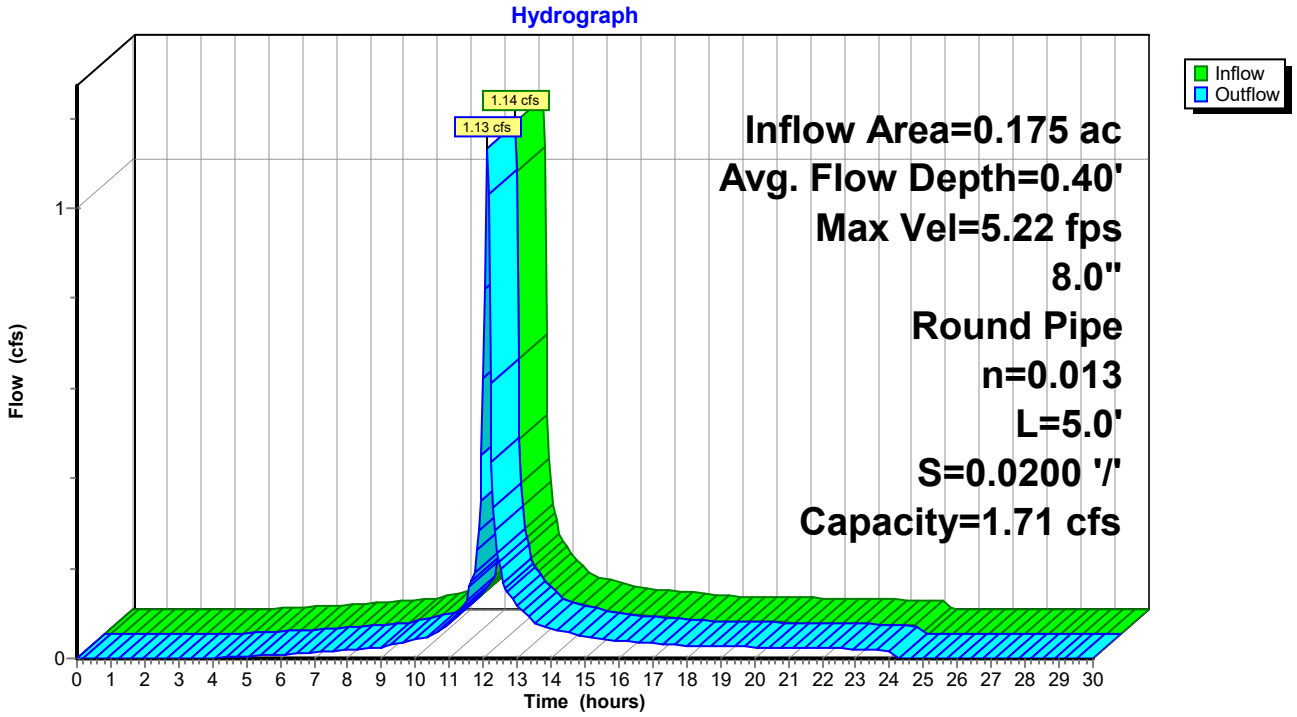
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.22 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.90 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 0.65'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.71 cfs

8.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 467.10', Outlet Invert= 467.00'



Reach DCB21: TO DMH#109A



Summary for Reach DCB22: TO DMH#111

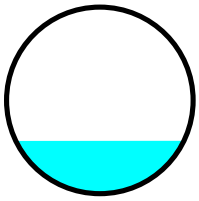
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.235 ac, 44.85% Impervious, Inflow Depth = 4.17" for 100-Year event
Inflow = 1.09 cfs @ 12.12 hrs, Volume= 0.082 af
Outflow = 1.08 cfs @ 12.12 hrs, Volume= 0.082 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH111 : TO DMH#112

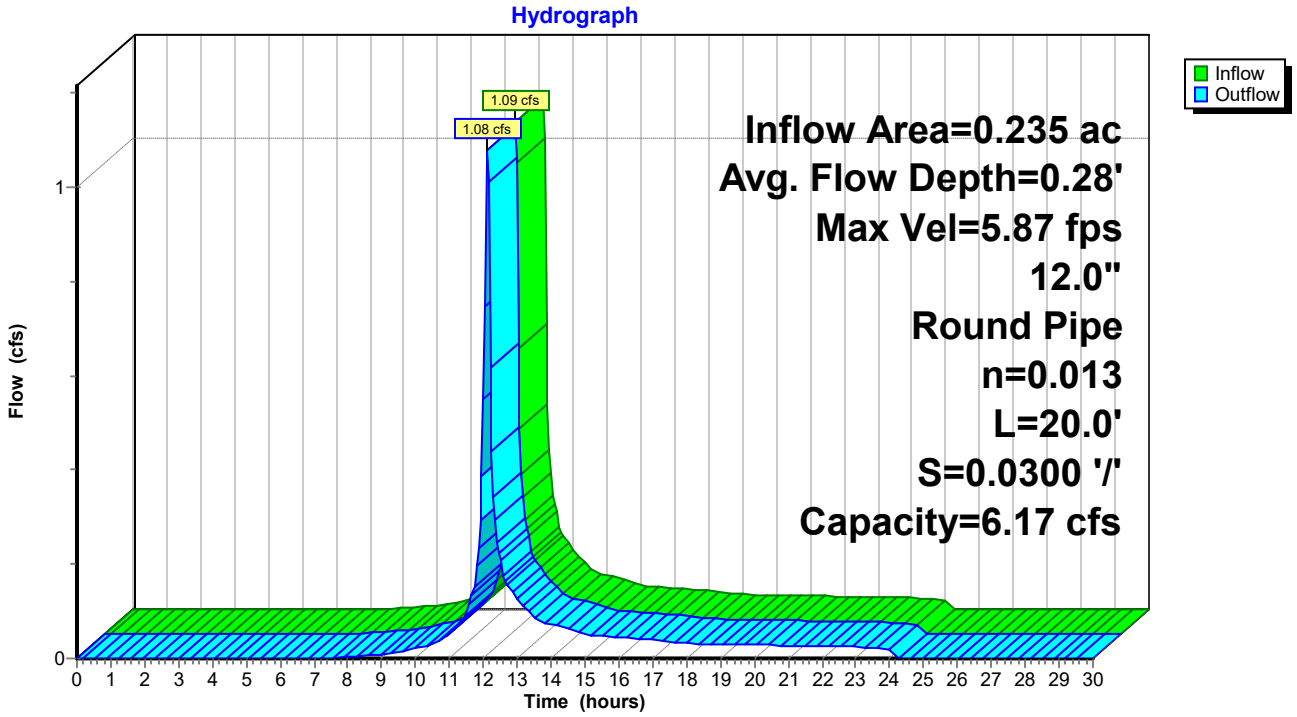
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.87 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 0.90'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.17 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 20.0' Slope= 0.0300 '/'
Inlet Invert= 464.20', Outlet Invert= 463.60'



Reach DCB22: TO DMH#111



Summary for Reach DCB23: TO DMH#111

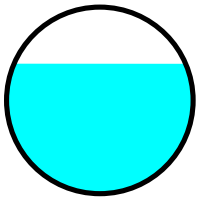
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.766 ac, 40.00% Impervious, Inflow Depth = 3.94" for 100-Year event
Inflow = 3.34 cfs @ 12.12 hrs, Volume= 0.251 af
Outflow = 3.21 cfs @ 12.14 hrs, Volume= 0.251 af, Atten= 4%, Lag= 1.4 min
Routed to Reach DMH111 : TO DMH#112

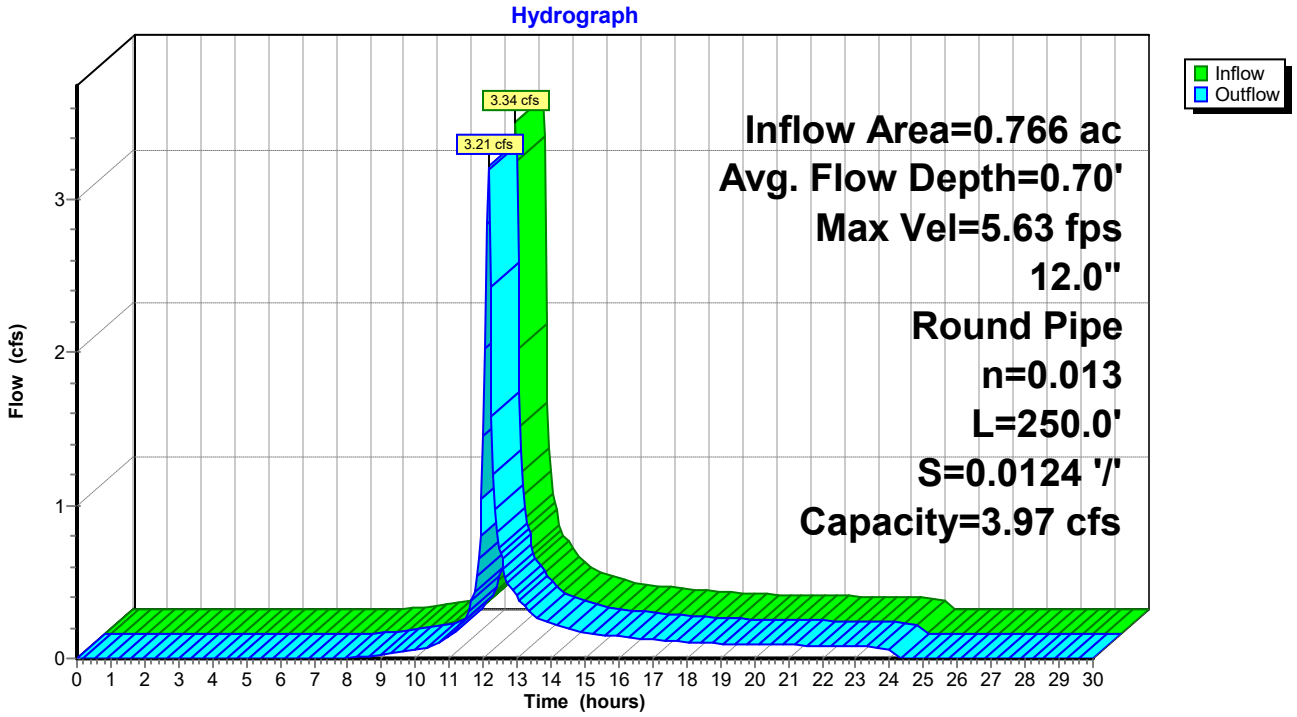
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.63 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.20 fps, Avg. Travel Time= 1.9 min

Peak Storage= 146 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.70' , Surface Width= 0.92'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.97 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 250.0' Slope= 0.0124 '/'
Inlet Invert= 466.70', Outlet Invert= 463.60'



Reach DCB23: TO DMH#111



Summary for Reach DCB24: TO DMH#113

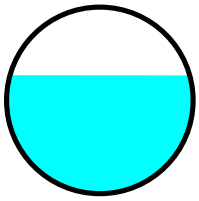
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.797 ac, 47.02% Impervious, Inflow Depth = 4.41" for 100-Year event
Inflow = 3.89 cfs @ 12.12 hrs, Volume= 0.292 af
Outflow = 3.88 cfs @ 12.12 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH113 : TO DMH#114

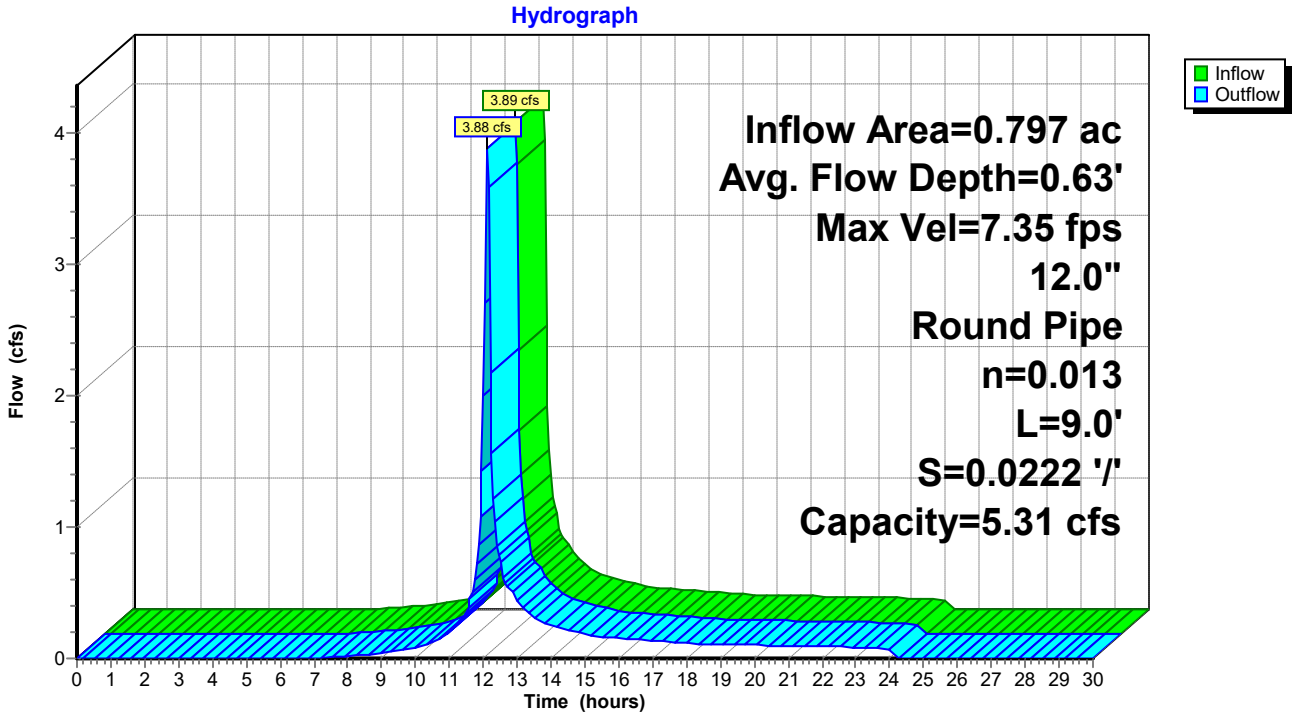
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.35 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.82 fps, Avg. Travel Time= 0.1 min

Peak Storage= 5 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 0.96'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.31 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 9.0' Slope= 0.0222 '/'
Inlet Invert= 460.50', Outlet Invert= 460.30'



Reach DCB24: TO DMH#113



Summary for Reach DCB25: TO DMH#109A

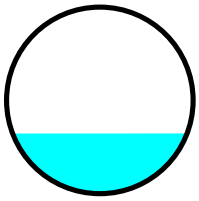
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.064 ac, 89.32% Impervious, Inflow Depth = 7.38" for 100-Year event
Inflow = 0.47 cfs @ 12.11 hrs, Volume= 0.039 af
Outflow = 0.46 cfs @ 12.12 hrs, Volume= 0.039 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH109A : TO DMH109

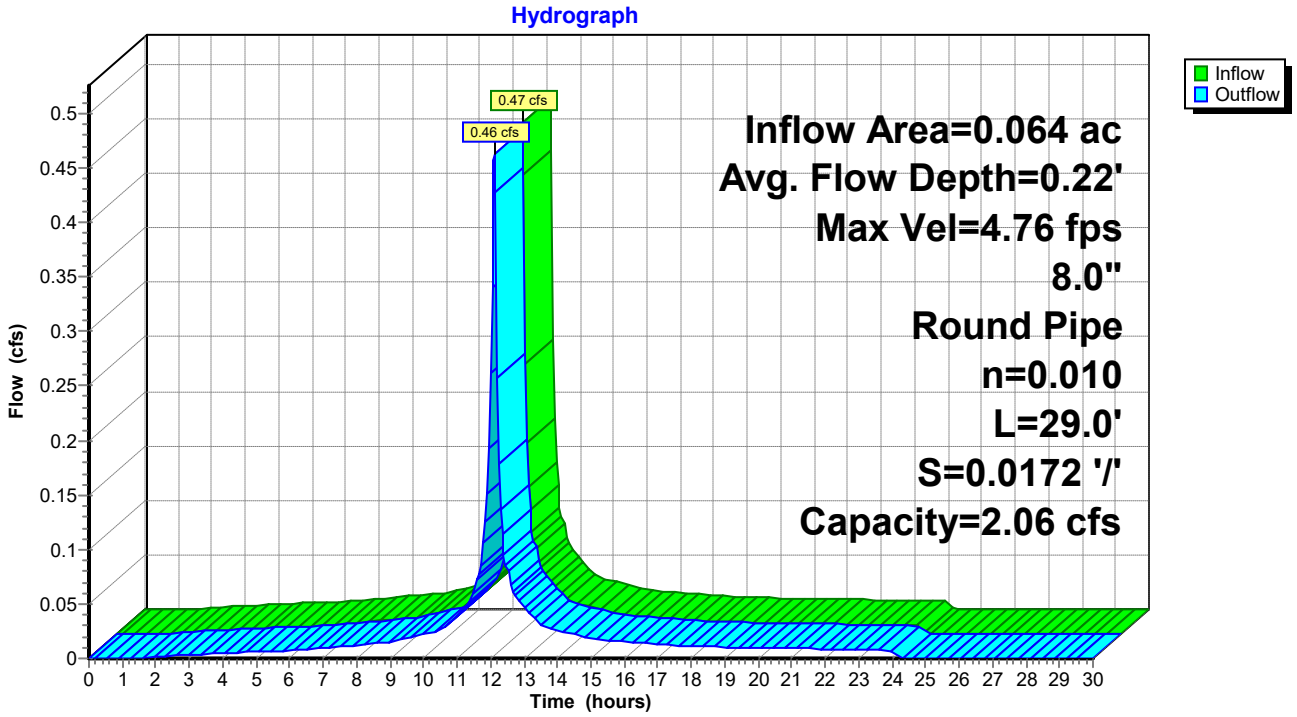
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.76 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 0.3 min

Peak Storage= 3 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 0.62'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.06 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 29.0' Slope= 0.0172 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Reach DCB25: TO DMH#109A



Summary for Reach DCB5: TO DMH#108

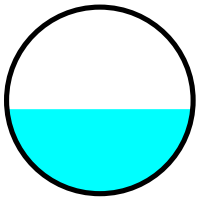
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.283 ac, 35.47% Impervious, Inflow Depth = 3.59" for 100-Year event
Inflow = 1.12 cfs @ 12.12 hrs, Volume= 0.085 af
Outflow = 1.12 cfs @ 12.12 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH108 : TO DMH#107

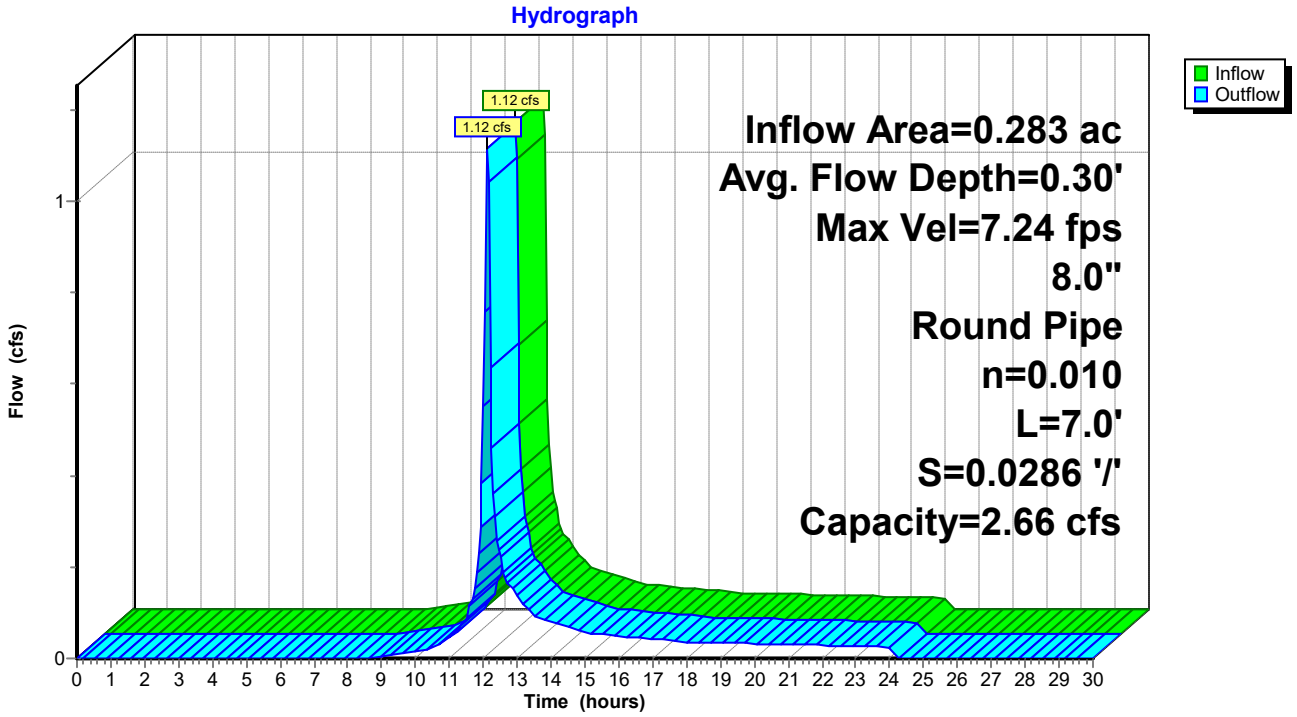
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.24 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.82 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.30' , Surface Width= 0.66'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.66 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 7.0' Slope= 0.0286 '/'
Inlet Invert= 468.20', Outlet Invert= 468.00'



Reach DCB5: TO DMH#108



Summary for Reach DCB6: TO DMH#107

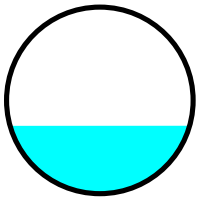
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.150 ac, 94.27% Impervious, Inflow Depth = 7.74" for 100-Year event
Inflow = 1.12 cfs @ 12.11 hrs, Volume= 0.097 af
Outflow = 1.11 cfs @ 12.11 hrs, Volume= 0.097 af, Atten= 1%, Lag= 0.2 min
Routed to Reach DMH107 : TO DMH#100

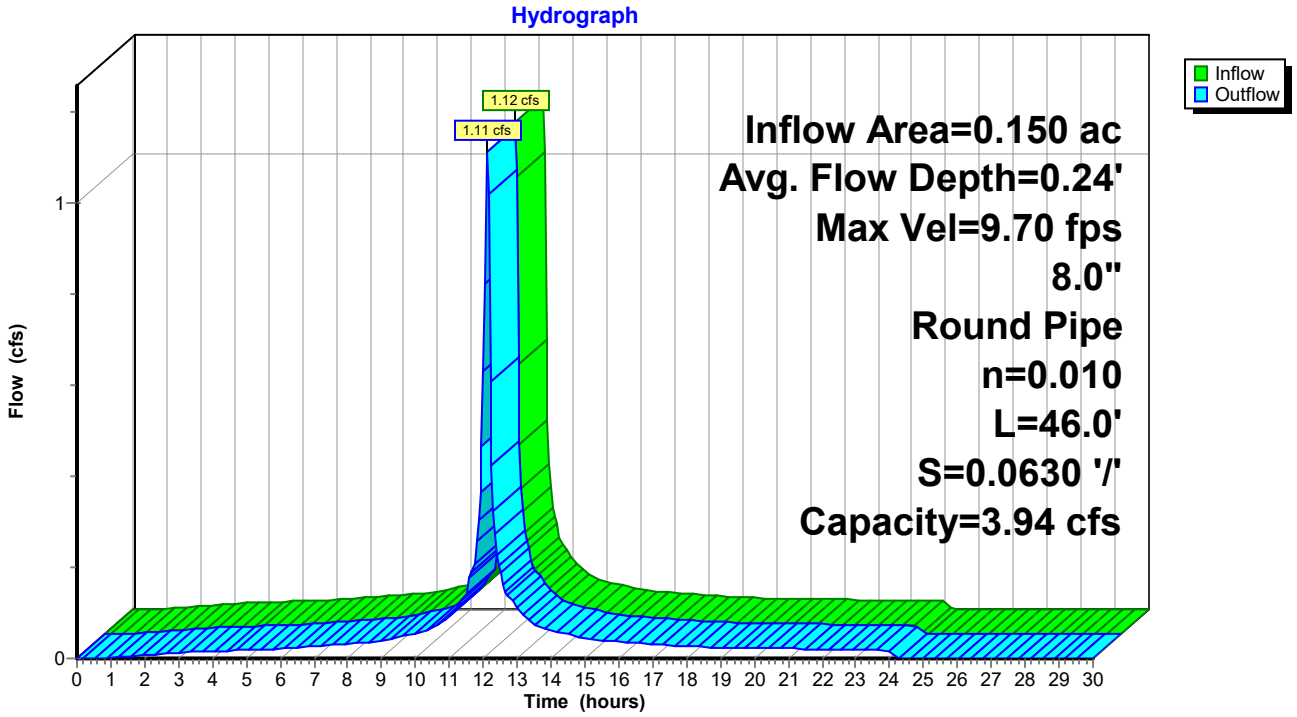
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.70 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.46 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 0.64'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.94 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 46.0' Slope= 0.0630 '/'
Inlet Invert= 469.80', Outlet Invert= 466.90'



Reach DCB6: TO DMH#107



Summary for Reach DCB7: TO DMH#102

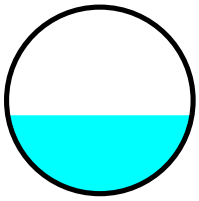
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.332 ac, 83.32% Impervious, Inflow Depth = 6.90" for 100-Year event
Inflow = 2.35 cfs @ 12.11 hrs, Volume= 0.191 af
Outflow = 2.32 cfs @ 12.12 hrs, Volume= 0.191 af, Atten= 2%, Lag= 0.3 min
Routed to Reach DMH102 : TO UGS#1A

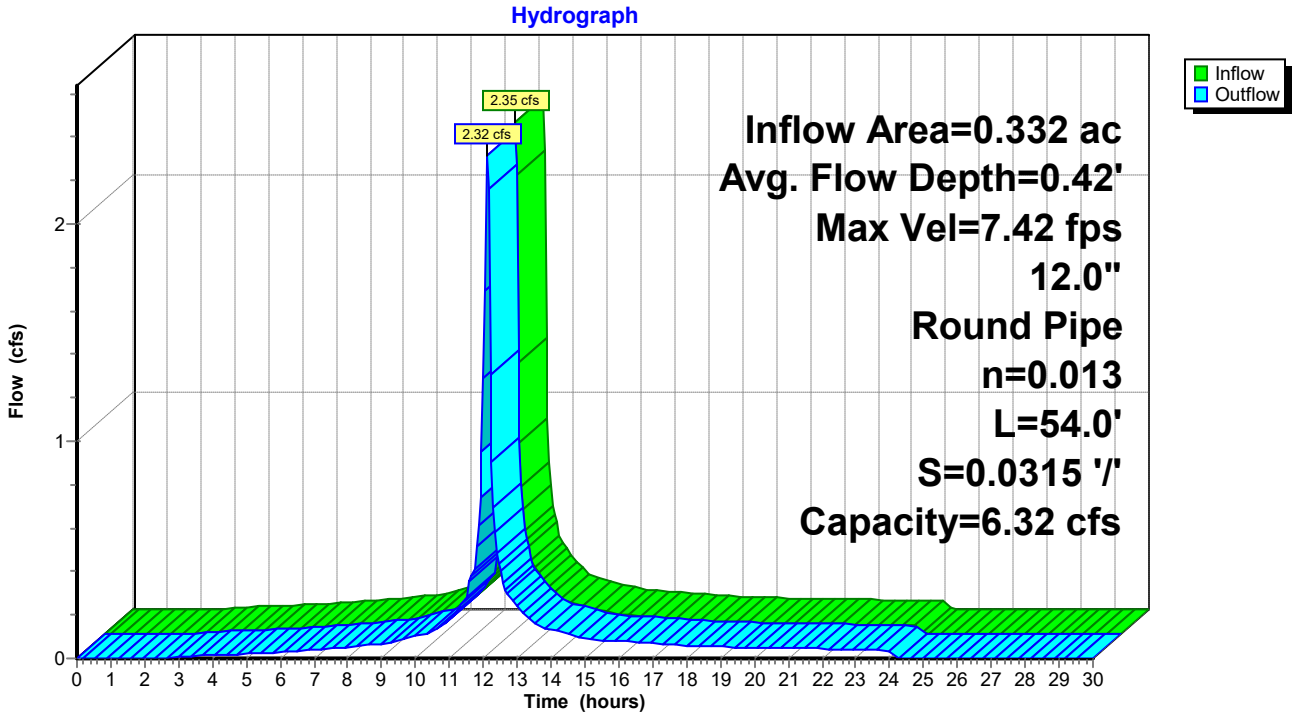
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.42 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 0.3 min

Peak Storage= 17 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.32 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 54.0' Slope= 0.0315 '/'
Inlet Invert= 468.40', Outlet Invert= 466.70'



Reach DCB7: TO DMH#102



Summary for Reach DCB8: TO DMH#103

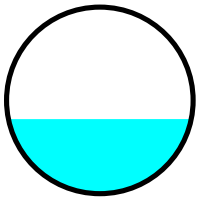
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.175 ac, 76.33% Impervious, Inflow Depth = 6.42" for 100-Year event
Inflow = 1.18 cfs @ 12.11 hrs, Volume= 0.094 af
Outflow = 1.18 cfs @ 12.11 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH104 : TO DMH#104

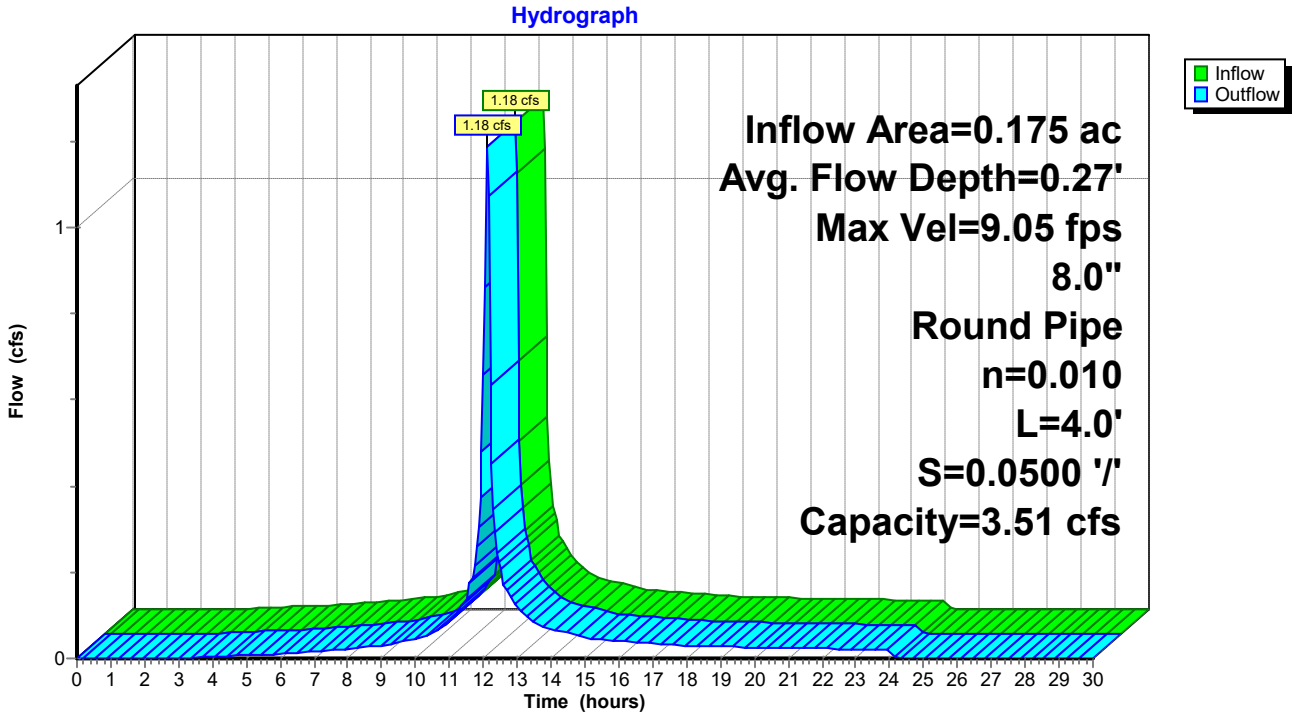
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.18 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.65'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.51 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 4.0' Slope= 0.0500 '/'
Inlet Invert= 470.00', Outlet Invert= 469.80'



Reach DCB8: TO DMH#103



Summary for Reach DCB9: TO DMH#103

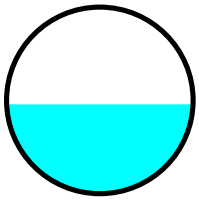
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.225 ac, 39.59% Impervious, Inflow Depth = 3.82" for 100-Year event
Inflow = 0.95 cfs @ 12.12 hrs, Volume= 0.072 af
Outflow = 0.94 cfs @ 12.12 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH104 : TO DMH#104

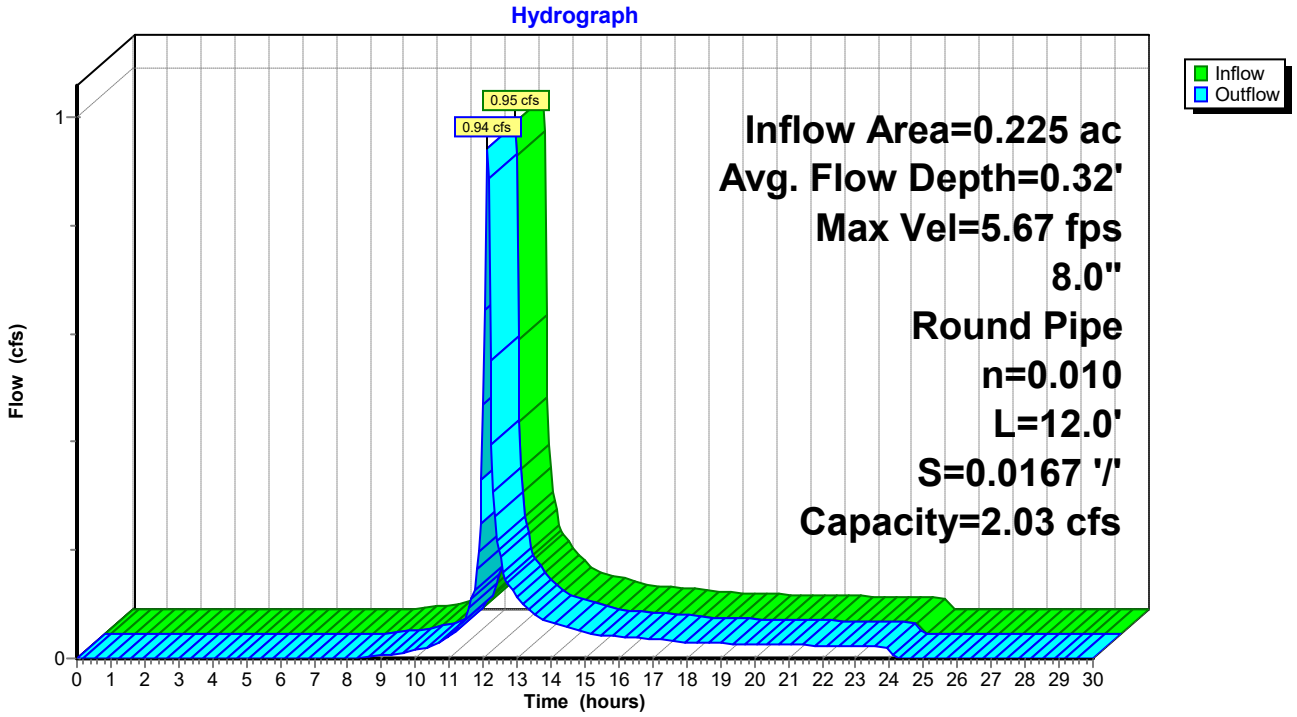
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.67 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.19 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 0.67'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.03 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 12.0' Slope= 0.0167 '/'
Inlet Invert= 470.00', Outlet Invert= 469.80'



Reach DCB9: TO DMH#103



Summary for Reach DMH-A*: TO DMH-B

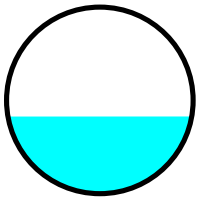
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH100 outlet invert by 0.71' @ 12.15 hrs

Inflow Area = 1.825 ac, 82.07% Impervious, Inflow Depth = 6.84" for 100-Year event
Inflow = 11.95 cfs @ 12.12 hrs, Volume= 1.040 af
Outflow = 11.82 cfs @ 12.13 hrs, Volume= 1.040 af, Atten= 1%, Lag= 0.8 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

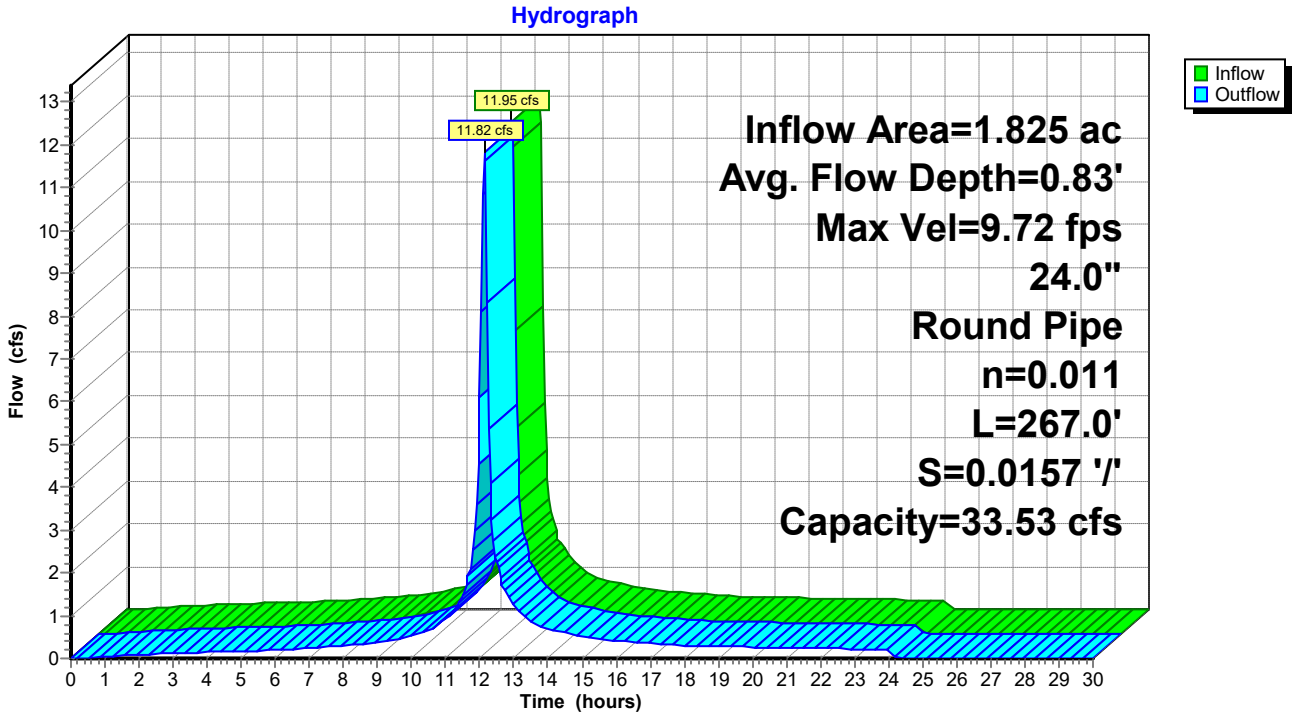
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.72 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.42 fps, Avg. Travel Time= 1.3 min

Peak Storage= 329 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.83' , Surface Width= 1.97'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 33.53 cfs

24.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 267.0' Slope= 0.0157 '/'
Inlet Invert= 463.70', Outlet Invert= 459.50'



Reach DMH-A*: TO DMH-B



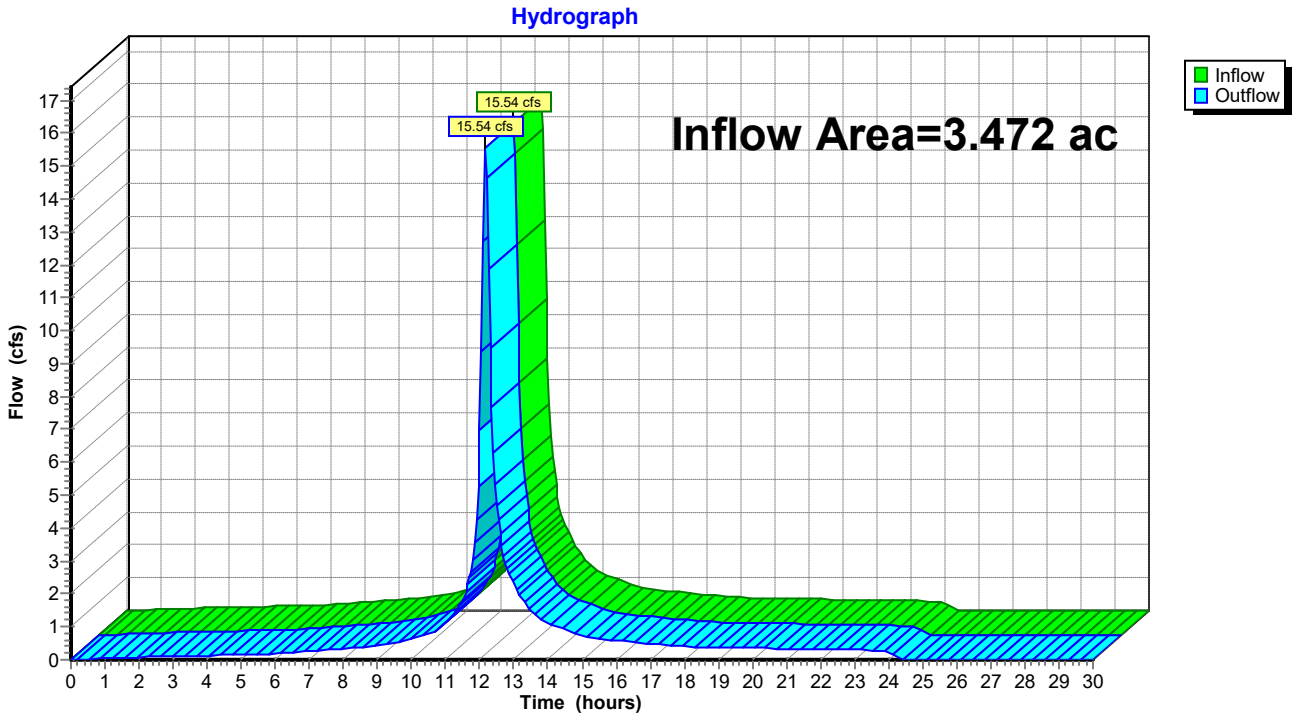
Summary for Reach DMH-C: TO DP#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.472 ac, 77.40% Impervious, Inflow Depth = 5.09" for 100-Year event
Inflow = 15.54 cfs @ 12.16 hrs, Volume= 1.473 af
Outflow = 15.54 cfs @ 12.16 hrs, Volume= 1.473 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP2 : MUNICIPAL SYSTEM

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

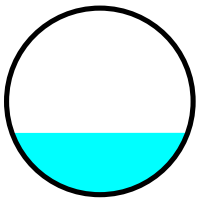
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH-E OUTLET depth by 0.01' @ 24.25 hrs
[79] Warning: Submerged Pond DMH-B Primary device # 1 INLET by 0.09'

Inflow Area = 3.472 ac, 77.40% Impervious, Inflow Depth = 5.09" for 100-Year event
Inflow = 15.70 cfs @ 12.16 hrs, Volume= 1.473 af
Outflow = 15.54 cfs @ 12.16 hrs, Volume= 1.473 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH-C : TO DP#1

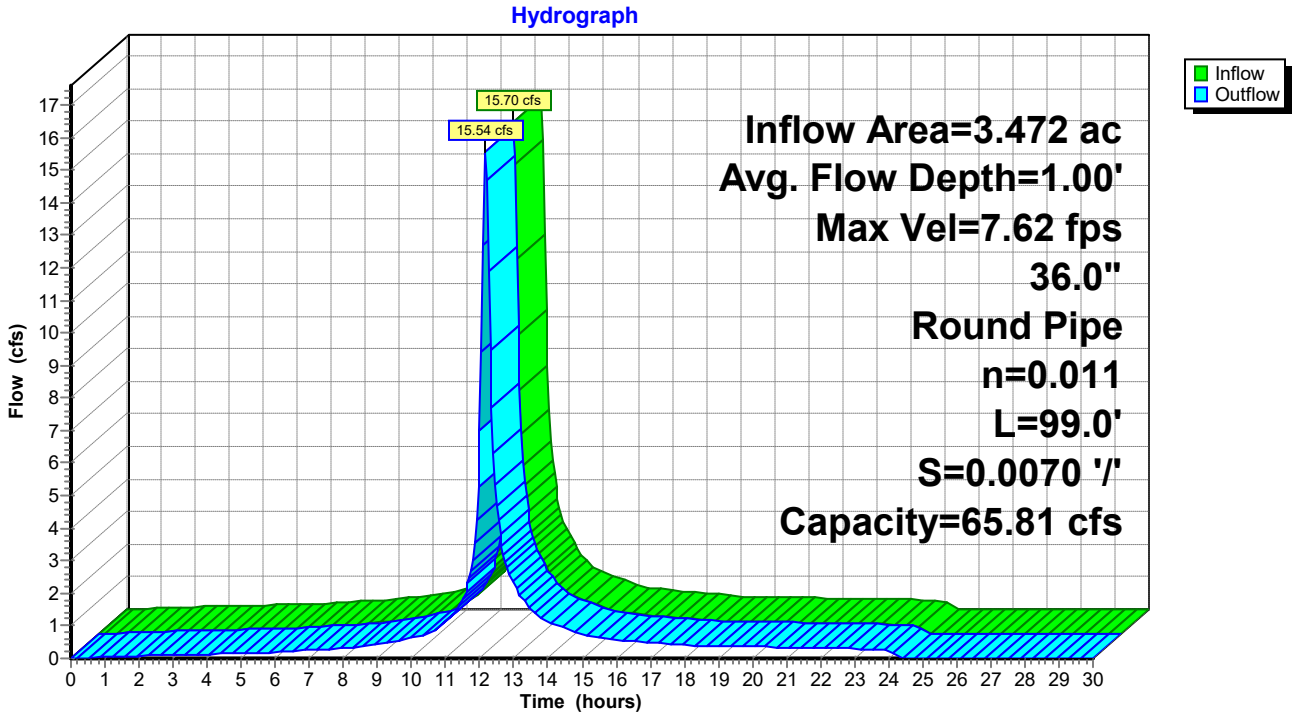
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.60 fps, Avg. Travel Time= 0.6 min

Peak Storage= 203 cf @ 12.16 hrs
Average Depth at Peak Storage= 1.00' , Surface Width= 2.83'
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

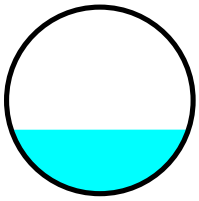
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach CMH3 OUTLET depth by 0.08' @ 12.20 hrs

Inflow Area = 3.330 ac, 76.67% Impervious, Inflow Depth = 4.98" for 100-Year event
Inflow = 15.03 cfs @ 12.16 hrs, Volume= 1.381 af
Outflow = 14.81 cfs @ 12.16 hrs, Volume= 1.381 af, Atten= 1%, Lag= 0.5 min
Routed to Reach DMH-D : TO DMH-C

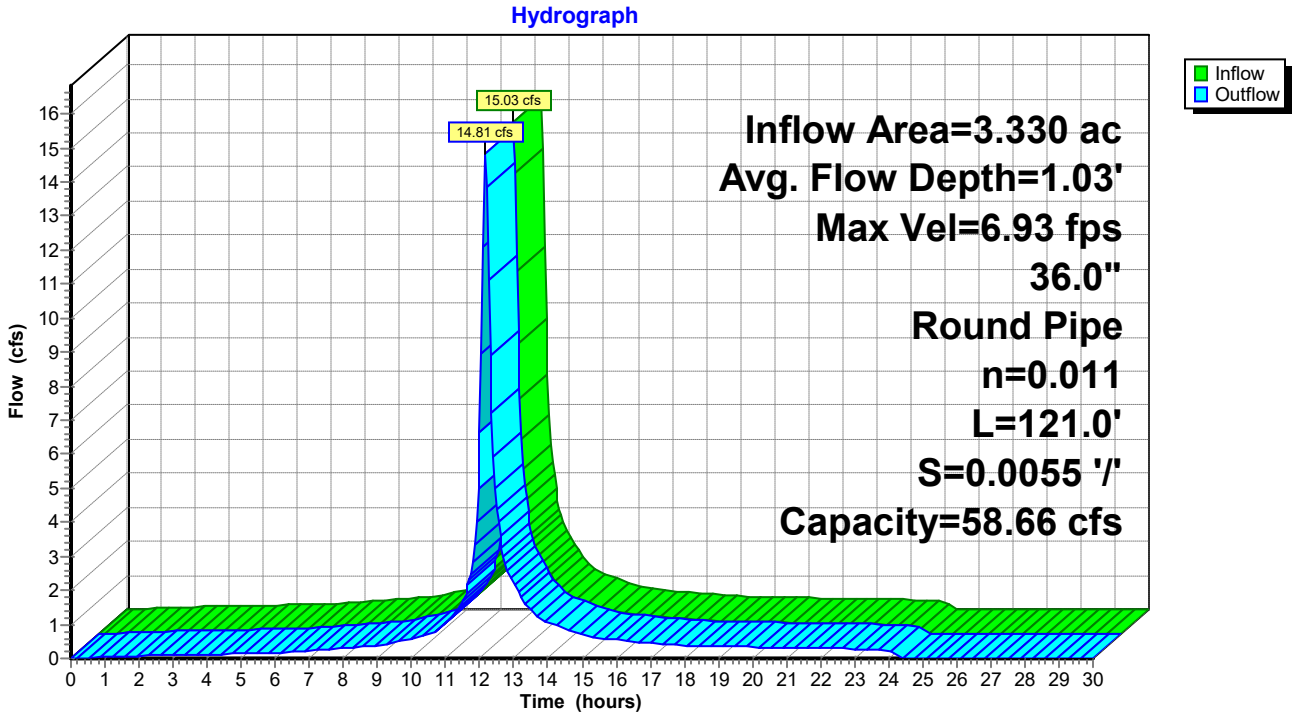
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.93 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.34 fps, Avg. Travel Time= 0.9 min

Peak Storage= 262 cf @ 12.16 hrs
Average Depth at Peak Storage= 1.03' , Surface Width= 2.85'
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

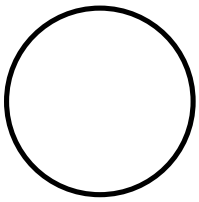


Summary for Reach DMH-F: TO DMH-E

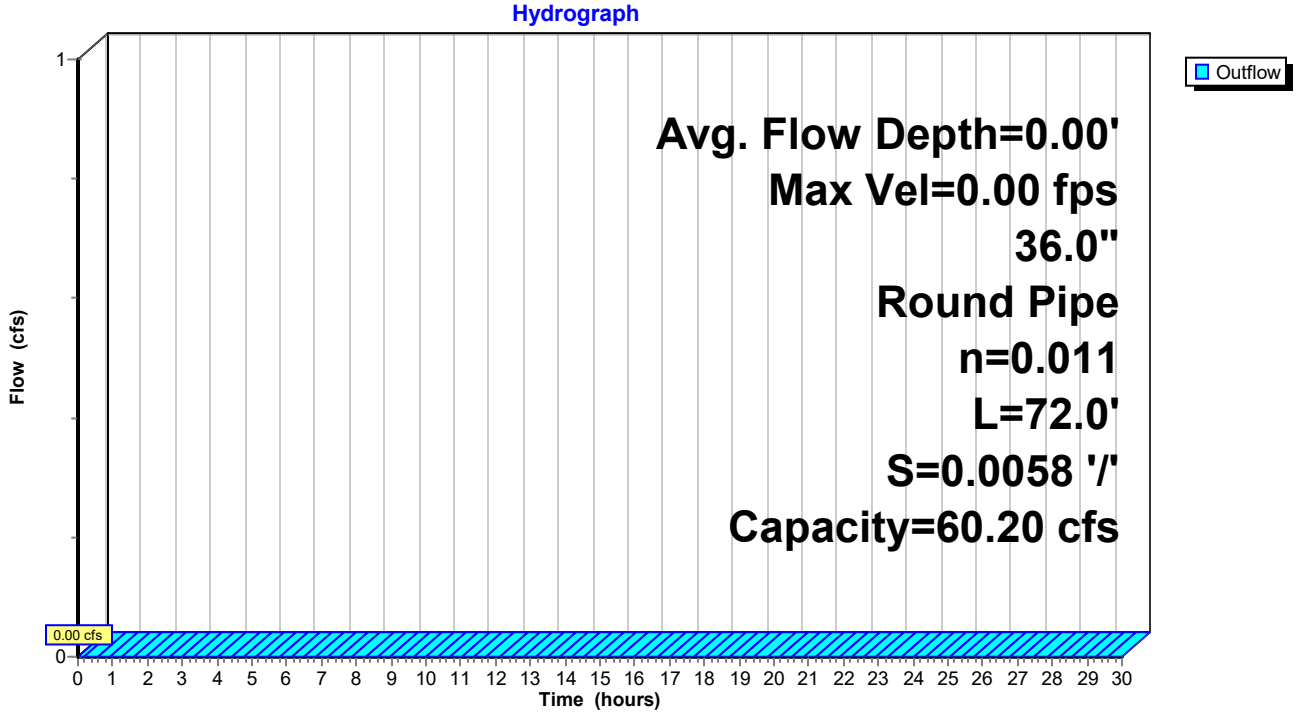
[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 60.20 cfs

36.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 72.0' Slope= 0.0058 '/'
Inlet Invert= 458.13', Outlet Invert= 457.71'



Reach DMH-F: TO DMH-E



Summary for Reach DMH100: TO DMH-A

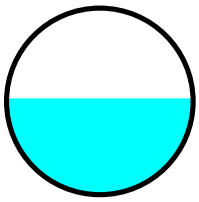
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH101 OUTLET depth by 0.04' @ 12.15 hrs
[62] Hint: Exceeded Reach DMH107 OUTLET depth by 0.09' @ 12.10 hrs

Inflow Area = 1.400 ac, 85.41% Impervious, Inflow Depth = 7.08" for 100-Year event
Inflow = 9.33 cfs @ 12.12 hrs, Volume= 0.826 af
Outflow = 9.23 cfs @ 12.12 hrs, Volume= 0.826 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH-A* : TO DMH-B

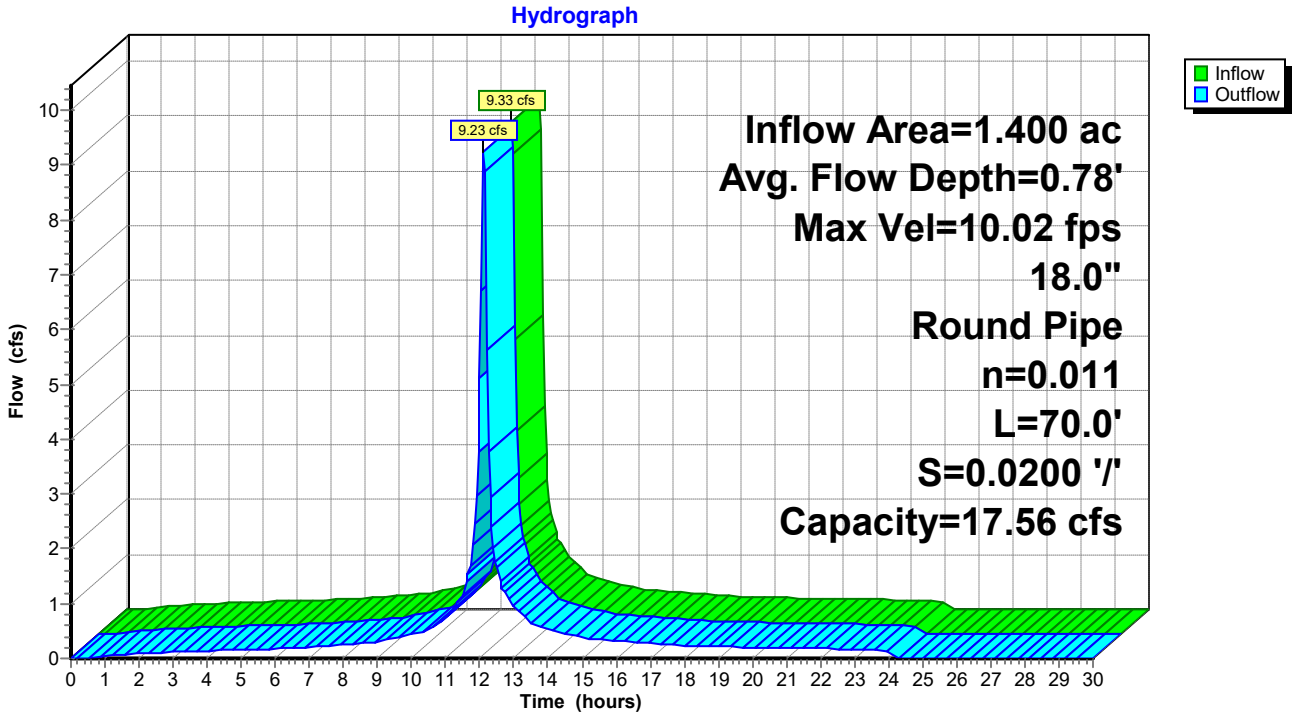
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.02 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.65 fps, Avg. Travel Time= 0.3 min

Peak Storage= 65 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.78' , Surface Width= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 17.56 cfs

18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 70.0' Slope= 0.0200 '/'
Inlet Invert= 465.20', Outlet Invert= 463.80'



Reach DMH100: TO DMH-A



Summary for Reach DMH101: TO DMH#100

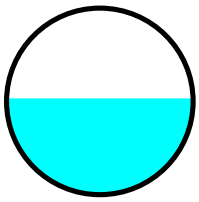
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach RF1 outlet invert by 0.34' @ 12.10 hrs
[61] Hint: Exceeded Reach RF2 outlet invert by 0.34' @ 12.10 hrs

Inflow Area = 0.759 ac,100.00% Impervious, Inflow Depth = 8.10" for 100-Year event
Inflow = 5.70 cfs @ 12.11 hrs, Volume= 0.513 af
Outflow = 5.69 cfs @ 12.11 hrs, Volume= 0.513 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH100 : TO DMH-A

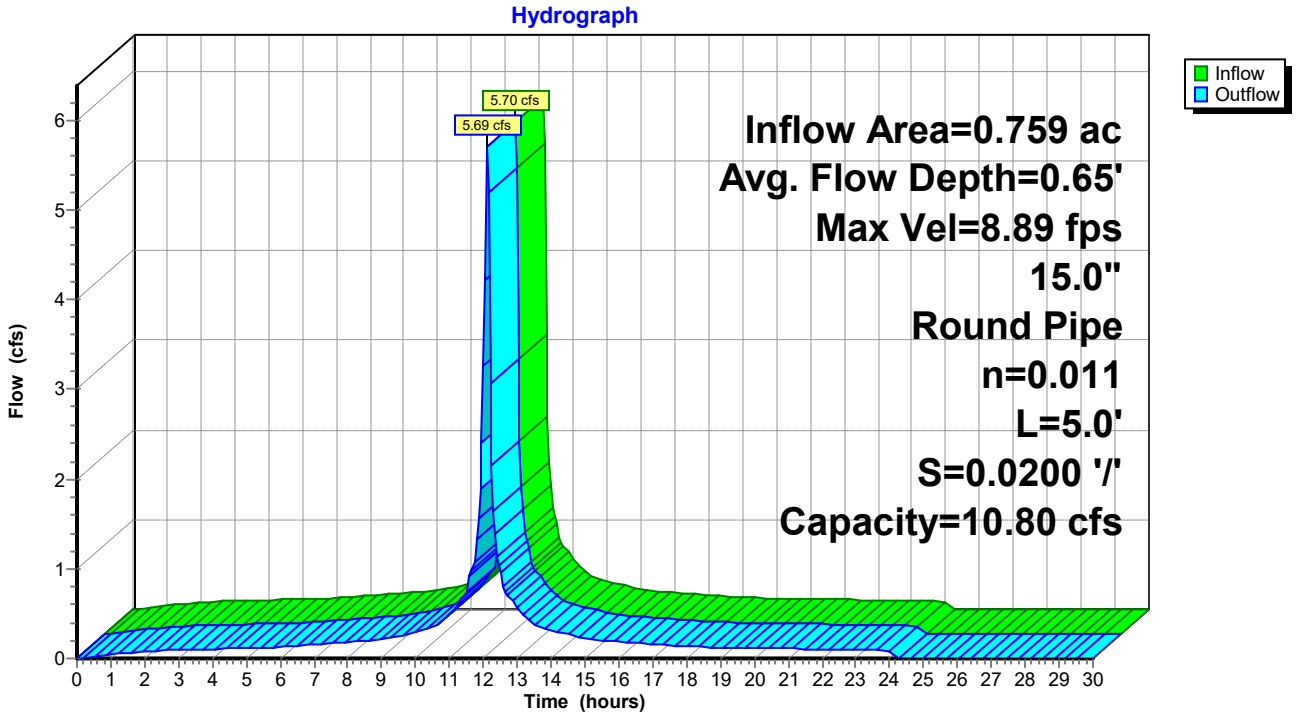
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.89 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 0.0 min

Peak Storage= 3 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.65' , Surface Width= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 10.80 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 465.40', Outlet Invert= 465.30'



Reach DMH101: TO DMH#100



Summary for Reach DMH102: TO UGS#1A

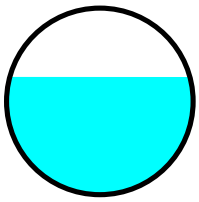
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB15 outlet invert by 0.58' @ 12.10 hrs
[61] Hint: Exceeded Reach DCB7 outlet invert by 0.18' @ 12.10 hrs

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 6.77" for 100-Year event
Inflow = 6.65 cfs @ 12.12 hrs, Volume= 0.550 af
Outflow = 6.64 cfs @ 12.12 hrs, Volume= 0.550 af, Atten= 0%, Lag= 0.0 min
Routed to Reach UGS1A : TO UGS#1

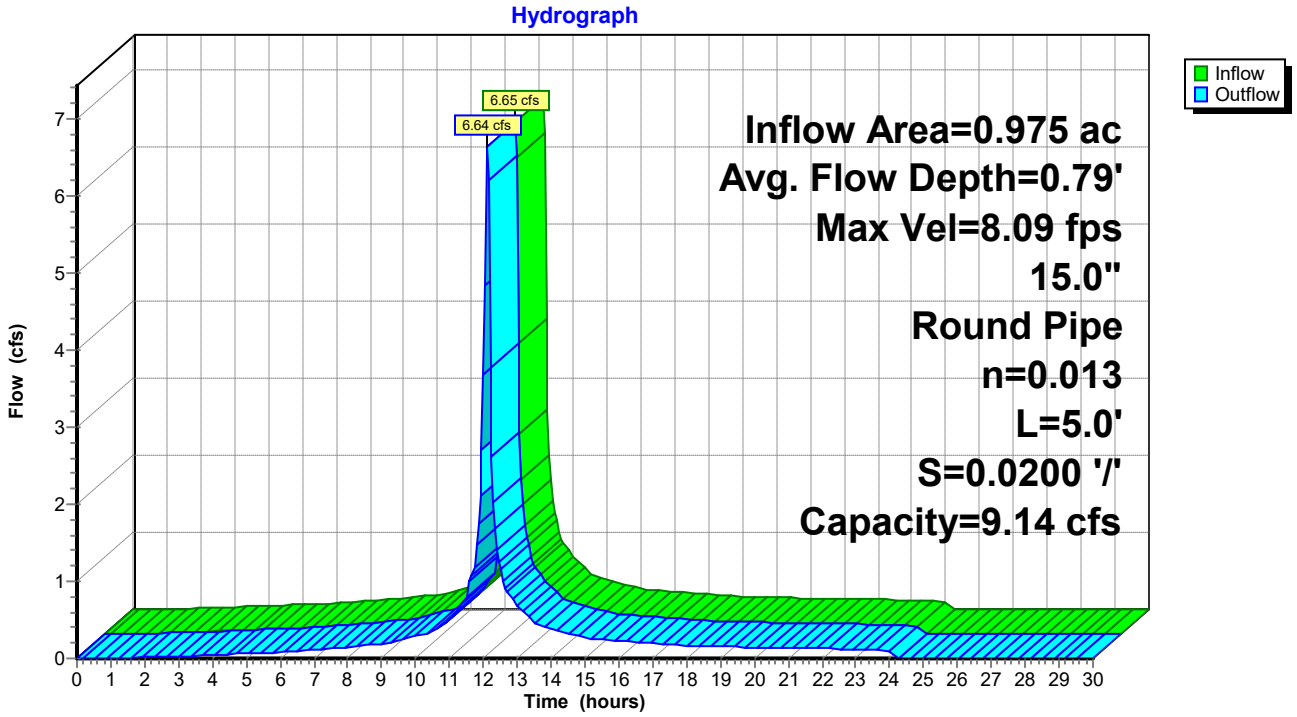
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.09 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.88 fps, Avg. Travel Time= 0.0 min

Peak Storage= 4 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.79' , Surface Width= 1.21'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.14 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 466.10', Outlet Invert= 466.00'



Reach DMH102: TO UGS#1A



Summary for Reach DMH103: TO CMH#2

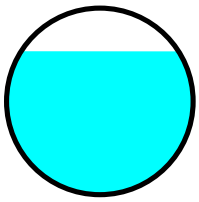
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH104 OUTLET depth by 0.41' @ 12.10 hrs
[61] Hint: Exceeded Reach DMHR1 outlet invert by 0.25' @ 12.15 hrs

Inflow Area = 3.013 ac, 76.57% Impervious, Inflow Depth = 4.82" for 100-Year event
Inflow = 13.56 cfs @ 12.14 hrs, Volume= 1.209 af
Outflow = 13.43 cfs @ 12.15 hrs, Volume= 1.209 af, Atten= 1%, Lag= 0.4 min
Routed to Reach CMH3 : TO DMH-E

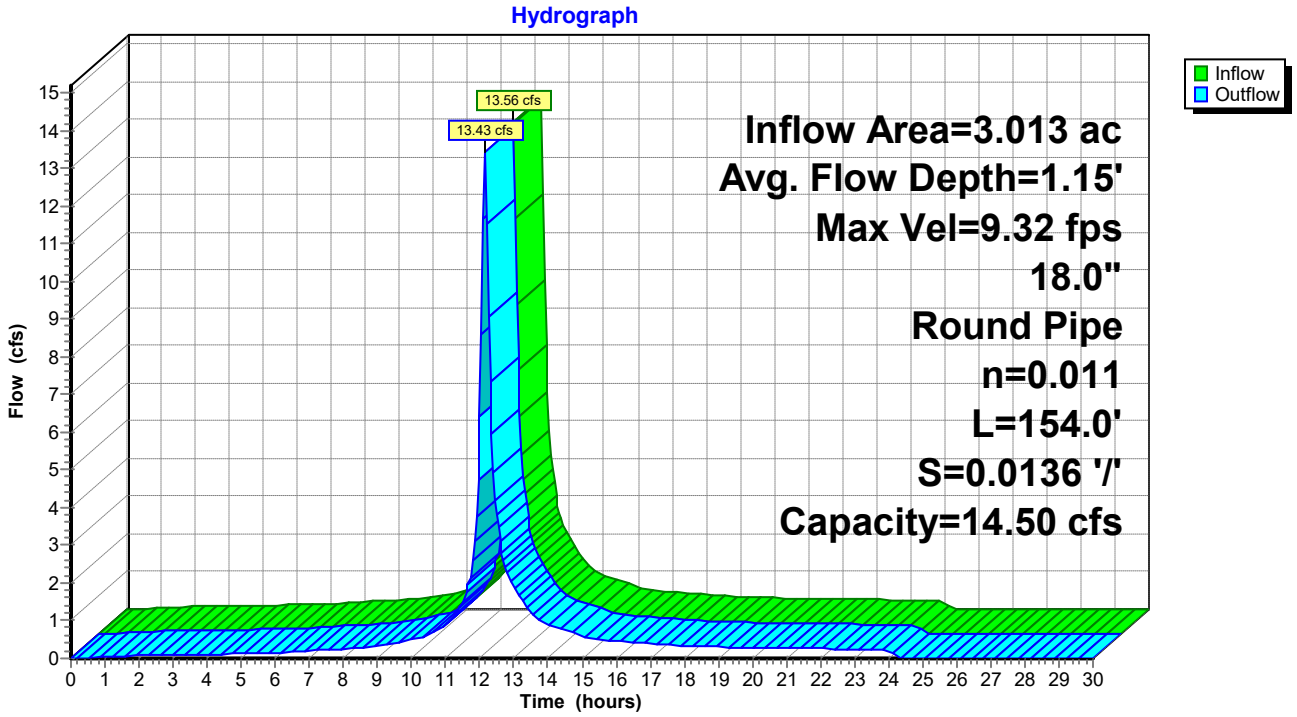
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.32 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.39 fps, Avg. Travel Time= 0.8 min

Peak Storage= 224 cf @ 12.15 hrs
Average Depth at Peak Storage= 1.15' , Surface Width= 1.27'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 14.50 cfs

18.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 154.0' Slope= 0.0136 '/'
Inlet Invert= 464.10', Outlet Invert= 462.00'



Reach DMH103: TO CMH#2



Summary for Reach DMH104: TO DMH#104

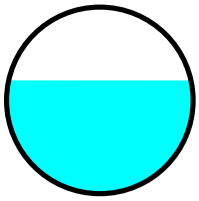
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DMH105 OUTLET depth by 0.13' @ 12.10 hrs

Inflow Area = 1.535 ac, 70.86% Impervious, Inflow Depth = 2.87" for 100-Year event
Inflow = 5.22 cfs @ 12.20 hrs, Volume= 0.367 af
Outflow = 5.17 cfs @ 12.21 hrs, Volume= 0.367 af, Atten= 1%, Lag= 0.5 min
Routed to Reach DMH103 : TO CMH#2

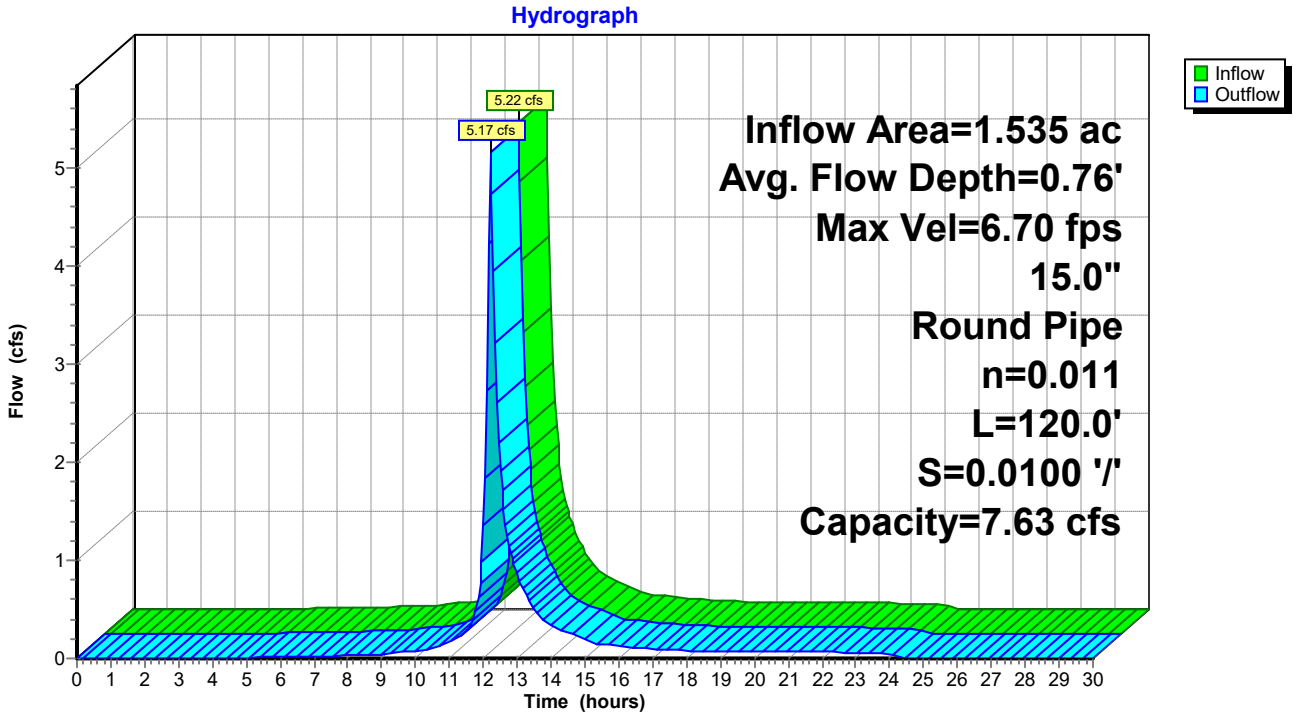
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.70 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 1.0 min

Peak Storage= 94 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.76' , Surface Width= 1.22'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.63 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 120.0' Slope= 0.0100 '/'
Inlet Invert= 465.40', Outlet Invert= 464.20'



Reach DMH104: TO DMH#104



Summary for Reach DMH105: TO DMH#104

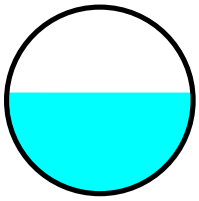
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach UGS1B OUTLET depth by 0.11' @ 12.05 hrs

Inflow Area = 1.135 ac, 76.23% Impervious, Inflow Depth = 2.13" for 100-Year event
Inflow = 4.17 cfs @ 12.21 hrs, Volume= 0.201 af
Outflow = 4.14 cfs @ 12.22 hrs, Volume= 0.201 af, Atten= 1%, Lag= 0.7 min
Routed to Reach DMH104 : TO DMH#104

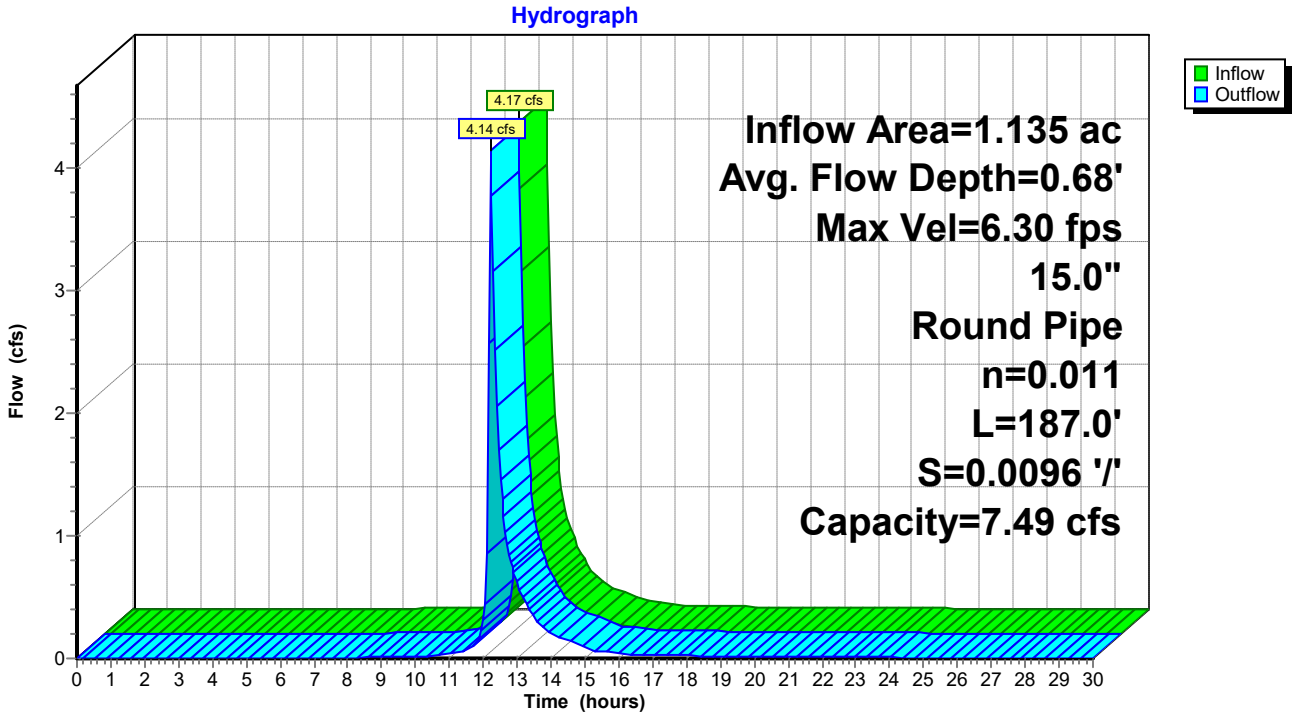
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.30 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 2.0 min

Peak Storage= 127 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.68' , Surface Width= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.49 cfs

15.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 187.0' Slope= 0.0096 '/'
Inlet Invert= 467.30', Outlet Invert= 465.50'



Reach DMH105: TO DMH#104



Summary for Reach DMH106: TO DMH#105

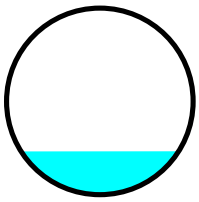
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB10 outlet invert by 0.13' @ 12.10 hrs
[61] Hint: Exceeded Reach DCB11 outlet invert by 0.13' @ 12.10 hrs

Inflow Area = 0.160 ac, 44.63% Impervious, Inflow Depth = 4.22" for 100-Year event
Inflow = 0.73 cfs @ 12.12 hrs, Volume= 0.056 af
Outflow = 0.72 cfs @ 12.13 hrs, Volume= 0.056 af, Atten= 1%, Lag= 0.5 min
Routed to Reach DMH105 : TO DMH#104

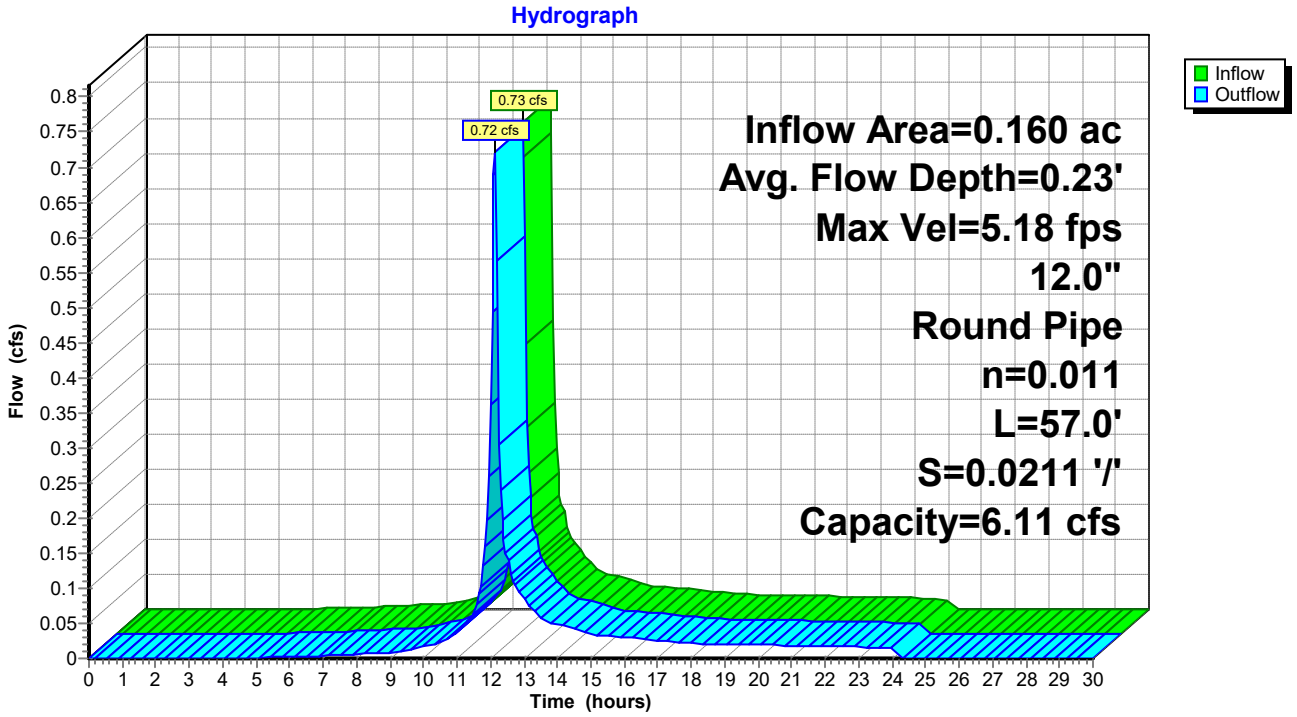
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.18 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.79 fps, Avg. Travel Time= 0.5 min

Peak Storage= 8 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 0.84'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.11 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 57.0' Slope= 0.0211 '/'
Inlet Invert= 470.00', Outlet Invert= 468.80'



Reach DMH106: TO DMH#105



Summary for Reach DMH107: TO DMH#100

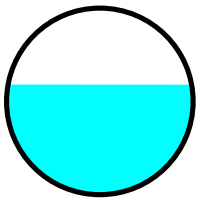
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DCB6 OUTLET depth by 0.15' @ 12.15 hrs
[61] Hint: Exceeded Reach DMH108 outlet invert by 0.38' @ 12.10 hrs

Inflow Area = 0.641 ac, 68.12% Impervious, Inflow Depth = 5.87" for 100-Year event
Inflow = 3.72 cfs @ 12.12 hrs, Volume= 0.313 af
Outflow = 3.71 cfs @ 12.13 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.4 min
Routed to Reach DMH100 : TO DMH-A

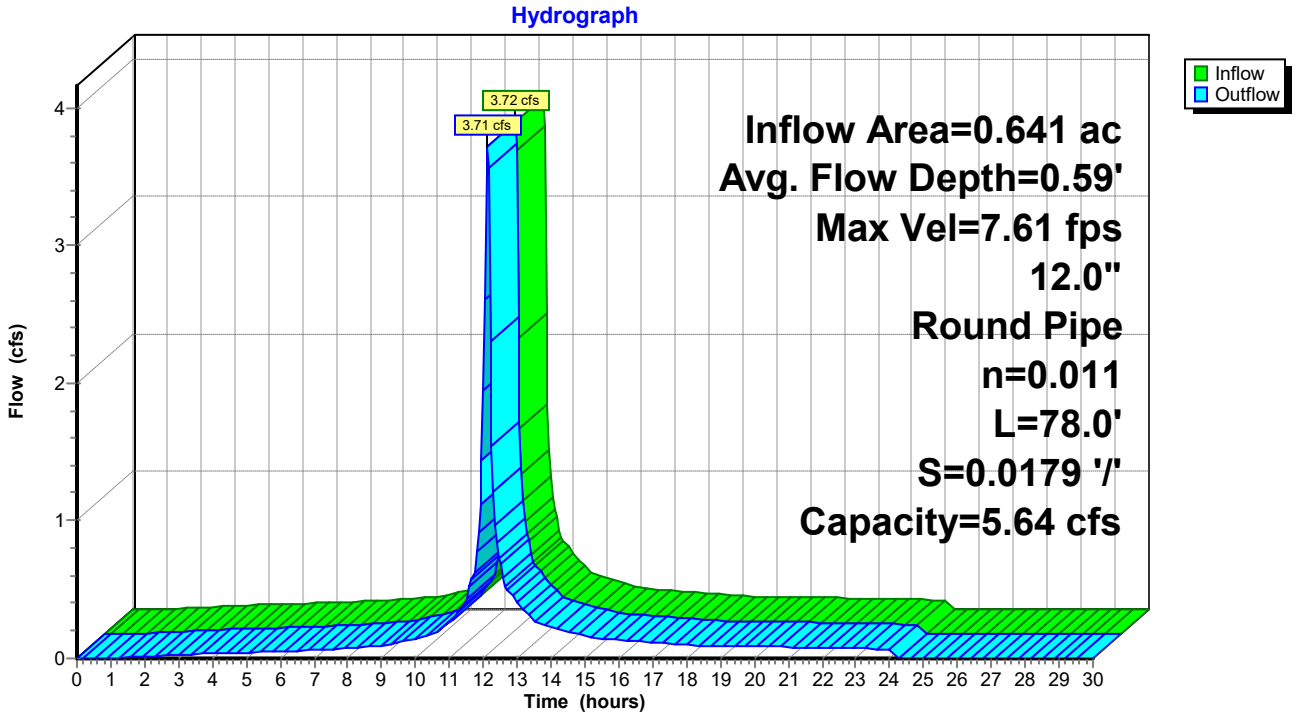
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.61 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.75 fps, Avg. Travel Time= 0.5 min

Peak Storage= 38 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.64 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 78.0' Slope= 0.0179 '/'
Inlet Invert= 466.70', Outlet Invert= 465.30'



Reach DMH107: TO DMH#100



Summary for Reach DMH108: TO DMH#107

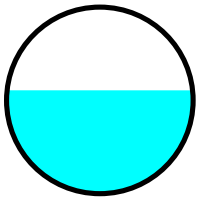
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB12 outlet invert by 0.45' @ 12.10 hrs

Inflow Area = 0.491 ac, 60.11% Impervious, Inflow Depth = 5.30" for 100-Year event
Inflow = 2.65 cfs @ 12.12 hrs, Volume= 0.217 af
Outflow = 2.61 cfs @ 12.12 hrs, Volume= 0.217 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH107 : TO DMH#100

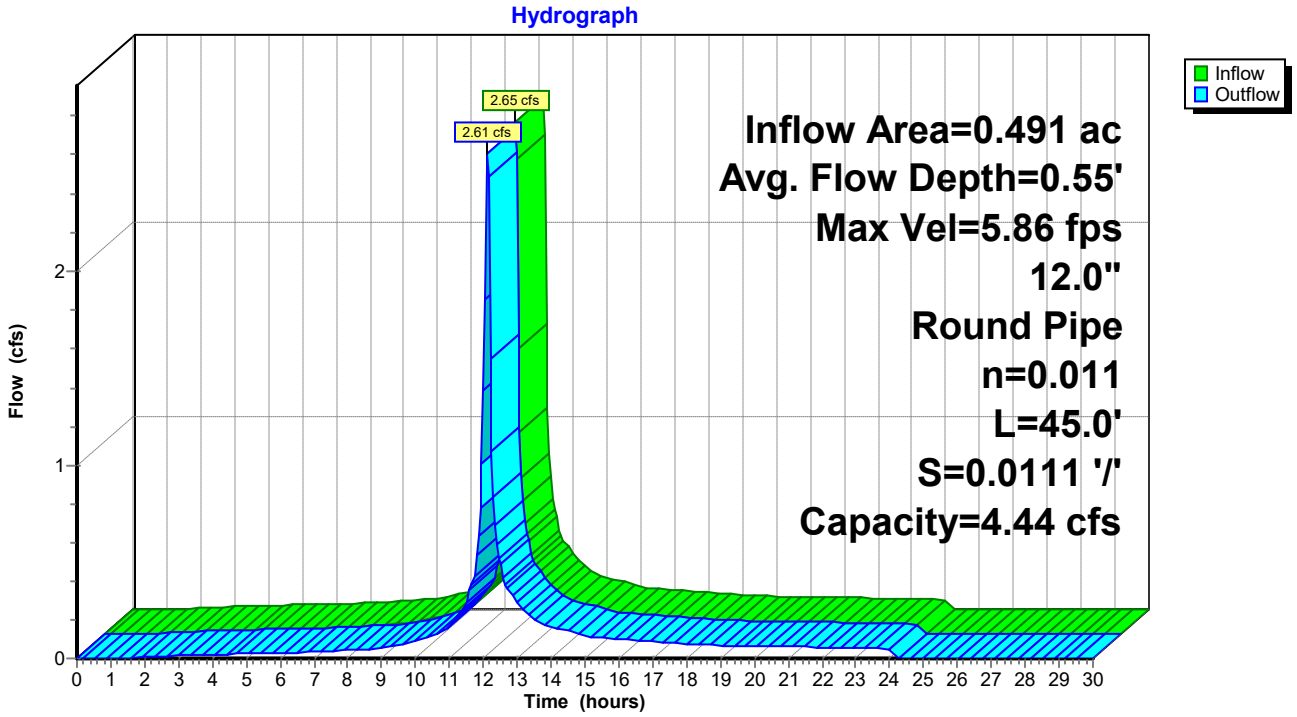
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.86 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 0.4 min

Peak Storage= 20 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.55' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0111 '/'
Inlet Invert= 467.40', Outlet Invert= 466.90'



Reach DMH108: TO DMH#107



Summary for Reach DMH109: TO DMH#110

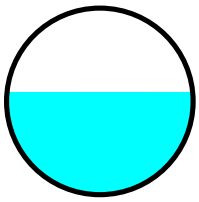
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach DCB14 OUTLET depth by 0.10' @ 12.10 hrs
[61] Hint: Exceeded Reach DCB20 outlet invert by 0.35' @ 12.10 hrs
[61] Hint: Exceeded Reach DMH109A outlet invert by 0.35' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 6.98" for 100-Year event
Inflow = 4.19 cfs @ 12.11 hrs, Volume= 0.348 af
Outflow = 4.19 cfs @ 12.12 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH110 : TO UGS#2A

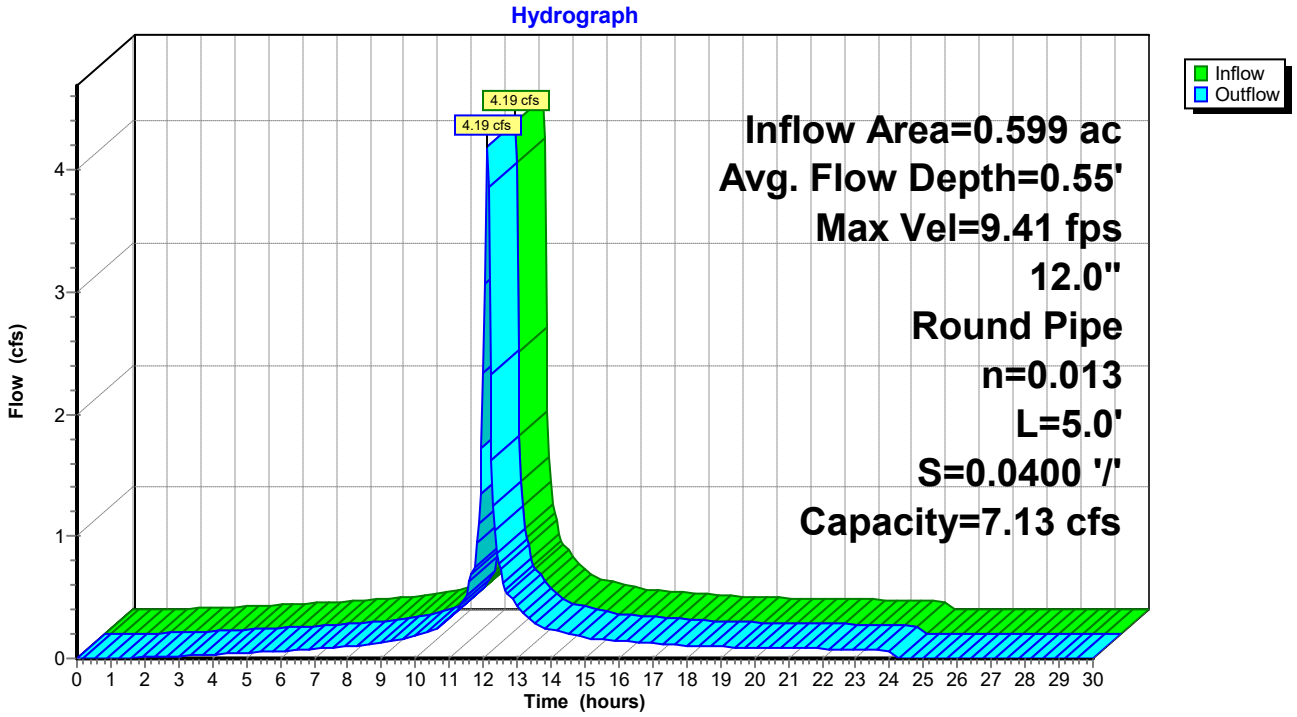
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.41 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.31 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.55' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.13 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0400 '/'
Inlet Invert= 466.20', Outlet Invert= 466.00'



Reach DMH109: TO DMH#110



Summary for Reach DMH109A: TO DMH109

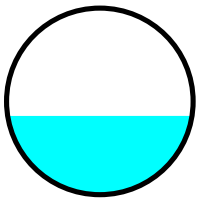
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB21 outlet invert by 0.32' @ 12.10 hrs
[62] Hint: Exceeded Reach DCB25 OUTLET depth by 0.10' @ 12.10 hrs

Inflow Area = 0.239 ac, 75.90% Impervious, Inflow Depth = 6.42" for 100-Year event
Inflow = 1.60 cfs @ 12.11 hrs, Volume= 0.128 af
Outflow = 1.57 cfs @ 12.12 hrs, Volume= 0.128 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH109 : TO DMH#110

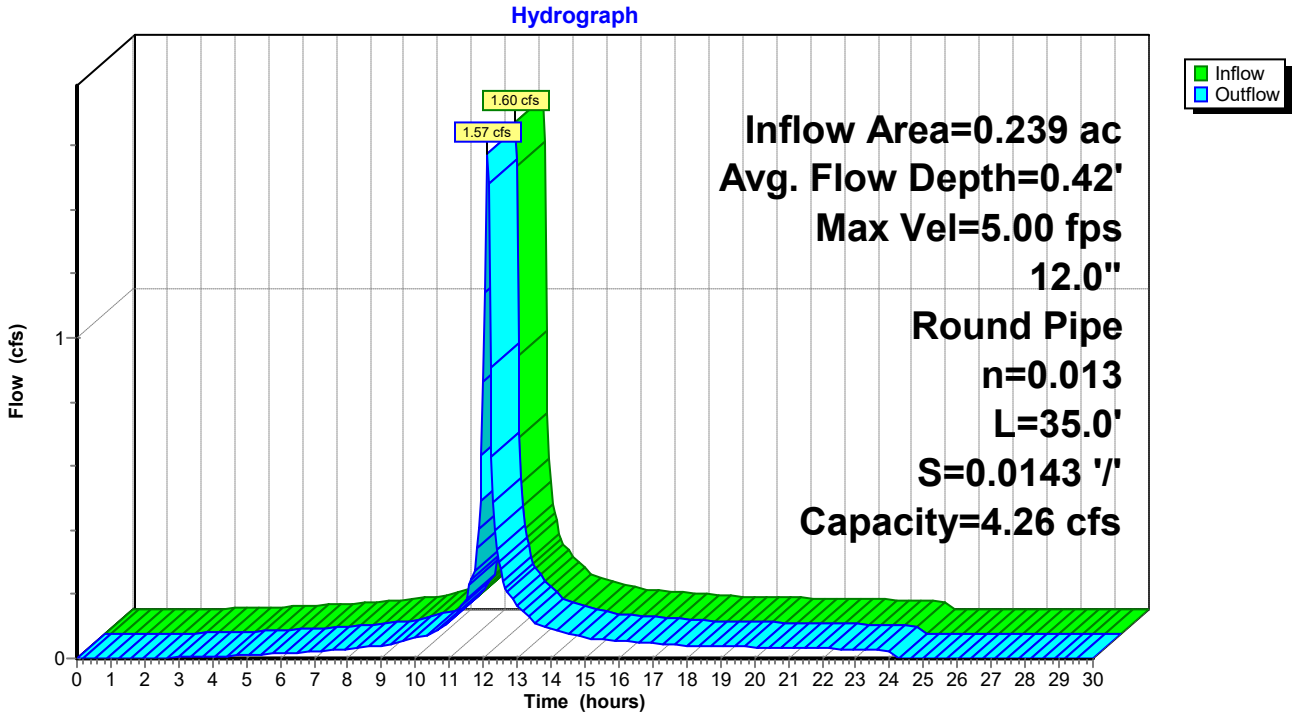
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.00 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.42' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0143 '/'
Inlet Invert= 466.90', Outlet Invert= 466.40'



Reach DMH109A: TO DMH109



Summary for Reach DMH110: TO UGS#2A

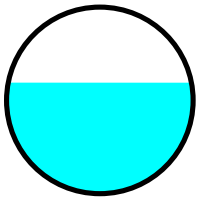
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH109 outlet invert by 0.34' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 6.98" for 100-Year event
Inflow = 4.19 cfs @ 12.12 hrs, Volume= 0.348 af
Outflow = 4.17 cfs @ 12.12 hrs, Volume= 0.348 af, Atten= 1%, Lag= 0.1 min
Routed to Reach UGS2A : TO UGS#2

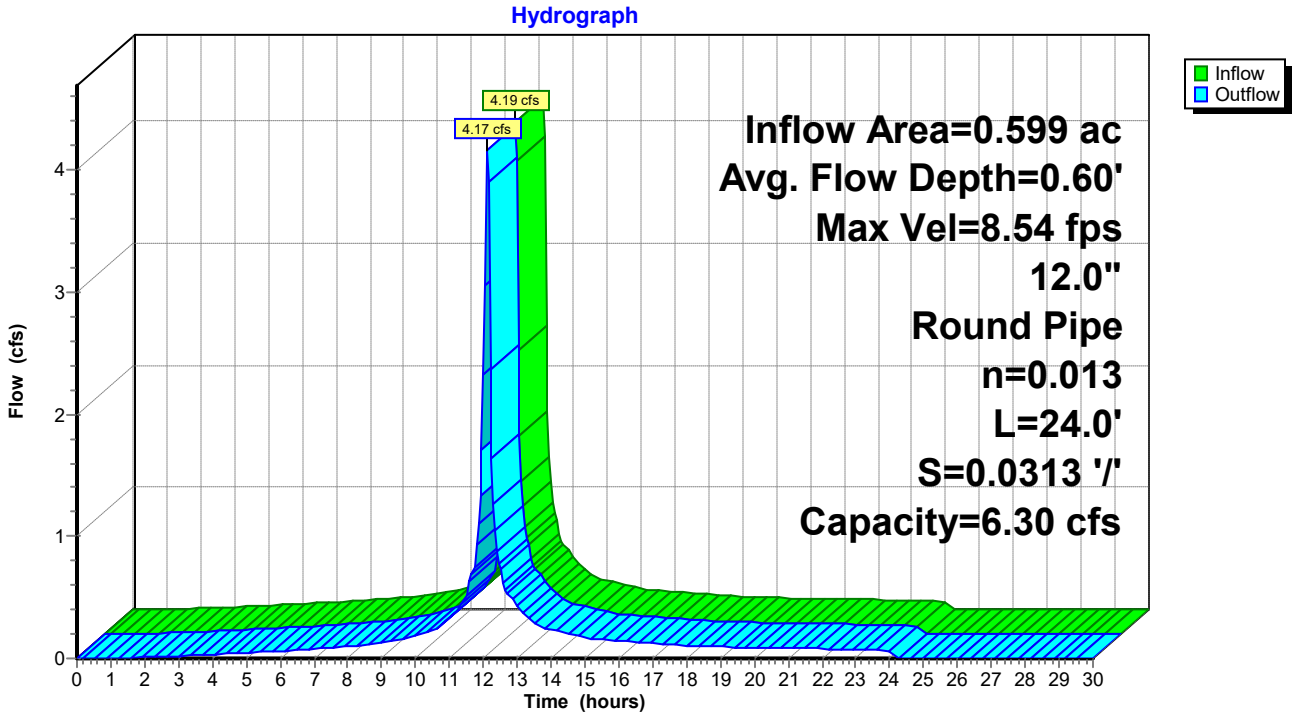
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.54 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.04 fps, Avg. Travel Time= 0.1 min

Peak Storage= 12 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.60' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.30 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0313 '/'
Inlet Invert= 465.75', Outlet Invert= 465.00'



Reach DMH110: TO UGS#2A



Summary for Reach DMH111: TO DMH#112

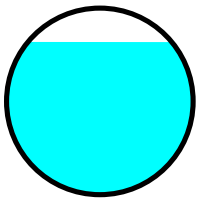
[52] Hint: Inlet/Outlet conditions not evaluated
[63] Warning: Exceeded Reach DCB19 INLET depth by 0.25' @ 12.15 hrs
[62] Hint: Exceeded Reach DCB22 OUTLET depth by 0.43' @ 12.15 hrs
[62] Hint: Exceeded Reach DCB23 OUTLET depth by 0.02' @ 12.15 hrs

Inflow Area = 1.171 ac, 46.54% Impervious, Inflow Depth = 4.36" for 100-Year event
Inflow = 5.39 cfs @ 12.13 hrs, Volume= 0.426 af
Outflow = 5.36 cfs @ 12.14 hrs, Volume= 0.426 af, Atten= 0%, Lag= 0.3 min
Routed to Reach DMH112 : TO DMH#113

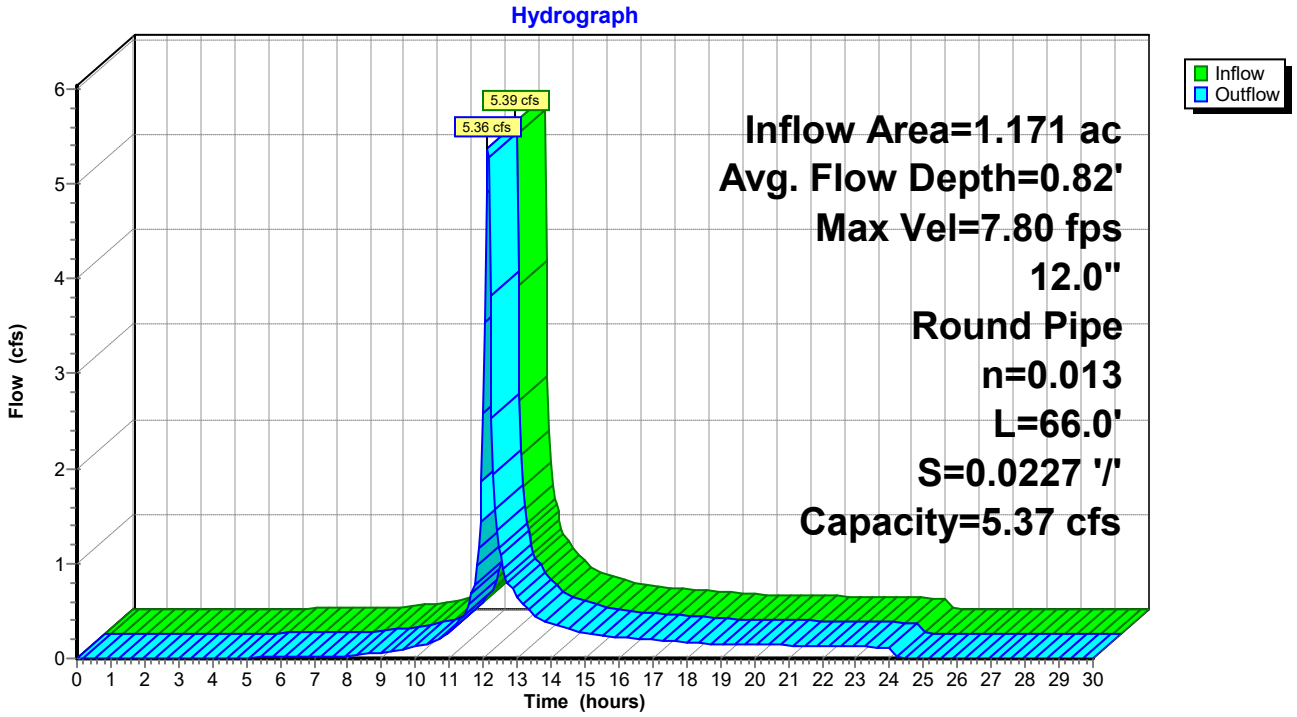
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.80 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.78 fps, Avg. Travel Time= 0.4 min

Peak Storage= 46 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.82' , Surface Width= 0.77'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.37 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 66.0' Slope= 0.0227 '/'
Inlet Invert= 463.50', Outlet Invert= 462.00'



Reach DMH111: TO DMH#112



Summary for Reach DMH112: TO DMH#113

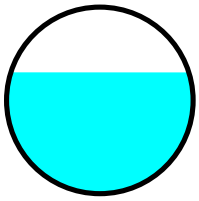
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach UGS2B OUTLET depth by 0.35' @ 12.05 hrs

Inflow Area = 1.770 ac, 59.09% Impervious, Inflow Depth > 5.23" for 100-Year event
Inflow = 8.53 cfs @ 12.16 hrs, Volume= 0.772 af
Outflow = 8.46 cfs @ 12.16 hrs, Volume= 0.772 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH113 : TO DMH#114

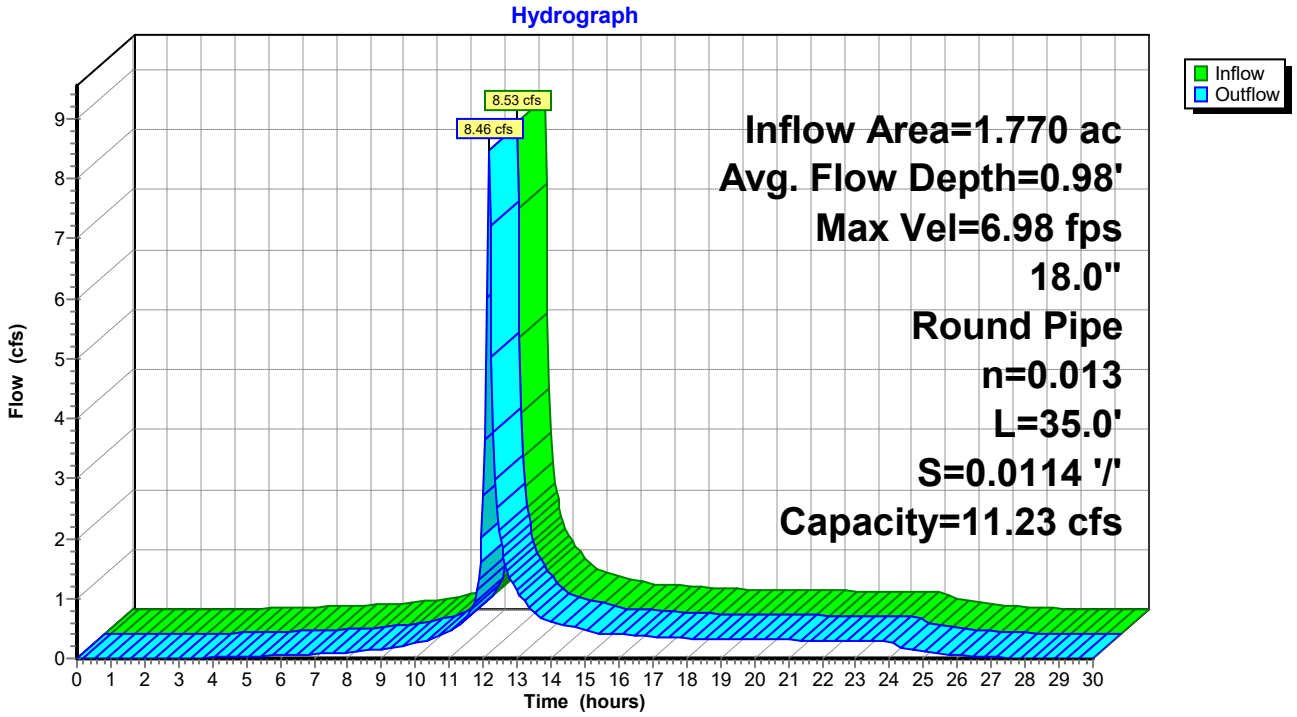
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.98 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.36 fps, Avg. Travel Time= 0.2 min

Peak Storage= 43 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.98' , Surface Width= 1.43'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.23 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0114 '/'
Inlet Invert= 460.20', Outlet Invert= 459.80'



Reach DMH112: TO DMH#113



Summary for Reach DMH113: TO DMH#114

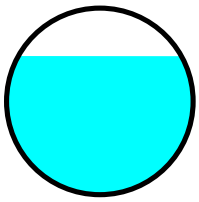
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB24 outlet invert by 0.51' @ 12.15 hrs
[62] Hint: Exceeded Reach DMH112 OUTLET depth by 0.07' @ 12.10 hrs

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 4.97" for 100-Year event
Inflow = 12.00 cfs @ 12.15 hrs, Volume= 1.064 af
Outflow = 11.97 cfs @ 12.15 hrs, Volume= 1.064 af, Atten= 0%, Lag= 0.1 min
Routed to Reach DMH114 : TO DMH-K1

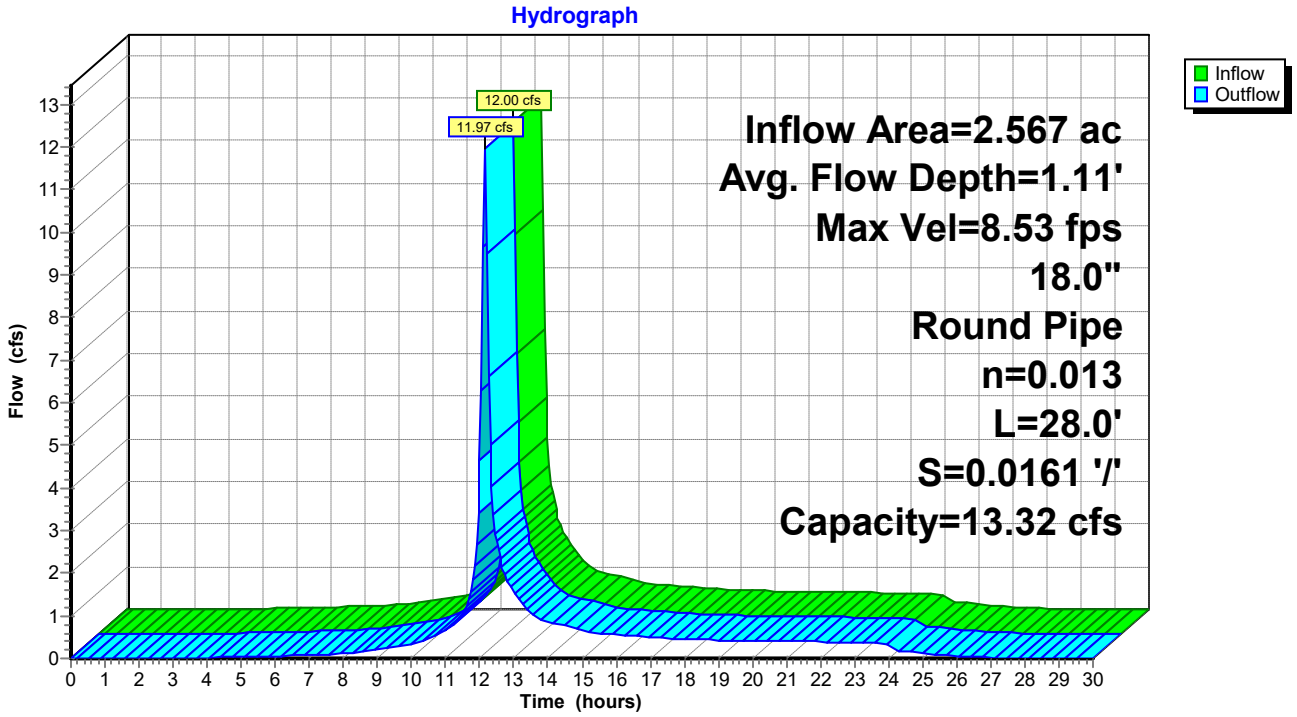
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.53 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.85 fps, Avg. Travel Time= 0.2 min

Peak Storage= 39 cf @ 12.15 hrs
Average Depth at Peak Storage= 1.11' , Surface Width= 1.31'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 13.32 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 28.0' Slope= 0.0161 '/'
Inlet Invert= 459.70', Outlet Invert= 459.25'



Reach DMH113: TO DMH#114



Summary for Reach DMH114: TO DMH-K1

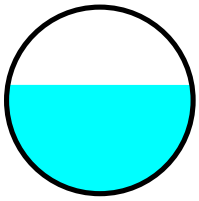
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH113 outlet invert by 0.63' @ 12.15 hrs

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 4.97" for 100-Year event
Inflow = 11.97 cfs @ 12.15 hrs, Volume= 1.064 af
Outflow = 11.96 cfs @ 12.15 hrs, Volume= 1.064 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

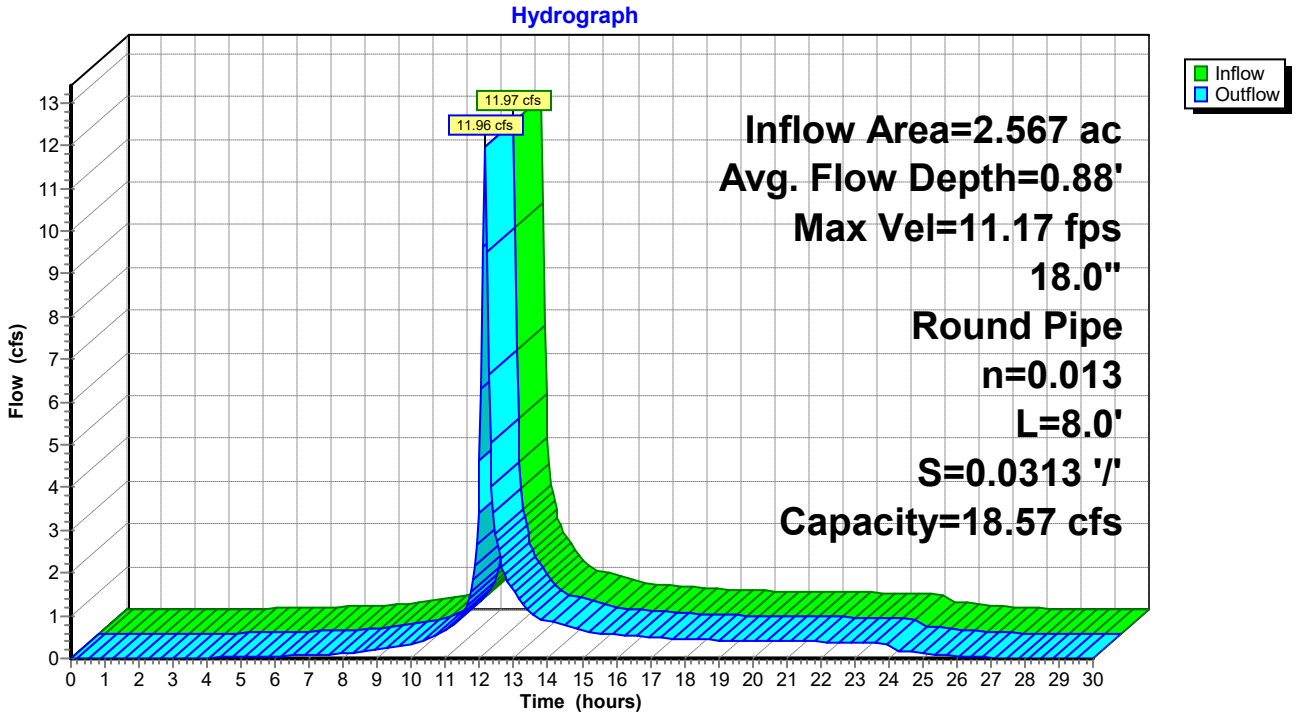
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.17 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.61 fps, Avg. Travel Time= 0.0 min

Peak Storage= 9 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.88' , Surface Width= 1.48'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.57 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 8.0' Slope= 0.0313 '/'
Inlet Invert= 459.00', Outlet Invert= 458.75'



Reach DMH114: TO DMH-K1



Summary for Reach DMHR1: TO DMH#104

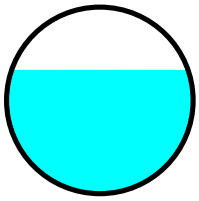
[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMHR2 outlet invert by 0.55' @ 12.15 hrs

Inflow Area = 0.739 ac, 65.00% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 4.39 cfs @ 12.13 hrs, Volume= 0.344 af
Outflow = 4.36 cfs @ 12.13 hrs, Volume= 0.344 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH103 : TO CMH#2

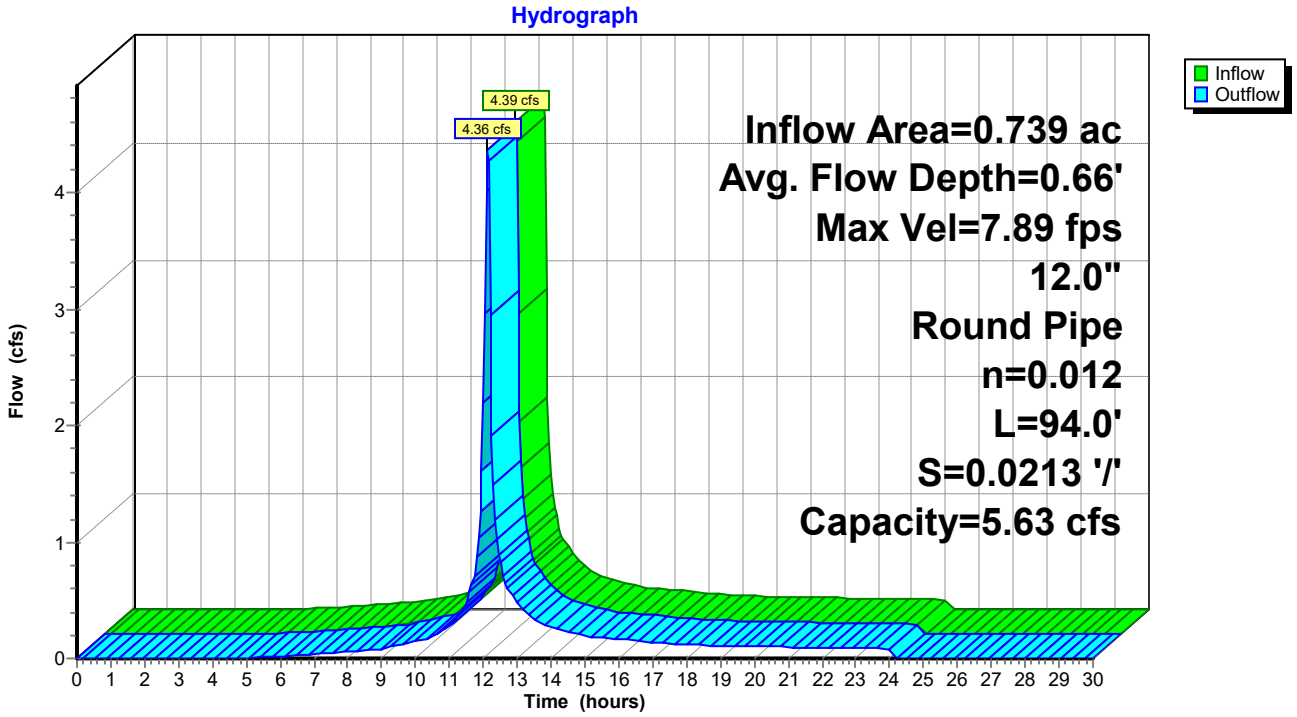
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.89 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.92 fps, Avg. Travel Time= 0.5 min

Peak Storage= 52 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.66' , Surface Width= 0.94'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.63 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 94.0' Slope= 0.0213 '/'
Inlet Invert= 467.00', Outlet Invert= 465.00'



Reach DMHR1: TO DMH#104



Summary for Reach DMHR2: TO DMH#R2

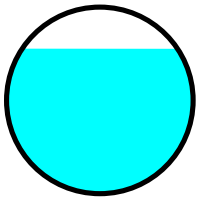
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.739 ac, 65.00% Impervious, Inflow Depth = 5.59" for 100-Year event
Inflow = 4.49 cfs @ 12.11 hrs, Volume= 0.344 af
Outflow = 4.39 cfs @ 12.13 hrs, Volume= 0.344 af, Atten= 2%, Lag= 0.8 min
Routed to Reach DMHR1 : TO DMH#104

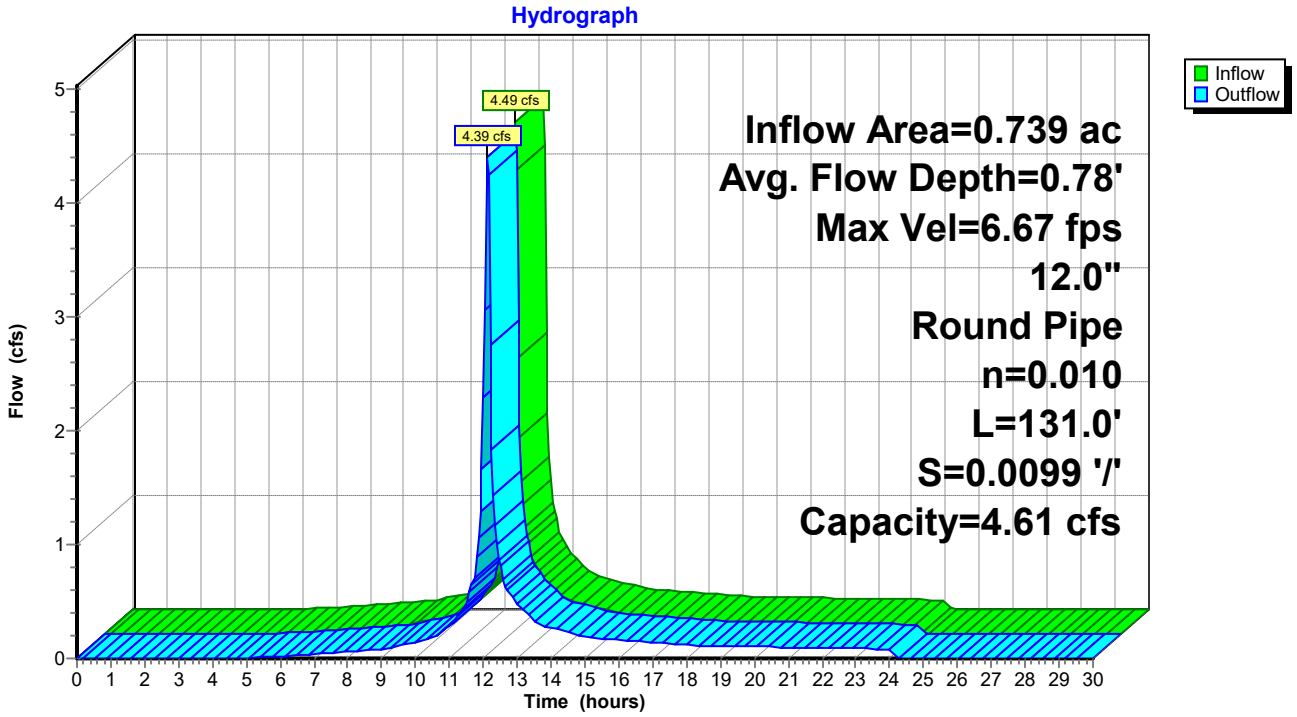
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.67 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.55 fps, Avg. Travel Time= 0.9 min

Peak Storage= 86 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.78' , Surface Width= 0.83'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.61 cfs

12.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 131.0' Slope= 0.0099 '/'
Inlet Invert= 468.40', Outlet Invert= 467.10'



Reach DMHR2: TO DMH#R2



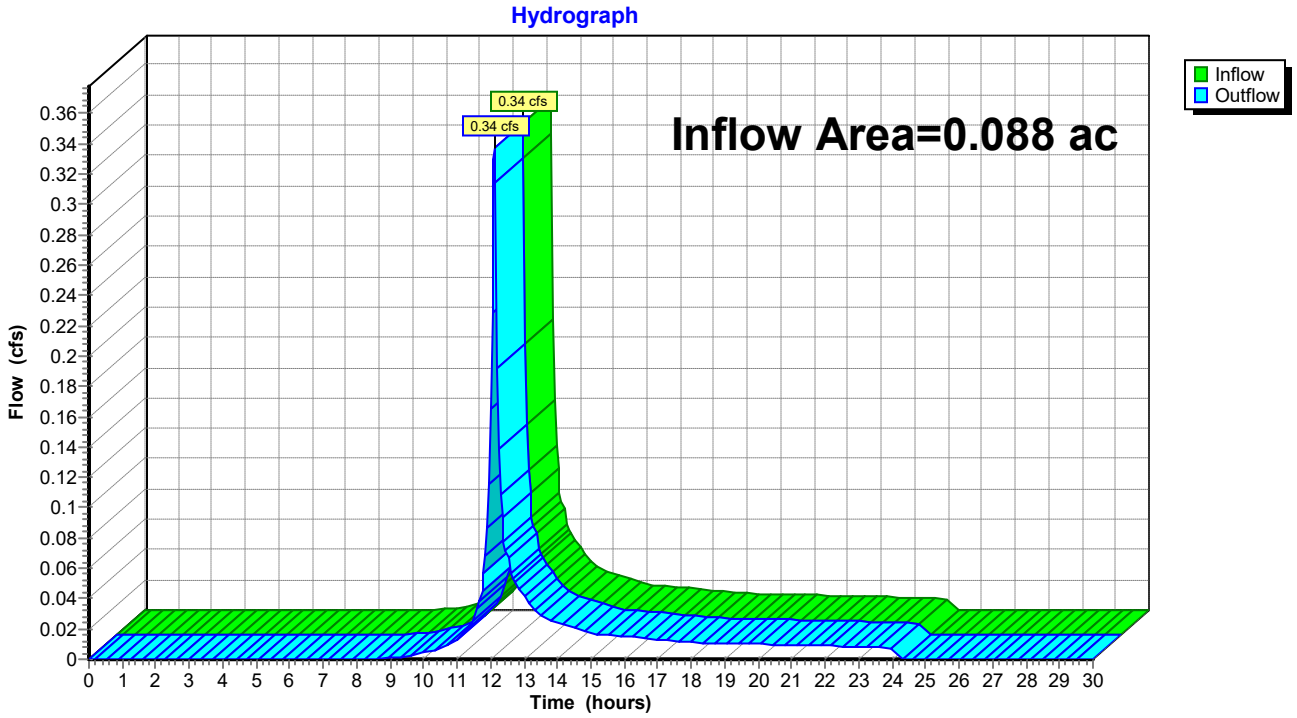
Summary for Reach DP#6: OFFSITE LOW POINT

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.088 ac, 33.45% Impervious, Inflow Depth = 3.48" for 100-Year event
Inflow = 0.34 cfs @ 12.12 hrs, Volume= 0.026 af
Outflow = 0.34 cfs @ 12.12 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 DP#6: OFFSITE LOW POINT



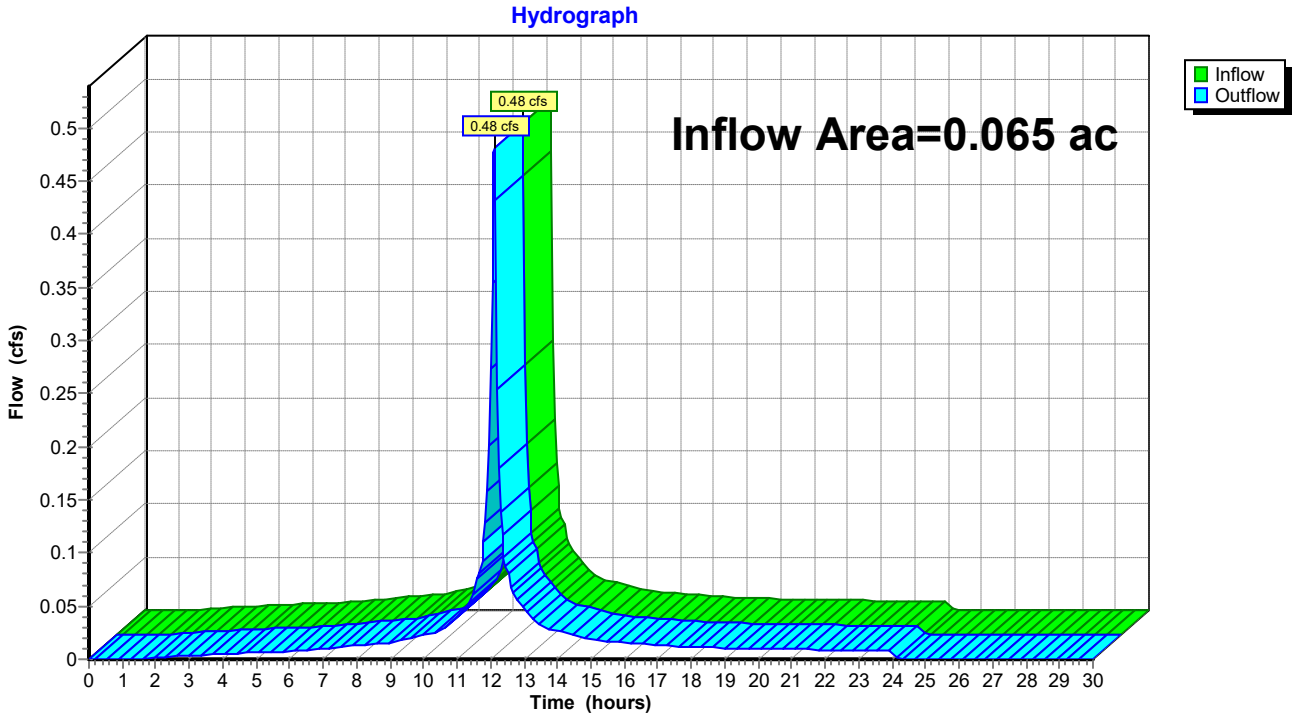
Summary for Reach DP1: GUTTER POINT FRANKLIN (WEST)

[40] Hint: Not Described (Outflow=Inflow)

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)



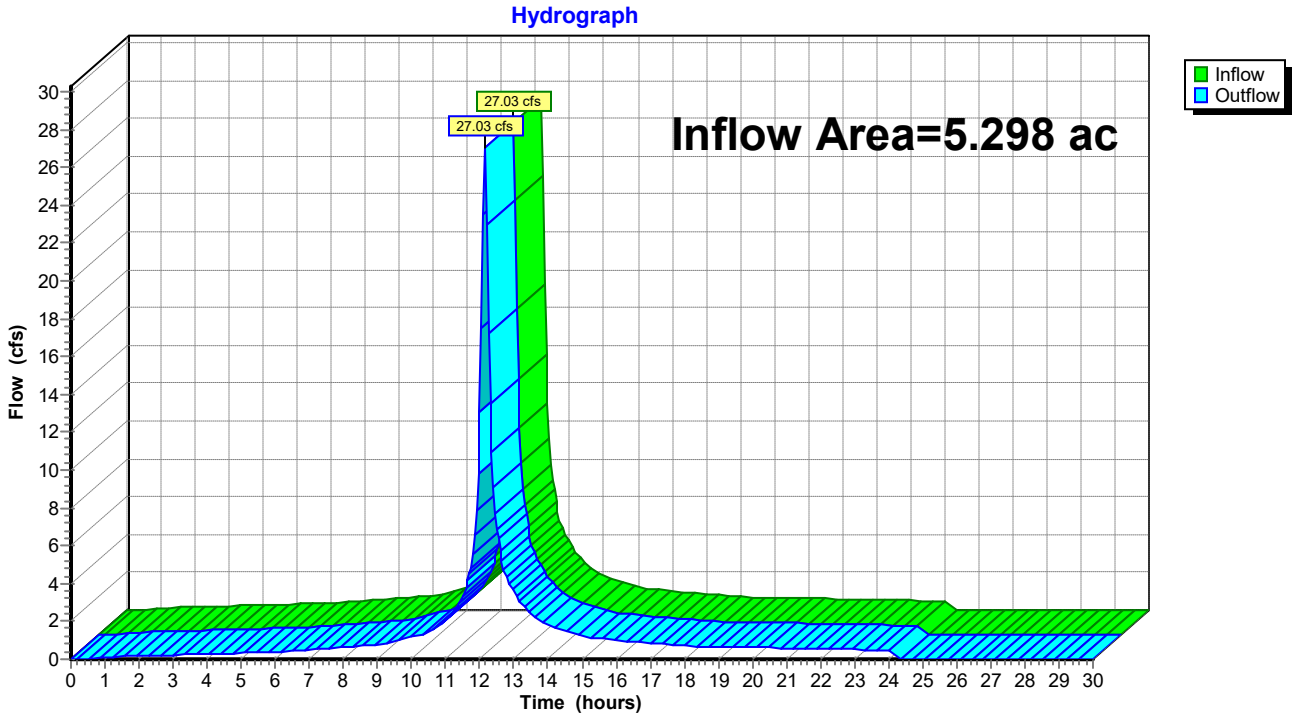
Summary for Reach DP2: MUNICIPAL SYSTEM

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.298 ac, 79.01% Impervious, Inflow Depth = 5.69" for 100-Year event
Inflow = 27.03 cfs @ 12.15 hrs, Volume= 2.513 af
Outflow = 27.03 cfs @ 12.15 hrs, Volume= 2.513 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



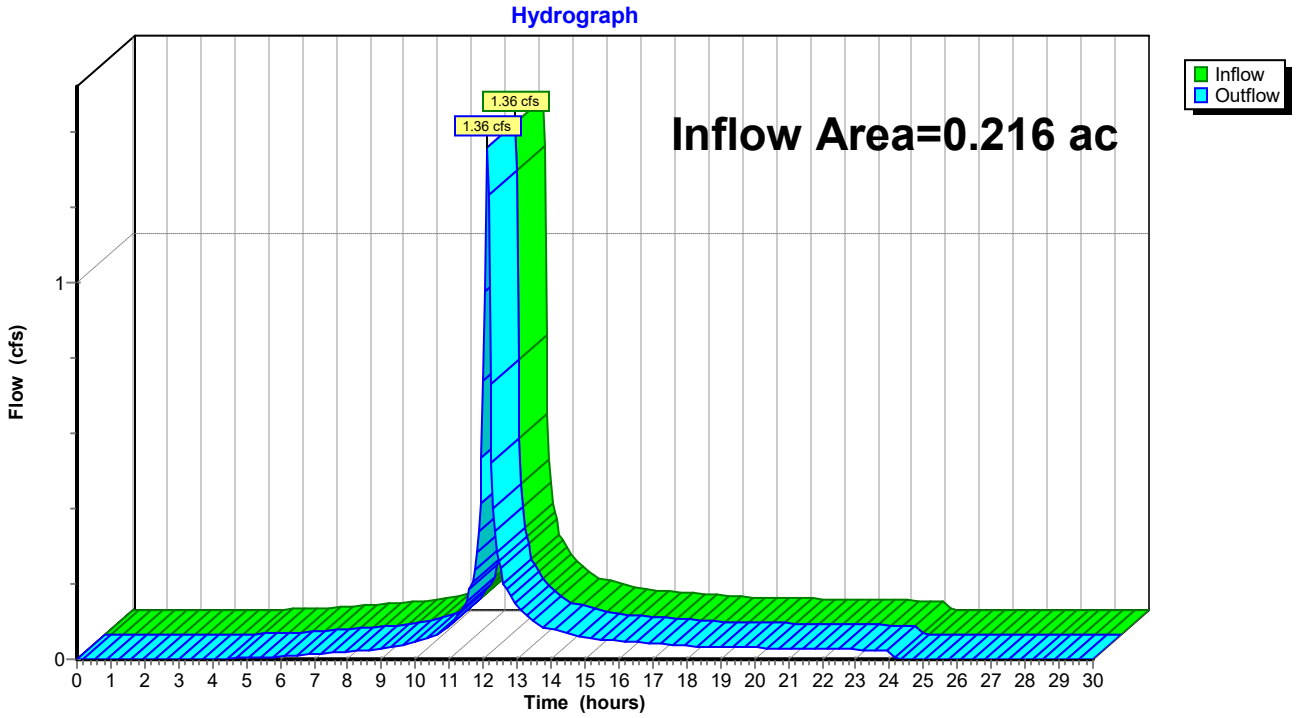
Summary for Reach DP3: CATCHBASIN (FIRE STATION)

[40] Hint: Not Described (Outflow=Inflow)

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)



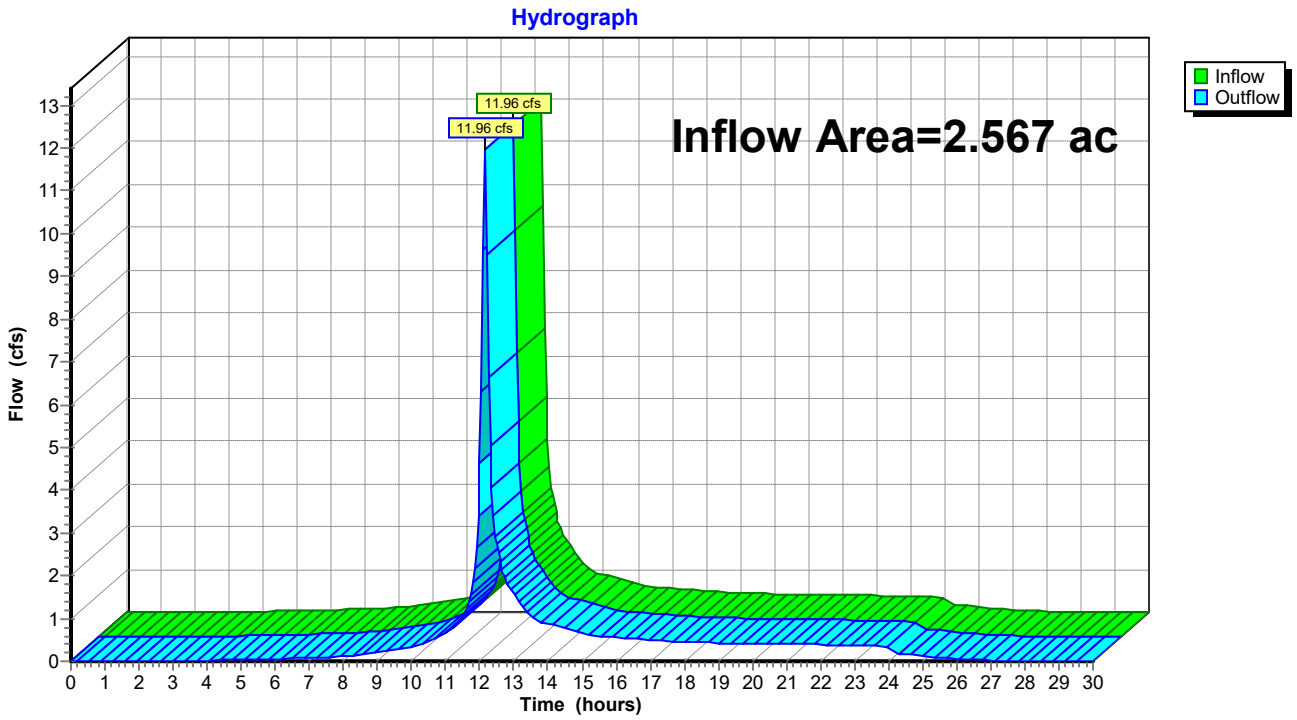
Summary for Reach DP4: DMH-K1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.567 ac, 55.34% Impervious, Inflow Depth > 4.97" for 100-Year event
Inflow = 11.96 cfs @ 12.15 hrs, Volume= 1.064 af
Outflow = 11.96 cfs @ 12.15 hrs, Volume= 1.064 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 DP4: DMH-K1



Summary for Reach DP5: DCB-H

[40] Hint: Not Described (Outflow=Inflow)

Summary for Reach RF1: TO DMH#101

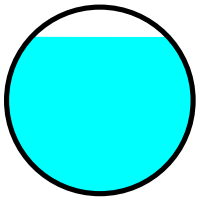
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 103% of Manning's capacity

Inflow Area = 0.759 ac,100.00% Impervious, Inflow Depth = 8.10" for 100-Year event
Inflow = 5.74 cfs @ 12.11 hrs, Volume= 0.513 af
Outflow = 5.70 cfs @ 12.11 hrs, Volume= 0.513 af, Atten= 1%, Lag= 0.1 min
Routed to Reach DMH101 : TO DMH#100

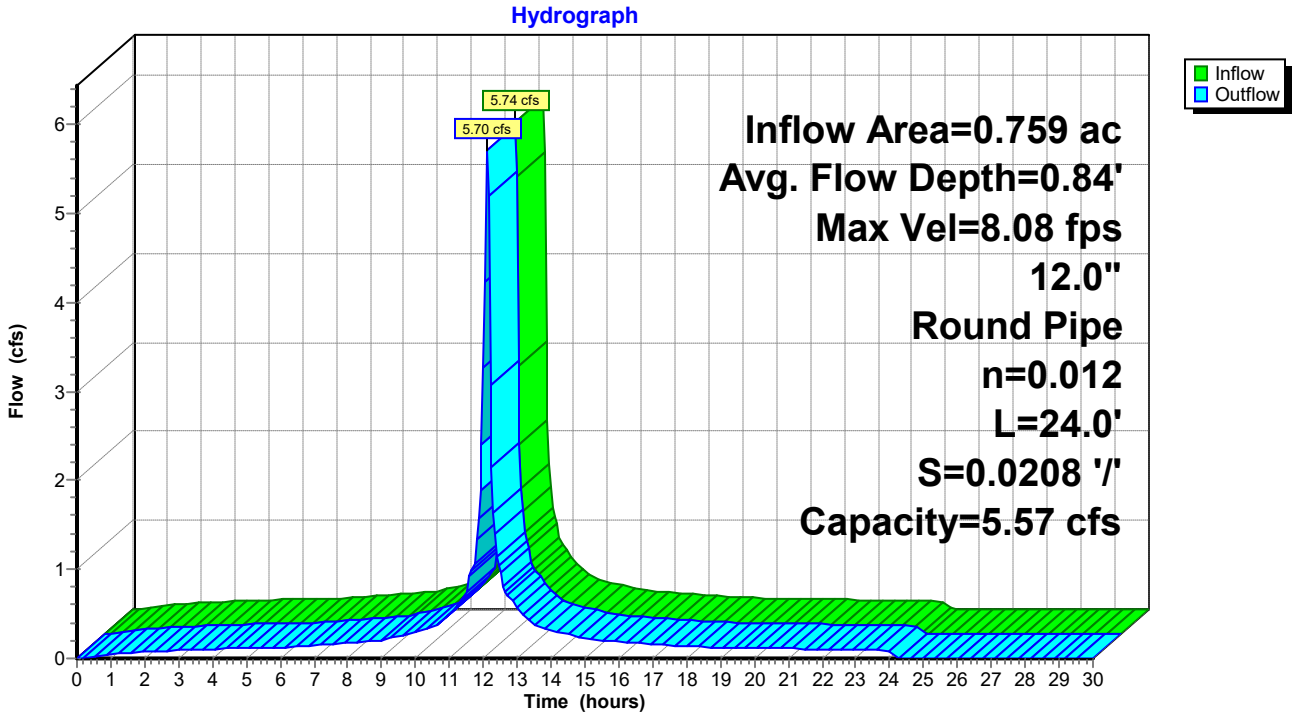
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.08 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.22 fps, Avg. Travel Time= 0.1 min

Peak Storage= 17 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.84' , Surface Width= 0.73'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.57 cfs

12.0" Round Pipe
n= 0.012 Steel, smooth
Length= 24.0' Slope= 0.0208 '/'
Inlet Invert= 466.20', Outlet Invert= 465.70'



Reach RF1: TO DMH#101

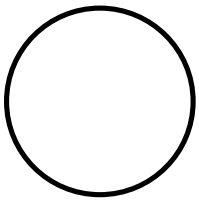


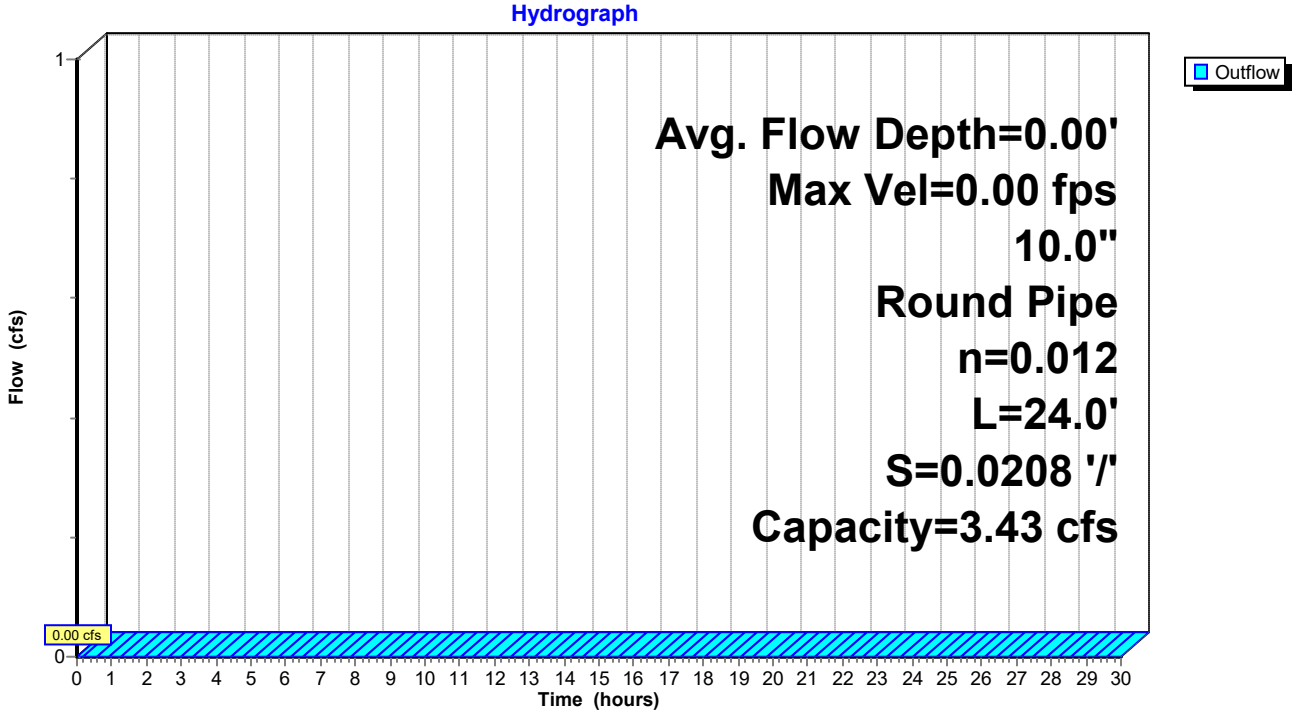
Summary for Reach RF2: TO DMH#101

[43] Hint: Has no inflow (Outflow=Zero)

Bank-Full Depth= 0.83' Flow Area= 0.5 sf, Capacity= 3.43 cfs

10.0" Round Pipe
n= 0.012 Steel, smooth
Length= 24.0' Slope= 0.0208 '/'
Inlet Invert= 466.20', Outlet Invert= 465.70'





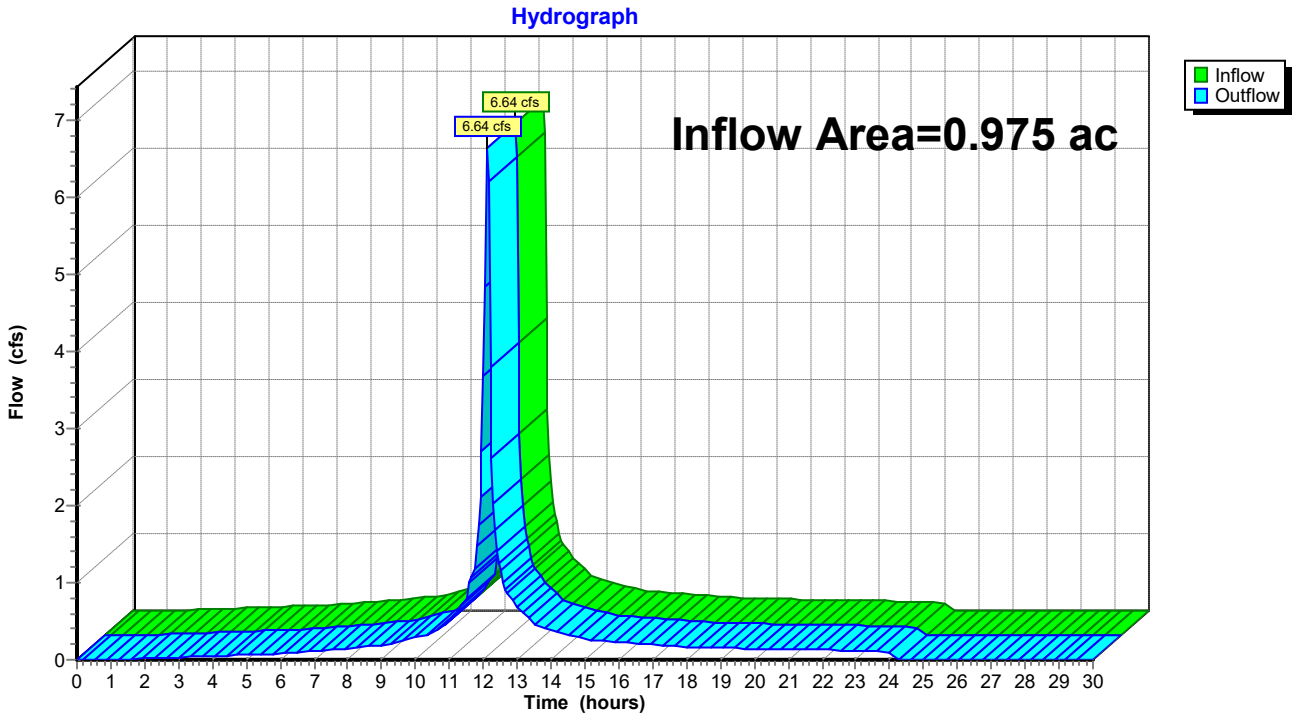
Summary for Reach UGS1A: TO UGS#1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 6.77" for 100-Year event
Inflow = 6.64 cfs @ 12.12 hrs, Volume= 0.550 af
Outflow = 6.64 cfs @ 12.12 hrs, Volume= 0.550 af, Atten= 0%, Lag= 0.0 min
Routed to Pond UGS1 : TO DMH#106

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

Reach UGS1A: TO UGS#1



Summary for Reach UGS1B: TO DMH106

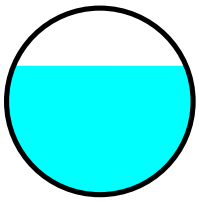
[52] Hint: Inlet/Outlet conditions not evaluated
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[79] Warning: Submerged Pond UGS1 Primary device # 1 by 0.54'

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 1.78" for 100-Year event
Inflow = 3.75 cfs @ 12.21 hrs, Volume= 0.145 af
Outflow = 3.76 cfs @ 12.21 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DMH105 : TO DMH#104

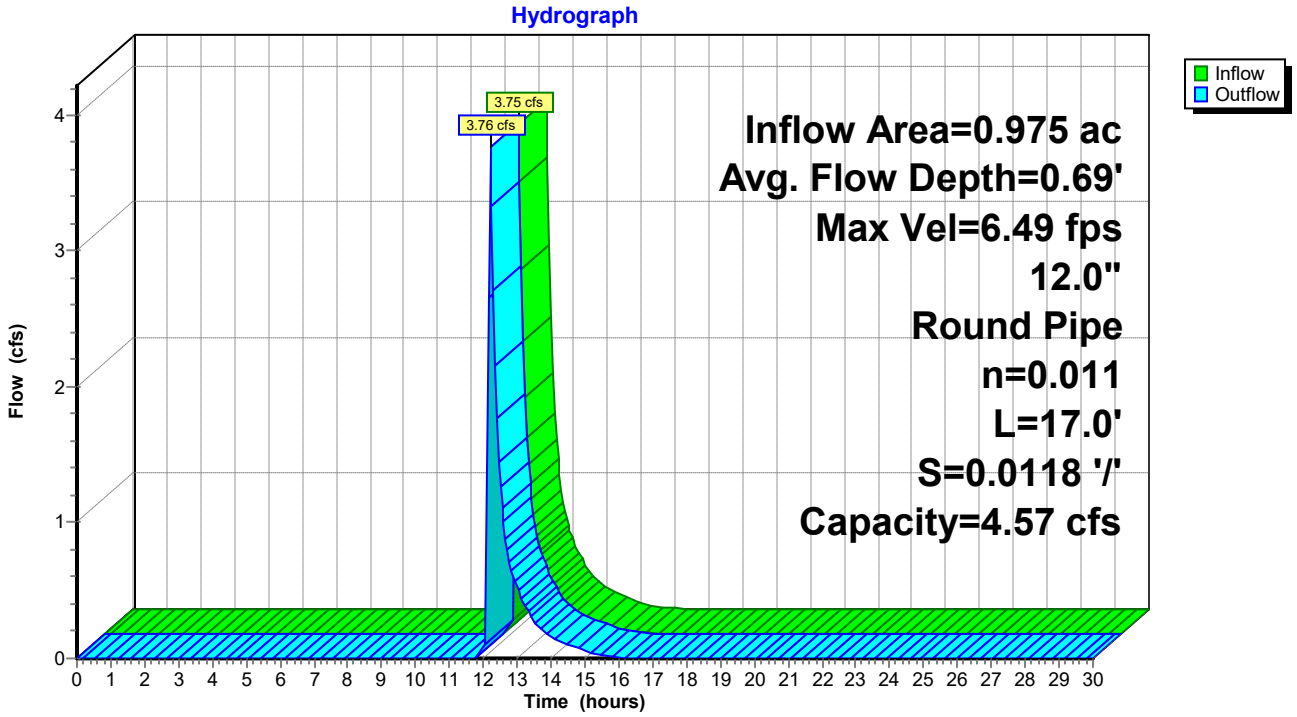
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.49 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.82 fps, Avg. Travel Time= 0.1 min

Peak Storage= 10 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.69' , Surface Width= 0.92'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.57 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 17.0' Slope= 0.0118 '/'
Inlet Invert= 467.60', Outlet Invert= 467.40'



Reach UGS1B: TO DMH106



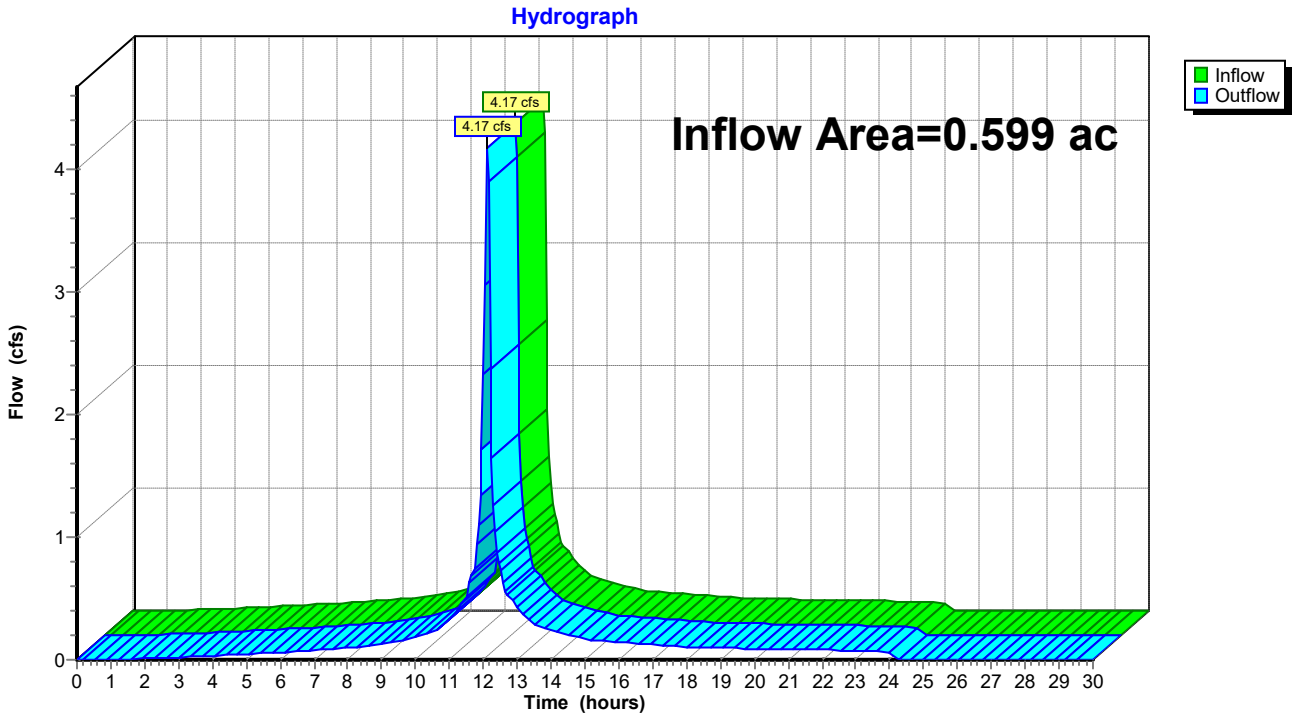
Summary for Reach UGS2A: TO UGS#2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 6.98" for 100-Year event
Inflow = 4.17 cfs @ 12.12 hrs, Volume= 0.348 af
Outflow = 4.17 cfs @ 12.12 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min
Routed to Pond UGS2 : TO UGS#2B

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

Reach UGS2A: TO UGS#2



Summary for Reach UGS2B: TO DMH#112

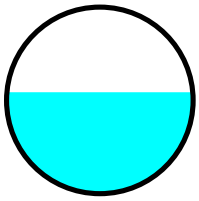
[52] Hint: Inlet/Outlet conditions not evaluated
[78] Warning: Submerged Pond UGS2 Primary device # 2 by 0.60'

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth > 6.92" for 100-Year event
Inflow = 3.60 cfs @ 12.17 hrs, Volume= 0.346 af
Outflow = 3.36 cfs @ 12.18 hrs, Volume= 0.346 af, Atten= 6%, Lag= 0.6 min
Routed to Reach DMH112 : TO DMH#113

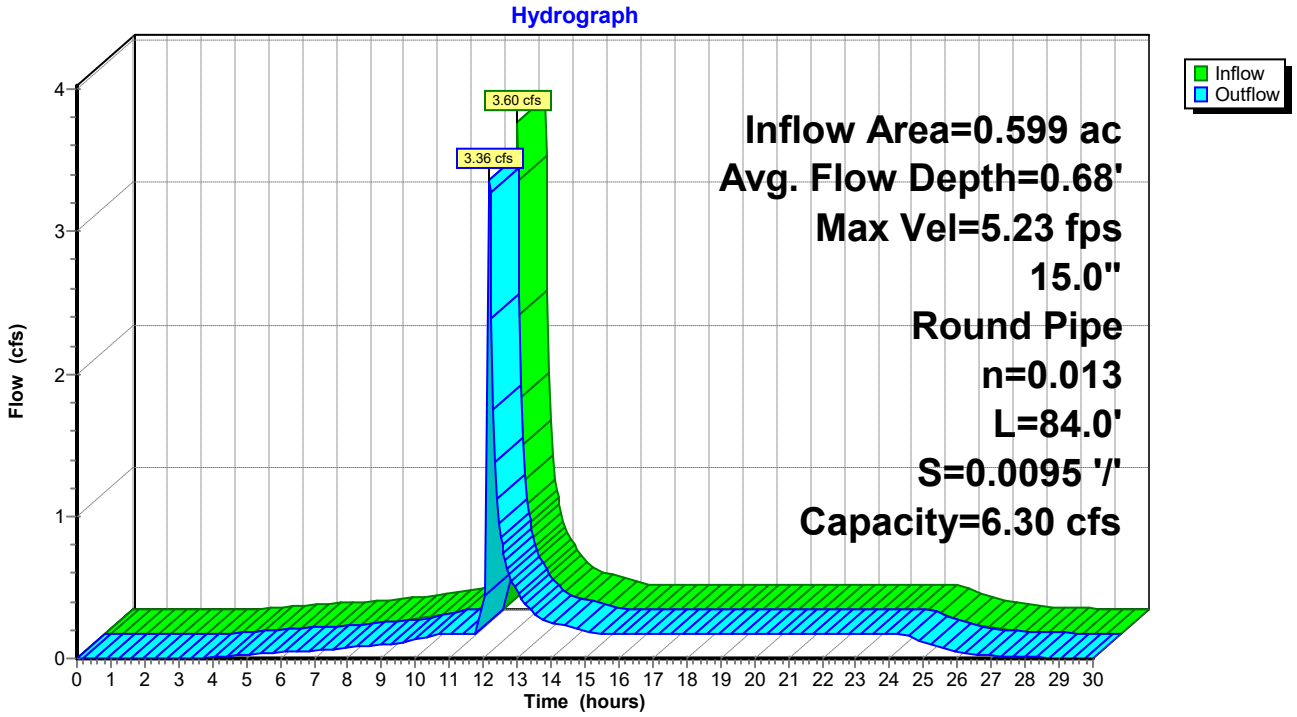
Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.23 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 0.7 min

Peak Storage= 57 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.68' , Surface Width= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.30 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 84.0' Slope= 0.0095 '/'
Inlet Invert= 461.10', Outlet Invert= 460.30'



Reach UGS2B: TO DMH#112



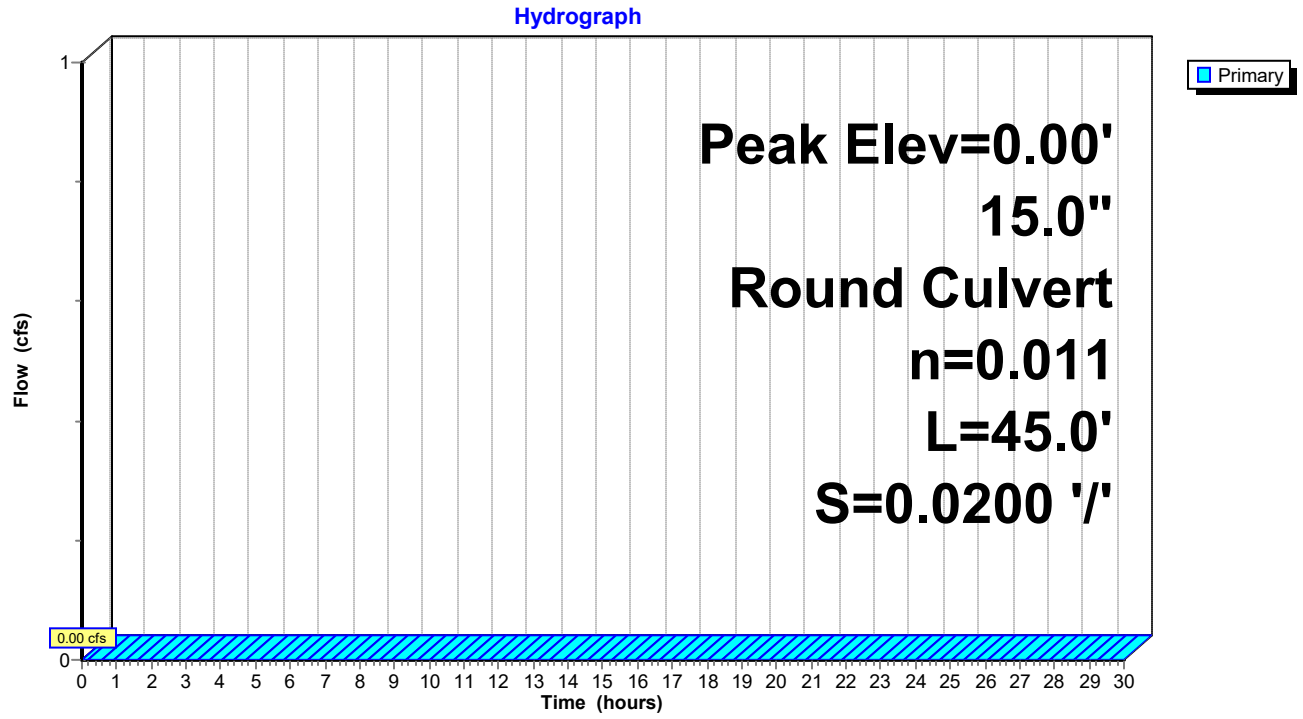
Summary for Pond DMH-B: TO DMH-D

[43] Hint: Has no inflow (Outflow=Zero)

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=0.00 cfs @ 0.00 hrs HW=0.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

Pond DMH-B: TO DMH-D



Summary for Pond UGS1: TO DMH#106

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 6.77" for 100-Year event
Inflow = 6.64 cfs @ 12.12 hrs, Volume= 0.550 af
Outflow = 4.03 cfs @ 12.21 hrs, Volume= 0.550 af, Atten= 39%, Lag= 5.6 min
Discarded = 0.28 cfs @ 12.21 hrs, Volume= 0.405 af
Primary = 3.75 cfs @ 12.21 hrs, Volume= 0.145 af
Routed to Reach UGS1B : TO DMH106

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 468.50' @ 12.21 hrs Surf.Area= 0.065 ac Storage= 0.162 af

Plug-Flow detention time= 171.4 min calculated for 0.550 af (100% of inflow)
Center-of-Mass det. time= 171.3 min (960.5 - 789.1)

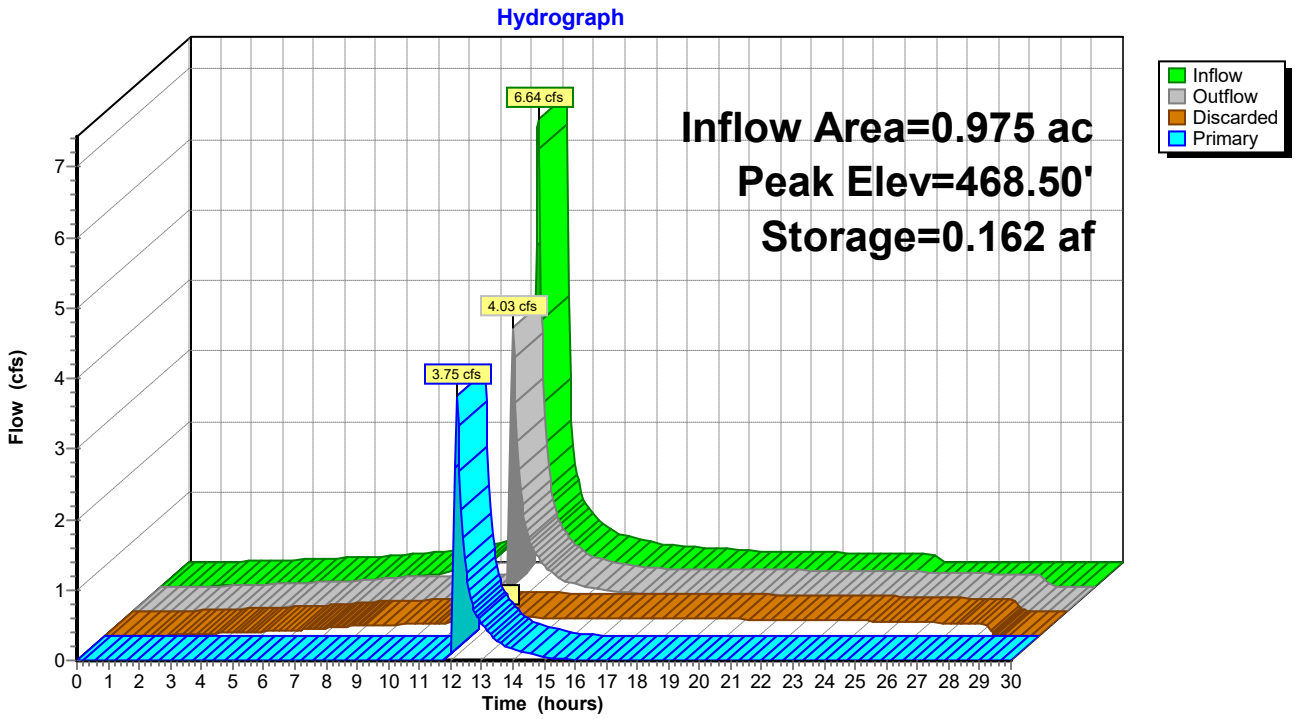
Volume	Invert	Avail.Storage	Storage Description
#1	464.75'	0.073 af	**38.00'W x 74.00'L x 6.00'H Prismatoid** 0.387 af Overall - 0.206 af Embedded = 0.181 af x 40.0% Voids
#2	465.50'	0.153 af	**Shea Leaching Chamber 4x4x4** x 144 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		0.226 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	467.75'	**12.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	464.75'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'

Discarded OutFlow Max=0.28 cfs @ 12.21 hrs HW=468.49' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.28 cfs)

Primary OutFlow Max=3.64 cfs @ 12.21 hrs HW=468.49' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 3.64 cfs @ 2.93 fps)

Pond UGS1: TO DMH#106



Summary for Pond UGS2: TO UGS#2B

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 6.98" for 100-Year event
Inflow = 4.17 cfs @ 12.12 hrs, Volume= 0.348 af
Outflow = 3.60 cfs @ 12.17 hrs, Volume= 0.346 af, Atten= 14%, Lag= 3.1 min
Primary = 3.60 cfs @ 12.17 hrs, Volume= 0.346 af
Routed to Reach UGS2B : TO DMH#112

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 464.81' @ 12.17 hrs Surf.Area= 0.041 ac Storage= 0.094 af

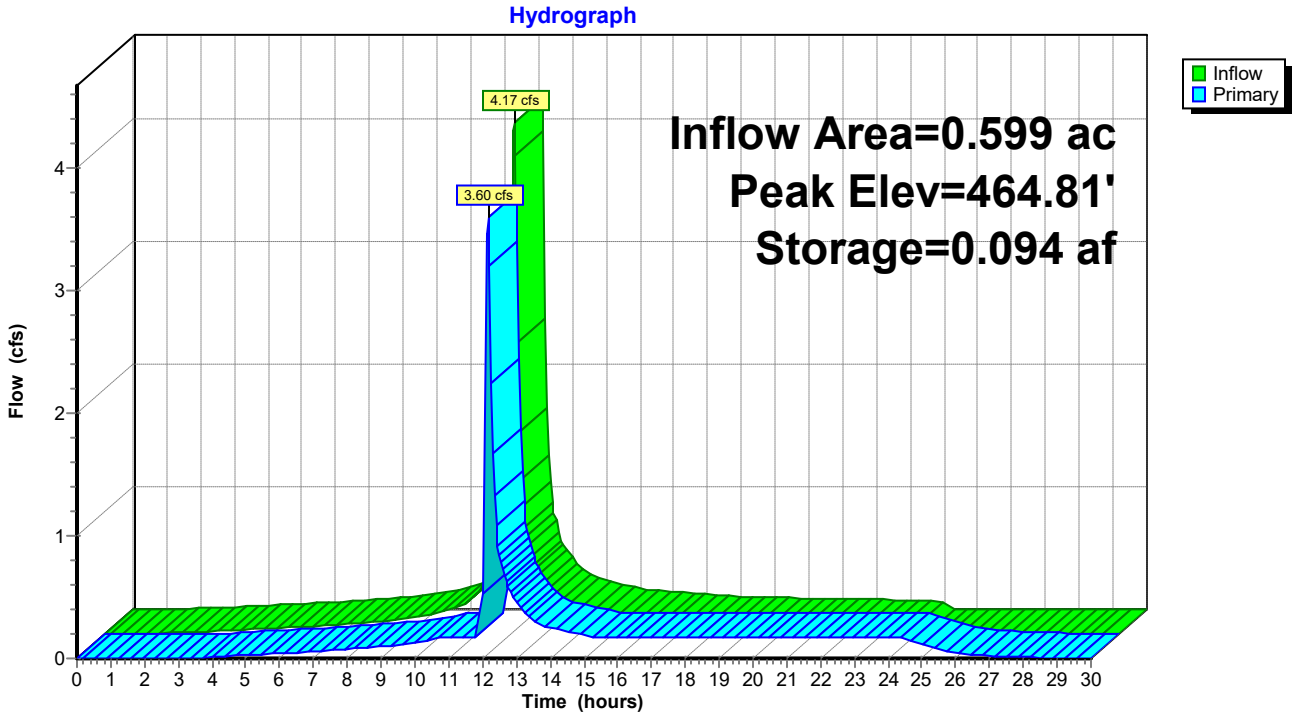
Plug-Flow detention time= 154.1 min calculated for 0.345 af (99% of inflow)
Center-of-Mass det. time= 149.6 min (933.7 - 784.1)

Volume	Invert	Avail.Storage	Storage Description
#1	461.00'	0.052 af	**38.00'W x 47.00'L x 6.30'H Prismatoid** 0.258 af Overall - 0.129 af Embedded = 0.130 af x 40.0% Voids
#2	462.50'	0.096 af	**Shea Leaching Chamber 4x4x4** x 90 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 90 Chambers in 10 Rows
		0.148 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	464.25'	**12.0" Vert. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#2	Primary	461.15'	**Special & User-Defined** Head (feet) 0.00 1.00 15.00 Disch. (cfs) 0.000 0.170 0.170

Primary OutFlow Max=3.34 cfs @ 12.17 hrs HW=464.78' (Free Discharge)
1=Orifice/Grate (Orifice Controls 3.17 cfs @ 2.49 fps)
2=Special & User-Defined (Custom Controls 0.17 cfs)

Pond UGS2: TO UGS#2B



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.

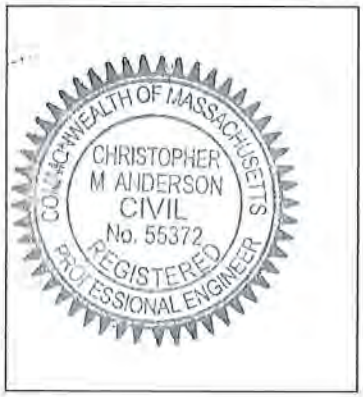
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the 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



10-18-2024
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-NA Maximum Extent Practicable

☐ 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 NA Maximum Extent Practicable

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

☒ *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 OCTOBER 18, 2024

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 2 Keese Street Property that discharges to an existing 48" drainage line that runs under Interstate 290 and Design Point #5 is located at a catchbasin located within Keyes Street. Design Point #6 is designated as runoff to an offsite point within the Interstate 290 Layout.

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-	10.15	16.25	21.00	30.75
	Post-	7.44	12.85	17.23	27.03
#3	Pre-	0.31	0.61	0.85	1.36
	Post-	0.31	0.61	0.85	1.36
#4	Pre-	4.57	8.59	12.28	19.13
	Post-	1.33	3.36	5.19	11.96
#5	Pre-	0.30	0.46	0.58	0.83
	Post-	0.00	0.00	0.00	0.94
#6	Pre-	0.07	0.15	0.21	0.35
	Post-	0.02	0.09	0.16	0.34

All flows are in cubic feet per second.

As outline above, the post-development peak rates of runoff have been mitigated for all design. Compliance has been provided.

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:	6.022 ac	262,318 sf
Proposed Impervious HSG-A:	5.361 ac	233,525 sf
Net New Impervious HSG-A:	-0.659 ac	-28,793 s.f.

Total New Impervious area = -28,793 s.f.
Total Project Impervious = 231,846 s.f.

Required Recharge Volume:

Net Increase HSG Soil A

Net New Impervious HSG A= -28,793 s.f.
HSG A: -7,868 s.f. x (0.6 in/12) = 0 c.f.

Required Recharge Volume = 0 c.f.

Capture Rate:

Total Impervious to UGS#1	34,544 sf
Total Impervious to UGS#2	21,824 sf
Net Captured Impervious	**56,368 sf**

Capture Rate = 56,367 s.f. / 231,846 s.f. = 24.3%

Compliance not provided, Capture rate in less of 65%

Adjustment Calculation

(1 / 0.243) x 0 cf = 0.00 c.f.
Required recharge volume = 0 c.f.

Recharge Provided:

Total Volume Required: 0 c.f.

UGS#1:	5,053 c.f. of Infiltration Volume provided *
	5,053 c.f. of infiltration volume provided

**Recharge volume based on 1-Year Storm event.*

Required Recharge Volume = 0 c.f.
Provided Recharge Volume = 5,053 c.f.

Compliance is provided

Drawdown Volume Provided:

Volume below lowest outlet within detention facility.

UGS#1:	5,488 c.f. of storage volume provided
UGS#2:	3,354 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: 5,488 c.f. of storage volume provided.
Time = 5,448 c.f. / (2.41 in/hr x (1 ft/ 12 in) x 2,812 s.f.) = **9.7 hrs**

UGS#2: 3,354 c.f. of storage volume provided.
Time = 3,354 c.f. / (2.41 in/hr x (1 ft/ 12 in) x 1,786 s.f.) = **9.4 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	= 464.75	
Offset to Groundwater	= 6.3 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	= 464.75	
Offset to Groundwater	= 6.3 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 (231,846 s.f.) = 19,320 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#102, DMH#107, DMH#109 and DMH#114. 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 17,380 c.f. during the 1-year storm event.

Compliance has been provided to the maximum extent practicable. Currently the majority of the stormwater from the development is derived from the roof top runoff (65,266 sf or 28% of total impervious area), which is considered generally clean runoff as it does not generate the sediment load of other impervious surfaces, such as pavements and walkways. If the roof runoff was to be omitted from the calculation the resulting WQV would equate to 13,881 c.f, and compliance would be provided. It should be noted that 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, 4, 5, and 6 have been provided.

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 DMH#106

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 1.42" for 1-Year event
Inflow = 1.46 cfs @ 12.12 hrs, Volume= 0.116 af
Outflow = 0.19 cfs @ 12.85 hrs, Volume= 0.116 af, Atten= 87%, Lag= 43.6 min
Discarded = 0.19 cfs @ 12.85 hrs, Volume= 0.116 af <=recharge volume
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach UGS1B : TO DMH106

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 465.75' @ 12.85 hrs Surf.Area= 0.065 ac Storage= 0.031 af

Plug-Flow detention time= 51.5 min calculated for 0.115 af (100% of inflow)
Center-of-Mass det. time= 51.4 min (888.6 - 837.2)

Volume	Invert	Avail.Storage	Storage Description
#1	464.75'	0.073 af	**38.00'W x 74.00'L x 6.00'H Prismatoid** 0.387 af Overall - 0.206 af Embedded = 0.181 af x 40.0% Voids
#2	465.50'	0.153 af	**Shea Leaching Chamber 4x4x4** x 144 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf
		0.226 af	Total Available Storage

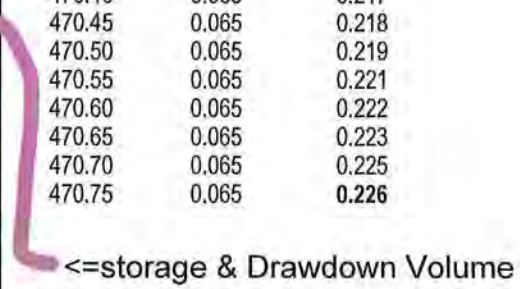
Device	Routing	Invert	Outlet Devices
#1	Primary	467.75'	**12.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#2	Discarded	464.75'	**2.410 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 460.00'

Discarded OutFlow Max=0.19 cfs @ 12.85 hrs HW=465.75' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=464.75' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Stage-Area-Storage for Pond UGS1: TO DMH#106

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
464.75	**0.065**	0.000	467.45	0.065	0.112	470.15	0.065	0.210
464.80	0.065	0.001	467.50	0.065	0.114	470.20	0.065	0.212
464.85	0.065	0.003	467.55	0.065	0.117	470.25	0.065	0.213
464.90	0.065	0.004	467.60	0.065	0.119	470.30	0.065	0.214
464.95	0.065	0.005	467.65	0.065	0.121	470.35	0.065	0.216
465.00	0.065	0.006	467.70	0.065	0.124	470.40	0.065	0.217
465.05	0.065	0.008	467.75	0.065	0.126	470.45	0.065	0.218
465.10	0.065	0.009	467.80	0.065	0.129	470.50	0.065	0.219
465.15	0.065	0.010	467.85	0.065	0.131	470.55	0.065	0.221
465.20	0.065	0.012	467.90	0.065	0.133	470.60	0.065	0.222
465.25	0.065	0.013	467.95	0.065	0.136	470.65	0.065	0.223
465.30	0.065	0.014	468.00	0.065	0.138	470.70	0.065	0.225
465.35	0.065	0.015	468.05	0.065	0.140	470.75	0.065	**0.226**
465.40	0.065	0.017	468.10	0.065	0.143			
465.45	0.065	0.018	468.15	0.065	0.145			
465.50	0.065	0.019	468.20	0.065	0.147			
465.55	0.065	0.022	468.25	0.065	0.150			
465.60	0.065	0.024	468.30	0.065	0.152			
465.65	0.065	0.026	468.35	0.065	0.154			
465.70	0.065	0.029	468.40	0.065	0.157			
465.75	0.065	0.031	468.45	0.065	0.159			
465.80	0.065	0.033	468.50	0.065	0.161			
465.85	0.065	0.036	468.55	0.065	0.164			
465.90	0.065	0.038	468.60	0.065	0.166			
465.95	0.065	0.041	468.65	0.065	0.168			
466.00	0.065	0.043	468.70	0.065	0.171			
466.05	0.065	0.045	468.75	0.065	0.173			
466.10	0.065	0.048	468.80	0.065	0.175			
466.15	0.065	0.050	468.85	0.065	0.178			
466.20	0.065	0.053	468.90	0.065	0.180			
466.25	0.065	0.055	468.95	0.065	0.182			
466.30	0.065	0.057	469.00	0.065	0.185			
466.35	0.065	0.060	469.05	0.065	0.187			
466.40	0.065	0.062	469.10	0.065	0.189			
466.45	0.065	0.065	469.15	0.065	0.192			
466.50	0.065	0.067	469.20	0.065	0.194			
466.55	0.065	0.069	469.25	0.065	0.196			
466.60	0.065	0.072	469.30	0.065	0.197			
466.65	0.065	0.074	469.35	0.065	0.197			
466.70	0.065	0.076	469.40	0.065	0.198			
466.75	0.065	0.079	469.45	0.065	0.198			
466.80	0.065	0.081	469.50	0.065	0.198			
466.85	0.065	0.084	469.55	0.065	0.199			
466.90	0.065	0.086	469.60	0.065	0.199			
466.95	0.065	0.088	469.65	0.065	0.199			
467.00	0.065	0.091	469.70	0.065	0.200			
467.05	0.065	0.093	469.75	0.065	0.200			
467.10	0.065	0.095	469.80	0.065	0.201			
467.15	0.065	0.098	469.85	0.065	0.203			
467.20	0.065	0.100	469.90	0.065	0.204			
467.25	0.065	0.103	469.95	0.065	0.205			
467.30	0.065	0.105	470.00	0.065	0.206			
467.35	0.065	0.107	470.05	0.065	0.208			
467.40	0.065	0.110	470.10	0.065	0.209			



Summary for Pond UGS2: TO UGS#2B

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 3.71" for Custom event
Inflow = 2.28 cfs @ 12.12 hrs, Volume= 0.185 af
Outflow = 0.17 cfs @ 13.45 hrs, Volume= 0.182 af, Atten= 92%, Lag= 80.1 min
Primary = 0.17 cfs @ 13.45 hrs, Volume= 0.182 af
Routed to Reach UGS2B : TO DMH#112

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 464.25' @ 13.45 hrs Surf.Area= 0.041 ac Storage= 0.077 af <=storage & Drawdown Volume

Plug-Flow detention time= 194.6 min calculated for 0.182 af (99% of inflow)
Center-of-Mass det. time= 186.3 min (989.9 - 803.6)

Volume	Invert	Avail.Storage	Storage Description
#1	461.00'	0.052 af	**38.00'W x 47.00'L x 6.30'H Prismatoid** 0.258 af Overall - 0.129 af Embedded = 0.130 af x 40.0% Voids
#2	462.50'	0.096 af	**Shea Leaching Chamber 4x4x4** x 90 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 90 Chambers in 10 Rows
		0.148 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	464.25'	**12.0" Vert. Orifice/Grate X 3.00** C= 0.600 Limited to weir flow at low heads
#2	Primary	461.15'	**Special & User-Defined** Head (feet) 0.00 1.00 15.00 Disch. (cfs) 0.000 0.170 0.170

Primary OutFlow Max=0.17 cfs @ 13.45 hrs HW=464.25' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.15 fps)
└—**2=Special & User-Defined** (Custom Controls 0.17 cfs)

MASS DEP "Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices"

DMH#102-Water Quality Unit

For First 1.0-Inch Runoff WQV

Step 1: Area of Impervious Surface to Structure

0.975 acres @ 81.42% impervious = 0.794 Acres Impervious
0.794 Acres x .0015625 sq mi = ***1.24x(10^-3) square miles.***

Step 2: Tc of Train

P115 to DCB#15:	5.0 min
DCB#15 to DMH#102	1.0 min
Total Tc to DMH#102	***6.0 min or 0.10 hours***

Step 3: Determine qu

From Figure 4:

Tc @ 0.083, qu=774csm/in

Step 4: Determine Q(1)

Q(1) = (qu)x(A)x(WQV)

Q(1) = (774csm/in)x(1.24x(10^-3)) x(1.0 in)

Q(1) = 0.96 CFS

Determination
Determination of Water Quality Flow rates for units by Connecticut DOT (CONNDOT)

From Technology Verification
HS 5 Treatment Flow rate
1.7 cf.s > 0.96 c.f.s. "Pass"

HydroGuard HS5 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#102

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 HS5	**0.79**	**0.75**	**0.59**	**0.16**

Total TSS Removal = **84%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Franklin Street, Worcester**

Prepared By: **Hannigan Engineering, Inc.**

Date: **10/15/2024**

*Equals remaining load from previous BMP (E) which enters the BMP

Summary for Reach DMH102: TO UGS#1A

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB15 outlet invert by 0.13' @ 12.10 hrs

Inflow Area = 0.975 ac, 81.42% Impervious, Inflow Depth = 1.42" for 1-Year event
Inflow = 1.46 cfs @ 12.12 hrs, Volume= 0.116 af <=WQV
Outflow = 1.46 cfs @ 12.12 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min
Routed to Reach UGS1A : TO UGS#1

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.41 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 1.11'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.14 cfs

15.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 5.0' Slope= 0.0200 '/'
Inlet Invert= 466.10', Outlet Invert= 466.00'

Summary for Subcatchment P115: TO DCB#15

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.36 cfs @ 12.12 hrs, Volume= 0.027 af, Depth= 0.89"
Routed to Reach DCB15 : TO DMH#102

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 1-Year Rainfall=2.58"

Area (sf)	CN	Description
5,220	39	>75% Grass cover, Good, HSG A
10,880	98	Paved parking, HSG A
16,100	79	Weighted Average
5,220		32.42% Pervious Area
10,880		67.58% 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"
0.5	72	0.0170	2.65		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	122	Total, Increased to minimum Tc = 5.0 min			<=Tc

Summary for Reach DCB15: TO DMH#102

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.370 ac, 67.58% Impervious, Inflow Depth = 0.89" for 1-Year event
Inflow = 0.36 cfs @ 12.12 hrs, Volume= 0.027 af
Outflow = 0.35 cfs @ 12.13 hrs, Volume= 0.027 af, Atten= 2%, Lag= 0.9 min
Routed to Reach DMH102 : TO UGS#1A

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.88 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 1.0 min <=Tc

Peak Storage= 9 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.82'
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= 70.0' Slope= 0.0100 '/'
Inlet Invert= 467.00', Outlet Invert= 466.30'

```
**************************************************
*      Storm Water Management Sizing Model       *
*                Hydroworks, LLC                 *
*                 Version 4.4                    *
*                                                *
*        Continuous Simulation Program           *
*              Based on SWMM 4.4H                *
*              Hydroworks, LLC                   *
*               Graham Bryant                    *
*                2003 - 2021                     *
**************************************************

                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 888-290-7900   *
*     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 Captial Group, Frankin Street, Worcester
DMH#102

HydroStorm Simulation

```
 ########################################
 #  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 Captial Group, Frankin Street, Worcester

                DMH#102


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	INFILTRATION RATE(IN/HR) MINIMUM	DECAY RATE (1/SEC)	GAGE NO.	MAXIMUM VOLUME (INCHES)
1	300	200	206.08	0.98	81.42	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).... 0.98
IMPERVIOUS AREA (ACRES)..... 0.79
PERVIOUS AREA (ACRES)..... 0.18
TOTAL WIDTH (FEET)..... 206.08
PERCENT IMPERVIOUSNESS..... 81.42

****
* 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)	ELEVATIONS BOTTOM (FT)	ELEVATIONS STAGE (FT)	ELEVATIONS BC (FT)	ELEVATIONS TW (FT)	FLOW CONSTANTS A1 (IN/HR-FT^B1)	FLOW CONSTANTS B1	FLOW CONSTANTS A2 (IN/HR-FT^B2)	FLOW CONSTANTS B2	FLOW CONSTANTS 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	PERCOLATION PARAMETERS PCO	ET PARAMETERS DEPTH OF ET (ft)	ET PARAMETERS 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.......     0.300

 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)	0.300
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	4.10	1.00	0.0E+00
Totals (Loads in lb or other)			4.10	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 Captial Group, Frankin Street, Worcester
DMH#102

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 =                    3055995
Final Julian Date  =                            2001365
Final time of day  =                             86400. 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  13574739   3380113

**************************************************
*     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)                   7873132.      2225.
Total Infiltration                                     1444378.       408.
Total Evaporation                                       312069.        88.
Surface Runoff from Watersheds                         6164248.      1742.
Total Water remaining in Surface Storage                    43.         0.
Infiltration over the Pervious Area...                 1444378.      2196.
                      --------
Infiltration + Evaporation +
Surface Runoff + Snow removal +
Water remaining in Surface Storage +
```

```
Water remaining in Snow Cover.........                  7920738.      2238.
Total Precipitation + Initial Storage.                  7873132.      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.................................       -0.605 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..............           6164248.      1742.
Baseflow....................................                 0.
Groundwater Subsurface Inflow...............                 0.         0.
Evaporation Loss from Channels..............                 0.         0.
Channel/Pipe/Inlet Outflow..................           6164248.      1742.
Initial Storage + Inflow....................           6164248.      1742.
Final Storage + Outflow.....................           6164248.      1742.
*******************************************
* 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                             127413.        36.
```

Final Subsurface Storage	127413.	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

				PERVIOUS AREA			IMPERVIOUS AREA		TOTAL SUBCATCHMENT AREA		
SUBCATCHMENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	TOTAL SIMULATED RAINFALL (IN)	TOTAL RUNOFF DEPTH (IN)	TOTAL LOSSES (IN)	PEAK RUNOFF RATE (CFS)	RUNOFF DEPTH (IN)	PEAK RUNOFF RATE (CFS)	RUNOFF DEPTH (IN)	PEAK RUNOFF RATE (CFS)	PEAK UNIT RUNOFF (IN/HR)
300	200	0.98	81.4	2224.52	25.776	2199.361	0.445	2131.528	2.882	1740.279	3.327	3.412

*** 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				3.28				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.....	19.
2. TOTAL SURFACE BUILDUP.....	36874.
3. INITIAL CATCHBASIN LOAD.....	0.
4. TOTAL CATCHBASIN LOAD.....	0.
5. TOTAL CATCHBASIN AND SURFACE BUILDUP (2+4).....	36874.
Remaining Loads	
6. LOAD REMAINING ON SURFACE...	6.
7. REMAINING IN CATCHBASINS....	0.
8. REMAINING IN CHANNEL/PIPES..	0.
Removals	
9. STREET SWEEPING REMOVAL.....	1539.
10. NET SURFACE BUILDUP (2-9)...	35334.
11. SURFACE WASHOFF.....	35308.
12. CATCHBASIN WASHOFF.....	0.
13. TOTAL WASHOFF (11+12).....	35308.
14. LOAD FROM OTHER CONSTITUENTS	0.
15. PRECIPITATION LOAD.....	0.
15a.SUM SURFACE LOAD (13+14+15).	35308.
16. TOTAL GROUNDWATER LOAD.....	0.
16a.TOTAL I/I LOAD.....	0.
17. NET SUBCATCHMENT LOAD (15a-15b-15c-15d+16+16a).....	35308.
>>Removal in channel/pipes (17a, 17b):	
17a.REMOVE BY BMP FRACTION.....	0.
17b.REMOVE BY 1st ORDER DECAY...	0.
18. TOTAL LOAD TO INLETS.....	35308.
19. FLOW WT'D AVE.CONCENTRATION (INLET LOAD/TOTAL FLOW).....	mg/l 92.
Percentages	
20. STREET SWEEPING (9/2).....	4.
21. SURFACE WASHOFF (11/2).....	96.
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    %     Specific    Settling Velocity   Critical Peclet
     (um)            Gravity        (ft/s)               Number


      1.     5.0      2.65         0.000002           0.022000
      4.     5.0      2.65         0.000035           0.049420
      7.    10.0      2.65         0.000108           0.068516
     18.    15.0      2.65         0.000710           0.118919
     45.    10.0      2.65         0.004352           0.203034
     70.     5.0      2.65         0.010215           0.262779
     90.    10.0      2.65         0.016354           0.304305
    125.    15.0      2.65         0.029465           0.368637
    200.    15.0      2.65         0.063279           0.485025
    400.     5.0      2.65         0.156843           0.726951
```

850. 5.0 2.65 0.321303 1.128801

****
* *
* 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 3	0.579	9.136	96.2	63.7
HS 4	0.997	9.136	98.7	72.0
HS 5	1.245	9.136	99.2	79.3 <=TSS Removal
HS 6	1.488	9.136	99.6	84.2
HS 7	2.092	9.136	99.9	87.2
HS 8	2.773	9.136	100.0	89.6
HS 10	3.984	9.136	100.0	93.9
HS 12	5.410	9.136	100.0	96.7

****
* *
* Summary of Annual Flow Treatmnet & TSS Removal *
* *
****

HS 3

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	1101261.	1072714.	650.	410.	240.	0.	97.4	63.0
1958.	1837267.	1771180.	895.	533.	362.	0.	96.4	59.5
1959.	1920240.	1798261.	890.	554.	336.	0.	93.6	62.3
1960.	1756867.	1658499.	863.	556.	307.	0.	94.4	64.4
1961.	1559329.	1489298.	852.	551.	302.	0.	95.5	64.6
1962.	1662506.	1622030.	799.	512.	287.	0.	97.6	64.0
1963.	1334268.	1329408.	780.	514.	266.	0.	99.6	65.9
1964.	1280700.	1248440.	761.	500.	261.	0.	97.5	65.7
1965.	1115518.	1105755.	738.	486.	253.	0.	99.1	65.8
1966.	1389806.	1361545.	791.	508.	283.	0.	98.0	64.2
1967.	1693253.	1647024.	902.	565.	337.	0.	97.3	62.7
1968.	1558614.	1511917.	769.	497.	271.	0.	97.0	64.7
1969.	1555414.	1521450.	783.	505.	278.	0.	97.8	64.5
1970.	1397148.	1325459.	756.	490.	266.	0.	94.9	64.8
1971.	1485555.	1420124.	838.	506.	332.	0.	95.6	60.4
1972.	2407718.	2205438.	1087.	612.	476.	0.	91.6	56.3
1973.	1877088.	1791156.	921.	532.	389.	0.	95.4	57.7
1974.	1886241.	1706625.	875.	516.	359.	0.	90.5	59.0
1975.	1758488.	1756428.	814.	542.	272.	0.	99.9	66.6
1976.	1356149.	1290767.	810.	517.	293.	0.	95.2	63.9

1977.	1665254.	1617560.	894.	580.	314.	0.	97.1	64.9
1978.	1401690.	1380327.	726.	485.	241.	0.	98.5	66.8
1979.	1800989.	1670198.	845.	520.	325.	0.	92.7	61.5
1980.	1305212.	1258984.	764.	468.	296.	0.	96.5	61.2
1981.	1668480.	1588006.	850.	520.	330.	0.	95.2	61.2
1982.	1694760.	1614074.	845.	519.	326.	0.	95.2	61.4
1983.	2143746.	2084177.	982.	618.	364.	0.	97.2	62.9
1984.	1682574.	1658920.	833.	538.	295.	0.	98.6	64.5
1985.	1533337.	1421885.	826.	547.	279.	0.	92.7	66.2
1986.	1597411.	1577001.	777.	508.	269.	0.	98.7	65.4
1987.	1642915.	1630581.	774.	520.	255.	0.	99.2	67.1
1988.	1411344.	1367186.	774.	499.	275.	0.	96.9	64.5
1989.	1262447.	1228696.	667.	430.	237.	0.	97.3	64.4
1991.	976348.	880794.	401.	267.	134.	0.	90.2	66.6
1992.	1535285.	1515725.	856.	577.	279.	0.	98.7	67.4
1993.	1578012.	1478624.	865.	560.	304.	0.	93.7	64.8
1994.	1689998.	1637395.	881.	563.	318.	0.	96.9	63.9
1995.	1189278.	1150914.	636.	412.	224.	0.	96.8	64.8
1996.	1699024.	1646143.	892.	562.	330.	0.	96.9	63.0
1997.	1039562.	1030228.	687.	461.	226.	0.	99.1	67.1
1998.	1383807.	1342792.	742.	460.	282.	0.	97.0	62.0
1999.	1388298.	1344065.	752.	490.	261.	0.	96.8	65.2
2000.	1469348.	1441455.	820.	535.	285.	0.	98.1	65.3
2001.	1098436.	1042467.	682.	449.	233.	0.	94.9	65.8

HS 4

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	1101261.	1094714.	650.	460.	190.	0.	99.4	70.8
1958.	1837267.	1828012.	895.	621.	274.	0.	99.5	69.4
1959.	1920240.	1846743.	890.	632.	258.	0.	96.2	71.0
1960.	1756867.	1722863.	863.	631.	232.	0.	98.1	73.1
1961.	1559329.	1530414.	852.	625.	227.	0.	98.1	73.3
1962.	1662506.	1654646.	799.	580.	219.	0.	99.5	72.6
1963.	1334268.	1334268.	780.	575.	205.	0.	100.0	73.8
1964.	1280700.	1275336.	761.	560.	201.	0.	99.6	73.7
1965.	1115518.	1115518.	738.	547.	192.	0.	100.0	74.0
1966.	1389806.	1381062.	791.	575.	216.	0.	99.4	72.7
1967.	1693253.	1681725.	902.	646.	256.	0.	99.3	71.6
1968.	1558614.	1536348.	769.	559.	209.	0.	98.6	72.8
1969.	1555414.	1542930.	783.	567.	216.	0.	99.2	72.4
1970.	1397148.	1376619.	756.	554.	202.	0.	98.5	73.3
1971.	1485555.	1471771.	838.	583.	256.	0.	99.1	69.5
1972.	2407718.	2295669.	1087.	715.	372.	0.	95.3	65.7
1973.	1877088.	1857784.	921.	627.	294.	0.	99.0	68.1
1974.	1886241.	1798308.	875.	592.	282.	0.	95.3	67.7
1975.	1758488.	1758488.	814.	604.	210.	0.	100.0	74.2
1976.	1356149.	1332679.	810.	591.	219.	0.	98.3	73.0
1977.	1665254.	1642332.	894.	655.	239.	0.	98.6	73.3
1978.	1401690.	1400948.	726.	546.	180.	0.	99.9	75.2
1979.	1800989.	1730111.	845.	588.	257.	0.	96.1	69.6

1980.	1305212.	1291591.	764.	536.	228.	0.	99.0	70.2
1981.	1668480.	1641863.	850.	595.	255.	0.	98.4	70.0
1982.	1694760.	1686631.	845.	598.	247.	0.	99.5	70.8
1983.	2143746.	2129776.	982.	700.	282.	0.	99.3	71.3
1984.	1682574.	1677086.	833.	609.	225.	0.	99.7	73.1
1985.	1533337.	1479755.	826.	610.	216.	0.	96.5	73.8
1986.	1597411.	1595791.	777.	569.	208.	0.	99.9	73.2
1987.	1642915.	1642915.	774.	580.	195.	0.	100.0	74.9
1988.	1411344.	1395403.	774.	561.	213.	0.	98.9	72.5
1989.	1262447.	1253039.	667.	484.	183.	0.	99.3	72.5
1991.	976348.	941339.	401.	295.	106.	0.	96.4	73.5
1992.	1535285.	1531025.	856.	637.	219.	0.	99.7	74.4
1993.	1578012.	1545025.	865.	628.	237.	0.	97.9	72.6
1994.	1689998.	1683497.	881.	633.	248.	0.	99.6	71.8
1995.	1189278.	1176018.	636.	459.	177.	0.	98.9	72.2
1996.	1699024.	1679343.	892.	633.	259.	0.	98.8	71.0
1997.	1039562.	1038855.	687.	510.	177.	0.	99.9	74.3
1998.	1383807.	1376133.	742.	517.	225.	0.	99.4	69.7
1999.	1388298.	1375904.	752.	544.	207.	0.	99.1	72.4
2000.	1469348.	1465999.	820.	597.	222.	0.	99.8	72.9
2001.	1098436.	1066602.	682.	498.	184.	0.	97.1	73.0

HS 5

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	1101261.	1098804.	650.	505.	145.	0.	99.8	77.7
1958.	1837267.	1834384.	895.	690.	206.	0.	99.8	77.0
1959.	1920240.	1867398.	890.	698.	192.	0.	97.2	78.5
1960.	1756867.	1733843.	863.	690.	173.	0.	98.7	80.0
1961.	1559329.	1543498.	852.	689.	163.	0.	99.0	80.9
1962.	1662506.	1659480.	799.	640.	159.	0.	99.8	80.1
1963.	1334268.	1334268.	780.	626.	154.	0.	100.0	80.3
1964.	1280700.	1280700.	761.	618.	143.	0.	100.0	81.2
1965.	1115518.	1115518.	738.	596.	142.	0.	100.0	80.7
1966.	1389806.	1385855.	791.	634.	157.	0.	99.7	80.1
1967.	1693253.	1690428.	902.	712.	190.	0.	99.8	78.9
1968.	1558614.	1541258.	769.	618.	150.	0.	98.9	80.4
1969.	1555414.	1548112.	783.	627.	156.	0.	99.5	80.1
1970.	1397148.	1389167.	756.	610.	146.	0.	99.4	80.7
1971.	1485555.	1477238.	838.	647.	191.	0.	99.4	77.2
1972.	2407718.	2319570.	1087.	802.	285.	0.	96.3	73.8
1973.	1877088.	1870164.	921.	700.	221.	0.	99.6	76.0
1974.	1886241.	1836620.	875.	660.	214.	0.	97.4	75.5
1975.	1758488.	1758488.	814.	660.	154.	0.	100.0	81.1
1976.	1356149.	1345474.	810.	653.	157.	0.	99.2	80.6
1977.	1665254.	1651213.	894.	721.	173.	0.	99.2	80.7
1978.	1401690.	1401690.	726.	600.	126.	0.	100.0	82.7
1979.	1800989.	1754994.	845.	659.	187.	0.	97.4	77.9
1980.	1305212.	1301818.	764.	592.	172.	0.	99.7	77.5
1981.	1668480.	1656414.	850.	659.	190.	0.	99.3	77.6
1982.	1694760.	1694752.	845.	664.	181.	0.	100.0	78.6

1983.	2143746.	2135512.	982.	769.	214.	0.	99.6	78.3
1984.	1682574.	1682159.	833.	673.	161.	0.	100.0	80.7
1985.	1533337.	1500790.	826.	669.	157.	0.	97.9	81.0
1986.	1597411.	1597411.	777.	624.	153.	0.	100.0	80.3
1987.	1642915.	1642915.	774.	633.	142.	0.	100.0	81.7
1988.	1411344.	1400291.	774.	615.	160.	0.	99.2	79.4
1989.	1262447.	1259463.	667.	535.	132.	0.	99.8	80.2
1991.	976348.	959031.	401.	320.	81.	0.	98.2	79.8
1992.	1535285.	1534871.	856.	698.	158.	0.	100.0	81.6
1993.	1578012.	1559321.	865.	690.	174.	0.	98.8	79.8
1994.	1689998.	1689968.	881.	698.	184.	0.	100.0	79.2
1995.	1189278.	1180884.	636.	503.	132.	0.	99.3	79.2
1996.	1699024.	1689735.	892.	696.	196.	0.	99.5	78.0
1997.	1039562.	1039562.	687.	560.	127.	0.	100.0	81.5
1998.	1383807.	1380926.	742.	569.	173.	0.	99.8	76.7
1999.	1388298.	1384081.	752.	599.	153.	0.	99.7	79.7
2000.	1469348.	1469348.	820.	654.	166.	0.	100.0	79.7
2001.	1098436.	1079445.	682.	547.	135.	0.	98.3	80.3

HS 6

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	1101261.	1101261.	650.	535.	115.	0.	100.0	82.3
1958.	1837267.	1837267.	895.	733.	162.	0.	100.0	81.9
1959.	1920240.	1879838.	890.	745.	145.	0.	97.9	83.7
1960.	1756867.	1742462.	863.	734.	129.	0.	99.2	85.0
1961.	1559329.	1552931.	852.	732.	121.	0.	99.6	85.8
1962.	1662506.	1662506.	799.	679.	120.	0.	100.0	85.0
1963.	1334268.	1334268.	780.	663.	117.	0.	100.0	85.0
1964.	1280700.	1280700.	761.	656.	105.	0.	100.0	86.2
1965.	1115518.	1115518.	738.	631.	107.	0.	100.0	85.5
1966.	1389806.	1389633.	791.	673.	118.	0.	100.0	85.1
1967.	1693253.	1693253.	902.	758.	144.	0.	100.0	84.0
1968.	1558614.	1546082.	769.	656.	113.	0.	99.2	85.3
1969.	1555414.	1552163.	783.	668.	115.	0.	99.8	85.3
1970.	1397148.	1396607.	756.	645.	111.	0.	100.0	85.3
1971.	1485555.	1481256.	838.	685.	153.	0.	99.7	81.8
1972.	2407718.	2337976.	1087.	865.	223.	0.	97.1	79.5
1973.	1877088.	1875383.	921.	750.	171.	0.	99.9	81.4
1974.	1886241.	1861986.	875.	708.	166.	0.	98.7	81.0
1975.	1758488.	1758488.	814.	701.	113.	0.	100.0	86.2
1976.	1356149.	1353765.	810.	691.	119.	0.	99.8	85.3
1977.	1665254.	1659247.	894.	764.	130.	0.	99.6	85.5
1978.	1401690.	1401690.	726.	630.	96.	0.	100.0	86.8
1979.	1800989.	1769260.	845.	700.	146.	0.	98.2	82.8
1980.	1305212.	1305212.	764.	630.	134.	0.	100.0	82.4
1981.	1668480.	1666401.	850.	701.	149.	0.	99.9	82.5
1982.	1694760.	1694760.	845.	703.	142.	0.	100.0	83.2
1983.	2143746.	2139526.	982.	820.	162.	0.	99.8	83.5
1984.	1682574.	1682574.	833.	711.	122.	0.	100.0	85.4
1985.	1533337.	1512562.	826.	707.	120.	0.	98.6	85.5

1986.	1597411.	1597411.	777.	660.	117.	0.	100.0	85.0
1987.	1642915.	1642915.	774.	668.	106.	0.	100.0	86.3
1988.	1411344.	1404401.	774.	651.	123.	0.	99.5	84.1
1989.	1262447.	1262447.	667.	567.	100.	0.	100.0	85.0
1991.	976348.	971999.	401.	339.	63.	0.	99.6	84.3
1992.	1535285.	1535285.	856.	736.	120.	0.	100.0	86.0
1993.	1578012.	1567979.	865.	731.	133.	0.	99.4	84.6
1994.	1689998.	1689998.	881.	738.	143.	0.	100.0	83.8
1995.	1189278.	1184905.	636.	532.	104.	0.	99.6	83.6
1996.	1699024.	1694321.	892.	739.	153.	0.	99.7	82.8
1997.	1039562.	1039562.	687.	596.	91.	0.	100.0	86.8
1998.	1383807.	1383807.	742.	611.	131.	0.	100.0	82.4
1999.	1388298.	1388190.	752.	631.	120.	0.	100.0	84.0
2000.	1469348.	1469348.	820.	692.	128.	0.	100.0	84.4
2001.	1098436.	1088034.	682.	579.	103.	0.	99.1	84.9

HS 7

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	1101261.	1101261.	650.	555.	95.	0.	100.0	85.3
1958.	1837267.	1837267.	895.	762.	133.	0.	100.0	85.2
1959.	1920240.	1902575.	890.	771.	119.	0.	99.1	86.6
1960.	1756867.	1756313.	863.	763.	100.	0.	100.0	88.4
1961.	1559329.	1559329.	852.	756.	96.	0.	100.0	88.8
1962.	1662506.	1662506.	799.	703.	96.	0.	100.0	88.0
1963.	1334268.	1334268.	780.	689.	91.	0.	100.0	88.3
1964.	1280700.	1280700.	761.	677.	84.	0.	100.0	89.0
1965.	1115518.	1115518.	738.	654.	84.	0.	100.0	88.7
1966.	1389806.	1389806.	791.	695.	96.	0.	100.0	87.9
1967.	1693253.	1693253.	902.	785.	117.	0.	100.0	87.0
1968.	1558614.	1556270.	769.	678.	90.	0.	99.8	88.2
1969.	1555414.	1555414.	783.	691.	92.	0.	100.0	88.3
1970.	1397148.	1397148.	756.	668.	88.	0.	100.0	88.3
1971.	1485555.	1485555.	838.	712.	127.	0.	100.0	84.9
1972.	2407718.	2375560.	1087.	903.	184.	0.	98.7	83.1
1973.	1877088.	1877088.	921.	782.	139.	0.	100.0	84.9
1974.	1886241.	1885615.	875.	738.	137.	0.	100.0	84.4
1975.	1758488.	1758488.	814.	726.	87.	0.	100.0	89.3
1976.	1356149.	1356149.	810.	714.	96.	0.	100.0	88.1
1977.	1665254.	1665254.	894.	792.	102.	0.	100.0	88.6
1978.	1401690.	1401690.	726.	650.	75.	0.	100.0	89.6
1979.	1800989.	1790890.	845.	725.	120.	0.	99.4	85.8
1980.	1305212.	1305212.	764.	651.	113.	0.	100.0	85.2
1981.	1668480.	1668480.	850.	726.	124.	0.	100.0	85.4
1982.	1694760.	1694760.	845.	729.	116.	0.	100.0	86.3
1983.	2143746.	2143746.	982.	850.	132.	0.	100.0	86.6
1984.	1682574.	1682574.	833.	736.	97.	0.	100.0	88.4
1985.	1533337.	1528466.	826.	730.	96.	0.	99.7	88.3
1986.	1597411.	1597411.	777.	684.	94.	0.	100.0	88.0
1987.	1642915.	1642915.	774.	689.	85.	0.	100.0	89.0
1988.	1411344.	1411344.	774.	675.	99.	0.	100.0	87.2

1989.	1262447.	1262447.	667.	586.	81.	0.	100.0	87.9
1991.	976348.	976348.	401.	351.	50.	0.	100.0	87.5
1992.	1535285.	1535285.	856.	759.	97.	0.	100.0	88.7
1993.	1578012.	1578012.	865.	756.	109.	0.	100.0	87.4
1994.	1689998.	1689998.	881.	763.	118.	0.	100.0	86.6
1995.	1189278.	1189278.	636.	552.	83.	0.	100.0	86.9
1996.	1699024.	1699024.	892.	766.	126.	0.	100.0	85.9
1997.	1039562.	1039562.	687.	615.	72.	0.	100.0	89.5
1998.	1383807.	1383807.	742.	636.	106.	0.	100.0	85.7
1999.	1388298.	1388298.	752.	655.	97.	0.	100.0	87.1
2000.	1469348.	1469348.	820.	717.	103.	0.	100.0	87.5
2001.	1098436.	1097822.	682.	601.	81.	0.	99.9	88.1

HS 8

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	1101261.	1101261.	650.	572.	77.	0.	100.0	88.1
1958.	1837267.	1837267.	895.	783.	112.	0.	100.0	87.5
1959.	1920240.	1919513.	890.	792.	98.	0.	100.0	88.9
1960.	1756867.	1756867.	863.	783.	80.	0.	100.0	90.7
1961.	1559329.	1559329.	852.	776.	76.	0.	100.0	91.0
1962.	1662506.	1662506.	799.	721.	78.	0.	100.0	90.3
1963.	1334268.	1334268.	780.	709.	71.	0.	100.0	90.9
1964.	1280700.	1280700.	761.	693.	68.	0.	100.0	91.1
1965.	1115518.	1115518.	738.	671.	67.	0.	100.0	90.9
1966.	1389806.	1389806.	791.	714.	77.	0.	100.0	90.2
1967.	1693253.	1693253.	902.	807.	95.	0.	100.0	89.5
1968.	1558614.	1558614.	769.	697.	72.	0.	100.0	90.6
1969.	1555414.	1555414.	783.	709.	74.	0.	100.0	90.6
1970.	1397148.	1397148.	756.	682.	74.	0.	100.0	90.2
1971.	1485555.	1485555.	838.	734.	104.	0.	100.0	87.6
1972.	2407718.	2402279.	1087.	934.	153.	0.	99.8	85.9
1973.	1877088.	1877088.	921.	805.	116.	0.	100.0	87.4
1974.	1886241.	1886241.	875.	761.	113.	0.	100.0	87.1
1975.	1758488.	1758488.	814.	744.	70.	0.	100.0	91.4
1976.	1356149.	1356149.	810.	732.	78.	0.	100.0	90.4
1977.	1665254.	1665254.	894.	812.	82.	0.	100.0	90.8
1978.	1401690.	1401690.	726.	667.	58.	0.	100.0	92.0
1979.	1800989.	1800766.	845.	745.	101.	0.	100.0	88.1
1980.	1305212.	1305212.	764.	671.	93.	0.	100.0	87.8
1981.	1668480.	1668480.	850.	747.	103.	0.	100.0	87.9
1982.	1694760.	1694760.	845.	749.	96.	0.	100.0	88.7
1983.	2143746.	2143746.	982.	875.	107.	0.	100.0	89.1
1984.	1682574.	1682574.	833.	756.	77.	0.	100.0	90.7
1985.	1533337.	1533337.	826.	748.	78.	0.	100.0	90.6
1986.	1597411.	1597411.	777.	703.	74.	0.	100.0	90.4
1987.	1642915.	1642915.	774.	706.	68.	0.	100.0	91.2
1988.	1411344.	1411344.	774.	693.	82.	0.	100.0	89.5
1989.	1262447.	1262447.	667.	601.	66.	0.	100.0	90.1
1991.	976348.	976348.	401.	361.	40.	0.	100.0	90.0
1992.	1535285.	1535285.	856.	780.	76.	0.	100.0	91.1

1993.	1578012.	1578012.	865.	775.	89.	0.	100.0	89.7
1994.	1689998.	1689998.	881.	784.	97.	0.	100.0	89.0
1995.	1189278.	1189278.	636.	568.	68.	0.	100.0	89.3
1996.	1699024.	1699024.	892.	790.	102.	0.	100.0	88.5
1997.	1039562.	1039562.	687.	632.	55.	0.	100.0	92.0
1998.	1383807.	1383807.	742.	655.	87.	0.	100.0	88.3
1999.	1388298.	1388298.	752.	670.	81.	0.	100.0	89.2
2000.	1469348.	1469348.	820.	738.	81.	0.	100.0	90.1
2001.	1098436.	1098436.	682.	616.	66.	0.	100.0	90.4

HS 10

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	1101261.	1101261.	650.	605.	44.	0.	100.0	93.2
1958.	1837267.	1837267.	895.	826.	69.	0.	100.0	92.3
1959.	1920240.	1920240.	890.	831.	59.	0.	100.0	93.4
1960.	1756867.	1756867.	863.	816.	47.	0.	100.0	94.5
1961.	1559329.	1559329.	852.	809.	43.	0.	100.0	94.9
1962.	1662506.	1662506.	799.	753.	45.	0.	100.0	94.3
1963.	1334268.	1334268.	780.	742.	38.	0.	100.0	95.1
1964.	1280700.	1280700.	761.	719.	42.	0.	100.0	94.5
1965.	1115518.	1115518.	738.	702.	36.	0.	100.0	95.1
1966.	1389806.	1389806.	791.	745.	46.	0.	100.0	94.2
1967.	1693253.	1693253.	902.	847.	55.	0.	100.0	93.9
1968.	1558614.	1558614.	769.	727.	41.	0.	100.0	94.6
1969.	1555414.	1555414.	783.	741.	42.	0.	100.0	94.7
1970.	1397148.	1397148.	756.	713.	43.	0.	100.0	94.3
1971.	1485555.	1485555.	838.	776.	62.	0.	100.0	92.6
1972.	2407718.	2407718.	1087.	987.	100.	0.	100.0	90.8
1973.	1877088.	1877088.	921.	852.	69.	0.	100.0	92.5
1974.	1886241.	1886241.	875.	802.	72.	0.	100.0	91.7
1975.	1758488.	1758488.	814.	776.	37.	0.	100.0	95.4
1976.	1356149.	1356149.	810.	765.	45.	0.	100.0	94.4
1977.	1665254.	1665254.	894.	847.	47.	0.	100.0	94.7
1978.	1401690.	1401690.	726.	693.	33.	0.	100.0	95.4
1979.	1800989.	1800989.	845.	784.	61.	0.	100.0	92.7
1980.	1305212.	1305212.	764.	707.	57.	0.	100.0	92.6
1981.	1668480.	1668480.	850.	785.	65.	0.	100.0	92.4
1982.	1694760.	1694760.	845.	788.	57.	0.	100.0	93.2
1983.	2143746.	2143746.	982.	921.	61.	0.	100.0	93.8
1984.	1682574.	1682574.	833.	789.	44.	0.	100.0	94.8
1985.	1533337.	1533337.	826.	783.	44.	0.	100.0	94.7
1986.	1597411.	1597411.	777.	735.	42.	0.	100.0	94.6
1987.	1642915.	1642915.	774.	738.	36.	0.	100.0	95.3
1988.	1411344.	1411344.	774.	726.	48.	0.	100.0	93.8
1989.	1262447.	1262447.	667.	631.	36.	0.	100.0	94.6
1991.	976348.	976348.	401.	379.	23.	0.	100.0	94.4
1992.	1535285.	1535285.	856.	817.	39.	0.	100.0	95.4
1993.	1578012.	1578012.	865.	809.	55.	0.	100.0	93.6
1994.	1689998.	1689998.	881.	822.	59.	0.	100.0	93.3
1995.	1189278.	1189278.	636.	596.	40.	0.	100.0	93.7

1996.	1699024.	1699024.	892.	831.	61.	0.	100.0	93.2
1997.	1039562.	1039562.	687.	659.	28.	0.	100.0	95.9
1998.	1383807.	1383807.	742.	691.	51.	0.	100.0	93.1
1999.	1388298.	1388298.	752.	705.	46.	0.	100.0	93.8
2000.	1469348.	1469348.	820.	772.	47.	0.	100.0	94.2
2001.	1098436.	1098436.	682.	640.	41.	0.	100.0	93.9

HS 12

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	1101261.	1101261.	650.	625.	25.	0.	100.0	96.2
1958.	1837267.	1837267.	895.	856.	40.	0.	100.0	95.6
1959.	1920240.	1920240.	890.	856.	34.	0.	100.0	96.2
1960.	1756867.	1756867.	863.	838.	25.	0.	100.0	97.1
1961.	1559329.	1559329.	852.	828.	24.	0.	100.0	97.1
1962.	1662506.	1662506.	799.	773.	25.	0.	100.0	96.8
1963.	1334268.	1334268.	780.	761.	19.	0.	100.0	97.6
1964.	1280700.	1280700.	761.	738.	23.	0.	100.0	97.0
1965.	1115518.	1115518.	738.	722.	17.	0.	100.0	97.8
1966.	1389806.	1389806.	791.	766.	25.	0.	100.0	96.8
1967.	1693253.	1693253.	902.	874.	29.	0.	100.0	96.8
1968.	1558614.	1558614.	769.	746.	22.	0.	100.0	97.1
1969.	1555414.	1555414.	783.	760.	23.	0.	100.0	97.1
1970.	1397148.	1397148.	756.	732.	23.	0.	100.0	96.9
1971.	1485555.	1485555.	838.	806.	32.	0.	100.0	96.1
1972.	2407718.	2407718.	1087.	1027.	60.	0.	100.0	94.4
1973.	1877088.	1877088.	921.	884.	37.	0.	100.0	96.0
1974.	1886241.	1886241.	875.	829.	45.	0.	100.0	94.8
1975.	1758488.	1758488.	814.	797.	17.	0.	100.0	97.9
1976.	1356149.	1356149.	810.	784.	26.	0.	100.0	96.8
1977.	1665254.	1665254.	894.	869.	25.	0.	100.0	97.2
1978.	1401690.	1401690.	726.	710.	16.	0.	100.0	97.8
1979.	1800989.	1800989.	845.	807.	39.	0.	100.0	95.4
1980.	1305212.	1305212.	764.	733.	31.	0.	100.0	95.9
1981.	1668480.	1668480.	850.	813.	37.	0.	100.0	95.6
1982.	1694760.	1694760.	845.	814.	32.	0.	100.0	96.3
1983.	2143746.	2143746.	982.	951.	31.	0.	100.0	96.8
1984.	1682574.	1682574.	833.	810.	23.	0.	100.0	97.2
1985.	1533337.	1533337.	826.	804.	23.	0.	100.0	97.3
1986.	1597411.	1597411.	777.	755.	22.	0.	100.0	97.2
1987.	1642915.	1642915.	774.	758.	17.	0.	100.0	97.9
1988.	1411344.	1411344.	774.	749.	26.	0.	100.0	96.7
1989.	1262447.	1262447.	667.	648.	19.	0.	100.0	97.2
1991.	976348.	976348.	401.	390.	11.	0.	100.0	97.2
1992.	1535285.	1535285.	856.	837.	19.	0.	100.0	97.7
1993.	1578012.	1578012.	865.	836.	28.	0.	100.0	96.7
1994.	1689998.	1689998.	881.	851.	30.	0.	100.0	96.6
1995.	1189278.	1189278.	636.	615.	21.	0.	100.0	96.8
1996.	1699024.	1699024.	892.	858.	34.	0.	100.0	96.2
1997.	1039562.	1039562.	687.	673.	14.	0.	100.0	98.0
1998.	1383807.	1383807.	742.	714.	27.	0.	100.0	96.3

1999.	1388298.	1388298.	752.	727.	24.	0.	100.0	96.8
2000.	1469348.	1469348.	820.	794.	26.	0.	100.0	96.9
2001.	1098436.	1098436.	682.	656.	26.	0.	100.0	96.2

```
**************************************************
*  Summary of Quantity and Quality Results at    *
*  Location        200  INFlow in cfs.           *
*  Values are instantaneous at indicated time step *
**************************************************

  Goventure Captial Group, Frankin Street, Worcester
  DMH#102

     Date      Time         Flow   Total Su
 Mo/Da/Year  Hr:Min          cfs    mg/l
 ----------  -------     -------  --------
Flow wtd means.....         0.010       92.
Flow wtd std devs..         0.048       68.
Maximum value......         3.282      293.
Minimum value......         0.000        0.
Total loads........      6159740.    35329.
                         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... June       22, 2023              *
*          Time...          11:14:49.712             *
*   Ending Date... June       22, 2023              *
*          Time...          11:14:55.501             *
*  Elapsed Time...               0.096 minutes.     *
*  Elapsed Time...               5.789 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#107-Water Quality Unit

For First 1.0-Inch Runoff WQV

Step 1: Area of Impervious Surface to Structure

0.641 acres @ 68.12% Impervious = 0.436 Acres Impervious
0.436 Acres x .0015625 sq mi = ***6.8x(10^-4) square miles.***

Step 2: Tc of Train

P112 to DCB#12:	5.0 min
DCB#12 to DMH#108	0.3 min
DMH#108 to DMH#107	0.6 min
Total Tc to DMH#107	***5.9 min or 0.098 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(6.8x(10^-4)) x(1.0 in)

Q(1) = 0.538 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 > 0.538 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#107

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 HS4	**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: **10/15/2024**

*Equals remaining load from previous BMP (E) which enters the BMP

Summary for Reach DMH107: TO DMH#100

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB6 outlet invert by 0.06' @ 12.15 hrs
[61] Hint: Exceeded Reach DMH108 outlet invert by 0.06' @ 12.15 hrs

Inflow Area = 0.487 ac, 89.00% Impervious, Inflow Depth = 1.76" for 1-Year event
Inflow = 0.88 cfs @ 12.12 hrs, Volume= 0.071 af <=WQV
Outflow = 0.88 cfs @ 12.13 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.5 min
Routed to Reach DMH100 : TO DMH-A

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 = 1.79 fps, Avg. Travel Time= 0.7 min

Peak Storage= 13 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.89'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.64 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 78.0' Slope= 0.0179 '/'
Inlet Invert= 466.70', Outlet Invert= 465.30'

Summary for Subcatchment P112: TO DCB#12

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.43 cfs @ 12.11 hrs, Volume= 0.034 af, Depth= 1.95"
Routed to Reach DCB12 : TO DMH#12

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 1-Year Rainfall=2.58"

Area (sf)	CN	Description
575	39	>75% Grass cover, Good, HSG A
8,479	98	Paved parking, HSG A
9,054	94	Weighted Average
575		6.35% Pervious Area
8,479		93.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0130	1.00		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	100	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	150	Total, Increased to minimum Tc = 5.0 min			<=TC

Summary for Reach DCB12: TO DMH#12

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.208 ac, 93.65% Impervious, Inflow Depth = 1.95" for 1-Year event
Inflow = 0.43 cfs @ 12.11 hrs, Volume= 0.034 af
Outflow = 0.42 cfs @ 12.12 hrs, Volume= 0.034 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH108 : TO DMH#107

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= 0.1 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 0.3 min<=TC

Peak Storage= 3 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 0.64'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.63 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 28.0' Slope= 0.0107 '/'
Inlet Invert= 467.80', Outlet Invert= 467.50'

Summary for Reach DMH108: TO DMH#107

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB12 outlet invert by 0.14' @ 12.10 hrs

Inflow Area = 0.336 ac, 86.65% Impervious, Inflow Depth = 1.63" for 1-Year event
Inflow = 0.58 cfs @ 12.12 hrs, Volume= 0.046 af
Outflow = 0.58 cfs @ 12.13 hrs, Volume= 0.046 af, Atten= 1%, Lag= 0.5 min
Routed to Reach DMH107 : TO DMH#100

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.87 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 0.6 min <=TC

Peak Storage= 7 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 0.86'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.44 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 45.0' Slope= 0.0111 '/'
Inlet Invert= 467.40', Outlet Invert= 466.90'

```
**************************************************
*      Storm Water Management Sizing Model       *
*                Hydroworks, LLC                 *
*                 Version 4.4                    *
*                                                *
*         Continuous Simulation Program          *
*              Based on SWMM 4.4H                *
*              Hydroworks, LLC                   *
*               Graham Bryant                    *
*                2003 - 2021                     *
**************************************************

                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 888-290-7900   *
*     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 Captial, Franklin Street
DMH#107

HydroStorm Simulation

```
 ########################################
 #  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 Captial,  Franklin Street

                  DMH#107



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
```

****
* CHANNEL AND PIPE DATA *
****

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

****
* SUBCATCHMENT DATA *
****

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	INFILTRATION RATE(IN/HR) MINIMUM	DECAY RATE (1/SEC)	GAGE NO.	MAXIMUM VOLUME (INCHES)
1	300	200	145.65	0.49	89.00	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).... 0.49
IMPERVIOUS AREA (ACRES)..... 0.43
PERVIOUS AREA (ACRES)..... 0.05
TOTAL WIDTH (FEET)..... 145.65
PERCENT IMPERVIOUSNESS..... 89.00

****
* GROUNDWATER INPUT DATA *
****

SUB-CATCH NUMBER	CHANNEL OR INLET	ELEVATIONS GROUND (FT)	ELEVATIONS BOTTOM (FT)	ELEVATIONS STAGE (FT)	ELEVATIONS BC (FT)	ELEVATIONS TW (FT)	FLOW CONSTANTS A1 (IN/HR-FT^B1)	FLOW CONSTANTS B1	FLOW CONSTANTS A2 (IN/HR-FT^B2)	FLOW CONSTANTS B2	FLOW CONSTANTS 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

****
* GROUNDWATER INPUT DATA (CONTINUED) *
****

SOIL PROPERTIES

SUBCAT. NO.	POROSITY	SATURATED HYDRAULIC CONDUCTIVITY (in/hr)	WILTING POINT	FIELD CAPACITY	INITIAL MOISTURE	MAX. DEEP PERCOLATION (in/hr)	PERCOLATION PARAMETERS HCO	PERCOLATION PARAMETERS PCO	ET PARAMETERS DEPTH OF ET (ft)	ET PARAMETERS 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.......     0.300

 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)	0.300
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         2.90     1.00  0.0E+00
   Totals (Loads in lb or other)    2.90     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 Captial, Franklin Street
DMH#107

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  13553147   3364141

*************************************************
*     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)                   3932529.      2225.
Total Infiltration                                      426729.       241.
Total Evaporation                                       166388.        94.
Surface Runoff from Watersheds                         3369661.      1906.
Total Water remaining in Surface Storage                    24.         0.
Infiltration over the Pervious Area...                  426729.      2194.
                      --------
Infiltration + Evaporation +
Surface Runoff + Snow removal +
Water remaining in Surface Storage +
```

```
Water remaining in Snow Cover.....                3962801.      2242.
Total Precipitation + Initial Storage.            3932529.      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.....................................      -0.770 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...                3369661.      1906.
Baseflow.........................                     0.
Groundwater Subsurface Inflow....                     0.         0.
Evaporation Loss from Channels...                     0.         0.
Channel/Pipe/Inlet Outflow.......                3369661.      1906.
Initial Storage + Inflow.........                3369661.      1906.
Final Storage + Outflow..........                3369661.      1906.
*****************************************
* 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                        63641.        36.
```

Final Subsurface Storage	63641.	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

SUBCATCHMENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	PERVIOUS AREA: 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	0.49	89.0	2224.52	28.318	2197.288	0.133	2136.686	1.573	1904.766	1.706	3.504

*** 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				1.70				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.....	9.
2. TOTAL SURFACE BUILDUP.....	19228.
3. INITIAL CATCHBASIN LOAD.....	0.
4. TOTAL CATCHBASIN LOAD.....	0.
5. TOTAL CATCHBASIN AND SURFACE BUILDUP (2+4).....	19228.
Remaining Loads	
6. LOAD REMAINING ON SURFACE...	2.
7. REMAINING IN CATCHBASINS....	0.
8. REMAINING IN CHANNEL/PIPES..	0.
Removals	
9. STREET SWEEPING REMOVAL.....	766.
10. NET SURFACE BUILDUP (2-9)...	18462.
11. SURFACE WASHOFF.....	18450.
12. CATCHBASIN WASHOFF.....	0.
13. TOTAL WASHOFF (11+12).....	18450.
14. LOAD FROM OTHER CONSTITUENTS	0.
15. PRECIPITATION LOAD.....	0.
15a.SUM SURFACE LOAD (13+14+15).	18450.
16. TOTAL GROUNDWATER LOAD.....	0.
16a.TOTAL I/I LOAD.....	0.
17. NET SUBCATCHMENT LOAD (15a-15b-15c-15d+16+16a)....	18450.
>>Removal in channel/pipes (17a, 17b):	
17a.REMOVE BY BMP FRACTION.....	0.
17b.REMOVE BY 1st ORDER DECAY...	0.
18. TOTAL LOAD TO INLETS.....	18449.
19. FLOW WT'D AVE.CONCENTRATION (INLET LOAD/TOTAL FLOW).....	mg/l 88.
Percentages	
20. STREET SWEEPING (9/2).....	4.
21. SURFACE WASHOFF (11/2).....	96.
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     %     Specific    Settling Velocity   Critical Peclet
     (um)             Gravity        (ft/s)               Number


      1.      5.0      2.65         0.000002            0.022000
      4.      5.0      2.65         0.000035            0.049420
      7.     10.0      2.65         0.000108            0.068516
     18.     15.0      2.65         0.000710            0.118919
     45.     10.0      2.65         0.004352            0.203034
     70.      5.0      2.65         0.010215            0.262779
     90.     10.0      2.65         0.016354            0.304305
    125.     15.0      2.65         0.029465            0.368637
    200.     15.0      2.65         0.063279            0.485025
    400.      5.0      2.65         0.156843            0.726951
```

850.	5.0	2.65	0.321303	1.128801

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 3	0.536	4.911	98.6	73.5
HS 4	0.913	4.911	99.8	80.3 <=TSS Removal
HS 5	1.142	4.911	99.9	86.1
HS 6	1.391	4.911	100.0	90.1
HS 7	1.937	4.911	100.0	92.6
HS 8	2.582	4.911	100.0	94.6
HS 10	3.711	4.911	100.0	97.3
HS 12	4.911	4.911	100.0	98.6

Summary of Annual Flow Treatmnet & TSS Removal

HS 3

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	602818.	598838.	340.	246.	94.	0.	99.3	72.4
1958.	1005594.	1000114.	466.	330.	136.	0.	99.5	70.9
1959.	1048460.	1008507.	464.	335.	128.	0.	96.2	72.3
1960.	958583.	940858.	448.	334.	114.	0.	98.2	74.5
1961.	853084.	836259.	444.	334.	111.	0.	98.0	75.1
1962.	907224.	902349.	417.	310.	107.	0.	99.5	74.3
1963.	730228.	730228.	410.	309.	101.	0.	100.0	75.3
1964.	700829.	697427.	399.	300.	99.	0.	99.5	75.3
1965.	610683.	610683.	388.	293.	95.	0.	100.0	75.6
1966.	760623.	755385.	414.	309.	105.	0.	99.3	74.6
1967.	926544.	919655.	472.	346.	126.	0.	99.3	73.3
1968.	849492.	837292.	403.	301.	102.	0.	98.6	74.7
1969.	851192.	843795.	410.	304.	106.	0.	99.1	74.2
1970.	763629.	752229.	397.	296.	101.	0.	98.5	74.6
1971.	812314.	804512.	438.	313.	126.	0.	99.0	71.4
1972.	1314650.	1252750.	563.	382.	182.	0.	95.3	67.7
1973.	1026530.	1015335.	478.	333.	145.	0.	98.9	69.6
1974.	1029932.	980214.	453.	315.	138.	0.	95.2	69.6
1975.	962155.	962155.	425.	321.	104.	0.	100.0	75.6
1976.	742112.	728280.	425.	316.	109.	0.	98.1	74.3

1977.	910768.	897752.	468.	349.	118.	0.	98.6	74.7
1978.	767112.	766515.	381.	291.	89.	0.	99.9	76.5
1979.	983619.	944110.	441.	315.	126.	0.	96.0	71.4
1980.	714612.	706290.	401.	288.	113.	0.	98.8	71.9
1981.	912939.	897056.	444.	320.	124.	0.	98.3	72.1
1982.	926113.	921021.	441.	320.	121.	0.	99.5	72.6
1983.	1171873.	1163956.	509.	370.	139.	0.	99.3	72.7
1984.	917877.	914430.	436.	323.	113.	0.	99.6	74.2
1985.	836734.	807931.	433.	325.	108.	0.	96.6	75.1
1986.	873316.	872202.	406.	304.	102.	0.	99.9	74.8
1987.	893028.	893028.	404.	307.	97.	0.	100.0	76.1
1988.	772606.	763440.	406.	299.	106.	0.	98.8	73.8
1989.	691230.	685459.	349.	258.	90.	0.	99.2	74.1
1991.	531464.	512855.	209.	157.	51.	0.	96.5	75.4
1992.	840193.	837684.	448.	339.	108.	0.	99.7	75.8
1993.	862039.	843593.	452.	335.	117.	0.	97.9	74.1
1994.	924852.	920732.	461.	337.	124.	0.	99.6	73.2
1995.	650405.	642987.	332.	245.	87.	0.	98.9	73.7
1996.	929759.	918204.	466.	338.	128.	0.	98.8	72.5
1997.	569075.	568539.	361.	273.	89.	0.	99.9	75.5
1998.	757312.	752746.	388.	275.	112.	0.	99.4	71.0
1999.	758808.	751832.	393.	290.	104.	0.	99.1	73.6
2000.	804445.	802406.	429.	319.	110.	0.	99.7	74.3
2001.	601184.	582851.	359.	268.	91.	0.	97.0	74.7

HS 4

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	602818.	602818.	340.	267.	73.	0.	100.0	78.4
1958.	1005594.	1005594.	466.	364.	101.	0.	100.0	78.2
1959.	1048460.	1031317.	464.	369.	95.	0.	98.4	79.5
1960.	958583.	955263.	448.	363.	85.	0.	99.7	81.1
1961.	853084.	851407.	444.	363.	81.	0.	99.8	81.8
1962.	907224.	907224.	417.	338.	78.	0.	100.0	81.2
1963.	730228.	730228.	410.	332.	78.	0.	100.0	81.0
1964.	700829.	700829.	399.	327.	72.	0.	100.0	82.0
1965.	610683.	610683.	388.	317.	71.	0.	100.0	81.6
1966.	760623.	760623.	414.	335.	79.	0.	100.0	81.0
1967.	926544.	926544.	472.	377.	95.	0.	100.0	79.8
1968.	849492.	844745.	403.	328.	75.	0.	99.4	81.4
1969.	851192.	850996.	410.	331.	78.	0.	100.0	80.9
1970.	763629.	763629.	397.	324.	73.	0.	100.0	81.6
1971.	812314.	811779.	438.	342.	96.	0.	99.9	78.0
1972.	1314650.	1284888.	563.	423.	140.	0.	97.7	75.1
1973.	1026530.	1026530.	478.	369.	109.	0.	100.0	77.3
1974.	1029932.	1023968.	453.	349.	104.	0.	99.4	77.0
1975.	962155.	962155.	425.	349.	76.	0.	100.0	82.2
1976.	742112.	742112.	425.	347.	78.	0.	100.0	81.7
1977.	910768.	910416.	468.	381.	87.	0.	100.0	81.5
1978.	767112.	767112.	381.	317.	64.	0.	100.0	83.2
1979.	983619.	972423.	441.	349.	92.	0.	98.9	79.2

1980.	714612.	714612.	401.	314.	86.	0.	100.0	78.5
1981.	912939.	912939.	444.	349.	96.	0.	100.0	78.4
1982.	926113.	926113.	441.	351.	90.	0.	100.0	79.7
1983.	1171873.	1171450.	509.	404.	105.	0.	100.0	79.5
1984.	917877.	917877.	436.	355.	81.	0.	100.0	81.4
1985.	836734.	829867.	433.	354.	78.	0.	99.2	81.9
1986.	873316.	873316.	406.	331.	76.	0.	100.0	81.4
1987.	893028.	893028.	404.	335.	69.	0.	100.0	82.8
1988.	772606.	770433.	406.	326.	79.	0.	99.7	80.5
1989.	691230.	691230.	349.	283.	66.	0.	100.0	81.2
1991.	531464.	531464.	209.	169.	40.	0.	100.0	80.9
1992.	840193.	840193.	448.	369.	79.	0.	100.0	82.4
1993.	862039.	859814.	452.	365.	87.	0.	99.7	80.8
1994.	924852.	924852.	461.	370.	91.	0.	100.0	80.2
1995.	650405.	649794.	332.	266.	67.	0.	99.9	80.0
1996.	929759.	928884.	466.	368.	98.	0.	99.9	78.9
1997.	569075.	569075.	361.	297.	64.	0.	100.0	82.2
1998.	757312.	757312.	388.	301.	86.	0.	100.0	77.8
1999.	758808.	758808.	393.	317.	76.	0.	100.0	80.6
2000.	804445.	804445.	429.	345.	84.	0.	100.0	80.5
2001.	601184.	597234.	359.	291.	67.	0.	99.3	81.3

HS 5

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	602818.	602818.	340.	286.	54.	0.	100.0	84.1
1958.	1005594.	1005594.	466.	391.	74.	0.	100.0	84.0
1959.	1048460.	1040035.	464.	396.	67.	0.	99.2	85.5
1960.	958583.	958583.	448.	390.	58.	0.	100.0	87.1
1961.	853084.	853084.	444.	390.	55.	0.	100.0	87.7
1962.	907224.	907224.	417.	362.	54.	0.	100.0	87.0
1963.	730228.	730228.	410.	355.	54.	0.	100.0	86.8
1964.	700829.	700829.	399.	351.	48.	0.	100.0	88.0
1965.	610683.	610683.	388.	339.	49.	0.	100.0	87.3
1966.	760623.	760623.	414.	359.	55.	0.	100.0	86.7
1967.	926544.	926544.	472.	405.	67.	0.	100.0	85.7
1968.	849492.	848618.	403.	351.	52.	0.	99.9	87.0
1969.	851192.	851192.	410.	357.	53.	0.	100.0	87.0
1970.	763629.	763629.	397.	347.	50.	0.	100.0	87.3
1971.	812314.	812314.	438.	367.	72.	0.	100.0	83.7
1972.	1314650.	1298510.	563.	461.	103.	0.	98.8	81.8
1973.	1026530.	1026530.	478.	399.	78.	0.	100.0	83.6
1974.	1029932.	1029932.	453.	377.	76.	0.	100.0	83.2
1975.	962155.	962155.	425.	374.	51.	0.	100.0	88.1
1976.	742112.	742112.	425.	370.	55.	0.	100.0	87.0
1977.	910768.	910768.	468.	409.	59.	0.	100.0	87.5
1978.	767112.	767112.	381.	338.	43.	0.	100.0	88.7
1979.	983619.	979220.	441.	373.	68.	0.	99.6	84.6
1980.	714612.	714612.	401.	337.	64.	0.	100.0	84.0
1981.	912939.	912939.	444.	374.	70.	0.	100.0	84.2
1982.	926113.	926113.	441.	376.	65.	0.	100.0	85.2

1983.	1171873.	1171873.	509.	434.	75.	0.	100.0	85.3
1984.	917877.	917877.	436.	380.	56.	0.	100.0	87.2
1985.	836734.	834573.	433.	379.	54.	0.	99.7	87.5
1986.	873316.	873316.	406.	352.	54.	0.	100.0	86.7
1987.	893028.	893028.	404.	356.	48.	0.	100.0	88.1
1988.	772606.	772606.	406.	349.	56.	0.	100.0	86.1
1989.	691230.	691230.	349.	303.	46.	0.	100.0	86.8
1991.	531464.	531464.	209.	180.	28.	0.	100.0	86.4
1992.	840193.	840193.	448.	392.	56.	0.	100.0	87.5
1993.	862039.	862039.	452.	391.	61.	0.	100.0	86.5
1994.	924852.	924852.	461.	394.	67.	0.	100.0	85.5
1995.	650405.	650405.	332.	285.	47.	0.	100.0	85.8
1996.	929759.	929759.	466.	395.	71.	0.	100.0	84.8
1997.	569075.	569075.	361.	319.	42.	0.	100.0	88.3
1998.	757312.	757312.	388.	326.	61.	0.	100.0	84.2
1999.	758808.	758808.	393.	338.	55.	0.	100.0	86.0
2000.	804445.	804445.	429.	370.	58.	0.	100.0	86.4
2001.	601184.	600904.	359.	312.	47.	0.	100.0	87.0

HS 6

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	602818.	602818.	340.	301.	39.	0.	100.0	88.5
1958.	1005594.	1005594.	466.	409.	56.	0.	100.0	87.9
1959.	1048460.	1047201.	464.	416.	47.	0.	99.9	89.8
1960.	958583.	958583.	448.	408.	40.	0.	100.0	91.1
1961.	853084.	853084.	444.	407.	37.	0.	100.0	91.6
1962.	907224.	907224.	417.	379.	38.	0.	100.0	90.9
1963.	730228.	730228.	410.	374.	35.	0.	100.0	91.4
1964.	700829.	700829.	399.	365.	34.	0.	100.0	91.6
1965.	610683.	610683.	388.	354.	34.	0.	100.0	91.2
1966.	760623.	760623.	414.	375.	39.	0.	100.0	90.6
1967.	926544.	926544.	472.	425.	47.	0.	100.0	90.1
1968.	849492.	849492.	403.	368.	35.	0.	100.0	91.3
1969.	851192.	851192.	410.	373.	37.	0.	100.0	91.1
1970.	763629.	763629.	397.	360.	37.	0.	100.0	90.7
1971.	812314.	812314.	438.	386.	52.	0.	100.0	88.1
1972.	1314650.	1310035.	563.	488.	75.	0.	99.6	86.7
1973.	1026530.	1026530.	478.	421.	57.	0.	100.0	88.1
1974.	1029932.	1029932.	453.	397.	55.	0.	100.0	87.7
1975.	962155.	962155.	425.	390.	35.	0.	100.0	91.9
1976.	742112.	742112.	425.	386.	39.	0.	100.0	90.8
1977.	910768.	910768.	468.	426.	41.	0.	100.0	91.2
1978.	767112.	767112.	381.	351.	29.	0.	100.0	92.3
1979.	983619.	983218.	441.	391.	50.	0.	100.0	88.8
1980.	714612.	714612.	401.	354.	47.	0.	100.0	88.4
1981.	912939.	912939.	444.	393.	51.	0.	100.0	88.5
1982.	926113.	926113.	441.	393.	48.	0.	100.0	89.1
1983.	1171873.	1171873.	509.	456.	53.	0.	100.0	89.6
1984.	917877.	917877.	436.	398.	38.	0.	100.0	91.4
1985.	836734.	836734.	433.	395.	38.	0.	100.0	91.2

1986.	873316.	873316.	406.	369.	37.	0.	100.0	90.9
1987.	893028.	893028.	404.	371.	33.	0.	100.0	91.8
1988.	772606.	772606.	406.	364.	41.	0.	100.0	89.8
1989.	691230.	691230.	349.	317.	32.	0.	100.0	90.9
1991.	531464.	531464.	209.	189.	19.	0.	100.0	90.8
1992.	840193.	840193.	448.	410.	37.	0.	100.0	91.7
1993.	862039.	862039.	452.	407.	45.	0.	100.0	90.1
1994.	924852.	924852.	461.	412.	49.	0.	100.0	89.4
1995.	650405.	650405.	332.	298.	34.	0.	100.0	89.7
1996.	929759.	929759.	466.	416.	51.	0.	100.0	89.1
1997.	569075.	569075.	361.	335.	26.	0.	100.0	92.7
1998.	757312.	757312.	388.	344.	43.	0.	100.0	88.8
1999.	758808.	758808.	393.	352.	41.	0.	100.0	89.6
2000.	804445.	804445.	429.	388.	41.	0.	100.0	90.5
2001.	601184.	601184.	359.	326.	32.	0.	100.0	91.0

HS 7

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	602818.	602818.	340.	310.	30.	0.	100.0	91.2
1958.	1005594.	1005594.	466.	422.	44.	0.	100.0	90.6
1959.	1048460.	1048460.	464.	427.	37.	0.	100.0	92.1
1960.	958583.	958583.	448.	418.	30.	0.	100.0	93.3
1961.	853084.	853084.	444.	417.	27.	0.	100.0	93.8
1962.	907224.	907224.	417.	388.	28.	0.	100.0	93.2
1963.	730228.	730228.	410.	384.	26.	0.	100.0	93.7
1964.	700829.	700829.	399.	373.	27.	0.	100.0	93.3
1965.	610683.	610683.	388.	363.	25.	0.	100.0	93.6
1966.	760623.	760623.	414.	385.	29.	0.	100.0	93.0
1967.	926544.	926544.	472.	436.	36.	0.	100.0	92.4
1968.	849492.	849492.	403.	377.	26.	0.	100.0	93.5
1969.	851192.	851192.	410.	383.	27.	0.	100.0	93.5
1970.	763629.	763629.	397.	370.	27.	0.	100.0	93.1
1971.	812314.	812314.	438.	399.	39.	0.	100.0	91.0
1972.	1314650.	1314650.	563.	504.	59.	0.	100.0	89.5
1973.	1026530.	1026530.	478.	434.	44.	0.	100.0	90.9
1974.	1029932.	1029932.	453.	410.	43.	0.	100.0	90.4
1975.	962155.	962155.	425.	400.	25.	0.	100.0	94.1
1976.	742112.	742112.	425.	396.	29.	0.	100.0	93.2
1977.	910768.	910768.	468.	437.	31.	0.	100.0	93.5
1978.	767112.	767112.	381.	359.	21.	0.	100.0	94.4
1979.	983619.	983619.	441.	403.	38.	0.	100.0	91.4
1980.	714612.	714612.	401.	365.	36.	0.	100.0	91.1
1981.	912939.	912939.	444.	405.	40.	0.	100.0	91.1
1982.	926113.	926113.	441.	404.	37.	0.	100.0	91.6
1983.	1171873.	1171873.	509.	469.	40.	0.	100.0	92.2
1984.	917877.	917877.	436.	407.	28.	0.	100.0	93.5
1985.	836734.	836734.	433.	405.	28.	0.	100.0	93.5
1986.	873316.	873316.	406.	379.	28.	0.	100.0	93.2
1987.	893028.	893028.	404.	380.	24.	0.	100.0	94.1
1988.	772606.	772606.	406.	375.	31.	0.	100.0	92.4

1989.	691230.	691230.	349.	325.	23.	0.	100.0	93.3
1991.	531464.	531464.	209.	194.	14.	0.	100.0	93.1
1992.	840193.	840193.	448.	422.	26.	0.	100.0	94.2
1993.	862039.	862039.	452.	417.	35.	0.	100.0	92.2
1994.	924852.	924852.	461.	423.	38.	0.	100.0	91.7
1995.	650405.	650405.	332.	307.	26.	0.	100.0	92.3
1996.	929759.	929759.	466.	428.	39.	0.	100.0	91.7
1997.	569075.	569075.	361.	342.	19.	0.	100.0	94.8
1998.	757312.	757312.	388.	355.	33.	0.	100.0	91.5
1999.	758808.	758808.	393.	362.	31.	0.	100.0	92.2
2000.	804445.	804445.	429.	398.	31.	0.	100.0	92.8
2001.	601184.	601184.	359.	334.	25.	0.	100.0	93.0

HS 8

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	602818.	602818.	340.	318.	22.	0.	100.0	93.5
1958.	1005594.	1005594.	466.	433.	33.	0.	100.0	93.0
1959.	1048460.	1048460.	464.	436.	27.	0.	100.0	94.1
1960.	958583.	958583.	448.	426.	22.	0.	100.0	95.1
1961.	853084.	853084.	444.	424.	20.	0.	100.0	95.5
1962.	907224.	907224.	417.	396.	21.	0.	100.0	94.9
1963.	730228.	730228.	410.	392.	18.	0.	100.0	95.7
1964.	700829.	700829.	399.	379.	20.	0.	100.0	95.0
1965.	610683.	610683.	388.	372.	16.	0.	100.0	95.8
1966.	760623.	760623.	414.	393.	21.	0.	100.0	94.9
1967.	926544.	926544.	472.	447.	25.	0.	100.0	94.7
1968.	849492.	849492.	403.	384.	19.	0.	100.0	95.3
1969.	851192.	851192.	410.	391.	19.	0.	100.0	95.5
1970.	763629.	763629.	397.	377.	20.	0.	100.0	94.9
1971.	812314.	812314.	438.	409.	29.	0.	100.0	93.3
1972.	1314650.	1314650.	563.	517.	47.	0.	100.0	91.7
1973.	1026530.	1026530.	478.	445.	33.	0.	100.0	93.0
1974.	1029932.	1029932.	453.	420.	33.	0.	100.0	92.8
1975.	962155.	962155.	425.	409.	16.	0.	100.0	96.3
1976.	742112.	742112.	425.	404.	21.	0.	100.0	95.1
1977.	910768.	910768.	468.	446.	22.	0.	100.0	95.4
1978.	767112.	767112.	381.	366.	15.	0.	100.0	96.1
1979.	983619.	983619.	441.	412.	29.	0.	100.0	93.4
1980.	714612.	714612.	401.	374.	26.	0.	100.0	93.4
1981.	912939.	912939.	444.	414.	30.	0.	100.0	93.1
1982.	926113.	926113.	441.	414.	27.	0.	100.0	93.9
1983.	1171873.	1171873.	509.	481.	28.	0.	100.0	94.6
1984.	917877.	917877.	436.	416.	20.	0.	100.0	95.4
1985.	836734.	836734.	433.	413.	20.	0.	100.0	95.4
1986.	873316.	873316.	406.	387.	19.	0.	100.0	95.3
1987.	893028.	893028.	404.	389.	15.	0.	100.0	96.2
1988.	772606.	772606.	406.	384.	22.	0.	100.0	94.7
1989.	691230.	691230.	349.	332.	16.	0.	100.0	95.3
1991.	531464.	531464.	209.	199.	10.	0.	100.0	95.2
1992.	840193.	840193.	448.	430.	17.	0.	100.0	96.1

1993.	862039.	862039.	452.	427.	25.	0.	100.0	94.5
1994.	924852.	924852.	461.	434.	27.	0.	100.0	94.2
1995.	650405.	650405.	332.	314.	18.	0.	100.0	94.5
1996.	929759.	929759.	466.	437.	29.	0.	100.0	93.8
1997.	569075.	569075.	361.	348.	13.	0.	100.0	96.3
1998.	757312.	757312.	388.	363.	24.	0.	100.0	93.7
1999.	758808.	758808.	393.	372.	21.	0.	100.0	94.6
2000.	804445.	804445.	429.	406.	23.	0.	100.0	94.7
2001.	601184.	601184.	359.	340.	19.	0.	100.0	94.7

HS 10

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	602818.	602818.	340.	329.	11.	0.	100.0	96.7
1958.	1005594.	1005594.	466.	450.	16.	0.	100.0	96.6
1959.	1048460.	1048460.	464.	449.	15.	0.	100.0	96.8
1960.	958583.	958583.	448.	438.	10.	0.	100.0	97.8
1961.	853084.	853084.	444.	434.	10.	0.	100.0	97.7
1962.	907224.	907224.	417.	406.	11.	0.	100.0	97.5
1963.	730228.	730228.	410.	402.	8.	0.	100.0	98.1
1964.	700829.	700829.	399.	389.	10.	0.	100.0	97.6
1965.	610683.	610683.	388.	381.	7.	0.	100.0	98.1
1966.	760623.	760623.	414.	402.	11.	0.	100.0	97.2
1967.	926544.	926544.	472.	459.	13.	0.	100.0	97.3
1968.	849492.	849492.	403.	394.	9.	0.	100.0	97.7
1969.	851192.	851192.	410.	400.	10.	0.	100.0	97.6
1970.	763629.	763629.	397.	387.	10.	0.	100.0	97.5
1971.	812314.	812314.	438.	425.	14.	0.	100.0	96.9
1972.	1314650.	1314650.	563.	537.	27.	0.	100.0	95.2
1973.	1026530.	1026530.	478.	462.	16.	0.	100.0	96.7
1974.	1029932.	1029932.	453.	433.	20.	0.	100.0	95.6
1975.	962155.	962155.	425.	418.	7.	0.	100.0	98.3
1976.	742112.	742112.	425.	414.	11.	0.	100.0	97.3
1977.	910768.	910768.	468.	456.	11.	0.	100.0	97.6
1978.	767112.	767112.	381.	374.	7.	0.	100.0	98.2
1979.	983619.	983619.	441.	423.	18.	0.	100.0	96.0
1980.	714612.	714612.	401.	387.	14.	0.	100.0	96.4
1981.	912939.	912939.	444.	427.	17.	0.	100.0	96.2
1982.	926113.	926113.	441.	428.	13.	0.	100.0	97.0
1983.	1171873.	1171873.	509.	496.	13.	0.	100.0	97.4
1984.	917877.	917877.	436.	425.	10.	0.	100.0	97.6
1985.	836734.	836734.	433.	423.	10.	0.	100.0	97.7
1986.	873316.	873316.	406.	397.	9.	0.	100.0	97.7
1987.	893028.	893028.	404.	397.	7.	0.	100.0	98.2
1988.	772606.	772606.	406.	394.	11.	0.	100.0	97.3
1989.	691230.	691230.	349.	340.	9.	0.	100.0	97.5
1991.	531464.	531464.	209.	204.	5.	0.	100.0	97.8
1992.	840193.	840193.	448.	439.	9.	0.	100.0	98.1
1993.	862039.	862039.	452.	440.	12.	0.	100.0	97.4
1994.	924852.	924852.	461.	448.	13.	0.	100.0	97.1
1995.	650405.	650405.	332.	324.	8.	0.	100.0	97.5

1999.	758808.	758808.	393.	388.	5.	0.	100.0	98.7
2000.	804445.	804445.	429.	424.	5.	0.	100.0	98.8
2001.	601184.	601184.	359.	352.	7.	0.	100.0	98.1

```
**************************************************
*  Summary of Quantity and Quality Results at    *
*  Location        200  INFlow in cfs.           *
*  Values are instantaneous at indicated time step *
**************************************************

  GoVenture Captial,  Franklin Street
  DMH#107

     Date      Time         Flow   Total Su
 Mo/Da/Year  Hr:Min          cfs    mg/l
 ----------  -------     -------  --------
Flow wtd means.....         0.005       88.
Flow wtd std devs..         0.026       68.
Maximum value......         1.700      293.
Minimum value......         0.000        0.
Total loads........      3368263.    18460.
                         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... June        2, 2023           *
*          Time...          13:33:57.155          *
*   Ending Date... June        2, 2023           *
*          Time...          13:34: 2.984          *
*  Elapsed Time...               0.097 minutes.   *
*  Elapsed Time...               5.829 seconds.   *
**************************************************
```

1996.	929759.	929759.	466.	451.	16.	0.	100.0	96.7
1997.	569075.	569075.	361.	355.	6.	0.	100.0	98.3
1998.	757312.	757312.	388.	376.	12.	0.	100.0	96.9
1999.	758808.	758808.	393.	383.	11.	0.	100.0	97.3
2000.	804445.	804445.	429.	418.	11.	0.	100.0	97.4
2001.	601184.	601184.	359.	347.	12.	0.	100.0	96.7

HS 12

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	602818.	602818.	340.	335.	6.	0.	100.0	98.3
1958.	1005594.	1005594.	466.	457.	9.	0.	100.0	98.2
1959.	1048460.	1048460.	464.	455.	8.	0.	100.0	98.2
1960.	958583.	958583.	448.	443.	5.	0.	100.0	99.0
1961.	853084.	853084.	444.	439.	5.	0.	100.0	98.9
1962.	907224.	907224.	417.	412.	5.	0.	100.0	98.9
1963.	730228.	730228.	410.	406.	3.	0.	100.0	99.2
1964.	700829.	700829.	399.	395.	5.	0.	100.0	98.9
1965.	610683.	610683.	388.	385.	4.	0.	100.0	99.1
1966.	760623.	760623.	414.	408.	6.	0.	100.0	98.6
1967.	926544.	926544.	472.	466.	6.	0.	100.0	98.8
1968.	849492.	849492.	403.	398.	5.	0.	100.0	98.8
1969.	851192.	851192.	410.	405.	5.	0.	100.0	98.8
1970.	763629.	763629.	397.	392.	5.	0.	100.0	98.8
1971.	812314.	812314.	438.	431.	7.	0.	100.0	98.3
1972.	1314650.	1314650.	563.	547.	16.	0.	100.0	97.1
1973.	1026530.	1026530.	478.	470.	8.	0.	100.0	98.3
1974.	1029932.	1029932.	453.	442.	11.	0.	100.0	97.6
1975.	962155.	962155.	425.	422.	3.	0.	100.0	99.3
1976.	742112.	742112.	425.	420.	6.	0.	100.0	98.7
1977.	910768.	910768.	468.	462.	6.	0.	100.0	98.8
1978.	767112.	767112.	381.	377.	3.	0.	100.0	99.2
1979.	983619.	983619.	441.	431.	9.	0.	100.0	97.9
1980.	714612.	714612.	401.	394.	7.	0.	100.0	98.2
1981.	912939.	912939.	444.	435.	9.	0.	100.0	98.0
1982.	926113.	926113.	441.	434.	7.	0.	100.0	98.5
1983.	1171873.	1171873.	509.	503.	6.	0.	100.0	98.8
1984.	917877.	917877.	436.	431.	4.	0.	100.0	99.0
1985.	836734.	836734.	433.	427.	6.	0.	100.0	98.7
1986.	873316.	873316.	406.	402.	4.	0.	100.0	99.0
1987.	893028.	893028.	404.	401.	3.	0.	100.0	99.2
1988.	772606.	772606.	406.	400.	6.	0.	100.0	98.5
1989.	691230.	691230.	349.	345.	4.	0.	100.0	98.8
1991.	531464.	531464.	209.	206.	2.	0.	100.0	98.9
1992.	840193.	840193.	448.	444.	4.	0.	100.0	99.2
1993.	862039.	862039.	452.	446.	6.	0.	100.0	98.7
1994.	924852.	924852.	461.	455.	6.	0.	100.0	98.6
1995.	650405.	650405.	332.	328.	4.	0.	100.0	98.7
1996.	929759.	929759.	466.	459.	8.	0.	100.0	98.4
1997.	569075.	569075.	361.	359.	3.	0.	100.0	99.3
1998.	757312.	757312.	388.	382.	6.	0.	100.0	98.5

MASS DEP "Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices"

DMH#110-Water Quality Unit

For First 1.0-Inch Runoff WQV

Step 1: Area of Impervious Surface to Structure

0.647 acres @ 84.14% Impervious = 0.544 Acres Impervious
0.544 Acres x .0015625 sq mi = ***8.5x(10^-4) square miles.***

Step 2: Tc of Train

P116 to DCB#25:	5.0 min
DCB#25 to DMH#109A	0.4 min
DMH#109A to DMH#109	0.5 min
DMH#109 to DMH#110	0.0 min
Total Tc to DMH#109	***5.9 min or 0.098 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(8.3x(10^-4)) x(1.0 in)

Q(1) = 0.66 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 > 0.66 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#110

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 HS4	**0.77**	**0.75**	**0.58**	**0.17**

Total TSS Removal = **83%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Franklin Street, Worcester**

Prepared By: **Hannigan Engineering, Inc.**

Date: **10/15/2024**

*Equals remaining load from previous BMP (E) which enters the BMP

Summary for Reach DMH110: TO UGS#2A

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH109 outlet invert by 0.01' @ 12.10 hrs

Inflow Area = 0.599 ac, 83.64% Impervious, Inflow Depth = 1.54" for 1-Year event
Inflow = 0.98 cfs @ 12.12 hrs, Volume= 0.077 af <=wqv
Outflow = 0.97 cfs @ 12.12 hrs, Volume= 0.077 af, Atten= 1%, Lag= 0.2 min
Routed to Reach UGS2A : TO UGS#2

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.77 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.94 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 0.88'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.30 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 24.0' Slope= 0.0313 '/'
Inlet Invert= 465.75', Outlet Invert= 465.00'

Summary for Subcatchment P116: TO DCB#25

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af, Depth= 1.77"
Routed to Reach DCB25 : TO DMH#109A

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 1-Year Rainfall=2.58"

Area (sf)	CN	Description
297	39	>75% Grass cover, Good, HSG A
2,483	98	Paved parking, HSG A
2,780	92	Weighted Average
297		10.68% Pervious Area
2,483		89.32% 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"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	80	Total, Increased to minimum Tc = 5.0 min <=tc			

Summary for Reach DCB25: TO DMH#109A

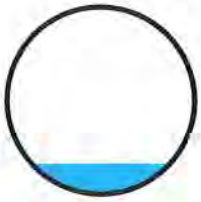
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.064 ac, 89.32% Impervious, Inflow Depth = 1.77" for 1-Year event
Inflow = 0.12 cfs @ 12.11 hrs, Volume= 0.009 af
Outflow = 0.12 cfs @ 12.12 hrs, Volume= 0.009 af, Atten= 2%, Lag= 0.3 min
Routed to Reach DMH109A : TO DMH109

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.21 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 0.4 min<=tc

Peak Storage= 1 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 0.49'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.06 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 29.0' Slope= 0.0172 '/'
Inlet Invert= 467.50', Outlet Invert= 467.00'



Summary for Reach DMH109A: TO DMH109

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB21 outlet invert by 0.08' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB25 outlet invert by 0.08' @ 12.15 hrs

Inflow Area = 0.239 ac, 75.90% Impervious, Inflow Depth = 1.20" for 1-Year event
Inflow = 0.31 cfs @ 12.12 hrs, Volume= 0.024 af
Outflow = 0.31 cfs @ 12.13 hrs, Volume= 0.024 af, Atten= 1%, Lag= 0.5 min
Routed to Reach DMH109 : TO DMH#110

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 0.5 min <=Tc

Peak Storage= 3 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 0.77'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 4.26 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0143 '/'
Inlet Invert= 466.90', Outlet Invert= 466.40'

```
**************************************************
*      Storm Water Management Sizing Model       *
*                Hydroworks, LLC                 *
*                 Version 4.4                    *
*                                                *
*         Continuous Simulation Program          *
*              Based on SWMM 4.4H                *
*              Hydroworks, LLC                   *
*               Graham Bryant                    *
*                2003 - 2021                     *
**************************************************

                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 888-290-7900   *
*     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 Capital Group Franklin Street
DMH#110

HydroStorm Simulation

```
 ########################################
 #  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 Capital Group Franklin Street

                DMH#110



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	INFILTRATION RATE(IN/HR) MINIMUM	DECAY RATE (1/SEC)	GAGE NO.	MAXIMUM VOLUME (INCHES)
1	300	200	167.88	0.65	87.14	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).... 0.65
IMPERVIOUS AREA (ACRES)..... 0.56
PERVIOUS AREA (ACRES)..... 0.08
TOTAL WIDTH (FEET)..... 167.88
PERCENT IMPERVIOUSNESS..... 87.14

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)	ELEVATIONS BOTTOM (FT)	ELEVATIONS STAGE (FT)	ELEVATIONS BC (FT)	ELEVATIONS TW (FT)	FLOW CONSTANTS A1 (IN/HR-FT^B1)	FLOW CONSTANTS B1	FLOW CONSTANTS A2 (IN/HR-FT^B2)	FLOW CONSTANTS B2	FLOW CONSTANTS 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	PERCOLATION PARAMETERS PCO	ET PARAMETERS DEPTH OF ET (ft)	ET PARAMETERS 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/ PIPE	CONSTITUENT 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 Capital Group Franklin Street
DMH#110

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 =                    3055980
Final Julian Date  =                            2001365
Final time of day  =                             86399. 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  13546640   3370448

**************************************************
*     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)                   5224530.      2225.
Total Infiltration                                      662980.       282.
Total Evaporation                                       218638.        93.
Surface Runoff from Watersheds                         4379592.      1865.
Total Water remaining in Surface Storage                    31.         0.
Infiltration over the Pervious Area...                  662980.      2195.
                      --------
Infiltration + Evaporation +
Surface Runoff + Snow removal +
Water remaining in Surface Storage +
```

```
Water remaining in Snow Cover.........                  5261242.      2240.
Total Precipitation + Initial Storage.                  5224530.      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..................................       -0.703 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..............           4379592.      1865.
Baseflow....................................                 0.
Groundwater Subsurface Inflow...............                 0.         0.
Evaporation Loss from Channels..............                 0.         0.
Channel/Pipe/Inlet Outflow..................           4379592.      1865.
Initial Storage + Inflow....................           4379592.      1865.
Final Storage + Outflow.....................           4379592.      1865.
*******************************************
* 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                                 84550.        36.
```

Final Subsurface Storage	84550.	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

SUBCATCHMENT 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	0.65	87.1	2224.52	27.500	2197.935	0.207	2134.396	2.047	1863.449	2.253	3.483

*** 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				2.24				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.....	24398.
3. INITIAL CATCHBASIN LOAD.....	0.
4. TOTAL CATCHBASIN LOAD.....	0.
5. TOTAL CATCHBASIN AND SURFACE BUILDUP (2+4).....	24398.
Remaining Loads	
6. LOAD REMAINING ON SURFACE...	3.
7. REMAINING IN CATCHBASINS....	0.
8. REMAINING IN CHANNEL/PIPES..	0.
Removals	
9. STREET SWEEPING REMOVAL.....	0.
10. NET SURFACE BUILDUP (2-9)...	24398.
11. SURFACE WASHOFF.....	24379.
12. CATCHBASIN WASHOFF.....	0.
13. TOTAL WASHOFF (11+12).....	24379.
14. LOAD FROM OTHER CONSTITUENTS	0.
15. PRECIPITATION LOAD.....	0.
15a.SUM SURFACE LOAD (13+14+15).	24379.
16. TOTAL GROUNDWATER LOAD.....	0.
16a.TOTAL I/I LOAD.....	0.
17. NET SUBCATCHMENT LOAD (15a-15b-15c-15d+16+16a)....	24379.
>>Removal in channel/pipes (17a, 17b):	
17a.REMOVE BY BMP FRACTION.....	0.
17b.REMOVE BY 1st ORDER DECAY...	0.
18. TOTAL LOAD TO INLETS.....	24379.
19. FLOW WT'D AVE.CONCENTRATION (INLET LOAD/TOTAL FLOW).....	mg/l 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     %     Specific    Settling Velocity   Critical Peclet
     (um)             Gravity        (ft/s)               Number


      1.      5.0      2.65         0.000002            0.022000
      4.      5.0      2.65         0.000035            0.049420
      6.      5.0      2.65         0.000079            0.062619
      7.      5.0      2.65         0.000108            0.068516
     18.     15.0      2.65         0.000710            0.118919
     45.     10.0      2.65         0.004352            0.203034
     70.      5.0      2.65         0.010215            0.262779
     90.     10.0      2.65         0.016354            0.304305
    125.     15.0      2.65         0.029465            0.368637
    200.     15.0      2.65         0.063279            0.485025
```

400.	5.0	2.65	0.156843	0.726951
850.	5.0	2.65	0.321303	1.128801

****
*
* 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 3	0.397	6.273	96.0	69.6
HS 4	0.685	6.273	98.6	77.1 <=TSS Removal
HS 5	0.833	6.273	99.1	83.3
HS 6	1.017	6.273	99.5	87.7
HS 7	1.404	6.273	99.9	90.3
HS 8	1.868	6.273	100.0	92.4
HS 10	2.709	6.273	100.0	96.2
HS 12	3.687	6.273	100.0	97.9

****
*
* Summary of Annual Flow Treatmnet & TSS Removal *
*
****

HS 3

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	854358.	829726.	448.	307.	141.	0.	97.1	68.5
1958.	1425351.	1368904.	614.	409.	206.	0.	96.0	66.5
1959.	1487101.	1389133.	611.	419.	192.	0.	93.4	68.6
1960.	1359795.	1280965.	593.	417.	177.	0.	94.2	70.2
1961.	1209362.	1152220.	587.	414.	173.	0.	95.3	70.5
1962.	1286845.	1252434.	558.	390.	168.	0.	97.3	70.0
1963.	1035039.	1030520.	549.	391.	158.	0.	99.6	71.2
1964.	993412.	966041.	524.	373.	151.	0.	97.2	71.2
1965.	865471.	856440.	509.	363.	146.	0.	99.0	71.3
1966.	1078169.	1053926.	553.	386.	167.	0.	97.8	69.8
1967.	1313553.	1274265.	624.	430.	195.	0.	97.0	68.8
1968.	1205347.	1166930.	529.	372.	157.	0.	96.8	70.3
1969.	1206572.	1178777.	538.	377.	162.	0.	97.7	70.0
1970.	1082775.	1024057.	523.	368.	155.	0.	94.6	70.4
1971.	1151774.	1096251.	578.	386.	192.	0.	95.2	66.8
1972.	1864922.	1701145.	746.	471.	275.	0.	91.2	63.1
1973.	1455440.	1383211.	630.	409.	221.	0.	95.0	64.9
1974.	1460820.	1315868.	610.	397.	212.	0.	90.1	65.2
1975.	1364043.	1361371.	562.	403.	159.	0.	99.8	71.7

1976.	1051996.	997895.	563.	395.	169.	0.	94.9	70.1
1977.	1291208.	1251983.	615.	435.	180.	0.	97.0	70.7
1978.	1087380.	1068061.	500.	364.	136.	0.	98.2	72.8
1979.	1395054.	1290576.	580.	390.	190.	0.	92.5	67.2
1980.	1012756.	972694.	526.	355.	172.	0.	96.0	67.4
1981.	1294230.	1226695.	589.	393.	196.	0.	94.8	66.7
1982.	1313310.	1245613.	581.	394.	187.	0.	94.8	67.8
1983.	1661720.	1611249.	672.	464.	209.	0.	97.0	69.0
1984.	1302171.	1282184.	574.	404.	170.	0.	98.5	70.4
1985.	1186828.	1097360.	573.	408.	164.	0.	92.5	71.3
1986.	1238252.	1220632.	533.	378.	155.	0.	98.6	70.9
1987.	1267900.	1255944.	533.	386.	147.	0.	99.1	72.4
1988.	1095006.	1057875.	533.	374.	159.	0.	96.6	70.2
1989.	979618.	950603.	464.	326.	138.	0.	97.0	70.2
1991.	754243.	677601.	274.	195.	79.	0.	89.8	71.2
1992.	1191006.	1174094.	592.	429.	163.	0.	98.6	72.4
1993.	1222501.	1140779.	593.	417.	176.	0.	93.3	70.3
1994.	1311092.	1265511.	615.	425.	190.	0.	96.5	69.1
1995.	922087.	889782.	438.	306.	131.	0.	96.5	70.0
1996.	1317928.	1273174.	627.	431.	196.	0.	96.6	68.7
1997.	806527.	798213.	477.	342.	136.	0.	99.0	71.6
1998.	1073450.	1038017.	516.	350.	166.	0.	96.7	67.8
1999.	1075949.	1038734.	518.	364.	154.	0.	96.5	70.3
2000.	1140116.	1115492.	564.	397.	167.	0.	97.8	70.4
2001.	852077.	807214.	470.	332.	138.	0.	94.7	70.7

HS 4

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	854358.	848604.	448.	338.	109.	0.	99.3	75.6
1958.	1425351.	1417195.	614.	459.	155.	0.	99.4	74.7
1959.	1487101.	1429090.	611.	466.	145.	0.	96.1	76.3
1960.	1359795.	1333453.	593.	461.	132.	0.	98.1	77.7
1961.	1209362.	1185037.	587.	461.	126.	0.	98.0	78.5
1962.	1286845.	1279658.	558.	434.	124.	0.	99.4	77.7
1963.	1035039.	1035039.	549.	430.	119.	0.	100.0	78.4
1964.	993412.	988241.	524.	412.	112.	0.	99.5	78.7
1965.	865471.	865471.	509.	399.	110.	0.	100.0	78.4
1966.	1078169.	1070471.	553.	429.	124.	0.	99.3	77.6
1967.	1313553.	1303230.	624.	479.	146.	0.	99.2	76.6
1968.	1205347.	1187789.	529.	414.	115.	0.	98.5	78.2
1969.	1206572.	1195814.	538.	417.	121.	0.	99.1	77.5
1970.	1082775.	1065726.	523.	409.	114.	0.	98.4	78.2
1971.	1151774.	1140280.	578.	433.	145.	0.	99.0	75.0
1972.	1864922.	1775540.	746.	532.	214.	0.	95.2	71.3
1973.	1455440.	1438838.	630.	463.	167.	0.	98.9	73.5
1974.	1460820.	1388613.	610.	446.	164.	0.	95.1	73.1
1975.	1364043.	1364043.	562.	441.	121.	0.	100.0	78.5
1976.	1051996.	1031845.	563.	439.	124.	0.	98.1	77.9
1977.	1291208.	1272396.	615.	480.	135.	0.	98.5	78.1
1978.	1087380.	1086351.	500.	400.	99.	0.	99.9	80.1

1979.	1395054.	1337799.	580.	436.	143.	0.	95.9	75.3
1980.	1012756.	1000488.	526.	397.	130.	0.	98.8	75.4
1981.	1294230.	1270974.	589.	441.	148.	0.	98.2	74.8
1982.	1313310.	1304874.	581.	442.	138.	0.	99.4	76.2
1983.	1661720.	1649847.	672.	510.	162.	0.	99.3	75.9
1984.	1302171.	1296934.	574.	447.	127.	0.	99.6	77.9
1985.	1186828.	1144530.	573.	451.	122.	0.	96.4	78.7
1986.	1238252.	1236494.	533.	416.	117.	0.	99.9	78.0
1987.	1267900.	1267900.	533.	424.	109.	0.	100.0	79.5
1988.	1095006.	1081856.	533.	411.	121.	0.	98.8	77.3
1989.	979618.	971130.	464.	360.	104.	0.	99.1	77.6
1991.	754243.	726390.	274.	214.	61.	0.	96.3	77.8
1992.	1191006.	1187239.	592.	469.	123.	0.	99.7	79.2
1993.	1222501.	1195049.	593.	460.	134.	0.	97.8	77.5
1994.	1311092.	1304711.	615.	471.	144.	0.	99.5	76.6
1995.	922087.	911362.	438.	336.	102.	0.	98.8	76.8
1996.	1317928.	1301062.	627.	475.	152.	0.	98.7	75.7
1997.	806527.	805600.	477.	376.	101.	0.	99.9	78.8
1998.	1073450.	1066628.	516.	383.	134.	0.	99.4	74.1
1999.	1075949.	1065688.	518.	400.	119.	0.	99.0	77.1
2000.	1140116.	1137039.	564.	436.	128.	0.	99.7	77.3
2001.	852077.	825679.	470.	368.	102.	0.	96.9	78.3

HS 5

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	854358.	851473.	448.	364.	84.	0.	99.7	81.2
1958.	1425351.	1422112.	614.	497.	117.	0.	99.8	80.9
1959.	1487101.	1443066.	611.	505.	106.	0.	97.0	82.7
1960.	1359795.	1341188.	593.	498.	95.	0.	98.6	84.0
1961.	1209362.	1194022.	587.	498.	89.	0.	98.7	84.8
1962.	1286845.	1283513.	558.	469.	89.	0.	99.7	84.0
1963.	1035039.	1035039.	549.	461.	88.	0.	100.0	83.9
1964.	993412.	992988.	524.	445.	78.	0.	100.0	85.1
1965.	865471.	865471.	509.	430.	80.	0.	100.0	84.4
1966.	1078169.	1074108.	553.	465.	88.	0.	99.6	84.1
1967.	1313553.	1309572.	624.	518.	107.	0.	99.7	82.9
1968.	1205347.	1190989.	529.	446.	84.	0.	98.8	84.2
1969.	1206572.	1199587.	538.	453.	86.	0.	99.4	84.1
1970.	1082775.	1074415.	523.	441.	82.	0.	99.2	84.3
1971.	1151774.	1144494.	578.	466.	112.	0.	99.4	80.7
1972.	1864922.	1793121.	746.	585.	161.	0.	96.1	78.5
1973.	1455440.	1447994.	630.	506.	124.	0.	99.5	80.3
1974.	1460820.	1415009.	610.	488.	121.	0.	96.9	80.1
1975.	1364043.	1364043.	562.	478.	84.	0.	100.0	85.1
1976.	1051996.	1040868.	563.	475.	89.	0.	98.9	84.3
1977.	1291208.	1278606.	615.	519.	95.	0.	99.0	84.5
1978.	1087380.	1087380.	500.	429.	70.	0.	100.0	85.9
1979.	1395054.	1355295.	580.	474.	105.	0.	97.2	81.8
1980.	1012756.	1008256.	526.	429.	97.	0.	99.6	81.5
1981.	1294230.	1281884.	589.	480.	109.	0.	99.0	81.4

1982.	1313310.	1312981.	581.	479.	102.	0.	100.0	82.4
1983.	1661720.	1654665.	672.	555.	117.	0.	99.6	82.6
1984.	1302171.	1301008.	574.	484.	90.	0.	99.9	84.3
1985.	1186828.	1158686.	573.	484.	88.	0.	97.6	84.6
1986.	1238252.	1238252.	533.	448.	85.	0.	100.0	84.1
1987.	1267900.	1267900.	533.	456.	77.	0.	100.0	85.5
1988.	1095006.	1085128.	533.	443.	90.	0.	99.1	83.2
1989.	979618.	976320.	464.	390.	74.	0.	99.7	84.0
1991.	754243.	738941.	274.	229.	45.	0.	98.0	83.5
1992.	1191006.	1189901.	592.	504.	89.	0.	99.9	85.0
1993.	1222501.	1206234.	593.	496.	97.	0.	98.7	83.6
1994.	1311092.	1310454.	615.	510.	105.	0.	100.0	82.9
1995.	922087.	914560.	438.	362.	75.	0.	99.2	82.8
1996.	1317928.	1308675.	627.	513.	114.	0.	99.3	81.9
1997.	806527.	806527.	477.	408.	69.	0.	100.0	85.6
1998.	1073450.	1070216.	516.	420.	97.	0.	99.7	81.3
1999.	1075949.	1071070.	518.	431.	88.	0.	99.5	83.1
2000.	1140116.	1139682.	564.	470.	94.	0.	100.0	83.4
2001.	852077.	834244.	470.	394.	76.	0.	97.9	83.8

HS 6

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	854358.	854358.	448.	384.	64.	0.	100.0	85.7
1958.	1425351.	1425286.	614.	526.	88.	0.	100.0	85.6
1959.	1487101.	1455262.	611.	531.	80.	0.	97.9	86.9
1960.	1359795.	1348648.	593.	527.	66.	0.	99.2	88.8
1961.	1209362.	1203828.	587.	524.	63.	0.	99.5	89.2
1962.	1286845.	1286734.	558.	494.	64.	0.	100.0	88.5
1963.	1035039.	1035039.	549.	487.	62.	0.	100.0	88.7
1964.	993412.	993412.	524.	468.	56.	0.	100.0	89.3
1965.	865471.	865471.	509.	452.	57.	0.	100.0	88.8
1966.	1078169.	1077430.	553.	488.	65.	0.	99.9	88.3
1967.	1313553.	1313465.	624.	545.	79.	0.	100.0	87.3
1968.	1205347.	1194970.	529.	469.	60.	0.	99.1	88.6
1969.	1206572.	1203282.	538.	478.	61.	0.	99.7	88.7
1970.	1082775.	1082369.	523.	462.	60.	0.	100.0	88.5
1971.	1151774.	1148035.	578.	493.	85.	0.	99.7	85.3
1972.	1864922.	1808606.	746.	624.	122.	0.	97.0	83.6
1973.	1455440.	1453860.	630.	537.	93.	0.	99.9	85.2
1974.	1460820.	1439245.	610.	518.	91.	0.	98.5	85.1
1975.	1364043.	1364043.	562.	503.	59.	0.	100.0	89.5
1976.	1051996.	1048822.	563.	499.	65.	0.	99.7	88.5
1977.	1291208.	1285400.	615.	546.	68.	0.	99.6	88.9
1978.	1087380.	1087380.	500.	450.	49.	0.	100.0	90.1
1979.	1395054.	1369226.	580.	500.	80.	0.	98.1	86.2
1980.	1012756.	1012682.	526.	451.	75.	0.	100.0	85.7
1981.	1294230.	1291071.	589.	504.	84.	0.	99.8	85.7
1982.	1313310.	1313310.	581.	503.	78.	0.	100.0	86.6
1983.	1661720.	1658153.	672.	585.	87.	0.	99.8	87.0
1984.	1302171.	1302171.	574.	508.	65.	0.	100.0	88.6

1985.	1186828.	1170251.	573.	508.	64.	0.	98.6	88.8
1986.	1238252.	1238252.	533.	471.	62.	0.	100.0	88.3
1987.	1267900.	1267900.	533.	476.	57.	0.	100.0	89.3
1988.	1095006.	1088892.	533.	466.	67.	0.	99.4	87.5
1989.	979618.	979545.	464.	410.	54.	0.	100.0	88.3
1991.	754243.	750666.	274.	241.	33.	0.	99.5	87.9
1992.	1191006.	1191006.	592.	527.	65.	0.	100.0	89.0
1993.	1222501.	1214310.	593.	521.	72.	0.	99.3	87.9
1994.	1311092.	1311092.	615.	534.	81.	0.	100.0	86.9
1995.	922087.	918192.	438.	382.	56.	0.	99.6	87.2
1996.	1317928.	1313643.	627.	541.	86.	0.	99.7	86.3
1997.	806527.	806527.	477.	429.	48.	0.	100.0	89.8
1998.	1073450.	1073384.	516.	445.	72.	0.	100.0	86.1
1999.	1075949.	1075855.	518.	452.	66.	0.	100.0	87.3
2000.	1140116.	1140116.	564.	496.	68.	0.	100.0	87.9
2001.	852077.	842435.	470.	416.	54.	0.	98.9	88.5

HS 7

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	854358.	854358.	448.	398.	50.	0.	100.0	88.8
1958.	1425351.	1425351.	614.	541.	73.	0.	100.0	88.1
1959.	1487101.	1471547.	611.	549.	62.	0.	99.0	89.8
1960.	1359795.	1359200.	593.	541.	52.	0.	100.0	91.3
1961.	1209362.	1209362.	587.	538.	49.	0.	100.0	91.7
1962.	1286845.	1286845.	558.	508.	50.	0.	100.0	91.0
1963.	1035039.	1035039.	549.	503.	46.	0.	100.0	91.6
1964.	993412.	993412.	524.	480.	44.	0.	100.0	91.7
1965.	865471.	865471.	509.	465.	44.	0.	100.0	91.3
1966.	1078169.	1078169.	553.	501.	51.	0.	100.0	90.7
1967.	1313553.	1313553.	624.	563.	61.	0.	100.0	90.2
1968.	1205347.	1202587.	529.	483.	46.	0.	99.8	91.3
1969.	1206572.	1206572.	538.	490.	48.	0.	100.0	91.1
1970.	1082775.	1082775.	523.	474.	48.	0.	100.0	90.7
1971.	1151774.	1151774.	578.	510.	68.	0.	100.0	88.2
1972.	1864922.	1836721.	746.	647.	99.	0.	98.5	86.7
1973.	1455440.	1455440.	630.	555.	75.	0.	100.0	88.2
1974.	1460820.	1459609.	610.	535.	74.	0.	99.9	87.8
1975.	1364043.	1364043.	562.	517.	45.	0.	100.0	92.0
1976.	1051996.	1051996.	563.	513.	51.	0.	100.0	91.0
1977.	1291208.	1291208.	615.	561.	53.	0.	100.0	91.3
1978.	1087380.	1087380.	500.	462.	38.	0.	100.0	92.4
1979.	1395054.	1386849.	580.	516.	64.	0.	99.4	89.0
1980.	1012756.	1012756.	526.	466.	60.	0.	100.0	88.5
1981.	1294230.	1294230.	589.	521.	68.	0.	100.0	88.4
1982.	1313310.	1313310.	581.	518.	62.	0.	100.0	89.2
1983.	1661720.	1661720.	672.	603.	69.	0.	100.0	89.7
1984.	1302171.	1302171.	574.	525.	49.	0.	100.0	91.4
1985.	1186828.	1182106.	573.	522.	50.	0.	99.6	91.2
1986.	1238252.	1238252.	533.	485.	48.	0.	100.0	91.0
1987.	1267900.	1267900.	533.	489.	44.	0.	100.0	91.8

1988.	1095006.	1094953.	533.	479.	54.	0.	100.0	89.9
1989.	979618.	979618.	464.	422.	42.	0.	100.0	91.0
1991.	754243.	754243.	274.	249.	25.	0.	100.0	90.8
1992.	1191006.	1191006.	592.	543.	49.	0.	100.0	91.7
1993.	1222501.	1222391.	593.	535.	58.	0.	100.0	90.2
1994.	1311092.	1311092.	615.	551.	64.	0.	100.0	89.5
1995.	922087.	922087.	438.	393.	44.	0.	100.0	89.9
1996.	1317928.	1317928.	627.	560.	66.	0.	100.0	89.4
1997.	806527.	806527.	477.	442.	35.	0.	100.0	92.7
1998.	1073450.	1073450.	516.	459.	58.	0.	100.0	88.8
1999.	1075949.	1075949.	518.	466.	52.	0.	100.0	89.9
2000.	1140116.	1140116.	564.	511.	53.	0.	100.0	90.6
2001.	852077.	850389.	470.	427.	42.	0.	99.8	91.0

HS 8

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	854358.	854358.	448.	409.	39.	0.	100.0	91.3
1958.	1425351.	1425351.	614.	555.	59.	0.	100.0	90.4
1959.	1487101.	1485945.	611.	562.	49.	0.	99.9	92.0
1960.	1359795.	1359795.	593.	553.	41.	0.	100.0	93.1
1961.	1209362.	1209362.	587.	549.	37.	0.	100.0	93.6
1962.	1286845.	1286845.	558.	520.	38.	0.	100.0	93.1
1963.	1035039.	1035039.	549.	514.	35.	0.	100.0	93.7
1964.	993412.	993412.	524.	488.	35.	0.	100.0	93.3
1965.	865471.	865471.	509.	476.	33.	0.	100.0	93.6
1966.	1078169.	1078169.	553.	514.	39.	0.	100.0	93.0
1967.	1313553.	1313553.	624.	576.	48.	0.	100.0	92.3
1968.	1205347.	1205347.	529.	494.	36.	0.	100.0	93.3
1969.	1206572.	1206572.	538.	502.	36.	0.	100.0	93.2
1970.	1082775.	1082775.	523.	485.	37.	0.	100.0	92.8
1971.	1151774.	1151774.	578.	526.	52.	0.	100.0	90.9
1972.	1864922.	1859506.	746.	664.	82.	0.	99.7	89.1
1973.	1455440.	1455440.	630.	572.	58.	0.	100.0	90.8
1974.	1460820.	1460820.	610.	549.	60.	0.	100.0	90.1
1975.	1364043.	1364043.	562.	528.	34.	0.	100.0	94.0
1976.	1051996.	1051996.	563.	524.	39.	0.	100.0	93.1
1977.	1291208.	1291208.	615.	573.	41.	0.	100.0	93.3
1978.	1087380.	1087380.	500.	471.	29.	0.	100.0	94.3
1979.	1395054.	1394862.	580.	528.	52.	0.	100.0	91.1
1980.	1012756.	1012756.	526.	478.	48.	0.	100.0	90.9
1981.	1294230.	1294230.	589.	534.	54.	0.	100.0	90.8
1982.	1313310.	1313310.	581.	531.	49.	0.	100.0	91.5
1983.	1661720.	1661720.	672.	619.	53.	0.	100.0	92.1
1984.	1302171.	1302171.	574.	536.	38.	0.	100.0	93.4
1985.	1186828.	1186828.	573.	535.	38.	0.	100.0	93.4
1986.	1238252.	1238252.	533.	496.	37.	0.	100.0	93.1
1987.	1267900.	1267900.	533.	500.	33.	0.	100.0	93.9
1988.	1095006.	1095006.	533.	491.	41.	0.	100.0	92.3
1989.	979618.	979618.	464.	432.	32.	0.	100.0	93.2
1991.	754243.	754243.	274.	255.	20.	0.	100.0	92.9

1992.	1191006.	1191006.	592.	557.	35.	0.	100.0	94.0
1993.	1222501.	1222501.	593.	546.	47.	0.	100.0	92.1
1994.	1311092.	1311092.	615.	564.	51.	0.	100.0	91.7
1995.	922087.	922087.	438.	403.	35.	0.	100.0	92.1
1996.	1317928.	1317928.	627.	574.	53.	0.	100.0	91.6
1997.	806527.	806527.	477.	452.	25.	0.	100.0	94.7
1998.	1073450.	1073450.	516.	472.	44.	0.	100.0	91.4
1999.	1075949.	1075949.	518.	478.	41.	0.	100.0	92.1
2000.	1140116.	1140116.	564.	523.	41.	0.	100.0	92.7
2001.	852077.	852077.	470.	436.	33.	0.	100.0	92.9

HS 10

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	854358.	854358.	448.	427.	20.	0.	100.0	95.4
1958.	1425351.	1425351.	614.	582.	32.	0.	100.0	94.8
1959.	1487101.	1487101.	611.	585.	27.	0.	100.0	95.7
1960.	1359795.	1359795.	593.	573.	20.	0.	100.0	96.6
1961.	1209362.	1209362.	587.	567.	20.	0.	100.0	96.7
1962.	1286845.	1286845.	558.	537.	21.	0.	100.0	96.3
1963.	1035039.	1035039.	549.	533.	16.	0.	100.0	97.1
1964.	993412.	993412.	524.	505.	18.	0.	100.0	96.5
1965.	865471.	865471.	509.	495.	14.	0.	100.0	97.2
1966.	1078169.	1078169.	553.	533.	20.	0.	100.0	96.3
1967.	1313553.	1313553.	624.	601.	24.	0.	100.0	96.2
1968.	1205347.	1205347.	529.	512.	17.	0.	100.0	96.7
1969.	1206572.	1206572.	538.	520.	18.	0.	100.0	96.6
1970.	1082775.	1082775.	523.	504.	19.	0.	100.0	96.4
1971.	1151774.	1151774.	578.	551.	27.	0.	100.0	95.4
1972.	1864922.	1864922.	746.	699.	47.	0.	100.0	93.7
1973.	1455440.	1455440.	630.	600.	30.	0.	100.0	95.2
1974.	1460820.	1460820.	610.	575.	35.	0.	100.0	94.3
1975.	1364043.	1364043.	562.	547.	14.	0.	100.0	97.4
1976.	1051996.	1051996.	563.	543.	21.	0.	100.0	96.3
1977.	1291208.	1291208.	615.	594.	21.	0.	100.0	96.6
1978.	1087380.	1087380.	500.	486.	13.	0.	100.0	97.4
1979.	1395054.	1395054.	580.	550.	30.	0.	100.0	94.8
1980.	1012756.	1012756.	526.	502.	25.	0.	100.0	95.3
1981.	1294230.	1294230.	589.	559.	30.	0.	100.0	94.9
1982.	1313310.	1313310.	581.	555.	25.	0.	100.0	95.7
1983.	1661720.	1661720.	672.	647.	25.	0.	100.0	96.3
1984.	1302171.	1302171.	574.	555.	19.	0.	100.0	96.7
1985.	1186828.	1186828.	573.	554.	18.	0.	100.0	96.8
1986.	1238252.	1238252.	533.	515.	18.	0.	100.0	96.7
1987.	1267900.	1267900.	533.	519.	14.	0.	100.0	97.4
1988.	1095006.	1095006.	533.	512.	20.	0.	100.0	96.2
1989.	979618.	979618.	464.	449.	16.	0.	100.0	96.6
1991.	754243.	754243.	274.	265.	9.	0.	100.0	96.6
1992.	1191006.	1191006.	592.	576.	16.	0.	100.0	97.3
1993.	1222501.	1222501.	593.	570.	23.	0.	100.0	96.1
1994.	1311092.	1311092.	615.	590.	25.	0.	100.0	95.9

1995.	922087.	922087.	438.	421.	17.	0.	100.0	96.2
1996.	1317928.	1317928.	627.	599.	28.	0.	100.0	95.5
1997.	806527.	806527.	477.	465.	12.	0.	100.0	97.5
1998.	1073450.	1073450.	516.	494.	23.	0.	100.0	95.6
1999.	1075949.	1075949.	518.	498.	20.	0.	100.0	96.1
2000.	1140116.	1140116.	564.	543.	21.	0.	100.0	96.3
2001.	852077.	852077.	470.	450.	20.	0.	100.0	95.8

HS 12

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	854358.	854358.	448.	436.	11.	0.	100.0	97.4
1958.	1425351.	1425351.	614.	598.	17.	0.	100.0	97.3
1959.	1487101.	1487101.	611.	595.	16.	0.	100.0	97.3
1960.	1359795.	1359795.	593.	583.	10.	0.	100.0	98.3
1961.	1209362.	1209362.	587.	576.	10.	0.	100.0	98.2
1962.	1286845.	1286845.	558.	548.	10.	0.	100.0	98.2
1963.	1035039.	1035039.	549.	541.	8.	0.	100.0	98.6
1964.	993412.	993412.	524.	514.	10.	0.	100.0	98.1
1965.	865471.	865471.	509.	502.	7.	0.	100.0	98.5
1966.	1078169.	1078169.	553.	542.	11.	0.	100.0	98.0
1967.	1313553.	1313553.	624.	612.	12.	0.	100.0	98.0
1968.	1205347.	1205347.	529.	519.	10.	0.	100.0	98.2
1969.	1206572.	1206572.	538.	529.	10.	0.	100.0	98.2
1970.	1082775.	1082775.	523.	512.	10.	0.	100.0	98.0
1971.	1151774.	1151774.	578.	564.	14.	0.	100.0	97.6
1972.	1864922.	1864922.	746.	717.	29.	0.	100.0	96.1
1973.	1455440.	1455440.	630.	614.	16.	0.	100.0	97.5
1974.	1460820.	1460820.	610.	587.	22.	0.	100.0	96.4
1975.	1364043.	1364043.	562.	555.	7.	0.	100.0	98.7
1976.	1051996.	1051996.	563.	552.	12.	0.	100.0	97.9
1977.	1291208.	1291208.	615.	603.	12.	0.	100.0	98.1
1978.	1087380.	1087380.	500.	493.	7.	0.	100.0	98.7
1979.	1395054.	1395054.	580.	561.	19.	0.	100.0	96.7
1980.	1012756.	1012756.	526.	512.	14.	0.	100.0	97.3
1981.	1294230.	1294230.	589.	572.	17.	0.	100.0	97.1
1982.	1313310.	1313310.	581.	568.	13.	0.	100.0	97.8
1983.	1661720.	1661720.	672.	659.	13.	0.	100.0	98.1
1984.	1302171.	1302171.	574.	564.	10.	0.	100.0	98.3
1985.	1186828.	1186828.	573.	562.	10.	0.	100.0	98.2
1986.	1238252.	1238252.	533.	524.	9.	0.	100.0	98.3
1987.	1267900.	1267900.	533.	525.	7.	0.	100.0	98.6
1988.	1095006.	1095006.	533.	521.	12.	0.	100.0	97.8
1989.	979618.	979618.	464.	455.	9.	0.	100.0	98.1
1991.	754243.	754243.	274.	270.	5.	0.	100.0	98.3
1992.	1191006.	1191006.	592.	584.	9.	0.	100.0	98.5
1993.	1222501.	1222501.	593.	581.	12.	0.	100.0	98.0
1994.	1311092.	1311092.	615.	602.	13.	0.	100.0	97.9
1995.	922087.	922087.	438.	429.	9.	0.	100.0	98.0
1996.	1317928.	1317928.	627.	611.	16.	0.	100.0	97.4
1997.	806527.	806527.	477.	471.	6.	0.	100.0	98.8

1998.	1073450.	1073450.	516.	505.	12.	0.	100.0	97.7
1999.	1075949.	1075949.	518.	508.	11.	0.	100.0	97.9
2000.	1140116.	1140116.	564.	552.	11.	0.	100.0	98.0
2001.	852077.	852077.	470.	457.	13.	0.	100.0	97.3

****
* *
* Summary of Toronto Rainfall Intensities *
* *
****

Rainfall Intensity (mm/h)	Flow (L/s)	Percentage %
1.50	0.9	NaN
2.25	1.4	NaN
3.00	1.8	NaN
3.75	2.3	NaN
4.75	2.9	NaN
5.75	3.5	NaN
8.00	4.9	NaN
10.00	6.2	NaN
15.50	9.5	NaN
23.25	14.3	NaN

****
* Summary of Quantity and Quality Results at *
* Location 200 INFlow in cfs. *
* Values are instantaneous at indicated time step *
****

GoVenture Capital Group Franklin Street
DMH#110

Date Mo/Da/Year	Time Hr:Min	Flow cfs	Total Su mg/l
Flow wtd means.....		0.007	89.
Flow wtd std devs..		0.034	68.
Maximum value.....		2.240	294.
Minimum value.....		0.000	0.
Total loads.....		4375864. Cub-Ft	24393. 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... October    15, 2024               *
*          Time...          17:56:14.599              *
*   Ending Date... October    15, 2024               *
*          Time...          17:56:20.542              *
*  Elapsed Time...               0.099 minutes.      *
*  Elapsed Time...               5.943 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#114-Water Quality Unit

For First 1.0-Inch Runoff WQV

Step 1: Area of Impervious Surface to Structure

2.567 acres 55.34% Impervious = 1.42 Acres Impervious
1.42 Acres x .0015625 sq mi = ***2.2x(10^-3) square miles.***

Step 2: Tc of Train

P123 to DCB#123:	5.0 min
DCB#23 to DMH#111	3.5 min
DMH#111 to DMH#112	0.6 min
DMH#112 to DMH#113	0.4 min
DMH#113 to DMH#114	0.3 min
Total Tc to DMH#109	***9.8 min or 0.163 hours***

Step 3: Determine qu

From Figure 4:

Tc @ 0.167, qu=700csm/in

Step 4: Determine Q(1)

Q(1) = (qu)x(A)x(WQV)

Q(1) = (700csm/in)x(2.2x(10^-3)) x(1.0 in)

Q(1) = 1.54 CFS

Determination
Determination of Water Quality Flow rates for units by Connecticut DOT (CONNDOT)

From Technology Verification
HS 6 Treatment Flow rate
2.6 cf.s > 1.54 c.f.s. "Pass"

HydroGuard HS6 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#114

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 HS6	**0.76**	**0.75**	**0.57**	**0.18**

Total TSS Removal = **82%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Franklin Street, Worcester**

Prepared By: **Hannigan Engineering, Inc.**

Date: **10/15/2024**

*Equals remaining load from previous BMP (E) which enters the BMP

Summary for Reach DMH114: TO DMH-K1

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 2.314 ac, 61.30% Impervious, Inflow Depth > 0.81" for 1-Year event
Inflow = 0.94 cfs @ 12.14 hrs, Volume= 0.157 af <=wqv
Outflow = 0.94 cfs @ 12.14 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.0 min
Routed to Reach DP4 : DMH-K1

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= 0.0 min
Avg. Velocity = 2.15 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 1.08'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.57 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 8.0' Slope= 0.0313 '/'
Inlet Invert= 459.00', Outlet Invert= 458.75'

Summary for Subcatchment P123: TO DCB#23

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.12 cfs @ 12.15 hrs, Volume= 0.017 af, Depth= 0.27"
Routed to Reach DCB23 : TO DMH#111

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 1-Year Rainfall=2.58"

Area (sf)	CN	Description
20,008	39	>75% Grass cover, Good, HSG A
13,338	98	Paved parking, HSG A
33,346	63	Weighted Average
20,008		60.00% Pervious Area
13,338		40.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	40	0.1000	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.13"
0.2	10	0.0200	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.13"
0.7	121	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.4	171	Total, Increased to minimum Tc = 5.0 min <=tc			

Summary for Reach DCB23: TO DMH#111

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.766 ac, 40.00% Impervious, Inflow Depth = 0.27" for 1-Year event
Inflow = 0.12 cfs @ 12.15 hrs, Volume= 0.017 af
Outflow = 0.10 cfs @ 12.22 hrs, Volume= 0.017 af, Atten= 12%, Lag= 3.9 min
Routed to Reach DMH111 : TO DMH#112

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.17 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 3.5 min<=tc

Peak Storage= 12 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 0.63'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.97 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 250.0' Slope= 0.0124 '/'
Inlet Invert= 466.70', Outlet Invert= 463.60'

Summary for Reach DMH111: TO DMH#112

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DCB19 outlet invert by 0.05' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB22 outlet invert by 0.05' @ 12.15 hrs
[61] Hint: Exceeded Reach DCB23 outlet invert by 0.05' @ 12.15 hrs

Inflow Area = 1.139 ac, 44.50% Impervious, Inflow Depth = 0.40" for 1-Year event
Inflow = 0.29 cfs @ 12.14 hrs, Volume= 0.038 af
Outflow = 0.28 cfs @ 12.15 hrs, Volume= 0.038 af, Atten= 1%, Lag= 0.4 min
Routed to Reach DMH112 : TO DMH#113

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 = 1.61 fps, Avg. Travel Time= 0.6 min <=Tc

Peak Storage= 5 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 0.72'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.63 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 60.0' Slope= 0.0250 '/'
Inlet Invert= 463.50', Outlet Invert= 462.00'

Summary for Reach DMH112: TO DMH#113

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach UGS2B outlet invert by 0.12' @ 12.15 hrs

Inflow Area = 1.770 ac, 59.09% Impervious, Inflow Depth > 0.78" for 1-Year event
Inflow = 0.50 cfs @ 12.16 hrs, Volume= 0.116 af
Outflow = 0.50 cfs @ 12.16 hrs, Volume= 0.116 af, Atten= 1%, Lag= 0.3 min
Routed to Reach DMH113 : TO DMH#114

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.20 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.4 min<=tc

Peak Storage= 5 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 1.05'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.23 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 35.0' Slope= 0.0114 '/'
Inlet Invert= 460.20', Outlet Invert= 459.80'

Summary for Reach DMH113: TO DMH#114

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach DMH112 outlet invert by 0.16' @ 12.15 hrs

Inflow Area = 2.314 ac, 59.12% Impervious, Inflow Depth > 0.76" for 1-Year event
Inflow = 0.85 cfs @ 12.14 hrs, Volume= 0.147 af
Outflow = 0.84 cfs @ 12.14 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.2 min
Routed to Reach DMH114 : TO DMH-K1

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 0.3 min <=TC

Peak Storage= 6 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.26' , Surface Width= 1.13'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 13.32 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 28.0' Slope= 0.0161 '/'
Inlet Invert= 459.70', Outlet Invert= 459.25'

```
*************************************************
*      Storm Water Management Sizing Model      *
*                Hydroworks, LLC                *
*                 Version 4.4                   *
*                                               *
*        Continuous Simulation Program          *
*              Based on SWMM 4.4H               *
*              Hydroworks, LLC                  *
*               Graham Bryant                   *
*                2003 - 2021                    *
*************************************************

                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 888-290-7900  *
*     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 Capital Group Franklin Street
DMH#114

HydroStorm Simulation

```
 ########################################
 #  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 Capital Group Franklin Street

                DMH#114



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	INFILTRATION RATE(IN/HR) MINIMUM	DECAY RATE (1/SEC)	GAGE NO.	MAXIMUM VOLUME (INCHES)
1	300	200	334.39	2.57	55.34	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).... 2.57
IMPERVIOUS AREA (ACRES)..... 1.42
PERVIOUS AREA (ACRES)..... 1.15
TOTAL WIDTH (FEET)..... 334.39
PERCENT IMPERVIOUSNESS..... 55.34

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          6.70     4.00  0.0E+00
   Totals (Loads in lb or other)    6.70     4.00  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 Capital Group Franklin Street
DMH#114

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 =                     3056067
Final Julian Date  =                             2002001
Final time of day  =                                  2. 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  13588193   3387191

*************************************************
*     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)                  20728543.      2225.
Total Infiltration                                     9154488.       982.
Total Evaporation                                       574319.        62.
Surface Runoff from Watersheds                        11079930.      1189.
Total Water remaining in Surface Storage                   77.         0.
Infiltration over the Pervious Area...                 9154488.      2200.
                      --------
Infiltration + Evaporation +
Surface Runoff + Snow removal +
Water remaining in Surface Storage +
```

Water remaining in Snow Cover.....	20808814.	2233.
Total Precipitation + Initial Storage.	20728544.	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..... -0.387 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.....	11079930.	1189.
Baseflow.....	0.	
Groundwater Subsurface Inflow.....	0.	0.
Evaporation Loss from Channels.....	0.	0.
Channel/Pipe/Inlet Outflow.....	11079930.	1189.
Initial Storage + Inflow.....	11079930.	1189.
Final Storage + Outflow.....	11079930.	1189.

```
*****************************************
* 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	335456.	36.

Final Subsurface Storage	335456.	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

				PERVIOUS AREA			IMPERVIOUS AREA		TOTAL SUBCATCHMENT AREA		
SUBCATCHMENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	TOTAL SIMULATED RAINFALL (IN)	TOTAL RUNOFF DEPTH (IN)	TOTAL LOSSES (IN)	PEAK RUNOFF RATE (CFS)	RUNOFF DEPTH (IN)	PEAK RUNOFF RATE (CFS)	RUNOFF DEPTH (IN)	PEAK RUNOFF RATE (CFS)	PEAK UNIT RUNOFF (IN/HR)
300	200	2.57	55.3	2224.52	21.445	2203.277	2.251	2129.483	5.157	1188.033	7.407	2.886

*** 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				6.77				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.....	50.
2. TOTAL SURFACE BUILDUP.....	78760.
3. INITIAL CATCHBASIN LOAD.....	0.
4. TOTAL CATCHBASIN LOAD.....	0.
5. TOTAL CATCHBASIN AND SURFACE BUILDUP (2+4).....	78760.
Remaining Loads	
6. LOAD REMAINING ON SURFACE...	24.
7. REMAINING IN CATCHBASINS....	0.
8. REMAINING IN CHANNEL/PIPES..	0.
Removals	
9. STREET SWEEPING REMOVAL.....	0.
10. NET SURFACE BUILDUP (2-9)...	78760.
11. SURFACE WASHOFF.....	78686.
12. CATCHBASIN WASHOFF.....	0.
13. TOTAL WASHOFF (11+12).....	78686.
14. LOAD FROM OTHER CONSTITUENTS	0.
15. PRECIPITATION LOAD.....	0.
15a.SUM SURFACE LOAD (13+14+15).	78686.
16. TOTAL GROUNDWATER LOAD.....	0.
16a.TOTAL I/I LOAD.....	0.
17. NET SUBCATCHMENT LOAD (15a-15b-15c-15d+16+16a)....	78686.
>>Removal in channel/pipes (17a, 17b):	
17a.REMOVE BY BMP FRACTION.....	0.
17b.REMOVE BY 1st ORDER DECAY...	0.
18. TOTAL LOAD TO INLETS.....	78681.
19. FLOW WT'D AVE.CONCENTRATION (INLET LOAD/TOTAL FLOW).....	mg/l 114.
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
1.	5.0	2.65	0.000002	0.022000
4.	5.0	2.65	0.000035	0.049420
6.	5.0	2.65	0.000079	0.062619
7.	5.0	2.65	0.000108	0.068516
18.	15.0	2.65	0.000710	0.118919
45.	10.0	2.65	0.004352	0.203034
70.	5.0	2.65	0.010215	0.262779
90.	10.0	2.65	0.016354	0.304305
125.	15.0	2.65	0.029465	0.368637
200.	15.0	2.65	0.063279	0.485025

400.	5.0	2.65	0.156843	0.726951
850.	5.0	2.65	0.321303	1.128801

****
*
* 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 3	0.486	18.495	88.5	49.0
HS 4	0.805	18.495	94.3	60.5
HS 5	1.022	18.495	96.1	69.6
HS 6	1.234	18.495	97.1	76.1 <=tss removal
HS 7	1.713	18.495	98.4	79.9
HS 8	2.222	18.495	99.1	83.1
HS 10	3.166	18.495	99.7	88.9
HS 12	4.301	18.495	99.9	92.7

****
*
* Summary of Annual Flow Treatmnet & TSS Removal *
*
****

HS 3

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	2147739.	1887943.	1419.	689.	730.	0.	87.9	48.6
1958.	3583236.	3129838.	2021.	876.	1145.	0.	87.3	43.4
1959.	3777918.	3182902.	2013.	953.	1060.	0.	84.3	47.3
1960.	3477684.	3003833.	1949.	960.	989.	0.	86.4	49.2
1961.	3044446.	2760479.	1901.	957.	944.	0.	90.7	50.3
1962.	3297150.	2990152.	1811.	893.	919.	0.	90.7	49.3
1963.	2602401.	2465164.	1725.	882.	843.	0.	94.7	51.1
1964.	2497945.	2342117.	1653.	866.	787.	0.	93.8	52.4
1965.	2175439.	2035560.	1582.	792.	790.	0.	93.6	50.1
1966.	2710681.	2498623.	1763.	876.	888.	0.	92.2	49.7
1967.	3302580.	2998781.	2009.	954.	1055.	0.	90.8	47.5
1968.	3101141.	2860577.	1691.	852.	839.	0.	92.2	50.4
1969.	3033579.	2840648.	1742.	872.	870.	0.	93.6	50.1
1970.	2739990.	2409069.	1654.	821.	834.	0.	87.9	49.6
1971.	2903187.	2475314.	1855.	821.	1034.	0.	85.3	44.3
1972.	4730816.	3846504.	2517.	1030.	1487.	0.	81.3	40.9
1973.	3671674.	3105886.	2089.	876.	1213.	0.	84.6	41.9
1974.	3704591.	2951776.	2023.	875.	1147.	0.	79.7	43.3
1975.	3429739.	3217802.	1842.	957.	885.	0.	93.8	52.0

1976.	2645985.	2334250.	1772.	873.	899.	0.	88.2	49.3
1977.	3256463.	2987940.	1981.	1020.	962.	0.	91.8	51.5
1978.	2733655.	2519148.	1596.	830.	766.	0.	92.2	52.0
1979.	3542112.	3040120.	1907.	904.	1003.	0.	85.8	47.4
1980.	2545177.	2165303.	1665.	750.	915.	0.	85.1	45.0
1981.	3253994.	2857165.	1907.	887.	1020.	0.	87.8	46.5
1982.	3327298.	2861717.	1880.	870.	1009.	0.	86.0	46.3
1983.	4193488.	3738736.	2262.	1081.	1181.	0.	89.2	47.8
1984.	3336914.	3140654.	1847.	932.	916.	0.	94.1	50.4
1985.	3030148.	2537312.	1833.	942.	891.	0.	83.7	51.4
1986.	3134400.	2870373.	1726.	872.	854.	0.	91.6	50.5
1987.	3325364.	3033516.	1721.	892.	829.	0.	91.2	51.8
1988.	2752944.	2394294.	1696.	854.	843.	0.	87.0	50.3
1989.	2461736.	2192848.	1494.	747.	748.	0.	89.1	50.0
1991.	1951820.	1502401.	908.	490.	419.	0.	77.0	53.9
1992.	2994369.	2775016.	1906.	1005.	901.	0.	92.7	52.7
1993.	3102550.	2631696.	1916.	961.	956.	0.	84.8	50.1
1994.	3295920.	2925428.	1995.	985.	1010.	0.	88.8	49.4
1995.	2323442.	2048508.	1424.	714.	710.	0.	88.2	50.1
1996.	3314965.	2889404.	2020.	956.	1063.	0.	87.2	47.4
1997.	2027434.	1929026.	1480.	808.	672.	0.	95.1	54.6
1998.	2701996.	2364306.	1644.	781.	863.	0.	87.5	47.5
1999.	2726378.	2369008.	1661.	834.	827.	0.	86.9	50.2
2000.	2865293.	2594456.	1798.	904.	894.	0.	90.5	50.3
2001.	2142851.	1944008.	1470.	780.	690.	0.	90.7	53.1

HS 4

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	2147739.	2050995.	1419.	851.	568.	0.	95.5	60.0
1958.	3583236.	3374158.	2021.	1134.	887.	0.	94.2	56.1
1959.	3777918.	3436468.	2013.	1186.	827.	0.	91.0	58.9
1960.	3477684.	3183710.	1949.	1189.	760.	0.	91.5	61.0
1961.	3044446.	2865347.	1901.	1167.	734.	0.	94.1	61.4
1962.	3297150.	3168458.	1811.	1103.	708.	0.	96.1	60.9
1963.	2602401.	2574602.	1725.	1094.	631.	0.	98.9	63.4
1964.	2497945.	2406843.	1653.	1046.	607.	0.	96.4	63.3
1965.	2175439.	2128848.	1582.	998.	584.	0.	97.9	63.1
1966.	2710681.	2617694.	1763.	1086.	677.	0.	96.6	61.6
1967.	3302580.	3158164.	2009.	1196.	813.	0.	95.6	59.5
1968.	3101141.	2967250.	1691.	1048.	644.	0.	95.7	62.0
1969.	3033579.	2948687.	1742.	1075.	667.	0.	97.2	61.7
1970.	2739990.	2543492.	1654.	1017.	638.	0.	92.8	61.5
1971.	2903187.	2701954.	1855.	1053.	802.	0.	93.1	56.8
1972.	4730816.	4181261.	2517.	1315.	1201.	0.	88.4	52.3
1973.	3671674.	3407240.	2089.	1128.	960.	0.	92.8	54.0
1974.	3704591.	3236897.	2023.	1108.	914.	0.	87.4	54.8
1975.	3429739.	3390366.	1842.	1172.	670.	0.	98.9	63.6
1976.	2645985.	2472950.	1772.	1070.	702.	0.	93.5	60.4
1977.	3256463.	3119270.	1981.	1235.	746.	0.	95.8	62.3
1978.	2733655.	2648674.	1596.	1015.	582.	0.	96.9	63.6

1979.	3542112.	3208170.	1907.	1112.	796.	0.	90.6	58.3
1980.	2545177.	2383087.	1665.	958.	707.	0.	93.6	57.6
1981.	3253994.	3032016.	1907.	1103.	803.	0.	93.2	57.9
1982.	3327298.	3078217.	1880.	1087.	793.	0.	92.5	57.8
1983.	4193488.	3990670.	2262.	1344.	918.	0.	95.2	59.4
1984.	3336914.	3265991.	1847.	1133.	715.	0.	97.9	61.3
1985.	3030148.	2715604.	1833.	1148.	685.	0.	89.6	62.6
1986.	3134400.	3051646.	1726.	1075.	651.	0.	97.4	62.3
1987.	3325364.	3246242.	1721.	1097.	624.	0.	97.6	63.7
1988.	2752944.	2614602.	1696.	1043.	654.	0.	95.0	61.5
1989.	2461736.	2346718.	1494.	913.	581.	0.	95.3	61.1
1991.	1951820.	1667340.	908.	573.	335.	0.	85.4	63.1
1992.	2994369.	2922880.	1906.	1226.	681.	0.	97.6	64.3
1993.	3102550.	2808228.	1916.	1174.	743.	0.	90.5	61.2
1994.	3295920.	3125344.	1995.	1206.	789.	0.	94.8	60.5
1995.	2323442.	2200297.	1424.	878.	546.	0.	94.7	61.6
1996.	3314965.	3147530.	2020.	1206.	814.	0.	94.9	59.7
1997.	2027434.	1993628.	1480.	959.	521.	0.	98.3	64.8
1998.	2701996.	2552184.	1644.	968.	676.	0.	94.5	58.9
1999.	2726378.	2572581.	1661.	1033.	629.	0.	94.4	62.2
2000.	2865293.	2762794.	1798.	1122.	676.	0.	96.4	62.4
2001.	2142851.	2017553.	1470.	927.	543.	0.	94.2	63.1

HS 5

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	2147739.	2091481.	1419.	978.	441.	0.	97.4	68.9
1958.	3583236.	3453166.	2021.	1345.	675.	0.	96.4	66.6
1959.	3777918.	3517580.	2013.	1376.	637.	0.	93.1	68.4
1960.	3477684.	3250212.	1949.	1363.	586.	0.	93.5	69.9
1961.	3044446.	2906000.	1901.	1340.	561.	0.	95.5	70.5
1962.	3297150.	3214795.	1811.	1272.	539.	0.	97.5	70.2
1963.	2602401.	2592557.	1725.	1243.	482.	0.	99.6	72.1
1964.	2497945.	2434762.	1653.	1184.	469.	0.	97.5	71.7
1965.	2175439.	2155867.	1582.	1139.	443.	0.	99.1	72.0
1966.	2710681.	2654863.	1763.	1241.	522.	0.	97.9	70.4
1967.	3302580.	3211658.	2009.	1393.	616.	0.	97.2	69.3
1968.	3101141.	3005182.	1691.	1194.	497.	0.	96.9	70.6
1969.	3033579.	2967277.	1742.	1225.	517.	0.	97.8	70.3
1970.	2739990.	2590884.	1654.	1168.	487.	0.	94.6	70.6
1971.	2903187.	2771271.	1855.	1243.	613.	0.	95.5	67.0
1972.	4730816.	4309779.	2517.	1573.	944.	0.	91.1	62.5
1973.	3671674.	3498230.	2089.	1357.	731.	0.	95.3	65.0
1974.	3704591.	3339962.	2023.	1301.	722.	0.	90.2	64.3
1975.	3429739.	3425133.	1842.	1328.	514.	0.	99.9	72.1
1976.	2645985.	2517935.	1772.	1243.	529.	0.	95.2	70.2
1977.	3256463.	3157946.	1981.	1411.	570.	0.	97.0	71.2
1978.	2733655.	2691082.	1596.	1164.	432.	0.	98.4	72.9
1979.	3542112.	3265804.	1907.	1283.	624.	0.	92.2	67.3
1980.	2545177.	2454088.	1665.	1115.	550.	0.	96.4	67.0
1981.	3253994.	3096690.	1907.	1270.	636.	0.	95.2	66.6

1982.	3327298.	3162802.	1880.	1276.	604.	0.	95.1	67.9
1983.	4193488.	4068724.	2262.	1563.	699.	0.	97.0	69.1
1984.	3336914.	3290686.	1847.	1310.	537.	0.	98.6	70.9
1985.	3030148.	2785580.	1833.	1304.	529.	0.	91.9	71.2
1986.	3134400.	3094030.	1726.	1223.	503.	0.	98.7	70.9
1987.	3325364.	3300243.	1721.	1247.	474.	0.	99.2	72.4
1988.	2752944.	2666037.	1696.	1189.	508.	0.	96.8	70.1
1989.	2461736.	2395254.	1494.	1053.	441.	0.	97.3	70.5
1991.	1951820.	1734275.	908.	641.	267.	0.	88.9	70.6
1992.	2994369.	2955749.	1906.	1382.	525.	0.	98.7	72.5
1993.	3102550.	2891464.	1916.	1342.	574.	0.	93.2	70.0
1994.	3295920.	3192249.	1995.	1386.	609.	0.	96.9	69.5
1995.	2323442.	2246078.	1424.	996.	429.	0.	96.7	69.9
1996.	3314965.	3210440.	2020.	1384.	636.	0.	96.8	68.5
1997.	2027434.	2008854.	1480.	1074.	406.	0.	99.1	72.6
1998.	2701996.	2619910.	1644.	1113.	531.	0.	97.0	67.7
1999.	2726378.	2634846.	1661.	1169.	492.	0.	96.6	70.4
2000.	2865293.	2810061.	1798.	1269.	529.	0.	98.1	70.6
2001.	2142851.	2033749.	1470.	1043.	427.	0.	94.9	71.0

HS 6

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	2147739.	2115177.	1419.	1063.	355.	0.	98.5	75.0
1958.	3583236.	3500988.	2021.	1484.	537.	0.	97.7	73.4
1959.	3777918.	3558365.	2013.	1511.	501.	0.	94.2	75.1
1960.	3477684.	3300762.	1949.	1497.	452.	0.	94.9	76.8
1961.	3044446.	2935826.	1901.	1473.	428.	0.	96.4	77.5
1962.	3297150.	3244436.	1811.	1393.	419.	0.	98.4	76.9
1963.	2602401.	2598526.	1725.	1349.	376.	0.	99.9	78.2
1964.	2497945.	2455989.	1653.	1293.	360.	0.	98.3	78.2
1965.	2175439.	2165594.	1582.	1237.	345.	0.	99.5	78.2
1966.	2710681.	2673032.	1763.	1356.	408.	0.	98.6	76.9
1967.	3302580.	3238230.	2009.	1535.	474.	0.	98.1	76.4
1968.	3101141.	3028690.	1691.	1308.	384.	0.	97.7	77.3
1969.	3033579.	2982638.	1742.	1340.	402.	0.	98.3	76.9
1970.	2739990.	2629532.	1654.	1280.	375.	0.	96.0	77.4
1971.	2903187.	2817921.	1855.	1379.	476.	0.	97.1	74.3
1972.	4730816.	4390470.	2517.	1754.	763.	0.	92.8	69.7
1973.	3671674.	3556365.	2089.	1511.	578.	0.	96.9	72.3
1974.	3704591.	3402868.	2023.	1443.	580.	0.	91.9	71.3
1975.	3429739.	3429739.	1842.	1439.	403.	0.	100.0	78.1
1976.	2645985.	2547025.	1772.	1364.	409.	0.	96.3	76.9
1977.	3256463.	3180271.	1981.	1539.	442.	0.	97.7	77.7
1978.	2733655.	2716680.	1596.	1266.	330.	0.	99.4	79.3
1979.	3542112.	3307430.	1907.	1415.	492.	0.	93.4	74.2
1980.	2545177.	2483208.	1665.	1229.	436.	0.	97.6	73.8
1981.	3253994.	3139926.	1907.	1410.	497.	0.	96.5	73.9
1982.	3327298.	3217488.	1880.	1412.	467.	0.	96.7	75.1
1983.	4193488.	4116711.	2262.	1699.	563.	0.	98.2	75.1
1984.	3336914.	3304854.	1847.	1430.	417.	0.	99.0	77.4

1985.	3030148.	2833356.	1833.	1423.	410.	0.	93.5	77.6
1986.	3134400.	3108649.	1726.	1330.	396.	0.	99.2	77.0
1987.	3325364.	3316855.	1721.	1353.	368.	0.	99.7	78.6
1988.	2752944.	2690112.	1696.	1293.	404.	0.	97.7	76.2
1989.	2461736.	2418025.	1494.	1151.	343.	0.	98.2	77.0
1991.	1951820.	1781802.	908.	695.	213.	0.	91.3	76.5
1992.	2994369.	2970773.	1906.	1494.	412.	0.	99.2	78.4
1993.	3102550.	2947850.	1916.	1465.	451.	0.	95.0	76.4
1994.	3295920.	3230520.	1995.	1516.	479.	0.	98.0	76.0
1995.	2323442.	2269448.	1424.	1080.	344.	0.	97.7	75.9
1996.	3314965.	3238007.	2020.	1508.	512.	0.	97.7	74.7
1997.	2027434.	2016638.	1480.	1169.	311.	0.	99.5	79.0
1998.	2701996.	2651212.	1644.	1213.	432.	0.	98.1	73.8
1999.	2726378.	2663952.	1661.	1266.	395.	0.	97.7	76.2
2000.	2865293.	2833400.	1798.	1377.	421.	0.	98.9	76.6
2001.	2142851.	2047426.	1470.	1141.	328.	0.	95.5	77.7

HS 7

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	2147739.	2133804.	1419.	1112.	307.	0.	99.4	78.4
1958.	3583236.	3562800.	2021.	1568.	453.	0.	99.4	77.6
1959.	3777918.	3611758.	2013.	1583.	429.	0.	95.6	78.7
1960.	3477684.	3377313.	1949.	1568.	381.	0.	97.1	80.4
1961.	3044446.	2982812.	1901.	1546.	355.	0.	98.0	81.3
1962.	3297150.	3279634.	1811.	1462.	349.	0.	99.5	80.7
1963.	2602401.	2602401.	1725.	1405.	320.	0.	100.0	81.5
1964.	2497945.	2485183.	1653.	1356.	297.	0.	99.5	82.0
1965.	2175439.	2175398.	1582.	1294.	288.	0.	100.0	81.8
1966.	2710681.	2691520.	1763.	1426.	337.	0.	99.3	80.9
1967.	3302580.	3276494.	2009.	1606.	403.	0.	99.2	79.9
1968.	3101141.	3053300.	1691.	1373.	318.	0.	98.5	81.2
1969.	3033579.	3007142.	1742.	1411.	331.	0.	99.1	81.0
1970.	2739990.	2687355.	1654.	1342.	312.	0.	98.1	81.1
1971.	2903187.	2871408.	1855.	1446.	409.	0.	98.9	78.0
1972.	4730816.	4486942.	2517.	1867.	650.	0.	94.8	74.2
1973.	3671674.	3625039.	2089.	1601.	487.	0.	98.7	76.7
1974.	3704591.	3511073.	2023.	1525.	497.	0.	94.8	75.4
1975.	3429739.	3429739.	1842.	1508.	334.	0.	100.0	81.9
1976.	2645985.	2595777.	1772.	1435.	337.	0.	98.1	81.0
1977.	3256463.	3206502.	1981.	1617.	364.	0.	98.5	81.6
1978.	2733655.	2731110.	1596.	1326.	270.	0.	99.9	83.1
1979.	3542112.	3378813.	1907.	1496.	411.	0.	95.4	78.4
1980.	2545177.	2515196.	1665.	1292.	373.	0.	98.8	77.6
1981.	3253994.	3196645.	1907.	1487.	420.	0.	98.2	78.0
1982.	3327298.	3301303.	1880.	1484.	396.	0.	99.2	79.0
1983.	4193488.	4159394.	2262.	1787.	475.	0.	99.2	79.0
1984.	3336914.	3323939.	1847.	1505.	342.	0.	99.6	81.5
1985.	3030148.	2897892.	1833.	1489.	345.	0.	95.6	81.2
1986.	3134400.	3130128.	1726.	1394.	333.	0.	99.9	80.7
1987.	3325364.	3325364.	1721.	1411.	310.	0.	100.0	82.0

1988.	2752944.	2720194.	1696.	1350.	346.	0.	98.8	79.6
1989.	2461736.	2441078.	1494.	1208.	286.	0.	99.2	80.9
1991.	1951820.	1852886.	908.	726.	182.	0.	94.9	80.0
1992.	2994369.	2984783.	1906.	1565.	341.	0.	99.7	82.1
1993.	3102550.	3020010.	1916.	1534.	382.	0.	97.3	80.1
1994.	3295920.	3279943.	1995.	1593.	402.	0.	99.5	79.8
1995.	2323442.	2294784.	1424.	1134.	291.	0.	98.8	79.6
1996.	3314965.	3272552.	2020.	1585.	435.	0.	98.7	78.5
1997.	2027434.	2025070.	1480.	1222.	257.	0.	99.9	82.6
1998.	2701996.	2684579.	1644.	1277.	367.	0.	99.4	77.7
1999.	2726378.	2697158.	1661.	1330.	331.	0.	98.9	80.0
2000.	2865293.	2857554.	1798.	1444.	354.	0.	99.7	80.3
2001.	2142851.	2077049.	1470.	1185.	285.	0.	96.9	80.6

HS 8

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	2147739.	2142961.	1419.	1153.	265.	0.	99.8	81.3
1958.	3583236.	3577666.	2021.	1632.	389.	0.	99.8	80.7
1959.	3777918.	3659503.	2013.	1655.	358.	0.	96.9	82.2
1960.	3477684.	3411939.	1949.	1629.	320.	0.	98.1	83.6
1961.	3044446.	3012350.	1901.	1610.	291.	0.	98.9	84.7
1962.	3297150.	3291269.	1811.	1520.	291.	0.	99.8	83.9
1963.	2602401.	2602401.	1725.	1458.	267.	0.	100.0	84.5
1964.	2497945.	2497945.	1653.	1403.	250.	0.	100.0	84.9
1965.	2175439.	2175439.	1582.	1341.	240.	0.	100.0	84.8
1966.	2710681.	2703050.	1763.	1484.	279.	0.	99.7	84.2
1967.	3302580.	3296812.	2009.	1673.	336.	0.	99.8	83.3
1968.	3101141.	3064336.	1691.	1426.	265.	0.	98.8	84.3
1969.	3033579.	3019424.	1742.	1467.	276.	0.	99.5	84.2
1970.	2739990.	2716443.	1654.	1389.	265.	0.	99.1	84.0
1971.	2903187.	2884359.	1855.	1501.	355.	0.	99.4	80.9
1972.	4730816.	4542544.	2517.	1952.	565.	0.	96.0	77.6
1973.	3671674.	3655938.	2089.	1670.	419.	0.	99.6	79.9
1974.	3704591.	3596804.	2023.	1599.	424.	0.	97.1	79.0
1975.	3429739.	3429739.	1842.	1570.	273.	0.	100.0	85.2
1976.	2645985.	2624697.	1772.	1488.	284.	0.	99.2	84.0
1977.	3256463.	3226120.	1981.	1675.	306.	0.	99.1	84.6
1978.	2733655.	2733655.	1596.	1367.	229.	0.	100.0	85.7
1979.	3542112.	3436337.	1907.	1553.	354.	0.	97.0	81.4
1980.	2545177.	2538490.	1665.	1347.	318.	0.	99.7	80.9
1981.	3253994.	3230589.	1907.	1544.	363.	0.	99.3	81.0
1982.	3327298.	3326404.	1880.	1543.	336.	0.	100.0	82.1
1983.	4193488.	4173822.	2262.	1862.	400.	0.	99.5	82.3
1984.	3336914.	3336066.	1847.	1562.	286.	0.	100.0	84.5
1985.	3030148.	2946255.	1833.	1539.	294.	0.	97.2	83.9
1986.	3134400.	3134400.	1726.	1446.	280.	0.	100.0	83.8
1987.	3325364.	3325364.	1721.	1464.	257.	0.	100.0	85.1
1988.	2752944.	2731344.	1696.	1407.	289.	0.	99.2	82.9
1989.	2461736.	2455935.	1494.	1255.	239.	0.	99.8	84.0
1991.	1951820.	1894368.	908.	752.	156.	0.	97.1	82.9

1992.	2994369.	2993388.	1906.	1619.	287.	0.	100.0	85.0
1993.	3102550.	3054906.	1916.	1593.	324.	0.	98.5	83.1
1994.	3295920.	3295831.	1995.	1654.	340.	0.	100.0	82.9
1995.	2323442.	2305468.	1424.	1175.	250.	0.	99.2	82.5
1996.	3314965.	3296471.	2020.	1647.	373.	0.	99.4	81.5
1997.	2027434.	2027434.	1480.	1272.	208.	0.	100.0	86.0
1998.	2701996.	2696440.	1644.	1337.	308.	0.	99.8	81.3
1999.	2726378.	2715488.	1661.	1378.	283.	0.	99.6	82.9
2000.	2865293.	2865293.	1798.	1497.	301.	0.	100.0	83.2
2001.	2142851.	2105836.	1470.	1233.	237.	0.	98.3	83.9

HS 10

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	2147739.	2147739.	1419.	1240.	179.	0.	100.0	87.4
1958.	3583236.	3583236.	2021.	1756.	265.	0.	100.0	86.9
1959.	3777918.	3706283.	2013.	1770.	243.	0.	98.1	87.9
1960.	3477684.	3448020.	1949.	1753.	197.	0.	99.1	89.9
1961.	3044446.	3039304.	1901.	1713.	187.	0.	99.8	90.1
1962.	3297150.	3297150.	1811.	1624.	188.	0.	100.0	89.6
1963.	2602401.	2602401.	1725.	1563.	162.	0.	100.0	90.6
1964.	2497945.	2497945.	1653.	1496.	157.	0.	100.0	90.5
1965.	2175439.	2175439.	1582.	1433.	149.	0.	100.0	90.6
1966.	2710681.	2710681.	1763.	1580.	183.	0.	100.0	89.6
1967.	3302580.	3302580.	2009.	1786.	222.	0.	100.0	88.9
1968.	3101141.	3083379.	1691.	1522.	169.	0.	99.4	90.0
1969.	3033579.	3033579.	1742.	1569.	173.	0.	100.0	90.1
1970.	2739990.	2738769.	1654.	1481.	173.	0.	100.0	89.5
1971.	2903187.	2899482.	1855.	1615.	240.	0.	99.9	87.1
1972.	4730816.	4617753.	2517.	2131.	386.	0.	97.6	84.7
1973.	3671674.	3670886.	2089.	1810.	279.	0.	100.0	86.7
1974.	3704591.	3678448.	2023.	1733.	289.	0.	99.3	85.7
1975.	3429739.	3429739.	1842.	1674.	168.	0.	100.0	90.9
1976.	2645985.	2645985.	1772.	1587.	186.	0.	100.0	89.5
1977.	3256463.	3252795.	1981.	1787.	194.	0.	99.9	90.2
1978.	2733655.	2733655.	1596.	1454.	143.	0.	100.0	91.1
1979.	3542112.	3490314.	1907.	1665.	242.	0.	98.5	87.3
1980.	2545177.	2545177.	1665.	1445.	220.	0.	100.0	86.8
1981.	3253994.	3253994.	1907.	1659.	247.	0.	100.0	87.0
1982.	3327298.	3327298.	1880.	1651.	229.	0.	100.0	87.8
1983.	4193488.	4188896.	2262.	2001.	260.	0.	99.9	88.5
1984.	3336914.	3336914.	1847.	1664.	184.	0.	100.0	90.1
1985.	3030148.	2995842.	1833.	1641.	192.	0.	98.9	89.5
1986.	3134400.	3134400.	1726.	1546.	180.	0.	100.0	89.6
1987.	3325364.	3325364.	1721.	1554.	167.	0.	100.0	90.3
1988.	2752944.	2748334.	1696.	1503.	194.	0.	99.8	88.6
1989.	2461736.	2461736.	1494.	1336.	158.	0.	100.0	89.4
1991.	1951820.	1943981.	908.	806.	102.	0.	99.6	88.7
1992.	2994369.	2994369.	1906.	1725.	182.	0.	100.0	90.5
1993.	3102550.	3088848.	1916.	1701.	215.	0.	99.6	88.8
1994.	3295920.	3295920.	1995.	1765.	230.	0.	100.0	88.5

1995.	2323442.	2320699.	1424.	1261.	164.	0.	99.9	88.5
1996.	3314965.	3313268.	2020.	1769.	250.	0.	99.9	87.6
1997.	2027434.	2027434.	1480.	1353.	126.	0.	100.0	91.5
1998.	2701996.	2701996.	1644.	1446.	199.	0.	100.0	87.9
1999.	2726378.	2726378.	1661.	1473.	188.	0.	100.0	88.7
2000.	2865293.	2865293.	1798.	1606.	193.	0.	100.0	89.3
2001.	2142851.	2131752.	1470.	1316.	154.	0.	99.5	89.5

HS 12

Year	Flow Vol (ft3)	Flow Treated (ft3)	TSS In (lb)	TSS Rem (lb)	TSS Out (lb)	TSS Byp (lb)	Flow Treated (%)	TSS Removal (%)
1957.	2147739.	2147739.	1419.	1305.	114.	0.	100.0	92.0
1958.	3583236.	3583236.	2021.	1838.	183.	0.	100.0	90.9
1959.	3777918.	3747932.	2013.	1852.	160.	0.	99.2	92.0
1960.	3477684.	3472026.	1949.	1820.	130.	0.	99.8	93.3
1961.	3044446.	3044446.	1901.	1778.	122.	0.	100.0	93.6
1962.	3297150.	3297150.	1811.	1689.	122.	0.	100.0	93.2
1963.	2602401.	2602401.	1725.	1626.	99.	0.	100.0	94.3
1964.	2497945.	2497945.	1653.	1548.	105.	0.	100.0	93.7
1965.	2175439.	2175439.	1582.	1486.	96.	0.	100.0	94.0
1966.	2710681.	2710681.	1763.	1641.	122.	0.	100.0	93.1
1967.	3302580.	3302580.	2009.	1864.	144.	0.	100.0	92.8
1968.	3101141.	3099016.	1691.	1579.	112.	0.	99.9	93.4
1969.	3033579.	3033579.	1742.	1626.	116.	0.	100.0	93.4
1970.	2739990.	2739990.	1654.	1538.	116.	0.	100.0	93.0
1971.	2903187.	2903187.	1855.	1699.	156.	0.	100.0	91.6
1972.	4730816.	4681246.	2517.	2240.	277.	0.	99.0	89.0
1973.	3671674.	3671674.	2089.	1903.	186.	0.	100.0	91.1
1974.	3704591.	3703644.	2023.	1817.	206.	0.	100.0	89.8
1975.	3429739.	3429739.	1842.	1736.	107.	0.	100.0	94.2
1976.	2645985.	2645985.	1772.	1651.	122.	0.	100.0	93.1
1977.	3256463.	3256463.	1981.	1852.	129.	0.	100.0	93.5
1978.	2733655.	2733655.	1596.	1506.	90.	0.	100.0	94.4
1979.	3542112.	3517468.	1907.	1739.	169.	0.	99.3	91.2
1980.	2545177.	2545177.	1665.	1518.	147.	0.	100.0	91.2
1981.	3253994.	3253994.	1907.	1735.	172.	0.	100.0	91.0
1982.	3327298.	3327298.	1880.	1726.	154.	0.	100.0	91.8
1983.	4193488.	4193488.	2262.	2089.	173.	0.	100.0	92.4
1984.	3336914.	3336914.	1847.	1732.	116.	0.	100.0	93.7
1985.	3030148.	3024095.	1833.	1706.	127.	0.	99.8	93.1
1986.	3134400.	3134400.	1726.	1610.	116.	0.	100.0	93.3
1987.	3325364.	3325364.	1721.	1616.	105.	0.	100.0	93.9
1988.	2752944.	2752944.	1696.	1567.	129.	0.	100.0	92.4
1989.	2461736.	2461736.	1494.	1393.	101.	0.	100.0	93.2
1991.	1951820.	1951820.	908.	841.	67.	0.	100.0	92.7
1992.	2994369.	2994369.	1906.	1796.	111.	0.	100.0	94.2
1993.	3102550.	3102550.	1916.	1767.	149.	0.	100.0	92.2
1994.	3295920.	3295920.	1995.	1841.	154.	0.	100.0	92.3
1995.	2323442.	2323442.	1424.	1314.	110.	0.	100.0	92.3
1996.	3314965.	3314965.	2020.	1855.	165.	0.	100.0	91.9
1997.	2027434.	2027434.	1480.	1405.	75.	0.	100.0	94.9

1998.	2701996.	2701996.	1644.	1510.	134.	0.	100.0	91.9
1999.	2726378.	2726378.	1661.	1538.	123.	0.	100.0	92.6
2000.	2865293.	2865293.	1798.	1674.	125.	0.	100.0	93.1
2001.	2142851.	2142851.	1470.	1366.	104.	0.	100.0	93.0

****
* *
* Summary of Toronto Rainfall Intensities *
* *
****

Rainfall Intensity (mm/h)	Flow (L/s)	Percentage %
1.50	2.6	NaN
2.25	4.0	NaN
3.00	5.3	NaN
3.75	6.6	NaN
4.75	8.4	NaN
5.75	10.1	NaN
8.00	14.1	NaN
10.00	17.6	NaN
15.50	27.3	NaN
23.25	40.9	NaN

****
* Summary of Quantity and Quality Results at *
* Location 200 INFlow in cfs. *
* Values are instantaneous at indicated time step *
****

GoVenture Capital Group Franklin Street
DMH#114

Date Mo/Da/Year	Time Hr:Min	Flow cfs	Total Su mg/l
Flow wtd means.....		0.018	114.
Flow wtd std devs..		0.086	66.
Maximum value.....		6.774	291.
Minimum value.....		0.000	0.
Total loads.....		11069806. Cub-Ft	78727. 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... October    15, 2024                  *
*          Time...          18: 0:55. 98                *
*   Ending Date... October    15, 2024                  *
*          Time...          18: 1: 1.109                *
*  Elapsed Time...               0.100 minutes.         *
*  Elapsed Time...               6.011 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/Yard Drains	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	$3,000* *($3,000/Year)*	Land Owner
Hydroworks Unit	Annually in the spring	Annually in the spring	Clean/Remove Debris and sediment	$3,000* *($3,000/Year)*	Land Owner
Underground Storage System	Seasonally	Six Months	Clean/Remove Debris	$2,000* *($2,000/Year)*	Land Owner
	Total Annual Estimated Cost			$8,000/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

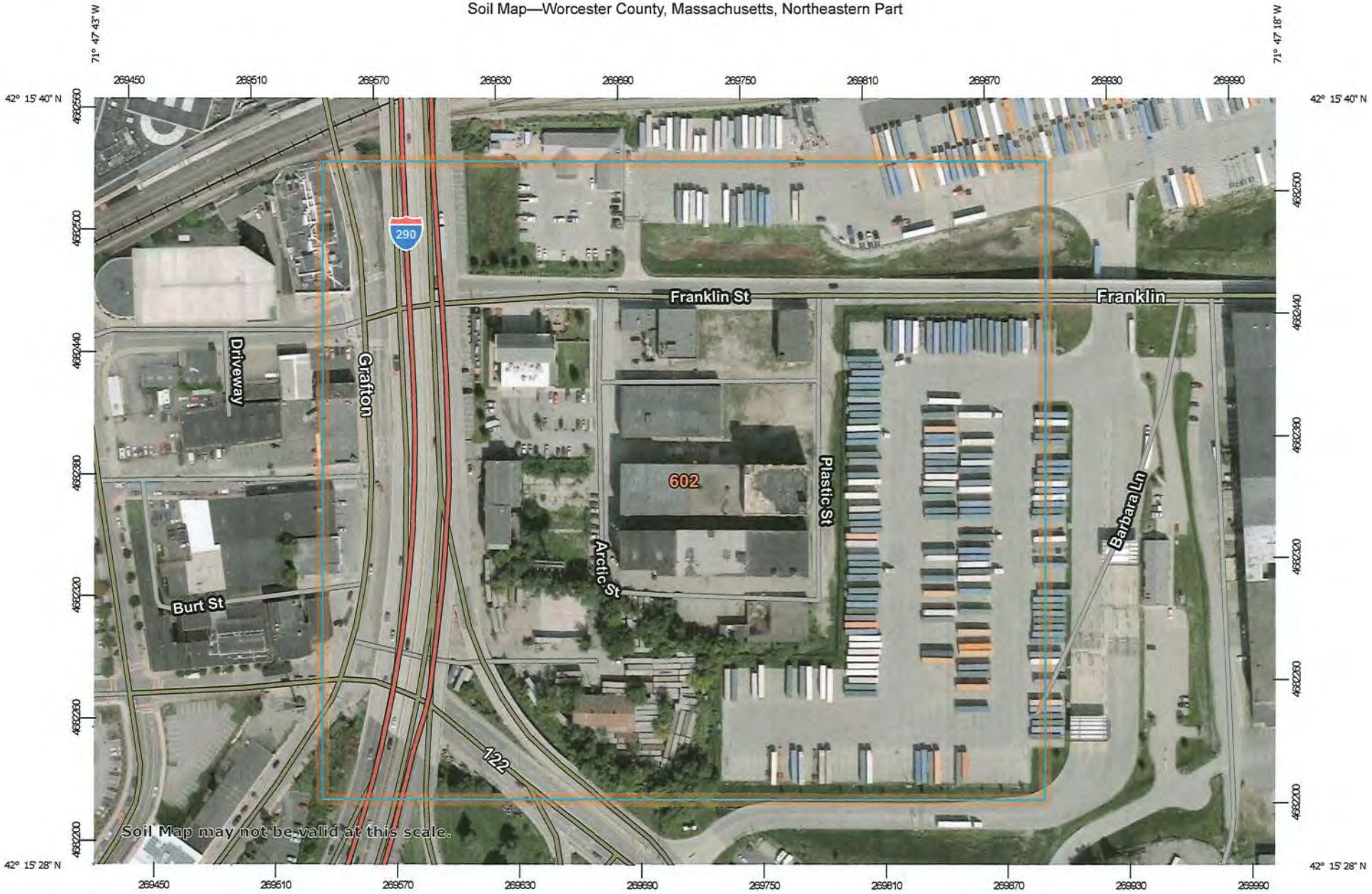
DATE	ACTION	RESULT	PERFORMED BY

Maintenance Log

Franklin Street, Worcester, Massachusetts

DATE	ACTION	PERFORMED BY

FIGURE 1
LOCUS MAP AND SOILS MAP



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

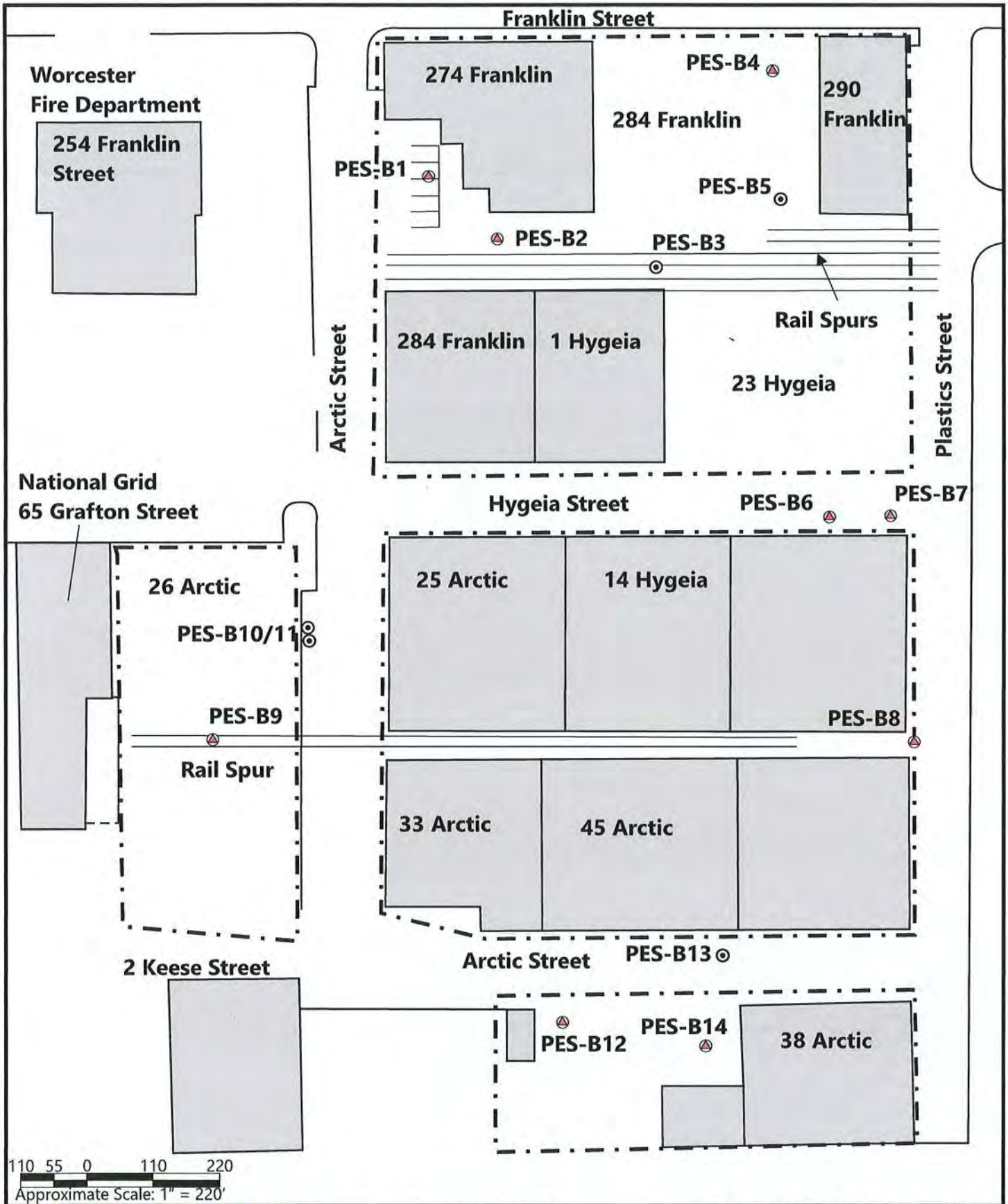
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

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			SM	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.	Penetration/Recovery: 60/44
2					
3					
4		1.1			
5					
6	PES-B1-6	2.2		10" fine to medium dark brown SAND with brick fragments, ash, wood ash over 36" light brown fine to medium SAND with small Gravel	Penetration/Recovery: 60/46
7					
8					
9		<1			
10					
11			SM	12" Blowback over 48" light brown fine to medium SAND with small Gravel	Penetration/Recovery: 60/60
12					
13					
14		<1			
15					
16			SM	36" light brown fine to medium SAND with small Gravel with faint petroleum odor	Penetration/Recovery: 60/36
17					
18					
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	PES-B2-4	5.1	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	Penetration/Recovery: 60/50
2					
3					
4					
5					
6		3.7	SM	18" light brown medium to coarse SAND over 38" light brown fine to medium SAND	Penetration/Recovery: 60/56
7					
8					
9					
10					
11		2.3		60" light brown fine to medium SAND	Penetration/Recovery: 60/60
12					
13					
14					
15					
16			SM	44" light brown fine to medium SAND	Penetration/Recovery: 60/44
17					
18					
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

FIGURE 2
PRE-DEVELOMPENT WATERSHED MAP

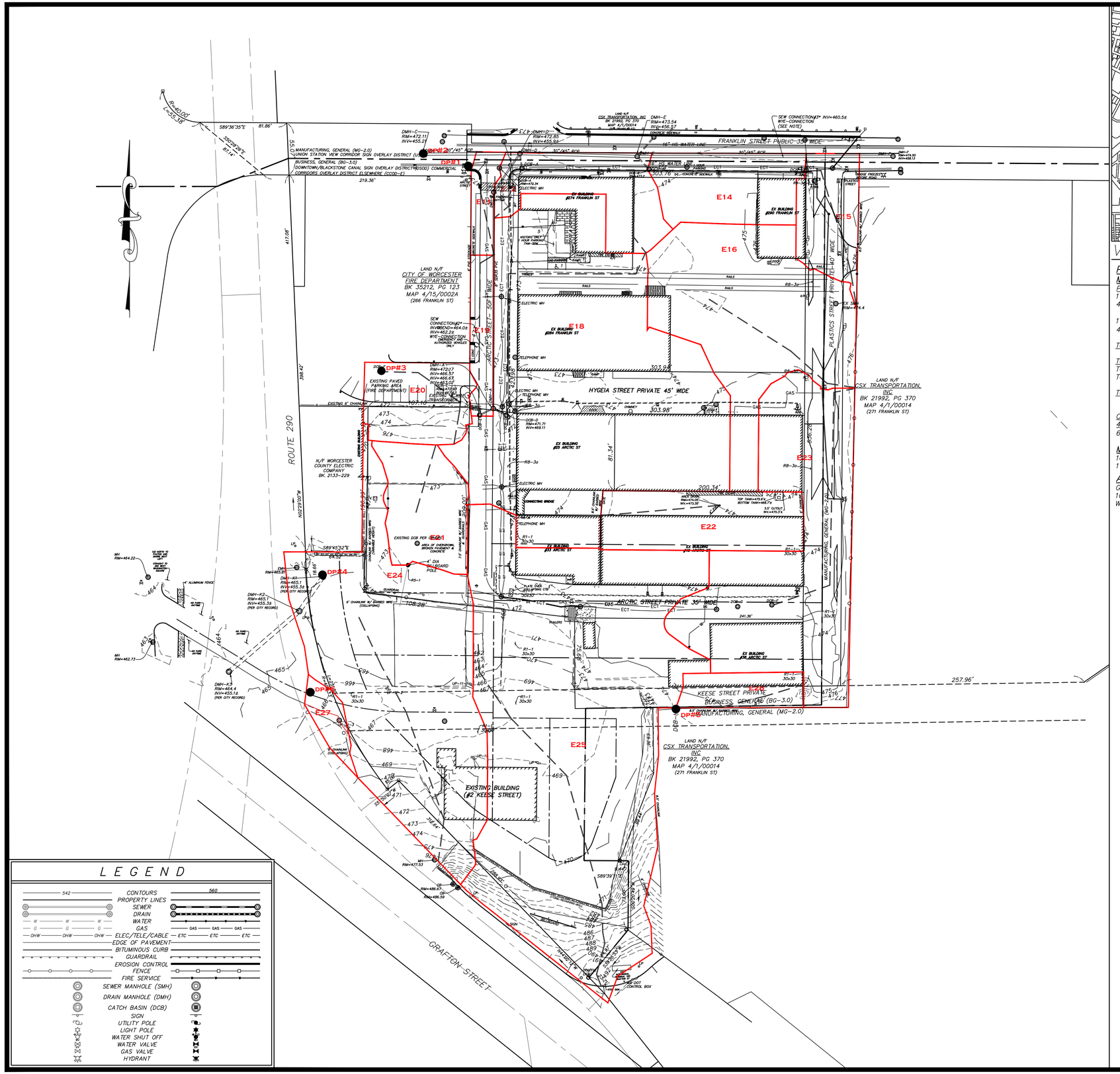
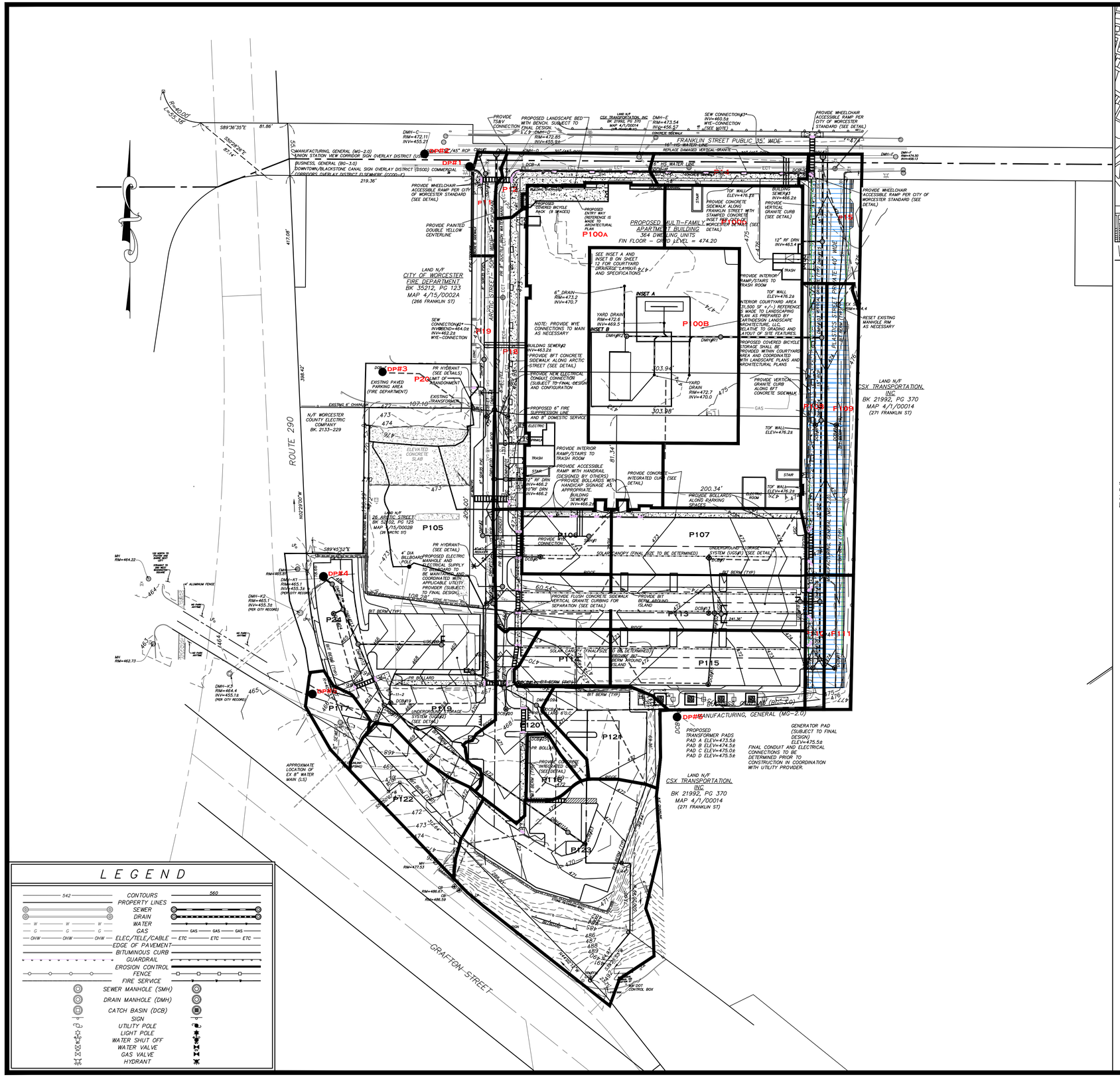

ROUTE 290
FRANKLIN STREET PUBLIC - 53' WIDE
ARCTIC STREET - 50' WIDE
HYGEIA STREET PRIVATE 45' WIDE
PLASTICS STREET PRIVATE - 40' WIDE
ARCTIC STREET PRIVATE 35' WIDE
KEESE STREET PRIVATE
GRAFTON STREET
LAND N/F CITY OF WORCESTER FIRE DEPARTMENT BK 35212, PG 123 MAP 4/15/0002A (266 FRANKLIN ST)
LAND N/F CSX TRANSPORTATION, INC BK 21992, PG 370 MAP 4/1/00014 (271 FRANKLIN ST)
N/F WORCESTER COUNTY ELECTRIC COMPANY BK 2133-229
EXISTING BUILDING (42 KEESE STREET)
E1
E2
E3
E4
E5
E14
E15
E16
E17
E18
E19
E20
E21
E22
E23
E24
E25
E26
E27
DP#1
DP#2
DP#3
DP#4
DP#5
DP#6
DP#7
DP#8
DP#9
DP#10
DP#11
DP#12
DP#13
DP#14
DP#15
DP#16
DP#17
DP#18
DP#19
DP#20
DP#21
DP#22
DP#23
DP#24
DP#25
DP#26
DP#27
DP#28
DP#29
DP#30
DP#31
DP#32
DP#33
DP#34
DP#35
DP#36
DP#37
DP#38
DP#39
DP#40

FIGURE 3
POST-DEVELOMPENT WATERSHED MAP


FRANKLIN STREET PUBLIC 35' WIDE
ROUTE 290
GRAFTON STREET
ARCTIC STREET
PLASTICS STREET PRIVATE 40' WIDE
PROPOSED MULTI-FAMILY APARTMENT BUILDING
364 HOUSING UNITS
FIN FLOOR = GRID LEVEL = 474.20
INSET A
INSET B
P100A
P100B
P100C
P101
P102
P103
P104
P105
P106
P107
P108
P109
P110
P111
P112
P113
P114
P115
P116
P117
P118
P119
P120
P121
P122
P123
P124
DP#1
DP#2
DP#3
DP#4
DP#5
DP#6
DP#7
DP#8
DP#9
DP#10
DP#11
DP#12
DP#13
DP#14
DP#15
DP#16
DP#17
DP#18
DP#19
DP#20
DP#21
DP#22
DP#23
DP#24
LAND N/F CITY OF WORCESTER FIRE DEPARTMENT BK 35212, PG 123 MAP 4/15/0002A (266 FRANKLIN ST)
LAND N/F CSX TRANSPORTATION, INC BK 21992, PG 370 MAP 4/1/00014 (271 FRANKLIN ST)
LAND N/F WORCESTER COUNTY ELECTRIC COMPANY BK 2133-229
LAND N/F 26 ARCTIC STREET BK 52102, PG 125 MAP 4/15/0002B (26 ARCTIC ST)
PROPOSED TRANSFORMER PADS PAD A ELEV=473.5± PAD B ELEV=474.5± PAD C ELEV=475.0± PAD D ELEV=475.5±
FINAL CONDUIT AND ELECTRICAL CONNECTIONS TO BE DETERMINED PRIOR TO CONSTRUCTION IN COORDINATION WITH UTILITY PROVIDER.
GENERATOR PAD (SUBJECT TO FINAL DESIGN) ELEV=475.5±
MANUFACTURING, GENERAL (MG-2.0)
BUSINESS, GENERAL (BG-3.0)
DOWNTOWN/BLACKSTONE CANAL SIGN OVERLAY DISTRICT (DSOD) COMMERCIAL CORRIDORS OVERLAY DISTRICT ELSEWHERE (CCOD-E)
UNION STATION VIEW CORRIDOR SIGN OVERLAY DISTRICT (USVC)
PROVIDE PROPOSED LANDSCAPE BED WITH BENCH, SUBJECT TO FINAL DESIGN
PROVIDE WHEELCHAIR ACCESSIBLE RAMP PER CITY OF WORCESTER STANDARD (SEE DETAIL)
PROVIDE PAINTED DOUBLE YELLOW CENTERLINE
PROPOSED COVERED BICYCLE RACK (8 SPACES)
PROPOSED ENTRY WAY DEFERENCE IS MADE TO ARCHITECTURAL PLANS
PROVIDE CONCRETE SIDEWALK ALONG FRANKLIN STREET WITH INTEGRATED CONCRETE CURB (SEE WORCESTER DETAILS (SEE DETAIL)
PROVIDE VERTICAL GRANITE CURB (SEE DETAIL)
SEE INSET A AND INSET B ON SHEET 12 FOR COURTYARD DRAINAGE LAYOUT & SPECIFICATIONS
PROVIDE INTERIOR RAMP/STAIRS TO TRASH ROOM
INTERIOR COURTYARD AREA (31,500 SF +/-) REFERENCE IS MADE TO LANDSCAPING PLAN AS PREPARED BY CARTHAGENIAN LANDSCAPE ARCHITECTURE, LLC, RELATIVE TO GRADING AND LAYOUT OF SITE FEATURES.
PROPOSED COVERED BICYCLE STORAGE SHALL BE PROVIDED WITHIN COURTYARD AREA AND COORDINATED WITH LANDSCAPE PLANS AND ARCHITECTURAL PLANS
NOTE: PROVIDE WYE CONNECTIONS TO MAIN AS NECESSARY
PROVIDE NEW ELECTRICAL CONDUIT CONNECTION (SUBJECT TO FINAL DESIGN AND CONFIGURATION
PROPOSED 6" FIRE SUPPRESSION LINE AND 8" DOMESTIC SERVICE
PROVIDE ACCESSIBLE RAMP WITH HANDRAIL (DESIGNED BY OTHERS)
PROVIDE BOLLARDS WITH HANDICAP SIGNAGE AS APPROPRIATE.
PROVIDE CONCRETE INTEGRATED CURB (SEE DETAIL)
PROVIDE BOLLARDS ALONG PARKING SPACES
PROVIDE FLUSH CONCRETE SIDEWALK VERTICAL GRANITE CURBING FOR SEPARATION (SEE DETAIL)
PROVIDE BIT BERM AROUND ISLAND
PROVIDE 8FT CONCRETE SIDEWALK ALONG ARCTIC STREET (SEE DETAIL)
PROVIDE NEW CONCRETE SIDEWALK
PROVIDE VERTICAL GRANITE CURB ALONG 8FT CONCRETE SIDEWALK
RESET EXISTING MANHOLE RIM AS NECESSARY
PROVIDE WHEELCHAIR ACCESSIBLE RAMP PER CITY OF WORCESTER STANDARD (SEE DETAIL)
EXISTING PAVED PARKING AREA (FIRE DEPARTMENT)
EXISTING TRANSFORMER
PROPOSED ELECTRIC MANHOLE AND ELECTRICAL SUPPLY TO BE MAINTAINED AND COORDINATED WITH APPLICABLE UTILITY PROVIDER (SUBJECT TO FINAL DESIGN).
PR HYDRANT (SEE DETAIL)
PR BOLLARD
PR BILLBOARD
UNDERGROUND DRAINAGE SYSTEM (UGS#1) (SEE DETAIL)
SOLAR CANOPY (FINAL SIZE TO BE DETERMINED)
4" DIA
6" DIA
8" DIA
12" RF DRN
18"RF DRN
18"W DRN
24"RF DRN
24"W DRN
DMH-A
DMH-B
DMH-C
DMH-D
DMH-E
DMH-F
DMH-K1
DMH-K2
DMH-K3
DCB#1
DCB#2
DCB#3
DCB#4
DCB#5
DCB#6
DCB#7
DCB#8
DCB#9
DCB#10
DCB#11
DCB#12
DCB#13
DCB#14
DCB#15
DCB#16
DCB#17
DCB#18
DCB#19
DCB#20
DCB#21
DCB#22
DCB#23
DCB#24
DCB#25
DCB#26
DCB#27
DCB#28
DCB#29
DCB#30
DCB#31
DCB#32
DCB#33
DCB#34
DCB#35
DCB#36
DCB#37
DCB#38
DCB#39
DCB#40