STORMWATER MANAGEMENT REPORT

LINCOLN AVENUE REZONING PROJECT
WAUKESHA, WI

July 30, 2021

PREPARED BY

K. SINGH & ASSOCIATES, INC.
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PROJECT #40430

TABLE OF CONTENTS

List of Appendices

Section I. Introduction

1.1 Project Overview

K. Singh & Associates, Inc. (KSingh) was retained to provide Civil Engineering design services for the planned Lincoln Avenue re-surfacing/re-configuration project located off Lincoln Avenue in the City of Waukesha. The site is a gravel lot and positioned west of Les Paul Parkway. Refer to Appendix A for civil plans, Plat of Survey, CSM and Rezoning Exhibit.

The re-development includes re-surfacing a semi-truck parking lot, installation of concrete car wash area, and landscaping on the project site boundaries.

1.2 Code Compliance

This project is a re-development of an existing site. Please see below for a summary of the proposed site activities:

- Total area of property = 8.38 acres (Lot 1 & Lot 2)
- Total area of project limits = 2.82 acres
- *Total area of disturbance = 0.83 acres
- Impervious area before construction = 2.82 acres
- Total Impervious after construction = 2.50 acres

*Area where subgrade is disturbed

Please refer to the Appendix B for SWMP-1 to view the existing conditions drainage areas. Please refer to Appendix C for SWMP-2 which includes the proposed conditions drainage areas.

1.3 Legal Description of the Property and Owner Information

- A Plat of Survey, Certified Survey Map, and Rezoning Exhibit with legal description by Chaput Land Surveys can be found in Appendix A.
- The Owner for this project is Mr. Del Singh.

1.4 Report Organization

The following information presented in this report details the design assumptions, computations, conclusions, and recommendations for the proposed development. This report is organized into three sections. Section I provides an introduction for the proposed development. Section II provides a narrative of the stormwater management methodology for the development. Section III provides a certification of the site investigation, plans, designs, computations, and drawings.

1.5 Limitations of Assessment

The existing conditions were developed using a Plat of Survey by Chaput Land Surveys. Please refer to Appendix A for the Plat of Survey, CSM, and Rezoning Exhibit.

Section II. Project Narrative

2.1 Pre-development Conditions

2.1.1 Pre-development Watershed Description

The existing site is currently all gravel. The gravel was modeled as impervious surface in the pre-development condition. Please refer to SWMP-1 in Appendix B for more details on the breakdown of the existing drainage areas.

2.1.2 Topography and Surface Water Drainage

The existing surface elevation of the site ranges from 864' in the northwest corner to 857' in the southwest corner. A small portion of the southwest area of the site runs off site untreated, as does the northern section of the car wash area. Please refer to Appendix A for the Plat of Survey and Storm Map and Appendix B for SWMP-1 showing the existing drainage areas.

2.2 Post-development Conditions

2.2.1 Post-development Watershed Description

The total analysis area for the site is 2.82 acres. For stormwater purposes, only 0.83 acres of the project area has subgrade disturbance which occurs at the gravel semi-truck parking area. Within the area of analysis, 2.5 acres is proposed impervious area, and 0.32 acres is proposed pervious area.

2.2.2 Method of Analysis

The analysis of the pre and post-developed site was performed utilizing HydroCAD® Storm Water Analysis version 10.1. The analysis uses TR-55 methodology for hydrologic and hydraulic analysis.

2.2.3 Topography and Surface Water Drainage

The onsite overall drainage patterns flow from west to east and north to south. There is one existing pond located in the southeastern corner of the site and outlets to Lincoln Ave. The proposed drainage patterns will follow existing drainage patterns.

2.3 Site Hydrologic and Hydraulic Characteristics

Hydrologic and hydraulic volumetric design analyses were required to determine peak storm water runoff volumes from the site for existing and proposed post-developed conditions.

The following table summarize the storm event rainfall depths used during the analysis:

Table 1 – Storm Event Rainfall Depths

Storm Event (year)	Rainfall (inches) *
1	2.40
2	2.70
10	3.81
100	6.18

*Rainfall data is based on the MSE3 Distribution

2.3.1 Proposed Condition Peak Volumes

The proposed land slopes for the site will be 1.5% to 3.5%, with 15% being the typical maximum land slope in landscaped areas. Please refer to Appendix B for existing hydrologic inputs and output and Appendix C for the proposed hydrologic inputs and output.

An existing dry pond located on the southeast portion of the site is designed to capture and control the release rate of the site runoff in the existing and proposed conditions.

Table 2 summarizes the existing and proposed total peak volume discharge for the site:

Table 3 – Total Peak Volume Discharge

Rain Event	Existing Condition (cfs)	Proposed Condition (cfs)
1-Yr	0.50	0.32
2-Yr	0.57	0.37
10-Yr	0.84	0.56
100-Yr	1.81	1.67

* TR-55 used for methodology.

Table 3 summarizes the existing and proposed pond peak runoff release rates for the site:

Table 4 – Pond Peak Runoff Release Rate

Rain Event	Existing Condition (cfs)	Proposed Condition (cfs)
100-Yr	1.71	1.60

* TR-55 used for methodology.

Section III. Certification of Plans, Designs, Computations, and Drawings

3.1 Certification of Report

All plans, designs, computations, and drawings are certified by a Wisconsin-licensed professional engineer prepared in accordance with accepted engineering practice and requirements of the ordinance.

Section IV. References

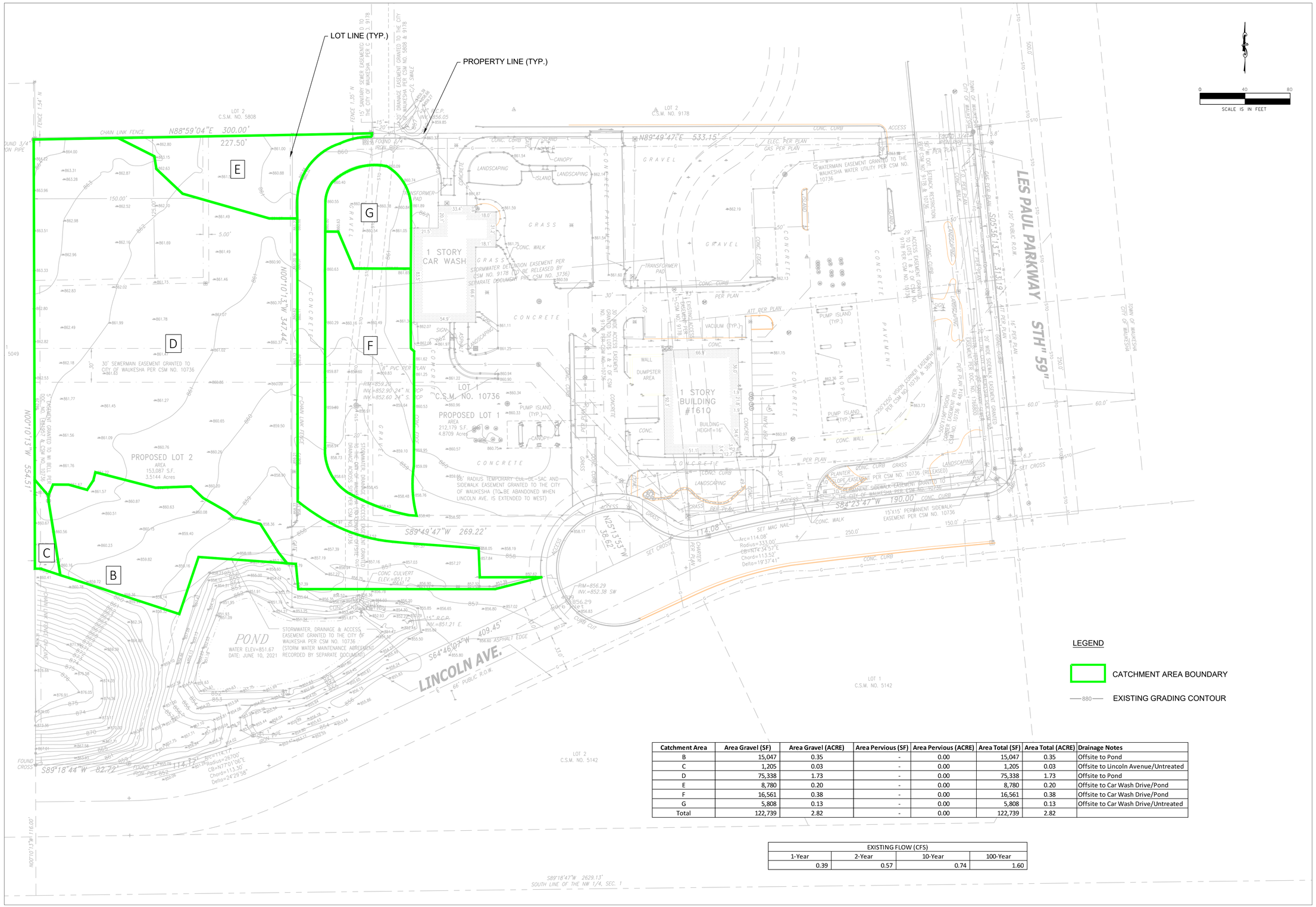
1. Web Page: http://hdsc.nws.noaa.gov/hdsc/pfds/ Location of “Precipitation Frequency Data Server”

Appendix A

Civil Plans, Plat of Survey, CSM & Rezoning Exhibit

Appendix B

Existing SWMP-1 and Hydrologic & Hydraulic Output



LEGEND

CATCHMENT AREA BOUNDARY

880 EXISTING GRADING CONTOUR

Catchment Area	Area Gravel (SF)	Area Gravel (ACRE)	Area Pervious (SF)	Area Pervious (ACRE)	Area Total (SF)	Area Total (ACRE)	Drainage Notes
B	15,047	0.35	-	0.00	15,047	0.35	Offsite to Pond
C	1,205	0.03	-	0.00	1,205	0.03	Offsite to Lincoln Avenue/Untreated
D	75,338	1.73	-	0.00	75,338	1.73	Offsite to Pond
E	8,780	0.20	-	0.00	8,780	0.20	Offsite to Car Wash Drive/Pond
F	16,561	0.38	-	0.00	16,561	0.38	Offsite to Car Wash Drive/Pond
G	5,808	0.13	-	0.00	5,808	0.13	Offsite to Car Wash Drive/Untreated
Total	122,739	2.82	-	0.00	122,739	2.82	

EXISTING FLOW (CFS)			
1-Year	2-Year	10-Year	100-Year
0.39	0.57	0.74	1.60

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3636 North 124th Street
Wauwatosa, WI 53222
262-821-1171

CONSULTANT

CONSULTANT

PROJECT TITLE: LINCOLN AVE SITE PLAN

CLIENT: MR. DEL SINGH

PROJECT LOCATION: 1610 LINCOLN AVE, WAUKESHA, WI

REVISIONS	DATE	DESCRIPTION

DRAWN BY	DATE
S. BHANDARI / R. TOY	07/02/2021
CHECKED BY	DATE
A. SINGH	07/02/2021

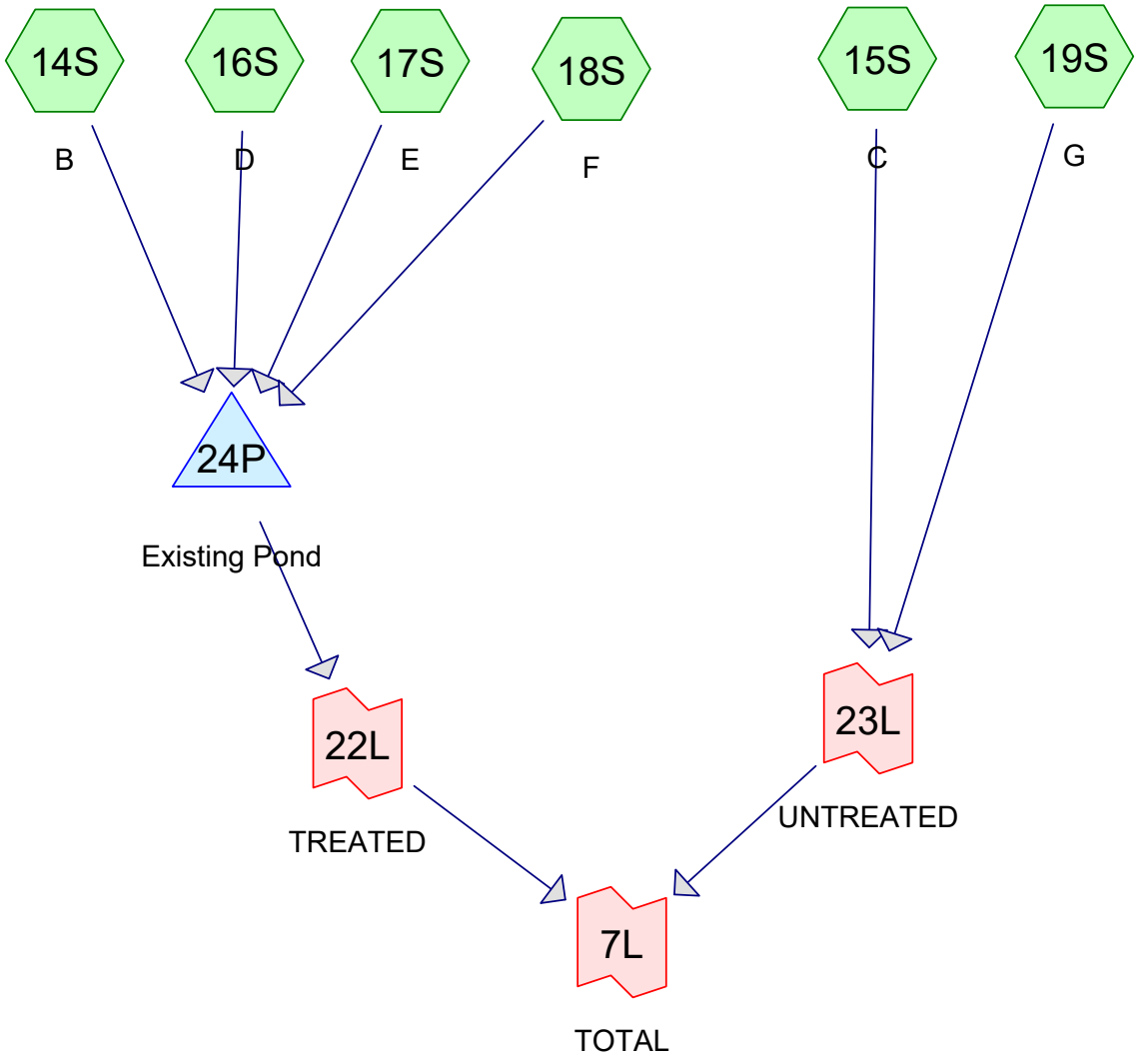
SHEET TITLE

EXISTING CONDITIONS

SWMP 1

SHEET XX of SHEET XX

EXISTING



Subcat Reach Pond Link

Routing Diagram for Proposed and Existing Conditions
Prepared by Microsoft, Printed 7/30/2021

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
100,370	89	IMP (GRAVEL) (14S, 15S, 16S, 17S)
22,369	96	IMP (GRAVEL) (18S, 19S)
122,739	**90**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
0	HSG D	
122,739	Other	14S, 15S, 16S, 17S, 18S, 19S
122,739		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
0	0	0	0	122,739	122,739	IMP (GRAVEL)	14S, 15S, 16S, 17S, 18S, 19S
0	**0**	**0**	**0**	**122,739**	**122,739**	**TOTAL AREA**	

Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 14S: B Runoff Area=15,047 sf 0.00% Impervious Runoff Depth>1.37"
Tc=6.0 min CN=89 Runoff=0.84 cfs 1,714 cf

Subcatchment 15S: C Runoff Area=1,205 sf 0.00% Impervious Runoff Depth>1.37"
Tc=6.0 min CN=89 Runoff=0.07 cfs 137 cf

Subcatchment 16S: D Runoff Area=75,338 sf 0.00% Impervious Runoff Depth>1.37"
Tc=6.0 min CN=89 Runoff=4.20 cfs 8,584 cf

Subcatchment 17S: E Runoff Area=8,780 sf 0.00% Impervious Runoff Depth>1.37"
Tc=6.0 min CN=89 Runoff=0.49 cfs 1,000 cf

Subcatchment 18S: F Runoff Area=16,561 sf 0.00% Impervious Runoff Depth>1.96"
Tc=6.0 min CN=96 Runoff=1.23 cfs 2,709 cf

Subcatchment 19S: G Runoff Area=5,808 sf 0.00% Impervious Runoff Depth>1.96"
Tc=6.0 min CN=96 Runoff=0.43 cfs 950 cf

Pond 24P: Existing Pond Peak Elev=852.50' Storage=14,006 cf Inflow=6.76 cfs 14,008 cf
Outflow=0.00 cfs 0 cf

Link 7L: TOTAL Inflow=0.50 cfs 1,087 cf
Primary=0.50 cfs 1,087 cf

Link 22L: TREATED Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 23L: UNTREATED Inflow=0.50 cfs 1,087 cf
Primary=0.50 cfs 1,087 cf

Total Runoff Area = 122,739 sf Runoff Volume = 15,095 cf Average Runoff Depth = 1.48"
100.00% Pervious = 122,739 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 14S: B

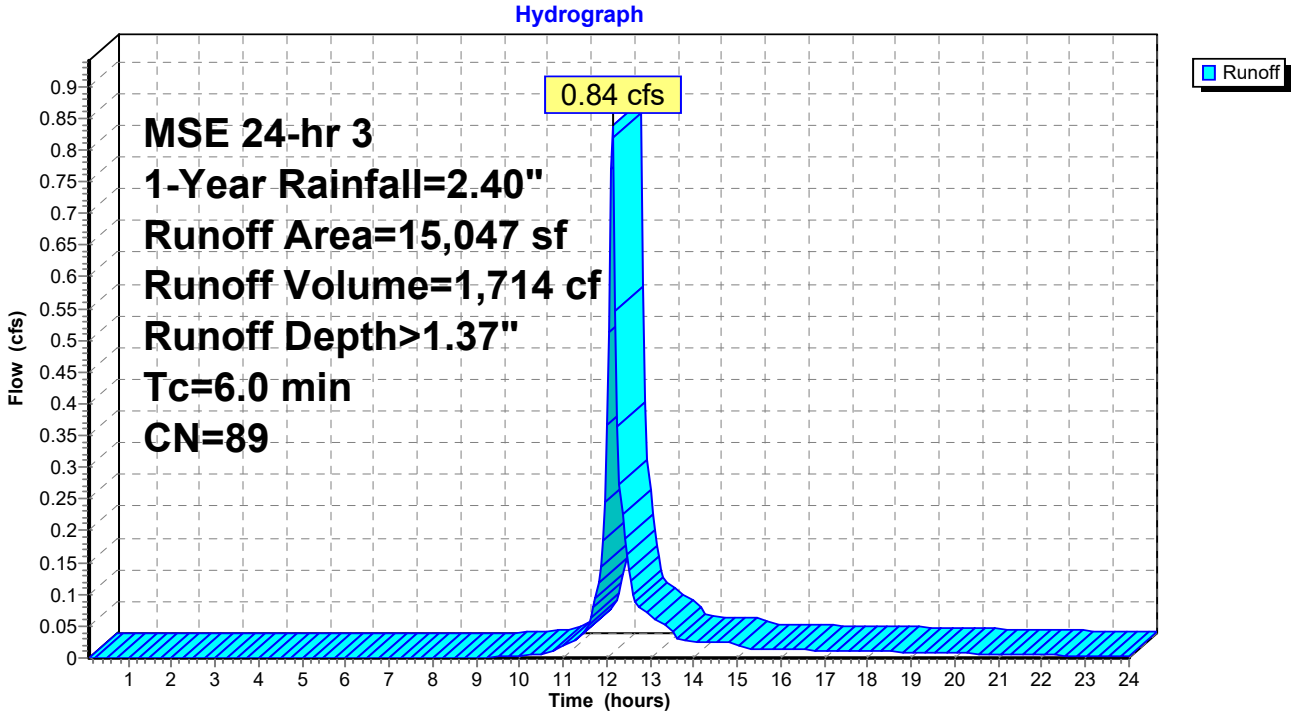
Runoff = 0.84 cfs @ 12.13 hrs, Volume= 1,714 cf, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	15,047	89	IMP (GRAVEL)
	15,047		100.00% Pervious Area

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

Subcatchment 14S: B



Summary for Subcatchment 15S: C

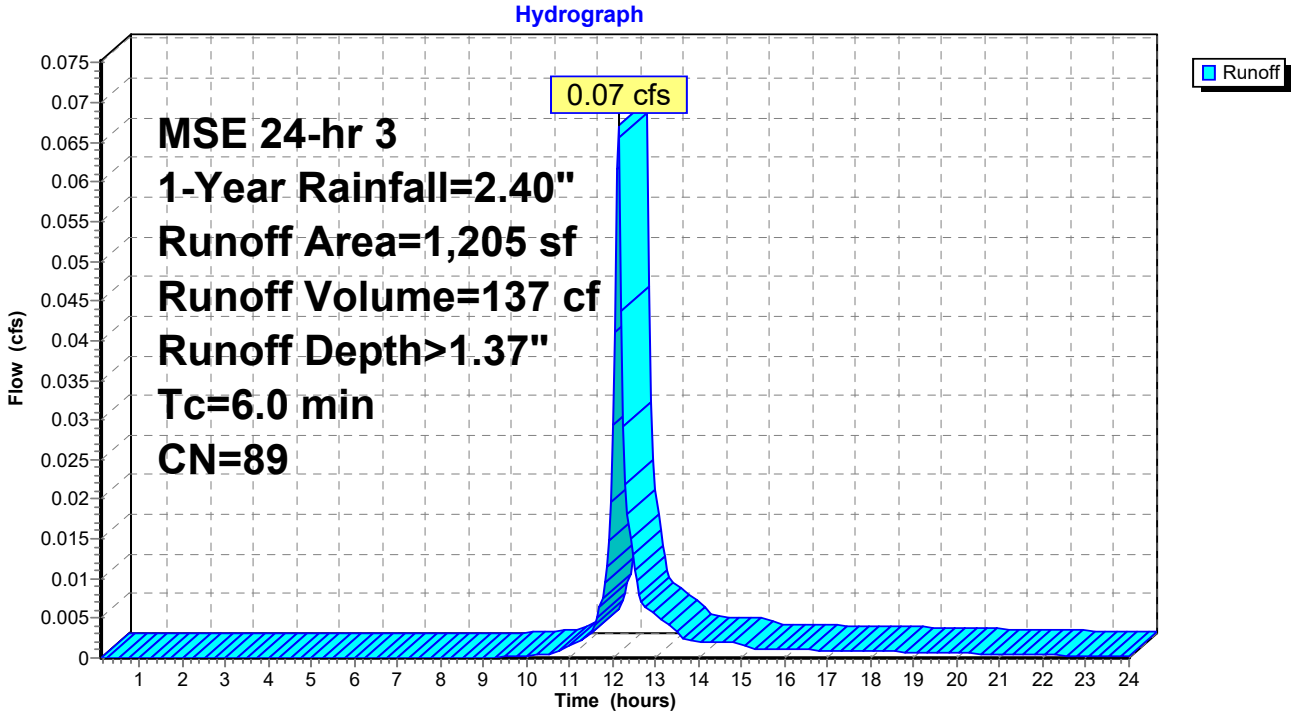
Runoff = 0.07 cfs @ 12.13 hrs, Volume= 137 cf, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,205	89	IMP (GRAVEL)
	1,205		100.00% Pervious Area

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

Subcatchment 15S: C



Summary for Subcatchment 16S: D

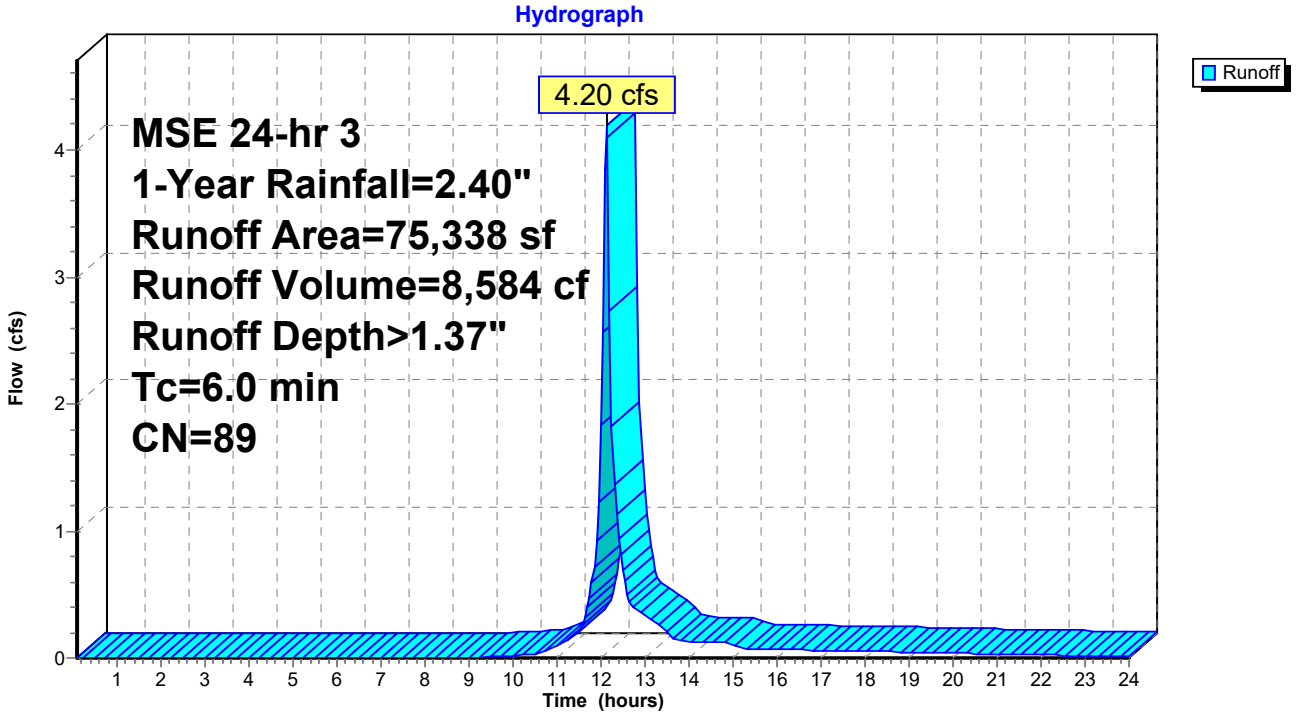
Runoff = 4.20 cfs @ 12.13 hrs, Volume= 8,584 cf, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	75,338	89	IMP (GRAVEL)
	75,338		100.00% Pervious Area

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

Subcatchment 16S: D



Summary for Subcatchment 17S: E

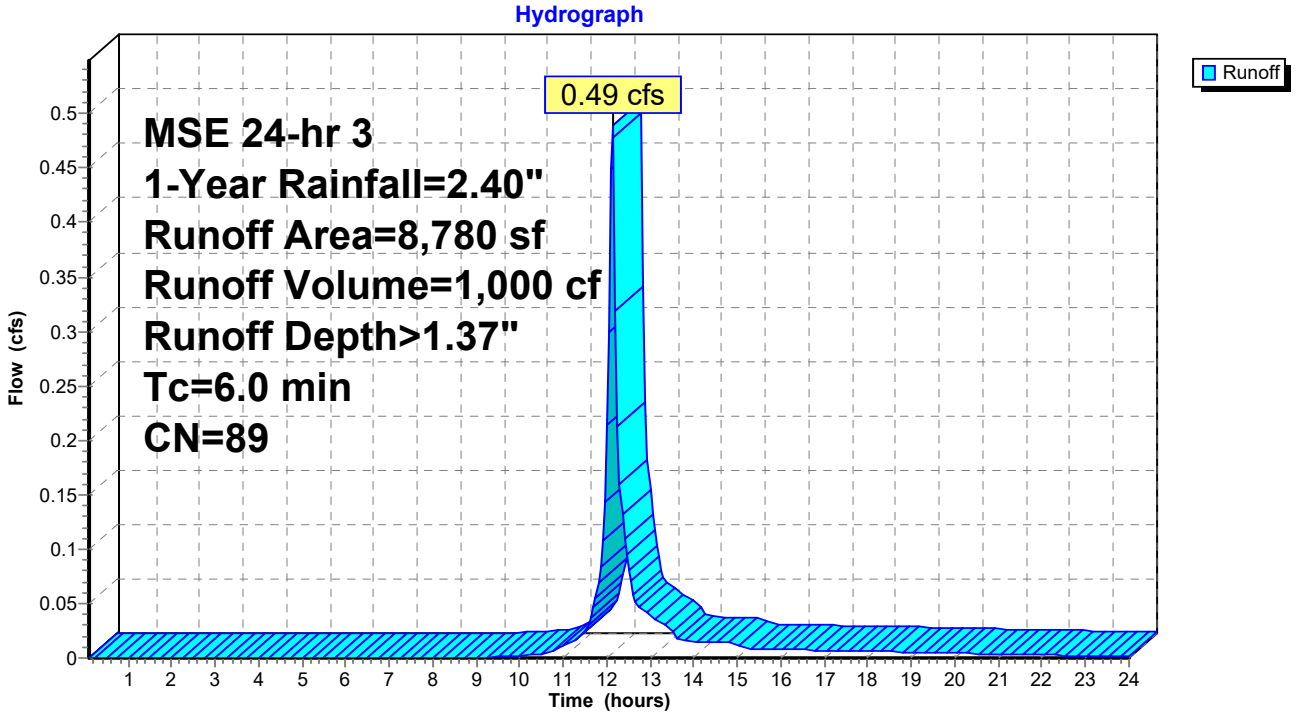
Runoff = 0.49 cfs @ 12.13 hrs, Volume= 1,000 cf, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	8,780	89	IMP (GRAVEL)
	8,780		100.00% Pervious Area

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

Subcatchment 17S: E



Summary for Subcatchment 18S: F

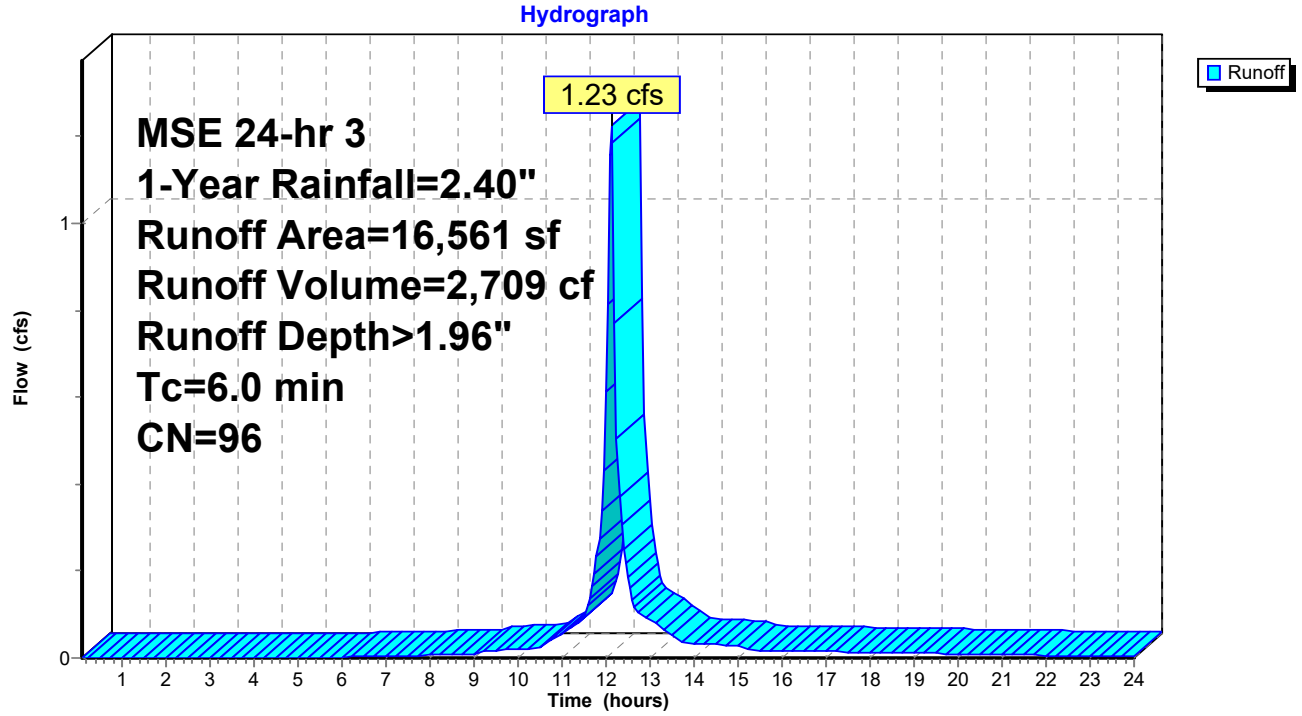
Runoff = 1.23 cfs @ 12.13 hrs, Volume= 2,709 cf, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	16,561	96	IMP (GRAVEL)
	16,561		100.00% Pervious Area

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

Subcatchment 18S: F



Summary for Subcatchment 19S: G

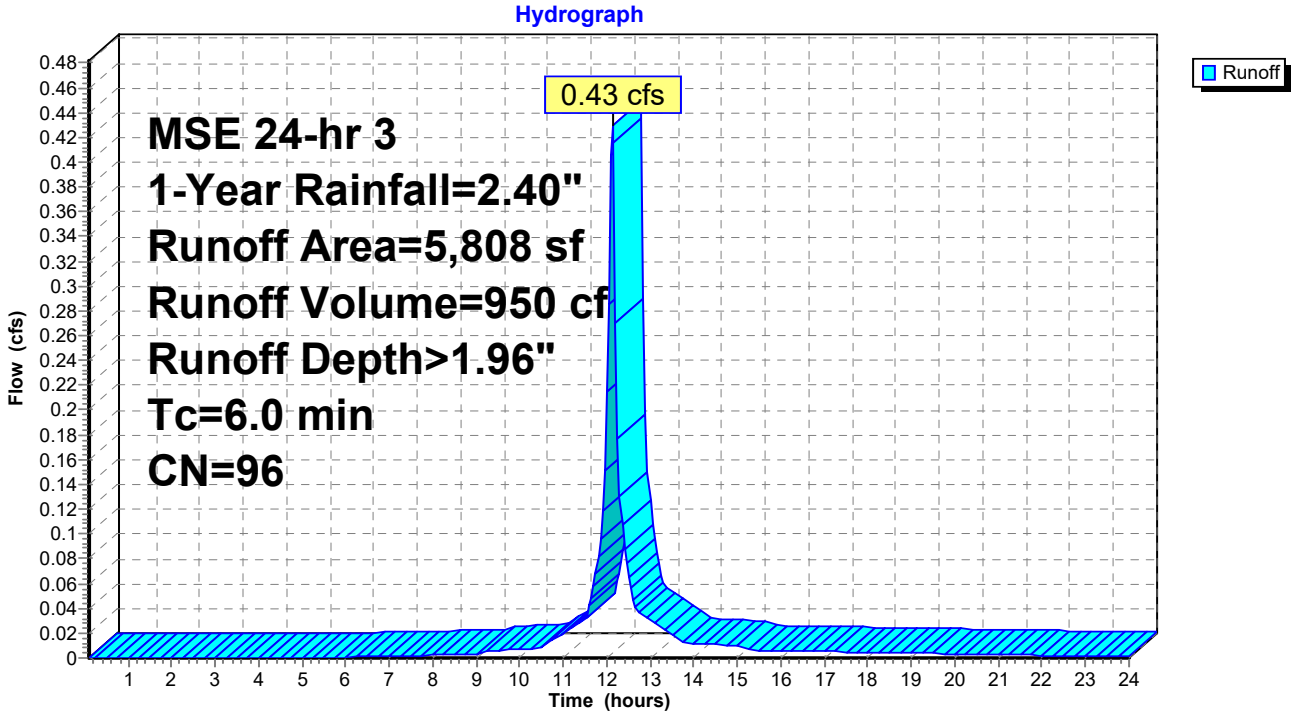
Runoff = 0.43 cfs @ 12.13 hrs, Volume= 950 cf, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	5,808	96	IMP (GRAVEL)
	5,808		100.00% Pervious Area

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

Subcatchment 19S: G



Summary for Pond 24P: Existing Pond

Inflow Area = 115,726 sf, 0.00% Impervious, Inflow Depth > 1.45" for 1-Year event
Inflow = 6.76 cfs @ 12.13 hrs, Volume= 14,008 cf
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 852.50' @ 24.00 hrs Surf.Area= 11,113 sf Storage= 14,006 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

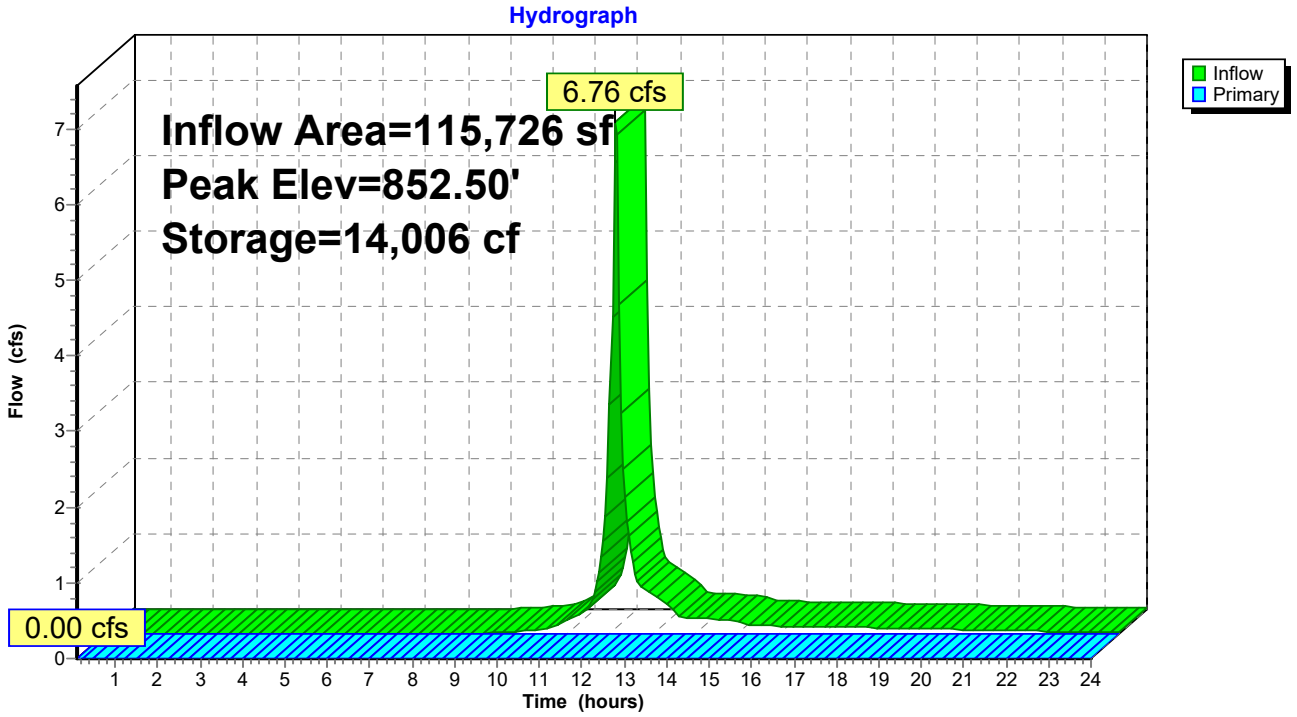
Volume	Invert	Avail.Storage	Storage Description
#1	851.00'	48,791 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
851.00	7,572	0	0
852.00	9,963	8,768	8,768
853.00	12,276	11,120	19,887
854.00	14,385	13,331	33,218
855.00	16,761	15,573	48,791

Device	Routing	Invert	Outlet Devices
#1	Primary	854.00'	**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=0.00 cfs @ 0.10 hrs HW=851.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 24P: Existing Pond

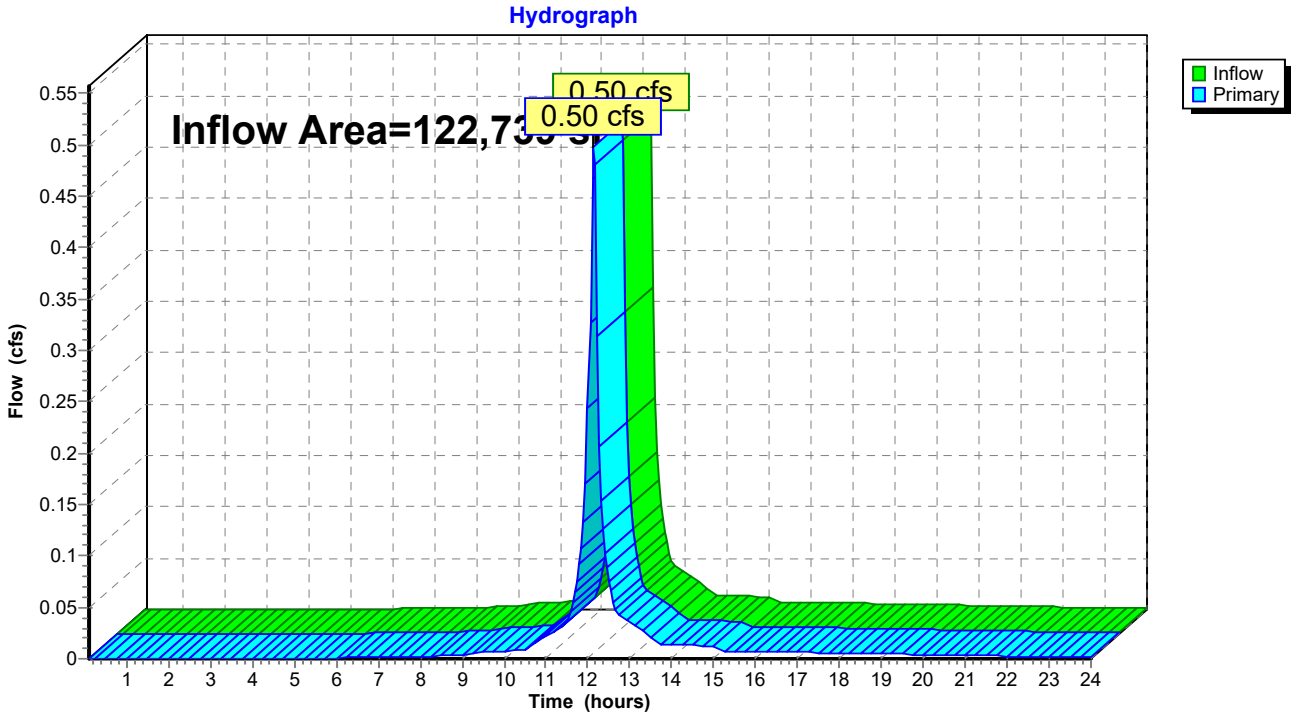


Summary for Link 7L: TOTAL

Inflow Area = 122,739 sf, 0.00% Impervious, Inflow Depth > 0.11" for 1-Year event
Inflow = 0.50 cfs @ 12.13 hrs, Volume= 1,087 cf
Primary = 0.50 cfs @ 12.13 hrs, Volume= 1,087 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 7L: TOTAL

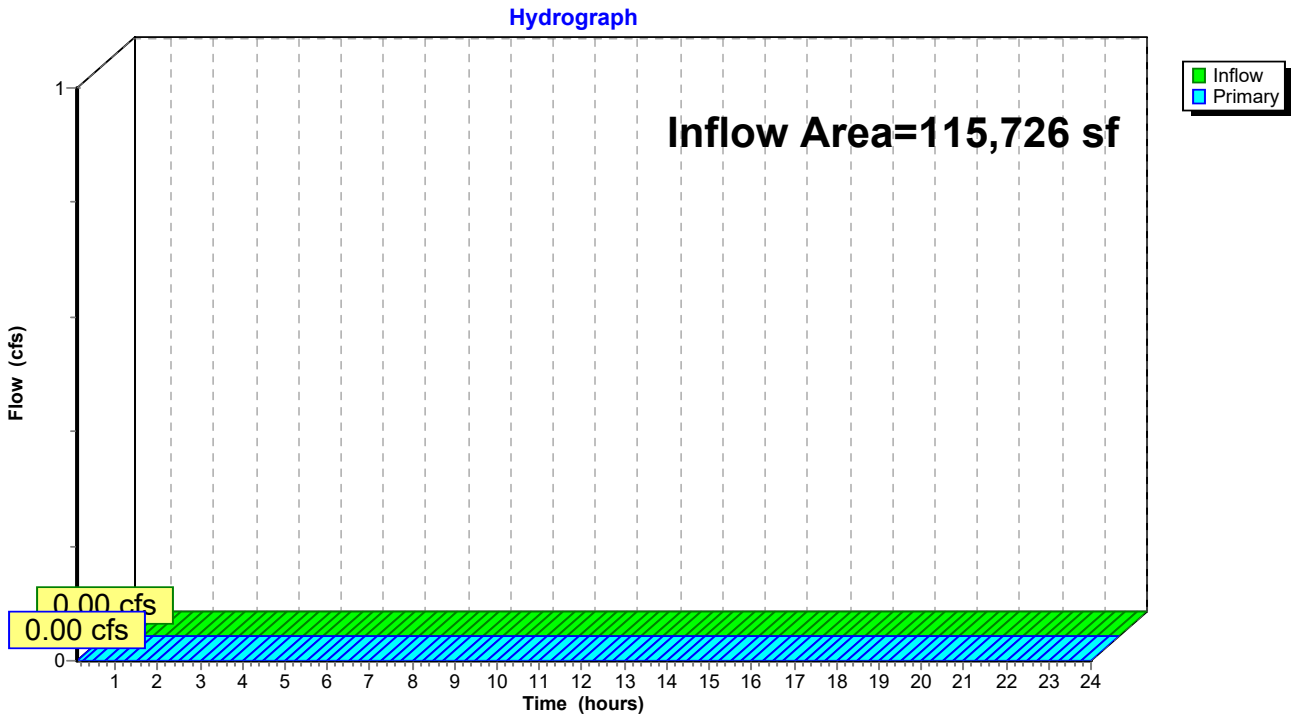


Summary for Link 22L: TREATED

Inflow Area = 115,726 sf, 0.00% Impervious, Inflow Depth = 0.00" for 1-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 22L: TREATED

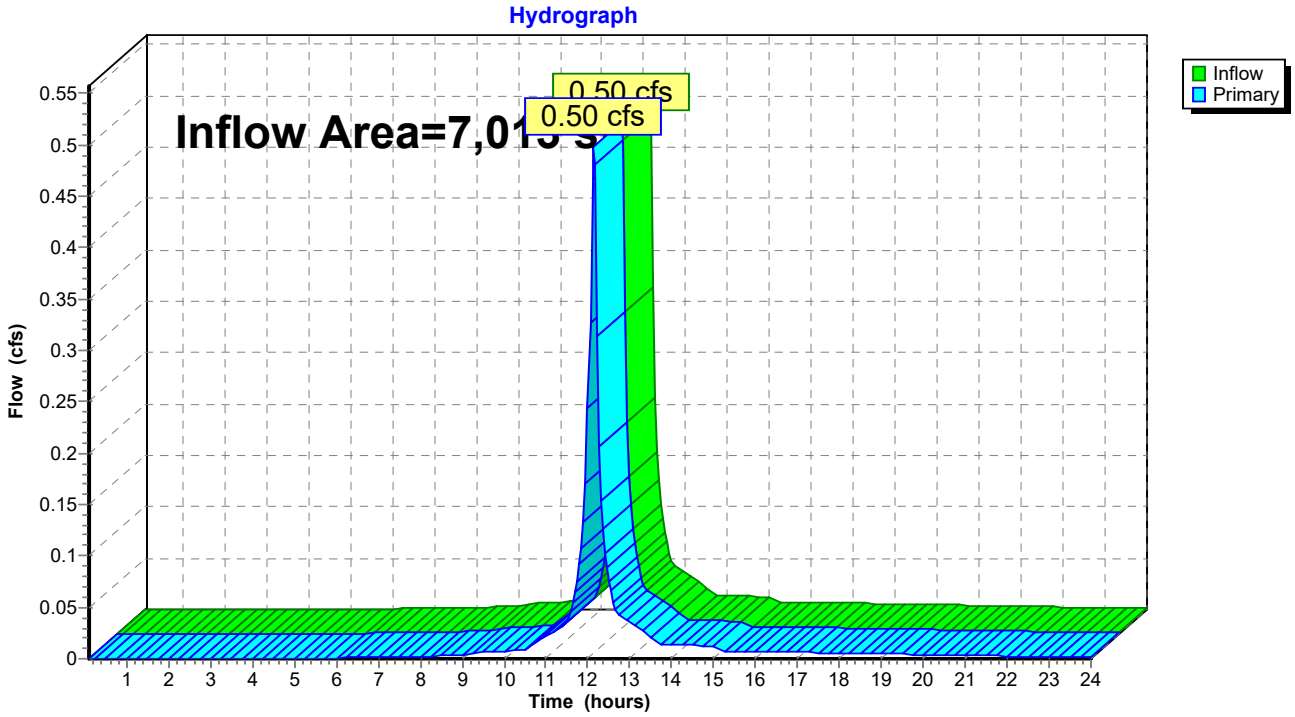


Summary for Link 23L: UNTREATED

Inflow Area = 7,013 sf, 0.00% Impervious, Inflow Depth > 1.86" for 1-Year event
Inflow = 0.50 cfs @ 12.13 hrs, Volume= 1,087 cf
Primary = 0.50 cfs @ 12.13 hrs, Volume= 1,087 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 23L: UNTREATED



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 14S: B Runoff Area=15,047 sf 0.00% Impervious Runoff Depth>1.63"
Tc=6.0 min CN=89 Runoff=1.00 cfs 2,045 cf

Subcatchment 15S: C Runoff Area=1,205 sf 0.00% Impervious Runoff Depth>1.63"
Tc=6.0 min CN=89 Runoff=0.08 cfs 164 cf

Subcatchment 16S: D Runoff Area=75,338 sf 0.00% Impervious Runoff Depth>1.63"
Tc=6.0 min CN=89 Runoff=4.98 cfs 10,237 cf

Subcatchment 17S: E Runoff Area=8,780 sf 0.00% Impervious Runoff Depth>1.63"
Tc=6.0 min CN=89 Runoff=0.58 cfs 1,193 cf

Subcatchment 18S: F Runoff Area=16,561 sf 0.00% Impervious Runoff Depth>2.26"
Tc=6.0 min CN=96 Runoff=1.40 cfs 3,115 cf

Subcatchment 19S: G Runoff Area=5,808 sf 0.00% Impervious Runoff Depth>2.26"
Tc=6.0 min CN=96 Runoff=0.49 cfs 1,092 cf

Pond 24P: Existing Pond Peak Elev=852.72' Storage=16,587 cf Inflow=7.95 cfs 16,589 cf
Outflow=0.00 cfs 0 cf

Link 7L: TOTAL Inflow=0.57 cfs 1,256 cf
Primary=0.57 cfs 1,256 cf

Link 22L: TREATED Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 23L: UNTREATED Inflow=0.57 cfs 1,256 cf
Primary=0.57 cfs 1,256 cf

Total Runoff Area = 122,739 sf Runoff Volume = 17,845 cf Average Runoff Depth = 1.74"
100.00% Pervious = 122,739 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 14S: B

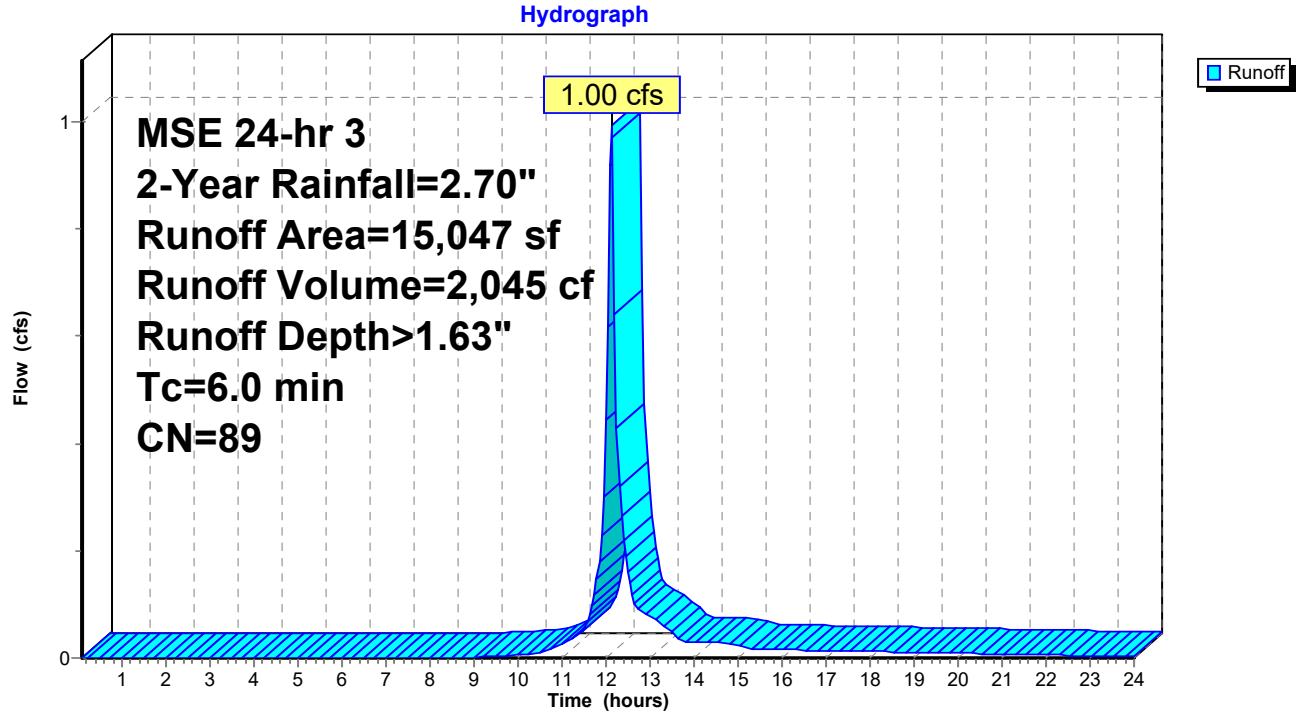
Runoff = 1.00 cfs @ 12.13 hrs, Volume= 2,045 cf, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	15,047	89	IMP (GRAVEL)
	15,047		100.00% Pervious Area

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

Subcatchment 14S: B



Summary for Subcatchment 15S: C

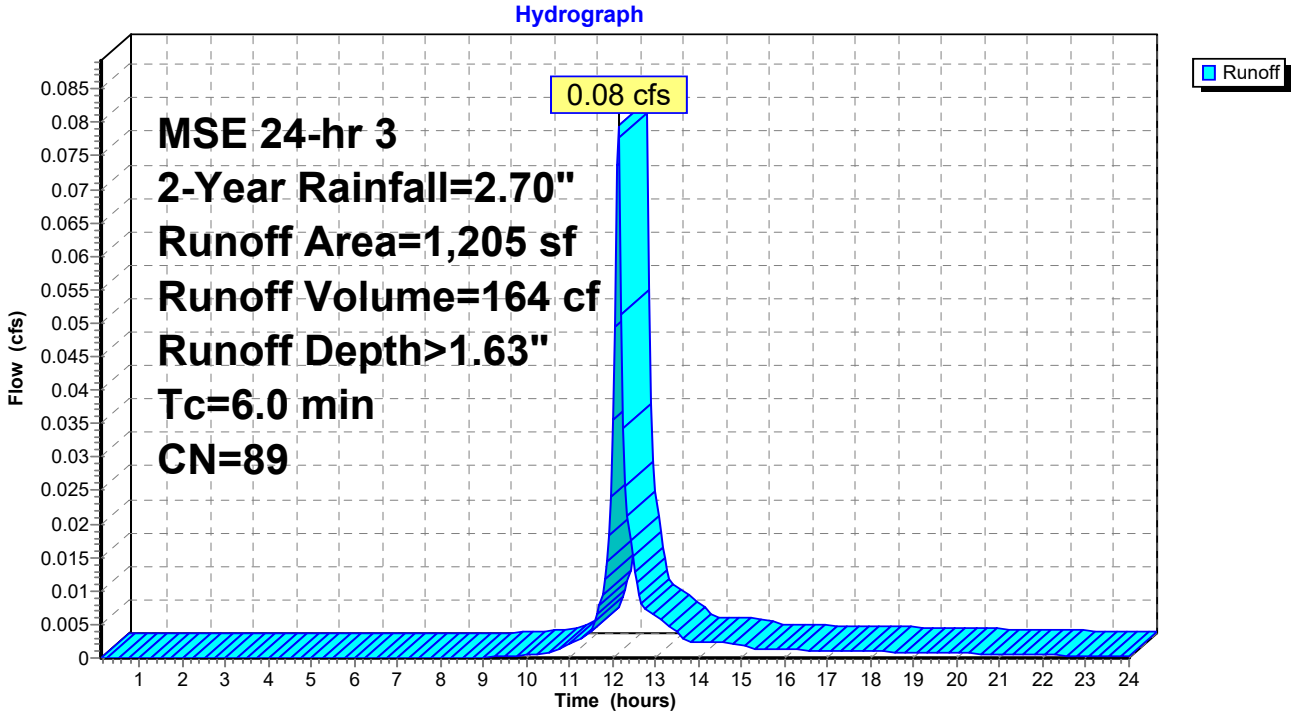
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 164 cf, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,205	89	IMP (GRAVEL)
	1,205		100.00% Pervious Area

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

Subcatchment 15S: C



Summary for Subcatchment 16S: D

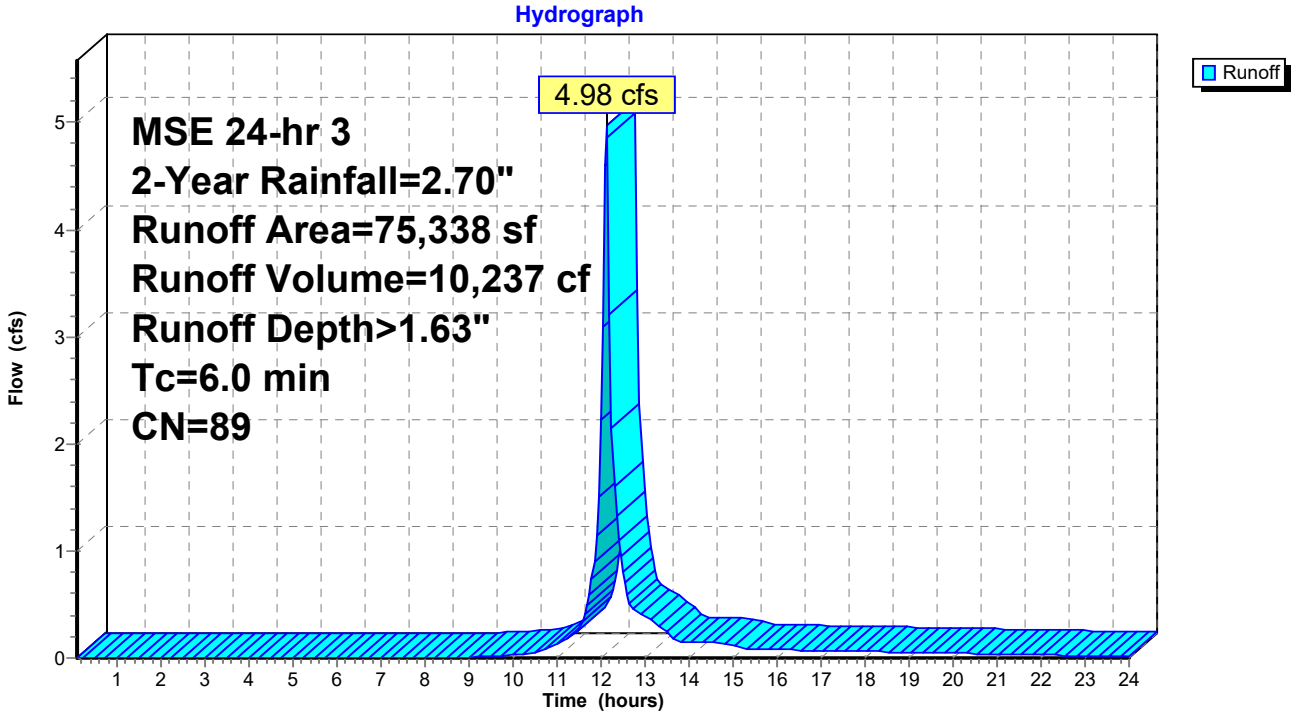
Runoff = 4.98 cfs @ 12.13 hrs, Volume= 10,237 cf, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	75,338	89	IMP (GRAVEL)
	75,338		100.00% Pervious Area

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

Subcatchment 16S: D



Summary for Subcatchment 17S: E

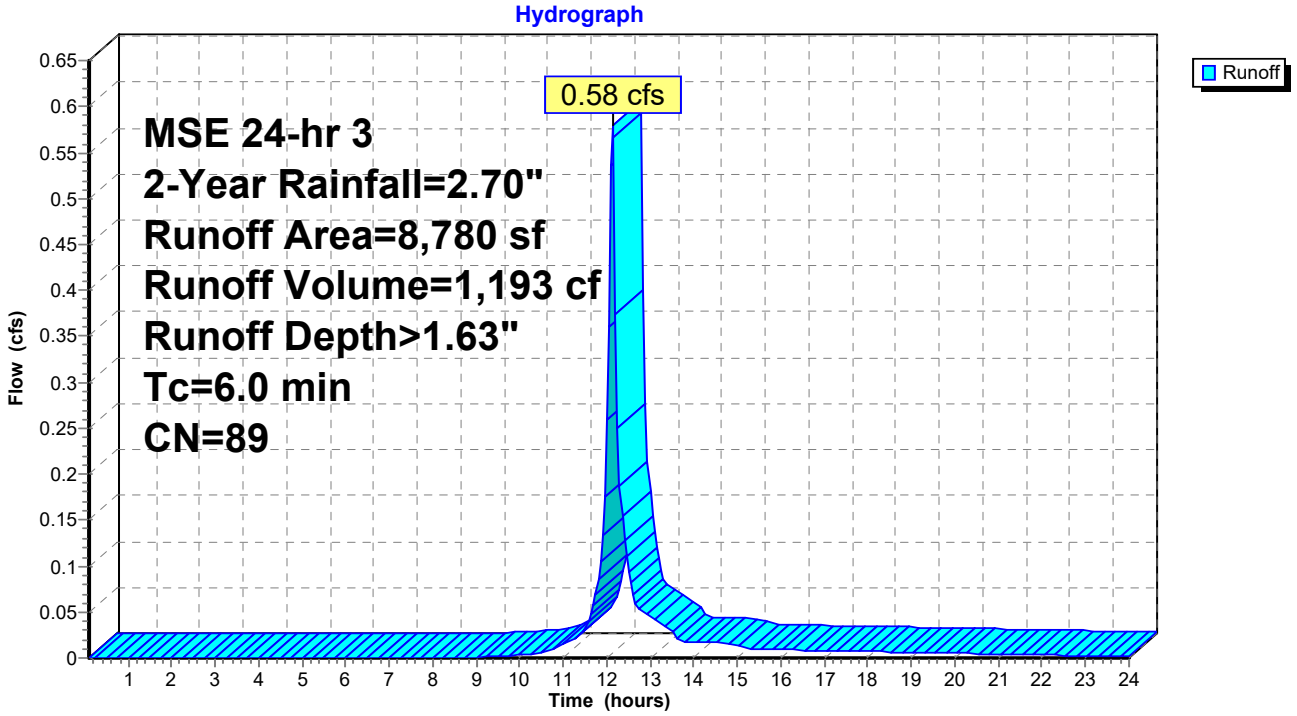
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 1,193 cf, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	8,780	89	IMP (GRAVEL)
	8,780		100.00% Pervious Area

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

Subcatchment 17S: E



Summary for Subcatchment 18S: F

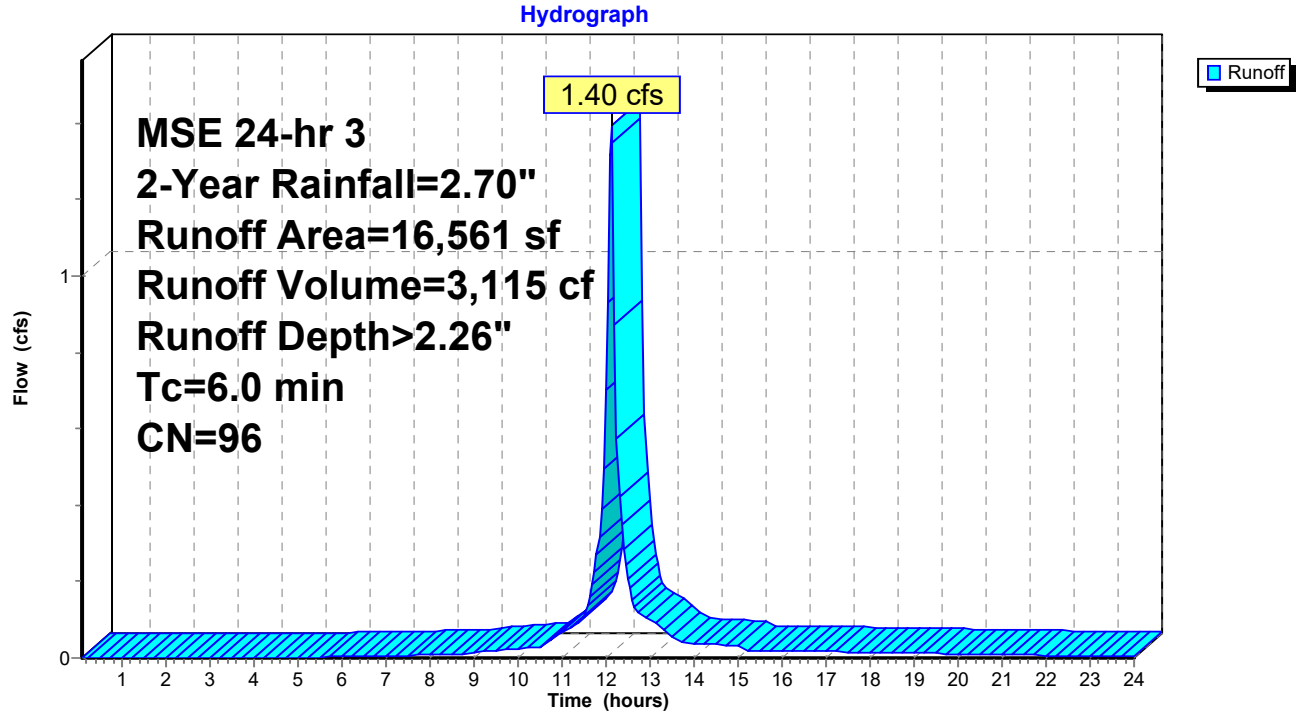
Runoff = 1.40 cfs @ 12.13 hrs, Volume= 3,115 cf, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	16,561	96	IMP (GRAVEL)
	16,561		100.00% Pervious Area

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

Subcatchment 18S: F



Summary for Subcatchment 19S: G

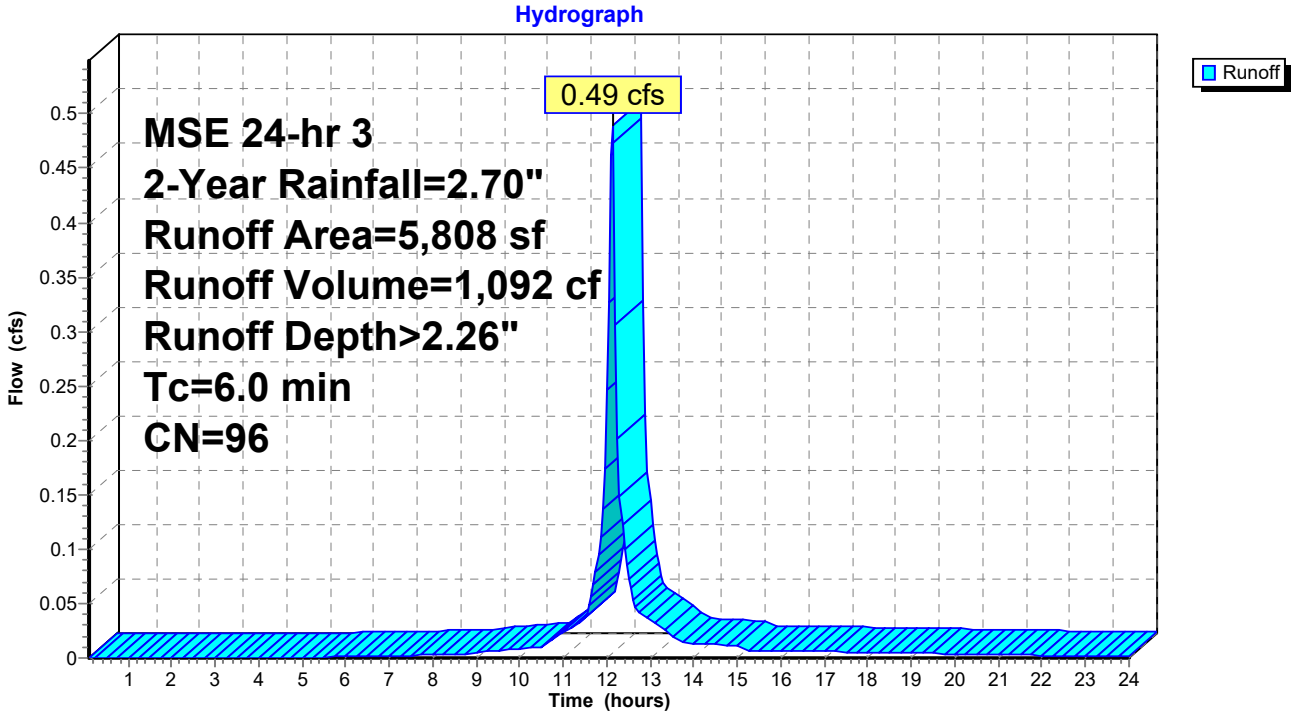
Runoff = 0.49 cfs @ 12.13 hrs, Volume= 1,092 cf, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	5,808	96	IMP (GRAVEL)
	5,808		100.00% Pervious Area

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

Subcatchment 19S: G



Summary for Pond 24P: Existing Pond

Inflow Area = 115,726 sf, 0.00% Impervious, Inflow Depth > 1.72" for 2-Year event
Inflow = 7.95 cfs @ 12.13 hrs, Volume= 16,589 cf
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 852.72' @ 24.00 hrs Surf.Area= 11,638 sf Storage= 16,587 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

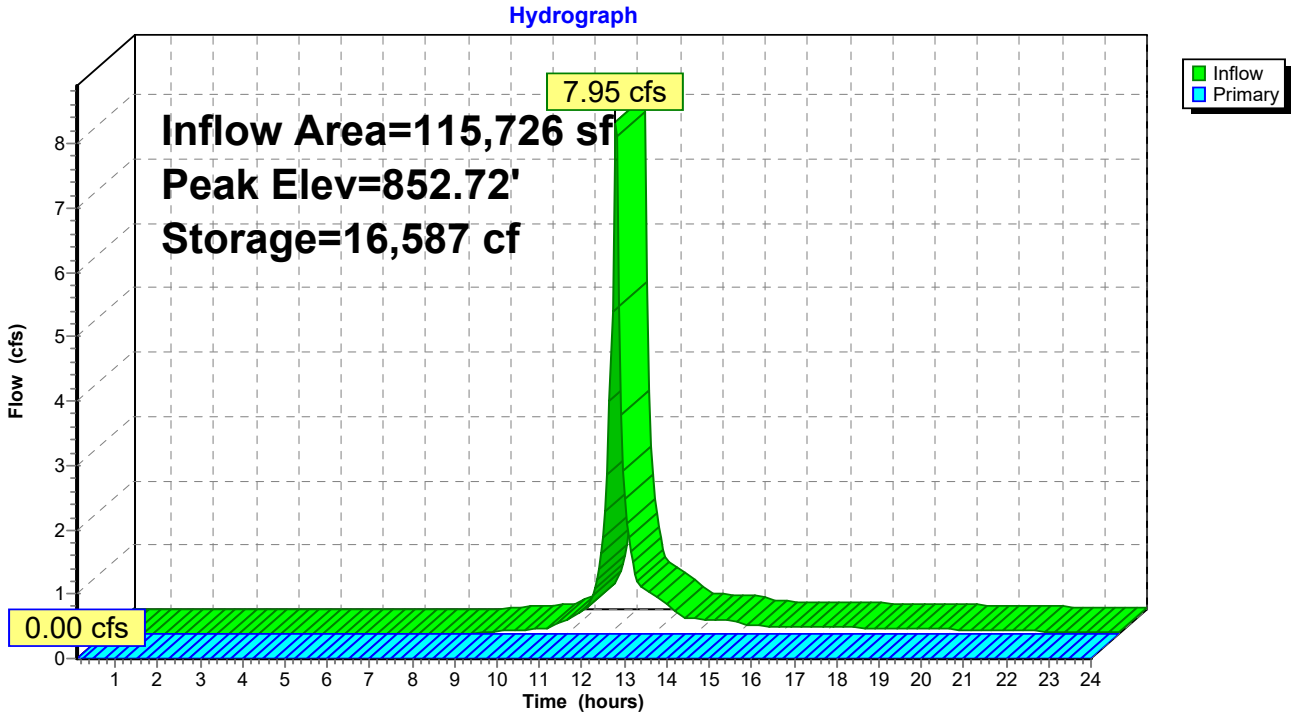
Volume	Invert	Avail.Storage	Storage Description
#1	851.00'	48,791 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
851.00	7,572	0	0
852.00	9,963	8,768	8,768
853.00	12,276	11,120	19,887
854.00	14,385	13,331	33,218
855.00	16,761	15,573	48,791

Device	Routing	Invert	Outlet Devices
#1	Primary	854.00'	**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=0.00 cfs @ 0.10 hrs HW=851.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 24P: Existing Pond

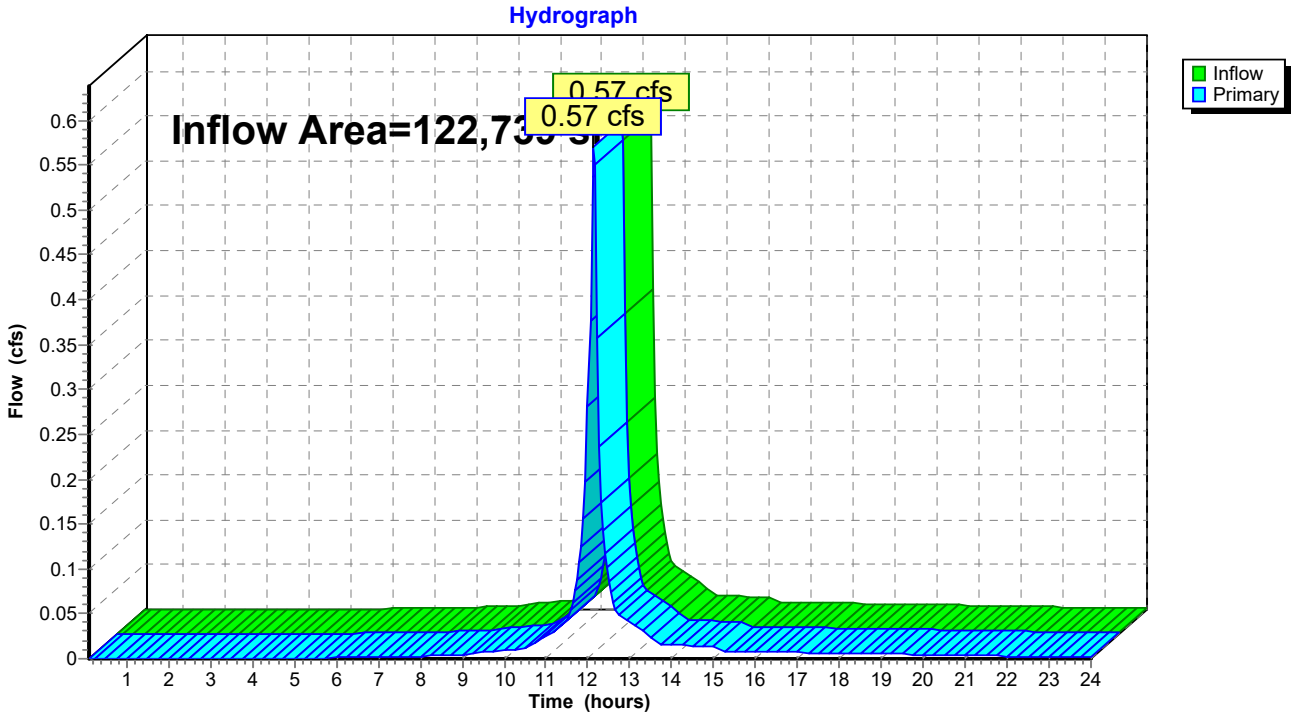


Summary for Link 7L: TOTAL

Inflow Area = 122,739 sf, 0.00% Impervious, Inflow Depth > 0.12" for 2-Year event
Inflow = 0.57 cfs @ 12.13 hrs, Volume= 1,256 cf
Primary = 0.57 cfs @ 12.13 hrs, Volume= 1,256 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 7L: TOTAL

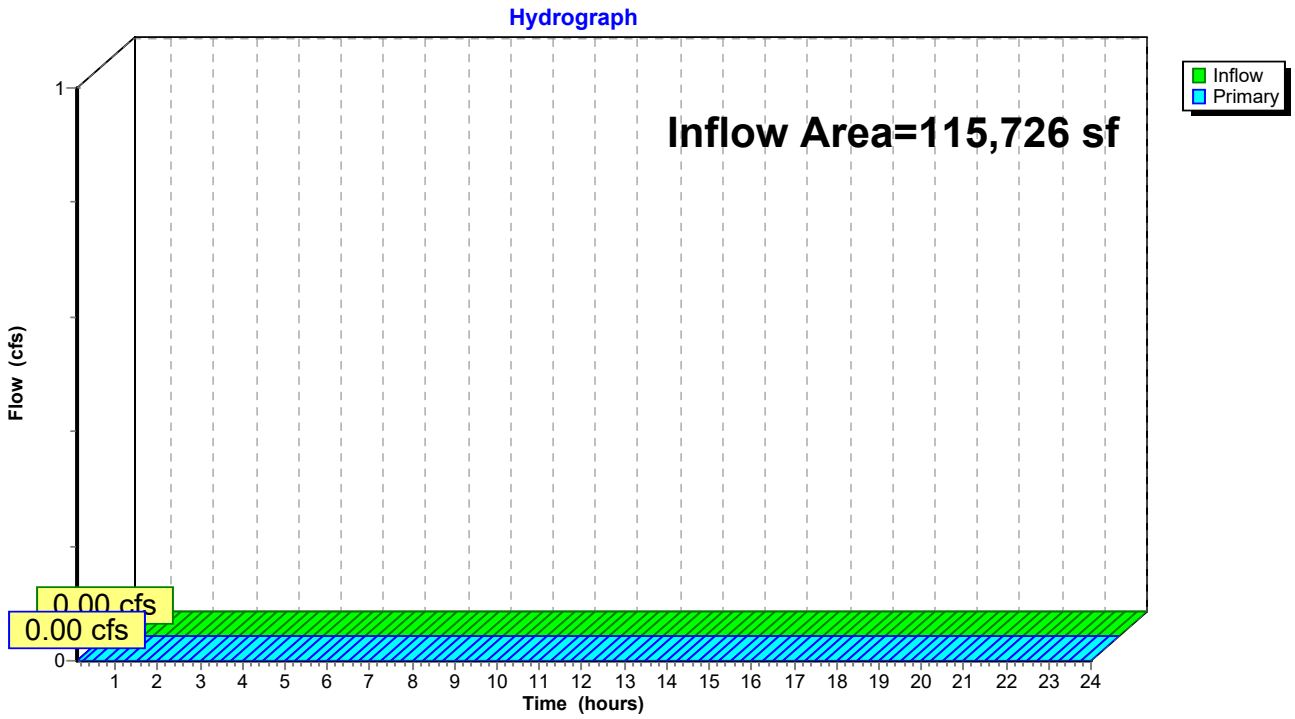


Summary for Link 22L: TREATED

Inflow Area = 115,726 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 22L: TREATED

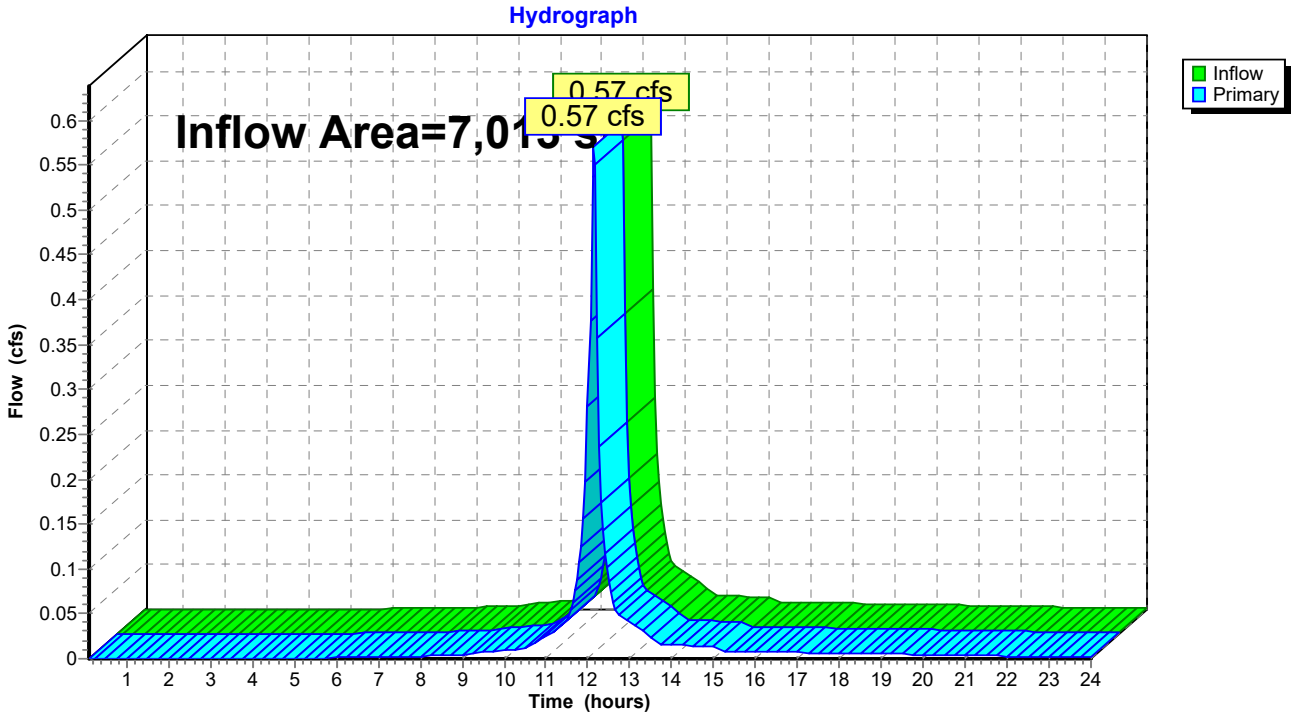


Summary for Link 23L: UNTREATED

Inflow Area = 7,013 sf, 0.00% Impervious, Inflow Depth > 2.15" for 2-Year event
Inflow = 0.57 cfs @ 12.13 hrs, Volume= 1,256 cf
Primary = 0.57 cfs @ 12.13 hrs, Volume= 1,256 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 23L: UNTREATED



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 14S: B Runoff Area=15,047 sf 0.00% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=89 Runoff=1.58 cfs 3,316 cf

Subcatchment 15S: C Runoff Area=1,205 sf 0.00% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=89 Runoff=0.13 cfs 266 cf

Subcatchment 16S: D Runoff Area=75,338 sf 0.00% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=89 Runoff=7.90 cfs 16,603 cf

Subcatchment 17S: E Runoff Area=8,780 sf 0.00% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=89 Runoff=0.92 cfs 1,935 cf

Subcatchment 18S: F Runoff Area=16,561 sf 0.00% Impervious Runoff Depth>3.35"
Tc=6.0 min CN=96 Runoff=2.02 cfs 4,625 cf

Subcatchment 19S: G Runoff Area=5,808 sf 0.00% Impervious Runoff Depth>3.35"
Tc=6.0 min CN=96 Runoff=0.71 cfs 1,622 cf

Pond 24P: Existing Pond Peak Elev=853.51' Storage=26,476 cf Inflow=12.42 cfs 26,479 cf
Outflow=0.00 cfs 0 cf

Link 7L: TOTAL Inflow=0.84 cfs 1,888 cf
Primary=0.84 cfs 1,888 cf

Link 22L: TREATED Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 23L: UNTREATED Inflow=0.84 cfs 1,888 cf
Primary=0.84 cfs 1,888 cf

Total Runoff Area = 122,739 sf Runoff Volume = 28,366 cf Average Runoff Depth = 2.77"
100.00% Pervious = 122,739 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 14S: B

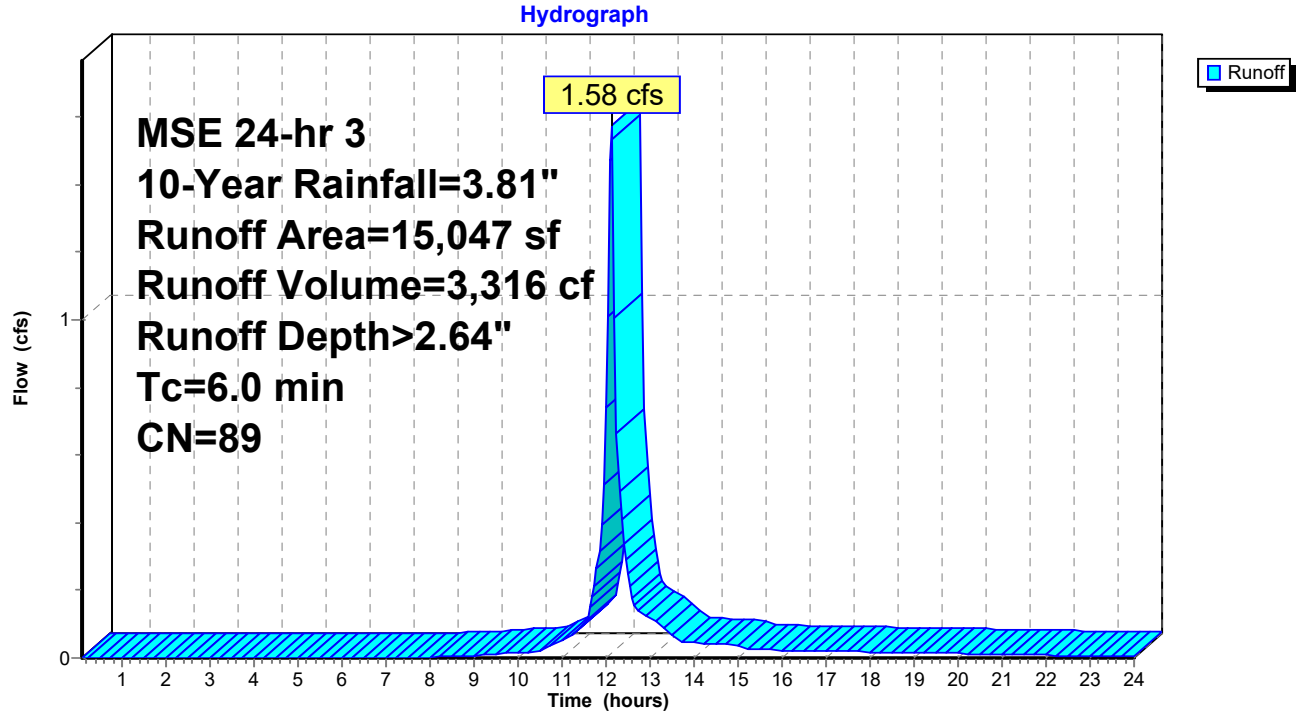
Runoff = 1.58 cfs @ 12.13 hrs, Volume= 3,316 cf, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	15,047	89	IMP (GRAVEL)
	15,047		100.00% Pervious Area

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

Subcatchment 14S: B



Summary for Subcatchment 15S: C

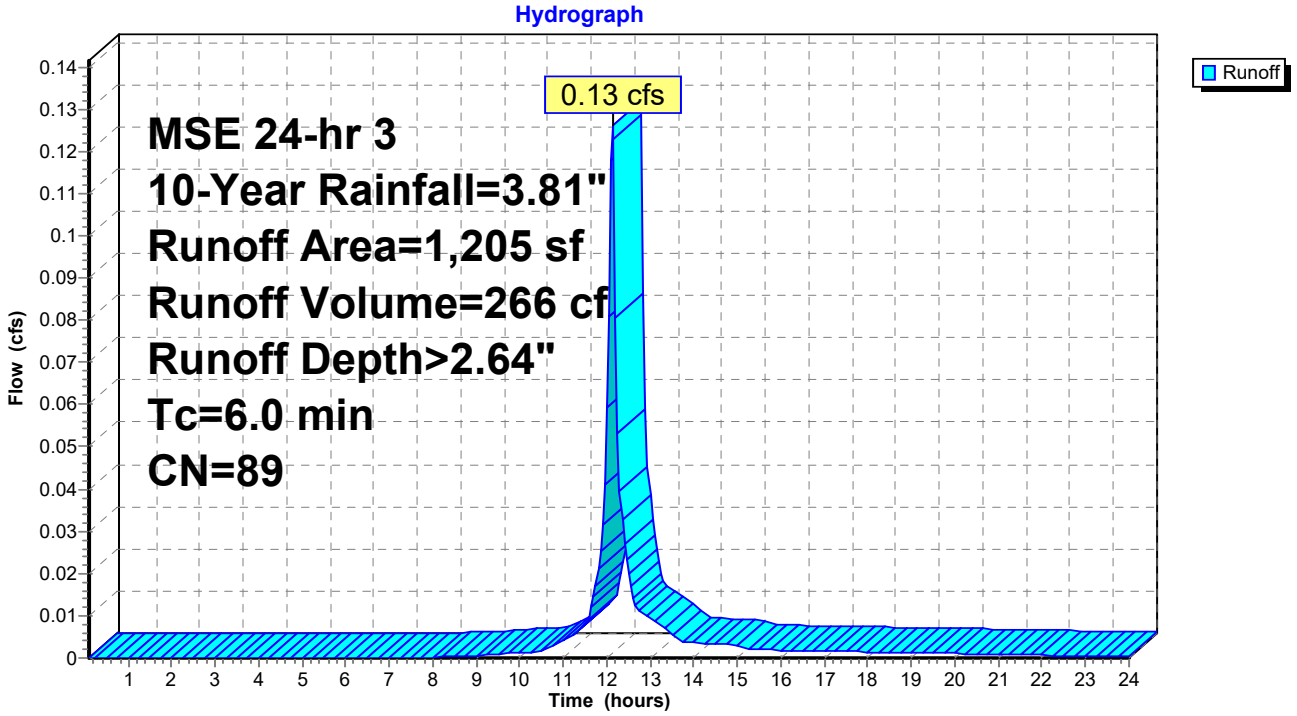
Runoff = 0.13 cfs @ 12.13 hrs, Volume= 266 cf, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,205	89	IMP (GRAVEL)
	1,205		100.00% Pervious Area

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

Subcatchment 15S: C



Summary for Subcatchment 16S: D

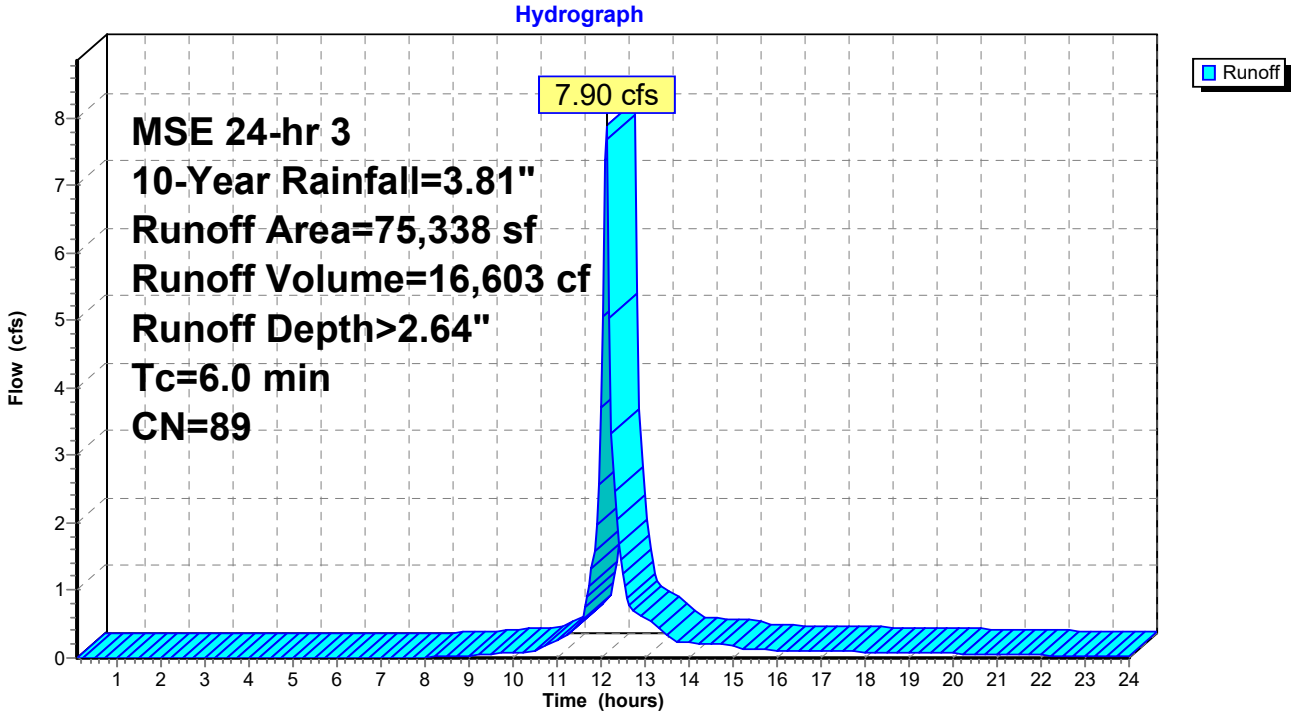
Runoff = 7.90 cfs @ 12.13 hrs, Volume= 16,603 cf, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	75,338	89	IMP (GRAVEL)
	75,338		100.00% Pervious Area

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

Subcatchment 16S: D



Summary for Subcatchment 17S: E

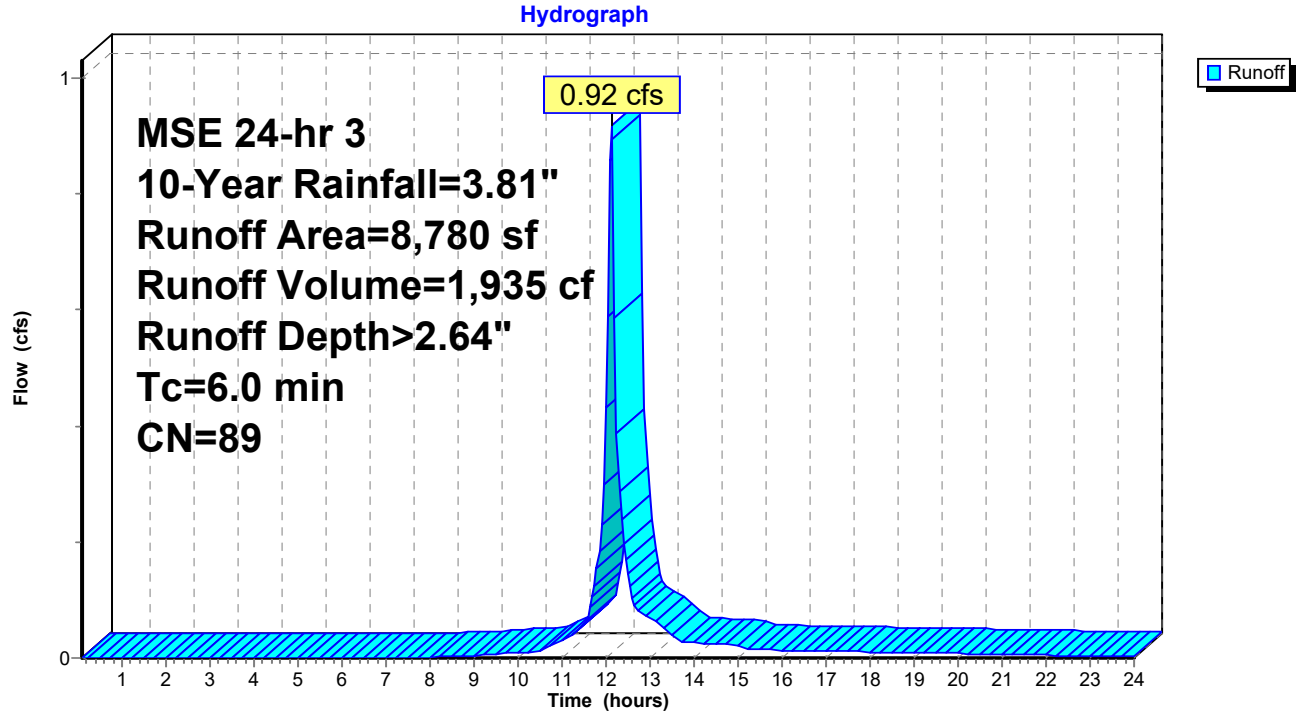
Runoff = 0.92 cfs @ 12.13 hrs, Volume= 1,935 cf, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	8,780	89	IMP (GRAVEL)
	8,780		100.00% Pervious Area

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

Subcatchment 17S: E



Summary for Subcatchment 18S: F

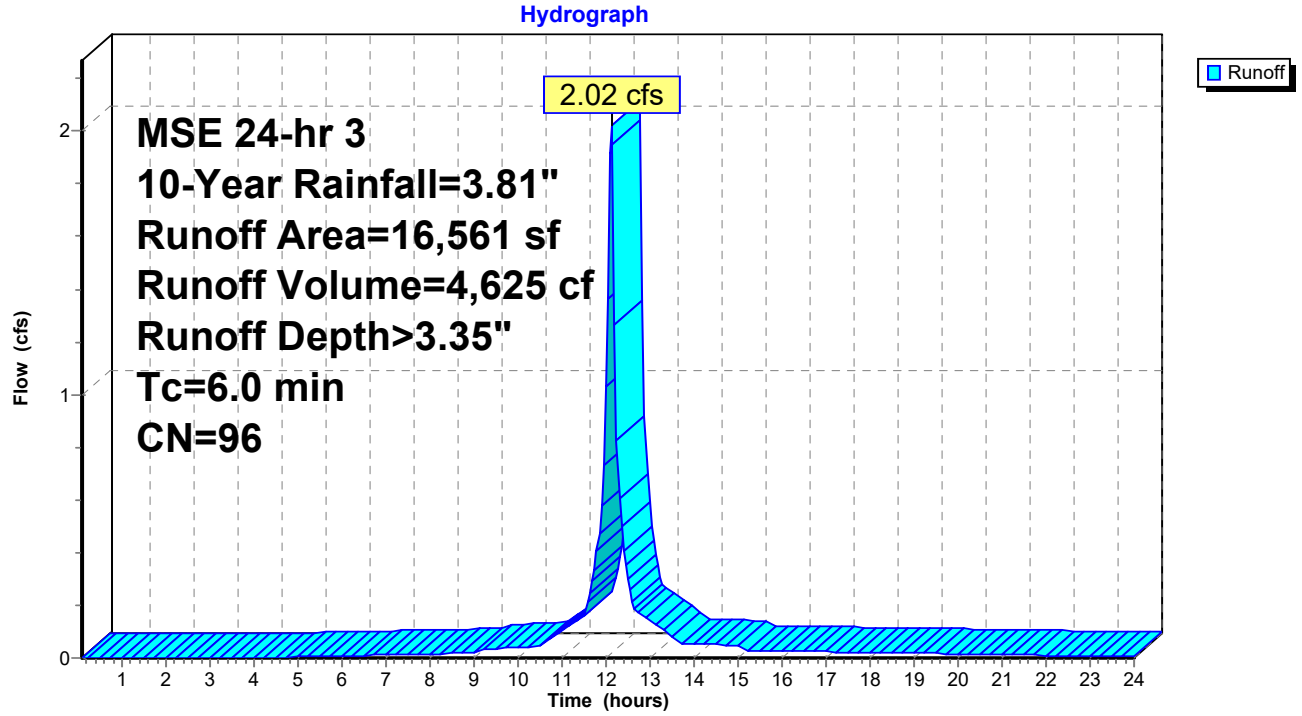
Runoff = 2.02 cfs @ 12.13 hrs, Volume= 4,625 cf, Depth> 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	16,561	96	IMP (GRAVEL)
	16,561		100.00% Pervious Area

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

Subcatchment 18S: F



Summary for Subcatchment 19S: G

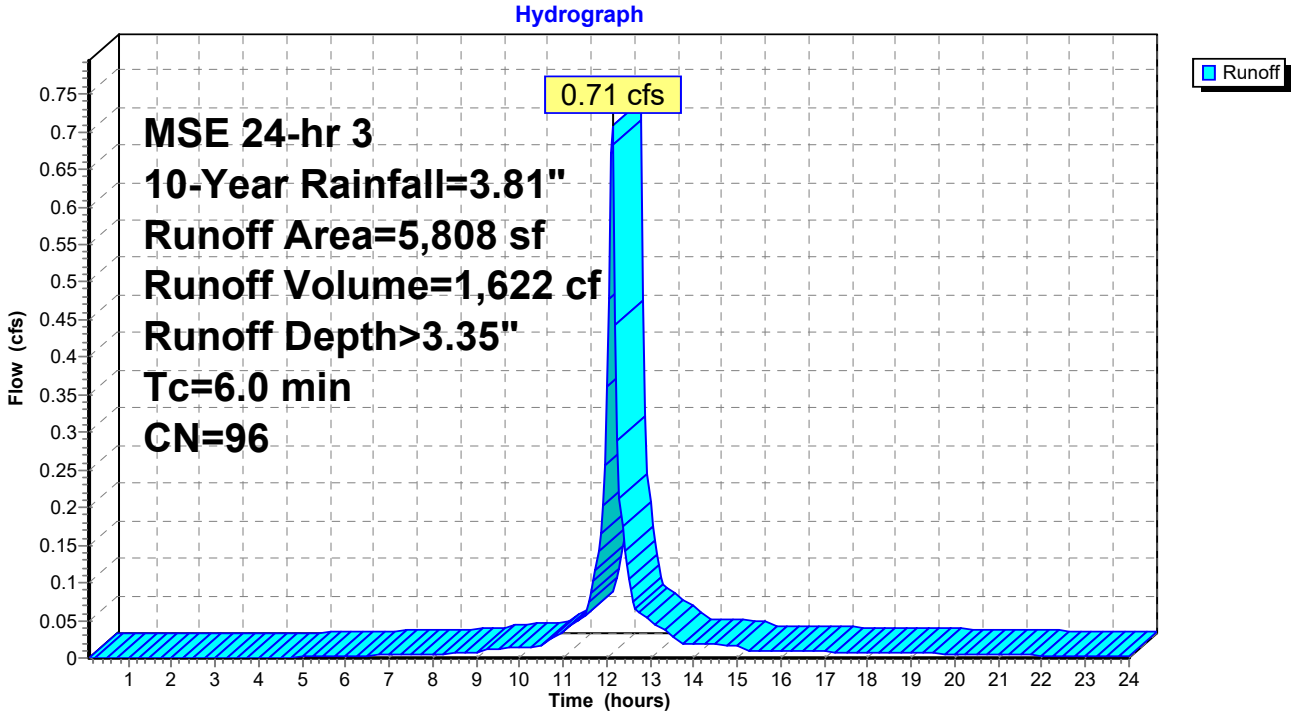
Runoff = 0.71 cfs @ 12.13 hrs, Volume= 1,622 cf, Depth> 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	5,808	96	IMP (GRAVEL)
	5,808		100.00% Pervious Area

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

Subcatchment 19S: G



Summary for Pond 24P: Existing Pond

Inflow Area = 115,726 sf, 0.00% Impervious, Inflow Depth > 2.75" for 10-Year event
Inflow = 12.42 cfs @ 12.13 hrs, Volume= 26,479 cf
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 853.51' @ 24.00 hrs Surf.Area= 13,360 sf Storage= 26,476 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

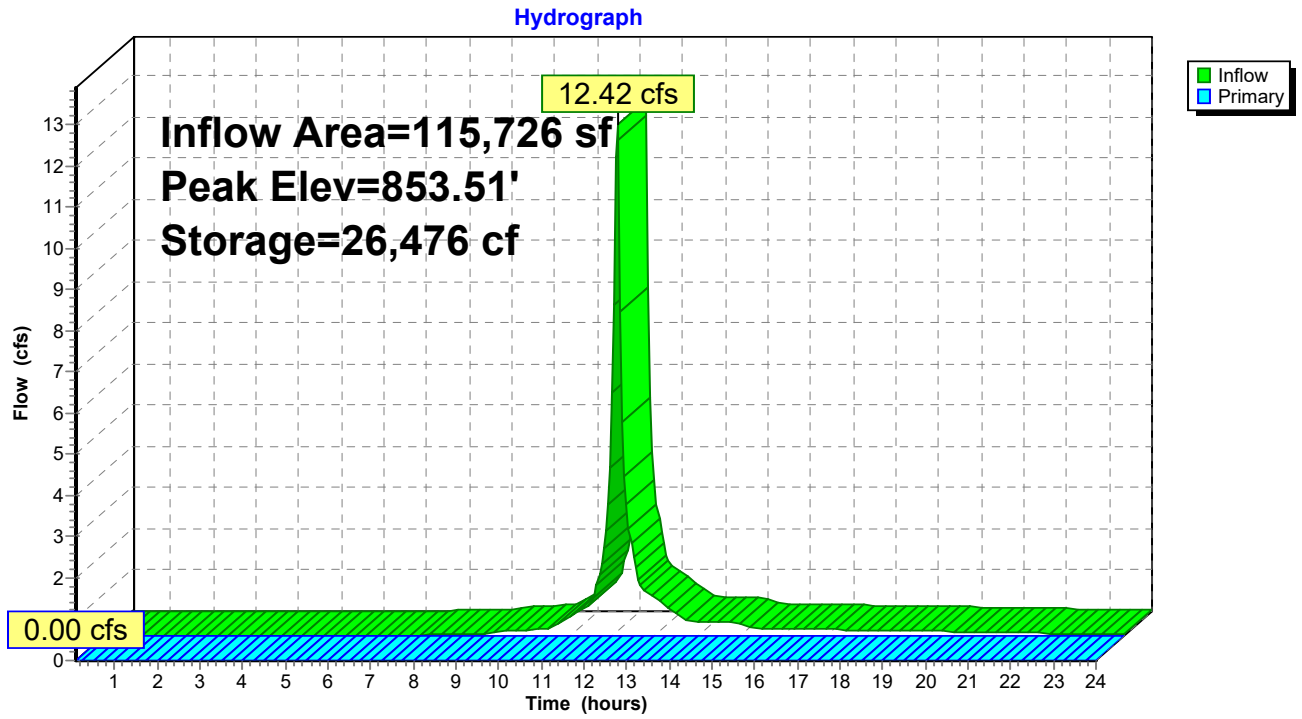
Volume	Invert	Avail.Storage	Storage Description
#1	851.00'	48,791 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
851.00	7,572	0	0
852.00	9,963	8,768	8,768
853.00	12,276	11,120	19,887
854.00	14,385	13,331	33,218
855.00	16,761	15,573	48,791

Device	Routing	Invert	Outlet Devices
#1	Primary	854.00'	**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=0.00 cfs @ 0.10 hrs HW=851.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 24P: Existing Pond

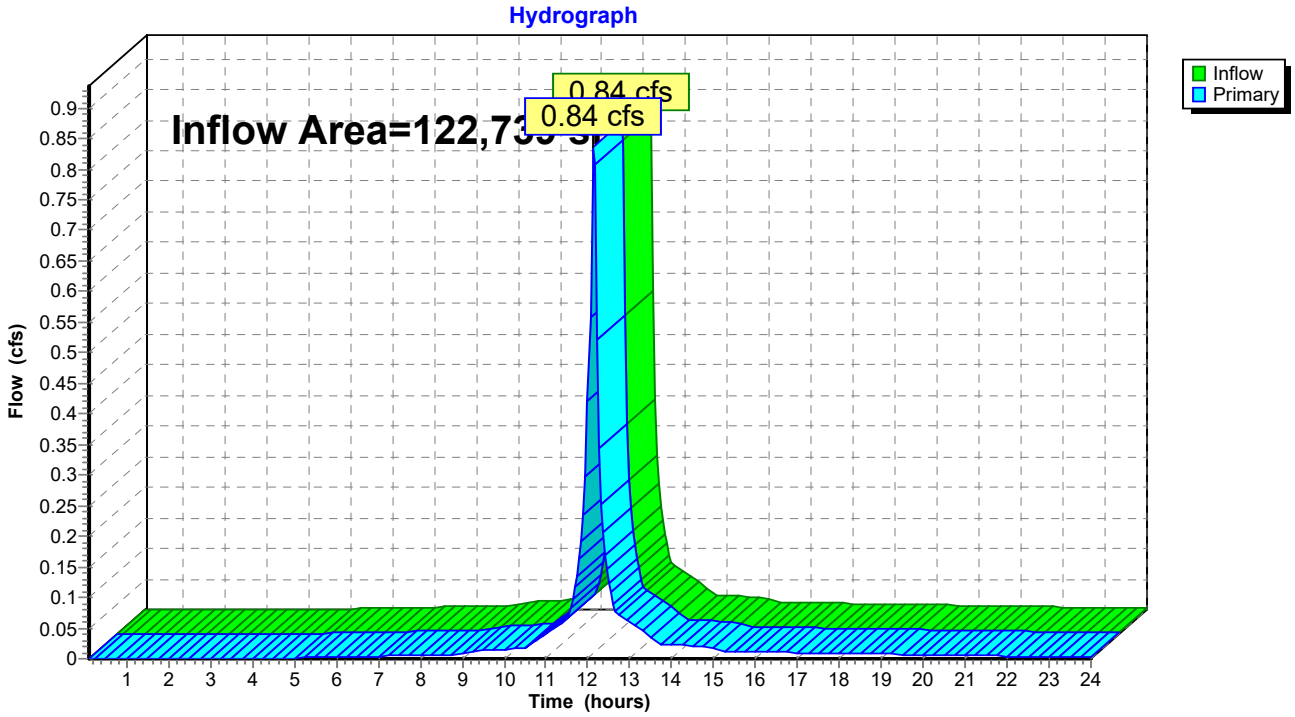


Summary for Link 7L: TOTAL

Inflow Area = 122,739 sf, 0.00% Impervious, Inflow Depth > 0.18" for 10-Year event
Inflow = 0.84 cfs @ 12.13 hrs, Volume= 1,888 cf
Primary = 0.84 cfs @ 12.13 hrs, Volume= 1,888 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 7L: TOTAL

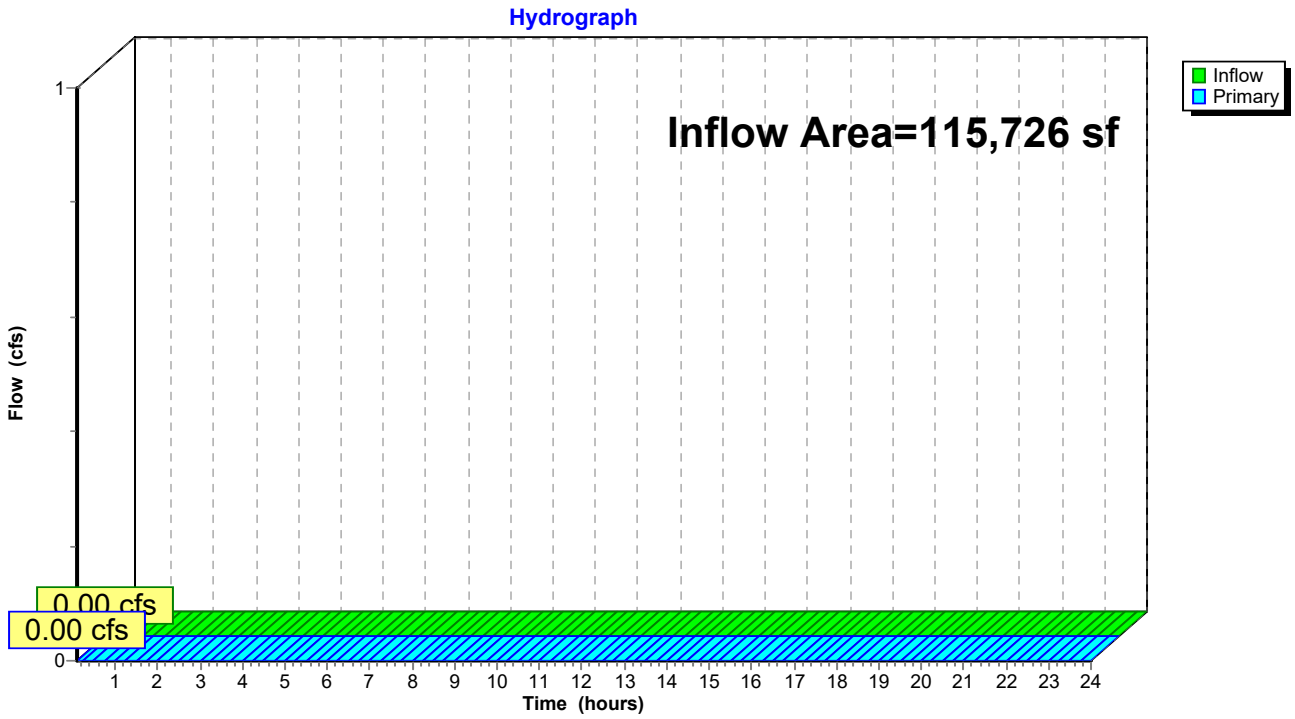


Summary for Link 22L: TREATED

Inflow Area = 115,726 sf, 0.00% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 22L: TREATED

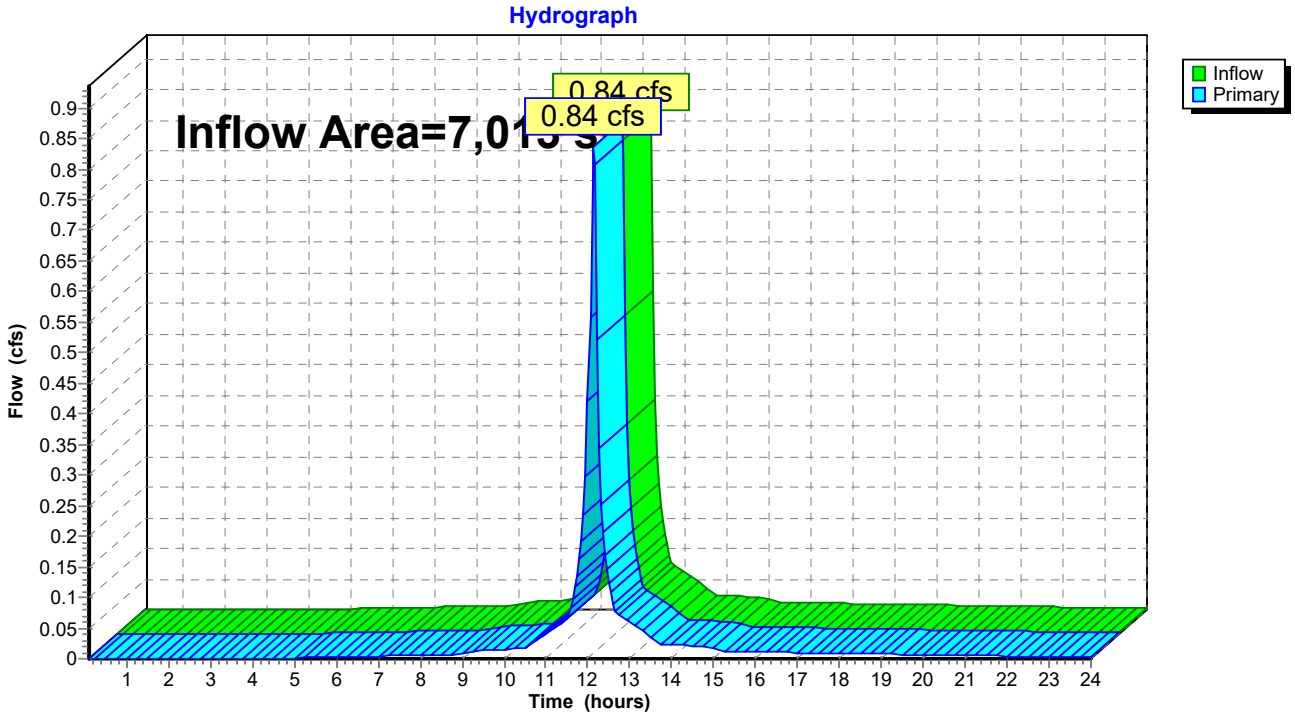


Summary for Link 23L: UNTREATED

Inflow Area = 7,013 sf, 0.00% Impervious, Inflow Depth > 3.23" for 10-Year event
Inflow = 0.84 cfs @ 12.13 hrs, Volume= 1,888 cf
Primary = 0.84 cfs @ 12.13 hrs, Volume= 1,888 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 23L: UNTREATED



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 14S: B Runoff Area=15,047 sf 0.00% Impervious Runoff Depth>4.91"
Tc=6.0 min CN=89 Runoff=2.82 cfs 6,155 cf

Subcatchment 15S: C Runoff Area=1,205 sf 0.00% Impervious Runoff Depth>4.91"
Tc=6.0 min CN=89 Runoff=0.23 cfs 493 cf

Subcatchment 16S: D Runoff Area=75,338 sf 0.00% Impervious Runoff Depth>4.91"
Tc=6.0 min CN=89 Runoff=14.11 cfs 30,819 cf

Subcatchment 17S: E Runoff Area=8,780 sf 0.00% Impervious Runoff Depth>4.91"
Tc=6.0 min CN=89 Runoff=1.64 cfs 3,592 cf

Subcatchment 18S: F Runoff Area=16,561 sf 0.00% Impervious Runoff Depth>5.71"
Tc=6.0 min CN=96 Runoff=3.34 cfs 7,874 cf

Subcatchment 19S: G Runoff Area=5,808 sf 0.00% Impervious Runoff Depth>5.71"
Tc=6.0 min CN=96 Runoff=1.17 cfs 2,761 cf

Pond 24P: Existing Pond Peak Elev=854.09' Storage=34,464 cf Inflow=21.92 cfs 48,440 cf
Outflow=1.71 cfs 15,165 cf

Link 7L: TOTAL Inflow=1.81 cfs 18,419 cf
Primary=1.81 cfs 18,419 cf

Link 22L: TREATED Inflow=1.71 cfs 15,165 cf
Primary=1.71 cfs 15,165 cf

Link 23L: UNTREATED Inflow=1.40 cfs 3,254 cf
Primary=1.40 cfs 3,254 cf

Total Runoff Area = 122,739 sf Runoff Volume = 51,694 cf Average Runoff Depth = 5.05"
100.00% Pervious = 122,739 sf 0.00% Impervious = 0 sf

Summary for Subcatchment 14S: B

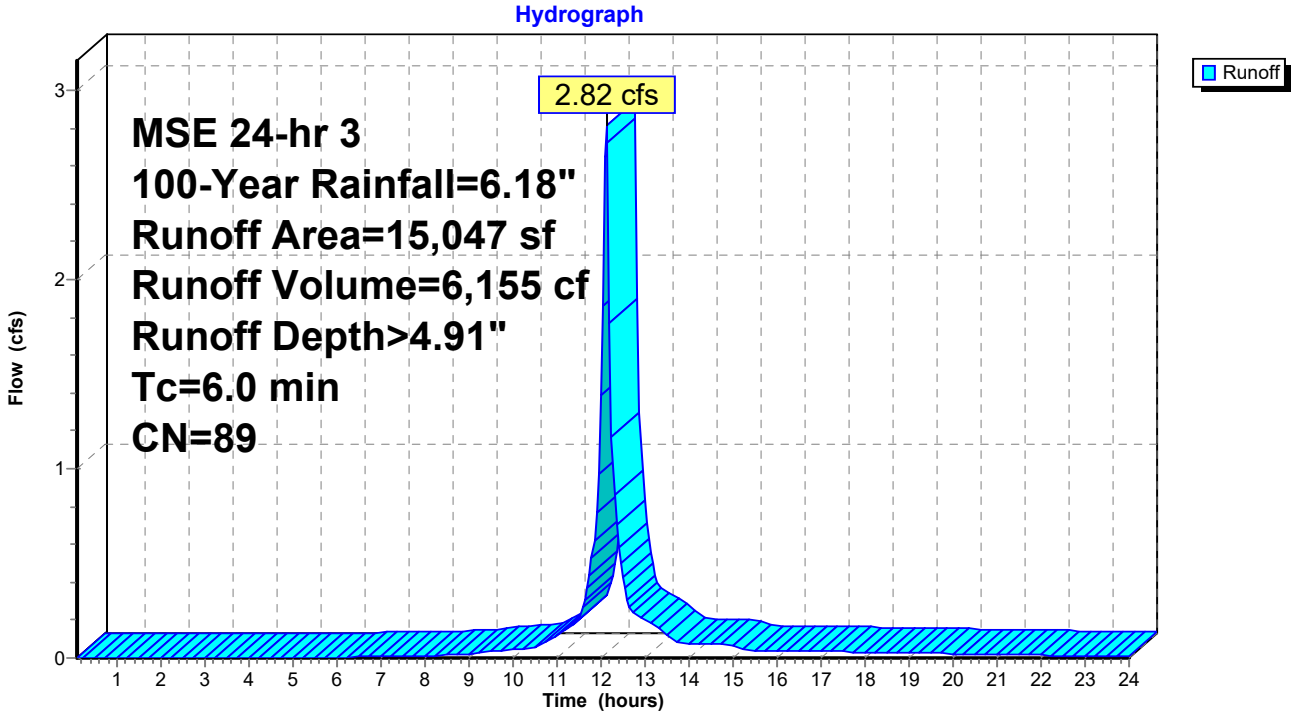
Runoff = 2.82 cfs @ 12.13 hrs, Volume= 6,155 cf, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	15,047	89	IMP (GRAVEL)
	15,047		100.00% Pervious Area

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

Subcatchment 14S: B



Summary for Subcatchment 15S: C

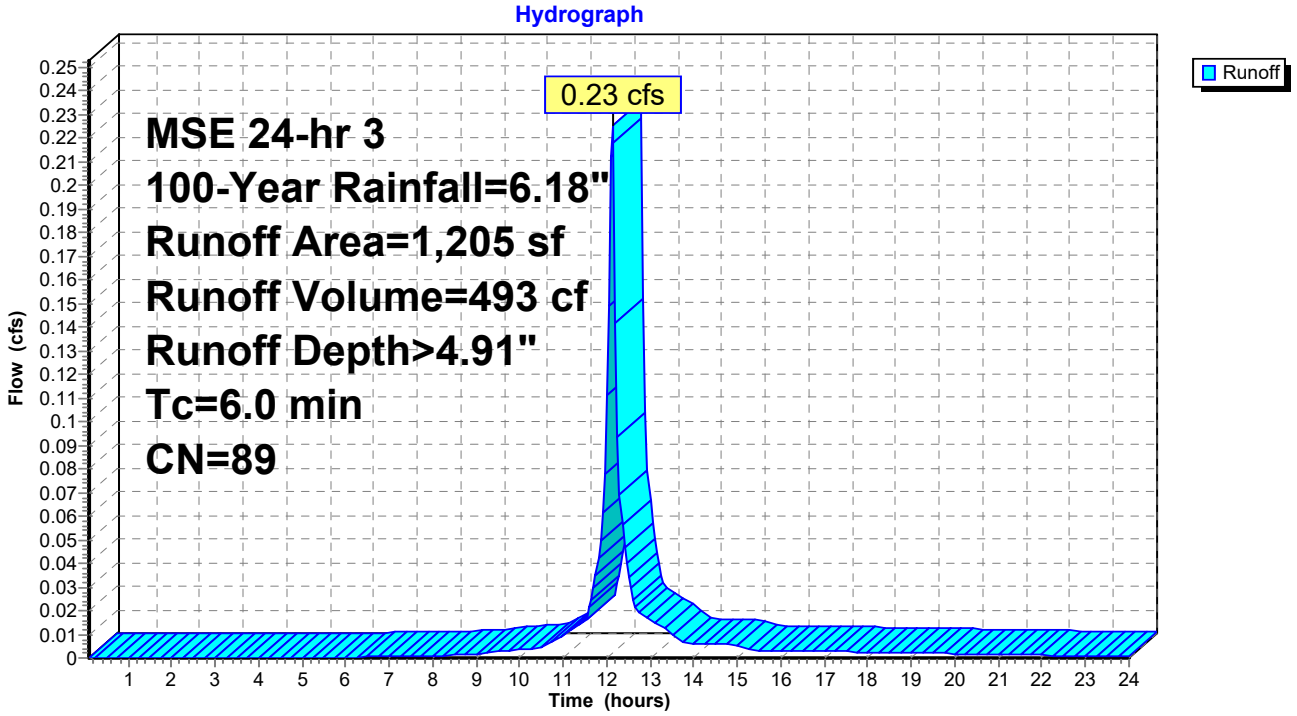
Runoff = 0.23 cfs @ 12.13 hrs, Volume= 493 cf, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,205	89	IMP (GRAVEL)
	1,205		100.00% Pervious Area

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

Subcatchment 15S: C



Summary for Subcatchment 16S: D

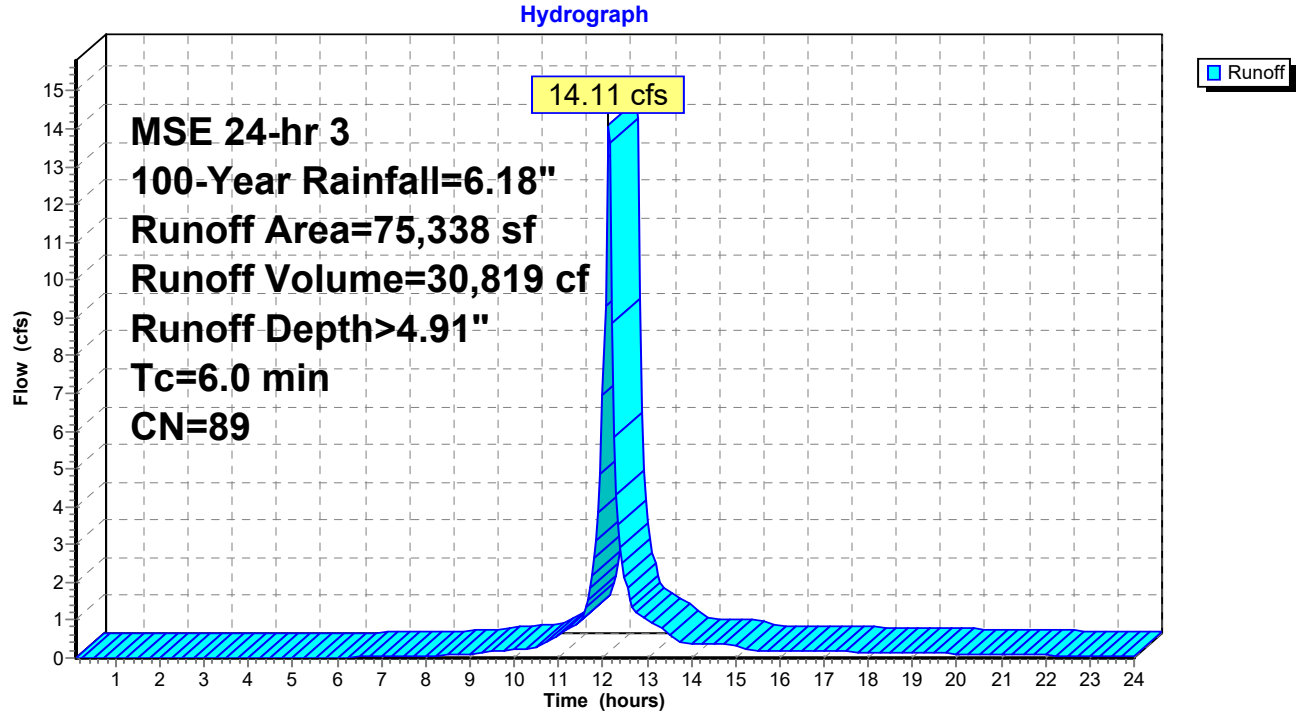
Runoff = 14.11 cfs @ 12.13 hrs, Volume= 30,819 cf, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	75,338	89	IMP (GRAVEL)
	75,338		100.00% Pervious Area

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

Subcatchment 16S: D



Summary for Subcatchment 17S: E

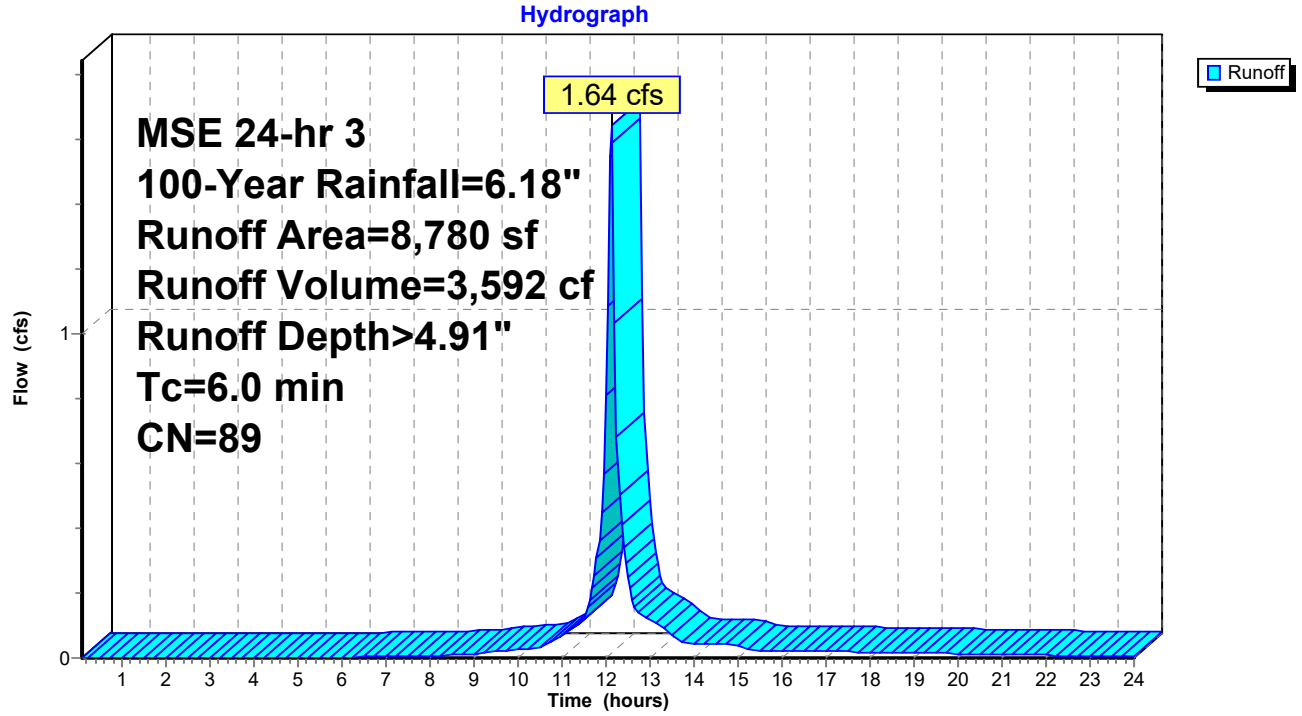
Runoff = 1.64 cfs @ 12.13 hrs, Volume= 3,592 cf, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	8,780	89	IMP (GRAVEL)
	8,780		100.00% Pervious Area

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

Subcatchment 17S: E



Summary for Subcatchment 18S: F

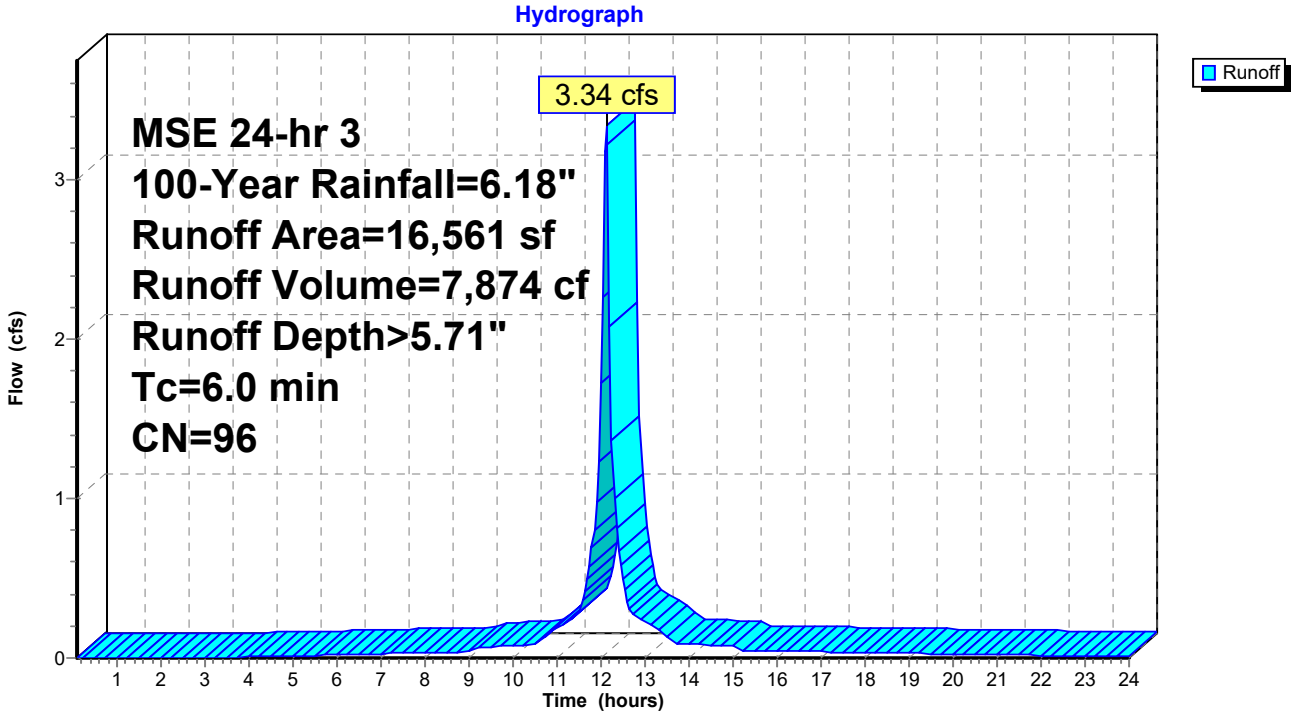
Runoff = 3.34 cfs @ 12.13 hrs, Volume= 7,874 cf, Depth> 5.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	16,561	96	IMP (GRAVEL)
	16,561		100.00% Pervious Area

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

Subcatchment 18S: F



Summary for Subcatchment 19S: G

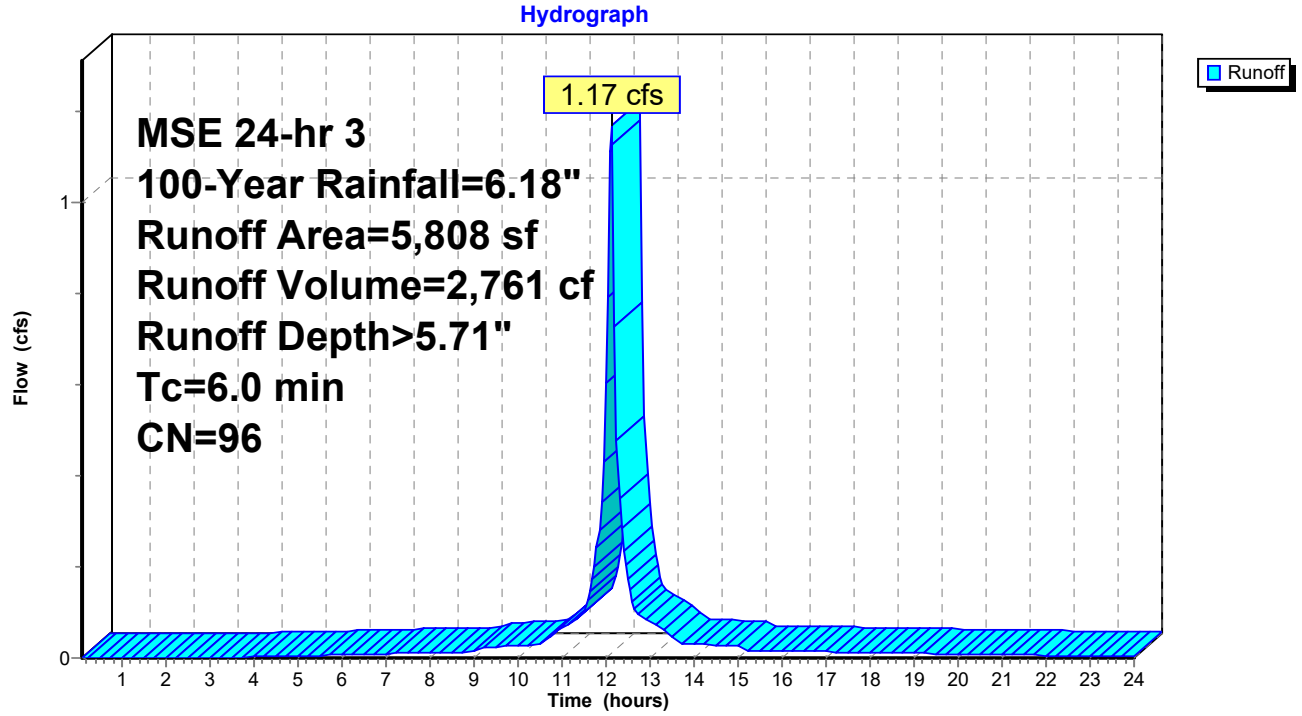
Runoff = 1.17 cfs @ 12.13 hrs, Volume= 2,761 cf, Depth> 5.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	5,808	96	IMP (GRAVEL)
	5,808		100.00% Pervious Area

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

Subcatchment 19S: G



Summary for Pond 24P: Existing Pond

Inflow Area = 115,726 sf, 0.00% Impervious, Inflow Depth > 5.02" for 100-Year event
Inflow = 21.92 cfs @ 12.13 hrs, Volume= 48,440 cf
Outflow = 1.71 cfs @ 12.89 hrs, Volume= 15,165 cf, Atten= 92%, Lag= 45.6 min
Primary = 1.71 cfs @ 12.89 hrs, Volume= 15,165 cf

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 854.09' @ 12.89 hrs Surf.Area= 14,589 sf Storage= 34,464 cf

Plug-Flow detention time= 267.8 min calculated for 15,133 cf (31% of inflow)
Center-of-Mass det. time= 164.9 min (936.2 - 771.2)

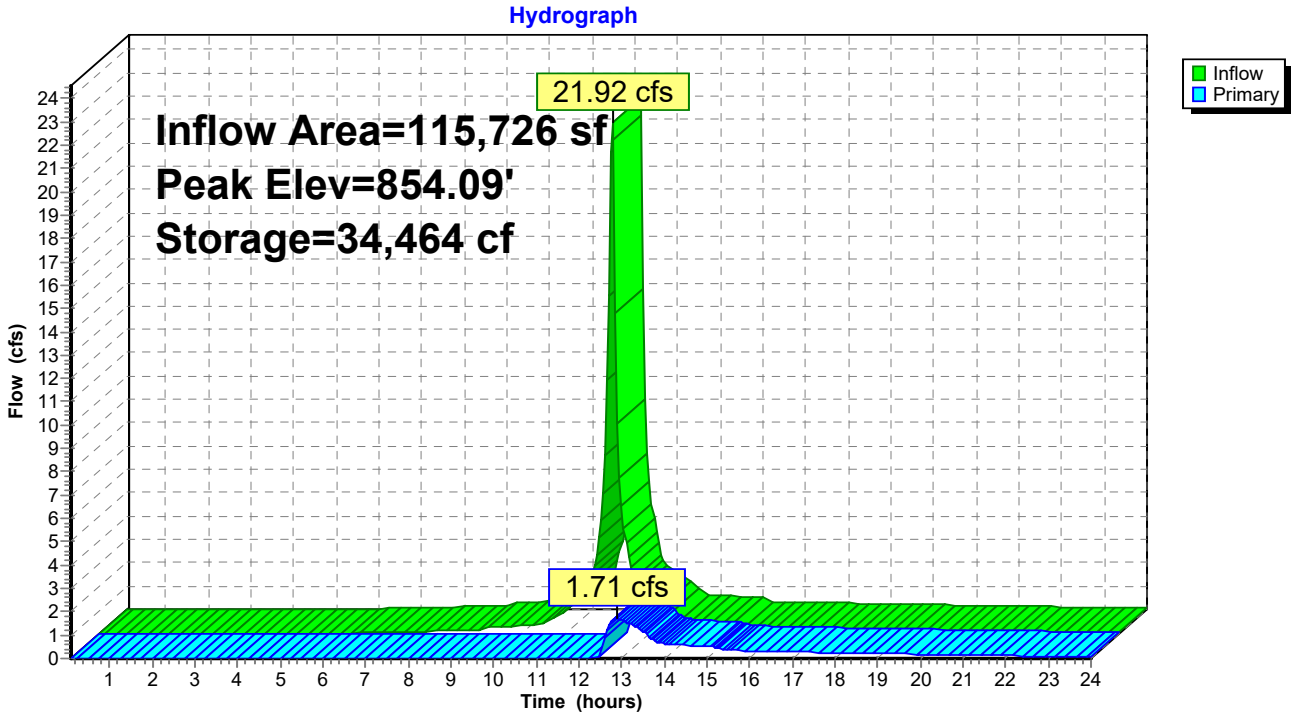
Volume	Invert	Avail.Storage	Storage Description
#1	851.00'	48,791 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
851.00	7,572	0	0
852.00	9,963	8,768	8,768
853.00	12,276	11,120	19,887
854.00	14,385	13,331	33,218
855.00	16,761	15,573	48,791

Device	Routing	Invert	Outlet Devices
#1	Primary	854.00'	**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=1.69 cfs @ 12.89 hrs HW=854.09' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.69 cfs @ 0.79 fps)

Pond 24P: Existing Pond

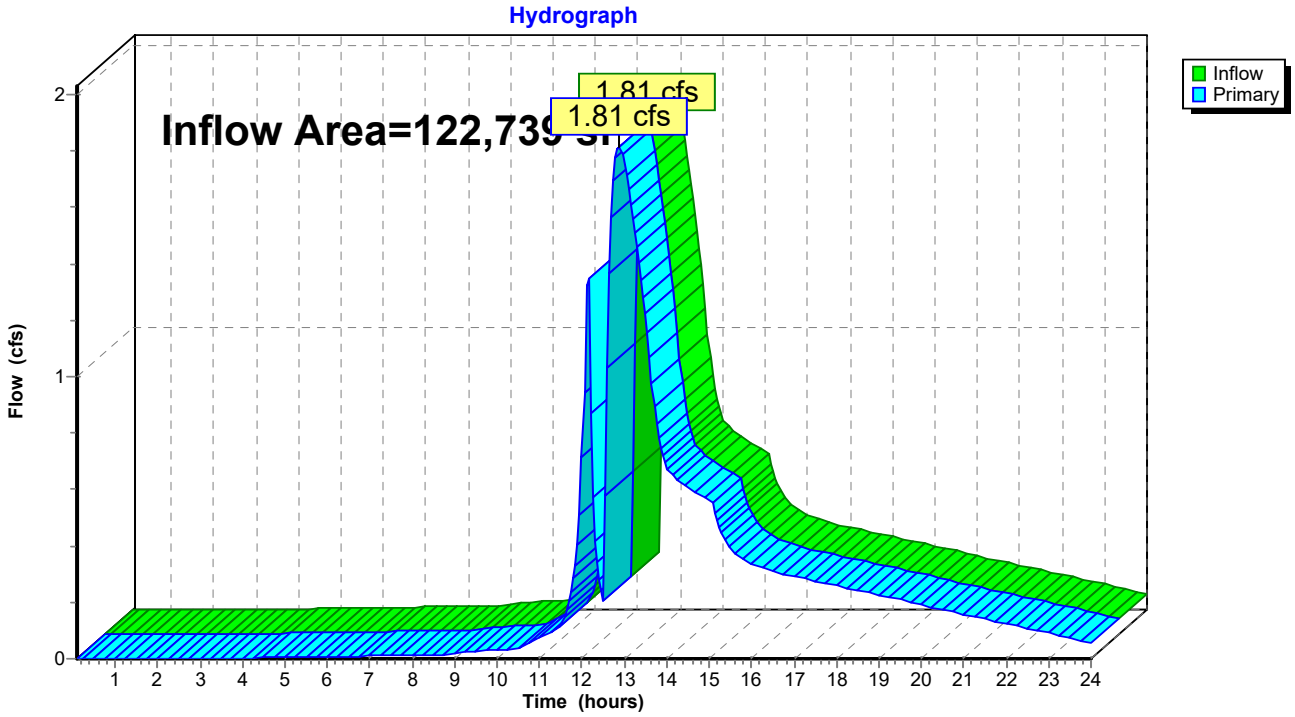


Summary for Link 7L: TOTAL

Inflow Area = 122,739 sf, 0.00% Impervious, Inflow Depth > 1.80" for 100-Year event
Inflow = 1.81 cfs @ 12.88 hrs, Volume= 18,419 cf
Primary = 1.81 cfs @ 12.88 hrs, Volume= 18,419 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 7L: TOTAL

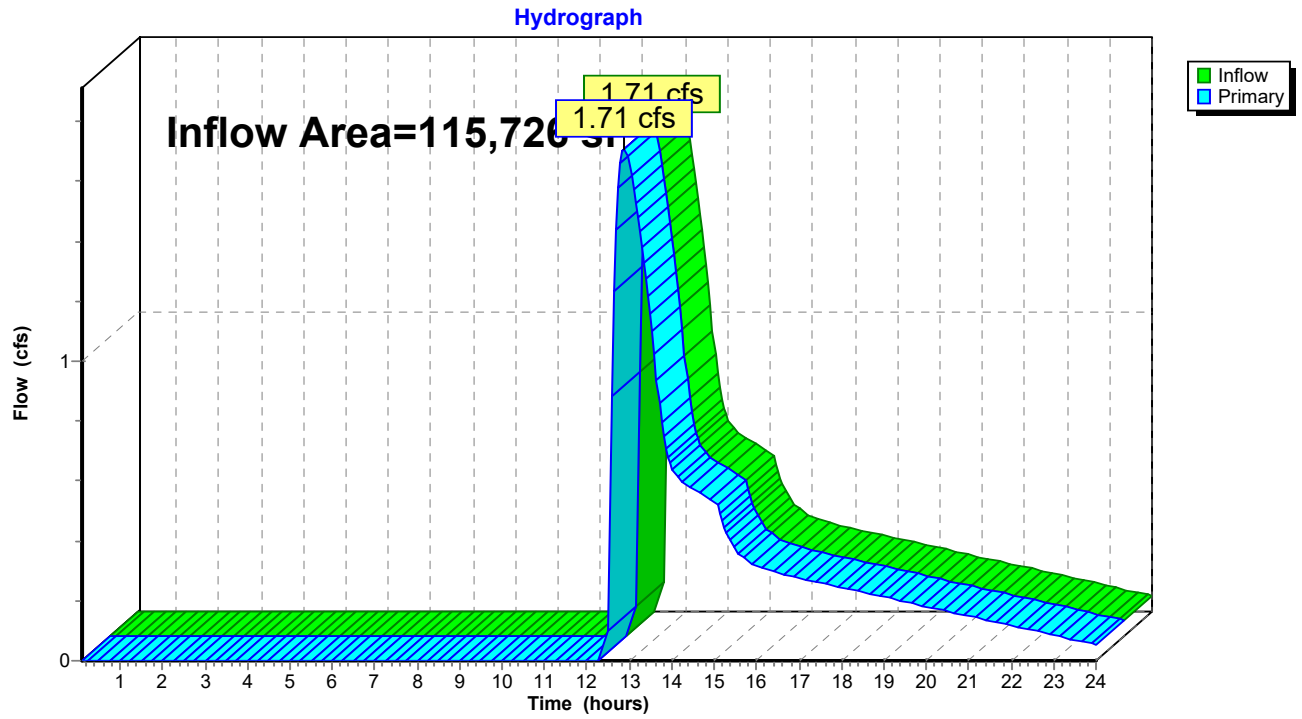


Summary for Link 22L: TREATED

Inflow Area = 115,726 sf, 0.00% Impervious, Inflow Depth > 1.57" for 100-Year event
Inflow = 1.71 cfs @ 12.89 hrs, Volume= 15,165 cf
Primary = 1.71 cfs @ 12.89 hrs, Volume= 15,165 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 22L: TREATED

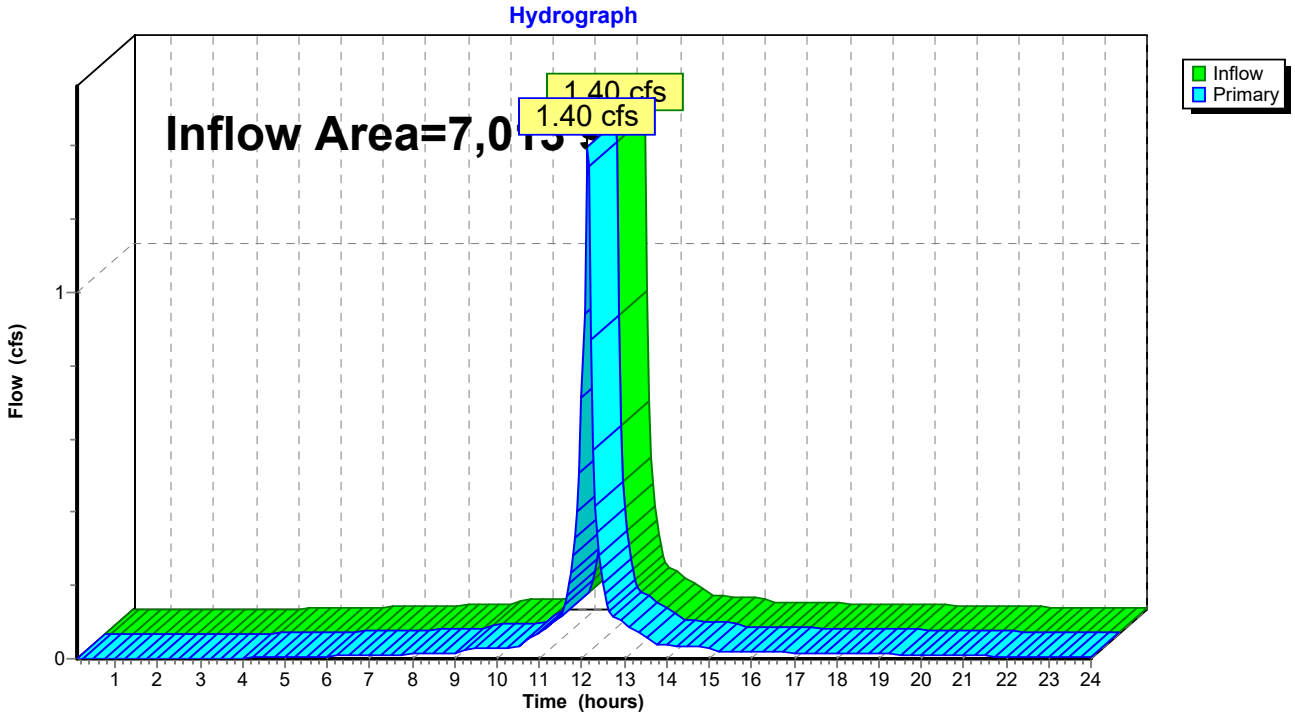


Summary for Link 23L: UNTREATED

Inflow Area = 7,013 sf, 0.00% Impervious, Inflow Depth > 5.57" for 100-Year event
Inflow = 1.40 cfs @ 12.13 hrs, Volume= 3,254 cf
Primary = 1.40 cfs @ 12.13 hrs, Volume= 3,254 cf, Atten= 0%, Lag= 0.0 min

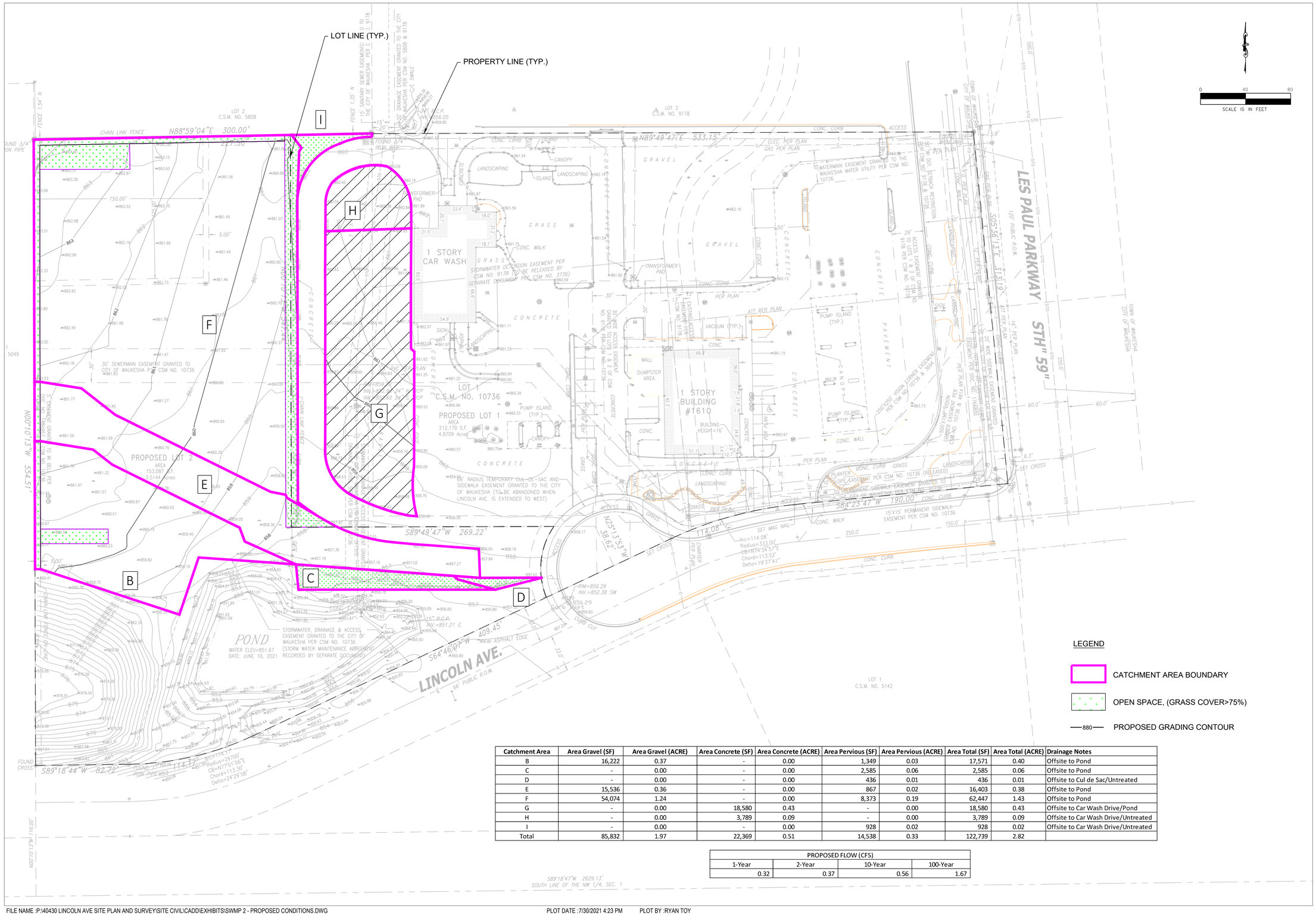
Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 23L: UNTREATED



Appendix C

Proposed SWMP-2 and Hydrologic & Hydraulic Output



LEGEND

- CATCHMENT AREA BOUNDARY
- OPEN SPACE, (GRASS COVER>75%)
- 880 PROPOSED GRADING CONTOUR

Catchment Area	Area Gravel (SF)	Area Gravel (ACRE)	Area Concrete (SF)	Area Concrete (ACRE)	Area Pervious (SF)	Area Pervious (ACRE)	Area Total (SF)	Area Total (ACRE)	Drainage Notes
B	16,222	0.37	-	0.00	1,349	0.03	17,571	0.40	Offsite to Pond
C	-	0.00	-	0.00	2,585	0.06	2,585	0.06	Offsite to Pond
D	-	0.00	-	0.00	436	0.01	436	0.01	Offsite to Cul de Sac/Untreated
E	15,536	0.36	-	0.00	867	0.02	16,403	0.38	Offsite to Pond
F	54,074	1.24	-	0.00	8,373	0.19	62,447	1.43	Offsite to Pond
G	-	0.00	18,580	0.43	-	0.00	18,580	0.43	Offsite to Car Wash Drive/Pond
H	-	0.00	3,789	0.09	-	0.00	3,789	0.09	Offsite to Car Wash Drive/Untreated
I	-	0.00	-	0.00	928	0.02	928	0.02	Offsite to Car Wash Drive/Untreated
Total	85,832	1.97	22,369	0.51	14,538	0.33	122,739	2.82	

PROPOSED FLOW (CFS)			
1-Year	2-Year	10-Year	100-Year
0.32	0.37	0.56	1.67

KSingh | Engineers Scientists Consultants
3636 North 124th Street
Wauwatosa, WI 53222
262-821-1171

CONSULTANT

CONSULTANT

PROJECT TITLE: LINCOLN AVE SITE PLAN

CLIENT: MR. DEL SINGH

PROJECT LOCATION: 1610 LINCOLN AVE, WAUKESHA, WI

REVISIONS	DATE	DESCRIPTION

DRAWN BY	DATE
S. BHANDARI / R. TOY	07/02/2021
CHECKED BY	DATE
A. SINGH	07/02/2021

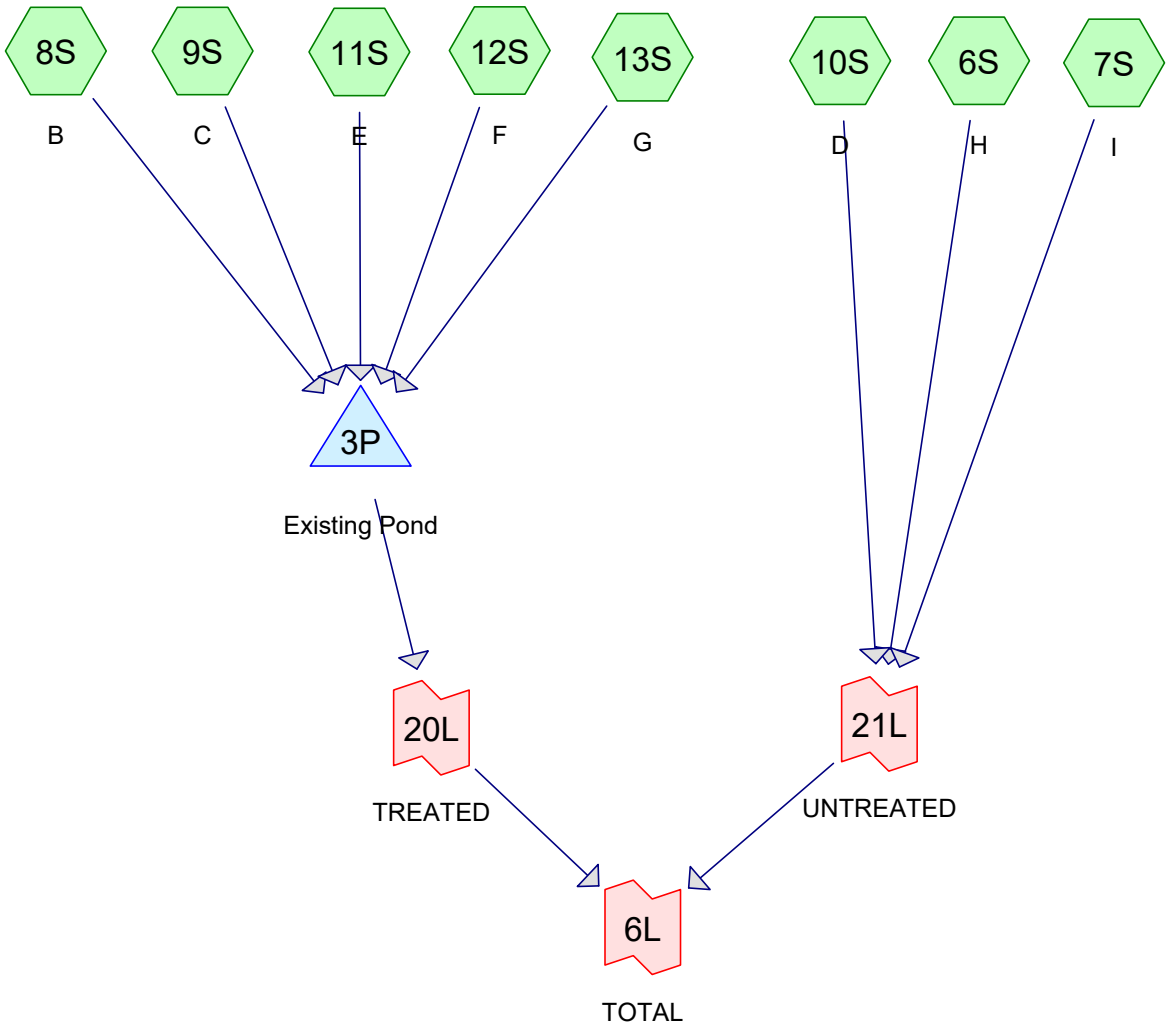
SHEET TITLE

PROPOSED CONDITIONS

SWMP 2

SHEET XX of SHEET XX

PROPOSED



Subcat Reach Pond Link

Routing Diagram for Proposed and Existing Conditions
Prepared by Microsoft, Printed 7/30/2021

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
22,369	98	IMP (CONCRETE) (6S, 13S)
85,832	89	IMP (GRAVEL) (8S, 11S, 12S)
14,538	74	PER (GRASS) (7S, 8S, 9S, 10S, 11S, 12S)
122,739	**89**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
0	HSG D	
122,739	Other	6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S
122,739		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchm Numbers
0	0	0	0	22,369	22,369	IMP (CONCRETE)	
0	0	0	0	85,832	85,832	IMP (GRAVEL)	
0	0	0	0	14,538	14,538	PER (GRASS)	
0	**0**	**0**	**0**	**122,739**	**122,739**	**TOTAL AREA**	

Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 6S: H Runoff Area=3,789 sf 100.00% Impervious Runoff Depth>2.17"
Tc=6.0 min CN=98 Runoff=0.30 cfs 685 cf

Subcatchment 7S: I Runoff Area=928 sf 0.00% Impervious Runoff Depth>0.55"
Tc=6.0 min CN=74 Runoff=0.02 cfs 43 cf

Subcatchment 8S: B Runoff Area=17,571 sf 0.00% Impervious Runoff Depth>1.30"
Tc=6.0 min CN=88 Runoff=0.93 cfs 1,898 cf

Subcatchment 9S: C Runoff Area=2,585 sf 0.00% Impervious Runoff Depth>0.55"
Tc=6.0 min CN=74 Runoff=0.06 cfs 119 cf

Subcatchment 10S: D Runoff Area=436 sf 0.00% Impervious Runoff Depth>0.55"
Tc=6.0 min CN=74 Runoff=0.01 cfs 20 cf

Subcatchment 11S: E Runoff Area=16,403 sf 0.00% Impervious Runoff Depth>1.30"
Tc=6.0 min CN=88 Runoff=0.87 cfs 1,771 cf

Subcatchment 12S: F Runoff Area=62,447 sf 0.00% Impervious Runoff Depth>1.23"
Tc=6.0 min CN=87 Runoff=3.15 cfs 6,388 cf

Subcatchment 13S: G Runoff Area=18,580 sf 100.00% Impervious Runoff Depth>2.17"
Tc=6.0 min CN=98 Runoff=1.45 cfs 3,361 cf

Pond 3P: Existing Pond Peak Elev=852.45' Storage=13,536 cf Inflow=6.45 cfs 13,537 cf
Outflow=0.00 cfs 0 cf

Link 6L: TOTAL Inflow=0.32 cfs 748 cf
Primary=0.32 cfs 748 cf

Link 20L: TREATED Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 21L: UNTREATED Inflow=0.32 cfs 748 cf
Primary=0.32 cfs 748 cf

Total Runoff Area = 122,739 sf Runoff Volume = 14,286 cf Average Runoff Depth = 1.40"
81.78% Pervious = 100,370 sf 18.22% Impervious = 22,369 sf

Summary for Subcatchment 6S: H

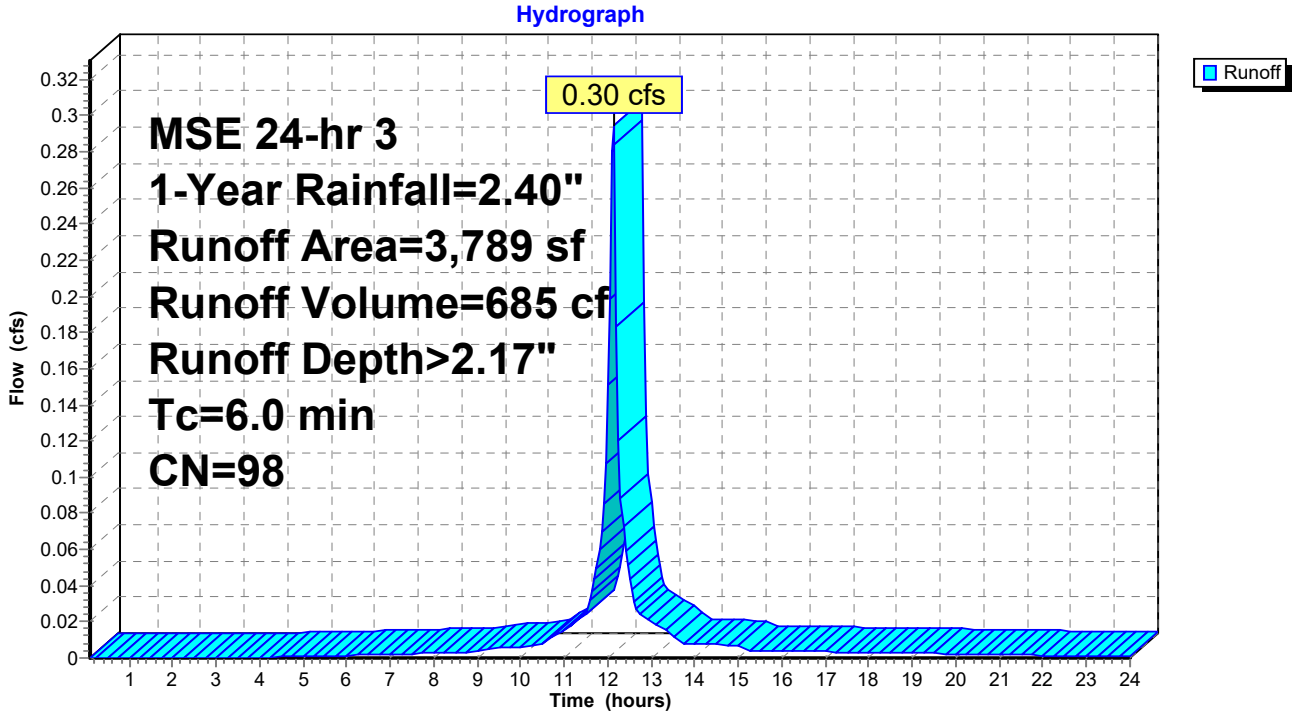
Runoff = 0.30 cfs @ 12.13 hrs, Volume= 685 cf, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	3,789	98	IMP (CONCRETE)
	3,789		100.00% Impervious Area

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

Subcatchment 6S: H



Summary for Subcatchment 7S: I

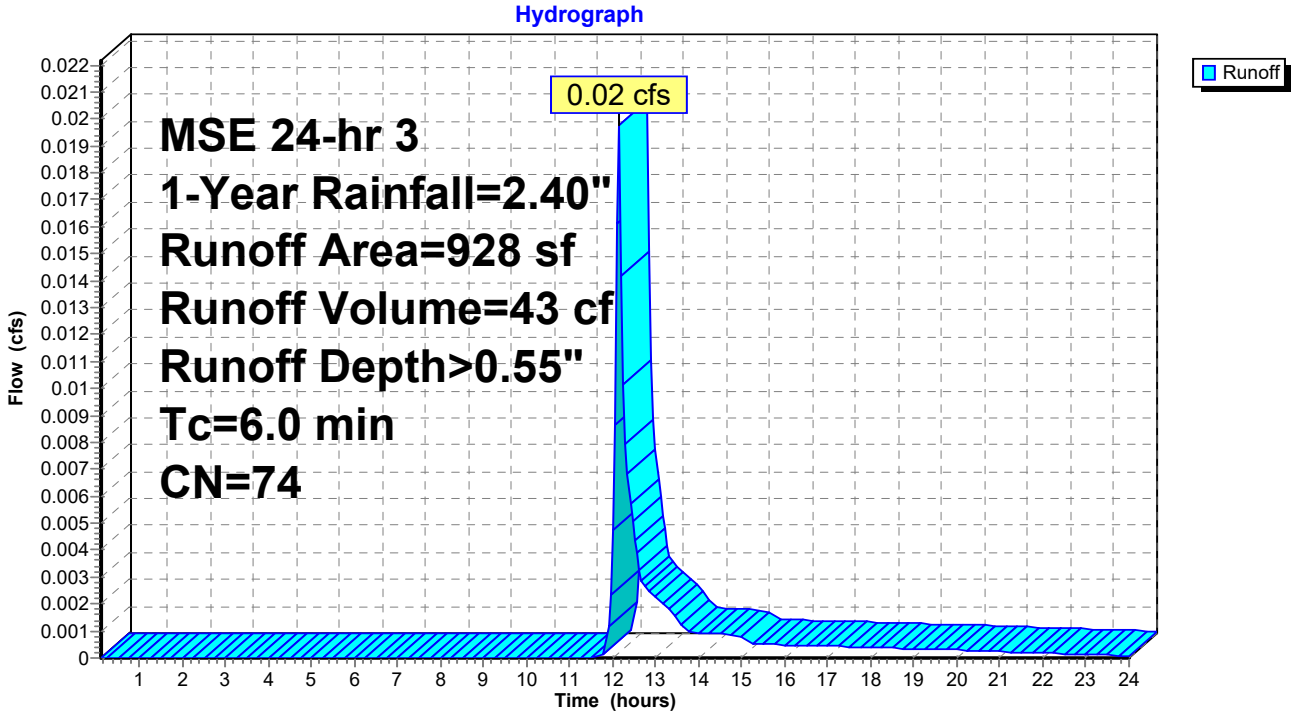
Runoff = 0.02 cfs @ 12.14 hrs, Volume= 43 cf, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	928	74	PER (GRASS)
	928		100.00% Pervious Area

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

Subcatchment 7S: I



Summary for Subcatchment 8S: B

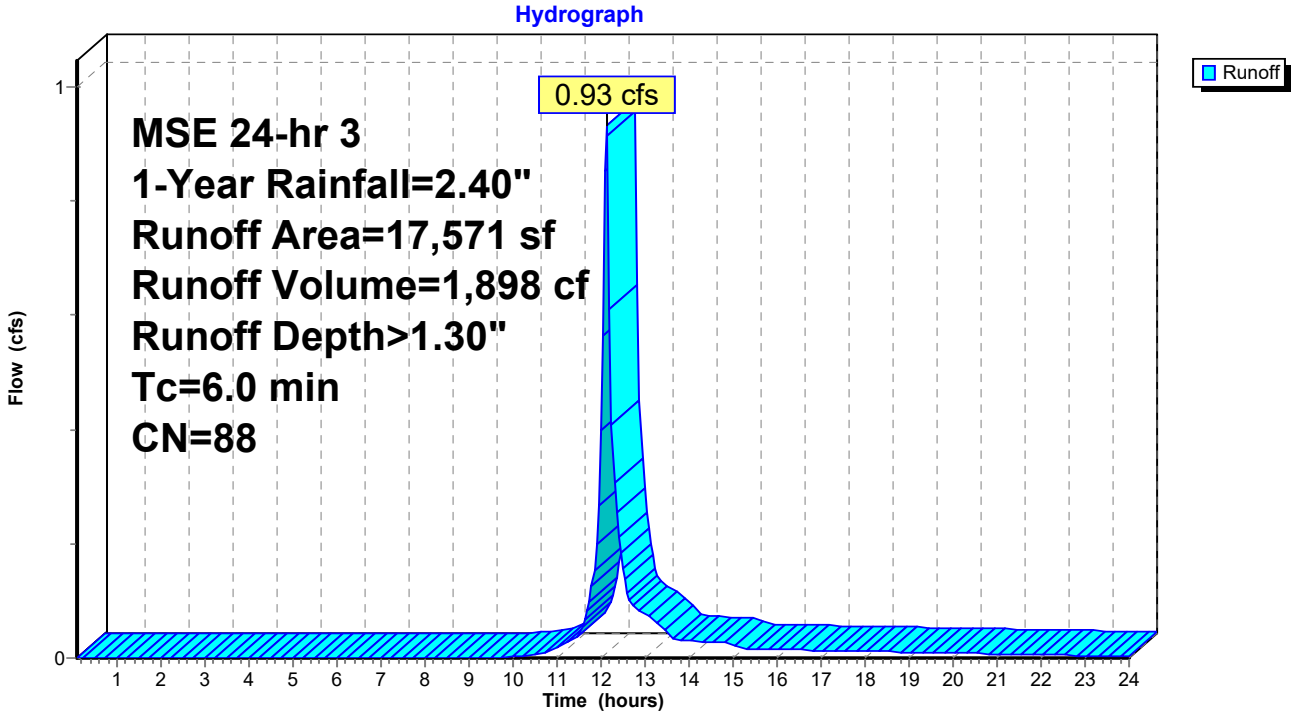
Runoff = 0.93 cfs @ 12.13 hrs, Volume= 1,898 cf, Depth> 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	16,222	89	IMP (GRAVEL)
*	1,349	74	PER (GRASS)
	17,571	88	Weighted Average
	17,571		100.00% Pervious Area

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

Subcatchment 8S: B



Summary for Subcatchment 9S: C

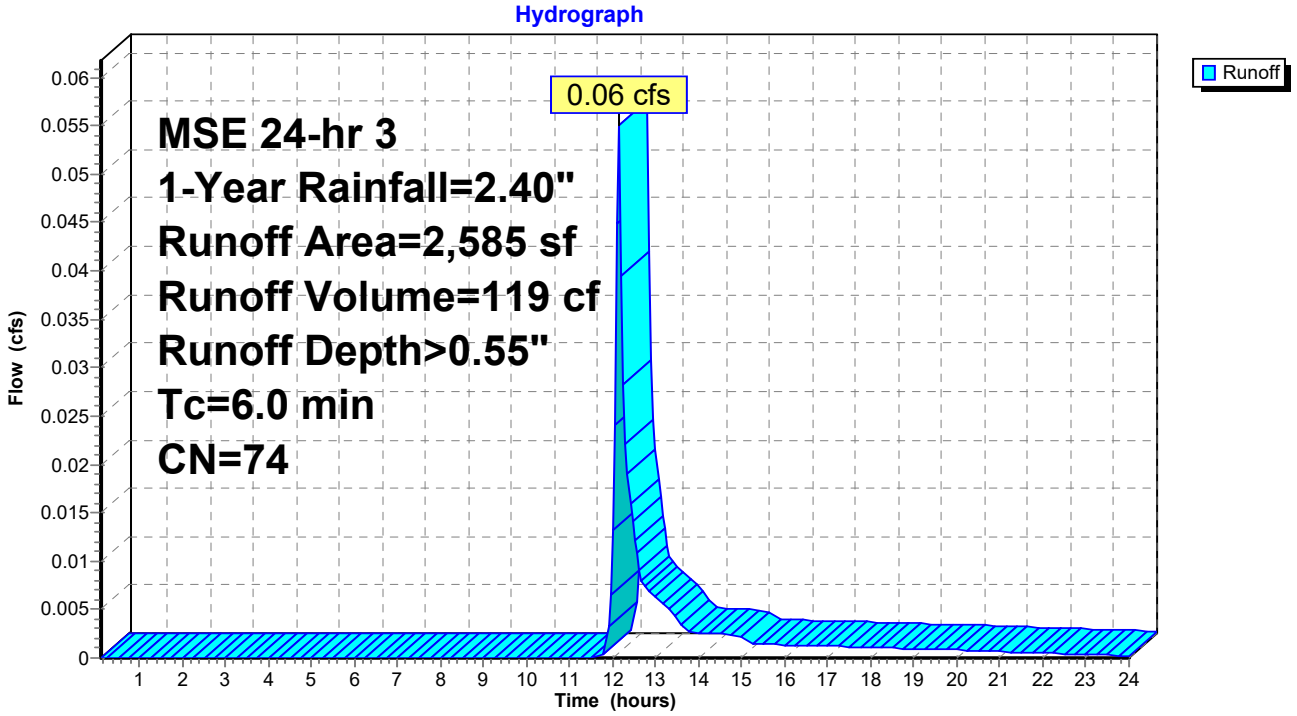
Runoff = 0.06 cfs @ 12.14 hrs, Volume= 119 cf, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	2,585	74	PER (GRASS)
	2,585		100.00% Pervious Area

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

Subcatchment 9S: C



Summary for Subcatchment 10S: D

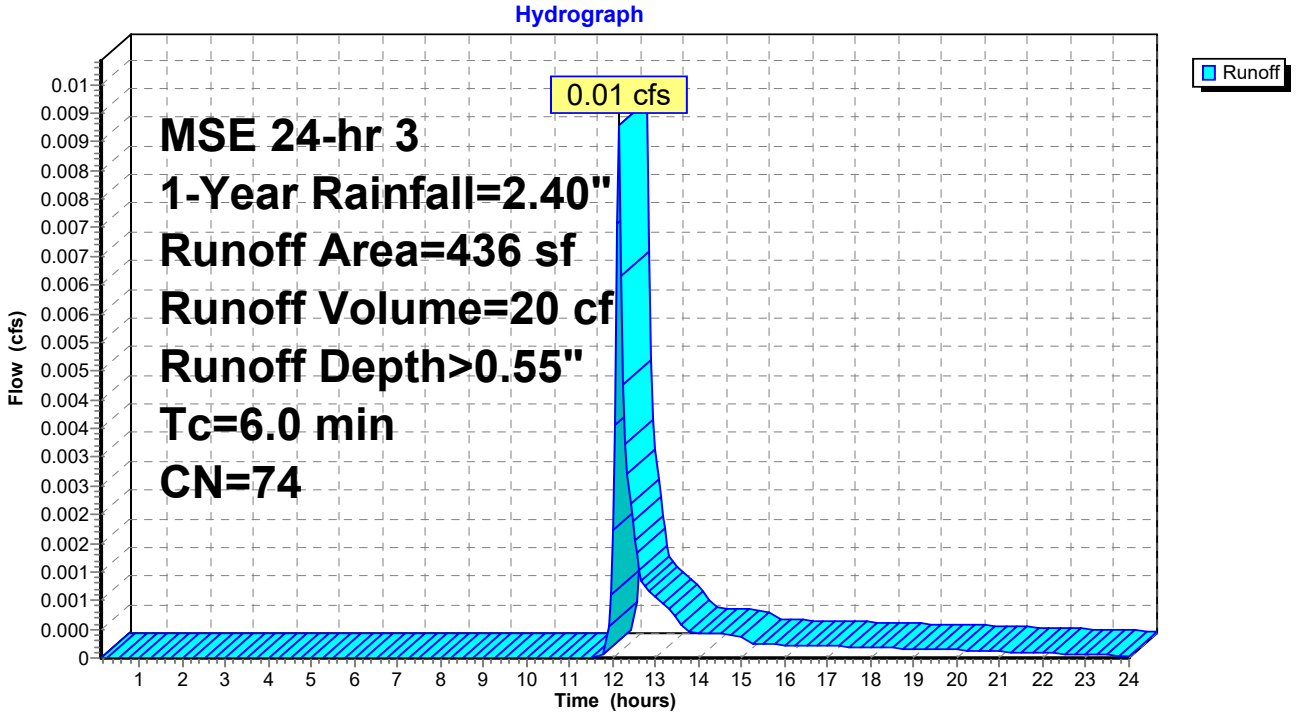
Runoff = 0.01 cfs @ 12.14 hrs, Volume= 20 cf, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	436	74	PER (GRASS)
	436		100.00% Pervious Area

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

Subcatchment 10S: D



Summary for Subcatchment 11S: E

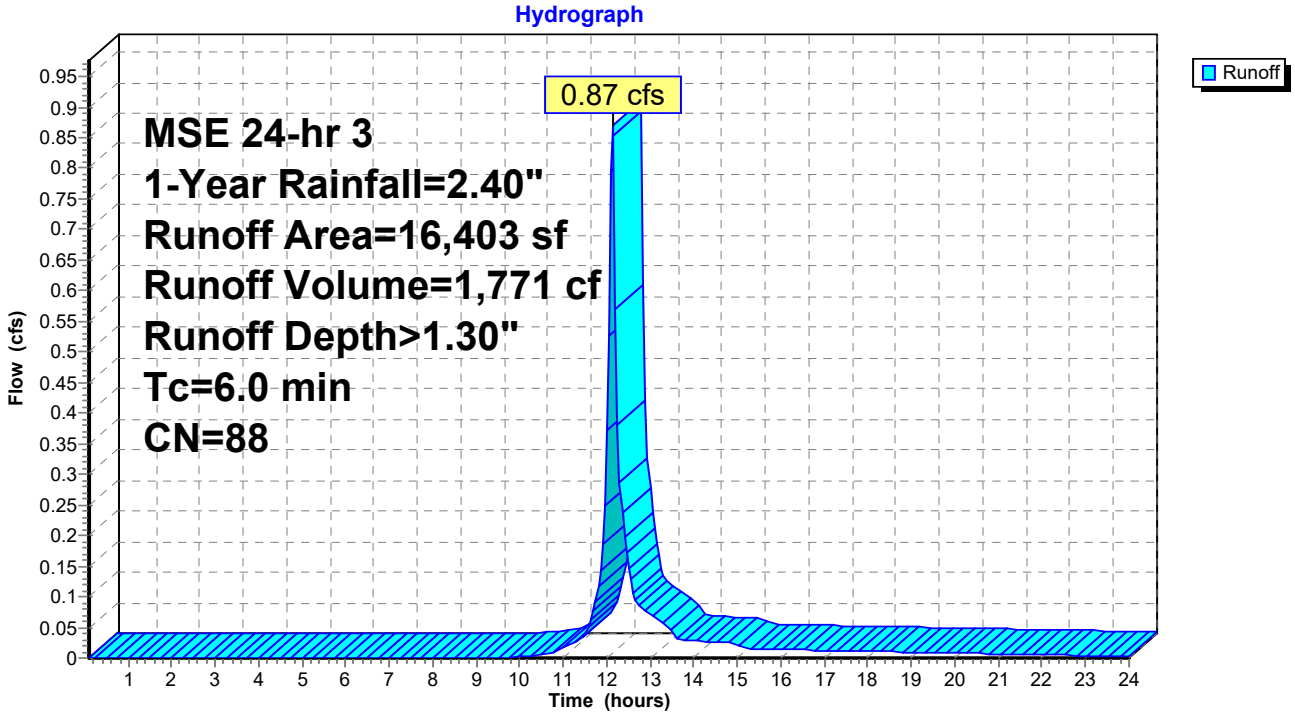
Runoff = 0.87 cfs @ 12.13 hrs, Volume= 1,771 cf, Depth> 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	15,536	89	IMP (GRAVEL)
*	867	74	PER (GRASS)
	16,403	88	Weighted Average
	16,403		100.00% Pervious Area

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

Subcatchment 11S: E



Summary for Subcatchment 12S: F

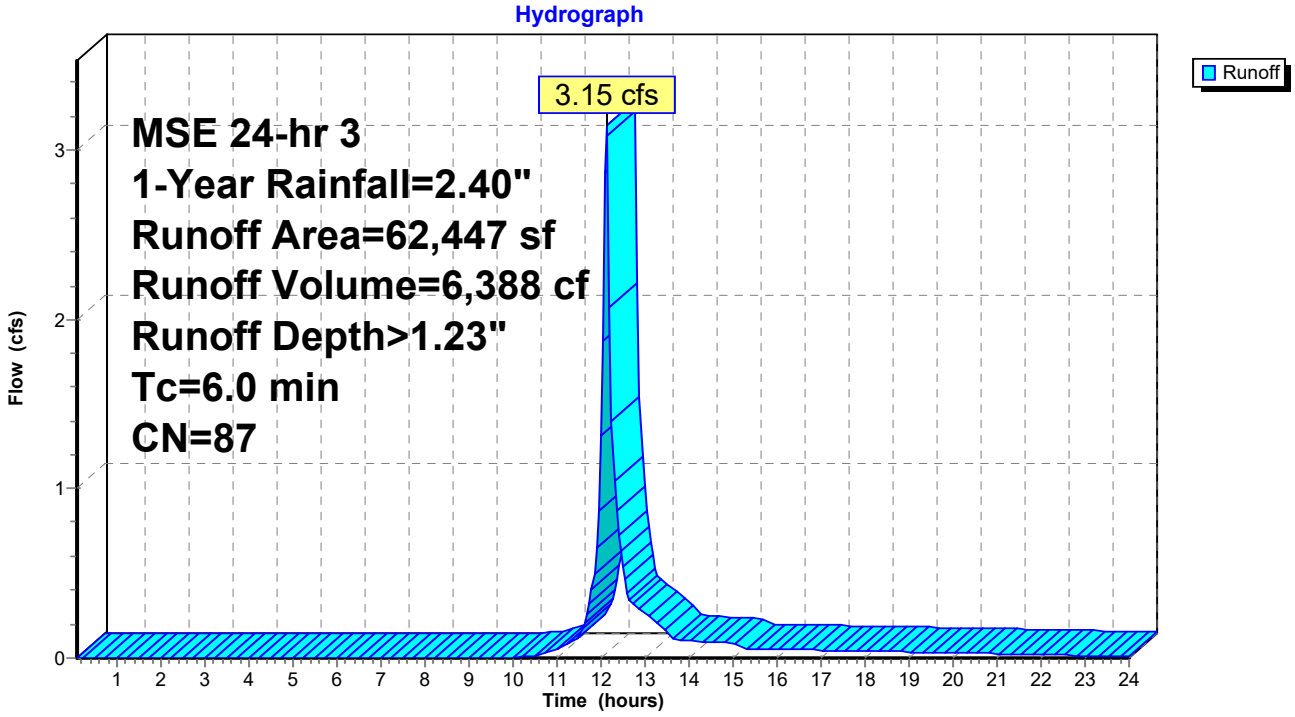
Runoff = 3.15 cfs @ 12.13 hrs, Volume= 6,388 cf, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	54,074	89	IMP (GRAVEL)
*	8,373	74	PER (GRASS)
	62,447	87	Weighted Average
	62,447		100.00% Pervious Area

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

Subcatchment 12S: F



Summary for Subcatchment 13S: G

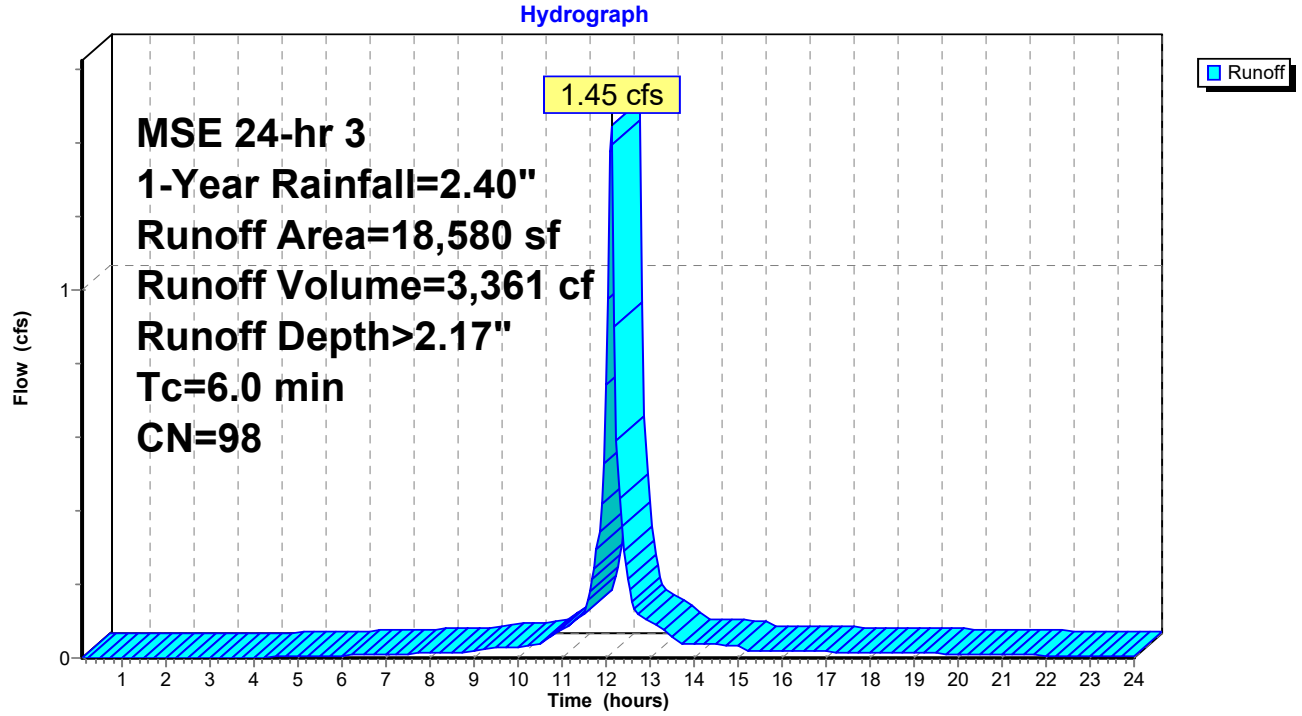
Runoff = 1.45 cfs @ 12.13 hrs, Volume= 3,361 cf, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	18,580	98	IMP (CONCRETE)
	18,580		100.00% Impervious Area

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

Subcatchment 13S: G



Summary for Pond 3P: Existing Pond

Inflow Area = 117,586 sf, 15.80% Impervious, Inflow Depth > 1.38" for 1-Year event
Inflow = 6.45 cfs @ 12.13 hrs, Volume= 13,537 cf
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 852.45' @ 24.00 hrs Surf.Area= 11,014 sf Storage= 13,536 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

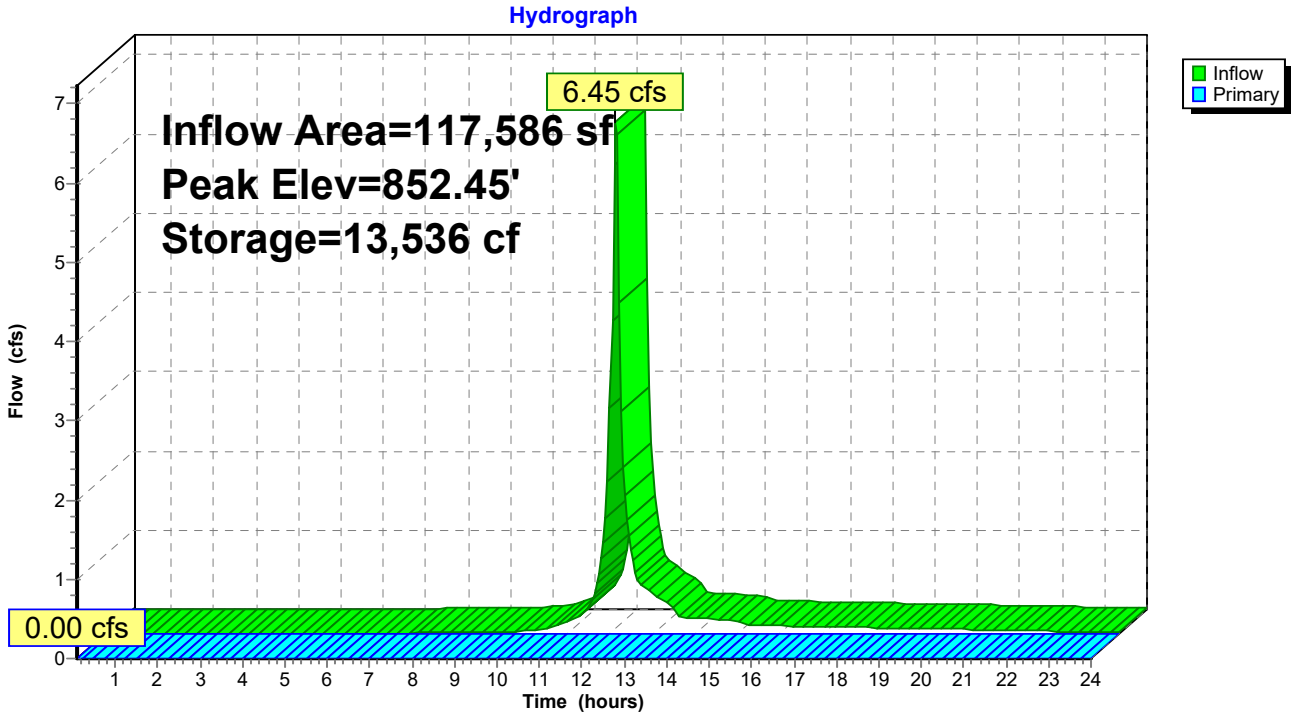
Volume	Invert	Avail.Storage	Storage Description
#1	851.00'	48,791 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
851.00	7,572	0	0
852.00	9,963	8,768	8,768
853.00	12,276	11,120	19,887
854.00	14,385	13,331	33,218
855.00	16,761	15,573	48,791

Device	Routing	Invert	Outlet Devices
#1	Primary	854.00'	**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=0.00 cfs @ 0.10 hrs HW=851.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Existing Pond

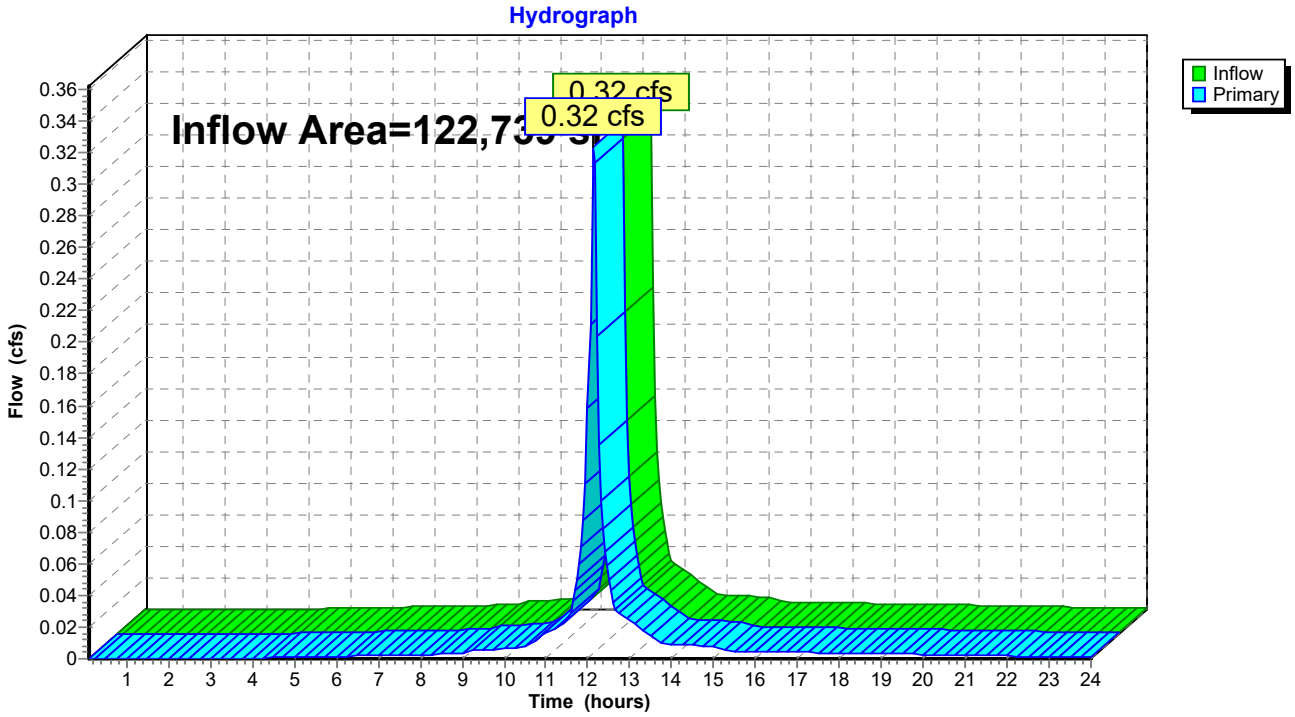


Summary for Link 6L: TOTAL

Inflow Area = 122,739 sf, 18.22% Impervious, Inflow Depth > 0.07" for 1-Year event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 748 cf
Primary = 0.32 cfs @ 12.13 hrs, Volume= 748 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 6L: TOTAL

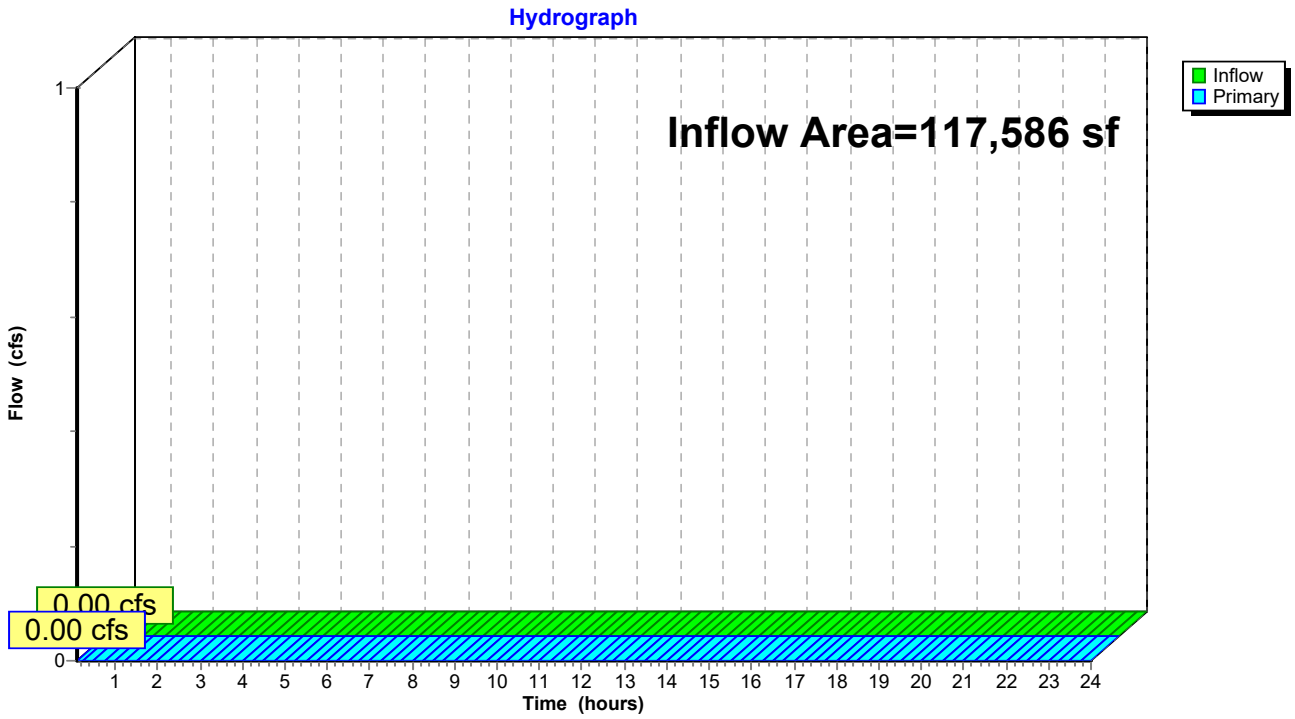


Summary for Link 20L: TREATED

Inflow Area = 117,586 sf, 15.80% Impervious, Inflow Depth = 0.00" for 1-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 20L: TREATED

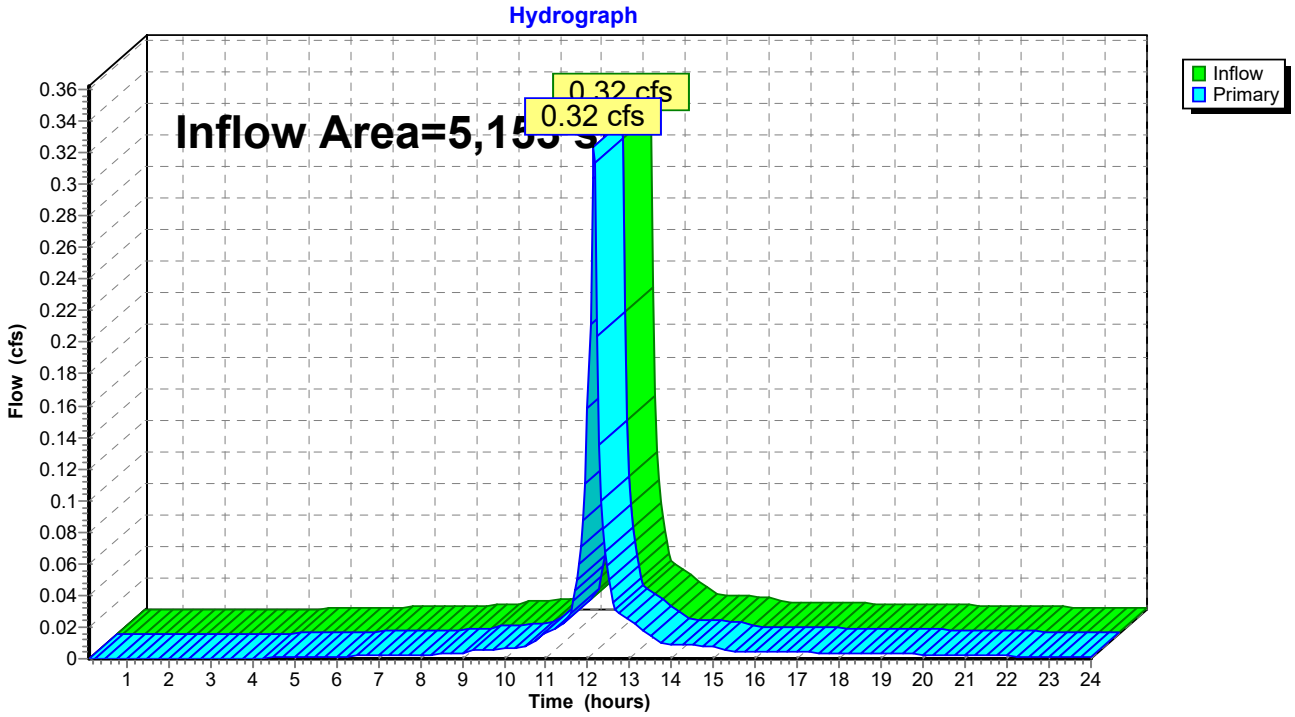


Summary for Link 21L: UNTREATED

Inflow Area = 5,153 sf, 73.53% Impervious, Inflow Depth > 1.74" for 1-Year event
Inflow = 0.32 cfs @ 12.13 hrs, Volume= 748 cf
Primary = 0.32 cfs @ 12.13 hrs, Volume= 748 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 21L: UNTREATED



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 6S: H Runoff Area=3,789 sf 100.00% Impervious Runoff Depth>2.47"
Tc=6.0 min CN=98 Runoff=0.33 cfs 780 cf

Subcatchment 7S: I Runoff Area=928 sf 0.00% Impervious Runoff Depth>0.72"
Tc=6.0 min CN=74 Runoff=0.03 cfs 56 cf

Subcatchment 8S: B Runoff Area=17,571 sf 0.00% Impervious Runoff Depth>1.55"
Tc=6.0 min CN=88 Runoff=1.11 cfs 2,275 cf

Subcatchment 9S: C Runoff Area=2,585 sf 0.00% Impervious Runoff Depth>0.72"
Tc=6.0 min CN=74 Runoff=0.07 cfs 156 cf

Subcatchment 10S: D Runoff Area=436 sf 0.00% Impervious Runoff Depth>0.72"
Tc=6.0 min CN=74 Runoff=0.01 cfs 26 cf

Subcatchment 11S: E Runoff Area=16,403 sf 0.00% Impervious Runoff Depth>1.55"
Tc=6.0 min CN=88 Runoff=1.04 cfs 2,124 cf

Subcatchment 12S: F Runoff Area=62,447 sf 0.00% Impervious Runoff Depth>1.48"
Tc=6.0 min CN=87 Runoff=3.78 cfs 7,700 cf

Subcatchment 13S: G Runoff Area=18,580 sf 100.00% Impervious Runoff Depth>2.47"
Tc=6.0 min CN=98 Runoff=1.63 cfs 3,823 cf

Pond 3P: Existing Pond Peak Elev=852.68' Storage=16,076 cf Inflow=7.64 cfs 16,078 cf
Outflow=0.00 cfs 0 cf

Link 6L: TOTAL Inflow=0.37 cfs 862 cf
Primary=0.37 cfs 862 cf

Link 20L: TREATED Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 21L: UNTREATED Inflow=0.37 cfs 862 cf
Primary=0.37 cfs 862 cf

Total Runoff Area = 122,739 sf Runoff Volume = 16,940 cf Average Runoff Depth = 1.66"
81.78% Pervious = 100,370 sf 18.22% Impervious = 22,369 sf

Summary for Subcatchment 6S: H

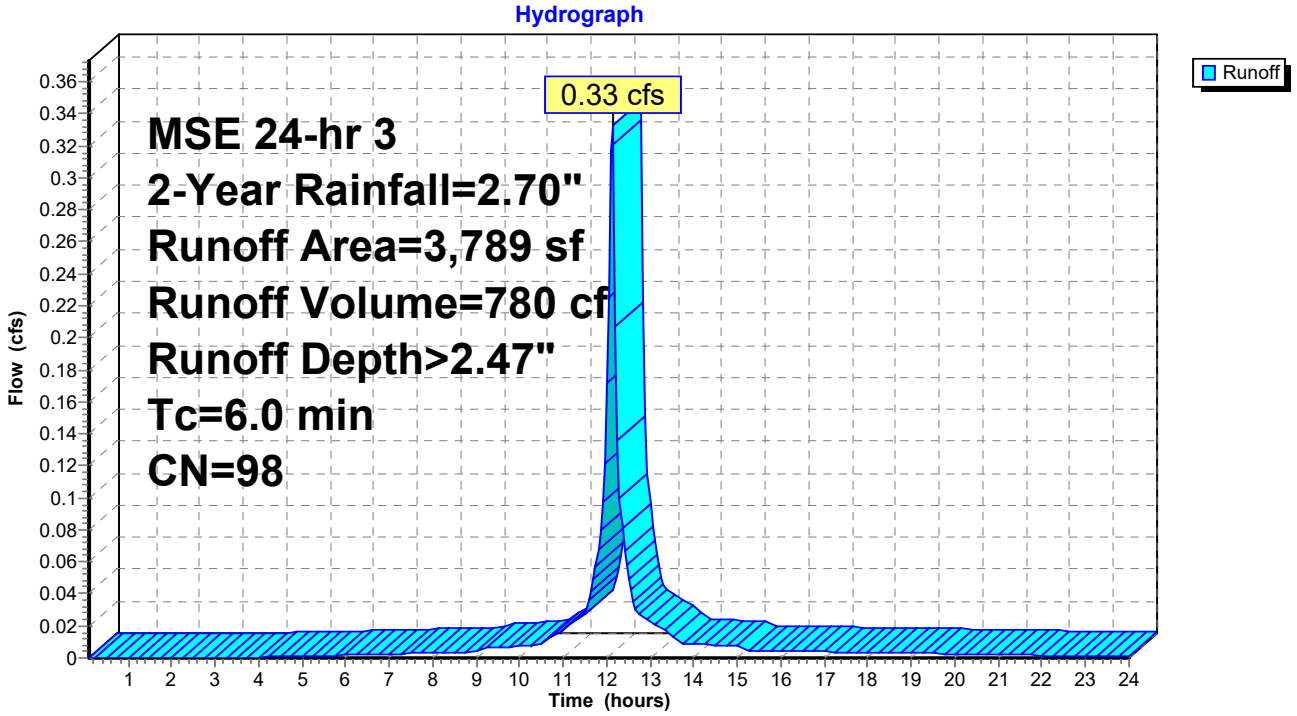
Runoff = 0.33 cfs @ 12.13 hrs, Volume= 780 cf, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	3,789	98	IMP (CONCRETE)
	3,789		100.00% Impervious Area

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

Subcatchment 6S: H



Summary for Subcatchment 7S: I

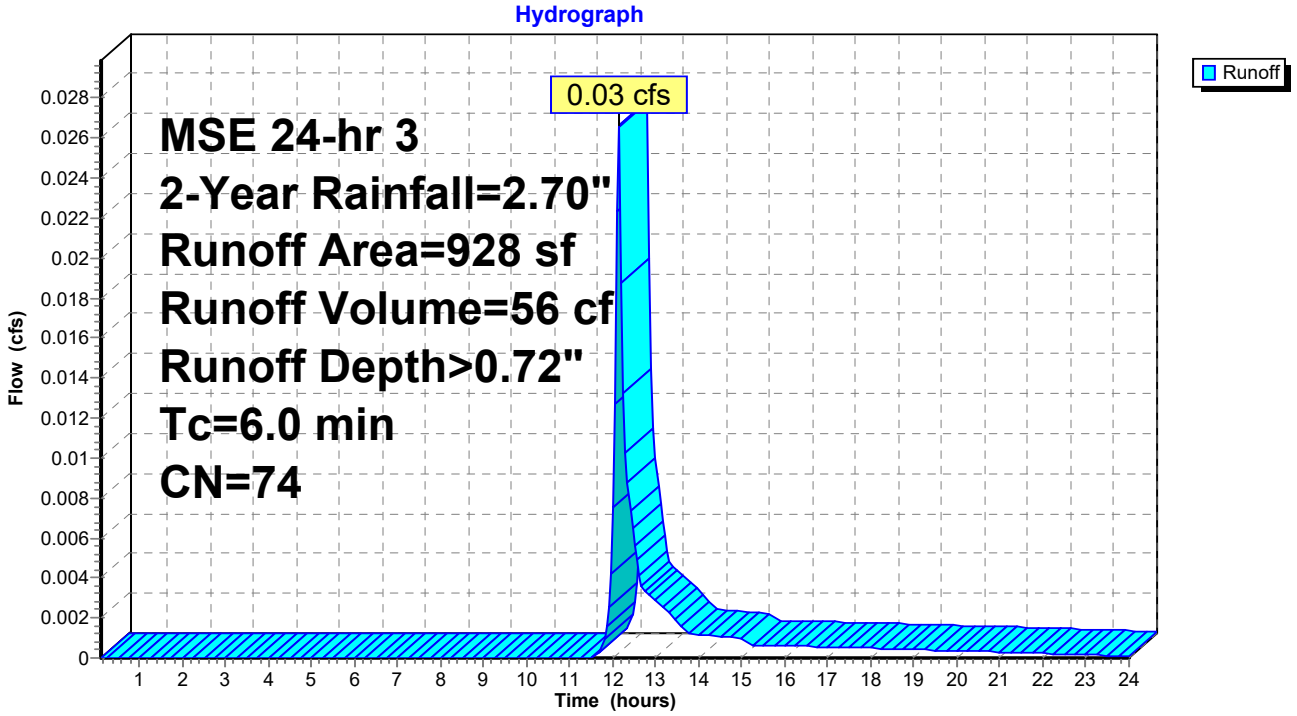
Runoff = 0.03 cfs @ 12.14 hrs, Volume= 56 cf, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	928	74	PER (GRASS)
	928		100.00% Pervious Area

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

Subcatchment 7S: I



Summary for Subcatchment 8S: B

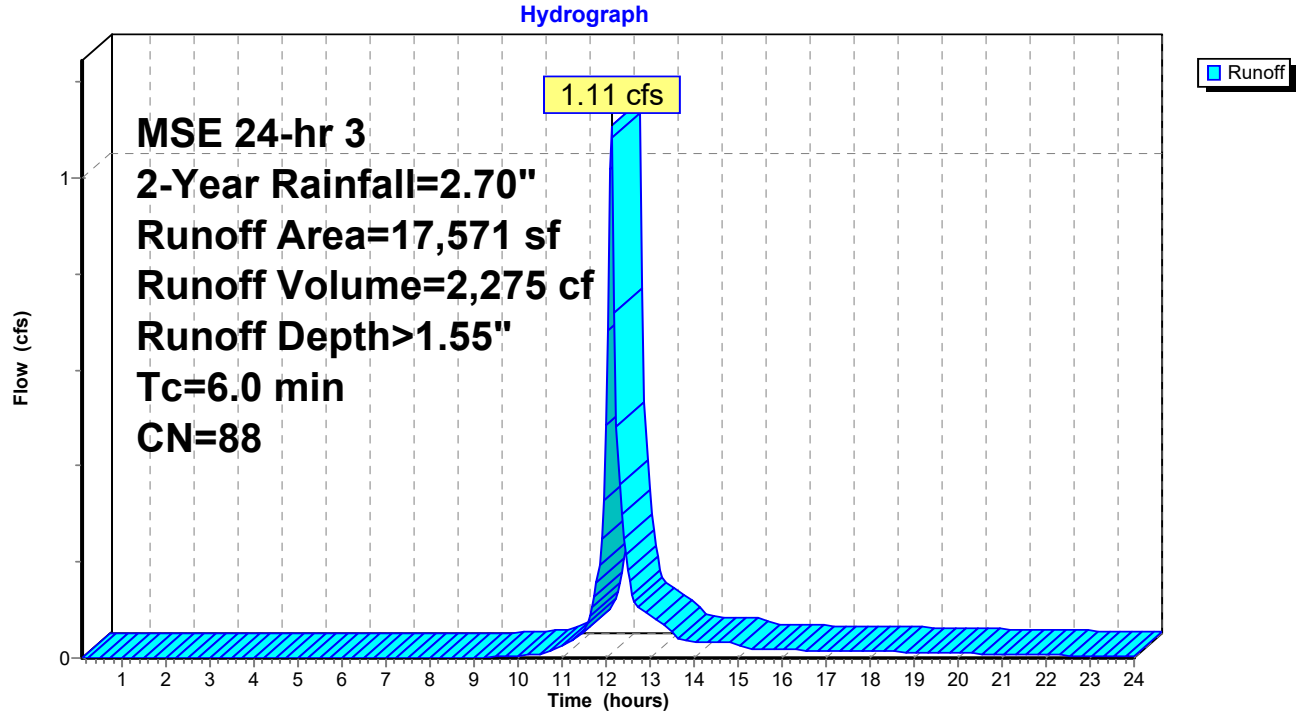
Runoff = 1.11 cfs @ 12.13 hrs, Volume= 2,275 cf, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	16,222	89	IMP (GRAVEL)
*	1,349	74	PER (GRASS)
	17,571	88	Weighted Average
	17,571		100.00% Pervious Area

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

Subcatchment 8S: B



Summary for Subcatchment 9S: C

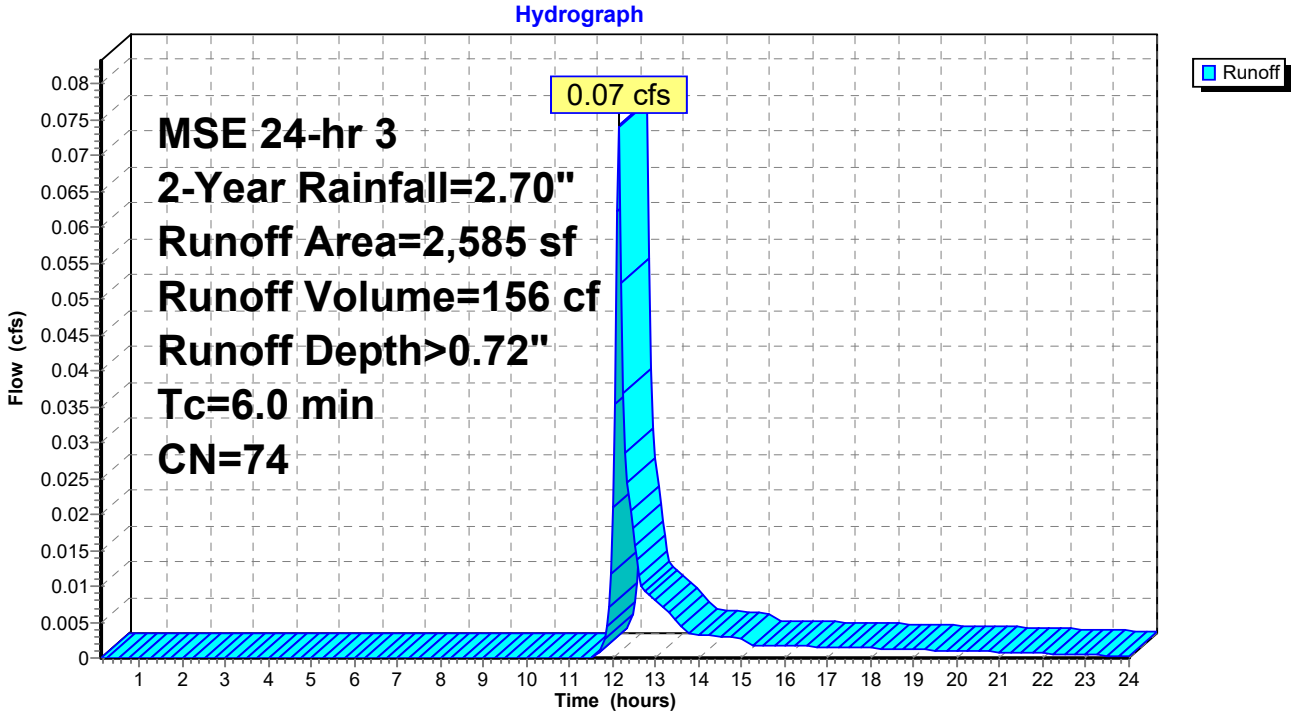
Runoff = 0.07 cfs @ 12.14 hrs, Volume= 156 cf, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	2,585	74	PER (GRASS)
	2,585		100.00% Pervious Area

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

Subcatchment 9S: C



Summary for Subcatchment 10S: D

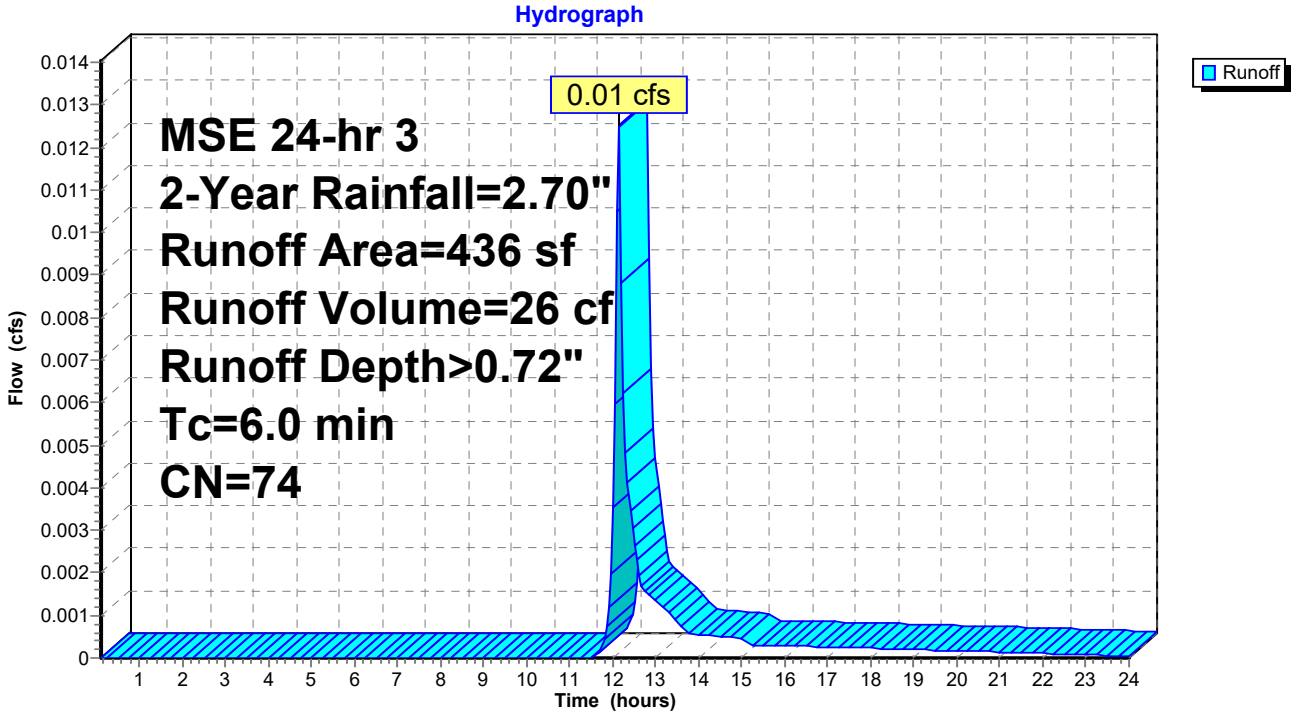
Runoff = 0.01 cfs @ 12.14 hrs, Volume= 26 cf, Depth> 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	436	74	PER (GRASS)
	436		100.00% Pervious Area

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

Subcatchment 10S: D



Summary for Subcatchment 11S: E

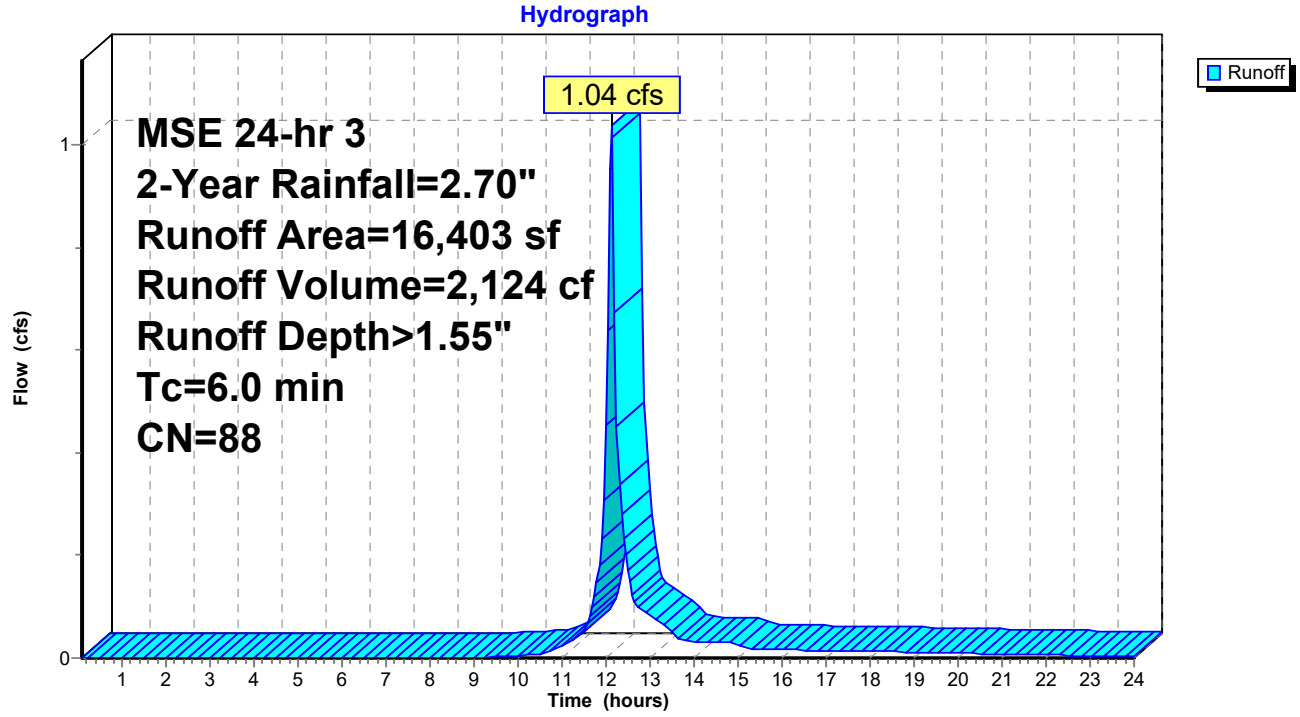
Runoff = 1.04 cfs @ 12.13 hrs, Volume= 2,124 cf, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	15,536	89	IMP (GRAVEL)
*	867	74	PER (GRASS)
	16,403	88	Weighted Average
	16,403		100.00% Pervious Area

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

Subcatchment 11S: E



Summary for Subcatchment 12S: F

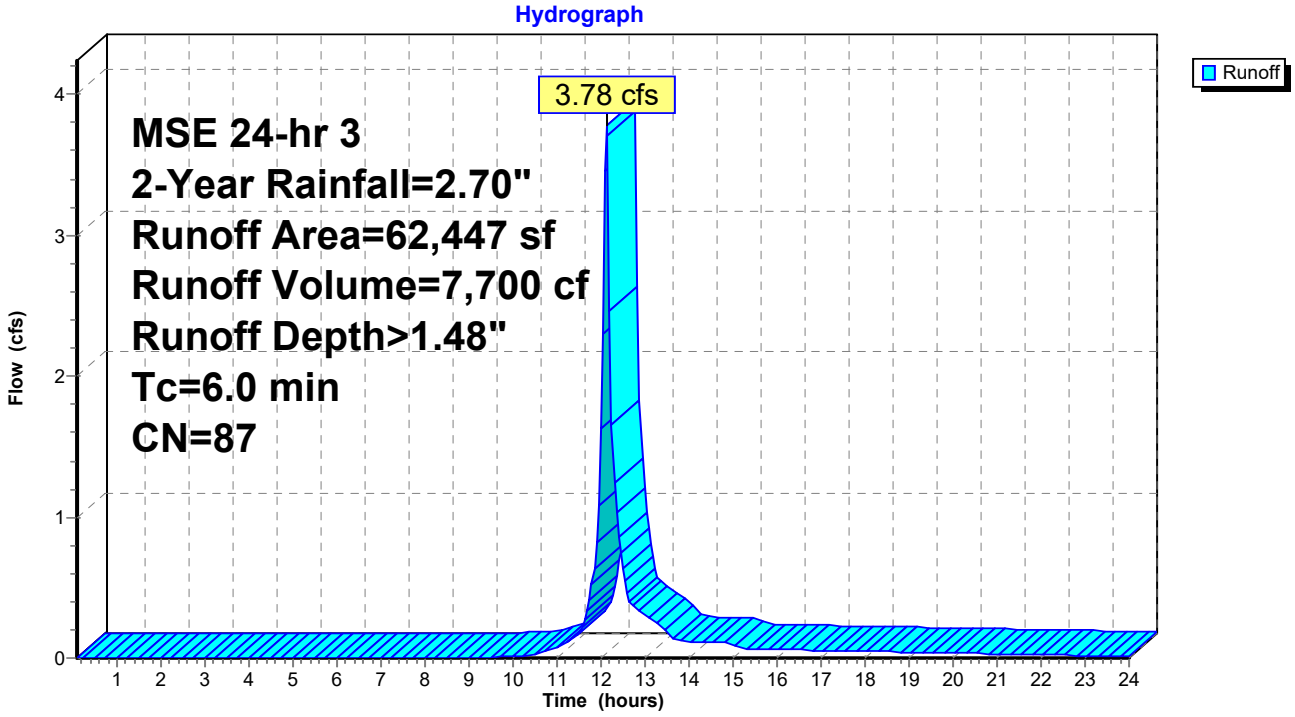
Runoff = 3.78 cfs @ 12.13 hrs, Volume= 7,700 cf, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	54,074	89	IMP (GRAVEL)
*	8,373	74	PER (GRASS)
	62,447	87	Weighted Average
	62,447		100.00% Pervious Area

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

Subcatchment 12S: F



Summary for Subcatchment 13S: G

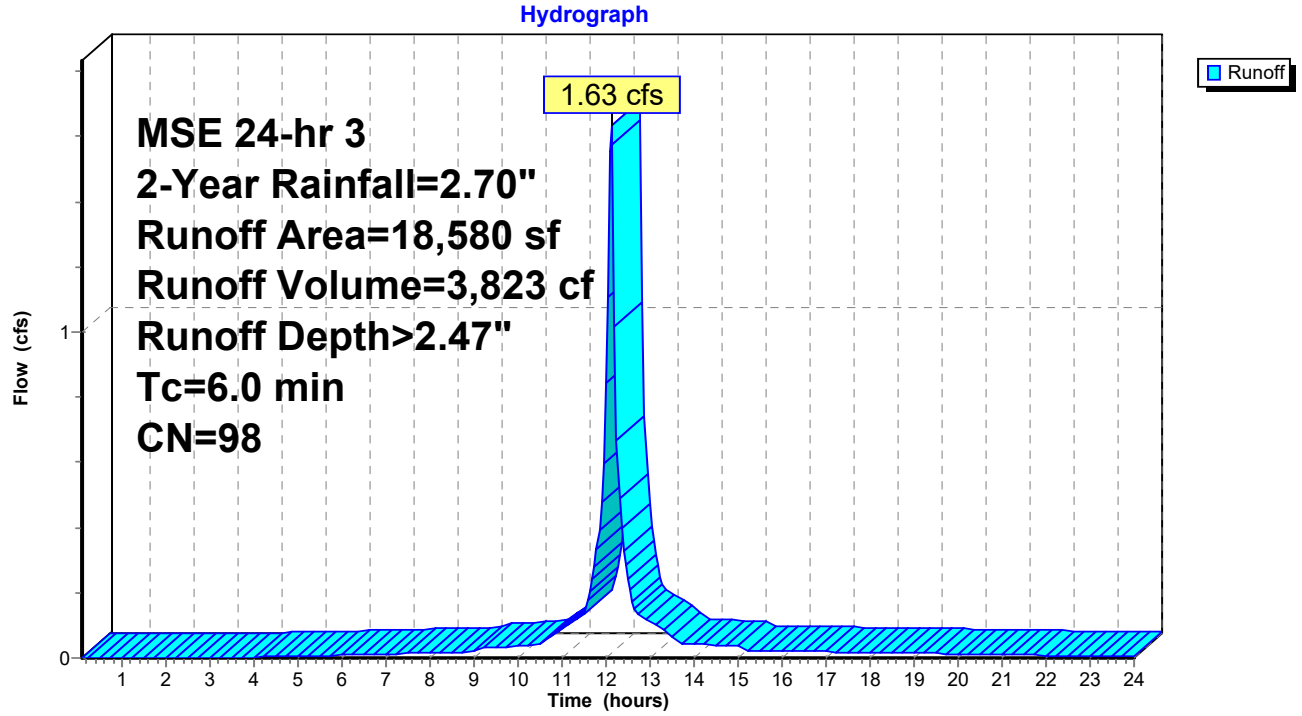
Runoff = 1.63 cfs @ 12.13 hrs, Volume= 3,823 cf, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	18,580	98	IMP (CONCRETE)
	18,580		100.00% Impervious Area

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

Subcatchment 13S: G



Summary for Pond 3P: Existing Pond

Inflow Area = 117,586 sf, 15.80% Impervious, Inflow Depth > 1.64" for 2-Year event
Inflow = 7.64 cfs @ 12.13 hrs, Volume= 16,078 cf
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 852.68' @ 24.00 hrs Surf.Area= 11,536 sf Storage= 16,076 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

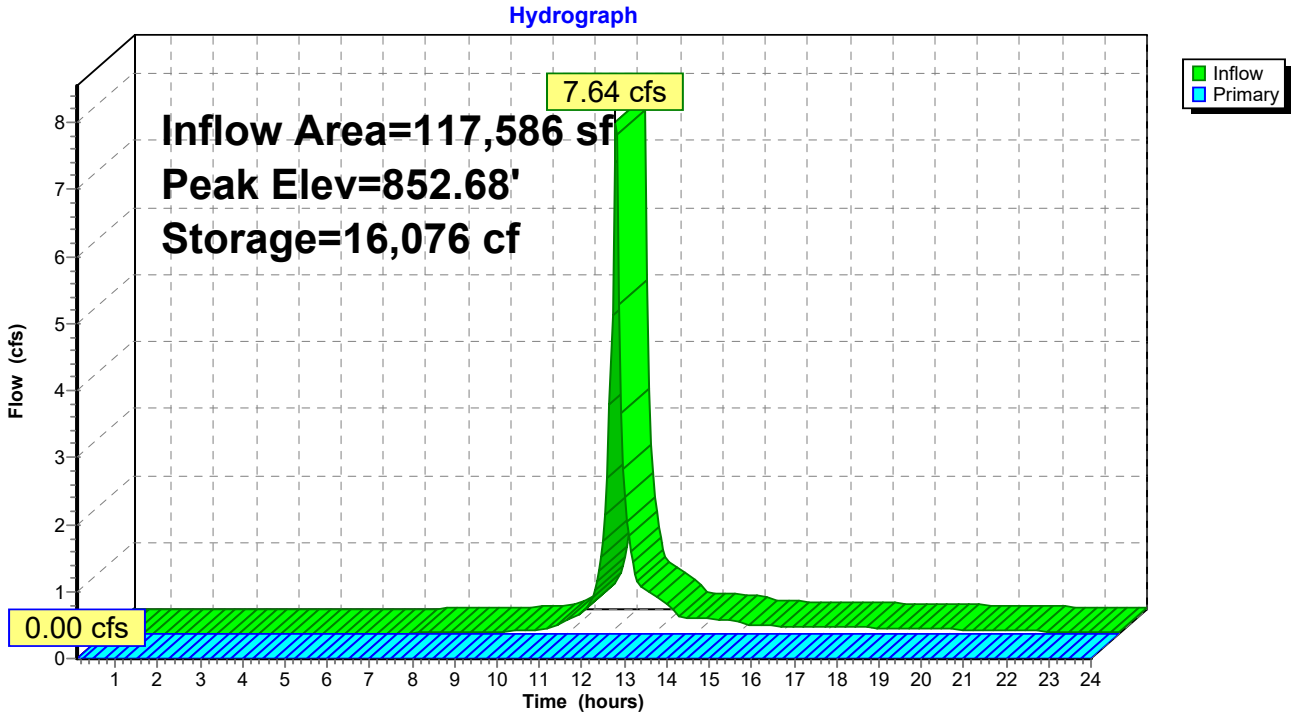
Volume	Invert	Avail.Storage	Storage Description
#1	851.00'	48,791 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
851.00	7,572	0	0
852.00	9,963	8,768	8,768
853.00	12,276	11,120	19,887
854.00	14,385	13,331	33,218
855.00	16,761	15,573	48,791

Device	Routing	Invert	Outlet Devices
#1	Primary	854.00'	**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=0.00 cfs @ 0.10 hrs HW=851.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Existing Pond

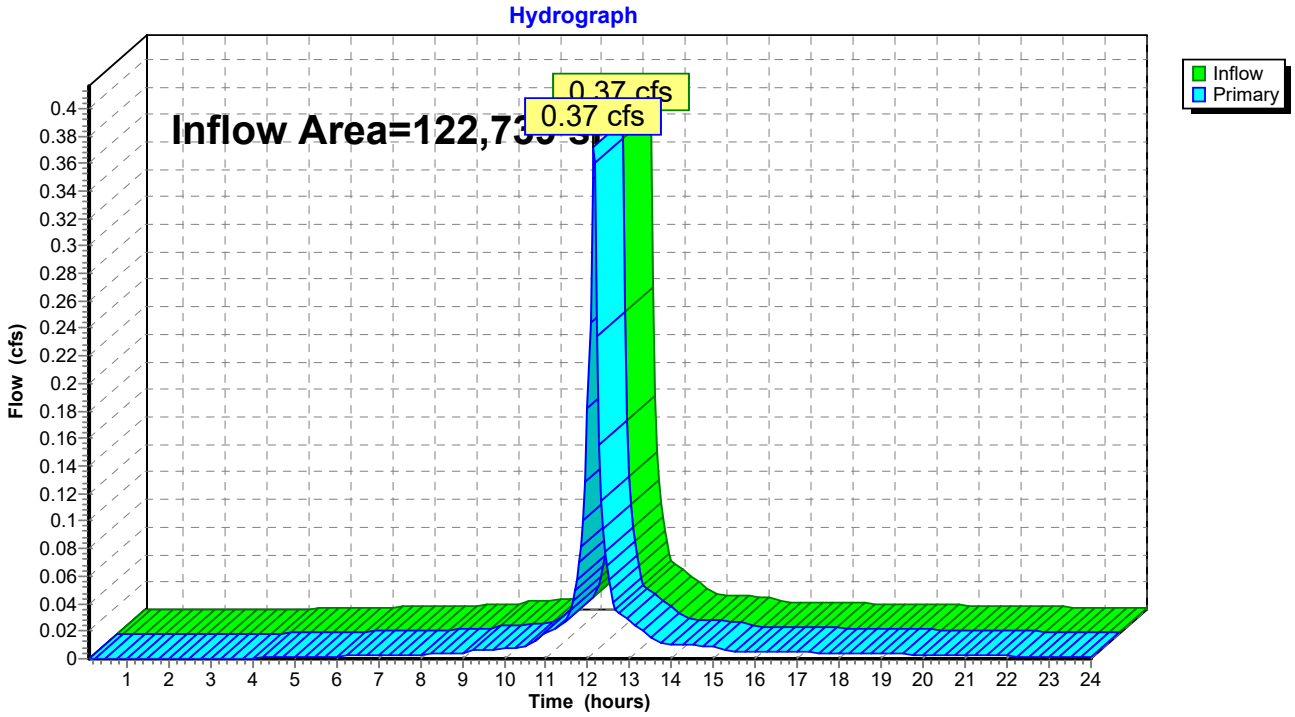


Summary for Link 6L: TOTAL

Inflow Area = 122,739 sf, 18.22% Impervious, Inflow Depth > 0.08" for 2-Year event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 862 cf
Primary = 0.37 cfs @ 12.13 hrs, Volume= 862 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 6L: TOTAL

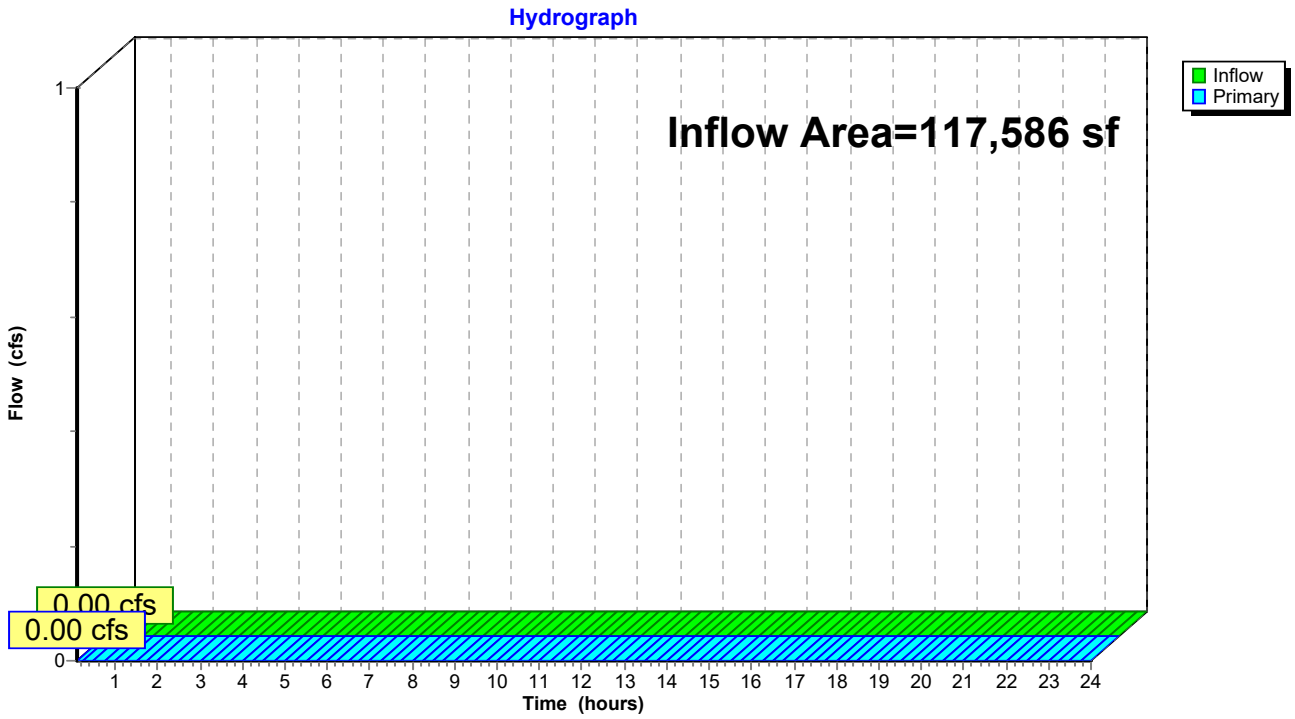


Summary for Link 20L: TREATED

Inflow Area = 117,586 sf, 15.80% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 20L: TREATED

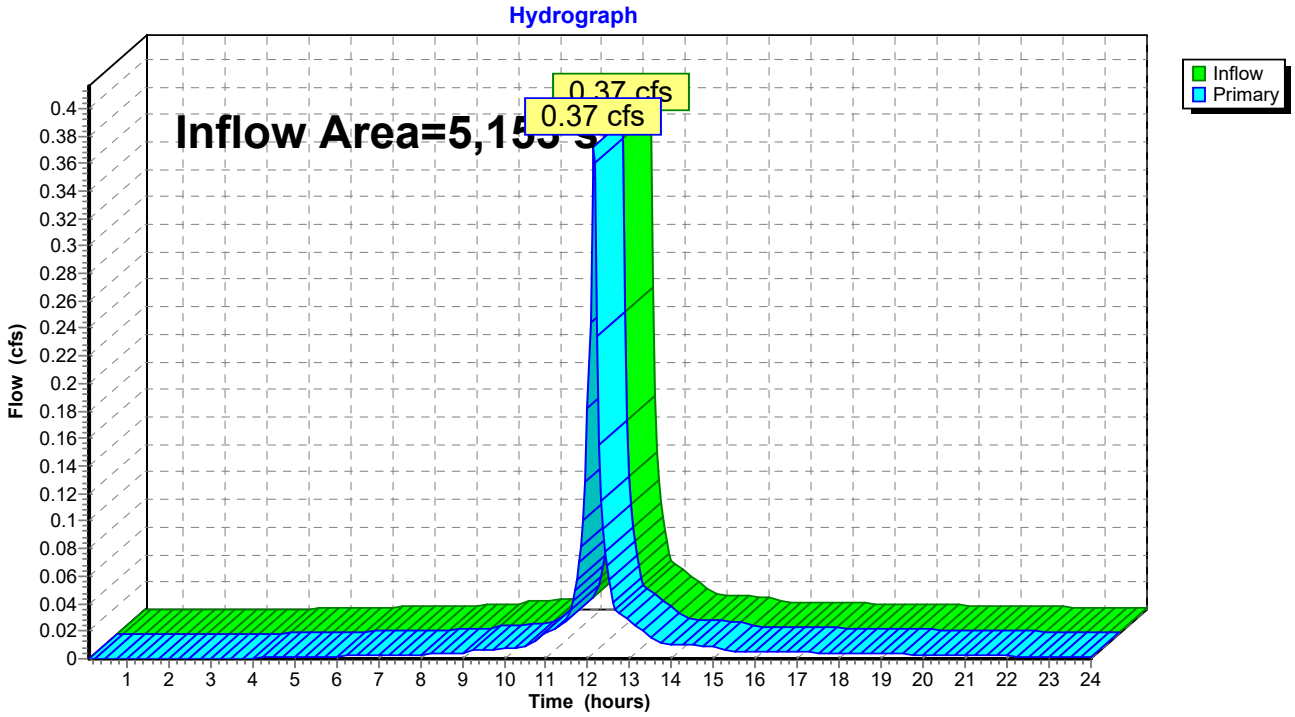


Summary for Link 21L: UNTREATED

Inflow Area = 5,153 sf, 73.53% Impervious, Inflow Depth > 2.01" for 2-Year event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 862 cf
Primary = 0.37 cfs @ 12.13 hrs, Volume= 862 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 21L: UNTREATED



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 6S: H Runoff Area=3,789 sf 100.00% Impervious Runoff Depth>3.57"
Tc=6.0 min CN=98 Runoff=0.47 cfs 1,129 cf

Subcatchment 7S: I Runoff Area=928 sf 0.00% Impervious Runoff Depth>1.46"
Tc=6.0 min CN=74 Runoff=0.06 cfs 113 cf

Subcatchment 8S: B Runoff Area=17,571 sf 0.00% Impervious Runoff Depth>2.55"
Tc=6.0 min CN=88 Runoff=1.79 cfs 3,737 cf

Subcatchment 9S: C Runoff Area=2,585 sf 0.00% Impervious Runoff Depth>1.46"
Tc=6.0 min CN=74 Runoff=0.16 cfs 314 cf

Subcatchment 10S: D Runoff Area=436 sf 0.00% Impervious Runoff Depth>1.46"
Tc=6.0 min CN=74 Runoff=0.03 cfs 53 cf

Subcatchment 11S: E Runoff Area=16,403 sf 0.00% Impervious Runoff Depth>2.55"
Tc=6.0 min CN=88 Runoff=1.67 cfs 3,489 cf

Subcatchment 12S: F Runoff Area=62,447 sf 0.00% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=87 Runoff=6.18 cfs 12,814 cf

Subcatchment 13S: G Runoff Area=18,580 sf 100.00% Impervious Runoff Depth>3.57"
Tc=6.0 min CN=98 Runoff=2.32 cfs 5,535 cf

Pond 3P: Existing Pond Peak Elev=853.47' Storage=25,887 cf Inflow=12.12 cfs 25,889 cf
Outflow=0.00 cfs 0 cf

Link 6L: TOTAL Inflow=0.56 cfs 1,294 cf
Primary=0.56 cfs 1,294 cf

Link 20L: TREATED Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 21L: UNTREATED Inflow=0.56 cfs 1,294 cf
Primary=0.56 cfs 1,294 cf

Total Runoff Area = 122,739 sf Runoff Volume = 27,184 cf Average Runoff Depth = 2.66"
81.78% Pervious = 100,370 sf 18.22% Impervious = 22,369 sf

Summary for Subcatchment 6S: H

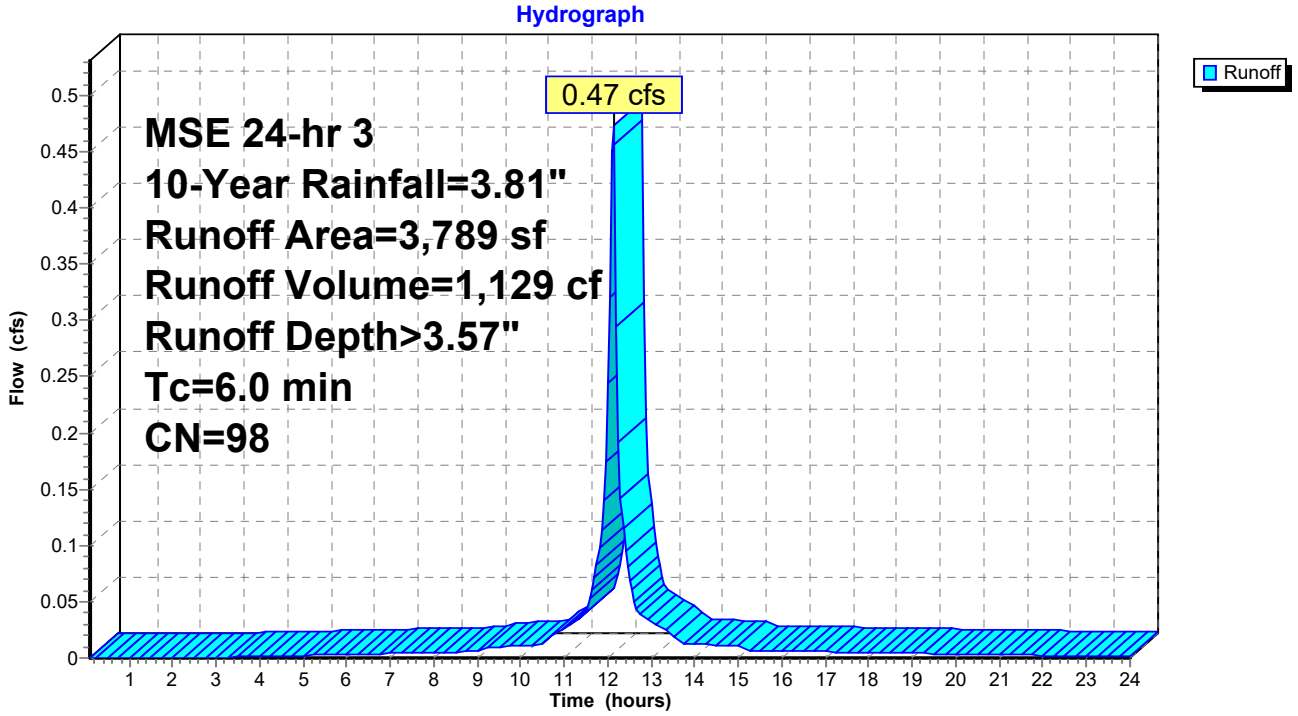
Runoff = 0.47 cfs @ 12.13 hrs, Volume= 1,129 cf, Depth> 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	3,789	98	IMP (CONCRETE)
	3,789		100.00% Impervious Area

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

Subcatchment 6S: H



Summary for Subcatchment 7S: I

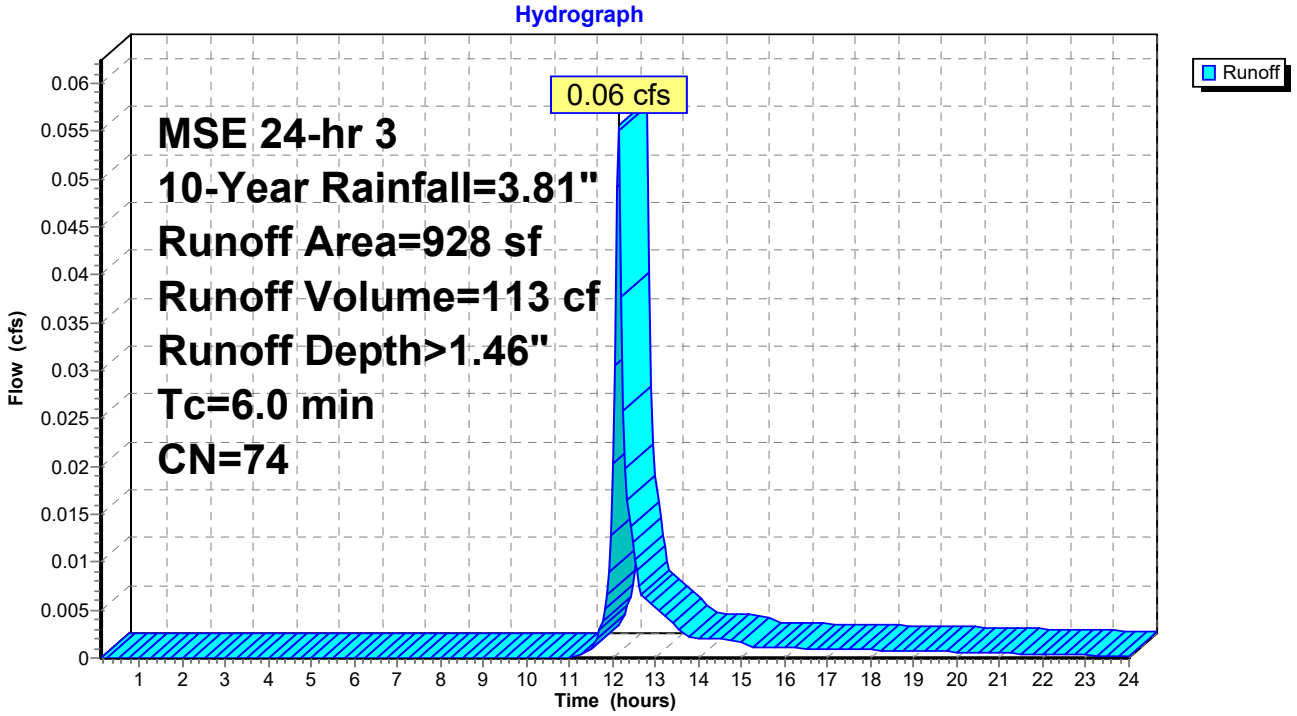
Runoff = 0.06 cfs @ 12.14 hrs, Volume= 113 cf, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	928	74	PER (GRASS)
	928		100.00% Pervious Area

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

Subcatchment 7S: I



Summary for Subcatchment 8S: B

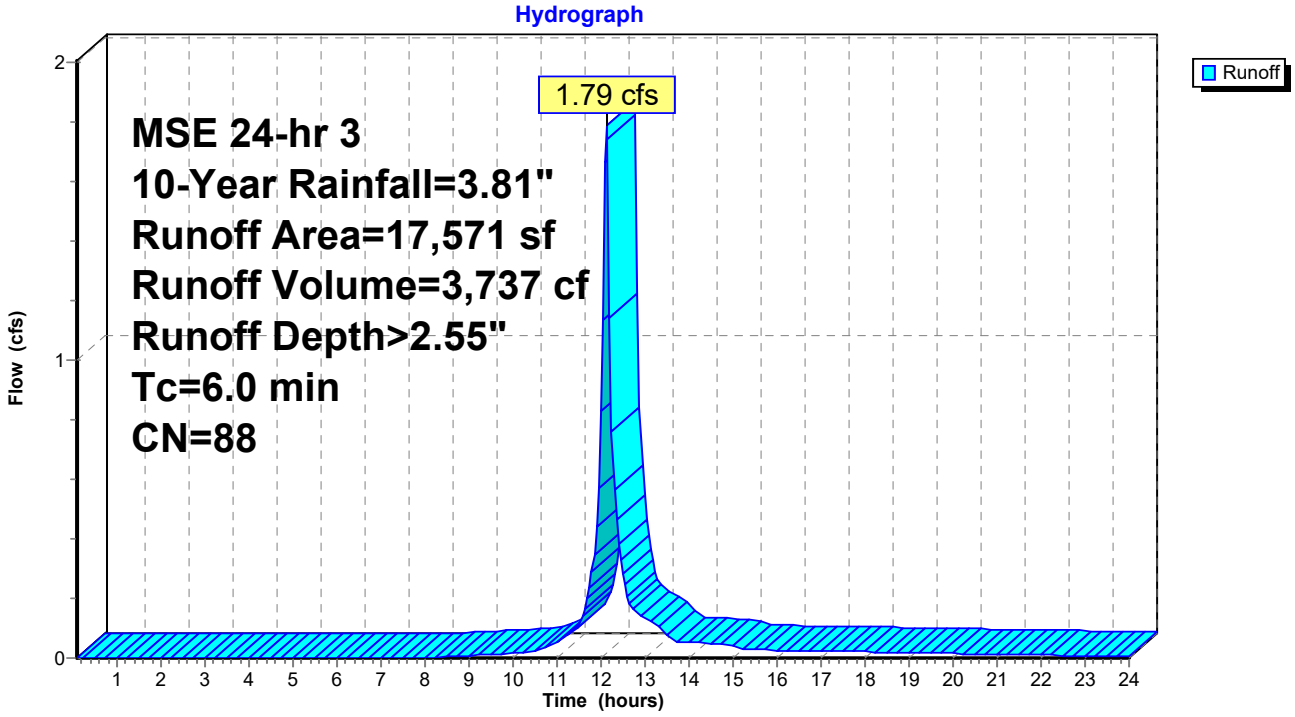
Runoff = 1.79 cfs @ 12.13 hrs, Volume= 3,737 cf, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	16,222	89	IMP (GRAVEL)
*	1,349	74	PER (GRASS)
	17,571	88	Weighted Average
	17,571		100.00% Pervious Area

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

Subcatchment 8S: B



Summary for Subcatchment 9S: C

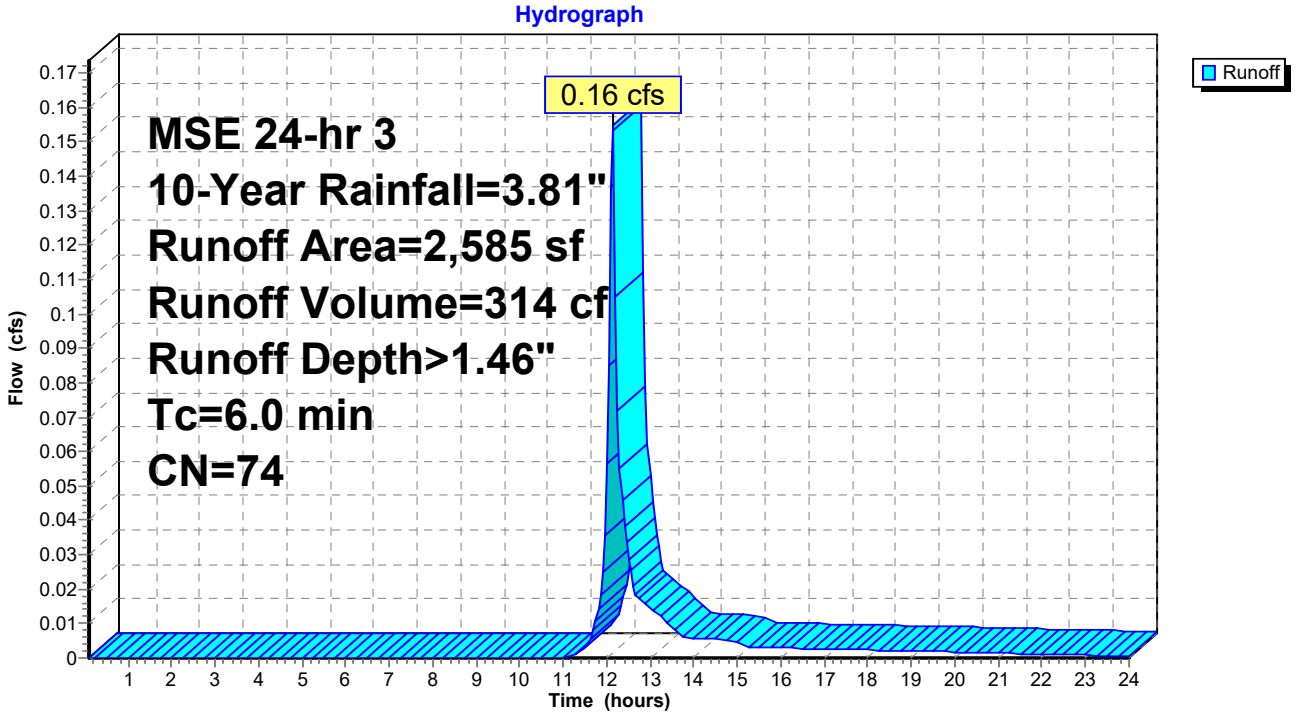
Runoff = 0.16 cfs @ 12.14 hrs, Volume= 314 cf, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	2,585	74	PER (GRASS)
	2,585		100.00% Pervious Area

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

Subcatchment 9S: C



Summary for Subcatchment 10S: D

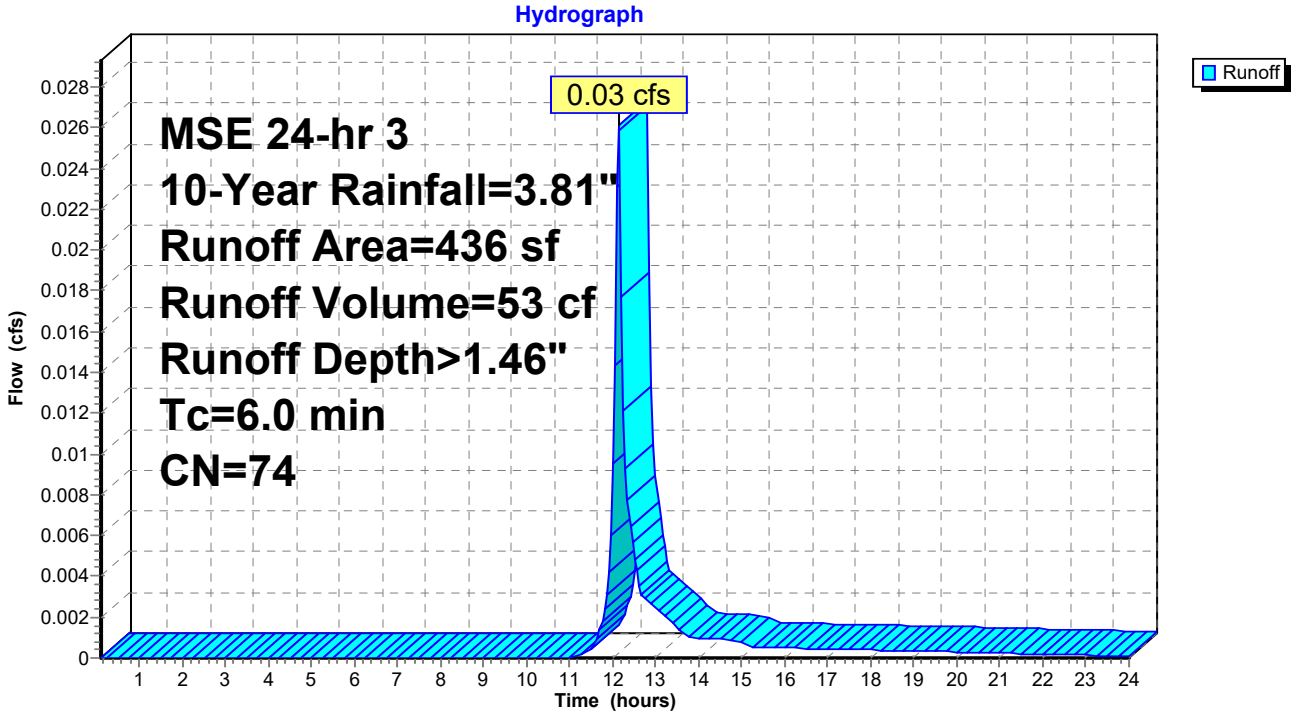
Runoff = 0.03 cfs @ 12.14 hrs, Volume= 53 cf, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	436	74	PER (GRASS)
	436		100.00% Pervious Area

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

Subcatchment 10S: D



Summary for Subcatchment 11S: E

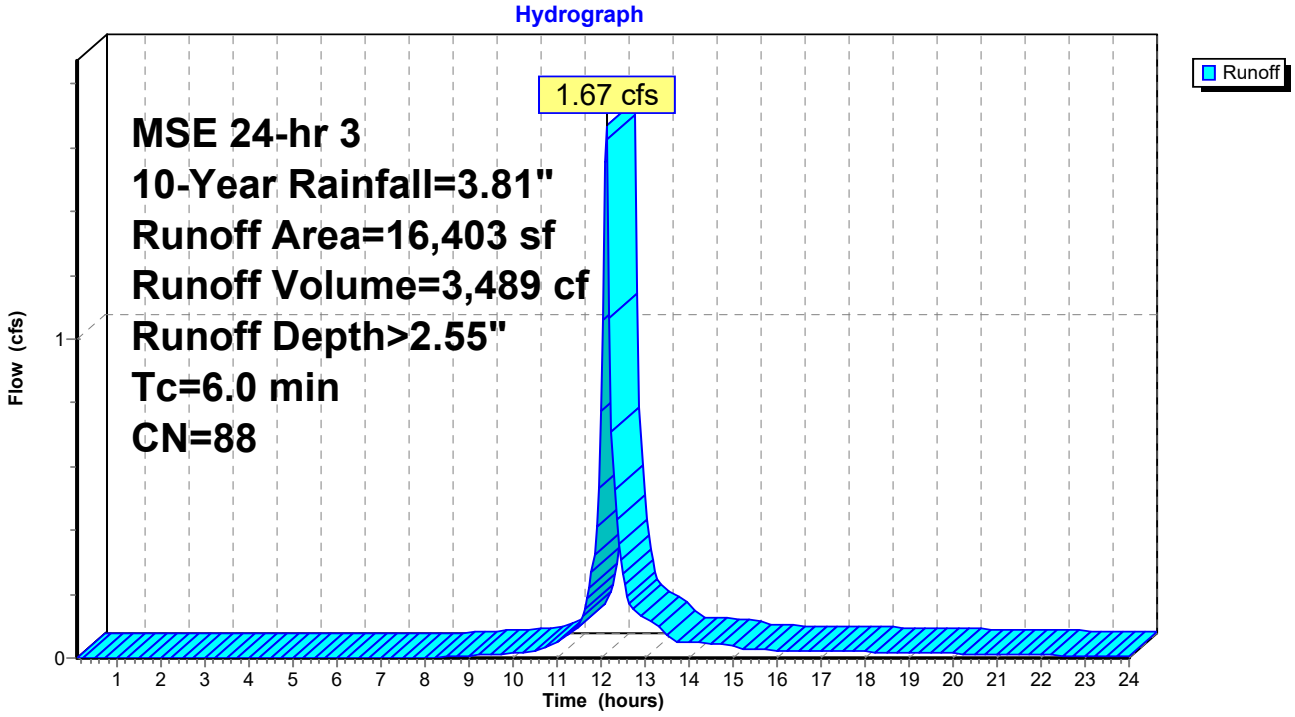
Runoff = 1.67 cfs @ 12.13 hrs, Volume= 3,489 cf, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	15,536	89	IMP (GRAVEL)
*	867	74	PER (GRASS)
	16,403	88	Weighted Average
	16,403		100.00% Pervious Area

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

Subcatchment 11S: E



Summary for Subcatchment 12S: F

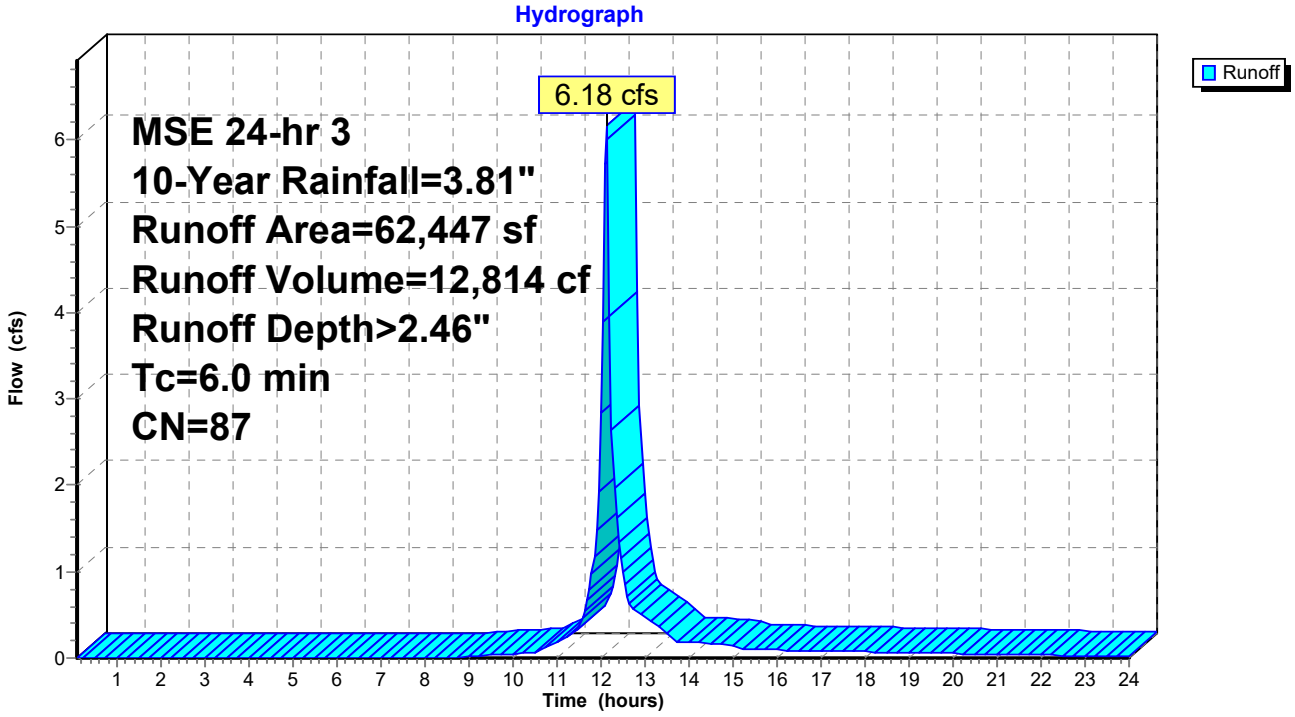
Runoff = 6.18 cfs @ 12.13 hrs, Volume= 12,814 cf, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	54,074	89	IMP (GRAVEL)
*	8,373	74	PER (GRASS)
	62,447	87	Weighted Average
	62,447		100.00% Pervious Area

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

Subcatchment 12S: F



Summary for Subcatchment 13S: G

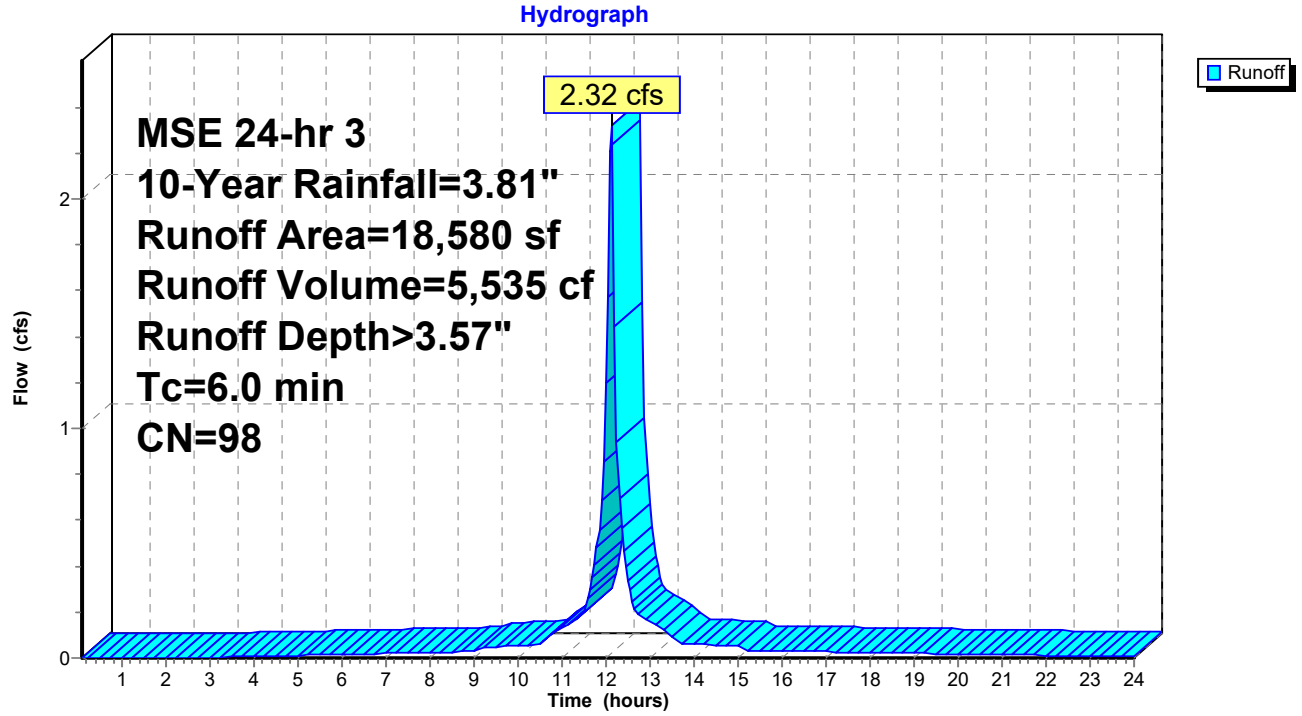
Runoff = 2.32 cfs @ 12.13 hrs, Volume= 5,535 cf, Depth> 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	18,580	98	IMP (CONCRETE)
	18,580		100.00% Impervious Area

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

Subcatchment 13S: G



Summary for Pond 3P: Existing Pond

Inflow Area = 117,586 sf, 15.80% Impervious, Inflow Depth > 2.64" for 10-Year event
Inflow = 12.12 cfs @ 12.13 hrs, Volume= 25,889 cf
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 853.47' @ 24.00 hrs Surf.Area= 13,267 sf Storage= 25,887 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

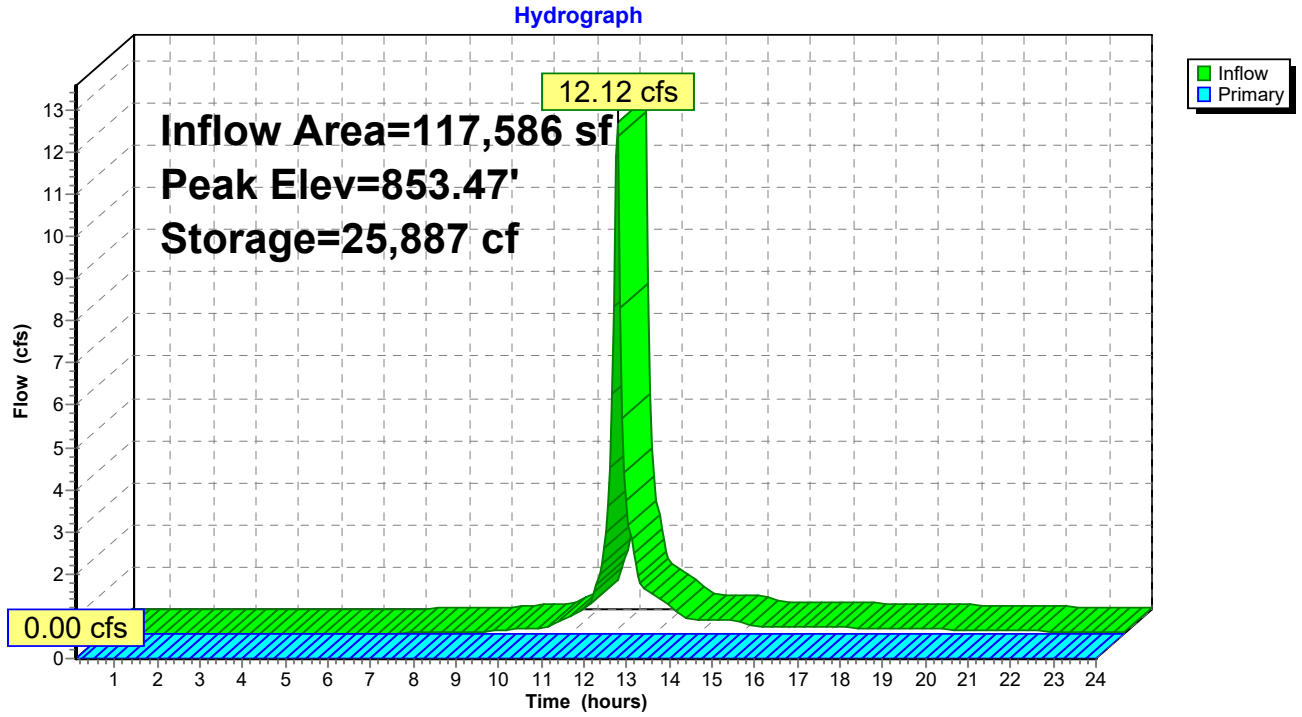
Volume	Invert	Avail.Storage	Storage Description
#1	851.00'	48,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
851.00	7,572	0	0
852.00	9,963	8,768	8,768
853.00	12,276	11,120	19,887
854.00	14,385	13,331	33,218
855.00	16,761	15,573	48,791

Device	Routing	Invert	Outlet Devices
#1	Primary	854.00'	**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=0.00 cfs @ 0.10 hrs HW=851.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Existing Pond

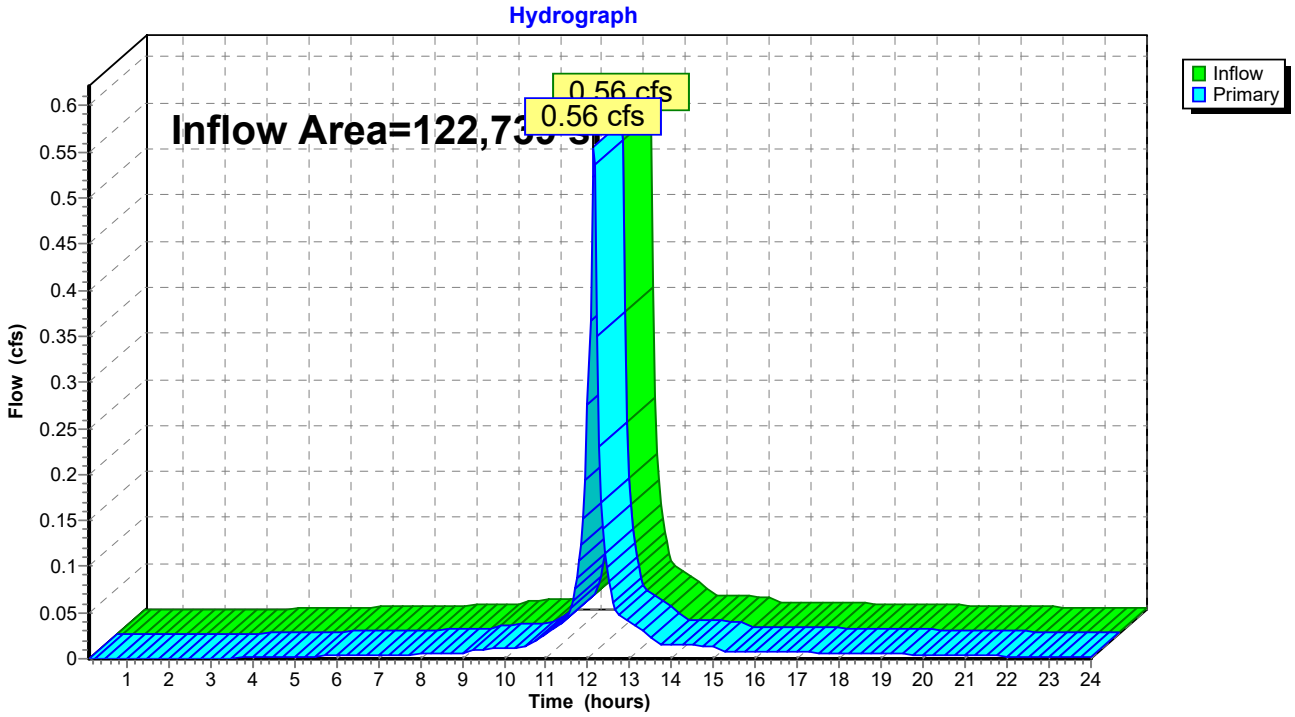


Summary for Link 6L: TOTAL

Inflow Area = 122,739 sf, 18.22% Impervious, Inflow Depth > 0.13" for 10-Year event
Inflow = 0.56 cfs @ 12.13 hrs, Volume= 1,294 cf
Primary = 0.56 cfs @ 12.13 hrs, Volume= 1,294 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 6L: TOTAL

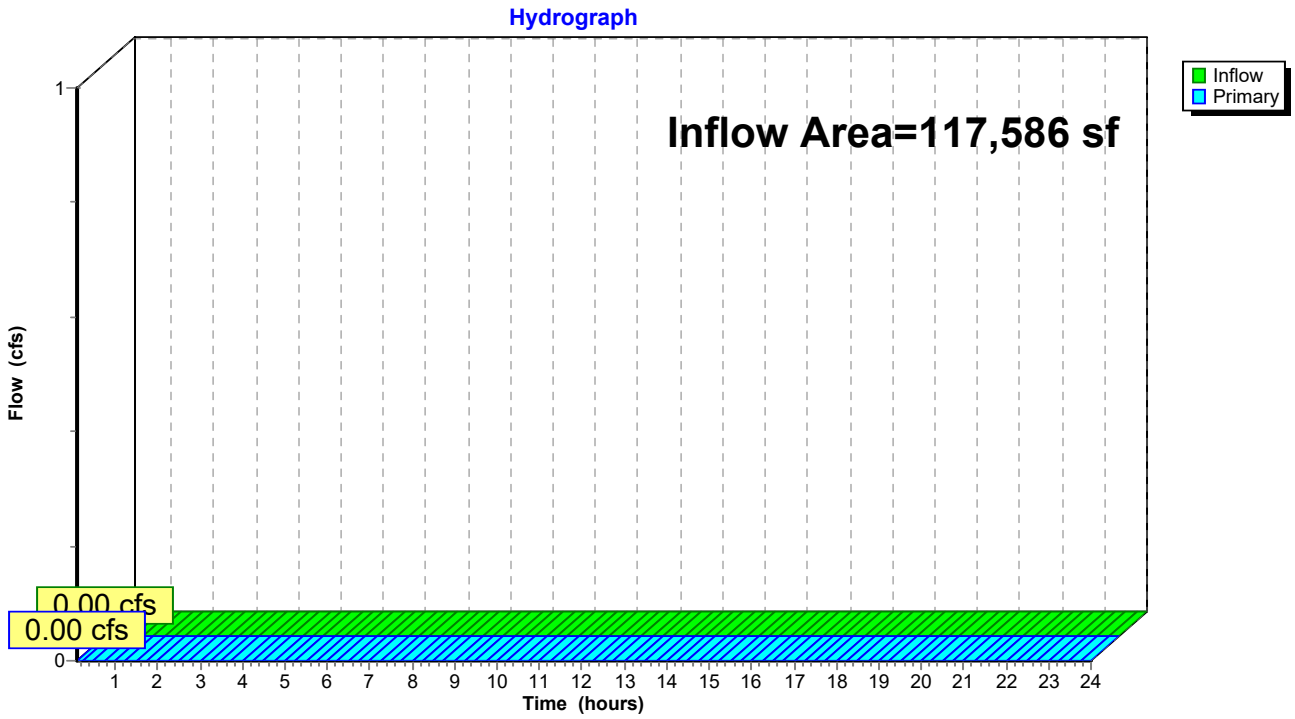


Summary for Link 20L: TREATED

Inflow Area = 117,586 sf, 15.80% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.10 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 20L: TREATED

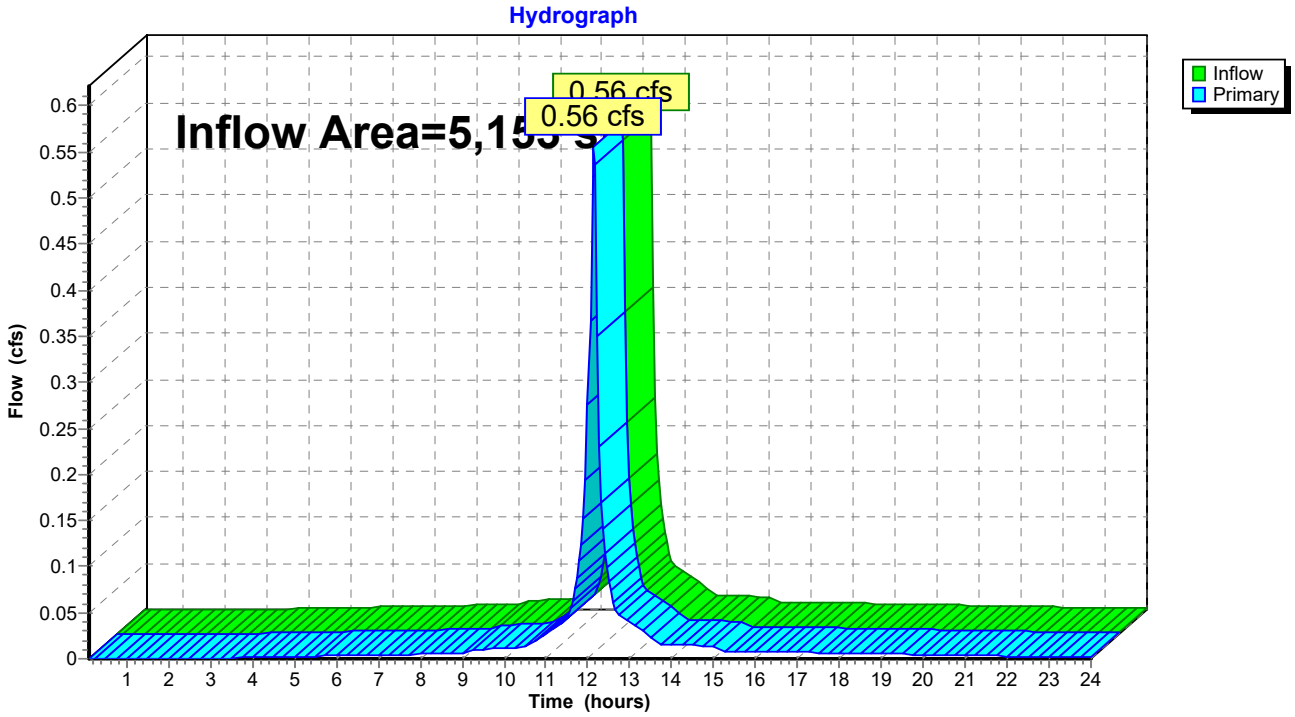


Summary for Link 21L: UNTREATED

Inflow Area = 5,153 sf, 73.53% Impervious, Inflow Depth > 3.01" for 10-Year event
Inflow = 0.56 cfs @ 12.13 hrs, Volume= 1,294 cf
Primary = 0.56 cfs @ 12.13 hrs, Volume= 1,294 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 21L: UNTREATED



Time span=0.10-24.00 hrs, dt=0.05 hrs, 479 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 6S: H Runoff Area=3,789 sf 100.00% Impervious Runoff Depth>5.94"
Tc=6.0 min CN=98 Runoff=0.77 cfs 1,876 cf

Subcatchment 7S: I Runoff Area=928 sf 0.00% Impervious Runoff Depth>3.34"
Tc=6.0 min CN=74 Runoff=0.13 cfs 258 cf

Subcatchment 8S: B Runoff Area=17,571 sf 0.00% Impervious Runoff Depth>4.80"
Tc=6.0 min CN=88 Runoff=3.24 cfs 7,026 cf

Subcatchment 9S: C Runoff Area=2,585 sf 0.00% Impervious Runoff Depth>3.34"
Tc=6.0 min CN=74 Runoff=0.35 cfs 719 cf

Subcatchment 10S: D Runoff Area=436 sf 0.00% Impervious Runoff Depth>3.34"
Tc=6.0 min CN=74 Runoff=0.06 cfs 121 cf

Subcatchment 11S: E Runoff Area=16,403 sf 0.00% Impervious Runoff Depth>4.80"
Tc=6.0 min CN=88 Runoff=3.03 cfs 6,559 cf

Subcatchment 12S: F Runoff Area=62,447 sf 0.00% Impervious Runoff Depth>4.69"
Tc=6.0 min CN=87 Runoff=11.35 cfs 24,399 cf

Subcatchment 13S: G Runoff Area=18,580 sf 100.00% Impervious Runoff Depth>5.94"
Tc=6.0 min CN=98 Runoff=3.79 cfs 9,198 cf

Pond 3P: Existing Pond Peak Elev=854.08' Storage=34,416 cf Inflow=21.76 cfs 47,900 cf
Outflow=1.60 cfs 14,625 cf

Link 6L: TOTAL Inflow=1.67 cfs 16,880 cf
Primary=1.67 cfs 16,880 cf

Link 20L: TREATED Inflow=1.60 cfs 14,625 cf
Primary=1.60 cfs 14,625 cf

Link 21L: UNTREATED Inflow=0.96 cfs 2,255 cf
Primary=0.96 cfs 2,255 cf

Total Runoff Area = 122,739 sf Runoff Volume = 50,155 cf Average Runoff Depth = 4.90"
81.78% Pervious = 100,370 sf 18.22% Impervious = 22,369 sf

Summary for Subcatchment 6S: H

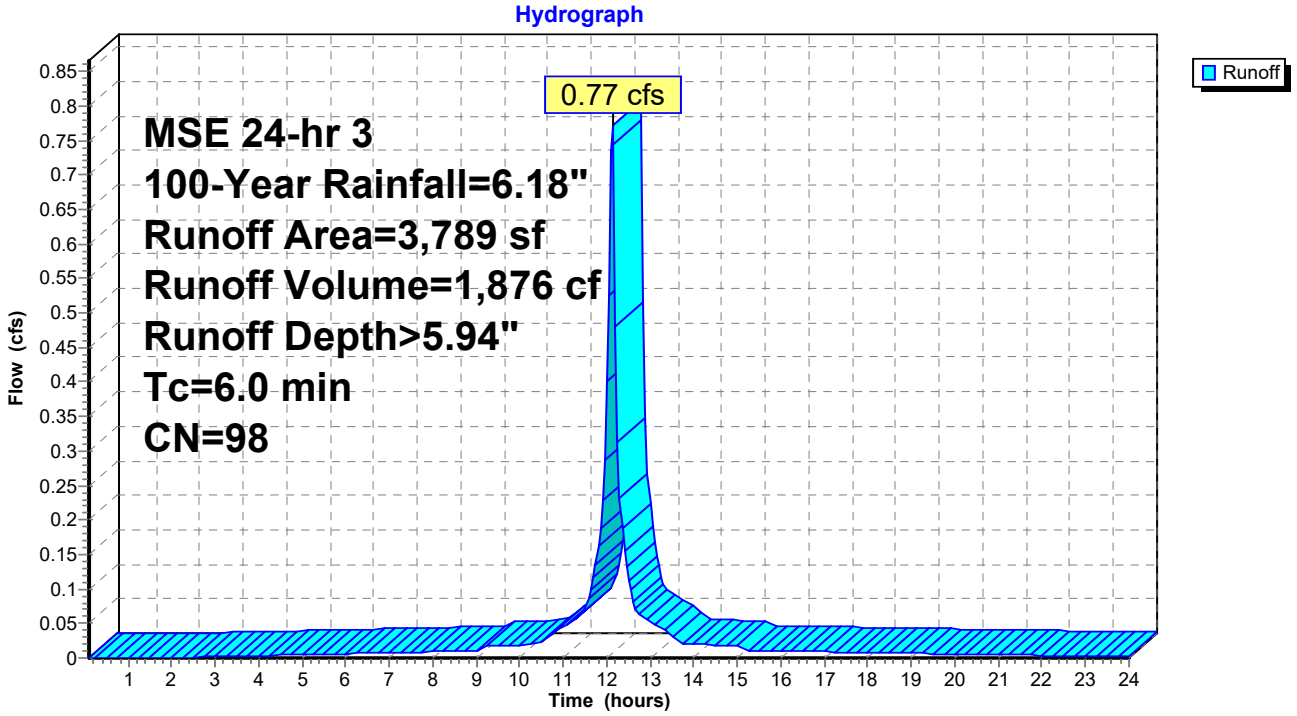
Runoff = 0.77 cfs @ 12.13 hrs, Volume= 1,876 cf, Depth> 5.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	3,789	98	IMP (CONCRETE)
	3,789		100.00% Impervious Area

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

Subcatchment 6S: H



Summary for Subcatchment 7S: I

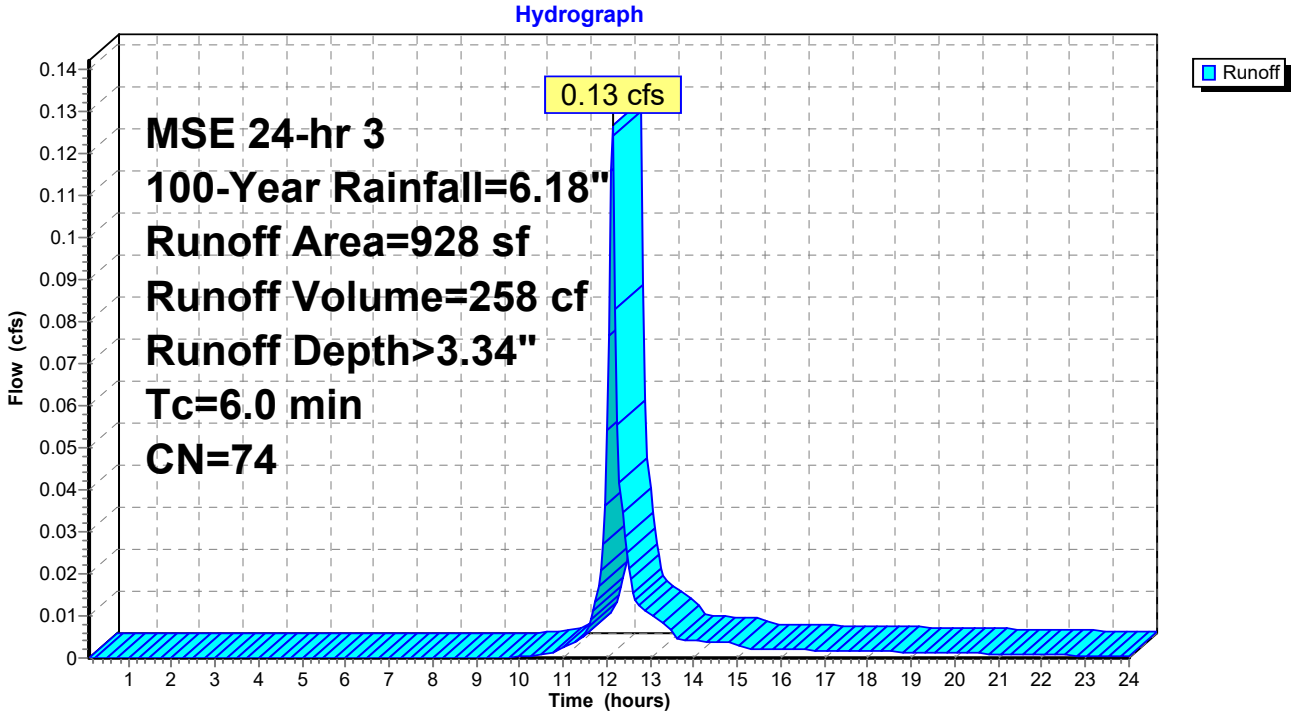
Runoff = 0.13 cfs @ 12.13 hrs, Volume= 258 cf, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	928	74	PER (GRASS)
	928		100.00% Pervious Area

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

Subcatchment 7S: I



Summary for Subcatchment 8S: B

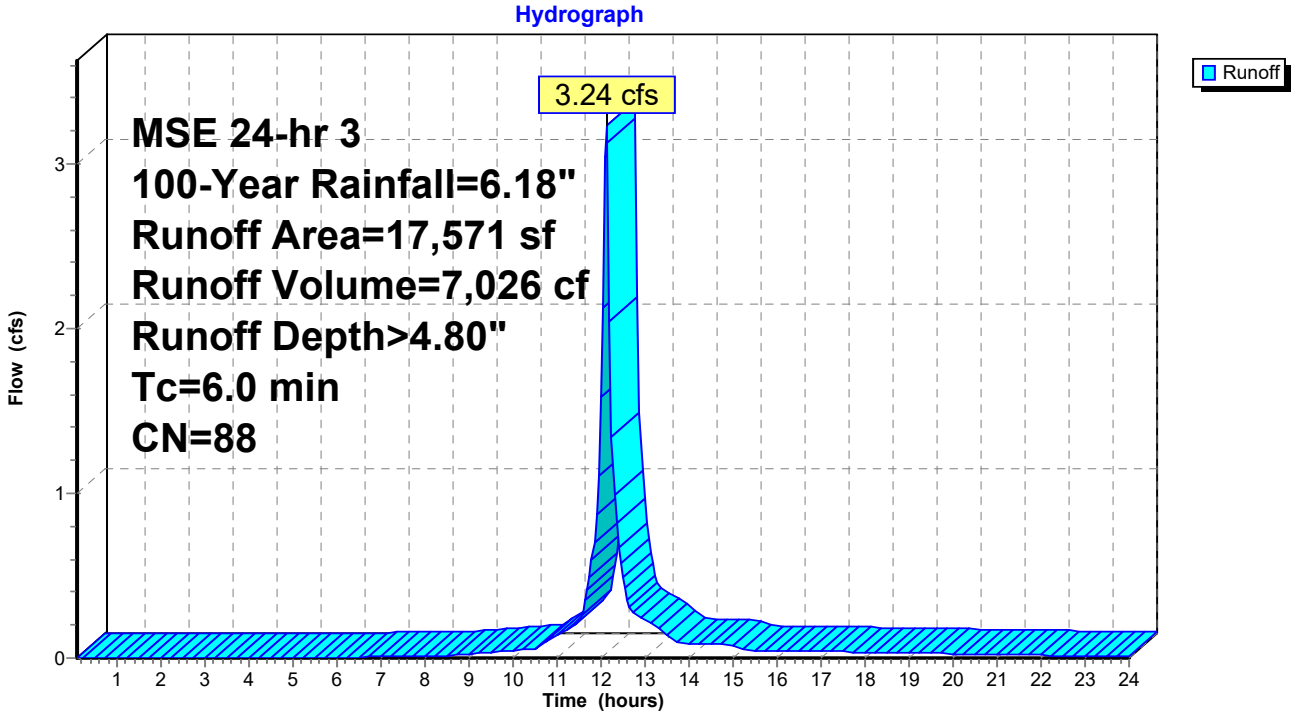
Runoff = 3.24 cfs @ 12.13 hrs, Volume= 7,026 cf, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	16,222	89	IMP (GRAVEL)
*	1,349	74	PER (GRASS)
	17,571	88	Weighted Average
	17,571		100.00% Pervious Area

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

Subcatchment 8S: B



Summary for Subcatchment 9S: C

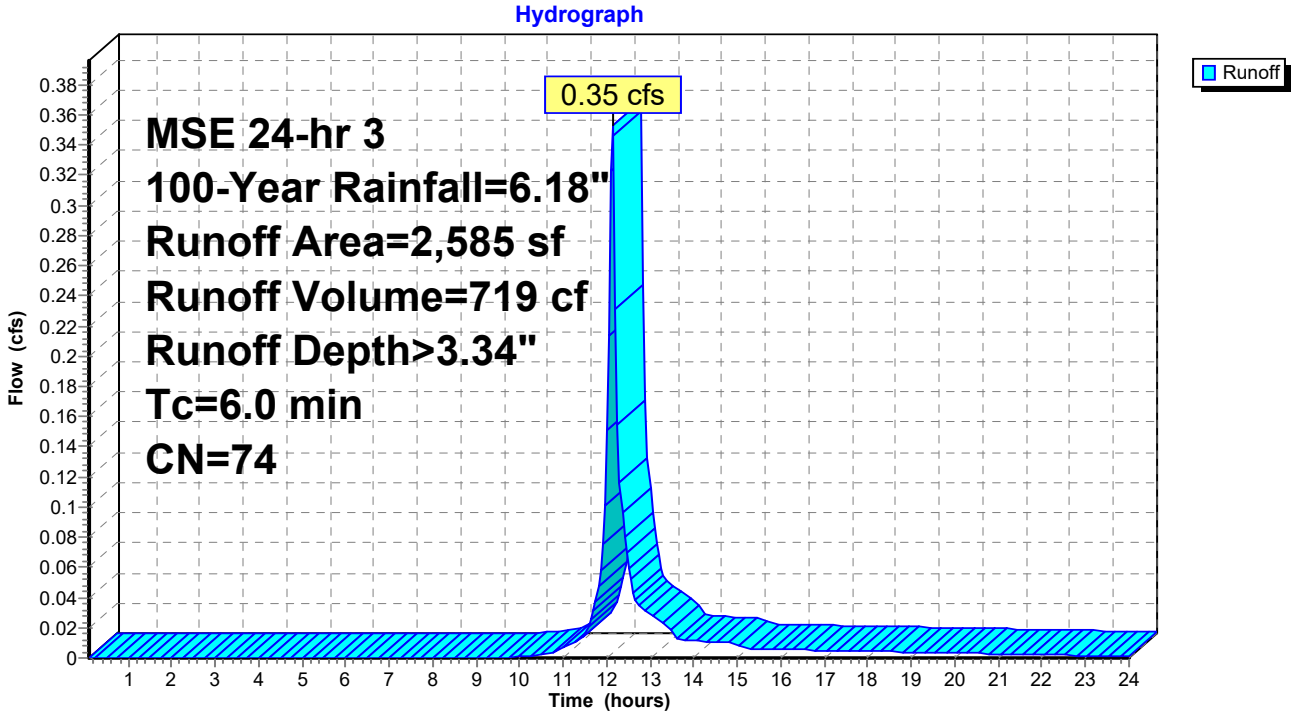
Runoff = 0.35 cfs @ 12.13 hrs, Volume= 719 cf, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	2,585	74	PER (GRASS)
	2,585		100.00% Pervious Area

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

Subcatchment 9S: C



Summary for Subcatchment 10S: D

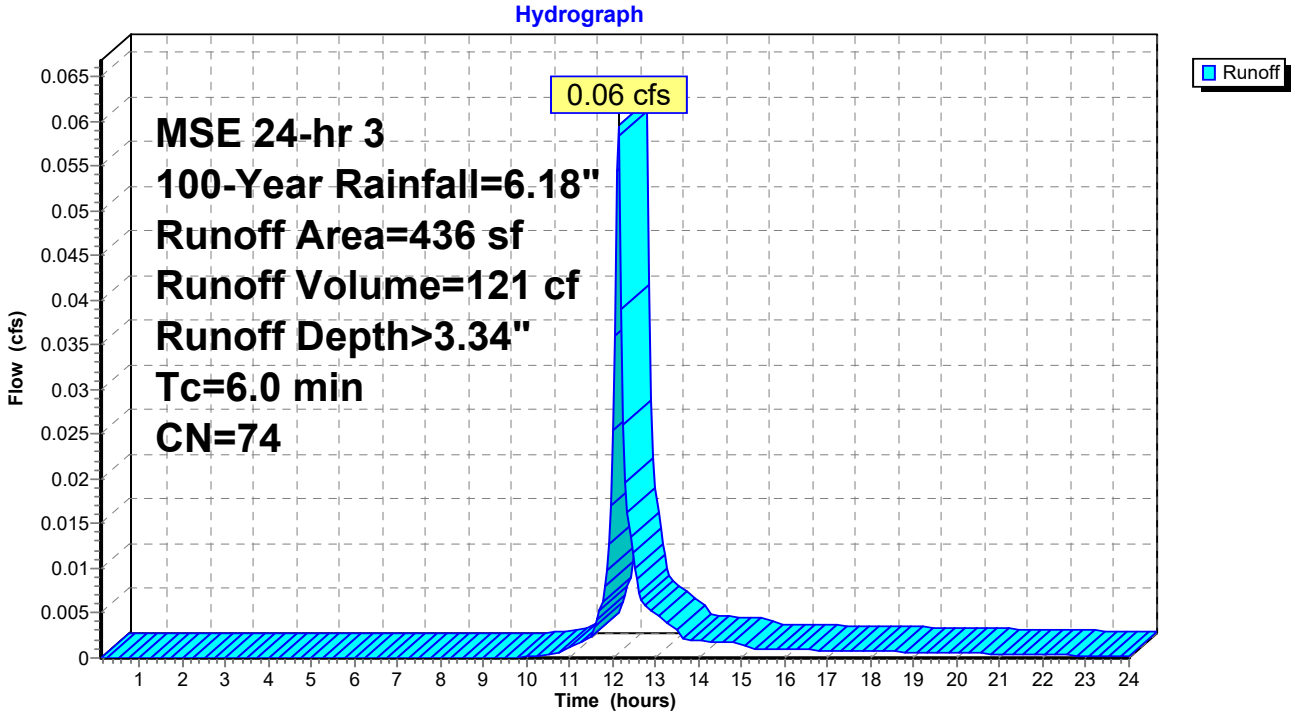
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 121 cf, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	436	74	PER (GRASS)
	436		100.00% Pervious Area

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

Subcatchment 10S: D



Summary for Subcatchment 11S: E

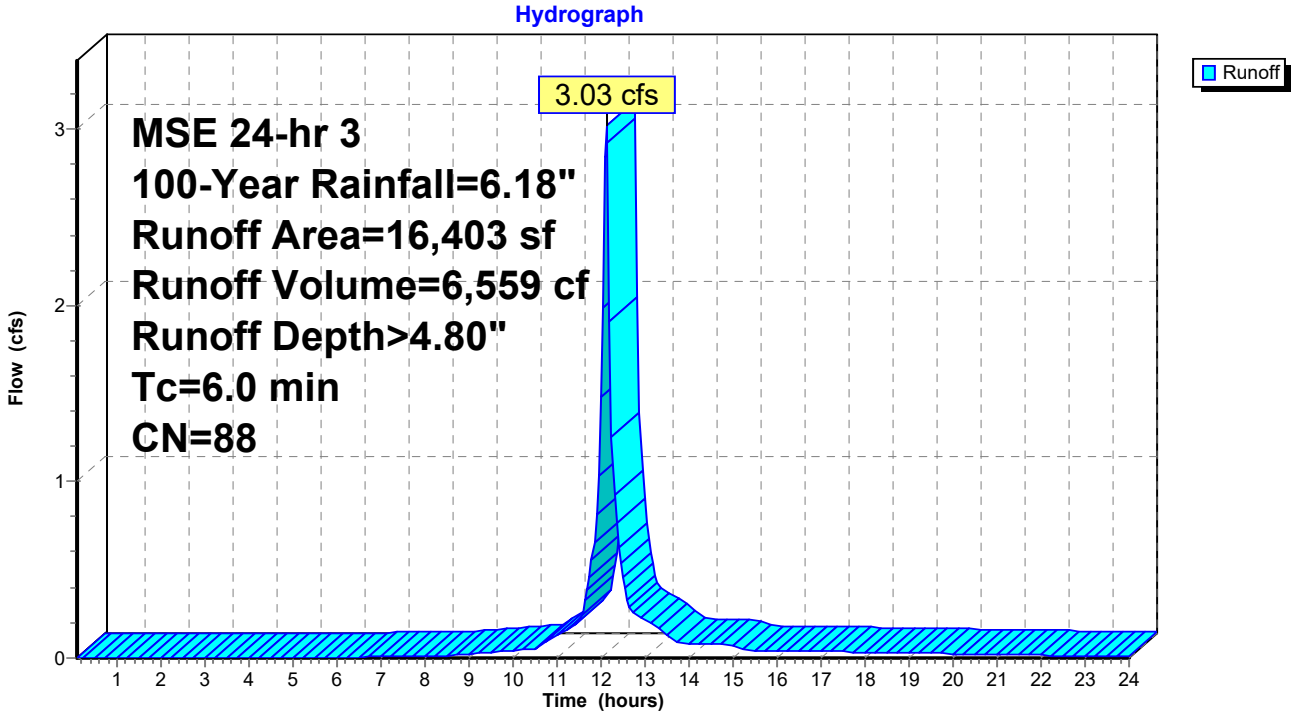
Runoff = 3.03 cfs @ 12.13 hrs, Volume= 6,559 cf, Depth> 4.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	15,536	89	IMP (GRAVEL)
*	867	74	PER (GRASS)
	16,403	88	Weighted Average
	16,403		100.00% Pervious Area

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

Subcatchment 11S: E



Summary for Subcatchment 12S: F

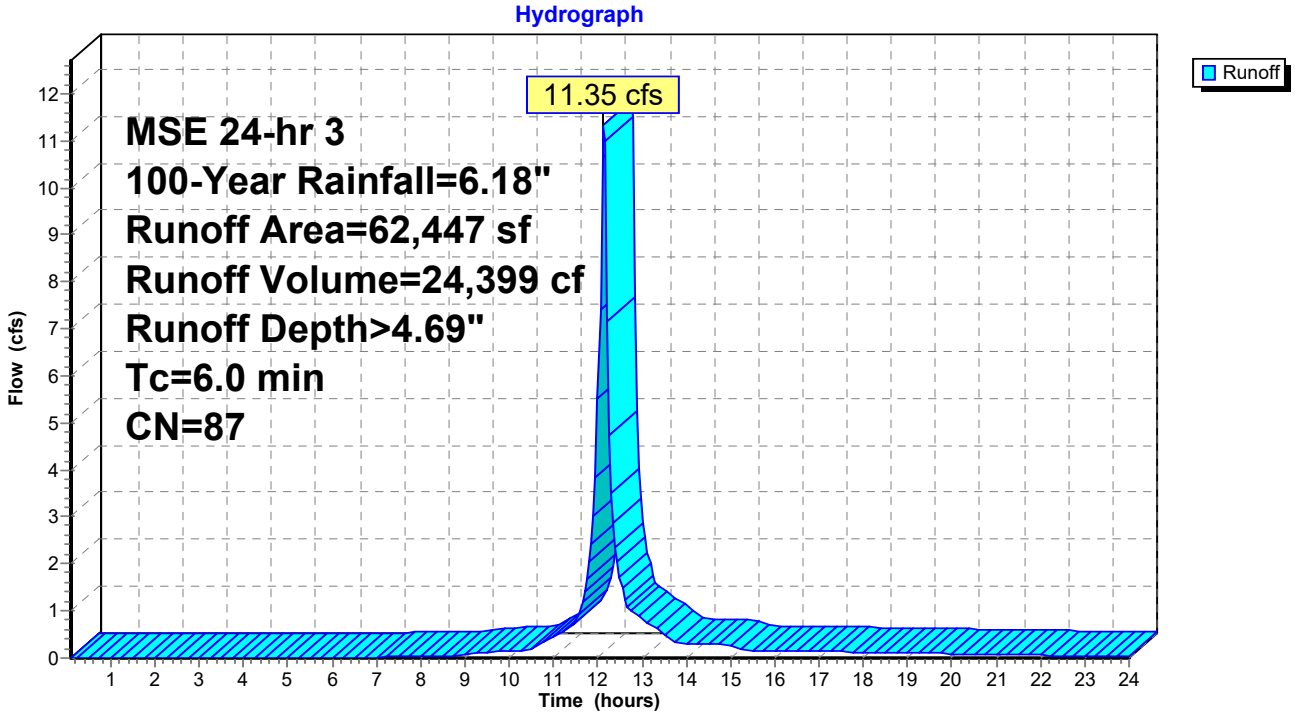
Runoff = 11.35 cfs @ 12.13 hrs, Volume= 24,399 cf, Depth> 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	54,074	89	IMP (GRAVEL)
*	8,373	74	PER (GRASS)
	62,447	87	Weighted Average
	62,447		100.00% Pervious Area

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

Subcatchment 12S: F



Summary for Subcatchment 13S: G

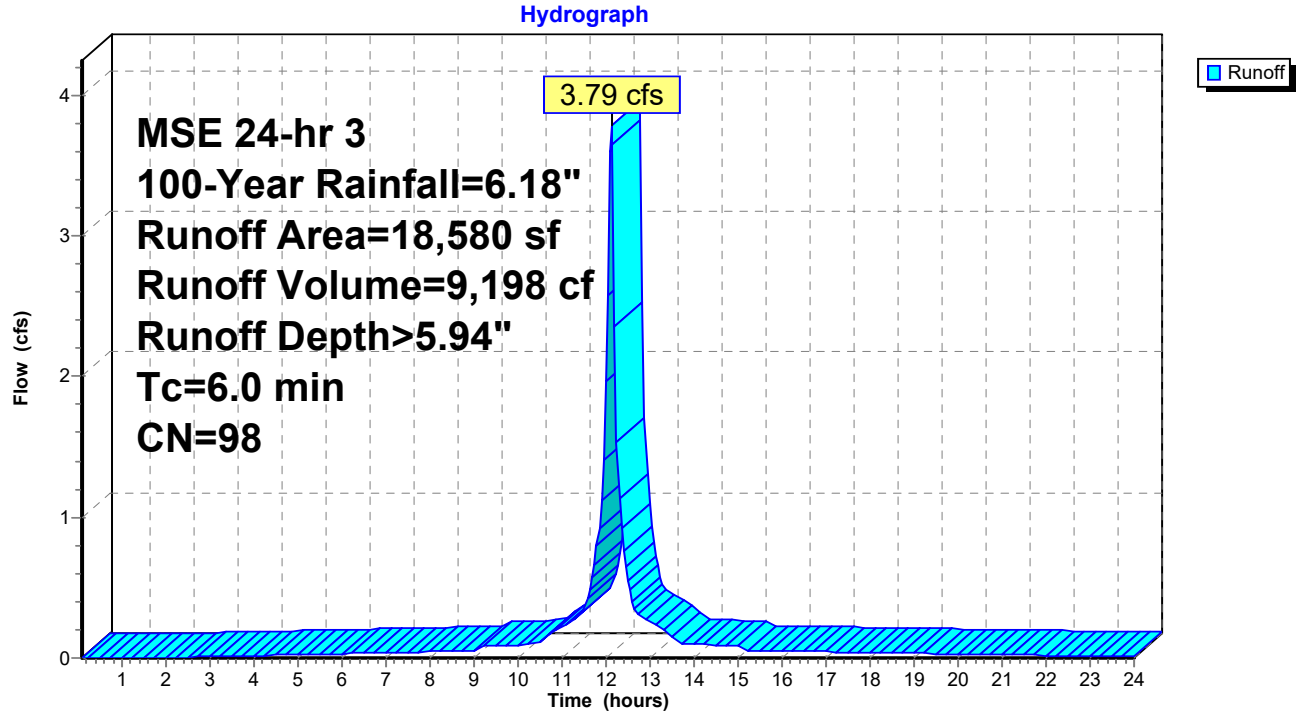
Runoff = 3.79 cfs @ 12.13 hrs, Volume= 9,198 cf, Depth> 5.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	18,580	98	IMP (CONCRETE)
	18,580		100.00% Impervious Area

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

Subcatchment 13S: G



Summary for Pond 3P: Existing Pond

Inflow Area = 117,586 sf, 15.80% Impervious, Inflow Depth > 4.89" for 100-Year event
Inflow = 21.76 cfs @ 12.13 hrs, Volume= 47,900 cf
Outflow = 1.60 cfs @ 12.98 hrs, Volume= 14,625 cf, Atten= 93%, Lag= 51.0 min
Primary = 1.60 cfs @ 12.98 hrs, Volume= 14,625 cf

Routing by Stor-Ind method, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs
Peak Elev= 854.08' @ 12.98 hrs Surf.Area= 14,582 sf Storage= 34,416 cf

Plug-Flow detention time= 278.1 min calculated for 14,625 cf (31% of inflow)
Center-of-Mass det. time= 171.4 min (943.5 - 772.1)

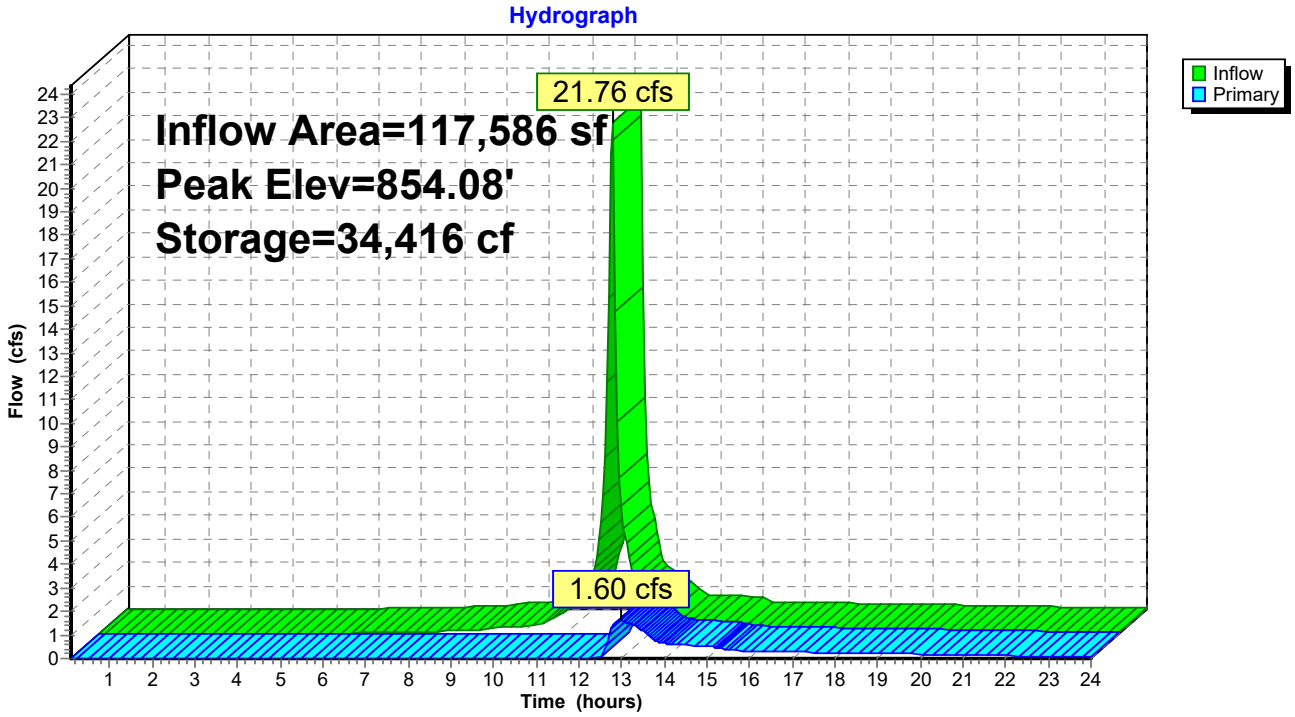
Volume	Invert	Avail.Storage	Storage Description
#1	851.00'	48,791 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
851.00	7,572	0	0
852.00	9,963	8,768	8,768
853.00	12,276	11,120	19,887
854.00	14,385	13,331	33,218
855.00	16,761	15,573	48,791

Device	Routing	Invert	Outlet Devices
#1	Primary	854.00'	**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=1.59 cfs @ 12.98 hrs HW=854.08' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.59 cfs @ 0.77 fps)

Pond 3P: Existing Pond

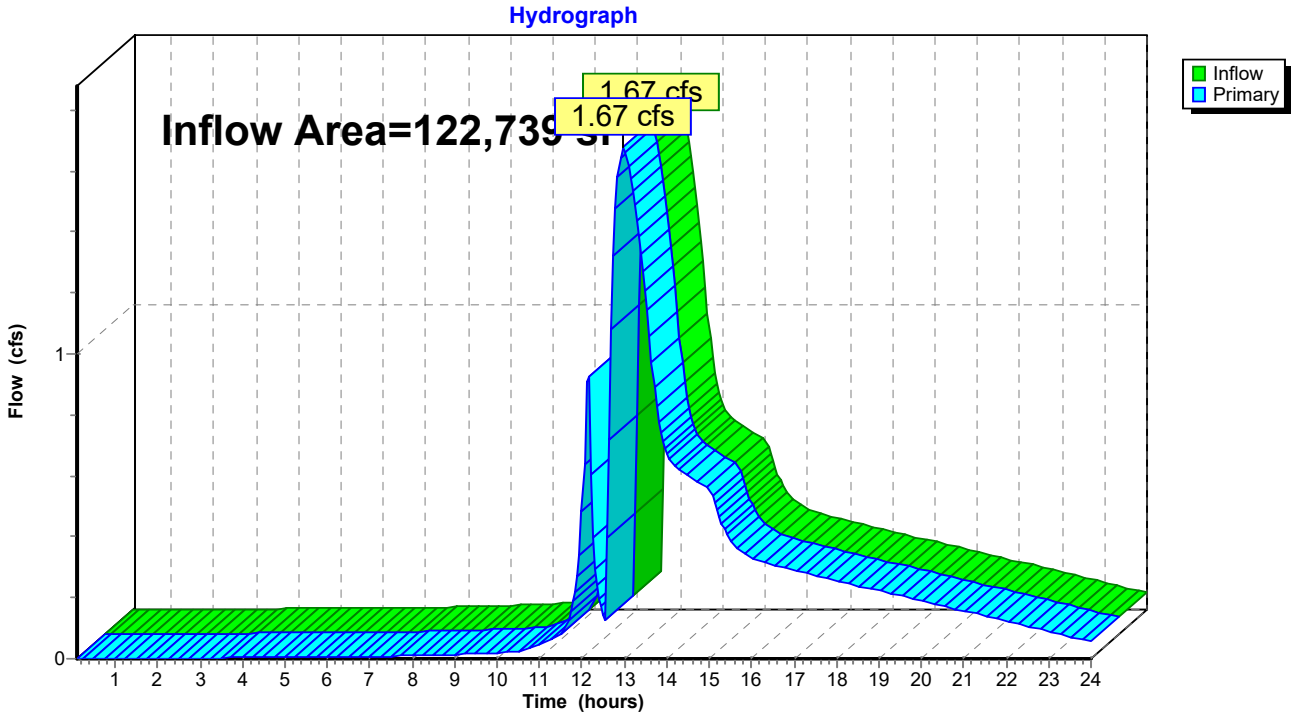


Summary for Link 6L: TOTAL

Inflow Area = 122,739 sf, 18.22% Impervious, Inflow Depth > 1.65" for 100-Year event
Inflow = 1.67 cfs @ 12.97 hrs, Volume= 16,880 cf
Primary = 1.67 cfs @ 12.97 hrs, Volume= 16,880 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 6L: TOTAL

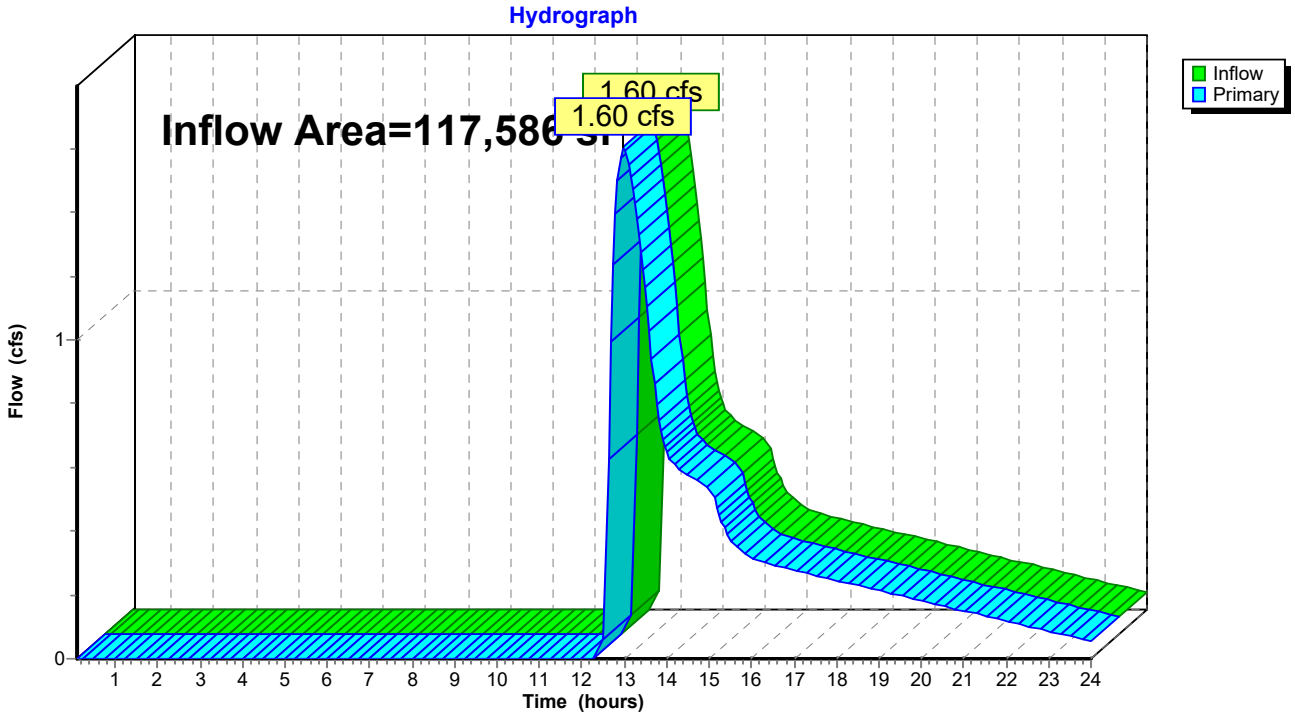


Summary for Link 20L: TREATED

Inflow Area = 117,586 sf, 15.80% Impervious, Inflow Depth > 1.49" for 100-Year event
Inflow = 1.60 cfs @ 12.98 hrs, Volume= 14,625 cf
Primary = 1.60 cfs @ 12.98 hrs, Volume= 14,625 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 20L: TREATED



Summary for Link 21L: UNTREATED

Inflow Area = 5,153 sf, 73.53% Impervious, Inflow Depth > 5.25" for 100-Year event
Inflow = 0.96 cfs @ 12.13 hrs, Volume= 2,255 cf
Primary = 0.96 cfs @ 12.13 hrs, Volume= 2,255 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-24.00 hrs, dt= 0.05 hrs

Link 21L: UNTREATED