

# BADGER WEST DEVELOPMENT STORMWATER NARRATIVE

March 7, 2025

REPORT FOR:  
CITY OF LA CROSSE – ENGINEERING DEPARTMENT  
Attn: Yuri Nasonovs

FROM:  
Kris Roppe PE, CFM  
Civil Engineer  
ISG  
201 Main Street, Suite 1020  
La Crosse, WI 54601  
608.789.2034  
kris.roppe@isginc.com

# TABLE OF CONTENTS

- Introduction ..... 1
- Design Standards..... 1
- Existing Conditions..... 2
- Proposed Conditions..... 2
- Stormwater Management Summary ..... 2
- Calculation summary ..... 3

# Introduction

This stormwater management report has been prepared to accompany the submitted plans and stormwater calculations for the Badger West Development in La Crosse, WI. The project will consist of a new 36-unit apartment building along with reconstruction of the existing 12<sup>th</sup> Street adjacent to the site. Construction will include footings, erection of building, parking lot, site grading, stormwater management, sanitary and water services, concrete pavement, erosion control, and turf restoration. A project location map is provided in the submitted plan set.

# Design Standards

Stormwater management plans and calculations have been prepared to meet the City of La Crosse Municipal Code of Ordinances and the Stormwater Management Requirements of NR 151. The disturbed area for the project is over one acre therefore it will require a Wisconsin DNR WPDES permit.

*Table 1.1: Design Criteria*

	Performance Standard	Requirements
Wisconsin Department of Natural Resources NR 151	Total Suspended Solids NR 151.122	Redevelopment – 40% TSS reduction from parking areas and roads.
	Peak Discharge NR 151.123	Exempt per NR 151.123(2)(b) – Redevelopment Site.
	Infiltration NR 151.124	Exempt per NR 151.124 (3)(b)3 – Redevelopment Site.
	Protective Areas NR 151.125	N/A – No protective areas within proposed site.
	Fueling & Vehicle Maintenance NR 151.126	N/A – No fueling or vehicle maintenance areas within proposed site.
	Location NR 151.127	BMP’s will be located on site.
	Timing NR 151.128	BMP’s will be installed prior to final stabilization.
City of La Crosse Municipal Code of Ordinances Section 105-61	Total Suspended Solids Sec. 105-61(b)(4)a.	Redevelopment – 40% TSS reduction from parking areas and roads.
	Peak Discharge Sec. 105-61(b)(4)b.	Maintain or reduce 2-yr and 10-yr 24-hour post construction peak runoff to predevelopment rates
	Safe Outlet Sec. 105-61(b)(4)c.	Safe passage of 100-year storm event
	Infiltration Sec. 105-61(b)(4)d.	Redevelopment site (exempt)
	Protective Areas Sec. 105-61(b)(4)e.	N/A – No protective areas within proposed site
	Fueling and vehicle maintenance Sec. 105-61(b)(4)f.	N/A – No fueling or vehicle maintenance areas within proposed site.
	Swale Treatment for Transportation Facilities Sec. 105-61(b)(4)f.	N/A

## Existing Conditions

The existing site currently consists of a single-family homes and the street. The site has been modeled as 2 drainage areas for the existing street ROW and the existing single family residences. The existing drainage map and ground cover is provided in the attachments.

## Proposed Conditions

The proposed site has been separated into 2 drainage areas. The proposed site will consist of a new 36-unit apartment building and the reconstruction of 12<sup>th</sup> Street.

A breakdown of the watersheds and land cover characteristics is provided on the proposed drainage map included in the stormwater calculations.

## Stormwater Management Summary

Temporary erosion control measures will be implicated for the proposed project prior to the start of construction. Proposed erosion control measures include silt fence, stabilized construction exit, inlet protection, erosion control mat, and a concrete washout area. Locations of the proposed BMPs along with construction activity notes are provided on the erosion control sheets. Sediment and soil loss calculations are included in the attachments. Approximate construction sequencing for the project is listed below.

- Install temporary erosion control BMPs
- Stripping topsoil, soil corrections and rough grading
- Installation of underground utilities
- Subgrade preparation
- Construction of pavement
- Turf restoration
- Stabilization and establishment of turf
- Removal of temporary erosion control BMPs

Proposed stormwater management will include a filtration basin with a layer of engineered soil to provide water quality along with peak flow reduction from the site. The basin will discharge through an outlet structure to the City storm sewer adjacent to the site

# Calculation summary

In conjunction with the plans for the project, calculations were performed for the existing and proposed drainage conditions. Water quantity calculations were completed using hydraulic models developed by utilizing the design data and the HydroCAD Version 10.20-5c computer modeling system. This was used to provide sizing and analysis for the proposed filtration basin and dry basin. Hydrographs for existing and proposed scenarios were generated and routed through these models using the Atlas-14 rainfall distribution. The proposed runoff from the analyzed events is provided in the table below. The HydroCAD calculations for the proposed conditions are included in the attachments.

*Table 1.3: Site Runoff Calculations*

Rainfall Event	Existing Conditions	Proposed Conditions
24-Hour Storm	Peak Flow (CFS)	Peak Flow (CFS)
2-year	1.98	0.72
10-year	3.38	2.78
100-year	6.65	5.69

The table above shows that the proposed 2 and 10-year peak runoff rates for the development are reduced compared to existing conditions, meeting the City requirements. Also, the 100-year event is contained without overtopping the proposed basins.

Water quality calculations have been completed by utilizing the design data and the WinSLAMM Version 10.5.0 computer modeling system. This was used to provide an analysis of the reduction in total suspended solids for the stormwater management system. Results show a total TSS removal of 79.45% from the impervious surfaces for the proposed site using suitable parameters for the project area when compared to no controls. The WinSLAMM model shows that the proposed conditions meet the City requirements to reduce total suspended solids for the redeveloped lot from the parking and road areas by 40% compared to no controls. The WinSLAMM model overview, inputs, and outputs can be found in the attachments.



### LEGEND

EXISTING		PROPOSED
--- >> ---	STORM DRAIN	--- >> ---
--- > ---	SANITARY SEWER	--- > ---
--- II> ---	SANITARY SEWER FORCEMAIN	--- II> ---
--- I ---	WATER MAIN	--- I ---
--- G ---	GAS	--- G ---
--- OE ---	OVERHEAD ELECTRIC	--- OE ---
--- UE ---	UNDERGROUND ELECTRIC	--- UE ---
--- UT ---	UNDERGROUND TELEPHONE	--- UT ---
--- UTV ---	UNDERGROUND TV	
--- OHL ---	OVERHEAD UTILITY	
--- UTL ---	UNDERGROUND UTILITY	
--- FBO ---	FIBER OPTIC	
--- WET ---	WETLAND	
--- W ---	WATER EDGE	
--- X --- X ---	FENCE LINE	
---	PROPERTY / LOT LINE	---
---	RIGHT OF WAY LINE	---
--- Δ --- Δ ---	ACCESS CONTROL	
---	EASEMENT LINE	---
--- 100 ---	CONTOURS (MAJOR)	--- 100 ---
--- 101 ---	CONTOURS (MINOR)	--- 101 ---
●	SPOT ELEVATION	●
	TOP BACK OF CURB / TOP OF TURNDOWN WALK SPOT ELEVATION	●

**NOTE:**  
CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

Watershed	Surface Cover	Area (SF)	Area (AC)	Percent Impervious
DA-1	Impervious	7020	0.161	33%
	Pervious	14119	0.324	
	<b>Total</b>	<b>21139</b>	<b>0.485</b>	
DA-2	Impervious	10911	0.250	74%
	Pervious	3759	0.087	
	<b>Total</b>	<b>14670</b>	<b>0.337</b>	

<b>TOTAL IMPERVIOUS</b>	<b>0.411</b>	50%
<b>TOTAL PERVIOUS</b>	<b>0.411</b>	
<b>TOTAL AREA</b>	<b>0.822</b>	



SHEET NOT VALID UNLESS THIS TEXT IS COLOR.

PROJECT

## BADGER WEST DEVELOPMENT

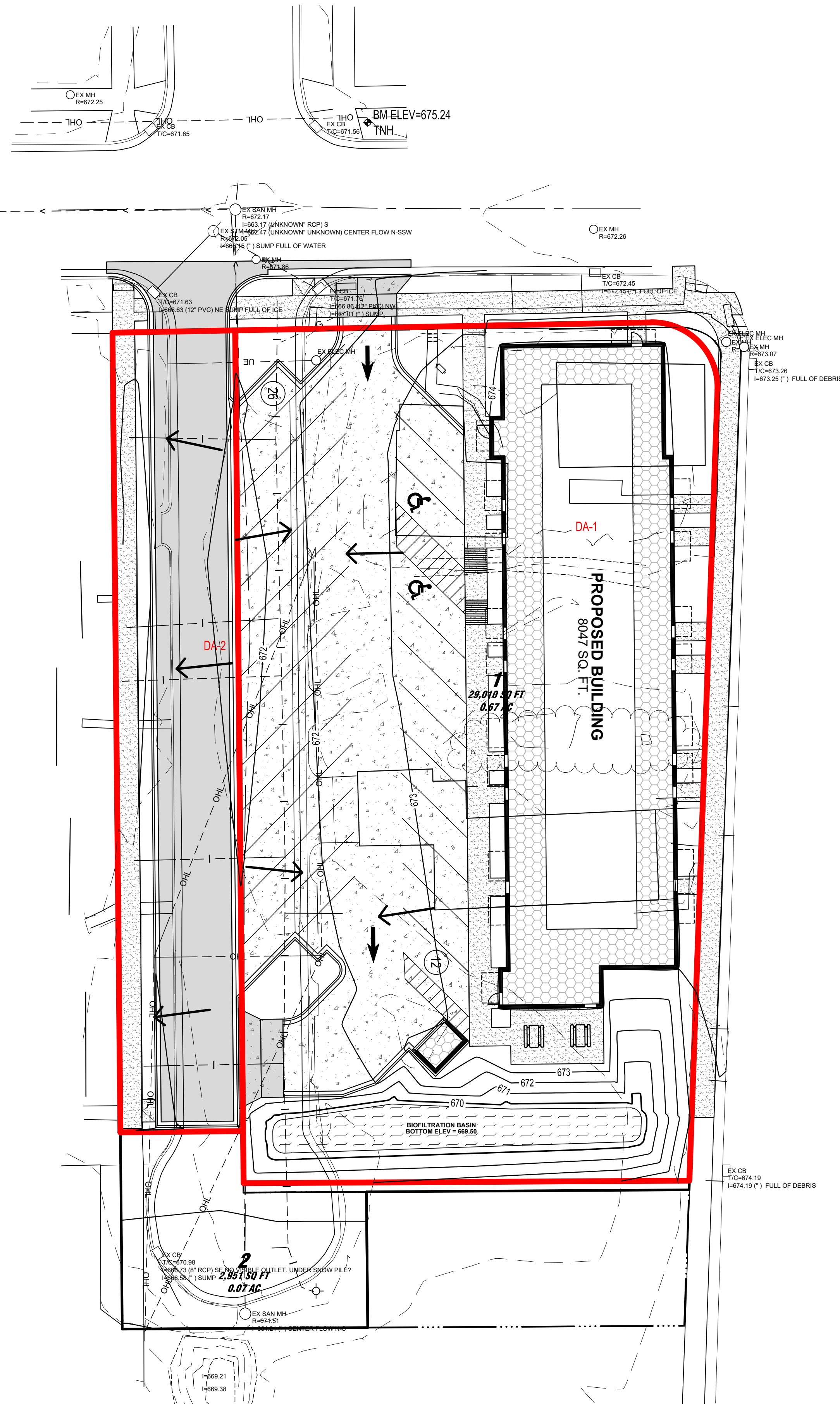
LA CROSSE WISCONSIN

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	PROJ. NO
FILE NAME	EXISTING DRAINAGE MAP
DRAWN BY	---
DESIGNED BY	---
REVIEWED BY	---
ORIGINAL ISSUE DATE	---/---/---
CLIENT PROJECT NO.	-

TITLE

## EXISTING DRAINAGE MAP



LEGEND		
EXISTING	PROPOSED	
--- >> ---	STORM DRAIN	--- >> ---
--- > ---	SANITARY SEWER	--- > ---
---   > ---	SANITARY SEWER FORCEMAIN	---   > ---
---   ---	WATER MAIN	---   ---
--- G ---	GAS	--- G ---
--- OE ---	OVERHEAD ELECTRIC	--- OE ---
--- UE ---	UNDERGROUND ELECTRIC	--- UE ---
--- UT ---	UNDERGROUND TELEPHONE	--- UT ---
--- UTV ---	UNDERGROUND TV	--- UTV ---
--- OHL ---	OVERHEAD UTILITY	--- OHL ---
--- UTL ---	UNDERGROUND UTILITY	--- UTL ---
--- FBO ---	FIBER OPTIC	--- FBO ---
--- WET ---	WETLAND	--- WET ---
--- W ---	WATER EDGE	--- W ---
--- x --- x ---	FENCE LINE	--- x --- x ---
--- ····· ---	PROPERTY / LOT LINE	--- ····· ---
--- - - - -	RIGHT OF WAY LINE	--- - - - -
--- Δ --- Δ ---	ACCESS CONTROL	--- Δ --- Δ ---
--- - - - -	EASEMENT LINE	--- - - - -
--- 100 ---	CONTOURS (MAJOR)	--- 100 ---
--- 101 ---	CONTOURS (MINOR)	--- 101 ---
--- ● ---	SPOT ELEVATION	--- ● ---
	TOP BACK OF CURB / TOP OF TURNDOWN WALK SPOT ELEVATION	--- ● ---

NOTE:  
CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

Watershed	Surface Cover	Area (SF)	Area (AC)	Percent Impervious
DA-1	Impervious	21160	0.486	74%
	Pervious	7551	0.173	
	<b>Total</b>	<b>28711</b>	<b>0.659</b>	
DA-2	Impervious	6317	0.145	89%
	Pervious	781	0.018	
	<b>Total</b>	<b>7098</b>	<b>0.163</b>	
<b>TOTAL IMPERVIOUS</b>		<b>0.631</b>	<b>77%</b>	
<b>TOTAL PERVIOUS</b>		<b>0.191</b>		
<b>TOTAL AREA</b>		<b>0.822</b>		

SHEET NOT VALID UNLESS THIS TEXT IS COLOR.

PROJECT

## BADGER WEST DEVELOPMENT

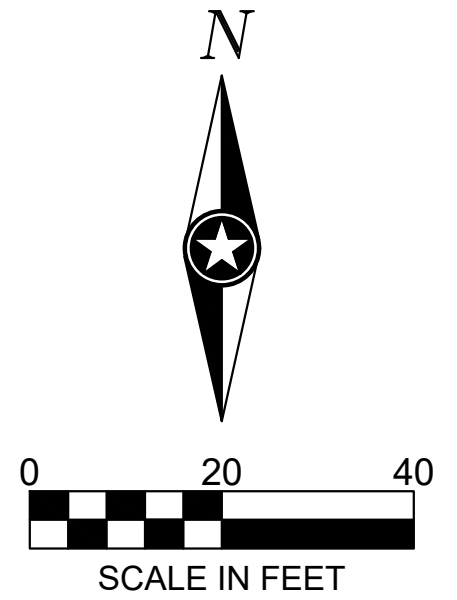
LA CROSSE WISCONSIN

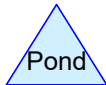
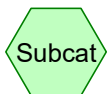
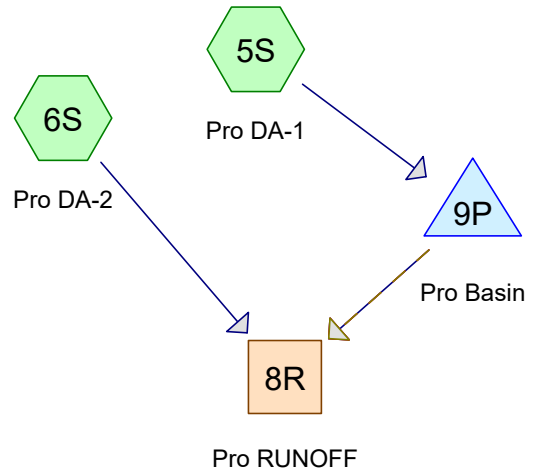
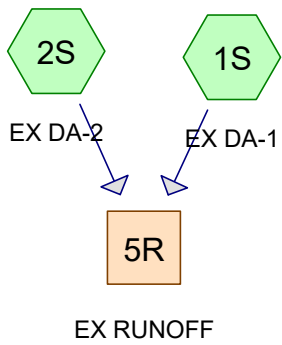
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	PROJ. NO
FILE NAME	PROPOSED DRAINAGE MAP
DRAWN BY	---
DESIGNED BY	---
REVIEWED BY	---
ORIGINAL ISSUE DATE	---/---/---
CLIENT PROJECT NO.	---

TITLE

## PROPOSED DRAINAGE MAP







## **Project Notes**

Defined 10 rainfall events from La Crosse IDF

# 32213 HydroCAD

Prepared by I&S Group, Inc

HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

Printed 3/7/2025

Page 3

## Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	MSE 24-hr	4	Default	24.00	1	3.00	2
2	10-yr	MSE 24-hr	4	Default	24.00	1	4.44	2
3	100-yr	MSE 24-hr	4	Default	24.00	1	7.53	2

### 32213 HydroCAD

Prepared by I&S Group, Inc

HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

Printed 3/7/2025

Page 4

#### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.602	69	50-75% Grass cover, Fair, HSG B (1S, 2S, 5S, 6S)
1.042	98	Paved parking, HSG B (1S, 2S, 5S, 6S)
<b>1.644</b>	<b>87</b>	<b>TOTAL AREA</b>

# 32213 HydroCAD

Prepared by I&S Group, Inc

HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

Printed 3/7/2025

Page 5

## Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.644	HSG B	1S, 2S, 5S, 6S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
<b>1.644</b>		<b>TOTAL AREA</b>

### 32213 HydroCAD

Prepared by I&S Group, Inc

HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

Printed 3/7/2025

Page 6

#### Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.602	0.000	0.000	0.000	0.602	50-75% Grass cover, Fair	1S, 2S, 5S, 6S
0.000	1.042	0.000	0.000	0.000	1.042	Paved parking	1S, 2S, 5S, 6S
<b>0.000</b>	<b>1.644</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>1.644</b>	<b>TOTAL AREA</b>	

**32213 HydroCAD**

Prepared by I&amp;S Group, Inc

HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

*MSE 24-hr 4 2-yr Rainfall=3.00"*

Printed 3/7/2025

Page 7

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-Q  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1S: EX DA-1** Runoff Area=0.485 ac 33.20% Impervious Runoff Depth=1.37"  
 Tc=5.0 min CN=WQ Runoff=0.93 cfs 0.055 af

**Subcatchment2S: EX DA-2** Runoff Area=0.337 ac 74.18% Impervious Runoff Depth=2.23"  
 Flow Length=266' Tc=5.0 min CN=WQ Runoff=1.05 cfs 0.063 af

**Subcatchment5S: Pro DA-1** Runoff Area=0.659 ac 73.75% Impervious Runoff Depth=2.22"  
 Tc=5.0 min CN=WQ Runoff=2.05 cfs 0.122 af

**Subcatchment6S: Pro DA-2** Runoff Area=0.163 ac 88.96% Impervious Runoff Depth=2.54"  
 Tc=5.0 min CN=WQ Runoff=0.58 cfs 0.034 af

**Reach 5R: EX RUNOFF** Inflow=1.98 cfs 0.118 af  
 Outflow=1.98 cfs 0.118 af

**Reach 8R: Pro RUNOFF** Inflow=0.72 cfs 0.156 af  
 Outflow=0.72 cfs 0.156 af

**Pond 9P: Pro Basin** Peak Elev=670.84' Storage=1,988 cf Inflow=2.05 cfs 0.122 af  
 Primary=0.16 cfs 0.111 af Secondary=0.29 cfs 0.010 af Tertiary=0.00 cfs 0.000 af Outflow=0.46 cfs 0.122 af

**Total Runoff Area = 1.644 ac Runoff Volume = 0.274 af Average Runoff Depth = 2.00"**  
**36.62% Pervious = 0.602 ac 63.38% Impervious = 1.042 ac**

**Summary for Subcatchment 1S: EX DA-1**

Runoff = 0.93 cfs @ 12.12 hrs, Volume= 0.055 af, Depth= 1.37"  
 Routed to Reach 5R : EX RUNOFF

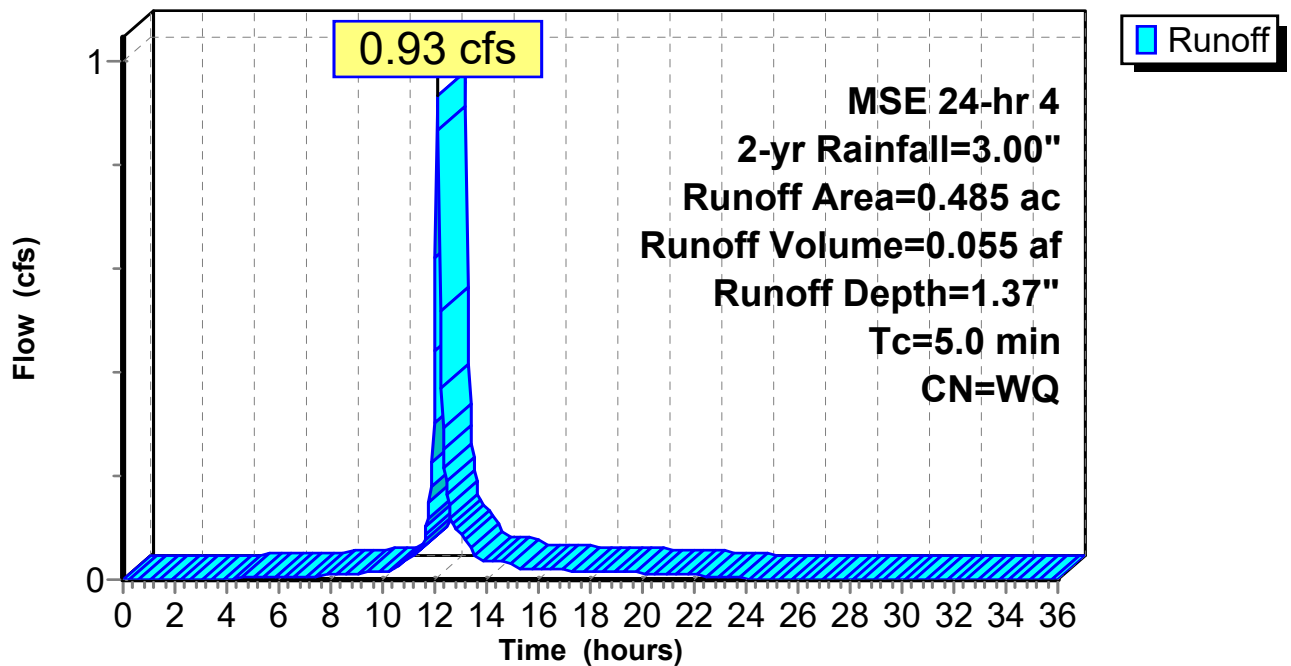
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 2-yr Rainfall=3.00"

Area (ac)	CN	Description
0.161	98	Paved parking, HSG B
0.324	69	50-75% Grass cover, Fair, HSG B
0.485		Weighted Average
0.324		66.80% Pervious Area
0.161		33.20% Impervious Area

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

**Subcatchment 1S: EX DA-1**

**Hydrograph**



**Summary for Subcatchment 2S: EX DA-2**

Runoff = 1.05 cfs @ 12.11 hrs, Volume= 0.063 af, Depth= 2.23"  
 Routed to Reach 5R : EX RUNOFF

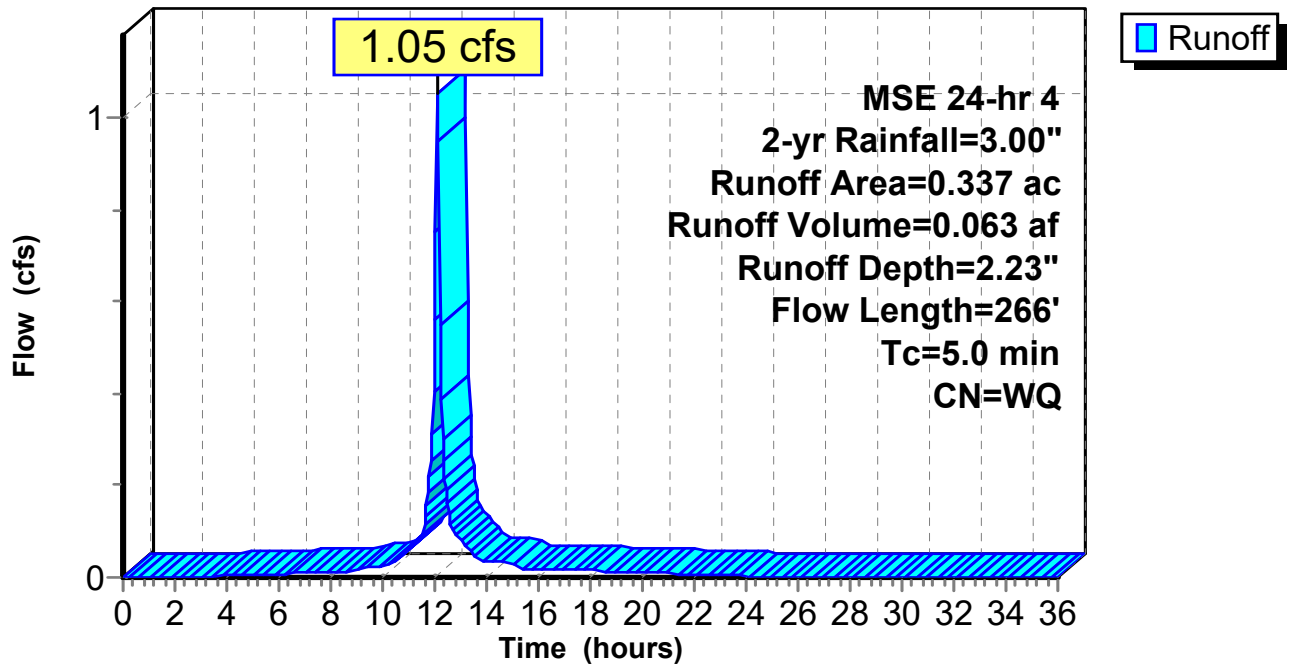
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 2-yr Rainfall=3.00"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.087	69	50-75% Grass cover, Fair, HSG B
0.337		Weighted Average
0.087		25.82% Pervious Area
0.250		74.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	178	0.0202	2.89		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.7	88	0.0144	0.84		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
2.7	266	Total, Increased to minimum Tc = 5.0 min			

**Subcatchment 2S: EX DA-2**

**Hydrograph**





**Summary for Subcatchment 5S: Pro DA-1**

Runoff = 2.05 cfs @ 12.11 hrs, Volume= 0.122 af, Depth= 2.22"  
 Routed to Pond 9P : Pro Basin

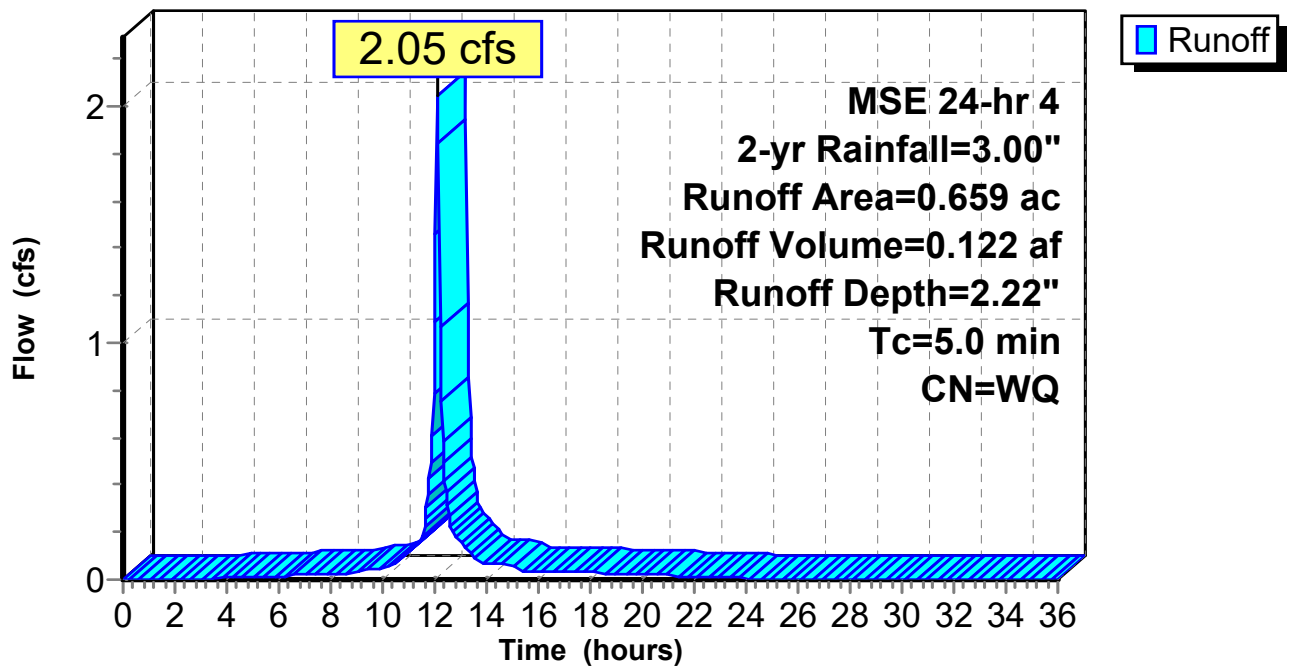
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 2-yr Rainfall=3.00"

Area (ac)	CN	Description
0.486	98	Paved parking, HSG B
0.173	69	50-75% Grass cover, Fair, HSG B
Weighted Average		
0.659		26.25% Pervious Area
0.173		73.75% Impervious Area
0.486		

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

**Subcatchment 5S: Pro DA-1**

**Hydrograph**



**Summary for Subcatchment 6S: Pro DA-2**

Runoff = 0.58 cfs @ 12.11 hrs, Volume= 0.034 af, Depth= 2.54"  
 Routed to Reach 8R : Pro RUNOFF

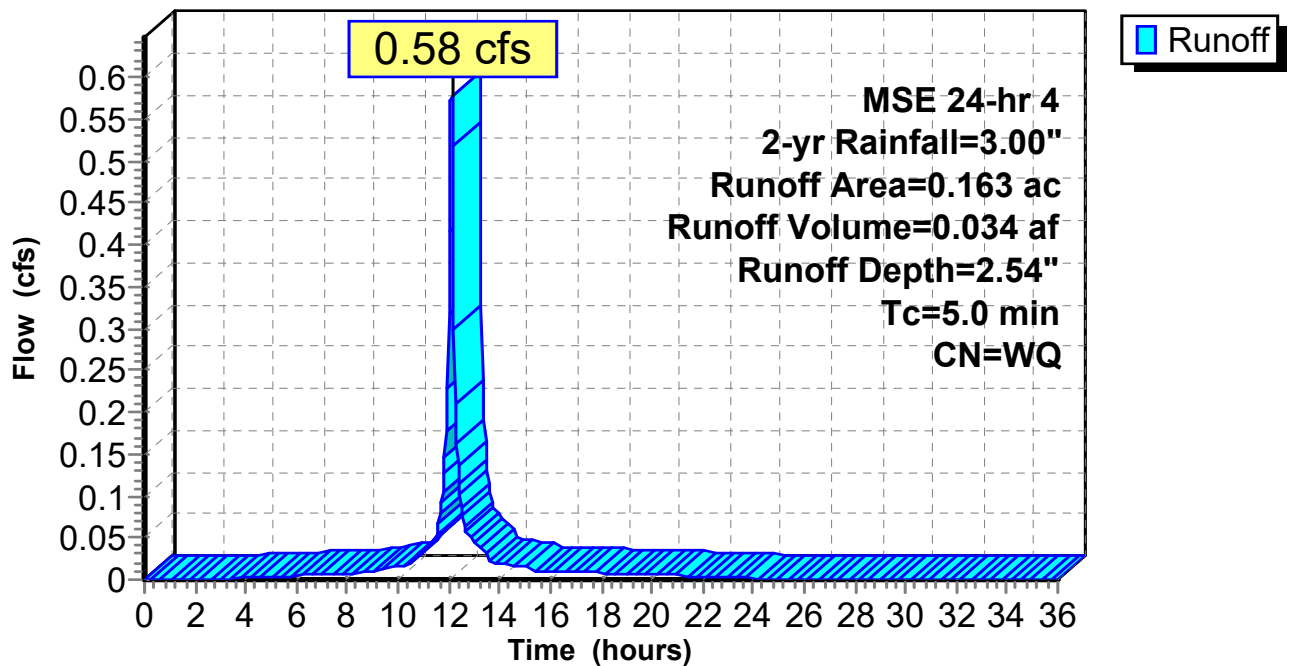
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 2-yr Rainfall=3.00"

Area (ac)	CN	Description
0.145	98	Paved parking, HSG B
0.018	69	50-75% Grass cover, Fair, HSG B
0.163		Weighted Average
0.018		11.04% Pervious Area
0.145		88.96% Impervious Area

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

**Subcatchment 6S: Pro DA-2**

**Hydrograph**



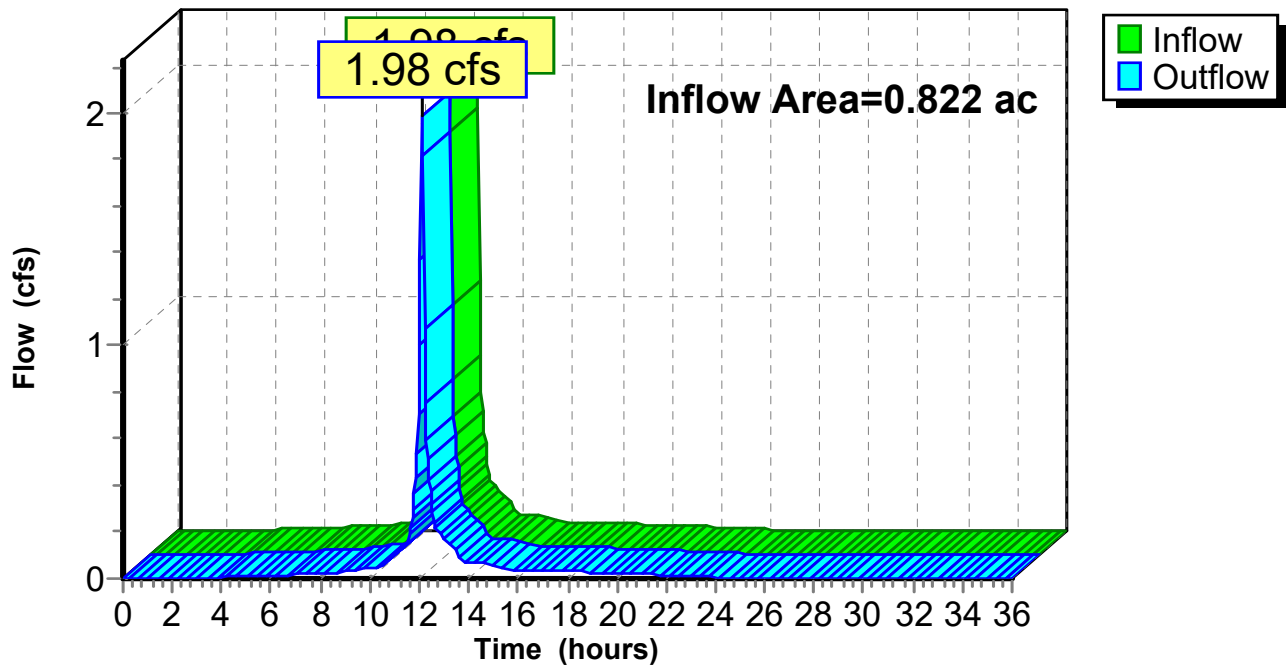
### Summary for Reach 5R: EX RUNOFF

Inflow Area = 0.822 ac, 50.00% Impervious, Inflow Depth = 1.72" for 2-yr event  
Inflow = 1.98 cfs @ 12.12 hrs, Volume= 0.118 af  
Outflow = 1.98 cfs @ 12.12 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 5R: EX RUNOFF

Hydrograph



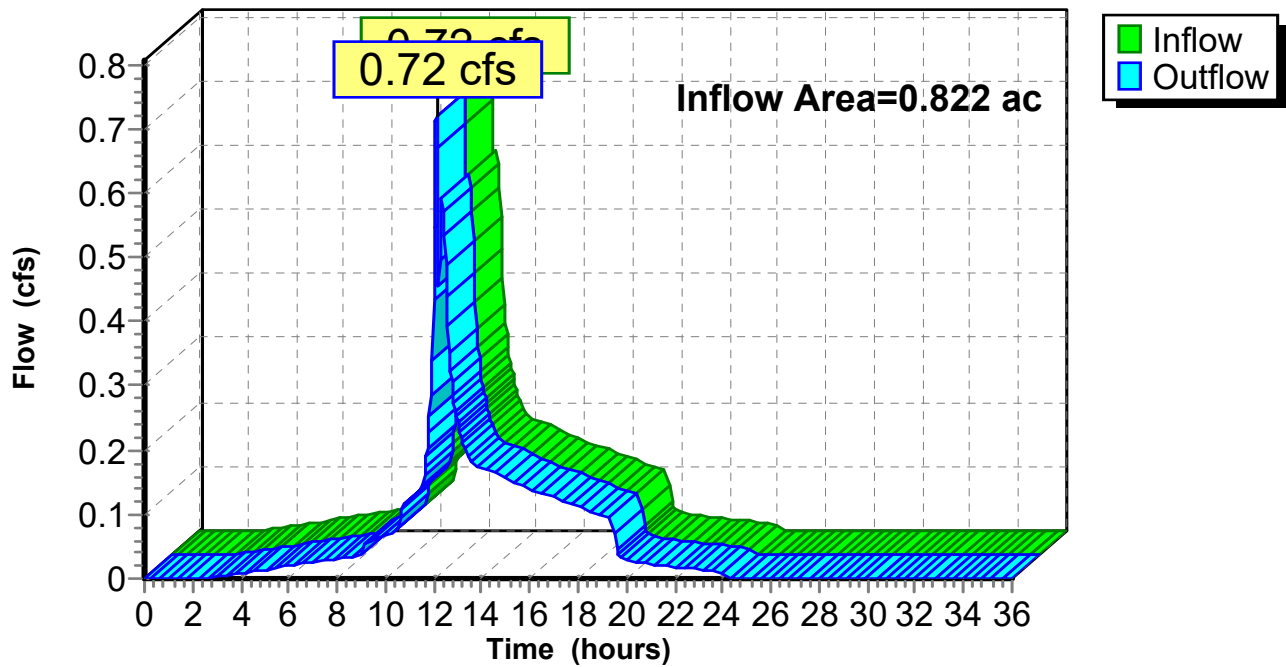
### Summary for Reach 8R: Pro RUNOFF

Inflow Area = 0.822 ac, 76.76% Impervious, Inflow Depth = 2.28" for 2-yr event  
Inflow = 0.72 cfs @ 12.11 hrs, Volume= 0.156 af  
Outflow = 0.72 cfs @ 12.11 hrs, Volume= 0.156 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 8R: Pro RUNOFF

#### Hydrograph



**Summary for Pond 9P: Pro Basin**

Inflow Area = 0.659 ac, 73.75% Impervious, Inflow Depth = 2.22" for 2-yr event  
 Inflow = 2.05 cfs @ 12.11 hrs, Volume= 0.122 af  
 Outflow = 0.46 cfs @ 12.38 hrs, Volume= 0.122 af, Atten= 78%, Lag= 15.8 min  
 Primary = 0.16 cfs @ 12.38 hrs, Volume= 0.111 af  
     Routed to Reach 8R : Pro RUNOFF  
 Secondary = 0.29 cfs @ 12.38 hrs, Volume= 0.010 af  
     Routed to Reach 8R : Pro RUNOFF  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
     Routed to Reach 8R : Pro RUNOFF

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 Peak Elev= 670.84' @ 12.38 hrs Surf.Area= 1,966 sf Storage= 1,988 cf

Plug-Flow detention time= 92.5 min calculated for 0.122 af (100% of inflow)  
 Center-of-Mass det. time= 92.4 min ( 855.1 - 762.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	669.50'	3,575 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
669.50	1,010	0	0
670.00	1,350	590	590
671.00	2,080	1,715	2,305
671.50	3,000	1,270	3,575

Device	Routing	Invert	Outlet Devices
#1	Primary	669.50'	<b>3.600 in/hr Exfiltration over Surface area</b>
#2	Secondary	670.75'	<b>12.0" Horiz. Orifice/Grate</b> C= 0.600 in 12.0" Grate (100% open area) Limited to weir flow at low heads
#3	Tertiary	671.25'	<b>5.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

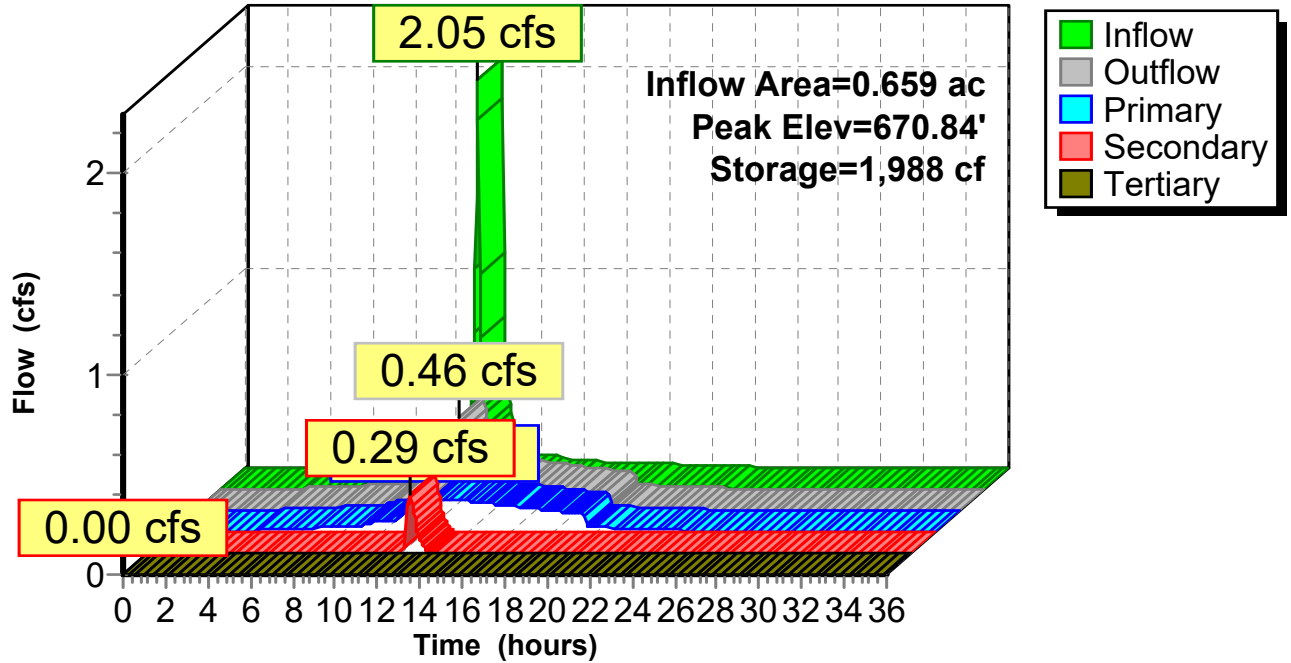
**Primary OutFlow** Max=0.16 cfs @ 12.38 hrs HW=670.84' (Free Discharge)  
 ↑1=**Exfiltration** (Exfiltration Controls 0.16 cfs)

**Secondary OutFlow** Max=0.29 cfs @ 12.38 hrs HW=670.84' (Free Discharge)  
 ↑2=**Orifice/Grate** (Weir Controls 0.29 cfs @ 1.00 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=669.50' (Free Discharge)  
 ↑3=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

### Pond 9P: Pro Basin

#### Hydrograph



**32213 HydroCAD**

Prepared by I&S Group, Inc

HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

MSE 24-hr 4 10-yr Rainfall=4.44"

Printed 3/7/2025

Page 16

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1S: EX DA-1** Runoff Area=0.485 ac 33.20% Impervious Runoff Depth=2.44"  
Tc=5.0 min CN=WQ Runoff=1.73 cfs 0.099 af

**Subcatchment2S: EX DA-2** Runoff Area=0.337 ac 74.18% Impervious Runoff Depth=3.52"  
Flow Length=266' Tc=5.0 min CN=WQ Runoff=1.66 cfs 0.099 af

**Subcatchment5S: Pro DA-1** Runoff Area=0.659 ac 73.75% Impervious Runoff Depth=3.51"  
Tc=5.0 min CN=WQ Runoff=3.23 cfs 0.193 af

**Subcatchment6S: Pro DA-2** Runoff Area=0.163 ac 88.96% Impervious Runoff Depth=3.91"  
Tc=5.0 min CN=WQ Runoff=0.88 cfs 0.053 af

**Reach 5R: EX RUNOFF** Inflow=3.38 cfs 0.197 af  
Outflow=3.38 cfs 0.197 af

**Reach 8R: Pro RUNOFF** Inflow=2.78 cfs 0.246 af  
Outflow=2.78 cfs 0.246 af

**Pond 9P: Pro Basin** Peak Elev=671.08' Storage=2,474 cf Inflow=3.23 cfs 0.193 af  
Primary=0.19 cfs 0.139 af Secondary=1.93 cfs 0.054 af Tertiary=0.00 cfs 0.000 af Outflow=2.12 cfs 0.193 af

**Total Runoff Area = 1.644 ac Runoff Volume = 0.443 af Average Runoff Depth = 3.24"**  
**36.62% Pervious = 0.602 ac 63.38% Impervious = 1.042 ac**

**Summary for Subcatchment 1S: EX DA-1**

Runoff = 1.73 cfs @ 12.12 hrs, Volume= 0.099 af, Depth= 2.44"  
 Routed to Reach 5R : EX RUNOFF

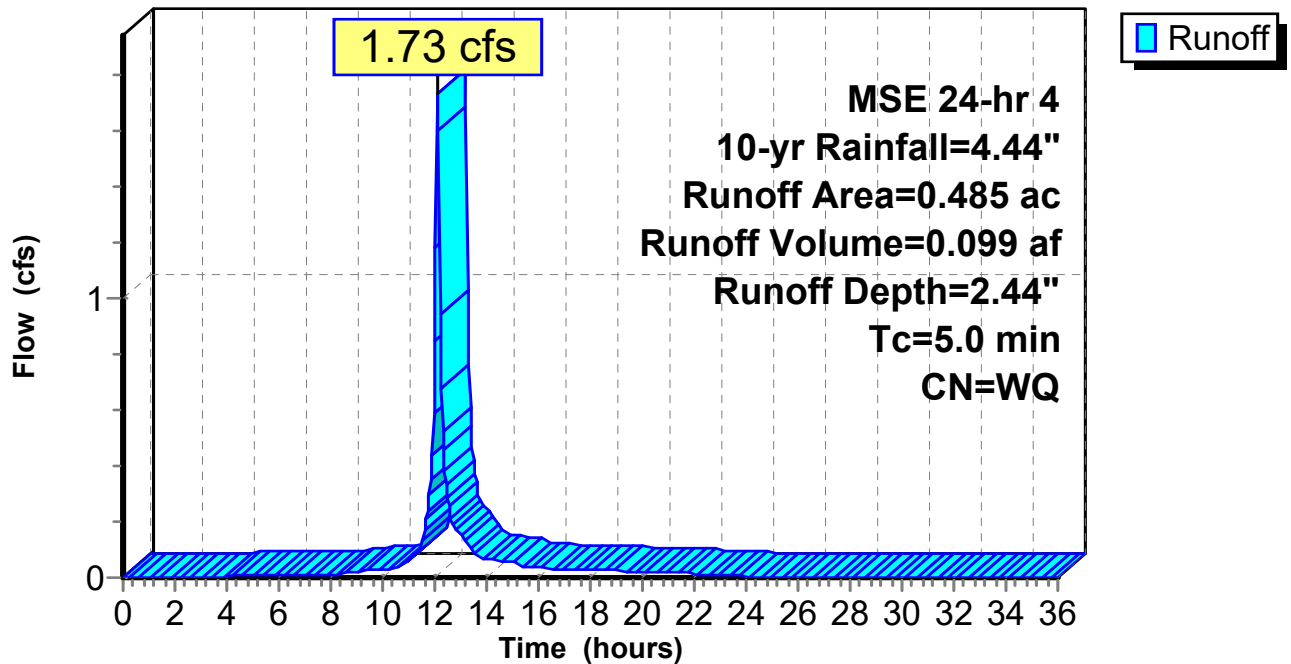
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 10-yr Rainfall=4.44"

Area (ac)	CN	Description
0.161	98	Paved parking, HSG B
0.324	69	50-75% Grass cover, Fair, HSG B
0.485		Weighted Average
0.324		66.80% Pervious Area
0.161		33.20% Impervious Area

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

**Subcatchment 1S: EX DA-1**

**Hydrograph**





**Summary for Subcatchment 2S: EX DA-2**

Runoff = 1.66 cfs @ 12.11 hrs, Volume= 0.099 af, Depth= 3.52"  
 Routed to Reach 5R : EX RUNOFF

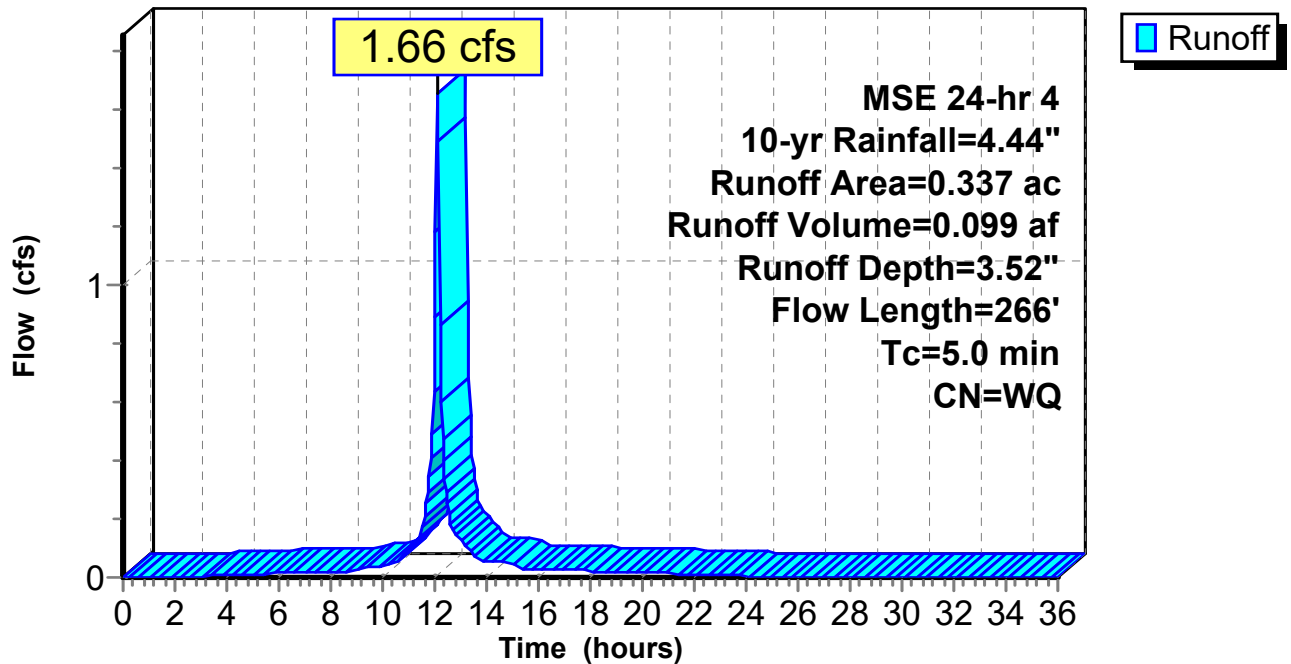
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 10-yr Rainfall=4.44"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.087	69	50-75% Grass cover, Fair, HSG B
0.337		Weighted Average
0.087		25.82% Pervious Area
0.250		74.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	178	0.0202	2.89		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.7	88	0.0144	0.84		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
2.7	266	Total, Increased to minimum Tc = 5.0 min			

**Subcatchment 2S: EX DA-2**

**Hydrograph**



**Summary for Subcatchment 5S: Pro DA-1**

Runoff = 3.23 cfs @ 12.11 hrs, Volume= 0.193 af, Depth= 3.51"  
 Routed to Pond 9P : Pro Basin

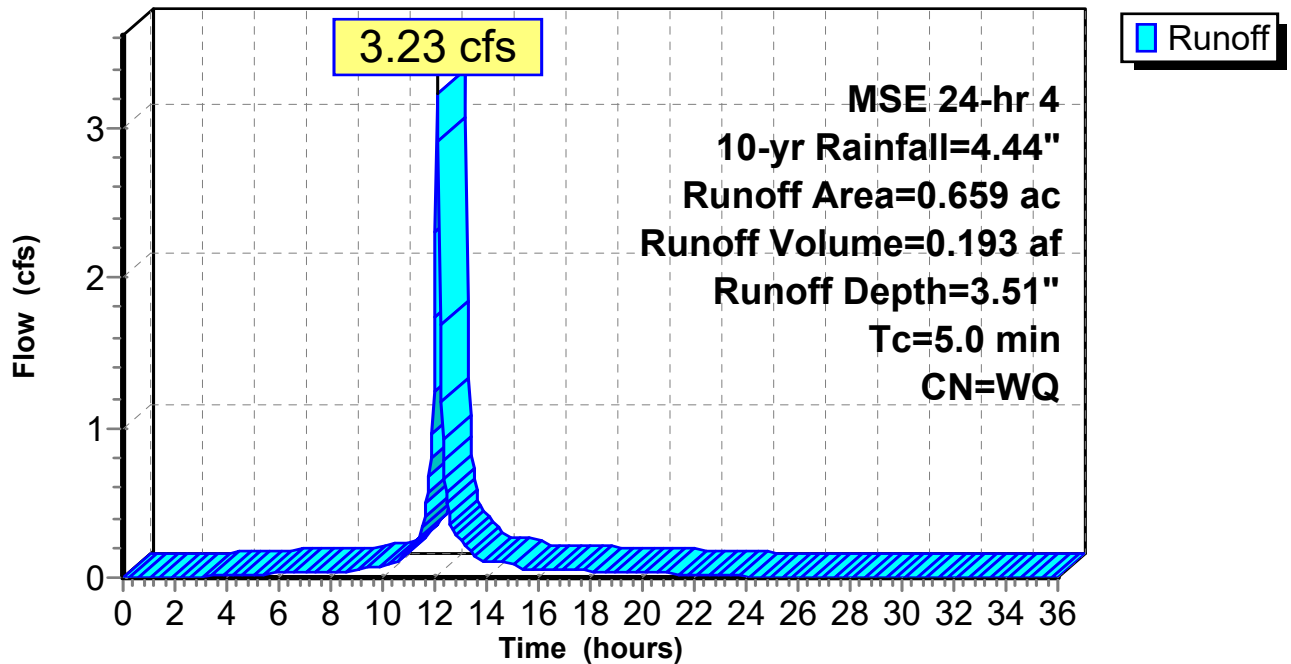
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 10-yr Rainfall=4.44"

Area (ac)	CN	Description
0.486	98	Paved parking, HSG B
0.173	69	50-75% Grass cover, Fair, HSG B
Weighted Average		
0.659		26.25% Pervious Area
0.173		73.75% Impervious Area
0.486		

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

**Subcatchment 5S: Pro DA-1**

**Hydrograph**



**Summary for Subcatchment 6S: Pro DA-2**

Runoff = 0.88 cfs @ 12.11 hrs, Volume= 0.053 af, Depth= 3.91"  
 Routed to Reach 8R : Pro RUNOFF

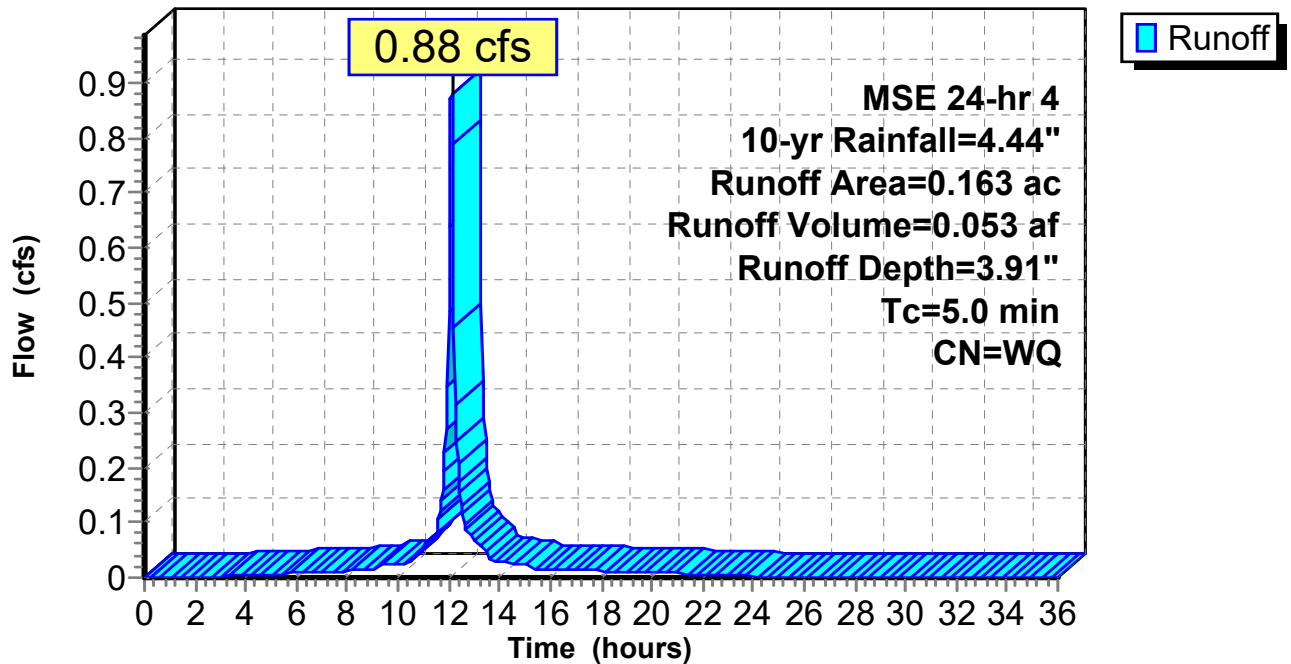
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 10-yr Rainfall=4.44"

Area (ac)	CN	Description
0.145	98	Paved parking, HSG B
0.018	69	50-75% Grass cover, Fair, HSG B
0.163		Weighted Average
0.018		11.04% Pervious Area
0.145		88.96% Impervious Area

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

**Subcatchment 6S: Pro DA-2**

**Hydrograph**



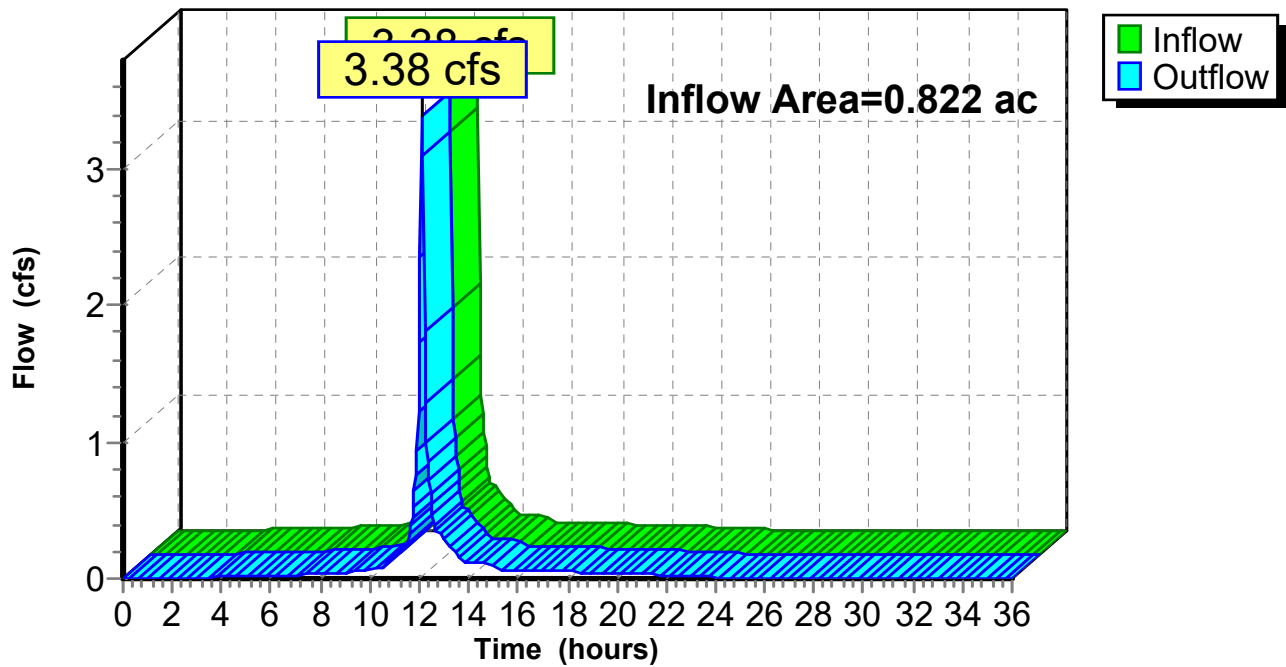
### Summary for Reach 5R: EX RUNOFF

Inflow Area = 0.822 ac, 50.00% Impervious, Inflow Depth = 2.88" for 10-yr event  
Inflow = 3.38 cfs @ 12.11 hrs, Volume= 0.197 af  
Outflow = 3.38 cfs @ 12.11 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 5R: EX RUNOFF

Hydrograph



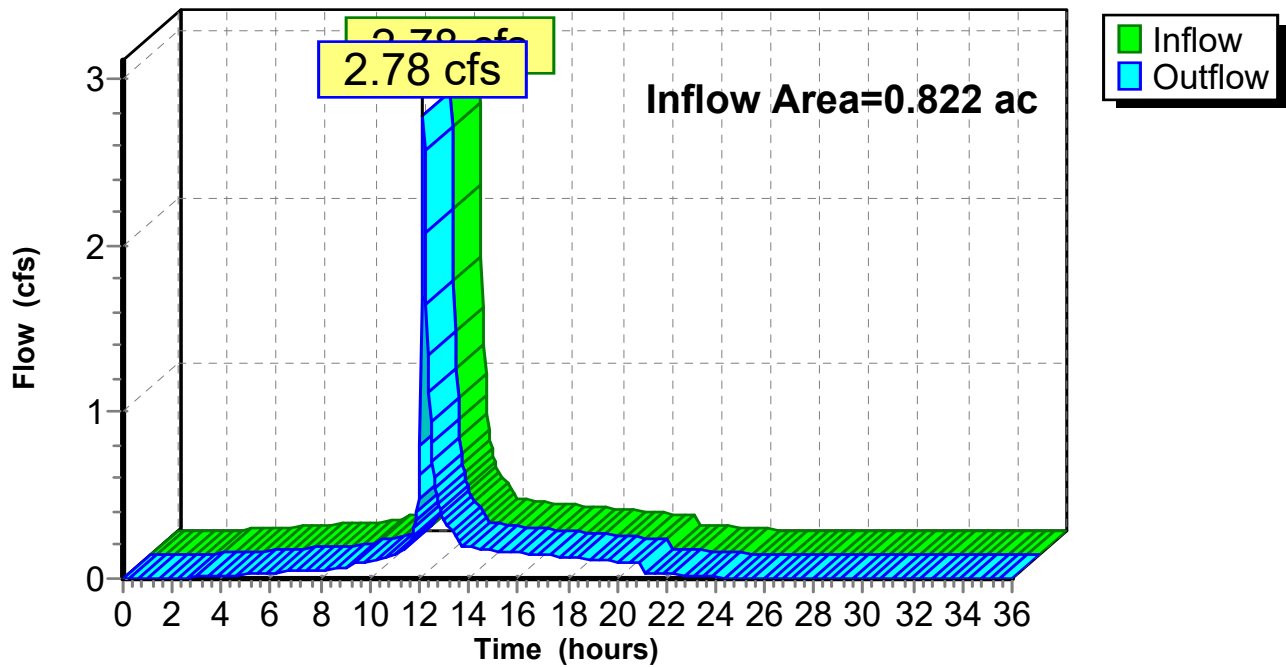
### Summary for Reach 8R: Pro RUNOFF

Inflow Area = 0.822 ac, 76.76% Impervious, Inflow Depth = 3.59" for 10-yr event  
Inflow = 2.78 cfs @ 12.17 hrs, Volume= 0.246 af  
Outflow = 2.78 cfs @ 12.17 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 8R: Pro RUNOFF

#### Hydrograph



**Summary for Pond 9P: Pro Basin**

Inflow Area = 0.659 ac, 73.75% Impervious, Inflow Depth = 3.51" for 10-yr event  
 Inflow = 3.23 cfs @ 12.11 hrs, Volume= 0.193 af  
 Outflow = 2.12 cfs @ 12.19 hrs, Volume= 0.193 af, Atten= 34%, Lag= 4.8 min  
 Primary = 0.19 cfs @ 12.19 hrs, Volume= 0.139 af  
     Routed to Reach 8R : Pro RUNOFF  
 Secondary = 1.93 cfs @ 12.19 hrs, Volume= 0.054 af  
     Routed to Reach 8R : Pro RUNOFF  
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
     Routed to Reach 8R : Pro RUNOFF

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 Peak Elev= 671.08' @ 12.19 hrs Surf.Area= 2,224 sf Storage= 2,474 cf

Plug-Flow detention time= 75.6 min calculated for 0.193 af (100% of inflow)  
 Center-of-Mass det. time= 75.5 min ( 833.5 - 757.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	669.50'	3,575 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
669.50	1,010	0	0
670.00	1,350	590	590
671.00	2,080	1,715	2,305
671.50	3,000	1,270	3,575

Device	Routing	Invert	Outlet Devices
#1	Primary	669.50'	<b>3.600 in/hr Exfiltration over Surface area</b>
#2	Secondary	670.75'	<b>12.0" Horiz. Orifice/Grate</b> C= 0.600 in 12.0" Grate (100% open area) Limited to weir flow at low heads
#3	Tertiary	671.25'	<b>5.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

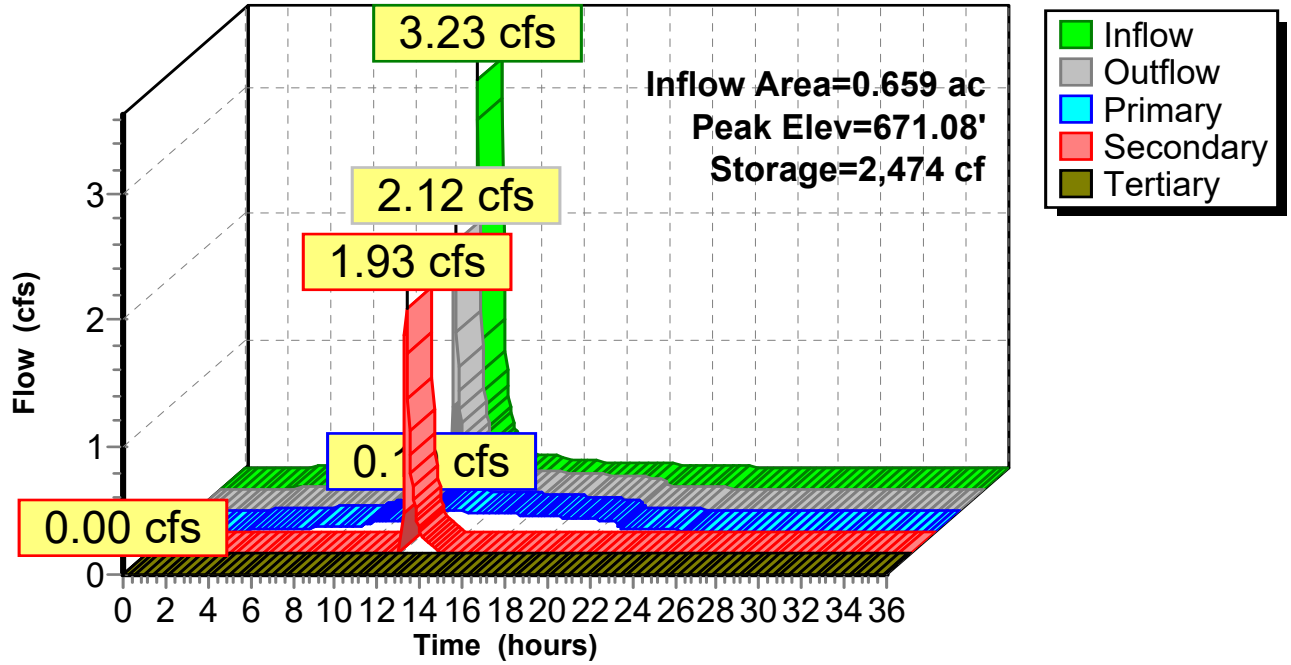
**Primary OutFlow** Max=0.18 cfs @ 12.19 hrs HW=671.07' (Free Discharge)  
 ↑1=**Exfiltration** (Exfiltration Controls 0.18 cfs)

**Secondary OutFlow** Max=1.90 cfs @ 12.19 hrs HW=671.07' (Free Discharge)  
 ↑2=**Orifice/Grate** (Weir Controls 1.90 cfs @ 1.86 fps)

**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=669.50' (Free Discharge)  
 ↑3=**Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

### Pond 9P: Pro Basin

#### Hydrograph



**32213 HydroCAD**

Prepared by I&amp;S Group, Inc

HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

*MSE 24-hr 4 100-yr Rainfall=7.53"*

Printed 3/7/2025

Page 25

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-Q  
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment1S: EX DA-1** Runoff Area=0.485 ac 33.20% Impervious Runoff Depth=5.06"  
 Tc=5.0 min CN=WQ Runoff=3.64 cfs 0.205 af

**Subcatchment2S: EX DA-2** Runoff Area=0.337 ac 74.18% Impervious Runoff Depth=6.43"  
 Flow Length=266' Tc=5.0 min CN=WQ Runoff=3.01 cfs 0.181 af

**Subcatchment5S: Pro DA-1** Runoff Area=0.659 ac 73.75% Impervious Runoff Depth=6.41"  
 Tc=5.0 min CN=WQ Runoff=5.88 cfs 0.352 af

**Subcatchment6S: Pro DA-2** Runoff Area=0.163 ac 88.96% Impervious Runoff Depth=6.92"  
 Tc=5.0 min CN=WQ Runoff=1.54 cfs 0.094 af

**Reach 5R: EX RUNOFF** Inflow=6.65 cfs 0.385 af  
 Outflow=6.65 cfs 0.385 af

**Reach 8R: Pro RUNOFF** Inflow=5.69 cfs 0.446 af  
 Outflow=5.69 cfs 0.446 af

**Pond 9P: Pro Basin** Peak Elev=671.45' Storage=3,419 cf Inflow=5.88 cfs 0.352 af  
 Primary=0.24 cfs 0.187 af Secondary=3.16 cfs 0.155 af Tertiary=1.01 cfs 0.010 af Outflow=4.41 cfs 0.352 af

**Total Runoff Area = 1.644 ac Runoff Volume = 0.831 af Average Runoff Depth = 6.07"**  
**36.62% Pervious = 0.602 ac 63.38% Impervious = 1.042 ac**



**Summary for Subcatchment 1S: EX DA-1**

Runoff = 3.64 cfs @ 12.11 hrs, Volume= 0.205 af, Depth= 5.06"  
 Routed to Reach 5R : EX RUNOFF

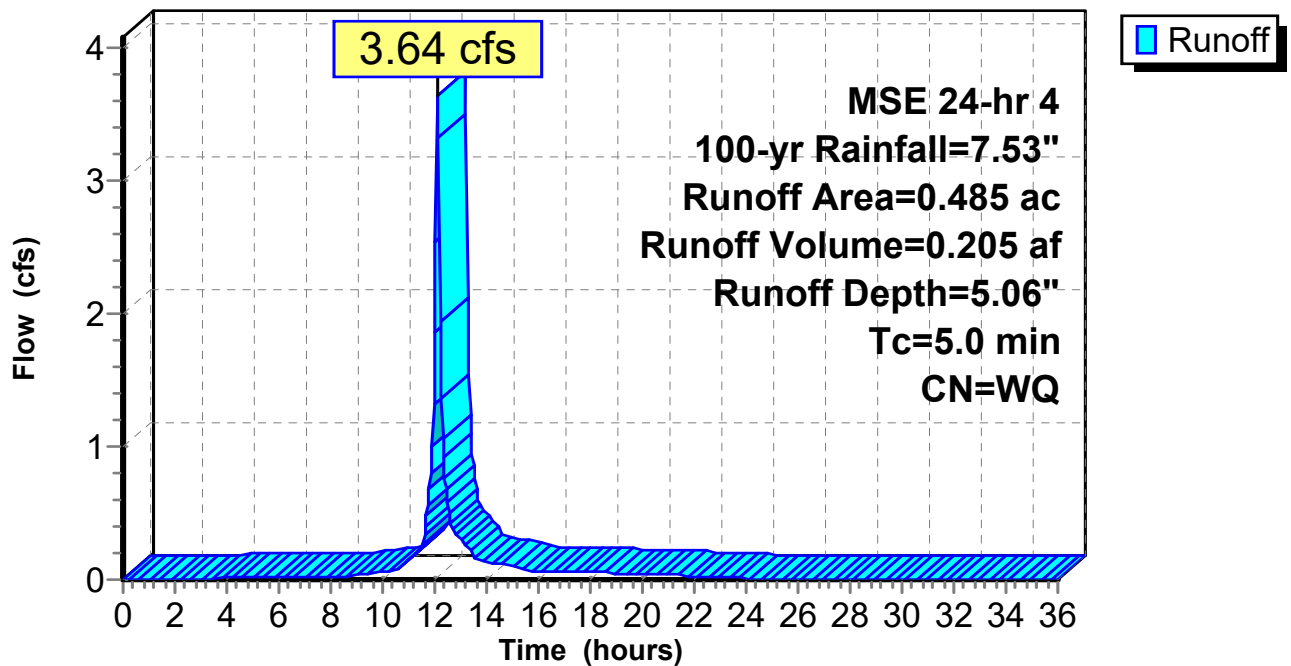
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 100-yr Rainfall=7.53"

Area (ac)	CN	Description
0.161	98	Paved parking, HSG B
0.324	69	50-75% Grass cover, Fair, HSG B
0.485		Weighted Average
0.324		66.80% Pervious Area
0.161		33.20% Impervious Area

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

**Subcatchment 1S: EX DA-1**

**Hydrograph**



**Summary for Subcatchment 2S: EX DA-2**

Runoff = 3.01 cfs @ 12.11 hrs, Volume= 0.181 af, Depth= 6.43"  
 Routed to Reach 5R : EX RUNOFF

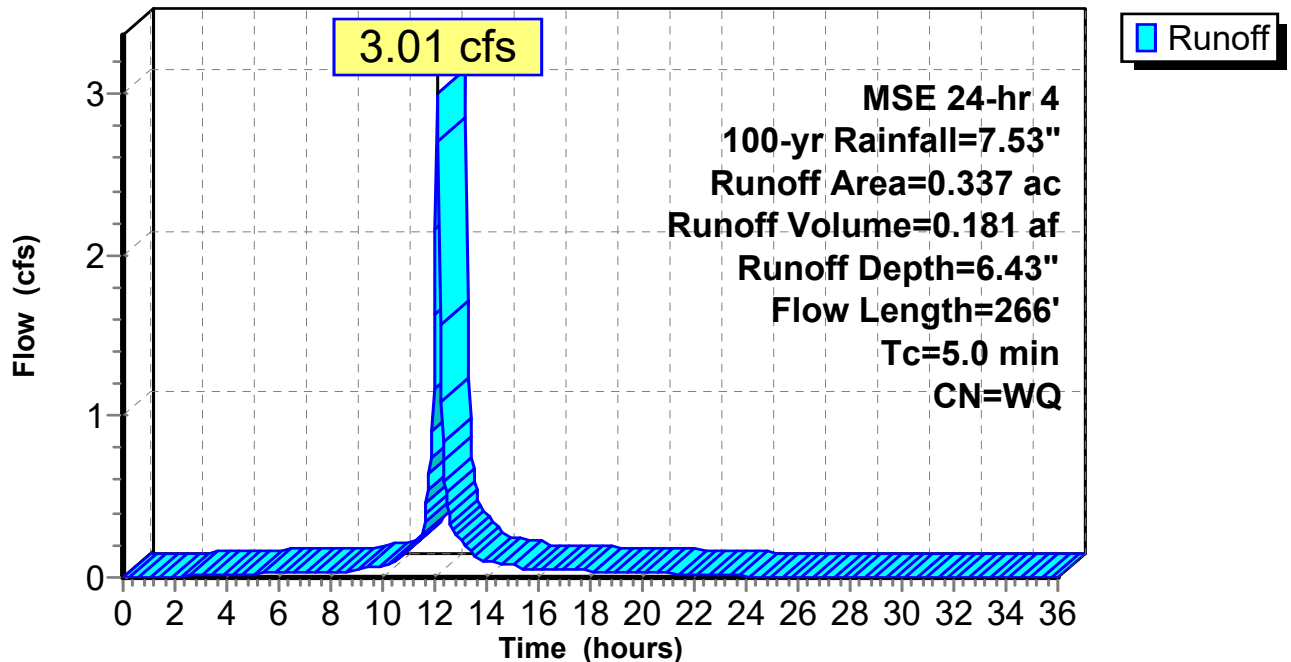
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 100-yr Rainfall=7.53"

Area (ac)	CN	Description
0.250	98	Paved parking, HSG B
0.087	69	50-75% Grass cover, Fair, HSG B
0.337		Weighted Average
0.087		25.82% Pervious Area
0.250		74.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	178	0.0202	2.89		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
1.7	88	0.0144	0.84		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
2.7	266	Total, Increased to minimum Tc = 5.0 min			

**Subcatchment 2S: EX DA-2**

**Hydrograph**



**Summary for Subcatchment 5S: Pro DA-1**

Runoff = 5.88 cfs @ 12.11 hrs, Volume= 0.352 af, Depth= 6.41"  
 Routed to Pond 9P : Pro Basin

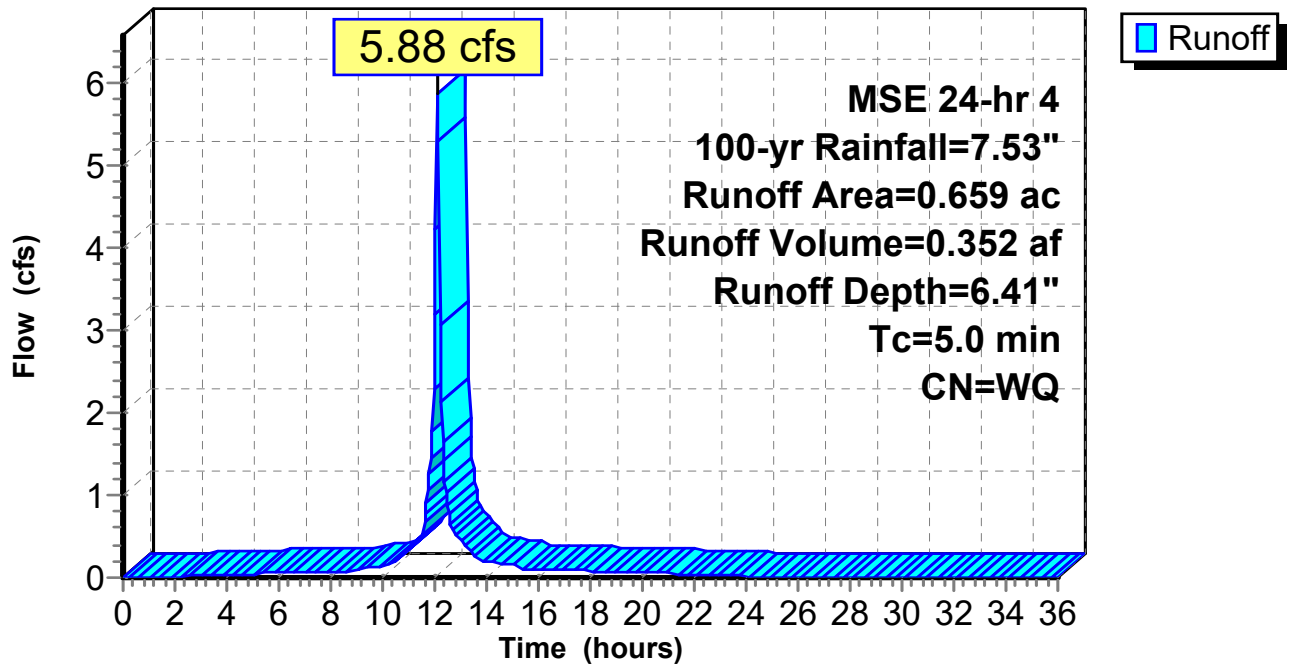
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 100-yr Rainfall=7.53"

Area (ac)	CN	Description
0.486	98	Paved parking, HSG B
0.173	69	50-75% Grass cover, Fair, HSG B
0.659		Weighted Average
0.173		26.25% Pervious Area
0.486		73.75% Impervious Area

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

**Subcatchment 5S: Pro DA-1**

**Hydrograph**



**Summary for Subcatchment 6S: Pro DA-2**

Runoff = 1.54 cfs @ 12.11 hrs, Volume= 0.094 af, Depth= 6.92"  
 Routed to Reach 8R : Pro RUNOFF

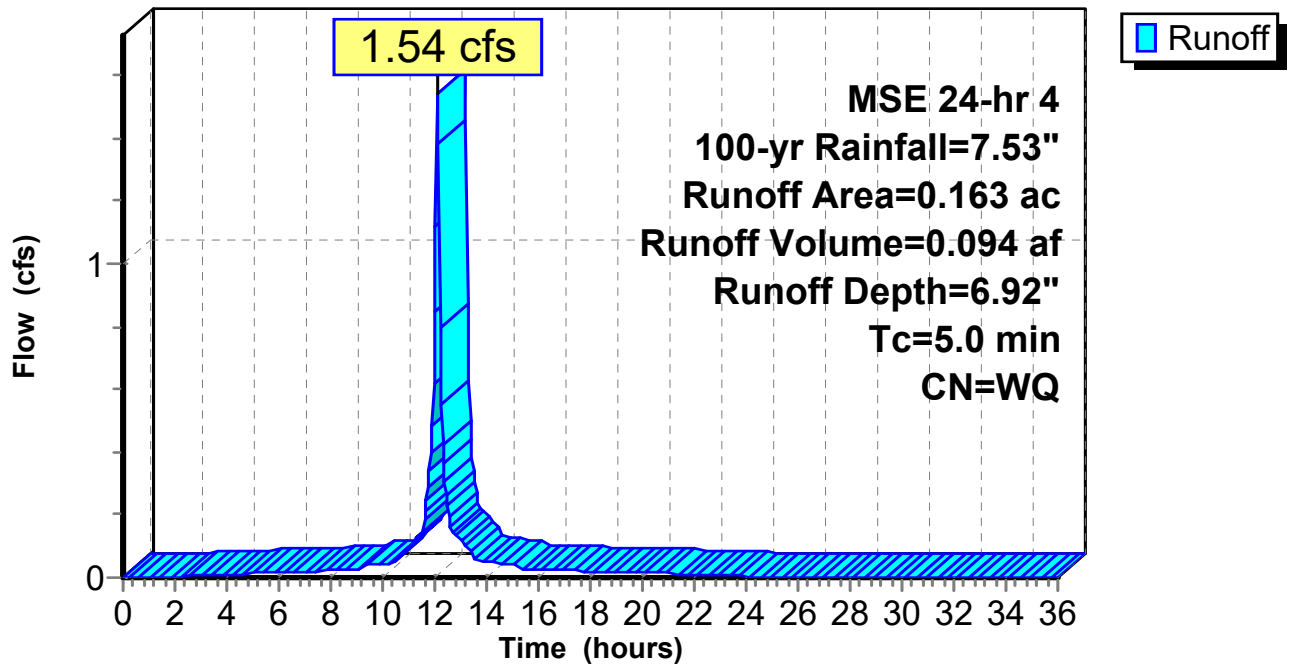
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 4 100-yr Rainfall=7.53"

Area (ac)	CN	Description
0.145	98	Paved parking, HSG B
0.018	69	50-75% Grass cover, Fair, HSG B
<hr/>		
0.163		Weighted Average
0.018		11.04% Pervious Area
0.145		88.96% Impervious Area

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

**Subcatchment 6S: Pro DA-2**

**Hydrograph**



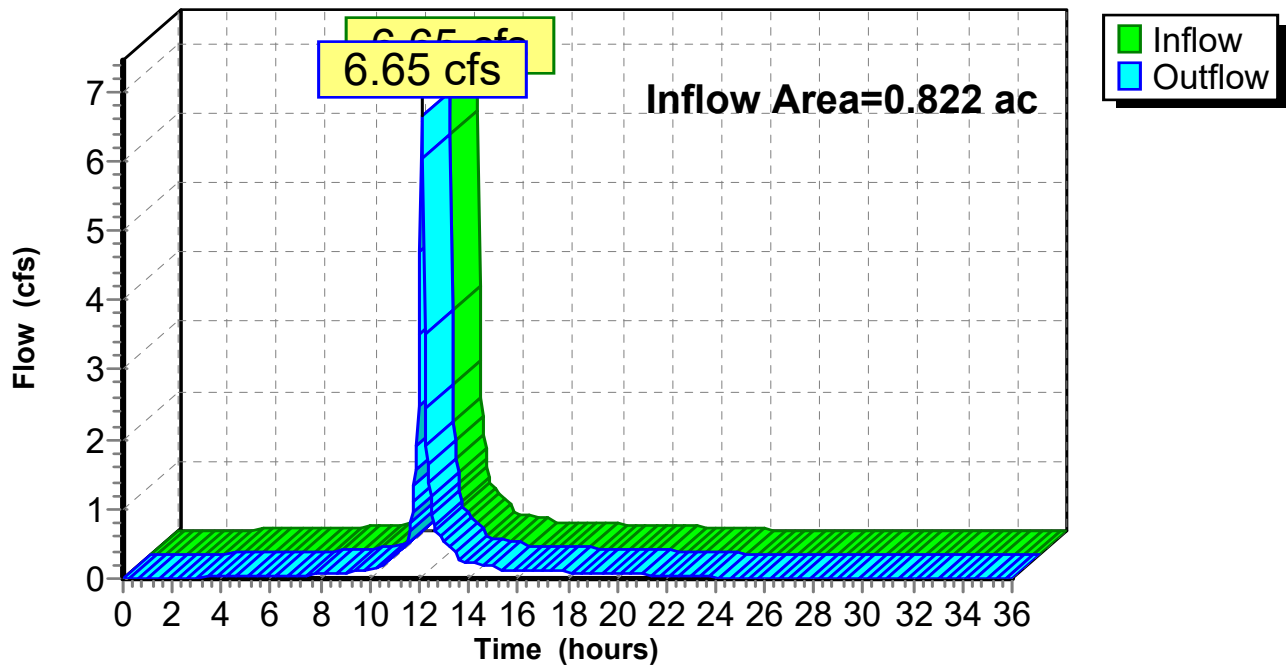
### Summary for Reach 5R: EX RUNOFF

Inflow Area = 0.822 ac, 50.00% Impervious, Inflow Depth = 5.62" for 100-yr event  
Inflow = 6.65 cfs @ 12.11 hrs, Volume= 0.385 af  
Outflow = 6.65 cfs @ 12.11 hrs, Volume= 0.385 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 5R: EX RUNOFF

#### Hydrograph



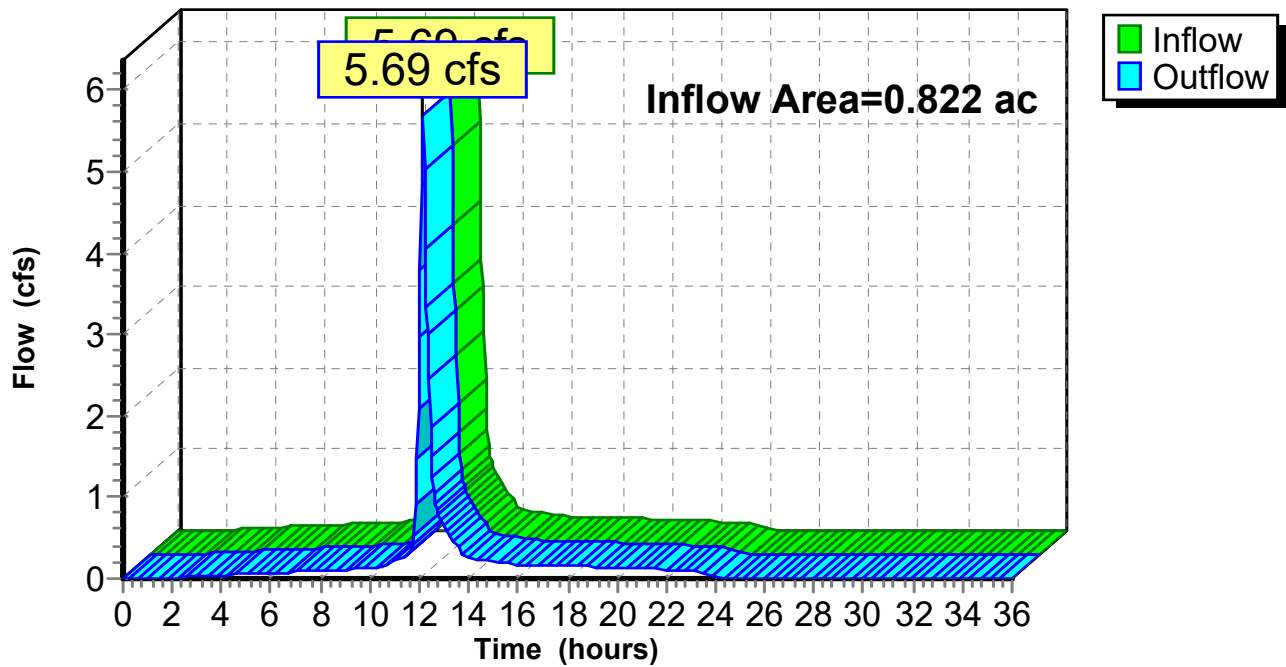
### Summary for Reach 8R: Pro RUNOFF

Inflow Area = 0.822 ac, 76.76% Impervious, Inflow Depth = 6.52" for 100-yr event  
Inflow = 5.69 cfs @ 12.15 hrs, Volume= 0.446 af  
Outflow = 5.69 cfs @ 12.15 hrs, Volume= 0.446 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### Reach 8R: Pro RUNOFF

#### Hydrograph



**Summary for Pond 9P: Pro Basin**

Inflow Area = 0.659 ac, 73.75% Impervious, Inflow Depth = 6.41" for 100-yr event  
 Inflow = 5.88 cfs @ 12.11 hrs, Volume= 0.352 af  
 Outflow = 4.41 cfs @ 12.17 hrs, Volume= 0.352 af, Atten= 25%, Lag= 3.6 min  
 Primary = 0.24 cfs @ 12.17 hrs, Volume= 0.187 af  
     Routed to Reach 8R : Pro RUNOFF  
 Secondary = 3.16 cfs @ 12.17 hrs, Volume= 0.155 af  
     Routed to Reach 8R : Pro RUNOFF  
 Tertiary = 1.01 cfs @ 12.17 hrs, Volume= 0.010 af  
     Routed to Reach 8R : Pro RUNOFF

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs  
 Peak Elev= 671.45' @ 12.17 hrs Surf.Area= 2,903 sf Storage= 3,419 cf

Plug-Flow detention time= 63.4 min calculated for 0.352 af (100% of inflow)  
 Center-of-Mass det. time= 63.3 min ( 815.5 - 752.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	669.50'	3,575 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
669.50	1,010	0	0
670.00	1,350	590	590
671.00	2,080	1,715	2,305
671.50	3,000	1,270	3,575

Device	Routing	Invert	Outlet Devices
#1	Primary	669.50'	<b>3.600 in/hr Exfiltration over Surface area</b>
#2	Secondary	670.75'	<b>12.0" Horiz. Orifice/Grate</b> C= 0.600 in 12.0" Grate (100% open area) Limited to weir flow at low heads
#3	Tertiary	671.25'	<b>5.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

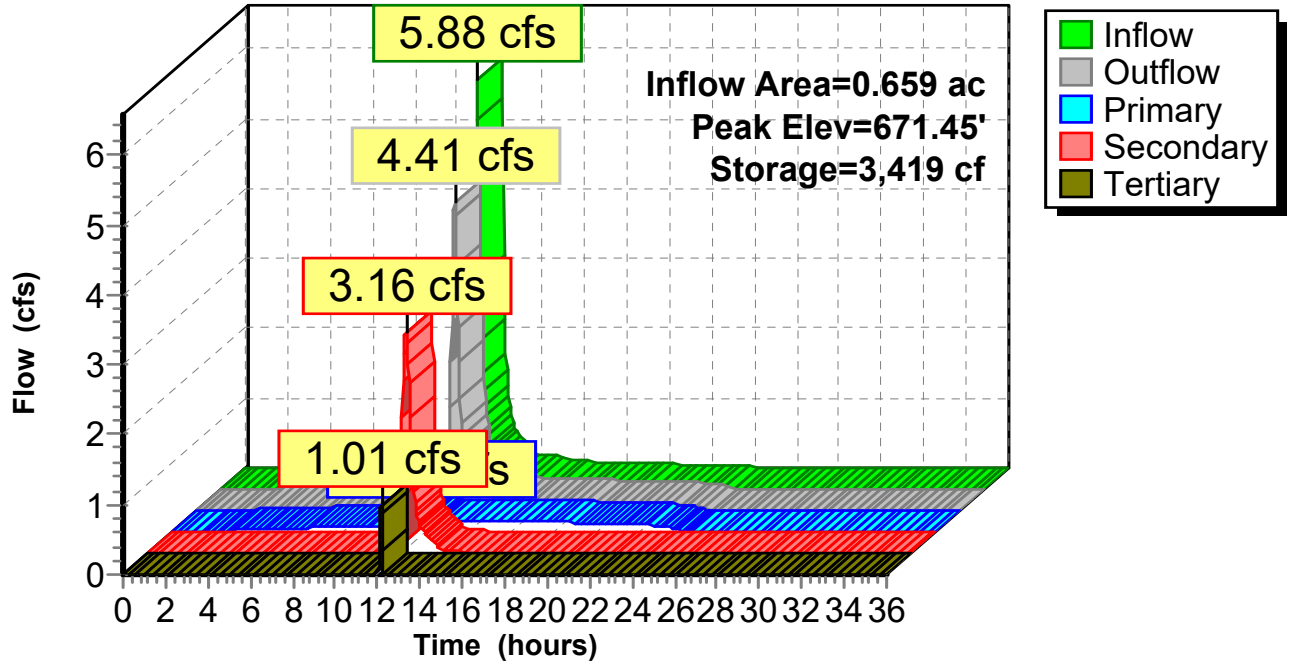
**Primary OutFlow** Max=0.24 cfs @ 12.17 hrs HW=671.43' (Free Discharge)  
 ↑1=**Exfiltration** (Exfiltration Controls 0.24 cfs)

**Secondary OutFlow** Max=3.12 cfs @ 12.17 hrs HW=671.43' (Free Discharge)  
 ↑2=**Orifice/Grate** (Orifice Controls 3.12 cfs @ 3.98 fps)

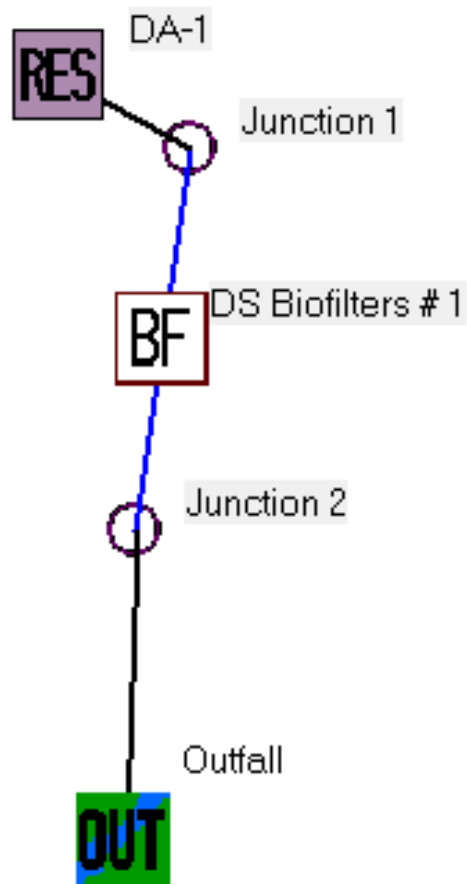
**Tertiary OutFlow** Max=0.91 cfs @ 12.17 hrs HW=671.43' (Free Discharge)  
 ↑3=**Broad-Crested Rectangular Weir**(Weir Controls 0.91 cfs @ 1.00 fps)

### Pond 9P: Pro Basin

#### Hydrograph







Data file name: S:\Projects\32000 PROJ\32200-32299\32213 Badger West-La Crosse WI\32213 Practice Groups\32213 Civil-Survey\Civil Calcs\Proposed Conditions.m  
WinSLAMM Version 10.5.0

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Minneapolis MN 1959.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI\_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI\_SL06 Dec06.rsvx

Residential Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI\_GEO03.ppdx

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations

Seed for random number generator: -42

Study period starting date: 01/02/59

Study period ending date: 12/28/59

Start of Winter Season: 12/02

End of Winter Season: 03/12

Date: 03-07-2025

Time: 16:23:10

Site information:

LU# 1 - Residential: DA-1 Total area (ac): 0.659

1 - Roofs 1: 0.185 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

13 - Paved Parking 1: 0.301 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.150 ac. Moderately Compacted Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.023 ac. PSD File: Source Area PSD File:

Control Practice 1: Biofilter CP# 1 (DS) - DS Biofilters # 1

1. Top area (square feet) = 3000

2. Bottom area (square feet) = 1010

3. Depth (ft): 5

4. Biofilter width (ft) - for Cost Purposes Only: 10

5. Infiltration rate (in/hr) = 0

6. Random infiltration rate generation? No

7. Infiltration rate fraction (side): 0.01

8. Infiltration rate fraction (bottom): 1

9. Depth of biofilter that is rock filled (ft) 1

10. Porosity of rock filled volume = 0.33

11. Engineered soil infiltration rate: 3.6

12. Engineered soil depth (ft) = 2

13. Engineered soil porosity = 0.27

14. Percent solids reduction due to flow through engineered soil = 80

15. Biofilter peak to average flow ratio = 3.8

16. Number of biofiltration control devices = 1

17. Particle size distribution file: Not needed - calculated by program

18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

User-Defined Media Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 5

2. Weir crest width (ft): 5

3. Height of datum to bottom of weir opening: 4.75

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 1

2. Stand pipe height above datum (ft): 4.25

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.5

2. Invert elevation above datum (ft): 0

3. Number of underdrain outlets: 1

Data file name: S:\Projects\32000 PROJ\32200-32299\32213 Badger West-La Crosse WI\32213 Practice Groups\32213 Civil-Survey\Civil Calcs\Proposed Conditions.m  
WinSLAMM Version 10.5.0  
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Minneapolis MN 1959.RAN  
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI\_AVG01.pscx  
Runoff Coefficient file name: C:\WinSLAMM Files\WI\_SL06 Dec06.rsvx  
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI\_GEO03.ppdx  
Residential Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Institutional Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Commercial Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Industrial Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Freeway Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False  
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv  
Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations  
Seed for random number generator: -42  
Study period starting date: 01/02/59      Study period ending date: 12/28/59  
Start of Winter Season: 12/02      End of Winter Season: 03/12  
Model Run Start Date: 01/02/59    Model Run End Date: 12/28/59  
Date of run: 03-07-2025    Time of run: 16:23:43  
Total Area Modeled (acres): 0.659  
Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	42242	-	117.7	310.5	-
Outfall Total with Controls:	42332	-0.21%	24.14	63.80	79.45%
Annualized Total After Outfall Controls:	42920			64.69	

Biofilter # 1 is expected to clog in 6.71 years.. Percent Solids Reduction due to Engineered Media = 80