

Storm Water & Erosion Control Calculations For:

7 Brew

La Crosse, Wisconsin

Excel Job # 250351400

December 11, 2025



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0.0 Introduction

0.1 Existing Conditions

The proposed development is located on the south side of State Hwy 16 approximately at the intersection of Braund St in the Valley View Mall parking lot in the City of La Crosse of Wisconsin. The project is bound by a parking lot to the south and west, access drive to the north, and a future development to the east. The existing site currently contains a parking lot. The site currently drains to two existing catch basins that are part of the master development storm system which drains to the west. The existing site can be seen in Appendix A.

- Property Area: 0.81 acres

0.2 Proposed Project Overview

The proposed project will include a proposed coffee shop with drive thru and associated site improvements. The proposed development will drain to inlets that will drain stormwater to the master development storm system which drains to the west. The proposed site can be seen in Appendix B.

- Disturbed Area: 0.87 acres

1.0 Design Criteria

1.1 Soils

Soil borings will be completed for the project site. The complete geotechnical investigation with boring logs will be Appendix D once completed.

1.2 Rainfall Data

NOAA Atlas 14 rainfall depths with a type II distribution was used for stormwater calculations.

Table 1: NOAA Atlas 14 24-hour Rainfall Depth

DESIGN STORM	RAINFALL DEPTH (INCHES)
2-YEAR	2.98
10-YEAR	4.39
100-YEAR	7.43

2.0 Stormwater Management Requirements

2.1 Peak Discharge

City of La Crosse- Maintain or reduce the 2-yr and 10-yr 24 hour post development peak runoff discharge rates to the 2-yr and 10-yr, 24 hour pre development peak runoff discharge rates respectively.

The proposed site will decrease impervious area by 8,057 SF. This implies a decrease in post development stormwater runoff rates.

Table 2: Peak Discharge Release Summary

DESIGN STORM	PREDEVELOPMENT (CFS)	POST DEVELOPMENT (CFS)
2 YR- 24 HR	3.15	2.33
10 YR- 24 HR	4.74	3.98

Table 2 shows that post development release rates will be less than predevelopment release rates for all design storms. See Appendix C for peak discharge calculations.

Therefore, peak discharge requirements are met.

2.2 Stormwater Quality

City of La Crosse- The site is considered a redevelopment project and will be required to remove 40% of total suspended solids (TSS) from runoff from parking areas and roads.

Table 3: Stormwater Quality Summary

TSS REMOVAL REQUIRED (LBS)	TSS REMOVAL PROVIDED (LBS)
108.04	129.10

The site will treat stormwater using an Up-flo filter. The Up-flo filter will be installed in a 4' diameter structure and will have 1 filter. SLAMM analysis was used to determine the quantity of suspended solids that will be removed by the proposed Up-flo filter. The proposed site will create 270.10 lbs of TSS and the proposed Up-flo filter will reduce TSS by 129.10 lbs, which results in a 47.80% reduction in TSS.

The proposed Up-flo filter removes 47.80% of suspended solids which is greater than the required 40%.

Table 3 for a summary of the stormwater quality requirements and the annual loading removed by the stormwater management BMP. See Appendix H for SLAMM input and output information.

Therefore, stormwater quality requirements have been met.

2.3 Infiltration

City of La Crosse - The site is considered a redevelopment post construction site. Therefore, the project is exempt from infiltration requirements.

3.0 Storm Sewer Design

All storm sewer has been designed to convey the 100-year 24-hour post development storm.

See Appendix E, Appendix F, and Appendix G for pipe drainage areas and pipe sizing calculations.

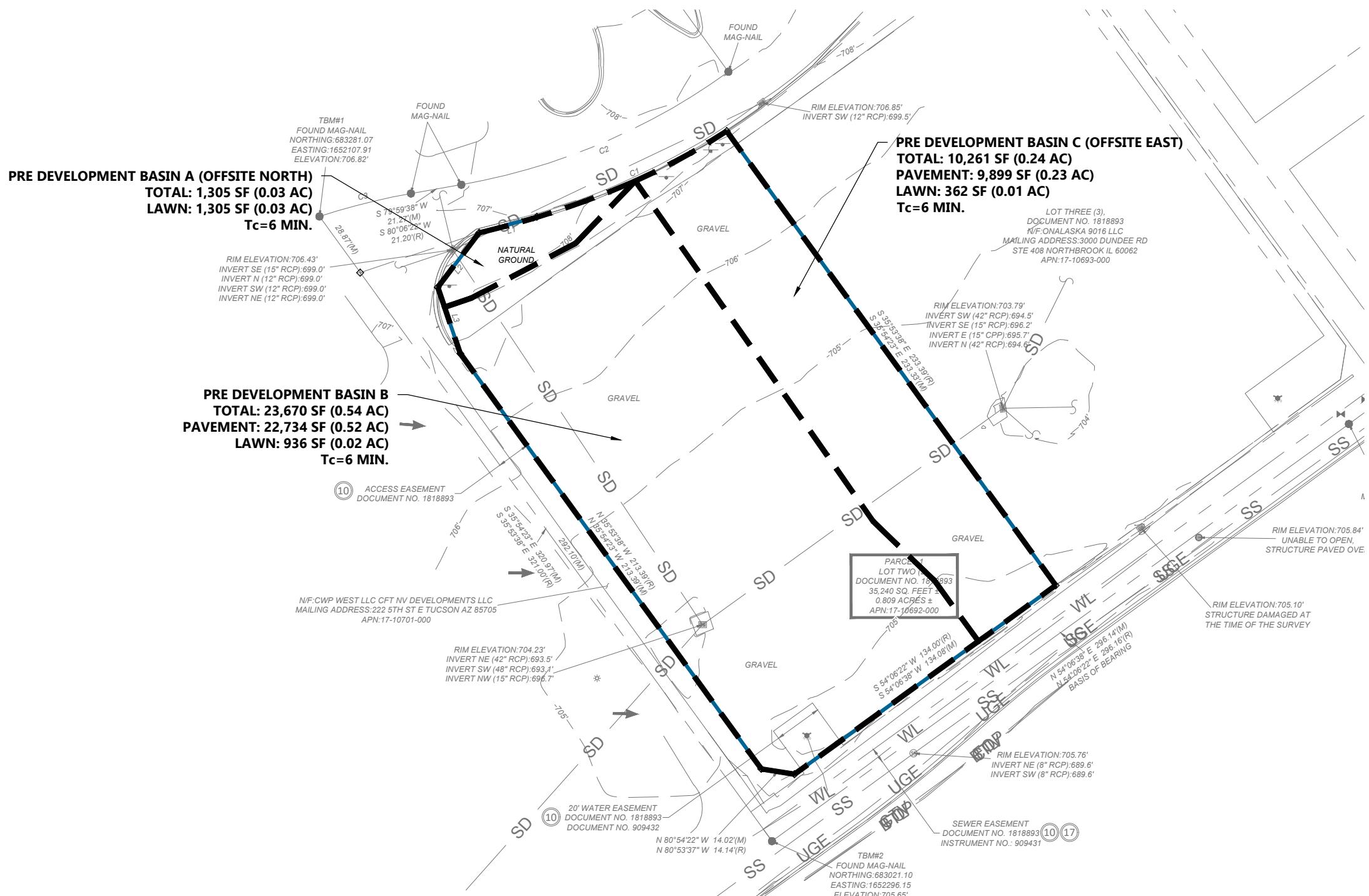
3.1 Emergency Overflow Route

The emergency overflow route is to the west, over the curb and gutter. Maximum ponding onsite will be 4" in drive aisles and 6" in parking stalls.

4.0 Erosion Control

The erosion control specifications, construction sequence, site stabilization notes, seeding notes, dewatering notes, and post construction and maintenance plan will be included on sheet C0.2 of the construction plan set.

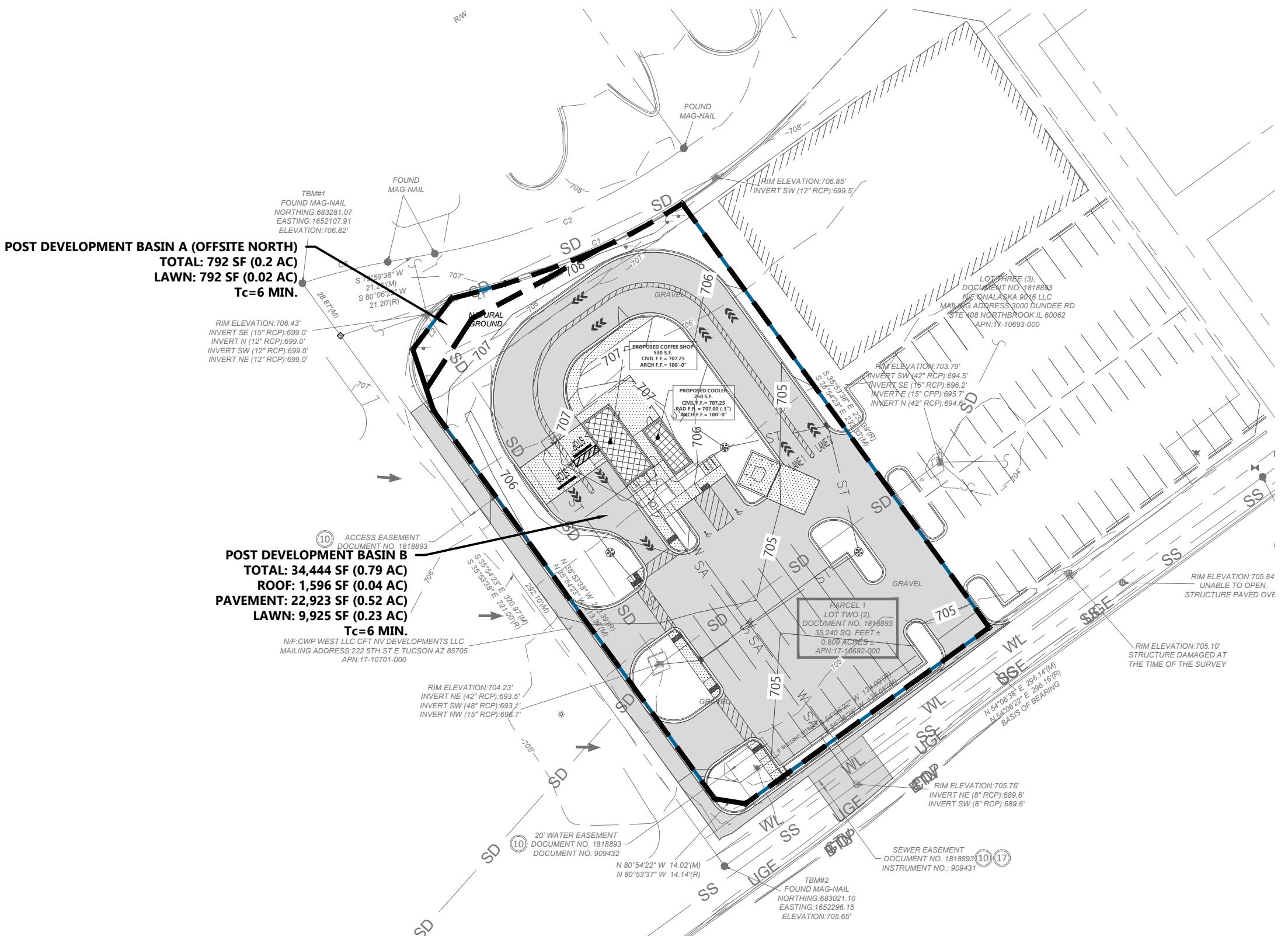
Appendix A: Pre-Development Basin Area(s)



PRE-DEVELOPMENT BASIN AREA(S)

SCALE: 1"= 50' (AT 11"X17" SHEET SIZE)

Appendix B: Post Development Basin Area(s)

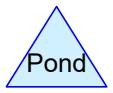
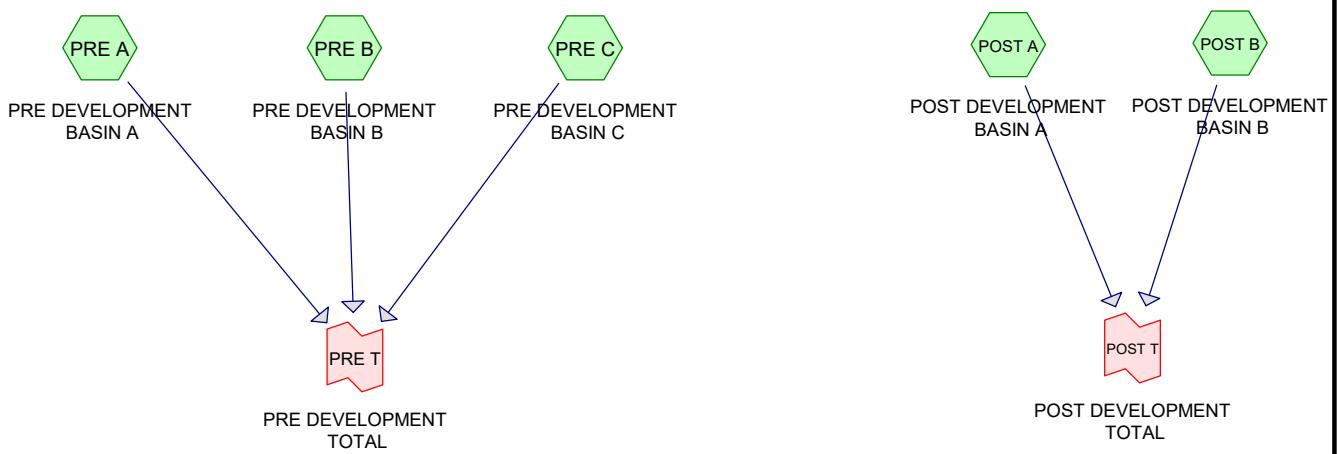


POST-DEVELOPMENT BASIN AREA(S)



SCALE: 1" = 50' (AT 11"X17" SHEET SIZE)

Appendix C: Peak Discharge Calculations



Routing Diagram for 250351400 HydroCAD
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250351400 HydroCAD

Prepared by Excel Engineering

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.306	61	>75% Grass cover, Good, HSG B (POST A, POST B, PRE A, PRE B, PRE C)
1.275	98	Paved parking, HSG B (POST B, PRE B, PRE C)
0.037	98	Roofs, HSG B (POST B)
1.618	91	TOTAL AREA

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 POST A: POST DEVELOPMENT Runoff Area=792 sf 0.00% Impervious Runoff Depth>0.30"
Tc=6.0 min CN=61 Runoff=0.01 cfs 0.000 af

Subcatchment POST B: POST Runoff Area=34,444 sf 71.19% Impervious Runoff Depth>1.60"
Tc=6.0 min CN=87 Runoff=2.32 cfs 0.105 af

Subcatchment PRE A: PRE DEVELOPMENT Runoff Area=1,305 sf 0.00% Impervious Runoff Depth>0.30"
Tc=6.0 min CN=61 Runoff=0.01 cfs 0.001 af

Subcatchment PRE B: PRE Runoff Area=23,670 sf 96.05% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=97 Runoff=2.19 cfs 0.111 af

Subcatchment PRE C: PRE Runoff Area=10,261 sf 96.47% Impervious Runoff Depth>2.46"
Tc=6.0 min CN=97 Runoff=0.95 cfs 0.048 af

Link POST T: POST DEVELOPMENT TOTAL Inflow=2.33 cfs 0.106 af
Primary=2.33 cfs 0.106 af

Link PRE T: PRE DEVELOPMENT TOTAL Inflow=3.15 cfs 0.160 af
Primary=3.15 cfs 0.160 af

Total Runoff Area = 1.618 ac Runoff Volume = 0.266 af Average Runoff Depth = 1.97"
18.90% Pervious = 0.306 ac 81.10% Impervious = 1.312 ac

Summary for Subcatchment POST A: POST DEVELOPMENT BASIN A

Runoff = 0.01 cfs @ 12.00 hrs, Volume= 0.000 af, Depth> 0.30"
 Routed to Link POST T : POST DEVELOPMENT TOTAL

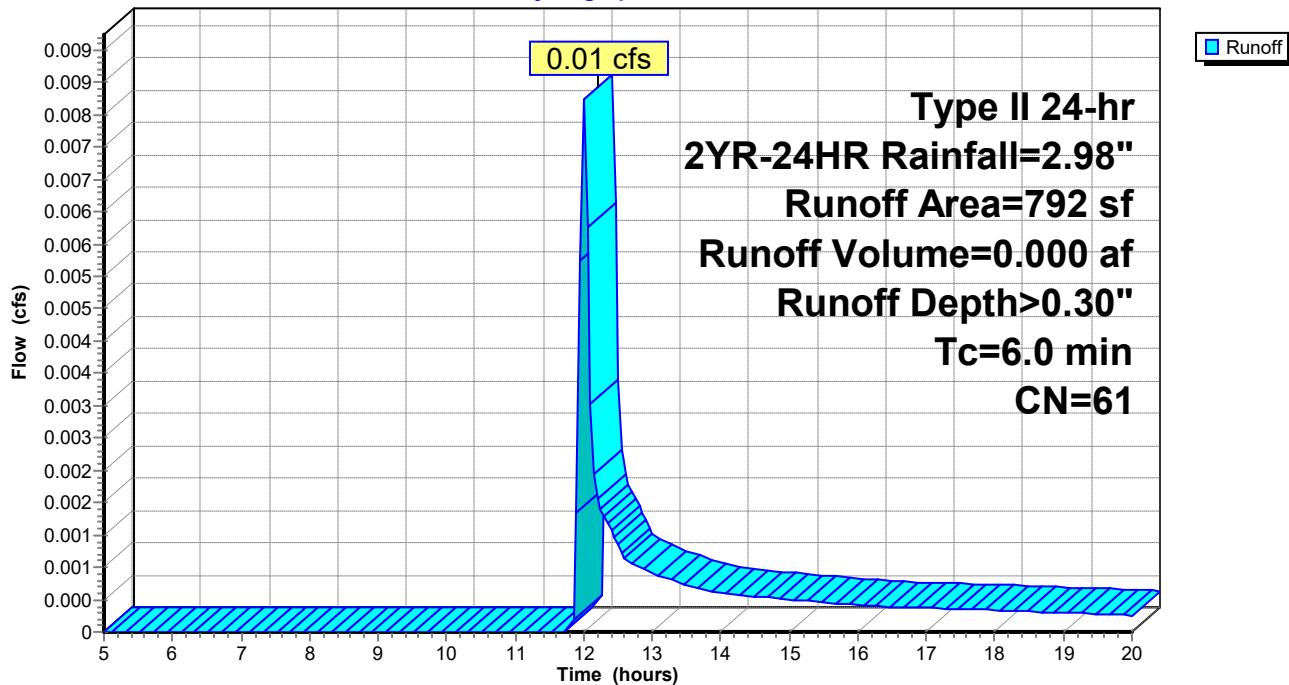
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2YR-24HR Rainfall=2.98"

Area (sf)	CN	Description
792	61	>75% Grass cover, Good, HSG B
792		100.00% Pervious Area

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

Subcatchment POST A: POST DEVELOPMENT BASIN A

Hydrograph



Summary for Subcatchment POST B: POST DEVELOPMENT BASIN B

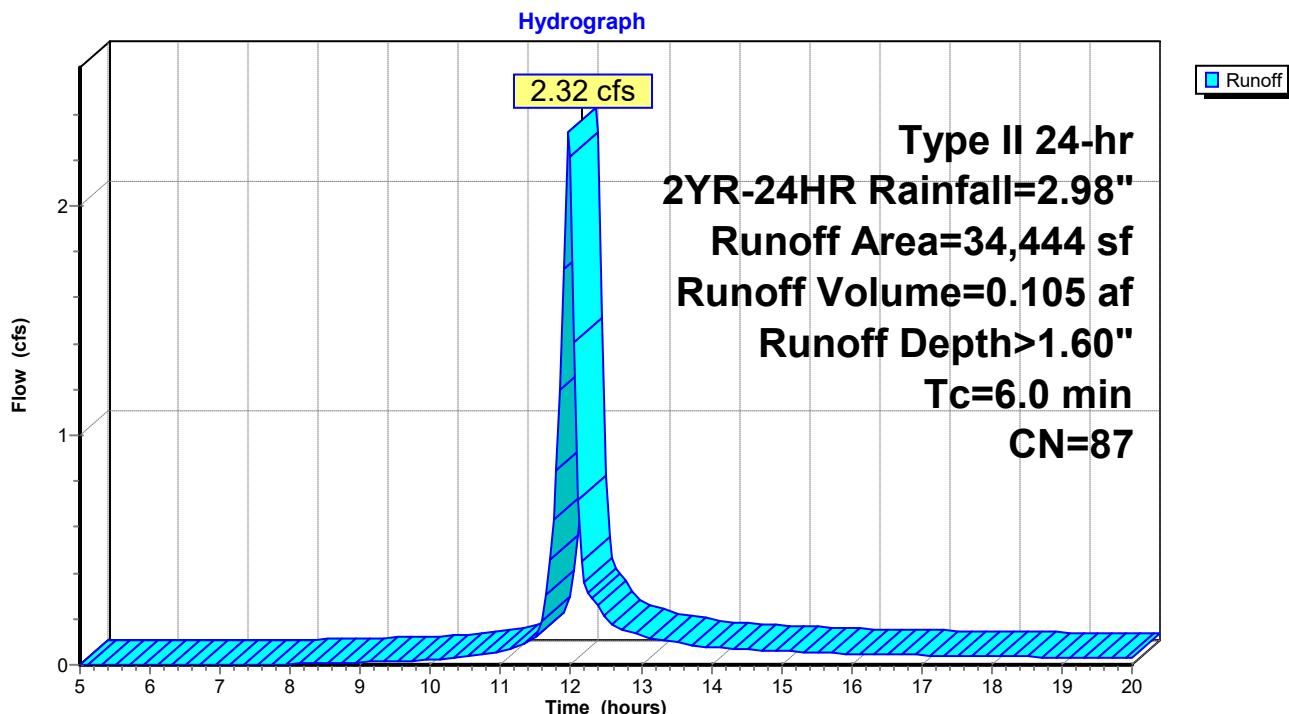
Runoff = 2.32 cfs @ 11.97 hrs, Volume= 0.105 af, Depth> 1.60"
 Routed to Link POST T : POST DEVELOPMENT TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2YR-24HR Rainfall=2.98"

Area (sf)	CN	Description
1,596	98	Roofs, HSG B
22,923	98	Paved parking, HSG B
9,925	61	>75% Grass cover, Good, HSG B
34,444	87	Weighted Average
9,925		28.81% Pervious Area
24,519		71.19% Impervious Area

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

Subcatchment POST B: POST DEVELOPMENT BASIN B



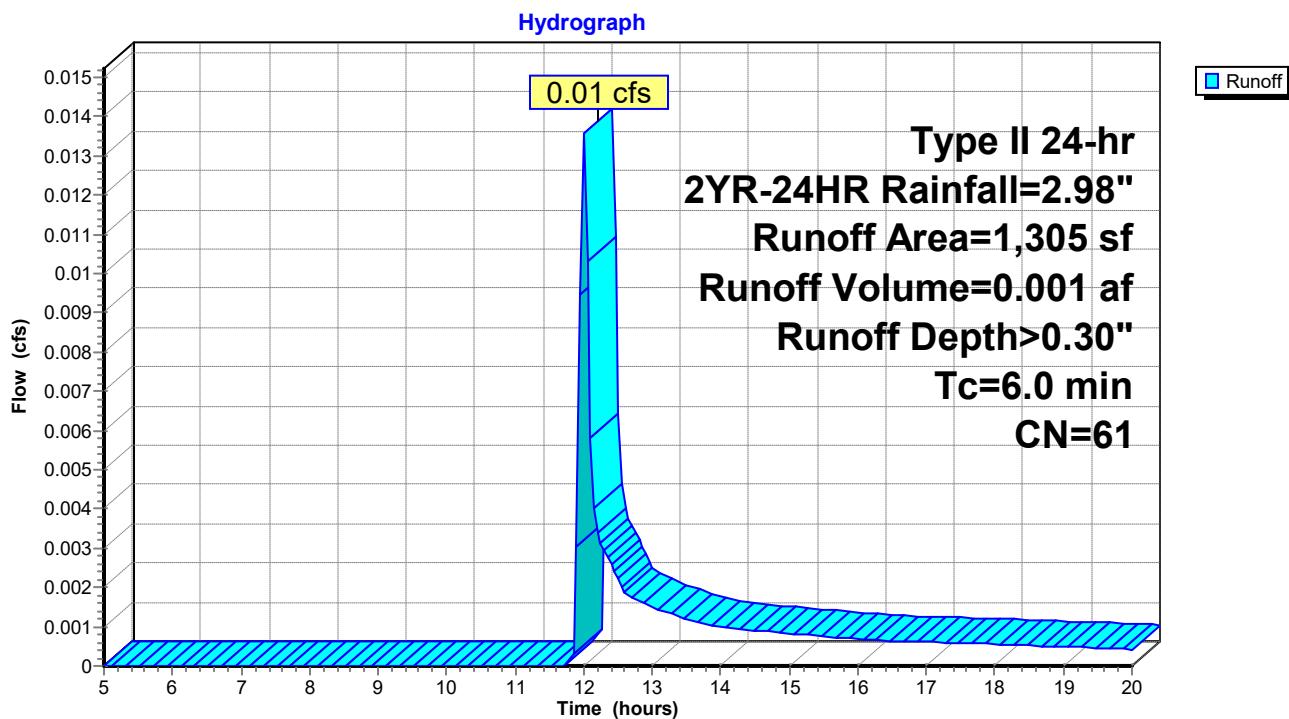
Summary for Subcatchment PRE A: PRE DEVELOPMENT BASIN A

Runoff = 0.01 cfs @ 12.00 hrs, Volume= 0.001 af, Depth> 0.30"
 Routed to Link PRE T : PRE DEVELOPMENT TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2YR-24HR Rainfall=2.98"

Area (sf)	CN	Description			
1,305	61	>75% Grass cover, Good, HSG B			
1,305		100.00% Pervious Area			
<hr/>					
Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment PRE A: PRE DEVELOPMENT BASIN A



Summary for Subcatchment PRE B: PRE DEVELOPMENT BASIN B

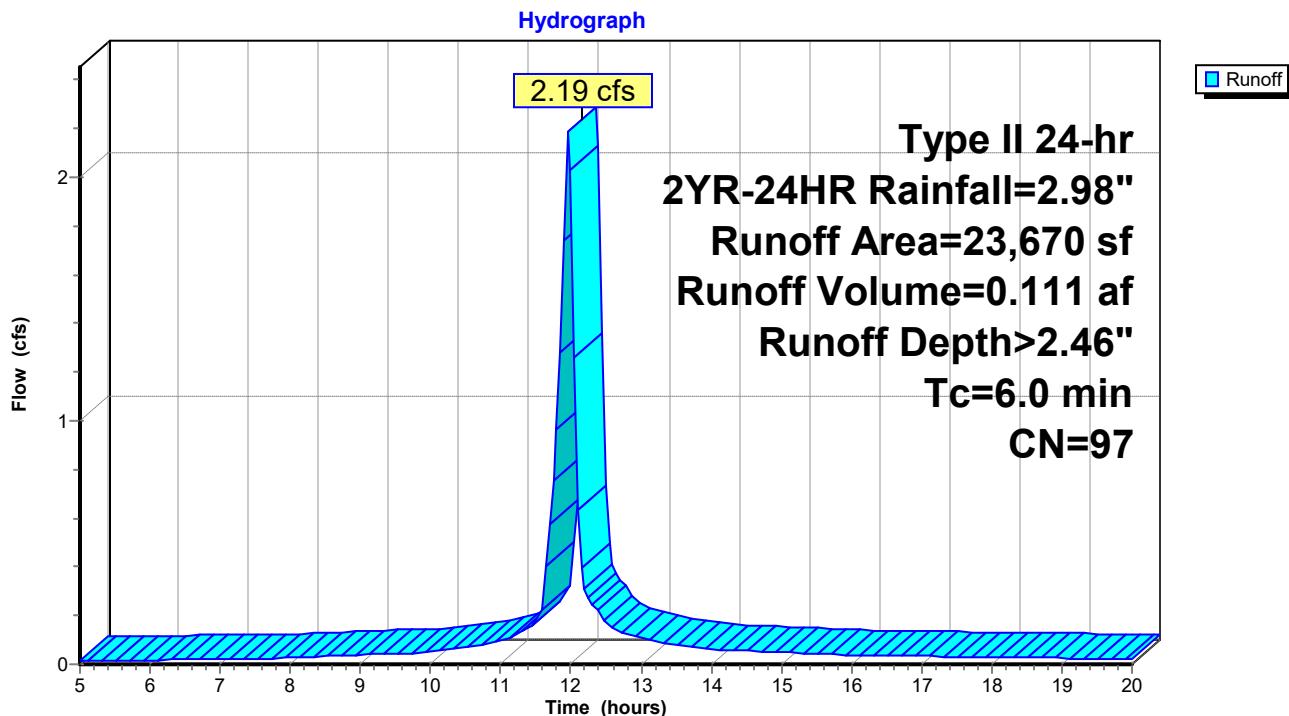
Runoff = 2.19 cfs @ 11.96 hrs, Volume= 0.111 af, Depth> 2.46"
 Routed to Link PRE T : PRE DEVELOPMENT TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2YR-24HR Rainfall=2.98"

Area (sf)	CN	Description
22,734	98	Paved parking, HSG B
936	61	>75% Grass cover, Good, HSG B
23,670	97	Weighted Average
936		3.95% Pervious Area
22,734		96.05% Impervious Area

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

Subcatchment PRE B: PRE DEVELOPMENT BASIN B



Summary for Subcatchment PRE C: PRE DEVELOPMENT BASIN C

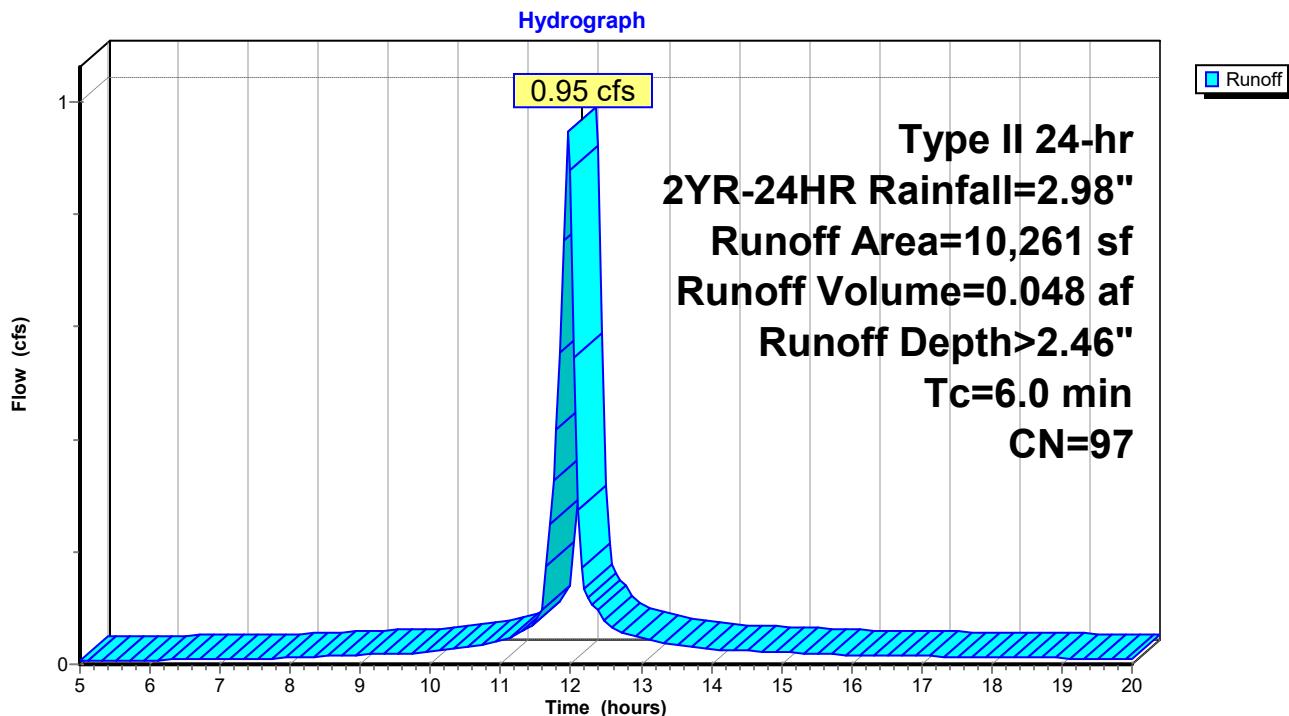
Runoff = 0.95 cfs @ 11.96 hrs, Volume= 0.048 af, Depth> 2.46"
 Routed to Link PRE T : PRE DEVELOPMENT TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2YR-24HR Rainfall=2.98"

Area (sf)	CN	Description
9,899	98	Paved parking, HSG B
362	61	>75% Grass cover, Good, HSG B
10,261	97	Weighted Average
362		3.53% Pervious Area
9,899		96.47% Impervious Area

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

Subcatchment PRE C: PRE DEVELOPMENT BASIN C



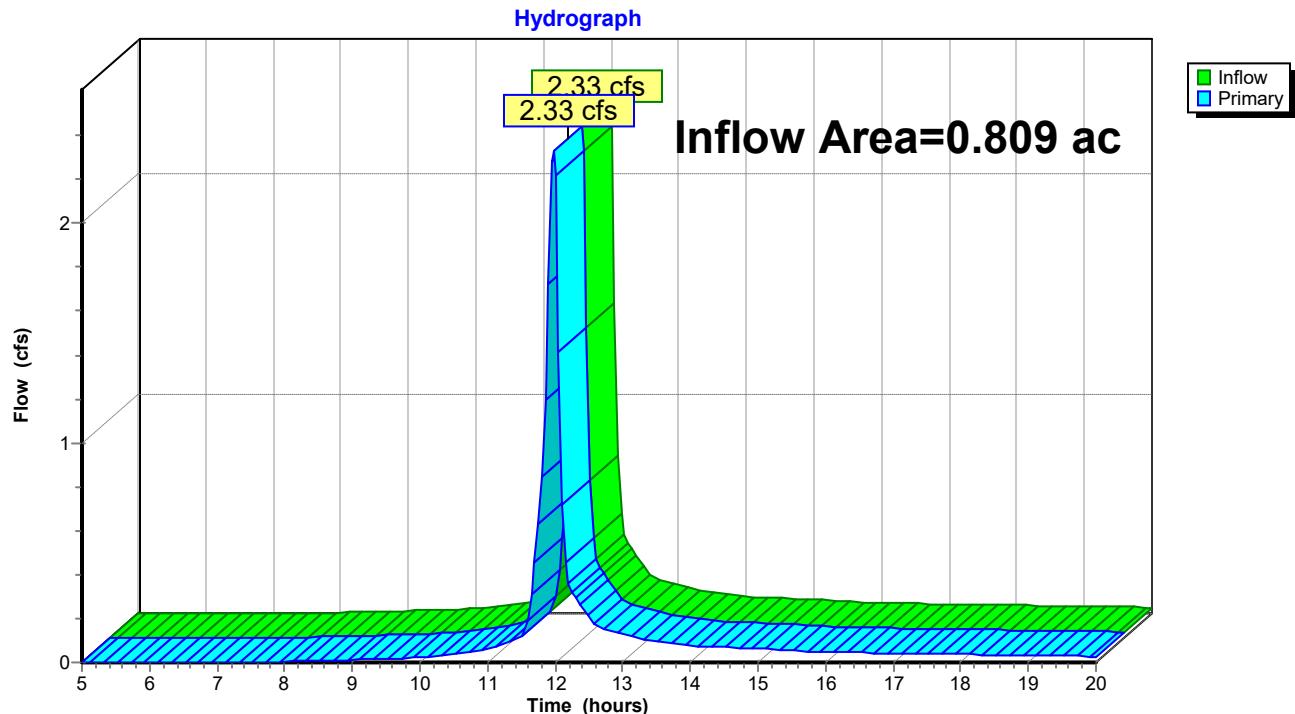
Summary for Link POST T: POST DEVELOPMENT TOTAL

Inflow Area = 0.809 ac, 69.59% Impervious, Inflow Depth > 1.57" for 2YR-24HR event

Inflow = 2.33 cfs @ 11.97 hrs, Volume= 0.106 af

Primary = 2.33 cfs @ 11.97 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POST T: POST DEVELOPMENT TOTAL

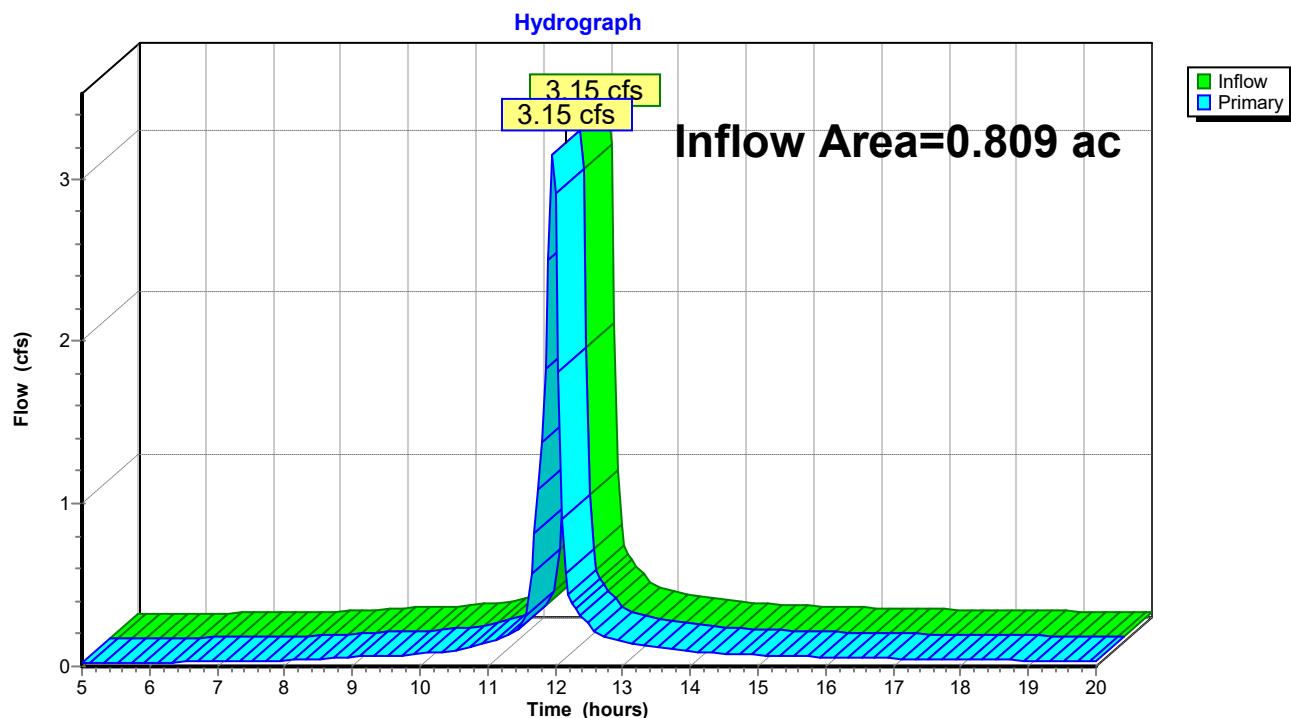
Summary for Link PRE T: PRE DEVELOPMENT TOTAL

Inflow Area = 0.809 ac, 92.61% Impervious, Inflow Depth > 2.38" for 2YR-24HR event

Inflow = 3.15 cfs @ 11.96 hrs, Volume= 0.160 af

Primary = 3.15 cfs @ 11.96 hrs, Volume= 0.160 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link PRE T: PRE DEVELOPMENT TOTAL

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 POST A: POST DEVELOPMENT Runoff Area=792 sf 0.00% Impervious Runoff Depth>0.90"
Tc=6.0 min CN=61 Runoff=0.03 cfs 0.001 af

Subcatchment POST B: POST Runoff Area=34,444 sf 71.19% Impervious Runoff Depth>2.80"
Tc=6.0 min CN=87 Runoff=3.95 cfs 0.184 af

Subcatchment PRE A: PRE DEVELOPMENT Runoff Area=1,305 sf 0.00% Impervious Runoff Depth>0.90"
Tc=6.0 min CN=61 Runoff=0.05 cfs 0.002 af

Subcatchment PRE B: PRE Runoff Area=23,670 sf 96.05% Impervious Runoff Depth>3.74"
Tc=6.0 min CN=97 Runoff=3.27 cfs 0.170 af

Subcatchment PRE C: PRE Runoff Area=10,261 sf 96.47% Impervious Runoff Depth>3.74"
Tc=6.0 min CN=97 Runoff=1.42 cfs 0.073 af

Link POST T: POST DEVELOPMENT TOTAL Inflow=3.98 cfs 0.186 af
Primary=3.98 cfs 0.186 af

Link PRE T: PRE DEVELOPMENT TOTAL Inflow=4.74 cfs 0.245 af
Primary=4.74 cfs 0.245 af

Total Runoff Area = 1.618 ac Runoff Volume = 0.431 af Average Runoff Depth = 3.20"
18.90% Pervious = 0.306 ac 81.10% Impervious = 1.312 ac

Summary for Subcatchment POST A: POST DEVELOPMENT BASIN A

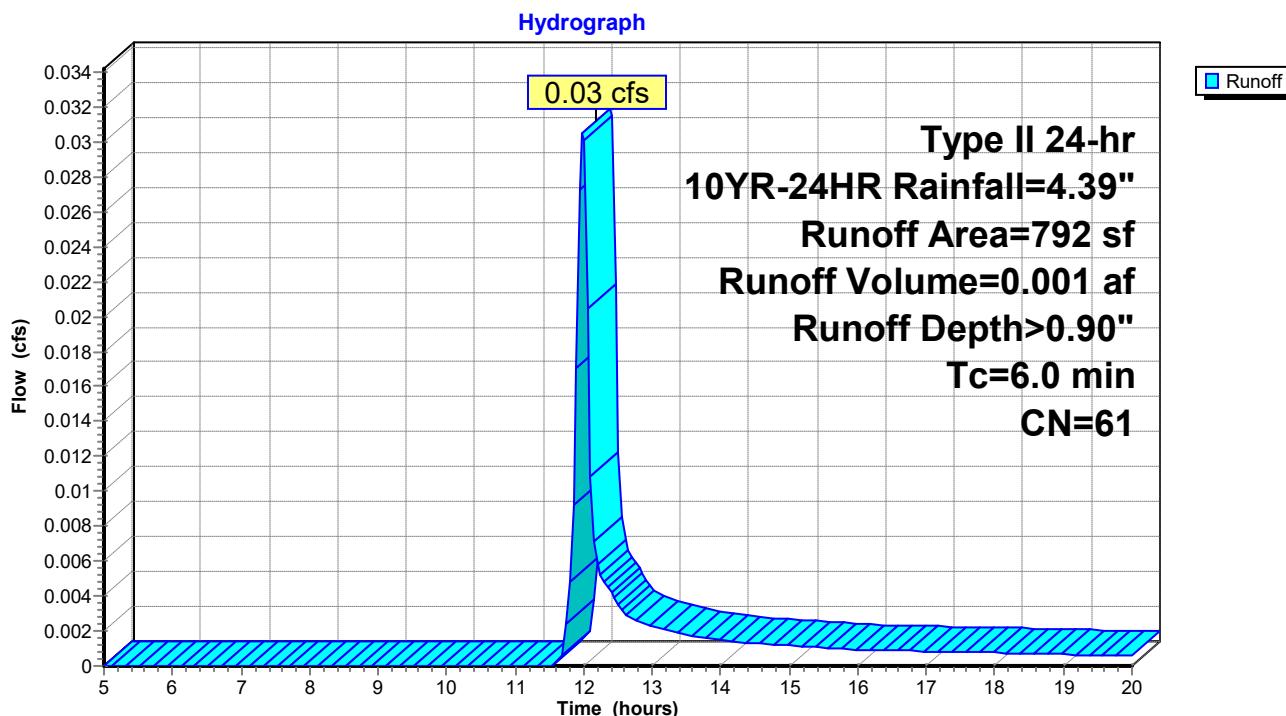
Runoff = 0.03 cfs @ 11.99 hrs, Volume= 0.001 af, Depth> 0.90"
Routed to Link POST T : POST DEVELOPMENT TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10YR-24HR Rainfall=4.39"

Area (sf)	CN	Description
792	61	>75% Grass cover, Good, HSG B
700	100	100-90% Deciduous, A

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

Subcatchment POST A: POST DEVELOPMENT BASIN A



Summary for Subcatchment POST B: POST DEVELOPMENT BASIN B

Runoff = 3.95 cfs @ 11.97 hrs, Volume= 0.184 af, Depth> 2.80"
 Routed to Link POST T : POST DEVELOPMENT TOTAL

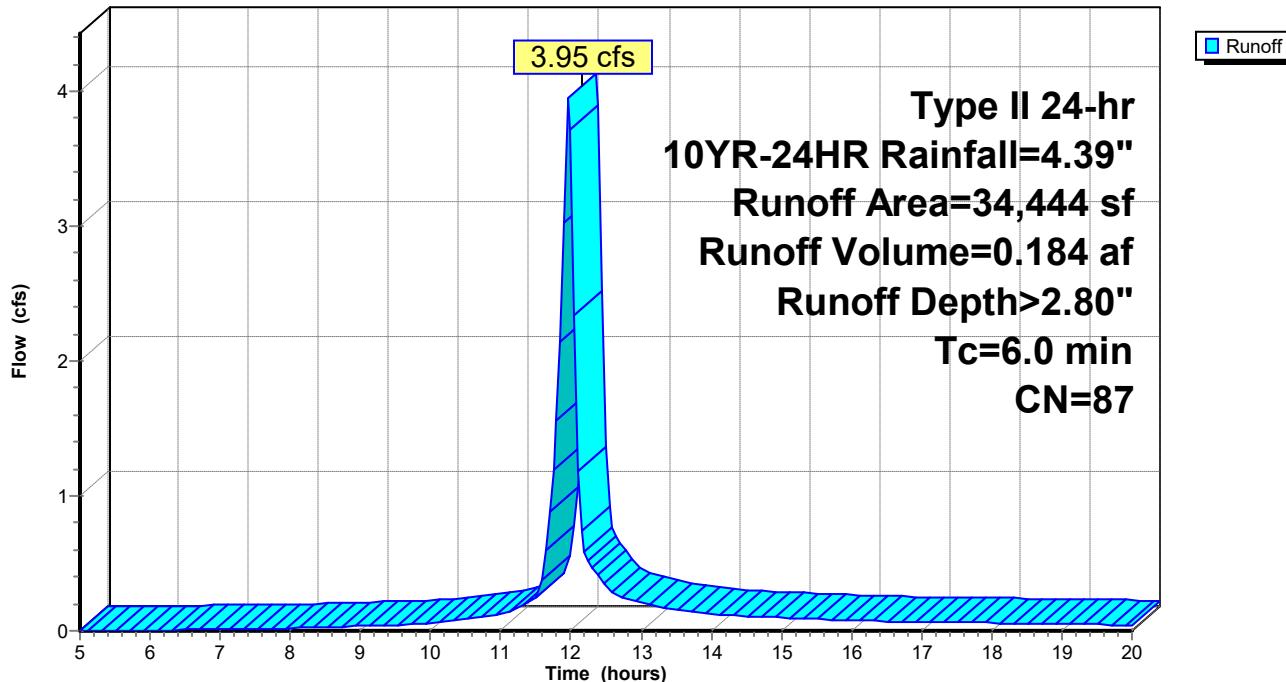
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10YR-24HR Rainfall=4.39"

Area (sf)	CN	Description
1,596	98	Roofs, HSG B
22,923	98	Paved parking, HSG B
9,925	61	>75% Grass cover, Good, HSG B
34,444	87	Weighted Average
9,925		28.81% Pervious Area
24,519		71.19% Impervious Area

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

Subcatchment POST B: POST DEVELOPMENT BASIN B

Hydrograph



Summary for Subcatchment PRE A: PRE DEVELOPMENT BASIN A

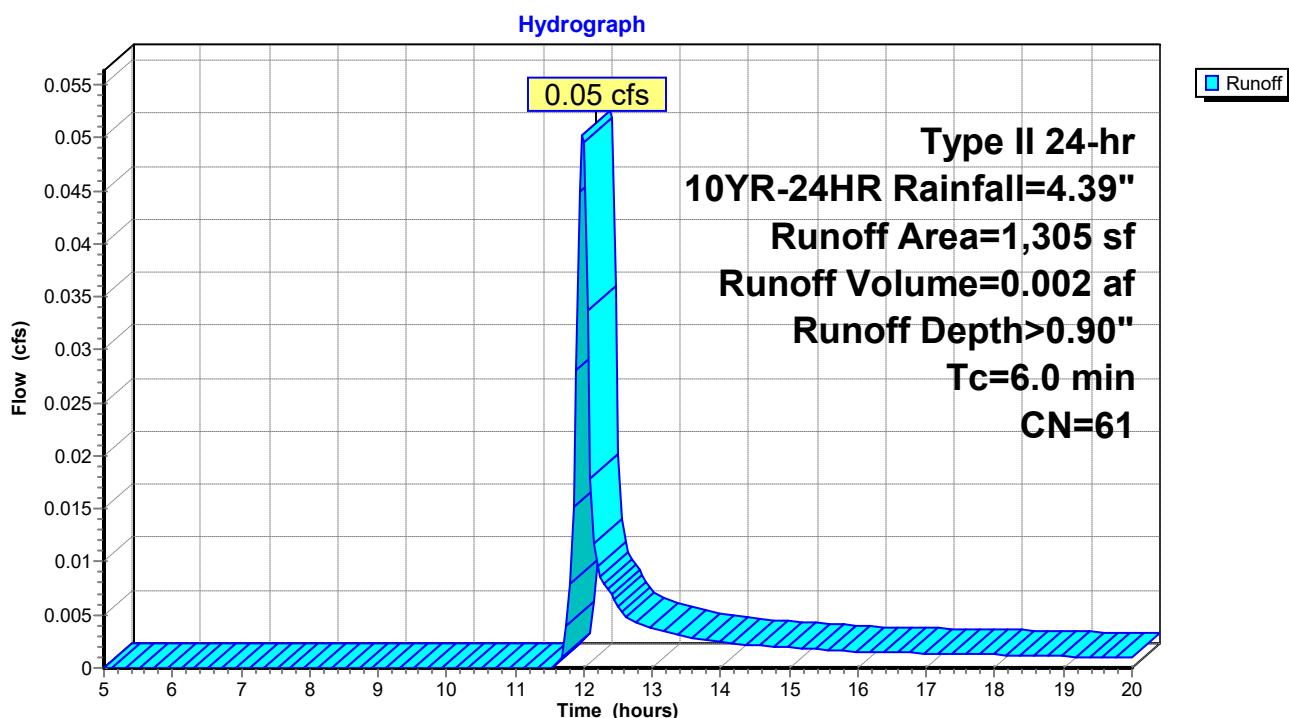
Runoff = 0.05 cfs @ 11.99 hrs, Volume= 0.002 af, Depth> 0.90"
 Routed to Link PRE T : PRE DEVELOPMENT TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10YR-24HR Rainfall=4.39"

Area (sf)	CN	Description
1,305	61	>75% Grass cover, Good, HSG B
1,305		100.00% Pervious Area

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

Subcatchment PRE A: PRE DEVELOPMENT BASIN A



Summary for Subcatchment PRE B: PRE DEVELOPMENT BASIN B

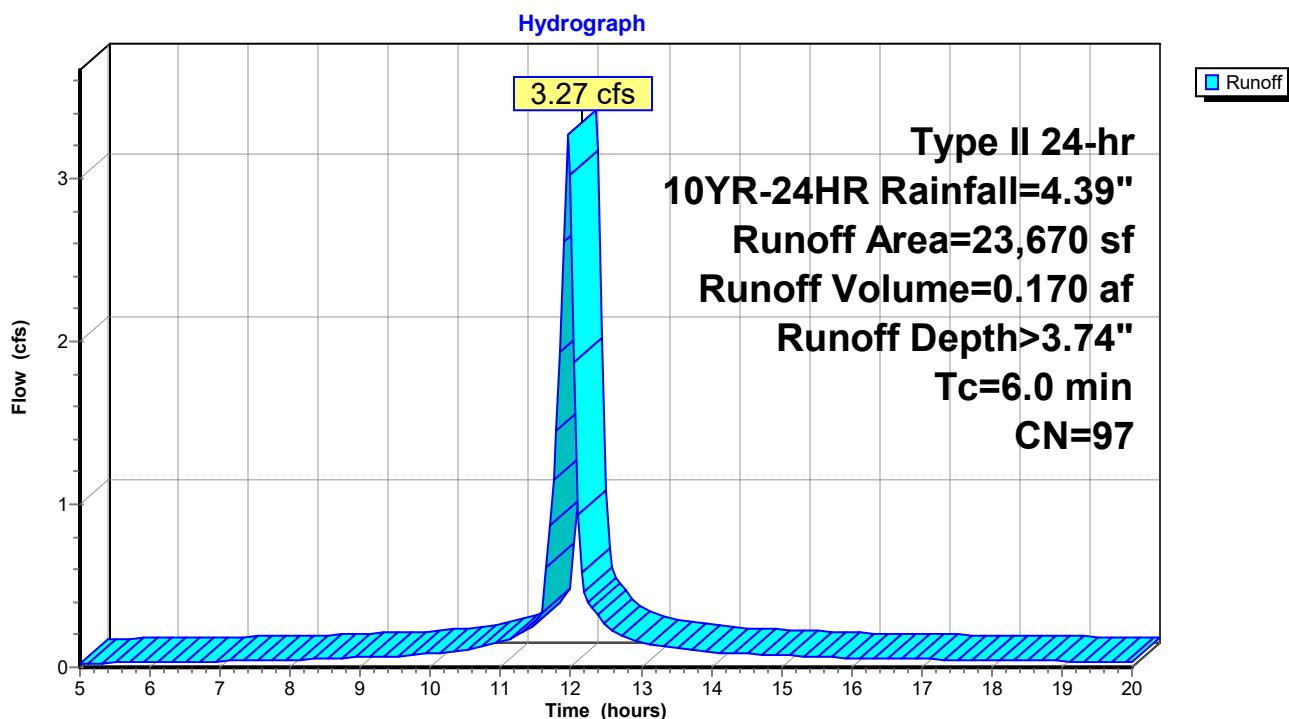
Runoff = 3.27 cfs @ 11.96 hrs, Volume= 0.170 af, Depth> 3.74"
 Routed to Link PRE T : PRE DEVELOPMENT TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10YR-24HR Rainfall=4.39"

Area (sf)	CN	Description
22,734	98	Paved parking, HSG B
936	61	>75% Grass cover, Good, HSG B
23,670	97	Weighted Average
936		3.95% Pervious Area
22,734		96.05% Impervious Area

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

Subcatchment PRE B: PRE DEVELOPMENT BASIN B



Summary for Subcatchment PRE C: PRE DEVELOPMENT BASIN C

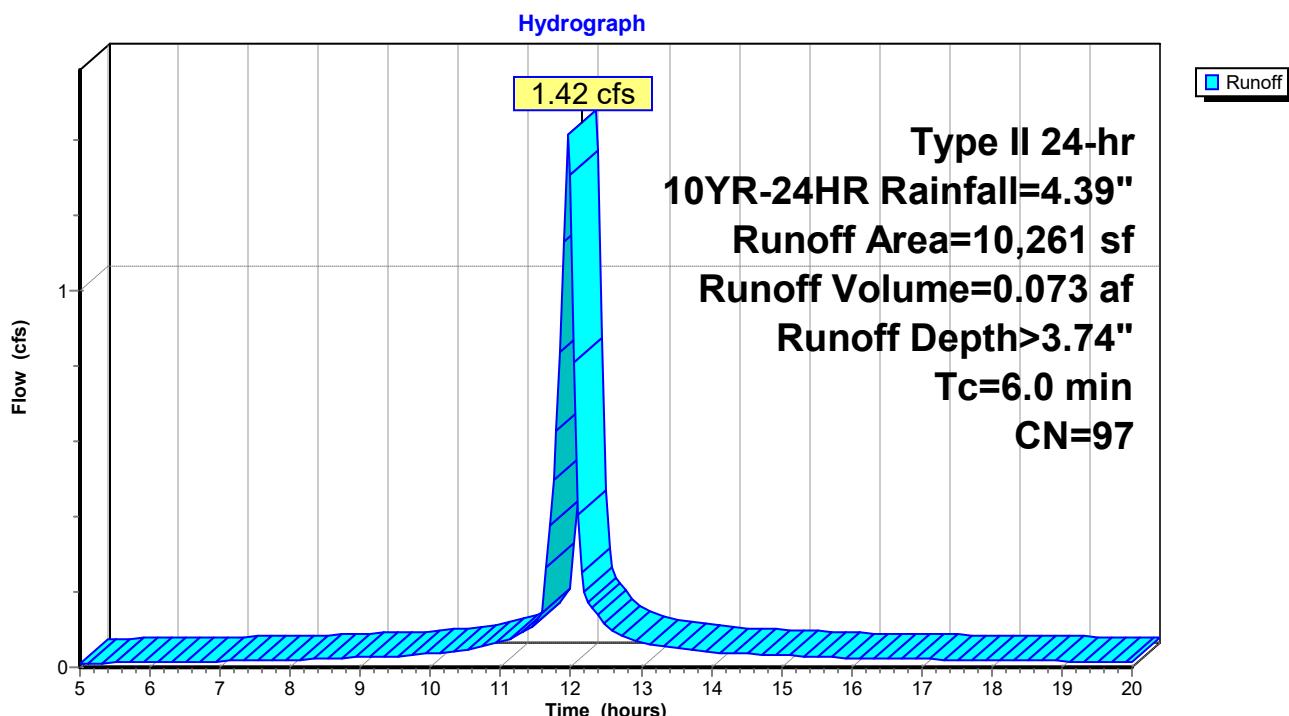
Runoff = 1.42 cfs @ 11.96 hrs, Volume= 0.073 af, Depth> 3.74"
 Routed to Link PRE T : PRE DEVELOPMENT TOTAL

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10YR-24HR Rainfall=4.39"

Area (sf)	CN	Description
9,899	98	Paved parking, HSG B
362	61	>75% Grass cover, Good, HSG B
10,261	97	Weighted Average
362		3.53% Pervious Area
9,899		96.47% Impervious Area

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

Subcatchment PRE C: PRE DEVELOPMENT BASIN C



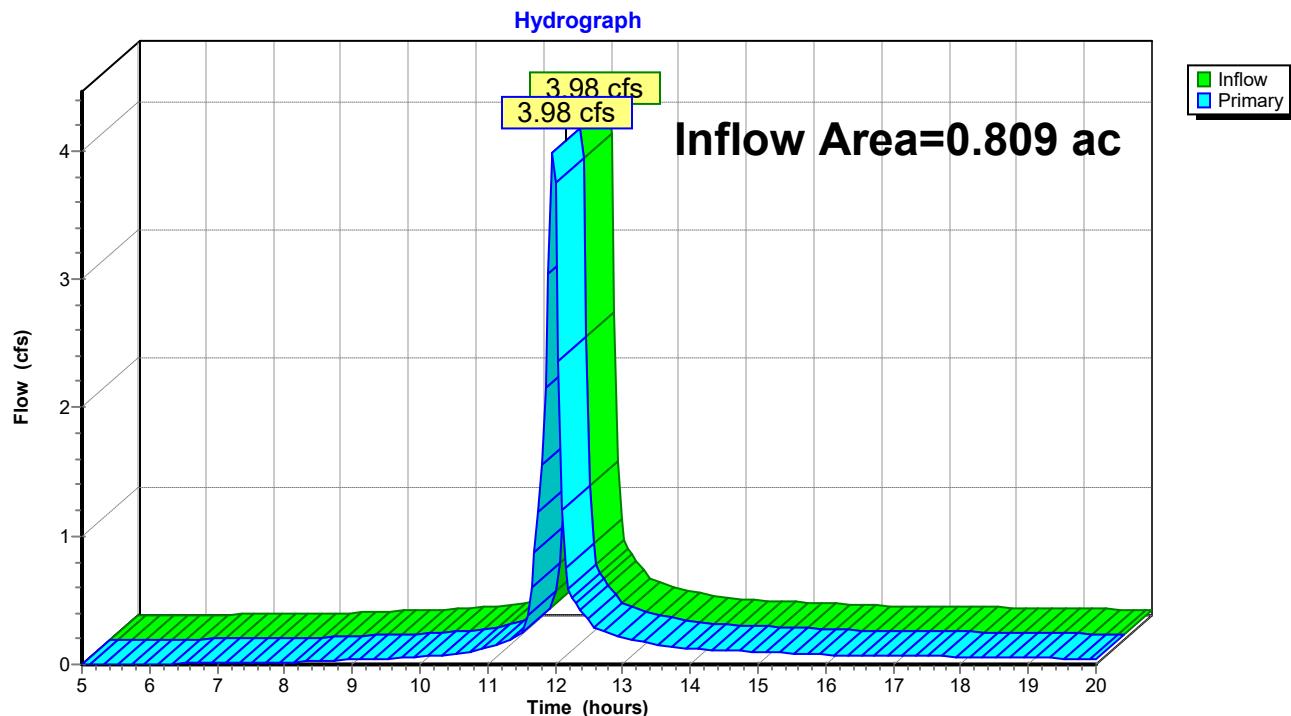
Summary for Link POST T: POST DEVELOPMENT TOTAL

Inflow Area = 0.809 ac, 69.59% Impervious, Inflow Depth > 2.76" for 10YR-24HR event

Inflow = 3.98 cfs @ 11.97 hrs, Volume= 0.186 af

Primary = 3.98 cfs @ 11.97 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link POST T: POST DEVELOPMENT TOTAL

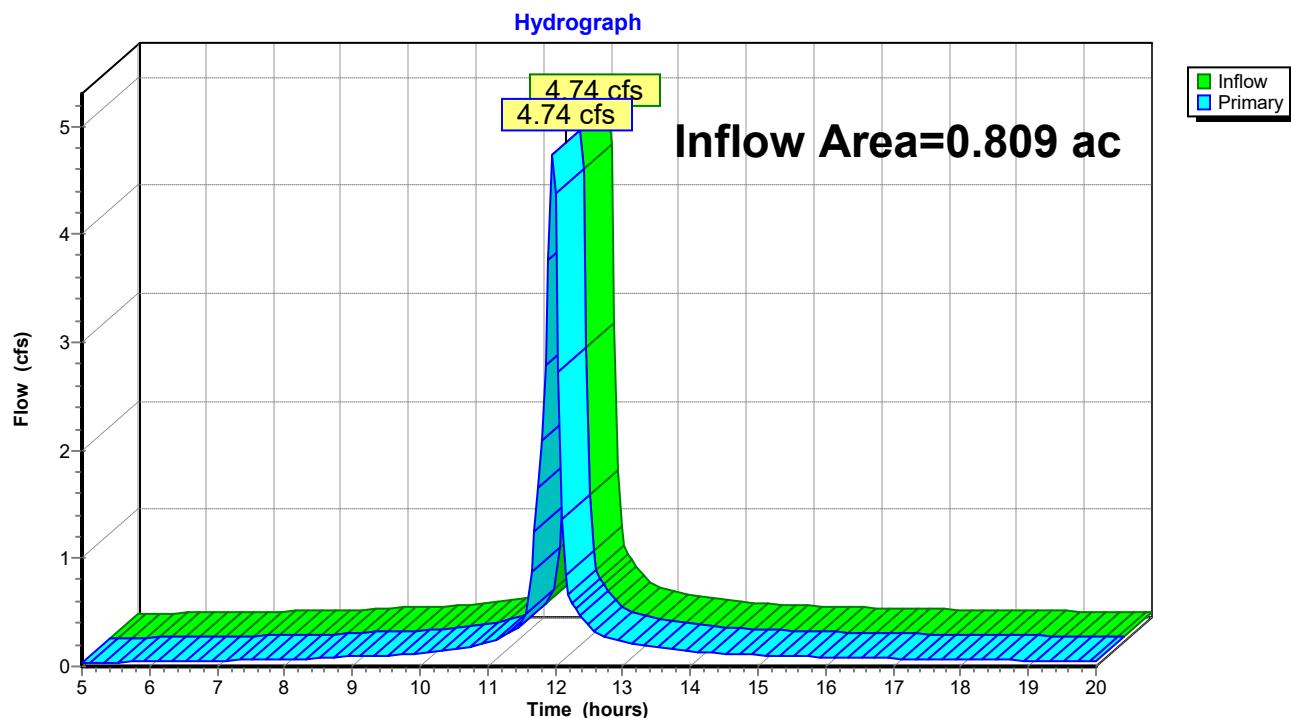
Summary for Link PRE T: PRE DEVELOPMENT TOTAL

Inflow Area = 0.809 ac, 92.61% Impervious, Inflow Depth > 3.64" for 10YR-24HR event

Inflow = 4.74 cfs @ 11.96 hrs, Volume= 0.245 af

Primary = 4.74 cfs @ 11.96 hrs, Volume= 0.245 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link PRE T: PRE DEVELOPMENT TOTAL

Appendix D: Geotechnical Report & Stormwater Soil Evaluation

(To be provided once completed)

Appendix E: Storm Sewer Basin Map

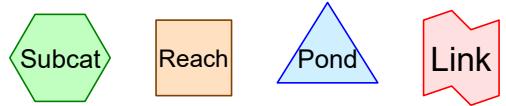


STORM SEWER BASIN MAP

SCALE: 1" = 50' (AT 11"X17" SHEET SIZE)



Appendix F: Storm Sewer TR-55 Calculations



Routing Diagram for 250351400 HydroCAD
Prepared by Excel Engineering, Printed 12/5/2025
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250351400 HydroCAD

Prepared by Excel Engineering

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Printed 12/5/2025

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.209	61	>75% Grass cover, Good, HSG B (SSB, SSC, SSD, SSE, SSF)
0.614	98	Paved parking, HSG B (SSC, SSD, SSE, SSF)
0.037	98	Roofs, HSG B (SSA)
0.860	89	TOTAL AREA

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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 SSA: STORM SEWER Runoff Area=1,596 sf 100.00% Impervious Runoff Depth>6.55"
Tc=6.0 min CN=98 Runoff=0.38 cfs 0.020 af

Subcatchment SSB: STORM SEWER BASIN Runoff Area=2,535 sf 0.00% Impervious Runoff Depth>2.75"
Tc=6.0 min CN=61 Runoff=0.31 cfs 0.013 af

Subcatchment SSC: STORM SEWER BASIN Runoff Area=4,858 sf 77.27% Impervious Runoff Depth>5.85"
Tc=6.0 min CN=90 Runoff=1.09 cfs 0.054 af

Subcatchment SSD: STORM SEWER Runoff Area=10,478 sf 91.21% Impervious Runoff Depth>6.33"
Tc=6.0 min CN=95 Runoff=2.45 cfs 0.127 af

Subcatchment SSE: STORM SEWER BASIN Runoff Area=6,949 sf 45.88% Impervious Runoff Depth>4.54"
Tc=6.0 min CN=78 Runoff=1.30 cfs 0.060 af

Subcatchment SSF: STORM SEWER Runoff Area=11,030 sf 93.09% Impervious Runoff Depth>6.33"
Tc=6.0 min CN=95 Runoff=2.58 cfs 0.134 af

Total Runoff Area = 0.860 ac Runoff Volume = 0.409 af Average Runoff Depth = 5.70"
24.26% Pervious = 0.209 ac 75.74% Impervious = 0.651 ac

Summary for Subcatchment SSA: STORM SEWER BASIN A

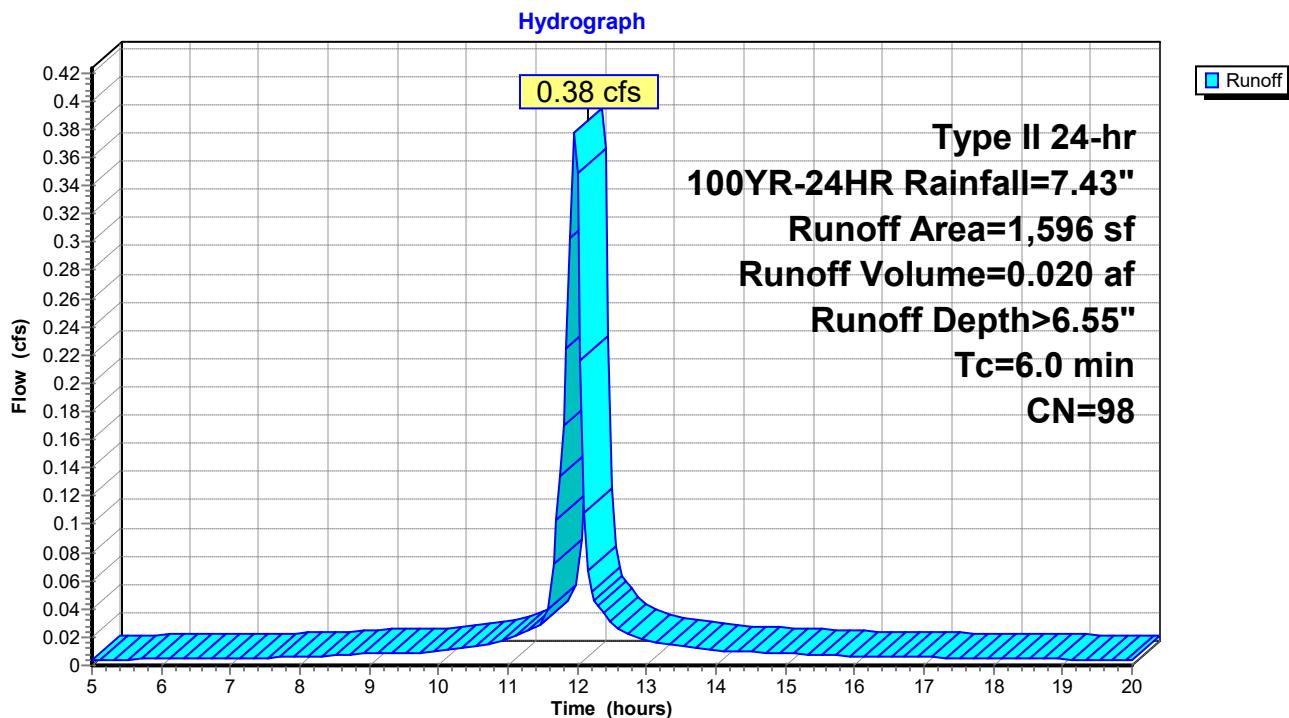
Runoff = 0.38 cfs @ 11.96 hrs, Volume= 0.020 af, Depth> 6.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100YR-24HR Rainfall=7.43"

Area (sf)	CN	Description
1,596	98	Roofs, HSG B
1,596		100.00% Impervious Area

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

Subcatchment SSA: STORM SEWER BASIN A



Summary for Subcatchment SSB: STORM SEWER BASIN B

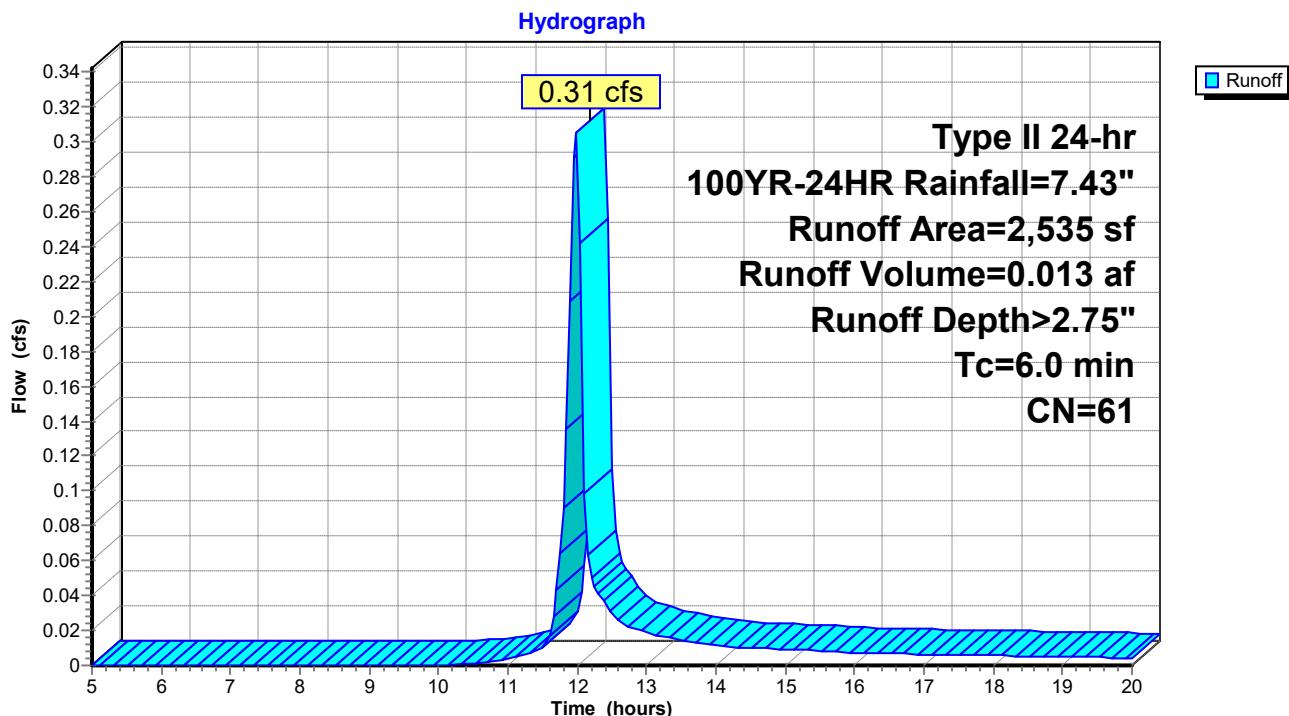
Runoff = 0.31 cfs @ 11.98 hrs, Volume= 0.013 af, Depth> 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR-24HR Rainfall=7.43"

Area (sf)	CN	Description
2,535	61	>75% Grass cover, Good, HSG B
2,535		100.00% Pervious Area

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

Subcatchment SSB: STORM SEWER BASIN B



Summary for Subcatchment SSC: STORM SEWER BASIN C

Runoff = 1.09 cfs @ 11.96 hrs, Volume= 0.054 af, Depth> 5.85"

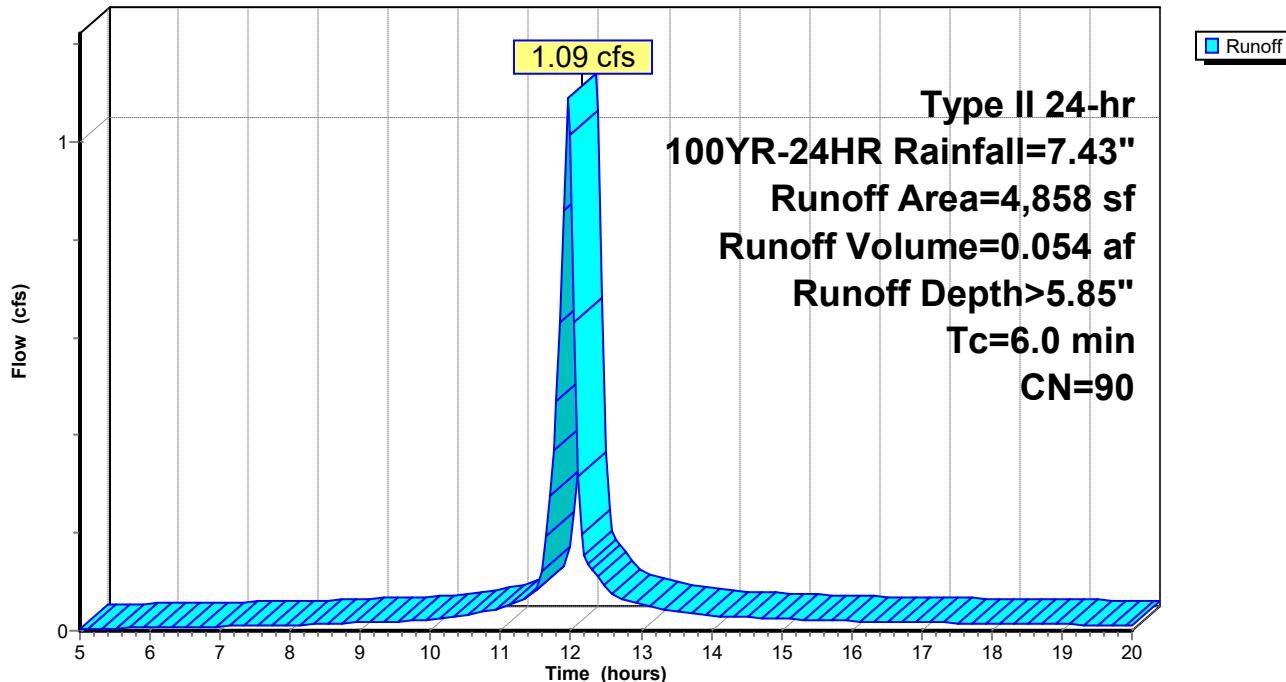
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR-24HR Rainfall=7.43"

Area (sf)	CN	Description
3,754	98	Paved parking, HSG B
1,104	61	>75% Grass cover, Good, HSG B
4,858	90	Weighted Average
1,104		22.73% Pervious Area
3,754		77.27% Impervious Area

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

Subcatchment SSC: STORM SEWER BASIN C

Hydrograph



Summary for Subcatchment SSD: STORM SEWER BASIN D

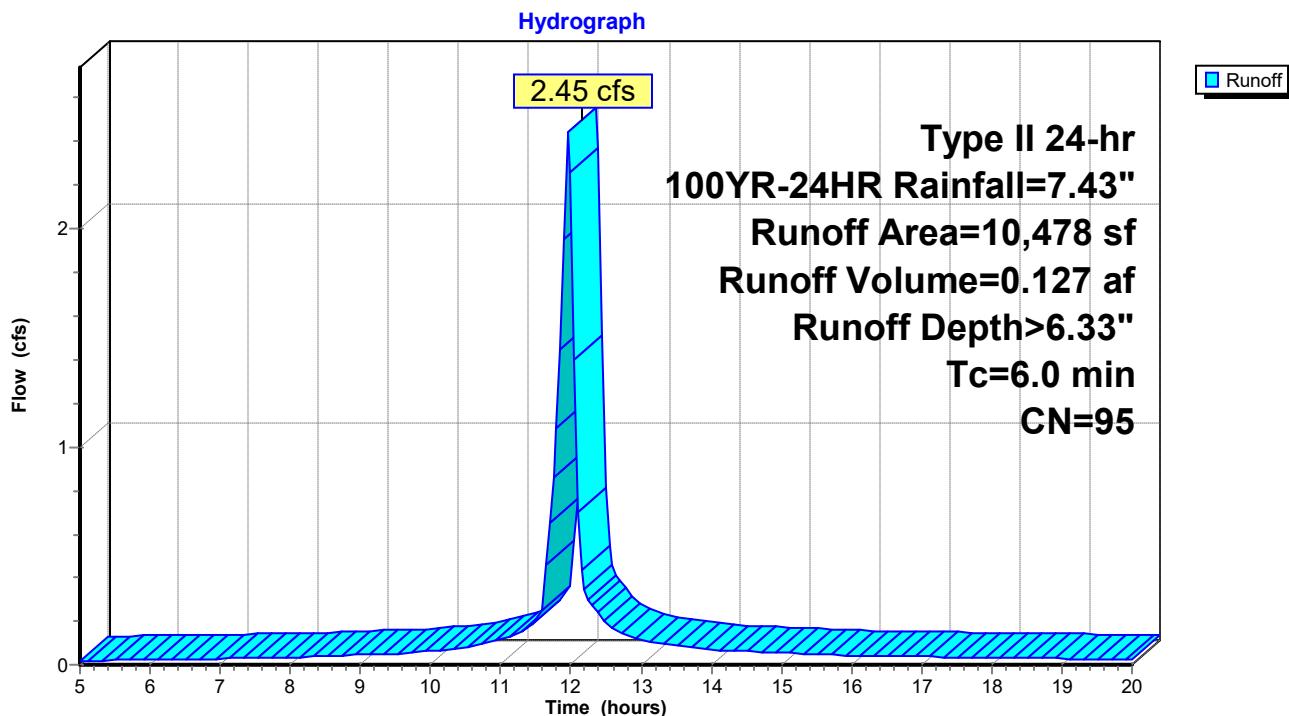
Runoff = 2.45 cfs @ 11.96 hrs, Volume= 0.127 af, Depth> 6.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR-24HR Rainfall=7.43"

Area (sf)	CN	Description
9,557	98	Paved parking, HSG B
921	61	>75% Grass cover, Good, HSG B
10,478	95	Weighted Average
921		8.79% Pervious Area
9,557		91.21% Impervious Area

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

Subcatchment SSD: STORM SEWER BASIN D



Summary for Subcatchment SSE: STORM SEWER BASIN E

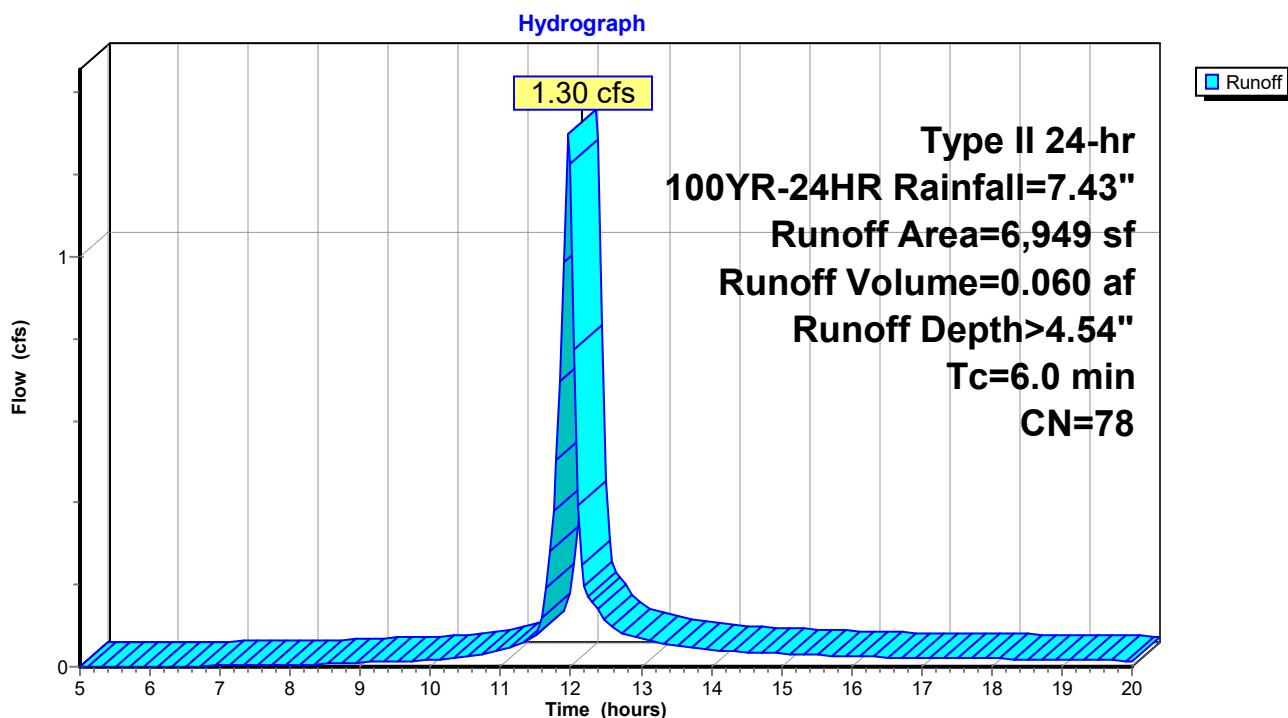
Runoff = 1.30 cfs @ 11.97 hrs, Volume= 0.060 af, Depth> 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR-24HR Rainfall=7.43"

Area (sf)	CN	Description
3,188	98	Paved parking, HSG B
3,761	61	>75% Grass cover, Good, HSG B
6,949	78	Weighted Average
3,761		54.12% Pervious Area
3,188		45.88% Impervious Area

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

Subcatchment SSE: STORM SEWER BASIN E



Summary for Subcatchment SSF: STORM SEWER BASIN F

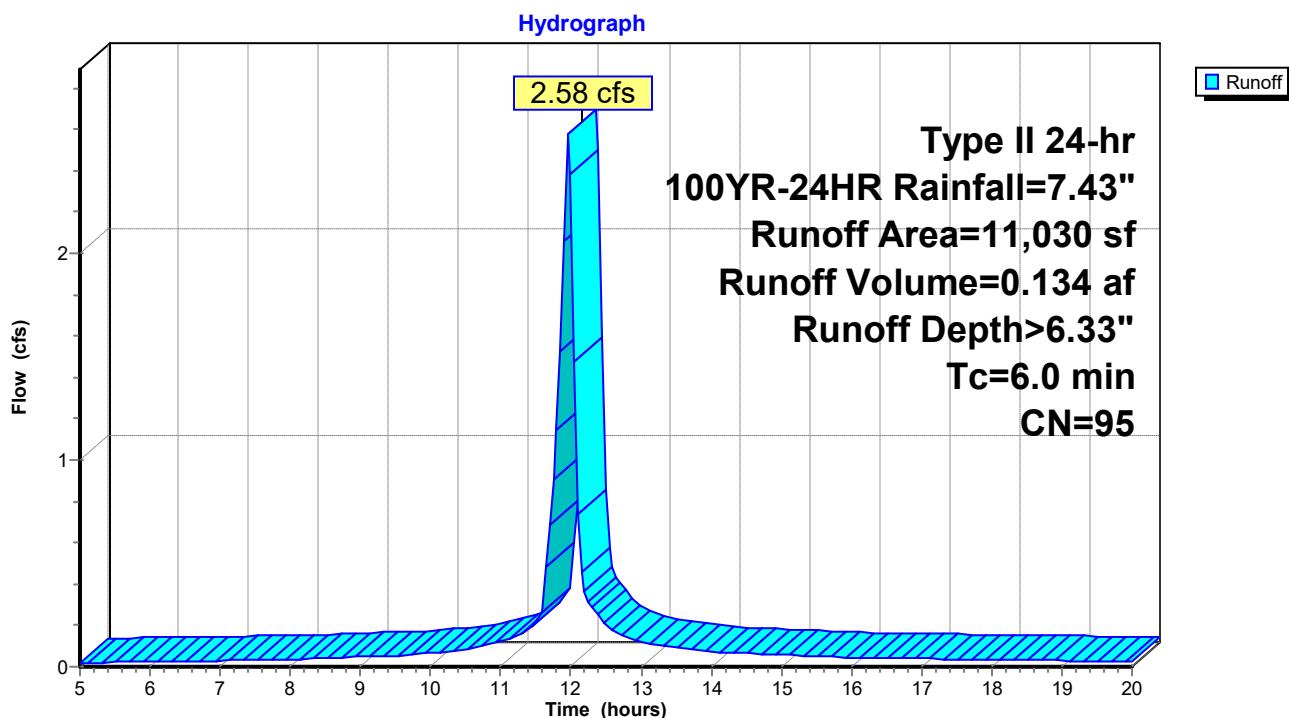
Runoff = 2.58 cfs @ 11.96 hrs, Volume= 0.134 af, Depth> 6.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100YR-24HR Rainfall=7.43"

Area (sf)	CN	Description
10,268	98	Paved parking, HSG B
762	61	>75% Grass cover, Good, HSG B
11,030	95	Weighted Average
762		6.91% Pervious Area
10,268		93.09% Impervious Area

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

Subcatchment SSF: STORM SEWER BASIN F



Appendix G: Storm Sewer Manning's Spreadsheet

Excel Engineering Project No.

250351400

Project Name 7 Brew La Crosse

Pipe Data					Pipe Capacity (100-yr, 24-hr)				
Pipe ID	Diameter (FT)	Pipe Qty.	Slope (FT/FT)	Manning's n	Basin ID	Total Flow (cfs)	Total Flow (gpm)	Full Flow Capacity (cfs)	Full Flow Capacity (gpm)
A	0.67	1	0.010	0.012	A	0.10	45	1.33	597
B	0.67	1	0.010	0.012	A	0.10	45	1.33	597
C	0.67	1	0.010	0.012	A,B	0.50	224	1.33	597
D	0.67	1	0.015	0.012	A,B,C	1.59	714	1.63	731
E	1	1	0.015	0.012	A,B,C,D	4.04	1,813	4.74	2,127
F	0.67	1	0.010	0.012	A	0.19	85	1.33	597
G	0.67	1	0.015	0.012	A,E	1.49	669	1.63	731
H	1.5	1	0.010	0.012	A,B,C,D,E,F	8.11	3,640	11.41	5,121

Full Flow Capacity based off Manning's Equation

$$Q = \frac{1.49}{n} R^{2/3} S^{1/2} a$$

Where:

Q = Full Flow Capacity of Pipe (cfs)
 n = manning's roughness coefficient
 R = hydraulic radius (ft) (D/4)
 s = hydraulic gradient, slope (ft/ft)
 a = flow area (sq. ft.)

Typical Manning's n

HDPE	0.012
PVC	0.012
Concrete	0.013
CMP	0.024

*Total Flow calculated via TR-55 hydrologic calculations. Reference Storm Pipe Basin Map & TR-55 Calculations

Appendix H: SLAMM Input/ Output Information

Data file name: \\job-files\\2025 Job Files\\250351400 PSP - 7 Brew - La Crosse WI\\250351404 Civil\\storm water report and calculations\\Calcs\\250351400 SLAMM Input.ran

WinSLAMM Version 10.5.0

Rain file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WisReg - Minneapolis MN 1959.ran

Particulate Solids Concentration file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_SL06 Dec06.rsvx

Residential Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\Freeway Dec06.std

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

Pollutant Relative Concentration file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_GEO03.ppdx

Source Area PSD and Peak to Average Flow Ratio File: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter 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: 11/04

End of Winter Season: 03/13

Date: 12-05-2025

Time: 13:16:20

Site information:

LU# 1 - Commercial: Commercial 1 Total area (ac): 0.020

45 - Large Landscaped Areas 1: 0.020 ac. Normal Sandy PSD File: C:\\WinSLAMM Files\\NURP.cpz Source Area PSD File: C:\\WinSLAMM Files\\NURP.cpz

LU# 2 - Commercial: Commercial 2 Total area (ac): 0.790

1 - Roofs 1: 0.040 ac. Flat Connected PSD File: C:\\WinSLAMM Files\\NURP.cpz Source Area PSD File: C:\\WinSLAMM Files\\NURP.cpz

13 - Paved Parking 1: 0.520 ac. Connected PSD File: C:\\WinSLAMM Files\\NURP.cpz Source Area PSD File: C:\\WinSLAMM Files\\NURP.cpz

45 - Large Landscaped Areas 1: 0.230 ac. Normal Sandy PSD File: C:\\WinSLAMM Files\\NURP.cpz Source Area PSD File: C:\\WinSLAMM Files\\NURP.cpz

Data file name: \\job-files\\2025 Job Files\\250351400 PSP - 7 Brew - La Crosse WI\\250351404 Civil\\storm water report and calculations\\Calcs\\250351400 SLAMM Input.ran

WinSLAMM Version 10.5.0

Rain file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WisReg - Minneapolis MN 1959.ran

Particulate Solids Concentration file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\10.1 WI_AVG01.pscx

Runoff Coefficient file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_SL06 Dec06.rsvx

Pollutant Relative Concentration file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_GEO03.ppdx

Residential Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\Freeway 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: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter 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: 11/04 End of Winter Season: 03/13

Model Run Start Date: 01/02/59 Model Run End Date: 12/28/59

Date of run: 12-05-2025 Time of run: 13:11:56

Total Area Modeled (acres): 0.810

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:	35113	-	123.2	270.1	-
Outfall Total with Controls:	35113	0.00%	123.2	270.1	0.00%
Annualized Total After Outfall Controls:	35600			273.8	

Data file name: \\job-files\\2025 Job Files\\250351400 PSP - 7 Brew - La Crosse WI\\250351404 Civil\\storm water report and calculations\\Calcs\\250351400 SLAMM Output
WinSLAMM Version 10.5.0
Rain file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WisReg - Minneapolis MN 1959.ran
Particulate Solids Concentration file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter 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: 11/04 End of Winter Season: 03/13
Date: 12-05-2025 Time: 14:56:44
Site information:

LU# 1 - Commercial: Commercial 1 Total area (ac): 0.750
1 - Roofs 1: 0.040 ac. Flat Connected PSD File: C:\\WinSLAMM Files\\NURP.cpz Source Area PSD File: C:\\WinSLAMM Files\\NURP.cpz
13 - Paved Parking 1: 0.500 ac. Connected PSD File: C:\\WinSLAMM Files\\NURP.cpz Source Area PSD File: C:\\WinSLAMM Files\\NURP.cpz
45 - Large Landscaped Areas 1: 0.210 ac. Normal Sandy PSD File: C:\\WinSLAMM Files\\NURP.cpz Source Area PSD File: C:\\WinSLAMM Files\\NURP.cpz

Data file name: \\job-files\\2025 Job Files\\250351400 PSP - 7 Brew - La Crosse WI\\250351404 Civil\\storm water report and calculations\\Calcs\\250351400 SLAMM Output

WinSLAMM Version 10.5.0

Rain file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WisReg - Minneapolis MN 1959.ran

Particulate Solids Concentration file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\10.1 WI_AVG01.pscx

Runoff Coefficient file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_SL06 Dec06.rsvx

Pollutant Relative Concentration file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_GEO03.ppdx

Residential Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter Files\\Freeway 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: J:\\Programs\\civil\\WinSLAMM\\v10.5.0\\Parameter 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: 11/04 End of Winter Season: 03/13

Model Run Start Date: 01/02/59 Model Run End Date: 12/28/59

Date of run: 12-05-2025 Time of run: 14:53:12

Total Area Modeled (acres): 0.750

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:	33841	-	122.9	259.6	-
Outfall Total with Controls:	33916	-0.22%	61.65	130.5	49.73%
Annualized Total After Outfall Controls:	34387			132.4	

Appendix I: Post Construction Operation and Maintenance Plan

<p>The owner of the property affected shall inspect and maintain the following stormwater management systems frequently, especially after heavy rainfalls, but at least on an annual basis unless otherwise specified.</p>	
STORMWATER FACILITY	TYPE OF ACTION
1. Lawn and Landscaped Areas	All lawn areas shall be kept clear of any materials that block the flow of stormwater. Rills and small gullies shall immediately be filled and seeded or have sod placed in them. The lawn shall be kept mowed, tree seedlings shall be removed, and litter shall be removed from landscaped areas.
2. Swales	All grassed swales showing signs of erosion, scour, or channelization shall be repaired, reinforced, and revegetated immediately. All swales shall be repaired to the original plan requirements. Mowing shall take place no less than twice per year at a height of no less than 3" inches. Grasses shall not grow to a height that permits branching or bending. Mowing shall only take place when the ground is dry and able to support machinery.
3. Rip Rap	All rip rap showing signs of erosion or scour shall be repaired, reinforced, and revegetated immediately. Rip rap should be kept clean of vegetation and sediment. All rip rap shall be repaired to the construction plan requirements.
4. Catch Basin/Curb Inlet Grates	The grate openings to these structures must be cleared of any clogging or the blocking of stormwater flow from getting into the stormwater conveyance system of any kind.
5. Catch Basin/Curb Inlet Sumps	Sumps shall visually be inspected every 3 months. Siltation shall be removed and disposed of offsite when the sump depth is within 3" of the outlet pipe invert elevation. The removal of siltation should occur a minimum of once per year.
6. Forebay and Sediment Basin or Trap	Sediment shall be removed once the facility is filled to approximately 50% of its total volume. Bare areas shall be regraded, seeded, or otherwise vegetated to the original plan requirements. The removed sediment shall be placed in an appropriate upland disposal area and stabilized.
7. Up Flo Filter	Maintenance shall be in accordance with the manufacturers guidelines, which at a minimum shall be 3 inspections per year, 3 cleanings per year, and 1 filter replacement per year. More specifically, debris shall be removed and the filter medium shall be replaced any time the filter medium appears to be 50% coated with oil and grease.
8. Record of Maintenance	The operation and maintenance plan shall remain onsite and available for inspection when requested by WDNR. When requested, the owner shall make all maintenance records available for inspection to the department/agent for the life of the system.