# *STORM WATER MANAGEMENT PLAN*

FOR

# *NEENAH ENTERPRISES – STORAGE YARD EXPANSION*

1220 S. Prairie Avenue
Waukesha, WI

September 20, 2021


PREPARED BY:
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CJE Job No.: 2151R0-SWMP

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## Introduction:

The proposed development of the parking lot expansion for the Neenah Enterprises building in the City of Waukesha will consist of the development of a site located 1220 S. Prairie Avenue. The existing building will remain along with the north portion of the parking area and entrance drive. The existing grass area immediately on the north side of the existing building will be converted to a paved storage yard addition. Along with the new paved storage yard to the north and a small parking lot addition to the east of the building, a new storm water basin will be constructed. The proposed paved storage yard will drain to the proposed storm water basin to the west of the paved storage yard. The development will result in an increase of impervious area by 1.11 acres.

The development of this site will create a disturbed area equal to 1.69 acres. This storm water management plan has been created to show conformance with the City of Waukesha and WI DNR storm water requirements for this development by analyzing the entire 2.107 acres of contributing area. The storm water practice included in this project consists of creating a storm water basin located on the west side of the development. The proposed storm water basin will then discharge through a pond outlet structure to an existing storm water swale located on the west side of the site. This is consistent with the existing drainage pattern of the existing site. This storm water basin will provide sediment removal for water quality as well as providing water quantity control.

The proposed development meets and exceeds the storm water management requirements of NR 151 and the City of Waukesha.

## Storm water requirements per the WI DNR – NR 151and Chapter 32 City of Waukesha Stormwater Oridnance:

Runoff Quantity Control:
WI DNR AND City – Per Section 32.10.d.1 of the Waukesha City Ordinance:
The calculated post-development peak storm water discharge rate shall not exceed the calculated pre-development discharge rates for the 1-year, 2-year, 10-year, and 100-year, 24-hour design storms

Runoff Quality Control:
WI DNR & City – 80% to total suspend sediment (TSS) loads from parking areas and roads shall be removed prior to discharge. (Per NR 151.122 (2))
City of Waukesha – Per section 32.10.d.2(i):
For new land development and in-fill development, 80% reduction in total suspended solids load;

Developed Site: (See the Proposed Conditions Plan: Appendix "B").

Soil Types: Per the NRCS soil survey for Waukesh County the underlying soils in the area of redevelopment consist of Lorenzo Loam (LyB2), HSG B.

Cover & CN: CN 61, 75-100% Grass Cover, Good condition, HSG B.
CN 98, Paved Parking, Drives & Roofs (impervious surface)

Analyzed Area: **2.107 Acres**

## 24-Hour Rainfall Values:

1-Year: 2.40"
2-Year: 2.70"
10-Year: 3.81"
100-Year: 6.18"

All rainfall values per NRCS 24-hour Rain Fall Distribution & Values for Waukesha County Based on NOAA atlas 14 rainfall values and the MSE3 distribution for Waukesha County.

## Method of Analysis:

The storm water runoff quantity was calculated using the methods outlines in TR-55 ("Urban Hydrology for Small Watersheds" by the U.S. Department of Agriculture's Soil Conservation Services). Calculations were performed with the "HydroCAD 10.00" computer software. Water quality calculations were done using WinSLAMM for Windows version 10.2.0

## Drainage Summary: (See Summary of Calculations in Appendix)

| Area | 1 Year Storm | 2 Year Storm | 10 Year Storm | 100 Year Storm |
|---|---|---|---|---|
| | | | | |
| **Existing Conditions** | | | | |
| Subcatchment 1 (total runoff) | 0.72 cfs | 1.15 cfs | 3.14 cfs | 8.58 cfs |
| | | | | |
| **Proposed Conditions** | | | | |
| Subcatchment 1 (Into Pond) | 4.31 cfs | 5.10 cfs | 8.09 cfs | 14.46 cfs |
| Pond (Outflow) | 0.27 cfs | 0.32 cfs | 1.14 cfs | 3.31 cfs |
| Undetained | 0.28 cfs | 0.39 cfs | 0.83 cfs | 1.94 cfs |
| **Reach--Total Peak Discharge** | **0.39 cfs** | **0.57 cfs** | **1.29 cfs** | **4.95 cfs** |
| | | | | |

## Water Quality:

WDNR requirements for development for water quality per section NR151.122 (2) table 1, requires the project to remove over 80% of the total suspended solids (TSS) from parking areas and roads prior to discharge off site, as quantified using WinSLAMM for Windows version 10.2.0 (See appendix for calculation results and inputs). This is achieved by creating a storm water pond with permanent water storage. The TSS removal of site is as summarized below:

| | Before Drainage System | After Controls | % Reduction |
|---|---|---|---|
| Disturbed Area | 962.8 lbs | 184.1 lbs | **80.88%** |

## Infiltration:

Per NR 151.124(4)c); A site has infiltration rate exemptions where the infiltration rate of the soil measured at the proposed bottom of the infiltration system is less than 0.6 inches per hour using a scientifically credible field test method. Based on WDNR technical standard 1002.5 Table 2. Loam soils have a design infiltration rate of 0.24 inches per hour the proposed site exempt from infiltration requirements.

## Conclusion:

The proposed peak runoff rates under post-redevelopment conditions are below the peak runoff rate under the existing conditions. The storm water pond will remove over 80% of TSS from the proposed runoff from the disturbed areas after development. Therefore, the proposed development meets and exceeds the storm water management and water quality requirements for the City of Waukesha and WDNR NR 151.

# APPENDIX

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Milwaukee and Waukesha Counties, Wisconsin


September 20, 2021

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# Contents

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map


Map Scale: 1:822 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Milwaukee and Waukesha Counties, Wisconsin
Survey Area Data: Version 16, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 20, 2020—Aug 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

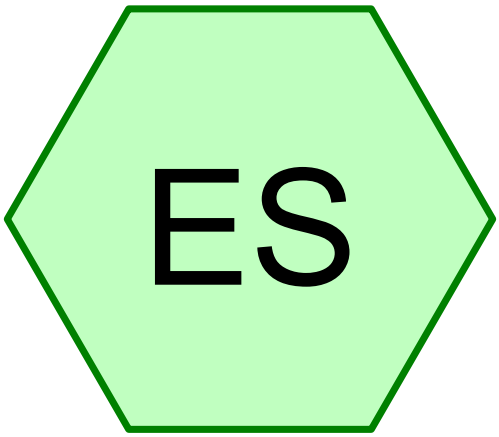
## MAP LEGEND

## MAP INFORMATION

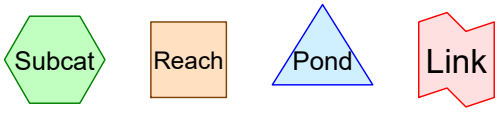
imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| KeA | Kane silt loam, 1 to 3 percent slopes | 0.5 | 15.5% |
| LyB2 | Lorenzo loam, 2 to 6 percent slopes, eroded | 2.5 | 81.2% |
| WhA | Warsaw silt loam, 0 to 2 percent slopes | 0.1 | 3.3% |
| **Totals for Area of Interest** | | **3.1** | **100.0%** |




# EXISTING CONDITIONS




**Routing Diagram for CJE2151R1**
Prepared by {enter your company name here}, Printed 9/20/2021

## Area Listing (selected nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 1.750 | 61 | >75% Grass cover, Good, HSG B (ES) |
| 0.357 | 98 | Paved parking, HSG B (ES) |
| **2.107** | **67** | **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 ES: EXISTING CONDITIONS** Runoff Area=2.107 ac 16.94% Impervious Runoff Depth>0.29"
Flow Length=170' Tc=9.7 min CN=67 Runoff=0.72 cfs 0.051 af

**Total Runoff Area = 2.107 ac Runoff Volume = 0.051 af Average Runoff Depth = 0.29"**
**83.06% Pervious = 1.750 ac 16.94% Impervious = 0.357 ac**

## Summary for Subcatchment ES: EXISTING CONDITIONS

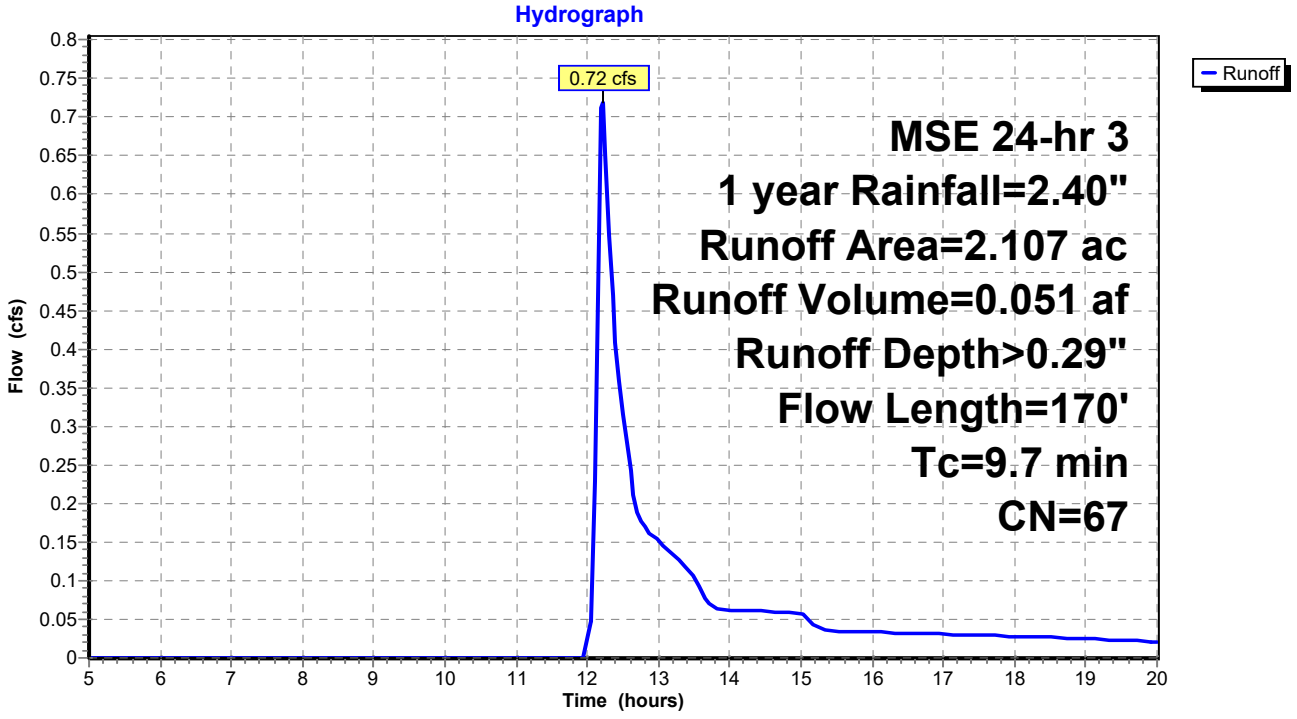
Runoff = 0.72 cfs @ 12.21 hrs, Volume= 0.051 af, Depth> 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

| Area (ac) | CN | Description |
|---|---|---|
| 1.750 | 61 | >75% Grass cover, Good, HSG B |
| 0.357 | 98 | Paved parking, HSG B |
| 2.107 | 67 | Weighted Average |
| 1.750 | | 83.06% Pervious Area |
| 0.357 | | 16.94% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0290 | 0.18 | | **Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70" |
| 0.5 | 70 | 0.0200 | 2.28 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 9.7 | 170 | Total | | | |

## Subcatchment ES: EXISTING CONDITIONS



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 ES: EXISTING CONDITIONS** Runoff Area=2.107 ac 16.94% Impervious Runoff Depth>0.41"
Flow Length=170' Tc=9.7 min CN=67 Runoff=1.15 cfs 0.072 af

**Total Runoff Area = 2.107 ac Runoff Volume = 0.072 af Average Runoff Depth = 0.41"**
**83.06% Pervious = 1.750 ac 16.94% Impervious = 0.357 ac**

## Summary for Subcatchment ES: EXISTING CONDITIONS

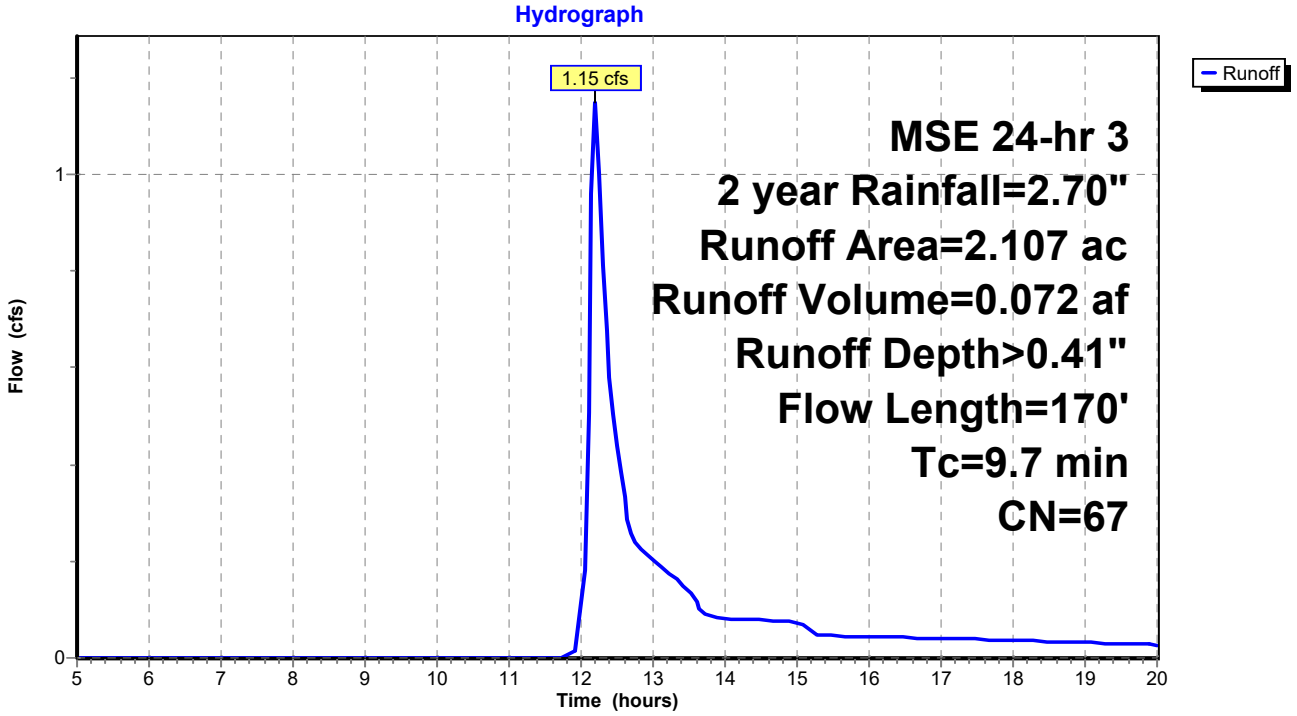
Runoff = 1.15 cfs @ 12.20 hrs, Volume= 0.072 af, Depth> 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

| Area (ac) | CN | Description |
|---|---|---|
| 1.750 | 61 | >75% Grass cover, Good, HSG B |
| 0.357 | 98 | Paved parking, HSG B |
| 2.107 | 67 | Weighted Average |
| 1.750 | | 83.06% Pervious Area |
| 0.357 | | 16.94% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0290 | 0.18 | | **Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70" |
| 0.5 | 70 | 0.0200 | 2.28 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 9.7 | 170 | Total | | | |

## Subcatchment ES: EXISTING CONDITIONS



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 ES: EXISTING CONDITIONS** Runoff Area=2.107 ac 16.94% Impervious Runoff Depth>0.97"
Flow Length=170' Tc=9.7 min CN=67 Runoff=3.14 cfs 0.170 af

**Total Runoff Area = 2.107 ac Runoff Volume = 0.170 af Average Runoff Depth = 0.97"**
**83.06% Pervious = 1.750 ac 16.94% Impervious = 0.357 ac**

## Summary for Subcatchment ES: EXISTING CONDITIONS

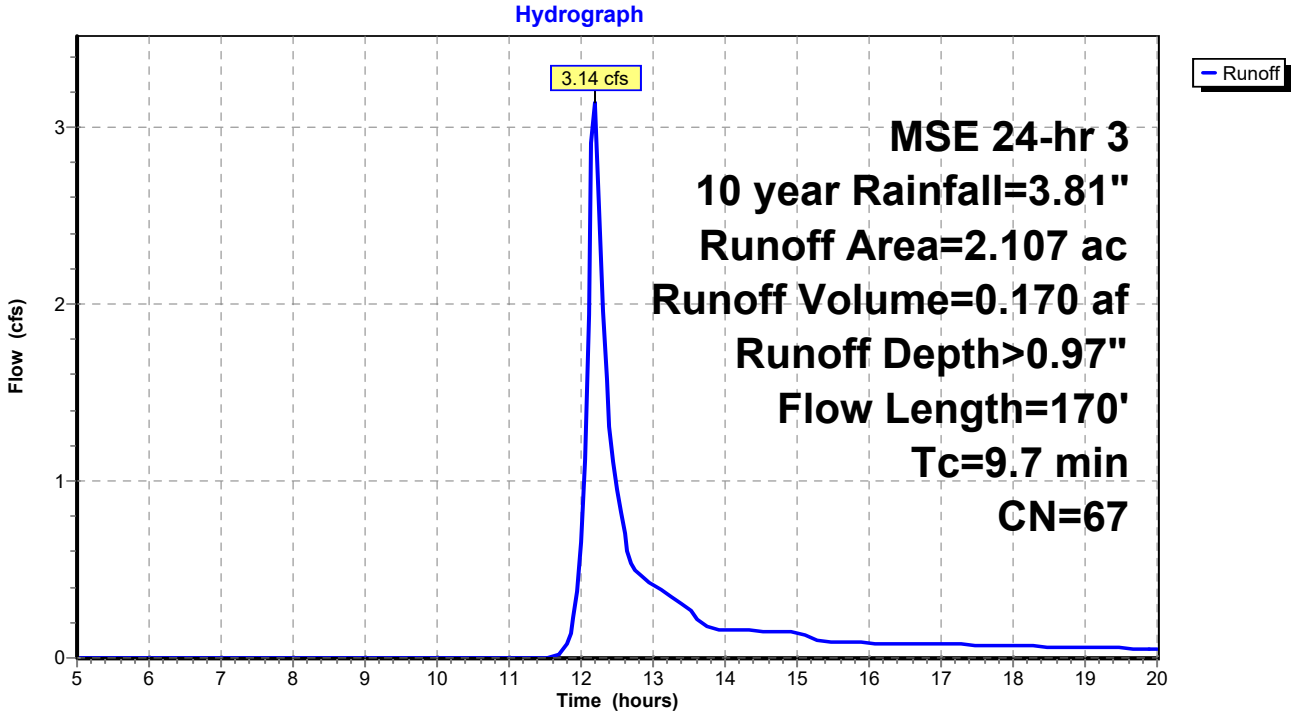
Runoff = 3.14 cfs @ 12.19 hrs, Volume= 0.170 af, Depth> 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

| Area (ac) | CN | Description |
|---|---|---|
| 1.750 | 61 | >75% Grass cover, Good, HSG B |
| 0.357 | 98 | Paved parking, HSG B |
| 2.107 | 67 | Weighted Average |
| 1.750 | | 83.06% Pervious Area |
| 0.357 | | 16.94% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0290 | 0.18 | | **Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70" |
| 0.5 | 70 | 0.0200 | 2.28 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 9.7 | 170 | Total | | | |

## Subcatchment ES: EXISTING CONDITIONS



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 ES: EXISTING CONDITIONS** Runoff Area=2.107 ac 16.94% Impervious Runoff Depth>2.54"
Flow Length=170' Tc=9.7 min CN=67 Runoff=8.58 cfs 0.446 af

**Total Runoff Area = 2.107 ac Runoff Volume = 0.446 af Average Runoff Depth = 2.54"**
**83.06% Pervious = 1.750 ac 16.94% Impervious = 0.357 ac**

## Summary for Subcatchment ES: EXISTING CONDITIONS

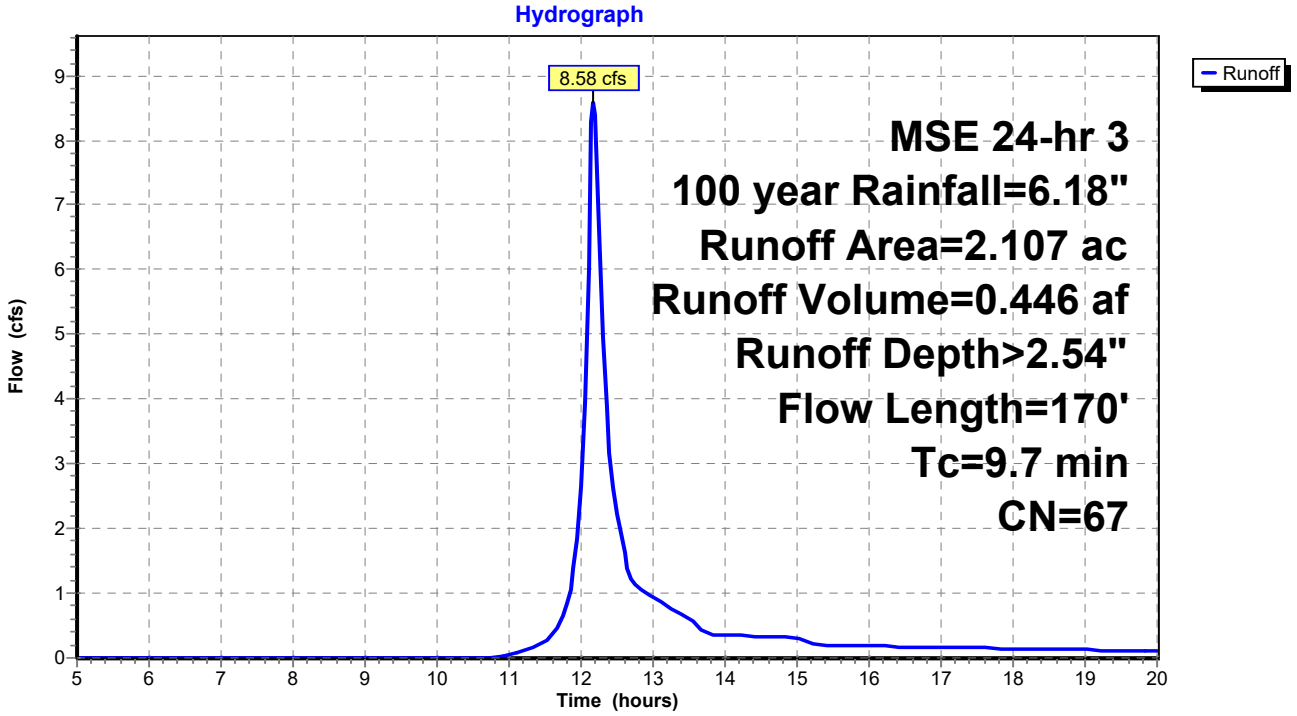
Runoff = 8.58 cfs @ 12.18 hrs, Volume= 0.446 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

| Area (ac) | CN | Description |
|---|---|---|
| 1.750 | 61 | >75% Grass cover, Good, HSG B |
| 0.357 | 98 | Paved parking, HSG B |
| 2.107 | 67 | Weighted Average |
| 1.750 | | 83.06% Pervious Area |
| 0.357 | | 16.94% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 9.2 | 100 | 0.0290 | 0.18 | | **Sheet Flow, A-B** Grass: Short n= 0.150 P2= 2.70" |
| 0.5 | 70 | 0.0200 | 2.28 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 9.7 | 170 | Total | | | |

## Subcatchment ES: EXISTING CONDITIONS



CJ engineering
civil design and consulting
9205 W. Center Street
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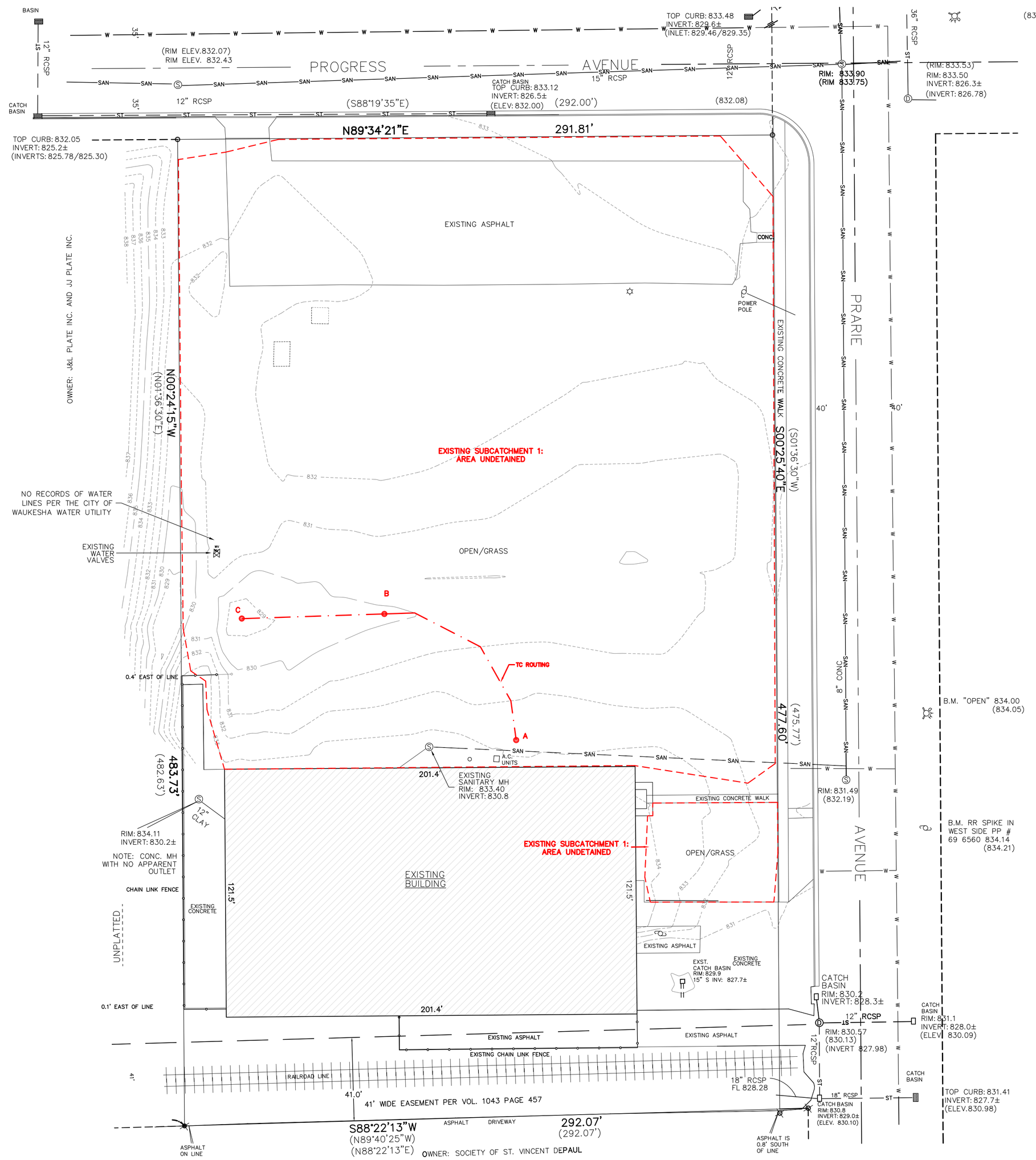
PH. (414) 443-1312
www.cj-engineering.com

# NEENAH ENTERPRISES
## STORAGE YARD EXPANSION
1220 S. PRAIRIE. AVENUE WAUKESHA, WI




N

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft

www.DiggersHotline.com
DIGGERS HOTLINE
DIAL 811 OR (800) 242-8511

## LEGEND

| | |
|---|---|
| 96 | EXISTING CONTOUR |
| 96 | PROPOSED CONTOUR |
| x 96.5 | PROPOSED ELEVATION |
| ST | EXISTING STORM SEWER |
| ST | PROPOSED STORM SEWER |
| SAN | EXISTING SANITARY SEWER |
| SAN | PROPOSED SANITARY SEWER |
| W | EXISTING WATER MAIN |
| W | PROPOSED WATER MAIN |
| G | BURIED GAS MAIN |
| // | OVER HEAD WIRE |
| E | BURIED ELECTRIC |
| | PROPOSED SILT FENCE |

CJE NO.: 215IRI
SEPTEMBER 20, 2021

# SWMP - EXISTING CONDITIONS

CJ engineering
civil design and consulting
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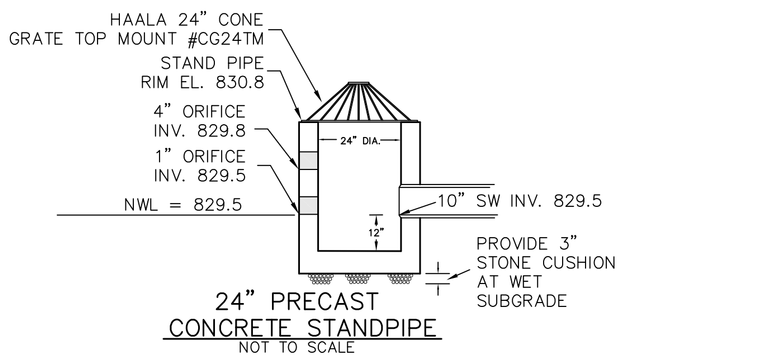
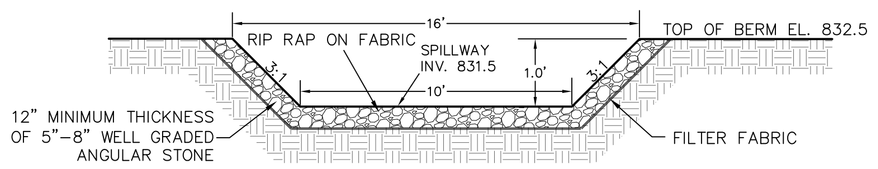
www.cj-engineering.com

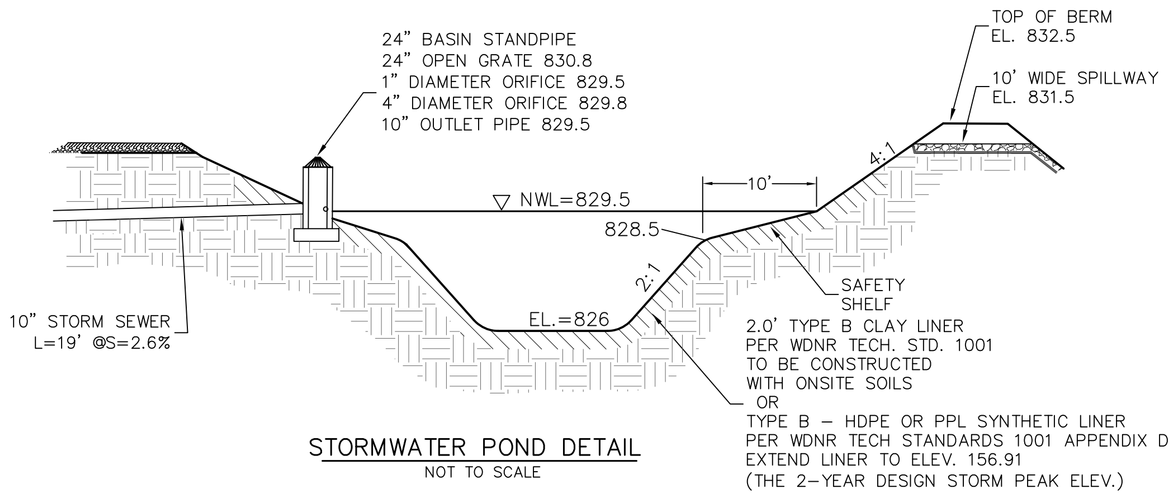
# NEENAH ENTERPRISES
## STORAGE YARD EXPANSION
1220 S. PRAIRIE AVENUE WAUKESHA, WI



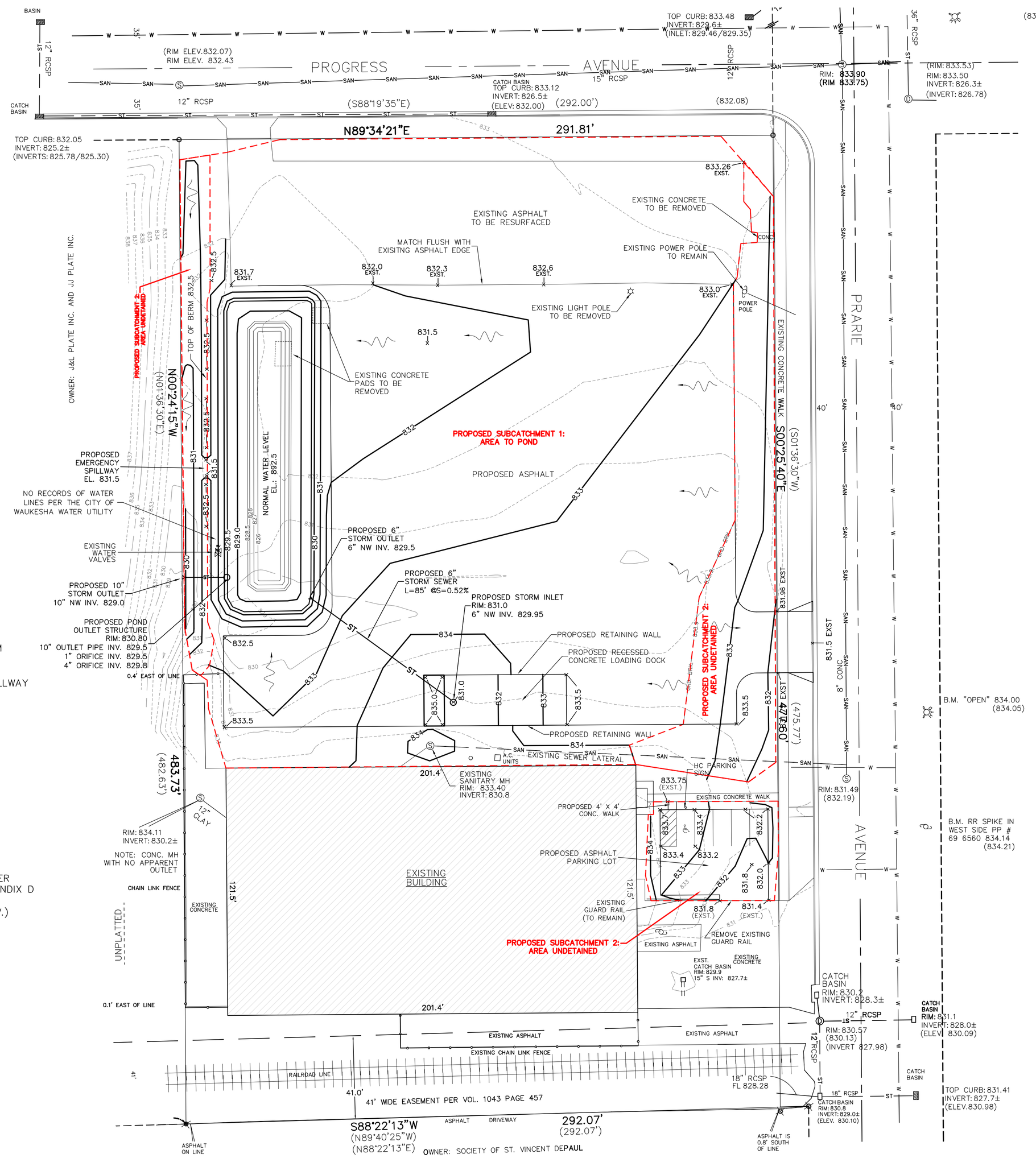

24" PRECAST
CONCRETE STANDPIPE
NOT TO SCALE




EMERGENCY SPILLWAY DETAIL
NOT TO SCALE




STORMWATER POND DETAIL
NOT TO SCALE

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DIAL 811 OR (800) 242-8511

## LEGEND

| | |
|---|---|
| 96 | EXISTING CONTOUR |
| 96 | PROPOSED CONTOUR |
| x 96.5 | PROPOSED ELEVATION |
| ST | EXISTING STORM SEWER |
| ST | PROPOSED STORM SEWER |
| SAN | EXISTING SANITARY SEWER |
| SAN | PROPOSED SANITARY SEWER |
| W | EXISTING WATER MAIN |
| W | PROPOSED WATER MAIN |
| G | BURIED GAS MAIN |
| // | OVER HEAD WIRE |
| E | BURIED ELECTRIC |
| | PROPOSED SILT FENCE |

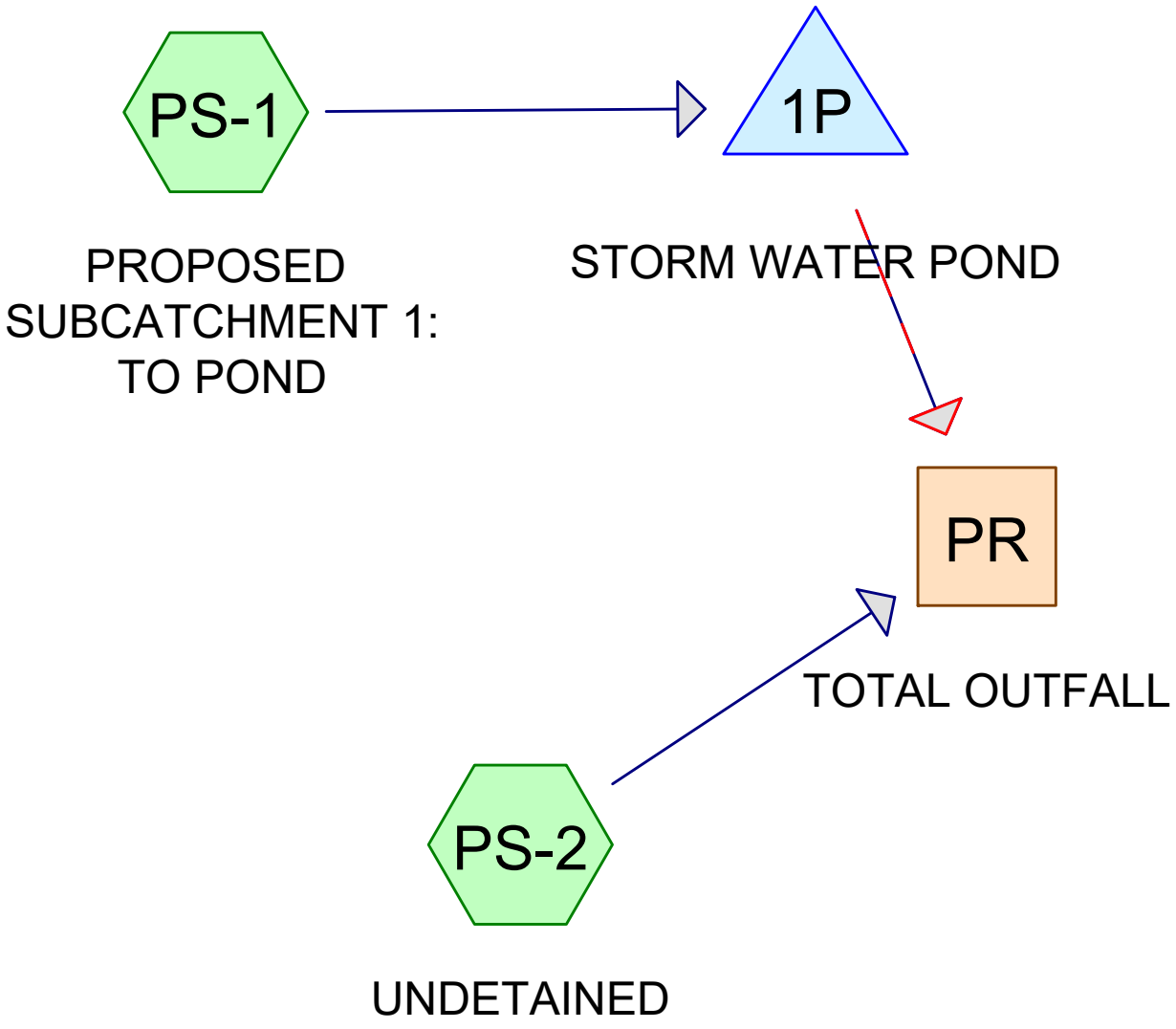
NOTES:

1. EXISTING CONDITIONS BASED ON SURVEY BY KETTLE MORAINE SURVEYING, INC.
2. DISTURBED AREA = 72,800 S.F. (1.67 ACRES)
3. THE DEVELOPMENT WILL RESULT IN AN INCREASE IN IMPERVIOUS SURFACE AREA ON THE SITE BY 1.11 ACRES.
4. STORM WATER MANAGEMENT MEETING ALL THE REQUIREMENTS OF THE CITY. AND NR 151 WILL BE PROVIDED BY A PROPOSED STORM WATER POND ALONG THE WEST SIDE OF THE SITE.

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft

CJE NO.: 215IRI
SEPTEMBER 20, 2021

# SWMP - PROPOSED CONDITIONS




Subcat Reach Pond Link

**Routing Diagram for CJE2151R1**
Prepared by {enter your company name here}, Printed 9/20/2021

## Area Listing (selected nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.639 | 61 | >75% Grass cover, Good, HSG B (PS-1, PS-2) |
| 1.468 | 98 | Paved parking, HSG B (PS-1, PS-2) |
| **2.107** | **87** | **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 PS-1: PROPOSED** Runoff Area=1.772 ac 76.81% Impervious Runoff Depth>1.31"
Tc=6.0 min CN=89 Runoff=4.31 cfs 0.194 af

**Subcatchment PS-2: UNDETAINED** Runoff Area=0.335 ac 31.94% Impervious Runoff Depth>0.48"
Tc=6.0 min CN=73 Runoff=0.28 cfs 0.013 af

**Reach PR: TOTAL OUTFALL** Inflow=0.39 cfs 0.136 af
Outflow=0.39 cfs 0.136 af

**Pond 1P: STORM WATER POND** Peak Elev=830.31' Storage=5,443 cf Inflow=4.31 cfs 0.194 af
Primary=0.27 cfs 0.122 af Secondary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.122 af

**Total Runoff Area = 2.107 ac Runoff Volume = 0.207 af Average Runoff Depth = 1.18"**
**30.33% Pervious = 0.639 ac 69.67% Impervious = 1.468 ac**

## Summary for Subcatchment PS-1: PROPOSED SUBCATCHMENT 1: TO POND

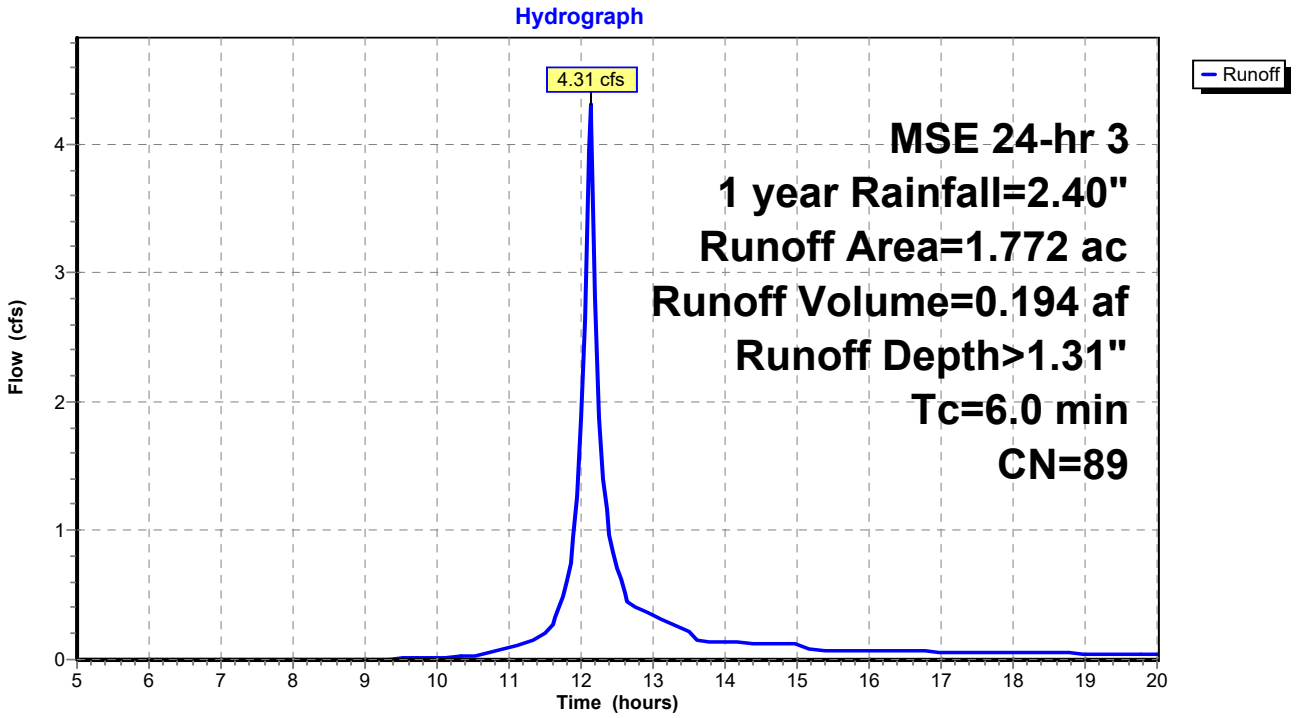
Runoff = 4.31 cfs @ 12.13 hrs, Volume= 0.194 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

| Area (ac) | CN | Description |
|---|---|---|
| 1.361 | 98 | Paved parking, HSG B |
| 0.411 | 61 | >75% Grass cover, Good, HSG B |
| 1.772 | 89 | Weighted Average |
| 0.411 | | 23.19% Pervious Area |
| 1.361 | | 76.81% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, Min TC** |

## Subcatchment PS-1: PROPOSED SUBCATCHMENT 1: TO POND



## Summary for Subcatchment PS-2: UNDETAINED

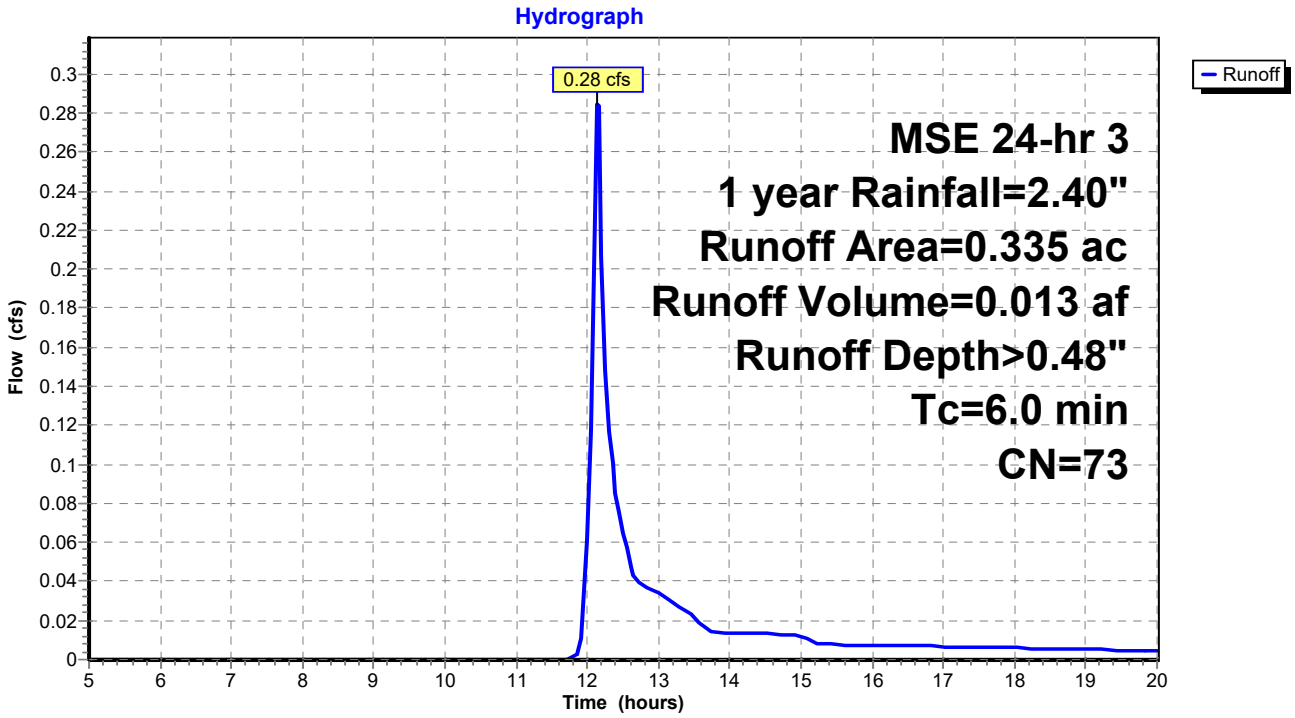
Runoff = 0.28 cfs @ 12.15 hrs, Volume= 0.013 af, Depth> 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1 year Rainfall=2.40"

| Area (ac) | CN | Description |
|---|---|---|
| 0.228 | 61 | >75% Grass cover, Good, HSG B |
| 0.107 | 98 | Paved parking, HSG B |
| 0.335 | 73 | Weighted Average |
| 0.228 | | 68.06% Pervious Area |
| 0.107 | | 31.94% Impervious Area |

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

## Subcatchment PS-2: UNDETAINED

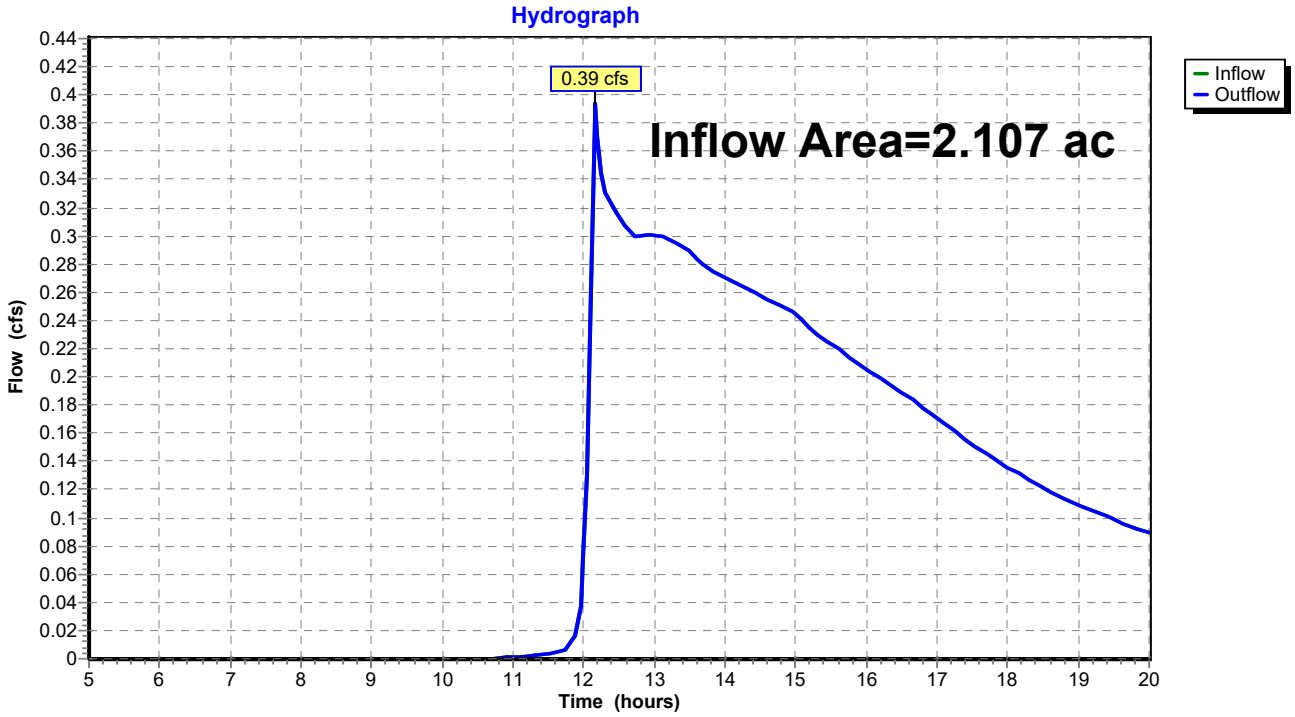


## Summary for Reach PR: TOTAL OUTFALL

Inflow Area = 2.107 ac, 69.67% Impervious, Inflow Depth > 0.77" for 1 year event
Inflow = 0.39 cfs @ 12.17 hrs, Volume= 0.136 af
Outflow = 0.39 cfs @ 12.17 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

## Reach PR: TOTAL OUTFALL



## Summary for Pond 1P: STORM WATER POND

Inflow Area = 1.772 ac, 76.81% Impervious, Inflow Depth > 1.31" for 1 year event
Inflow = 4.31 cfs @ 12.13 hrs, Volume= 0.194 af
Outflow = 0.27 cfs @ 13.30 hrs, Volume= 0.122 af, Atten= 94%, Lag= 70.2 min
Primary = 0.27 cfs @ 13.30 hrs, Volume= 0.122 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 830.31' @ 13.30 hrs Surf.Area= 7,206 sf Storage= 5,443 cf

Plug-Flow detention time= 200.7 min calculated for 0.122 af (63% of inflow)
Center-of-Mass det. time= 142.4 min ( 921.6 - 779.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 829.50' | 35,686 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

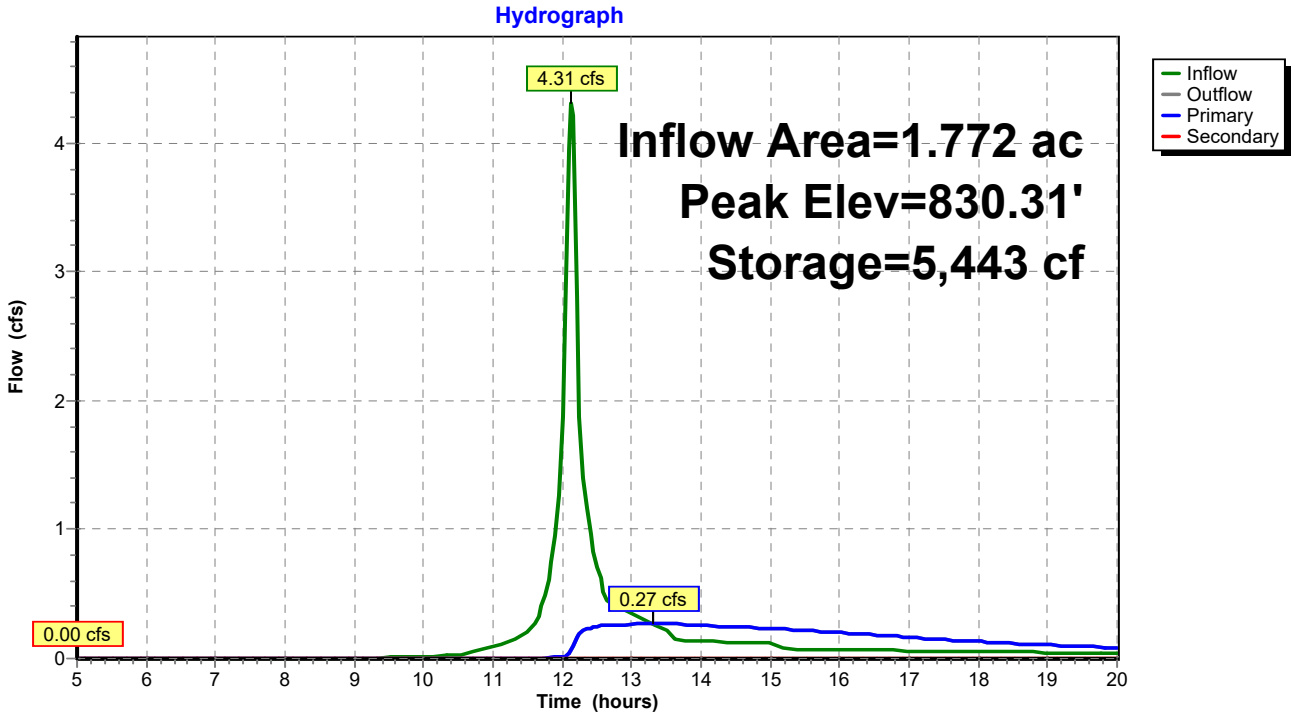
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 829.50 | 6,263 | 0 | 0 |
| 830.00 | 6,838 | 3,275 | 3,275 |
| 831.00 | 8,030 | 7,434 | 10,709 |
| 832.00 | 18,066 | 13,048 | 23,757 |
| 832.50 | 29,647 | 11,928 | 35,686 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 829.50' | **10.0" Round Culvert**<br>L= 19.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 829.50' / 829.00' S= 0.0263 '/' Cc= 0.900<br>n= 0.011, Flow Area= 0.55 sf |
| #2 | Device 1 | 829.50' | **1.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 829.80' | **4.0" Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 830.80' | **24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Secondary | 831.50' | **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.27 cfs @ 13.30 hrs HW=830.31' (Free Discharge)
└**1=Culvert** (Passes 0.27 cfs of 1.66 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 4.22 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.25 cfs @ 2.82 fps)
  └**4=Orifice/Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=829.50' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: STORM WATER POND



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 PS-1: PROPOSED** Runoff Area=1.772 ac 76.81% Impervious Runoff Depth>1.57"
Tc=6.0 min CN=89 Runoff=5.10 cfs 0.231 af

**Subcatchment PS-2: UNDETAINED** Runoff Area=0.335 ac 31.94% Impervious Runoff Depth>0.64"
Tc=6.0 min CN=73 Runoff=0.39 cfs 0.018 af

**Reach PR: TOTAL OUTFALL** Inflow=0.57 cfs 0.172 af
Outflow=0.57 cfs 0.172 af

**Pond 1P: STORM WATER POND** Peak Elev=830.46' Storage=6,529 cf Inflow=5.10 cfs 0.231 af
Primary=0.32 cfs 0.154 af Secondary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.154 af

**Total Runoff Area = 2.107 ac Runoff Volume = 0.249 af Average Runoff Depth = 1.42"**
**30.33% Pervious = 0.639 ac 69.67% Impervious = 1.468 ac**

## Summary for Subcatchment PS-1: PROPOSED SUBCATCHMENT 1: TO POND

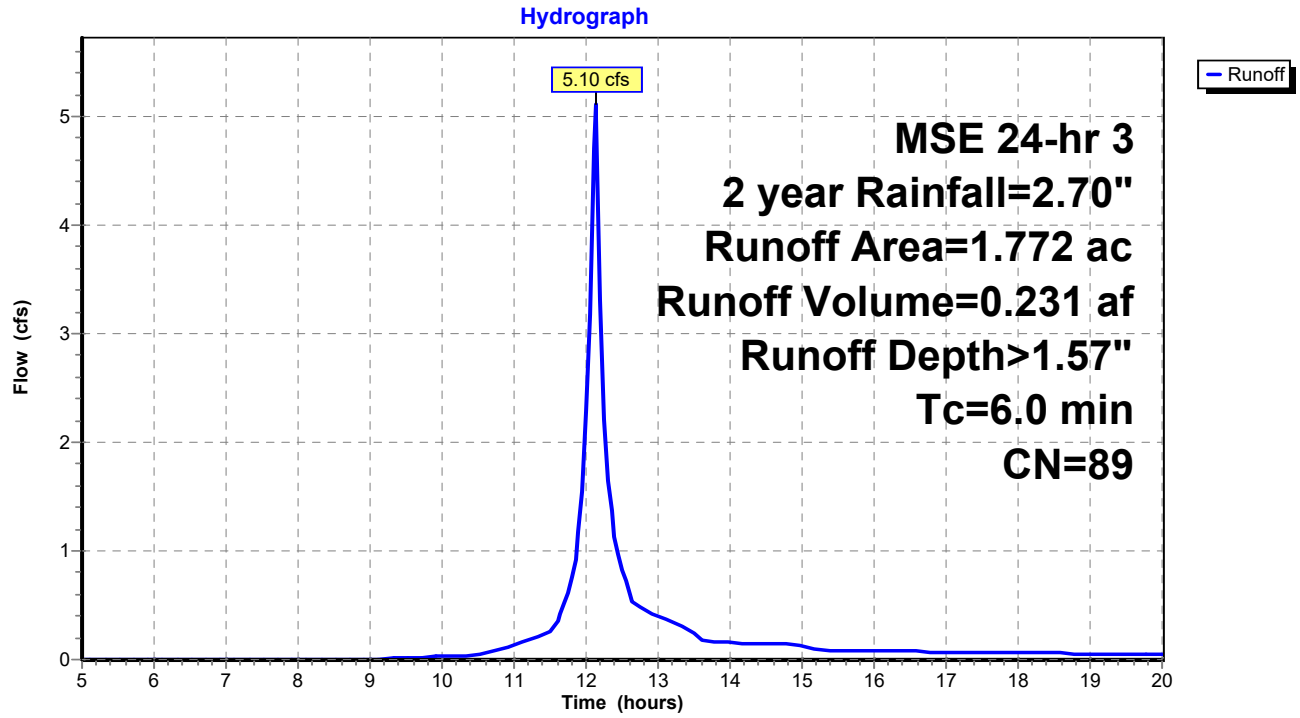
Runoff = 5.10 cfs @ 12.13 hrs, Volume= 0.231 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

| Area (ac) | CN | Description |
|---|---|---|
| 1.361 | 98 | Paved parking, HSG B |
| 0.411 | 61 | >75% Grass cover, Good, HSG B |
| 1.772 | 89 | Weighted Average |
| 0.411 | | 23.19% Pervious Area |
| 1.361 | | 76.81% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, Min TC** |

## Subcatchment PS-1: PROPOSED SUBCATCHMENT 1: TO POND



## Summary for Subcatchment PS-2: UNDETAINED

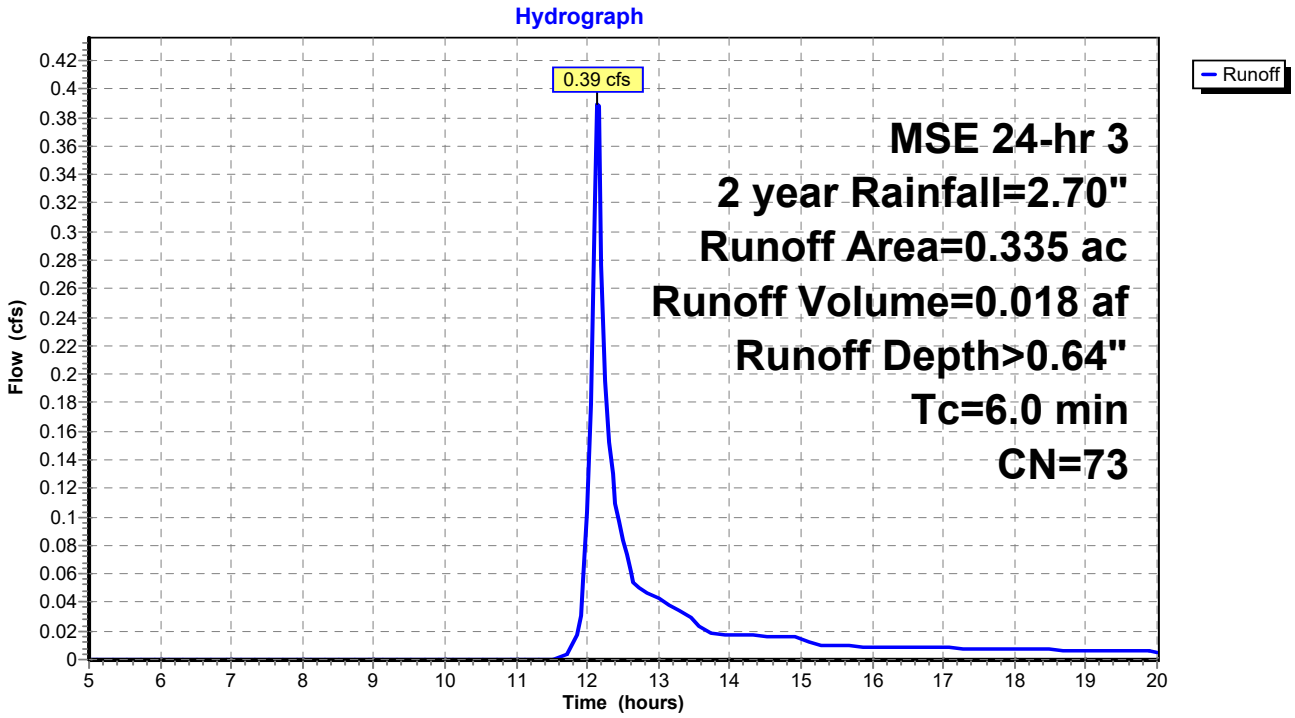
Runoff = 0.39 cfs @ 12.14 hrs, Volume= 0.018 af, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2 year Rainfall=2.70"

| Area (ac) | CN | Description |
|---|---|---|
| 0.228 | 61 | >75% Grass cover, Good, HSG B |
| 0.107 | 98 | Paved parking, HSG B |
| 0.335 | 73 | Weighted Average |
| 0.228 | | 68.06% Pervious Area |
| 0.107 | | 31.94% Impervious Area |

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

## Subcatchment PS-2: UNDETAINED

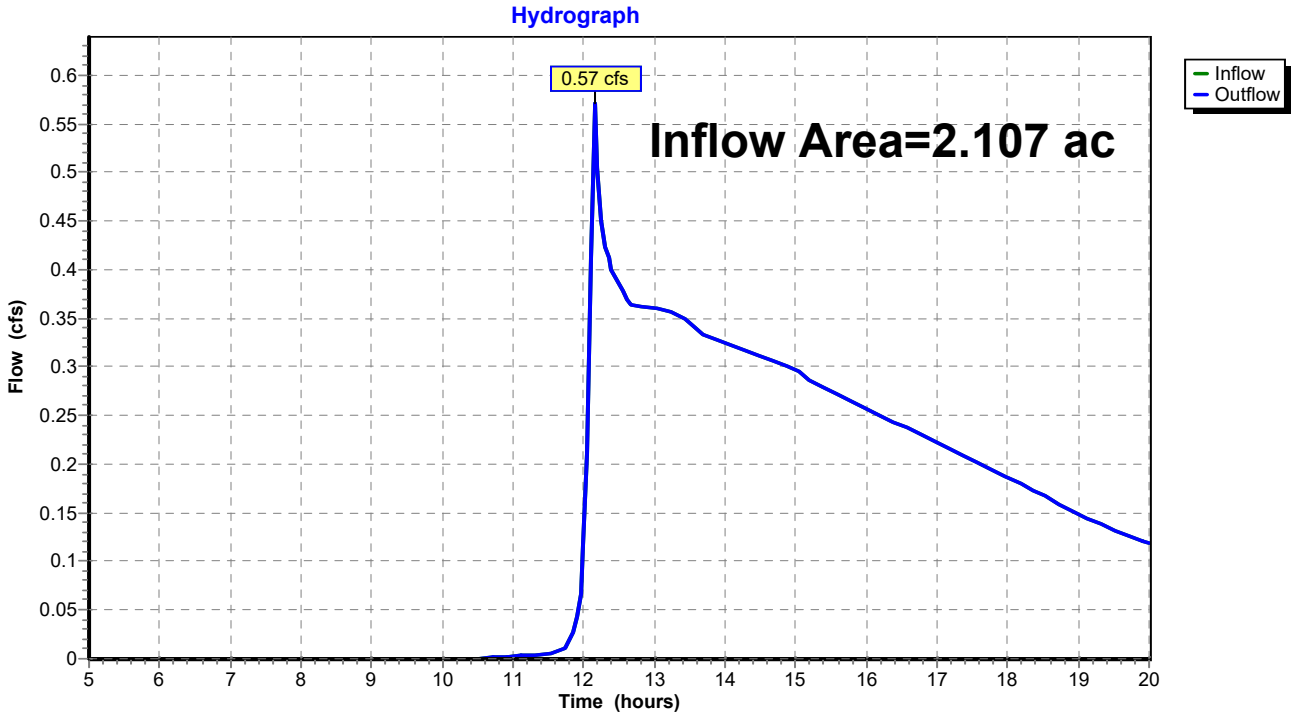


## Summary for Reach PR: TOTAL OUTFALL

Inflow Area = 2.107 ac, 69.67% Impervious, Inflow Depth > 0.98" for 2 year event
Inflow = 0.57 cfs @ 12.16 hrs, Volume= 0.172 af
Outflow = 0.57 cfs @ 12.16 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

## Reach PR: TOTAL OUTFALL



## Summary for Pond 1P: STORM WATER POND

Inflow Area = 1.772 ac, 76.81% Impervious, Inflow Depth > 1.57" for 2 year event
Inflow = 5.10 cfs @ 12.13 hrs, Volume= 0.231 af
Outflow = 0.32 cfs @ 13.28 hrs, Volume= 0.154 af, Atten= 94%, Lag= 68.7 min
Primary = 0.32 cfs @ 13.28 hrs, Volume= 0.154 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 830.46' @ 13.28 hrs Surf.Area= 7,383 sf Storage= 6,529 cf

Plug-Flow detention time= 206.1 min calculated for 0.154 af (67% of inflow)
Center-of-Mass det. time= 150.2 min ( 926.5 - 776.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 829.50' | 35,686 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

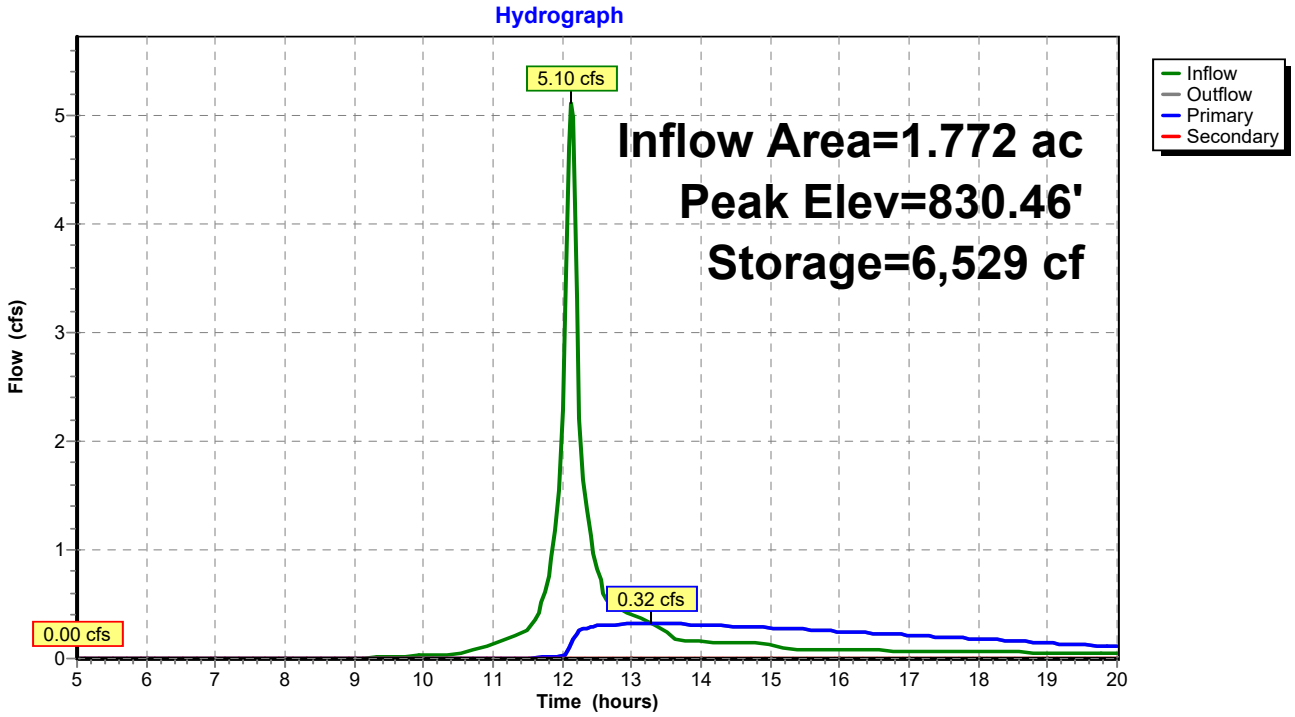
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 829.50 | 6,263 | 0 | 0 |
| 830.00 | 6,838 | 3,275 | 3,275 |
| 831.00 | 8,030 | 7,434 | 10,709 |
| 832.00 | 18,066 | 13,048 | 23,757 |
| 832.50 | 29,647 | 11,928 | 35,686 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 829.50' | **10.0" Round Culvert**<br>L= 19.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 829.50' / 829.00' S= 0.0263 '/' Cc= 0.900<br>n= 0.011, Flow Area= 0.55 sf |
| #2 | Device 1 | 829.50' | **1.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 829.80' | **4.0" Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 830.80' | **24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Secondary | 831.50' | **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.32 cfs @ 13.28 hrs HW=830.46' (Free Discharge)
└**1=Culvert** (Passes 0.32 cfs of 1.93 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 4.61 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.29 cfs @ 3.37 fps)
  └**4=Orifice/Grate** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=829.50' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: STORM WATER POND



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 PS-1: PROPOSED** Runoff Area=1.772 ac 76.81% Impervious Runoff Depth>2.55"
Tc=6.0 min CN=89 Runoff=8.09 cfs 0.377 af

**Subcatchment PS-2: UNDETAINED** Runoff Area=0.335 ac 31.94% Impervious Runoff Depth>1.32"
Tc=6.0 min CN=73 Runoff=0.83 cfs 0.037 af

**Reach PR: TOTAL OUTFALL** Inflow=1.29 cfs 0.308 af
Outflow=1.29 cfs 0.308 af

**Pond 1P: STORM WATER POND** Peak Elev=830.91' Storage=9,955 cf Inflow=8.09 cfs 0.377 af
Primary=1.14 cfs 0.271 af Secondary=0.00 cfs 0.000 af Outflow=1.14 cfs 0.271 af

**Total Runoff Area = 2.107 ac Runoff Volume = 0.413 af Average Runoff Depth = 2.35"**
**30.33% Pervious = 0.639 ac 69.67% Impervious = 1.468 ac**

## Summary for Subcatchment PS-1: PROPOSED SUBCATCHMENT 1: TO POND

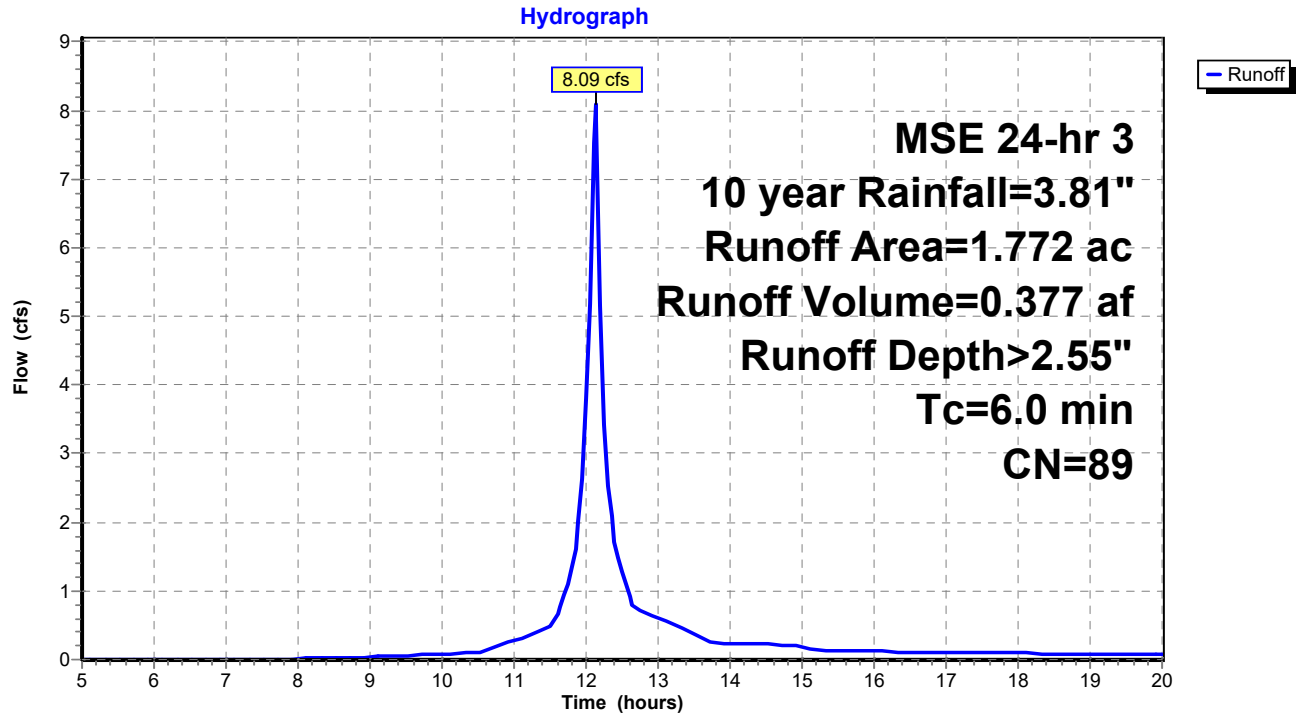
Runoff = 8.09 cfs @ 12.13 hrs, Volume= 0.377 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

| Area (ac) | CN | Description |
|---|---|---|
| 1.361 | 98 | Paved parking, HSG B |
| 0.411 | 61 | >75% Grass cover, Good, HSG B |
| 1.772 | 89 | Weighted Average |
| 0.411 | | 23.19% Pervious Area |
| 1.361 | | 76.81% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, Min TC** |

## Subcatchment PS-1: PROPOSED SUBCATCHMENT 1: TO POND



## Summary for Subcatchment PS-2: UNDETAINED

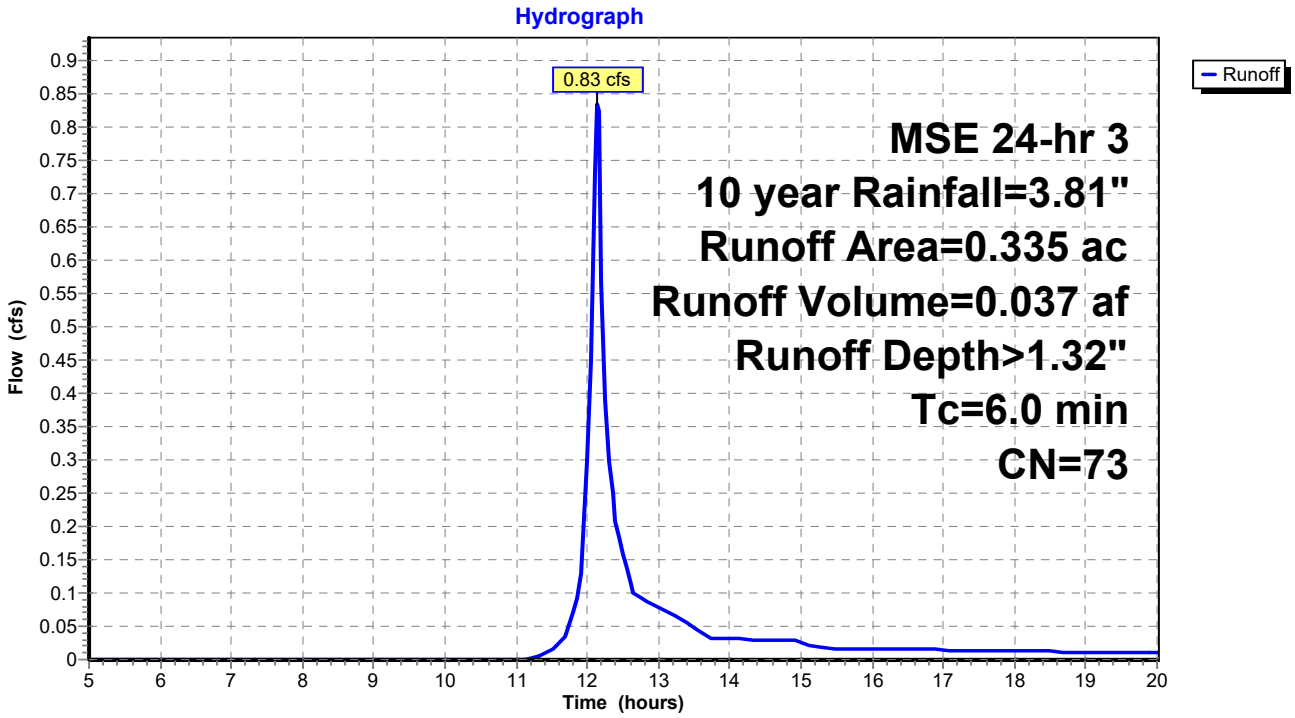
Runoff = 0.83 cfs @ 12.14 hrs, Volume= 0.037 af, Depth> 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10 year Rainfall=3.81"

| Area (ac) | CN | Description |
|---|---|---|
| 0.228 | 61 | >75% Grass cover, Good, HSG B |
| 0.107 | 98 | Paved parking, HSG B |
| 0.335 | 73 | Weighted Average |
| 0.228 | | 68.06% Pervious Area |
| 0.107 | | 31.94% Impervious Area |

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

## Subcatchment PS-2: UNDETAINED

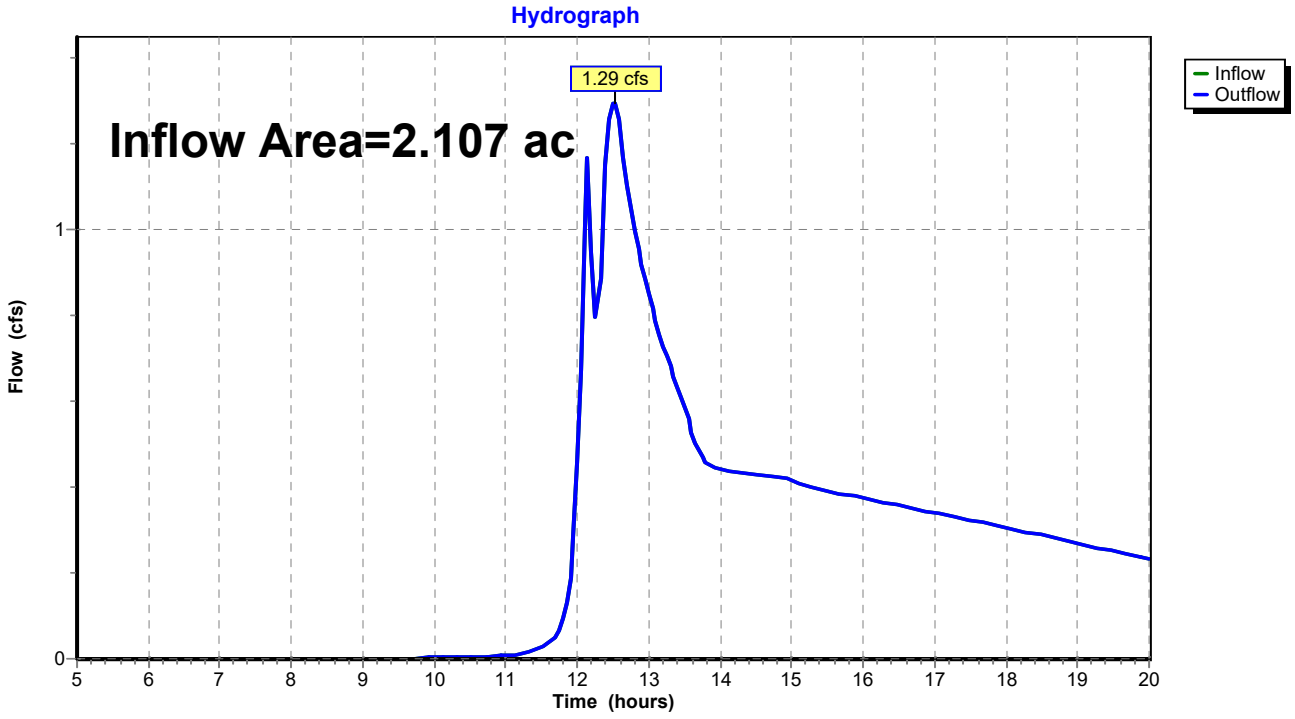


## Summary for Reach PR: TOTAL OUTFALL

Inflow Area = 2.107 ac, 69.67% Impervious, Inflow Depth > 1.75" for 10 year event
Inflow = 1.29 cfs @ 12.51 hrs, Volume= 0.308 af
Outflow = 1.29 cfs @ 12.51 hrs, Volume= 0.308 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

## Reach PR: TOTAL OUTFALL



## Summary for Pond 1P: STORM WATER POND

Inflow Area = 1.772 ac, 76.81% Impervious, Inflow Depth > 2.55" for 10 year event
Inflow = 8.09 cfs @ 12.13 hrs, Volume= 0.377 af
Outflow = 1.14 cfs @ 12.54 hrs, Volume= 0.271 af, Atten= 86%, Lag= 24.5 min
Primary = 1.14 cfs @ 12.54 hrs, Volume= 0.271 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 830.91' @ 12.54 hrs Surf.Area= 7,917 sf Storage= 9,955 cf

Plug-Flow detention time= 193.0 min calculated for 0.271 af (72% of inflow)
Center-of-Mass det. time= 141.7 min ( 909.8 - 768.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 829.50' | 35,686 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

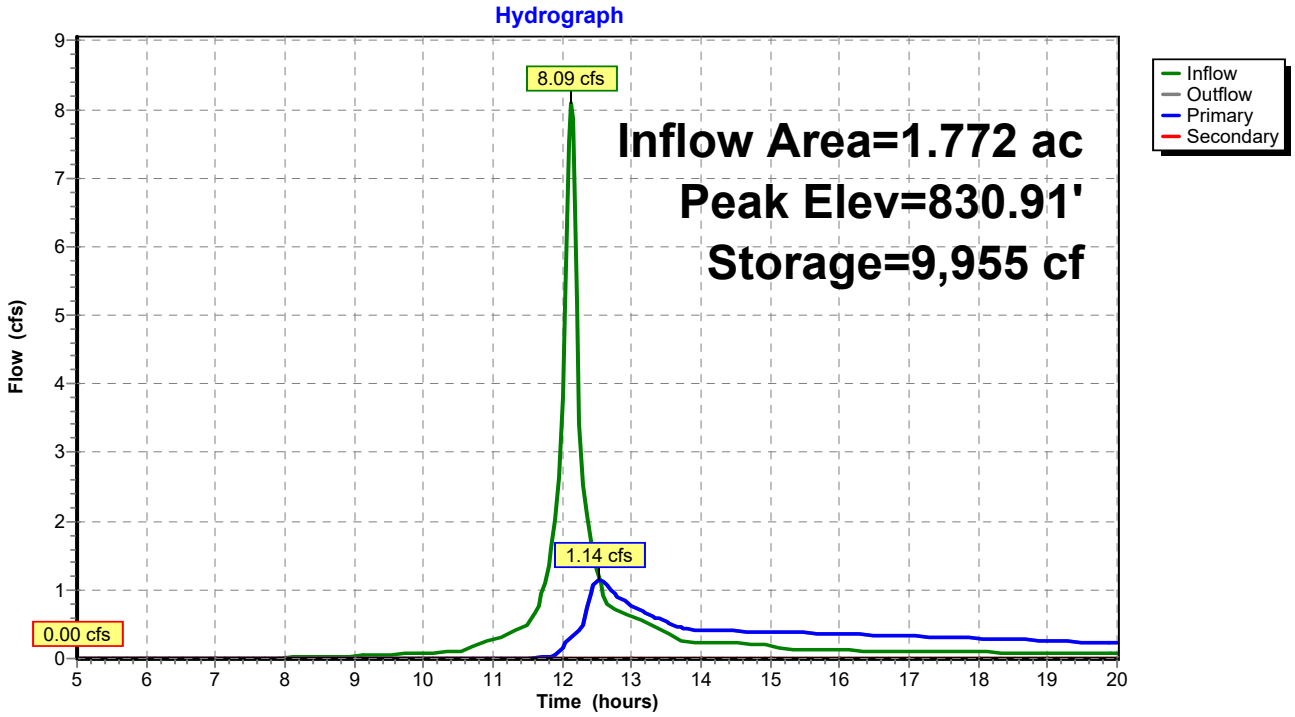
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 829.50 | 6,263 | 0 | 0 |
| 830.00 | 6,838 | 3,275 | 3,275 |
| 831.00 | 8,030 | 7,434 | 10,709 |
| 832.00 | 18,066 | 13,048 | 23,757 |
| 832.50 | 29,647 | 11,928 | 35,686 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 829.50' | **10.0" Round Culvert**<br>L= 19.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 829.50' / 829.00' S= 0.0263 '/' Cc= 0.900<br>n= 0.011, Flow Area= 0.55 sf |
| #2 | Device 1 | 829.50' | **1.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 829.80' | **4.0" Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 830.80' | **24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Secondary | 831.50' | **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=1.14 cfs @ 12.54 hrs HW=830.91' (Free Discharge)
└**1=Culvert** (Passes 1.14 cfs of 2.61 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 5.62 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.41 cfs @ 4.66 fps)
  └**4=Orifice/Grate** (Weir Controls 0.70 cfs @ 1.06 fps)

**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=829.50' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: STORM WATER POND



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 PS-1: PROPOSED** Runoff Area=1.772 ac 76.81% Impervious Runoff Depth>4.75"
Tc=6.0 min CN=89 Runoff=14.46 cfs 0.701 af

**Subcatchment PS-2: UNDETAINED** Runoff Area=0.335 ac 31.94% Impervious Runoff Depth>3.10"
Tc=6.0 min CN=73 Runoff=1.94 cfs 0.087 af

**Reach PR: TOTAL OUTFALL** Inflow=4.95 cfs 0.656 af
Outflow=4.95 cfs 0.656 af

**Pond 1P: STORM WATER POND** Peak Elev=831.50' Storage=15,991 cf Inflow=14.46 cfs 0.701 af
Primary=3.31 cfs 0.569 af Secondary=0.00 cfs 0.000 af Outflow=3.31 cfs 0.569 af

**Total Runoff Area = 2.107 ac Runoff Volume = 0.788 af Average Runoff Depth = 4.49"**
**30.33% Pervious = 0.639 ac 69.67% Impervious = 1.468 ac**

## Summary for Subcatchment PS-1: PROPOSED SUBCATCHMENT 1: TO POND

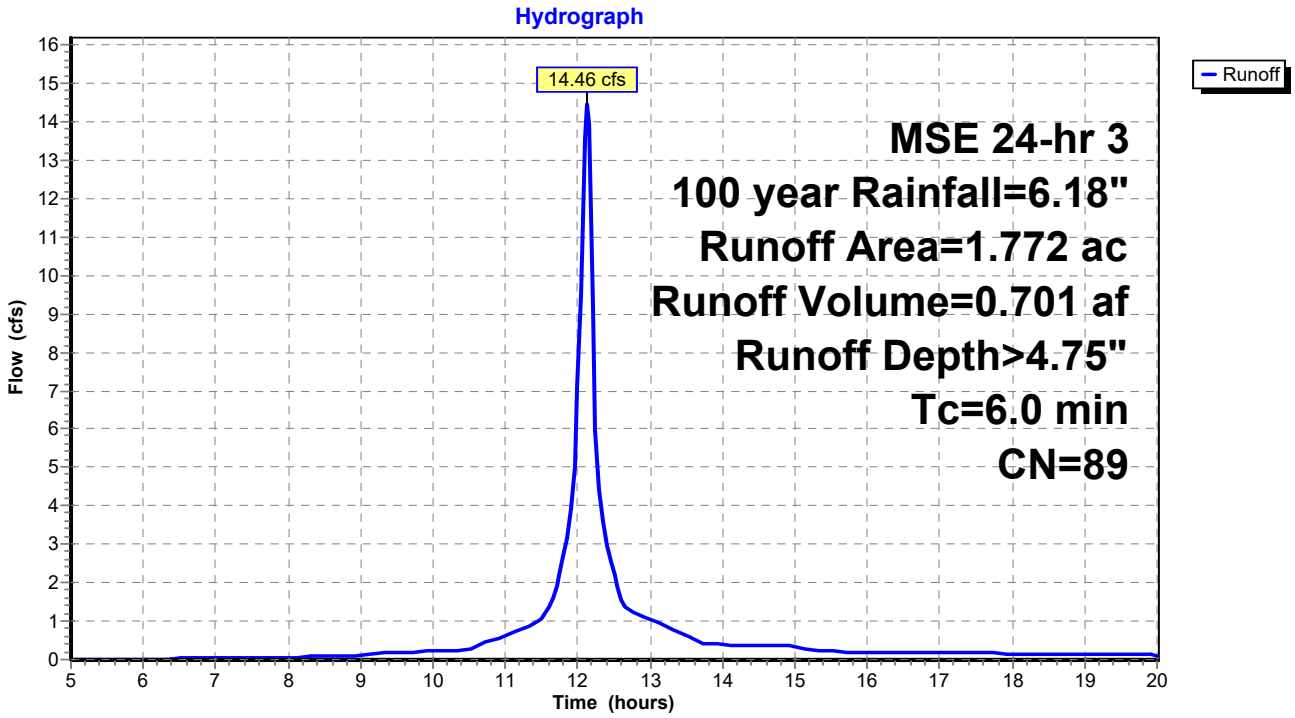
Runoff = 14.46 cfs @ 12.13 hrs, Volume= 0.701 af, Depth> 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

| Area (ac) | CN | Description |
|---|---|---|
| 1.361 | 98 | Paved parking, HSG B |
| 0.411 | 61 | >75% Grass cover, Good, HSG B |
| 1.772 | 89 | Weighted Average |
| 0.411 | | 23.19% Pervious Area |
| 1.361 | | 76.81% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 6.0 | | | | | **Direct Entry, Min TC** |

## Subcatchment PS-1: PROPOSED SUBCATCHMENT 1: TO POND



## Summary for Subcatchment PS-2: UNDETAINED

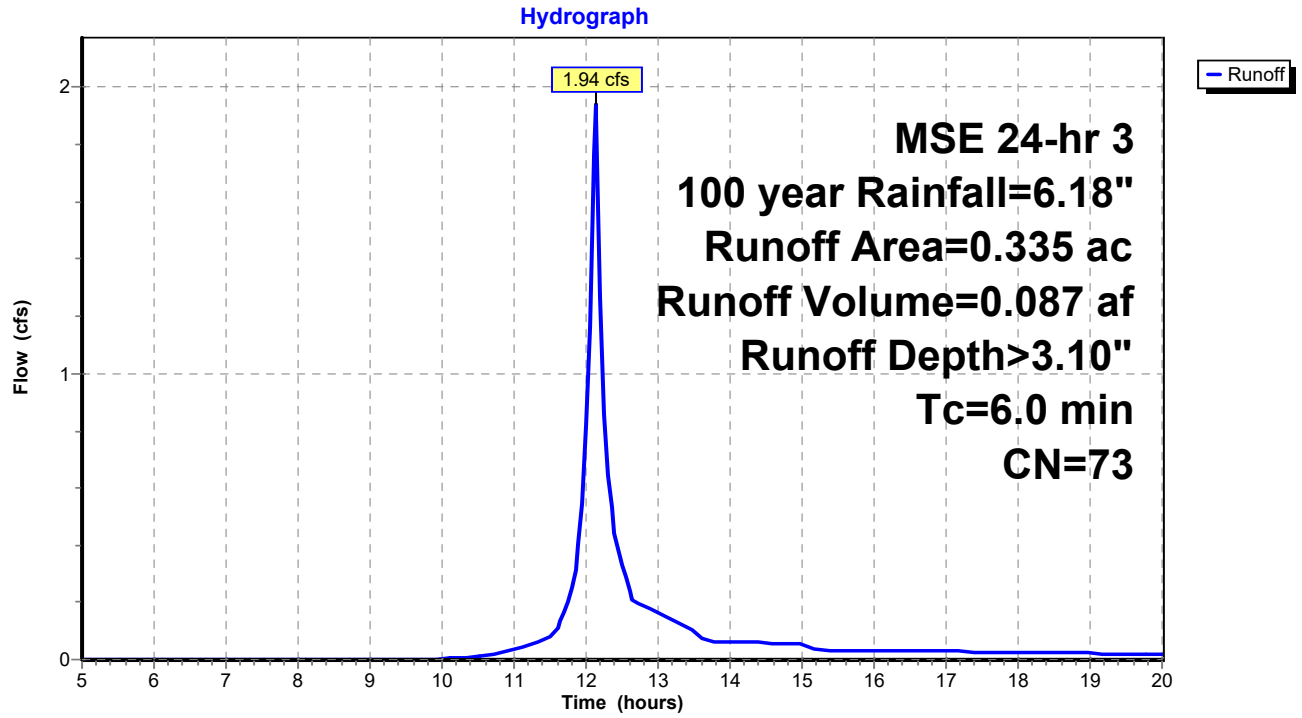
Runoff = 1.94 cfs @ 12.13 hrs, Volume= 0.087 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100 year Rainfall=6.18"

| Area (ac) | CN | Description |
|---|---|---|
| 0.228 | 61 | >75% Grass cover, Good, HSG B |
| 0.107 | 98 | Paved parking, HSG B |
| 0.335 | 73 | Weighted Average |
| 0.228 | | 68.06% Pervious Area |
| 0.107 | | 31.94% Impervious Area |

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

## Subcatchment PS-2: UNDETAINED

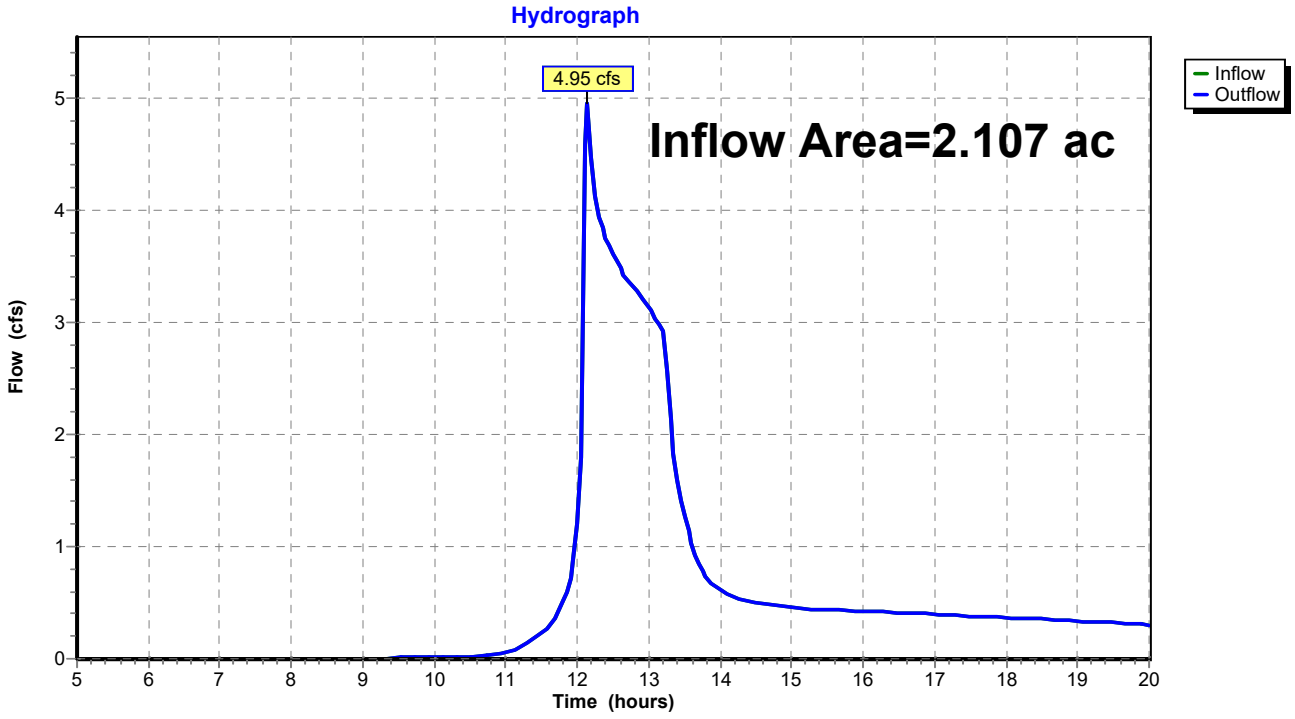


## Summary for Reach PR: TOTAL OUTFALL

Inflow Area = 2.107 ac, 69.67% Impervious, Inflow Depth > 3.73" for 100 year event
Inflow = 4.95 cfs @ 12.15 hrs, Volume= 0.656 af
Outflow = 4.95 cfs @ 12.15 hrs, Volume= 0.656 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

## Reach PR: TOTAL OUTFALL



## Summary for Pond 1P: STORM WATER POND

Inflow Area = 1.772 ac, 76.81% Impervious, Inflow Depth > 4.75" for 100 year event
Inflow = 14.46 cfs @ 12.13 hrs, Volume= 0.701 af
Outflow = 3.31 cfs @ 12.37 hrs, Volume= 0.569 af, Atten= 77%, Lag= 14.8 min
Primary = 3.31 cfs @ 12.37 hrs, Volume= 0.569 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 831.50' @ 12.37 hrs Surf.Area= 13,058 sf Storage= 15,991 cf

Plug-Flow detention time= 127.4 min calculated for 0.567 af (81% of inflow)
Center-of-Mass det. time= 85.5 min ( 842.8 - 757.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 829.50' | 35,686 cf | **Custom Stage Data (Prismatic)**Listed below (Recalc) |

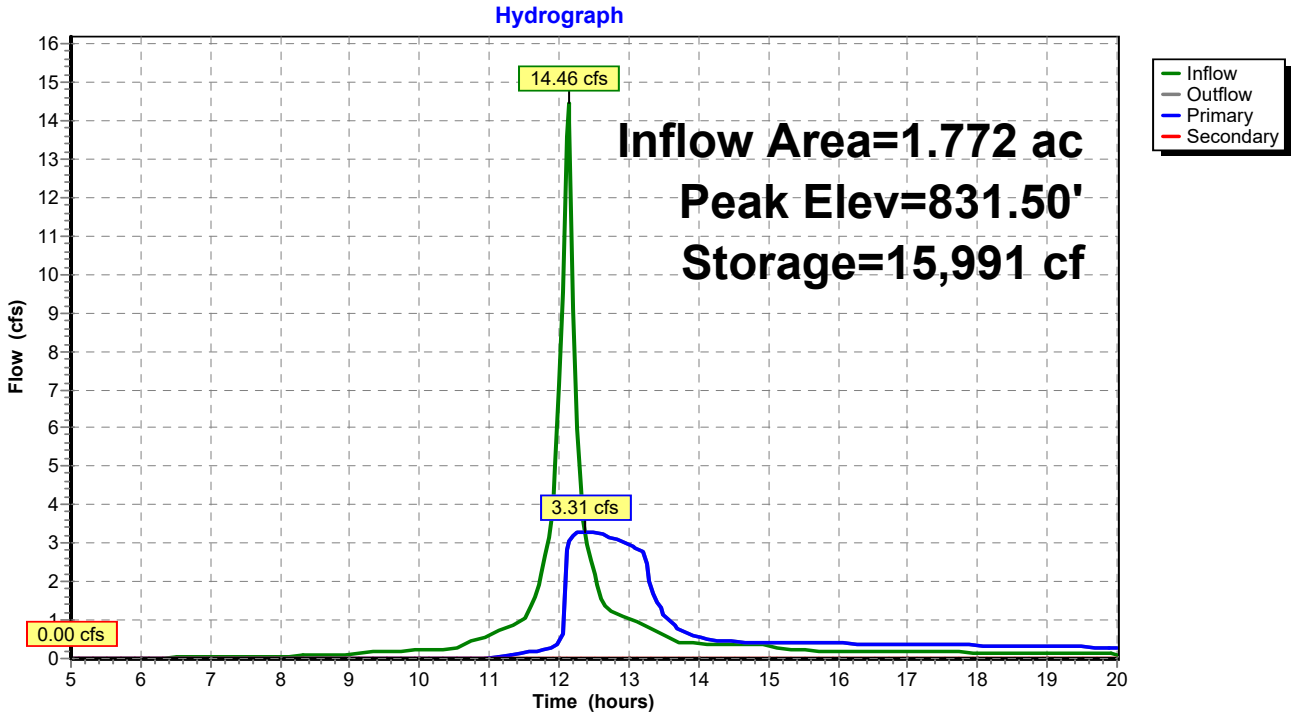
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 829.50 | 6,263 | 0 | 0 |
| 830.00 | 6,838 | 3,275 | 3,275 |
| 831.00 | 8,030 | 7,434 | 10,709 |
| 832.00 | 18,066 | 13,048 | 23,757 |
| 832.50 | 29,647 | 11,928 | 35,686 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 829.50' | **10.0" Round Culvert**<br>L= 19.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 829.50' / 829.00' S= 0.0263 '/' Cc= 0.900<br>n= 0.011, Flow Area= 0.55 sf |
| #2 | Device 1 | 829.50' | **1.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 829.80' | **4.0" Vert. Orifice/Grate** C= 0.600 |
| #4 | Device 1 | 830.80' | **24.0" Horiz. Orifice/Grate** C= 0.600<br>Limited to weir flow at low heads |
| #5 | Secondary | 831.50' | **10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

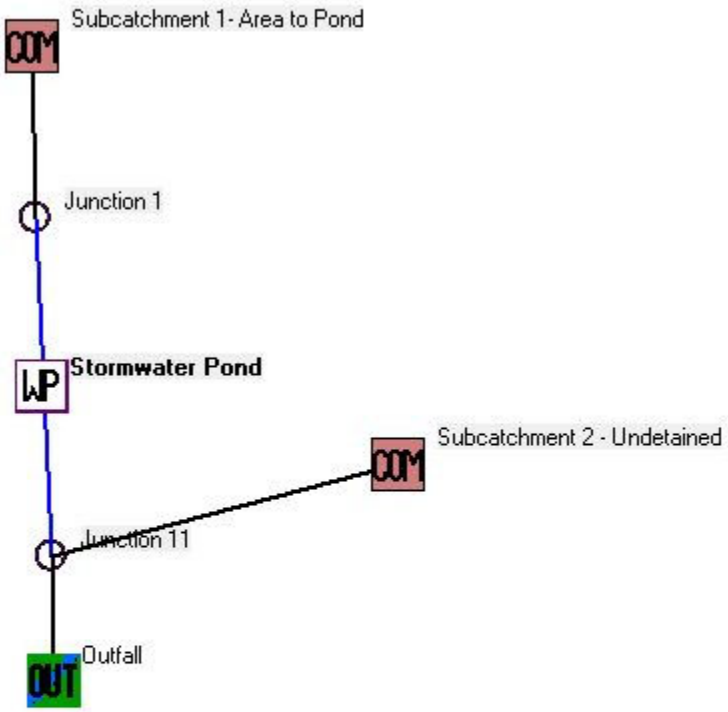
**Primary OutFlow** Max=3.30 cfs @ 12.37 hrs HW=831.50' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.30 cfs @ 6.06 fps)
  ├**2=Orifice/Grate** (Passes < 0.04 cfs potential flow)
  ├**3=Orifice/Grate** (Passes < 0.52 cfs potential flow)
  └**4=Orifice/Grate** (Passes < 12.03 cfs potential flow)

**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=829.50' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond 1P: STORM WATER POND



# WinSLAMM Schematic Diagram



Data file name: Z:\WinSLAMM\CJE2151R1.mdb
WinSLAMM Version 10.2.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.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_Com Inst Indust Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust 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:
Seed for random number generator: -42
Study period starting date: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/06 End of Winter Season: 03/28
Date: 09-20-2021 Time: 11:10:52
Site information:

LU# 1 - Commercial: Subcatchment 1- Area to Pond Total area (ac): 1.772
13 - Paved Parking 1: 1.361 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.411 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Commercial: Subcatchment 2 - Undetained Total area (ac): 0.335
13 - Paved Parking 1: 0.107 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.228 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - Stormwater Pond
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 3.5
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:
Outlet type: Orifice 1
1. Orifice diameter (ft): 0.08
2. Number of orifices: 1
3. Invert elevation above datum (ft): 3.5
Outlet type: Orifice 2
1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 3.8
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 5
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 5.5
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 2

2. Stand pipe height above datum (ft): 4.8

Pond stage and surface area

| Entry Number | Stage (ft) | Pond Area (acres) | Natural Seepage (in/hr) | Other Outflow (cfs) |
|---|---|---|---|---|
| 0 | 0.00 | 0.0000 | 0.00 | 0.00 |
| 1 | 0.01 | 0.0320 | 0.00 | 0.00 |
| 2 | 1.00 | 0.0440 | 0.00 | 0.00 |
| 3 | 2.00 | 0.0580 | 0.00 | 0.00 |
| 4 | 2.50 | 0.0640 | 0.00 | 0.00 |
| 5 | 3.00 | 0.1020 | 0.00 | 0.00 |
| 6 | 3.50 | 0.1440 | 0.00 | 0.00 |
| 7 | 4.00 | 0.1570 | 0.00 | 0.00 |
| 8 | 5.00 | 0.1840 | 0.00 | 0.00 |
| 9 | 6.00 | 0.4150 | 0.00 | 0.00 |
| 10 | 6.50 | 0.6810 | 0.00 | 0.00 |

SLAMM for Windows Version 10.2.0


Data file name: Z:\WinSLAMM\CJE2151R1.mdb
Data file description:
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.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_Com Inst Indust Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Start of Winter Season: 12/06 End of Winter Season: 03/28
Model Run Start Date: 01/05/69 Model Run End Date: 12/31/69
Date of run: 09-20-2021 Time of run: 11:08:43
Total Area Modeled (acres): 2.107
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: | 116131 | - | 132.8 | 962.8 | - |
| Outfall Total with Controls: | 115865 | 0.23% | 25.45 | 184.1 | 80.88% |
| Annualized Total After Outfall Controls: | 117474 | | | 186.6 | |

# 1220 S. Prairie Avenue
# Storm Water Management Practice Maintenance Agreement

Owner: _____

as "Owner" of the subject property, in accordance with the City of Waukesha agrees to install and maintain storm water management practice(s) on the subject property in accordance with approved plans and Storm Water Management Plan conditions. The owner further agrees to the terms stated in this document to ensure that the storm water management practice(s) continues serving the intended functions in perpetuity. This Agreement shall run with the Property and be binding upon all heirs, successors and assigns.

***Minimum Maintenance Requirements***:
To ensure the proper function of the storm water management facilities described above, the following activities must be completed:

1. All outlet pipes must be checked monthly to ensure there is no blockage from floating debris or ice. Any blockage must be removed immediately.
2. Grass buffer areas shall be preserved and maintained to allow free flowing of sheetflow surface runoff in accordance with approved grading plans. No grading or filling is allowed that may interrupt flows in any way.
3. Inlets and outlets must be checked after heavy rains (minimum of annually) for signs of erosion. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the downstream basin. Erosion matting is recommended for repairing grassed areas.
4. NO trees are to be planted or allowed to grow on the earthen berms. Tree root systems can reduce soil compaction and cause berm failure. The berms must be inspected annually and any woody vegetation removed.
5. If floating algae or weed growth becomes a nuisance (decay odors, etc.), it must be removed from the basin and deposited where it cannot drain back into the basin. Removal of the vegetation from the water reduces regrowth the following season (by harvesting the nutrients).
6. When sediment in the basin has accumulated to an elevation of two foot below the outlet elevation, it must be removed. All removed sediment must be placed in an appropriate upland disposal site and stabilized (grass cover) to prevent sediment from washing back into the basin. Failure to remove sediment will cause resuspension of previously trapped sediments and increase downstream deposition.
7. No grading or filling of the basin or berm other than for sediment removal is allowed, unless otherwise approved by the City of Waukesha.
8. Periodic mowing of the grass swales will encourage rigorous grass cover and allow better inspections for erosion. Waiting until after August 1 will avoid disturbing nesting wildlife. Mowing around the basin may attract nuisance populations of geese to the property and is not necessary or recommended.
9. Any other repair or maintenance needed to ensure the continued function of the storm water practices or as ordered by the City of Waukesha.