Erosion Control/Storm Water Management Maintenance/Operation Plan

For:

Premier Property Holdings LLC
1190 Gardner Park Road
Kronenwetter, WI 54455

Prepared By:

VREELAND ASSOCIATE
LAND SURVEYORS & ENGINEERS

6103 Dawn Street
Weston, WI 54476

Located in:

Village of Kronenwetter
Marathon County, WI

Dated:

November 21st, 2025

Revised:

February 5th, 2026

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Premier Property Holdings LLC
Village of Kronenwetter, Wisconsin

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Erosion Control/Storm Water Management
Maintenance and Operation Plan
for
Premier Property Holdings LLC

1.0 BACKGROUND & GENERAL INFORMATION

1.1 Introduction and Project Location

Vreeland Associates has been retained by Premier Property Holdings – Vinnie Tesch to perform storm water management calculations and prepare a storm water management plan per NR216.47 and NR151, for the proposed commercial buildings project. The project site is located at 1190 Gardner Park Road Kronenwetter, WI 54455. The project all of Parcel 1 of CSM 8726-34-104 located in part of the Southwest ¼ of the Southeast ¼ of Section 3, Township 27 North, Range 7 East, Village of Kronenwetter, Marathon County, Wisconsin.

1.2 Project Description

The proposed project consists of developing proposed 5.3 acres for commercial buildings and parking lot. The site will be graded for storm water management best management practices. (See Location Plan in **Appendix A**).

1.3 Project Requirements

The project area includes approximately 5.3 acres that will be disturbed. Since the disturbed area exceeds one acre, a Wisconsin Department of Natural Resources Notice of Intent application/permit (NOI-WPDES per WDNR) is required.

The storm water management plan for this project is developed in accordance with the NOI-WPDES requirements and NR216.47/NR151.121 for new development sites.

1.4 General Project Data

Soils
Based on existing soil mapping data from the Natural Resources Conservation Service (NRCS), the existing subgrade soils are expected to be Mahtomedi loamy sand, which are classified as hydrologic class “A”. Stormwater test pits were performed by Star Environmental. The test pits found to topsoil overlaying loam fine sand and sand. These test pits are consistent with NRCS. The determined limiting factor for stormwater infiltration was sand layer with an infiltration rate of 3.6 in/hr. The geotechnical data containing soil hydrologic classes are attached in **Appendix B**.

Groundwater
At the site of the proposed infiltration groundwater was not encountered. Groundwater will be well below the proposed project and will not be disturbed.

Wetlands
According to the Wisconsin DNR Wetlands and Wetlands Indicator map, there are not identified wetlands within the project limits.

2.0 EXISTING DRAINAGE CONDITIONS

2.1 Existing Drainage Area

The existing site consists of one sub-basin (E1). Sub-basin E1 contains existing woods, grass, buildings and gravel driveways. E1 generally flows to the south of the property. An existing drainage map can be found in **Appendix C.**

2.2 Existing Drainage Calculation Summary

Existing drainage calculations utilize TR-55 methodology and results for a 1, 2, 10, 25 and 100-year design storm are included. Existing drainage calculations are provided in **Appendix C.**

2.3 Existing Off-Site Drainage

Existing off-site storm water runoff draining onto the project site has been taken into consideration for the existing or proposed drainage evaluation.

3.0 PROPOSED DRAINAGE CONDITIONS

3.1 Proposed Drainage Areas

The proposed site is divided into 4 sub-basins (D1-D4). D1 consists of runoff from the proposed buildings, parking lot and lawn area. D1 is conveyed to the west and will flow to the south through a designed swale for infiltration and treatment. The swale will flow into 2P for treatment and rate control. D2 consists of runoff from the proposed building, parking lot and grass area. Runoff from D2 is conveyed in the middle of the property and will flow to the south through a designed swale for infiltration and treatment. The swale will flow into 2P for treatment and rate control. D3 consists of runoff from the proposed building, parking lot and lawn area. D3 is conveyed to the east and will flow to the south through a designed swale for infiltration and treatment. The swale will flow into 2P for treatment and rate control. D4 consists of runoff from roadway and lawn area. D4 is conveyed into the proposed infiltration basin between the two roadways for treatment and rate control. Runoff from D1-D4 and 2P is conveyed into the proposed stormwater detention basin (1P) for treatment and rate control. A proposed drainage area map is provided in **Appendix C.**

3.2 Post-Development Runoff Summary

Proposed drainage calculations utilize TR-55 methodology and results for a 1, 2, 10, 25 and 100-year design storm have been attached. A proposed drainage area map and calculations are provided in **Appendix D.**

3.3 Proposed Detention Areas

There are two proposed treatment and rate control devices for storm water management. 2P is a stormwater infiltration basin that will be used for infiltration purposes, total suspended solids removal and peak discharge control. Infiltration basin (2P) is located in the south side in the middle of the proposed project. The basin will utilize a storm sewer culvert as overflow to control the depth of water. 1P is a stormwater infiltration basin that will be used for infiltration purposes, total suspended solids removal and peak discharge control. Infiltration basin (1P) is located in the south side of Gardner Park Road of the proposed project. The basin will utilize a broad-crested weir as overflow to control the depth of water. An emergency overflow has been included for extreme storm events. See **Appendix C** detention basin volume calculations.

4.0 POST-DEVELOPMENT PERFORMANCE STANDARDS

4.1 Total Suspended Solids

1. According to NR151.122, BMPs shall be designed in accordance with Table 1, or to the maximum extent practicable. For new development projects Table 1 indicates that the total suspended solids load from parking areas and roads shall be reduced by 80 percent, based on an average annual rainfall, as compared to no runoff management controls.

The total suspended solids removal has been modeled in WinSLAMM version 10.5. According to the WinSLAMM modeling the expected TSS removal from the entire site is **94.60% (**excluding the proposed grass swales) the proposed design meets the requirements of NR151.122. See **Appendix D** for the WinSLAMM modeling inputs and outputs.

4.2 Infiltration

NR 151 requires that the post-development site infiltrate 90% of the pre-development runoff based on an average annual rainfall. Using WinSLAMM and HydroCAD the results show that the post-development site infiltrates **97.91%** of the average annual rainfall utilizing the swales and infiltration basin for infiltration. See **Appendix D** for input and output results using HydroCAD and WinSLAMM and soil report for measured infiltration.

4.3 Peak Discharge

According to NR151.123(1), BMPs shall be employed to maintain or reduce the peak runoff discharge rates, to the maximum extent practicable, as compared to pre-development conditions.

The pre-development and post-development peak rates of discharge leaving the site are summarized in the table below. See **Appendix C** for HydroCAD modeling routing diagrams, summaries, and node listings.

	Pre-Development	Post-Development
	Total (E1)	Total (2L)
1-year 24-hour Peak Flow	1.33 cfs	0.00 cfs
2-year 24-hour Peak Flow	1.54 cfs	0.00 cfs
10-year 24-hour Peak Flow	2.24 cfs	0.00 cfs
25-year 24-hour Peak Flow	2.73 cfs	0.00 cfs
100-year 24-hour Peak Flow	3.77 cfs	1.80 cfs

4.4 Protective Area

According to NR151.125(4)(e) areas of post-construction sites from which the runoff does not enter the surface water, including wetlands, without first being treated by a BMP to meet the requirements of 151.122 to 151.123, are exempt from meeting the requirements of the Protective Areas performance standards. Not applicable.

4.5 Summary

The modeling of this site shows that the requirements set by the Department of Natural Resources for total suspended solids, peak discharge, and infiltration can all be met with the proposed design.

The Storm Water Management Plan shows basic compliance with accepted engineering practice in hydrology planning and design. The resulting development will function as a positive addition to the community while sustaining environmental benefits in storm water management and quality.

5.0 CONSTRUCTION SITE PERFORMANCE STANDARDS

5.1 Erosion Control

The purpose of this control plan is to provide guidelines that comply with the state and local requirements, as well as to make recommendations regarding erosion control and storm water management. The construction of this development is a critical phase in terms of storm water management and runoff control. Construction site erosion control will help minimize the impact of development, enhance and protect local environment, and protect the surrounding project area by applying best management practices for erosion control at construction sites. This work shall be planned and executed in accordance with the Wisconsin Department of Natural Resources Storm Water Management Technical Standards and/or accepted local engineering practice. The owner/developer will be responsible for erosion control during the process of construction. Silt fence, site vegetation, inlet protection, tracking pad, and erosion mat will be utilized to keep sediment from leaving the construction site.

5.2 Construction Site Erosion Control Measures

The following erosion control devices may be used on the project site at any time during the construction phases to ensure the compliance with NR 216 and local erosion control requirements, as applicable.

a) Silt Fence (WDNR 1056)

Continuous silt fencing will be required along all areas downstream of disturbed area, and around the base of all stockpiled material subject to sediment transportation during rain fall events (stockpiled topsoil, gravel base, etc.). The silt fencing will provide a siltation barrier between the disturbed area and any inlets and ultimately downstream water bodies. All silt fence shall be removed upon completion of the project or when disturbed areas have generated sufficient vegetation to prevent erosion and the threat of sediment reaching inlets and bodies of water.

b) Site Vegetation

Existing site vegetation outside of project limits shall be protected and maintained to the maximum extent practicable. Existing site vegetation within the project limits shall remain undisturbed until construction schedule warrants disturbance. For disturbed areas vegetation that resists erosion, maintains slow storm water velocities, and retains sediment from runoff shall be provided by the contractor. Temporary seeding may be required for disturbed areas that are subject to long periods of construction inactivity. Temporary vegetation is used when areas are disturbed and may remain unfinished long enough to allow vegetation to grow and assist with erosion control. Permanent vegetation is encouraged as soon as possible in the construction process.

c) Tracking Pad (WDNR 1057)

Stone tracking pads will be constructed at all entrances to the construction site to minimize sediment tracking onto existing streets. A minimum of one construction entrance is required for the project site. Tracking pads are temporary and will be removed or much of the aggregate will be removed before the site is completed.

d) Non-channel Erosion Mat (WDNR 1052)

The purpose of this practice is to protect the soil surface from the erosive effect of rainfall and prevent sheet erosion during the establishment of grass or other vegetation, and to reduce soil moisture loss due to evaporation. This practice applies to both Erosion Control Re-vegetative Mats (ECRM) and Turf-Reinforcement Mats (TRM).

1. CLASS I: A short-term duration (minimum of 6 months), light duty, organic mat with photodegradable plastic or biodegradable netting.

a. Type A – Use on erodible slopes 2.5:1 or flatter.

b. Type B – Double netted product for use on erodible slopes 2:1 or flatter.

e) Temporary Ditch Check (WDNR 1062)

Temporary Ditch Checks are used to create a temporary dam across a swale or drainage ditch to reduce the velocity of water flowing through the channel. The reduction in velocity reduces active channel erosion and promotes settling of suspended solids. They are composed of straw or wood fibers that are tightly compacted in a fiber mesh tubular cylinder.

f) Waste and Material Disposal

All waste and unused building materials (including garbage, debris, cleaning wastes, or other construction materials) shall be properly disposed of and not allowed to be carried by runoff into a receiving channel or inlet.

5.3 Operation and Maintenance, Short-term

The OWNER of this project is directly responsible for implementation and maintenance of the construction site erosion control measures.

The Contractor shall conduct the following inspections:
- Weekly inspections of implemented erosion and sediment controls.
- Inspections of erosion and sediment controls within 24 hours after precipitation event 0.5 inches or greater which results in runoff during active construction periods.

The Contractor shall maintain weekly written reports of all inspections that include:
- The date, time, and exact place of the inspection.
- The name of the individual who performed the inspection.
- An assessment of the condition of erosion and sediment controls.
- A description of any erosion and sediment control implementation and maintenance performed.
- A description of the present phase of construction at the site.

Repairs shall be made immediately, as required, to maintain effectiveness, until permanent vegetation is established. All repairs to erosion control devices shall be documented on the Wisconsin Department of Natural Resources Construction Site Inspection Report (Form 3400-187). A copy of Form 3400-187 can be found in **Appendix F**.

5.4 Operation and Maintenance, Long-term

The OWNER of this project is directly responsible for the operation, inspection, and maintenance of all storm water facilities located within the project site, as described below.

- Infiltration Basin:
  Inspection: Look for accumulation of sediment and/or debris in basin and riprap. Length of time water is retained in basin. Look for erosion or damage. Review plant health; look for weeds and grasses encroaching on plants.
  Maintenance: Remove accumulated sediment deposits and/or debris in basin and riprap and repair any eroded or damaged grass areas. Remove any identified weeds or grasses. Do not plow/store snow in bio-retention basin. Annually mow the side slopes to reduce brush and other large root vegetation that may weaken the berms. Once every five years, deep-till infiltration basin promotes infiltration.

- Grass Swale:
  Inspection: Look for accumulation of sediment and/or debris in pond and riprap. Look for erosion or damage. Review plant/grass health.
  Maintenance: Remove accumulated sediment deposits and/or debris in swale and riprap and repair any eroded or damaged grass areas. If water is retained for more than 24-48 hours after a storm event, replace topsoil by removing the top 6" of topsoil, tilling bottom of basin, installing new topsoil and restoring grass in basin.

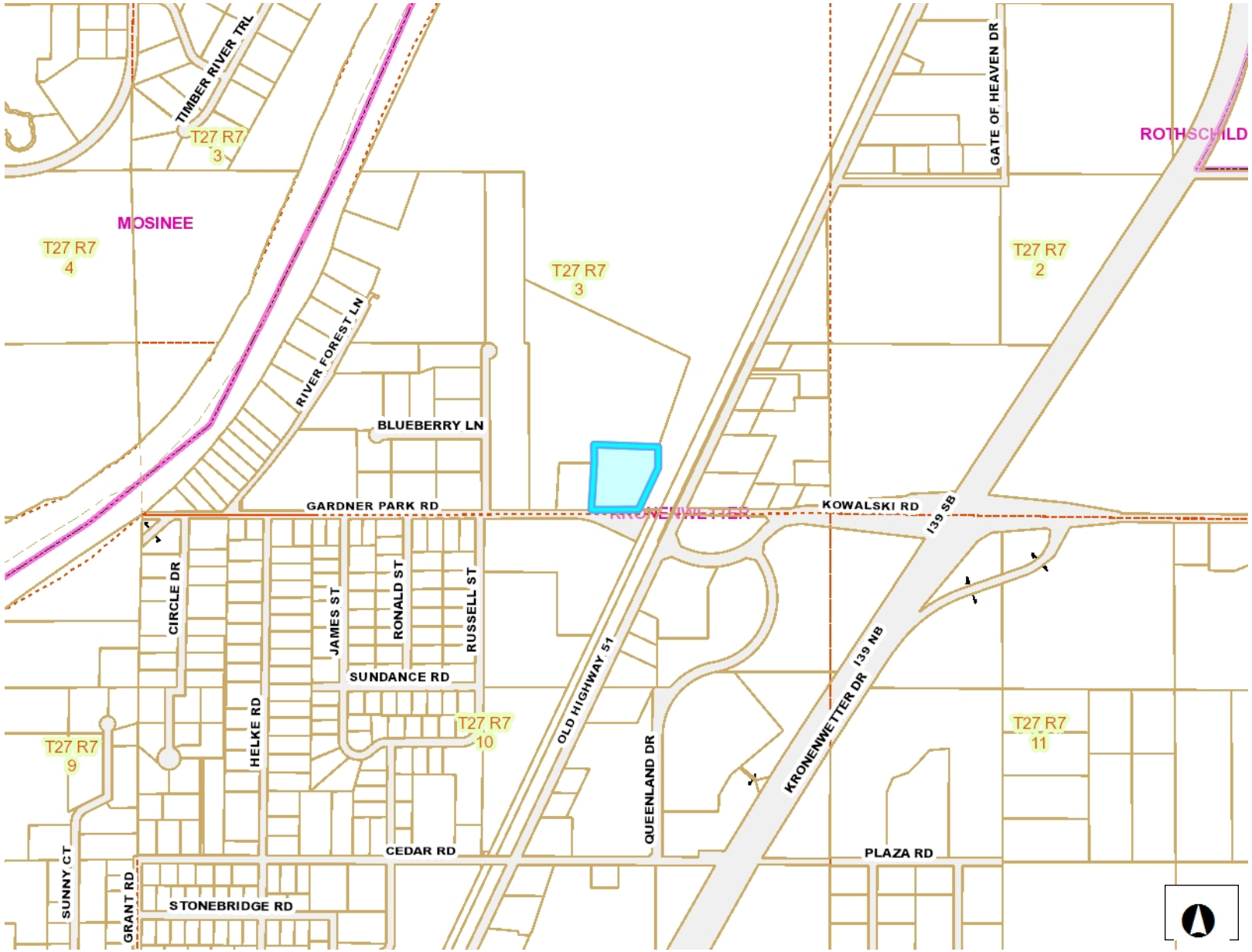
6.0 SOIL AND SEDIMENT LOSS DISCHARGE

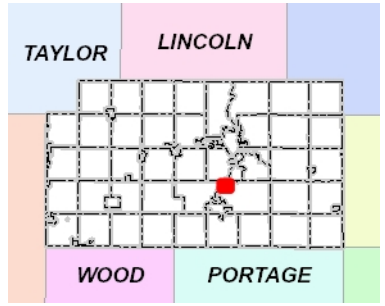
The Wisconsin DNR requires that all construction sites must lose less than 5 tons per acre of sediment during the construction of the project. The DNR Soil Loss & Sediment Discharge Calculation Tool version 2.0 was used to determine the construction site sediment discharge. Using the worst-case scenario of a fully disturbed site and the maximum possible flow length, the calculations show that the soil loss is 4.7 tons/acre and the sediment discharge is 2.6 tons/acre. This assumes silt fence sediment control practices. This meets the DNR requirements. Calculations are shown in **Appendix E**. Soil Loss map shows the worst case scenario.

APPENDIX A

Location Map

Land Information Mapping System





Legend

- Road Names
- Parcels
- Parcel Lot Lines
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- Section Lines/Numbers
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- Municipalities

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Notes

APPENDIX B

Geotechnical Data

SOIL EVALUATION FOR STORMWATER

ON THE

PREMIER PROPERTY HOLDINGS, LLC PROPERTY

VILLAGE OF KRONENWETTER

MARATHON COUNTY

WISCONSIN

Prepared for:

Mr. Vinnie Tesch
Premier Property Holdings, LLC
2210 River Forest Lane
Kronenwetter, WI 54455

December 12, 2025

Prepared by:

BRIAN CAMLEK
CERTIFIED PROFESSIONAL SOIL SCIENTIST
WDNR PROFESSIONALLY ASSURED WETLAND DELINEATOR
CERTIFIED SOIL TESTER

ALEX J. BLUME
CERTIFIED PROFESSIONAL SOIL SCIENTIST
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December 12, 2025

Mr. Vinnie Tesch
Premier Property Holdings, LLC
2210 River Forest Lane
Kronenwetter, WI 54455

RE: Soils Evaluation for Stormwater on the Premier Property Holdings, LLC Property, located in the SW1/4, SE1/4, Sec. 3, T.27N-R.7E., Village of Kronenwetter, Marathon County, Wisconsin.

The Soils Evaluation for Stormwater and Stormwater Report on Premier Property Holdings, LLC property has been completed and is enclosed for your review.

If you have any questions or concerns on the report or project, please call me. Thank you.

Sincerely,

Brian Camlek
Certified Professional Soil Scientist
WDNR Professionally Assured Wetland Delineator
Certified Soil Tester
Star Environmental, Inc.

Enclosures

SOIL EVALUATION FOR STORMWATER
ON THE
PREMIER PROPERTY HOLDINGS, LLC PROPERTY

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SOILS EVALUATION FOR STORMWATER
ON THE PREMIER PROPERTY HOLDINGS, LLC PROPERTY

Introduction

On October 9, 2025, Star Environmental, Inc. conducted a Soils Evaluation for Stormwater on the Premier Property Holdings, LLC Property, located in part of the SW1/4, SE1/4, Sec. 3, T.27N-R.7E., Village of Kronenwetter, Marathon County, Wisconsin.

Methods

Soils Evaluation techniques used, followed the USDA-NRCS soil descriptive system. The property was subjected to an initial site screening and preliminary survey using the project plan map, recent aerial photographs, and soils maps.

Soil Pit 1 and 2 were described to determine soil limitations and hydraulic application rate for WDNR Storm Water Infiltration Practices, depth to groundwater and bedrock.

On October 9, 2025, Mr. Brian Camlek and Mr. Alex J. Blume, both Certified Professional Soil Scientists, Certified Soil Testers, and WDNR Professionally Assured Wetland Delineators, of Star Environmental, Inc. evaluated the soil backhoe pit excavated by Mr. Vinnie Tesch utilizing a Cat 304 Excavator.

Soil was classified for engineering properties, depth to >50 percent rock fragments, percent fines in each profile, depth to groundwater present, estimated high zone of soil saturation and notes on the geomorphologic landscape position were recorded.

Geomorphologic Landscape Position

This project site's geomorphologic landscape position would be classified as an outwash plain controlled upland.

Depth to Bedrock

Bedrock or >50% rock was not present to the depth of the pit or greater than 125 inches.

Hydrology

Per the WDNR Surface Water Data Viewer, the closest navigable waterbody is the Wisconsin River, located 2,600 feet north west of the site.

Hydrology (continued)

Redoximorphic soil features were not observed to the depth of the soil pits, or greater than 125 inches in both TP-1 and TP-2.

The Antecedent Precipitation Tool (APT) shows that the hydrologic determination is normal for this time of year. (Attachment 3).

Soils

Per the USDA-NRCS Soil Survey, soil pits were in the excessively drained Mahtomedi Loamy Sand Soil Series, an Oxyaquic Glossudalf. The Freeon soil series consists loess or silty lacustrine deposits over dense sandy loam till. The soils present onsite have outwash sands and gravel beneath the silt cap indicating a differing soil mapping unit is present.

History

This site has been historically manipulated multiple times throughout history. Currently the site is used as a staging area for a landscaping business. A house was located in the south east portion of the property but has since been removed.

Conclusion and Recommendations

The apparent groundwater table, or endosaturation was not observed to the depth of both soil pits 1 and 2 or greater than 125 inches.

Bedrock or greater than 50% rock was not encountered to the depth of the soil pits or greater than 125 inches.

This Soils Evaluation for Stormwater Report should be beneficial in determining suitable stormwater practices per the guidelines established by the Wisconsin Department of Natural Resources (WDNR).

This report, conclusion and recommendations are the professional opinion of Brian Camlek and Alex J. Blume, both Certified Professional Soil Scientists, Certified Soil Testers, and WDNR Professionally Assured Wetland Delineators.

December 12, 2025

Brian Camlek
Certified Professional Soil Scientist
WDNR Professionally Assured Wetland Delineator
Certified Soil Tester

December 12, 2025

Alex J. Blume
Certified Professional Soil Scientist
WDNR Professionally Assured Wetland Delineator
Certified Soil Tester

References Cited

1. United States Department of Agriculture. 1989. *Soil Survey of Marathon County, Wisconsin*. 217 pp. and appendices and maps.

2. Chapter NR 151 – Wisconsin Runoff Management, May 2013. 32 pp.

3. Evaluation for Storm Water Infiltration – Technical Standard (1002). September 2017.

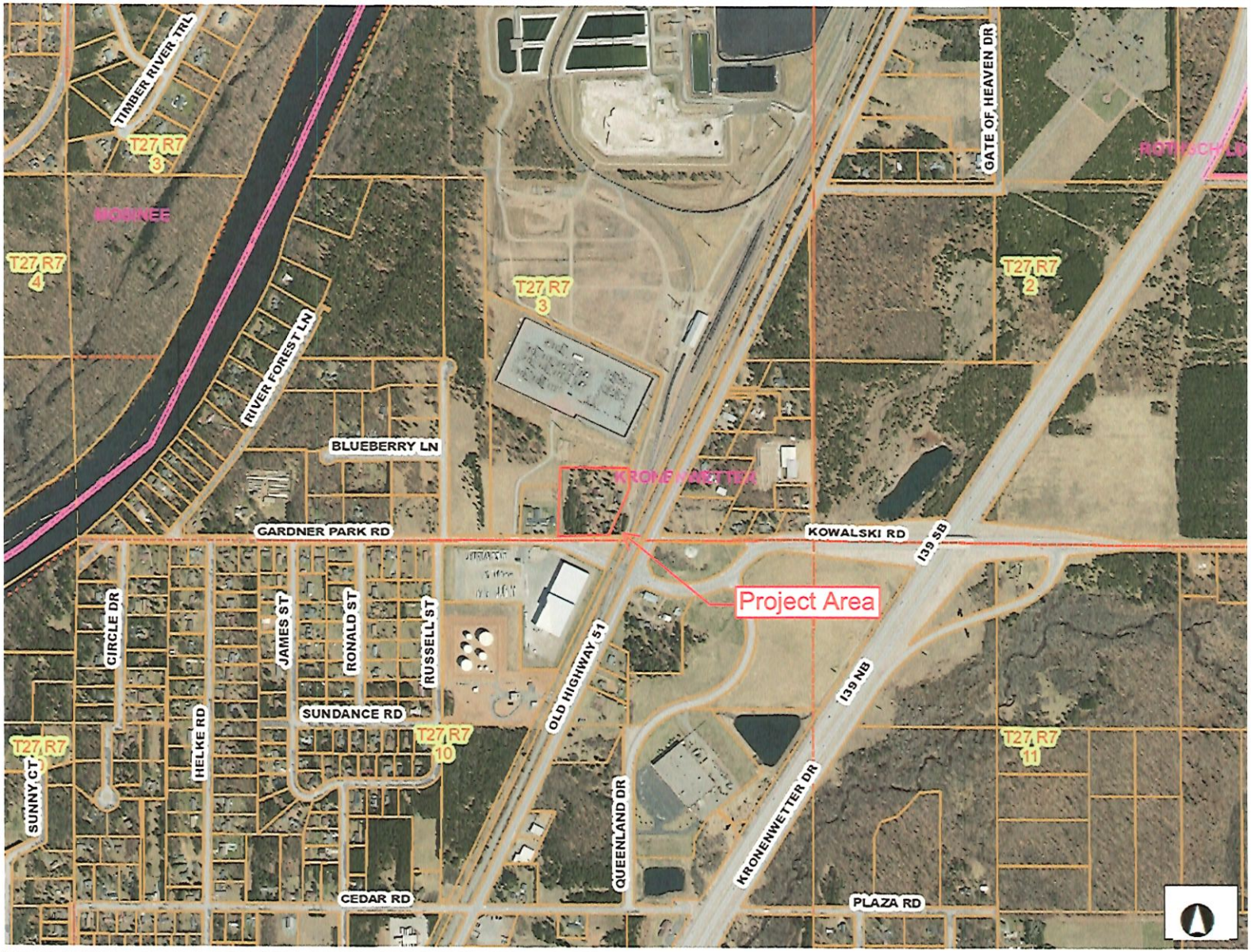
ATTACHMENT 1

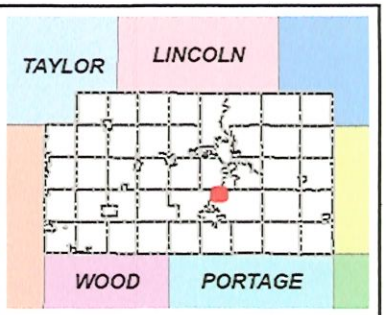
PROJECT SITE MAPS

Figure 1 – Location Map
Figure 2 – Marathon County Soil Survey Map
Figure 3 – Marathon County Soil Survey Legend
Figure 4 – Surface Water Data Viewer Map
Figure 5 – Marathon County Topographic Map
Figure 6 – Soil Pit Location Map

Land Information Mapping System

Location Map





Legend

- Road Names
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- 2020 Orthos Countywide
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3

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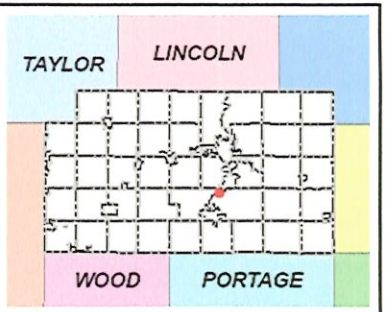
Notes

Figure 1

Land Information Mapping System

Soil Map



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Notes

Figure 2

Marathon County Soil Legend

Map Symbol	Soil Name
AbB	Alban loam, 1 to 6 percent slopes
Ad	Altdorf mucky silt loam, 0 to 2 percent slopes
AmC	Amery silt loam, 5 to 15 percent slopes
CbA	Cable silt loam, 0 to 3 percent slopes, stony
Ch	Cathro muck, 0 to 1 percent slopes
CkA	Chetek sandy loam, 0 to 2 percent slopes
CkB	Chetek sandy loam, 2 to 6 percent slopes
CkC	Chetek sandy loam, 6 to 15 percent slopes|
CkE	Chetek sandy loam, 15 to 30 percent slopes
Da	Dancy sandy loam, 0 to 2 percent slopes
DoA	Dolph silt loam, 0 to 3 percent slopes
DuB	Dunnville fine sandy loam, 1 to 4 percent slopes
FeC	Fenwood silt loam, 6 to 12 percent slopes
FeD	Fenwood silt loam, 12 to 20 percent slopes
FfC	Fenwood silt loam, 2 to 15 percent slopes, stony
FfE	Fenwood silt loam, 15 to 30 percent slopes, stony
FgB	Fenwood-Rozellville silt loams, 2 to 6 percent slopes
Fh	Fordum silt loam, 0 to 1 percent slopes
FnB	Freeon silt loam, 2 to 6 percent slopes
FnC	Freeon silt loam, 6 to 12 percent slopes
GcB	Graycalm loamy sand, 2 to 6 percent slopes
Gm	Graycalm loamy sand, moderately well drained, 0 to 2 percent slopes
Gr	Greenwood peat, 0 to 1 percent slopes
GuB	Guenther loamy sand, 2 to 6 percent slopes
HtB	Hatley silt loam, 1 to 6 percent slopes
HyB	Hatley cobbly silt loam, 1 to 6 percent slopes, boulder
KaB	Kennan sandy loam, 2 to 8 percent slopes
KaC	Kennan sandy loam, 8 to 15 percent slopes
KaD2	Kennan sandy loam, 15 to 30 percent slopes, eroded
KeB	Kennan sandy loam, 2 to 8 percent slopes, boulder
KeC	Kennan sandy loam, 8 to 15 percent slopes, boulder
KeE	Kennan sandy loam, 15 to 30 percent slopes, boulder
LDF	Landfill
LoB	Loyal silt loam, 1 to 6 percent slopes
LoC	Loyal silt loam, 6 to 12 percent slopes
MaB	Magnor silt loam, 0 to 4 percent slopes
MbB	Mahtomedi loamy sand, 0 to 6 percent slopes
MbC	Mahtomedi loamy sand, 6 to 15 percent slopes
MbE	Mahtomedi loamy sand, 15 to 45 percent slopes
McA	Mahtomedi loamy sand, moderately well drained, 0 to 3 percent slopes
MdB	Marathon silt loam, 2 to 6 percent slopes
MdC	Marathon silt loam, 6 to 12 percent slopes
MeC	Marathon silt loam, 2 to 15 percent slopes, stony
MfA	Marshfield silt loam, 0 to 3 percent slopes
MgA	Meadland loam, 0 to 3 percent slopes
MhA	Meadland loam, 0 to 3 percent slopes, stony
Mm	Meehan loamy sand, 0 to 2 percent slopes
Mn	Minocqua sandy loam, 0 to 2 percent slopes
MoB	Moberg gravelly silt loam, 2 to 6 percent slopes
MoC	Moberg gravelly silt loam, 6 to 15 percent slopes
MsB	Mosinee sandy loam, 2 to 6 percent slopes
MsC	Mosinee sandy loam, 6 to 12 percent slopes
MsD	Mosinee sandy loam, 12 to 20 percent slopes
MtC	Mosinee sandy loam, 2 to 15 percent slopes, stony
MyB	Myrea silt loam, 1 to 6 percent slopes
MzB	Myrea silt loam, 1 to 6 percent slopes, stony
Ne	Newson mucky loamy sand, 0 to 1 percent slopes
Oe	Oesterle loam, 0 to 2 percent slopes
Pg	Pits, gravel
Ph	Pits, quarries
Po	Plover sandy loam, 0 to 2 percent slopes
RbC	Ribhill cobbly silt loam, 6 to 15 percent slopes
RbE	Ribhill cobbly silt loam, 15 to 30 percent slopes, stony
RcB	Rietbrock silt loam, 1 to 8 percent slopes, stony
ReB	Rietbrock silt loam, 1 to 8 percent slopes
RhA	Rockers loamy sand, 0 to 3 percent slopes
RoA	Rosholt sandy loam, 0 to 2 percent slopes
RoB	Rosholt sandy loam, 2 to 6 percent slopes
RsA	Rosholt silt loam, 0 to 2 percent slopes
RsB	Rosholt silt loam, 2 to 6 percent slopes
ScA	Scott Lake sandy loam, 0 to 3 percent slopes
SdA	Scott Lake silt loam, 0 to 3 percent slopes
Se	Seelyeville muck, 0 to 1 percent slopes
ShA	Sherry silt loam, 0 to 3 percent slopes
St	Sturgeon silt loam, 0 to 2 percent slopes
UoB	Udorthents, loamy, gently sloping
UoE	Udorthents, loamy, steep (earthen dam)
WtA, WtB	Withee silt loam 0 to 3 percent slopes

Figure 3

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Legend: (some map layers may not be displayed)

Notes:

Map projection: NAD 1983 HARN Wisconsin TM

N

Map: 0 175 350 Feet
0 50 100 Meters

Service Layer Credits:
Wetland Indicators & Soils^: Surface Water Data Viewer Team, Latest Leaf Off: , DNR Basic Feature Vector Tile Layer WTM: , Surface Water (Cached): WiDNR, USGS, and other data, Wetland Inventory NWI (Dynamic): Calvin Lawrence, Dennis Weise, Nina Rihn

Figure 4

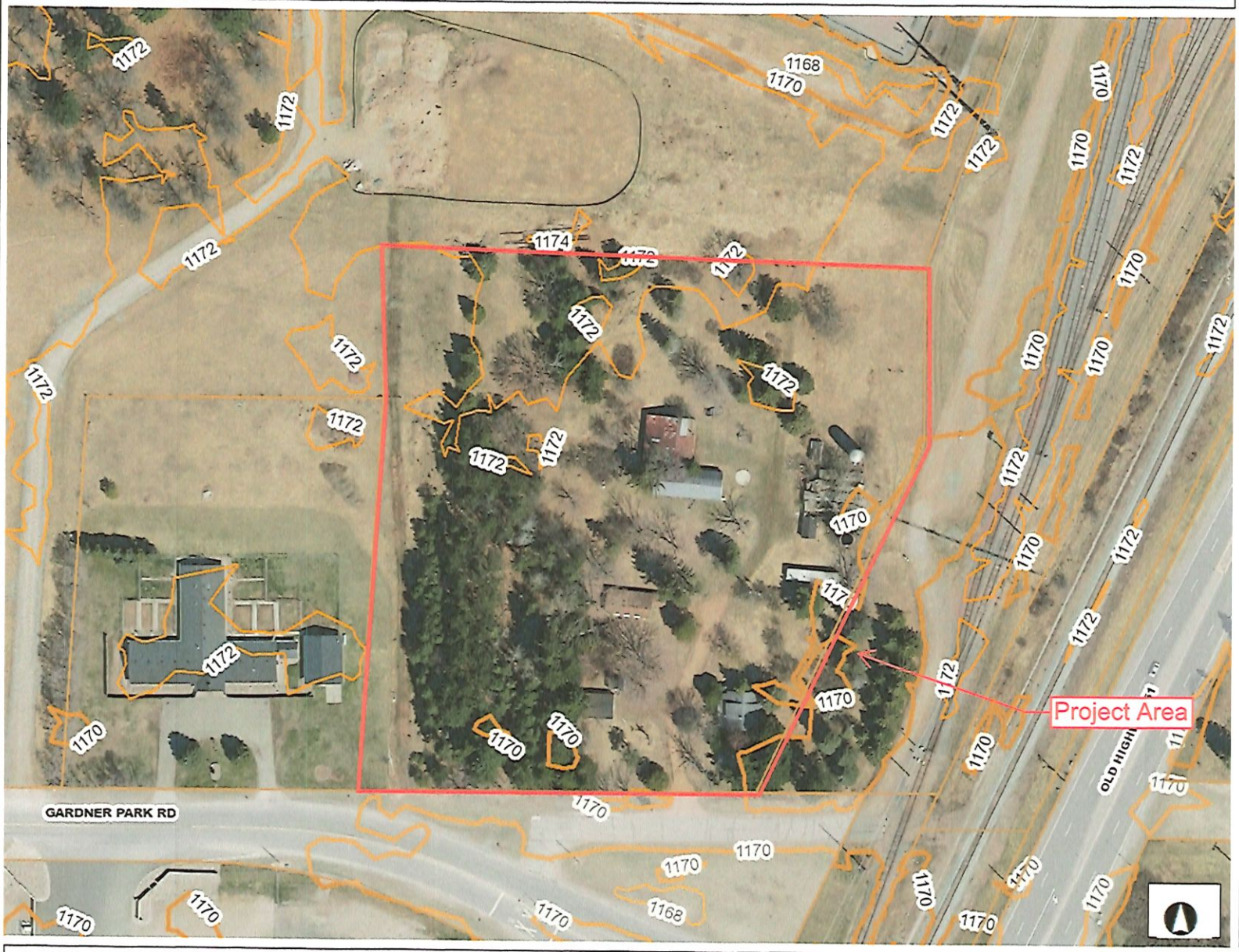
This map is a product generated by a DNR web mapping application.

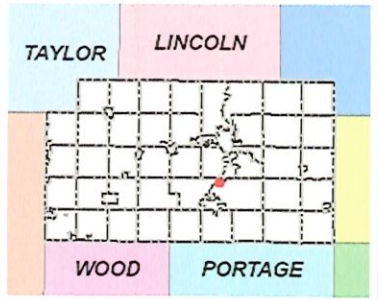
This map is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. The user is solely responsible for verifying the accuracy of information before using for any purpose. By using this product for any purpose user agrees to be bound by all disclaimers found here: https://dnr.wisconsin.gov/legal.

Date Printed: 12/12/2025 11:45 AM

Land Information Mapping System

Topographic Map





Legend

- Road Names
- Parcels
- Parcel Lot Lines
- Land Hooks
- Right Of Ways
- Named Places
- Municipalities
- 2ft Contour Labels
- County-wide 2ft Contours (2012)
  - Index
  - Intermediate
- 2020 Orthos Countywide
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3

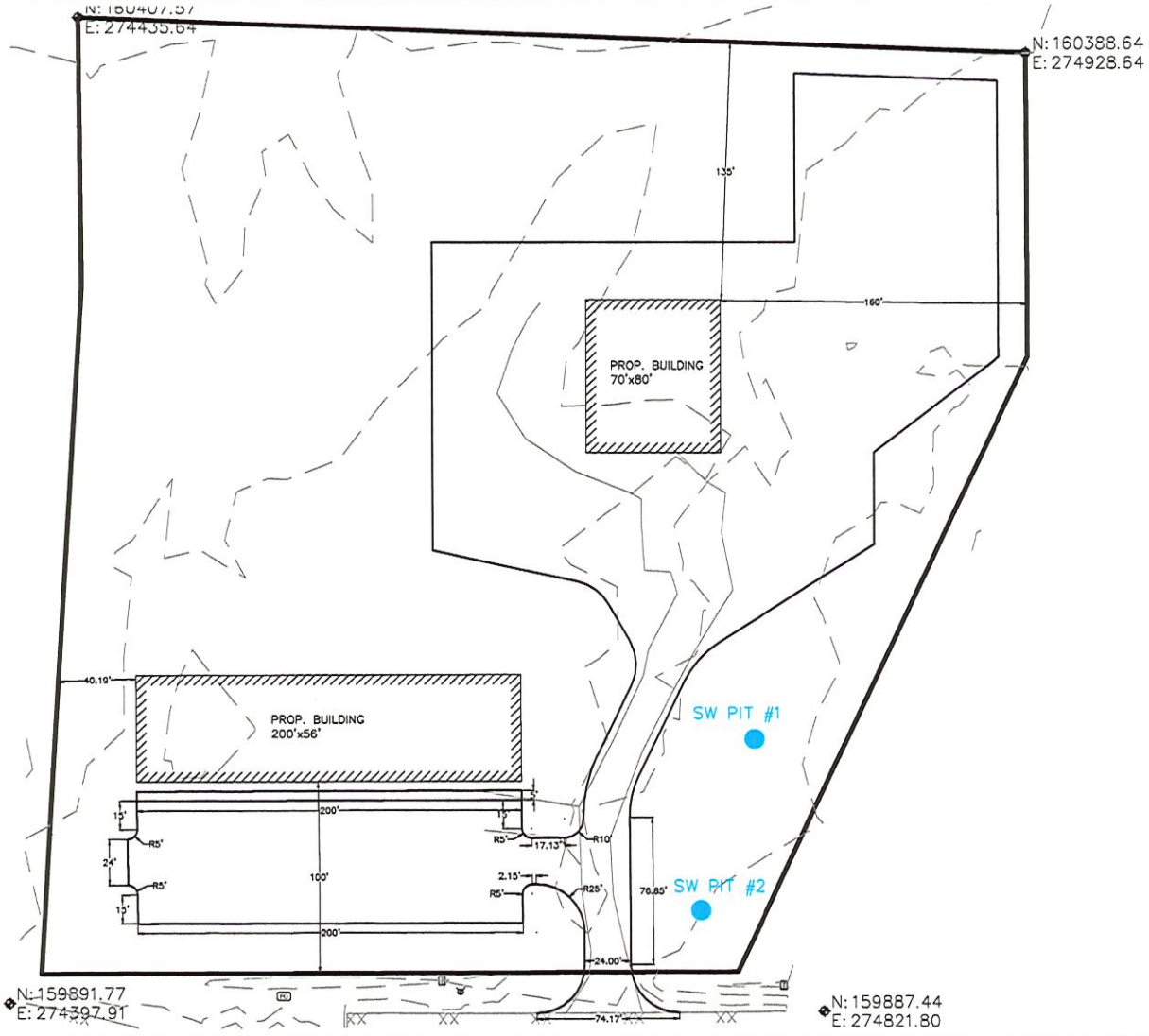
66.74 0 66.74 Feet

NAD_1983_HARN_WISCRS_Marathon_County_Feet

DISCLAIMER: The information and depictions herein are for informational purposes and Marathon County-City of Wausau specifically disclaims accuracy in this reproduction and specifically admonishes and advises that if specific and precise accuracy is required, the same should be determined by procurement of certified maps, surveys, plats, Flood Insurance Studies, or other official means. Marathon County-City of Wausau will not be responsible for any damages which result from third party use of the information and depictions herein or for use which ignores this warning.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Figure 5



STAMP/SIGNATURE:

REVISIONS		
BY	DATE	DESCRIPTION

TITLE PAGE:

STORMWATER PIT MAP

PROJECT: PREMIER PROPERTY DEVELOPMENT

LOCATION: VILLAGE OF KRONENWETTER
MARATHON COUNTY, WISCONSIN

VREELAND ASSOCIATES LAND SURVEYORS & ENGINEERS
6103 DAWN STREET WESTON, WI. 54476
PHONE NO.: (715) 241-0947
EMAIL: dustin@vreelandassociates.us
WEBSITE: www.vreelandlandsurveying.com

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PREPARED FOR: GREG TESCH

PLAN DATE: OCTOBER 6TH, 2025

DESIGNER: DUSTIN VREELAND
SURVEYED BY: CS & TV
FILE NO.: 25-0410 ENGINEERING
DATE: SEPTEMBER 15, 2025
SCALE: 1" = 60'
SHEET PIT

ATTACHMENT 2

SOIL PIT LOGS

Soil Evaluation -- Storm Logs
Soil Pits Logs Summary Table
WDNR Stormwater Tables

Attachment 2:

SOIL AND SITE EVALUATION – STORM

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

1002-CPS-23
Division of Industry Services
P. O. Box 2658
Madison, Wisconsin 53701
Scott Walker, Governor
Laura Gutierrez, Secretary

Attach a complete site plan on paper not less than 8 ½ x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent of slope, scale or dimensions, north arrow, and BM referenced to nearest road

Please print all information

Personal information you provide may be used for secondary purposes (Privacy Law, s. 15.04(1)(m))

County	Marathon
Parcel I.D.	145-2707-034-0972
Reviewed by	Date

Property Owner: Premier Property Holdings LLC, CO Vinnie Tesch	Property Location: [x] SW 1/4 SE 1/4 S 3 T 27 N R 7 E (or) W
Property Owner's Mailing Address: 2210 River Forest Lane	Lot # / Block # / Subd. Name or CSM#
City: Kronenwetter; State: WI; Zip Code: 54455; Phone Number: -	[ ] City [x] Village [ ] Town: Kronenwetter; Nearest Road: 1190 Gardner Park Road

Drainage area _____ [ ] sq. ft. [ ] acres

Test site suitable for (check all that apply): [ ] Site not suitable;

[ ] Bioretention; [ ] Subsurface Dispersal System;

[ ] Resuse; [ ] Irrigation; [ ] Other _____

Hydraulic Application Test Method

[x] Morphological Evaluation

[ ] Double Ring Infiltrometer

[ ] Other: (specify) _____

Soil Moisture

Date of soil Borings: 10/9/2025

USDA-NRCS WETS Value:

[ ] Dry = 1;

[x] Normal = 2;

[ ] Wet = 3.

TP-1 Boring # [ ] Boring [x] Pit Ground surface elev. 1710 ft Depth to limiting factor 125 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr
1	0-10	10YR 3/3	-	LS	2MSBK	MVFR	AS	5	19	1.63
2	-22	10YR 4/4	-	LS	2MABK	MVFR	CW	5	19	1.63
3	-48	7.5YR 4/6	-	GRS	SG	ML	CW	20	8	3.60
4	-125	7.5YR 6/6	-	GRS	SG	ML	-	25	7	3.60

Comments: Groundwater, saturation, redoximorphic features, and bedrock not present to the depth of the pit.

TP-2 Boring # [ ] Boring [x] Pit Ground surface elev. 1710 ft Depth to limiting factor 125 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr
1	0-6	10YR 3/3	-	LS	2MSBK	MVFR	AS	5	19	1.63
2	-16	10YR 4/4	-	LS	2MABK	MVFR	CW	5	19	1.63
3	-38	7.5YR 4/6	-	GRS	SG	ML	CW	20	8	3.60
4	-125	7.5YR 6/6	-	GRS	SG	ML	-	20	8	3.60

Comments: Groundwater, saturation, redoximorphic features, and bedrock not present to the depth of the pit.

CST Name (Please Print)	Signature	Credential Number
Brian Camlek, Alex J. Blume	BC Alex Blume	1226509, 1491460
Address	**Date Evaluation Conducted**	**Telephone Number**
PO Box 434 Marathon WI 54448	10/9/2025	(715) 443-6115

STORMWATER AND BEDROCK STUDY
SOIL PIT LOGS SUMMARY TABLE

Pit #	Depth to Bedrock (in.)	Depth to Ground Water (in.)	Groundwater Present	Est. High Ground Water (in.)	Depth to Redoximorphic Features
TP-1	>125	>125	No	>125	>125
TP-2	>125	>125	No	>125	>125

Notes:

Bedrock or >50% rock was not observed in any of the pits to the depth of the soil pits or greater than 125 inches in TP-1 and TP-2.

The apparent groundwater table, or endosaturation, and saturation was not observed in any of the pits to the depth of the pits or greater than 125 inches in TP-1 and TP-2.

Redoximorphic soil features were not observed to the depth of the pits in both pits, or greater than 125 inches in TP-1 and greater than 96 inches in TP-2.

Date: 10-9-2025

Backhoe: CAT 304 operated by Vinnie Tesch of Premier Lawn & Landscape, LLC

Recorded By: Brian Camlek, Certified Professional Soil Scientist
Alex J. Blume, Certified Professional Soil Scientist
Star Environmental, Inc.
(715) 443-6115

Table 1. Evaluation Requirements to Proposed Infiltration Devices [Note 1]

Infiltration Device (Technical Standard [Note 2, Note 3]**)**	**Tests Required**	**Minimum Number of Test Pits Required** [Note 4, Note 5]
Rain Garden	Soil texture evaluation or infiltration test	N/A
Infiltration Trenches (1007)	Test pits	1 test pit/100 linear feet of trench with a minimum of 2 test pits, and sufficient to determine / confirm variability
Vegetated Swale (1005)	Test pits	1 test pit/ 500 linear feet of swale with a minimum of 2 test pits, and sufficient to determine / confirm variability
Bioretention Systems (1004)	Test pits	1 test pit or a number sufficient to assess infiltration potential, and sufficient to determine / confirm variability
Surface Infiltration Basins (1003)	Test pits	2 test pits then an additional test pit /10,000 square feet and sufficient to determine / confirm variability
Subsurface Dispersal Systems (N/A) greater than 15 feet in width	Test pits	2 test pits then an additional test pit /10,000 square feet and sufficient to determine / confirm variability
Permeable Pavement Systems (1008)	Test pits	2 test pits then an additional test pit /10,000 square feet and sufficient to determine / confirm variability

Note 1 Maintain trench safety requirements; test pit evaluations can be made from the surface without entering the pit.

Note 2 Technical standards refer to the corresponding WDNR design technical standard containing design criteria for this practice.

Note 3 Where initial site borings show uniform soils throughout the site, the professional meeting the Qualifications (see Step D) may reduce the number of test pits, provided information from both test pits and soil borings confirm a uniform soil condition across the proposed device location.

Note 4 Test pits are optimally located within 10 feet of the footprint perimeter, and not within the footprint.

Note 5 If a backhoe is unable to excavate a test pit deep enough from the existing surface to reach 5 feet below the native soil interface, then soil borings may be used to evaluate the depth below the which the backhoe is unable to reach. It is expected that even a medium sized backhoe can reach at least 15 feet below grade.

Step C.2. Infiltration Rate Exemption.

To determine if a site is eligible for exemption from infiltration under s. NR 151.124(4)(c), Wis. Adm. Code, use a scientifically credible field test method unless the least permeable soil horizon within five feet below the native soil interface is one of the following: sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, or clay. Take at least three infiltration tests at the optimal infiltration location per the criteria obtained in Step B, and distribute tests so that they best represent the area being tested (see Step C.3. Infiltration Option 2 for infiltration test methods). Conduct tests within the native soil layer being evaluated for exemption. For a site to be exempt from infiltration requirements, at least two-thirds of tests are to have a measured infiltration rate of less than 0.6 in/hr. Use the infiltration rate from actual field measurements to request an exemption to infiltration requirements; correction factors do not apply.

Step C.3. Infiltration Rate Determination.

The purpose of this step is to determine a design infiltration rate (Infiltration Options 1 – 3).

Use Infiltration Options below to determine the design infiltration rate. Examples calculate the *static infiltration rate.*

Note that *soil compaction mitigation* reduces the soil density and promotes infiltration.

Infiltration Option 1 – Infiltration Rate Not Measured, Soil Compaction Mitigated

Using information from soil test pits, select the design static infiltration rate from Table 2 based on soil texture of the least permeable soil horizon within 5 feet below the native soil interface. See Example 1.

Table 2. Design Static Infiltration Rates for Soil Textures Receiving Storm Water [Note 1]

Soil Texture	Design Static Infiltration Rate Without Measurement (Inches/Hour) [Note 2]
Coarse sand or coarser	3.60
Loamy coarse sand	3.60
Sand	3.60
Loamy sand	1.63
Sandy loam, fine sand, loamy sand, very fine sand, and loamy fine sand	0.50
Loam	0.24
Silt loam	0.13
Sandy clay loam	0.11
Clay loam	0.03
Silty Clay loam	0.04 [Note 3]
Sandy clay	0.04
Silty clay	0.07
Clay	0.07

[Note 1] These infiltration rates are not to be used to request exemption from infiltration requirements.

[Note 2] Infiltration rates represent the lowest value for each textural class presented in Table 2 of Rawls, 1998.

[Note 3] Infiltration rate is an average based on Rawls, 1982 and Clapp & Hornberger, 1978.

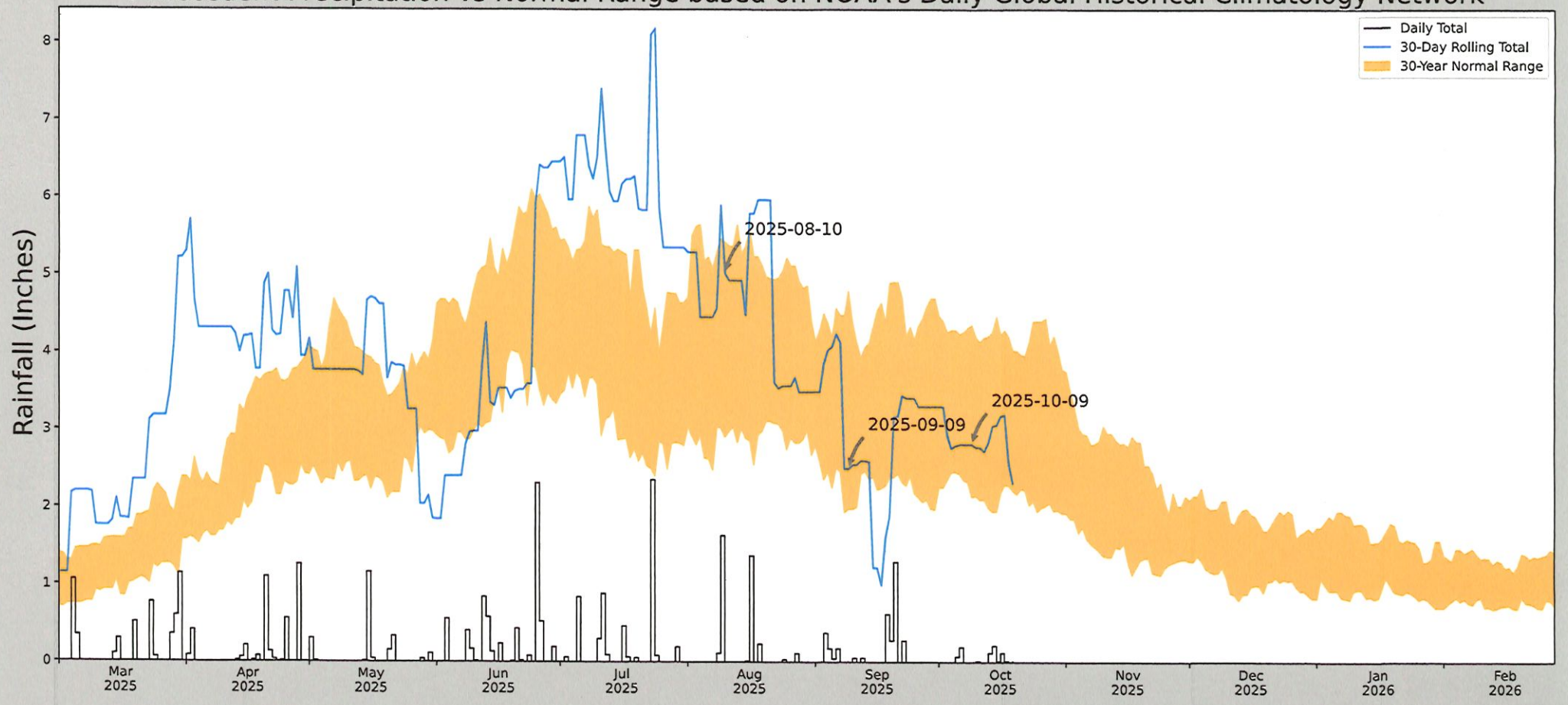
Table 2 assumes separation from the native soil interface to a limiting layer such that mounding of water will not reach the native soil interface. A regulatory authority may require a mounding analysis when concerned that mounding may impair the function of the device or have an adverse impact to property. See Considerations section for more information.

Where adverse soil structure is present, such as moderate to strong platy soil structure, compacted or cemented soil horizons, or massive soil conditions with high bulk density reduce the design static infiltration rates per judgment of an individual meeting the Qualifications in Step D.

ATTACHMENT 3

ANTECEDENT PRECIPITATION TOOL (APT)

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	44.84431, -89.6553
Observation Date	2025-10-09
Elevation (ft)	1171.882
Drought Index (PDSI)	Not available (2025-09)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-10-09	2.135827	4.357087	2.814961	Normal	2	3	6
2025-09-09	1.974803	4.789764	2.5	Normal	2	2	4
2025-08-10	2.906299	5.422047	5.019685	Normal	2	1	2
Result							Normal Conditions - 12

Figures and tables made by the Antecedent Precipitation Tool Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WAUSAU ASOS	44.9275, -89.6253	1201.116	5.933	29.234	2.843	11351	90
WAUSAU WSAW TV	44.9464, -89.6222	1196.85	1.315	4.266	0.597	2	0

ATTACHMENT 4

ONSITE PHOTOS

PREMIER PROPERY HOLDINGS, LLC PROPERTY PHOTOS

Project Area

Cat 304 Excavator Operated by Vinnie Tesch

TP-1 Location

TP-1

TP-1 Excavated Material

Total Depth TP-1

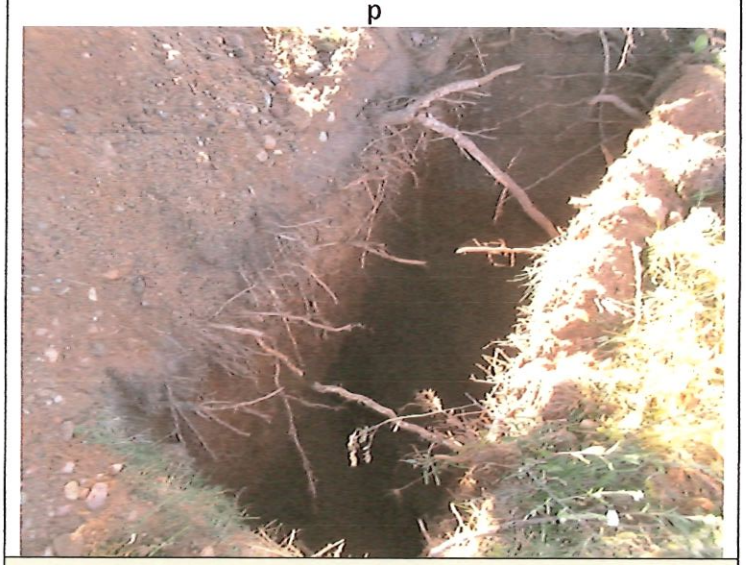
Photographs taken October 9, 2025

PREMIER PROPERY HOLDINGS, LLC PROPERTY PHOTOS

TP-2 Location

TP-2

p



TP-1 Total Depth

Photographs taken October 9, 2025

ATTACHMENT 5

RESUME'

Résumé' of Qualifications
Brian Camlek
Certified Professional Soil Scientist
WDNR Professionally Assured Wetland Delineator,
Licensed Designer of Engineering Systems
Star Environmental, Inc.
705 Third Street, P.O. Box 434
Marathon, WI 54448
Telephone: 715-443-6115, Cell: 715-630-4401
Email: bcamlek.starenvironmental@hotmail.com

Experience:

Star Environmental, Inc., Certified Professional Soil Scientist

Professional Experiences in Wetland Delineations, Wetland Mitigation Banks, Non-Metallic Mine Reclamation Plans, Pond Development Plans, Stormwater Pollution Prevention Plans, Soil and Site Evaluations for Septic Systems and Stormwater, Septic System Designs, Septic System and Well Inspections.

Dade Moeller, Inc., Environmental Scientist

Sampled Soil, Water, Vegetation and Aquatic Organism while conducting extensive QA/QC of data collected during offshore operations in the Gulf of Mexico in response to the BP Deepwater Horizon Oil Spill of 2010.

Water and Environmental Analysis Laboratory, UWSP, Environmental Lab Technician

Analyzed and interpreted water samples for Nitrates, Nitrites, Chloride, Fluoride, Bacteria, Total Hardness, Alkalinity, pH, Turbidity, Biological Oxygen Demand, Chemical Oxygen Demand.

Education:

B.S.-Water Resources and Soil Science, May 2010 University of Wisconsin-Stevens Point

WDNR Basic and Advanced Wetland Delineation Training Workshops

WDNR Critical Methods in Wetland Delineation Workshop

Completion of UW-La Crosse Grasses, Sedge & Rushes Workshop

Certified Environmental Inspector - Commonground University ASTM E1527-13 Phase 1 ESA

Completion of UW-Madison-WinSLAMM v.10.2 Meeting Urban Stormwater Management

Qualifications:

Certified Professional Soil Scientist

WDNR Professionally Assured Wetland Delineator

Licensed Designer of Engineering Systems

Certified Environmental Inspector, Environmental Assessment Association

Certified Soil Tester, State of Wisconsin

Certified POWTS Inspector, State of Wisconsin

Licensed Pump Installer, State of Wisconsin

Résumé' of Qualifications

Alex J. Blume
Certified Professional Soil Scientist,
WDNR Professionally Assured Wetland Delineator,
Certified Soil Tester, POWTS Inspector,
Licensed Designer of Engineered Systems,
Certified Environmental Inspector
Star Environmental, Inc.
705 Third Street, P.O. Box 434
Marathon, WI 54448
Telephone: 715-443-6115
Email: ablume.starenvironmental@hotmail.com

Experience: **Star Environmental, Inc., Environmental Specialist**

Professional Experiences in Wetland Delineations, Wetland Mitigation Banks, Grading Plans, Erosion Control Plans, Pond Development Plans, Wetland Crossings, Septic System and Well Inspections, and Soil and Site Evaluations for Septic Systems and Storm Water.

Education:

B.S.-Soil and Land Management, May 2019 University of Wisconsin Stevens Point

Treehaven Summer Camp. Six weeks of intensive field exercises practicing techniques used to inventory and manage forest, soil, water and wildlife resources. Special emphasis on mapping, air photo interpretation and vegetation identification.

WDNR Basic and Advanced Wetland Delineation Training Workshops

Completion of UW – Stevens Point Wetland Plants Identification and Sampling Workshop

Qualifications:

Certified Soil Tester – State of Wisconsin

Certified Professional Soil Scientist

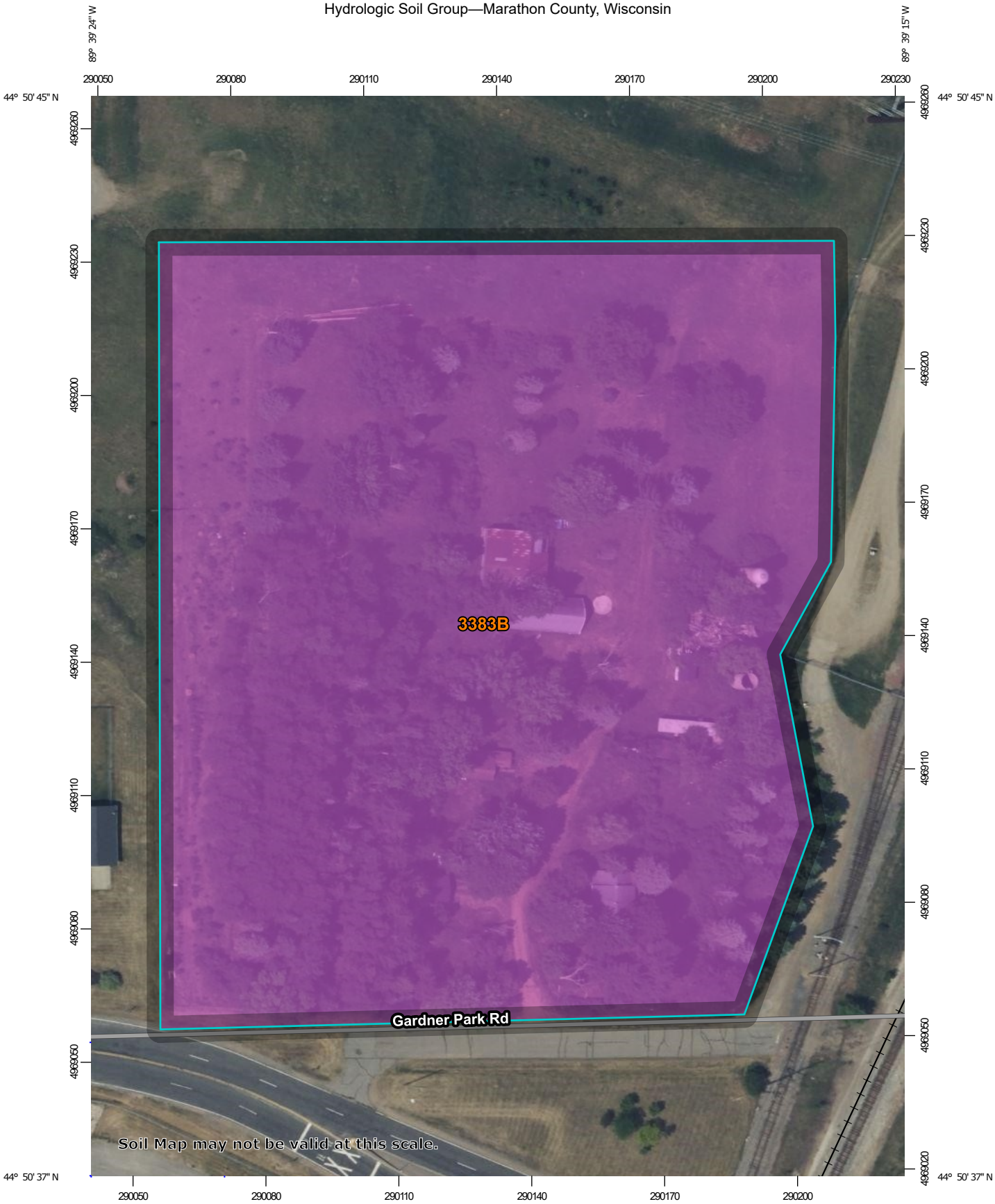
Certified POWTS Inspector – State of Wisconsin

WDNR Professionally Assured Wetland Delineator

Recognized USACE Wetland Consultant

Licensed Designer of Engineered Systems

Certified Environmental Inspector, Environmental Assessment Association



Map Scale: 1:1,180 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Marathon County, Wisconsin
Survey Area Data: Version 23, Sep 10, 2025

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

Date(s) aerial images were photographed: Jun 7, 2023—Jun 8, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3383B	Mahtomedi loamy sand, 0 to 6 percent slopes	A	6.4	100.0%
Totals for Area of Interest			**6.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

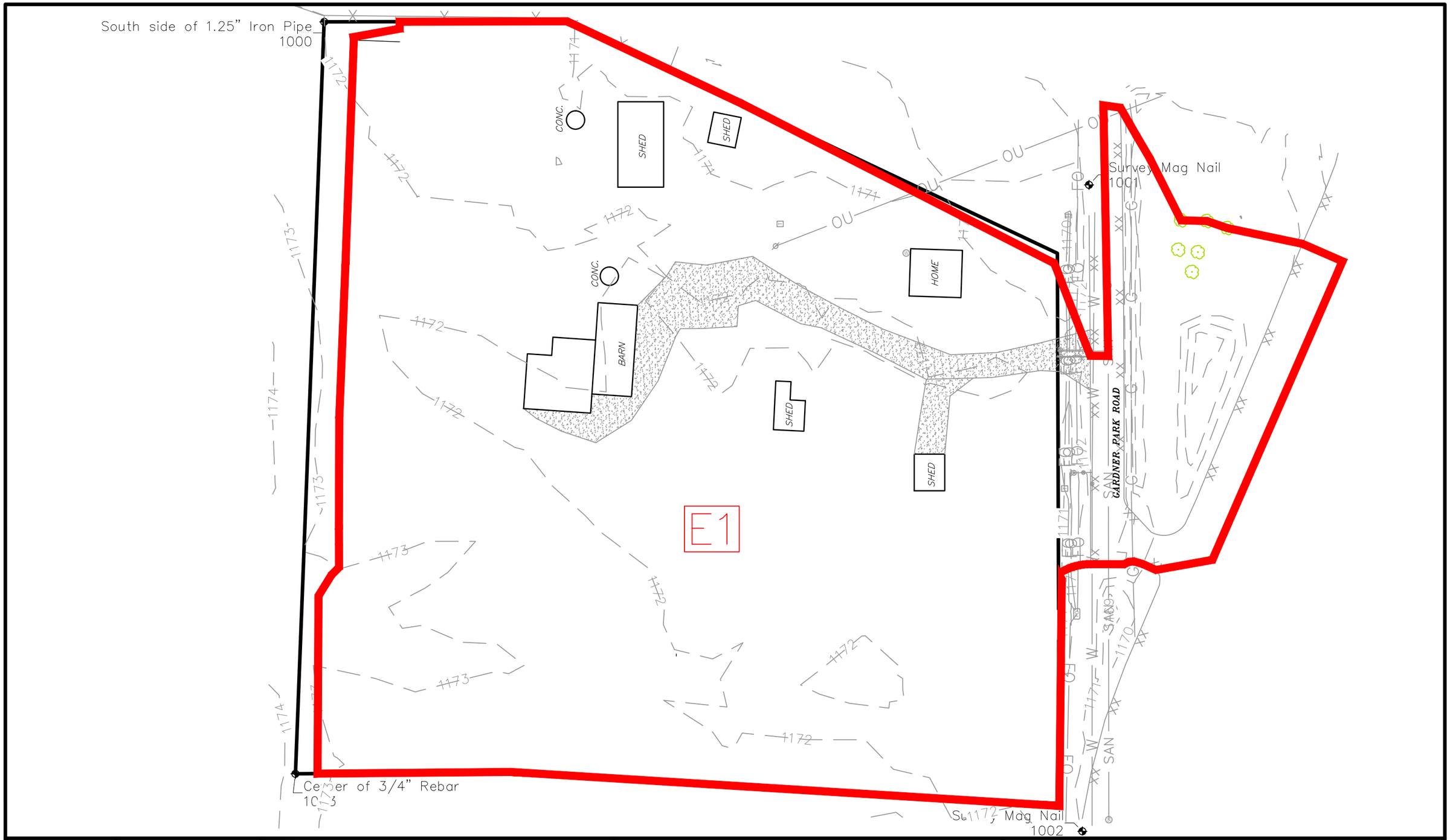
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX C

Existing & Proposed Drainage Map and Calculations



STAMP/SIGNATURE:	REVISIONS: BY / DATE / DESCRIPTION	TITLE PAGE: EXISTING CATCHMENT
		PROJECT: PREMIER PROPERTY DEVELOPMENT
		LOCATION: VILLAGE OF KRONENWETTER, MARATHON COUNTY, WISCONSIN

VREELAND ASSOCIATES LAND SURVEYORS & ENGINEERS
6103 DAWN STREET WESTON, WI. 54476
PHONE NO.: (715) 241-0947
EMAIL: dustin@vreelandassociates.us
WEBSITE: www.vreelandlandsurveying.com
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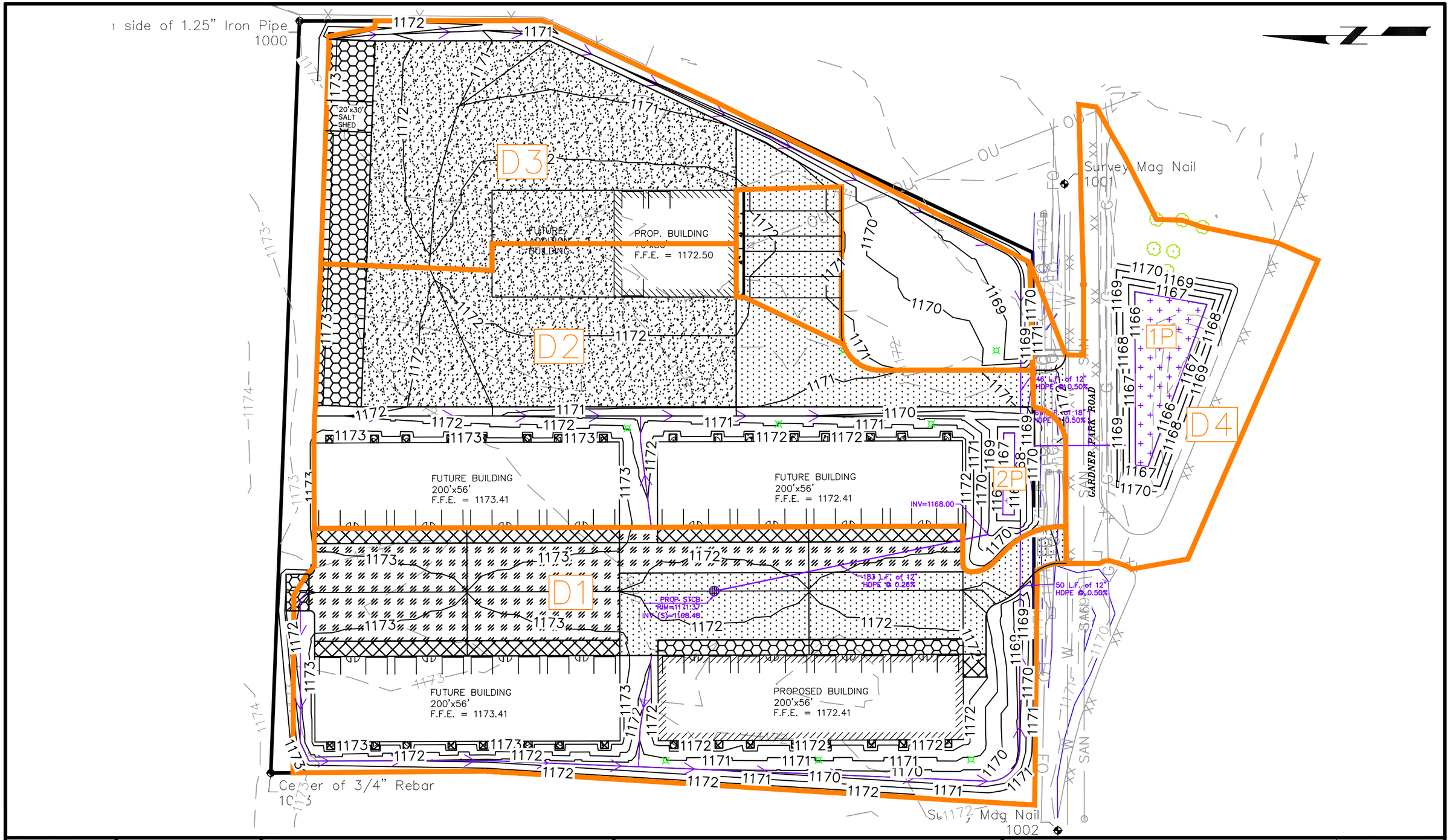
PREPARED FOR:	GREG TESCH
PLAN DATE:	OCTOBER 6TH, 2025
DESIGNER: DUSTIN VREELAND	
SURVEYED BY: CB & TV	
FILE NO.: 25-0410 ENGINEERING	
DATE: SEPTEMBER 15, 2025	
SCALE:	1" = 60'
SHEET	EXIST



STAMP/SIGNATURE:

REVISIONS		
BY	DATE	DESCRIPTION

TITLE PAGE:

PROPOSED CATCHMENT

PROJECT: PREMIER PROPERTY DEVELOPMENT

LOCATION: VILLAGE OF KRONENWETTER
MARATHON COUNTY, WISCONSIN

VREELAND ASSOCIATES LAND SURVEYORS & ENGINEERS
6103 DAWN STREET WESTON, WI. 54476
PHONE NO.: (715) 241-0947
EMAIL: dustin@vreelandassociates.us
WEBSITE: www.vreelandlandsurveying.com

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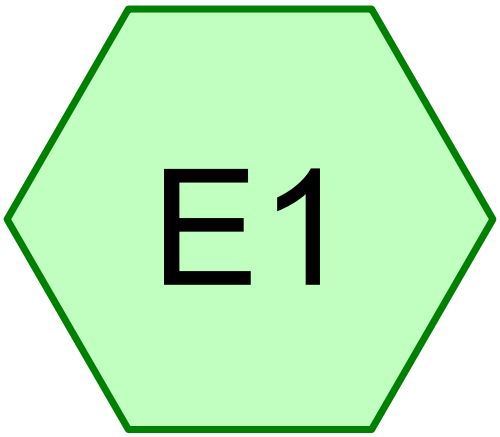
PREPARED FOR: GREG TESCH

PLAN DATE: OCTOBER 6TH, 2025

DESIGNER: DUSTIN VREELAND
SURVEYED BY: CB & TV
FILE NO.: 25-0410 ENGINEERING
DATE: SEPTEMBER 15, 2025
SCALE: 1" = 60'
SHEET PROP



existing

Subcat Reach Pond Link

Routing Diagram for 25-0410 existing
Prepared by {enter your company name here}, Printed 12/1/2025
HydroCAD® 10.00-26 s/n 09881 © 2020 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.077	39	>75% Grass cover, Good, HSG A (E1)
2.592	30	Woods, Good, HSG A (E1)
0.180	98	buildings (E1)
0.240	96	gravel (E1)
0.232	98	roadway (E1)
5.321	**42**	**TOTAL AREA**

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: existing Runoff Area=5.321 ac 7.74% Impervious Runoff Depth=0.24"
Tc=20.0 min CN=WQ Runoff=1.33 cfs 0.107 af

Total Runoff Area = 5.321 ac Runoff Volume = 0.107 af Average Runoff Depth = 0.24"
92.26% Pervious = 4.909 ac 7.74% Impervious = 0.412 ac

Summary for Subcatchment E1: existing

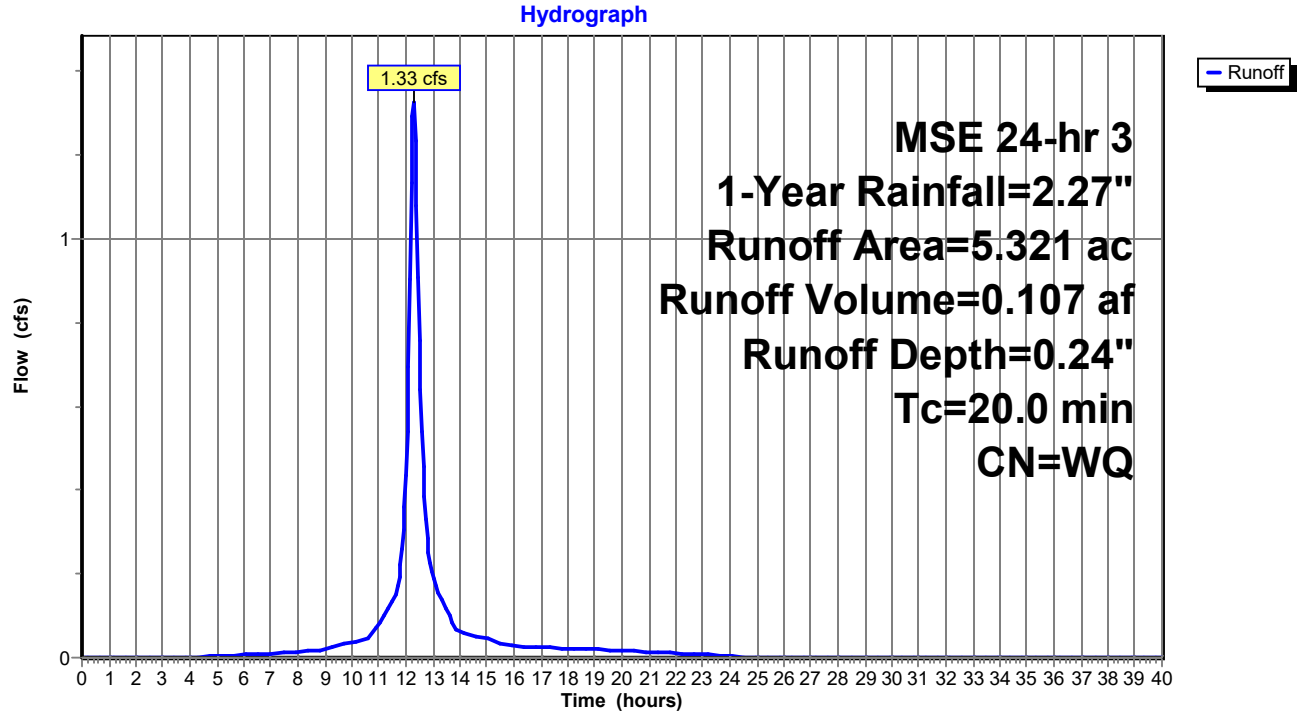
Runoff = 1.33 cfs @ 12.29 hrs, Volume= 0.107 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.27"

	Area (ac)	CN	Description
*	0.240	96	gravel
*	0.180	98	buildings
	2.592	30	Woods, Good, HSG A
	1.753	39	>75% Grass cover, Good, HSG A
*	0.232	98	roadway
	0.324	39	>75% Grass cover, Good, HSG A
	5.321		Weighted Average
	4.909		92.26% Pervious Area
	0.412		7.74% Impervious Area

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

Subcatchment E1: existing



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: existing Runoff Area=5.321 ac 7.74% Impervious Runoff Depth=0.28"
Tc=20.0 min CN=WQ Runoff=1.54 cfs 0.125 af

Total Runoff Area = 5.321 ac Runoff Volume = 0.125 af Average Runoff Depth = 0.28"
92.26% Pervious = 4.909 ac 7.74% Impervious = 0.412 ac

Summary for Subcatchment E1: existing

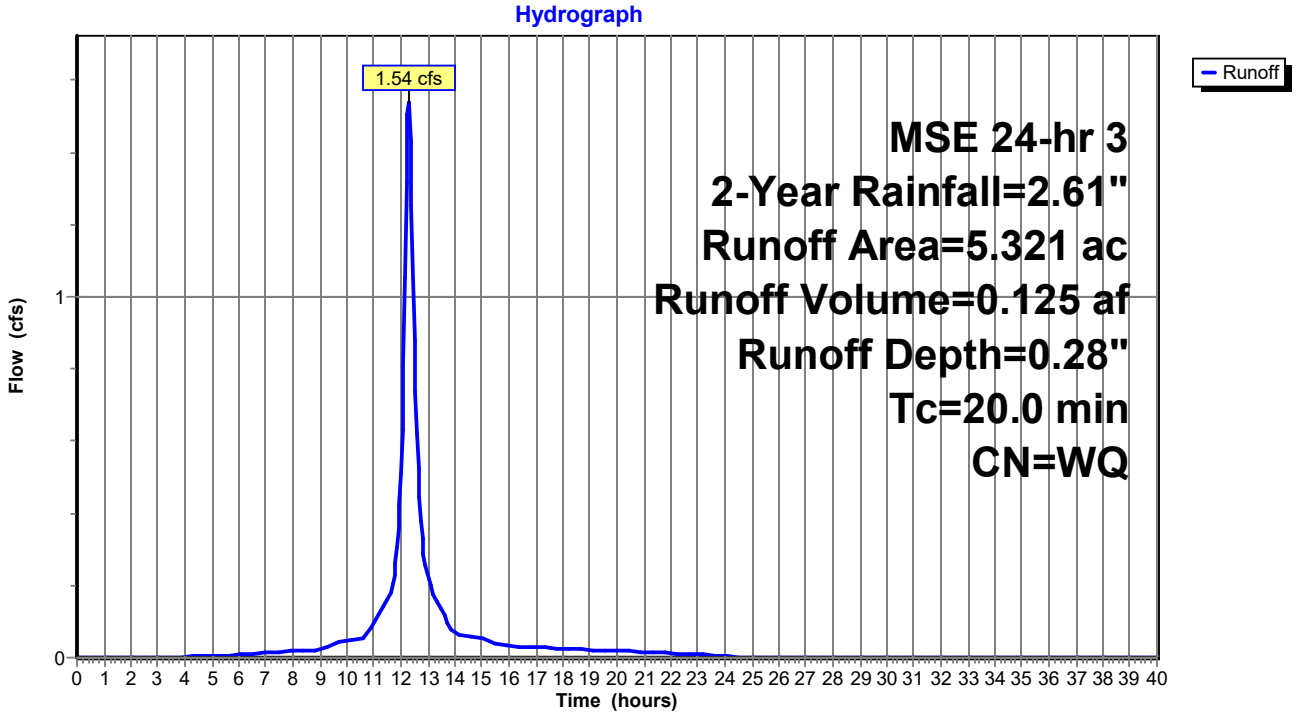
Runoff = 1.54 cfs @ 12.29 hrs, Volume= 0.125 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.61"

	Area (ac)	CN	Description
*	0.240	96	gravel
*	0.180	98	buildings
	2.592	30	Woods, Good, HSG A
	1.753	39	>75% Grass cover, Good, HSG A
*	0.232	98	roadway
	0.324	39	>75% Grass cover, Good, HSG A
	5.321		Weighted Average
	4.909		92.26% Pervious Area
	0.412		7.74% Impervious Area

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

Subcatchment E1: existing



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: existing Runoff Area=5.321 ac 7.74% Impervious Runoff Depth=0.43"
Tc=20.0 min CN=WQ Runoff=2.24 cfs 0.189 af

Total Runoff Area = 5.321 ac Runoff Volume = 0.189 af Average Runoff Depth = 0.43"
92.26% Pervious = 4.909 ac 7.74% Impervious = 0.412 ac

Summary for Subcatchment E1: existing

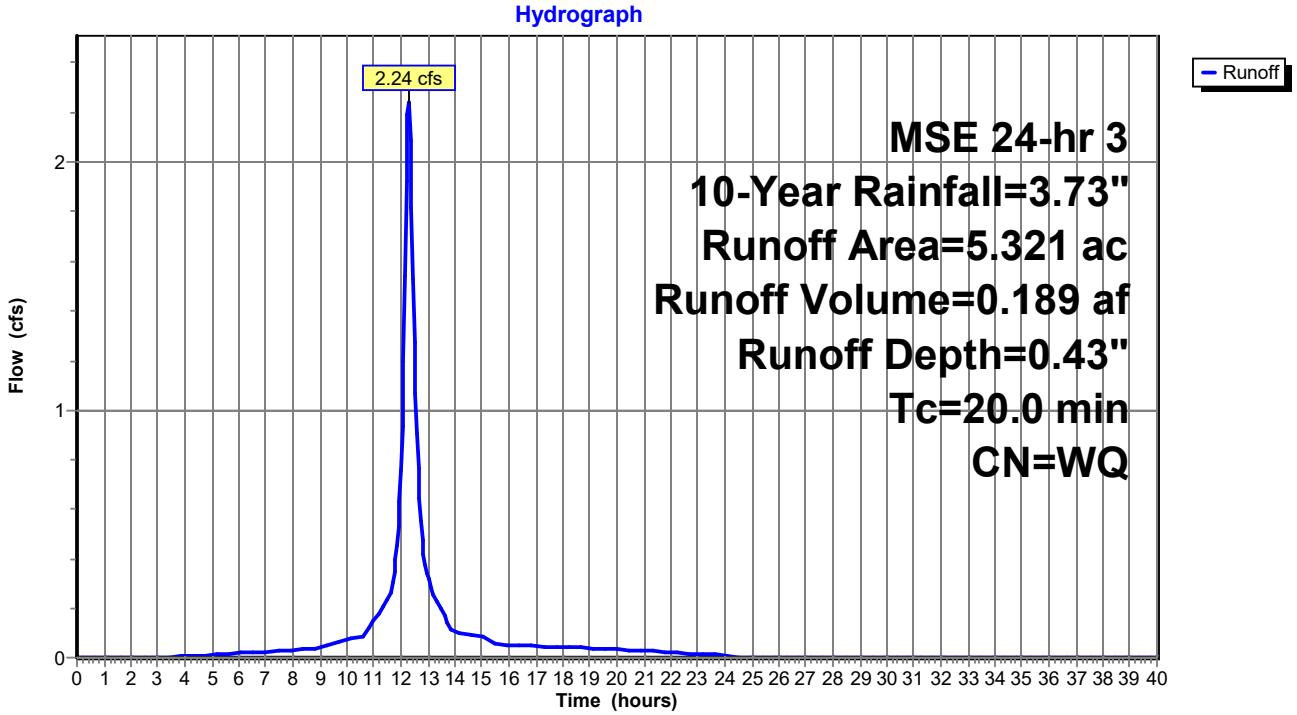
Runoff = 2.24 cfs @ 12.29 hrs, Volume= 0.189 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.73"

	Area (ac)	CN	Description
*	0.240	96	gravel
*	0.180	98	buildings
	2.592	30	Woods, Good, HSG A
	1.753	39	>75% Grass cover, Good, HSG A
*	0.232	98	roadway
	0.324	39	>75% Grass cover, Good, HSG A
	5.321		Weighted Average
	4.909		92.26% Pervious Area
	0.412		7.74% Impervious Area

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

Subcatchment E1: existing



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: existing Runoff Area=5.321 ac 7.74% Impervious Runoff Depth=0.86"
Tc=20.0 min CN=WQ Runoff=3.77 cfs 0.382 af

Total Runoff Area = 5.321 ac Runoff Volume = 0.382 af Average Runoff Depth = 0.86"
92.26% Pervious = 4.909 ac 7.74% Impervious = 0.412 ac

Summary for Subcatchment E1: existing

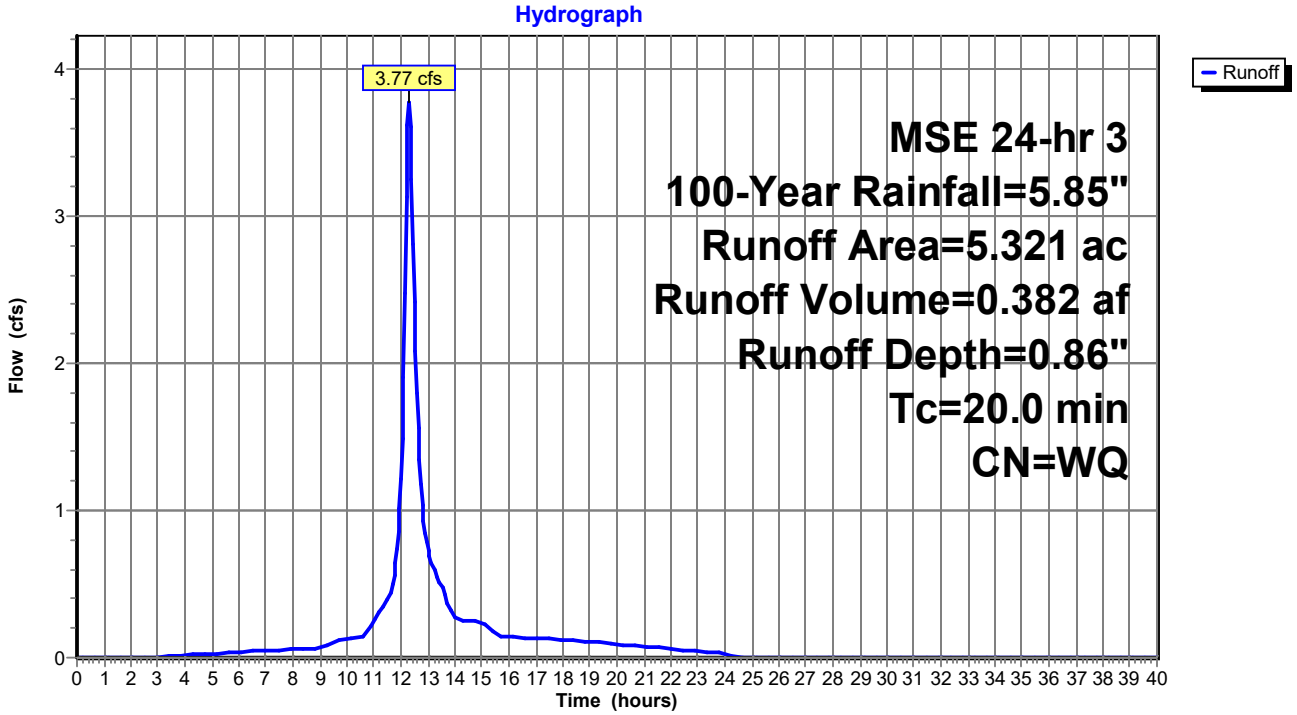
Runoff = 3.77 cfs @ 12.30 hrs, Volume= 0.382 af, Depth= 0.86"

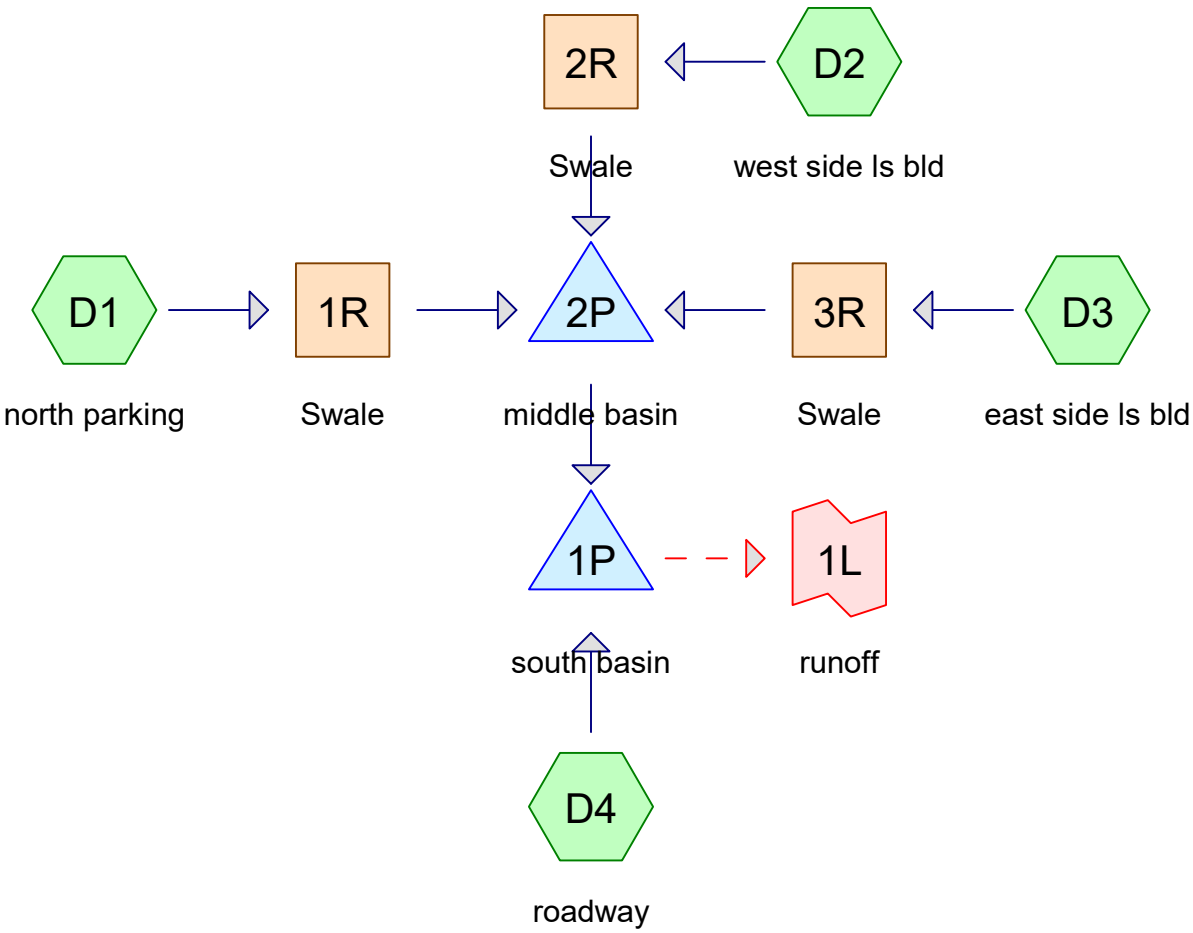
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=5.85"

	Area (ac)	CN	Description
*	0.240	96	gravel
*	0.180	98	buildings
	2.592	30	Woods, Good, HSG A
	1.753	39	>75% Grass cover, Good, HSG A
*	0.232	98	roadway
	0.324	39	>75% Grass cover, Good, HSG A
	5.321		Weighted Average
	4.909		92.26% Pervious Area
	0.412		7.74% Impervious Area

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

Subcatchment E1: existing





Subcat Reach Pond Link

Routing Diagram for 25-0410 hydrocad 11-17-25
Prepared by Vreeland Associates, Printed 2/5/2026
HydroCAD® 10.20-8a s/n 09881 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	MSE 24-hr	3	Default	24.00	1	2.27	2
2	2-Year	MSE 24-hr	3	Default	24.00	1	2.61	2
3	10-Year	MSE 24-hr	3	Default	24.00	1	3.73	2
4	25-Year	MSE 24-hr	3	Default	24.00	1	4.51	2
5	100-Year	MSE 24-hr	3	Default	24.00	1	5.85	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.480	39	>75% Grass cover, Good, HSG A (D1, D2, D3, D4)
0.111	98	basin (D2, D3, D4)
0.257	98	future bld (D2)
0.257	98	future building (D1)
0.532	98	future parking (D1)
0.005	98	future stoop (D1)
0.005	98	future sw (D2)
0.576	96	gravel park (D2)
0.297	98	parking lot (D2)
0.232	98	pavement (D4)
0.385	98	prop building (D2, D3)
0.572	96	prop gravel (D3)
0.035	98	prop parking (D3)
0.005	98	prop sidewalk (D2)
0.257	98	proposed building (D1)
0.310	98	proposed parking (D1)
0.005	98	stoop (D1)
5.321	**81**	**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	2P	1,168.00	1,167.67	66.0	0.0050	0.012	0.0	18.0	0.0	

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment D1: north parking Runoff Area=1.854 ac 73.68% Impervious Runoff Depth=1.50"
Tc=10.0 min CN=WQ Runoff=3.79 cfs 0.232 af

Subcatchment D2: west side ls bld Runoff Area=1.868 ac 47.97% Impervious Runoff Depth=1.55"
Tc=10.0 min CN=WQ Runoff=4.00 cfs 0.241 af

Subcatchment D3: east side ls bld Runoff Area=0.971 ac 13.08% Impervious Runoff Depth=1.35"
Tc=10.0 min CN=WQ Runoff=1.85 cfs 0.109 af

Subcatchment D4: roadway Runoff Area=0.628 ac 48.41% Impervious Runoff Depth=0.99"
Tc=10.0 min CN=WQ Runoff=0.84 cfs 0.052 af

Reach 1R: Swale Avg. Flow Depth=0.57' Max Vel=1.66 fps Inflow=3.79 cfs 0.232 af
n=0.030 L=689.0' S=0.0050 '/' Capacity=11.62 cfs Outflow=3.12 cfs 0.232 af

Reach 2R: Swale Avg. Flow Depth=0.61' Max Vel=1.72 fps Inflow=4.00 cfs 0.241 af
n=0.030 L=441.0' S=0.0050 '/' Capacity=11.61 cfs Outflow=3.60 cfs 0.241 af

Reach 3R: Swale Avg. Flow Depth=0.40' Max Vel=1.53 fps Inflow=1.85 cfs 0.109 af
n=0.030 L=514.7' S=0.0064 '/' Capacity=13.12 cfs Outflow=1.58 cfs 0.109 af

Pond 1P: south basin Peak Elev=1,168.67' Storage=12,901 cf Inflow=6.24 cfs 0.449 af
Discarded=0.55 cfs 0.449 af Secondary=0.00 cfs 0.000 af Outflow=0.55 cfs 0.449 af

Pond 2P: middle basin Peak Elev=1,169.42' Storage=4,476 cf Inflow=8.26 cfs 0.582 af
Discarded=0.33 cfs 0.186 af Primary=5.85 cfs 0.397 af Outflow=6.18 cfs 0.582 af

Link 1L: runoff Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 5.321 ac Runoff Volume = 0.634 af Average Runoff Depth = 1.43"
49.39% Pervious = 2.628 ac 50.61% Impervious = 2.693 ac

Summary for Subcatchment D1: north parking

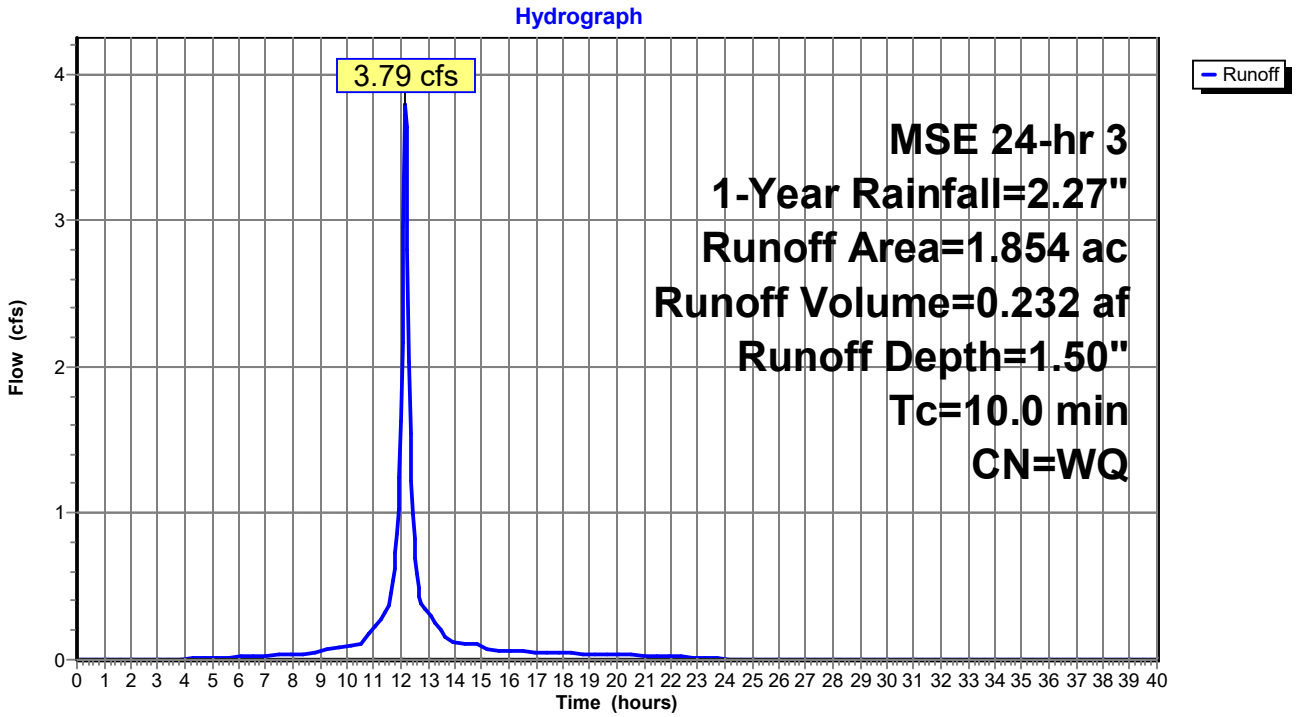
Runoff = 3.79 cfs @ 12.17 hrs, Volume= 0.232 af, Depth= 1.50"
Routed to Reach 1R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.27"

	Area (ac)	CN	Description
*	0.532	98	future parking
*	0.257	98	future building
	0.488	39	>75% Grass cover, Good, HSG A
*	0.310	98	proposed parking
*	0.257	98	proposed building
*	0.005	98	stoop
*	0.005	98	future stoop
	1.854		Weighted Average
	0.488		26.32% Pervious Area
	1.366		73.68% Impervious Area

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

Subcatchment D1: north parking



Summary for Subcatchment D2: west side ls bld

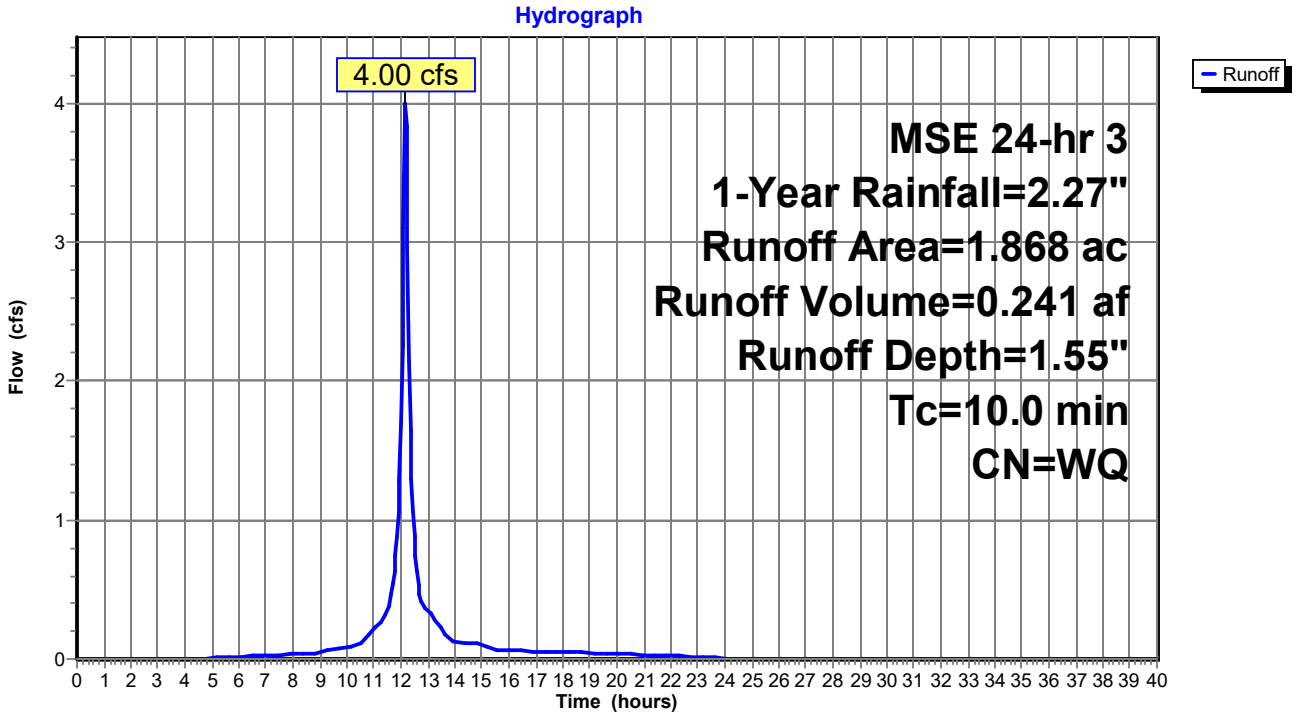
Runoff = 4.00 cfs @ 12.17 hrs, Volume= 0.241 af, Depth= 1.55"
Routed to Reach 2R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.27"

	Area (ac)	CN	Description
*	0.297	98	parking lot
*	0.576	96	gravel park
*	0.321	98	prop building
*	0.005	98	future sw
*	0.005	98	prop sidewalk
*	0.257	98	future bld
	0.396	39	>75% Grass cover, Good, HSG A
*	0.011	98	basin
	1.868		Weighted Average
	0.972		52.03% Pervious Area
	0.896		47.97% Impervious Area

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

Subcatchment D2: west side ls bld



Summary for Subcatchment D3: east side ls bld

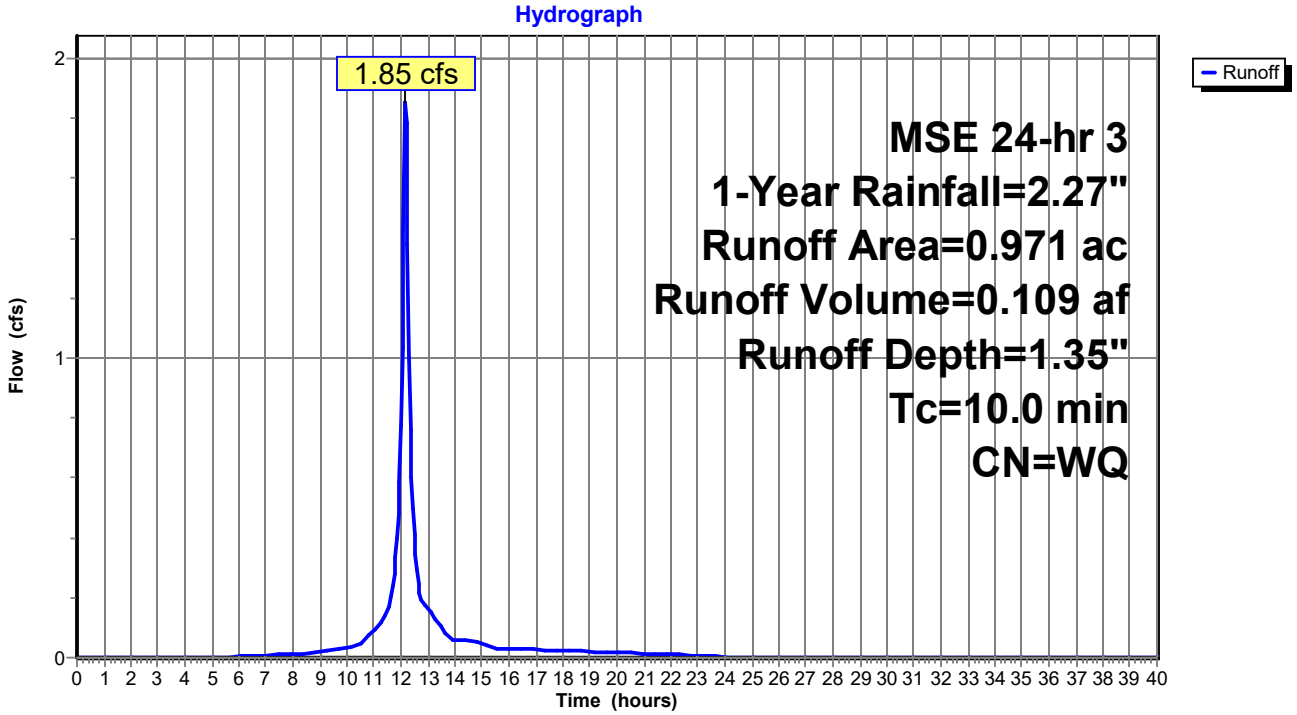
Runoff = 1.85 cfs @ 12.17 hrs, Volume= 0.109 af, Depth= 1.35"
Routed to Reach 3R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.27"

	Area (ac)	CN	Description
*	0.035	98	prop parking
*	0.572	96	prop gravel
*	0.064	98	prop building
*	0.028	98	basin
	0.272	39	>75% Grass cover, Good, HSG A
	0.971		Weighted Average
	0.844		86.92% Pervious Area
	0.127		13.08% Impervious Area

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

Subcatchment D3: east side ls bld



Summary for Subcatchment D4: roadway

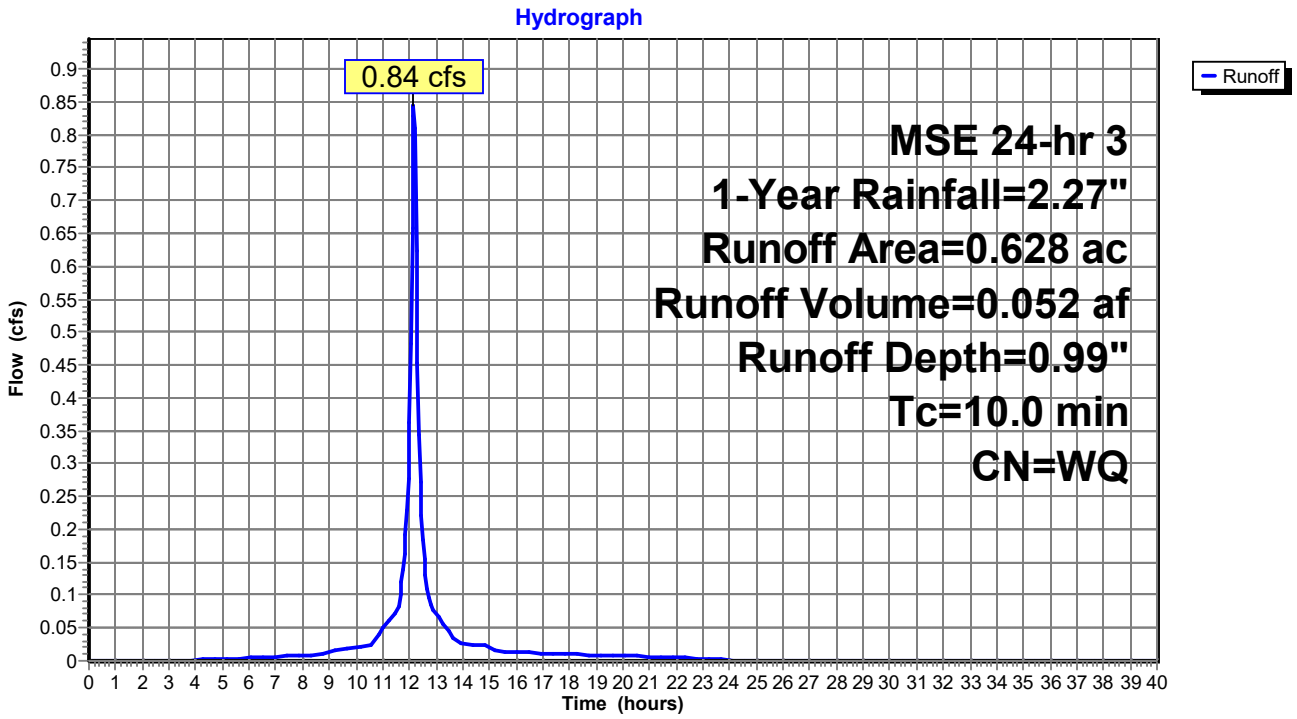
Runoff = 0.84 cfs @ 12.17 hrs, Volume= 0.052 af, Depth= 0.99"
Routed to Pond 1P : south basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.27"

	Area (ac)	CN	Description
*	0.232	98	pavement
	0.324	39	>75% Grass cover, Good, HSG A
*	0.072	98	basin
	0.628		Weighted Average
	0.324		51.59% Pervious Area
	0.304		48.41% Impervious Area

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

Subcatchment D4: roadway



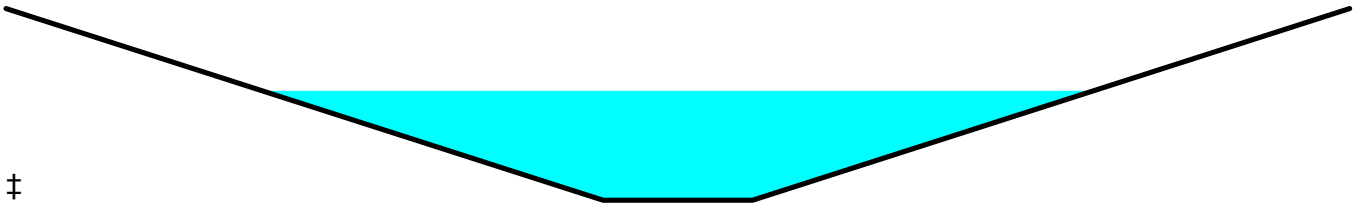
Summary for Reach 1R: Swale

Inflow Area = 1.854 ac, 73.68% Impervious, Inflow Depth = 1.50" for 1-Year event
Inflow = 3.79 cfs @ 12.17 hrs, Volume= 0.232 af
Outflow = 3.12 cfs @ 12.24 hrs, Volume= 0.232 af, Atten= 18%, Lag= 4.0 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.66 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 0.45 fps, Avg. Travel Time= 25.3 min

Peak Storage= 1,289 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.57' , Surface Width= 5.56'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.62 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 689.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.94', Outlet Invert= 1,168.50'



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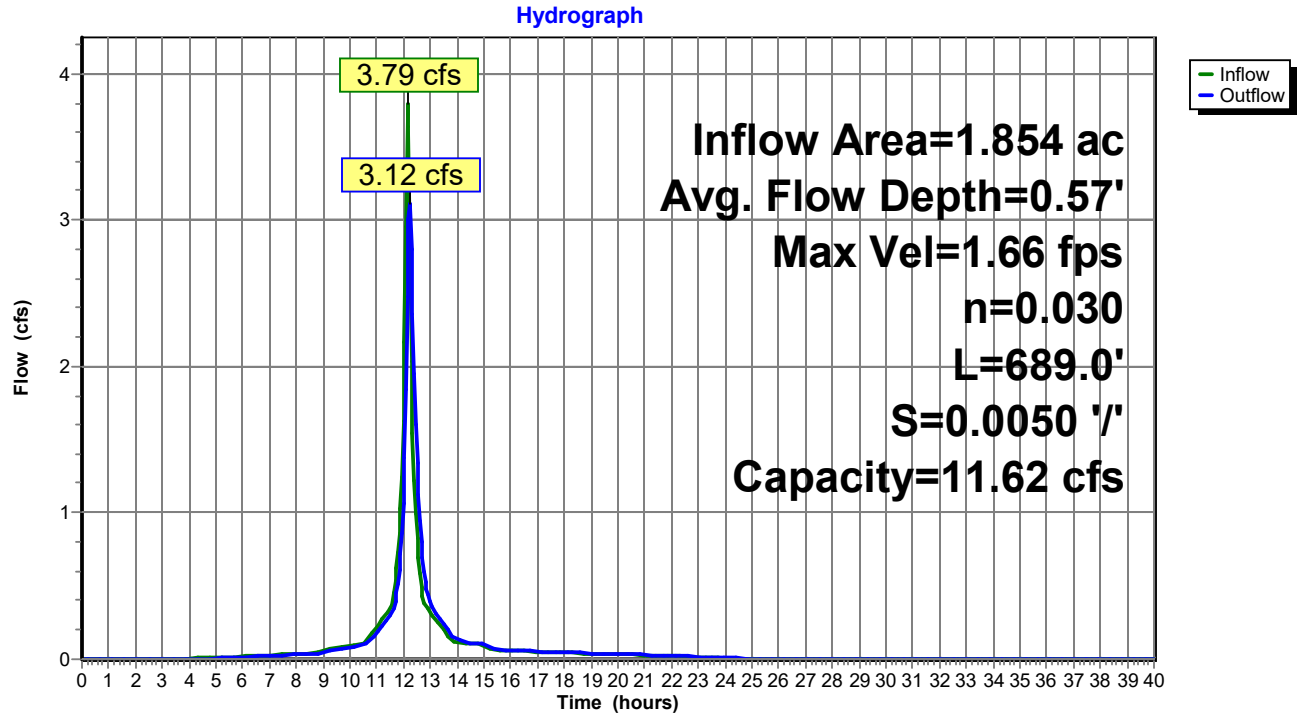


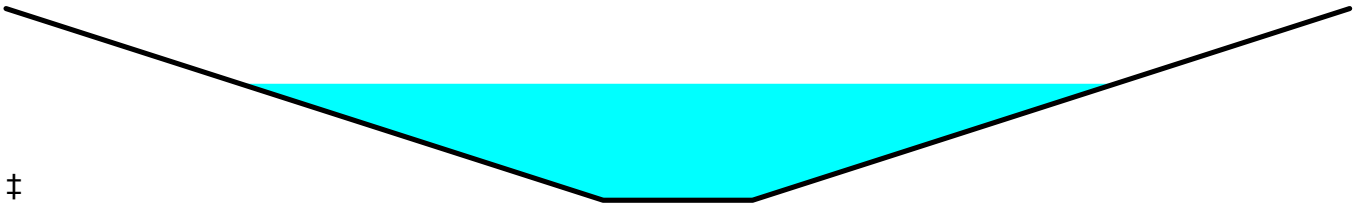
Summary for Reach 2R: Swale

Inflow Area = 1.868 ac, 47.97% Impervious, Inflow Depth = 1.55" for 1-Year event
Inflow = 4.00 cfs @ 12.17 hrs, Volume= 0.241 af
Outflow = 3.60 cfs @ 12.22 hrs, Volume= 0.241 af, Atten= 10%, Lag= 2.8 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.72 fps, Min. Travel Time= 4.3 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 15.3 min

Peak Storage= 919 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.61' , Surface Width= 5.86'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.61 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 441.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.78', Outlet Invert= 1,169.58'



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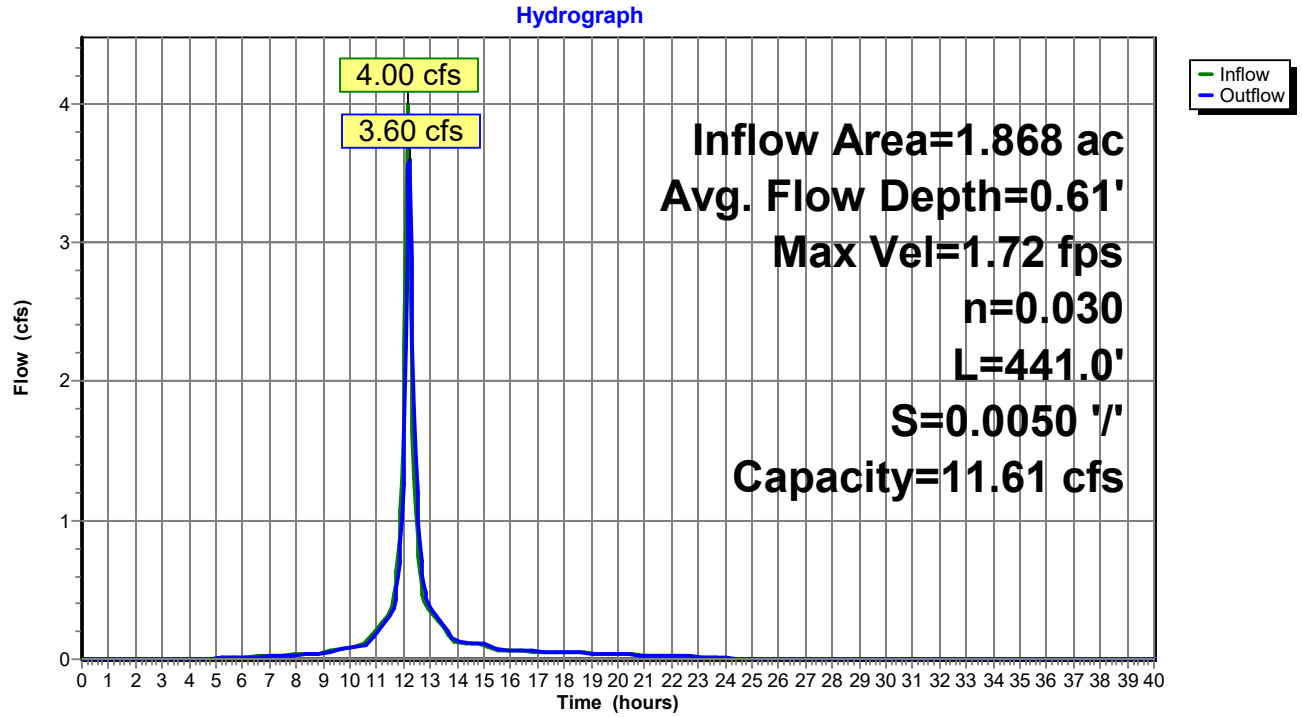


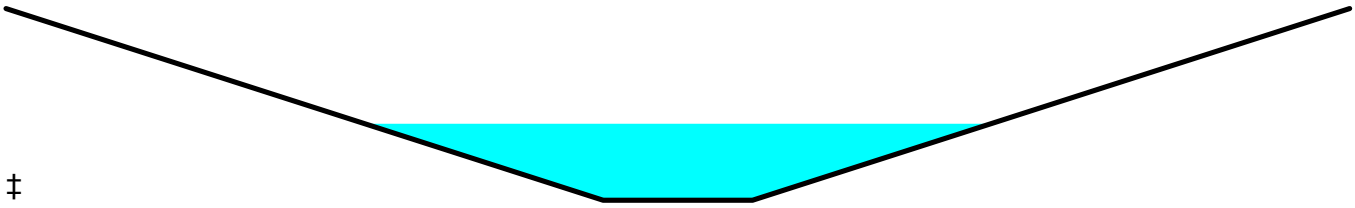
Summary for Reach 3R: Swale

Inflow Area = 0.971 ac, 13.08% Impervious, Inflow Depth = 1.35" for 1-Year event
Inflow = 1.85 cfs @ 12.17 hrs, Volume= 0.109 af
Outflow = 1.58 cfs @ 12.23 hrs, Volume= 0.109 af, Atten= 14%, Lag= 3.5 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.53 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 20.8 min

Peak Storage= 532 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 4.19'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.12 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 514.7' Slope= 0.0064 '/'
Inlet Invert= 1,171.90', Outlet Invert= 1,168.62'



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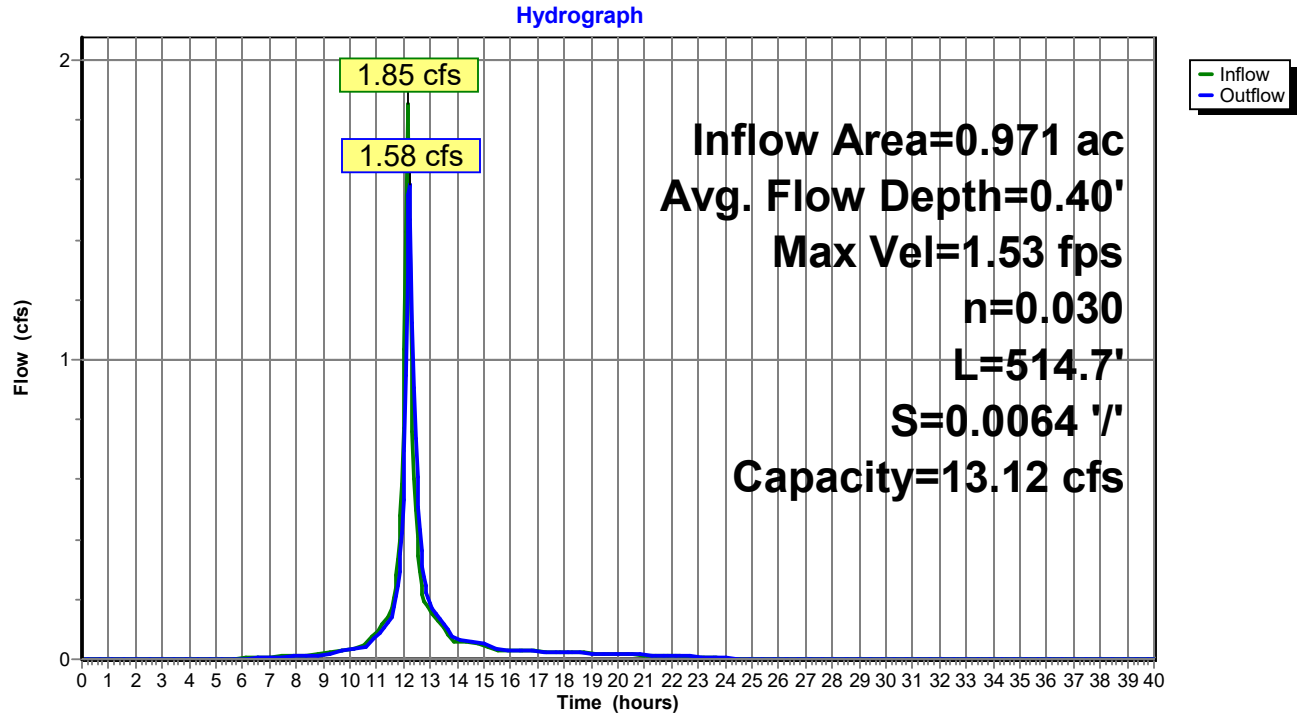


Summary for Pond 1P: south basin

Inflow Area = 5.321 ac, 50.61% Impervious, Inflow Depth = 1.01" for 1-Year event
Inflow = 6.24 cfs @ 12.32 hrs, Volume= 0.449 af
Outflow = 0.55 cfs @ 13.36 hrs, Volume= 0.449 af, Atten= 91%, Lag= 62.4 min
Discarded = 0.55 cfs @ 13.36 hrs, Volume= 0.449 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,168.67' @ 13.36 hrs Surf.Area= 6,655 sf Storage= 12,901 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 249.0 min (1,012.1 - 763.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,166.00'	44,780 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

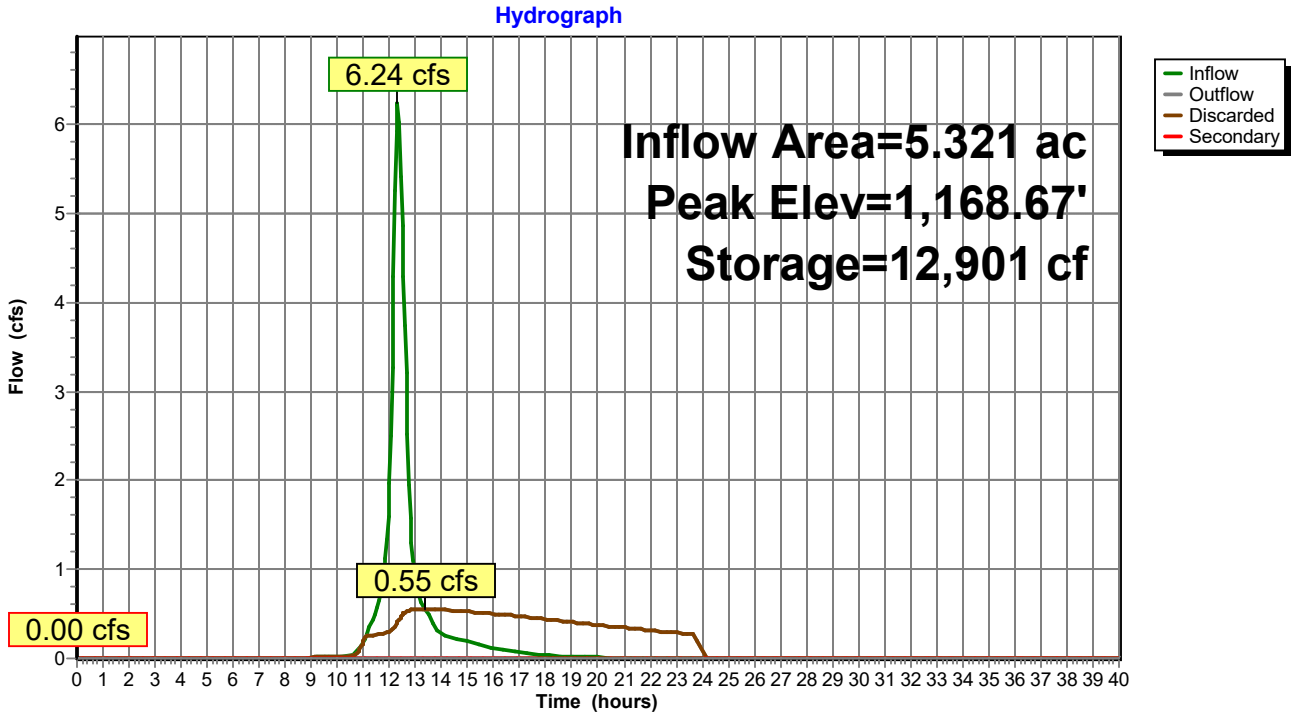
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,166.00	3,150	0	0
1,167.00	4,350	3,750	3,750
1,168.00	5,700	5,025	8,775
1,169.00	7,130	6,415	15,190
1,170.00	11,025	9,078	24,268
1,171.00	30,000	20,513	44,780

Device	Routing	Invert	Outlet Devices
#1	Secondary	1,170.18'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	1,166.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.55 cfs @ 13.36 hrs HW=1,168.67' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.55 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,166.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: south basin



Summary for Pond 2P: middle basin

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.42' @ 12.40 hrs
[62] Hint: Exceeded Reach 3R OUTLET depth by 0.46' @ 12.35 hrs

Inflow Area = 4.693 ac, 50.91% Impervious, Inflow Depth = 1.49" for 1-Year event
Inflow = 8.26 cfs @ 12.23 hrs, Volume= 0.582 af
Outflow = 6.18 cfs @ 12.34 hrs, Volume= 0.582 af, Atten= 25%, Lag= 6.7 min
Discarded = 0.33 cfs @ 12.34 hrs, Volume= 0.186 af
Primary = 5.85 cfs @ 12.34 hrs, Volume= 0.397 af
Routed to Pond 1P : south basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,169.42' @ 12.34 hrs Surf.Area= 4,013 sf Storage= 4,476 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 42.1 min (818.7 - 776.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,167.00'	27,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

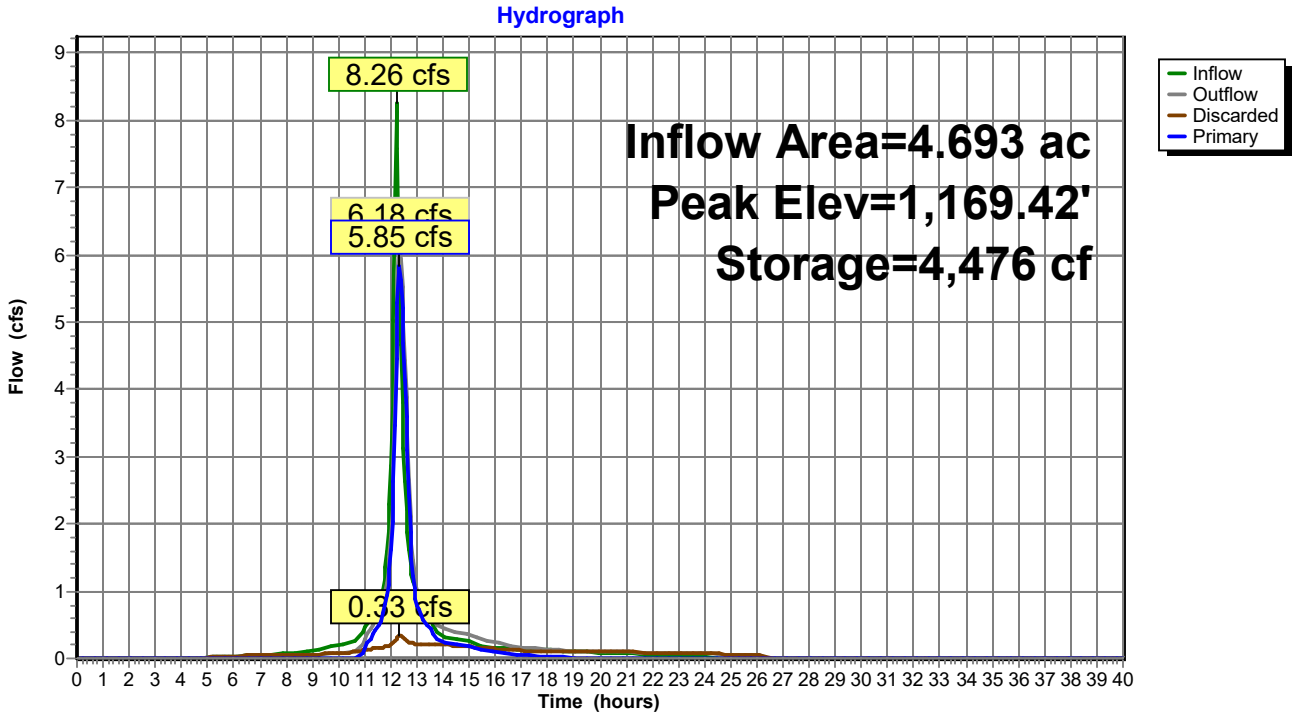
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,167.00	480	0	0
1,168.00	1,120	800	800
1,169.00	3,210	2,165	2,965
1,170.00	5,130	4,170	7,135
1,171.00	7,400	6,265	13,400
1,172.00	21,000	14,200	27,600

Device	Routing	Invert	Outlet Devices
#1	Primary	1,168.00'	**18.0" Round Culvert** L= 66.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,168.00' / 1,167.67' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	1,167.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.33 cfs @ 12.34 hrs HW=1,169.41' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=5.82 cfs @ 12.34 hrs HW=1,169.41' TW=1,167.56' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 5.82 cfs @ 4.36 fps)

Pond 2P: middle basin

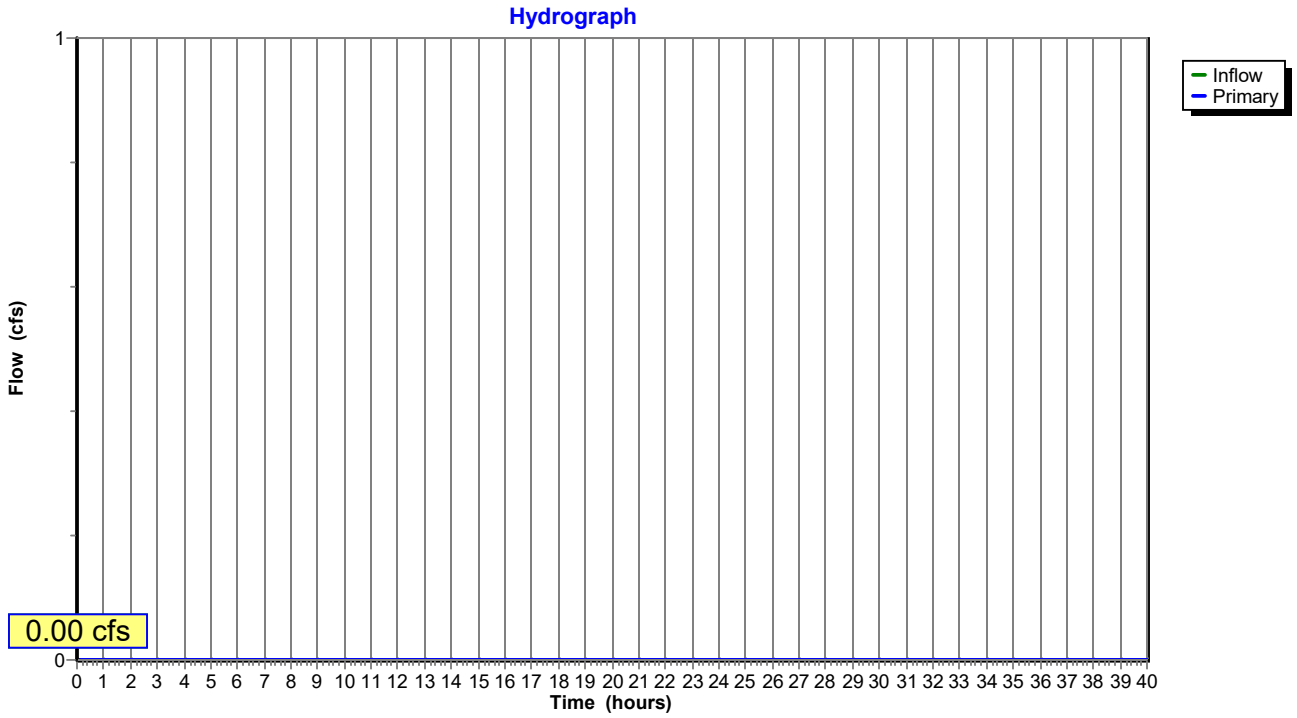


Summary for Link 1L: runoff

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 1L: runoff



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment D1: north parking Runoff Area=1.854 ac 73.68% Impervious Runoff Depth=1.75"
Tc=10.0 min CN=WQ Runoff=4.39 cfs 0.271 af

Subcatchment D2: west side ls bld Runoff Area=1.868 ac 47.97% Impervious Runoff Depth=1.81"
Tc=10.0 min CN=WQ Runoff=4.64 cfs 0.282 af

Subcatchment D3: east side ls bld Runoff Area=0.971 ac 13.08% Impervious Runoff Depth=1.59"
Tc=10.0 min CN=WQ Runoff=2.16 cfs 0.129 af

Subcatchment D4: roadway Runoff Area=0.628 ac 48.41% Impervious Runoff Depth=1.15"
Tc=10.0 min CN=WQ Runoff=0.98 cfs 0.060 af

Reach 1R: Swale Avg. Flow Depth=0.61' Max Vel=1.73 fps Inflow=4.39 cfs 0.271 af
n=0.030 L=689.0' S=0.0050 '/' Capacity=11.62 cfs Outflow=3.63 cfs 0.271 af

Reach 2R: Swale Avg. Flow Depth=0.65' Max Vel=1.79 fps Inflow=4.64 cfs 0.282 af
n=0.030 L=441.0' S=0.0050 '/' Capacity=11.61 cfs Outflow=4.20 cfs 0.282 af

Reach 3R: Swale Avg. Flow Depth=0.43' Max Vel=1.59 fps Inflow=2.16 cfs 0.129 af
n=0.030 L=514.7' S=0.0064 '/' Capacity=13.12 cfs Outflow=1.86 cfs 0.129 af

Pond 1P: south basin Peak Elev=1,168.97' Storage=14,963 cf Inflow=7.18 cfs 0.525 af
Discarded=0.59 cfs 0.525 af Secondary=0.00 cfs 0.000 af Outflow=0.59 cfs 0.525 af

Pond 2P: middle basin Peak Elev=1,169.57' Storage=5,124 cf Inflow=9.69 cfs 0.681 af
Discarded=0.36 cfs 0.217 af Primary=6.73 cfs 0.465 af Outflow=7.09 cfs 0.681 af

Link 1L: runoff Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 5.321 ac Runoff Volume = 0.742 af Average Runoff Depth = 1.67"
49.39% Pervious = 2.628 ac 50.61% Impervious = 2.693 ac

Summary for Subcatchment D1: north parking

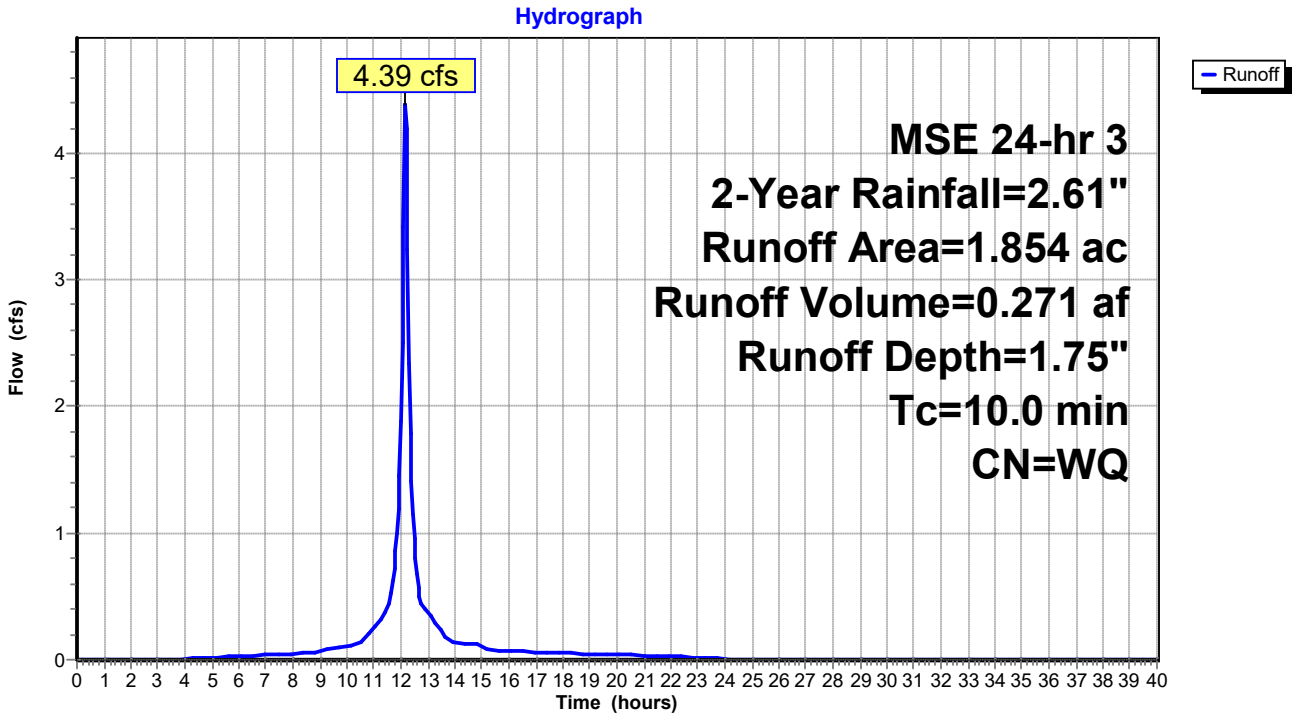
Runoff = 4.39 cfs @ 12.17 hrs, Volume= 0.271 af, Depth= 1.75"
Routed to Reach 1R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.61"

	Area (ac)	CN	Description
*	0.532	98	future parking
*	0.257	98	future building
	0.488	39	>75% Grass cover, Good, HSG A
*	0.310	98	proposed parking
*	0.257	98	proposed building
*	0.005	98	stoop
*	0.005	98	future stoop
	1.854		Weighted Average
	0.488		26.32% Pervious Area
	1.366		73.68% Impervious Area

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

Subcatchment D1: north parking



Summary for Subcatchment D2: west side ls bld

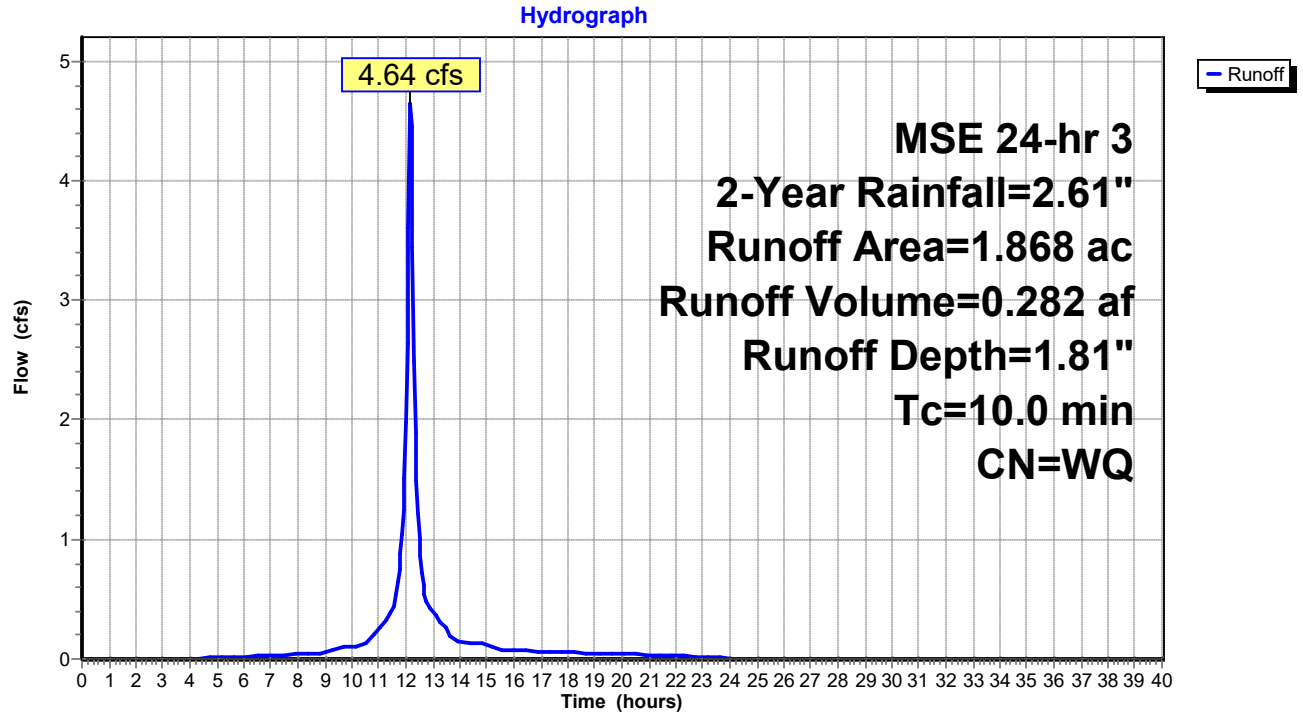
Runoff = 4.64 cfs @ 12.17 hrs, Volume= 0.282 af, Depth= 1.81"
Routed to Reach 2R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.61"

	Area (ac)	CN	Description
*	0.297	98	parking lot
*	0.576	96	gravel park
*	0.321	98	prop building
*	0.005	98	future sw
*	0.005	98	prop sidewalk
*	0.257	98	future bld
	0.396	39	>75% Grass cover, Good, HSG A
*	0.011	98	basin
	1.868		Weighted Average
	0.972		52.03% Pervious Area
	0.896		47.97% Impervious Area

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

Subcatchment D2: west side ls bld



Summary for Subcatchment D3: east side ls bld

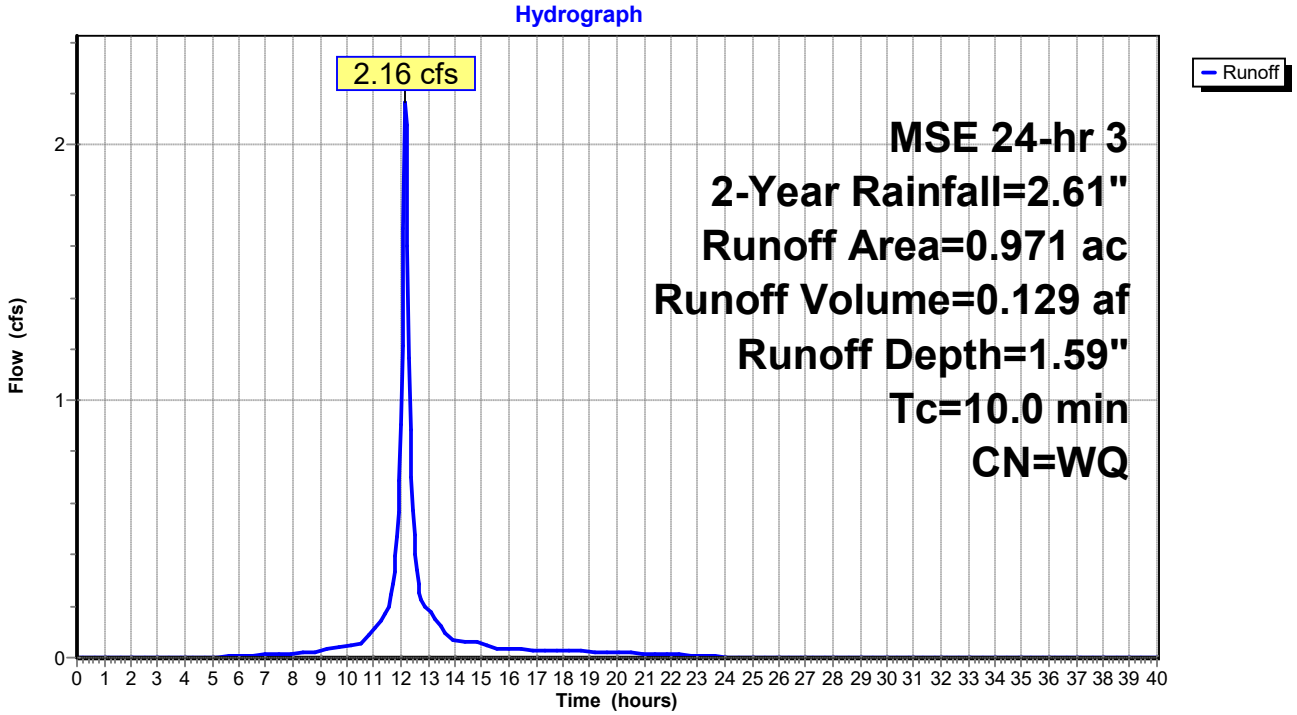
Runoff = 2.16 cfs @ 12.17 hrs, Volume= 0.129 af, Depth= 1.59"
Routed to Reach 3R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.61"

	Area (ac)	CN	Description
*	0.035	98	prop parking
*	0.572	96	prop gravel
*	0.064	98	prop building
*	0.028	98	basin
	0.272	39	>75% Grass cover, Good, HSG A
	0.971		Weighted Average
	0.844		86.92% Pervious Area
	0.127		13.08% Impervious Area

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

Subcatchment D3: east side ls bld



Summary for Subcatchment D4: roadway

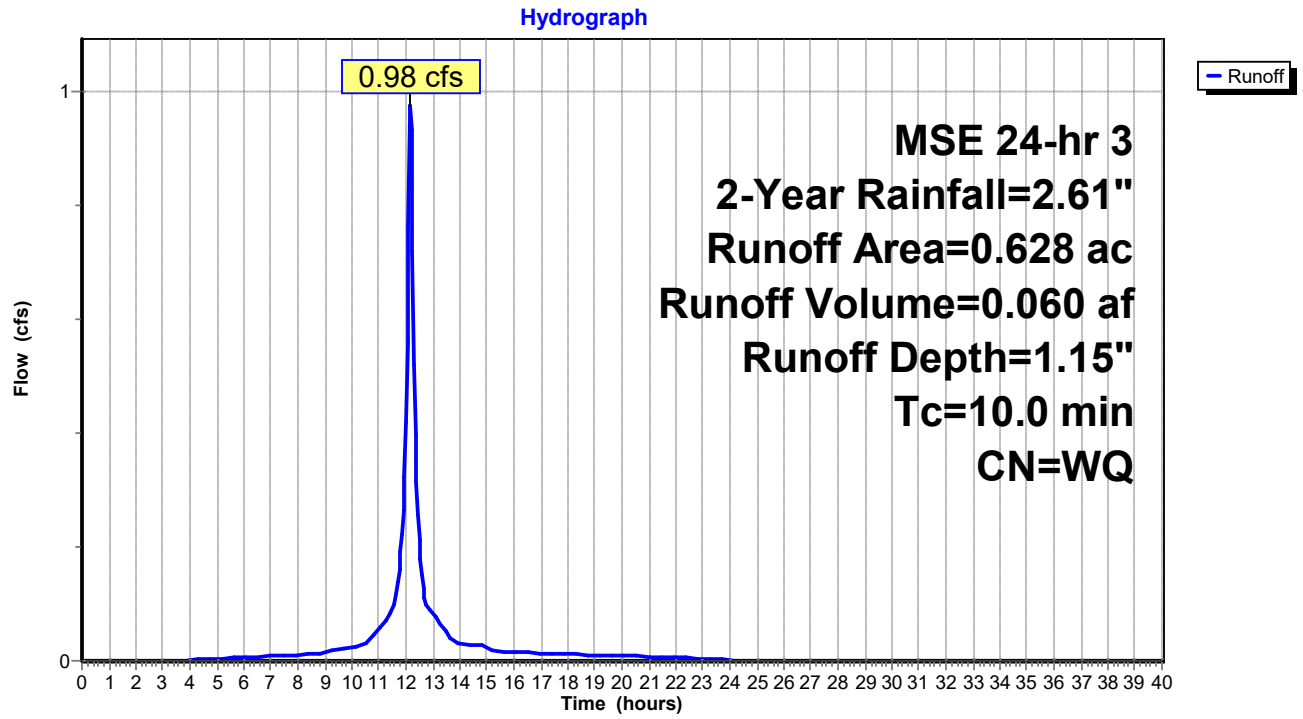
Runoff = 0.98 cfs @ 12.17 hrs, Volume= 0.060 af, Depth= 1.15"
Routed to Pond 1P : south basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.61"

	Area (ac)	CN	Description
*	0.232	98	pavement
	0.324	39	>75% Grass cover, Good, HSG A
*	0.072	98	basin
	0.628		Weighted Average
	0.324		51.59% Pervious Area
	0.304		48.41% Impervious Area

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

Subcatchment D4: roadway



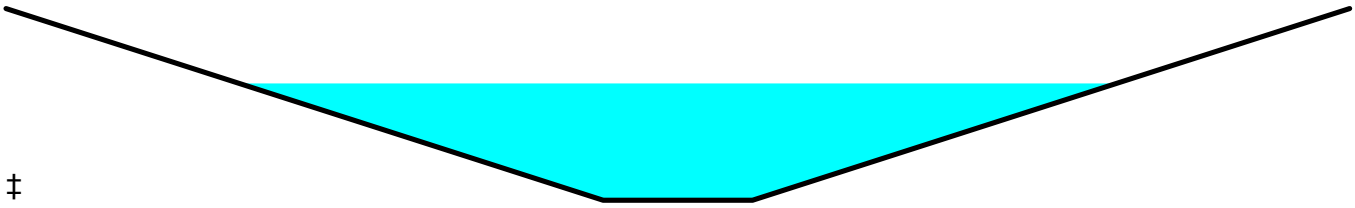
Summary for Reach 1R: Swale

Inflow Area = 1.854 ac, 73.68% Impervious, Inflow Depth = 1.75" for 2-Year event
Inflow = 4.39 cfs @ 12.17 hrs, Volume= 0.271 af
Outflow = 3.63 cfs @ 12.23 hrs, Volume= 0.271 af, Atten= 17%, Lag= 3.9 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.73 fps, Min. Travel Time= 6.6 min
Avg. Velocity = 0.47 fps, Avg. Travel Time= 24.2 min

Peak Storage= 1,446 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.61' , Surface Width= 5.88'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.62 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 689.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.94', Outlet Invert= 1,168.50'



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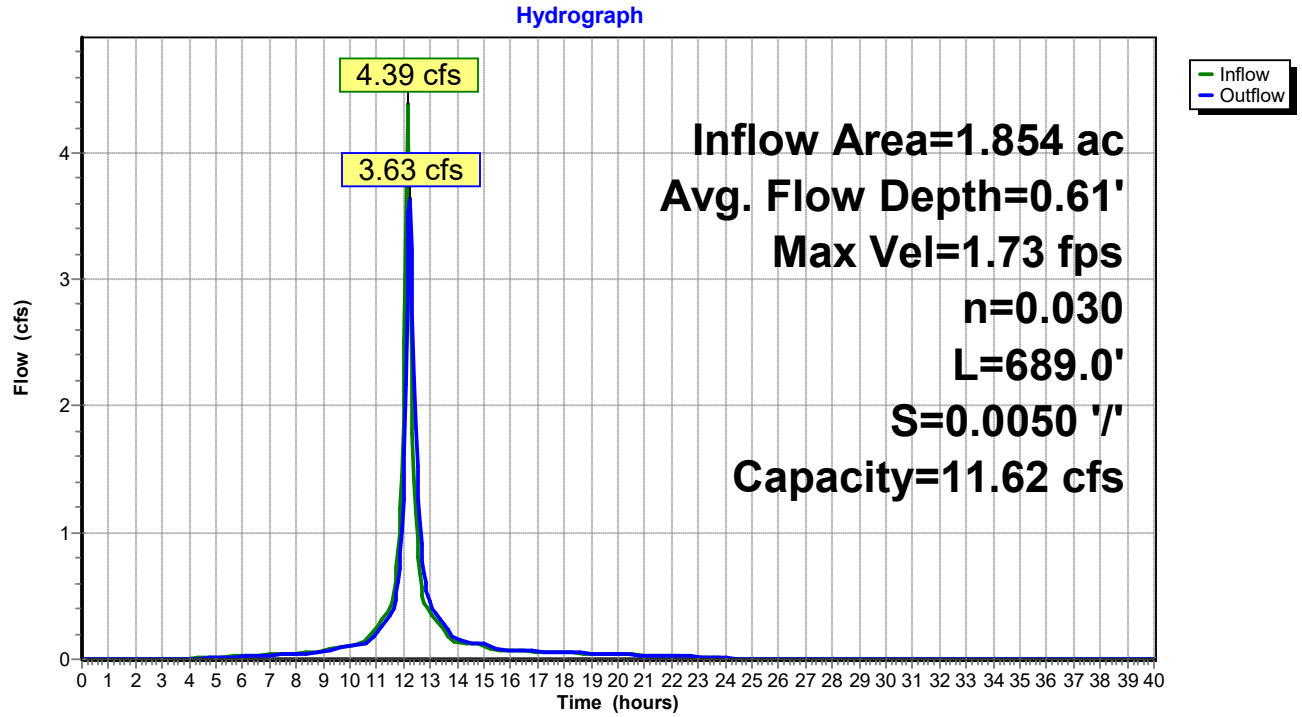


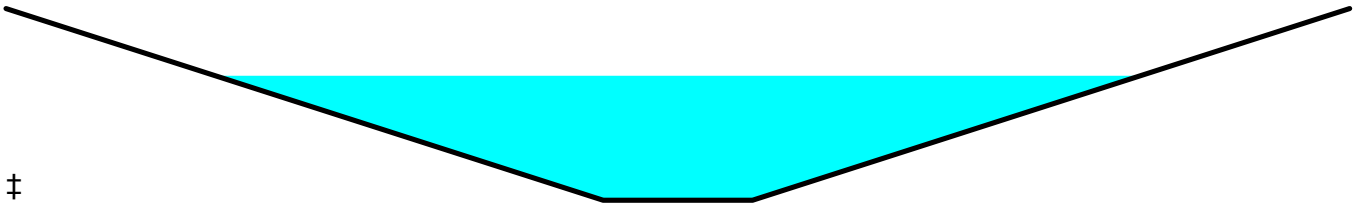
Summary for Reach 2R: Swale

Inflow Area = 1.868 ac, 47.97% Impervious, Inflow Depth = 1.81" for 2-Year event
Inflow = 4.64 cfs @ 12.17 hrs, Volume= 0.282 af
Outflow = 4.20 cfs @ 12.22 hrs, Volume= 0.282 af, Atten= 9%, Lag= 2.7 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.79 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.50 fps, Avg. Travel Time= 14.6 min

Peak Storage= 1,032 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.65' , Surface Width= 6.20'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.61 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 441.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.78', Outlet Invert= 1,169.58'



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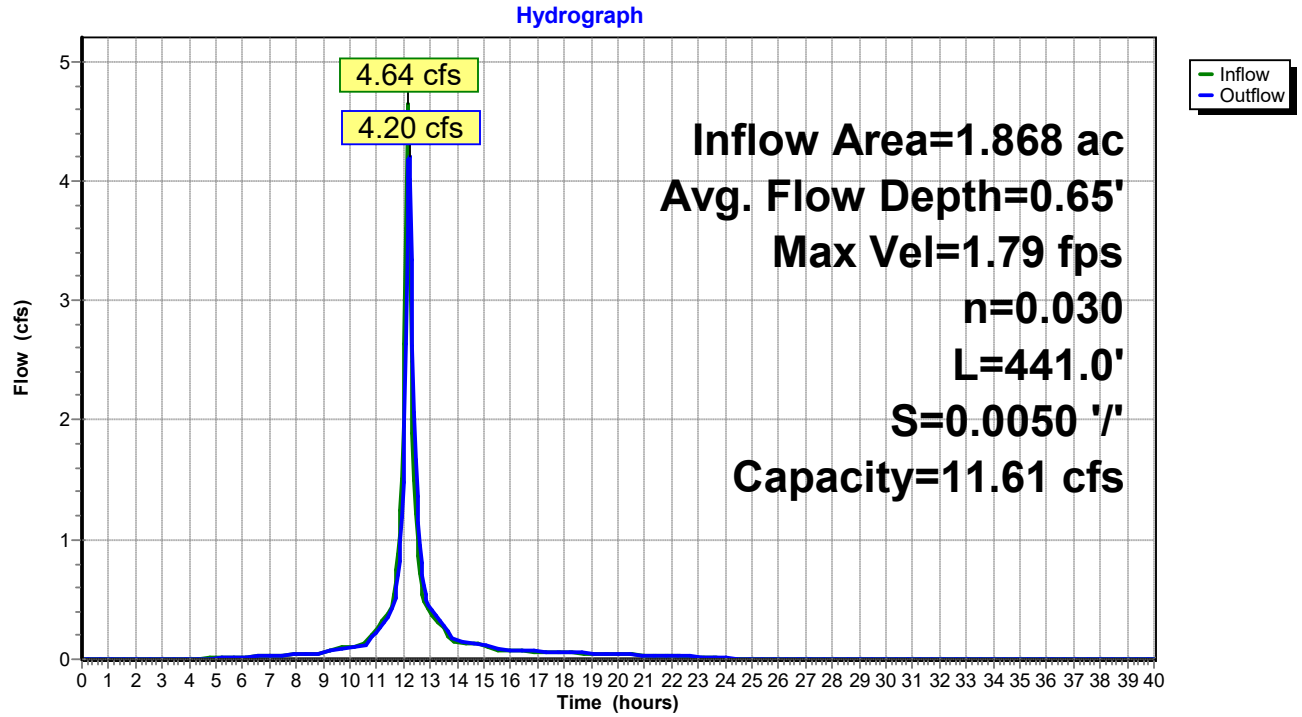
Reach 2R: Swale



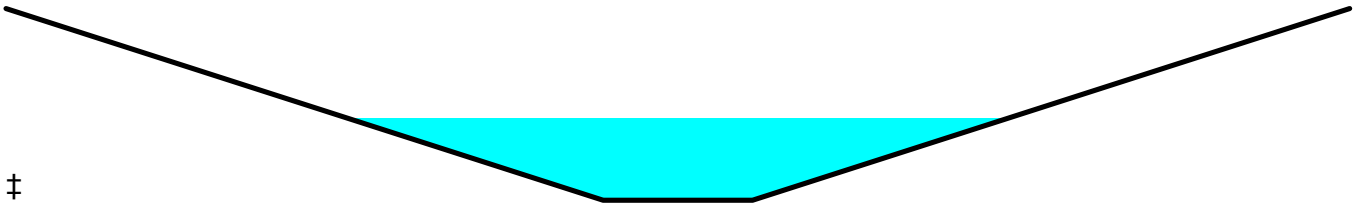
Summary for Reach 3R: Swale

Inflow Area = 0.971 ac, 13.08% Impervious, Inflow Depth = 1.59" for 2-Year event
Inflow = 2.16 cfs @ 12.17 hrs, Volume= 0.129 af
Outflow = 1.86 cfs @ 12.23 hrs, Volume= 0.129 af, Atten= 14%, Lag= 3.3 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.59 fps, Min. Travel Time= 5.4 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 19.8 min

Peak Storage= 600 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 4.43'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.12 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 514.7' Slope= 0.0064 '/'
Inlet Invert= 1,171.90', Outlet Invert= 1,168.62'



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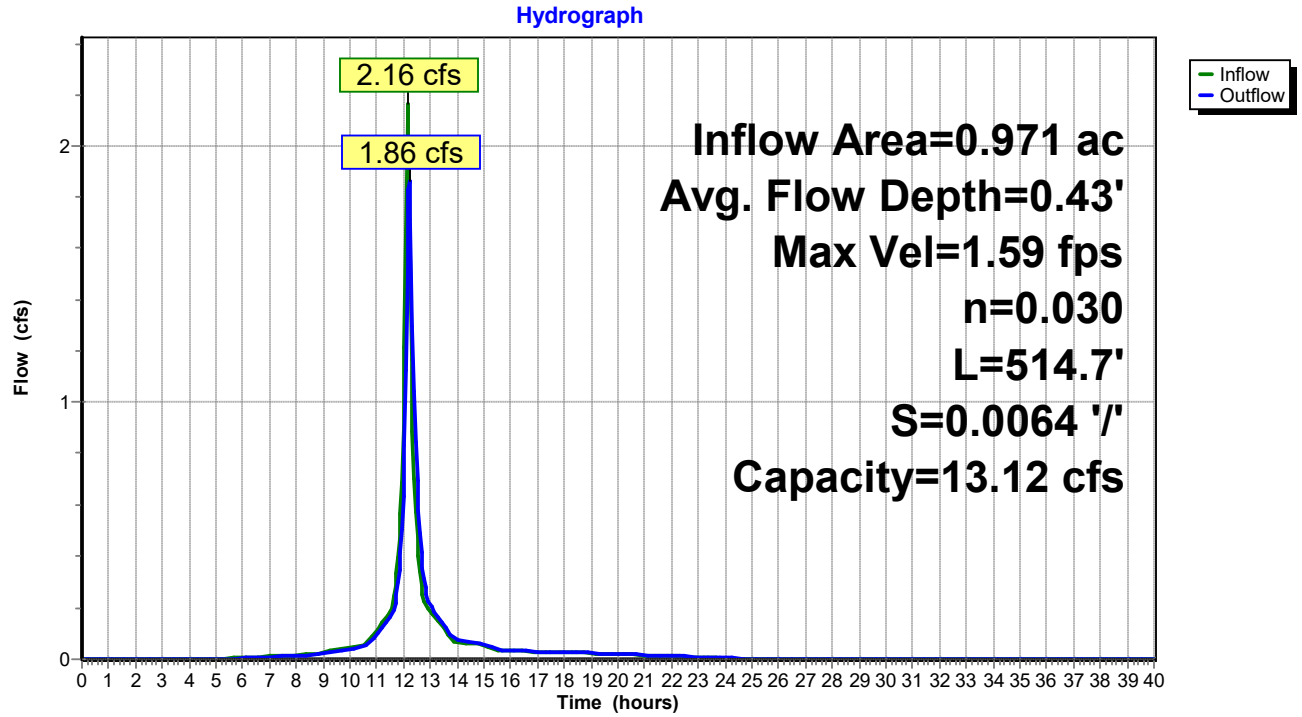


Summary for Pond 1P: south basin

Inflow Area = 5.321 ac, 50.61% Impervious, Inflow Depth = 1.18" for 2-Year event
Inflow = 7.18 cfs @ 12.32 hrs, Volume= 0.525 af
Outflow = 0.59 cfs @ 13.36 hrs, Volume= 0.525 af, Atten= 92%, Lag= 62.6 min
Discarded = 0.59 cfs @ 13.36 hrs, Volume= 0.525 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,168.97' @ 13.36 hrs Surf.Area= 7,084 sf Storage= 14,963 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 272.4 min (1,038.1 - 765.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,166.00'	44,780 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

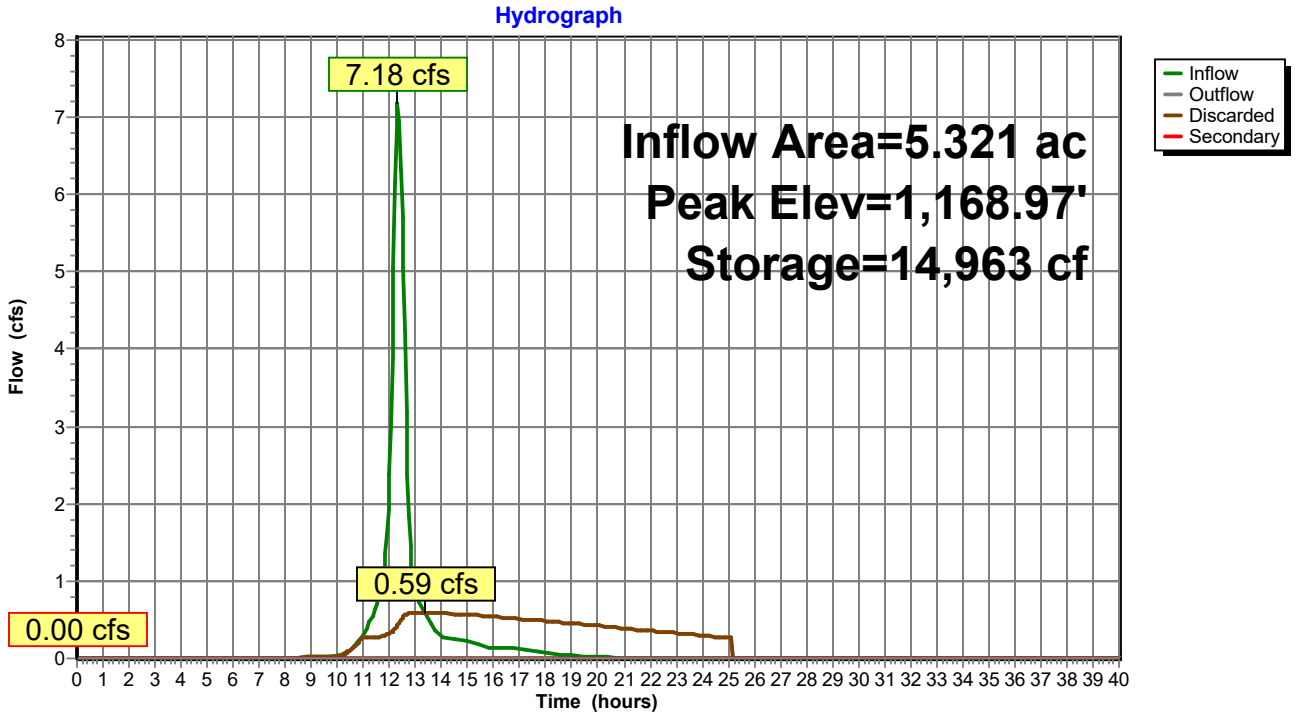
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,166.00	3,150	0	0
1,167.00	4,350	3,750	3,750
1,168.00	5,700	5,025	8,775
1,169.00	7,130	6,415	15,190
1,170.00	11,025	9,078	24,268
1,171.00	30,000	20,513	44,780

Device	Routing	Invert	Outlet Devices
#1	Secondary	1,170.18'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	1,166.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.59 cfs @ 13.36 hrs HW=1,168.97' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.59 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,166.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: south basin



Summary for Pond 2P: middle basin

[62] Hint: Exceeded Reach 1R OUTLET depth by 0.54' @ 12.40 hrs
[64] Warning: Exceeded Reach 1R outlet bank by 0.07' @ 12.34 hrs
[62] Hint: Exceeded Reach 3R OUTLET depth by 0.59' @ 12.35 hrs

Inflow Area = 4.693 ac, 50.91% Impervious, Inflow Depth = 1.74" for 2-Year event
Inflow = 9.69 cfs @ 12.22 hrs, Volume= 0.681 af
Outflow = 7.09 cfs @ 12.34 hrs, Volume= 0.681 af, Atten= 27%, Lag= 6.9 min
Discarded = 0.36 cfs @ 12.34 hrs, Volume= 0.217 af
Primary = 6.73 cfs @ 12.34 hrs, Volume= 0.465 af
Routed to Pond 1P : south basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,169.57' @ 12.34 hrs Surf.Area= 4,312 sf Storage= 5,124 cf

Plug-Flow detention time= 45.1 min calculated for 0.680 af (100% of inflow)
Center-of-Mass det. time= 45.2 min (818.6 - 773.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,167.00'	27,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

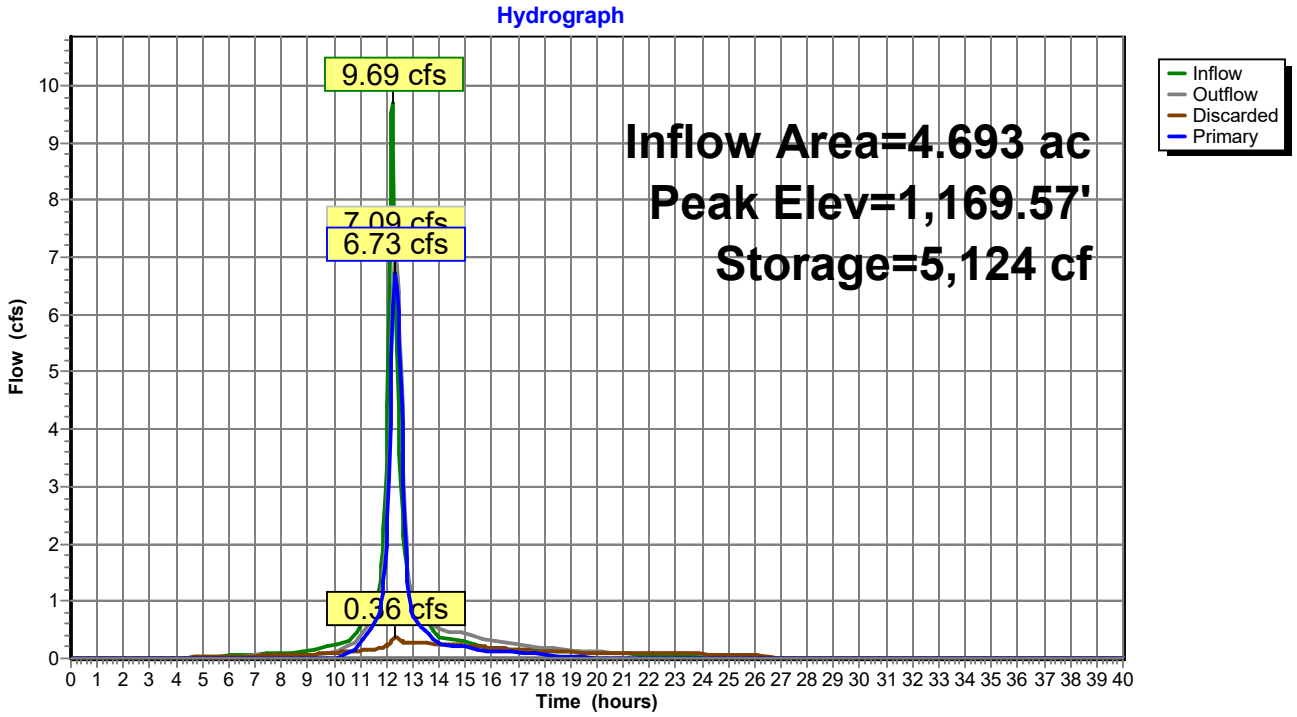
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,167.00	480	0	0
1,168.00	1,120	800	800
1,169.00	3,210	2,165	2,965
1,170.00	5,130	4,170	7,135
1,171.00	7,400	6,265	13,400
1,172.00	21,000	14,200	27,600

Device	Routing	Invert	Outlet Devices
#1	Primary	1,168.00'	**18.0" Round Culvert** L= 66.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,168.00' / 1,167.67' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	1,167.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.36 cfs @ 12.34 hrs HW=1,169.57' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=6.70 cfs @ 12.34 hrs HW=1,169.57' TW=1,167.85' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 6.70 cfs @ 4.50 fps)

Pond 2P: middle basin

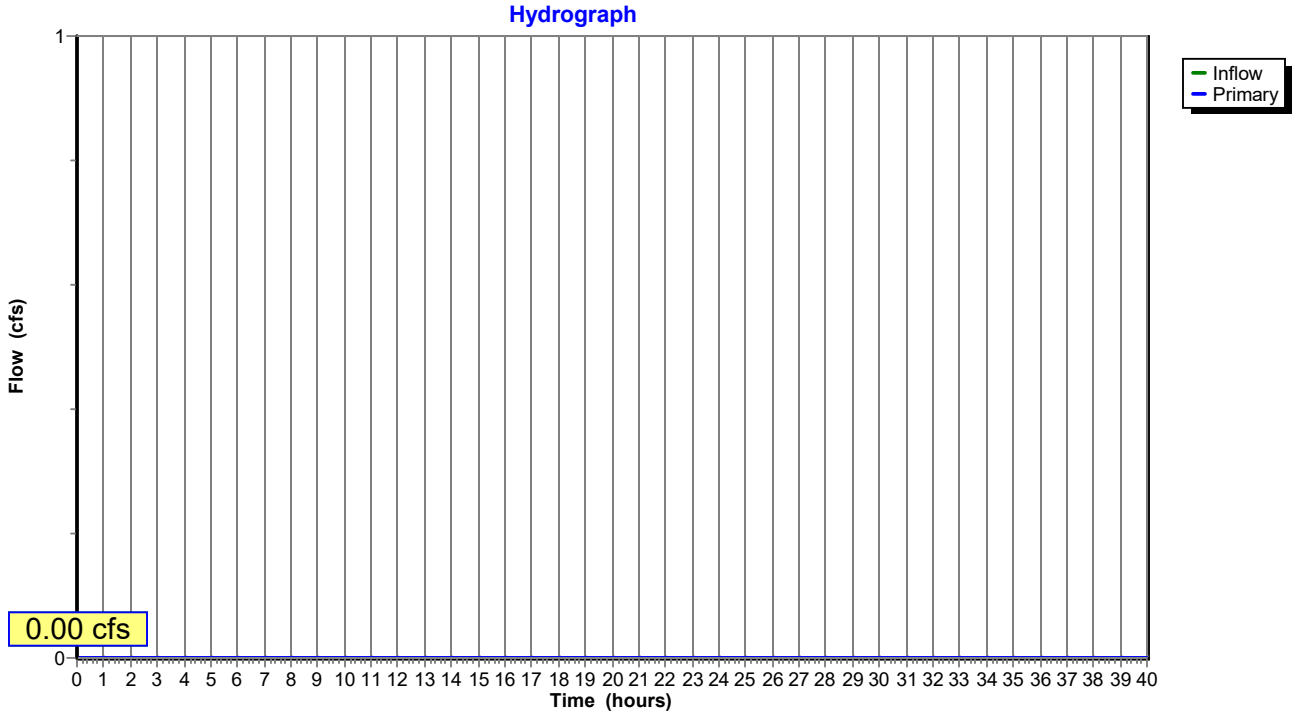


Summary for Link 1L: runoff

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 1L: runoff



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment D1: north parking Runoff Area=1.854 ac 73.68% Impervious Runoff Depth=2.58"
Tc=10.0 min CN=WQ Runoff=6.33 cfs 0.399 af

Subcatchment D2: west side ls bld Runoff Area=1.868 ac 47.97% Impervious Runoff Depth=2.69"
Tc=10.0 min CN=WQ Runoff=6.75 cfs 0.419 af

Subcatchment D3: east side ls bld Runoff Area=0.971 ac 13.08% Impervious Runoff Depth=2.39"
Tc=10.0 min CN=WQ Runoff=3.17 cfs 0.194 af

Subcatchment D4: roadway Runoff Area=0.628 ac 48.41% Impervious Runoff Depth=1.70"
Tc=10.0 min CN=WQ Runoff=1.41 cfs 0.089 af

Reach 1R: Swale Avg. Flow Depth=0.72' Max Vel=1.90 fps Inflow=6.33 cfs 0.399 af
n=0.030 L=689.0' S=0.0050 '/' Capacity=11.62 cfs Outflow=5.35 cfs 0.399 af

Reach 2R: Swale Avg. Flow Depth=0.77' Max Vel=1.98 fps Inflow=6.75 cfs 0.419 af
n=0.030 L=441.0' S=0.0050 '/' Capacity=11.61 cfs Outflow=6.20 cfs 0.419 af

Reach 3R: Swale Avg. Flow Depth=0.52' Max Vel=1.77 fps Inflow=3.17 cfs 0.194 af
n=0.030 L=514.7' S=0.0064 '/' Capacity=13.12 cfs Outflow=2.80 cfs 0.194 af

Pond 1P: south basin Peak Elev=1,169.72' Storage=21,331 cf Inflow=9.26 cfs 0.779 af
Discarded=0.83 cfs 0.779 af Secondary=0.00 cfs 0.000 af Outflow=0.83 cfs 0.779 af

Pond 2P: middle basin Peak Elev=1,170.12' Storage=7,766 cf Inflow=14.33 cfs 1.011 af
Discarded=0.45 cfs 0.322 af Primary=8.69 cfs 0.690 af Outflow=9.14 cfs 1.011 af

Link 1L: runoff Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 5.321 ac Runoff Volume = 1.100 af Average Runoff Depth = 2.48"
49.39% Pervious = 2.628 ac 50.61% Impervious = 2.693 ac

Summary for Subcatchment D1: north parking

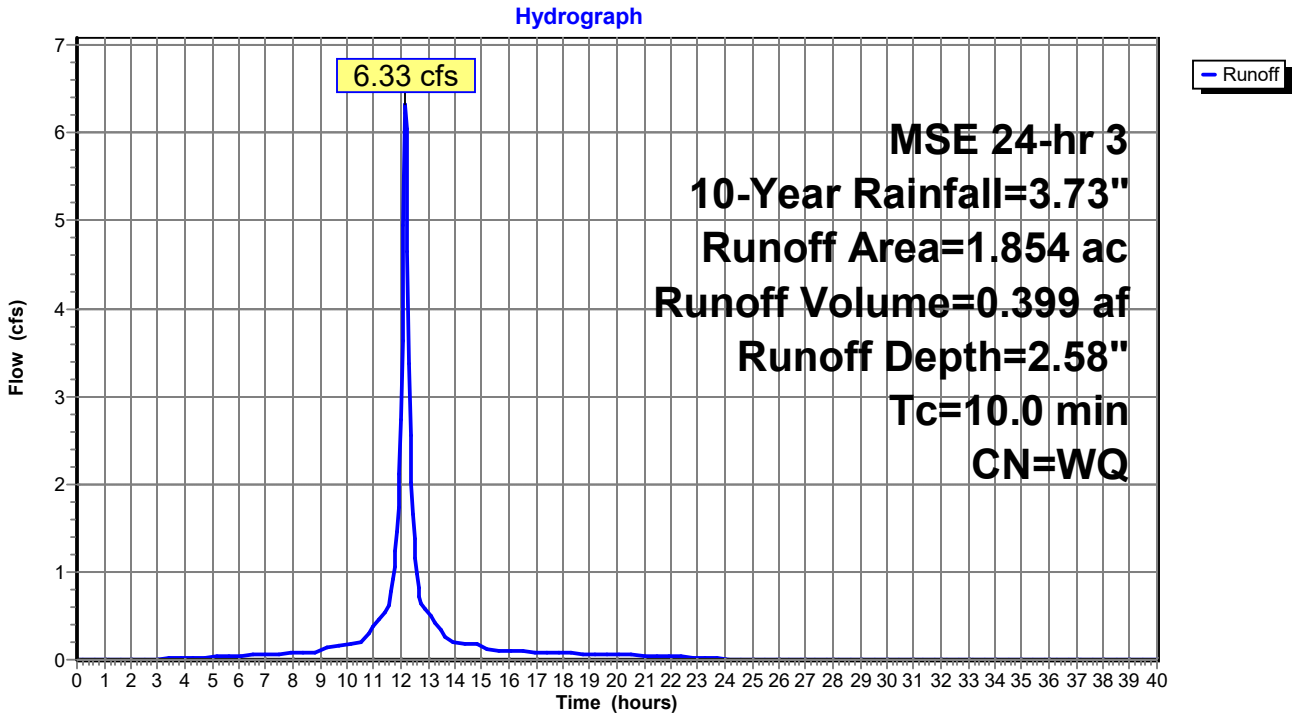
Runoff = 6.33 cfs @ 12.17 hrs, Volume= 0.399 af, Depth= 2.58"
Routed to Reach 1R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.73"

	Area (ac)	CN	Description
*	0.532	98	future parking
*	0.257	98	future building
	0.488	39	>75% Grass cover, Good, HSG A
*	0.310	98	proposed parking
*	0.257	98	proposed building
*	0.005	98	stoop
*	0.005	98	future stoop
	1.854		Weighted Average
	0.488		26.32% Pervious Area
	1.366		73.68% Impervious Area

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

Subcatchment D1: north parking



Summary for Subcatchment D2: west side ls bld

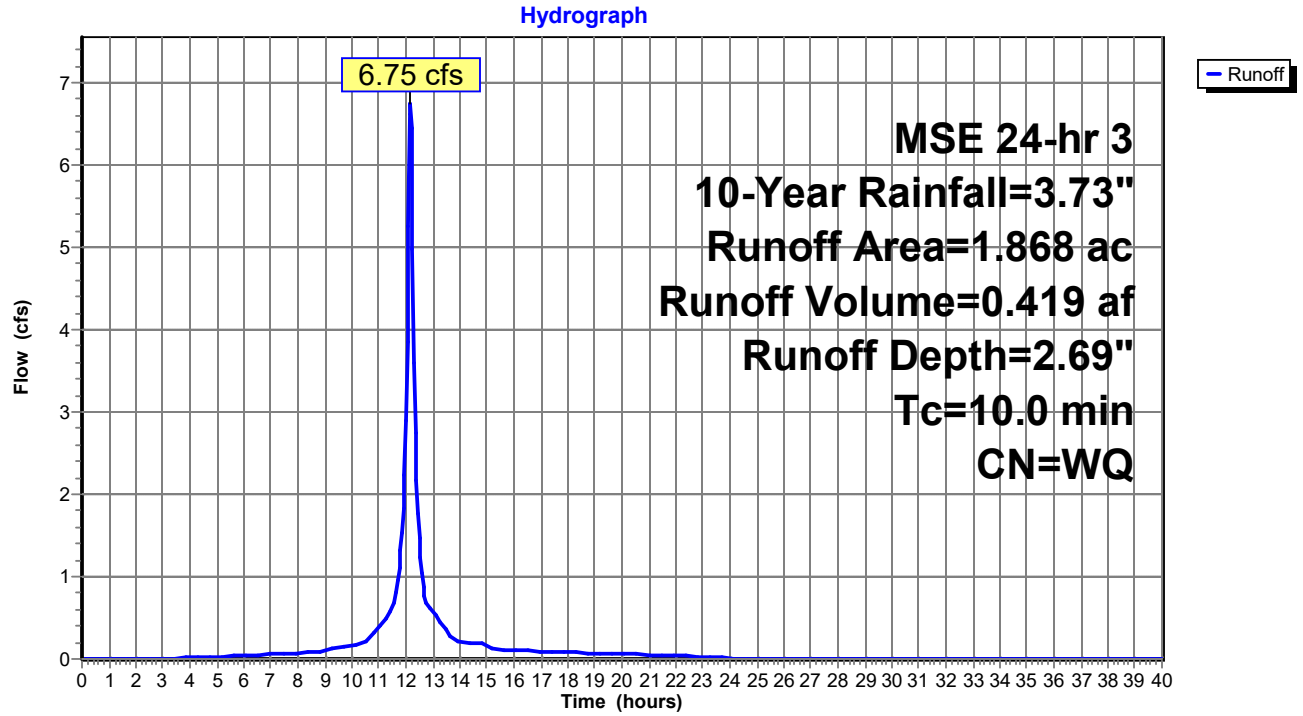
Runoff = 6.75 cfs @ 12.17 hrs, Volume= 0.419 af, Depth= 2.69"
Routed to Reach 2R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.73"

	Area (ac)	CN	Description
*	0.297	98	parking lot
*	0.576	96	gravel park
*	0.321	98	prop building
*	0.005	98	future sw
*	0.005	98	prop sidewalk
*	0.257	98	future bld
	0.396	39	>75% Grass cover, Good, HSG A
*	0.011	98	basin
	1.868		Weighted Average
	0.972		52.03% Pervious Area
	0.896		47.97% Impervious Area

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

Subcatchment D2: west side ls bld



Summary for Subcatchment D3: east side ls bld

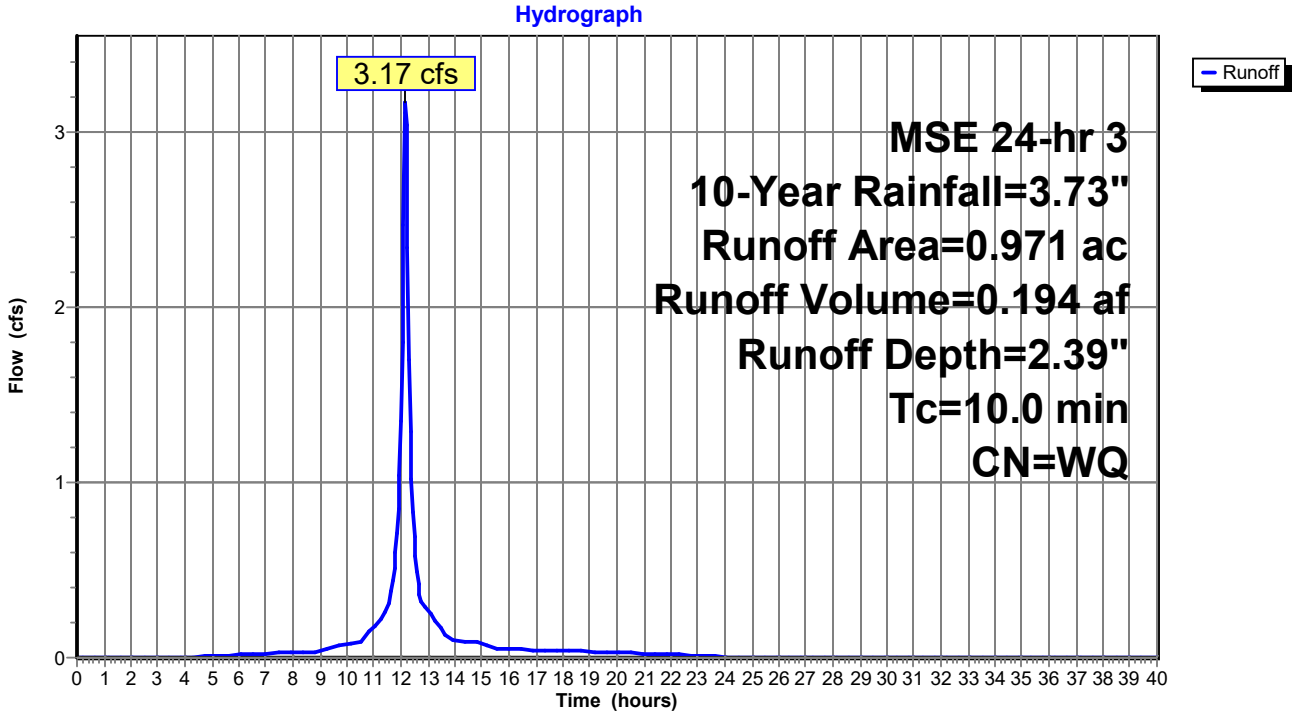
Runoff = 3.17 cfs @ 12.17 hrs, Volume= 0.194 af, Depth= 2.39"
Routed to Reach 3R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.73"

	Area (ac)	CN	Description
*	0.035	98	prop parking
*	0.572	96	prop gravel
*	0.064	98	prop building
*	0.028	98	basin
	0.272	39	>75% Grass cover, Good, HSG A
	0.971		Weighted Average
	0.844		86.92% Pervious Area
	0.127		13.08% Impervious Area

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

Subcatchment D3: east side ls bld



Summary for Subcatchment D4: roadway

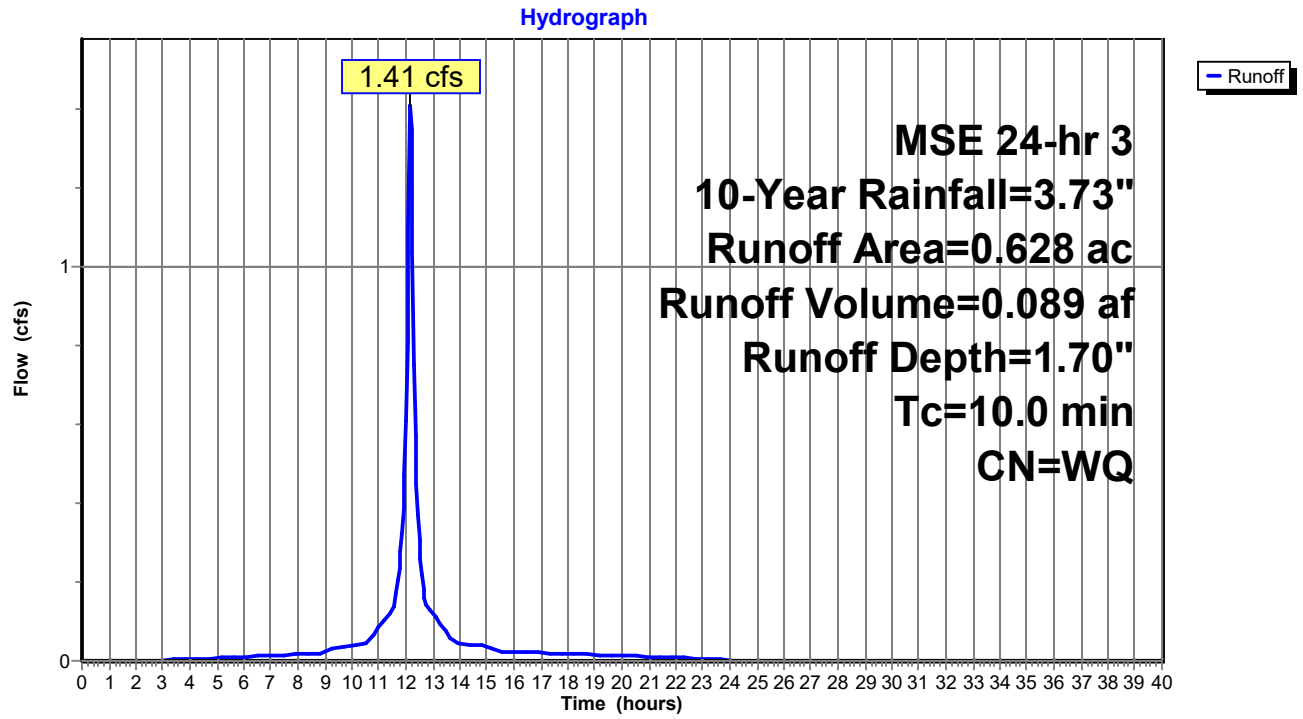
Runoff = 1.41 cfs @ 12.17 hrs, Volume= 0.089 af, Depth= 1.70"
Routed to Pond 1P : south basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.73"

	Area (ac)	CN	Description
*	0.232	98	pavement
	0.324	39	>75% Grass cover, Good, HSG A
*	0.072	98	basin
	0.628		Weighted Average
	0.324		51.59% Pervious Area
	0.304		48.41% Impervious Area

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

Subcatchment D4: roadway



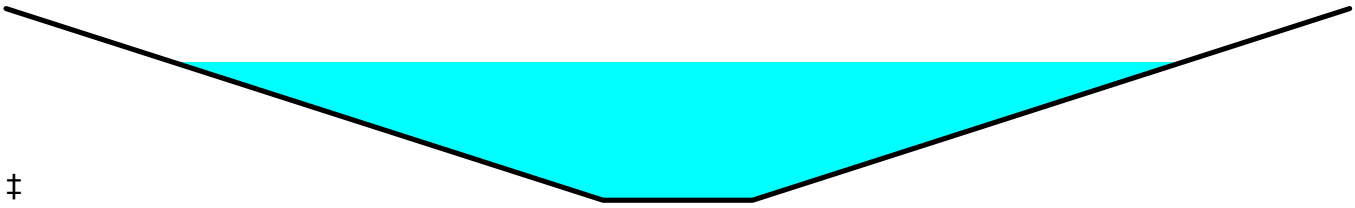
Summary for Reach 1R: Swale

Inflow Area = 1.854 ac, 73.68% Impervious, Inflow Depth = 2.58" for 10-Year event
Inflow = 6.33 cfs @ 12.17 hrs, Volume= 0.399 af
Outflow = 5.35 cfs @ 12.23 hrs, Volume= 0.399 af, Atten= 15%, Lag= 3.6 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.90 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 21.7 min

Peak Storage= 1,930 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.72' , Surface Width= 6.77'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.62 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 689.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.94', Outlet Invert= 1,168.50'



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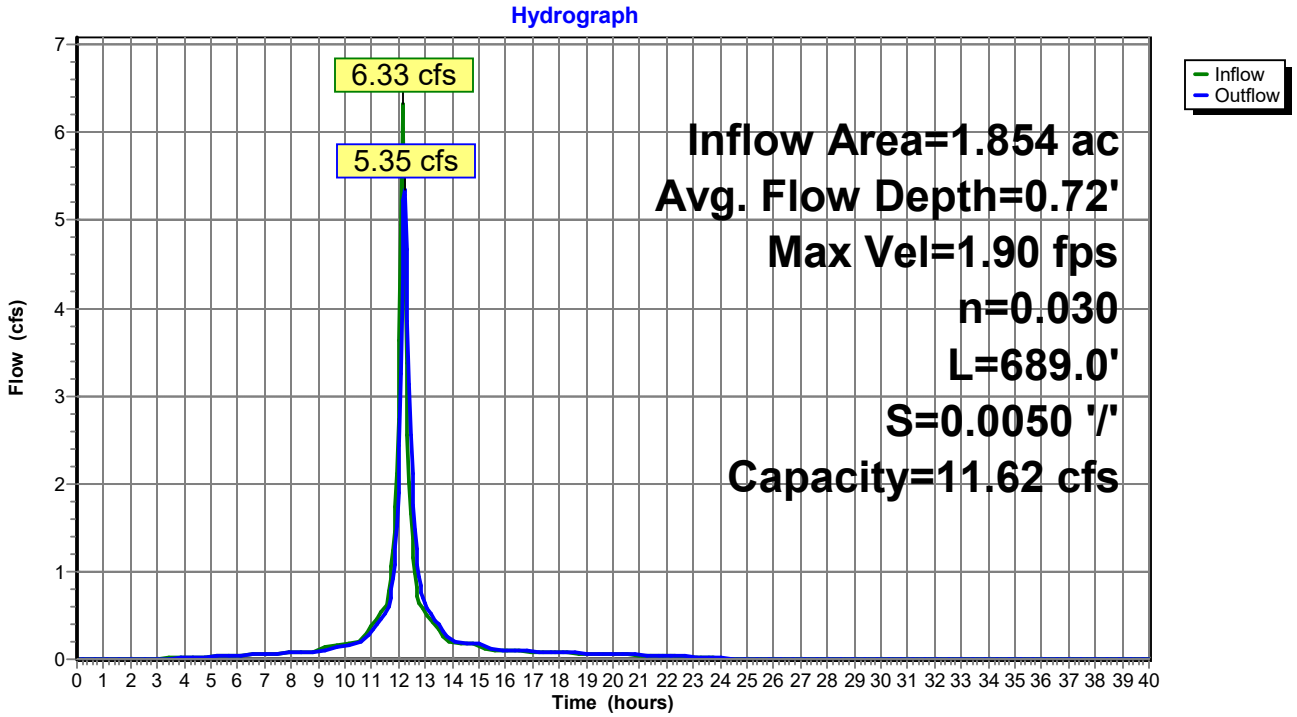
Reach 1R: Swale



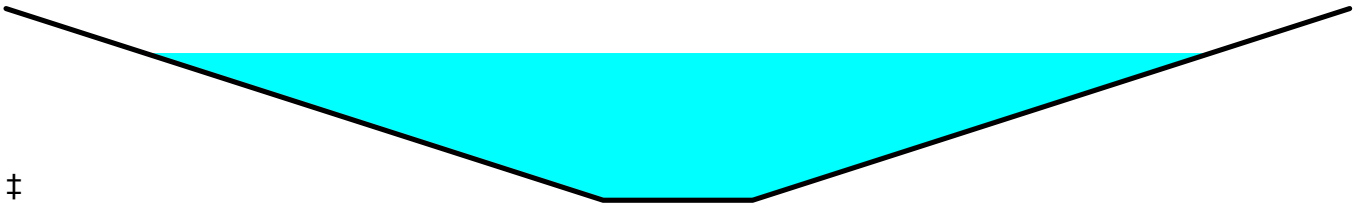
Summary for Reach 2R: Swale

Inflow Area = 1.868 ac, 47.97% Impervious, Inflow Depth = 2.69" for 10-Year event
Inflow = 6.75 cfs @ 12.17 hrs, Volume= 0.419 af
Outflow = 6.20 cfs @ 12.21 hrs, Volume= 0.419 af, Atten= 8%, Lag= 2.5 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.98 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 13.1 min

Peak Storage= 1,379 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.77' , Surface Width= 7.14'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.61 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 441.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.78', Outlet Invert= 1,169.58'



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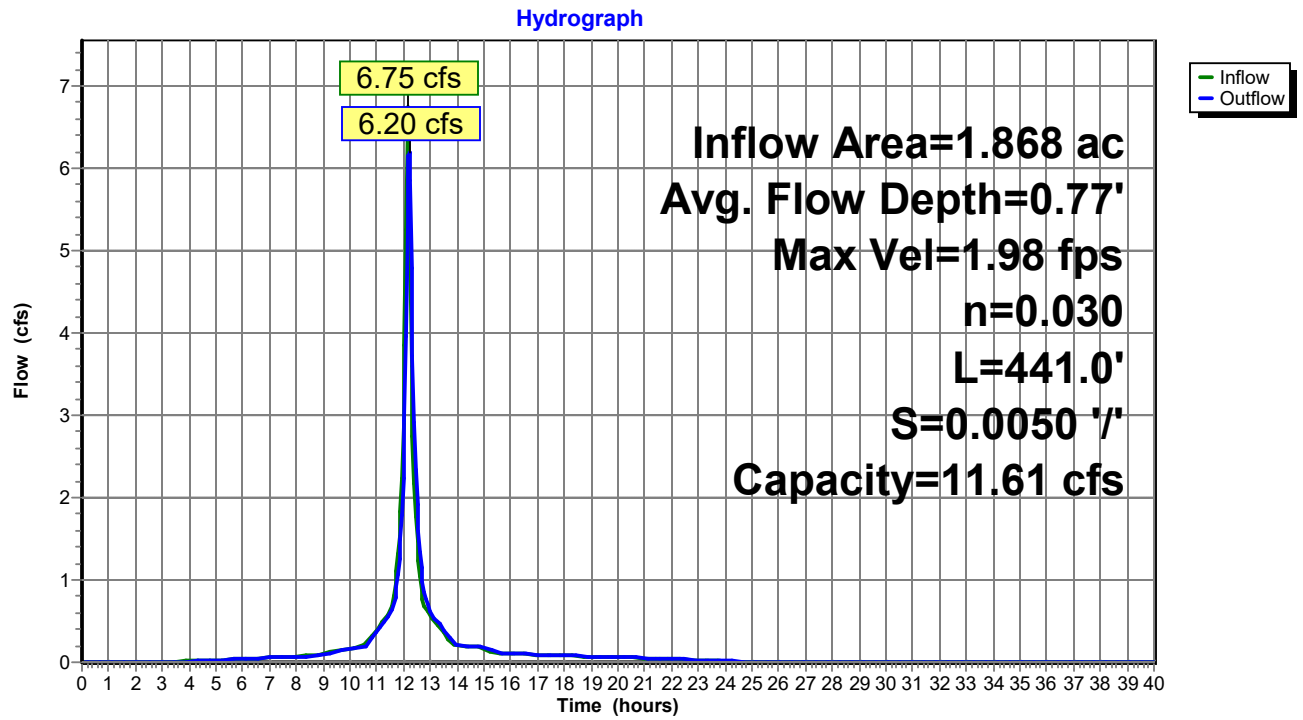


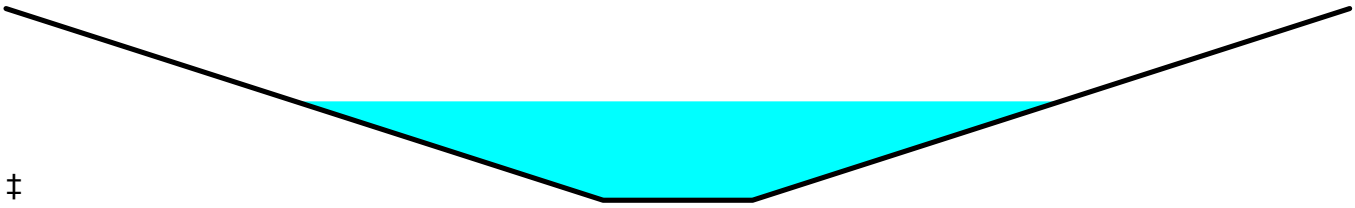
Summary for Reach 3R: Swale

Inflow Area = 0.971 ac, 13.08% Impervious, Inflow Depth = 2.39" for 10-Year event
Inflow = 3.17 cfs @ 12.17 hrs, Volume= 0.194 af
Outflow = 2.80 cfs @ 12.22 hrs, Volume= 0.194 af, Atten= 12%, Lag= 3.1 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.77 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 0.49 fps, Avg. Travel Time= 17.6 min

Peak Storage= 812 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 5.12'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.12 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 514.7' Slope= 0.0064 '/'
Inlet Invert= 1,171.90', Outlet Invert= 1,168.62'



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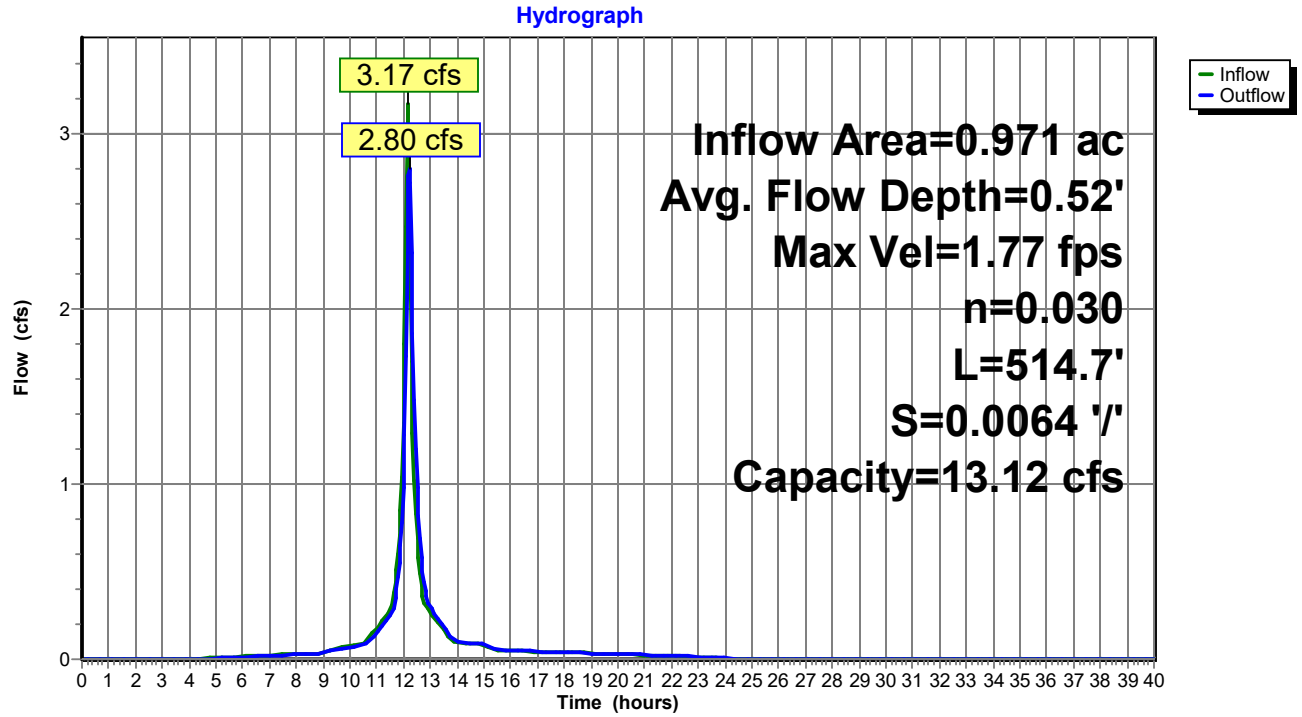


Summary for Pond 1P: south basin

Inflow Area = 5.321 ac, 50.61% Impervious, Inflow Depth = 1.76" for 10-Year event
Inflow = 9.26 cfs @ 12.34 hrs, Volume= 0.779 af
Outflow = 0.83 cfs @ 13.35 hrs, Volume= 0.779 af, Atten= 91%, Lag= 61.0 min
Discarded = 0.83 cfs @ 13.35 hrs, Volume= 0.779 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,169.72' @ 13.35 hrs Surf.Area= 9,933 sf Storage= 21,331 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 312.8 min (1,084.9 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,166.00'	44,780 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

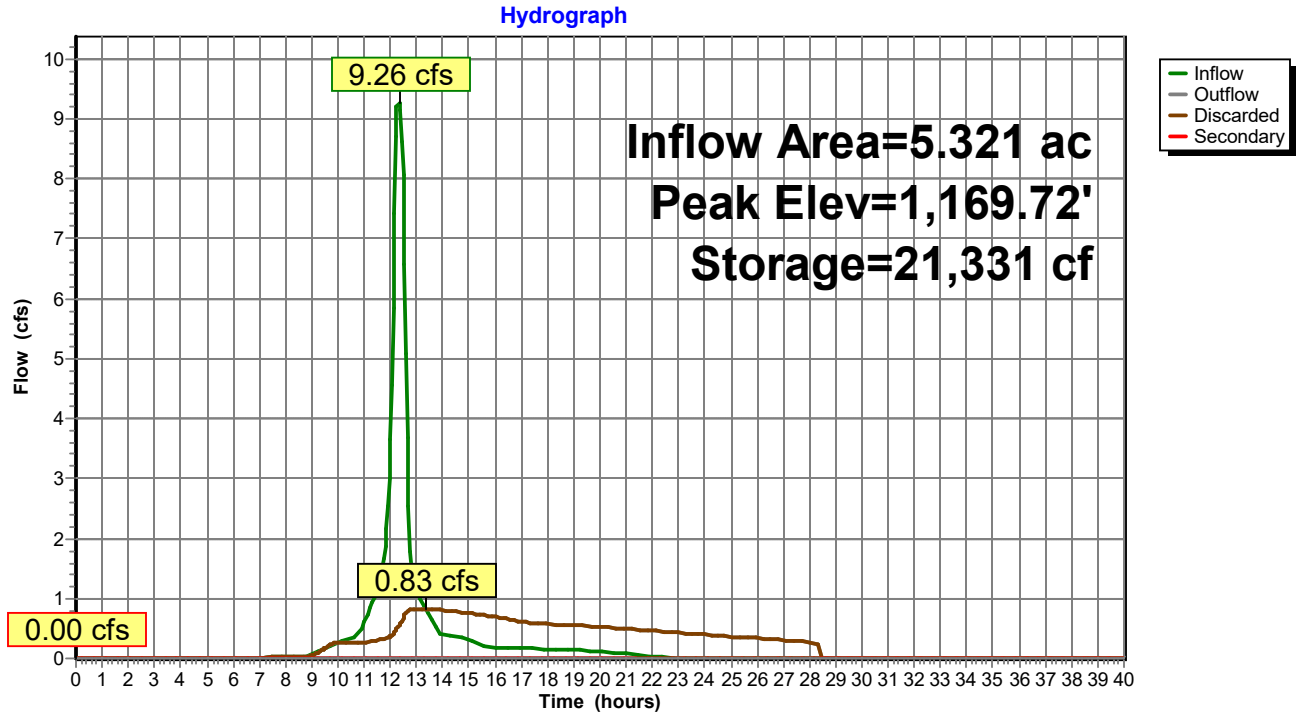
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,166.00	3,150	0	0
1,167.00	4,350	3,750	3,750
1,168.00	5,700	5,025	8,775
1,169.00	7,130	6,415	15,190
1,170.00	11,025	9,078	24,268
1,171.00	30,000	20,513	44,780

Device	Routing	Invert	Outlet Devices
#1	Secondary	1,170.18'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	1,166.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.83 cfs @ 13.35 hrs HW=1,169.72' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.83 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,166.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: south basin



Summary for Pond 2P: middle basin

[62] Hint: Exceeded Reach 1R OUTLET depth by 1.03' @ 12.40 hrs
[64] Warning: Exceeded Reach 1R outlet bank by 0.62' @ 12.36 hrs
[61] Hint: Exceeded Reach 2R outlet invert by 0.54' @ 12.35 hrs
[62] Hint: Exceeded Reach 3R OUTLET depth by 1.09' @ 12.40 hrs
[64] Warning: Exceeded Reach 3R outlet bank by 0.50' @ 12.36 hrs

Inflow Area = 4.693 ac, 50.91% Impervious, Inflow Depth = 2.59" for 10-Year event
Inflow = 14.33 cfs @ 12.22 hrs, Volume= 1.011 af
Outflow = 9.14 cfs @ 12.36 hrs, Volume= 1.011 af, Atten= 36%, Lag= 8.5 min
Discarded = 0.45 cfs @ 12.36 hrs, Volume= 0.322 af
Primary = 8.69 cfs @ 12.36 hrs, Volume= 0.690 af
Routed to Pond 1P : south basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,170.12' @ 12.36 hrs Surf.Area= 5,402 sf Storage= 7,766 cf

Plug-Flow detention time= 57.3 min calculated for 1.010 af (100% of inflow)
Center-of-Mass det. time= 57.4 min (824.2 - 766.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,167.00'	27,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

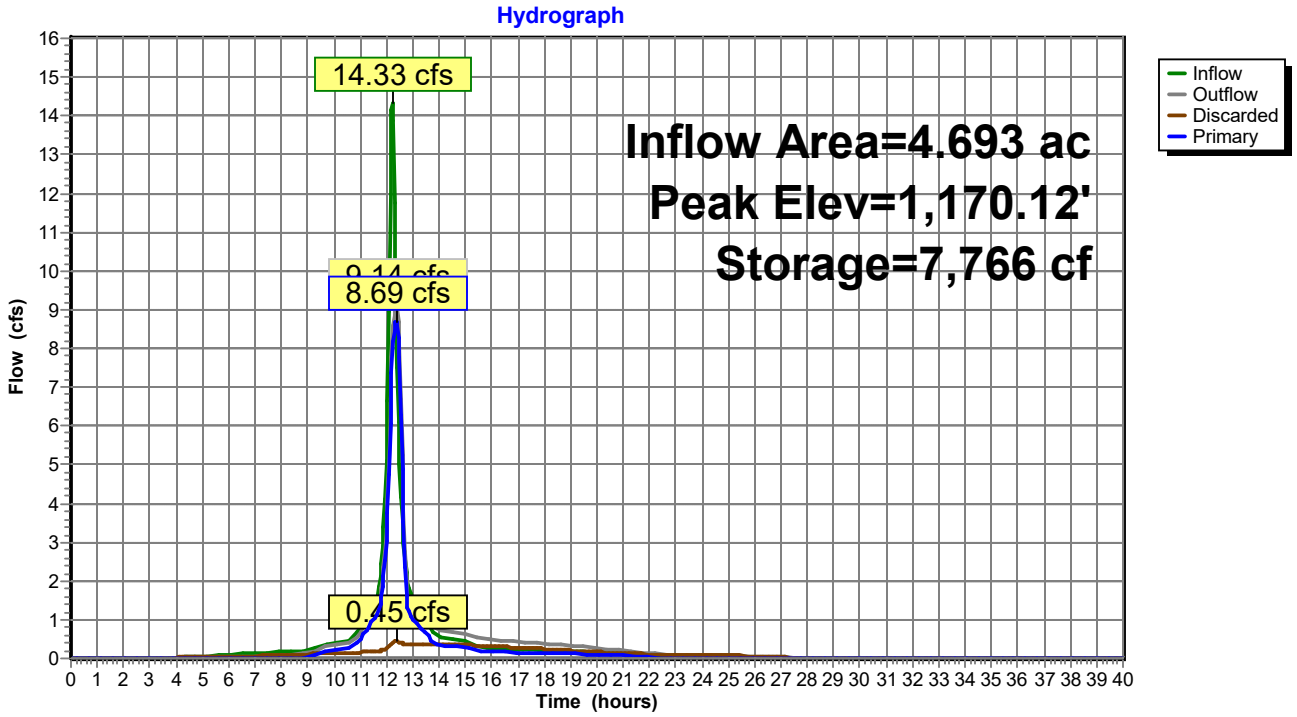
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,167.00	480	0	0
1,168.00	1,120	800	800
1,169.00	3,210	2,165	2,965
1,170.00	5,130	4,170	7,135
1,171.00	7,400	6,265	13,400
1,172.00	21,000	14,200	27,600

Device	Routing	Invert	Outlet Devices
#1	Primary	1,168.00'	**18.0" Round Culvert** L= 66.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,168.00' / 1,167.67' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	1,167.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.45 cfs @ 12.36 hrs HW=1,170.11' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=8.66 cfs @ 12.36 hrs HW=1,170.11' TW=1,168.71' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 8.66 cfs @ 4.90 fps)

Pond 2P: middle basin

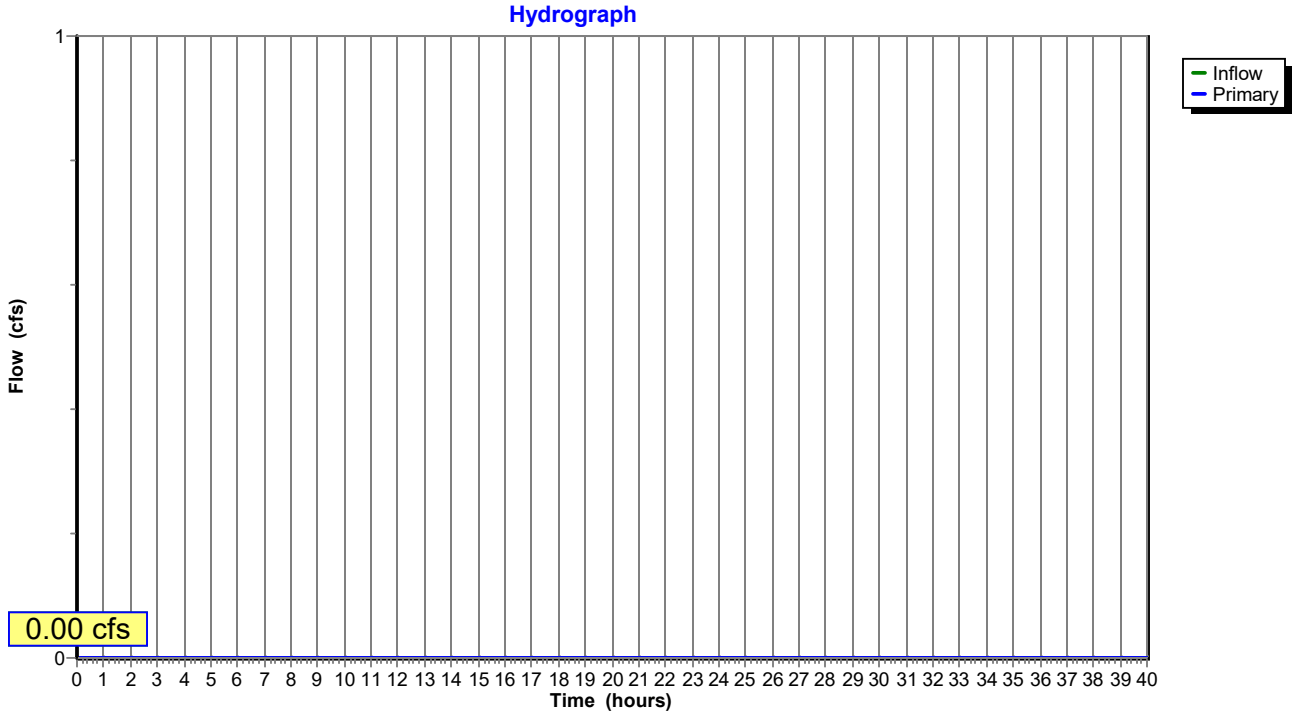


Summary for Link 1L: runoff

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 1L: runoff



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment D1: north parking Runoff Area=1.854 ac 73.68% Impervious Runoff Depth=3.18"
Tc=10.0 min CN=WQ Runoff=7.67 cfs 0.491 af

Subcatchment D2: west side ls bld Runoff Area=1.868 ac 47.97% Impervious Runoff Depth=3.32"
Tc=10.0 min CN=WQ Runoff=8.21 cfs 0.517 af

Subcatchment D3: east side ls bld Runoff Area=0.971 ac 13.08% Impervious Runoff Depth=2.97"
Tc=10.0 min CN=WQ Runoff=3.87 cfs 0.241 af

Subcatchment D4: roadway Runoff Area=0.628 ac 48.41% Impervious Runoff Depth=2.13"
Tc=10.0 min CN=WQ Runoff=1.71 cfs 0.111 af

Reach 1R: Swale Avg. Flow Depth=0.79' Max Vel=2.00 fps Inflow=7.67 cfs 0.491 af
n=0.030 L=689.0' S=0.0050 '/' Capacity=11.62 cfs Outflow=6.55 cfs 0.491 af

Reach 2R: Swale Avg. Flow Depth=0.84' Max Vel=2.08 fps Inflow=8.21 cfs 0.517 af
n=0.030 L=441.0' S=0.0050 '/' Capacity=11.61 cfs Outflow=7.58 cfs 0.517 af

Reach 3R: Swale Avg. Flow Depth=0.56' Max Vel=1.86 fps Inflow=3.87 cfs 0.241 af
n=0.030 L=514.7' S=0.0064 '/' Capacity=13.12 cfs Outflow=3.44 cfs 0.241 af

Pond 1P: south basin Peak Elev=1,170.13' Storage=25,808 cf Inflow=10.91 cfs 0.965 af
Discarded=1.12 cfs 0.965 af Secondary=0.00 cfs 0.000 af Outflow=1.12 cfs 0.965 af

Pond 2P: middle basin Peak Elev=1,170.47' Storage=9,825 cf Inflow=17.57 cfs 1.249 af
Discarded=0.52 cfs 0.395 af Primary=10.17 cfs 0.853 af Outflow=10.68 cfs 1.249 af

Link 1L: runoff Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 5.321 ac Runoff Volume = 1.360 af Average Runoff Depth = 3.07"
49.39% Pervious = 2.628 ac 50.61% Impervious = 2.693 ac

Summary for Subcatchment D1: north parking

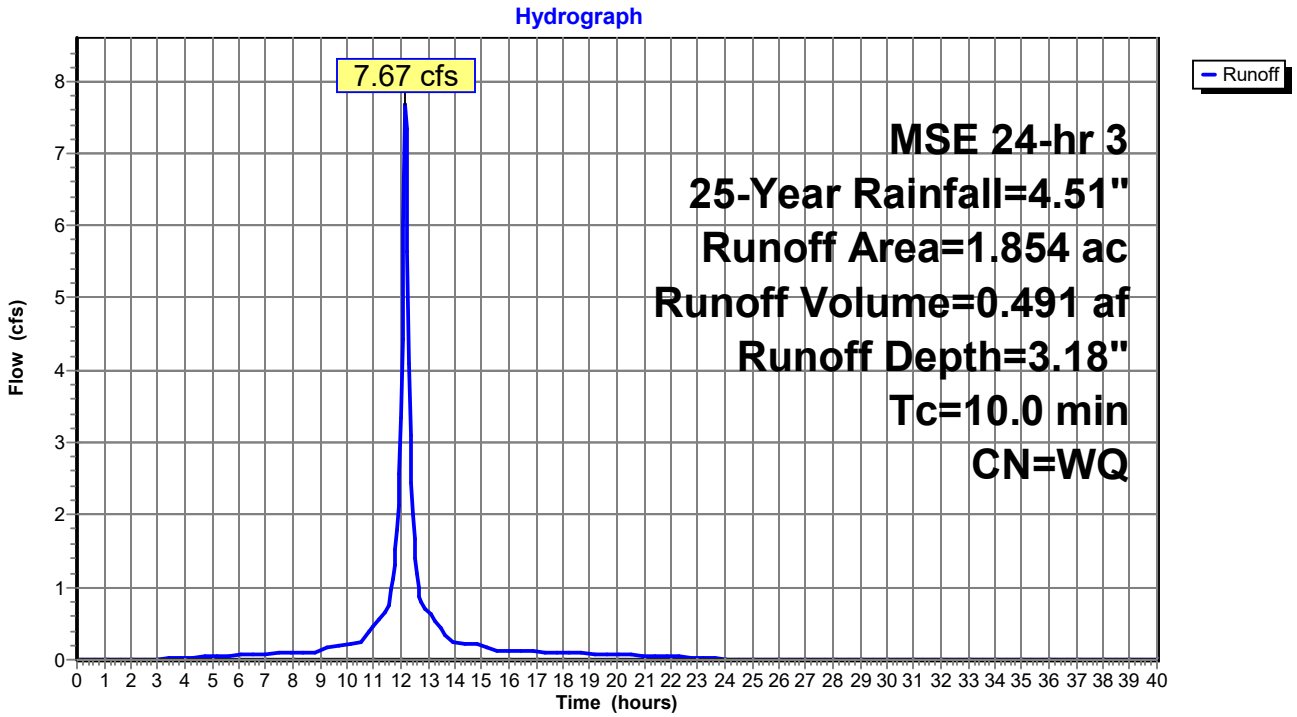
Runoff = 7.67 cfs @ 12.17 hrs, Volume= 0.491 af, Depth= 3.18"
Routed to Reach 1R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=4.51"

	Area (ac)	CN	Description
*	0.532	98	future parking
*	0.257	98	future building
	0.488	39	>75% Grass cover, Good, HSG A
*	0.310	98	proposed parking
*	0.257	98	proposed building
*	0.005	98	stoop
*	0.005	98	future stoop
	1.854		Weighted Average
	0.488		26.32% Pervious Area
	1.366		73.68% Impervious Area

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

Subcatchment D1: north parking



Summary for Subcatchment D2: west side ls bld

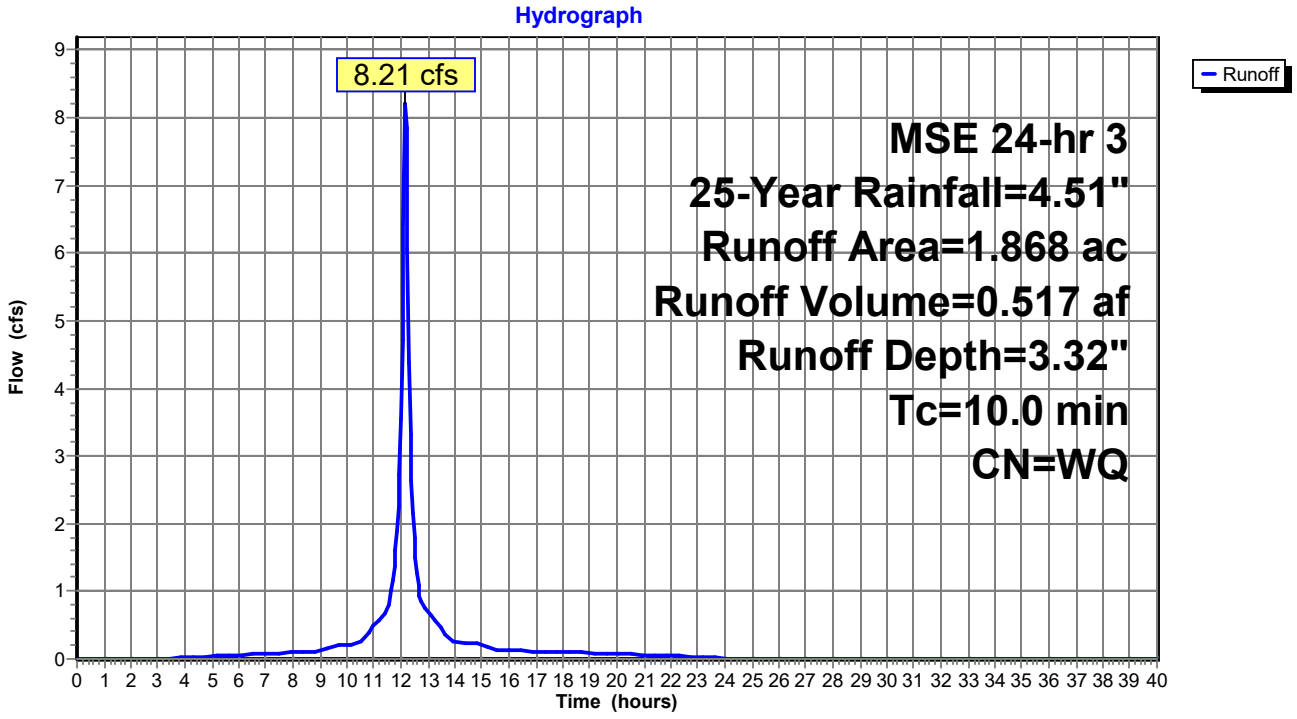
Runoff = 8.21 cfs @ 12.17 hrs, Volume= 0.517 af, Depth= 3.32"
Routed to Reach 2R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=4.51"

	Area (ac)	CN	Description
*	0.297	98	parking lot
*	0.576	96	gravel park
*	0.321	98	prop building
*	0.005	98	future sw
*	0.005	98	prop sidewalk
*	0.257	98	future bld
	0.396	39	>75% Grass cover, Good, HSG A
*	0.011	98	basin
	1.868		Weighted Average
	0.972		52.03% Pervious Area
	0.896		47.97% Impervious Area

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

Subcatchment D2: west side ls bld



Summary for Subcatchment D3: east side ls bld

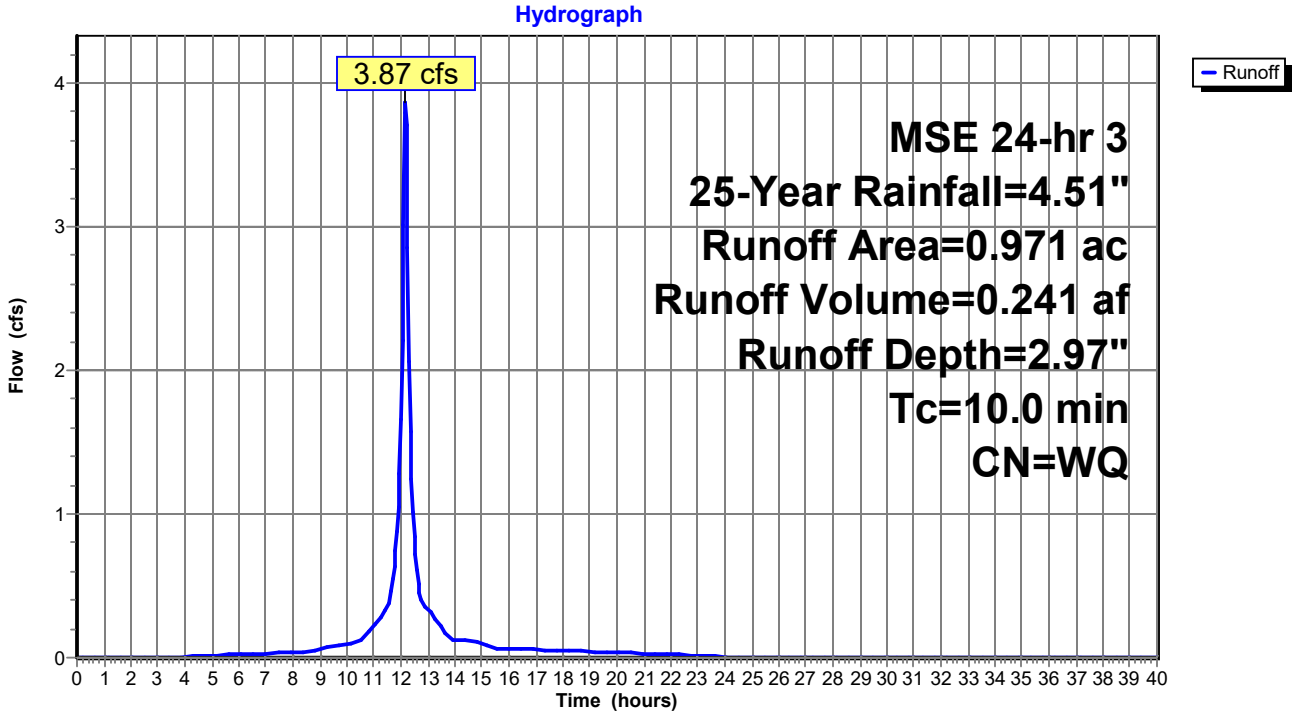
Runoff = 3.87 cfs @ 12.17 hrs, Volume= 0.241 af, Depth= 2.97"
Routed to Reach 3R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=4.51"

	Area (ac)	CN	Description
*	0.035	98	prop parking
*	0.572	96	prop gravel
*	0.064	98	prop building
*	0.028	98	basin
	0.272	39	>75% Grass cover, Good, HSG A
	0.971		Weighted Average
	0.844		86.92% Pervious Area
	0.127		13.08% Impervious Area

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

Subcatchment D3: east side ls bld



Summary for Subcatchment D4: roadway

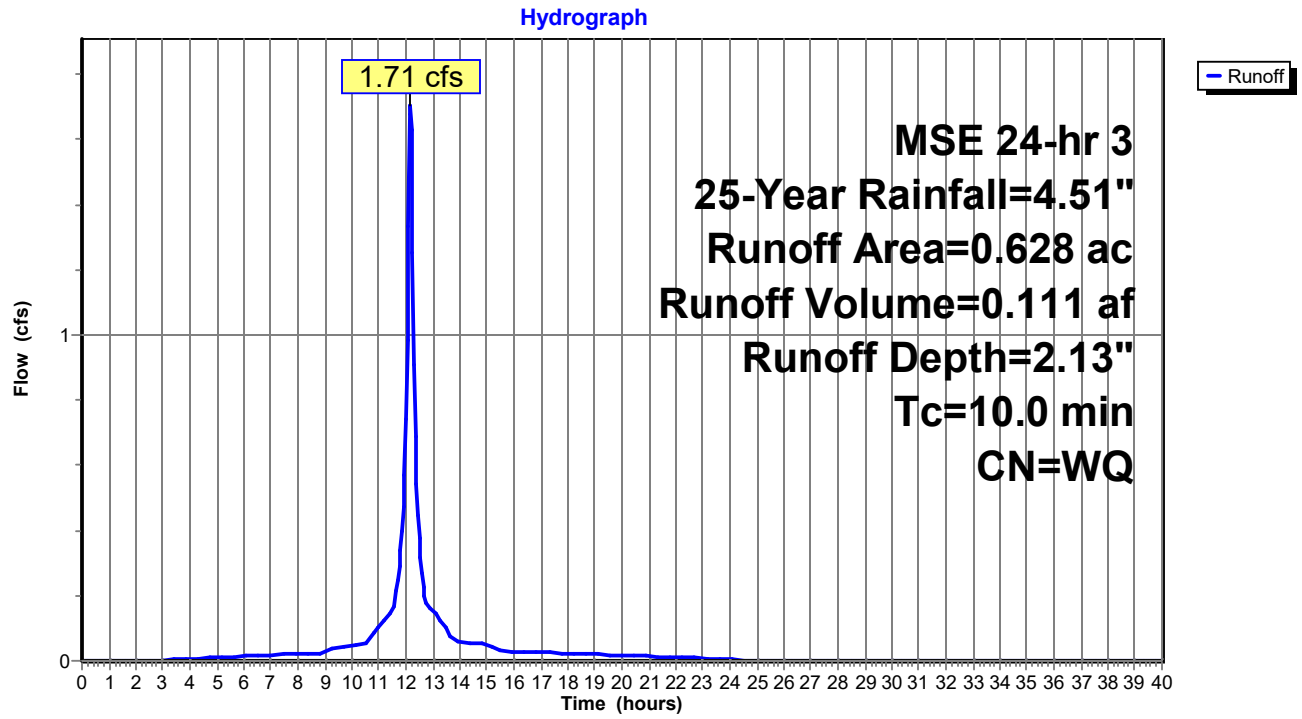
Runoff = 1.71 cfs @ 12.17 hrs, Volume= 0.111 af, Depth= 2.13"
Routed to Pond 1P : south basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 25-Year Rainfall=4.51"

	Area (ac)	CN	Description
*	0.232	98	pavement
	0.324	39	>75% Grass cover, Good, HSG A
*	0.072	98	basin
	0.628		Weighted Average
	0.324		51.59% Pervious Area
	0.304		48.41% Impervious Area

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

Subcatchment D4: roadway



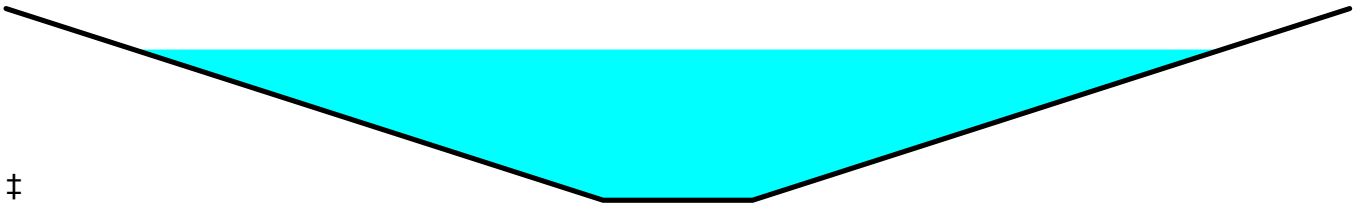
Summary for Reach 1R: Swale

Inflow Area = 1.854 ac, 73.68% Impervious, Inflow Depth = 3.18" for 25-Year event
Inflow = 7.67 cfs @ 12.17 hrs, Volume= 0.491 af
Outflow = 6.55 cfs @ 12.23 hrs, Volume= 0.491 af, Atten= 15%, Lag= 3.5 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.00 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 20.5 min

Peak Storage= 2,245 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.79' , Surface Width= 7.29'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.62 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 689.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.94', Outlet Invert= 1,168.50'



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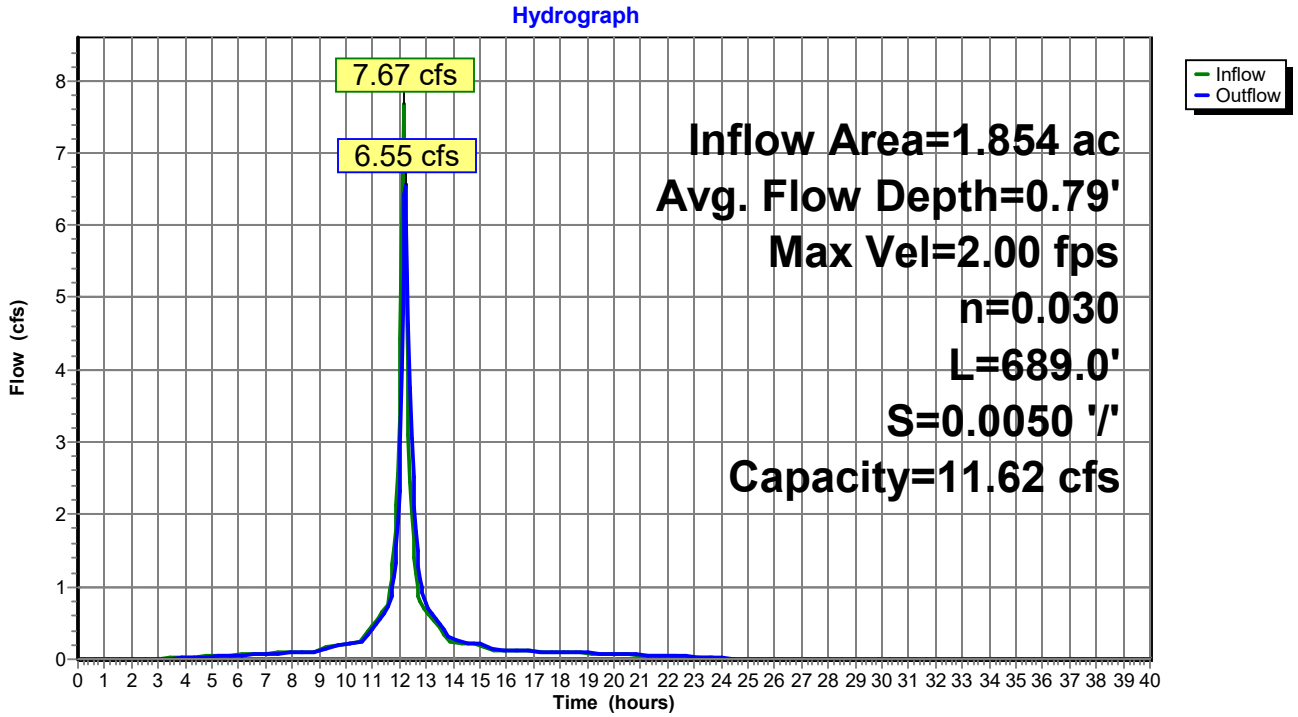
Reach 1R: Swale



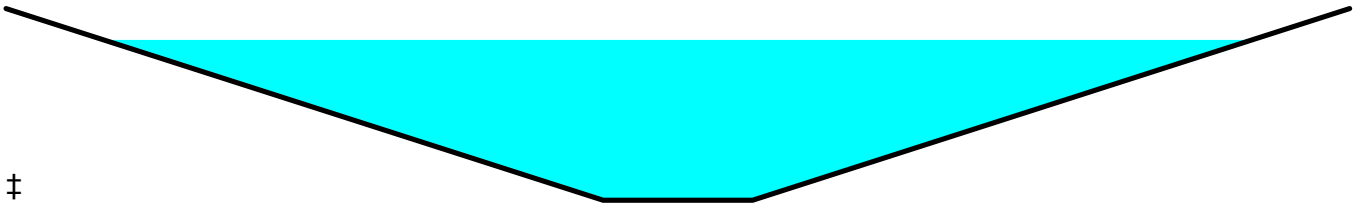
Summary for Reach 2R: Swale

Inflow Area = 1.868 ac, 47.97% Impervious, Inflow Depth = 3.32" for 25-Year event
Inflow = 8.21 cfs @ 12.17 hrs, Volume= 0.517 af
Outflow = 7.58 cfs @ 12.21 hrs, Volume= 0.517 af, Atten= 8%, Lag= 2.5 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.08 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 12.3 min

Peak Storage= 1,604 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.84' , Surface Width= 7.69'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.61 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 441.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.78', Outlet Invert= 1,169.58'



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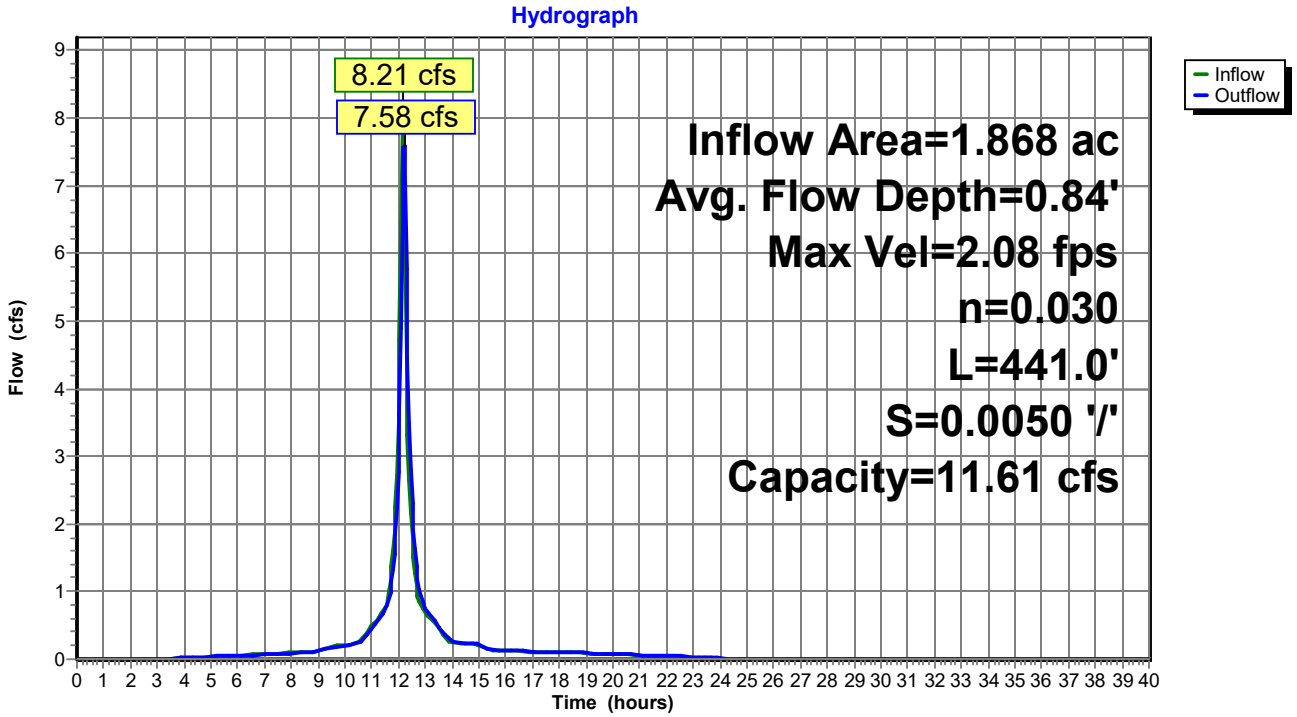
Reach 2R: Swale



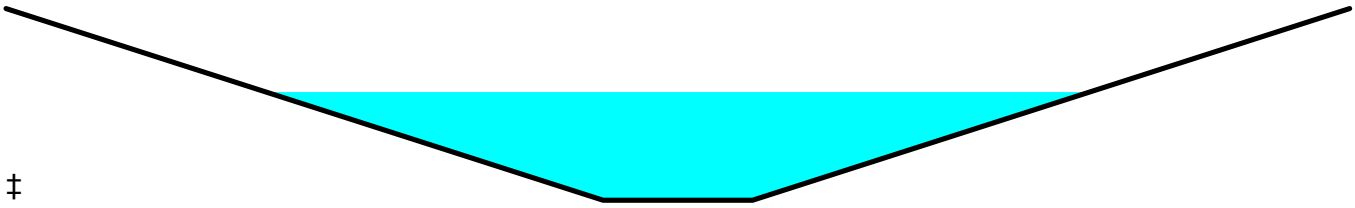
Summary for Reach 3R: Swale

Inflow Area = 0.971 ac, 13.08% Impervious, Inflow Depth = 2.97" for 25-Year event
Inflow = 3.87 cfs @ 12.17 hrs, Volume= 0.241 af
Outflow = 3.44 cfs @ 12.22 hrs, Volume= 0.241 af, Atten= 11%, Lag= 3.0 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.86 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 16.5 min

Peak Storage= 948 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.56' , Surface Width= 5.52'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.12 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 514.7' Slope= 0.0064 '/'
Inlet Invert= 1,171.90', Outlet Invert= 1,168.62'



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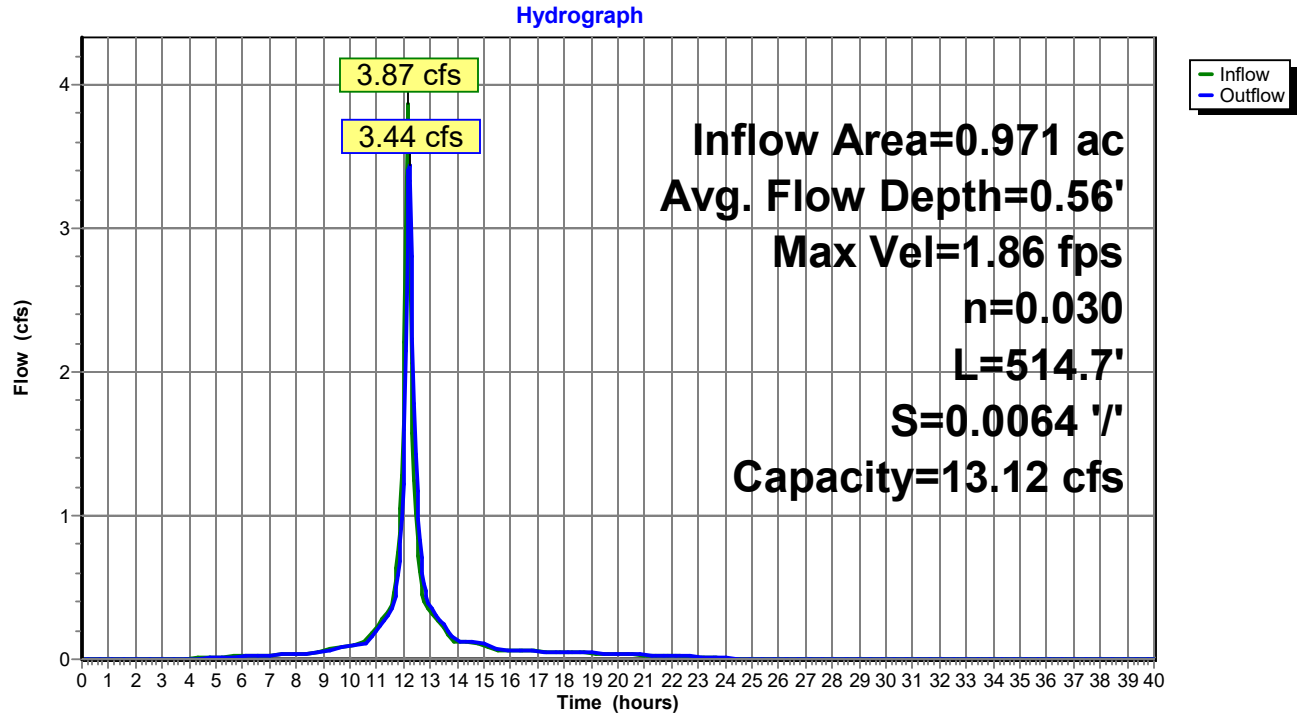


Summary for Pond 1P: south basin

Inflow Area = 5.321 ac, 50.61% Impervious, Inflow Depth = 2.18" for 25-Year event
Inflow = 10.91 cfs @ 12.33 hrs, Volume= 0.965 af
Outflow = 1.12 cfs @ 13.31 hrs, Volume= 0.965 af, Atten= 90%, Lag= 58.9 min
Discarded = 1.12 cfs @ 13.31 hrs, Volume= 0.965 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,170.13' @ 13.31 hrs Surf.Area= 13,417 sf Storage= 25,808 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 327.1 min (1,101.9 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,166.00'	44,780 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

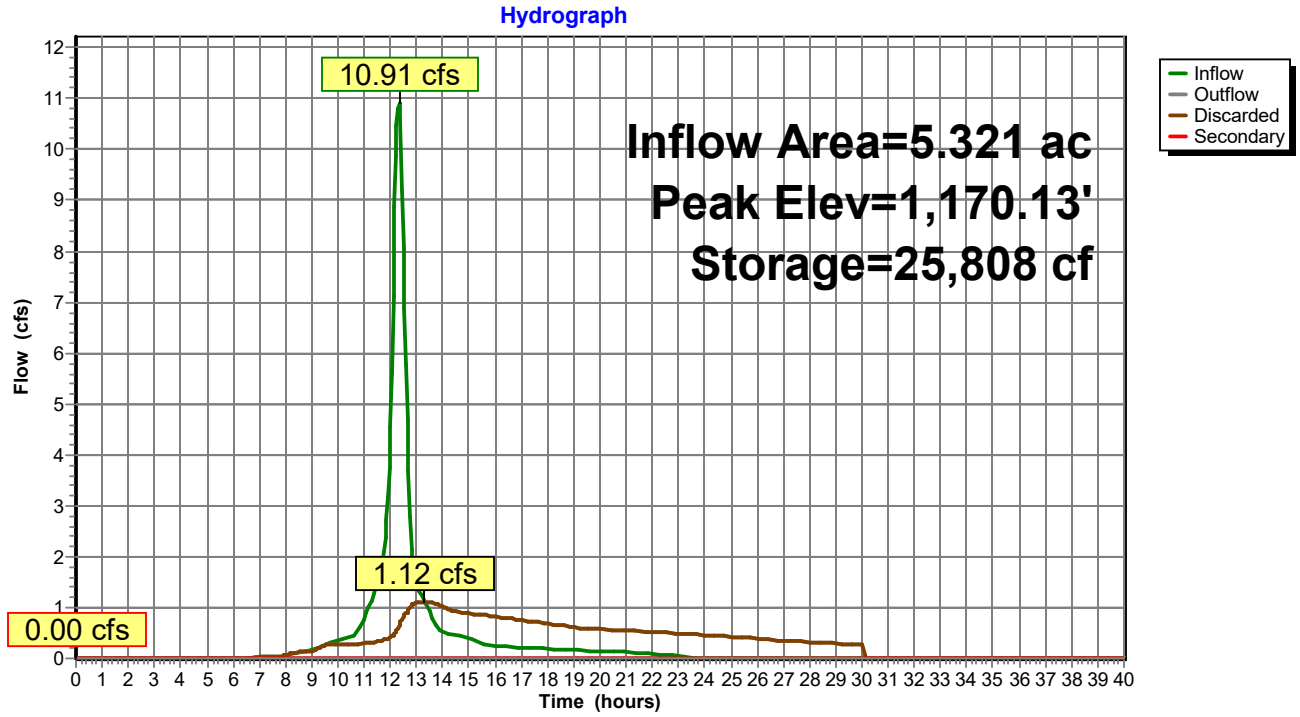
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,166.00	3,150	0	0
1,167.00	4,350	3,750	3,750
1,168.00	5,700	5,025	8,775
1,169.00	7,130	6,415	15,190
1,170.00	11,025	9,078	24,268
1,171.00	30,000	20,513	44,780

Device	Routing	Invert	Outlet Devices
#1	Secondary	1,170.18'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	1,166.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.12 cfs @ 13.31 hrs HW=1,170.13' (Free Discharge)
2=Exfiltration (Exfiltration Controls 1.12 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,166.00' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: south basin



Summary for Pond 2P: middle basin

[62] Hint: Exceeded Reach 1R OUTLET depth by 1.41' @ 13.80 hrs
[64] Warning: Exceeded Reach 1R outlet bank by 0.97' @ 12.37 hrs
[62] Hint: Exceeded Reach 2R OUTLET depth by 0.33' @ 13.80 hrs
[62] Hint: Exceeded Reach 3R OUTLET depth by 1.42' @ 12.40 hrs
[64] Warning: Exceeded Reach 3R outlet bank by 0.85' @ 12.37 hrs

Inflow Area = 4.693 ac, 50.91% Impervious, Inflow Depth = 3.19" for 25-Year event
Inflow = 17.57 cfs @ 12.22 hrs, Volume= 1.249 af
Outflow = 10.68 cfs @ 12.35 hrs, Volume= 1.249 af, Atten= 39%, Lag= 7.7 min
Discarded = 0.52 cfs @ 12.37 hrs, Volume= 0.395 af
Primary = 10.17 cfs @ 12.35 hrs, Volume= 0.853 af
Routed to Pond 1P : south basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,170.47' @ 12.37 hrs Surf.Area= 6,207 sf Storage= 9,825 cf

Plug-Flow detention time= 65.0 min calculated for 1.247 af (100% of inflow)
Center-of-Mass det. time= 65.1 min (829.7 - 764.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,167.00'	27,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

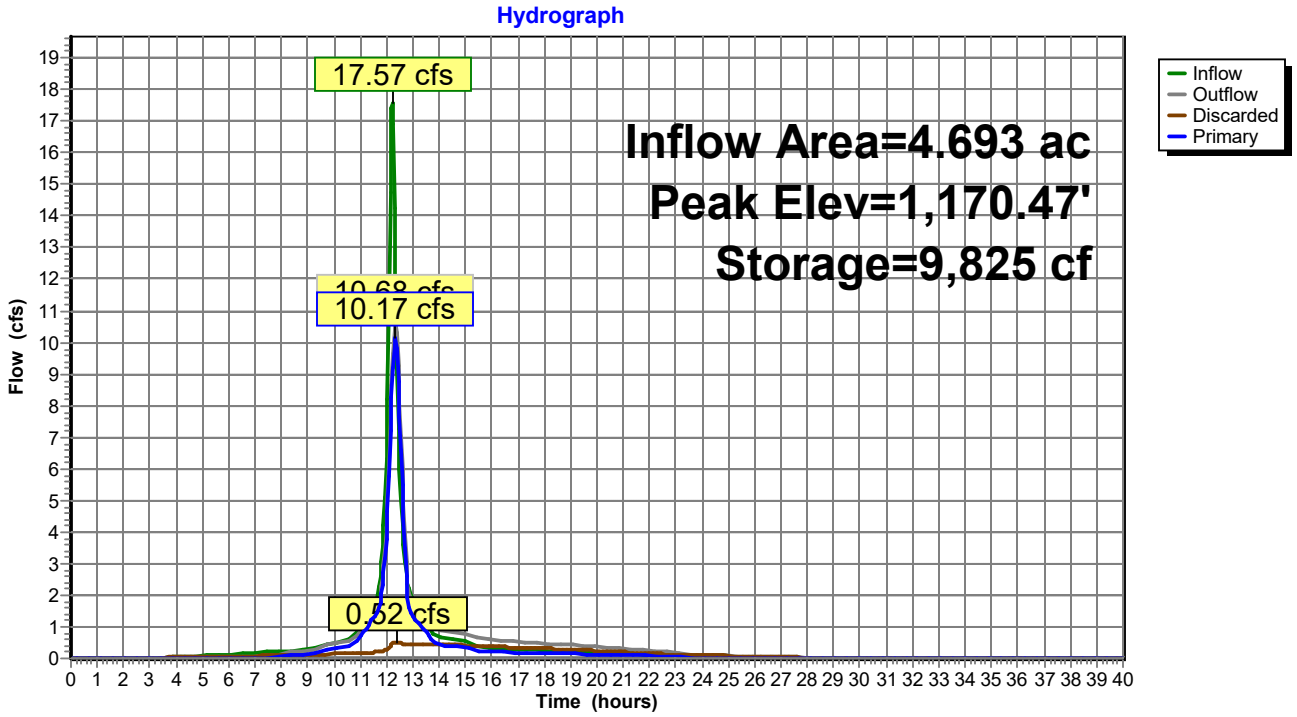
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,167.00	480	0	0
1,168.00	1,120	800	800
1,169.00	3,210	2,165	2,965
1,170.00	5,130	4,170	7,135
1,171.00	7,400	6,265	13,400
1,172.00	21,000	14,200	27,600

Device	Routing	Invert	Outlet Devices
#1	Primary	1,168.00'	**18.0" Round Culvert** L= 66.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,168.00' / 1,167.67' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	1,167.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.52 cfs @ 12.37 hrs HW=1,170.47' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.52 cfs)

Primary OutFlow Max=9.89 cfs @ 12.35 hrs HW=1,170.46' TW=1,169.11' (Dynamic Tailwater)
1=Culvert (Inlet Controls 9.89 cfs @ 5.60 fps)

Pond 2P: middle basin

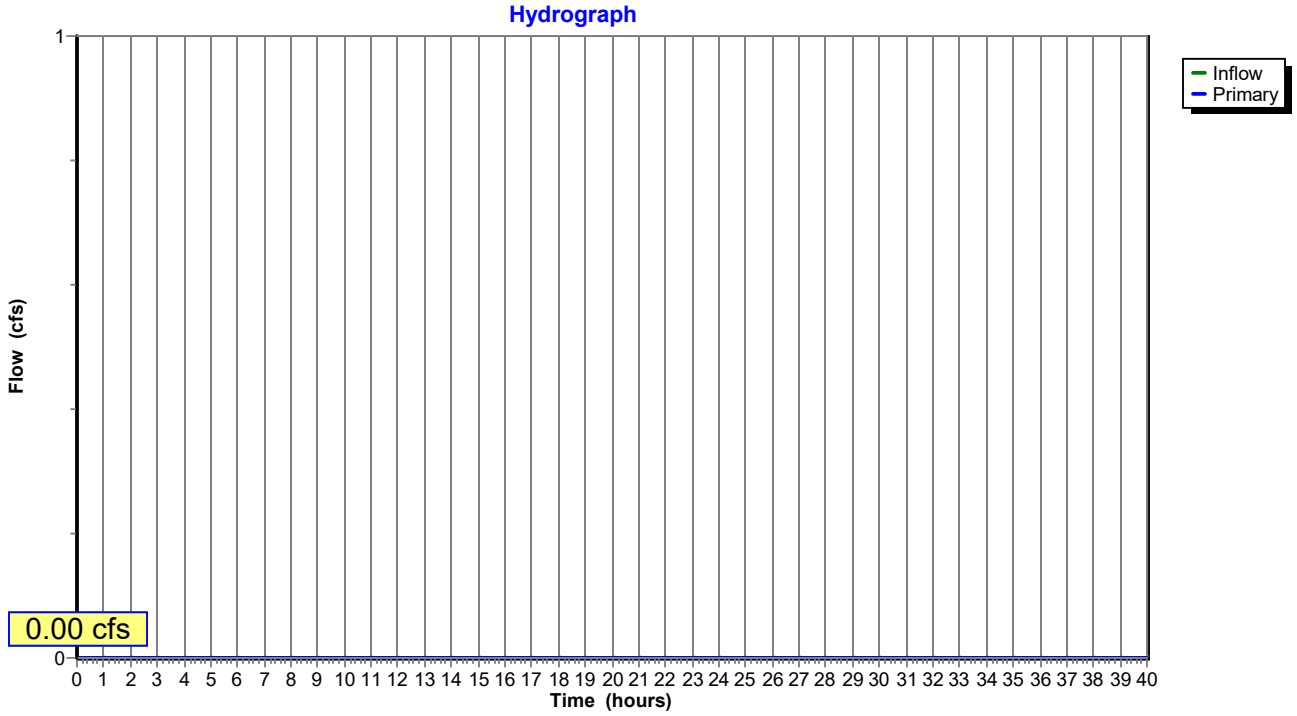


Summary for Link 1L: runoff

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 1L: runoff



Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment D1: north parking Runoff Area=1.854 ac 73.68% Impervious Runoff Depth=4.24"
Tc=10.0 min CN=WQ Runoff=10.03 cfs 0.655 af

Subcatchment D2: west side ls bld Runoff Area=1.868 ac 47.97% Impervious Runoff Depth=4.44"
Tc=10.0 min CN=WQ Runoff=10.74 cfs 0.690 af

Subcatchment D3: east side ls bld Runoff Area=0.971 ac 13.08% Impervious Runoff Depth=4.02"
Tc=10.0 min CN=WQ Runoff=5.09 cfs 0.325 af

Subcatchment D4: roadway Runoff Area=0.628 ac 48.41% Impervious Runoff Depth=2.92"
Tc=10.0 min CN=WQ Runoff=2.26 cfs 0.153 af

Reach 1R: Swale Avg. Flow Depth=0.89' Max Vel=2.15 fps Inflow=10.03 cfs 0.655 af
n=0.030 L=689.0' S=0.0050 '/' Capacity=11.62 cfs Outflow=8.71 cfs 0.655 af

Reach 2R: Swale Avg. Flow Depth=0.94' Max Vel=2.24 fps Inflow=10.74 cfs 0.690 af
n=0.030 L=441.0' S=0.0050 '/' Capacity=11.61 cfs Outflow=10.01 cfs 0.690 af

Reach 3R: Swale Avg. Flow Depth=0.64' Max Vel=2.01 fps Inflow=5.09 cfs 0.325 af
n=0.030 L=514.7' S=0.0064 '/' Capacity=13.12 cfs Outflow=4.58 cfs 0.325 af

Pond 1P: south basin Peak Elev=1,170.38' Storage=29,767 cf Inflow=12.85 cfs 1.366 af
Discarded=1.51 cfs 1.139 af Secondary=4.08 cfs 0.228 af Outflow=5.60 cfs 1.367 af

Pond 2P: middle basin Peak Elev=1,171.13' Storage=14,462 cf Inflow=23.27 cfs 1.671 af
Discarded=0.76 cfs 0.457 af Primary=11.26 cfs 1.213 af Outflow=11.84 cfs 1.671 af

Link 1L: runoff Inflow=4.08 cfs 0.228 af
Primary=4.08 cfs 0.228 af

Total Runoff Area = 5.321 ac Runoff Volume = 1.824 af Average Runoff Depth = 4.11"
49.39% Pervious = 2.628 ac 50.61% Impervious = 2.693 ac

Summary for Subcatchment D1: north parking

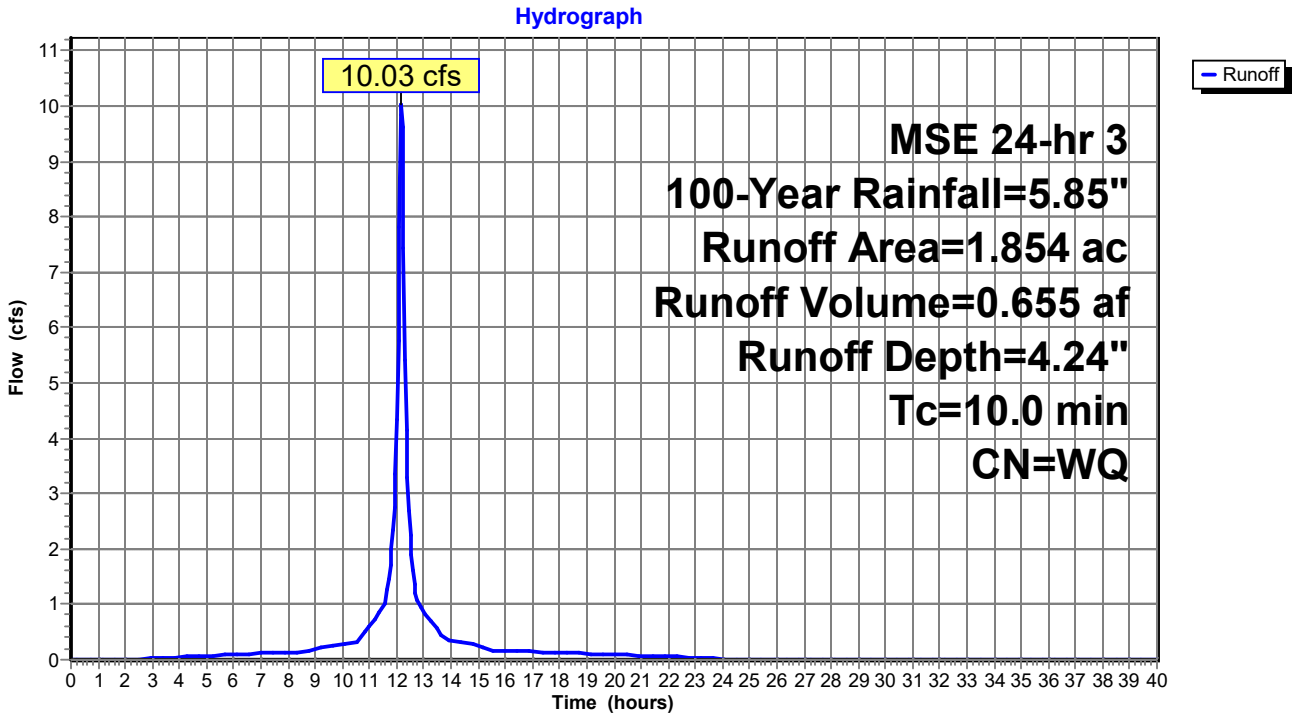
Runoff = 10.03 cfs @ 12.17 hrs, Volume= 0.655 af, Depth= 4.24"
Routed to Reach 1R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=5.85"

	Area (ac)	CN	Description
*	0.532	98	future parking
*	0.257	98	future building
	0.488	39	>75% Grass cover, Good, HSG A
*	0.310	98	proposed parking
*	0.257	98	proposed building
*	0.005	98	stoop
*	0.005	98	future stoop
	1.854		Weighted Average
	0.488		26.32% Pervious Area
	1.366		73.68% Impervious Area

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

Subcatchment D1: north parking



Summary for Subcatchment D2: west side ls bld

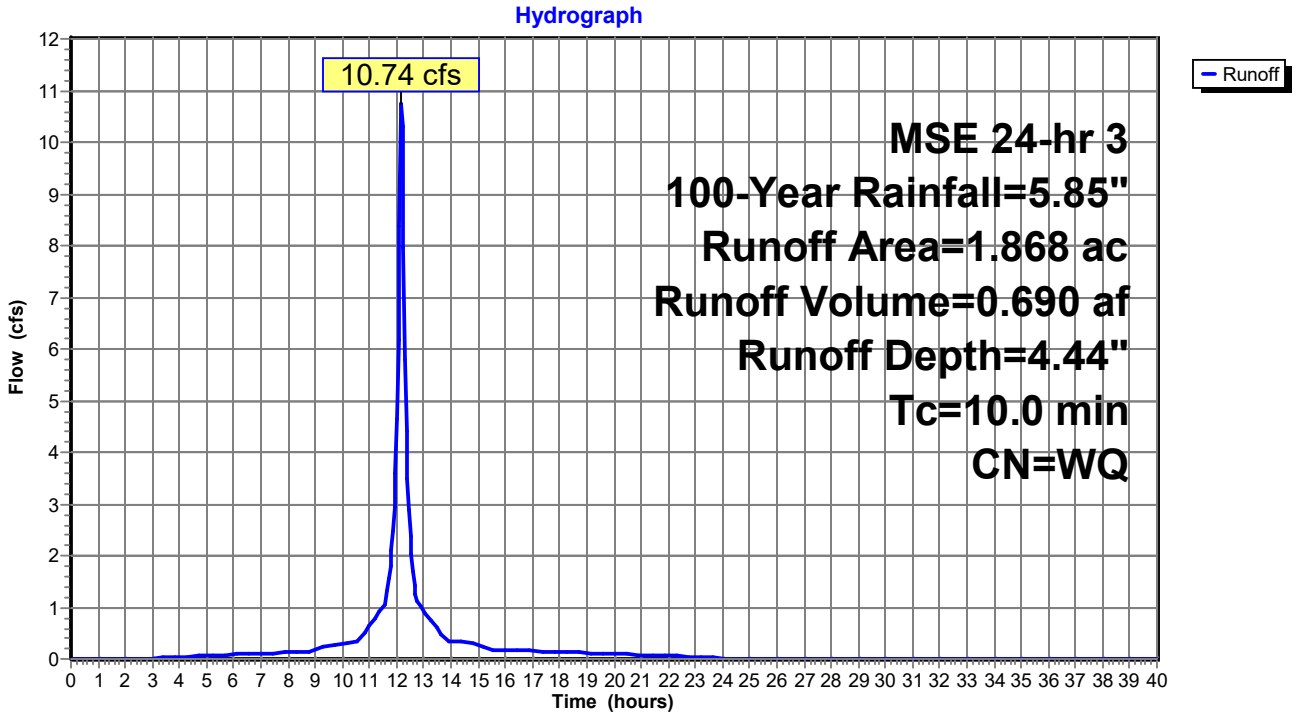
Runoff = 10.74 cfs @ 12.17 hrs, Volume= 0.690 af, Depth= 4.44"
Routed to Reach 2R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=5.85"

	Area (ac)	CN	Description
*	0.297	98	parking lot
*	0.576	96	gravel park
*	0.321	98	prop building
*	0.005	98	future sw
*	0.005	98	prop sidewalk
*	0.257	98	future bld
	0.396	39	>75% Grass cover, Good, HSG A
*	0.011	98	basin
	1.868		Weighted Average
	0.972		52.03% Pervious Area
	0.896		47.97% Impervious Area

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

Subcatchment D2: west side ls bld



Summary for Subcatchment D3: east side ls bld

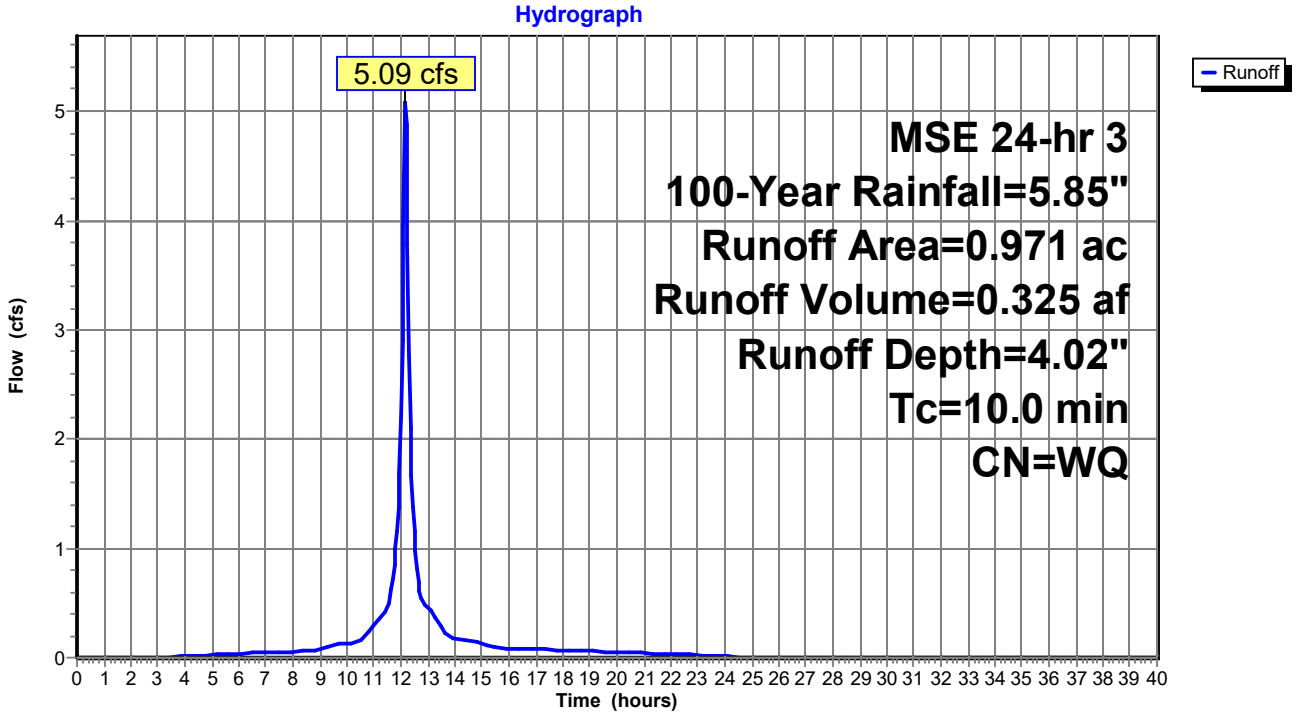
Runoff = 5.09 cfs @ 12.17 hrs, Volume= 0.325 af, Depth= 4.02"
Routed to Reach 3R : Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=5.85"

	Area (ac)	CN	Description
*	0.035	98	prop parking
*	0.572	96	prop gravel
*	0.064	98	prop building
*	0.028	98	basin
	0.272	39	>75% Grass cover, Good, HSG A
	0.971		Weighted Average
	0.844		86.92% Pervious Area
	0.127		13.08% Impervious Area

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

Subcatchment D3: east side ls bld



Summary for Subcatchment D4: roadway

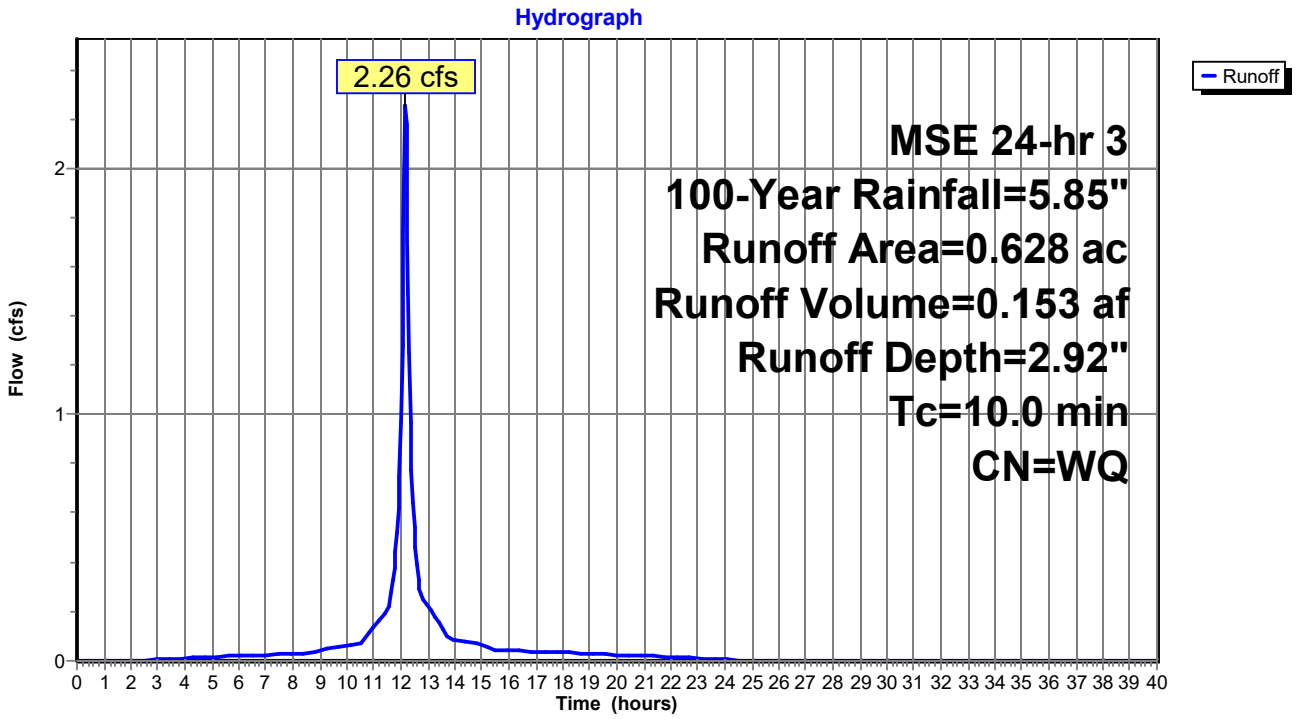
Runoff = 2.26 cfs @ 12.17 hrs, Volume= 0.153 af, Depth= 2.92"
Routed to Pond 1P : south basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=5.85"

	Area (ac)	CN	Description
*	0.232	98	pavement
	0.324	39	>75% Grass cover, Good, HSG A
*	0.072	98	basin
	0.628		Weighted Average
	0.324		51.59% Pervious Area
	0.304		48.41% Impervious Area

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

Subcatchment D4: roadway



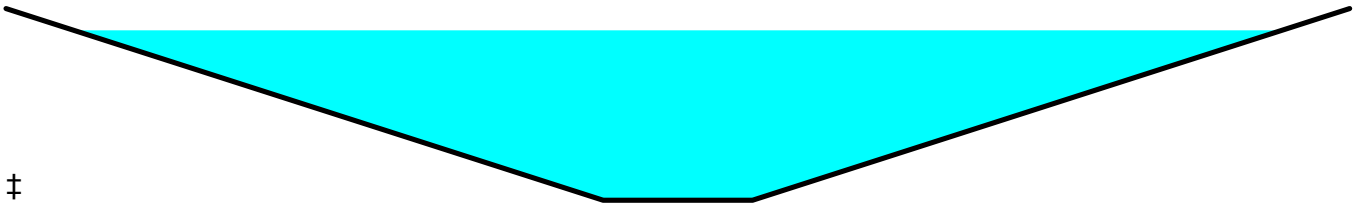
Summary for Reach 1R: Swale

Inflow Area = 1.854 ac, 73.68% Impervious, Inflow Depth = 4.24" for 100-Year event
Inflow = 10.03 cfs @ 12.17 hrs, Volume= 0.655 af
Outflow = 8.71 cfs @ 12.22 hrs, Volume= 0.655 af, Atten= 13%, Lag= 3.3 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.15 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 18.9 min

Peak Storage= 2,780 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.89' , Surface Width= 8.10'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.62 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 689.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.94', Outlet Invert= 1,168.50'



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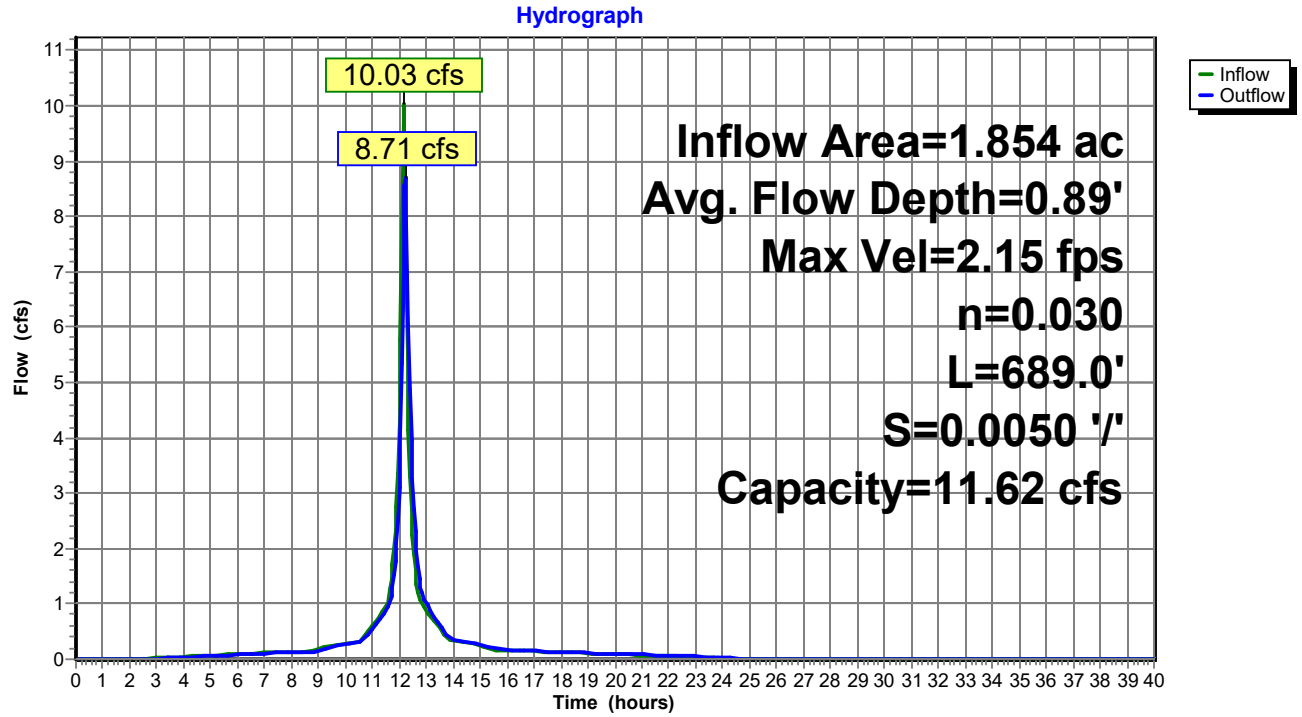
Reach 1R: Swale



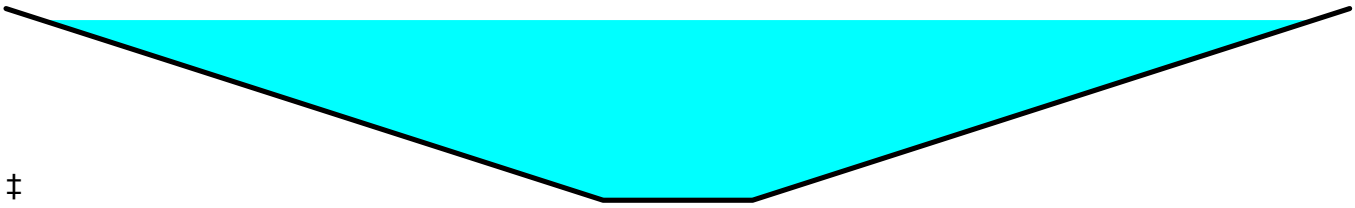
Summary for Reach 2R: Swale

Inflow Area = 1.868 ac, 47.97% Impervious, Inflow Depth = 4.44" for 100-Year event
Inflow = 10.74 cfs @ 12.17 hrs, Volume= 0.690 af
Outflow = 10.01 cfs @ 12.21 hrs, Volume= 0.690 af, Atten= 7%, Lag= 2.3 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.24 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 11.3 min

Peak Storage= 1,974 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.94' , Surface Width= 8.52'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 11.61 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 441.0' Slope= 0.0050 '/'
Inlet Invert= 1,171.78', Outlet Invert= 1,169.58'



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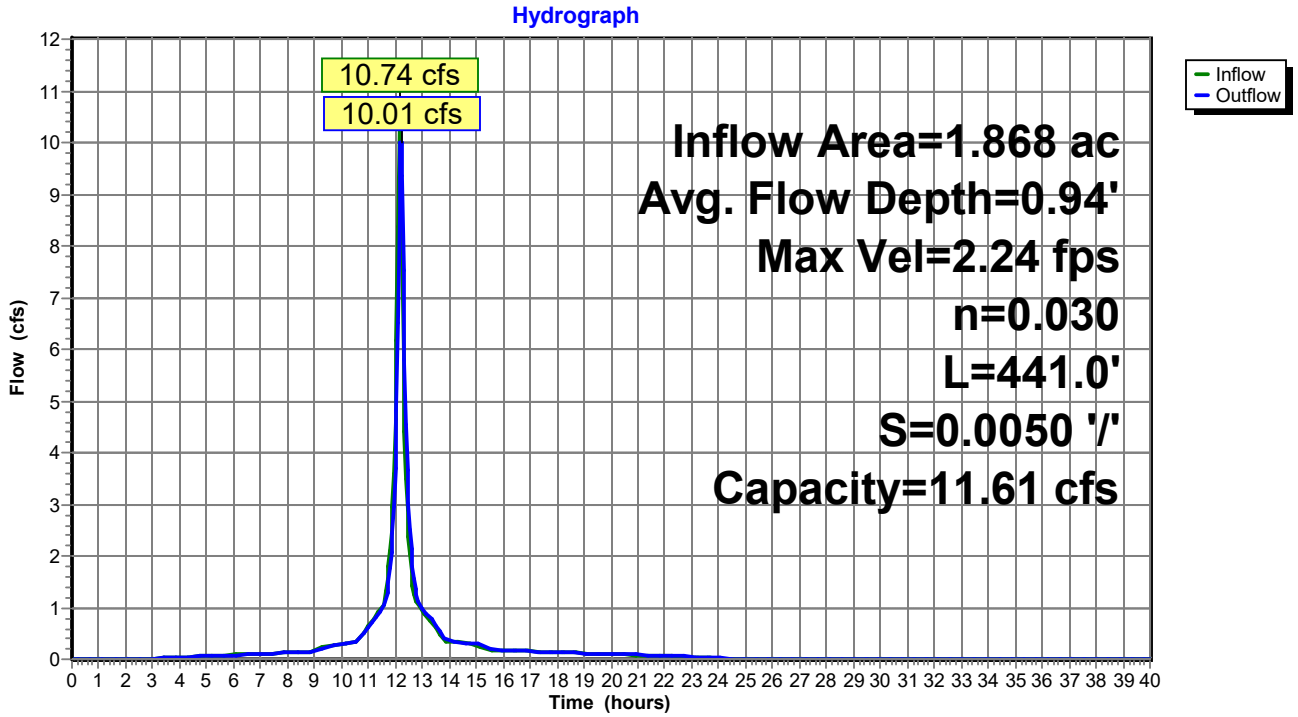
Reach 2R: Swale



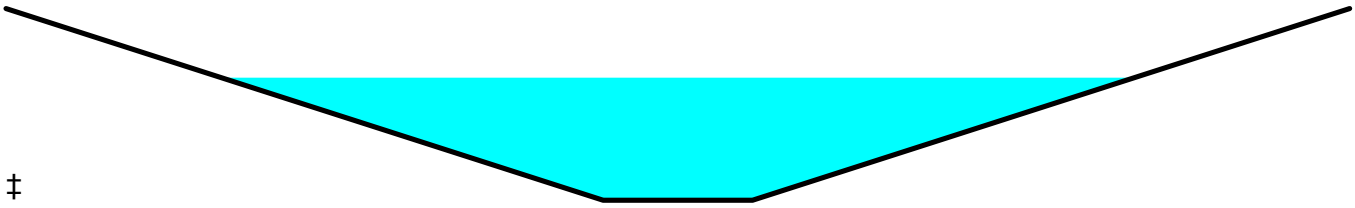
Summary for Reach 3R: Swale

Inflow Area = 0.971 ac, 13.08% Impervious, Inflow Depth = 4.02" for 100-Year event
Inflow = 5.09 cfs @ 12.17 hrs, Volume= 0.325 af
Outflow = 4.58 cfs @ 12.22 hrs, Volume= 0.325 af, Atten= 10%, Lag= 2.8 min
Routed to Pond 2P : middle basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.01 fps, Min. Travel Time= 4.3 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 15.1 min

Peak Storage= 1,173 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.64' , Surface Width= 6.12'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.12 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 514.7' Slope= 0.0064 '/'
Inlet Invert= 1,171.90', Outlet Invert= 1,168.62'



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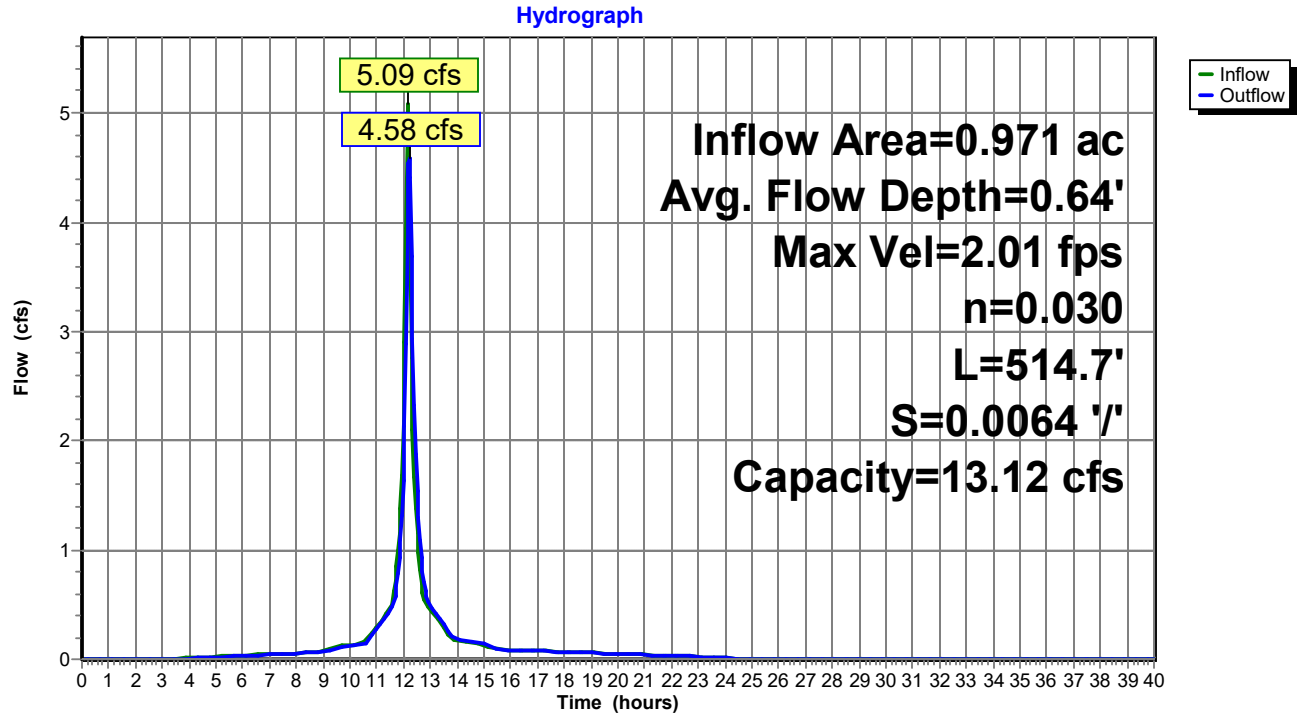


Summary for Pond 1P: south basin

Inflow Area = 5.321 ac, 50.61% Impervious, Inflow Depth = 3.08" for 100-Year event
Inflow = 12.85 cfs @ 12.25 hrs, Volume= 1.366 af
Outflow = 5.60 cfs @ 12.79 hrs, Volume= 1.367 af, Atten= 56%, Lag= 31.9 min
Discarded = 1.51 cfs @ 12.79 hrs, Volume= 1.139 af
Secondary = 4.08 cfs @ 12.79 hrs, Volume= 0.228 af
Routed to Link 1L : runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,170.38' @ 12.79 hrs Surf.Area= 18,172 sf Storage= 29,767 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 268.3 min (1,042.4 - 774.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,166.00'	44,780 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

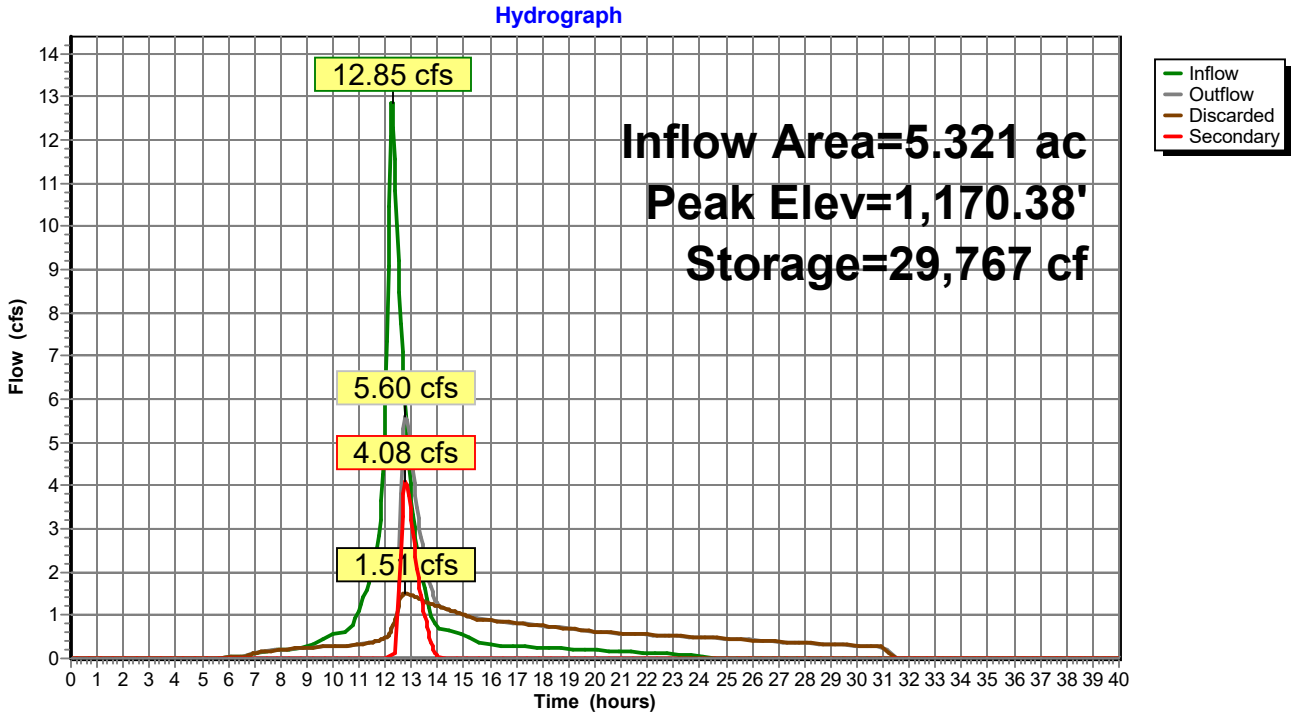
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,166.00	3,150	0	0
1,167.00	4,350	3,750	3,750
1,168.00	5,700	5,025	8,775
1,169.00	7,130	6,415	15,190
1,170.00	11,025	9,078	24,268
1,171.00	30,000	20,513	44,780

Device	Routing	Invert	Outlet Devices
#1	Secondary	1,170.18'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	1,166.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.51 cfs @ 12.79 hrs HW=1,170.38' (Free Discharge)
2=Exfiltration (Exfiltration Controls 1.51 cfs)

Secondary OutFlow Max=4.07 cfs @ 12.79 hrs HW=1,170.38' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 4.07 cfs @ 1.04 fps)

Pond 1P: south basin



Summary for Pond 2P: middle basin

[62] Hint: Exceeded Reach 1R OUTLET depth by 2.03' @ 12.55 hrs
[64] Warning: Exceeded Reach 1R outlet bank by 1.63' @ 12.43 hrs
[62] Hint: Exceeded Reach 2R OUTLET depth by 0.97' @ 12.55 hrs
[64] Warning: Exceeded Reach 2R outlet bank by 0.55' @ 12.43 hrs
[62] Hint: Exceeded Reach 3R OUTLET depth by 2.09' @ 12.50 hrs
[64] Warning: Exceeded Reach 3R outlet bank by 1.51' @ 12.43 hrs

Inflow Area = 4.693 ac, 50.91% Impervious, Inflow Depth = 4.27" for 100-Year event
Inflow = 23.27 cfs @ 12.22 hrs, Volume= 1.671 af
Outflow = 11.84 cfs @ 12.27 hrs, Volume= 1.671 af, Atten= 49%, Lag= 3.4 min
Discarded = 0.76 cfs @ 12.43 hrs, Volume= 0.457 af
Primary = 11.26 cfs @ 12.27 hrs, Volume= 1.213 af
Routed to Pond 1P : south basin

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Peak Elev= 1,171.13' @ 12.43 hrs Surf.Area= 9,147 sf Storage= 14,462 cf

Plug-Flow detention time= 60.0 min calculated for 1.669 af (100% of inflow)
Center-of-Mass det. time= 60.1 min (822.1 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,167.00'	27,600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

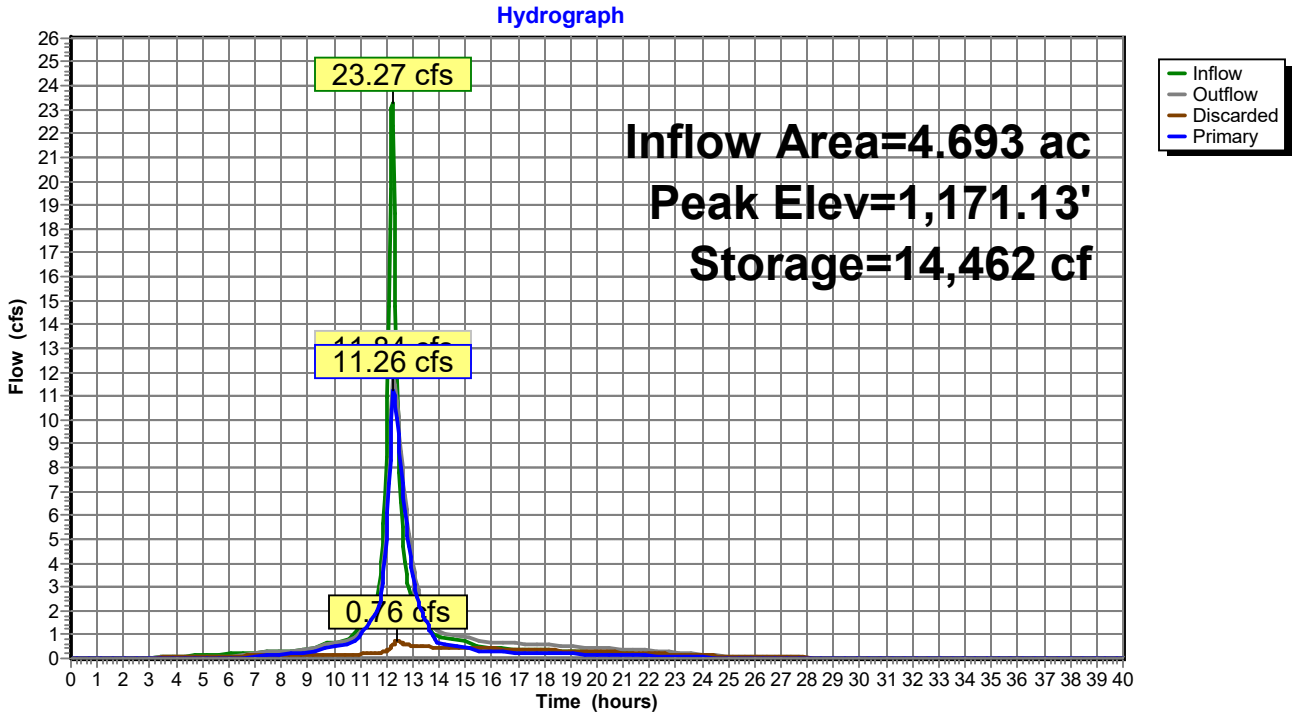
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,167.00	480	0	0
1,168.00	1,120	800	800
1,169.00	3,210	2,165	2,965
1,170.00	5,130	4,170	7,135
1,171.00	7,400	6,265	13,400
1,172.00	21,000	14,200	27,600

Device	Routing	Invert	Outlet Devices
#1	Primary	1,168.00'	**18.0" Round Culvert** L= 66.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,168.00' / 1,167.67' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Discarded	1,167.00'	**3.600 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.76 cfs @ 12.43 hrs HW=1,171.13' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.76 cfs)

Primary OutFlow Max=10.22 cfs @ 12.27 hrs HW=1,170.82' TW=1,169.38' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 10.22 cfs @ 5.78 fps)

Pond 2P: middle basin

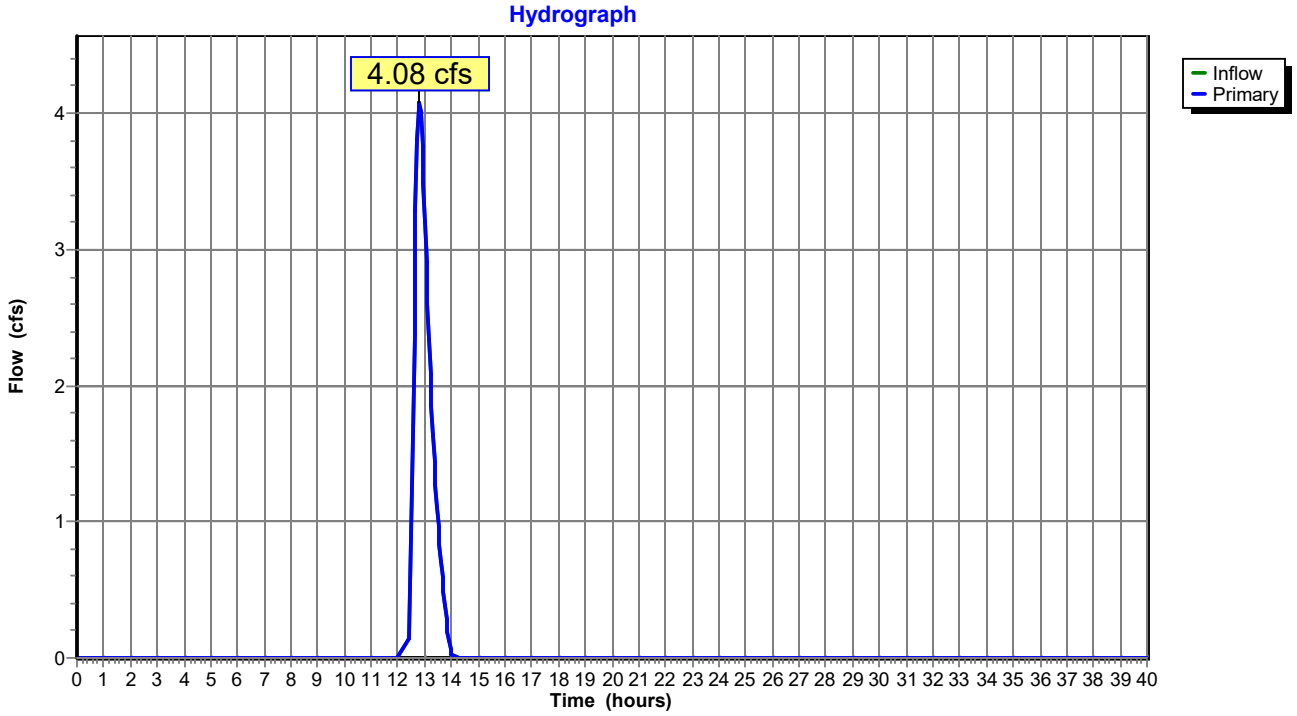


Summary for Link 1L: runoff

Inflow = 4.08 cfs @ 12.79 hrs, Volume= 0.228 af
Primary = 4.08 cfs @ 12.79 hrs, Volume= 0.228 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Link 1L: runoff



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APPENDIX D

Proposed Infiltration and WinSLAMM Calculations

Infiltration Volumes

Premier Property Holdings LLC

Location: Village of Kronenwetter

Existing Infiltration Volume:

Inflow Area: 241,192 sf
Rainfall Total: 22.63 in

Total Volume= Inflow Area x Rainfall Total
Total Volume: 454,847 cf

Volume Leaving Site: 0

Existing Infiltration Volume = Total Volume-Volume Leaving Site
Existing Infiltration Volume: 454,847 cf

Proposed Infiltration Volume:

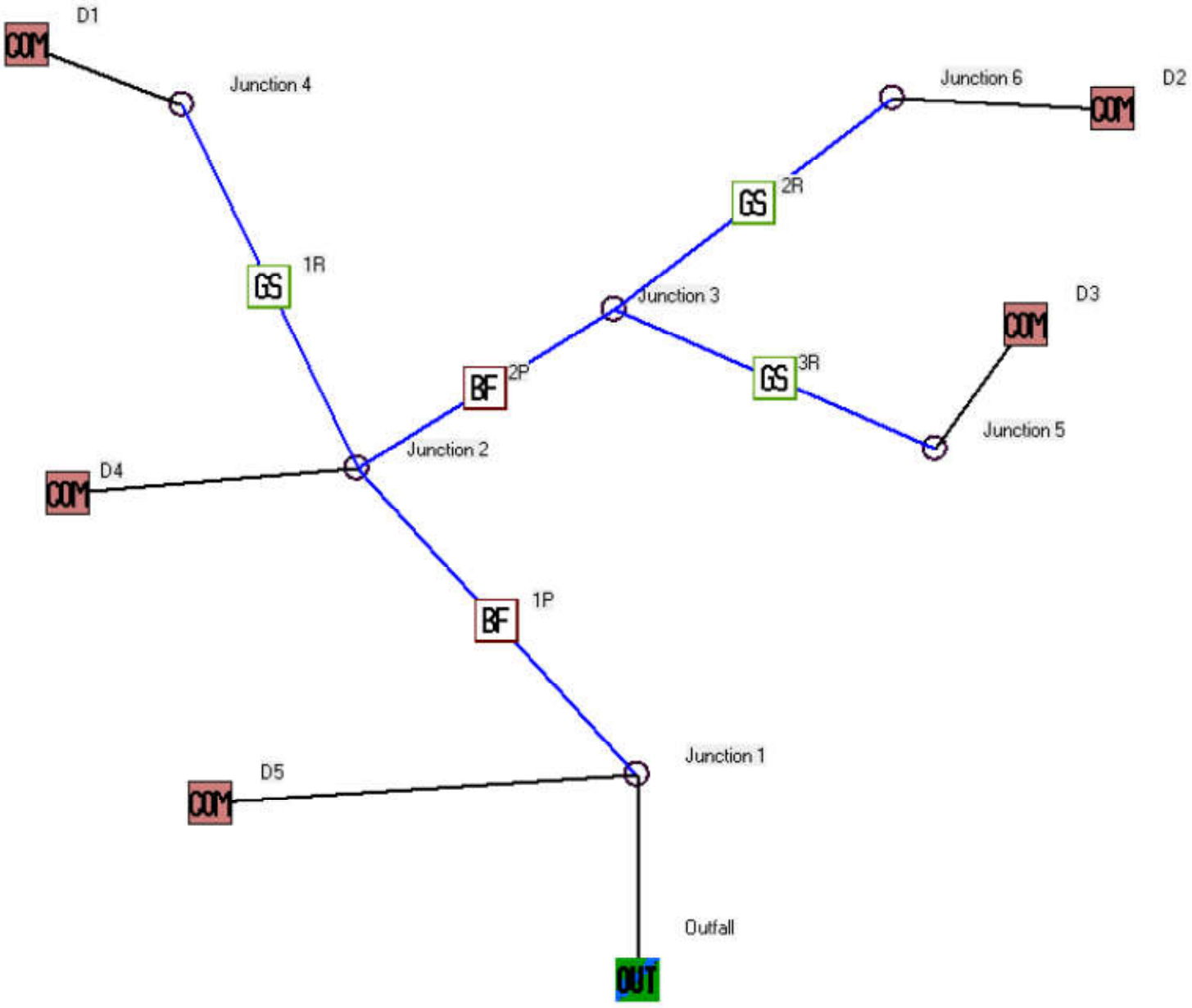
Inflow Area: 241,192 sf
Total Rainfall Infiltrated: 22.63 in

Total Volume= Inflow Area x Rainfall Total
Total Potential Volume Runoff: 454,847 cf
Outfall Total (from WinSLAMM): 9,511 cf
Proposed Infiltration Volume 445,336 cf

Percent of Pre-development Infiltration Volume Infiltrated:

Infiltration Percent = Proposed Infiltration Volume/Existing Infiltration Volume
Infiltration Percent: 97.91%

Calculated by: Dustin Vreeland
Date: 11/21/2025


D1
COM
Junction 4
1R
GS
Junction 6
D2
COM
2R
GS
Junction 3
D3
COM
2P
BF
3R
GS
Junction 5
D4
COM
Junction 2
1P
BF
Junction 1
D5
COM
Outfall
OUT

Data file name: \\VREELAND-SERVER\Data\Vital\Cad Files\2025\25-0410 Tesch\25-0410 winslamm 11-17-25.mdb
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Green Bay 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_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/02/69 Study period ending date: 12/28/69
Start of Winter Season: 11/25 End of Winter Season: 03/29
Date: 02-05-2026 Time: 10:02:23
Site information:

Pre-Development Area Description	Pre-Development Area (ac)	Pre-Development CN
gravel	.240	96
building	.180	98
woods	2.590	30
grass	1.882	39
Total Area (ac)/Composite CN	4.892	39

LU# 1 - Commercial: D1 Total area (ac): 1.854
  1 - Roofs 1: 0.257 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  2 - Roofs 2: 0.257 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  13 - Paved Parking 1: 0.532 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  14 - Paved Parking 2: 0.310 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  31 - Sidewalks 1: 0.005 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  32 - Sidewalks 2: 0.005 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  51 - Small Landscaped Areas 1: 0.488 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Commercial: D2 Total area (ac): 1.868
  1 - Roofs 1: 0.321 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  2 - Roofs 2: 0.257 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  13 - Paved Parking 1: 0.297 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
  19 - Unpaved Parking 1: 0.576 ac. Connected Source Area PSD File: C:\WinSLAMM

Files\NURP.cpz
     32 - Sidewalks 2: 0.005 ac.   Connected   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     33 - Sidewalks 3: 0.005 ac.   Connected   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     51 - Small Landscaped Areas 1: 0.396 ac.   Normal Sandy   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     70 - Water Body Areas: 0.011 ac.   Source Area PSD File:

LU# 3 - Commercial: D3   Total area (ac): 0.971
     1 - Roofs 1: 0.064 ac.   Pitched   Connected   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     13 - Paved Parking 1: 0.035 ac.   Connected   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     19 - Unpaved Parking 1: 0.572 ac.   Connected   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     51 - Small Landscaped Areas 1: 0.272 ac.   Normal Sandy   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     70 - Water Body Areas: 0.028 ac.   Source Area PSD File:

LU# 4 - Commercial: D4   Total area (ac): 0.628
     13 - Paved Parking 1: 0.232 ac.   Connected   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     51 - Small Landscaped Areas 1: 0.324 ac.   Normal Sandy   Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
     70 - Water Body Areas: 0.072 ac.   Source Area PSD File:

Control Practice 1: Biofilter CP# 1 (DS) - 1P
1. Top area (square feet) = 30000
2. Bottom aea (square feet) = 3150
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 3.6
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.01
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0
Soil Data Soil Type Fraction in Eng. Soil
Biofilter Outlet/Discharge Characteristics:
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
2. Weir crest width (ft): 5
3. Height of datum to bottom of weir opening: 4.18

Control Practice 2: Biofilter CP# 2 (DS) - 2P
1. Top area (square feet) = 21000

2. Bottom aea (square feet) = 480
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 3.6
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.001
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
2. Weir crest width (ft): 5
3. Height of datum to bottom of weir opening: 4.5

Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 1.5
2. Pipe invert elevation above datum (ft): 1
3. Number of surface pipe outlets: 1

Control Practice 3: Grass Swale CP# 1 (DS) - 1R

Total drainage area (acres)= 1.854
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 371.63
Total swale length (ft) = 689
Average swale length to outlet (ft)= 573
Typical bottom width (ft) = 1.0
Typical swale side slope (_H:1V) = 4.0
Typical longitudinal slope (ft.H/ft.V) = 0.005
Swale retardance factor: D
Typical grass height (in) = 2.0
Swale dynamic infiltration rate (in/hr)= 3.600
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations: True

Control Practice 4: Grass Swale CP# 2 (DS) - 2R

Total drainage area (acres)= 1.868
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 251.14
Total swale length (ft) = 441
Average swale length to outlet (ft)= 400
Typical bottom width (ft) = 1.0
Typical swale side slope (_H:1V) = 4.0
Typical longitudinal slope (ft.H/ft.V) = 0.005
Swale retardance factor: D
Typical grass height (in) = 2.0

Swale dynamic infiltration rate (in/hr)= 3.600
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations:
True

Control Practice 5: Grass Swale CP# 3 (DS) - 3R
Total drainage area (acres)= 0.971
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 530.38
Total swale length (ft) = 515
Average swale length to outlet (ft)= 500
Typical bottom width (ft) = 1.0
Typical swale side slope (_H:1V) = 4.0
Typical longitudinal slope (ft.H/ft.V) = 0.006
Swale retardance factor: D
Typical grass height (in) = 2.0
Swale dynamic infiltration rate (in/hr)= 3.600
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations:
True

SLAMM for Windows Version 10.5.0
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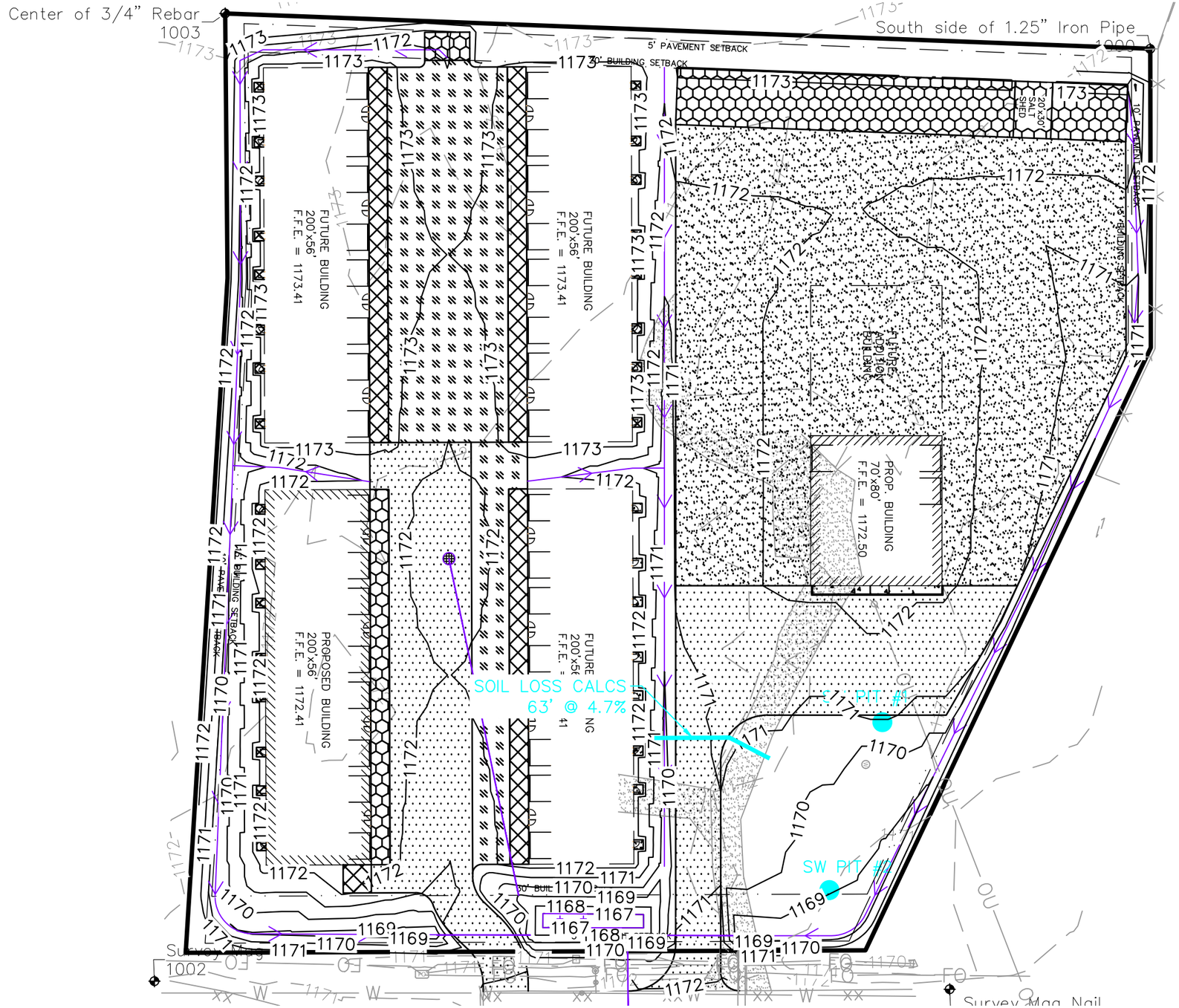
Data file name: \\VREELAND-SERVER\Data\Vital\Cad Files\2025\25-0410 Tesch\25-0410 winslamm 11-17-25.mdb
Data file description:
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Green Bay WI 1969.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Start of Winter Season: 11/25 End of Winter Season: 03/29
Model Run Start Date: 01/02/69 Model Run End Date: 12/28/69
Date of run: 12-01-2025 Time of run: 05:45:59
Total Area Modeled (acres): 5.537
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:	240126	-	95.66	1434	-
Outfall Total with Controls:	9511	96.04%	130.4	77.41	94.60%
Annualized Total After Outfall Controls:	9644			78.48	

APPENDIX E

Soil Loss and Sediment Discharge Map and Calculations



STAMP/SIGNATURE:	REVISIONS		
	BY	DATE	DESCRIPTION

TITLE PAGE:

SOIL LOSS MAP

PROJECT: PREMIER PROPERTY DEVELOPMENT

LOCATION: VILLAGE OF KRONENWETTER
MARATHON COUNTY, WISCONSIN

VREELAND ASSOCIATES LAND SURVEYORS & ENGINEERS
6103 DAWN STREET WESTON, WI. 54476
PHONE NO.: (715) 241-0947
EMAIL: dustin@vreelandassociates.us
WEBSITE: www.vreelandlandsurveying.com

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PREPARED FOR: GREG TESCH

PLAN DATE: OCTOBER 6TH, 2025

DESIGNER: DUSTIN VREELAND	
SURVEYED BY: CB & TV	
FILE NO.: 25-0410 ENGINEERING	
DATE: SEPTEMBER 15, 2025	
SCALE:	1" = 60'
SHEET	SOIL

Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Version 2.1 (12-05-2024)

WISCONSIN DEPT. OF NATURAL RESOURCES

YEAR 1

Developer: Premier Property Holding

Project: Premier Property Holding Development

Date: 10/21/25

County: Marathon

Version 2.1

Activity (1)	Begin Date (2)	End Date (3)	Period % R (4)	Annual R Factor (5)	Sub Soil Texture (6)	Soil Erodibility K Factor (7)	Slope (%) (8)	Slope Length (ft) (9)	LS Factor (10)	Land Cover C Factor (11)	Soil loss A (tons/acre) (12)	SDF (13)	Sediment Control Practice (14)	Sediment Discharge (t/ac) (15)
Bare Ground	08/04/25	06/03/26	56.1%	130	Sand	0.15	4.7%	64	0.40	1.00	4.4	0.910	Silt Fence	2.4
Seed with Mulch or Ero	06/03/26	08/03/26	43.2%	130	Sand	0.15	4.7%	64	0.40	0.10	0.3	0.910	Silt Fence	0.2
End	08/03/26	-----	-----	-----	-------	-----	4.7%	64	0.40	------	-----	0.000		0.0
		-----	-----	-----	-------	-----	4.7%	64	0.40	-----	-----	0.000		0.0
		-----	-----	-----	-------	-----	4.7%	0	-----	-----	-----	0.000		0.0
		-----	-----	-----	-------	-----	0.0%	0	-----	-----	-----	0.000		0.0
										TOTAL	**4.7**		**TOTAL**	**2.6**
													% Reduction Required	**NONE**

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.
The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.
For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/15-6/1	and	8/1-8/21	Turf, introduced grasses and legumes
Thaw-6/30			Native Grasses, forbs, and legumes

Designed By:	Dustin Vreeland
Date	7/10/2025

APPENDIX F

State of Wisconsin Construction Site Inspection Report

State of Wisconsin
Department of Natural Resources (DNR)
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

CONSTRUCTION SITE INSPECTION REPORT

Form 3400-187 (R 11/16)

Notice: This form was developed in accordance with s. NR 216.48 Wis. Adm. Code for WPDES permittees' convenience; however, use of this specific form is voluntary. Multiple copies of this form may be made to compile the inspection report. Inspections of the construction site and implemented erosion and sediment control best management practices (BMPs) must be performed weekly and within 24 hours after a rainfall event 0.5 inches or greater.

Construction Site Name and Location (Project, Municipality, and County):	**Site/Facility ID No. (FIN):**
Onsite Contact/Contractor:	**Onsite Phone/Cell:**

Note: Inspection reports, along with erosion control and storm water management plans, are required to be maintained on site in accordance with s. NR 216.48 (4) and made available upon request. PLEASE PRINT LEGIBLY.

Date of inspection:

Time of inspection:
Start: _____ ◯ **am** ◯ **pm**
End: _____ ◯ **am** ◯ **pm**

Type of inspection: ◯ **Weekly** ◯ **Precipitation Event** ◯ **Other (specify)**

Weather/Site Conditions:

Temp. _____ **°F** **Antecedent Soil Moisture**

◯ **Dry** ◯ **Frozen or snow covered**
◯ **Variable** ◯ **Frozen (Thaw predicted in next week)**
◯ **Wet** ◯ **Melting Snow/slush**

Last Rainfall Depth: _____ **inches**

Last Rainfall Date: _____

Describe current phase of construction:

Scheduled Final Stabilization Date for Universal Soil Loss Equation (USLE) [1] :

Project on Schedule[2]? ◯ **Yes** ◯ **No**

Name(s) of individual(s) performing inspection:

Inspector Phone/Cell:

I certify that the information contained on this form is an accurate assessment of site conditions at the time of inspection:

Inspector Signature _____ **Date:** _____

Inspection Questions:	**Yes**	**No (Identify Actions Required):**	**Location/Comments:**	**Actions Completed by Date & Initials**
1. Is the erosion control plan accessible to operators?	☐	☐ Provide onsite copy		
2. Is the permit certificate posted where visible?	☐	☐ Post certificate		
3. Is the current phase of construction on sequence with the site-specific erosion and sediment control plan, including installation/stabilization of ponds and ditches?	☐	☐ Add sediment control ☐ Install missing ditch/pipe/pond ☐ Stabilize bare soil		
4. Are all erosion and sediment control BMPs shown on plan properly installed and in functional condition?	☐	☐ Repair ☐ Modify ☐ Install/Replace		
5. Is inlet protection properly installed and functioning in all inlets likely to receive runoff from the site?	☐	☐ Clean ☐ Replace ☐ Install		
6. Is the air free of fugitive dust resulting from construction activity and bare soil exposure?	☐	☐ Apply water ☐ Apply dust control product		

[1] The Universal Soil Loss Equation (USLE) model and the Construction Site Soil Loss and Sediment Discharge Guidance are available at: http://dnr.wi.gov/topic/stormwater/standards/const_standards.html

[2] If the project is not on schedule then the soil loss summary for the project should be reviewed and schedule, plan or practices modified accordingly.

CONSTRUCTION SITE INSPECTION REPORT

Inspection Questions:	Yes	No (Identify Actions Required):	Location/Comments:	Actions Completed by Date & Initials
7. Is the public right of way curb line free of tracked soil and accumulation?	☐	☐ Install tracking pad ☐ Widen/lengthen pad ☐ Amend stone/Add geotextile ☐ Install wheel washing station ☐ Close entrance/exit ☐ Limit traffic across disturbed areas ☐ Sweep road and curb line		
8. Are wetlands, lakes, streams, ditches, or storm sewers downstream of the site free of sedimentation and turbid water leaving the site?[3]	☐	☐ Repair/Replace erosion control ☐ Add sediment controls ☐ Modify operations ☐ Contact DNR to verify extent of cleanup required		
9. Is dewatering and/or vehicle and equipment washing being done in a manner that prevents erosion and sediment discharge?	☐	☐ Install treatment train ☐ Install energy dissipation ☐ Modify discharge location ☐ Modify intake to reduce sediment		
10. Are soil stockpiles existing for more than 7 days covered and stabilized?	☐	☐ Seed ☐ Install mat/mulch/polymer ☐ Cover with tarp/plastic sheeting		
11. Are downstream channels and other downhill areas protected from scour and erosion?	☐	☐ Install energy dissipation at outfall ☐ Install ditch checks ☐ Install slope interruption ☐ Install onsite detention		
12. Are good housekeeping practices or treatment controls in place to prevent the discharge of chemicals, cement, trash, and other materials into wetlands, waterways, storm sewers, ditches, or drainage-ways?[4]	☐	☐ Properly dispose of trash ☐ Provide concrete washout station ☐ Contact DNR to verify extent of cleanup required		
13. Is the plan reflective of current site operations and does it address all erosion and sediment control issues identified during the inspection?	☐	☐ Revise sequence ☐ Revise sediment control BMP ☐ Revise erosion control BMP ☐ Revise post-construction storm water BMP		
14. Are all areas where construction has temporarily ceased (and will not resume for more than 2 weeks) temporarily stabilized?	☐	☐ Topsoil & seed ☐ Install mat/mulch/polymer ☐ Cover with tarp/plastic sheeting		
15. Are all areas at final grade permanently vegetated or stabilized with other treatments?	☐	☐ Topsoil & seed ☐ Install mat/mulch/polymer ☐ Sod ☐ Install stone base		
16. Have temporary sediment controls been removed in areas of the site that meet the permit definition of 'final stabilization'?	☐	☐ Water to establish vegetation ☐ Repair or reseed areas ☐ Remove temporary practices		

3 If sediment discharge enters a wetland or waterbody, the permittee should consult with DNR staff to determine if sediment cleanup and/or additional control measures are required.

4 The permittee shall notify the DNR immediately via the spills hotline at (800)943-0003 of any release or spill of a hazardous substance to the environment in accordance with s. 292.11, Wis. Stats., and ch. NR 706, Wis. Adm. Code.