

Meadowbrook Road Senior Living

Northwest Corner of
Meadowbrook Road & Coldwater Creek Drive
City of Waukesha, WI

Storm Water Management Plan

Prepared For:

Tukka Properties

Prepared By:



4100 N. CALHOUN RD., STE 300, BROOKFIELD, WI 53005

t: 262.790.1480 f: 262.790.1481

email: MBAILEY@trioeng.com

Submittal Date:

September 22, 2025

TABLE OF CONTENTS

INTRODUCTION.....	3
OWNER	3
DESIGN REQUIREMENTS.....	3
ANALYSIS OVERVIEW	4
PRE-DEVELOPMENT SITE DESCRIPTION & DRAINAGE SUMMARY.....	5
DESCRIPTION	5
DRAINAGE SUMMARY	5
POST-DEVELOPMENT SITE DESCRIPTION & DRAINAGE SUMMARY	6
DESCRIPTION	6
DRAINAGE SUMMARY	7
STORM WATER PRACTICE DESCRIPTION & SUMMARY	8
DESCRIPTION	8
BIO-FILTRATION BASIN BF-1.....	8
WET POND WP-2A & BIO-FILTRATION BASIN BF-2B.....	9
WET POND WP-3	9
WATER QUANTITY ANALYSIS (PEAK RELEASE RATE).....	10
WATER QUALITY ANALYSIS (TOTAL SUSPENDED SOLIDS)	11
INFILTRATION SUMMARY	12
CONCLUSION.....	13
 APPENDICES	
APPENDIX 1 – Soils Map & Geotechnical Report	
APPENDIX 2 – Existing & Proposed Drainage Maps	
APPENDIX 3 – HydroCAD Modeling	
APPENDIX 4 – WinSlamm Calculations	

Introduction

Tukka Properties is proposing to construct a single senior living building which will include Assisted Living, Memory Care, and Independent Living units at the northwest corner of Meadowbrook Road and Coldwater Creek Drive, in the City of Waukesha, WI. The project will also include the extension of a public road north from the west end of Coldwater Creek Drive. This stormwater management plan will include stormwater management for future development areas. These future areas are anticipated to support single-family residential, commercial development, public road extensions, and independent senior living condominiums. In total, the development area supported by this stormwater management plan will be 24.774 acres. The development area has been farmed as an agricultural field and contains mostly open space with some tree lines between fields.

The existing site currently drains from the center of the site in the north and south directions. To the north, discharge will ultimately be discharged to an unnamed stream, which discharges to Pebble Creek. Discharge flowing south is discharged to the Meadowbrook Road right of way at the northwest corner of the intersection with Coldwater Creek Drive. In the proposed condition, the site will discharge similar to existing conditions, where runoff will be collected and managed within three (3) stormwater management facilities.

This storm water management plan has notable objectives that are accomplished; they include:

1. Maintain and/or improve drainage patterns.
2. Promote infiltration where native soils, topography and site constraints allow.
3. Improve post construction storm water runoff quality.
4. Reduce post construction runoff per City requirements.

Owner

As a regional stormwater plan, the owners and entities responsible for the storm water management practices will be the respective owners of the current and future development sites or future property owners.

Design Requirements

The following design standards have been used to develop the storm water management plan for the Meadowbrook Road Senior Living development:

- City of Waukesha Stormwater Management Ordinance – Chapter 32, Stormwater Management and Erosion Control
- Wisconsin Department of Natural Resources (WDNR) Technical Standards, NR 151 and NR 216.
- Summary of design requirements:
- Summary of design requirements:
 - o Peak Discharge:
 - City of Waukesha: The peak flow discharge rates of stormwater runoff from the site under the post-development site conditions shall not exceed the rates under the pre-development conditions for the 1, 2, 10, and 100-year, 24-hour design storm event.

- o Water Quality (Total Suspended Solids): Reduce to the maximum extent practicable the total suspended solids load by 80%, based on an average annual rainfall, as compared to no runoff management controls.
- o Infiltration: For medium impervious developments, such as multifamily residential or institutional use, one of the following shall be met:
 - Infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 75% of the pre-development infiltration volume, based on an average annual rainfall.
 - No more than 2% of the project site is required as an effective infiltration area.

Analysis Overview

Existing and post development storm water runoff conditions for the Meadowbrook Road Senior Living development project have been analyzed for: runoff volume, peak volume, discharge, detention area storage capacity required, outlet structures and storm sewer system requirements. The software package used for modeling and analysis was HyrdroCAD 10.20-6a by HydroCAD Software Solutions, LLC. HydroCAD uses NRCS methods to generate runoff and pond routing hydrographs. HydroCAD's capabilities include: modeling simple or complex drainage basins, combining hydrographs to determine runoff and storage requirements, analyzing interconnected detention basins and outlet structure sizing.

The computer model analyzed the one, two, ten, and one hundred-year storm events utilizing Atlas 14 IDF curves. NOAA MSE3 rainfall distribution has also been used. The necessary hydrographs were generated to determine the storm water runoff rates, depths and volumes for pre and post development conditions. This information is used to calculate detention basin size and outlet requirements.

Run-off curve numbers for the onsite and off-site areas were determined using the requirements outlined in the NRCS TR-55 Manual. Per existing soils maps and data, the existing site contains hydrologic soil groups type B, C & D. The type B soils are Hochheim soils (HoC3 & HoD3). Type C soils are Theresa silt loam (ThB), and Type D soils are Hochheim loams (HmB, HmC2, & HmD2).

The post development analysis runoff curve numbers are assigned based on TR-55 standards, and by calculating composite curve numbers per TR-55 standards, as applicable.

The rainfall depths for the 24-hour duration storm are:

Rainfall Depths for 24-Hour Storm Duration			
(Site Name Eagle 2 W, based on Volume 8, version 2 of the Atlas 14)			
1 year	2 year	10 year	100 year
2.4 inches	2.7 inches	3.81 inches	6.18 inches

The following describes the curve numbers assigned for composite calculations:
Curve Numbers:

Impervious Area (Roof, Pavement, Sidewalk, Etc.),	CN = 98
Open Space in Good Condition: Type "B" Soil,	CN = 61
Open Space in Good Condition: Type "C" Soil,	CN = 74
Open Space in Good Condition: Type "D" Soil,	CN = 80
Cropland type "B" soils,	CN = 69
Cropland type "C" soils,	CN = 78

Cropland type "D" soils,	CN = 83
Woodlands type "B" soils,	CN = 55
Woodlands type "C" soils,	CN = 70
Woodlands type "D" soils,	CN = 77

Pre-development runoff curve number: All computations of pre-development conditions as specified in this article shall use those NRCS runoff curve numbers assigned for a "good" hydrologic condition for each land cover type.

Pre-Development Site Description & Drainage Summary

Description

The subject site is currently an undeveloped site containing mainly open space used for agricultural purposes. The existing site is currently tributary to Pebble Creek.

The existing site has been modeled as two (2) drainage areas, E-1 and E-2. Drainage Area E-1 drains south and discharges to the right of way of Meadowbrook Road at the northwest corner of the intersection with Coldwater Drive. Drainage area E-2 drains north to the un-named stream locate just north of the development site. This stream ultimately discharges to Pebble Creek to the east.

The table below depicts the pre-existing lot coverage associated with the existing drainage area.

EXISTING CONDITIONS			
Lot Coverage	E-1 (acres)	E-2 (acres)	Curve Number CN
Roof	0.000	0.000	98
Public Street	0.000	0.000	98
Driveway or Parking Lot	0.000	0.000	98
Sidewalk & Patio	0.000	0.000	98
Row Crops (B)	2.270	2.660	69
Row Crops (C)	0.000	1.270	78
Row Crops (D)	10.191	4.524	83
Woods (B)	0.170	0.750	55
Woods (C)	0.000	0.139	70
Woods (D)	1.920	0.469	77
Sub-Total (ac)	14.551	9.812	
Composite CN	80	76	

Drainage Summary

The following tables summarize the peak flows associated with the existing drainage areas. The peak discharge rate for the existing site is the summation of the hydrographs at the peak time. Please refer to the attached calculations for detailed hydrograph information.

Events for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.))

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	12.94	0.993	0.82
2-yr	2.70	16.48	1.247	1.03
10-yr	3.81	30.78	2.284	1.88
100-yr	6.18	64.10	4.777	3.94

Events for Subcatchment 17S: E-2 (Ex. Discharge North)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	6.27	0.518	0.63
2-yr	2.70	8.38	0.668	0.82
10-yr	3.81	17.10	1.302	1.59
100-yr	6.18	38.39	2.887	3.53

Post-Development Site Description & Drainage Summary**Description**

The Meadowbrook Road Senior Living development proposes constructing a single senior living building contains Independent, assisted Living, and Memory Care units. The building will be served by a public road extension and private road and asphalt guest parking stalls onsite. Future development areas are included in the stormwater management plan and are assumed to be single-family residential, future commercial area and senior living condominiums, as well as, future public road extensions.

The development site was analyzed utilizing seven (7) drainage areas with four (4) stormwater management facilities. Drainage Area P-1 makes up the majority of the proposed senior living development site, and includes a private road, parking lots, sidewalk, patios, and open space, which discharges to Biofiltration Basin BF-1. Drainage area P-2 encompasses the public road extension and steep adjacent slopes, and discharges to Wet Pond WP-2 and biofiltration Basin BF-2B. Drainage area P-2A, is a future commercial development area assigned assumed lot coverage and curve number, and discharges to Wet Pond WP-2A and biofiltration Basin BF-2B. Area P-2B is a future development area assumed to be single-family residential. Similar to the future commercial area, this area has been assigned an assumed lot coverage to account for single-family homes, driveways, sidewalks, patio and a public road extension. This area also discharges to Wet Pond WP-2A and Biofiltration Basin BF-2B. Drainage area P-3 is located at the northern end of the development site and contains the senior living condominiums. This area discharges to Wet Pond WP-3. The final two areas are un-detained areas UD-1 and UD-2. These areas drain un-detained offsite. Area UD-1 discharges north to the un-named stream, while UD-2 discharges south to the ditch line of Meadowbrook Road.

The table below depicts the proposed lot coverage associated with the proposed drainage areas.

PROPOSED CONDITIONS

AC.	P-1 (acres)	P-2 (acres)	P-2A (acres)	P-2B (acres)	P-3 (acres)	UD-1 (acres)	UD-2 (acres)	Curve Numbers CN
Roof	1.370	0.000	0.000	0.496	1.700	0.230	0.000	98
Private Road	1.290	0.000	0.000	0.000	1.057	0.000	0.000	98
Sidewalk/Patio	0.344	0.177	0.000	0.172	0.191	0.000	0.000	98
Driveway	0.000	0.000	0.000	0.331	0.320	0.000	0.000	98
Public Road	0.000	0.630	0.000	0.545	0.000	0.000	0.000	98
Pond	0.000	0.000	0.000	0.000	0.270	0.000	0.000	98
Open Space (B)	0.000	0.300	0.000	0.000	1.433	0.368	0.000	61
Woods (B)	0.000	0.000	0.000	0.000	0.080	0.000	0.000	55
Open Space (C)	0.000	0.000	0.000	0.000	0.750	0.684	0.000	74
Woods (C)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	70
Open Space (D)	2.076	0.510	0.000	1.135	0.980	0.599	0.250	80
Woods (D)	0.000	0.000	0.000	0.000	0.240	0.000	0.000	77
Sub-Total (ac)	5.080	1.617	5.835	2.679	7.021	1.881	0.250	
Composite CN	91	85	91	90	84	76	80	

Drainage Summary

The following tables summarize the peak flows associated with the proposed drainage areas. The peak discharge rate for the existing site is the summation of the hydrographs at the peak time. Please refer to the attached calculations for detailed hydrograph information.

Events for Subcatchment 9S: P-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	7.43	0.642	1.52
2-yr	2.70	8.74	0.758	1.79
10-yr	3.81	13.62	1.199	2.83
100-yr	6.18	23.99	2.170	5.13

Events for Subcatchment 11S: P-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	3.19	0.148	1.10
2-yr	2.70	3.88	0.180	1.34
10-yr	3.81	6.54	0.308	2.29
100-yr	6.18	12.37	0.603	4.47

Events for Subcatchment 10S: P-2A (Future Commercial)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	12.97	0.739	1.52
2-yr	2.70	15.21	0.872	1.79
10-yr	3.81	23.54	1.378	2.83
100-yr	6.18	41.16	2.495	5.13

Events for Subcatchment 12S: P-2B (Future Residential)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	4.59	0.322	1.44
2-yr	2.70	5.42	0.382	1.71
10-yr	3.81	8.55	0.611	2.74
100-yr	6.18	15.22	1.120	5.02

Events for Subcatchment 13S: P-3

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	6.70	0.607	1.04
2-yr	2.70	8.27	0.743	1.27
10-yr	3.81	14.40	1.287	2.20
100-yr	6.18	28.14	2.550	4.36

Events for Subcatchment 15S: UD-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	1.13	0.099	0.63
2-yr	2.70	1.50	0.128	0.82
10-yr	3.81	3.07	0.249	1.59
100-yr	6.18	6.89	0.553	3.53

Events for Subcatchment 19S: UD-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	0.37	0.017	0.82
2-yr	2.70	0.46	0.021	1.03
10-yr	3.81	0.85	0.039	1.89
100-yr	6.18	1.73	0.082	3.94

Storm Water Practice Description & Summary

Description

The project proposes managing the stormwater from the site through four (4) stormwater management facilities, Biofiltration Basin BF-1, Wet Pond WP-2A, Bio-filtration Basin BF-2B, and Wet Pond WP-3. Basin BF-1 is located within the proposed senior living development and discharges to the Meadowbrook Road right-of-way. Wet Pond WP-2A and Biofiltration Basin BF-2B will essentially be one facility where the wet pond will act as a pretreatment cell prior to discharging into the bio-filtration basin. These facilities discharge to the Meadowbrook Road right-of-way. Wet Pond WP-3 received runoff from the future senior living condominium area and the northern portion of the senior living development area and discharges north offsite to the un-named stream. The following describes the proposed stormwater management facilities in detail:

Bio-filtration Basin BF-1

Basin & Structure characteristics

- Top of Berm = 175.00
- 15' Wide Overflow Spillway = 174.00
- 48" dia. Riser Structure, Rim = 173.00
- 3' Sharp Crested Weir in Riser Structure = 172.00
- 6" Low Flow Orifice in Riser = 171.00
- Top of Engineered Soil = 179.00
- 6" Perforated Underdrain = 168.50
- Bottom of Engineered Soil = 168.00
- 15" Outlet Pipe from Riser = 168.00
- Minimum Design Native Soil Infiltration Rate = 0.50 in/hr.

Basin BF-1 Discharge Summary

Events for Pond 1P: Bio-Filtration Basin (BF-1)

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	7.43	1.70	0.13	1.57	171.84	0.312
2-yr	8.74	2.39	0.14	2.25	172.13	0.363
10-yr	13.62	7.53	0.16	7.37	172.68	0.467
100-yr	23.99	13.57	0.20	13.37	173.74	0.704

Wet Pond WP-2A & Bio-filtration Basin BF-2B

Basin & Structure characteristics

- Wet Pond WP-2A
 - Top of Berm = 139.00
 - 43' Spillway = 134.00
 - Normal Water Level = 134.00
 - Bottom of Wet Pool 129.00
- Bio-filtration Basin BF-2B
 - Top of Berm = 139.00
 - 10' Wide Overflow Weir = 138.00
 - 48" dia. Riser Structure, Rim = 137.00
 - 3' Wide Sharp Crested Weir in Riser = 136.10
 - 8" Low Flow Orifice in Riser = 134.25
 - Top of Engineered Soil = 133.50
 - 6" Perforated Underdrain = 132.00
 - Bottom of Engineered Soil = 131.50
 - 24" Outlet Pipe from Riser = 129.50
 - Minimum Design Native Soil Infiltration Rate = 0.50 in/hr.

Wet Pond WP-2A & Bio-filtration Basin BF-2B Discharge Summary

Events for Pond 2P: Wet Pond (WP-2A)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	19.20	12.25	136.09	0.246
2-yr	22.68	12.56	136.39	0.290
10-yr	35.70	20.24	137.12	0.408
100-yr	63.51	51.99	137.80	0.529

Events for Pond 3P: Bio-Filtration Basin (BF-2B)

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	12.25	3.26	0.10	3.15	136.10	0.332
2-yr	12.56	5.02	0.11	4.91	136.39	0.375
10-yr	20.24	15.28	0.13	15.15	137.12	0.495
100-yr	51.99	46.41	0.14	46.27	137.80	0.618

Wet Pond WP-3

Basin & Structure characteristics

- Top of Berm = 169.00
- 20' Spillway = 168.00
- 36" dia. Riser Structure, Rim = 167.00
- 4" Orifice = 165.00
- Normal Water Level = 165.00
- 24" Outlet Pipe from Riser = 162.50
- Bottom of Wet Pool = 160.00

Basin WP-3 Discharge Summary**Events for Pond 5P: Wet Pond (WP-3)**

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	6.70	1.04	167.06	0.349
2-yr	8.27	2.61	167.16	0.372
10-yr	14.40	10.59	167.47	0.447
100-yr	28.14	26.22	167.88	0.556

Water Quantity Analysis (Peak Release Rate)

The table below summarizes the storm water release rates associated with the development. The Allowable Release Rate is defined as the pre-development release rate, which is the existing/pre-development drainage area. The Total Proposed Release Rate is calculated as the addition of the:

- Stormwater Management Facilities BF-1, BF-2B, and WP-3 discharge rate at the peak time; and
- Drainage Areas UD-1 & UD-2 discharge rate at the peak time.

The table verifies that the Storm Water Management Plan reduces the calculated post-development peak storm water discharge rate, so it does not exceed the calculated pre-development discharge rates for the one-year, two-year, ten-year, and 100-year, critical duration design storms.

Site Discharge*

Storm Event	Allowable Release Rate from Site	Total Proposed Release Rate from Site
(Year)	(cfs)	(cfs)
1	19.20	5.74
2	24.83	9.38
10	47.85	31.61
100	102.45	85.02

* Total Peak Runoff Rates are based on the addition of the peak discharge rates from the associated hydrographs at the peak time for the site; due to varying peak times, the total discharge rates are not a direct summation of the peak rates for each. Refer to the attached calculations for additional information.

To ensure that discharges at each existing discharge point are not exceeded in the proposed condition the tables below have been provided illustrating the reduction in flows for each discharge point for the one-year, two-year, ten-year, and 100-year, critical duration design storms.

Discharge North to Un-named Stream*

Storm Event	Allowable Release Rate from Site	Total Proposed Release Rate from Site
(Year)	(cfs)	(cfs)
1	6.27	1.49
2	8.38	3.02
10	17.10	12.40
100	38.39	31.89

* Total Peak Runoff Rates are based on the addition of the peak discharge rates from the associated hydrographs at the peak time for the site; due to varying peak times, the total discharge rates are not a direct summation of the peak rates for each. Refer to the attached calculations for additional information.

Discharge South to Meadowbrook Road*

Storm Event	Allowable Release Rate from Site	Total Proposed Release Rate from Site
(Year)	(cfs)	(cfs)
1	12.94	4.76
2	16.48	6.61
10	30.78	19.47
100	64.10	57.32

* Total Peak Runoff Rates are based on the addition of the peak discharge rates from the associated hydrographs at the peak time for the site; due to varying peak times, the total discharge rates are not a direct summation of the peak rates for each. Refer to the attached calculations for additional information.

Water Quality Analysis (Total Suspended Solids)

The following water quality requirements were followed as a minimum design goal when implementing the above-described stormwater management practices for a re-development site.

- Reduce to the maximum extent practicable the total suspended solids load by 80%, based on an average annual rainfall, as compared to no runoff management controls.

The table below depict the Total Suspended Solids (TSS) that can be expected to be removed as a result of the proposed development and implementation of this Stormwater Management Plan.

SLAMM Results – Meadowbrook Road Senior Living development September 22, 2025			
Rain file: Milwaukee WI 1969.RAN			
Model Run Start Date: 03/28/69		Particulate Solids	Particulate
Model Run End Date: 12/06/69	Runoff Volume	Concentration	Pollutant yield
	(cu ft)	(mg/L)	(lbs)
Total T.S.S. Removal Without Controls	931,412	118.5	6,892
Total T.S.S. Removal After Outlet Controls	689,404	31.92	1374
Percent T.S.S. Reduction:	N/A	N/A	80.06%

Infiltration Summary

For medium impervious developments, such as multifamily residential or Institutional sites, one of the following shall be met:

- Infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 75% of the pre-development infiltration volume, based on an average annual rainfall.
- No more than 2% of the project site is required as an effective infiltration area.

Infiltration Volume

The following is the supporting infiltration calculations:

Pre-Development Runoff Volume (based on the site being undeveloped as modeled in WinSLAMM):
110,163 c.f.

Post-Development Runoff Volume after Infiltration/Outfall Controls:
698,979 c.f.

Infiltration Volume:

Pre-Development = $(29.02''/12 \times 24.363 \text{ ac.} \times 43,560 \text{ s.f./ac}) - 110,163 \text{ c.f.} = 2,456,299 \text{ c.f.}$

Post-Development = $(29.02''/12 \times 24.363 \text{ ac.} \times 43,560 \text{ s.f./ac}) - 698,979 \text{ c.f.} = 1,867,483 \text{ c.f.}$

(Note that 29.02'' is the average amount of rain in a given year.)

Post Development Infiltration as compared to pre-existing conditions = $1,867,483 \text{ c.f.} / 2,456,299 \text{ c.f.} = 0.760$
= 76.0% > 75% pre-development = OK

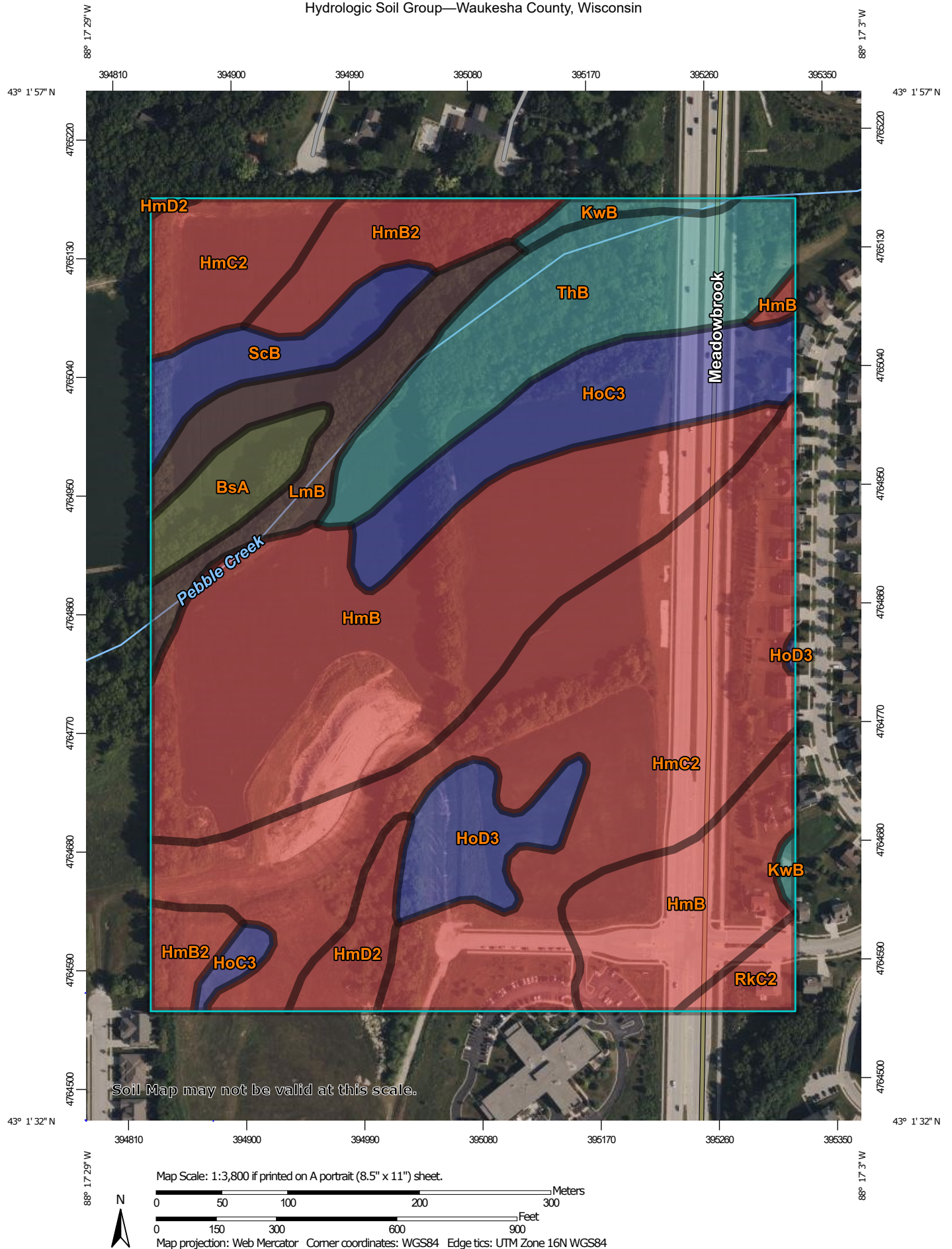
Conclusion

The storm water management plan for the River Road Villas development meets and exceeds both the City of Waukesha and WDNR requirements for water quality, infiltration and peak rate control. The results described above are supported by the calculations provided in the attachments.

APPENDIX 1

Soils Map & Geotechnical Report

Hydrologic Soil Group—Waukesha County, Wisconsin



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 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Waukesha County, Wisconsin
 Survey Area Data: Version 3, Dec 10, 2024

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

Date(s) aerial images were photographed: Aug 4, 2022—Sep 13, 2022

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
BsA	Brookston silt loam, 0 to 2 percent slopes	C/D	1.8	2.4%
HmB	Hochheim loam, 2 to 6 percent slopes	D	21.4	28.5%
HmB2	Hochheim loam, 2 to 6 percent slopes, eroded	D	3.7	4.9%
HmC2	Hochheim loam, 6 to 12 percent slopes, eroded	D	22.7	30.2%
HmD2	Hochheim loam, 12 to 20 percent slopes, eroded	D	1.5	2.0%
HoC3	Hochheim soils, 6 to 12 percent slopes, severely eroded	B	5.7	7.6%
HoD3	Hochheim soils, 12 to 20 percent slopes, severely eroded	B	2.6	3.4%
KwB	Knowles silt loam, 2 to 6 percent slopes	C	0.7	0.9%
LmB	Lamartine silt loam, 0 to 3 percent slopes	B/D	4.2	5.5%
RkC2	Ritchey silt loam, 6 to 12 percent slopes, eroded	D	0.8	1.1%
ScB	St. Charles silt loam, 2 to 6 percent slopes	B	2.3	3.0%
ThB	Theresa silt loam, 2 to 6 percent slopes	C	7.8	10.4%
Totals for Area of Interest			75.1	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



Professional Service Industries, Inc.
821 Corporate Court, Waukesha, WI 53189
Phone: (262) 521-2125
Fax: (262) 521-2471

June 2, 2025

R.F. Smart Development, LLC
144 W. Broadway
Waukesha, WI 53186

Attn: Ms. Carol O. Smart
Managing Member

Re: Preliminary Geotechnical Exploration and Site Feasibility Evaluation
Proposed Meadowbrook Rd. Development
NWC Meadowbrook Rd. and Coldwater Creek Dr.
Waukesha, Wisconsin
PSI Project No. 00523519

Dear Ms. Smart:

The preliminary geotechnical exploration and site feasibility evaluation for the referenced project has been completed. An electronic copy of the report is being provided via email. Paper copies can be issued upon request. After you have had the opportunity of reading the report, please call at any time with any questions or comments you may have. Professional Service Industries, Inc. (PSI), an Intertek Company, appreciates the opportunity to be of service on this project, and looks forward to continuing as your geotechnical consultant during the design and construction phases, as well as your upcoming projects.

Sincerely,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Ilyas Ahmed
Staff Engineer

Patrick J. Patterson, P.G.
Professional Geologist


6/2/25
James M. Becco, P.E.
Principal Consultant

The above Professional Engineering Seal and signature is an electronic production of the original seal and signature. Original hard copies can be provided upon request. This electronic reproduction shall not be construed as an original or certified document.

TABLE OF CONTENTS

INTRODUCTION	1
General.....	1
Purpose.....	1
Scope	1
Authorization	1
SITE AND PROJECT DESCRIPTION	1
Site Features	1
Project Description	2
EXPLORATION AND LABORATORY PROCEDURES	3
Scope Summary	3
Field Exploration.....	3
Laboratory Physical Testing.....	4
DESCRIPTION OF SUBSURFACE CONDITIONS.....	4
General.....	4
Soil Conditions.....	4
Groundwater Observations.....	5
EVALUATION AND RECOMMENDATIONS	5
General Development Considerations	5
Site Preparation.....	6
Foundation Evaluation.....	8
Floor Slab and Pavement Subgrades	10
Below Grade Walls	11
Exterior/Unheated Area Slabs	12
Utility Construction.....	12
CONSTRUCTION CONSIDERATIONS.....	13
Groundwater Control	13
Excavations and Site Drainage	14
Seismic Design Considerations	15
PAVEMENT DESIGN RECOMMENDATIONS	15
GENERAL COMMENTS.....	17

APPENDIX (in order of appearance)

Figure 1 – Boring Location Plan
Soil Boring Logs
General Notes



INTRODUCTION

General

This report presents the results of the preliminary geotechnical exploration and site feasibility evaluation for the proposed Meadowbrook Road Development project located in Waukesha, Wisconsin. The work was performed for R.F. Smart Development, LLC at the request of Ms. Carol O. Smart.

Purpose

The purpose of this preliminary study was to evaluate the subsurface conditions at specific boring locations on the site, and to provide subsurface information for general site feasibility and preliminary design planning. A comprehensive foundation evaluation and recommendations for specific structures were beyond the scope of this preliminary site evaluation but are recommended as part of design planning.

Scope

The scope of services included a site reconnaissance, the subsurface exploration, an evaluation of soil characteristics by field and laboratory testing, and an evaluation of the data obtained. The scope of the field work, including the number, location, and depth of the borings was determined by the client.

Authorization

The description of services and authorization to perform this preliminary geotechnical exploration and site feasibility evaluation were in the form of signed PSI Proposal No. 451339, dated May 7, 2025. This report has been prepared on behalf of, and exclusively for the use of R.F. Smart Development, LLC. The information contained in this report may not be relied upon by any other parties without the express written consent of PSI, and acceptance by such parties of PSI's General Conditions.

SITE AND PROJECT DESCRIPTION

Site Features

The project site is generally located to the northwest of the intersection of Meadowbrook Road and Coldwater Creek Drive in the City of Waukesha, Wisconsin. It is an irregularly shaped parcel that is approximately 90 acres in size. At the time of exploration, the site was vacant and comprised predominantly of agricultural fields and densely wooded areas. It is understood that wetlands are present from the west-central and extending toward the northeast corner of the site. An earthen berm and a stormwater flow channel are present in the south central portion of the site. The channel flows to the south towards the west end of Coldwater Creek Drive.

The property is surrounded by residential and commercial properties with vacant land to the west. Aerial photos of various years between 1941 and 2024 reviewed on the Waukesha County Interactive GIS Map indicate that the project site was predominantly vacant agricultural land and densely wooded areas throughout the series of photos. The subject site is depicted on the enclosed Boring Location Plans (Figure 1)

The topography of the project site is significantly rolling with an elevation difference at the borings of about 80 feet (EL. 223.8 to EL. 144.2), generally sloping down to the northeast.

Project Description

Based on the information provided by the client, it is understood that the proposed project will consist of the construction of single-family and/or two-family homes with attached garages and basements, associated roadways, and utilities. The structures are estimated to be up to 2 stories above grade, and with basement floors about 9 feet below grade. No other details were provided. Structural loads were not provided for the proposed buildings but are estimated to be light to moderate in magnitude. For this report, it is estimated that maximum column and wall loads will not exceed 100 kips and 10 kips per lineal foot, respectively. When structural loads are determined, PSI must be informed to determine if revisions to this report are necessary.

At the time of report preparation finished floor elevations were not known. Based on the elevations at the borings EL. 223.8 to EL. 144.2, substantial cuts and fills, possibly in excess of 10 feet, may be necessary at this site.

Pavements are estimated to consist of asphalt or concrete. Traffic loading for pavements has not been provided. However, it is anticipated that traffic will generally consist of light passenger vehicle traffic, delivery trucks, garbage trucks, school buses, and snow removal vehicles. Utility depths and locations were not provided. In addition, information regarding any stormwater management areas was not provided.

This preliminary exploration has been commissioned to evaluate the subsurface conditions at widely spaced borings across areas of the subject site, and to provide subsurface information for general site feasibility and preliminary design planning for the proposed development. The number and spacing of the borings requested is not considered sufficient to serve as a conventional foundation evaluation for the proposed buildings, or for an evaluation of utilities. Additional borings are necessary and recommended to further evaluate more specific soil conditions and provide subsequent recommendations. In addition, when finished floor, yard, utility invert, and other elevations are determined; and when additional design details of the planned development become available, PSI must be provided an opportunity to review them and determine if a redirection of the evaluation and recommendations contained herein is warranted.

EXPLORATION AND LABORATORY PROCEDURES

Scope Summary

The field and laboratory data utilized in the evaluation of the subsurface materials was obtained by drilling exploratory test borings, securing soil samples by the split-spoon sampling method, and subjecting the samples to standard laboratory testing.

Field Exploration

Twenty-seven (27) soil borings were performed for this development. B-1, B-3, B-4, B-10, and B-11 were planned to a depth of about 20 feet below existing grade, while the remaining borings were planned to a depth of about 15 feet below existing grade. However, as an exception, auger refusal was encountered within B-2 at a depth of about 6 feet (EL. 138.2) below the existing grade. The number, depth, and approximate location of the soil borings was determined by the client. The borings were staked in the field by the client prior to drilling. The surface elevations shown on the logs were provided by the client. The approximate locations of the borings performed are shown on the Boring Location Plan (Figure 1), which is provided in the Appendix of this report.

The soil test borings were performed with an all-terrain vehicle (ATV) mounted rotary drilling rig utilizing continuous flight hollow stem augers to advance the holes. Representative samples were obtained by the Standard Penetration Test (SPT) method using split-spoon sampling procedures in general accordance with ASTM D-1586 procedures. Samples from the general development areas were collected at 2.5-foot intervals to 10 feet, and then at 5-foot intervals thereafter to the end of the borings. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer, falling thirty (30) inches, required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of the three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental numbers. The SPT provides a means of estimating the relative density of granular soils and comparative consistency of cohesive soils, thereby providing a method of evaluating the relative strength and compressibility characteristics of the subsoils.

The SPT soil samples were transferred into clean glass jars immediately after retrieval and returned to the laboratory upon completion of the field operations. Samples will be discarded unless other instructions are received. The soil samples were visually classified in general accordance with the Unified Soil Classification System (ASTM D-2488-75). A description of the subsurface conditions encountered at each boring location is shown on the enclosed Soil Boring Logs. After completion of the borings, the auger holes were backfilled to the ground surface with bentonite chips.

A copy of the Soil Boring Logs and Boring Location Plans (Figure 1) are enclosed in the Appendix. The soil stratification shown on the logs represents the approximate soil conditions

in the actual boring locations at the time of the exploration. The terms and symbols used on the logs are described in the General Notes found in the Appendix.

Laboratory Physical Testing

Soil samples obtained from the exploration were visually classified in the laboratory, and subjected to testing, which included moisture content determinations.

Selected cohesive soil samples were tested in unconfined compression with a controlled strain loading rate and/or with a calibrated hand penetrometer to aid in evaluating the soil strength characteristics. The values of strength tests performed on soil samples obtained by the Standard Penetration Test Method (SPT) are considered approximate, recognizing that the SPT method provides a representative but somewhat disturbed soil sample.

The laboratory testing was performed in general accordance with the respective ASTM methods, as applicable, and the results are shown on the boring logs in the Appendix.

DESCRIPTION OF SUBSURFACE CONDITIONS

General

A description of the subsurface conditions encountered at the test boring locations is shown on the Soil Boring Logs. The lines of demarcation shown on the logs represent an approximate boundary between the various soil classifications. It must be recognized that the soil descriptions are considered representative estimates for the specific test hole location, but those variations may occur between and beyond the sampling intervals and boring locations. Soil depths, topsoil, and layer thicknesses, and demarcation lines utilized for preconstruction planning should not be expected to yield exact and final quantities. A summary of the major soil profile components is described in the following paragraphs.

Soil Conditions

The surface materials at the borings consisted of about 10 to 15 inches of topsoil, generally consisting of very dark brown to brown lean clay. Underlying the topsoil were natural soils predominately consisting of brown to gray silty to clayey sand, with varying amounts of gravel to termination depths of the borings. Intermixed clay layers were encountered in several of the borings. As an exception, silty sand with rubber pieces was encountered to a depth of about 4 feet (EL. 162) below the existing grade in B-4, which is situated near the east side of the earthen berm. Probable cobbles and/or boulders were encountered within the majority of the borings at depths of about 6 feet to termination depth of borings. Additionally, auger refusal on possible cobbles, boulders, or bedrock was encountered within B-2 at depth of 6 feet (EL. 138.2) below the existing grade. The natural cohesive soils were firm to very stiff in consistency with unconfined compressive strengths ranging from 0.5 to 4.1 tons per square foot (tsf). The natural

granular soils were in a loose to extremely dense condition with N-values ranging from 4 blows per foot (bpf) to 50 blows per one inch of sampler penetration.

The foregoing discussion of soil conditions on this site represents a generalized soil profile as determined at the test boring locations. A more detailed description and supporting data for each test location can be found on the individual Soil Boring Logs.

Groundwater Observations

Groundwater observations were made during the drilling operations and in the open boreholes upon completion of drilling and removal of the augers. Groundwater was encountered within B-5, B-6, B-7, B-9, B-10, B-11, B-12, B-13, B-14, B-15, B-16, B-17, B-18, B-19, B-21, B-23 and B-24 during auger advancement at depths ranging from about 1 to 15 feet (EL. 163.4 to EL. 210.8) below existing grade. Upon completion and removal of the augers, groundwater was present within B-5, B-6, B-7, B-9, B-13, B-14, B-15, B-17, B-18, B-20, B-21, B-23, B-24 and B-25 at depths ranging from about 4 feet to 11 feet (EL. 167.4 to EL. 211.9) below existing grade. No groundwater was observed within the remaining borings during auger advancement or upon completion of drilling and removal of the augers. The observations were somewhat variable and may be representative of both the long term level and/or of perched zones.

The groundwater observations reported herein are considered approximate. It must be recognized that groundwater levels fluctuate with time due to variations in seasonal precipitation, lateral drainage conditions, and soil permeability characteristics. Longer term monitoring would be required to further evaluate groundwater levels on this site.

EVALUATION AND RECOMMENDATIONS

General Development Considerations

In view of the subsurface conditions encountered in the test borings, together with the structural loading criteria and development grades anticipated, conventional spread footings, along with conventional slab-on-grade construction, can generally be used for support of the proposed structures. However, some undercutting of soft, unstable, or otherwise unsuitable soils may be necessary. Additionally, some undercutting of existing fill soils (such as were encountered in B-4) may be necessary. All footings must bear upon suitable and stable natural soils.

Substantial difficulty with groundwater and/or perched zones, and with excavation subgrade and sidewall stability may be experienced in some areas. An adequate dewatering effort will be necessary. The over-excavation of unstable zones along with the use of a crushed stone working mat may also be required. It is recommended that basement slabs be placed at least 2 feet above the groundwater level to help reduce the potential for moisture problems and constantly running sump pumps. Dependent upon planned/required surface grades, and resulting basement slab elevations, excavations may encroach upon or extend below the groundwater or perched water across much of the property. Further evaluation of groundwater

levels using backhoe test pits is recommended (especially in areas encroaching upon wetlands) to assist in establishing appropriate basement floor and corresponding surface elevations.

Substantial difficulty digging, longer excavation times, and refusal or near refusal conditions may be experienced in some areas due to the presence of very dense to extremely dense soils, and the presence of cobbles and/or boulders. Auger refusal was experienced at a depth of about 6 feet (EL. 138.2) at B-2 on possible cobbles, boulders, or bedrock. It is recommended that test pits be performed as part of design and construction planning to evaluate the excavatability of the soils.

The floor slabs and pavements can be supported by the existing soils following proper preparation, which will include the removal of soft, unstable or unsuitable zones. Some instability and the need for undercutting is likely to occur.

A discussion of the foundation design parameters, as well as the support conditions for the floor slab and pavement areas, is included in the following sections.

Site Preparation

The presence of organic topsoil and vegetation in the subgrade can adversely affect the serviceability of structural fills, foundations, floor slabs, pavements, and other structures placed upon them. Approximately 10 to 15 inches of topsoil were present on the surface of the site at the boring locations. However, some variation should be anticipated, especially when encroaching upon or extending within wetland areas where thicker deposits of organic soils may be present; and within agricultural fields, where tilling and other related operations can result in thicker pockets of topsoil, or topsoil having become intermixed within underlying soils. All topsoil, vegetation, trees, roots and other organic matter must be stripped from the areas of footings, floor slabs, pavements, sidewalks, and other structures.

Most of the property was farm fields. If any remnant drain tiles are encountered during construction, it is generally recommended that they be tied into new drainage structures or otherwise be properly drained to a suitable area (in accordance with any applicable regulatory requirements or restrictions), since they may still actively drain areas of the subject site or adjacent properties.

Topsoil depths and/or the presence of organic soils (which are not suitable for the support of buildings, slabs, utilities, pavements, and other structures) may increase substantially within and encroaching upon wetland areas. Very shallow groundwater levels may also be present. Extreme instability may be experienced during construction within or encroaching upon wetlands. It is generally recommended that development within wetland areas not be performed due to the typical presence of highly organic soils and shallow groundwater. If such development is contemplated, special permits may be required from the Army Corps of Engineers, the WDNR, or other government agencies.

After stripping the topsoil and cutting any high areas of the site to the planned finished grade, and prior to the placement of new fill which may be placed to raise grades, the subgrade must be thoroughly proofrolled to detect unstable, yielding soils. This should consist of overlapping passes in a perpendicular grid pattern, with a fully loaded tandem-axle dump truck, or other equipment of similar size and weight suitable for the surface conditions. Proofrolling should be performed in consultation with the geotechnical engineer at the time of construction. Substantial and widespread subgrade instability, possibly requiring deep undercutting, can occur within highly moisture sensitive silty and clayey soils (such as were encountered in some of the borings), especially in wet or cold weather, or during thawing conditions. It is generally recommended that earthwork be carried out during relatively warm, dry weather. Any soft, wet, or otherwise unstable zones which cannot be improved by scarification and aeration, must be removed and replaced with compacted structural fill, such as clean crushed stone, possibly in conjunction with the use of a geotextile fabric. Long construction delays and substantial difficulty with subgrade stabilization may be experienced if soils are wet or are otherwise at high moisture conditions during construction. It is recommended that construction roads be installed to reduce potential disturbance to the subgrade soils.

Every effort must be made to keep excavations dry. If construction proceeds during wet weather, some additional over excavation may be necessary. If the weather permits, the soil could be dried and recompacted. A crushed stone working mat, possibly in conjunction with a geotextile fabric, may also be feasible to help stabilize subgrades. Site grading runoff should be directed to catch basins, so that the potential for the softening of the foundation subgrade soils is reduced.

If site grades are raised in excess of 2 feet, the first lift of new fill must be placed so as to extend a minimum lateral distance of 5 feet beyond the planned top building pad dimension (for fills less than 5 feet in thickness), or for a distance equal to at least 1 foot laterally beyond the top pad dimension for every foot of fill thickness (for fills greater than 5 feet in depth). Subsequent lifts can then be placed on an approximate 1H:1V slope back up to the planned top perimeter dimension of the pad. Similarly, where undercutting of unsuitable soils is performed beneath foundations, floor slabs, or other structural areas, it is recommended that the removal extend laterally beyond the perimeter of the structure at least 1 foot for every foot of removal below the planned bearing depth. Proper moisture control is essential to reduce the amount of compactive effort necessary to achieve the desired densities.

When a firm and stable subgrade is established, low areas may be raised to planned grades with properly compacted structural fill. Any new fill should be a clean granular soil, such as those materials meeting the gradations outlined in Section 209 or 305 of the State of Wisconsin Standard Specification for Highway and Structure Construction. If high silt or clay content soils are used, they should generally be placed over large open areas, where conditions are more favorable for the proper placement and compaction of such materials. It must be recognized that high silt or clay content materials are extremely difficult to compact when placed at moisture contents beyond a few percent of the optimum moisture content. Fill must be placed in layers of not more than nine (9) inches in thickness, at moisture contents at or near optimum, and be

compacted to a minimum density of 95 percent of the maximum dry density as determined by ASTM designation D-698. Where new fill thicknesses are in excess of 12 feet, the compaction percentage must be increased to 98 percent. If the on-site soils encountered in the borings are used to raise grades on the site, substantial sorting and moisture conditioning is likely to be necessary. Additionally, long drying times may be required for soils obtained from below the groundwater or perched zones. Silt, clay, organic, and wet granular soils are not suitable for reuse as compacted fill in trenches, or adjacent to foundation stem walls or retaining walls.

Proper moisture control is essential to reduce the amount of compactive effort necessary to achieve the desired densities. This is especially true of clayey soils, where scarification and aeration may be required to achieve near - optimum moisture levels prior to compaction. A sheepsfoot roller is generally required for compaction of clayey soils, whereas a vibratory smooth drum roller is preferred for granular material. Small hand-operated compactors should be used in confined areas; granular fills are generally more readily compacted to the required densities in such applications.

It is recommended that well-graded granular soils be utilized as backfill in new utility trenches and alongside below grade walls to reduce the potential for consolidation and settlement of the fill. All fill soils must be placed and compacted under engineering-controlled conditions, to provide suitable support for overlaying structures and roadways. Additional guidance can be provided at the time of construction in the selection process for grade-raising fill and trench backfill.

The selection of fill materials for various applications should be done in consultation with the soils engineer. Similarly, the evaluation of the subgrade and placement and compaction of fill for structural applications should be monitored and tested by a qualified representative of the soils engineer.

Foundation Evaluation

The following is a general overview of the subsurface conditions for the site, as it relates to foundation analysis, and is intended only for use in preliminary site planning. Additionally, a specific bearing pressure (including within the range provided) must not be applied to any specific structure without the performance of additional borings beyond those of this study and/or confirmation of suitability from PSI.

The proposed structures may be supported by a conventional spread foundation system, bearing on suitable naturally occurring soils or within structural fill, prepared as discussed in a previous section. For preliminary planning, conventional spread footings bearing upon suitable natural soils, or compacted structural fill (or lean concrete mix) used to replace unsuitable materials, can be designed to exert net allowable soil bearing pressures of 2,000 to 4,000 psf, dependent upon location, loading conditions, bearing elevation, and other factors. However, some undercutting of soft, low strength, fill material, or unstable soils may be necessary on at least an isolated basis. This will also be dependent upon the final surface and resulting bearing

grades. Additionally, footings must be extended through any existing fill (such as was encountered at B-4), and any buried topsoil, to bear upon suitable natural soils, or upon compacted structural fill or lean concrete slurry used to replace the existing fill.

Dependent upon final grades, wet soils, and groundwater or perched zones may be encountered within foundation excavations, and a substantial loss in strength along with an extremely soft, loose, unstable or otherwise unsuitable subgrade may develop when the confining effect of the overburden is removed. This may require undercutting and the use of a crushed stone working mat or a "mud mat" to achieve a stable bearing grade. Substantial sloughing and caving may also occur, and dewatering may be required.

The suitability of the existing soils for support of the proposed foundation must be determined by testing by a qualified geotechnical engineer during construction, utilizing static cone penetrometer tests or dynamic cone penetrometer tests for cohesive and granular soils, respectively. Soft, loose, or otherwise unsuitable materials not disclosed by the borings, may be encountered in the foundation excavations at the bearing elevation. If unsuitable existing soil is present, it must be removed throughout a zone extending one foot laterally for each two feet removed below the foundation, on either side of the planned footing. The over-excavated area must be backfilled with structural compacted fill.

In lieu of the use of compacted structural fill, the isolated area of existing fill soils and any unsuitable natural materials could be removed from beneath new footings and the excavation backfilled to the original planned bearing depth with a lean concrete mix. If it is elected to utilize a lean concrete mix to replace the unsuitable soils, the foundation excavations should be about 4 inches wider than the proposed footing width and must extend through the unsuitable bearing materials to the natural soils. The concrete must be placed immediately after excavation to avoid intrusion of soil into the excavation. The concrete should contain sufficient aggregate and cement to attain a 28-day compressive strength of at least 1000 psi. Some sloughing or caving of the overlying soils may be experienced. Should this occur during concrete placement, the area must be removed and recast. Additionally, should caving become extensive, it may be necessary to substantially widen excavations to avoid soil intrusion into the concrete. This may result in the use of additional concrete quantities significantly in excess of preconstruction budget estimates.

All perimeter footings and all footings in unheated areas must be placed at a depth of at least 4 feet (or deeper if required by local code or in accordance with customary practice) below the finished grade for frost protection. Due to periodic severity of winters in this area, it is recommended that footings in poorly heated or unheated areas of the building also be placed at least 4 feet below the adjacent exterior grade. Interior footings not subject to frost action may be placed at a shallow depth of at least 18 inches below the floor slab, provided they bear on suitable natural soils or engineered fills. All footings must be protected from the effects of frost if construction is carried out during winter months.

It is recommended that the footings supporting individual columns have a minimum dimension of 24 inches, and continuous footings have a minimum width of 18 inches, even if the maximum recommended allowable bearing pressure is not fully utilized. In order to minimize the effects of any slight differential movement that may occur due to variations in the character of the supporting soils and any variations in seasonal moisture contents, it is recommended that all foundations be suitably reinforced to make them as rigid as needed.

In general, the performance of the foundation system on this site is dependent on the various factors discussed herein. The excavation, preparation, and concreting of foundations should be monitored and tested by a representative of the soils engineer.

Floor Slab and Pavement Subgrades

Prior to constructing the floor slabs or pavements, and prior to the placement of any fill used to raise grades, the exposed subgrade must be prepared utilizing the proofrolling procedures described previously. In areas that exhibit soft, yielding or unstable soil conditions, the following remedial measures are recommended to provide a stable subgrade. It must be recognized that the high silt and clay content soils present in several areas of the site are highly sensitive to increases in moisture and construction disturbance. It will therefore be necessary to maintain these materials in a relatively dry condition to allow for proper subgrade preparation. It is recommended that the proofrolling operations be monitored by a representative of the geotechnical engineer to ensure that a firm, suitable subgrade is present prior to placement of new fills, or to construction of floor slabs and pavements.

Localized wet, soft or unstable areas can be undercut to such depths determined necessary in the field to reach stable material, and the area backfilled with imported crushed stone, such as the 1¼-inch gradation specified in Section 305 of the WisDOT Standard Specifications, placed and compacted as recommended in the Site Preparation section of this report. If relatively thick zones or areas of extensive yielding are observed, and they cannot be stabilized by normal discing, aeration and recompaction procedures, undercutting and replacement with crushed stone and geotextile fabric (if needed) may also be required in these areas.

The floor slab(s) may be designed utilizing an estimated modulus of subgrade reaction of 125 pci based on the presence of suitable and stable soils, prepared as discussed in this report. However, this is based on common range values obtained from 1 ft. x 1 ft. plate load tests on specific soil types. Depending on how the slab load is applied, the value may need to be modified for larger areas using the following:

Modulus of Subgrade Reaction	$k_s = \left(\frac{k}{B} \right)$ for cohesive soil
	$k_s = k \left(\frac{B+1}{2B} \right)^2$ for cohesionless soil

where: k_s = coefficient of vertical subgrade reaction for loaded area
 k = coefficient of vertical subgrade reaction for a 1x1 foot square area

B = width of area loaded, in feet

The final design and detailing should be performed by a qualified structural engineer based on the intended slab use, loading conditions and anticipated subgrade conditions.

A granular mat, which can be designed as a drainage layer, should be provided below the floor slab. This must be a minimum of six (6) inches in thickness and properly compacted. In moisture sensitive areas, a vapor retarder may be placed beneath the floor slab or base course, however, it is recommended that the architect be consulted in this regard. The proper use of a vapor retarder may not completely prevent moisture beneath or on top of slabs. If the base course contains sharp particles, a cushion layer of sand approximately 2 inches in thickness may be required to provide protection from puncture.

The floor slabs should be suitably reinforced to make them as rigid as necessary and proper joints provided at the junction of slabs and the foundation system so that a small amount of independent movement can occur without causing damage. Large floor areas must be provided with joints at frequent intervals (maximum spacing of 30 times the slab thickness, per ACI) to compensate for concrete volume changes (shrinkage). Where the slab will be supporting live loads, such as from moving vehicles, joints must be keyed or dowelled to permit proper load transfer. It is recommended that appropriate construction methods and curing procedures be used to minimize shrinkage and curling of the floor slabs.

Below Grade Walls

It is recommended that basement slabs be placed at least 2 feet above the groundwater to reduce the potential for moisture problems and constantly running sump pumps. Groundwater was encountered within B-5, B-6, B-7, B-9, B-10, B-11, B-12, B-13, B-14, B-15, B-16, B-17, B-18, B-19, B-21, B-23 and B-24 during auger advancement at depths ranging from about 1 to 15 feet (EL. 163.4 to EL. 210.8) below existing grade. Upon completion and removal of the augers, groundwater was present within B-5, B-6, B-7, B-9, B-13, B-14, B-15, B-17, B-18, B-20, B-21, B-23, B-24 and B-25 at depths ranging from about 4 feet to 11 feet (EL. 167.4 to EL. 211.9) below existing grade. It is recommended that additional evaluation of groundwater levels be performed to assist in developing finished basement floor elevations. Dependent upon the results of the additional evaluation, some filling may be required to raise surface grades in some areas to accommodate placing basement slabs at higher elevations. Detailed and careful design and construction planning will be required. If grade raising is necessary but cannot be properly accomplished, or if it is elected to not raise existing surface elevations to establish basement floor elevations at least 2 feet above the groundwater level, it may be necessary to eliminate basements for some structures.

It is recommended that an underdrain system and drainage course be placed beneath the floor slab and that a drain tile system be placed alongside the basement foundation (if conventional construction is used) to alleviate excessive lateral pressure on the walls. The drainage system should be connected to adequate sumps for drainage and be properly discharged in

accordance with all state and local discharge requirements. Drain tile should have a minimum diameter of four (4) inches and should be wrapped with an appropriate filter fabric. Drainage pipes should be surrounded by clean gravel and extend up to the near ground surface in window well areas. At least six (6) inches of clean $\frac{3}{4}$ inch stone should be utilized for the free draining layer beneath the floor areas.

The below grade walls must be backfilled for a lateral distance of 3 to 4 feet with a well-graded, free draining granular material. This should be placed in lifts not exceeding 12 inches in thickness and be compacted to at least 95 percent of the Standard Proctor density. Based upon the use of a clean, crushed stone fill ($\phi=30$; $\gamma_m=130$ pcf), and a drained condition, an equivalent fluid pressure of 65 psf may be used as the horizontal component of earth pressure at rest. However, when a proposed fill material has been selected, a representative sample must be submitted to PSI for testing to verify the above values and associated recommendations. Silt and clay soils, organic soils, and wet granular materials are not suitable for use as backfill alongside basement walls. It must be recognized that the above value is based upon a drained condition and is exclusive of traffic and other surcharge loads near the walls, which must be factored into the design.

Exterior/Unheated Area Slabs

Based on the borings, entry slabs, sidewalks, aprons, and other slabs in exterior or unheated areas will likely bear upon silty or clayey soils in some areas of the site. Such materials are highly frost susceptible and poorly drained. Slabs placed directly upon such soils are subject to heaving and subsequent settlement due to freeze/thaw cycles. This can result in cracking, misalignment, and other related effects (especially at joints). It is recommended that consideration be given to limited undercutting of the frost susceptible materials to a depth of 1 to 2 feet below the slab, and replacement with well graded, properly placed and compacted granular soils. A properly designed underdrain system connected to the municipal sewer (if permissible) or directed to on-site stormwater management areas should also be incorporated to reduce the potential effects of freeze/thaw cycles.

Utility Construction

The on-site soils can generally be used for support of utility lines. However, substantial difficulty with subgrade stabilization may be experienced in some areas. Undercutting of soft, wet, low strength, or otherwise unsuitable soils, in conjunction with the placement of crushed stone or other suitable granular backfill will likely be necessary, and may become extensive. Some difficulty with the stability of utility trenches may also be experienced, especially in the presence of water. The use of sloping, shoring, bracing, or trench boxes will likely be required. Utility construction should be performed in accordance with "The Standard Specifications for Sewer and Water Line Construction" for the State of Wisconsin.

It is recommended that well graded granular soils such as those specified in Tables 37 and 39 of the Standard Specification for Sewer and Water Construction be utilized as backfill in utility

trenches to reduce the potential for consolidation and settlement of the backfill. All fill soils must be properly placed and compacted under engineering-controlled conditions to provide suitable support for overlaying structures and roadways. Silty and clayey soils, organic soils, and wet materials are not recommended for use as backfill within utility trenches due to the substantial difficulty of obtaining proper compaction in confined areas. Substantial importing of suitable fill will likely be required.

As with all excavation work, all open cut trenches must be properly shored and braced as required by applicable federal and state OSHA codes, and as necessary to protect life and property.

CONSTRUCTION CONSIDERATIONS

Groundwater Control

Groundwater observations were made during the drilling operations and in the open boreholes upon completion of drilling and removal of the augers. Groundwater was encountered within B-5, B-6, B-7, B-9, B-10, B-11, B-12, B-13, B-14, B-15, B-16, B-17, B-18, B-19, B-21, B-23 and B-24 during auger advancement at depths ranging from about 3 feet to 15 feet (EL. 163.4 to EL. 210.8) below existing grade. Upon completion and removal of the augers, groundwater was present within B-5, B-6, B-7, B-9, B-13, B-14, B-15, B-17, B-18, B-20, B-21, B-23, B-24 and B-25 at depths ranging from about 4 feet to 11 feet (EL. 167.4 to EL. 211.9) below existing grade. No groundwater was observed within the remaining borings during auger advancement or upon completion of drilling and removal of the augers.

On the basis of the observations, major difficulty with groundwater may be experienced during excavation work in at least some areas on this site. For low volume perched zones, a filtered sump pump may suffice for control. However, for excavations encroaching upon or extending below the groundwater, or for larger volume perched zones, prolonged dewatering with a series of sumps and high-capacity pumps (with sufficient lifting capacity) may be necessary to facilitate construction. It should be noted that higher groundwater levels and larger volumes may be encountered when encroaching upon or extending within wetlands areas, and when encroaching upon stormwater channels.

Every effort should be made to keep excavations dry. Site grading should be performed to direct runoff away from the construction area, so that the potential for the softening of the subgrade soils is reduced.

It must be recognized that groundwater levels fluctuate with time due to variations in seasonal precipitation, lateral drainage conditions, and soil permeability characteristics.

Excavations and Site Drainage

Sloping, shoring or bracing of excavation sidewalls will be necessary to facilitate construction and to protect life and property. Sloughing and caving should be expected within unprotected excavations. The degree of excavation instability problems is dependent upon the depth and length of time that excavations remain open, excavation bank slopes, water levels and the effectiveness of any dewatering systems. All excavation work must be performed in accordance with OSHA and local building code requirements.

Where excavations encroach upon or extend below the groundwater or perched zones and into organic, granular, or soft clay soils, a substantially unstable subgrade may develop when the confining effect of the overburden is removed. Significant sloughing or caving of sidewalls may also occur. Some over-excavation of softened or loosened soils, in conjunction with the use of a crushed stone working mat, may be necessary to establish a stable bearing subgrade. Additionally, significantly widened excavations may result, or be required to maintain or achieve sidewall stability. Major difficulty with excavations and in achieving a stable subgrade may be experienced in some areas of this site, especially when encroaching upon or extending below the groundwater.

Auger refusal on possible cobbles, boulders, or bedrock was encountered within B-2 at depth of 6 feet (EL. 138.2) below the existing grade, and extremely dense granular soils, with cobbles and/or boulders were encountered with increasing depth in several of the borings. Substantial difficulty digging and longer excavation times for conventional excavating, and substantial difficulty with the installation of bracing systems may be experienced. Refusal or near refusal conditions may also occur. It is recommended that additional exploration with backhoe test pits be performed in at least the area of B-2, and where cobbles and/or boulders were encountered to further evaluate the type, depth, and excavatability of the refusal materials.

All excavations must be performed with caution and utilize methods which will prevent undermining or destabilization of slopes, buildings, utilities, pavements, sidewalks or other structures. The use of a properly designed shoring and bracing, sheet piling, or underpinning system must be utilized as necessary to adequately protect buildings, utilities, pavements, and other structures. This must be performed by an experienced specialty contractor. Additionally, extreme care must be used during the installation of any bracing system, especially those using driven or vibratory methods, in order to avoid damaging existing buildings, utilities, and other structures. Consideration should be given to the performance of video and/or photographic documentation of the condition of nearby buildings, utilities, and other structures prior to installation. In addition, monitoring of such structures must be performed from the time of commencement and extending through completion of the installation activities.

It is mandated that excavations, whether they be for utility trenches, or footing excavations, be constructed in accordance with current Occupational Safety and Health Administration (OSHA) guidelines to protect workers and others during construction. PSI recommends that these regulations be strictly enforced; otherwise, workers could be in danger and the owner(s) and

the contractor(s) could be liable for substantial penalties. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

Since some areas of the subgrade soils are generally sensitive to moisture, every effort should be made to provide adequate drainage across the site during construction, and to prevent ponding of runoff on the subgrade. These soils are also subject to erosion caused by runoff, and erosion control measures should be implemented where needed or required by local ordinances.

Seismic Design Considerations

The soils encountered in the borings are estimated to meet the criteria for Site Class D in accordance with 1613.2.5.2 of the International Building Code-2018 (which directs to the simplified design procedure outlined in ASCE 7 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures).

PAVEMENT DESIGN RECOMMENDATIONS

Pavements for this project are understood to consist of residential roads, which are estimated to be primarily subjected to light passenger vehicle traffic, and occasional delivery trucks, garbage trucks, and school buses.

The near surface pavement subgrade soils encountered at the borings in several areas of the site consisted predominantly of clay with an estimated visual classification of A-6 by the AASHTO soil classification method. These soils are generally rated as poor for pavement subgrade support, based on their moderate to high shrink/swell potential and frost susceptibility; and poor drainage characteristics. Provided that the subgrade soils are prepared as outlined in the Site Preparation section of this report, the in-place subgrade soils and any new structural fill can be used for standard flexible or rigid pavement construction.

Evaluation of the visual soil classification has been made in estimating pertinent subgrade design coefficients as described in the Wisconsin Soils Manual for Pavement Design. Based on the soils encountered, and with proper subgrade preparation and drainage, the following pavement subgrade design parameters are recommended for the pavement section design. However, if soils with support characteristics different from the lean clay materials are

encountered or are used to raise grades in new pavement areas, revised coefficients will need to be provided.

PAVEMENT SUBGRADE DESIGN COEFFICIENTS

AASHTO Soil Classification	A-6
Design Frost Index	F-3
Design Group Index	14
Soil Support Value	3.8
Estimated Subgrade Modulus (k)	125 pci

During construction, the surficial subgrade soils can become wet, softened and disturbed from rainfall and construction equipment. Therefore, prior to placing the pavement base materials, the subgrade must be proofrolled as outlined previously. Particular attention should be given to high traffic areas that have become rutted and areas of backfilled trenches. Localized wet, soft, or unstable areas can be undercut to such depths determined necessary in the field to reach stable materials. The granular base course should consist of well-graded crushed stone meeting the requirements from the State of Wisconsin DOT Standard Specifications for construction for dense graded base. If relatively large or thick zones of extensive yielding are observed, and normal discing and recompaction procedures cannot stabilize them, undercutting and replacement with crushed stone and geotextile fabric (if needed) may be required in these areas. Preparation and evaluation of the pavement subgrade must be performed as outlined in the Site Preparation section of this report.

It should be recognized that all pavements require regular maintenance and occasional repairs to keep the pavements in a serviceable condition. Maintenance is necessary to reduce the effects of pavement stress caused by changes in temperature and moisture, repetitive traffic loadings, and movement of the subgrade soils. As pavement distress is observed, it should be repaired as quickly as possible. Timely sealing of joints and cracks is essential to help reduce the potential for water to enter the pavement section and cause rapid deterioration of the pavement during freeze-thaw cycles. Unrepaired areas will generally lead to more severe and widespread distress, and eventually, pavement disintegration. Therefore, annual maintenance should include sealing of cracks and joints, and maintenance of proper surface drainage to avoid ponding water on or near the pavements. Periodic pavement condition surveys of the pavement can also be implemented to evaluate the need for other surface maintenance, and treatments or repairs that may be needed to obtain the design service life.

The subject site is located in an area that experiences annual freezing cycles and the subgrade soils encountered in several areas of the site have been classified as moderately to highly susceptible to frost action when water is present. In order to reduce the potential for frost action, it will be necessary to control surface runoff and water seepage, because complete removal and replacement of the frost susceptible subgrade soils is not considered economically feasible. It is recommended that underdrains be placed within the subgrade, just below the granular base, to help reduce the potential for trapping water within the aggregate base layer. Sufficient drain tiles extending radially outward an adequate distance from each interior catch

basin must be installed. In addition, drain tiles should extend along curb lines, up the slope from curb inlets. The drain tile should be directly connected to the storm sewer manholes or catch basins (if permissible by local municipal or other applicable code). The drain tile should consist of perforated PVC pipe of adequate diameter placed beneath the base layer, extending a sufficient distance into the subgrade. The pipe should be surrounded by appropriately sized clean stone, with the pipe and stone being wrapped with a geotextile filter fabric to reduce the potential for soils to migrate into and obstruct the pipe.

GENERAL COMMENTS

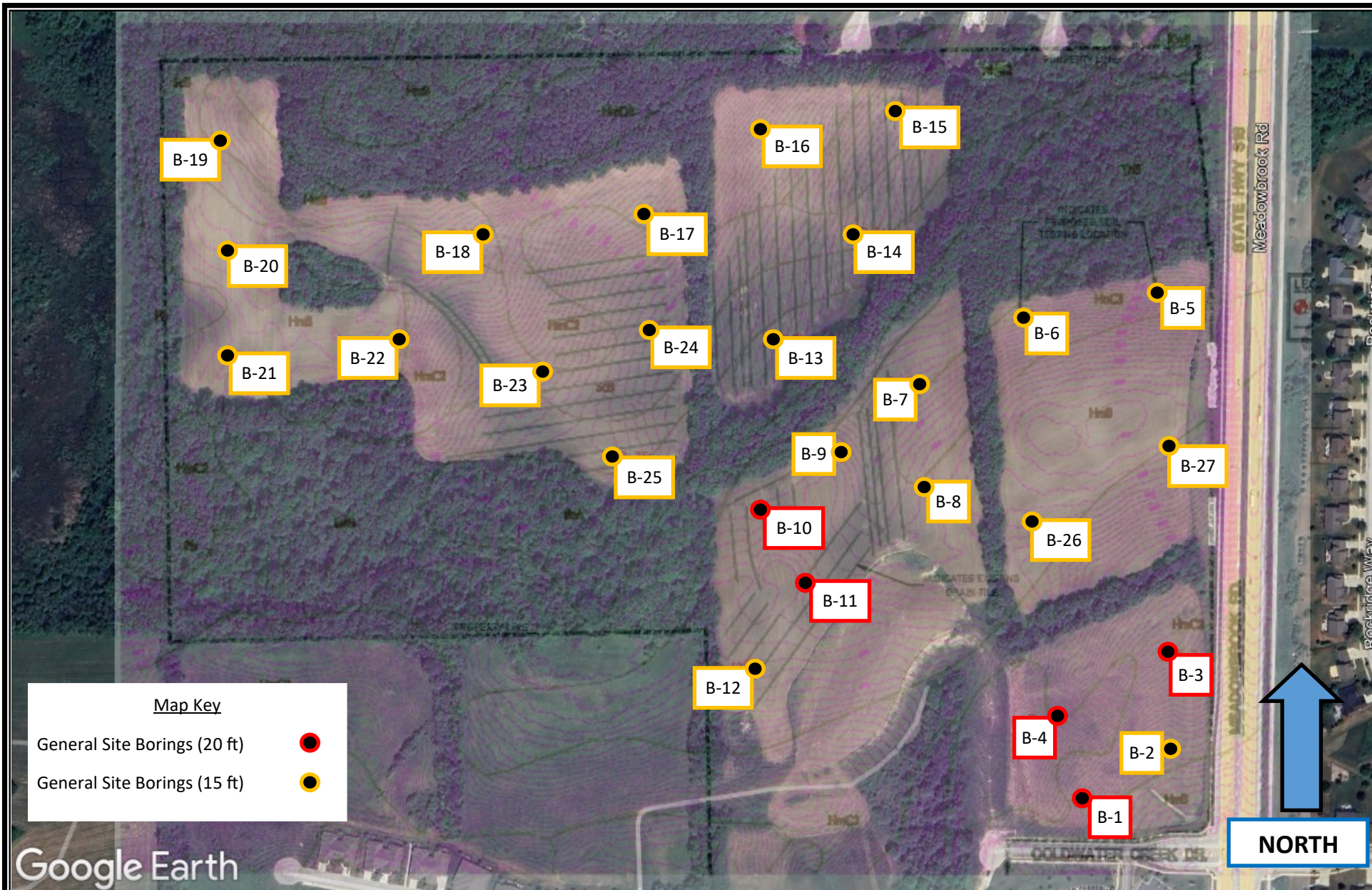
This geotechnical exploration and evaluation have been prepared to aid in the evaluation of the subsurface conditions on this site. The recommendations presented herein are based on the available soil information and the preliminary project information provided. Any changes in the planned project activities should be brought to the attention of the soil engineer to determine if modifications in the recommendations are required. The final design plans and specifications should also be reviewed by the soil engineer to determine that the recommendations presented herein have been interpreted and implemented as intended.

This geotechnical study has been conducted in a manner consistent with that level of care ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. The findings, recommendations and opinions contained herein have been promulgated in accordance with generally accepted practice in the fields of foundation engineering, soils mechanics, and engineering geology. No other representations expressed or implied, and no warranty or guarantee is included or intended in this report.

It is recommended that the earthwork and foundation operations be monitored by the soil engineer, to test and evaluate the subgrade stability, bearing capacities, and the selection, placement and compaction of controlled fills. WisDOT Standard Specifications for Highway and Structure Construction can also serve as a guide in implementing the subgrade preparation and other earthwork operations.

Appendix

Figure 1– Boring Location Plan
Soil Boring Logs
General Notes



	Proposed Meadowbrook Road Development NWC of Meadowbrook Rd. and Coldwater Creek Dr. Waukesha, WI		SCALE: 1 inch = 350 feet (approx.)
	FIGURE 1: BORING LOCATION PLAN		DATE: 05/16/2025
			PROJECT NUMBER: 00523519

DATE STARTED: 5/22/25
 DATE COMPLETED: 5/22/25
 COMPLETION DEPTH: 20.0 ft
 BENCHMARK: N/A
 ELEVATION: 148.9 ft
 LATITUDE:
 LONGITUDE:
 STATION: N/A OFFSET: N/A
 REMARKS:

DRILL COMPANY: PSI, Inc.
 DRILLER: RB LOGGED BY: AW
 DRILL RIG: Mobile Drill B-57
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY:

BORING B-01

Water
 ∇ While Drilling Not Observed
 ▼ Upon Completion Not Observed
 ▽ Delay N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @ N in blows/ft @ X Moisture PL + LL STRENGTH, tsf ▲ Qu * Qp	Additional Remarks
0	0					Topsoil, Dark Brown Lean Clay With Sand, Moist (12"± Thick)	TPSL	22			
				1	12	Brown Lean Clay With Sand and Gravel, Moist	CL	3-4-8 N=12			
145	5			2	8	Light Brown Fine to Medium Sand With Silt and Gravel, Possible Cobbles and/or Boulders, Moist	SP-SM	11-12-10 N=22			
				3	12			13-17-22 N=39			
140	10			4	3			14-29-30 N=59			
						Light Brown Fine to Medium Sand With Gravel and Silt Seams, Damp	SP	18-40-48 N=88			
135	15			5	14						
						Light Brown Fine to Medium Sand With Gravel and Silt Seams, Possible Cobbles and/or Boulders, Damp	SP	50/3"			
130	20			6	3						
						End of Boring at 20'					
						Cave-In at 10'					



Professional Service Industries, Inc.
 821 Corporate Court, Suite 100
 Waukesha, WI 53189
 Telephone: (262) 521-2125

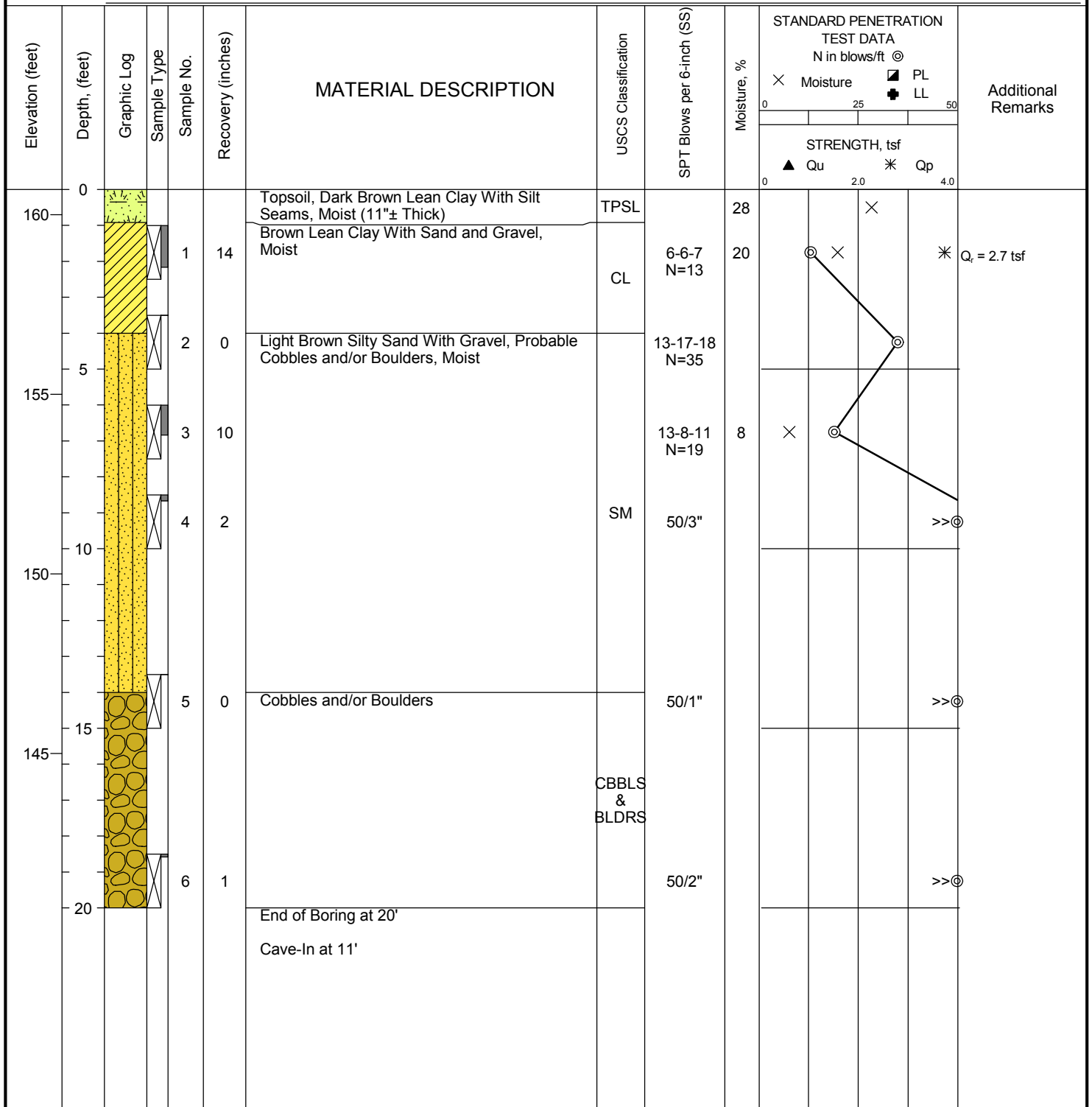
PROJECT NO.: 00523519
 PROJECT: Proposed Meadowbrook Rd. Development
 LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
 Waukesha, WI

DATE STARTED: 5/22/25 DATE COMPLETED: 5/22/25 COMPLETION DEPTH: 6.0 ft BENCHMARK: N/A ELEVATION: 144.2 ft LATITUDE: LONGITUDE: STATION: N/A OFFSET: N/A REMARKS:	DRILL COMPANY: PSI, Inc. DRILLER: RB LOGGED BY: AW DRILL RIG: Mobile Drill B-57 DRILLING METHOD: Hollow Stem Auger SAMPLING METHOD: 2-in SS HAMMER TYPE: Automatic EFFICIENCY: N/A REVIEWED BY:	BORING B-02 <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width:5%; text-align: center; font-weight: bold;">Water</td> <td style="width:5%; text-align: center;">▽</td> <td style="width:40%;">While Drilling</td> <td style="width:50%;">Not Observed</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td>Not Observed</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td>N/A</td> </tr> </table> BORING LOCATION:	Water	▽	While Drilling	Not Observed	▼	Upon Completion	Not Observed	▽	Delay	N/A
Water	▽	While Drilling		Not Observed								
	▼	Upon Completion		Not Observed								
	▽	Delay	N/A									

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ©	Additional Remarks
	0					Topsoil, Dark Brown Lean Clay, Trace Roots, Very Moist (12"± Thick)	TPSL				
				1	5	Brown Silty Sand With Gravel, Moist	SM	4-7-9 N=16			
140				2	8	Light Brown Silty Sand With Gravel, Probable Cobbles and/or Boulders, Damp	SM	13-15-19 N=34			
5						Auger Refusal on Possible Cobbles, Boulders, or Bedrock at 6 feet		50/1"			
						Attempt 1: Auger Refusal at 6 feet, Offset 10 feet North					
						Attempt 2: Auger Refusal at 6 feet					
						Cave-In at 5'					

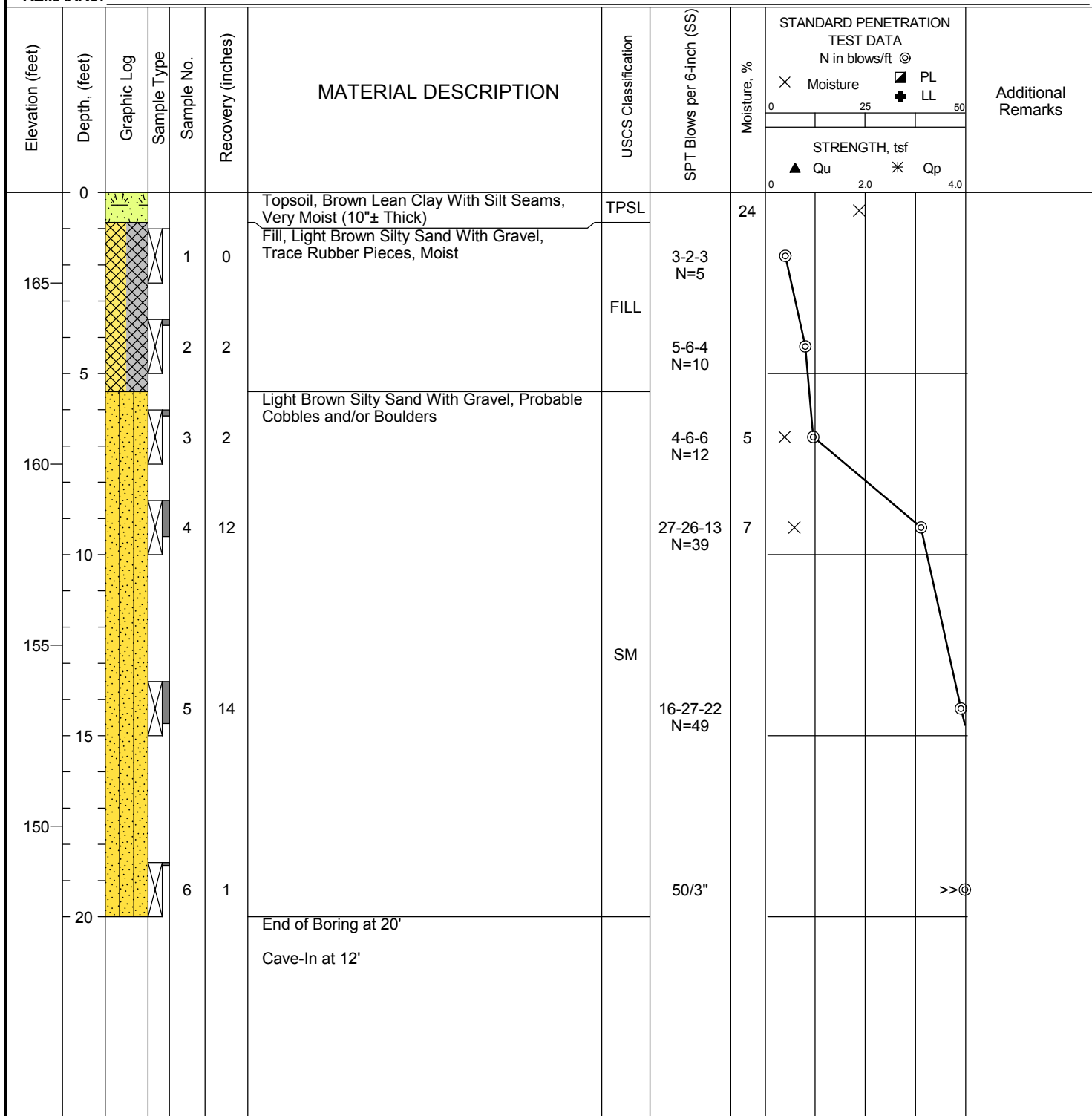
	Professional Service Industries, Inc. 821 Corporate Court, Suite 100 Waukesha, WI 53189 Telephone: (262) 521-2125	PROJECT NO.: 00523519 PROJECT: Proposed Meadowbrook Rd. Development LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr. Waukesha, WI
--	--	---

DATE STARTED: 5/22/25 DATE COMPLETED: 5/22/25 COMPLETION DEPTH: 20.0 ft BENCHMARK: N/A ELEVATION: 160.7 ft LATITUDE: LONGITUDE: STATION: N/A OFFSET: N/A REMARKS:	DRILL COMPANY: PSI, Inc. DRILLER: RB LOGGED BY: AW DRILL RIG: Mobile Drill B-57 DRILLING METHOD: Hollow Stem Auger SAMPLING METHOD: 2-in SS HAMMER TYPE: Automatic EFFICIENCY: N/A REVIEWED BY:	BORING B-03 <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width:5%; text-align: center; font-weight: bold;">Water</td> <td style="width:10%; text-align: center;">▽</td> <td style="width:45%;">While Drilling</td> <td style="width:40%;">Not Observed</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td>Not Observed</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td>N/A</td> </tr> </table> BORING LOCATION:	Water	▽	While Drilling	Not Observed	▼	Upon Completion	Not Observed	▽	Delay	N/A
Water	▽	While Drilling		Not Observed								
	▼	Upon Completion		Not Observed								
	▽	Delay	N/A									



	Professional Service Industries, Inc. 821 Corporate Court, Suite 100 Waukesha, WI 53189 Telephone: (262) 521-2125	PROJECT NO.: 00523519 PROJECT: Proposed Meadowbrook Rd. Development LOCATION: Intersection of Meadowbrook Rd. & Coldwater Creek Dr. Waukesha, WI
--	--	--

DATE STARTED: 5/22/25		DRILL COMPANY: PSI, Inc.		BORING B-04											
DATE COMPLETED: 5/22/25		DRILLER: RB LOGGED BY: AW													
COMPLETION DEPTH: 20.0 ft		DRILL RIG: Mobile Drill B-57		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width: 30px; text-align: center; vertical-align: middle;">Water</td> <td style="text-align: center;">▽</td> <td>While Drilling</td> <td>Not Observed</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td>Not Observed</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td>N/A</td> </tr> </table>		Water	▽	While Drilling	Not Observed	▼	Upon Completion	Not Observed	▽	Delay	N/A
Water	▽	While Drilling	Not Observed												
	▼	Upon Completion	Not Observed												
	▽	Delay	N/A												
BENCHMARK: N/A		DRILLING METHOD: Hollow Stem Auger		BORING LOCATION:											
ELEVATION: 167.5 ft		SAMPLING METHOD: 2-in SS													
LATITUDE:		HAMMER TYPE: Automatic													
LONGITUDE:		EFFICIENCY: N/A													
STATION: N/A OFFSET: N/A		REVIEWED BY:													
REMARKS:															



Water		While Drilling	3 feet
		Upon Completion	7 feet
		Delay	N/A

STANDARD PENETRATION
TEST DATA
N in blows/ft ©

✕ Moisture ☐ PL
 + LL

0 25 50

STRENGTH, tsf

▲ Qu ✱ Qp

0 2.0 4.0

PROJECT NO.: 00523519
PROJECT Proposed Meadowbrook Rd. Development
LOCATION: off of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

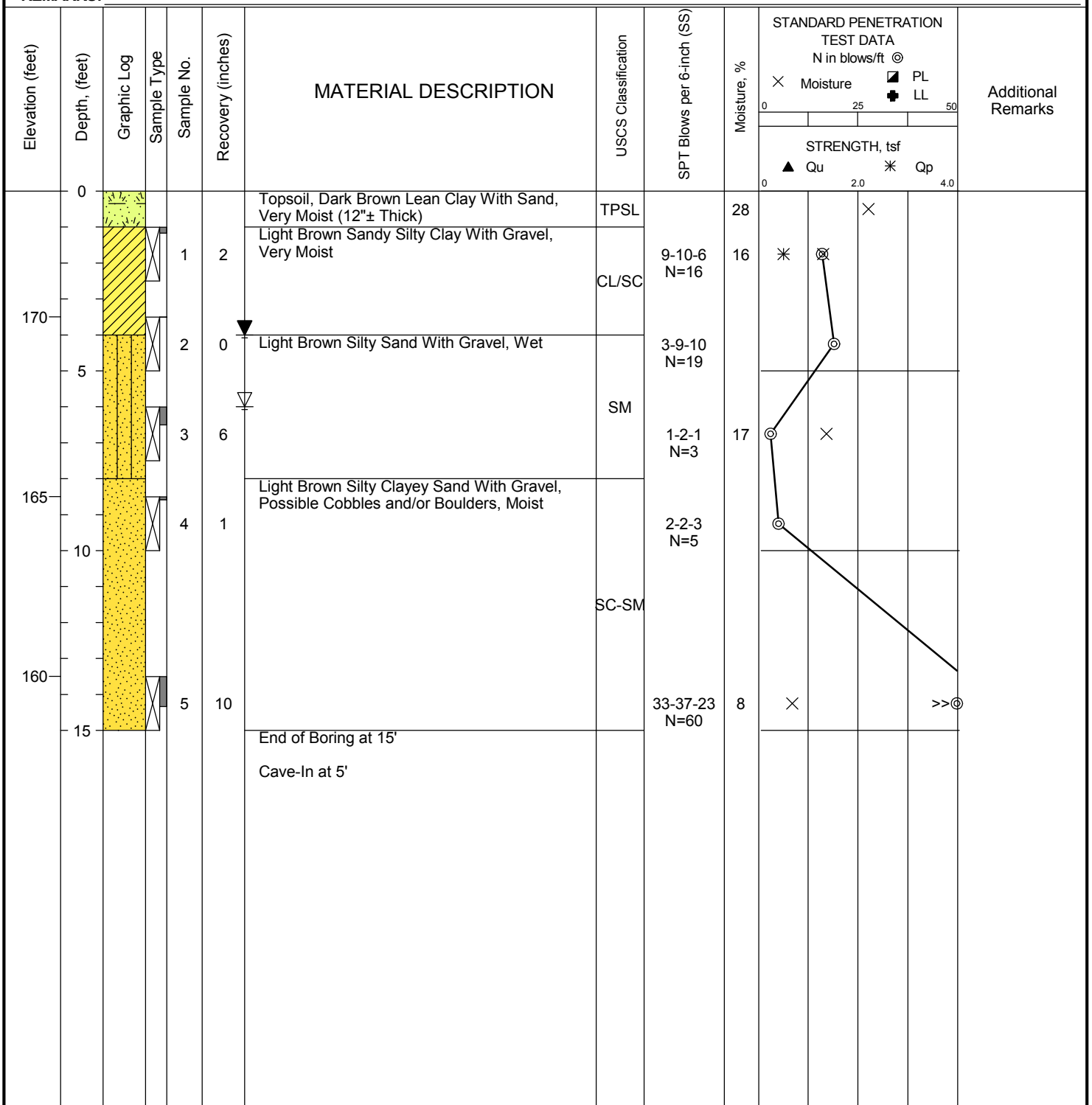
DATE STARTED: 5/22/25
DATE COMPLETED: 5/22/25
COMPLETION DEPTH: 15.0 ft
BENCHMARK: N/A
ELEVATION: 173.5 ft
LATITUDE:
LONGITUDE:
STATION: N/A OFFSET: N/A
REMARKS:

DRILL COMPANY: PSI, Inc.
DRILLER: RB LOGGED BY: AW
DRILL RIG: Mobile Drill B-57
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY:

BORING B-06

Water
▽ While Drilling 6 feet
▼ Upon Completion 4 feet
▽ Delay N/A

BORING LOCATION:



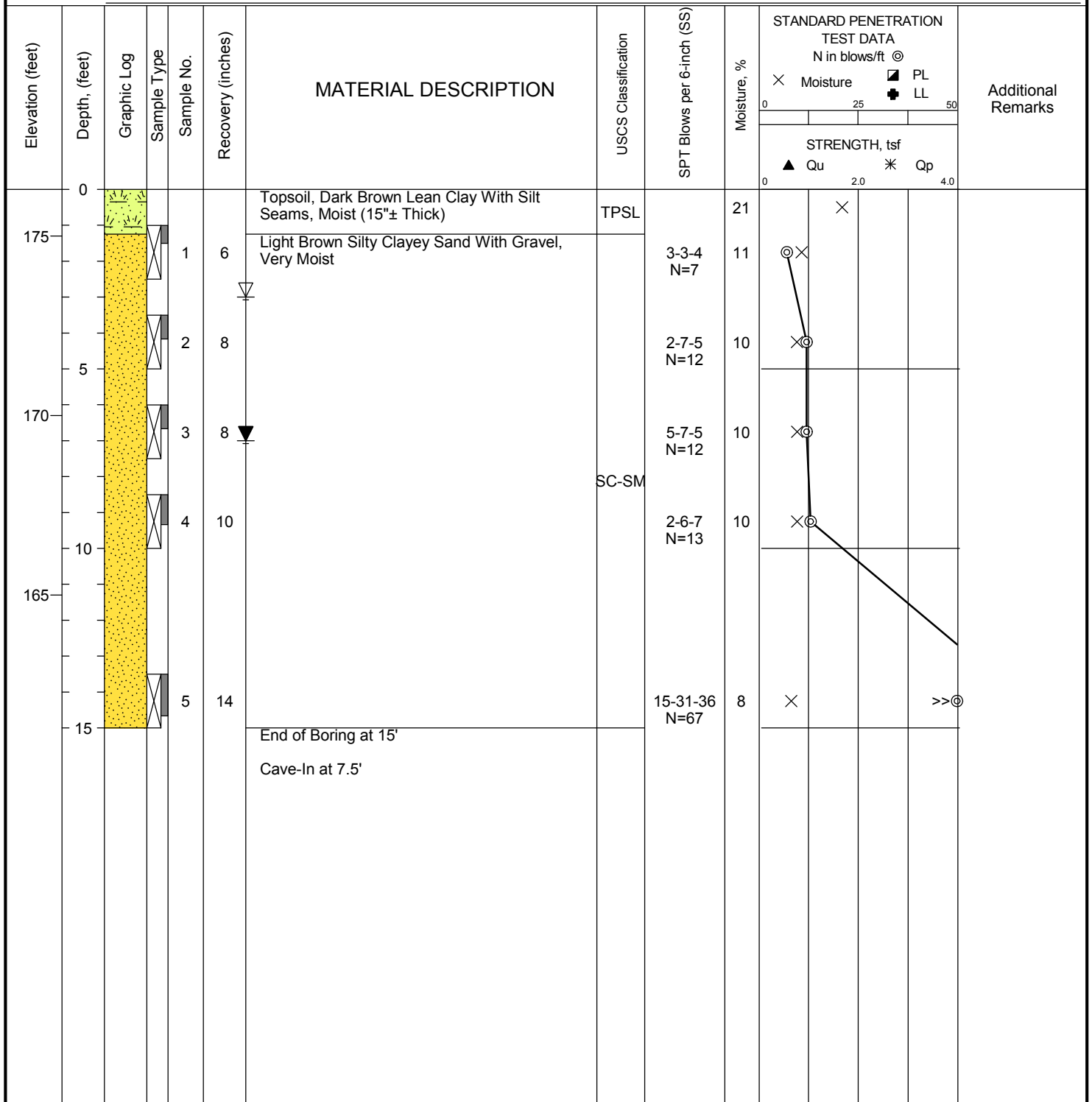
Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: Intersection of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

DATE STARTED: 5/19/25		DRILL COMPANY: PSI, Inc.		BORING B-07
DATE COMPLETED: 5/19/25		DRILLER: RB LOGGED BY: AW		
COMPLETION DEPTH: 15.0 ft		DRILL RIG: Diedrich HD D-50 ATV - Rig #419		
BENCHMARK: N/A		DRILLING METHOD: Hollow Stem Auger		
ELEVATION: 176.3 ft		SAMPLING METHOD: 2-in SS		
LATITUDE:		HAMMER TYPE: Automatic		
LONGITUDE:		EFFICIENCY: N/A		
STATION: N/A OFFSET: N/A		REVIEWED BY:		
REMARKS:				

Water	▽	While Drilling	3 feet
	▼	Upon Completion	7 feet
	▽	Delay	N/A

BORING LOCATION:



Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

DATE STARTED: 5/19/25	DRILL COMPANY: PSI, Inc.	BORING B-08
DATE COMPLETED: 5/19/25	DRILLER: RB / DT LOGGED BY: PB	
COMPLETION DEPTH: 15.0 ft	DRILL RIG: Mobile Drill B-57	
BENCHMARK: N/A	DRILLING METHOD: Hollow Stem Auger	
ELEVATION: 183.9 ft	SAMPLING METHOD: 2-in SS	
LATITUDE:	HAMMER TYPE: Automatic	
LONGITUDE:	EFFICIENCY: N/A	
STATION: N/A OFFSET: N/A REVIEWED BY:		BORING LOCATION:
REMARKS:		

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
										X Moisture PL LL 02550 ▲ Qu * Qp 02.04.0	
0						Topsoil, Dark Brown Lean Clay With Silt Seams, Moist (11"± Thick)	TPSL		19		
				1	10	Light Brown Silty Clayey Sand With Gravel, Moist		2-3-3 N=6	11	⊗	
180				2	0		SC-SM	4-9-6 N=15		⊗	
5				3	4			3-6-50/5"	7	X	
175				4	2	Cobbles and/or Boulders	PROB CBBLS	50/1"			>>⊗
10											
						Brown Silty Clayey Sand and Gravel, Probable Cobbles and/or Boulders, Moist	SC-SM	50/1"	6	X	>>⊗
170				5	4						
15						End of Boring at 15'					
						Cave-In at 8'					

	Professional Service Industries, Inc. 821 Corporate Court, Suite 100 Waukesha, WI 53189 Telephone: (262) 521-2125	PROJECT NO.: 00523519 PROJECT: Proposed Meadowbrook Rd. Development LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr. Waukesha, WI

DATE STARTED: 5/16/25 DATE COMPLETED: 5/16/25 COMPLETION DEPTH: 15.0 ft BENCHMARK: N/A ELEVATION: 182.8 ft LATITUDE: LONGITUDE: STATION: N/A OFFSET: N/A REMARKS:	DRILL COMPANY: PSI, Inc. DRILLER: LOGGED BY: DRILL RIG: Mobile Drill B-57 DRILLING METHOD: Hollow Stem Auger SAMPLING METHOD: 2-in SS HAMMER TYPE: Automatic EFFICIENCY: N/A REVIEWED BY:	BORING B-09 <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width:5%; text-align: center; font-weight: bold;">Water</td> <td style="width:10%; text-align: center;">▽</td> <td style="width:75%;">While Drilling</td> <td style="width:10%; text-align: right;">8 feet</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td style="text-align: right;">7 feet</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td style="text-align: right;">N/A</td> </tr> </table> BORING LOCATION:	Water	▽	While Drilling	8 feet	▼	Upon Completion	7 feet	▽	Delay	N/A
Water	▽	While Drilling		8 feet								
	▼	Upon Completion		7 feet								
	▽	Delay	N/A									

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
										X Moisture PL LL 02550 ▲ Qu * Qp 02.04.0	
0						Topsoil, Dark Brown Lean Clay With Silt Seams, Moist (12"± Thick)	TPSL		23		
				1	16	Brown Lean Clay With Sand and Gravel, Moist	CL	3-6-9 N=15	14		
180						Brown Silty Clayey Sand With Gravel, Moist	SC-SM	4-7-14 N=21	11		
5				2	18						
				3	16	Light Brown Silty Sand With Gravel, Possible Cobbles and/or Boulders, Moist	SM	14-13-11 N=24	7		
175						Light Brown Silty Sand With Gravel, Wet	SM	10-15-8 N=23	9		
10				4	18						
170											
15				5	16			6-5-5 N=10	9		
						End of Boring at 15'					

	Professional Service Industries, Inc. 821 Corporate Court, Suite 100 Waukesha, WI 53189 Telephone: (262) 521-2125	PROJECT NO.: 00523519 PROJECT: Proposed Meadowbrook Rd. Development LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr. Waukesha, WI
--	--	---

The stratification lines represent approximate boundaries. The transition may be gradual.

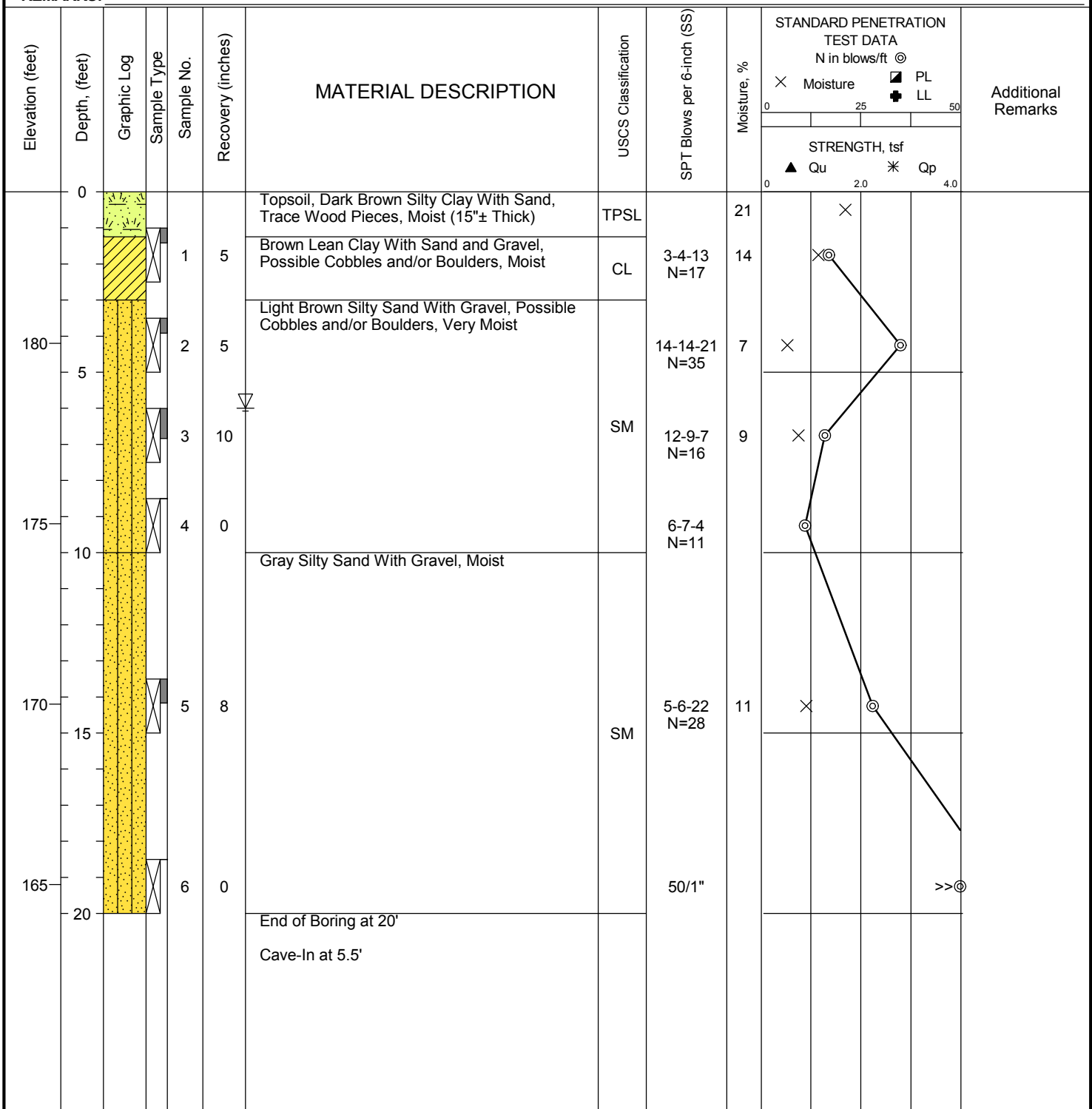
DATE STARTED: 5/16/25
DATE COMPLETED: 5/16/25
COMPLETION DEPTH: 20.0 ft
BENCHMARK: N/A
ELEVATION: 184.2 ft
LATITUDE:
LONGITUDE:
STATION: N/A OFFSET: N/A
REMARKS:

DRILL COMPANY: PSI, Inc.
DRILLER: RB LOGGED BY: AW
DRILL RIG: Diedrich HD D-50 ATV - Rig #419
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY:

BORING B-10

Water
▽ While Drilling 6 feet
▼ Upon Completion Not Observed
▽ Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

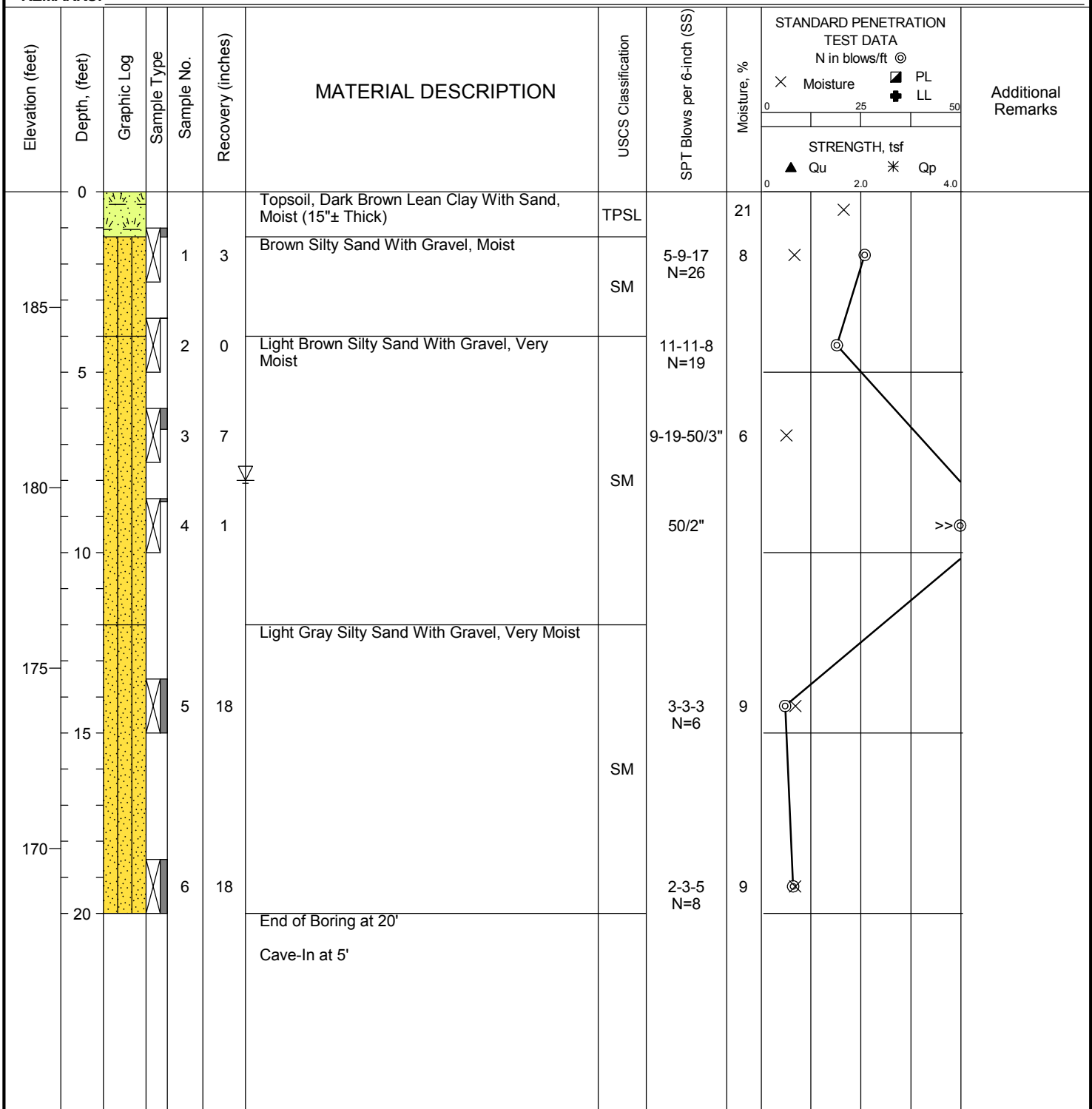
DATE STARTED: 5/16/25
 DATE COMPLETED: 5/16/25
 COMPLETION DEPTH: 20.0 ft
 BENCHMARK: N/A
 ELEVATION: 188.2 ft
 LATITUDE:
 LONGITUDE:
 STATION: N/A OFFSET: N/A
 REMARKS:

DRILL COMPANY: PSI, Inc.
 DRILLER: RB LOGGED BY: AW
 DRILL RIG: Diedrich HD D-50 ATV - Rig #419
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY:

BORING B-11

Water
 ∇ While Drilling 8 feet
 ▼ Upon Completion Not Observed
 ▽ Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
 821 Corporate Court, Suite 100
 Waukesha, WI 53189
 Telephone: (262) 521-2125

PROJECT NO.: 00523519
 PROJECT: Proposed Meadowbrook Rd. Development
 LOCATION: Intersection of Meadowbrook Rd. & Coldwater Creek Dr.
 Waukesha, WI

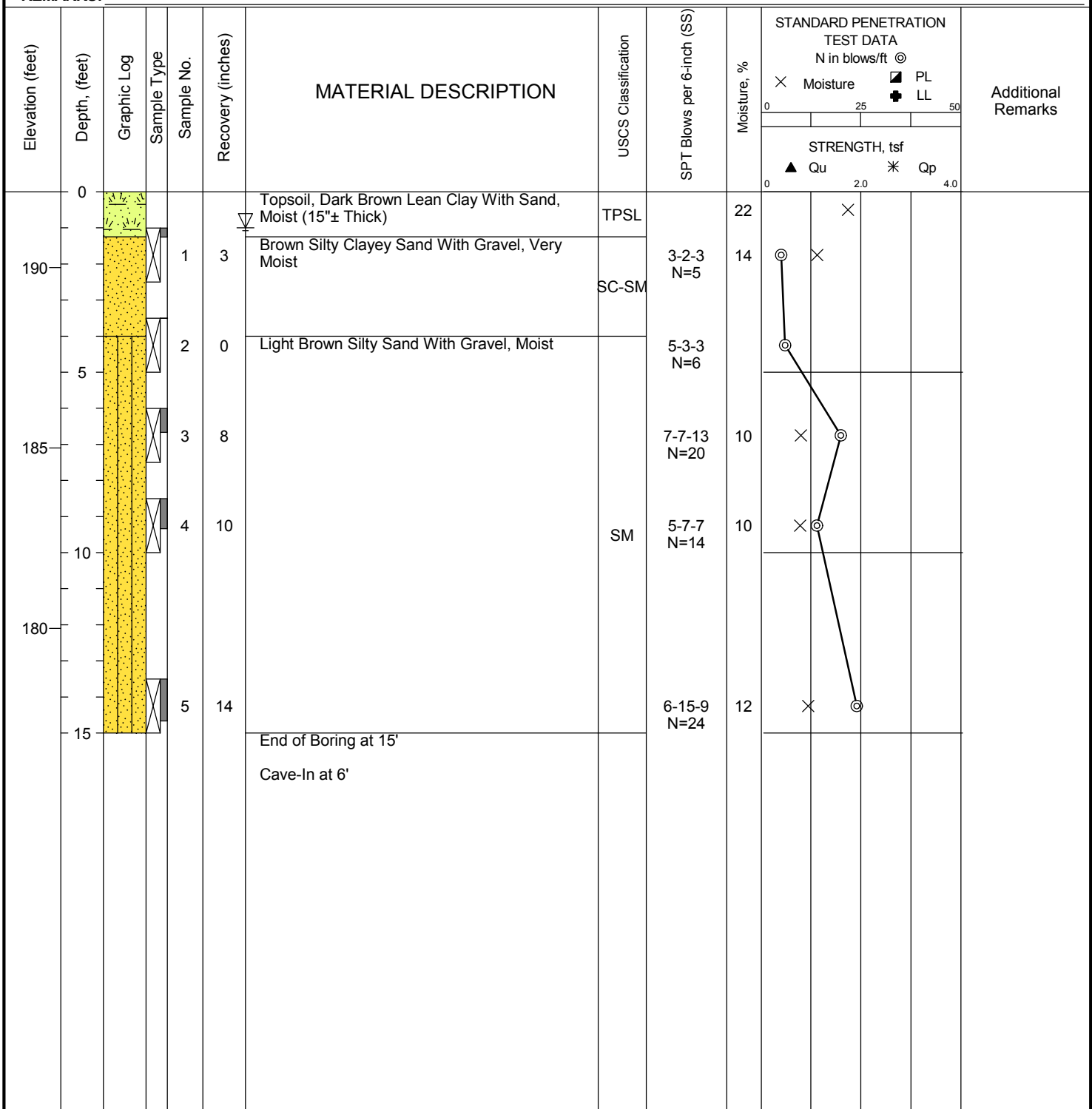
DATE STARTED: 5/16/25
 DATE COMPLETED: 5/16/25
 COMPLETION DEPTH: 15.0 ft
 BENCHMARK: N/A
 ELEVATION: 192.1 ft
 LATITUDE:
 LONGITUDE:
 STATION: N/A OFFSET: N/A
 REMARKS:

DRILL COMPANY: PSI, Inc.
 DRILLER: RB LOGGED BY: AW
 DRILL RIG: Diedrich HD D-50 ATV - Rig #419
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY:

BORING B-12

Water
 ▽ While Drilling 1 feet
 ▼ Upon Completion Not Observed
 ▽ Delay N/A

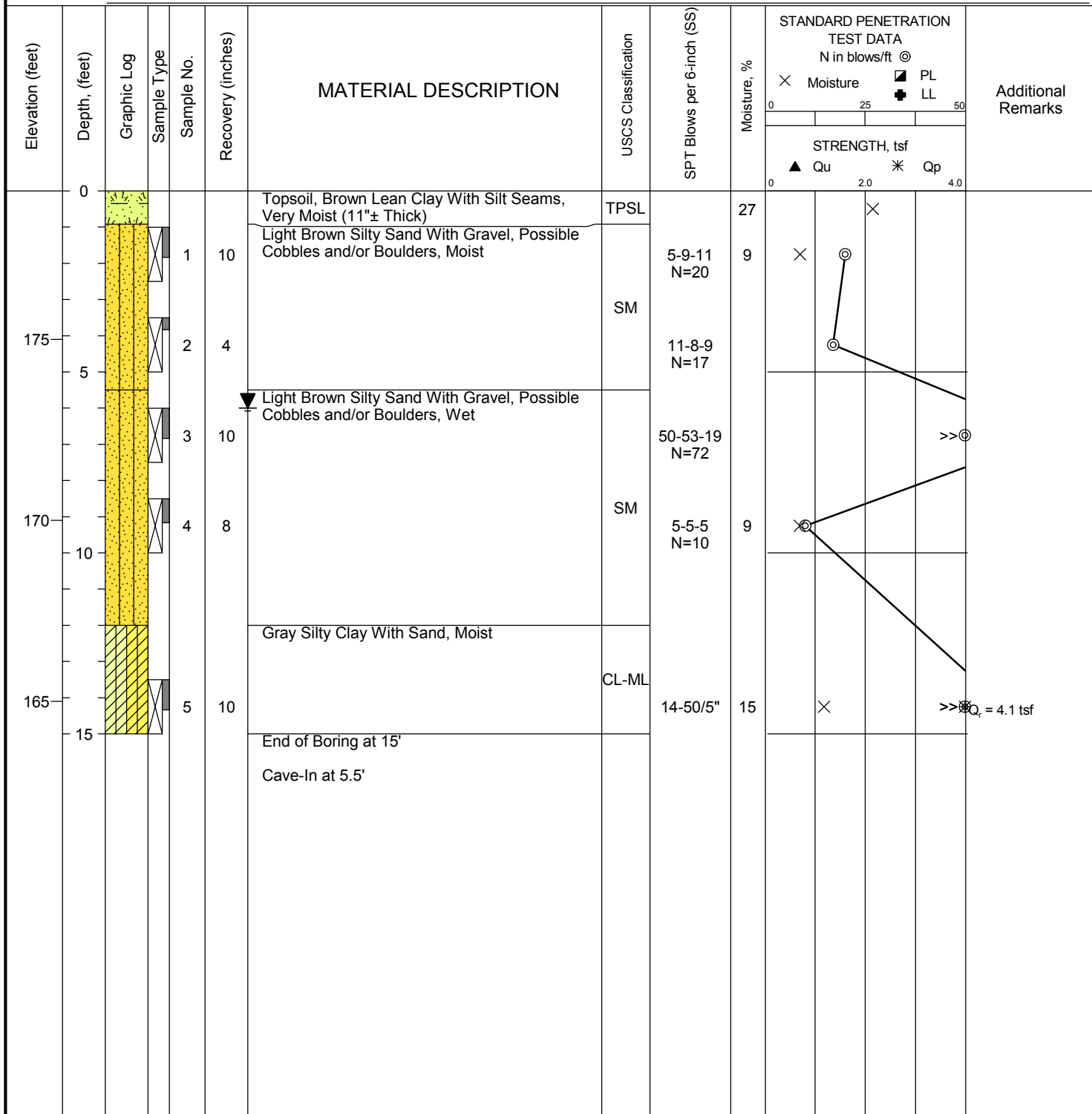
BORING LOCATION:



Professional Service Industries, Inc.
 821 Corporate Court, Suite 100
 Waukesha, WI 53189
 Telephone: (262) 521-2125

PROJECT NO.: 00523519
 PROJECT: Proposed Meadowbrook Rd. Development
 LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
 Waukesha, WI

DATE STARTED: 5/19/25		DRILL COMPANY: PSI, Inc.		BORING B-13											
DATE COMPLETED: 5/19/25		DRILLER: RB / DT LOGGED BY: PB													
COMPLETION DEPTH: 15.0 ft		DRILL RIG: Mobile Drill B-57		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width: 30px; text-align: center; vertical-align: middle;">Water</td> <td style="text-align: center;">▽</td> <td>While Drilling</td> <td style="text-align: right;">6 feet</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td style="text-align: right;">6 feet</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td style="text-align: right;">N/A</td> </tr> </table>		Water	▽	While Drilling	6 feet	▼	Upon Completion	6 feet	▽	Delay	N/A
Water	▽	While Drilling	6 feet												
	▼	Upon Completion	6 feet												
	▽	Delay	N/A												
BENCHMARK: N/A		DRILLING METHOD: Hollow Stem Auger		BORING LOCATION:											
ELEVATION: 179.1 ft		SAMPLING METHOD: 2-in SS													
LATITUDE:		HAMMER TYPE: Automatic													
LONGITUDE:		EFFICIENCY: N/A													
STATION: N/A OFFSET: N/A		REVIEWED BY:													
REMARKS:															



Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

DATE STARTED: 5/19/25
DATE COMPLETED: 5/19/25
COMPLETION DEPTH: 15.0 ft
BENCHMARK: N/A
ELEVATION: 172.4 ft
LATITUDE:
LONGITUDE:
STATION: N/A OFFSET: N/A
REMARKS:

DRILL COMPANY: PSI, Inc.
DRILLER: RB / DT LOGGED BY: PB
DRILL RIG: Mobile Drill B-57
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY:

BORING B-14

Water	▽	While Drilling	9 feet
	▼	Upon Completion	5 feet
	▽	Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
										X Moisture PL 0 25 50 STRENGTH, tsf ▲ Qu * Qp 2.0 4.0	
0	0					Topsoil, Very Dark Brown Lean Clay With Silt Seams, Very Moist (11"± Thick)	TPSL		23		
170	6		1	6		Brown Silty Clayey Sand With Gravel, Moist	SM	10-8-11 N=19	10		
5	0		2	0		Brown to Light Brown Silty Sand With Gravel, Possible Cobbles and/or Boulders, Moist		12-6-4 N=10			
165	10		3	10			SM	4-4-7 N=11	15		
10	12		4	12				8-18-10 N=28	11		
160						Light Gray Silty Sand With Gravel, Possible Cobbles and/or Boulders, Moist	SM				
15	8		5	8				33-50/6"	10		>>⊙
						End of Boring at 15'					
						Cave-In at 6'					



Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: Intersection of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

DATE STARTED: 5/19/25 DATE COMPLETED: 5/19/25 COMPLETION DEPTH: 15.0 ft BENCHMARK: N/A ELEVATION: 174.1 ft LATITUDE: LONGITUDE: STATION: N/A OFFSET: N/A REMARKS:	DRILL COMPANY: PSI, Inc. DRILLER: RB / DT LOGGED BY: PB DRILL RIG: Mobile Drill B-57 DRILLING METHOD: Hollow Stem Auger SAMPLING METHOD: 2-in SS HAMMER TYPE: Automatic EFFICIENCY: N/A REVIEWED BY:	BORING B-15 <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width: 5%; text-align: center; font-weight: bold;">Water</td> <td style="width: 5%; text-align: center;">▽</td> <td style="width: 70%;">While Drilling</td> <td style="width: 20%; text-align: right;">6 feet</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td style="text-align: right;">5 feet</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td style="text-align: right;">N/A</td> </tr> </table> BORING LOCATION:	Water	▽	While Drilling	6 feet	▼	Upon Completion	5 feet	▽	Delay	N/A
Water	▽	While Drilling		6 feet								
	▼	Upon Completion		5 feet								
	▽	Delay	N/A									

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
										X Moisture PL LL 02550 ▲ Qu * Qp 02.04.0	
0	0					Topsoil, Very Dark Brown Lean Clay With Silt Seams, Trace Gravel, Very Moist (11"± Thick)	TPSL	27			
				1	4	Light Greenish-Brown Silty Sand With Gravel, Possible Cobbles and/or Boulders, Moist	SM	3-5-8 N=13	14		
170	5			2	1			10-12-12 N=24			
				3	8	Light Brown Silty Sand With Gravel, Possible Cobbles and/or Boulders, Wet to Moist		13-9-6 N=15	15		
165	10			4	10		SM	14-15-17 N=32	11		
160	15			5	12			30-45-50/4"	9		
						End of Boring at 15'					
						Cave-In at 9'					

	Professional Service Industries, Inc. 821 Corporate Court, Suite 100 Waukesha, WI 53189 Telephone: (262) 521-2125	PROJECT NO.: 00523519 PROJECT: Proposed Meadowbrook Rd. Development LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr. Waukesha, WI
--	--	---

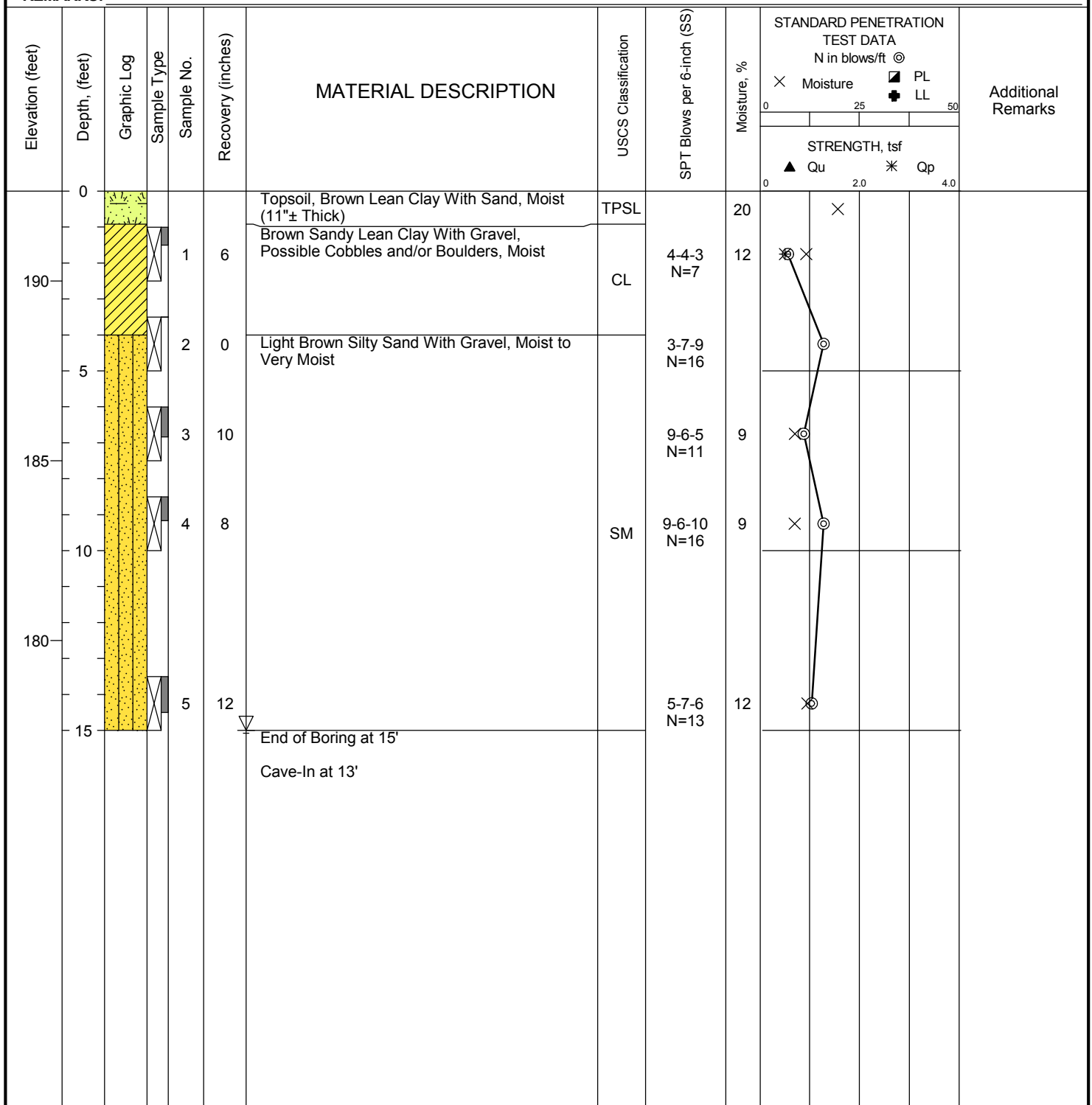
DATE STARTED: 5/19/25
 DATE COMPLETED: 5/19/25
 COMPLETION DEPTH: 15.0 ft
 BENCHMARK: N/A
 ELEVATION: 192.5 ft
 LATITUDE:
 LONGITUDE:
 STATION: N/A OFFSET: N/A
 REMARKS:

DRILL COMPANY: PSI, Inc.
 DRILLER: RB / DT LOGGED BY: PB
 DRILL RIG: Mobile Drill B-57
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY:

BORING B-16

Water
 ▽ While Drilling 15 feet
 ▼ Upon Completion Not Observed
 ▽ Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
 821 Corporate Court, Suite 100
 Waukesha, WI 53189
 Telephone: (262) 521-2125

PROJECT NO.: 00523519
 PROJECT: Proposed Meadowbrook Rd. Development
 LOCATION: N of Meadowbrook Rd. & Coldwater Creek Dr.
 Waukesha, WI

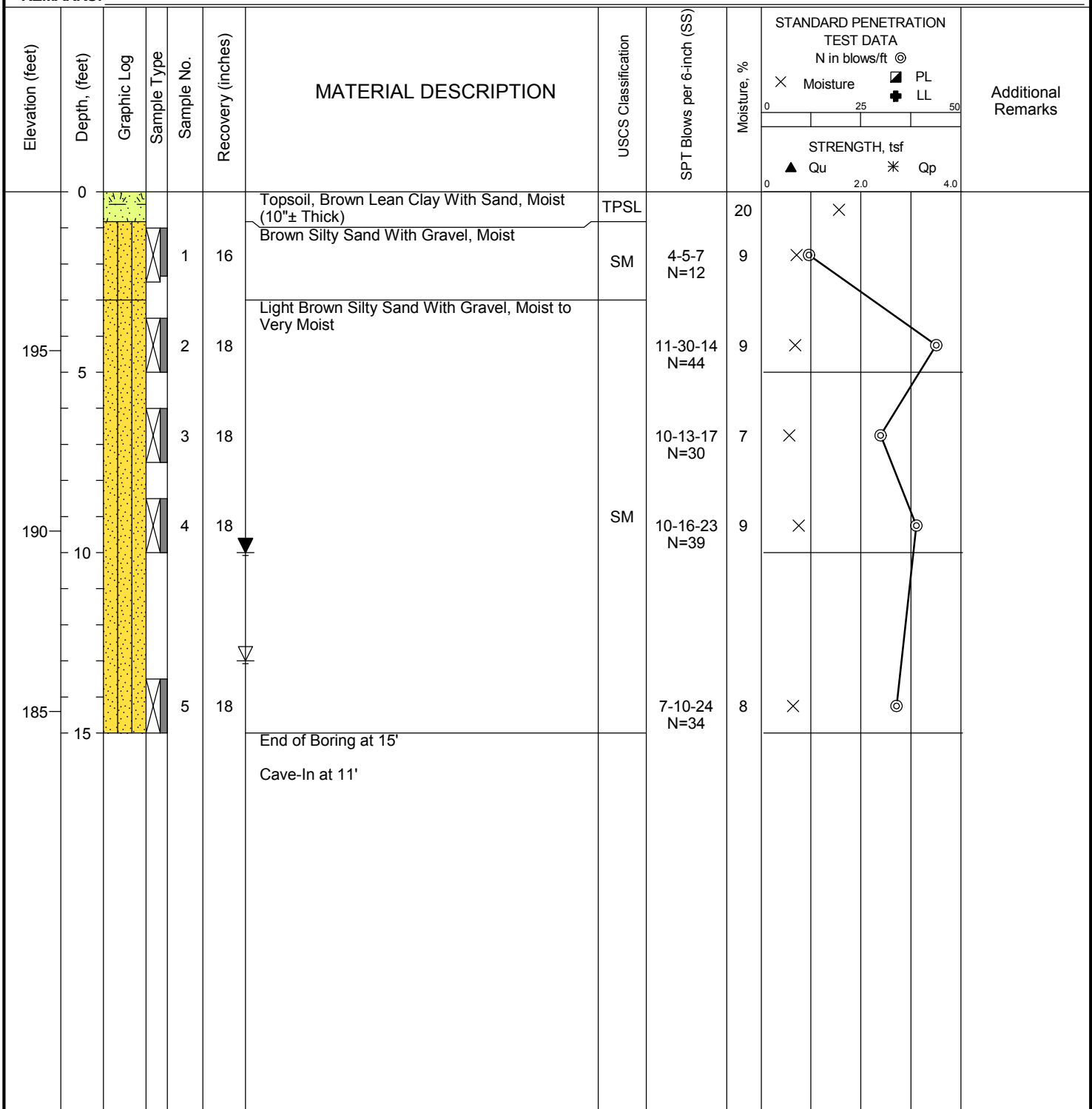
DATE STARTED: 5/19/25
 DATE COMPLETED: 5/19/25
 COMPLETION DEPTH: 15.0 ft
 BENCHMARK: N/A
 ELEVATION: 199.4 ft
 LATITUDE:
 LONGITUDE:
 STATION: N/A OFFSET: N/A
 REMARKS:

DRILL COMPANY: PSI, Inc.
 DRILLER: RB LOGGED BY: DT
 DRILL RIG: Mobile Drill B-57
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY:

BORING B-17

Water
 ▽ While Drilling 13 feet
 ▼ Upon Completion 10 feet
 ▽ Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
 821 Corporate Court, Suite 100
 Waukesha, WI 53189
 Telephone: (262) 521-2125

PROJECT NO.: 00523519
 PROJECT: Proposed Meadowbrook Rd. Development
 LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
 Waukesha, WI

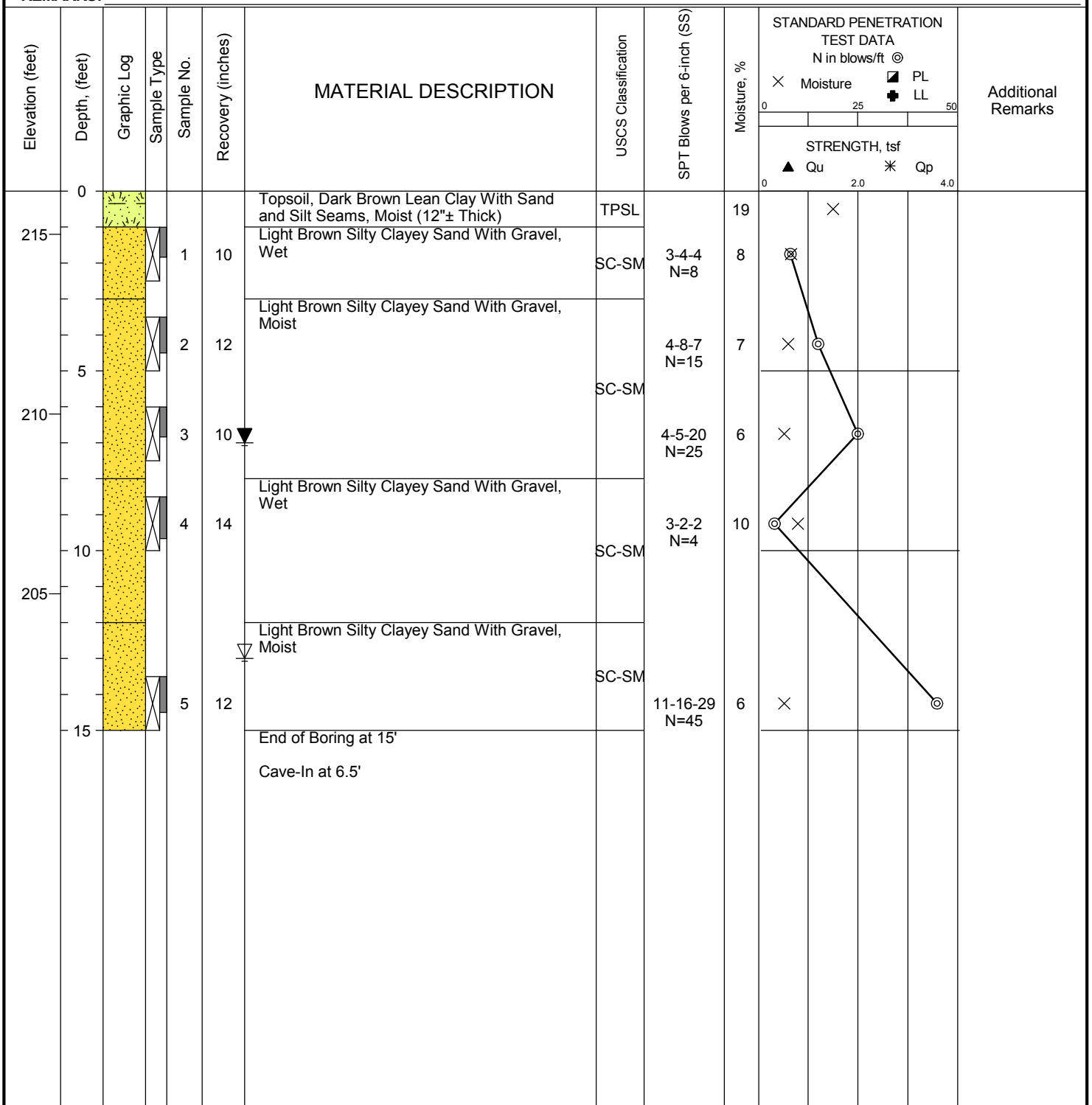
DATE STARTED: 5/16/25
 DATE COMPLETED: 5/16/25
 COMPLETION DEPTH: 15.0 ft
 BENCHMARK: N/A
 ELEVATION: 216.2 ft
 LATITUDE:
 LONGITUDE:
 STATION: N/A OFFSET: N/A
 REMARKS:

DRILL COMPANY: PSI, Inc.
 DRILLER: JF / DT LOGGED BY: PB
 DRILL RIG: Mobile Drill B-57
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY:

BORING B-18

Water
 ∇ While Drilling 13 feet
 ▼ Upon Completion 7 feet
 ▽ Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
 821 Corporate Court, Suite 100
 Waukesha, WI 53189
 Telephone: (262) 521-2125

PROJECT NO.: 00523519
 PROJECT: Proposed Meadowbrook Rd. Development
 LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
 Waukesha, WI

DATE STARTED: 5/16/25		DRILL COMPANY: PSI, Inc.		BORING B-19											
DATE COMPLETED: 5/16/25		DRILLER: DT LOGGED BY: PB													
COMPLETION DEPTH: 15.0 ft		DRILL RIG: Mobile Drill B-57		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width: 30px; text-align: center; vertical-align: middle;">Water</td> <td style="text-align: center;">▽</td> <td>While Drilling</td> <td style="text-align: right;">13 feet</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td style="text-align: right;">Not Observed</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td style="text-align: right;">N/A</td> </tr> </table>		Water	▽	While Drilling	13 feet	▼	Upon Completion	Not Observed	▽	Delay	N/A
Water	▽	While Drilling	13 feet												
	▼	Upon Completion	Not Observed												
	▽	Delay	N/A												
BENCHMARK: N/A		DRILLING METHOD: Hollow Stem Auger		BORING LOCATION:											
ELEVATION: 223.8 ft		SAMPLING METHOD: 2-in SS													
LATITUDE:		HAMMER TYPE: Automatic													
LONGITUDE:		EFFICIENCY: N/A													
STATION: N/A OFFSET: N/A		REVIEWED BY:													
REMARKS:															

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ X Moisture PL LL STRENGTH, tsf ▲ Qu * Qp	Additional Remarks
0						Topsoil, Dark Brown Silty Clay, Trace Sand, Moist (11"± Thick)	TPSL				
				1	10	Brown Silty Clayey Sand With Gravel, Wet		2-4-9 N=13			
220				2	12		SC-SM	2-5-10 N=15			
5				3	13			8-9-8 N=17			
215				4	12	Light Brown Silty Clayey Sand With Gravel, Wet		3-3-4 N=7			
10							SC-SM				
210				5	15			6-7-10 N=17			
15						End of Boring at 15'					
						Cave-In at 6'					

	Professional Service Industries, Inc. 821 Corporate Court, Suite 100 Waukesha, WI 53189 Telephone: (262) 521-2125		PROJECT NO.: 00523519 PROJECT: Proposed Meadowbrook Rd. Development LOCATION: Intersection of Meadowbrook Rd. & Coldwater Creek Dr. Waukesha, WI	

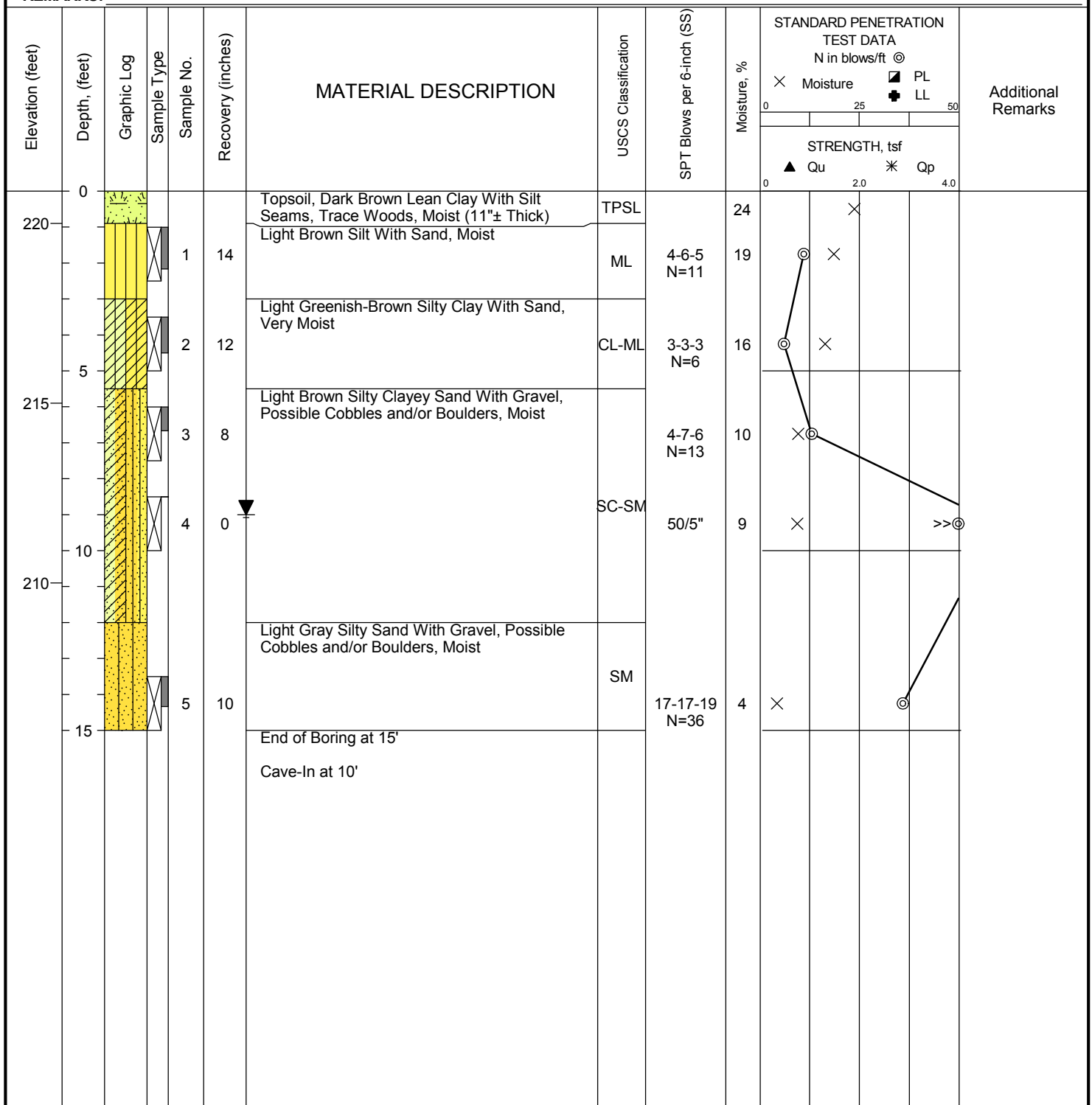
DATE STARTED: 5/16/25
DATE COMPLETED: 5/16/25
COMPLETION DEPTH: 15.0 ft
BENCHMARK: N/A
ELEVATION: 220.9 ft
LATITUDE:
LONGITUDE:
STATION: N/A OFFSET: N/A
REMARKS:

DRILL COMPANY: PSI, Inc.
DRILLER: DT / JF LOGGED BY: PB
DRILL RIG: Mobile Drill B-57
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY:

BORING B-20

Water
▽ While Drilling Not Observed
▼ Upon Completion 9 feet
▽ Delay N/A

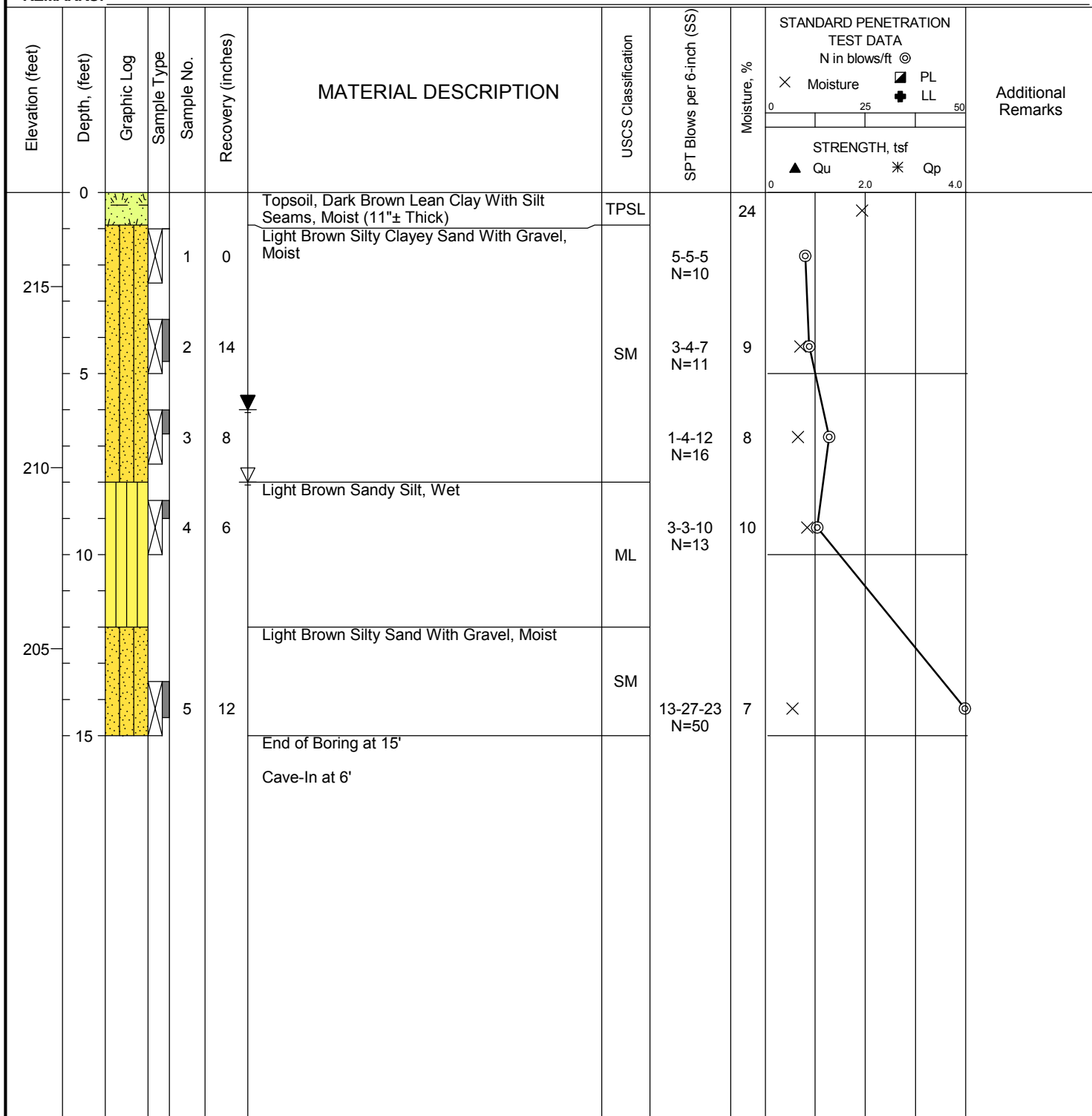
BORING LOCATION:



Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

DATE STARTED: 5/16/25		DRILL COMPANY: PSI, Inc.		BORING B-21											
DATE COMPLETED: 5/16/25		DRILLER: DT / JF LOGGED BY: PB													
COMPLETION DEPTH: 15.0 ft		DRILL RIG: Mobile Drill B-57		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width: 30px; text-align: center; vertical-align: middle;">Water</td> <td style="text-align: center;">▽</td> <td>While Drilling</td> <td style="text-align: right;">8 feet</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td style="text-align: right;">6 feet</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td style="text-align: right;">N/A</td> </tr> </table>		Water	▽	While Drilling	8 feet	▼	Upon Completion	6 feet	▽	Delay	N/A
Water	▽	While Drilling	8 feet												
	▼	Upon Completion	6 feet												
	▽	Delay	N/A												
BENCHMARK: N/A		DRILLING METHOD: Hollow Stem Auger		BORING LOCATION:											
ELEVATION: 217.6 ft		SAMPLING METHOD: 2-in SS													
LATITUDE:		HAMMER TYPE: Automatic													
LONGITUDE:		EFFICIENCY: N/A													
STATION: N/A OFFSET: N/A		REVIEWED BY:													
REMARKS:															



	Professional Service Industries, Inc. 821 Corporate Court, Suite 100 Waukesha, WI 53189 Telephone: (262) 521-2125	PROJECT NO.: 00523519 PROJECT: Proposed Meadowbrook Rd. Development LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr. Waukesha, WI

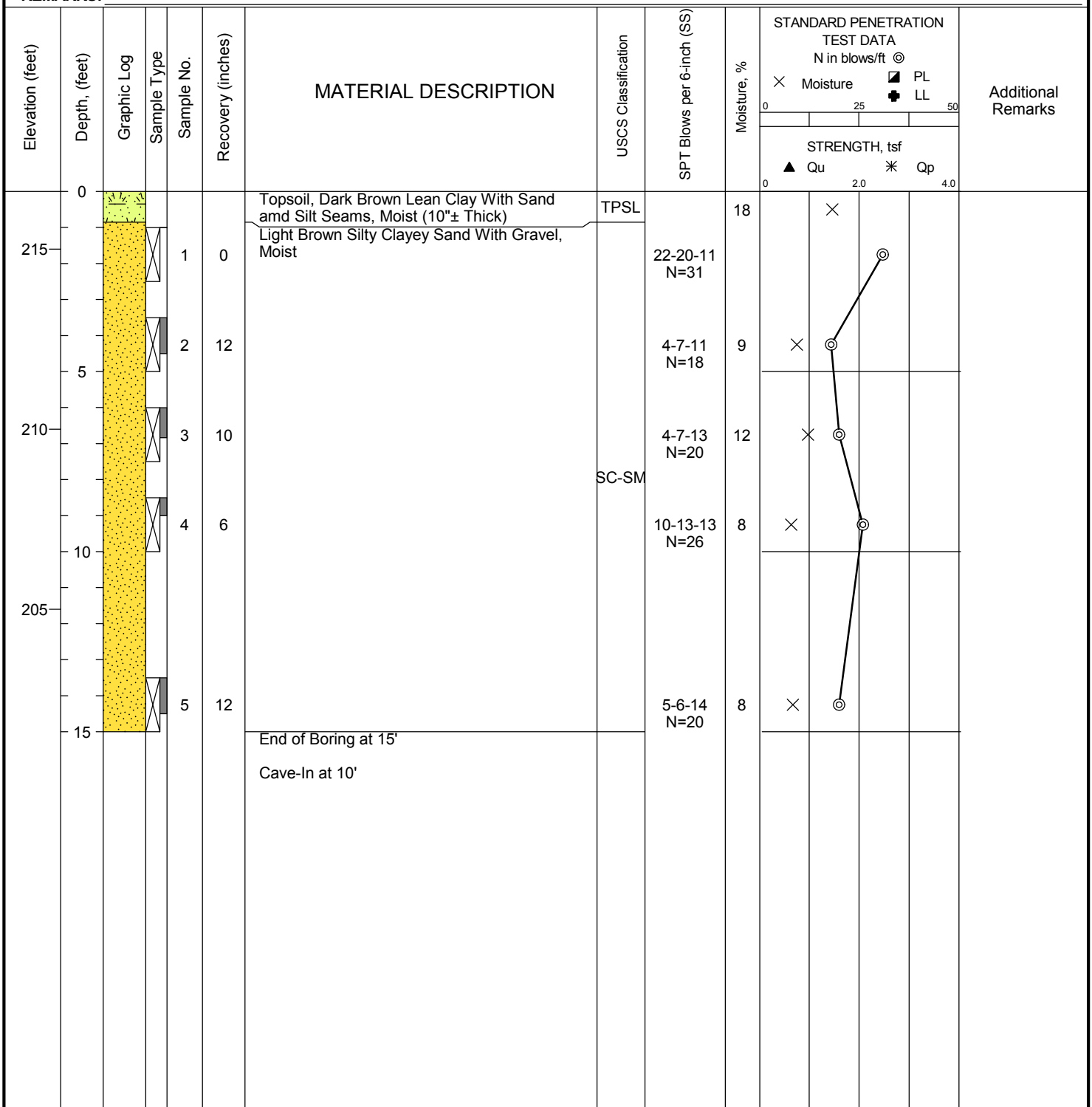
DATE STARTED: 5/16/25
DATE COMPLETED: 5/16/25
COMPLETION DEPTH: 15.0 ft
BENCHMARK: N/A
ELEVATION: 216.6 ft
LATITUDE:
LONGITUDE:
STATION: N/A OFFSET: N/A
REMARKS:

DRILL COMPANY: PSI, Inc.
DRILLER: DT / JF LOGGED BY: PB
DRILL RIG: Mobile Drill B-57
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY:

BORING B-22

Water
While Drilling Not Observed
Upon Completion Not Observed
Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: Intersection of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

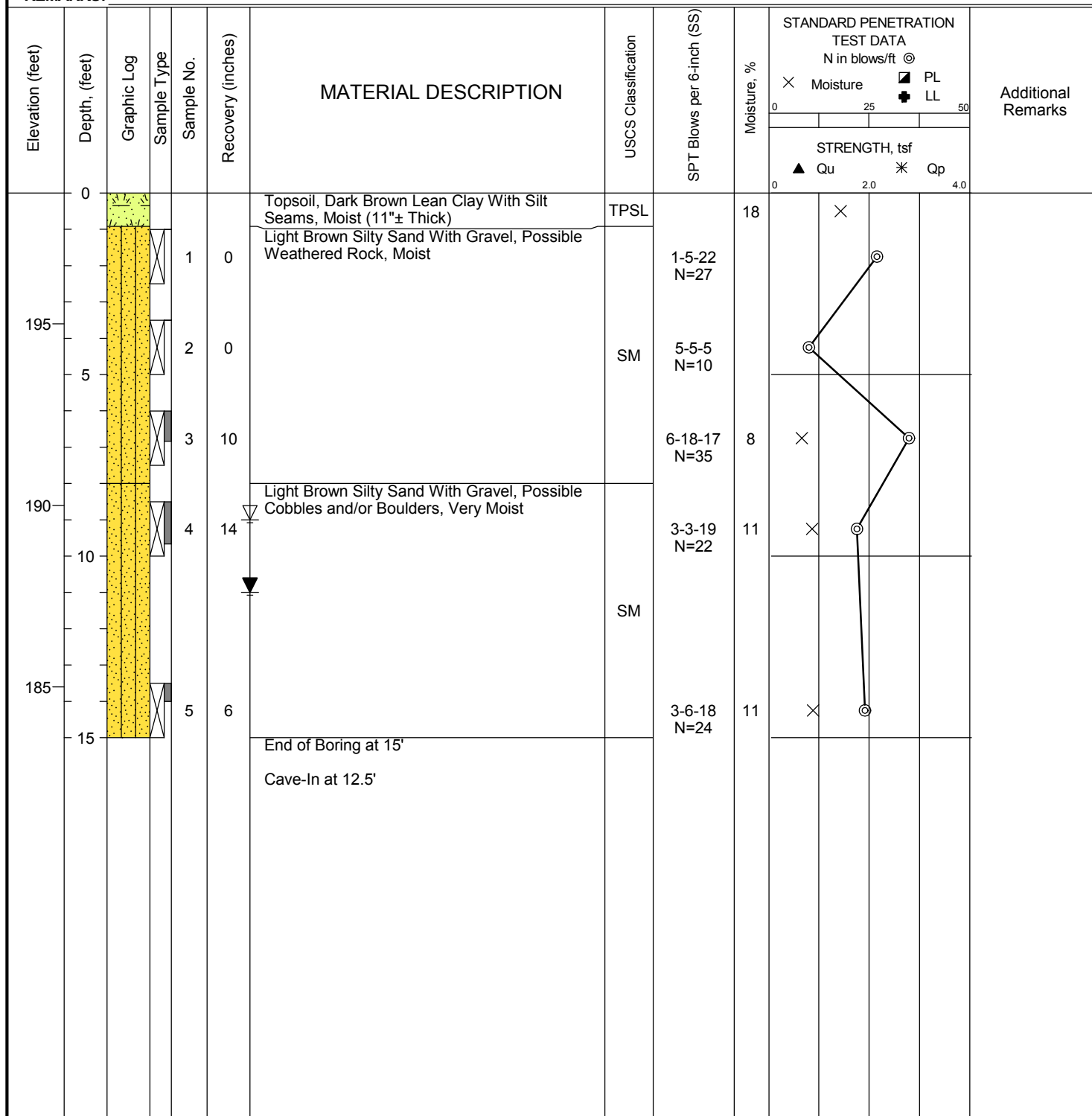
DATE STARTED: 5/19/25
 DATE COMPLETED: 5/19/25
 COMPLETION DEPTH: 15.0 ft
 BENCHMARK: N/A
 ELEVATION: 198.6 ft
 LATITUDE:
 LONGITUDE:
 STATION: N/A OFFSET: N/A
 REMARKS:

DRILL COMPANY: PSI, Inc.
 DRILLER: RB / DT LOGGED BY: PB
 DRILL RIG: Mobile Drill B-57
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY:

BORING B-23

Water
 ▽ While Drilling 9 feet
 ▼ Upon Completion 11 feet
 ▽ Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
 821 Corporate Court, Suite 100
 Waukesha, WI 53189
 Telephone: (262) 521-2125

PROJECT NO.: 00523519
 PROJECT: Proposed Meadowbrook Rd. Development
 LOCATION: Intersection of Meadowbrook Rd. & Coldwater Creek Dr.
 Waukesha, WI

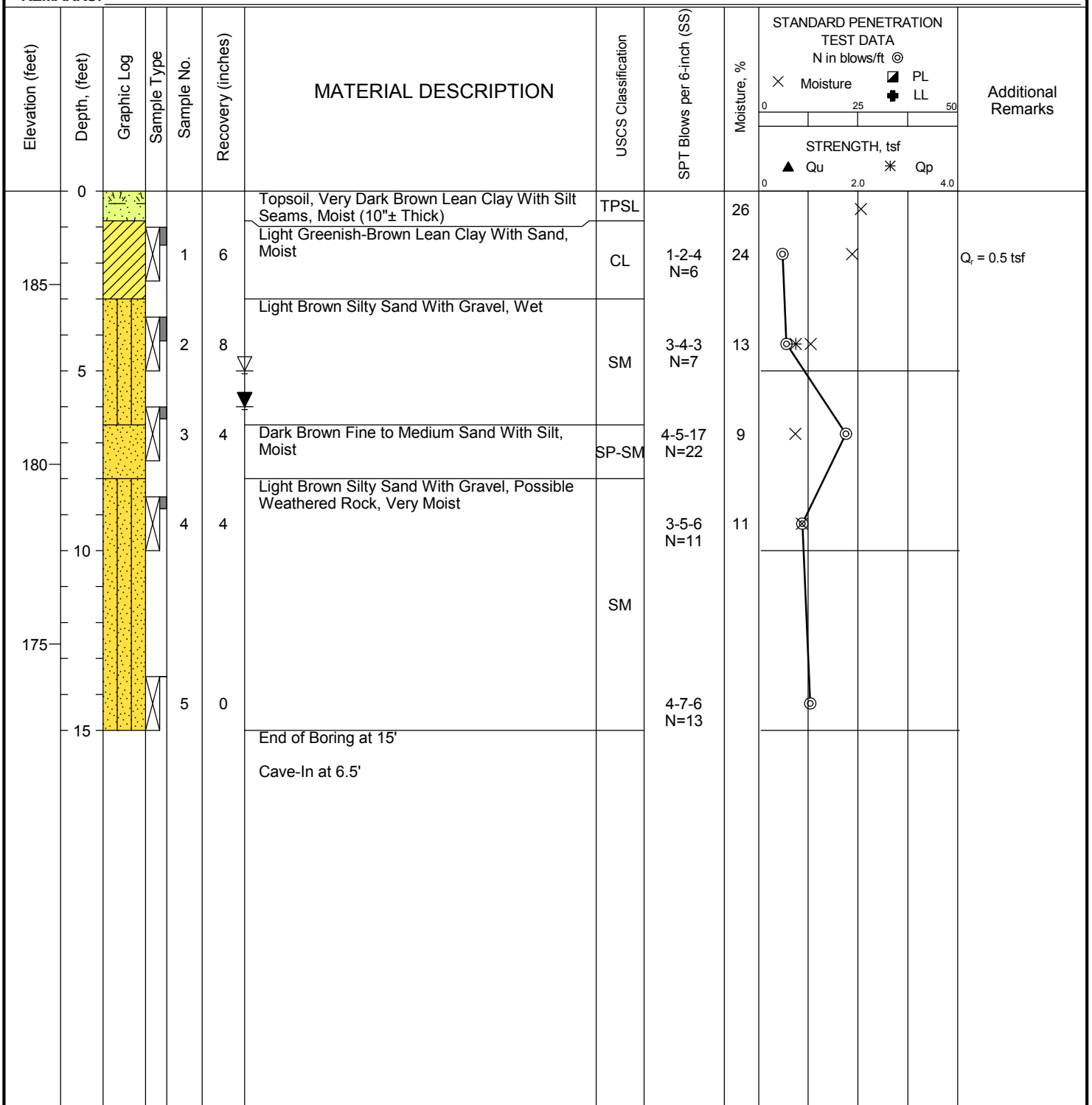
DATE STARTED: 5/19/25
DATE COMPLETED: 5/19/25
COMPLETION DEPTH: 15.0 ft
BENCHMARK: N/A
ELEVATION: 187.6 ft
LATITUDE:
LONGITUDE:
STATION: N/A OFFSET: N/A
REMARKS:

DRILL COMPANY: PSI, Inc.
DRILLER: RB LOGGED BY: PB
DRILL RIG: Mobile Drill B-57
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY:

BORING B-24

Water
▽ While Drilling 5 feet
▼ Upon Completion 6 feet
▽ Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

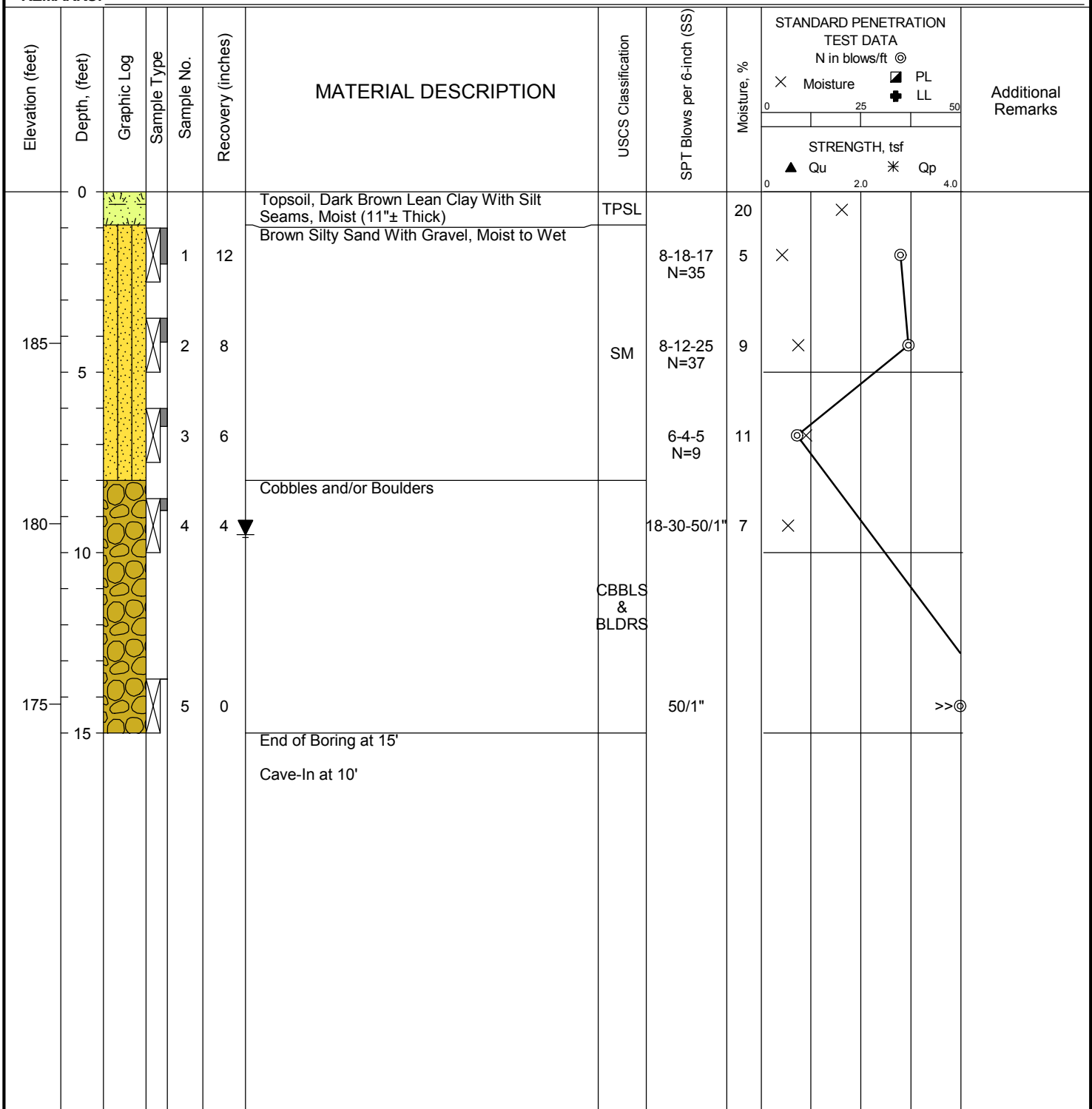
DATE STARTED: 5/19/25
DATE COMPLETED: 5/19/25
COMPLETION DEPTH: 15.0 ft
BENCHMARK: N/A
ELEVATION: 189.2 ft
LATITUDE:
LONGITUDE:
STATION: N/A OFFSET: N/A
REMARKS:

DRILL COMPANY: PSI, Inc.
DRILLER: RB / DT LOGGED BY: PB
DRILL RIG: Mobile Drill B-57
DRILLING METHOD: Hollow Stem Auger
SAMPLING METHOD: 2-in SS
HAMMER TYPE: Automatic
EFFICIENCY: N/A
REVIEWED BY:

BORING B-25

Water
While Drilling: Not Observed
Upon Completion: 9.5 feet
Delay: N/A

BORING LOCATION:



Professional Service Industries, Inc.
821 Corporate Court, Suite 100
Waukesha, WI 53189
Telephone: (262) 521-2125

PROJECT NO.: 00523519
PROJECT: Proposed Meadowbrook Rd. Development
LOCATION: N.E. of Meadowbrook Rd. & Coldwater Creek Dr.
Waukesha, WI

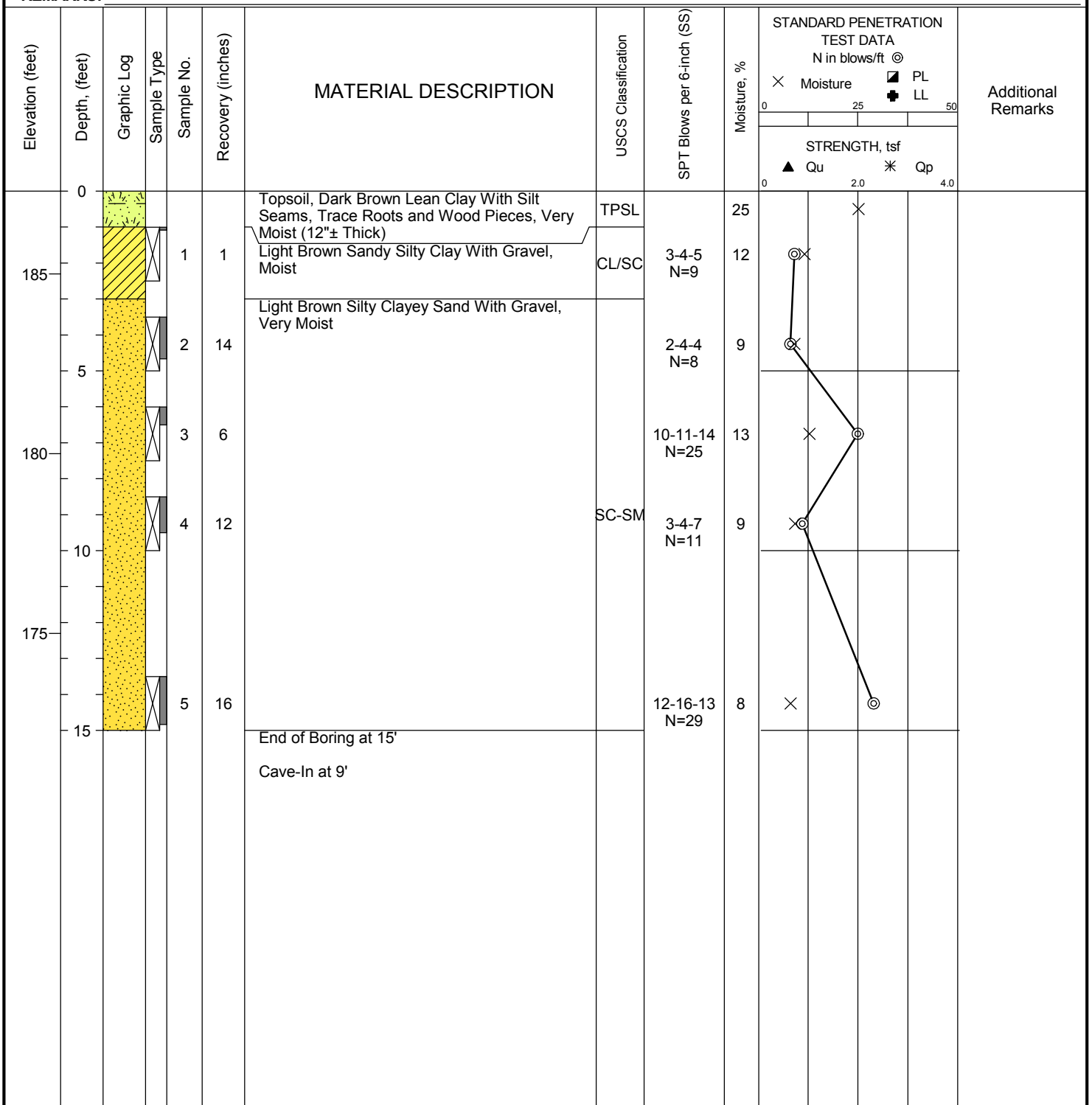
DATE STARTED: 5/22/25
 DATE COMPLETED: 5/22/25
 COMPLETION DEPTH: 15.0 ft
 BENCHMARK: N/A
 ELEVATION: 187.3 ft
 LATITUDE:
 LONGITUDE:
 STATION: N/A OFFSET: N/A
 REMARKS:

DRILL COMPANY: PSI, Inc.
 DRILLER: RB LOGGED BY: AW
 DRILL RIG: Mobile Drill B-57
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY:

BORING B-26

Water
 ∇ While Drilling Not Observed
 ▼ Upon Completion Not Observed
 ∇ Delay N/A

BORING LOCATION:



Professional Service Industries, Inc.
 821 Corporate Court, Suite 100
 Waukesha, WI 53189
 Telephone: (262) 521-2125

PROJECT NO.: 00523519
 PROJECT: Proposed Meadowbrook Rd. Development
 LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr.
 Waukesha, WI

DATE STARTED: 5/22/25 DATE COMPLETED: 5/22/25 COMPLETION DEPTH: 15.0 ft BENCHMARK: N/A ELEVATION: 187.8 ft LATITUDE: LONGITUDE: STATION: N/A OFFSET: N/A REMARKS:	DRILL COMPANY: PSI, Inc. DRILLER: RB LOGGED BY: AW DRILL RIG: Mobile Drill B-57 DRILLING METHOD: Hollow Stem Auger SAMPLING METHOD: 2-in SS HAMMER TYPE: Automatic EFFICIENCY: N/A REVIEWED BY:	BORING B-27 <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="width:5%; text-align: center; font-weight: bold;">Water</td> <td style="width:10%; text-align: center;">▽</td> <td style="width:45%;">While Drilling</td> <td style="width:40%;">Not Observed</td> </tr> <tr> <td style="text-align: center;">▼</td> <td>Upon Completion</td> <td>Not Observed</td> </tr> <tr> <td style="text-align: center;">▽</td> <td>Delay</td> <td>N/A</td> </tr> </table> BORING LOCATION:	Water	▽	While Drilling	Not Observed	▼	Upon Completion	Not Observed	▽	Delay	N/A
Water	▽	While Drilling		Not Observed								
	▼	Upon Completion		Not Observed								
	▽	Delay	N/A									

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ X Moisture PL LL STRENGTH, tsf ▲ Qu * Qp	Additional Remarks
0						Topsoil, Dark Brown Lean Clay With Silt Seams, Very Moist (13"± Thick)	TPSL	29			
				1	6	Light Brown Silty Clayey Sand With Gravel, Very Moist to Wet	SC-SM	3-4-5 N=9	12	◎	
185				2	14			3-5-4 N=9	10	◎	
5				3	14	Light Brown Silty Sand With Gravel, Moist	SM	4-12-24 N=36	5	X	◎
180				4	12			7-22-30 N=52	7	X	>>◎
10				5	16			9-17-46 N=63	7	X	>>◎
175						End of Boring at 15'					
15						Cave-In at 11'					

	Professional Service Industries, Inc. 821 Corporate Court, Suite 100 Waukesha, WI 53189 Telephone: (262) 521-2125	PROJECT NO.: 00523519 PROJECT: Proposed Meadowbrook Rd. Development LOCATION: of Meadowbrook Rd. & Coldwater Creek Dr. Waukesha, WI
--	--	---

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.	 SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
HSA: Hollow Stem Auger - typically 3 1/4" or 4 1/4" I.D. openings, except where noted.	 ST: Shelby Tube - 3" O.D., except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry	 RC: Rock Core
R.C.: Diamond Bit Core Sampler	 TC: Texas Cone
H.A.: Hand Auger	 BS: Bulk Sample
P.A.: Power Auger - Handheld motorized auger	 PM: Pressuremeter
	CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N ₆₀ : A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q _u : Unconfined compressive strength, TSF
Q _p : Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL), %
DD: Dry unit weight, pcf
 Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (3/4 in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to 3/4 in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

<u>Q_u - TSF</u>	<u>N - Blows/foot</u>	<u>Consistency</u>
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

<u>Description</u>	<u>Criteria</u>
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

<u>Description</u>	<u>Criteria</u>	<u>Description</u>	<u>Criteria</u>
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick	Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick	Lensed:	Inclusion of small pockets of different soils
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing	Layer:	Inclusion greater than 3 inches thick (75 mm)
Slickensided:	Fracture planes appear polished or glossy, sometimes striated	Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
		Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

<u>Q_u - TSF</u>	<u>Consistency</u>
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

<u>Description</u>	<u>Criteria</u>
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

<u>Voids</u>	<u>Void Diameter</u>
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

<u>(Typically Sedimentary Rock)</u>	
<u>Component</u>	<u>Size Range</u>
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

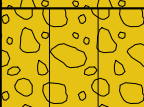
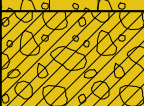
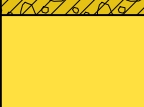
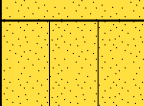
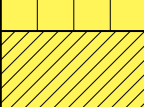
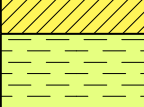
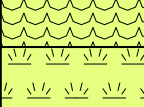
<u>Rock Mass Description</u>	<u>RQD Value</u>
Excellent	90 - 100
Good	75 - 90
Fair	50 - 75
Poor	25 - 50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

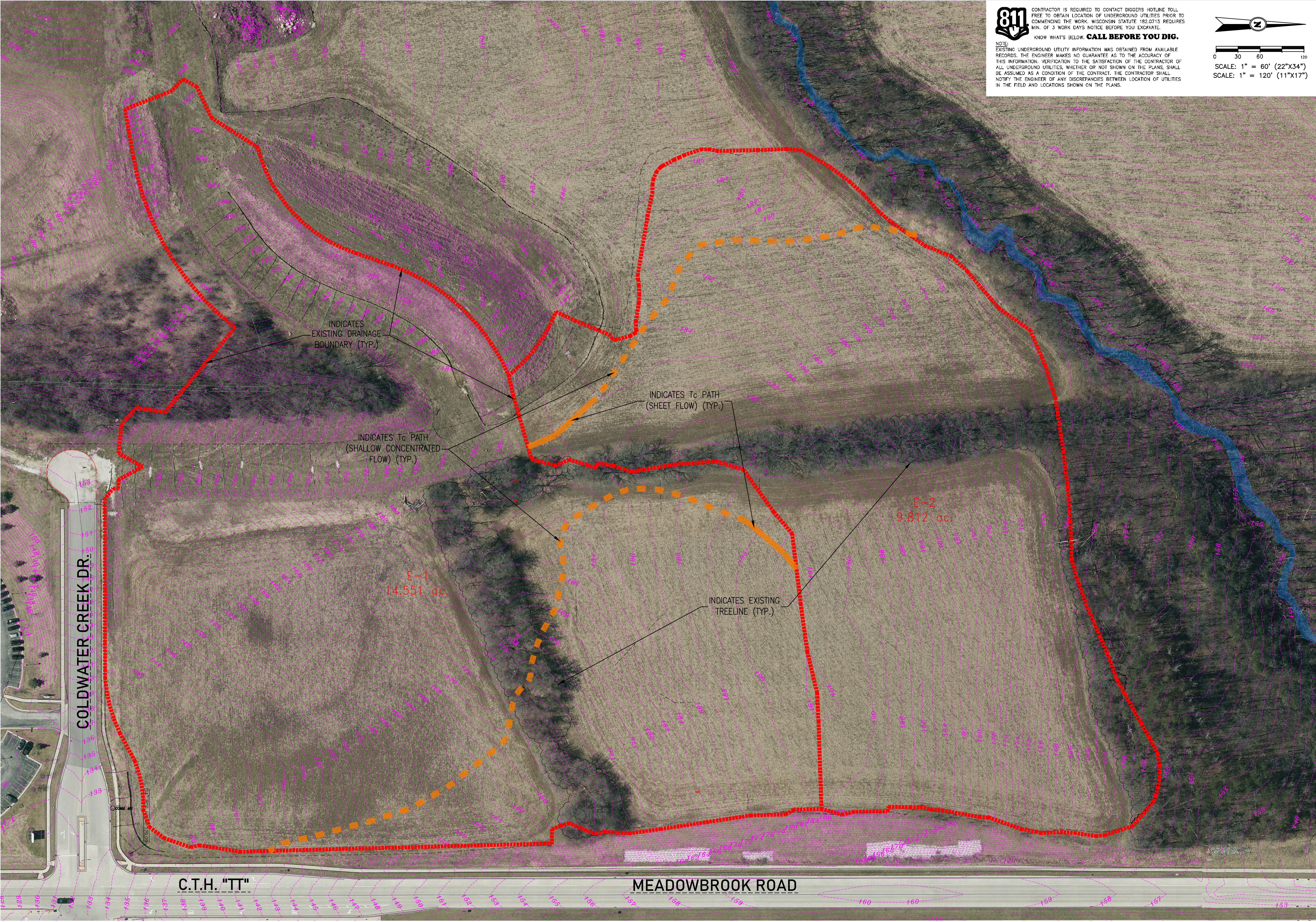
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

APPENDIX 2

Existing & Proposed Drainage Maps

\\HC800\889\05006-01\CONSTRUCTION PLANS\TUKKA-SENIOR LIVING\PRELIM PLANS\TUKKA_DRAINAGE MAP.DWG



4100 N. CALHOUN RD., SUITE 300
BROOKFIELD, WI 53005
PHONE: (262) 790-1480
FAX: (262) 790-1481
EMAIL: jpudelski@trioeng.com

DESIGN • LAND SURVEYING
TRIO
CIVIL ENGINEERING

PROJECT:
TUKKA - MEADOWBROOK ROAD
CITY OF WAUKESHA, WISCONSIN
BY: TUKKA PROPERTIES

REVISION HISTORY	
DATE	DESCRIPTION
6/23/2025	CONCEPTUAL SUBMITTAL
6/25/2025	BID SET SUBMITTAL
8/5/2025	CITY SUBMITTAL
9/22/2025	per CITY COMMENTS

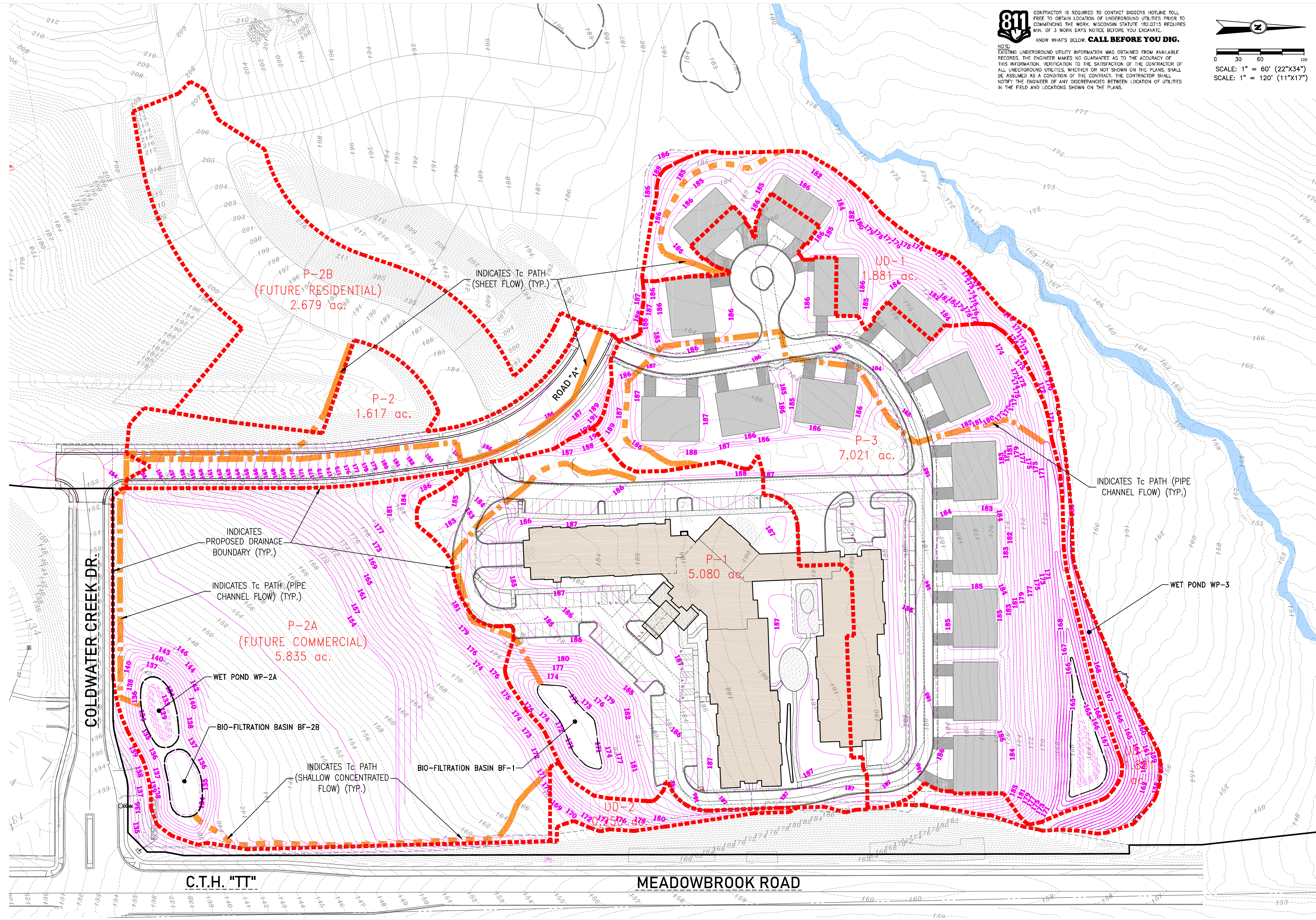
DATE:
SEPTEMBER 22, 2025

JOB NUMBER:
889-05006-01

DESCRIPTION:
EXISTING
DRAINAGE MAP

SHEET
D1.0

H:\C800\889\05006-01\CONSTRUCTION PLANS\TUKKA-SENIOR LIVING\PRELIM PLANS\TUKKA_DRAINAGE_MAP.DWG



4100 N. CALHOUN RD., SUITE 300
BROOKFIELD, WI 53005
PHONE: (262) 790-1480
FAX: (262) 790-1481
EMAIL: jpudefko@trioeng.com

PROJECT:
TUKKA - MEADOWBROOK ROAD
CITY OF WAUKESHA, WISCONSIN
BY: TUKKA PROPERTIES

REVISION HISTORY

DATE	DESCRIPTION
6/23/2025	CONCEPTUAL SUBMITTAL
6/25/2025	BID SET SUBMITTAL
8/5/2025	CITY SUBMITTAL
9/22/2025	per CITY COMMENTS

DATE:
SEPTEMBER 22, 2025

JOB NUMBER:
889-05006-01

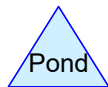
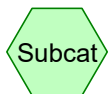
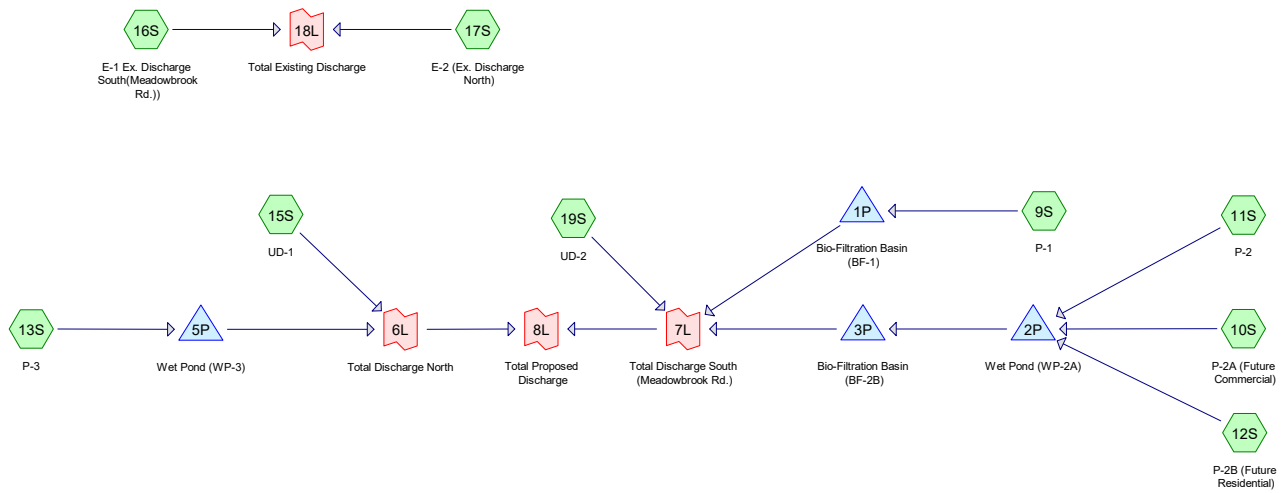
DESCRIPTION:
PROPOSED
DRAINAGE MAP

SHEET

D1.1

APPENDIX 3

HydroCAD Modeling



Routing Diagram for 2025-09-16_HydroCAD Calculation
 Prepared by Trio Engineering, Printed 9/18/2025
 HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 2

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	MSE 24-hr	3	Default	24.00	1	2.40	2
2	2-yr	MSE 24-hr	3	Default	24.00	1	2.70	2
3	10-yr	MSE 24-hr	3	Default	24.00	1	3.81	2
4	100-yr	MSE 24-hr	3	Default	24.00	1	6.18	2

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
10.915	91	(9S, 10S)
1.617	85	(11S)
2.679	90	(12S)
7.021	84	(13S)
11.693	76	(15S, 17S)
14.801	80	(16S, 19S)
48.726	83	TOTAL AREA

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 4

Summary for Subcatchment 9S: P-1

[47] Hint: Peak is 106% of capacity of segment #3

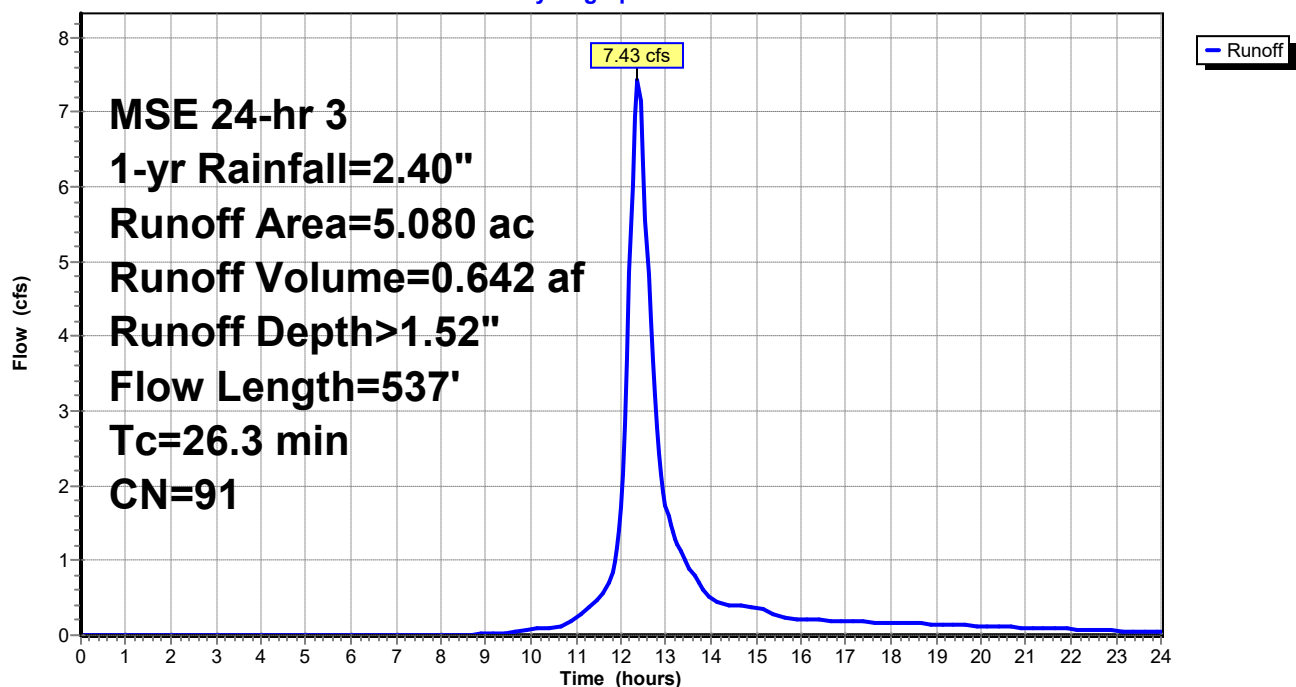
Runoff = 7.43 cfs @ 12.37 hrs, Volume= 0.642 af, Depth> 1.52"
Routed to Pond 1P : Bio-Filtration Basin (BF-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description			
* 5.080	91				
5.080		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	100	0.0175	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 2.70"
0.5	61	0.0160	2.04		Shallow Concentrated Flow, Shallow Conc. Unpaved Kv= 16.1 fps
1.1	376	0.0100	5.70	7.00	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
26.3	537	Total			

Subcatchment 9S: P-1

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 5

Hydrograph for Subcatchment 9S: P-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	1.11	1.75
0.25	0.00	0.00	0.00	13.25	1.99	1.15	1.21
0.50	0.00	0.00	0.00	13.50	2.02	1.19	0.92
0.75	0.01	0.00	0.00	13.75	2.05	1.21	0.69
1.00	0.01	0.00	0.00	14.00	2.07	1.23	0.49
1.25	0.01	0.00	0.00	14.25	2.09	1.24	0.42
1.50	0.01	0.00	0.00	14.50	2.11	1.26	0.40
1.75	0.02	0.00	0.00	14.75	2.13	1.28	0.38
2.00	0.02	0.00	0.00	15.00	2.15	1.30	0.37
2.25	0.03	0.00	0.00	15.25	2.16	1.31	0.33
2.50	0.03	0.00	0.00	15.50	2.18	1.32	0.25
2.75	0.03	0.00	0.00	15.75	2.19	1.33	0.22
3.00	0.04	0.00	0.00	16.00	2.20	1.34	0.21
3.25	0.05	0.00	0.00	16.25	2.21	1.35	0.20
3.50	0.05	0.00	0.00	16.50	2.22	1.36	0.20
3.75	0.06	0.00	0.00	16.75	2.23	1.37	0.19
4.00	0.06	0.00	0.00	17.00	2.24	1.38	0.19
4.25	0.07	0.00	0.00	17.25	2.25	1.39	0.18
4.50	0.08	0.00	0.00	17.50	2.26	1.39	0.18
4.75	0.08	0.00	0.00	17.75	2.27	1.40	0.17
5.00	0.09	0.00	0.00	18.00	2.28	1.41	0.17
5.25	0.10	0.00	0.00	18.25	2.29	1.42	0.16
5.50	0.11	0.00	0.00	18.50	2.29	1.42	0.16
5.75	0.11	0.00	0.00	18.75	2.30	1.43	0.15
6.00	0.12	0.00	0.00	19.00	2.31	1.44	0.15
6.25	0.13	0.00	0.00	19.25	2.32	1.45	0.14
6.50	0.14	0.00	0.00	19.50	2.32	1.45	0.14
6.75	0.15	0.00	0.00	19.75	2.33	1.46	0.13
7.00	0.16	0.00	0.00	20.00	2.34	1.46	0.12
7.25	0.17	0.00	0.00	20.25	2.34	1.47	0.12
7.50	0.18	0.00	0.00	20.50	2.35	1.47	0.11
7.75	0.19	0.00	0.00	20.75	2.35	1.48	0.11
8.00	0.20	0.00	0.00	21.00	2.36	1.48	0.10
8.25	0.21	0.00	0.00	21.25	2.37	1.49	0.10
8.50	0.22	0.00	0.00	21.50	2.37	1.49	0.09
8.75	0.24	0.00	0.01	21.75	2.37	1.50	0.09
9.00	0.25	0.00	0.01	22.00	2.38	1.50	0.08
9.25	0.27	0.00	0.02	22.25	2.38	1.50	0.08
9.50	0.29	0.01	0.04	22.50	2.39	1.51	0.07
9.75	0.31	0.01	0.06	22.75	2.39	1.51	0.06
10.00	0.33	0.02	0.07	23.00	2.39	1.51	0.06
10.25	0.35	0.02	0.09	23.25	2.39	1.51	0.05
10.50	0.38	0.03	0.11	23.50	2.40	1.52	0.05
10.75	0.41	0.04	0.14	23.75	2.40	1.52	0.04
11.00	0.46	0.06	0.23	24.00	2.40	1.52	0.04
11.25	0.52	0.08	0.35				
11.50	0.60	0.11	0.49				
11.75	0.74	0.19	0.75				
12.00	1.11	0.44	1.72				
12.25	1.66	0.87	6.02				
12.50	1.80	0.99	6.31				
12.75	1.88	1.06	3.20				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 6

Summary for Subcatchment 10S: P-2A (Future Commercial)

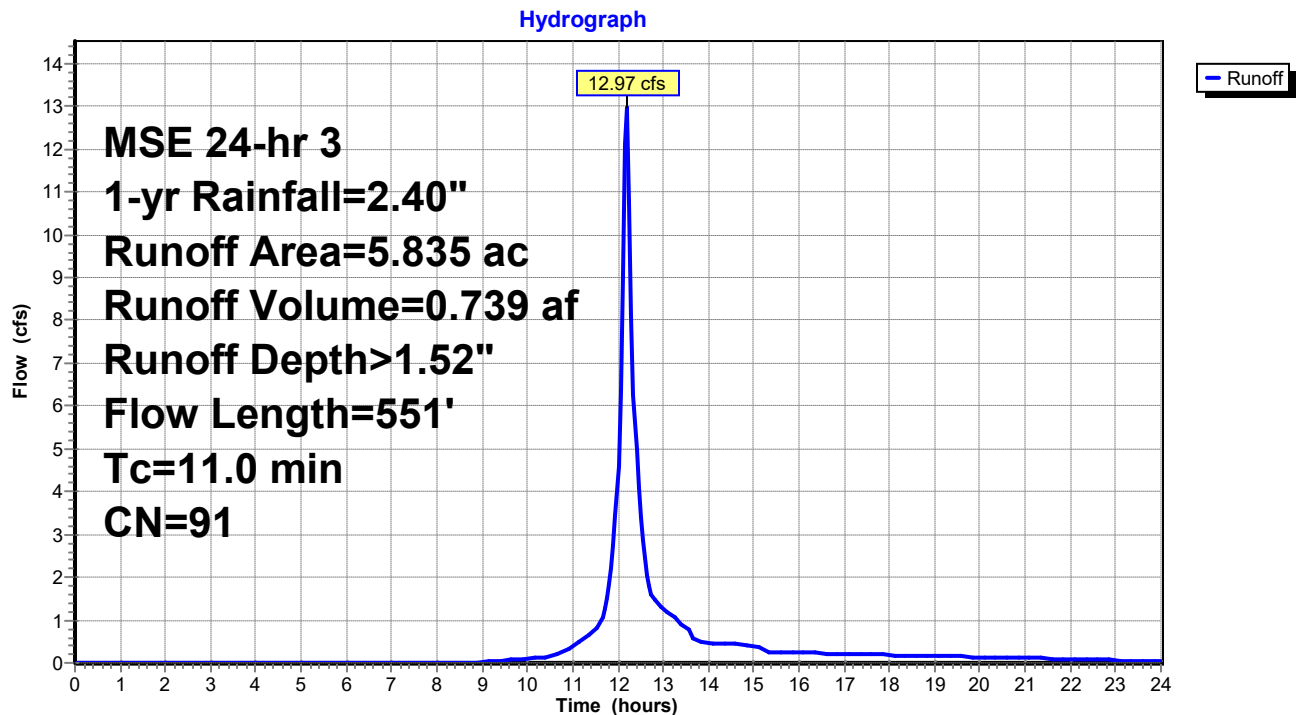
Runoff = 12.97 cfs @ 12.19 hrs, Volume= 0.739 af, Depth> 1.52"
Routed to Pond 2P : Wet Pond (WP-2A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 5.835	91	
5.835		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	25	0.2500	0.22		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
7.1	75	0.0800	0.18		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
2.0	451	0.0640	3.79		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
11.0	551	Total			

Subcatchment 10S: P-2A (Future Commercial)



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 7

Hydrograph for Subcatchment 10S: P-2A (Future Commercial)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	1.11	1.28
0.25	0.00	0.00	0.00	13.25	1.99	1.15	1.05
0.50	0.00	0.00	0.00	13.50	2.02	1.19	0.82
0.75	0.01	0.00	0.00	13.75	2.05	1.21	0.52
1.00	0.01	0.00	0.00	14.00	2.07	1.23	0.47
1.25	0.01	0.00	0.00	14.25	2.09	1.24	0.45
1.50	0.01	0.00	0.00	14.50	2.11	1.26	0.44
1.75	0.02	0.00	0.00	14.75	2.13	1.28	0.42
2.00	0.02	0.00	0.00	15.00	2.15	1.30	0.41
2.25	0.03	0.00	0.00	15.25	2.16	1.31	0.27
2.50	0.03	0.00	0.00	15.50	2.18	1.32	0.25
2.75	0.03	0.00	0.00	15.75	2.19	1.33	0.24
3.00	0.04	0.00	0.00	16.00	2.20	1.34	0.23
3.25	0.05	0.00	0.00	16.25	2.21	1.35	0.23
3.50	0.05	0.00	0.00	16.50	2.22	1.36	0.22
3.75	0.06	0.00	0.00	16.75	2.23	1.37	0.22
4.00	0.06	0.00	0.00	17.00	2.24	1.38	0.21
4.25	0.07	0.00	0.00	17.25	2.25	1.39	0.20
4.50	0.08	0.00	0.00	17.50	2.26	1.39	0.20
4.75	0.08	0.00	0.00	17.75	2.27	1.40	0.19
5.00	0.09	0.00	0.00	18.00	2.28	1.41	0.19
5.25	0.10	0.00	0.00	18.25	2.29	1.42	0.18
5.50	0.11	0.00	0.00	18.50	2.29	1.42	0.17
5.75	0.11	0.00	0.00	18.75	2.30	1.43	0.17
6.00	0.12	0.00	0.00	19.00	2.31	1.44	0.16
6.25	0.13	0.00	0.00	19.25	2.32	1.45	0.16
6.50	0.14	0.00	0.00	19.50	2.32	1.45	0.15
6.75	0.15	0.00	0.00	19.75	2.33	1.46	0.14
7.00	0.16	0.00	0.00	20.00	2.34	1.46	0.14
7.25	0.17	0.00	0.00	20.25	2.34	1.47	0.13
7.50	0.18	0.00	0.00	20.50	2.35	1.47	0.13
7.75	0.19	0.00	0.00	20.75	2.35	1.48	0.12
8.00	0.20	0.00	0.00	21.00	2.36	1.48	0.11
8.25	0.21	0.00	0.00	21.25	2.37	1.49	0.11
8.50	0.22	0.00	0.01	21.50	2.37	1.49	0.10
8.75	0.24	0.00	0.02	21.75	2.37	1.50	0.09
9.00	0.25	0.00	0.02	22.00	2.38	1.50	0.09
9.25	0.27	0.00	0.05	22.25	2.38	1.50	0.08
9.50	0.29	0.01	0.06	22.50	2.39	1.51	0.07
9.75	0.31	0.01	0.08	22.75	2.39	1.51	0.07
10.00	0.33	0.02	0.10	23.00	2.39	1.51	0.06
10.25	0.35	0.02	0.12	23.25	2.39	1.51	0.06
10.50	0.38	0.03	0.14	23.50	2.40	1.52	0.05
10.75	0.41	0.04	0.25	23.75	2.40	1.52	0.04
11.00	0.46	0.06	0.38	24.00	2.40	1.52	0.04
11.25	0.52	0.08	0.55				
11.50	0.60	0.11	0.75				
11.75	0.74	0.19	1.51				
12.00	1.11	0.44	4.57				
12.25	1.66	0.87	10.75				
12.50	1.80	0.99	3.40				
12.75	1.88	1.06	1.62				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 8

Summary for Subcatchment 11S: P-2

Runoff = 3.19 cfs @ 12.14 hrs, Volume= 0.148 af, Depth> 1.10"
Routed to Pond 2P : Wet Pond (WP-2A)

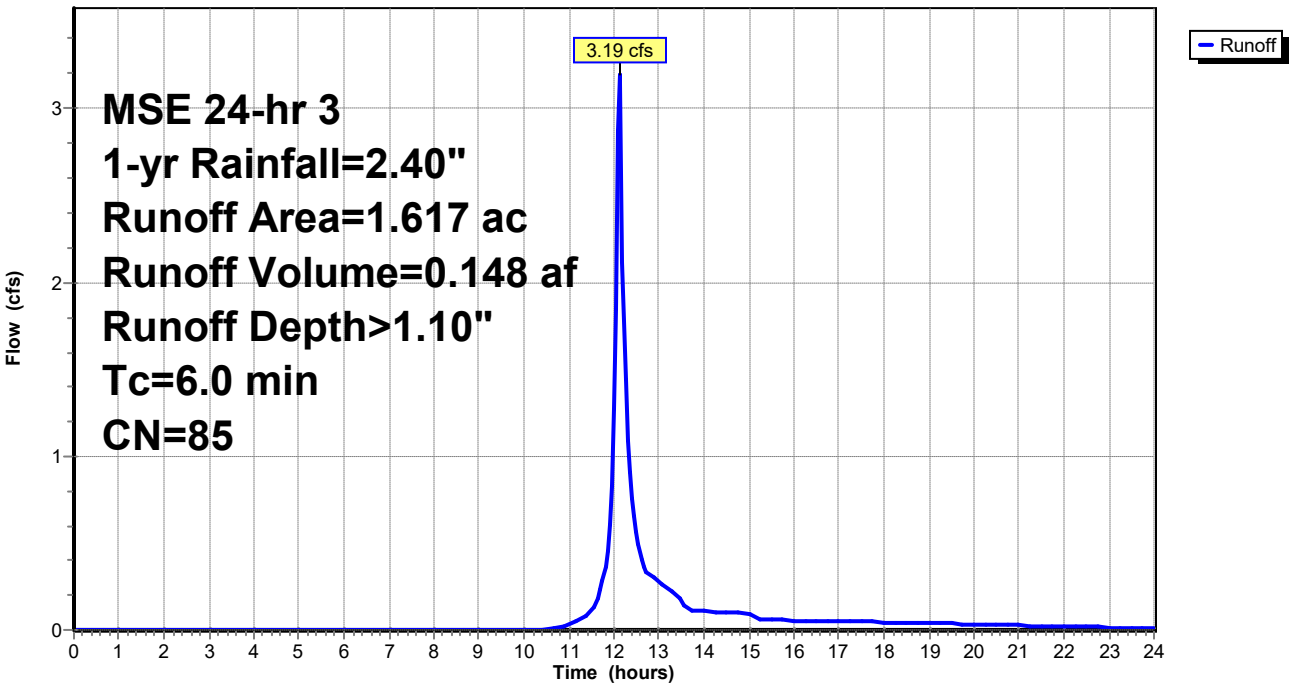
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 1.617	85	
1.617		100.00% Pervious Area

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

Subcatchment 11S: P-2

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 9

Hydrograph for Subcatchment 11S: P-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	0.75	0.28
0.25	0.00	0.00	0.00	13.25	1.99	0.79	0.23
0.50	0.00	0.00	0.00	13.50	2.02	0.81	0.17
0.75	0.01	0.00	0.00	13.75	2.05	0.83	0.11
1.00	0.01	0.00	0.00	14.00	2.07	0.85	0.11
1.25	0.01	0.00	0.00	14.25	2.09	0.86	0.10
1.50	0.01	0.00	0.00	14.50	2.11	0.88	0.10
1.75	0.02	0.00	0.00	14.75	2.13	0.89	0.10
2.00	0.02	0.00	0.00	15.00	2.15	0.91	0.10
2.25	0.03	0.00	0.00	15.25	2.16	0.92	0.06
2.50	0.03	0.00	0.00	15.50	2.18	0.93	0.06
2.75	0.03	0.00	0.00	15.75	2.19	0.94	0.06
3.00	0.04	0.00	0.00	16.00	2.20	0.94	0.06
3.25	0.05	0.00	0.00	16.25	2.21	0.95	0.05
3.50	0.05	0.00	0.00	16.50	2.22	0.96	0.05
3.75	0.06	0.00	0.00	16.75	2.23	0.97	0.05
4.00	0.06	0.00	0.00	17.00	2.24	0.98	0.05
4.25	0.07	0.00	0.00	17.25	2.25	0.98	0.05
4.50	0.08	0.00	0.00	17.50	2.26	0.99	0.05
4.75	0.08	0.00	0.00	17.75	2.27	1.00	0.05
5.00	0.09	0.00	0.00	18.00	2.28	1.00	0.04
5.25	0.10	0.00	0.00	18.25	2.29	1.01	0.04
5.50	0.11	0.00	0.00	18.50	2.29	1.02	0.04
5.75	0.11	0.00	0.00	18.75	2.30	1.02	0.04
6.00	0.12	0.00	0.00	19.00	2.31	1.03	0.04
6.25	0.13	0.00	0.00	19.25	2.32	1.03	0.04
6.50	0.14	0.00	0.00	19.50	2.32	1.04	0.04
6.75	0.15	0.00	0.00	19.75	2.33	1.05	0.03
7.00	0.16	0.00	0.00	20.00	2.34	1.05	0.03
7.25	0.17	0.00	0.00	20.25	2.34	1.06	0.03
7.50	0.18	0.00	0.00	20.50	2.35	1.06	0.03
7.75	0.19	0.00	0.00	20.75	2.35	1.06	0.03
8.00	0.20	0.00	0.00	21.00	2.36	1.07	0.03
8.25	0.21	0.00	0.00	21.25	2.37	1.07	0.03
8.50	0.22	0.00	0.00	21.50	2.37	1.08	0.02
8.75	0.24	0.00	0.00	21.75	2.37	1.08	0.02
9.00	0.25	0.00	0.00	22.00	2.38	1.08	0.02
9.25	0.27	0.00	0.00	22.25	2.38	1.09	0.02
9.50	0.29	0.00	0.00	22.50	2.39	1.09	0.02
9.75	0.31	0.00	0.00	22.75	2.39	1.09	0.02
10.00	0.33	0.00	0.00	23.00	2.39	1.09	0.01
10.25	0.35	0.00	0.00	23.25	2.39	1.09	0.01
10.50	0.38	0.00	0.00	23.50	2.40	1.10	0.01
10.75	0.41	0.00	0.01	23.75	2.40	1.10	0.01
11.00	0.46	0.01	0.03	24.00	2.40	1.10	0.01
11.25	0.52	0.02	0.06				
11.50	0.60	0.03	0.10				
11.75	0.74	0.07	0.28				
12.00	1.11	0.23	1.27				
12.25	1.66	0.56	1.44				
12.50	1.80	0.66	0.56				
12.75	1.88	0.71	0.33				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 10

Summary for Subcatchment 12S: P-2B (Future Residential)

Runoff = 4.59 cfs @ 12.27 hrs, Volume= 0.322 af, Depth> 1.44"
Routed to Pond 2P : Wet Pond (WP-2A)

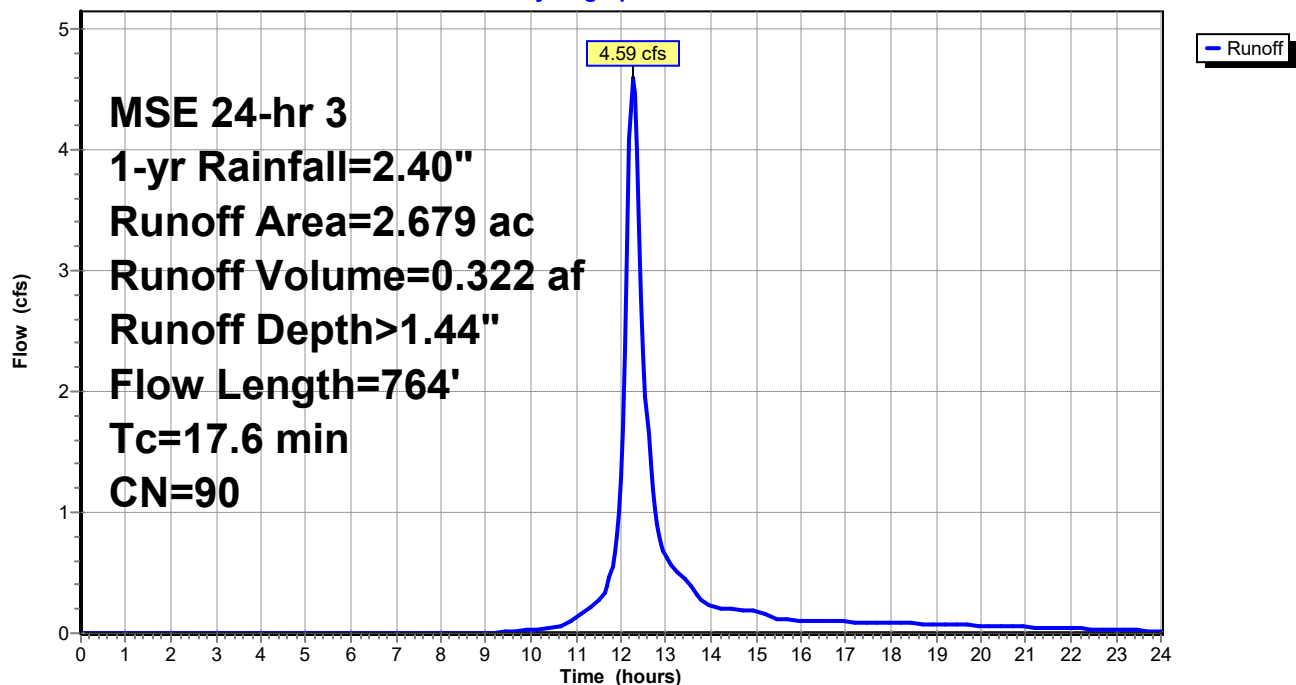
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 2.679	90	
2.679		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
0.2	80	0.2000	7.20		Shallow Concentrated Flow, Shallow Conc. Unpaved Kv= 16.1 fps
0.7	209	0.0690	5.33		Shallow Concentrated Flow, Shallow Conc. Paved Kv= 20.3 fps
1.2	375	0.0100	5.26	6.46	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
17.6	764	Total			

Subcatchment 12S: P-2B (Future Residential)

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 11

Hydrograph for Subcatchment 12S: P-2B (Future Residential)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	1.04	0.65
0.25	0.00	0.00	0.00	13.25	1.99	1.08	0.51
0.50	0.00	0.00	0.00	13.50	2.02	1.12	0.41
0.75	0.01	0.00	0.00	13.75	2.05	1.13	0.28
1.00	0.01	0.00	0.00	14.00	2.07	1.15	0.22
1.25	0.01	0.00	0.00	14.25	2.09	1.17	0.21
1.50	0.01	0.00	0.00	14.50	2.11	1.19	0.20
1.75	0.02	0.00	0.00	14.75	2.13	1.21	0.19
2.00	0.02	0.00	0.00	15.00	2.15	1.23	0.19
2.25	0.03	0.00	0.00	15.25	2.16	1.24	0.15
2.50	0.03	0.00	0.00	15.50	2.18	1.25	0.12
2.75	0.03	0.00	0.00	15.75	2.19	1.26	0.11
3.00	0.04	0.00	0.00	16.00	2.20	1.27	0.11
3.25	0.05	0.00	0.00	16.25	2.21	1.28	0.10
3.50	0.05	0.00	0.00	16.50	2.22	1.28	0.10
3.75	0.06	0.00	0.00	16.75	2.23	1.29	0.10
4.00	0.06	0.00	0.00	17.00	2.24	1.30	0.10
4.25	0.07	0.00	0.00	17.25	2.25	1.31	0.09
4.50	0.08	0.00	0.00	17.50	2.26	1.32	0.09
4.75	0.08	0.00	0.00	17.75	2.27	1.33	0.09
5.00	0.09	0.00	0.00	18.00	2.28	1.33	0.08
5.25	0.10	0.00	0.00	18.25	2.29	1.34	0.08
5.50	0.11	0.00	0.00	18.50	2.29	1.35	0.08
5.75	0.11	0.00	0.00	18.75	2.30	1.36	0.08
6.00	0.12	0.00	0.00	19.00	2.31	1.36	0.07
6.25	0.13	0.00	0.00	19.25	2.32	1.37	0.07
6.50	0.14	0.00	0.00	19.50	2.32	1.38	0.07
6.75	0.15	0.00	0.00	19.75	2.33	1.38	0.07
7.00	0.16	0.00	0.00	20.00	2.34	1.39	0.06
7.25	0.17	0.00	0.00	20.25	2.34	1.39	0.06
7.50	0.18	0.00	0.00	20.50	2.35	1.40	0.06
7.75	0.19	0.00	0.00	20.75	2.35	1.40	0.05
8.00	0.20	0.00	0.00	21.00	2.36	1.41	0.05
8.25	0.21	0.00	0.00	21.25	2.37	1.41	0.05
8.50	0.22	0.00	0.00	21.50	2.37	1.42	0.05
8.75	0.24	0.00	0.00	21.75	2.37	1.42	0.04
9.00	0.25	0.00	0.00	22.00	2.38	1.42	0.04
9.25	0.27	0.00	0.01	22.25	2.38	1.43	0.04
9.50	0.29	0.00	0.02	22.50	2.39	1.43	0.03
9.75	0.31	0.01	0.02	22.75	2.39	1.43	0.03
10.00	0.33	0.01	0.03	23.00	2.39	1.43	0.03
10.25	0.35	0.01	0.04	23.25	2.39	1.44	0.03
10.50	0.38	0.02	0.05	23.50	2.40	1.44	0.02
10.75	0.41	0.03	0.07	23.75	2.40	1.44	0.02
11.00	0.46	0.04	0.12	24.00	2.40	1.44	0.02
11.25	0.52	0.06	0.19				
11.50	0.60	0.09	0.27				
11.75	0.74	0.16	0.47				
12.00	1.11	0.39	1.28				
12.25	1.66	0.81	4.56				
12.50	1.80	0.93	2.32				
12.75	1.88	0.99	1.03				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 12

Summary for Subcatchment 13S: P-3

Runoff = 6.70 cfs @ 12.41 hrs, Volume= 0.607 af, Depth> 1.04"
Routed to Pond 5P : Wet Pond (WP-3)

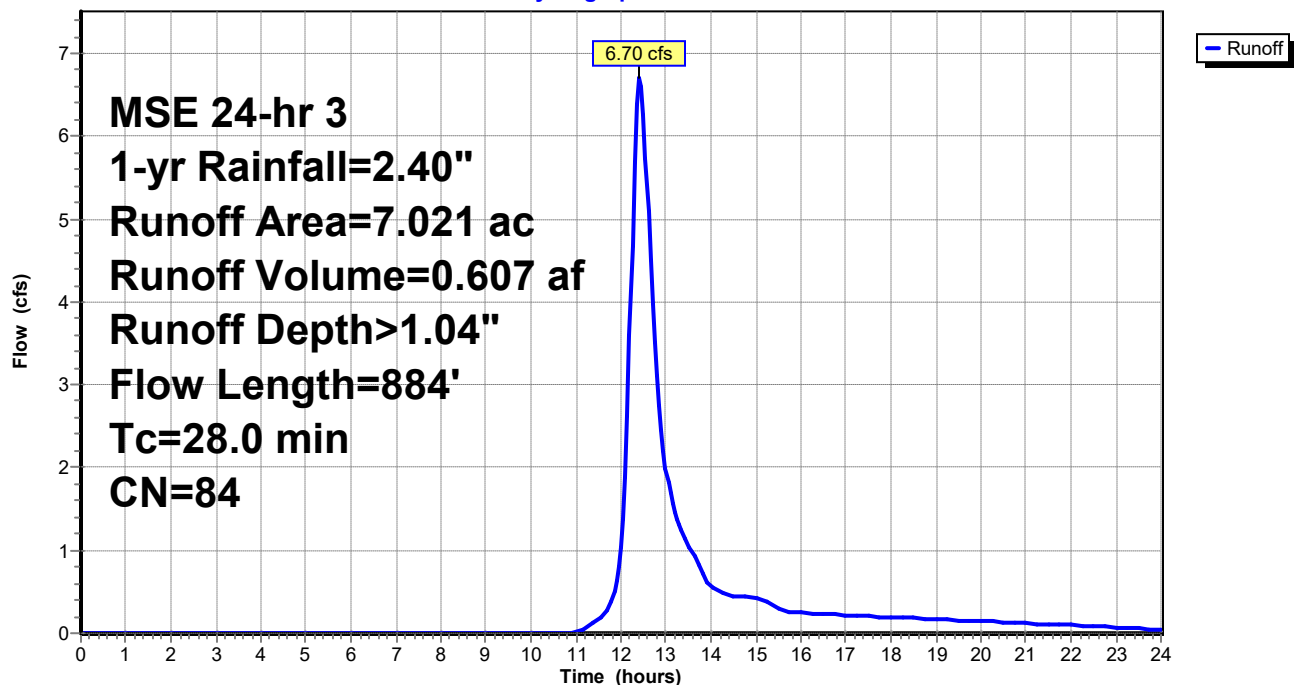
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 7.021	84	
7.021		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	50	0.0125	0.05		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 2.70"
8.9	50	0.0200	0.09		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
0.9	91	0.0125	1.68		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
2.0	693	0.0100	5.70	7.00	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
28.0	884	Total			

Subcatchment 13S: P-3

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 13

Hydrograph for Subcatchment 13S: P-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	0.70	1.99
0.25	0.00	0.00	0.00	13.25	1.99	0.73	1.38
0.50	0.00	0.00	0.00	13.50	2.02	0.76	1.06
0.75	0.01	0.00	0.00	13.75	2.05	0.78	0.80
1.00	0.01	0.00	0.00	14.00	2.07	0.79	0.57
1.25	0.01	0.00	0.00	14.25	2.09	0.81	0.48
1.50	0.01	0.00	0.00	14.50	2.11	0.82	0.45
1.75	0.02	0.00	0.00	14.75	2.13	0.84	0.43
2.00	0.02	0.00	0.00	15.00	2.15	0.85	0.42
2.25	0.03	0.00	0.00	15.25	2.16	0.86	0.38
2.50	0.03	0.00	0.00	15.50	2.18	0.87	0.30
2.75	0.03	0.00	0.00	15.75	2.19	0.88	0.26
3.00	0.04	0.00	0.00	16.00	2.20	0.89	0.24
3.25	0.05	0.00	0.00	16.25	2.21	0.90	0.24
3.50	0.05	0.00	0.00	16.50	2.22	0.90	0.23
3.75	0.06	0.00	0.00	16.75	2.23	0.91	0.22
4.00	0.06	0.00	0.00	17.00	2.24	0.92	0.22
4.25	0.07	0.00	0.00	17.25	2.25	0.93	0.21
4.50	0.08	0.00	0.00	17.50	2.26	0.93	0.21
4.75	0.08	0.00	0.00	17.75	2.27	0.94	0.20
5.00	0.09	0.00	0.00	18.00	2.28	0.95	0.19
5.25	0.10	0.00	0.00	18.25	2.29	0.95	0.19
5.50	0.11	0.00	0.00	18.50	2.29	0.96	0.18
5.75	0.11	0.00	0.00	18.75	2.30	0.96	0.18
6.00	0.12	0.00	0.00	19.00	2.31	0.97	0.17
6.25	0.13	0.00	0.00	19.25	2.32	0.98	0.16
6.50	0.14	0.00	0.00	19.50	2.32	0.98	0.16
6.75	0.15	0.00	0.00	19.75	2.33	0.99	0.15
7.00	0.16	0.00	0.00	20.00	2.34	0.99	0.15
7.25	0.17	0.00	0.00	20.25	2.34	1.00	0.14
7.50	0.18	0.00	0.00	20.50	2.35	1.00	0.13
7.75	0.19	0.00	0.00	20.75	2.35	1.00	0.13
8.00	0.20	0.00	0.00	21.00	2.36	1.01	0.12
8.25	0.21	0.00	0.00	21.25	2.37	1.01	0.11
8.50	0.22	0.00	0.00	21.50	2.37	1.02	0.11
8.75	0.24	0.00	0.00	21.75	2.37	1.02	0.10
9.00	0.25	0.00	0.00	22.00	2.38	1.02	0.10
9.25	0.27	0.00	0.00	22.25	2.38	1.03	0.09
9.50	0.29	0.00	0.00	22.50	2.39	1.03	0.08
9.75	0.31	0.00	0.00	22.75	2.39	1.03	0.08
10.00	0.33	0.00	0.00	23.00	2.39	1.03	0.07
10.25	0.35	0.00	0.00	23.25	2.39	1.03	0.06
10.50	0.38	0.00	0.00	23.50	2.40	1.04	0.06
10.75	0.41	0.00	0.00	23.75	2.40	1.04	0.05
11.00	0.46	0.00	0.02	24.00	2.40	1.04	0.04
11.25	0.52	0.01	0.07				
11.50	0.60	0.02	0.17				
11.75	0.74	0.06	0.35				
12.00	1.11	0.20	1.04				
12.25	1.66	0.52	4.68				
12.50	1.80	0.61	6.26				
12.75	1.88	0.66	3.52				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 14

Summary for Subcatchment 15S: UD-1

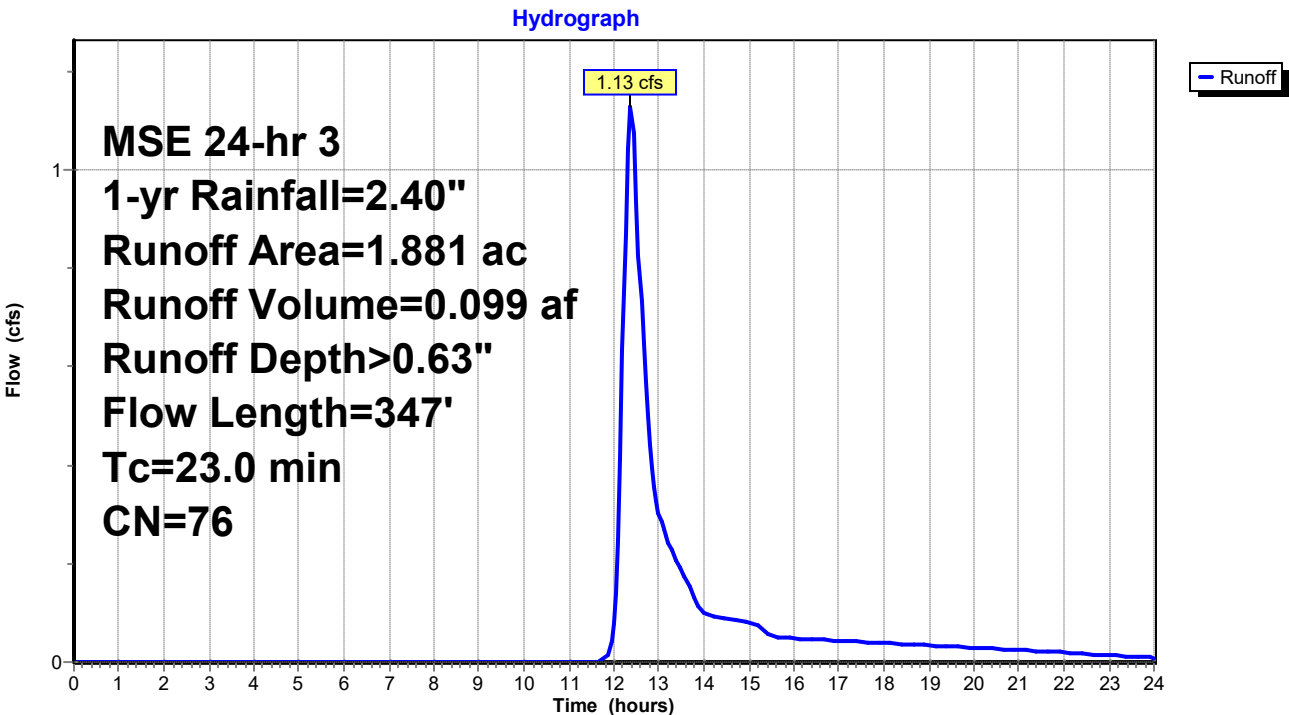
Runoff = 1.13 cfs @ 12.37 hrs, Volume= 0.099 af, Depth> 0.63"
Routed to Link 6L : Total Discharge North

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 1.881	76	
1.881		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		Sheet Flow, Sheet Flow
					Grass: Dense n= 0.240 P2= 2.70"
2.5	247	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc.
					Grassed Waterway Kv= 15.0 fps
23.0	347	Total			

Subcatchment 15S: UD-1



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 15

Hydrograph for Subcatchment 15S: UD-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	0.38	0.30
0.25	0.00	0.00	0.00	13.25	1.99	0.41	0.23
0.50	0.00	0.00	0.00	13.50	2.02	0.43	0.19
0.75	0.01	0.00	0.00	13.75	2.05	0.44	0.14
1.00	0.01	0.00	0.00	14.00	2.07	0.45	0.10
1.25	0.01	0.00	0.00	14.25	2.09	0.46	0.09
1.50	0.01	0.00	0.00	14.50	2.11	0.47	0.09
1.75	0.02	0.00	0.00	14.75	2.13	0.48	0.08
2.00	0.02	0.00	0.00	15.00	2.15	0.49	0.08
2.25	0.03	0.00	0.00	15.25	2.16	0.50	0.07
2.50	0.03	0.00	0.00	15.50	2.18	0.51	0.05
2.75	0.03	0.00	0.00	15.75	2.19	0.51	0.05
3.00	0.04	0.00	0.00	16.00	2.20	0.52	0.05
3.25	0.05	0.00	0.00	16.25	2.21	0.53	0.05
3.50	0.05	0.00	0.00	16.50	2.22	0.53	0.05
3.75	0.06	0.00	0.00	16.75	2.23	0.54	0.04
4.00	0.06	0.00	0.00	17.00	2.24	0.54	0.04
4.25	0.07	0.00	0.00	17.25	2.25	0.55	0.04
4.50	0.08	0.00	0.00	17.50	2.26	0.55	0.04
4.75	0.08	0.00	0.00	17.75	2.27	0.56	0.04
5.00	0.09	0.00	0.00	18.00	2.28	0.56	0.04
5.25	0.10	0.00	0.00	18.25	2.29	0.57	0.04
5.50	0.11	0.00	0.00	18.50	2.29	0.57	0.04
5.75	0.11	0.00	0.00	18.75	2.30	0.58	0.04
6.00	0.12	0.00	0.00	19.00	2.31	0.58	0.03
6.25	0.13	0.00	0.00	19.25	2.32	0.59	0.03
6.50	0.14	0.00	0.00	19.50	2.32	0.59	0.03
6.75	0.15	0.00	0.00	19.75	2.33	0.59	0.03
7.00	0.16	0.00	0.00	20.00	2.34	0.60	0.03
7.25	0.17	0.00	0.00	20.25	2.34	0.60	0.03
7.50	0.18	0.00	0.00	20.50	2.35	0.61	0.03
7.75	0.19	0.00	0.00	20.75	2.35	0.61	0.03
8.00	0.20	0.00	0.00	21.00	2.36	0.61	0.02
8.25	0.21	0.00	0.00	21.25	2.37	0.61	0.02
8.50	0.22	0.00	0.00	21.50	2.37	0.62	0.02
8.75	0.24	0.00	0.00	21.75	2.37	0.62	0.02
9.00	0.25	0.00	0.00	22.00	2.38	0.62	0.02
9.25	0.27	0.00	0.00	22.25	2.38	0.62	0.02
9.50	0.29	0.00	0.00	22.50	2.39	0.63	0.02
9.75	0.31	0.00	0.00	22.75	2.39	0.63	0.02
10.00	0.33	0.00	0.00	23.00	2.39	0.63	0.01
10.25	0.35	0.00	0.00	23.25	2.39	0.63	0.01
10.50	0.38	0.00	0.00	23.50	2.40	0.63	0.01
10.75	0.41	0.00	0.00	23.75	2.40	0.63	0.01
11.00	0.46	0.00	0.00	24.00	2.40	0.63	0.01
11.25	0.52	0.00	0.00				
11.50	0.60	0.00	0.00				
11.75	0.74	0.00	0.00				
12.00	1.11	0.06	0.08				
12.25	1.66	0.25	0.87				
12.50	1.80	0.32	0.93				
12.75	1.88	0.35	0.50				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 16

Summary for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Runoff = 12.94 cfs @ 12.31 hrs, Volume= 0.993 af, Depth> 0.82"
Routed to Link 18L : Total Existing Discharge

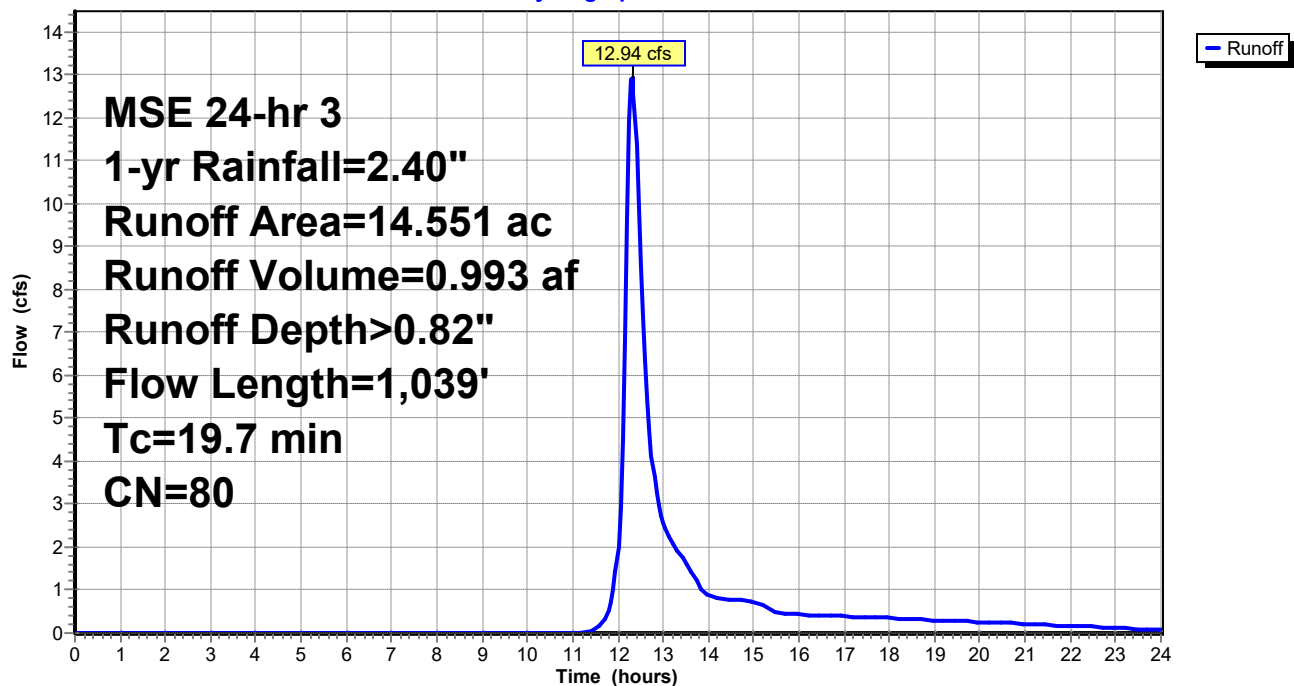
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 14.551	80	
14.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0200	0.14		Sheet Flow, Sheet Flow
					Cultivated: Residue>20% n= 0.170 P2= 2.70"
7.9	939	0.0485	1.98		Shallow Concentrated Flow, Shallow Conc.
					Cultivated Straight Rows Kv= 9.0 fps
19.7	1,039	Total			

Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 17

Hydrograph for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	0.52	2.58
0.25	0.00	0.00	0.00	13.25	1.99	0.55	2.02
0.50	0.00	0.00	0.00	13.50	2.02	0.58	1.63
0.75	0.01	0.00	0.00	13.75	2.05	0.59	1.16
1.00	0.01	0.00	0.00	14.00	2.07	0.61	0.88
1.25	0.01	0.00	0.00	14.25	2.09	0.62	0.82
1.50	0.01	0.00	0.00	14.50	2.11	0.63	0.79
1.75	0.02	0.00	0.00	14.75	2.13	0.65	0.77
2.00	0.02	0.00	0.00	15.00	2.15	0.66	0.75
2.25	0.03	0.00	0.00	15.25	2.16	0.67	0.62
2.50	0.03	0.00	0.00	15.50	2.18	0.67	0.48
2.75	0.03	0.00	0.00	15.75	2.19	0.68	0.44
3.00	0.04	0.00	0.00	16.00	2.20	0.69	0.43
3.25	0.05	0.00	0.00	16.25	2.21	0.69	0.42
3.50	0.05	0.00	0.00	16.50	2.22	0.70	0.41
3.75	0.06	0.00	0.00	16.75	2.23	0.71	0.40
4.00	0.06	0.00	0.00	17.00	2.24	0.71	0.39
4.25	0.07	0.00	0.00	17.25	2.25	0.72	0.38
4.50	0.08	0.00	0.00	17.50	2.26	0.73	0.37
4.75	0.08	0.00	0.00	17.75	2.27	0.73	0.36
5.00	0.09	0.00	0.00	18.00	2.28	0.74	0.35
5.25	0.10	0.00	0.00	18.25	2.29	0.74	0.34
5.50	0.11	0.00	0.00	18.50	2.29	0.75	0.33
5.75	0.11	0.00	0.00	18.75	2.30	0.76	0.32
6.00	0.12	0.00	0.00	19.00	2.31	0.76	0.30
6.25	0.13	0.00	0.00	19.25	2.32	0.76	0.29
6.50	0.14	0.00	0.00	19.50	2.32	0.77	0.28
6.75	0.15	0.00	0.00	19.75	2.33	0.77	0.27
7.00	0.16	0.00	0.00	20.00	2.34	0.78	0.26
7.25	0.17	0.00	0.00	20.25	2.34	0.78	0.25
7.50	0.18	0.00	0.00	20.50	2.35	0.79	0.24
7.75	0.19	0.00	0.00	20.75	2.35	0.79	0.23
8.00	0.20	0.00	0.00	21.00	2.36	0.79	0.21
8.25	0.21	0.00	0.00	21.25	2.37	0.80	0.20
8.50	0.22	0.00	0.00	21.50	2.37	0.80	0.19
8.75	0.24	0.00	0.00	21.75	2.37	0.80	0.18
9.00	0.25	0.00	0.00	22.00	2.38	0.81	0.17
9.25	0.27	0.00	0.00	22.25	2.38	0.81	0.16
9.50	0.29	0.00	0.00	22.50	2.39	0.81	0.15
9.75	0.31	0.00	0.00	22.75	2.39	0.81	0.13
10.00	0.33	0.00	0.00	23.00	2.39	0.81	0.12
10.25	0.35	0.00	0.00	23.25	2.39	0.82	0.11
10.50	0.38	0.00	0.00	23.50	2.40	0.82	0.10
10.75	0.41	0.00	0.00	23.75	2.40	0.82	0.09
11.00	0.46	0.00	0.00	24.00	2.40	0.82	0.08
11.25	0.52	0.00	0.00				
11.50	0.60	0.00	0.07				
11.75	0.74	0.02	0.39				
12.00	1.11	0.12	2.01				
12.25	1.66	0.37	11.92				
12.50	1.80	0.45	8.52				
12.75	1.88	0.49	4.14				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 18

Summary for Subcatchment 17S: E-2 (Ex. Discharge North)

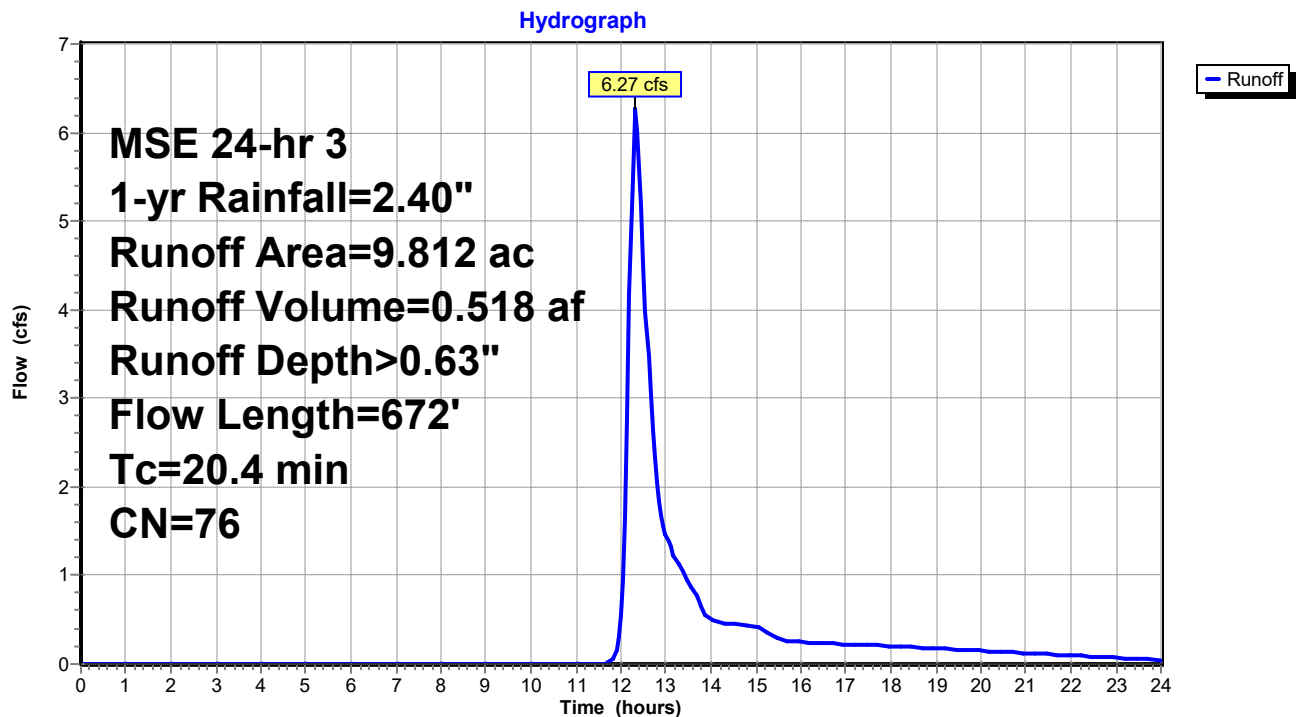
Runoff = 6.27 cfs @ 12.33 hrs, Volume= 0.518 af, Depth> 0.63"
Routed to Link 18L : Total Existing Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 9.812	76	
9.812		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0150	0.13		Sheet Flow, Sheet Flow Cultivated: Residue>20% n= 0.170 P2= 2.70"
7.2	572	0.0219	1.33		Shallow Concentrated Flow, Shallow Conc. Cultivated Straight Rows Kv= 9.0 fps
20.4	672	Total			

Subcatchment 17S: E-2 (Ex. Discharge North)



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 19

Hydrograph for Subcatchment 17S: E-2 (Ex. Discharge North)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	0.38	1.46
0.25	0.00	0.00	0.00	13.25	1.99	0.41	1.15
0.50	0.00	0.00	0.00	13.50	2.02	0.43	0.93
0.75	0.01	0.00	0.00	13.75	2.05	0.44	0.67
1.00	0.01	0.00	0.00	14.00	2.07	0.45	0.51
1.25	0.01	0.00	0.00	14.25	2.09	0.46	0.47
1.50	0.01	0.00	0.00	14.50	2.11	0.47	0.45
1.75	0.02	0.00	0.00	14.75	2.13	0.48	0.44
2.00	0.02	0.00	0.00	15.00	2.15	0.49	0.43
2.25	0.03	0.00	0.00	15.25	2.16	0.50	0.36
2.50	0.03	0.00	0.00	15.50	2.18	0.51	0.28
2.75	0.03	0.00	0.00	15.75	2.19	0.51	0.26
3.00	0.04	0.00	0.00	16.00	2.20	0.52	0.25
3.25	0.05	0.00	0.00	16.25	2.21	0.53	0.24
3.50	0.05	0.00	0.00	16.50	2.22	0.53	0.24
3.75	0.06	0.00	0.00	16.75	2.23	0.54	0.23
4.00	0.06	0.00	0.00	17.00	2.24	0.54	0.23
4.25	0.07	0.00	0.00	17.25	2.25	0.55	0.22
4.50	0.08	0.00	0.00	17.50	2.26	0.55	0.21
4.75	0.08	0.00	0.00	17.75	2.27	0.56	0.21
5.00	0.09	0.00	0.00	18.00	2.28	0.56	0.20
5.25	0.10	0.00	0.00	18.25	2.29	0.57	0.20
5.50	0.11	0.00	0.00	18.50	2.29	0.57	0.19
5.75	0.11	0.00	0.00	18.75	2.30	0.58	0.18
6.00	0.12	0.00	0.00	19.00	2.31	0.58	0.18
6.25	0.13	0.00	0.00	19.25	2.32	0.59	0.17
6.50	0.14	0.00	0.00	19.50	2.32	0.59	0.16
6.75	0.15	0.00	0.00	19.75	2.33	0.59	0.16
7.00	0.16	0.00	0.00	20.00	2.34	0.60	0.15
7.25	0.17	0.00	0.00	20.25	2.34	0.60	0.15
7.50	0.18	0.00	0.00	20.50	2.35	0.61	0.14
7.75	0.19	0.00	0.00	20.75	2.35	0.61	0.13
8.00	0.20	0.00	0.00	21.00	2.36	0.61	0.13
8.25	0.21	0.00	0.00	21.25	2.37	0.61	0.12
8.50	0.22	0.00	0.00	21.50	2.37	0.62	0.11
8.75	0.24	0.00	0.00	21.75	2.37	0.62	0.11
9.00	0.25	0.00	0.00	22.00	2.38	0.62	0.10
9.25	0.27	0.00	0.00	22.25	2.38	0.62	0.09
9.50	0.29	0.00	0.00	22.50	2.39	0.63	0.09
9.75	0.31	0.00	0.00	22.75	2.39	0.63	0.08
10.00	0.33	0.00	0.00	23.00	2.39	0.63	0.07
10.25	0.35	0.00	0.00	23.25	2.39	0.63	0.07
10.50	0.38	0.00	0.00	23.50	2.40	0.63	0.06
10.75	0.41	0.00	0.00	23.75	2.40	0.63	0.05
11.00	0.46	0.00	0.00	24.00	2.40	0.63	0.04
11.25	0.52	0.00	0.00				
11.50	0.60	0.00	0.00				
11.75	0.74	0.00	0.01				
12.00	1.11	0.06	0.54				
12.25	1.66	0.25	5.48				
12.50	1.80	0.32	4.52				
12.75	1.88	0.35	2.33				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 20

Summary for Subcatchment 19S: UD-2

Runoff = 0.37 cfs @ 12.14 hrs, Volume= 0.017 af, Depth> 0.82"

Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

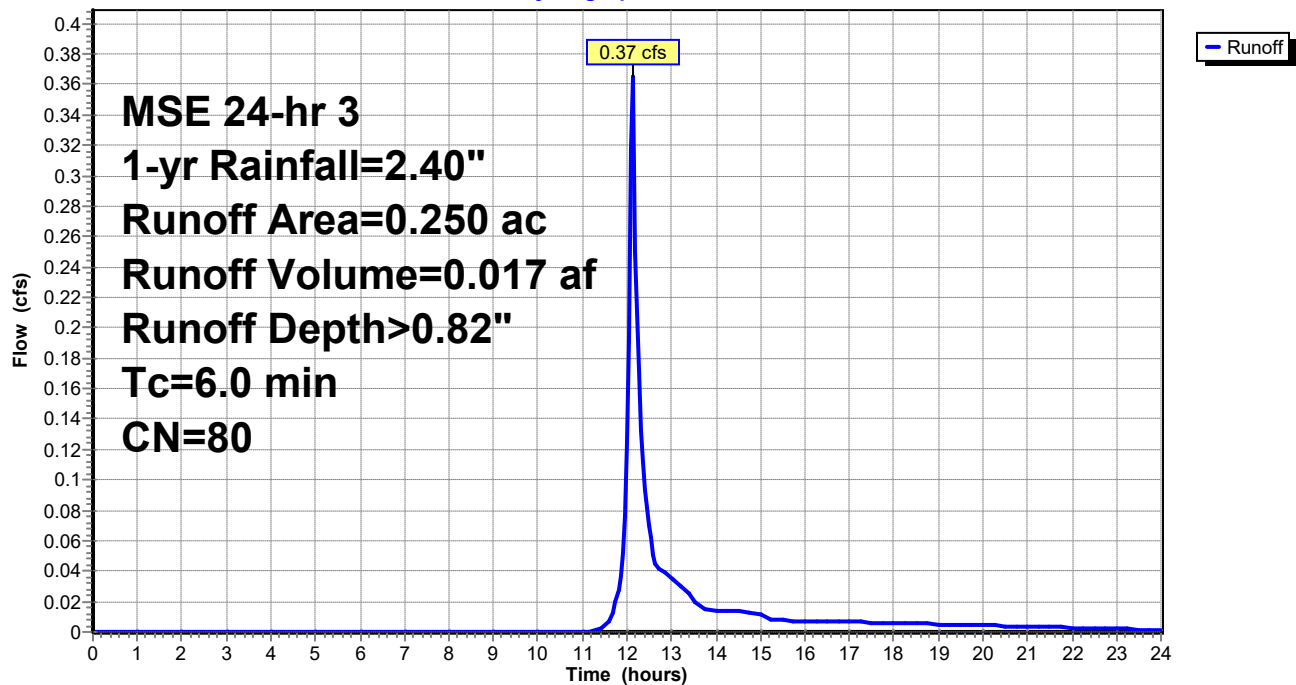
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 0.250	80	
0.250		100.00% Pervious Area

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

Subcatchment 19S: UD-2

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 21

Hydrograph for Subcatchment 19S: UD-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	1.94	0.52	0.04
0.25	0.00	0.00	0.00	13.25	1.99	0.55	0.03
0.50	0.00	0.00	0.00	13.50	2.02	0.58	0.02
0.75	0.01	0.00	0.00	13.75	2.05	0.59	0.01
1.00	0.01	0.00	0.00	14.00	2.07	0.61	0.01
1.25	0.01	0.00	0.00	14.25	2.09	0.62	0.01
1.50	0.01	0.00	0.00	14.50	2.11	0.63	0.01
1.75	0.02	0.00	0.00	14.75	2.13	0.65	0.01
2.00	0.02	0.00	0.00	15.00	2.15	0.66	0.01
2.25	0.03	0.00	0.00	15.25	2.16	0.67	0.01
2.50	0.03	0.00	0.00	15.50	2.18	0.67	0.01
2.75	0.03	0.00	0.00	15.75	2.19	0.68	0.01
3.00	0.04	0.00	0.00	16.00	2.20	0.69	0.01
3.25	0.05	0.00	0.00	16.25	2.21	0.69	0.01
3.50	0.05	0.00	0.00	16.50	2.22	0.70	0.01
3.75	0.06	0.00	0.00	16.75	2.23	0.71	0.01
4.00	0.06	0.00	0.00	17.00	2.24	0.71	0.01
4.25	0.07	0.00	0.00	17.25	2.25	0.72	0.01
4.50	0.08	0.00	0.00	17.50	2.26	0.73	0.01
4.75	0.08	0.00	0.00	17.75	2.27	0.73	0.01
5.00	0.09	0.00	0.00	18.00	2.28	0.74	0.01
5.25	0.10	0.00	0.00	18.25	2.29	0.74	0.01
5.50	0.11	0.00	0.00	18.50	2.29	0.75	0.01
5.75	0.11	0.00	0.00	18.75	2.30	0.76	0.01
6.00	0.12	0.00	0.00	19.00	2.31	0.76	0.01
6.25	0.13	0.00	0.00	19.25	2.32	0.76	0.00
6.50	0.14	0.00	0.00	19.50	2.32	0.77	0.00
6.75	0.15	0.00	0.00	19.75	2.33	0.77	0.00
7.00	0.16	0.00	0.00	20.00	2.34	0.78	0.00
7.25	0.17	0.00	0.00	20.25	2.34	0.78	0.00
7.50	0.18	0.00	0.00	20.50	2.35	0.79	0.00
7.75	0.19	0.00	0.00	20.75	2.35	0.79	0.00
8.00	0.20	0.00	0.00	21.00	2.36	0.79	0.00
8.25	0.21	0.00	0.00	21.25	2.37	0.80	0.00
8.50	0.22	0.00	0.00	21.50	2.37	0.80	0.00
8.75	0.24	0.00	0.00	21.75	2.37	0.80	0.00
9.00	0.25	0.00	0.00	22.00	2.38	0.81	0.00
9.25	0.27	0.00	0.00	22.25	2.38	0.81	0.00
9.50	0.29	0.00	0.00	22.50	2.39	0.81	0.00
9.75	0.31	0.00	0.00	22.75	2.39	0.81	0.00
10.00	0.33	0.00	0.00	23.00	2.39	0.81	0.00
10.25	0.35	0.00	0.00	23.25	2.39	0.82	0.00
10.50	0.38	0.00	0.00	23.50	2.40	0.82	0.00
10.75	0.41	0.00	0.00	23.75	2.40	0.82	0.00
11.00	0.46	0.00	0.00	24.00	2.40	0.82	0.00
11.25	0.52	0.00	0.00				
11.50	0.60	0.00	0.00				
11.75	0.74	0.02	0.02				
12.00	1.11	0.12	0.12				
12.25	1.66	0.37	0.17				
12.50	1.80	0.45	0.07				
12.75	1.88	0.49	0.04				

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 1-yr Rainfall=2.40"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 22

Summary for Pond 1P: Bio-Filtration Basin (BF-1)

Inflow Area = 5.080 ac, 0.00% Impervious, Inflow Depth > 1.52" for 1-yr event
 Inflow = 7.43 cfs @ 12.37 hrs, Volume= 0.642 af
 Outflow = 1.70 cfs @ 13.02 hrs, Volume= 0.622 af, Atten= 77%, Lag= 38.7 min
 Discarded = 0.13 cfs @ 13.02 hrs, Volume= 0.095 af
 Primary = 1.57 cfs @ 13.02 hrs, Volume= 0.527 af
 Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 171.84' @ 13.02 hrs Surf.Area= 0.167 ac Storage= 0.312 af

Plug-Flow detention time= 125.9 min calculated for 0.621 af (97% of inflow)
 Center-of-Mass det. time= 109.6 min (921.2 - 811.6)

Volume	Invert	Avail.Storage	Storage Description	
#1	168.00'	1.047 af	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (acres)	Voids (%)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.105	0.0	0.000	0.000
168.01	0.105	30.0	0.000	0.000
169.99	0.105	30.0	0.062	0.063
170.00	0.105	100.0	0.001	0.064
171.00	0.137	100.0	0.121	0.185
172.00	0.173	100.0	0.155	0.340
173.00	0.214	100.0	0.194	0.533
174.00	0.257	100.0	0.236	0.769
175.00	0.299	100.0	0.278	1.047

Device	Routing	Invert	Outlet Devices
#1	Primary	168.00'	15.0" Round Culvert L= 70.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 168.00' / 167.00' S= 0.0142 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Discarded	168.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 163.00'
#3	Device 1	168.50'	6.0" Round Underdrain L= 121.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 168.50' / 168.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 1	171.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	172.00'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#6	Device 1	173.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	174.00'	15.0' long + 5.5 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 23

Discarded OutFlow Max=0.13 cfs @ 13.02 hrs HW=171.83' (Free Discharge)

↳ **2=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=1.57 cfs @ 13.02 hrs HW=171.83' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 1.57 cfs of 10.59 cfs potential flow)

↳ **3=Underdrain** (Barrel Controls 0.85 cfs @ 4.34 fps)

↳ **4=Orifice/Grate** (Orifice Controls 0.72 cfs @ 3.68 fps)

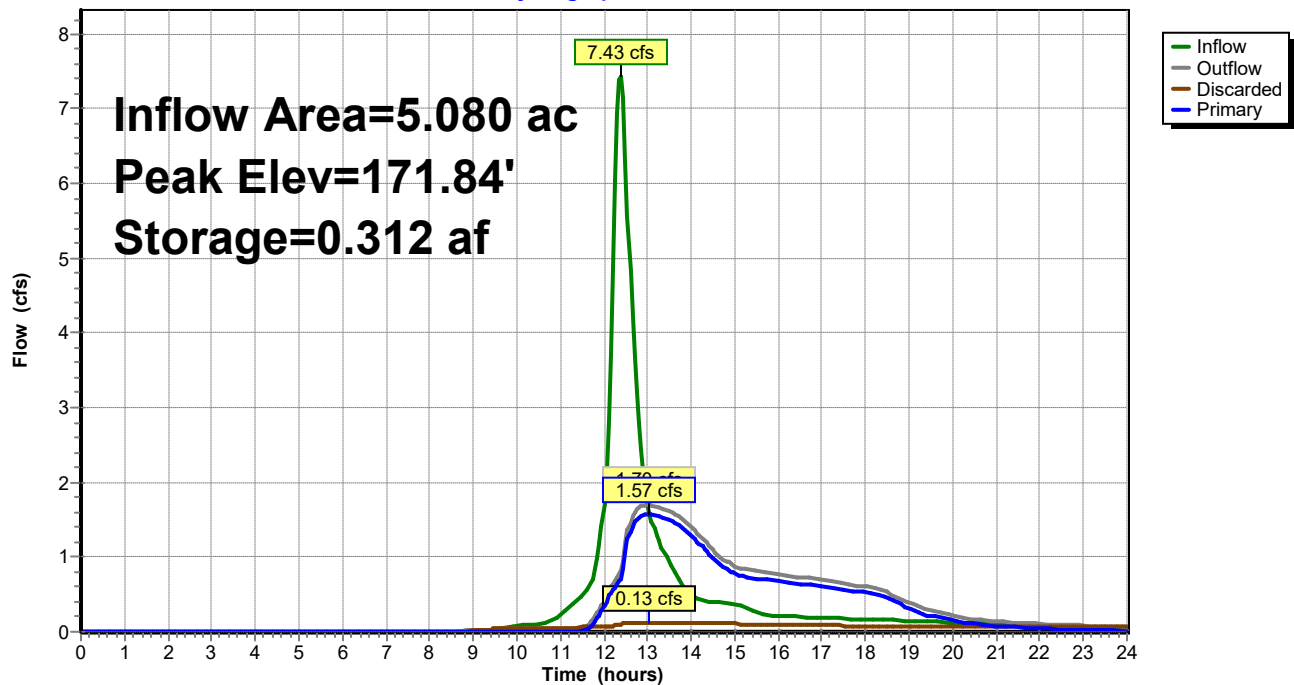
↳ **5=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

↳ **6=Orifice/Grate** (Controls 0.00 cfs)

↳ **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Bio-Filtration Basin (BF-1)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 1-yr Rainfall=2.40"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 24

Hydrograph for Pond 1P: Bio-Filtration Basin (BF-1)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	168.00	0.00	0.00	0.00
0.50	0.00	0.000	168.00	0.00	0.00	0.00
1.00	0.00	0.000	168.00	0.00	0.00	0.00
1.50	0.00	0.000	168.00	0.00	0.00	0.00
2.00	0.00	0.000	168.00	0.00	0.00	0.00
2.50	0.00	0.000	168.00	0.00	0.00	0.00
3.00	0.00	0.000	168.00	0.00	0.00	0.00
3.50	0.00	0.000	168.00	0.00	0.00	0.00
4.00	0.00	0.000	168.00	0.00	0.00	0.00
4.50	0.00	0.000	168.00	0.00	0.00	0.00
5.00	0.00	0.000	168.00	0.00	0.00	0.00
5.50	0.00	0.000	168.00	0.00	0.00	0.00
6.00	0.00	0.000	168.00	0.00	0.00	0.00
6.50	0.00	0.000	168.00	0.00	0.00	0.00
7.00	0.00	0.000	168.00	0.00	0.00	0.00
7.50	0.00	0.000	168.00	0.00	0.00	0.00
8.00	0.00	0.000	168.00	0.00	0.00	0.00
8.50	0.00	0.000	168.00	0.00	0.00	0.00
9.00	0.01	0.000	168.00	0.01	0.01	0.00
9.50	0.04	0.000	168.00	0.04	0.04	0.00
10.00	0.07	0.000	168.01	0.05	0.05	0.00
10.50	0.11	0.002	168.06	0.05	0.05	0.00
11.00	0.23	0.006	168.18	0.05	0.05	0.00
11.50	0.49	0.018	168.57	0.06	0.06	0.00
12.00	1.72	0.046	169.46	0.41	0.07	0.34
12.50	6.31	0.233	171.34	1.16	0.11	1.05
13.00	1.75	0.312	171.84	1.70	0.13	1.57
13.50	0.92	0.294	171.73	1.62	0.12	1.49
14.00	0.49	0.260	171.51	1.41	0.12	1.29
14.50	0.40	0.226	171.29	1.09	0.11	0.98
15.00	0.37	0.201	171.12	0.88	0.11	0.78
15.50	0.25	0.180	170.97	0.81	0.10	0.71
16.00	0.21	0.157	170.79	0.77	0.10	0.68
16.50	0.20	0.134	170.61	0.73	0.09	0.64
17.00	0.19	0.113	170.44	0.69	0.09	0.61
17.50	0.18	0.093	170.26	0.65	0.08	0.57
18.00	0.17	0.074	170.09	0.61	0.08	0.53
18.50	0.16	0.057	169.80	0.52	0.07	0.45
19.00	0.15	0.044	169.40	0.39	0.07	0.32
19.50	0.14	0.036	169.16	0.28	0.07	0.21
20.00	0.12	0.031	168.99	0.22	0.06	0.16
20.50	0.11	0.028	168.90	0.17	0.06	0.11
21.00	0.10	0.027	168.84	0.14	0.06	0.08
21.50	0.09	0.025	168.80	0.12	0.06	0.06
22.00	0.08	0.024	168.77	0.11	0.06	0.04
22.50	0.07	0.023	168.74	0.09	0.06	0.03
23.00	0.06	0.022	168.70	0.08	0.06	0.02
23.50	0.05	0.021	168.67	0.08	0.06	0.02
24.00	0.04	0.020	168.63	0.07	0.06	0.01

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 25

Stage-Discharge for Pond 1P: Bio-Filtration Basin (BF-1)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
168.00	0.00	0.00	0.00	173.20	12.82	0.18	12.64
168.10	0.05	0.05	0.00	173.30	12.96	0.18	12.78
168.20	0.06	0.06	0.00	173.40	13.10	0.19	12.91
168.30	0.06	0.06	0.00	173.50	13.24	0.19	13.05
168.40	0.06	0.06	0.00	173.60	13.37	0.19	13.18
168.50	0.06	0.06	0.00	173.70	13.51	0.20	13.31
168.60	0.06	0.06	0.00	173.80	13.64	0.20	13.44
168.70	0.08	0.06	0.02	173.90	13.78	0.21	13.57
168.80	0.12	0.06	0.06	174.00	13.91	0.21	13.70
168.90	0.17	0.06	0.11	174.10	15.35	0.21	15.13
169.00	0.22	0.06	0.16	174.20	17.98	0.22	17.76
169.10	0.27	0.06	0.20	174.30	21.51	0.22	21.29
169.20	0.29	0.07	0.23	174.40	25.87	0.23	25.65
169.30	0.34	0.07	0.28	174.50	30.97	0.23	30.74
169.40	0.39	0.07	0.32	174.60	36.81	0.23	36.58
169.50	0.43	0.07	0.36	174.70	43.07	0.24	42.84
169.60	0.46	0.07	0.39	174.80	49.91	0.24	49.67
169.70	0.49	0.07	0.42	174.90	57.70	0.25	57.46
169.80	0.52	0.07	0.45	175.00	66.19	0.25	65.94
169.90	0.55	0.07	0.48				
170.00	0.58	0.07	0.51				
170.10	0.61	0.08	0.53				
170.20	0.63	0.08	0.55				
170.30	0.66	0.08	0.58				
170.40	0.68	0.08	0.60				
170.50	0.71	0.09	0.62				
170.60	0.73	0.09	0.64				
170.70	0.75	0.09	0.66				
170.80	0.77	0.10	0.68				
170.90	0.80	0.10	0.70				
171.00	0.82	0.10	0.72				
171.10	0.87	0.10	0.76				
171.20	0.97	0.11	0.86				
171.30	1.11	0.11	1.00				
171.40	1.26	0.11	1.15				
171.50	1.39	0.12	1.27				
171.60	1.50	0.12	1.37				
171.70	1.59	0.12	1.47				
171.80	1.67	0.13	1.55				
171.90	1.75	0.13	1.62				
172.00	1.83	0.13	1.69				
172.10	2.21	0.14	2.07				
172.20	2.83	0.14	2.69				
172.30	3.61	0.14	3.47				
172.40	4.51	0.15	4.36				
172.50	5.51	0.15	5.36				
172.60	6.59	0.16	6.43				
172.70	7.75	0.16	7.59				
172.80	8.97	0.16	8.81				
172.90	10.25	0.17	10.09				
173.00	11.59	0.17	11.42				
173.10	12.67	0.17	12.50				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 26

Stage-Area-Storage for Pond 1P: Bio-Filtration Basin (BF-1)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
168.00	0.105	0.000	173.20	0.223	0.577
168.10	0.105	0.003	173.30	0.227	0.599
168.20	0.105	0.006	173.40	0.231	0.622
168.30	0.105	0.009	173.50	0.236	0.646
168.40	0.105	0.013	173.60	0.240	0.669
168.50	0.105	0.016	173.70	0.244	0.694
168.60	0.105	0.019	173.80	0.248	0.718
168.70	0.105	0.022	173.90	0.253	0.743
168.80	0.105	0.025	174.00	0.257	0.769
168.90	0.105	0.028	174.10	0.261	0.795
169.00	0.105	0.032	174.20	0.265	0.821
169.10	0.105	0.035	174.30	0.270	0.848
169.20	0.105	0.038	174.40	0.274	0.875
169.30	0.105	0.041	174.50	0.278	0.902
169.40	0.105	0.044	174.60	0.282	0.930
169.50	0.105	0.047	174.70	0.286	0.959
169.60	0.105	0.050	174.80	0.291	0.988
169.70	0.105	0.054	174.90	0.295	1.017
169.80	0.105	0.057	175.00	0.299	1.047
169.90	0.105	0.060			
170.00	0.105	0.064			
170.10	0.108	0.074			
170.20	0.111	0.085			
170.30	0.115	0.097			
170.40	0.118	0.108			
170.50	0.121	0.120			
170.60	0.124	0.132			
170.70	0.127	0.145			
170.80	0.131	0.158			
170.90	0.134	0.171			
171.00	0.137	0.185			
171.10	0.141	0.199			
171.20	0.144	0.213			
171.30	0.148	0.227			
171.40	0.151	0.242			
171.50	0.155	0.258			
171.60	0.159	0.273			
171.70	0.162	0.289			
171.80	0.166	0.306			
171.90	0.169	0.323			
172.00	0.173	0.340			
172.10	0.177	0.357			
172.20	0.181	0.375			
172.30	0.185	0.393			
172.40	0.189	0.412			
172.50	0.194	0.431			
172.60	0.198	0.451			
172.70	0.202	0.471			
172.80	0.206	0.491			
172.90	0.210	0.512			
173.00	0.214	0.533			
173.10	0.218	0.555			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 1-yr Rainfall=2.40"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 27

Summary for Pond 2P: Wet Pond (WP-2A)

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=51)

Inflow Area = 10.131 ac, 0.00% Impervious, Inflow Depth > 1.43" for 1-yr event
 Inflow = 19.20 cfs @ 12.19 hrs, Volume= 1.208 af
 Outflow = 12.25 cfs @ 12.19 hrs, Volume= 1.203 af, Atten= 36%, Lag= 0.4 min
 Primary = 12.25 cfs @ 12.19 hrs, Volume= 1.203 af
 Routed to Pond 3P : Bio-Filtration Basin (BF-2B)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 136.09' @ 12.79 hrs Surf.Area= 0.144 ac Storage= 0.246 af

Plug-Flow detention time= 36.7 min calculated for 1.203 af (100% of inflow)
 Center-of-Mass det. time= 33.8 min (836.1 - 802.2)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	0.775 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
134.00	0.087	0.000	0.000
135.00	0.118	0.102	0.102
136.00	0.142	0.130	0.233
137.00	0.167	0.155	0.387
138.00	0.194	0.180	0.568
139.00	0.221	0.208	0.775

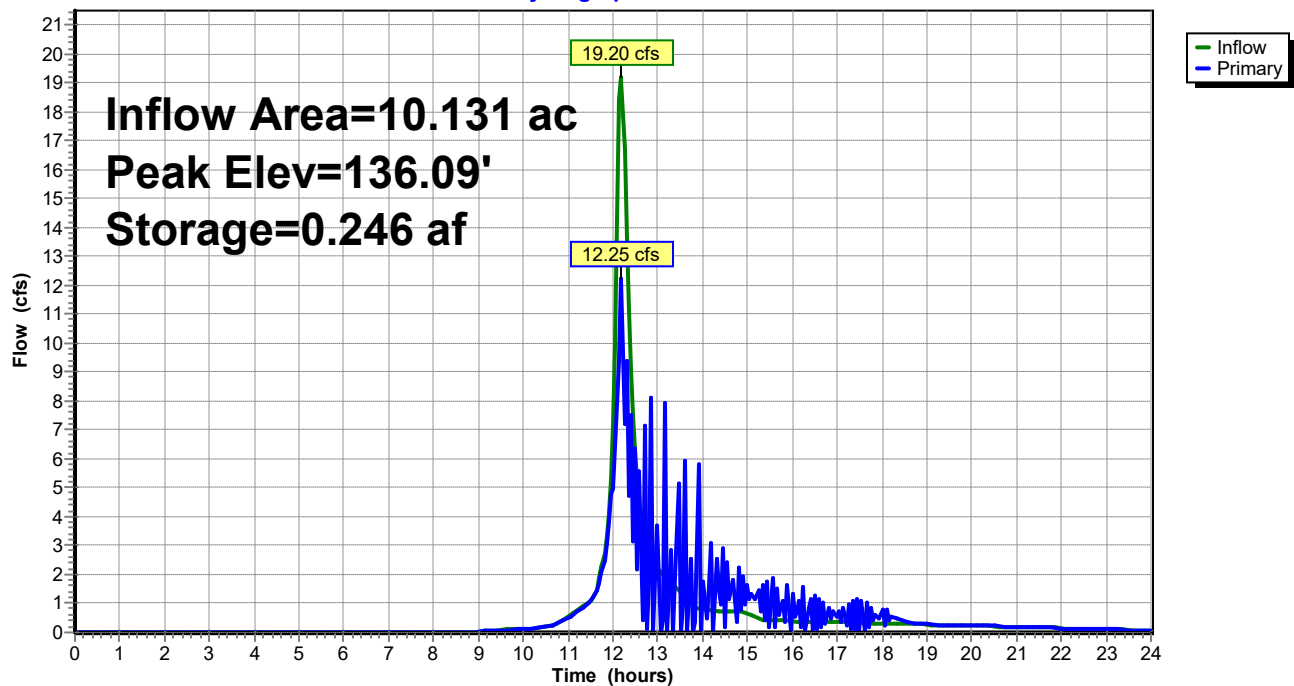
Device	Routing	Invert	Outlet Devices
#1	Primary	134.00'	43.0' long + 4.0 ' SideZ x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 12.19 hrs HW=135.00' TW=135.28' (Dynamic Tailwater)

↑1=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Wet Pond (WP-2A)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 1-yr Rainfall=2.40"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 29

Hydrograph for Pond 2P: Wet Pond (WP-2A)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	134.00	0.00
0.50	0.00	0.000	134.00	0.00
1.00	0.00	0.000	134.00	0.00
1.50	0.00	0.000	134.00	0.00
2.00	0.00	0.000	134.00	0.00
2.50	0.00	0.000	134.00	0.00
3.00	0.00	0.000	134.00	0.00
3.50	0.00	0.000	134.00	0.00
4.00	0.00	0.000	134.00	0.00
4.50	0.00	0.000	134.00	0.00
5.00	0.00	0.000	134.00	0.00
5.50	0.00	0.000	134.00	0.00
6.00	0.00	0.000	134.00	0.00
6.50	0.00	0.000	134.00	0.00
7.00	0.00	0.000	134.00	0.00
7.50	0.00	0.000	134.00	0.00
8.00	0.00	0.000	134.00	0.00
8.50	0.01	0.000	134.00	0.00
9.00	0.02	0.000	134.00	0.02
9.50	0.08	0.001	134.01	0.07
10.00	0.13	0.001	134.01	0.13
10.50	0.19	0.001	134.01	0.18
11.00	0.54	0.003	134.03	0.50
11.50	1.11	0.004	134.05	1.07
12.00	7.12	0.017	134.19	4.99
12.50	6.28	0.230	135.98	6.36
13.00	2.20	0.234	136.01	7.40
13.50	1.41	0.205	135.81	0.00
14.00	0.79	0.171	135.55	0.00
14.50	0.74	0.134	135.26	0.16
15.00	0.69	0.103	135.01	1.65
15.50	0.42	0.076	134.77	0.20
16.00	0.40	0.056	134.58	1.30
16.50	0.38	0.041	134.44	1.30
17.00	0.36	0.030	134.33	0.54
17.50	0.34	0.020	134.22	0.01
18.00	0.32	0.011	134.12	0.80
18.50	0.29	0.002	134.02	0.39
19.00	0.27	0.002	134.02	0.28
19.50	0.25	0.002	134.02	0.26
20.00	0.23	0.002	134.02	0.23
20.50	0.21	0.001	134.02	0.21
21.00	0.19	0.001	134.02	0.19
21.50	0.17	0.001	134.01	0.17
22.00	0.15	0.001	134.01	0.15
22.50	0.13	0.001	134.01	0.13
23.00	0.11	0.001	134.01	0.11
23.50	0.09	0.001	134.01	0.09
24.00	0.06	0.001	134.01	0.07

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 30

Stage-Discharge for Pond 2P: Wet Pond (WP-2A)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
134.00	0.00	136.60	572.31
134.05	1.14	136.65	590.73
134.10	3.25	136.70	609.42
134.15	5.99	136.75	628.36
134.20	9.25	136.80	647.57
134.25	13.17	136.85	667.04
134.30	17.63	136.90	686.77
134.35	22.61	136.95	706.77
134.40	28.12	137.00	727.02
134.45	34.31	137.05	747.82
134.50	41.08	137.10	768.90
134.55	48.43	137.15	790.26
134.60	56.37	137.20	811.89
134.65	63.67	137.25	833.80
134.70	71.27	137.30	856.00
134.75	79.18	137.35	878.47
134.80	87.37	137.40	901.22
134.85	96.02	137.45	924.26
134.90	104.98	137.50	947.57
134.95	114.25	137.55	971.53
135.00	123.82	137.60	995.80
135.05	133.55	137.65	1,020.36
135.10	143.57	137.70	1,045.23
135.15	153.85	137.75	1,070.40
135.20	164.40	137.80	1,095.87
135.25	175.05	137.85	1,121.65
135.30	185.94	137.90	1,147.73
135.35	197.07	137.95	1,174.12
135.40	208.42	138.00	1,200.82
135.45	220.43	138.05	1,228.28
135.50	232.71	138.10	1,256.07
135.55	245.26	138.15	1,284.19
135.60	258.08	138.20	1,312.64
135.65	271.17	138.25	1,341.43
135.70	284.53	138.30	1,370.55
135.75	298.15	138.35	1,400.00
135.80	312.05	138.40	1,429.79
135.85	326.20	138.45	1,459.92
135.90	340.63	138.50	1,490.39
135.95	355.32	138.55	1,521.76
136.00	370.27	138.60	1,553.49
136.05	385.63	138.65	1,585.58
136.10	401.27	138.70	1,618.04
136.15	417.18	138.75	1,650.87
136.20	433.36	138.80	1,684.07
136.25	449.82	138.85	1,717.65
136.30	466.56	138.90	1,751.59
136.35	483.57	138.95	1,785.91
136.40	500.85	139.00	1,820.61
136.45	518.41		
136.50	536.24		
136.55	554.14		

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 31

Stage-Area-Storage for Pond 2P: Wet Pond (WP-2A)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
134.00	0.087	0.000	136.60	0.157	0.322
134.05	0.089	0.004	136.65	0.158	0.330
134.10	0.090	0.009	136.70	0.159	0.338
134.15	0.092	0.013	136.75	0.161	0.346
134.20	0.093	0.018	136.80	0.162	0.354
134.25	0.095	0.023	136.85	0.163	0.362
134.30	0.096	0.027	136.90	0.165	0.370
134.35	0.098	0.032	136.95	0.166	0.379
134.40	0.099	0.037	137.00	0.167	0.387
134.45	0.101	0.042	137.05	0.168	0.395
134.50	0.102	0.047	137.10	0.170	0.404
134.55	0.104	0.053	137.15	0.171	0.412
134.60	0.106	0.058	137.20	0.172	0.421
134.65	0.107	0.063	137.25	0.174	0.430
134.70	0.109	0.068	137.30	0.175	0.438
134.75	0.110	0.074	137.35	0.176	0.447
134.80	0.112	0.080	137.40	0.178	0.456
134.85	0.113	0.085	137.45	0.179	0.465
134.90	0.115	0.091	137.50	0.180	0.474
134.95	0.116	0.097	137.55	0.182	0.483
135.00	0.118	0.102	137.60	0.183	0.492
135.05	0.119	0.108	137.65	0.185	0.501
135.10	0.120	0.114	137.70	0.186	0.511
135.15	0.122	0.120	137.75	0.187	0.520
135.20	0.123	0.127	137.80	0.189	0.529
135.25	0.124	0.133	137.85	0.190	0.539
135.30	0.125	0.139	137.90	0.191	0.548
135.35	0.126	0.145	137.95	0.193	0.558
135.40	0.128	0.152	138.00	0.194	0.568
135.45	0.129	0.158	138.05	0.195	0.577
135.50	0.130	0.164	138.10	0.197	0.587
135.55	0.131	0.171	138.15	0.198	0.597
135.60	0.132	0.178	138.20	0.199	0.607
135.65	0.134	0.184	138.25	0.201	0.617
135.70	0.135	0.191	138.30	0.202	0.627
135.75	0.136	0.198	138.35	0.203	0.637
135.80	0.137	0.205	138.40	0.205	0.647
135.85	0.138	0.211	138.45	0.206	0.658
135.90	0.140	0.218	138.50	0.208	0.668
135.95	0.141	0.225	138.55	0.209	0.678
136.00	0.142	0.233	138.60	0.210	0.689
136.05	0.143	0.240	138.65	0.212	0.699
136.10	0.144	0.247	138.70	0.213	0.710
136.15	0.146	0.254	138.75	0.214	0.721
136.20	0.147	0.261	138.80	0.216	0.731
136.25	0.148	0.269	138.85	0.217	0.742
136.30	0.150	0.276	138.90	0.218	0.753
136.35	0.151	0.284	138.95	0.220	0.764
136.40	0.152	0.291	139.00	0.221	0.775
136.45	0.153	0.299			
136.50	0.155	0.307			
136.55	0.156	0.314			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 1-yr Rainfall=2.40"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 32

Summary for Pond 3P: Bio-Filtration Basin (BF-2B)

[80] Warning: Exceeded Pond 2P by 0.29' @ 12.15 hrs (91.90 cfs 11.176 af)

Inflow Area = 10.131 ac, 0.00% Impervious, Inflow Depth > 1.42" for 1-yr event
 Inflow = 12.25 cfs @ 12.19 hrs, Volume= 1.203 af
 Outflow = 3.26 cfs @ 12.89 hrs, Volume= 1.187 af, Atten= 73%, Lag= 41.5 min
 Discarded = 0.10 cfs @ 12.89 hrs, Volume= 0.072 af
 Primary = 3.15 cfs @ 12.89 hrs, Volume= 1.115 af
 Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 136.10' @ 12.89 hrs Surf.Area= 0.148 ac Storage= 0.332 af

Plug-Flow detention time= 70.7 min calculated for 1.184 af (98% of inflow)
 Center-of-Mass det. time= 63.6 min (899.7 - 836.1)

Volume	Invert	Avail.Storage	Storage Description
#1	131.50'	0.868 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Voids (%)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
131.50	0.069	0.0	0.000	0.000
131.51	0.069	30.0	0.000	0.000
133.49	0.069	30.0	0.041	0.041
133.50	0.069	100.0	0.001	0.042
134.00	0.085	100.0	0.038	0.080
135.00	0.121	100.0	0.103	0.183
136.00	0.145	100.0	0.133	0.316
137.00	0.170	100.0	0.157	0.474
138.00	0.196	100.0	0.183	0.657
139.00	0.226	100.0	0.211	0.868

Device	Routing	Invert	Outlet Devices
#1	Primary	129.50'	24.0" Round Culvert L= 70.1' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.50' / 129.15' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Discarded	131.50'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 125.00'
#3	Device 1	132.00'	6.0" Round Underdrain L= 91.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 132.00' / 132.00' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 1	134.25'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	136.10'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#6	Device 1	137.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	138.00'	10.0' long + 4.0' /' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 33

Discarded OutFlow Max=0.10 cfs @ 12.89 hrs HW=136.09' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.10 cfs)

Primary OutFlow Max=3.14 cfs @ 12.89 hrs HW=136.09' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 3.14 cfs of 39.90 cfs potential flow)

↑ **3=Underdrain** (Barrel Controls 1.08 cfs @ 5.50 fps)

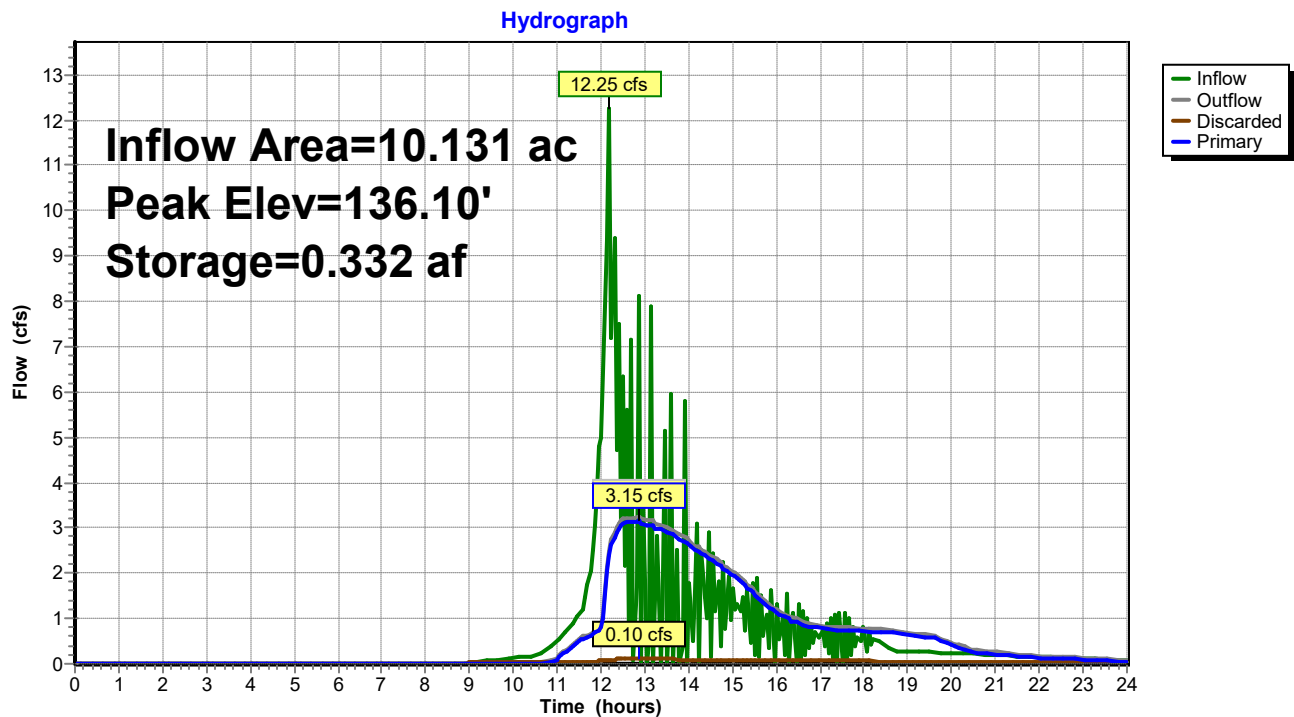
↑ **4=Orifice/Grate** (Orifice Controls 2.06 cfs @ 5.91 fps)

↑ **5=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

↑ **6=Orifice/Grate** (Controls 0.00 cfs)

↑ **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Bio-Filtration Basin (BF-2B)



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 1-yr Rainfall=2.40"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 34

Hydrograph for Pond 3P: Bio-Filtration Basin (BF-2B)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	131.50	0.00	0.00	0.00
0.50	0.00	0.000	131.50	0.00	0.00	0.00
1.00	0.00	0.000	131.50	0.00	0.00	0.00
1.50	0.00	0.000	131.50	0.00	0.00	0.00
2.00	0.00	0.000	131.50	0.00	0.00	0.00
2.50	0.00	0.000	131.50	0.00	0.00	0.00
3.00	0.00	0.000	131.50	0.00	0.00	0.00
3.50	0.00	0.000	131.50	0.00	0.00	0.00
4.00	0.00	0.000	131.50	0.00	0.00	0.00
4.50	0.00	0.000	131.50	0.00	0.00	0.00
5.00	0.00	0.000	131.50	0.00	0.00	0.00
5.50	0.00	0.000	131.50	0.00	0.00	0.00
6.00	0.00	0.000	131.50	0.00	0.00	0.00
6.50	0.00	0.000	131.50	0.00	0.00	0.00
7.00	0.00	0.000	131.50	0.00	0.00	0.00
7.50	0.00	0.000	131.50	0.00	0.00	0.00
8.00	0.00	0.000	131.50	0.00	0.00	0.00
8.50	0.00	0.000	131.50	0.00	0.00	0.00
9.00	0.02	0.000	131.50	0.02	0.02	0.00
9.50	0.07	0.000	131.52	0.03	0.03	0.00
10.00	0.13	0.003	131.65	0.04	0.04	0.00
10.50	0.18	0.008	131.89	0.04	0.04	0.00
11.00	0.50	0.018	132.39	0.15	0.04	0.11
11.50	1.07	0.036	133.23	0.53	0.04	0.49
12.00	4.99	0.111	134.33	0.86	0.06	0.80
12.50	6.36	0.320	136.03	3.19	0.10	3.09
13.00	7.40	0.320	136.02	3.19	0.10	3.09
13.50	0.00	0.294	135.84	3.03	0.10	2.93
14.00	0.00	0.250	135.52	2.71	0.09	2.62
14.50	0.16	0.213	135.24	2.39	0.09	2.31
15.00	1.65	0.181	134.98	2.04	0.08	1.96
15.50	0.20	0.154	134.75	1.60	0.08	1.52
16.00	1.30	0.134	134.56	1.19	0.07	1.12
16.50	1.30	0.120	134.43	0.97	0.07	0.90
17.00	0.54	0.109	134.32	0.85	0.06	0.78
17.50	0.01	0.099	134.21	0.81	0.06	0.75
18.00	0.80	0.090	134.11	0.78	0.06	0.72
18.50	0.39	0.079	133.99	0.75	0.06	0.69
19.00	0.28	0.061	133.77	0.69	0.05	0.64
19.50	0.26	0.045	133.55	0.63	0.05	0.58
20.00	0.23	0.032	133.05	0.47	0.04	0.42
20.50	0.21	0.025	132.73	0.31	0.04	0.27
21.00	0.19	0.022	132.57	0.26	0.04	0.22
21.50	0.17	0.020	132.48	0.21	0.04	0.17
22.00	0.15	0.019	132.42	0.17	0.04	0.13
22.50	0.13	0.018	132.38	0.15	0.04	0.11
23.00	0.11	0.017	132.35	0.13	0.04	0.09
23.50	0.09	0.017	132.31	0.11	0.04	0.07
24.00	0.07	0.016	132.26	0.09	0.04	0.05

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 35

Stage-Discharge for Pond 3P: Bio-Filtration Basin (BF-2B)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
131.50	0.00	0.00	0.00	136.70	8.11	0.12	7.99
131.60	0.04	0.04	0.00	136.80	9.28	0.12	9.16
131.70	0.04	0.04	0.00	136.90	10.52	0.12	10.40
131.80	0.04	0.04	0.00	137.00	11.82	0.13	11.69
131.90	0.04	0.04	0.00	137.10	14.47	0.13	14.34
132.00	0.04	0.04	0.00	137.20	18.25	0.13	18.12
132.10	0.04	0.04	0.00	137.30	22.77	0.13	22.63
132.20	0.06	0.04	0.03	137.40	27.89	0.13	27.76
132.30	0.10	0.04	0.07	137.50	33.54	0.14	33.41
132.40	0.16	0.04	0.12	137.60	39.66	0.14	39.52
132.50	0.22	0.04	0.18	137.70	46.07	0.14	45.93
132.60	0.27	0.04	0.23	137.80	46.42	0.14	46.28
132.70	0.30	0.04	0.25	137.90	46.77	0.15	46.62
132.80	0.35	0.04	0.31	138.00	47.12	0.15	46.97
132.90	0.40	0.04	0.36	138.10	48.27	0.15	48.12
133.00	0.45	0.04	0.40	138.20	50.17	0.15	50.02
133.10	0.48	0.04	0.44	138.30	52.69	0.16	52.53
133.20	0.52	0.04	0.48	138.40	55.78	0.16	55.63
133.30	0.55	0.04	0.51	138.50	59.60	0.16	59.44
133.40	0.59	0.04	0.54	138.60	64.10	0.17	63.94
133.50	0.62	0.05	0.57	138.70	68.80	0.17	68.63
133.60	0.65	0.05	0.60	138.80	73.98	0.17	73.81
133.70	0.67	0.05	0.62	138.90	79.66	0.17	79.49
133.80	0.70	0.05	0.65	139.00	85.83	0.18	85.66
133.90	0.73	0.05	0.67				
134.00	0.75	0.06	0.70				
134.10	0.78	0.06	0.72				
134.20	0.80	0.06	0.74				
134.30	0.84	0.06	0.77				
134.40	0.93	0.07	0.86				
134.50	1.08	0.07	1.01				
134.60	1.27	0.07	1.20				
134.70	1.49	0.07	1.42				
134.80	1.72	0.08	1.64				
134.90	1.91	0.08	1.83				
135.00	2.07	0.08	1.99				
135.10	2.21	0.08	2.13				
135.20	2.34	0.09	2.26				
135.30	2.46	0.09	2.38				
135.40	2.58	0.09	2.49				
135.50	2.69	0.09	2.60				
135.60	2.79	0.09	2.70				
135.70	2.89	0.10	2.79				
135.80	2.99	0.10	2.89				
135.90	3.08	0.10	2.98				
136.00	3.17	0.10	3.07				
136.10	3.26	0.10	3.15				
136.20	3.65	0.11	3.54				
136.30	4.29	0.11	4.18				
136.40	5.08	0.11	4.97				
136.50	6.00	0.11	5.88				
136.60	7.01	0.12	6.89				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 36

Stage-Area-Storage for Pond 3P: Bio-Filtration Basin (BF-2B)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
131.50	0.069	0.000	136.70	0.162	0.424
131.60	0.069	0.002	136.80	0.165	0.440
131.70	0.069	0.004	136.90	0.168	0.457
131.80	0.069	0.006	137.00	0.170	0.474
131.90	0.069	0.008	137.10	0.173	0.491
132.00	0.069	0.010	137.20	0.175	0.508
132.10	0.069	0.012	137.30	0.178	0.526
132.20	0.069	0.014	137.40	0.180	0.544
132.30	0.069	0.017	137.50	0.183	0.562
132.40	0.069	0.019	137.60	0.186	0.581
132.50	0.069	0.021	137.70	0.188	0.599
132.60	0.069	0.023	137.80	0.191	0.618
132.70	0.069	0.025	137.90	0.193	0.637
132.80	0.069	0.027	138.00	0.196	0.657
132.90	0.069	0.029	138.10	0.199	0.677
133.00	0.069	0.031	138.20	0.202	0.697
133.10	0.069	0.033	138.30	0.205	0.717
133.20	0.069	0.035	138.40	0.208	0.738
133.30	0.069	0.037	138.50	0.211	0.759
133.40	0.069	0.039	138.60	0.214	0.780
133.50	0.069	0.042	138.70	0.217	0.801
133.60	0.072	0.049	138.80	0.220	0.823
133.70	0.075	0.056	138.90	0.223	0.845
133.80	0.079	0.064	139.00	0.226	0.868
133.90	0.082	0.072			
134.00	0.085	0.080			
134.10	0.089	0.089			
134.20	0.092	0.098			
134.30	0.096	0.108			
134.40	0.099	0.117			
134.50	0.103	0.127			
134.60	0.107	0.138			
134.70	0.110	0.149			
134.80	0.114	0.160			
134.90	0.117	0.171			
135.00	0.121	0.183			
135.10	0.123	0.196			
135.20	0.126	0.208			
135.30	0.128	0.221			
135.40	0.131	0.234			
135.50	0.133	0.247			
135.60	0.135	0.260			
135.70	0.138	0.274			
135.80	0.140	0.288			
135.90	0.143	0.302			
136.00	0.145	0.316			
136.10	0.147	0.331			
136.20	0.150	0.346			
136.30	0.153	0.361			
136.40	0.155	0.376			
136.50	0.157	0.392			
136.60	0.160	0.408			

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 37

Summary for Pond 5P: Wet Pond (WP-3)

Inflow Area = 7.021 ac, 0.00% Impervious, Inflow Depth > 1.04" for 1-yr event
Inflow = 6.70 cfs @ 12.41 hrs, Volume= 0.607 af
Outflow = 1.04 cfs @ 13.52 hrs, Volume= 0.501 af, Atten= 84%, Lag= 66.6 min
Primary = 1.04 cfs @ 13.52 hrs, Volume= 0.501 af
Routed to Link 6L : Total Discharge North

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 167.06' @ 13.52 hrs Surf.Area= 0.225 ac Storage= 0.349 af

Plug-Flow detention time= 274.0 min calculated for 0.501 af (83% of inflow)
Center-of-Mass det. time= 212.4 min (1,046.3 - 833.9)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	0.931 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
165.00	0.119	0.000	0.000
166.00	0.165	0.142	0.142
167.00	0.221	0.193	0.335
168.00	0.289	0.255	0.590
169.00	0.393	0.341	0.931

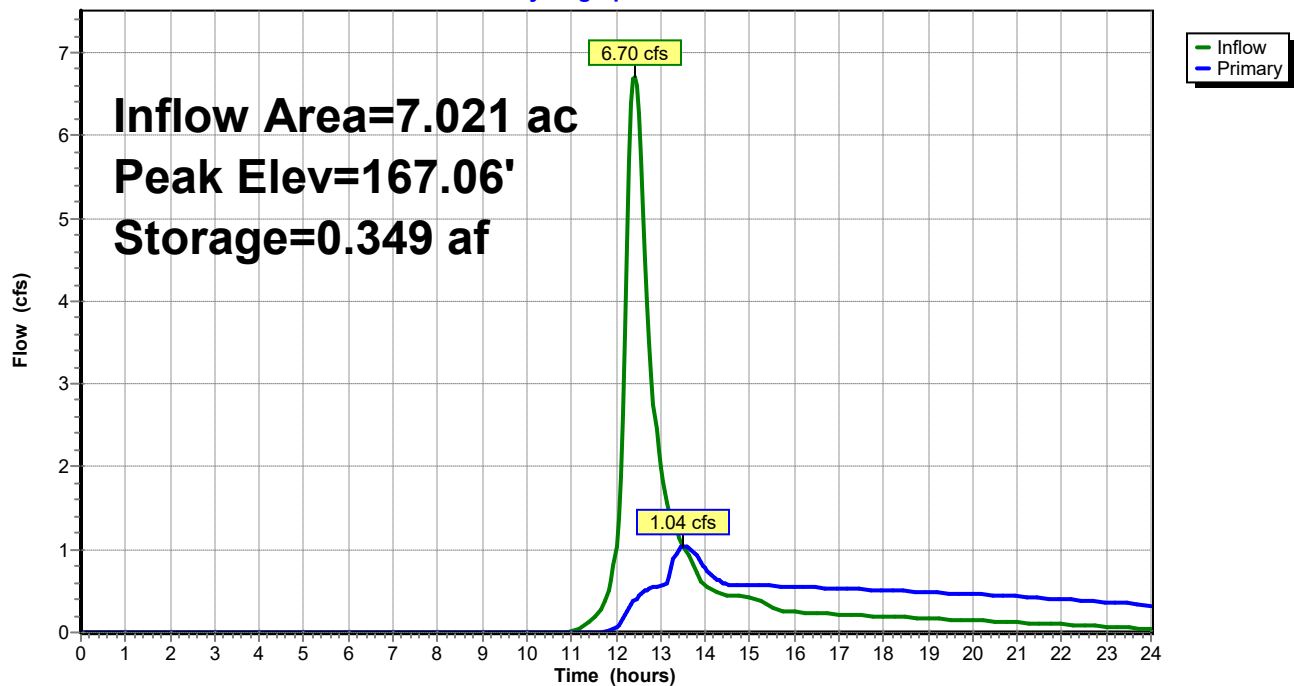
Device	Routing	Invert	Outlet Devices
#1	Primary	162.50'	24.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 162.50' / 161.50' S= 0.0182 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	165.00'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	167.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	168.00'	20.0' long + 4.0 ' SideZ x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.04 cfs @ 13.52 hrs HW=167.06' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 1.04 cfs of 28.54 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.58 cfs @ 6.63 fps)
3=Orifice/Grate (Weir Controls 0.46 cfs @ 0.81 fps)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: Wet Pond (WP-3)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 1-yr Rainfall=2.40"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 39

Hydrograph for Pond 5P: Wet Pond (WP-3)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	165.00	0.00
0.50	0.00	0.000	165.00	0.00
1.00	0.00	0.000	165.00	0.00
1.50	0.00	0.000	165.00	0.00
2.00	0.00	0.000	165.00	0.00
2.50	0.00	0.000	165.00	0.00
3.00	0.00	0.000	165.00	0.00
3.50	0.00	0.000	165.00	0.00
4.00	0.00	0.000	165.00	0.00
4.50	0.00	0.000	165.00	0.00
5.00	0.00	0.000	165.00	0.00
5.50	0.00	0.000	165.00	0.00
6.00	0.00	0.000	165.00	0.00
6.50	0.00	0.000	165.00	0.00
7.00	0.00	0.000	165.00	0.00
7.50	0.00	0.000	165.00	0.00
8.00	0.00	0.000	165.00	0.00
8.50	0.00	0.000	165.00	0.00
9.00	0.00	0.000	165.00	0.00
9.50	0.00	0.000	165.00	0.00
10.00	0.00	0.000	165.00	0.00
10.50	0.00	0.000	165.00	0.00
11.00	0.02	0.000	165.00	0.00
11.50	0.17	0.003	165.03	0.00
12.00	1.04	0.020	165.17	0.06
12.50	6.26	0.189	166.27	0.44
13.00	1.99	0.322	166.94	0.56
13.50	1.06	0.349	167.06	1.04
14.00	0.57	0.343	167.04	0.78
14.50	0.45	0.336	167.00	0.58
15.00	0.42	0.330	166.98	0.57
15.50	0.30	0.323	166.94	0.56
16.00	0.24	0.310	166.89	0.55
16.50	0.23	0.298	166.83	0.54
17.00	0.22	0.285	166.77	0.53
17.50	0.21	0.272	166.70	0.52
18.00	0.19	0.259	166.64	0.51
18.50	0.18	0.246	166.57	0.50
19.00	0.17	0.232	166.50	0.49
19.50	0.16	0.219	166.44	0.47
20.00	0.15	0.206	166.37	0.46
20.50	0.13	0.193	166.30	0.45
21.00	0.12	0.180	166.22	0.43
21.50	0.11	0.168	166.15	0.42
22.00	0.10	0.155	166.08	0.40
22.50	0.08	0.142	166.00	0.38
23.00	0.07	0.130	165.93	0.37
23.50	0.06	0.118	165.85	0.35
24.00	0.04	0.106	165.77	0.33

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 40

Stage-Discharge for Pond 5P: Wet Pond (WP-3)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
165.00	0.00	166.04	0.39	167.08	1.28	168.12	34.78
165.02	0.00	166.06	0.40	167.10	1.56	168.14	35.45
165.04	0.00	166.08	0.40	167.12	1.87	168.16	36.17
165.06	0.01	166.10	0.41	167.14	2.20	168.18	36.94
165.08	0.02	166.12	0.41	167.16	2.57	168.20	37.74
165.10	0.02	166.14	0.41	167.18	2.95	168.22	38.59
165.12	0.03	166.16	0.42	167.20	3.36	168.24	39.49
165.14	0.04	166.18	0.42	167.22	3.78	168.26	40.42
165.16	0.06	166.20	0.43	167.24	4.23	168.28	41.39
165.18	0.07	166.22	0.43	167.26	4.69	168.30	42.41
165.20	0.08	166.24	0.44	167.28	5.18	168.32	43.45
165.22	0.10	166.26	0.44	167.30	5.68	168.34	44.54
165.24	0.11	166.28	0.44	167.32	6.20	168.36	45.66
165.26	0.13	166.30	0.45	167.34	6.73	168.38	46.82
165.28	0.14	166.32	0.45	167.36	7.28	168.40	48.02
165.30	0.15	166.34	0.46	167.38	7.84	168.42	49.24
165.32	0.17	166.36	0.46	167.40	8.42	168.44	50.49
165.34	0.17	166.38	0.46	167.42	9.02	168.46	51.78
165.36	0.18	166.40	0.47	167.44	9.63	168.48	53.09
165.38	0.19	166.42	0.47	167.46	10.25	168.50	54.44
165.40	0.20	166.44	0.47	167.48	10.89	168.52	55.83
165.42	0.21	166.46	0.48	167.50	11.54	168.54	57.24
165.44	0.22	166.48	0.48	167.52	12.20	168.56	58.68
165.46	0.23	166.50	0.49	167.54	12.88	168.58	60.16
165.48	0.24	166.52	0.49	167.56	13.57	168.60	61.67
165.50	0.24	166.54	0.49	167.58	14.27	168.62	63.14
165.52	0.25	166.56	0.50	167.60	14.98	168.64	64.64
165.54	0.26	166.58	0.50	167.62	15.70	168.66	66.16
165.56	0.26	166.60	0.50	167.64	16.44	168.68	67.70
165.58	0.27	166.62	0.51	167.66	17.19	168.70	69.27
165.60	0.28	166.64	0.51	167.68	17.95	168.72	70.86
165.62	0.28	166.66	0.51	167.70	18.72	168.74	72.47
165.64	0.29	166.68	0.52	167.72	19.50	168.76	74.11
165.66	0.30	166.70	0.52	167.74	20.29	168.78	75.76
165.68	0.30	166.72	0.52	167.76	21.10	168.80	77.44
165.70	0.31	166.74	0.53	167.78	21.91	168.82	79.22
165.72	0.31	166.76	0.53	167.80	22.73	168.84	81.03
165.74	0.32	166.78	0.53	167.82	23.57	168.86	82.87
165.76	0.32	166.80	0.54	167.84	24.41	168.88	84.73
165.78	0.33	166.82	0.54	167.86	25.27	168.90	86.63
165.80	0.33	166.84	0.54	167.88	26.13	168.92	88.55
165.82	0.34	166.86	0.55	167.90	27.01	168.94	90.49
165.84	0.34	166.88	0.55	167.92	27.89	168.96	92.46
165.86	0.35	166.90	0.55	167.94	28.79	168.98	94.46
165.88	0.35	166.92	0.56	167.96	29.69	169.00	96.49
165.90	0.36	166.94	0.56	167.98	30.60		
165.92	0.36	166.96	0.56	168.00	31.53		
165.94	0.37	166.98	0.57	168.02	32.31		
165.96	0.37	167.00	0.57	168.04	32.66		
165.98	0.38	167.02	0.66	168.06	33.10		
166.00	0.38	167.04	0.82	168.08	33.60		
166.02	0.39	167.06	1.03	168.10	34.17		

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 41

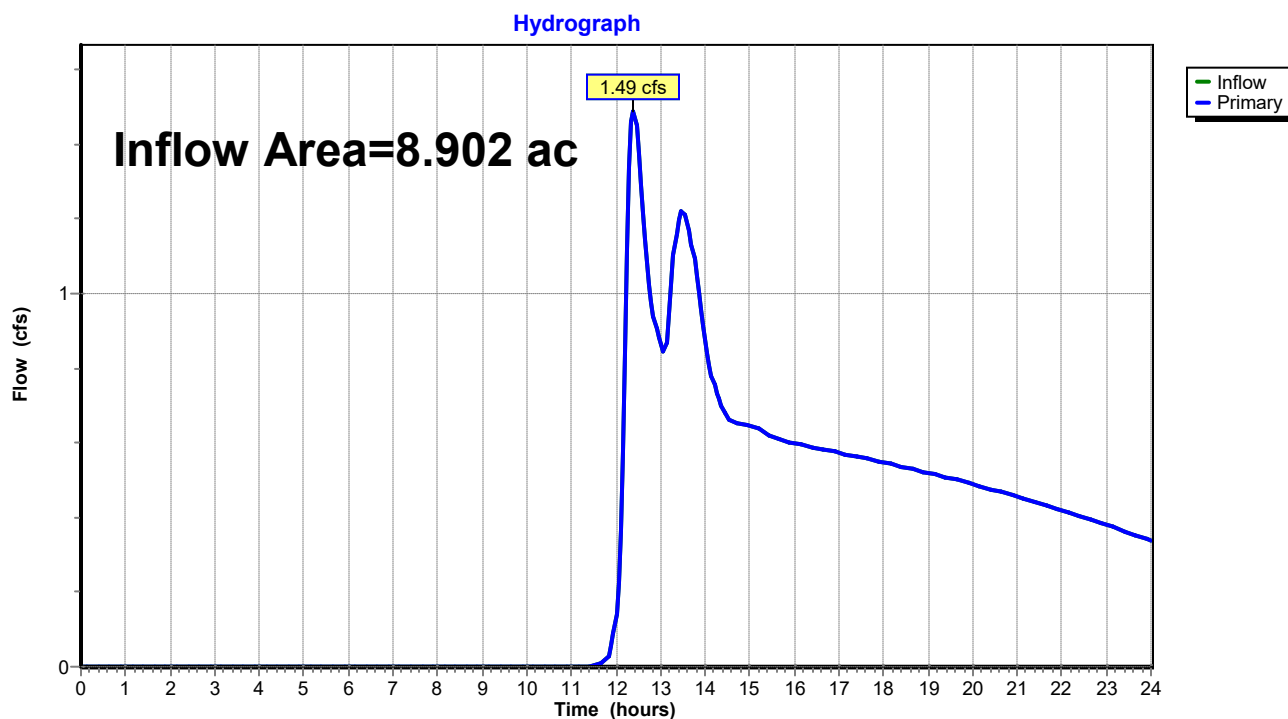
Stage-Area-Storage for Pond 5P: Wet Pond (WP-3)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
165.00	0.119	0.000	167.60	0.262	0.480
165.05	0.121	0.006	167.65	0.265	0.493
165.10	0.124	0.012	167.70	0.269	0.506
165.15	0.126	0.018	167.75	0.272	0.520
165.20	0.128	0.025	167.80	0.275	0.534
165.25	0.130	0.031	167.85	0.279	0.547
165.30	0.133	0.038	167.90	0.282	0.561
165.35	0.135	0.044	167.95	0.286	0.576
165.40	0.137	0.051	168.00	0.289	0.590
165.45	0.140	0.058	168.05	0.294	0.605
165.50	0.142	0.065	168.10	0.299	0.619
165.55	0.144	0.072	168.15	0.305	0.635
165.60	0.147	0.080	168.20	0.310	0.650
165.65	0.149	0.087	168.25	0.315	0.665
165.70	0.151	0.095	168.30	0.320	0.681
165.75	0.153	0.102	168.35	0.325	0.698
165.80	0.156	0.110	168.40	0.331	0.714
165.85	0.158	0.118	168.45	0.336	0.731
165.90	0.160	0.126	168.50	0.341	0.748
165.95	0.163	0.134	168.55	0.346	0.765
166.00	0.165	0.142	168.60	0.351	0.782
166.05	0.168	0.150	168.65	0.357	0.800
166.10	0.171	0.159	168.70	0.362	0.818
166.15	0.173	0.167	168.75	0.367	0.836
166.20	0.176	0.176	168.80	0.372	0.854
166.25	0.179	0.185	168.85	0.377	0.873
166.30	0.182	0.194	168.90	0.383	0.892
166.35	0.185	0.203	168.95	0.388	0.911
166.40	0.187	0.212	169.00	0.393	0.931
166.45	0.190	0.222			
166.50	0.193	0.231			
166.55	0.196	0.241			
166.60	0.199	0.251			
166.65	0.201	0.261			
166.70	0.204	0.271			
166.75	0.207	0.281			
166.80	0.210	0.292			
166.85	0.213	0.302			
166.90	0.215	0.313			
166.95	0.218	0.324			
167.00	0.221	0.335			
167.05	0.224	0.346			
167.10	0.228	0.357			
167.15	0.231	0.369			
167.20	0.235	0.381			
167.25	0.238	0.392			
167.30	0.241	0.404			
167.35	0.245	0.417			
167.40	0.248	0.429			
167.45	0.252	0.441			
167.50	0.255	0.454			
167.55	0.258	0.467			

Summary for Link 6L: Total Discharge North

Inflow Area = 8.902 ac, 0.00% Impervious, Inflow Depth > 0.81" for 1-yr event
Inflow = 1.49 cfs @ 12.40 hrs, Volume= 0.600 af
Primary = 1.49 cfs @ 12.40 hrs, Volume= 0.600 af, Atten= 0%, Lag= 0.0 min
Routed to Link 8L : Total Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 6L: Total Discharge North

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 43

Hydrograph for Link 6L: Total Discharge North

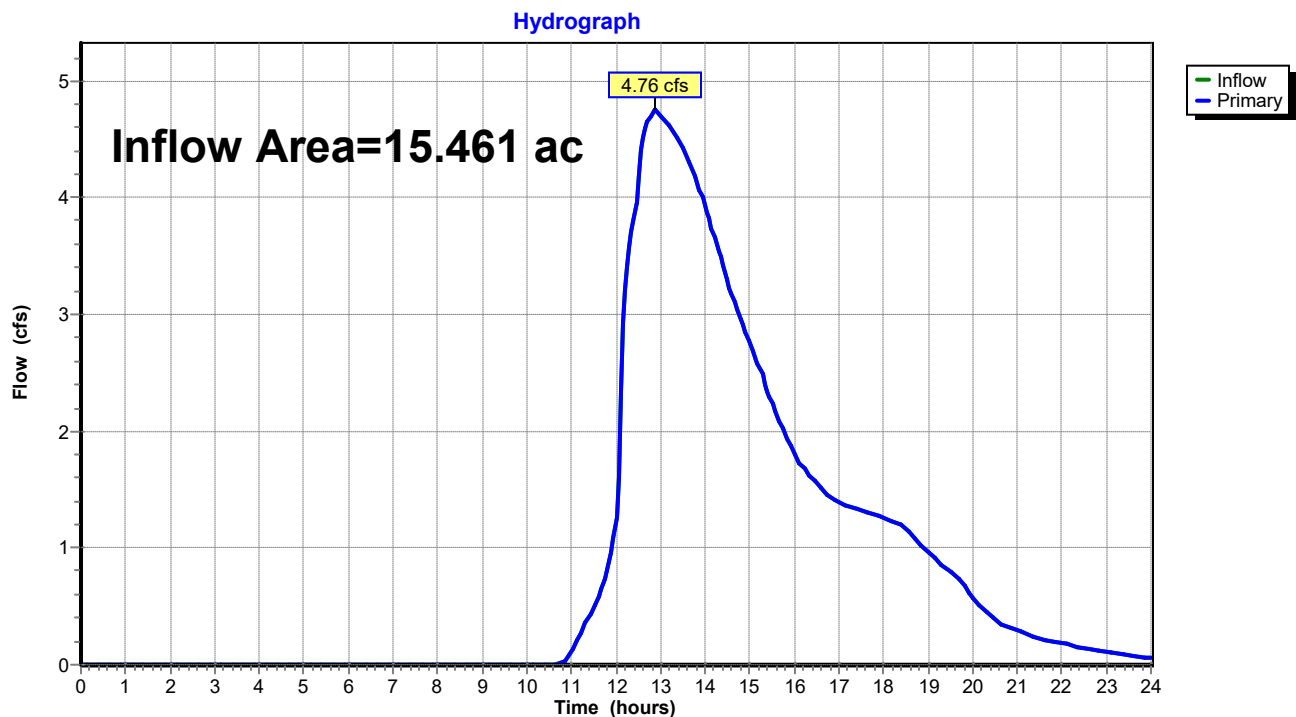
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	0.86	0.00	0.86
0.25	0.00	0.00	0.00	13.25	1.02	0.00	1.02
0.50	0.00	0.00	0.00	13.50	1.22	0.00	1.22
0.75	0.00	0.00	0.00	13.75	1.09	0.00	1.09
1.00	0.00	0.00	0.00	14.00	0.88	0.00	0.88
1.25	0.00	0.00	0.00	14.25	0.74	0.00	0.74
1.50	0.00	0.00	0.00	14.50	0.67	0.00	0.67
1.75	0.00	0.00	0.00	14.75	0.65	0.00	0.65
2.00	0.00	0.00	0.00	15.00	0.65	0.00	0.65
2.25	0.00	0.00	0.00	15.25	0.64	0.00	0.64
2.50	0.00	0.00	0.00	15.50	0.61	0.00	0.61
2.75	0.00	0.00	0.00	15.75	0.61	0.00	0.61
3.00	0.00	0.00	0.00	16.00	0.60	0.00	0.60
3.25	0.00	0.00	0.00	16.25	0.59	0.00	0.59
3.50	0.00	0.00	0.00	16.50	0.59	0.00	0.59
3.75	0.00	0.00	0.00	16.75	0.58	0.00	0.58
4.00	0.00	0.00	0.00	17.00	0.57	0.00	0.57
4.25	0.00	0.00	0.00	17.25	0.57	0.00	0.57
4.50	0.00	0.00	0.00	17.50	0.56	0.00	0.56
4.75	0.00	0.00	0.00	17.75	0.56	0.00	0.56
5.00	0.00	0.00	0.00	18.00	0.55	0.00	0.55
5.25	0.00	0.00	0.00	18.25	0.54	0.00	0.54
5.50	0.00	0.00	0.00	18.50	0.53	0.00	0.53
5.75	0.00	0.00	0.00	18.75	0.53	0.00	0.53
6.00	0.00	0.00	0.00	19.00	0.52	0.00	0.52
6.25	0.00	0.00	0.00	19.25	0.51	0.00	0.51
6.50	0.00	0.00	0.00	19.50	0.51	0.00	0.51
6.75	0.00	0.00	0.00	19.75	0.50	0.00	0.50
7.00	0.00	0.00	0.00	20.00	0.49	0.00	0.49
7.25	0.00	0.00	0.00	20.25	0.48	0.00	0.48
7.50	0.00	0.00	0.00	20.50	0.47	0.00	0.47
7.75	0.00	0.00	0.00	20.75	0.47	0.00	0.47
8.00	0.00	0.00	0.00	21.00	0.46	0.00	0.46
8.25	0.00	0.00	0.00	21.25	0.45	0.00	0.45
8.50	0.00	0.00	0.00	21.50	0.44	0.00	0.44
8.75	0.00	0.00	0.00	21.75	0.43	0.00	0.43
9.00	0.00	0.00	0.00	22.00	0.42	0.00	0.42
9.25	0.00	0.00	0.00	22.25	0.41	0.00	0.41
9.50	0.00	0.00	0.00	22.50	0.40	0.00	0.40
9.75	0.00	0.00	0.00	22.75	0.39	0.00	0.39
10.00	0.00	0.00	0.00	23.00	0.38	0.00	0.38
10.25	0.00	0.00	0.00	23.25	0.37	0.00	0.37
10.50	0.00	0.00	0.00	23.50	0.36	0.00	0.36
10.75	0.00	0.00	0.00	23.75	0.35	0.00	0.35
11.00	0.00	0.00	0.00	24.00	0.34	0.00	0.34
11.25	0.00	0.00	0.00				
11.50	0.00	0.00	0.00				
11.75	0.01	0.00	0.01				
12.00	0.14	0.00	0.14				
12.25	1.12	0.00	1.12				
12.50	1.38	0.00	1.38				
12.75	1.03	0.00	1.03				

Summary for Link 7L: Total Discharge South (Meadowbrook Rd.)

Inflow Area = 15.461 ac, 0.00% Impervious, Inflow Depth > 1.29" for 1-yr event
 Inflow = 4.76 cfs @ 12.89 hrs, Volume= 1.659 af
 Primary = 4.76 cfs @ 12.89 hrs, Volume= 1.659 af, Atten= 0%, Lag= 0.0 min
 Routed to Link 8L : Total Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: Total Discharge South (Meadowbrook Rd.)



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 45

Hydrograph for Link 7L: Total Discharge South (Meadowbrook Rd.)

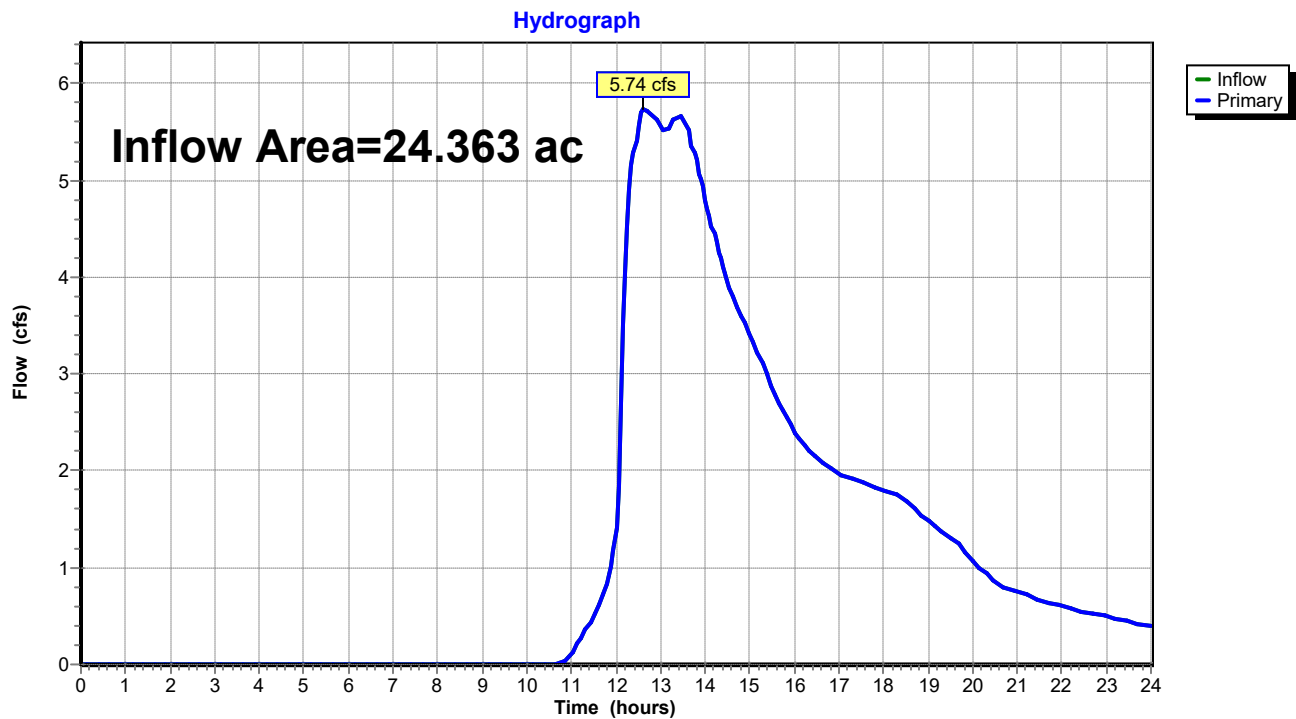
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	4.70	0.00	4.70
0.25	0.00	0.00	0.00	13.25	4.57	0.00	4.57
0.50	0.00	0.00	0.00	13.50	4.44	0.00	4.44
0.75	0.00	0.00	0.00	13.75	4.20	0.00	4.20
1.00	0.00	0.00	0.00	14.00	3.92	0.00	3.92
1.25	0.00	0.00	0.00	14.25	3.62	0.00	3.62
1.50	0.00	0.00	0.00	14.50	3.30	0.00	3.30
1.75	0.00	0.00	0.00	14.75	3.01	0.00	3.01
2.00	0.00	0.00	0.00	15.00	2.75	0.00	2.75
2.25	0.00	0.00	0.00	15.25	2.51	0.00	2.51
2.50	0.00	0.00	0.00	15.50	2.24	0.00	2.24
2.75	0.00	0.00	0.00	15.75	2.00	0.00	2.00
3.00	0.00	0.00	0.00	16.00	1.81	0.00	1.81
3.25	0.00	0.00	0.00	16.25	1.67	0.00	1.67
3.50	0.00	0.00	0.00	16.50	1.55	0.00	1.55
3.75	0.00	0.00	0.00	16.75	1.46	0.00	1.46
4.00	0.00	0.00	0.00	17.00	1.40	0.00	1.40
4.25	0.00	0.00	0.00	17.25	1.35	0.00	1.35
4.50	0.00	0.00	0.00	17.50	1.32	0.00	1.32
4.75	0.00	0.00	0.00	17.75	1.29	0.00	1.29
5.00	0.00	0.00	0.00	18.00	1.26	0.00	1.26
5.25	0.00	0.00	0.00	18.25	1.22	0.00	1.22
5.50	0.00	0.00	0.00	18.50	1.15	0.00	1.15
5.75	0.00	0.00	0.00	18.75	1.06	0.00	1.06
6.00	0.00	0.00	0.00	19.00	0.97	0.00	0.97
6.25	0.00	0.00	0.00	19.25	0.88	0.00	0.88
6.50	0.00	0.00	0.00	19.50	0.80	0.00	0.80
6.75	0.00	0.00	0.00	19.75	0.71	0.00	0.71
7.00	0.00	0.00	0.00	20.00	0.58	0.00	0.58
7.25	0.00	0.00	0.00	20.25	0.47	0.00	0.47
7.50	0.00	0.00	0.00	20.50	0.38	0.00	0.38
7.75	0.00	0.00	0.00	20.75	0.33	0.00	0.33
8.00	0.00	0.00	0.00	21.00	0.30	0.00	0.30
8.25	0.00	0.00	0.00	21.25	0.26	0.00	0.26
8.50	0.00	0.00	0.00	21.50	0.23	0.00	0.23
8.75	0.00	0.00	0.00	21.75	0.20	0.00	0.20
9.00	0.00	0.00	0.00	22.00	0.18	0.00	0.18
9.25	0.00	0.00	0.00	22.25	0.16	0.00	0.16
9.50	0.00	0.00	0.00	22.50	0.15	0.00	0.15
9.75	0.00	0.00	0.00	22.75	0.13	0.00	0.13
10.00	0.00	0.00	0.00	23.00	0.11	0.00	0.11
10.25	0.00	0.00	0.00	23.25	0.10	0.00	0.10
10.50	0.00	0.00	0.00	23.50	0.09	0.00	0.09
10.75	0.00	0.00	0.00	23.75	0.07	0.00	0.07
11.00	0.11	0.00	0.11	24.00	0.06	0.00	0.06
11.25	0.29	0.00	0.29				
11.50	0.49	0.00	0.49				
11.75	0.73	0.00	0.73				
12.00	1.26	0.00	1.26				
12.25	3.41	0.00	3.41				
12.50	4.21	0.00	4.21				
12.75	4.69	0.00	4.69				

Summary for Link 8L: Total Proposed Discharge

Inflow Area = 24.363 ac, 0.00% Impervious, Inflow Depth > 1.11" for 1-yr event
 Inflow = 5.74 cfs @ 12.60 hrs, Volume= 2.259 af
 Primary = 5.74 cfs @ 12.60 hrs, Volume= 2.259 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: Total Proposed Discharge



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 47

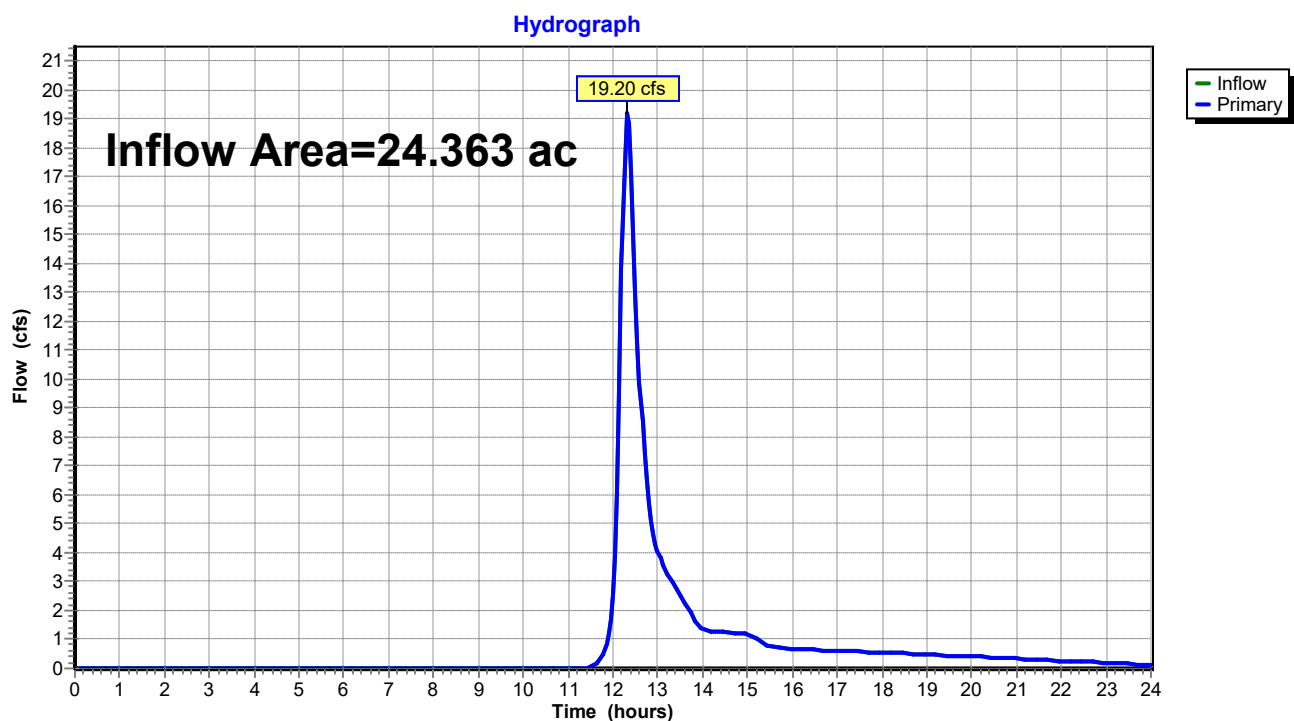
Hydrograph for Link 8L: Total Proposed Discharge

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	5.56	0.00	5.56
0.25	0.00	0.00	0.00	13.25	5.59	0.00	5.59
0.50	0.00	0.00	0.00	13.50	5.66	0.00	5.66
0.75	0.00	0.00	0.00	13.75	5.29	0.00	5.29
1.00	0.00	0.00	0.00	14.00	4.80	0.00	4.80
1.25	0.00	0.00	0.00	14.25	4.36	0.00	4.36
1.50	0.00	0.00	0.00	14.50	3.97	0.00	3.97
1.75	0.00	0.00	0.00	14.75	3.66	0.00	3.66
2.00	0.00	0.00	0.00	15.00	3.40	0.00	3.40
2.25	0.00	0.00	0.00	15.25	3.15	0.00	3.15
2.50	0.00	0.00	0.00	15.50	2.86	0.00	2.86
2.75	0.00	0.00	0.00	15.75	2.61	0.00	2.61
3.00	0.00	0.00	0.00	16.00	2.41	0.00	2.41
3.25	0.00	0.00	0.00	16.25	2.26	0.00	2.26
3.50	0.00	0.00	0.00	16.50	2.13	0.00	2.13
3.75	0.00	0.00	0.00	16.75	2.04	0.00	2.04
4.00	0.00	0.00	0.00	17.00	1.97	0.00	1.97
4.25	0.00	0.00	0.00	17.25	1.92	0.00	1.92
4.50	0.00	0.00	0.00	17.50	1.88	0.00	1.88
4.75	0.00	0.00	0.00	17.75	1.84	0.00	1.84
5.00	0.00	0.00	0.00	18.00	1.81	0.00	1.81
5.25	0.00	0.00	0.00	18.25	1.77	0.00	1.77
5.50	0.00	0.00	0.00	18.50	1.69	0.00	1.69
5.75	0.00	0.00	0.00	18.75	1.59	0.00	1.59
6.00	0.00	0.00	0.00	19.00	1.49	0.00	1.49
6.25	0.00	0.00	0.00	19.25	1.39	0.00	1.39
6.50	0.00	0.00	0.00	19.50	1.31	0.00	1.31
6.75	0.00	0.00	0.00	19.75	1.21	0.00	1.21
7.00	0.00	0.00	0.00	20.00	1.07	0.00	1.07
7.25	0.00	0.00	0.00	20.25	0.95	0.00	0.95
7.50	0.00	0.00	0.00	20.50	0.86	0.00	0.86
7.75	0.00	0.00	0.00	20.75	0.80	0.00	0.80
8.00	0.00	0.00	0.00	21.00	0.76	0.00	0.76
8.25	0.00	0.00	0.00	21.25	0.71	0.00	0.71
8.50	0.00	0.00	0.00	21.50	0.67	0.00	0.67
8.75	0.00	0.00	0.00	21.75	0.63	0.00	0.63
9.00	0.00	0.00	0.00	22.00	0.60	0.00	0.60
9.25	0.00	0.00	0.00	22.25	0.57	0.00	0.57
9.50	0.00	0.00	0.00	22.50	0.55	0.00	0.55
9.75	0.00	0.00	0.00	22.75	0.52	0.00	0.52
10.00	0.00	0.00	0.00	23.00	0.49	0.00	0.49
10.25	0.00	0.00	0.00	23.25	0.47	0.00	0.47
10.50	0.00	0.00	0.00	23.50	0.44	0.00	0.44
10.75	0.00	0.00	0.00	23.75	0.42	0.00	0.42
11.00	0.11	0.00	0.11	24.00	0.40	0.00	0.40
11.25	0.29	0.00	0.29				
11.50	0.50	0.00	0.50				
11.75	0.75	0.00	0.75				
12.00	1.40	0.00	1.40				
12.25	4.52	0.00	4.52				
12.50	5.58	0.00	5.58				
12.75	5.72	0.00	5.72				

Summary for Link 18L: Total Existing Discharge

Inflow Area = 24.363 ac, 0.00% Impervious, Inflow Depth > 0.74" for 1-yr event
Inflow = 19.20 cfs @ 12.32 hrs, Volume= 1.511 af
Primary = 19.20 cfs @ 12.32 hrs, Volume= 1.511 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 18L: Total Existing Discharge

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 9/18/2025

Page 49

Hydrograph for Link 18L: Total Existing Discharge

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	4.04	0.00	4.04
0.25	0.00	0.00	0.00	13.25	3.17	0.00	3.17
0.50	0.00	0.00	0.00	13.50	2.57	0.00	2.57
0.75	0.00	0.00	0.00	13.75	1.84	0.00	1.84
1.00	0.00	0.00	0.00	14.00	1.38	0.00	1.38
1.25	0.00	0.00	0.00	14.25	1.28	0.00	1.28
1.50	0.00	0.00	0.00	14.50	1.24	0.00	1.24
1.75	0.00	0.00	0.00	14.75	1.21	0.00	1.21
2.00	0.00	0.00	0.00	15.00	1.18	0.00	1.18
2.25	0.00	0.00	0.00	15.25	0.98	0.00	0.98
2.50	0.00	0.00	0.00	15.50	0.75	0.00	0.75
2.75	0.00	0.00	0.00	15.75	0.70	0.00	0.70
3.00	0.00	0.00	0.00	16.00	0.68	0.00	0.68
3.25	0.00	0.00	0.00	16.25	0.66	0.00	0.66
3.50	0.00	0.00	0.00	16.50	0.65	0.00	0.65
3.75	0.00	0.00	0.00	16.75	0.63	0.00	0.63
4.00	0.00	0.00	0.00	17.00	0.62	0.00	0.62
4.25	0.00	0.00	0.00	17.25	0.60	0.00	0.60
4.50	0.00	0.00	0.00	17.50	0.58	0.00	0.58
4.75	0.00	0.00	0.00	17.75	0.57	0.00	0.57
5.00	0.00	0.00	0.00	18.00	0.55	0.00	0.55
5.25	0.00	0.00	0.00	18.25	0.53	0.00	0.53
5.50	0.00	0.00	0.00	18.50	0.51	0.00	0.51
5.75	0.00	0.00	0.00	18.75	0.50	0.00	0.50
6.00	0.00	0.00	0.00	19.00	0.48	0.00	0.48
6.25	0.00	0.00	0.00	19.25	0.46	0.00	0.46
6.50	0.00	0.00	0.00	19.50	0.45	0.00	0.45
6.75	0.00	0.00	0.00	19.75	0.43	0.00	0.43
7.00	0.00	0.00	0.00	20.00	0.41	0.00	0.41
7.25	0.00	0.00	0.00	20.25	0.39	0.00	0.39
7.50	0.00	0.00	0.00	20.50	0.38	0.00	0.38
7.75	0.00	0.00	0.00	20.75	0.36	0.00	0.36
8.00	0.00	0.00	0.00	21.00	0.34	0.00	0.34
8.25	0.00	0.00	0.00	21.25	0.32	0.00	0.32
8.50	0.00	0.00	0.00	21.50	0.30	0.00	0.30
8.75	0.00	0.00	0.00	21.75	0.29	0.00	0.29
9.00	0.00	0.00	0.00	22.00	0.27	0.00	0.27
9.25	0.00	0.00	0.00	22.25	0.25	0.00	0.25
9.50	0.00	0.00	0.00	22.50	0.23	0.00	0.23
9.75	0.00	0.00	0.00	22.75	0.21	0.00	0.21
10.00	0.00	0.00	0.00	23.00	0.19	0.00	0.19
10.25	0.00	0.00	0.00	23.25	0.18	0.00	0.18
10.50	0.00	0.00	0.00	23.50	0.16	0.00	0.16
10.75	0.00	0.00	0.00	23.75	0.14	0.00	0.14
11.00	0.00	0.00	0.00	24.00	0.12	0.00	0.12
11.25	0.00	0.00	0.00				
11.50	0.07	0.00	0.07				
11.75	0.40	0.00	0.40				
12.00	2.55	0.00	2.55				
12.25	17.40	0.00	17.40				
12.50	13.05	0.00	13.05				
12.75	6.46	0.00	6.46				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 50

Summary for Subcatchment 9S: P-1

[47] Hint: Peak is 125% of capacity of segment #3

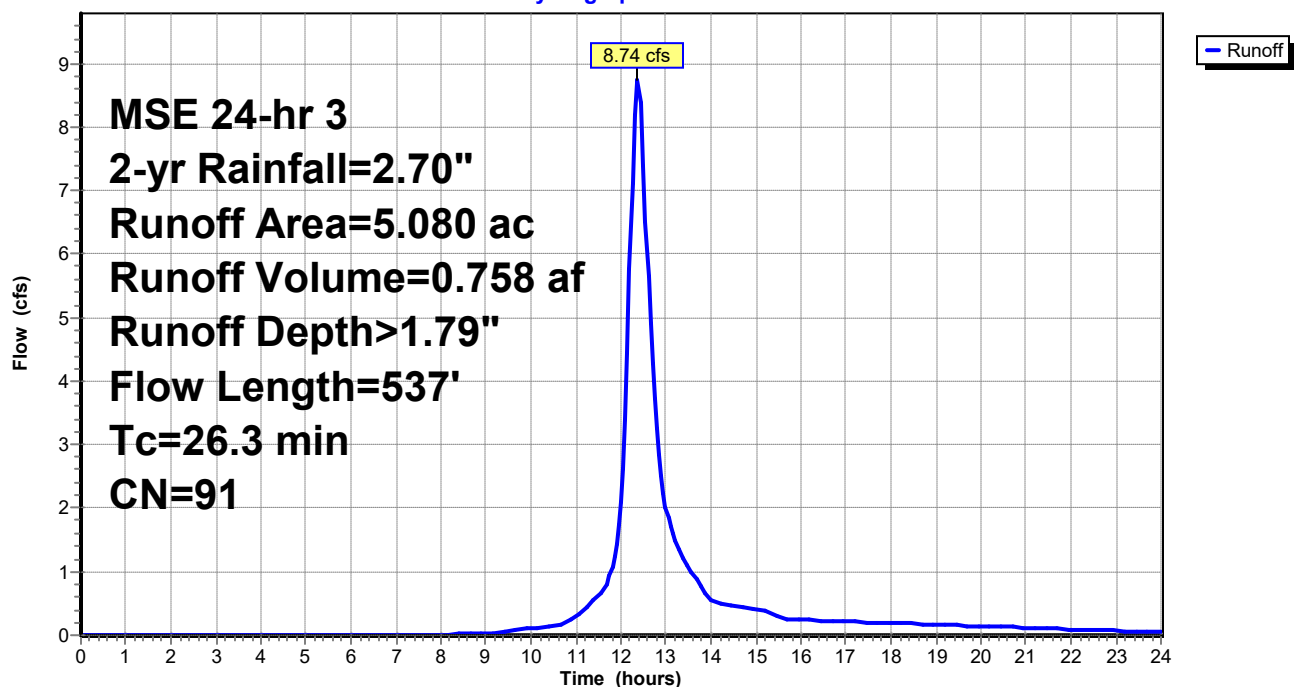
Runoff = 8.74 cfs @ 12.37 hrs, Volume= 0.758 af, Depth> 1.79"
Routed to Pond 1P : Bio-Filtration Basin (BF-1)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description			
* 5.080	91				
5.080		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	100	0.0175	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 2.70"
0.5	61	0.0160	2.04		Shallow Concentrated Flow, Shallow Conc. Unpaved Kv= 16.1 fps
1.1	376	0.0100	5.70	7.00	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
26.3	537	Total			

Subcatchment 9S: P-1

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 51

Hydrograph for Subcatchment 9S: P-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	1.32	2.02
0.25	0.00	0.00	0.00	13.25	2.23	1.37	1.40
0.50	0.00	0.00	0.00	13.50	2.28	1.41	1.06
0.75	0.01	0.00	0.00	13.75	2.30	1.43	0.79
1.00	0.01	0.00	0.00	14.00	2.33	1.46	0.56
1.25	0.01	0.00	0.00	14.25	2.35	1.48	0.48
1.50	0.02	0.00	0.00	14.50	2.38	1.50	0.46
1.75	0.02	0.00	0.00	14.75	2.40	1.52	0.44
2.00	0.02	0.00	0.00	15.00	2.42	1.54	0.42
2.25	0.03	0.00	0.00	15.25	2.44	1.55	0.38
2.50	0.03	0.00	0.00	15.50	2.45	1.56	0.29
2.75	0.04	0.00	0.00	15.75	2.46	1.58	0.26
3.00	0.04	0.00	0.00	16.00	2.47	1.59	0.24
3.25	0.05	0.00	0.00	16.25	2.49	1.60	0.23
3.50	0.06	0.00	0.00	16.50	2.50	1.61	0.23
3.75	0.06	0.00	0.00	16.75	2.51	1.62	0.22
4.00	0.07	0.00	0.00	17.00	2.52	1.63	0.22
4.25	0.08	0.00	0.00	17.25	2.53	1.64	0.21
4.50	0.09	0.00	0.00	17.50	2.54	1.65	0.20
4.75	0.09	0.00	0.00	17.75	2.55	1.66	0.20
5.00	0.10	0.00	0.00	18.00	2.56	1.67	0.19
5.25	0.11	0.00	0.00	18.25	2.57	1.68	0.19
5.50	0.12	0.00	0.00	18.50	2.58	1.68	0.18
5.75	0.13	0.00	0.00	18.75	2.59	1.69	0.17
6.00	0.14	0.00	0.00	19.00	2.60	1.70	0.17
6.25	0.15	0.00	0.00	19.25	2.61	1.71	0.16
6.50	0.16	0.00	0.00	19.50	2.61	1.72	0.16
6.75	0.17	0.00	0.00	19.75	2.62	1.72	0.15
7.00	0.18	0.00	0.00	20.00	2.63	1.73	0.14
7.25	0.19	0.00	0.00	20.25	2.64	1.74	0.14
7.50	0.20	0.00	0.00	20.50	2.64	1.74	0.13
7.75	0.21	0.00	0.00	20.75	2.65	1.75	0.12
8.00	0.23	0.00	0.00	21.00	2.66	1.75	0.12
8.25	0.24	0.00	0.01	21.25	2.66	1.76	0.11
8.50	0.25	0.00	0.02	21.50	2.67	1.76	0.11
8.75	0.26	0.00	0.02	21.75	2.67	1.77	0.10
9.00	0.28	0.01	0.03	22.00	2.68	1.77	0.09
9.25	0.30	0.01	0.04	22.25	2.68	1.77	0.09
9.50	0.32	0.01	0.07	22.50	2.68	1.78	0.08
9.75	0.35	0.02	0.09	22.75	2.69	1.78	0.07
10.00	0.37	0.03	0.11	23.00	2.69	1.78	0.07
10.25	0.40	0.03	0.13	23.25	2.69	1.79	0.06
10.50	0.42	0.04	0.15	23.50	2.70	1.79	0.06
10.75	0.47	0.06	0.19	23.75	2.70	1.79	0.05
11.00	0.52	0.08	0.30	24.00	2.70	1.79	0.04
11.25	0.59	0.11	0.45				
11.50	0.67	0.15	0.63				
11.75	0.83	0.25	0.93				
12.00	1.25	0.54	2.10				
12.25	1.87	1.05	7.13				
12.50	2.03	1.19	7.39				
12.75	2.11	1.26	3.72				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 52

Summary for Subcatchment 10S: P-2A (Future Commercial)

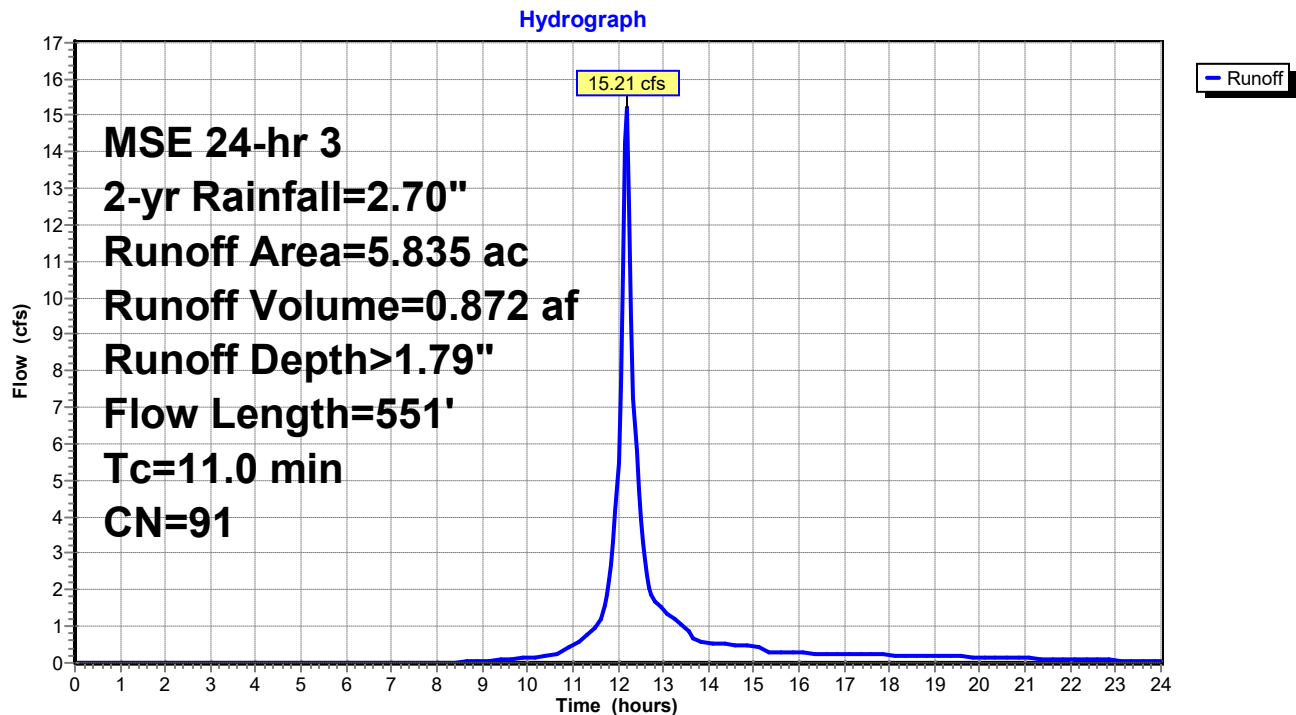
Runoff = 15.21 cfs @ 12.19 hrs, Volume= 0.872 af, Depth> 1.79"
Routed to Pond 2P : Wet Pond (WP-2A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 5.835	91	
5.835		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	25	0.2500	0.22		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
7.1	75	0.0800	0.18		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
2.0	451	0.0640	3.79		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
11.0	551	Total			

Subcatchment 10S: P-2A (Future Commercial)



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 53

Hydrograph for Subcatchment 10S: P-2A (Future Commercial)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	1.32	1.47
0.25	0.00	0.00	0.00	13.25	2.23	1.37	1.21
0.50	0.00	0.00	0.00	13.50	2.28	1.41	0.95
0.75	0.01	0.00	0.00	13.75	2.30	1.43	0.59
1.00	0.01	0.00	0.00	14.00	2.33	1.46	0.54
1.25	0.01	0.00	0.00	14.25	2.35	1.48	0.52
1.50	0.02	0.00	0.00	14.50	2.38	1.50	0.50
1.75	0.02	0.00	0.00	14.75	2.40	1.52	0.49
2.00	0.02	0.00	0.00	15.00	2.42	1.54	0.47
2.25	0.03	0.00	0.00	15.25	2.44	1.55	0.31
2.50	0.03	0.00	0.00	15.50	2.45	1.56	0.28
2.75	0.04	0.00	0.00	15.75	2.46	1.58	0.28
3.00	0.04	0.00	0.00	16.00	2.47	1.59	0.27
3.25	0.05	0.00	0.00	16.25	2.49	1.60	0.26
3.50	0.06	0.00	0.00	16.50	2.50	1.61	0.26
3.75	0.06	0.00	0.00	16.75	2.51	1.62	0.25
4.00	0.07	0.00	0.00	17.00	2.52	1.63	0.24
4.25	0.08	0.00	0.00	17.25	2.53	1.64	0.23
4.50	0.09	0.00	0.00	17.50	2.54	1.65	0.23
4.75	0.09	0.00	0.00	17.75	2.55	1.66	0.22
5.00	0.10	0.00	0.00	18.00	2.56	1.67	0.21
5.25	0.11	0.00	0.00	18.25	2.57	1.68	0.21
5.50	0.12	0.00	0.00	18.50	2.58	1.68	0.20
5.75	0.13	0.00	0.00	18.75	2.59	1.69	0.19
6.00	0.14	0.00	0.00	19.00	2.60	1.70	0.19
6.25	0.15	0.00	0.00	19.25	2.61	1.71	0.18
6.50	0.16	0.00	0.00	19.50	2.61	1.72	0.17
6.75	0.17	0.00	0.00	19.75	2.62	1.72	0.16
7.00	0.18	0.00	0.00	20.00	2.63	1.73	0.16
7.25	0.19	0.00	0.00	20.25	2.64	1.74	0.15
7.50	0.20	0.00	0.00	20.50	2.64	1.74	0.14
7.75	0.21	0.00	0.00	20.75	2.65	1.75	0.14
8.00	0.23	0.00	0.01	21.00	2.66	1.75	0.13
8.25	0.24	0.00	0.02	21.25	2.66	1.76	0.12
8.50	0.25	0.00	0.03	21.50	2.67	1.76	0.11
8.75	0.26	0.00	0.03	21.75	2.67	1.77	0.11
9.00	0.28	0.01	0.04	22.00	2.68	1.77	0.10
9.25	0.30	0.01	0.08	22.25	2.68	1.77	0.09
9.50	0.32	0.01	0.10	22.50	2.68	1.78	0.09
9.75	0.35	0.02	0.12	22.75	2.69	1.78	0.08
10.00	0.37	0.03	0.15	23.00	2.69	1.78	0.07
10.25	0.40	0.03	0.17	23.25	2.69	1.79	0.06
10.50	0.42	0.04	0.19	23.50	2.70	1.79	0.06
10.75	0.47	0.06	0.33	23.75	2.70	1.79	0.05
11.00	0.52	0.08	0.50	24.00	2.70	1.79	0.04
11.25	0.59	0.11	0.70				
11.50	0.67	0.15	0.94				
11.75	0.83	0.25	1.86				
12.00	1.25	0.54	5.49				
12.25	1.87	1.05	12.56				
12.50	2.03	1.19	3.94				
12.75	2.11	1.26	1.86				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 54

Summary for Subcatchment 11S: P-2

Runoff = 3.88 cfs @ 12.13 hrs, Volume= 0.180 af, Depth> 1.34"
Routed to Pond 2P : Wet Pond (WP-2A)

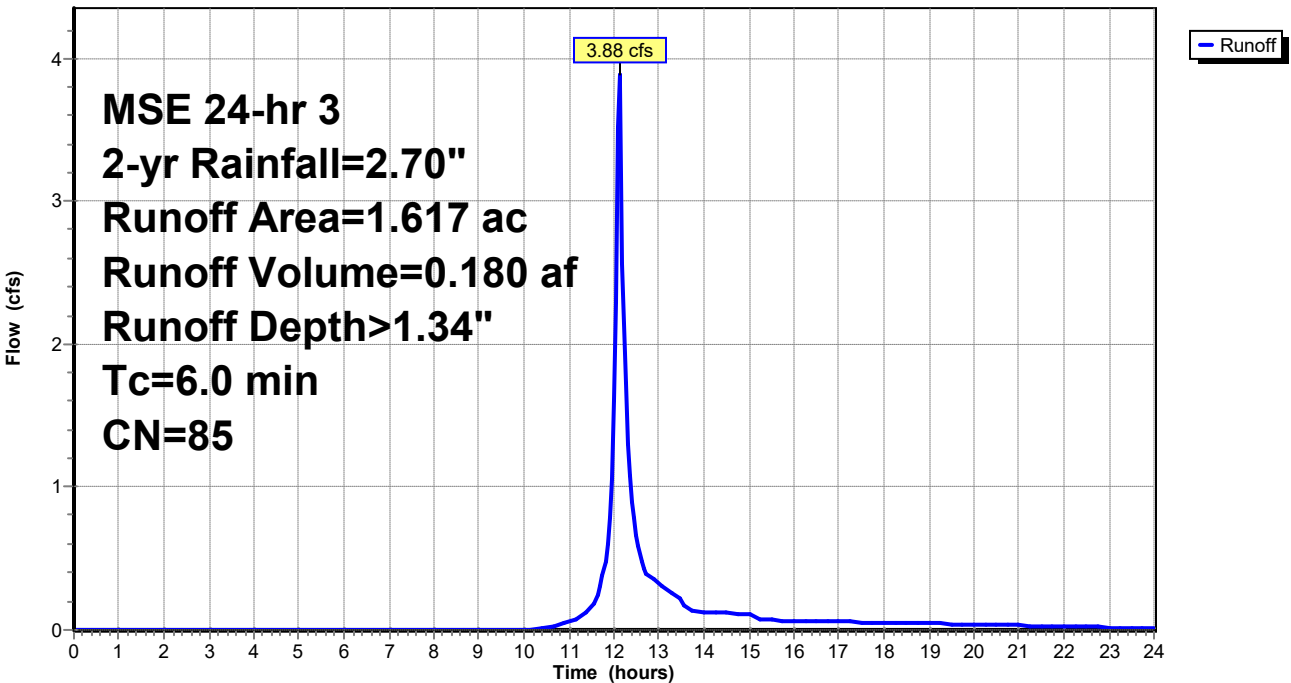
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 1.617	85	
1.617		100.00% Pervious Area

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

Subcatchment 11S: P-2

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 55

Hydrograph for Subcatchment 11S: P-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	0.93	0.33
0.25	0.00	0.00	0.00	13.25	2.23	0.97	0.27
0.50	0.00	0.00	0.00	13.50	2.28	1.00	0.21
0.75	0.01	0.00	0.00	13.75	2.30	1.02	0.13
1.00	0.01	0.00	0.00	14.00	2.33	1.04	0.13
1.25	0.01	0.00	0.00	14.25	2.35	1.06	0.12
1.50	0.02	0.00	0.00	14.50	2.38	1.08	0.12
1.75	0.02	0.00	0.00	14.75	2.40	1.10	0.12
2.00	0.02	0.00	0.00	15.00	2.42	1.12	0.11
2.25	0.03	0.00	0.00	15.25	2.44	1.13	0.07
2.50	0.03	0.00	0.00	15.50	2.45	1.14	0.07
2.75	0.04	0.00	0.00	15.75	2.46	1.15	0.07
3.00	0.04	0.00	0.00	16.00	2.47	1.16	0.06
3.25	0.05	0.00	0.00	16.25	2.49	1.17	0.06
3.50	0.06	0.00	0.00	16.50	2.50	1.18	0.06
3.75	0.06	0.00	0.00	16.75	2.51	1.19	0.06
4.00	0.07	0.00	0.00	17.00	2.52	1.20	0.06
4.25	0.08	0.00	0.00	17.25	2.53	1.20	0.06
4.50	0.09	0.00	0.00	17.50	2.54	1.21	0.05
4.75	0.09	0.00	0.00	17.75	2.55	1.22	0.05
5.00	0.10	0.00	0.00	18.00	2.56	1.23	0.05
5.25	0.11	0.00	0.00	18.25	2.57	1.24	0.05
5.50	0.12	0.00	0.00	18.50	2.58	1.24	0.05
5.75	0.13	0.00	0.00	18.75	2.59	1.25	0.05
6.00	0.14	0.00	0.00	19.00	2.60	1.26	0.04
6.25	0.15	0.00	0.00	19.25	2.61	1.26	0.04
6.50	0.16	0.00	0.00	19.50	2.61	1.27	0.04
6.75	0.17	0.00	0.00	19.75	2.62	1.28	0.04
7.00	0.18	0.00	0.00	20.00	2.63	1.28	0.04
7.25	0.19	0.00	0.00	20.25	2.64	1.29	0.04
7.50	0.20	0.00	0.00	20.50	2.64	1.29	0.03
7.75	0.21	0.00	0.00	20.75	2.65	1.30	0.03
8.00	0.23	0.00	0.00	21.00	2.66	1.30	0.03
8.25	0.24	0.00	0.00	21.25	2.66	1.31	0.03
8.50	0.25	0.00	0.00	21.50	2.67	1.31	0.03
8.75	0.26	0.00	0.00	21.75	2.67	1.32	0.03
9.00	0.28	0.00	0.00	22.00	2.68	1.32	0.02
9.25	0.30	0.00	0.00	22.25	2.68	1.32	0.02
9.50	0.32	0.00	0.00	22.50	2.68	1.33	0.02
9.75	0.35	0.00	0.00	22.75	2.69	1.33	0.02
10.00	0.37	0.00	0.00	23.00	2.69	1.33	0.02
10.25	0.40	0.00	0.01	23.25	2.69	1.33	0.02
10.50	0.42	0.00	0.01	23.50	2.70	1.34	0.01
10.75	0.47	0.01	0.03	23.75	2.70	1.34	0.01
11.00	0.52	0.01	0.05	24.00	2.70	1.34	0.01
11.25	0.59	0.03	0.09				
11.50	0.67	0.05	0.14				
11.75	0.83	0.10	0.38				
12.00	1.25	0.30	1.60				
12.25	1.87	0.70	1.73				
12.50	2.03	0.82	0.67				
12.75	2.11	0.88	0.39				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 56

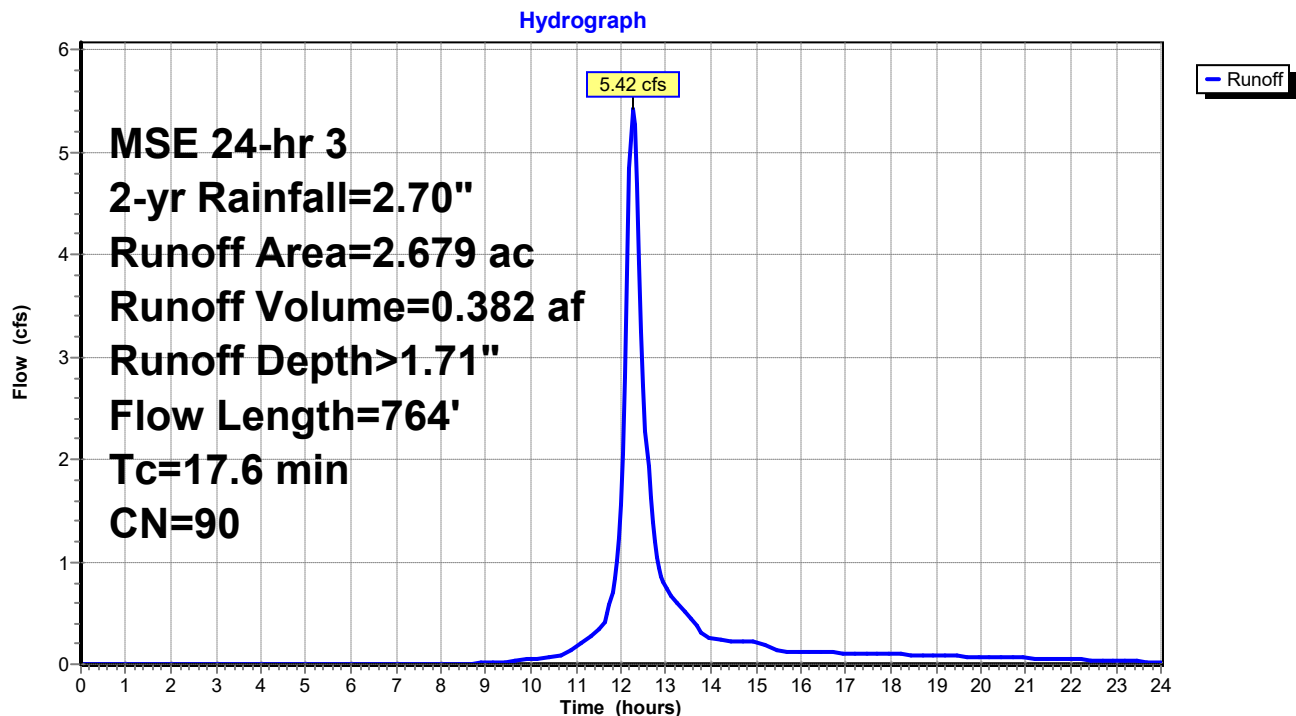
Summary for Subcatchment 12S: P-2B (Future Residential)

Runoff = 5.42 cfs @ 12.27 hrs, Volume= 0.382 af, Depth> 1.71"
Routed to Pond 2P : Wet Pond (WP-2A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 2.679	90	
2.679		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
0.2	80	0.2000	7.20		Shallow Concentrated Flow, Shallow Conc. Unpaved Kv= 16.1 fps
0.7	209	0.0690	5.33		Shallow Concentrated Flow, Shallow Conc. Paved Kv= 20.3 fps
1.2	375	0.0100	5.26	6.46	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
17.6	764	Total			

Subcatchment 12S: P-2B (Future Residential)

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 57

Hydrograph for Subcatchment 12S: P-2B (Future Residential)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	1.25	0.75
0.25	0.00	0.00	0.00	13.25	2.23	1.30	0.59
0.50	0.00	0.00	0.00	13.50	2.28	1.33	0.47
0.75	0.01	0.00	0.00	13.75	2.30	1.36	0.33
1.00	0.01	0.00	0.00	14.00	2.33	1.38	0.25
1.25	0.01	0.00	0.00	14.25	2.35	1.40	0.24
1.50	0.02	0.00	0.00	14.50	2.38	1.42	0.23
1.75	0.02	0.00	0.00	14.75	2.40	1.44	0.22
2.00	0.02	0.00	0.00	15.00	2.42	1.46	0.22
2.25	0.03	0.00	0.00	15.25	2.44	1.47	0.17
2.50	0.03	0.00	0.00	15.50	2.45	1.49	0.13
2.75	0.04	0.00	0.00	15.75	2.46	1.50	0.13
3.00	0.04	0.00	0.00	16.00	2.47	1.51	0.12
3.25	0.05	0.00	0.00	16.25	2.49	1.52	0.12
3.50	0.06	0.00	0.00	16.50	2.50	1.53	0.12
3.75	0.06	0.00	0.00	16.75	2.51	1.54	0.11
4.00	0.07	0.00	0.00	17.00	2.52	1.55	0.11
4.25	0.08	0.00	0.00	17.25	2.53	1.56	0.11
4.50	0.09	0.00	0.00	17.50	2.54	1.57	0.10
4.75	0.09	0.00	0.00	17.75	2.55	1.58	0.10
5.00	0.10	0.00	0.00	18.00	2.56	1.59	0.10
5.25	0.11	0.00	0.00	18.25	2.57	1.60	0.09
5.50	0.12	0.00	0.00	18.50	2.58	1.60	0.09
5.75	0.13	0.00	0.00	18.75	2.59	1.61	0.09
6.00	0.14	0.00	0.00	19.00	2.60	1.62	0.08
6.25	0.15	0.00	0.00	19.25	2.61	1.63	0.08
6.50	0.16	0.00	0.00	19.50	2.61	1.63	0.08
6.75	0.17	0.00	0.00	19.75	2.62	1.64	0.08
7.00	0.18	0.00	0.00	20.00	2.63	1.65	0.07
7.25	0.19	0.00	0.00	20.25	2.64	1.65	0.07
7.50	0.20	0.00	0.00	20.50	2.64	1.66	0.07
7.75	0.21	0.00	0.00	20.75	2.65	1.66	0.06
8.00	0.23	0.00	0.00	21.00	2.66	1.67	0.06
8.25	0.24	0.00	0.00	21.25	2.66	1.68	0.06
8.50	0.25	0.00	0.00	21.50	2.67	1.68	0.05
8.75	0.26	0.00	0.01	21.75	2.67	1.68	0.05
9.00	0.28	0.00	0.01	22.00	2.68	1.69	0.05
9.25	0.30	0.01	0.02	22.25	2.68	1.69	0.04
9.50	0.32	0.01	0.03	22.50	2.68	1.70	0.04
9.75	0.35	0.01	0.04	22.75	2.69	1.70	0.04
10.00	0.37	0.02	0.05	23.00	2.69	1.70	0.03
10.25	0.40	0.02	0.06	23.25	2.69	1.70	0.03
10.50	0.42	0.03	0.07	23.50	2.70	1.71	0.03
10.75	0.47	0.04	0.10	23.75	2.70	1.71	0.02
11.00	0.52	0.06	0.17	24.00	2.70	1.71	0.02
11.25	0.59	0.09	0.25				
11.50	0.67	0.13	0.34				
11.75	0.83	0.22	0.59				
12.00	1.25	0.49	1.56				
12.25	1.87	0.98	5.39				
12.50	2.03	1.12	2.71				
12.75	2.11	1.19	1.19				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 58

Summary for Subcatchment 13S: P-3

[47] Hint: Peak is 118% of capacity of segment #4

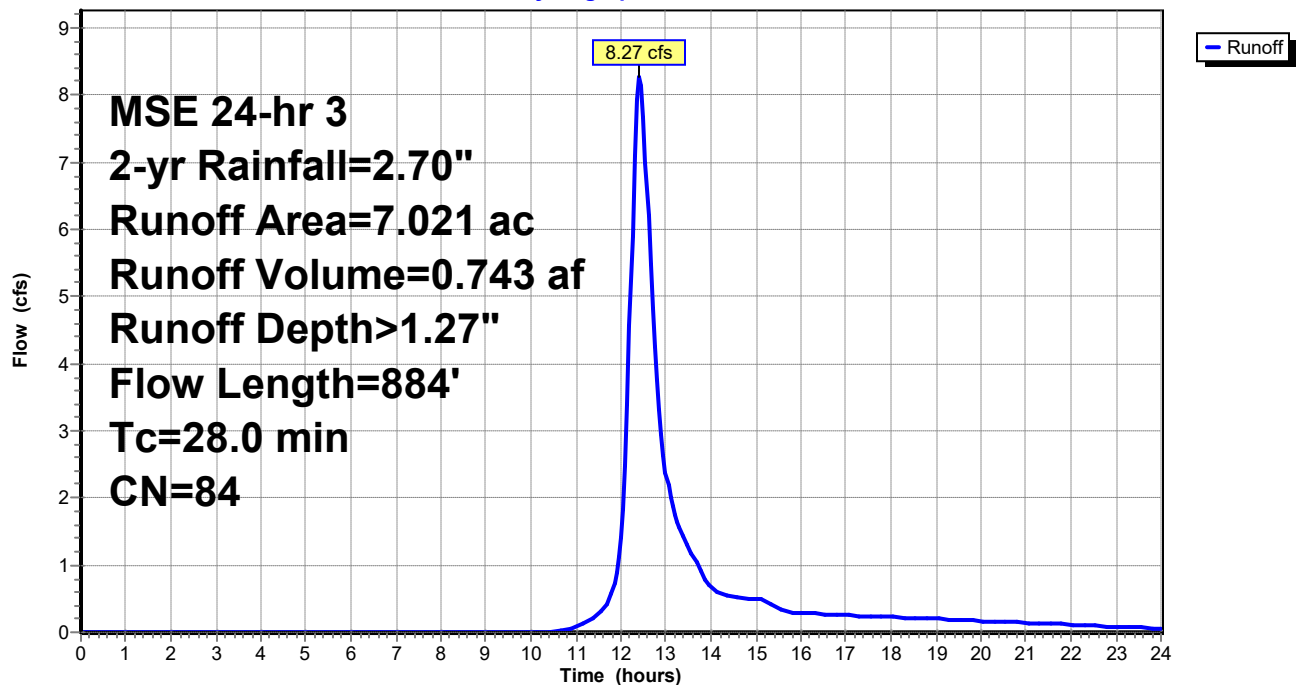
Runoff = 8.27 cfs @ 12.41 hrs, Volume= 0.743 af, Depth> 1.27"
Routed to Pond 5P : Wet Pond (WP-3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description			
* 7.021	84				
7.021		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	50	0.0125	0.05		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 2.70"
8.9	50	0.0200	0.09		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
0.9	91	0.0125	1.68		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
2.0	693	0.0100	5.70	7.00	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
28.0	884	Total			

Subcatchment 13S: P-3

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 59

Hydrograph for Subcatchment 13S: P-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	0.87	2.38
0.25	0.00	0.00	0.00	13.25	2.23	0.91	1.65
0.50	0.00	0.00	0.00	13.50	2.28	0.95	1.26
0.75	0.01	0.00	0.00	13.75	2.30	0.97	0.94
1.00	0.01	0.00	0.00	14.00	2.33	0.98	0.67
1.25	0.01	0.00	0.00	14.25	2.35	1.00	0.57
1.50	0.02	0.00	0.00	14.50	2.38	1.02	0.53
1.75	0.02	0.00	0.00	14.75	2.40	1.04	0.51
2.00	0.02	0.00	0.00	15.00	2.42	1.06	0.50
2.25	0.03	0.00	0.00	15.25	2.44	1.07	0.45
2.50	0.03	0.00	0.00	15.50	2.45	1.08	0.35
2.75	0.04	0.00	0.00	15.75	2.46	1.09	0.30
3.00	0.04	0.00	0.00	16.00	2.47	1.10	0.29
3.25	0.05	0.00	0.00	16.25	2.49	1.11	0.28
3.50	0.06	0.00	0.00	16.50	2.50	1.11	0.27
3.75	0.06	0.00	0.00	16.75	2.51	1.12	0.26
4.00	0.07	0.00	0.00	17.00	2.52	1.13	0.26
4.25	0.08	0.00	0.00	17.25	2.53	1.14	0.25
4.50	0.09	0.00	0.00	17.50	2.54	1.15	0.24
4.75	0.09	0.00	0.00	17.75	2.55	1.16	0.23
5.00	0.10	0.00	0.00	18.00	2.56	1.16	0.23
5.25	0.11	0.00	0.00	18.25	2.57	1.17	0.22
5.50	0.12	0.00	0.00	18.50	2.58	1.18	0.21
5.75	0.13	0.00	0.00	18.75	2.59	1.19	0.21
6.00	0.14	0.00	0.00	19.00	2.60	1.19	0.20
6.25	0.15	0.00	0.00	19.25	2.61	1.20	0.19
6.50	0.16	0.00	0.00	19.50	2.61	1.21	0.19
6.75	0.17	0.00	0.00	19.75	2.62	1.21	0.18
7.00	0.18	0.00	0.00	20.00	2.63	1.22	0.17
7.25	0.19	0.00	0.00	20.25	2.64	1.22	0.16
7.50	0.20	0.00	0.00	20.50	2.64	1.23	0.16
7.75	0.21	0.00	0.00	20.75	2.65	1.23	0.15
8.00	0.23	0.00	0.00	21.00	2.66	1.24	0.14
8.25	0.24	0.00	0.00	21.25	2.66	1.24	0.13
8.50	0.25	0.00	0.00	21.50	2.67	1.25	0.13
8.75	0.26	0.00	0.00	21.75	2.67	1.25	0.12
9.00	0.28	0.00	0.00	22.00	2.68	1.25	0.11
9.25	0.30	0.00	0.00	22.25	2.68	1.26	0.10
9.50	0.32	0.00	0.00	22.50	2.68	1.26	0.10
9.75	0.35	0.00	0.00	22.75	2.69	1.26	0.09
10.00	0.37	0.00	0.00	23.00	2.69	1.27	0.08
10.25	0.40	0.00	0.00	23.25	2.69	1.27	0.07
10.50	0.42	0.00	0.00	23.50	2.70	1.27	0.07
10.75	0.47	0.00	0.02	23.75	2.70	1.27	0.06
11.00	0.52	0.01	0.07	24.00	2.70	1.27	0.05
11.25	0.59	0.02	0.16				
11.50	0.67	0.04	0.29				
11.75	0.83	0.09	0.52				
12.00	1.25	0.27	1.41				
12.25	1.87	0.65	5.90				
12.50	2.03	0.77	7.67				
12.75	2.11	0.82	4.26				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 60

Summary for Subcatchment 15S: UD-1

Runoff = 1.50 cfs @ 12.36 hrs, Volume= 0.128 af, Depth> 0.82"
Routed to Link 6L : Total Discharge North

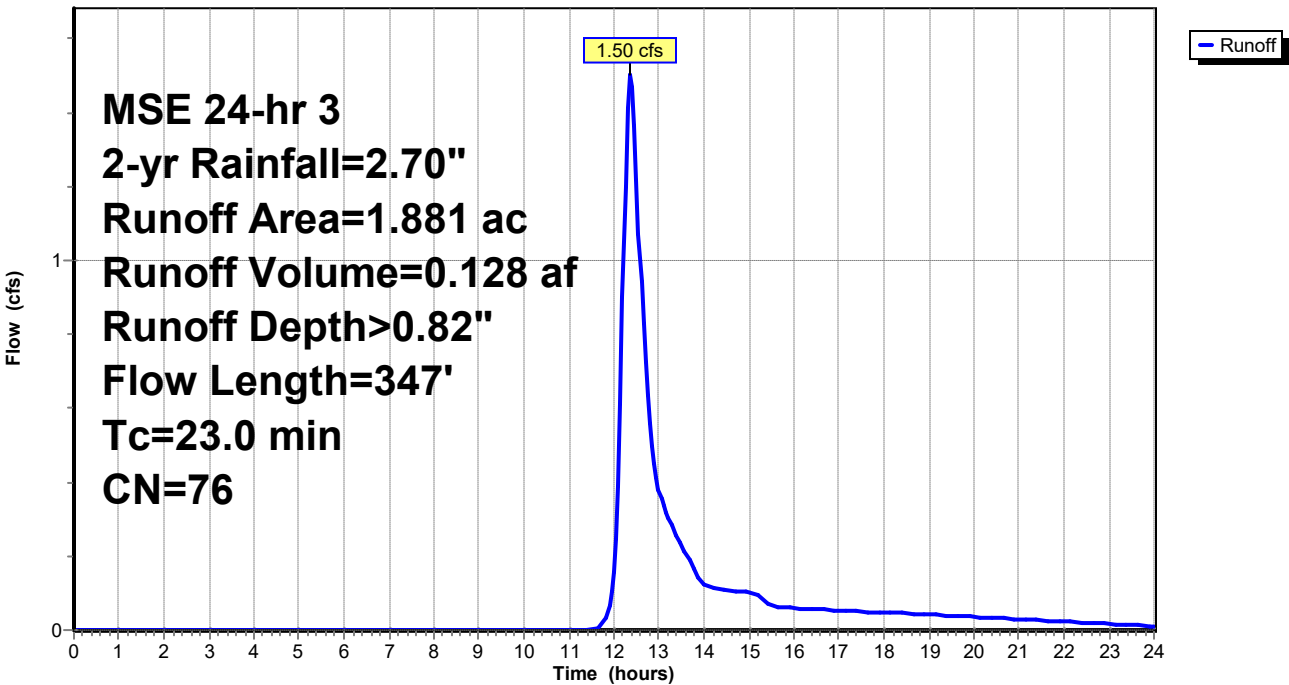
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 1.881	76	
1.881		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		Sheet Flow, Sheet Flow
					Grass: Dense n= 0.240 P2= 2.70"
2.5	247	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc.
					Grassed Waterway Kv= 15.0 fps
23.0	347	Total			

Subcatchment 15S: UD-1

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 61

Hydrograph for Subcatchment 15S: UD-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	0.51	0.38
0.25	0.00	0.00	0.00	13.25	2.23	0.54	0.29
0.50	0.00	0.00	0.00	13.50	2.28	0.56	0.23
0.75	0.01	0.00	0.00	13.75	2.30	0.58	0.17
1.00	0.01	0.00	0.00	14.00	2.33	0.59	0.12
1.25	0.01	0.00	0.00	14.25	2.35	0.61	0.11
1.50	0.02	0.00	0.00	14.50	2.38	0.62	0.11
1.75	0.02	0.00	0.00	14.75	2.40	0.63	0.10
2.00	0.02	0.00	0.00	15.00	2.42	0.65	0.10
2.25	0.03	0.00	0.00	15.25	2.44	0.66	0.09
2.50	0.03	0.00	0.00	15.50	2.45	0.66	0.07
2.75	0.04	0.00	0.00	15.75	2.46	0.67	0.06
3.00	0.04	0.00	0.00	16.00	2.47	0.68	0.06
3.25	0.05	0.00	0.00	16.25	2.49	0.69	0.06
3.50	0.06	0.00	0.00	16.50	2.50	0.69	0.06
3.75	0.06	0.00	0.00	16.75	2.51	0.70	0.05
4.00	0.07	0.00	0.00	17.00	2.52	0.71	0.05
4.25	0.08	0.00	0.00	17.25	2.53	0.71	0.05
4.50	0.09	0.00	0.00	17.50	2.54	0.72	0.05
4.75	0.09	0.00	0.00	17.75	2.55	0.73	0.05
5.00	0.10	0.00	0.00	18.00	2.56	0.73	0.05
5.25	0.11	0.00	0.00	18.25	2.57	0.74	0.05
5.50	0.12	0.00	0.00	18.50	2.58	0.74	0.04
5.75	0.13	0.00	0.00	18.75	2.59	0.75	0.04
6.00	0.14	0.00	0.00	19.00	2.60	0.76	0.04
6.25	0.15	0.00	0.00	19.25	2.61	0.76	0.04
6.50	0.16	0.00	0.00	19.50	2.61	0.77	0.04
6.75	0.17	0.00	0.00	19.75	2.62	0.77	0.04
7.00	0.18	0.00	0.00	20.00	2.63	0.77	0.04
7.25	0.19	0.00	0.00	20.25	2.64	0.78	0.03
7.50	0.20	0.00	0.00	20.50	2.64	0.78	0.03
7.75	0.21	0.00	0.00	20.75	2.65	0.79	0.03
8.00	0.23	0.00	0.00	21.00	2.66	0.79	0.03
8.25	0.24	0.00	0.00	21.25	2.66	0.79	0.03
8.50	0.25	0.00	0.00	21.50	2.67	0.80	0.03
8.75	0.26	0.00	0.00	21.75	2.67	0.80	0.02
9.00	0.28	0.00	0.00	22.00	2.68	0.80	0.02
9.25	0.30	0.00	0.00	22.25	2.68	0.81	0.02
9.50	0.32	0.00	0.00	22.50	2.68	0.81	0.02
9.75	0.35	0.00	0.00	22.75	2.69	0.81	0.02
10.00	0.37	0.00	0.00	23.00	2.69	0.81	0.02
10.25	0.40	0.00	0.00	23.25	2.69	0.81	0.02
10.50	0.42	0.00	0.00	23.50	2.70	0.82	0.01
10.75	0.47	0.00	0.00	23.75	2.70	0.82	0.01
11.00	0.52	0.00	0.00	24.00	2.70	0.82	0.01
11.25	0.59	0.00	0.00				
11.50	0.67	0.00	0.00				
11.75	0.83	0.01	0.02				
12.00	1.25	0.10	0.16				
12.25	1.87	0.35	1.20				
12.50	2.03	0.43	1.22				
12.75	2.11	0.47	0.64				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 62

Summary for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Runoff = 16.48 cfs @ 12.31 hrs, Volume= 1.247 af, Depth> 1.03"
Routed to Link 18L : Total Existing Discharge

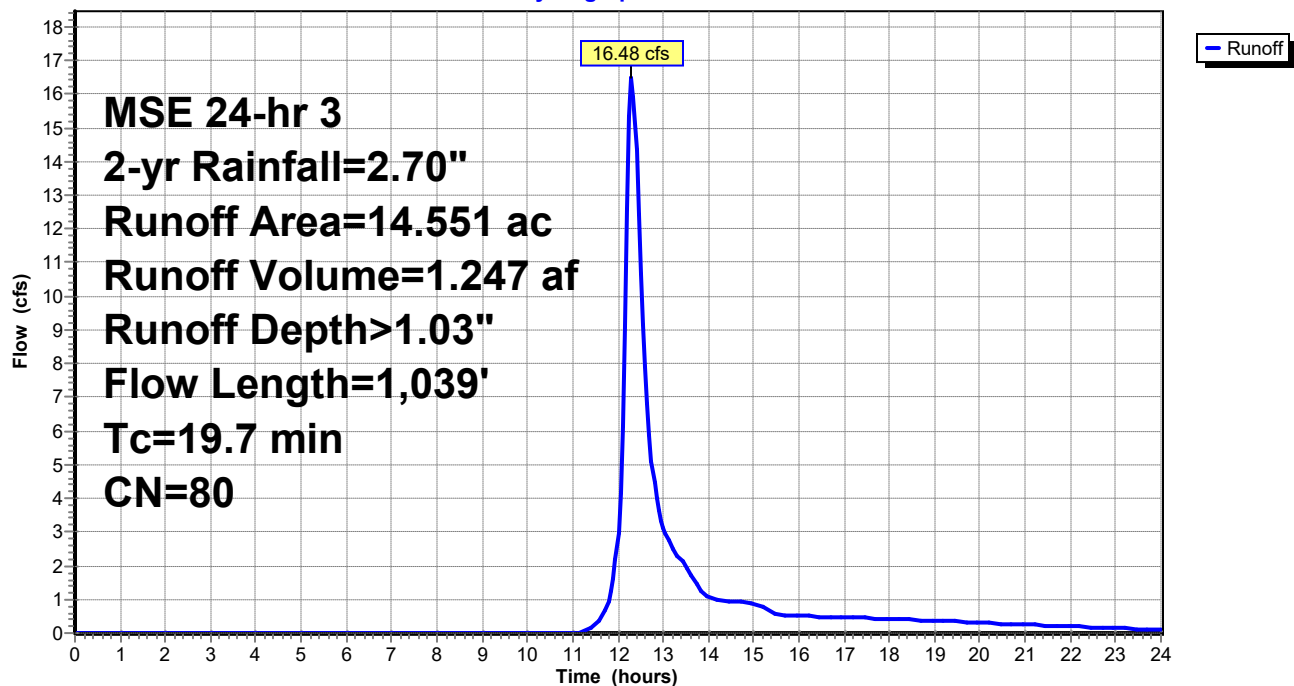
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 14.551	80	
14.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0200	0.14		Sheet Flow, Sheet Flow
					Cultivated: Residue>20% n= 0.170 P2= 2.70"
7.9	939	0.0485	1.98		Shallow Concentrated Flow, Shallow Conc.
					Cultivated Straight Rows Kv= 9.0 fps
19.7	1,039	Total			

Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 63

Hydrograph for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	0.67	3.14
0.25	0.00	0.00	0.00	13.25	2.23	0.71	2.45
0.50	0.00	0.00	0.00	13.50	2.28	0.74	1.98
0.75	0.01	0.00	0.00	13.75	2.30	0.76	1.41
1.00	0.01	0.00	0.00	14.00	2.33	0.77	1.06
1.25	0.01	0.00	0.00	14.25	2.35	0.79	0.98
1.50	0.02	0.00	0.00	14.50	2.38	0.80	0.95
1.75	0.02	0.00	0.00	14.75	2.40	0.82	0.92
2.00	0.02	0.00	0.00	15.00	2.42	0.84	0.90
2.25	0.03	0.00	0.00	15.25	2.44	0.84	0.74
2.50	0.03	0.00	0.00	15.50	2.45	0.85	0.57
2.75	0.04	0.00	0.00	15.75	2.46	0.86	0.53
3.00	0.04	0.00	0.00	16.00	2.47	0.87	0.52
3.25	0.05	0.00	0.00	16.25	2.49	0.88	0.50
3.50	0.06	0.00	0.00	16.50	2.50	0.89	0.49
3.75	0.06	0.00	0.00	16.75	2.51	0.90	0.48
4.00	0.07	0.00	0.00	17.00	2.52	0.90	0.47
4.25	0.08	0.00	0.00	17.25	2.53	0.91	0.45
4.50	0.09	0.00	0.00	17.50	2.54	0.92	0.44
4.75	0.09	0.00	0.00	17.75	2.55	0.93	0.43
5.00	0.10	0.00	0.00	18.00	2.56	0.93	0.42
5.25	0.11	0.00	0.00	18.25	2.57	0.94	0.40
5.50	0.12	0.00	0.00	18.50	2.58	0.95	0.39
5.75	0.13	0.00	0.00	18.75	2.59	0.95	0.38
6.00	0.14	0.00	0.00	19.00	2.60	0.96	0.36
6.25	0.15	0.00	0.00	19.25	2.61	0.96	0.35
6.50	0.16	0.00	0.00	19.50	2.61	0.97	0.34
6.75	0.17	0.00	0.00	19.75	2.62	0.97	0.32
7.00	0.18	0.00	0.00	20.00	2.63	0.98	0.31
7.25	0.19	0.00	0.00	20.25	2.64	0.98	0.30
7.50	0.20	0.00	0.00	20.50	2.64	0.99	0.28
7.75	0.21	0.00	0.00	20.75	2.65	0.99	0.27
8.00	0.23	0.00	0.00	21.00	2.66	1.00	0.26
8.25	0.24	0.00	0.00	21.25	2.66	1.00	0.24
8.50	0.25	0.00	0.00	21.50	2.67	1.01	0.23
8.75	0.26	0.00	0.00	21.75	2.67	1.01	0.21
9.00	0.28	0.00	0.00	22.00	2.68	1.01	0.20
9.25	0.30	0.00	0.00	22.25	2.68	1.02	0.19
9.50	0.32	0.00	0.00	22.50	2.68	1.02	0.17
9.75	0.35	0.00	0.00	22.75	2.69	1.02	0.16
10.00	0.37	0.00	0.00	23.00	2.69	1.02	0.15
10.25	0.40	0.00	0.00	23.25	2.69	1.02	0.13
10.50	0.42	0.00	0.00	23.50	2.70	1.03	0.12
10.75	0.47	0.00	0.00	23.75	2.70	1.03	0.10
11.00	0.52	0.00	0.00	24.00	2.70	1.03	0.09
11.25	0.59	0.00	0.06				
11.50	0.67	0.01	0.26				
11.75	0.83	0.04	0.74				
12.00	1.25	0.17	2.95				
12.25	1.87	0.48	15.35				
12.50	2.03	0.58	10.63				
12.75	2.11	0.63	5.08				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 64

Summary for Subcatchment 17S: E-2 (Ex. Discharge North)

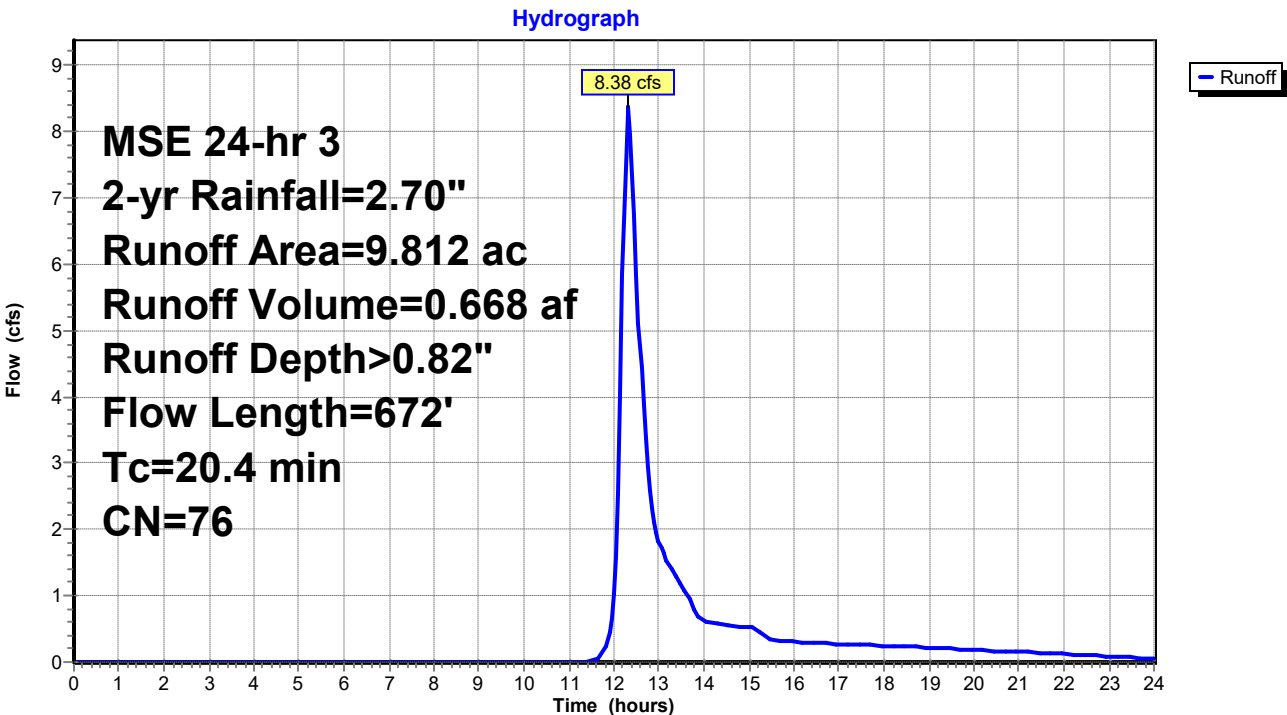
Runoff = 8.38 cfs @ 12.32 hrs, Volume= 0.668 af, Depth> 0.82"
Routed to Link 18L : Total Existing Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 9.812	76	
9.812		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0150	0.13		Sheet Flow, Sheet Flow
					Cultivated: Residue>20% n= 0.170 P2= 2.70"
7.2	572	0.0219	1.33		Shallow Concentrated Flow, Shallow Conc.
					Cultivated Straight Rows Kv= 9.0 fps
20.4	672	Total			

Subcatchment 17S: E-2 (Ex. Discharge North)



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 65

Hydrograph for Subcatchment 17S: E-2 (Ex. Discharge North)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	0.51	1.82
0.25	0.00	0.00	0.00	13.25	2.23	0.54	1.43
0.50	0.00	0.00	0.00	13.50	2.28	0.56	1.15
0.75	0.01	0.00	0.00	13.75	2.30	0.58	0.83
1.00	0.01	0.00	0.00	14.00	2.33	0.59	0.62
1.25	0.01	0.00	0.00	14.25	2.35	0.61	0.57
1.50	0.02	0.00	0.00	14.50	2.38	0.62	0.56
1.75	0.02	0.00	0.00	14.75	2.40	0.63	0.54
2.00	0.02	0.00	0.00	15.00	2.42	0.65	0.53
2.25	0.03	0.00	0.00	15.25	2.44	0.66	0.44
2.50	0.03	0.00	0.00	15.50	2.45	0.66	0.34
2.75	0.04	0.00	0.00	15.75	2.46	0.67	0.31
3.00	0.04	0.00	0.00	16.00	2.47	0.68	0.30
3.25	0.05	0.00	0.00	16.25	2.49	0.69	0.30
3.50	0.06	0.00	0.00	16.50	2.50	0.69	0.29
3.75	0.06	0.00	0.00	16.75	2.51	0.70	0.28
4.00	0.07	0.00	0.00	17.00	2.52	0.71	0.28
4.25	0.08	0.00	0.00	17.25	2.53	0.71	0.27
4.50	0.09	0.00	0.00	17.50	2.54	0.72	0.26
4.75	0.09	0.00	0.00	17.75	2.55	0.73	0.25
5.00	0.10	0.00	0.00	18.00	2.56	0.73	0.25
5.25	0.11	0.00	0.00	18.25	2.57	0.74	0.24
5.50	0.12	0.00	0.00	18.50	2.58	0.74	0.23
5.75	0.13	0.00	0.00	18.75	2.59	0.75	0.22
6.00	0.14	0.00	0.00	19.00	2.60	0.76	0.22
6.25	0.15	0.00	0.00	19.25	2.61	0.76	0.21
6.50	0.16	0.00	0.00	19.50	2.61	0.77	0.20
6.75	0.17	0.00	0.00	19.75	2.62	0.77	0.19
7.00	0.18	0.00	0.00	20.00	2.63	0.77	0.18
7.25	0.19	0.00	0.00	20.25	2.64	0.78	0.18
7.50	0.20	0.00	0.00	20.50	2.64	0.78	0.17
7.75	0.21	0.00	0.00	20.75	2.65	0.79	0.16
8.00	0.23	0.00	0.00	21.00	2.66	0.79	0.15
8.25	0.24	0.00	0.00	21.25	2.66	0.79	0.14
8.50	0.25	0.00	0.00	21.50	2.67	0.80	0.14
8.75	0.26	0.00	0.00	21.75	2.67	0.80	0.13
9.00	0.28	0.00	0.00	22.00	2.68	0.80	0.12
9.25	0.30	0.00	0.00	22.25	2.68	0.81	0.11
9.50	0.32	0.00	0.00	22.50	2.68	0.81	0.10
9.75	0.35	0.00	0.00	22.75	2.69	0.81	0.10
10.00	0.37	0.00	0.00	23.00	2.69	0.81	0.09
10.25	0.40	0.00	0.00	23.25	2.69	0.81	0.08
10.50	0.42	0.00	0.00	23.50	2.70	0.82	0.07
10.75	0.47	0.00	0.00	23.75	2.70	0.82	0.06
11.00	0.52	0.00	0.00	24.00	2.70	0.82	0.05
11.25	0.59	0.00	0.00				
11.50	0.67	0.00	0.00				
11.75	0.83	0.01	0.11				
12.00	1.25	0.10	1.02				
12.25	1.87	0.35	7.46				
12.50	2.03	0.43	5.85				
12.75	2.11	0.47	2.94				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 66

Summary for Subcatchment 19S: UD-2

Runoff = 0.46 cfs @ 12.14 hrs, Volume= 0.021 af, Depth> 1.03"

Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

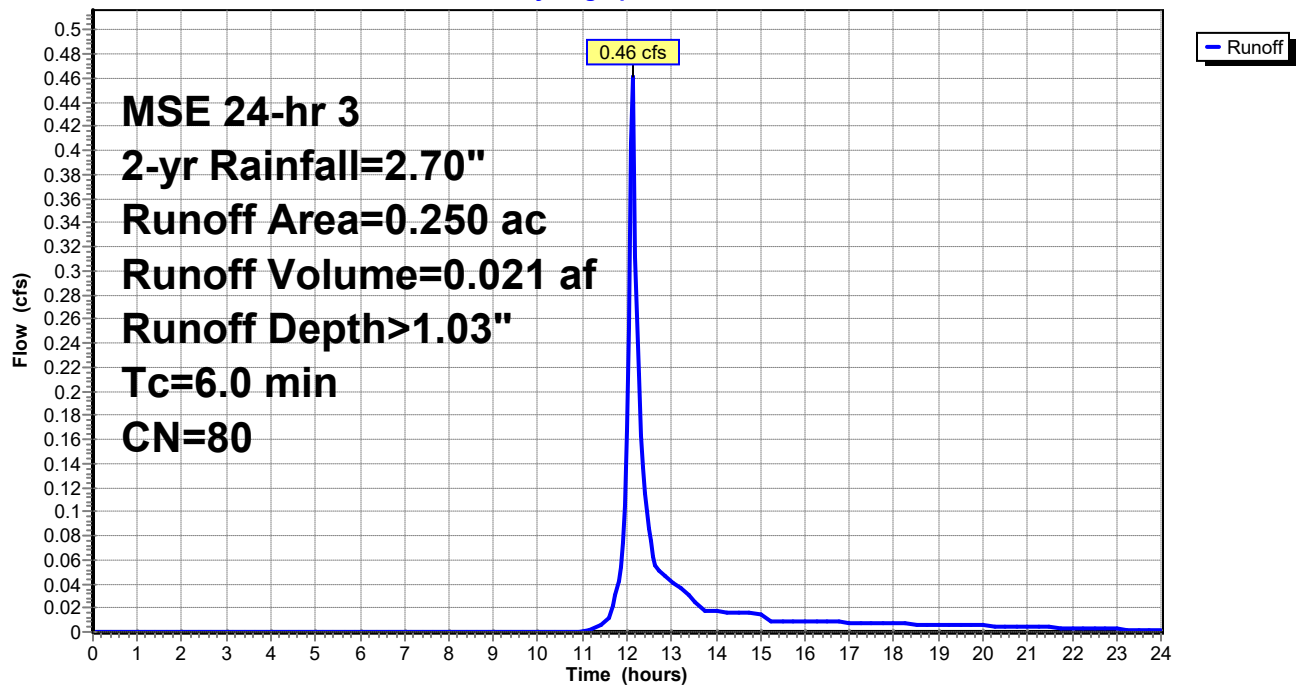
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 0.250	80	
0.250		100.00% Pervious Area

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

Subcatchment 19S: UD-2

Hydrograph



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 67

Hydrograph for Subcatchment 19S: UD-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	2.18	0.67	0.04
0.25	0.00	0.00	0.00	13.25	2.23	0.71	0.04
0.50	0.00	0.00	0.00	13.50	2.28	0.74	0.03
0.75	0.01	0.00	0.00	13.75	2.30	0.76	0.02
1.00	0.01	0.00	0.00	14.00	2.33	0.77	0.02
1.25	0.01	0.00	0.00	14.25	2.35	0.79	0.02
1.50	0.02	0.00	0.00	14.50	2.38	0.80	0.02
1.75	0.02	0.00	0.00	14.75	2.40	0.82	0.02
2.00	0.02	0.00	0.00	15.00	2.42	0.84	0.02
2.25	0.03	0.00	0.00	15.25	2.44	0.84	0.01
2.50	0.03	0.00	0.00	15.50	2.45	0.85	0.01
2.75	0.04	0.00	0.00	15.75	2.46	0.86	0.01
3.00	0.04	0.00	0.00	16.00	2.47	0.87	0.01
3.25	0.05	0.00	0.00	16.25	2.49	0.88	0.01
3.50	0.06	0.00	0.00	16.50	2.50	0.89	0.01
3.75	0.06	0.00	0.00	16.75	2.51	0.90	0.01
4.00	0.07	0.00	0.00	17.00	2.52	0.90	0.01
4.25	0.08	0.00	0.00	17.25	2.53	0.91	0.01
4.50	0.09	0.00	0.00	17.50	2.54	0.92	0.01
4.75	0.09	0.00	0.00	17.75	2.55	0.93	0.01
5.00	0.10	0.00	0.00	18.00	2.56	0.93	0.01
5.25	0.11	0.00	0.00	18.25	2.57	0.94	0.01
5.50	0.12	0.00	0.00	18.50	2.58	0.95	0.01
5.75	0.13	0.00	0.00	18.75	2.59	0.95	0.01
6.00	0.14	0.00	0.00	19.00	2.60	0.96	0.01
6.25	0.15	0.00	0.00	19.25	2.61	0.96	0.01
6.50	0.16	0.00	0.00	19.50	2.61	0.97	0.01
6.75	0.17	0.00	0.00	19.75	2.62	0.97	0.01
7.00	0.18	0.00	0.00	20.00	2.63	0.98	0.01
7.25	0.19	0.00	0.00	20.25	2.64	0.98	0.00
7.50	0.20	0.00	0.00	20.50	2.64	0.99	0.00
7.75	0.21	0.00	0.00	20.75	2.65	0.99	0.00
8.00	0.23	0.00	0.00	21.00	2.66	1.00	0.00
8.25	0.24	0.00	0.00	21.25	2.66	1.00	0.00
8.50	0.25	0.00	0.00	21.50	2.67	1.01	0.00
8.75	0.26	0.00	0.00	21.75	2.67	1.01	0.00
9.00	0.28	0.00	0.00	22.00	2.68	1.01	0.00
9.25	0.30	0.00	0.00	22.25	2.68	1.02	0.00
9.50	0.32	0.00	0.00	22.50	2.68	1.02	0.00
9.75	0.35	0.00	0.00	22.75	2.69	1.02	0.00
10.00	0.37	0.00	0.00	23.00	2.69	1.02	0.00
10.25	0.40	0.00	0.00	23.25	2.69	1.02	0.00
10.50	0.42	0.00	0.00	23.50	2.70	1.03	0.00
10.75	0.47	0.00	0.00	23.75	2.70	1.03	0.00
11.00	0.52	0.00	0.00	24.00	2.70	1.03	0.00
11.25	0.59	0.00	0.00				
11.50	0.67	0.01	0.01				
11.75	0.83	0.04	0.03				
12.00	1.25	0.17	0.17				
12.25	1.87	0.48	0.21				
12.50	2.03	0.58	0.09				
12.75	2.11	0.63	0.05				

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 2-yr Rainfall=2.70"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 68

Summary for Pond 1P: Bio-Filtration Basin (BF-1)

Inflow Area = 5.080 ac, 0.00% Impervious, Inflow Depth > 1.79" for 2-yr event
 Inflow = 8.74 cfs @ 12.37 hrs, Volume= 0.758 af
 Outflow = 2.39 cfs @ 12.92 hrs, Volume= 0.737 af, Atten= 73%, Lag= 33.2 min
 Discarded = 0.14 cfs @ 12.92 hrs, Volume= 0.101 af
 Primary = 2.25 cfs @ 12.92 hrs, Volume= 0.636 af
 Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 172.13' @ 12.92 hrs Surf.Area= 0.178 ac Storage= 0.363 af

Plug-Flow detention time= 123.8 min calculated for 0.737 af (97% of inflow)
 Center-of-Mass det. time= 108.9 min (917.2 - 808.3)

Volume	Invert	Avail.Storage	Storage Description	
#1	168.00'	1.047 af	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (acres)	Voids (%)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.105	0.0	0.000	0.000
168.01	0.105	30.0	0.000	0.000
169.99	0.105	30.0	0.062	0.063
170.00	0.105	100.0	0.001	0.064
171.00	0.137	100.0	0.121	0.185
172.00	0.173	100.0	0.155	0.340
173.00	0.214	100.0	0.194	0.533
174.00	0.257	100.0	0.236	0.769
175.00	0.299	100.0	0.278	1.047

Device	Routing	Invert	Outlet Devices
#1	Primary	168.00'	15.0" Round Culvert L= 70.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 168.00' / 167.00' S= 0.0142 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Discarded	168.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 163.00'
#3	Device 1	168.50'	6.0" Round Underdrain L= 121.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 168.50' / 168.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 1	171.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	172.00'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#6	Device 1	173.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	174.00'	15.0' long + 5.5 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 69

Discarded OutFlow Max=0.14 cfs @ 12.92 hrs HW=172.13' (Free Discharge)

↳ **2=Exfiltration** (Controls 0.14 cfs)

Primary OutFlow Max=2.25 cfs @ 12.92 hrs HW=172.13' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 2.25 cfs of 11.07 cfs potential flow)

↳ **3=Underdrain** (Barrel Controls 0.89 cfs @ 4.56 fps)

↳ **4=Orifice/Grate** (Orifice Controls 0.89 cfs @ 4.52 fps)

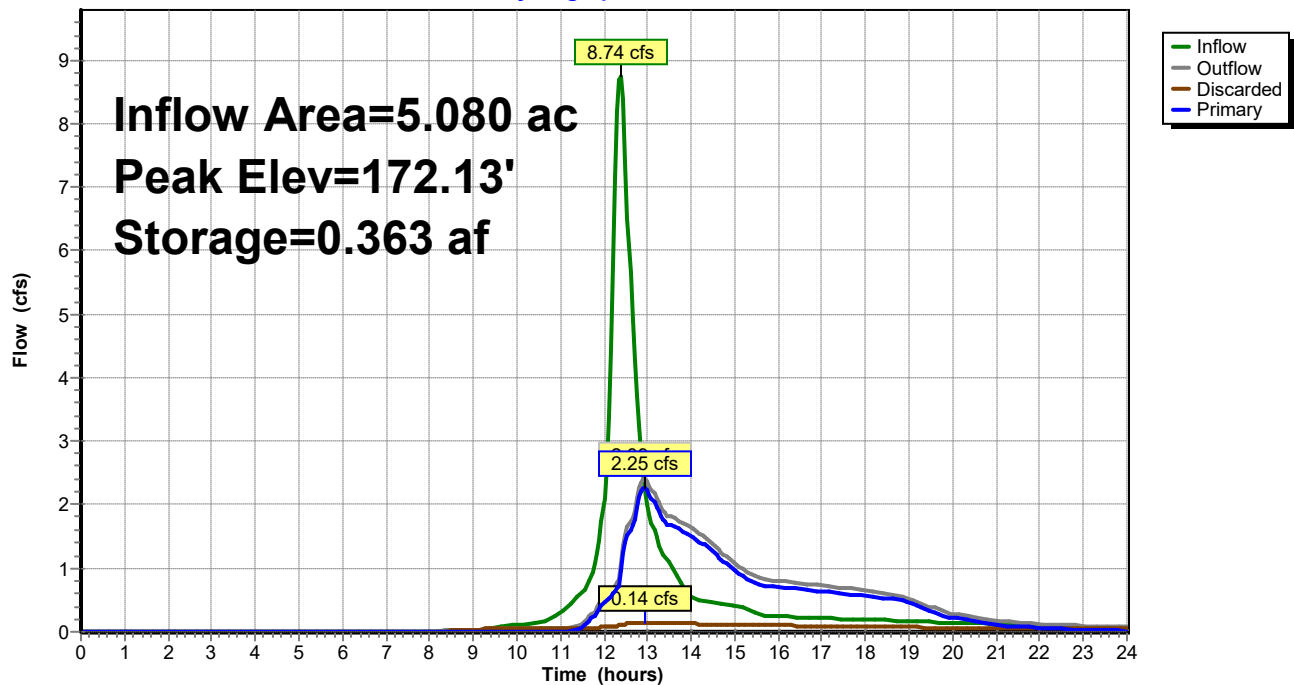
↳ **5=Sharp-Crested Rectangular Weir** (Weir Controls 0.47 cfs @ 1.19 fps)

↳ **6=Orifice/Grate** (Controls 0.00 cfs)

↳ **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Bio-Filtration Basin (BF-1)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 2-yr Rainfall=2.70"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 70

Hydrograph for Pond 1P: Bio-Filtration Basin (BF-1)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	168.00	0.00	0.00	0.00
0.50	0.00	0.000	168.00	0.00	0.00	0.00
1.00	0.00	0.000	168.00	0.00	0.00	0.00
1.50	0.00	0.000	168.00	0.00	0.00	0.00
2.00	0.00	0.000	168.00	0.00	0.00	0.00
2.50	0.00	0.000	168.00	0.00	0.00	0.00
3.00	0.00	0.000	168.00	0.00	0.00	0.00
3.50	0.00	0.000	168.00	0.00	0.00	0.00
4.00	0.00	0.000	168.00	0.00	0.00	0.00
4.50	0.00	0.000	168.00	0.00	0.00	0.00
5.00	0.00	0.000	168.00	0.00	0.00	0.00
5.50	0.00	0.000	168.00	0.00	0.00	0.00
6.00	0.00	0.000	168.00	0.00	0.00	0.00
6.50	0.00	0.000	168.00	0.00	0.00	0.00
7.00	0.00	0.000	168.00	0.00	0.00	0.00
7.50	0.00	0.000	168.00	0.00	0.00	0.00
8.00	0.00	0.000	168.00	0.00	0.00	0.00
8.50	0.02	0.000	168.00	0.02	0.02	0.00
9.00	0.03	0.000	168.00	0.03	0.03	0.00
9.50	0.07	0.000	168.00	0.05	0.05	0.00
10.00	0.11	0.002	168.05	0.05	0.05	0.00
10.50	0.15	0.005	168.15	0.05	0.05	0.00
11.00	0.30	0.011	168.34	0.06	0.06	0.00
11.50	0.63	0.026	168.84	0.14	0.06	0.08
12.00	2.10	0.058	169.84	0.53	0.07	0.46
12.50	7.39	0.279	171.63	1.53	0.12	1.41
13.00	2.02	0.362	172.13	2.35	0.14	2.21
13.50	1.06	0.337	171.98	1.82	0.13	1.68
14.00	0.56	0.298	171.75	1.64	0.13	1.51
14.50	0.46	0.256	171.49	1.38	0.12	1.26
15.00	0.42	0.224	171.27	1.07	0.11	0.96
15.50	0.29	0.199	171.10	0.87	0.11	0.77
16.00	0.24	0.176	170.93	0.80	0.10	0.70
16.50	0.23	0.153	170.76	0.77	0.10	0.67
17.00	0.22	0.131	170.59	0.73	0.09	0.64
17.50	0.20	0.111	170.42	0.69	0.09	0.60
18.00	0.19	0.091	170.25	0.65	0.08	0.57
18.50	0.18	0.073	170.09	0.60	0.08	0.53
19.00	0.17	0.057	169.80	0.52	0.07	0.45
19.50	0.16	0.044	169.41	0.39	0.07	0.32
20.00	0.14	0.037	169.17	0.27	0.07	0.21
20.50	0.13	0.032	169.01	0.23	0.06	0.16
21.00	0.12	0.029	168.91	0.17	0.06	0.11
21.50	0.11	0.027	168.85	0.14	0.06	0.08
22.00	0.09	0.025	168.81	0.12	0.06	0.06
22.50	0.08	0.024	168.77	0.11	0.06	0.05
23.00	0.07	0.023	168.74	0.09	0.06	0.03
23.50	0.06	0.022	168.70	0.08	0.06	0.02
24.00	0.04	0.021	168.66	0.07	0.06	0.01

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 71

Stage-Discharge for Pond 1P: Bio-Filtration Basin (BF-1)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
168.00	0.00	0.00	0.00	173.20	12.82	0.18	12.64
168.10	0.05	0.05	0.00	173.30	12.96	0.18	12.78
168.20	0.06	0.06	0.00	173.40	13.10	0.19	12.91
168.30	0.06	0.06	0.00	173.50	13.24	0.19	13.05
168.40	0.06	0.06	0.00	173.60	13.37	0.19	13.18
168.50	0.06	0.06	0.00	173.70	13.51	0.20	13.31
168.60	0.06	0.06	0.00	173.80	13.64	0.20	13.44
168.70	0.08	0.06	0.02	173.90	13.78	0.21	13.57
168.80	0.12	0.06	0.06	174.00	13.91	0.21	13.70
168.90	0.17	0.06	0.11	174.10	15.35	0.21	15.13
169.00	0.22	0.06	0.16	174.20	17.98	0.22	17.76
169.10	0.27	0.06	0.20	174.30	21.51	0.22	21.29
169.20	0.29	0.07	0.23	174.40	25.87	0.23	25.65
169.30	0.34	0.07	0.28	174.50	30.97	0.23	30.74
169.40	0.39	0.07	0.32	174.60	36.81	0.23	36.58
169.50	0.43	0.07	0.36	174.70	43.07	0.24	42.84
169.60	0.46	0.07	0.39	174.80	49.91	0.24	49.67
169.70	0.49	0.07	0.42	174.90	57.70	0.25	57.46
169.80	0.52	0.07	0.45	175.00	66.19	0.25	65.94
169.90	0.55	0.07	0.48				
170.00	0.58	0.07	0.51				
170.10	0.61	0.08	0.53				
170.20	0.63	0.08	0.55				
170.30	0.66	0.08	0.58				
170.40	0.68	0.08	0.60				
170.50	0.71	0.09	0.62				
170.60	0.73	0.09	0.64				
170.70	0.75	0.09	0.66				
170.80	0.77	0.10	0.68				
170.90	0.80	0.10	0.70				
171.00	0.82	0.10	0.72				
171.10	0.87	0.10	0.76				
171.20	0.97	0.11	0.86				
171.30	1.11	0.11	1.00				
171.40	1.26	0.11	1.15				
171.50	1.39	0.12	1.27				
171.60	1.50	0.12	1.37				
171.70	1.59	0.12	1.47				
171.80	1.67	0.13	1.55				
171.90	1.75	0.13	1.62				
172.00	1.83	0.13	1.69				
172.10	2.21	0.14	2.07				
172.20	2.83	0.14	2.69				
172.30	3.61	0.14	3.47				
172.40	4.51	0.15	4.36				
172.50	5.51	0.15	5.36				
172.60	6.59	0.16	6.43				
172.70	7.75	0.16	7.59				
172.80	8.97	0.16	8.81				
172.90	10.25	0.17	10.09				
173.00	11.59	0.17	11.42				
173.10	12.67	0.17	12.50				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 72

Stage-Area-Storage for Pond 1P: Bio-Filtration Basin (BF-1)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
168.00	0.105	0.000	173.20	0.223	0.577
168.10	0.105	0.003	173.30	0.227	0.599
168.20	0.105	0.006	173.40	0.231	0.622
168.30	0.105	0.009	173.50	0.236	0.646
168.40	0.105	0.013	173.60	0.240	0.669
168.50	0.105	0.016	173.70	0.244	0.694
168.60	0.105	0.019	173.80	0.248	0.718
168.70	0.105	0.022	173.90	0.253	0.743
168.80	0.105	0.025	174.00	0.257	0.769
168.90	0.105	0.028	174.10	0.261	0.795
169.00	0.105	0.032	174.20	0.265	0.821
169.10	0.105	0.035	174.30	0.270	0.848
169.20	0.105	0.038	174.40	0.274	0.875
169.30	0.105	0.041	174.50	0.278	0.902
169.40	0.105	0.044	174.60	0.282	0.930
169.50	0.105	0.047	174.70	0.286	0.959
169.60	0.105	0.050	174.80	0.291	0.988
169.70	0.105	0.054	174.90	0.295	1.017
169.80	0.105	0.057	175.00	0.299	1.047
169.90	0.105	0.060			
170.00	0.105	0.064			
170.10	0.108	0.074			
170.20	0.111	0.085			
170.30	0.115	0.097			
170.40	0.118	0.108			
170.50	0.121	0.120			
170.60	0.124	0.132			
170.70	0.127	0.145			
170.80	0.131	0.158			
170.90	0.134	0.171			
171.00	0.137	0.185			
171.10	0.141	0.199			
171.20	0.144	0.213			
171.30	0.148	0.227			
171.40	0.151	0.242			
171.50	0.155	0.258			
171.60	0.159	0.273			
171.70	0.162	0.289			
171.80	0.166	0.306			
171.90	0.169	0.323			
172.00	0.173	0.340			
172.10	0.177	0.357			
172.20	0.181	0.375			
172.30	0.185	0.393			
172.40	0.189	0.412			
172.50	0.194	0.431			
172.60	0.198	0.451			
172.70	0.202	0.471			
172.80	0.206	0.491			
172.90	0.210	0.512			
173.00	0.214	0.533			
173.10	0.218	0.555			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 2-yr Rainfall=2.70"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 73

Summary for Pond 2P: Wet Pond (WP-2A)

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=53)

Inflow Area = 10.131 ac, 0.00% Impervious, Inflow Depth > 1.70" for 2-yr event
 Inflow = 22.68 cfs @ 12.18 hrs, Volume= 1.434 af
 Outflow = 12.56 cfs @ 12.17 hrs, Volume= 1.431 af, Atten= 45%, Lag= 0.0 min
 Primary = 12.56 cfs @ 12.17 hrs, Volume= 1.431 af
 Routed to Pond 3P : Bio-Filtration Basin (BF-2B)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 136.39' @ 12.62 hrs Surf.Area= 0.152 ac Storage= 0.290 af

Plug-Flow detention time= 36.1 min calculated for 1.428 af (100% of inflow)
 Center-of-Mass det. time= 34.9 min (833.8 - 798.9)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	0.775 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
134.00	0.087	0.000	0.000
135.00	0.118	0.102	0.102
136.00	0.142	0.130	0.233
137.00	0.167	0.155	0.387
138.00	0.194	0.180	0.568
139.00	0.221	0.208	0.775

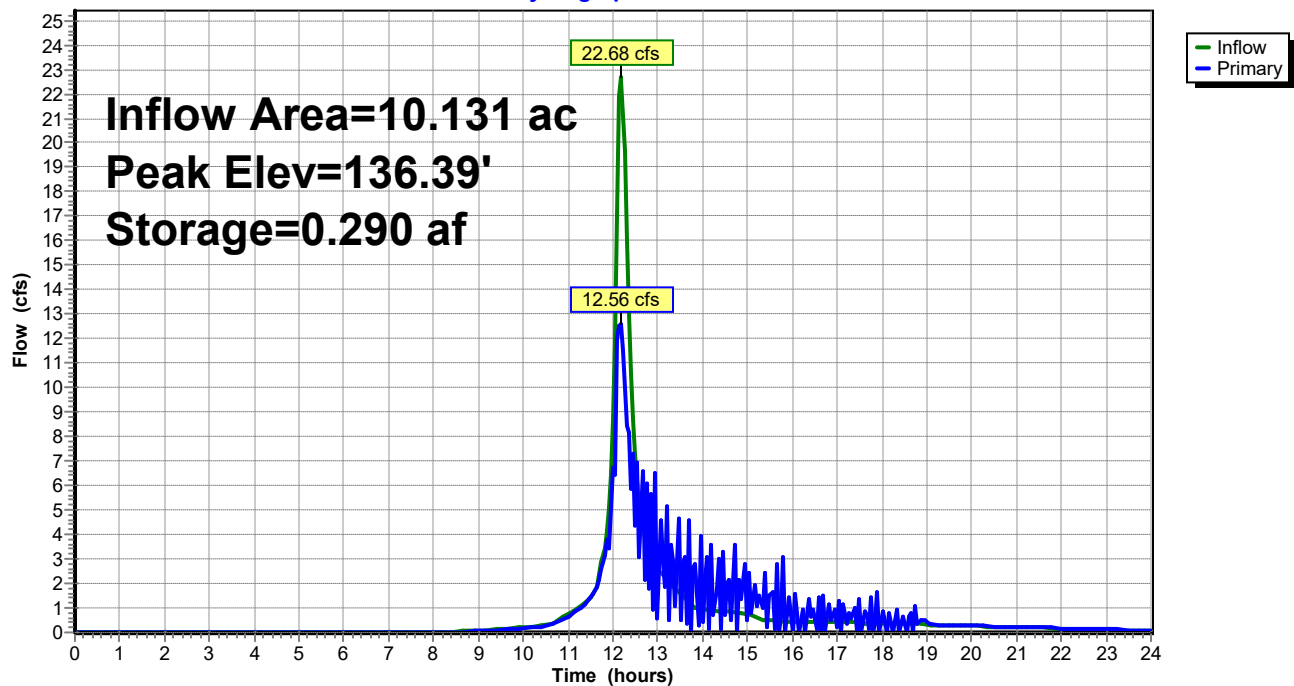
Device	Routing	Invert	Outlet Devices
#1	Primary	134.00'	43.0' long + 4.0 ' SideZ x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 12.17 hrs HW=135.13' TW=135.45' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Wet Pond (WP-2A)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 2-yr Rainfall=2.70"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 75

Hydrograph for Pond 2P: Wet Pond (WP-2A)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	134.00	0.00
0.50	0.00	0.000	134.00	0.00
1.00	0.00	0.000	134.00	0.00
1.50	0.00	0.000	134.00	0.00
2.00	0.00	0.000	134.00	0.00
2.50	0.00	0.000	134.00	0.00
3.00	0.00	0.000	134.00	0.00
3.50	0.00	0.000	134.00	0.00
4.00	0.00	0.000	134.00	0.00
4.50	0.00	0.000	134.00	0.00
5.00	0.00	0.000	134.00	0.00
5.50	0.00	0.000	134.00	0.00
6.00	0.00	0.000	134.00	0.00
6.50	0.00	0.000	134.00	0.00
7.00	0.00	0.000	134.00	0.00
7.50	0.00	0.000	134.00	0.00
8.00	0.01	0.000	134.00	0.01
8.50	0.03	0.000	134.00	0.02
9.00	0.05	0.001	134.01	0.05
9.50	0.13	0.001	134.01	0.12
10.00	0.20	0.001	134.02	0.19
10.50	0.27	0.002	134.02	0.26
11.00	0.72	0.003	134.04	0.68
11.50	1.42	0.005	134.06	1.37
12.00	8.65	0.034	134.37	6.74
12.50	7.32	0.282	136.34	4.38
13.00	2.55	0.271	136.26	0.55
13.50	1.63	0.242	136.07	0.51
14.00	0.92	0.203	135.79	0.45
14.50	0.85	0.164	135.49	0.72
15.00	0.80	0.130	135.23	0.49
15.50	0.49	0.098	134.96	1.50
16.00	0.46	0.068	134.70	0.00
16.50	0.43	0.052	134.55	1.25
17.00	0.41	0.040	134.43	0.25
17.50	0.39	0.029	134.32	1.33
18.00	0.36	0.021	134.23	0.00
18.50	0.34	0.011	134.12	1.31
19.00	0.32	0.003	134.03	0.42
19.50	0.29	0.002	134.02	0.29
20.00	0.27	0.002	134.02	0.27
20.50	0.24	0.002	134.02	0.25
21.00	0.22	0.001	134.02	0.22
21.50	0.19	0.001	134.02	0.20
22.00	0.17	0.001	134.01	0.17
22.50	0.15	0.001	134.01	0.15
23.00	0.12	0.001	134.01	0.12
23.50	0.10	0.001	134.01	0.10
24.00	0.07	0.001	134.01	0.08

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 76

Stage-Discharge for Pond 2P: Wet Pond (WP-2A)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
134.00	0.00	136.60	572.31
134.05	1.14	136.65	590.73
134.10	3.25	136.70	609.42
134.15	5.99	136.75	628.36
134.20	9.25	136.80	647.57
134.25	13.17	136.85	667.04
134.30	17.63	136.90	686.77
134.35	22.61	136.95	706.77
134.40	28.12	137.00	727.02
134.45	34.31	137.05	747.82
134.50	41.08	137.10	768.90
134.55	48.43	137.15	790.26
134.60	56.37	137.20	811.89
134.65	63.67	137.25	833.80
134.70	71.27	137.30	856.00
134.75	79.18	137.35	878.47
134.80	87.37	137.40	901.22
134.85	96.02	137.45	924.26
134.90	104.98	137.50	947.57
134.95	114.25	137.55	971.53
135.00	123.82	137.60	995.80
135.05	133.55	137.65	1,020.36
135.10	143.57	137.70	1,045.23
135.15	153.85	137.75	1,070.40
135.20	164.40	137.80	1,095.87
135.25	175.05	137.85	1,121.65
135.30	185.94	137.90	1,147.73
135.35	197.07	137.95	1,174.12
135.40	208.42	138.00	1,200.82
135.45	220.43	138.05	1,228.28
135.50	232.71	138.10	1,256.07
135.55	245.26	138.15	1,284.19
135.60	258.08	138.20	1,312.64
135.65	271.17	138.25	1,341.43
135.70	284.53	138.30	1,370.55
135.75	298.15	138.35	1,400.00
135.80	312.05	138.40	1,429.79
135.85	326.20	138.45	1,459.92
135.90	340.63	138.50	1,490.39
135.95	355.32	138.55	1,521.76
136.00	370.27	138.60	1,553.49
136.05	385.63	138.65	1,585.58
136.10	401.27	138.70	1,618.04
136.15	417.18	138.75	1,650.87
136.20	433.36	138.80	1,684.07
136.25	449.82	138.85	1,717.65
136.30	466.56	138.90	1,751.59
136.35	483.57	138.95	1,785.91
136.40	500.85	139.00	1,820.61
136.45	518.41		
136.50	536.24		
136.55	554.14		

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 77

Stage-Area-Storage for Pond 2P: Wet Pond (WP-2A)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
134.00	0.087	0.000	136.60	0.157	0.322
134.05	0.089	0.004	136.65	0.158	0.330
134.10	0.090	0.009	136.70	0.159	0.338
134.15	0.092	0.013	136.75	0.161	0.346
134.20	0.093	0.018	136.80	0.162	0.354
134.25	0.095	0.023	136.85	0.163	0.362
134.30	0.096	0.027	136.90	0.165	0.370
134.35	0.098	0.032	136.95	0.166	0.379
134.40	0.099	0.037	137.00	0.167	0.387
134.45	0.101	0.042	137.05	0.168	0.395
134.50	0.102	0.047	137.10	0.170	0.404
134.55	0.104	0.053	137.15	0.171	0.412
134.60	0.106	0.058	137.20	0.172	0.421
134.65	0.107	0.063	137.25	0.174	0.430
134.70	0.109	0.068	137.30	0.175	0.438
134.75	0.110	0.074	137.35	0.176	0.447
134.80	0.112	0.080	137.40	0.178	0.456
134.85	0.113	0.085	137.45	0.179	0.465
134.90	0.115	0.091	137.50	0.180	0.474
134.95	0.116	0.097	137.55	0.182	0.483
135.00	0.118	0.102	137.60	0.183	0.492
135.05	0.119	0.108	137.65	0.185	0.501
135.10	0.120	0.114	137.70	0.186	0.511
135.15	0.122	0.120	137.75	0.187	0.520
135.20	0.123	0.127	137.80	0.189	0.529
135.25	0.124	0.133	137.85	0.190	0.539
135.30	0.125	0.139	137.90	0.191	0.548
135.35	0.126	0.145	137.95	0.193	0.558
135.40	0.128	0.152	138.00	0.194	0.568
135.45	0.129	0.158	138.05	0.195	0.577
135.50	0.130	0.164	138.10	0.197	0.587
135.55	0.131	0.171	138.15	0.198	0.597
135.60	0.132	0.178	138.20	0.199	0.607
135.65	0.134	0.184	138.25	0.201	0.617
135.70	0.135	0.191	138.30	0.202	0.627
135.75	0.136	0.198	138.35	0.203	0.637
135.80	0.137	0.205	138.40	0.205	0.647
135.85	0.138	0.211	138.45	0.206	0.658
135.90	0.140	0.218	138.50	0.208	0.668
135.95	0.141	0.225	138.55	0.209	0.678
136.00	0.142	0.233	138.60	0.210	0.689
136.05	0.143	0.240	138.65	0.212	0.699
136.10	0.144	0.247	138.70	0.213	0.710
136.15	0.146	0.254	138.75	0.214	0.721
136.20	0.147	0.261	138.80	0.216	0.731
136.25	0.148	0.269	138.85	0.217	0.742
136.30	0.150	0.276	138.90	0.218	0.753
136.35	0.151	0.284	138.95	0.220	0.764
136.40	0.152	0.291	139.00	0.221	0.775
136.45	0.153	0.299			
136.50	0.155	0.307			
136.55	0.156	0.314			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 2-yr Rainfall=2.70"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 78

Summary for Pond 3P: Bio-Filtration Basin (BF-2B)

[80] Warning: Exceeded Pond 2P by 0.33' @ 12.15 hrs (128.12 cfs 6.953 af)

Inflow Area = 10.131 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-yr event
 Inflow = 12.56 cfs @ 12.17 hrs, Volume= 1.431 af
 Outflow = 5.02 cfs @ 12.57 hrs, Volume= 1.415 af, Atten= 60%, Lag= 24.2 min
 Discarded = 0.11 cfs @ 12.57 hrs, Volume= 0.077 af
 Primary = 4.91 cfs @ 12.57 hrs, Volume= 1.337 af
 Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 136.39' @ 12.57 hrs Surf.Area= 0.155 ac Storage= 0.375 af

Plug-Flow detention time= 68.4 min calculated for 1.415 af (99% of inflow)
 Center-of-Mass det. time= 62.1 min (895.8 - 833.8)

Volume	Invert	Avail.Storage	Storage Description
#1	131.50'	0.868 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Voids (%)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
131.50	0.069	0.0	0.000	0.000
131.51	0.069	30.0	0.000	0.000
133.49	0.069	30.0	0.041	0.041
133.50	0.069	100.0	0.001	0.042
134.00	0.085	100.0	0.038	0.080
135.00	0.121	100.0	0.103	0.183
136.00	0.145	100.0	0.133	0.316
137.00	0.170	100.0	0.157	0.474
138.00	0.196	100.0	0.183	0.657
139.00	0.226	100.0	0.211	0.868

Device	Routing	Invert	Outlet Devices
#1	Primary	129.50'	24.0" Round Culvert L= 70.1' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.50' / 129.15' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Discarded	131.50'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 125.00'
#3	Device 1	132.00'	6.0" Round Underdrain L= 91.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 132.00' / 132.00' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 1	134.25'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	136.10'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#6	Device 1	137.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	138.00'	10.0' long + 4.0 ' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 79

Discarded OutFlow Max=0.11 cfs @ 12.57 hrs HW=136.39' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=4.89 cfs @ 12.57 hrs HW=136.39' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 4.89 cfs of 41.08 cfs potential flow)

↑ **3=Underdrain** (Barrel Controls 1.12 cfs @ 5.72 fps)

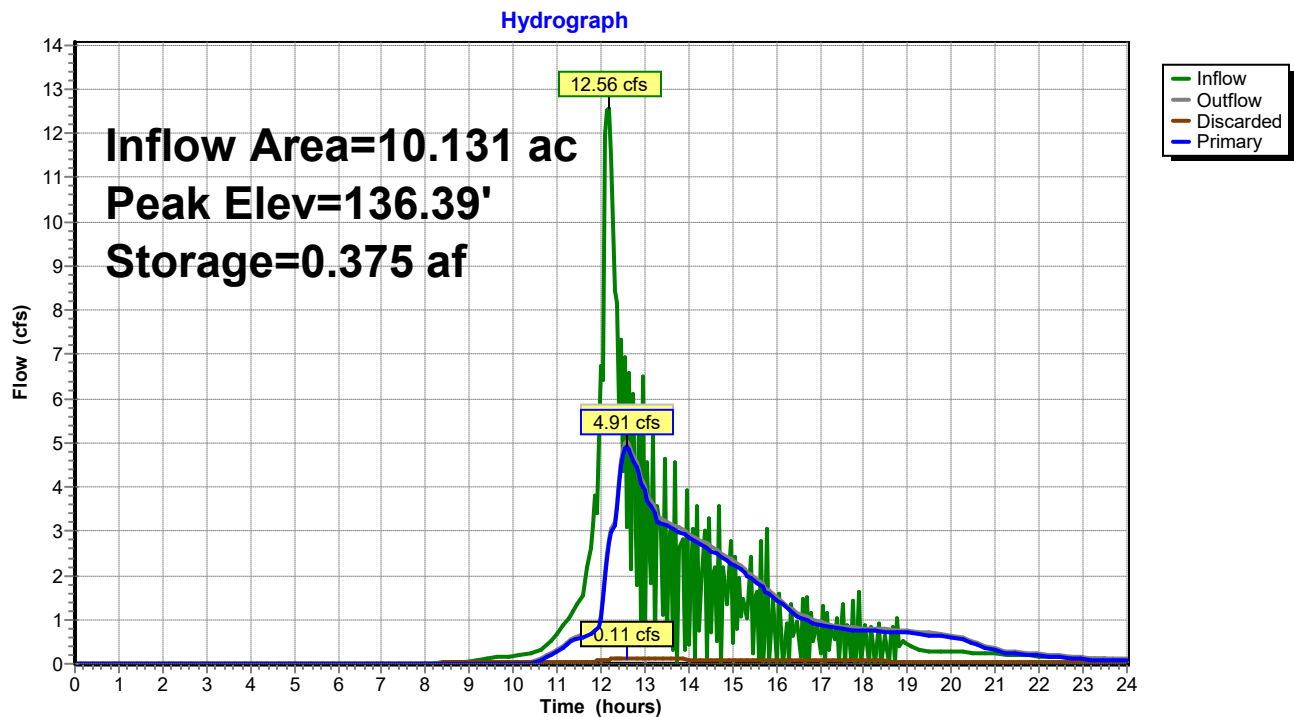
↑ **4=Orifice/Grate** (Orifice Controls 2.26 cfs @ 6.47 fps)

↑ **5=Sharp-Crested Rectangular Weir** (Weir Controls 1.51 cfs @ 1.76 fps)

↑ **6=Orifice/Grate** (Controls 0.00 cfs)

↑ **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Bio-Filtration Basin (BF-2B)



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 2-yr Rainfall=2.70"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 80

Hydrograph for Pond 3P: Bio-Filtration Basin (BF-2B)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	131.50	0.00	0.00	0.00
0.50	0.00	0.000	131.50	0.00	0.00	0.00
1.00	0.00	0.000	131.50	0.00	0.00	0.00
1.50	0.00	0.000	131.50	0.00	0.00	0.00
2.00	0.00	0.000	131.50	0.00	0.00	0.00
2.50	0.00	0.000	131.50	0.00	0.00	0.00
3.00	0.00	0.000	131.50	0.00	0.00	0.00
3.50	0.00	0.000	131.50	0.00	0.00	0.00
4.00	0.00	0.000	131.50	0.00	0.00	0.00
4.50	0.00	0.000	131.50	0.00	0.00	0.00
5.00	0.00	0.000	131.50	0.00	0.00	0.00
5.50	0.00	0.000	131.50	0.00	0.00	0.00
6.00	0.00	0.000	131.50	0.00	0.00	0.00
6.50	0.00	0.000	131.50	0.00	0.00	0.00
7.00	0.00	0.000	131.50	0.00	0.00	0.00
7.50	0.00	0.000	131.50	0.00	0.00	0.00
8.00	0.01	0.000	131.50	0.01	0.01	0.00
8.50	0.02	0.000	131.50	0.02	0.02	0.00
9.00	0.05	0.000	131.51	0.03	0.03	0.00
9.50	0.12	0.002	131.60	0.04	0.04	0.00
10.00	0.19	0.007	131.84	0.04	0.04	0.00
10.50	0.26	0.015	132.20	0.07	0.04	0.03
11.00	0.68	0.025	132.71	0.30	0.04	0.26
11.50	1.37	0.046	133.56	0.63	0.05	0.59
12.00	6.74	0.129	134.52	1.11	0.07	1.04
12.50	4.38	0.372	136.37	4.84	0.11	4.73
13.00	0.55	0.355	136.26	4.02	0.11	3.91
13.50	0.51	0.326	136.06	3.22	0.10	3.12
14.00	0.45	0.284	135.77	2.96	0.10	2.87
14.50	0.72	0.244	135.48	2.66	0.09	2.57
15.00	0.49	0.208	135.20	2.35	0.09	2.26
15.50	1.50	0.175	134.93	1.95	0.08	1.87
16.00	0.00	0.152	134.73	1.55	0.07	1.48
16.50	1.25	0.132	134.54	1.15	0.07	1.08
17.00	0.25	0.118	134.41	0.94	0.07	0.88
17.50	1.33	0.109	134.31	0.85	0.06	0.78
18.00	0.00	0.099	134.21	0.81	0.06	0.74
18.50	1.31	0.090	134.11	0.78	0.06	0.72
19.00	0.42	0.080	134.00	0.75	0.06	0.70
19.50	0.29	0.064	133.80	0.70	0.05	0.65
20.00	0.27	0.048	133.58	0.64	0.05	0.59
20.50	0.25	0.034	133.15	0.50	0.04	0.46
21.00	0.22	0.026	132.78	0.34	0.04	0.30
21.50	0.20	0.023	132.61	0.27	0.04	0.23
22.00	0.17	0.021	132.49	0.21	0.04	0.17
22.50	0.15	0.019	132.43	0.18	0.04	0.14
23.00	0.12	0.018	132.38	0.15	0.04	0.11
23.50	0.10	0.017	132.34	0.12	0.04	0.08
24.00	0.08	0.016	132.29	0.10	0.04	0.06

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 81

Stage-Discharge for Pond 3P: Bio-Filtration Basin (BF-2B)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
131.50	0.00	0.00	0.00	136.70	8.11	0.12	7.99
131.60	0.04	0.04	0.00	136.80	9.28	0.12	9.16
131.70	0.04	0.04	0.00	136.90	10.52	0.12	10.40
131.80	0.04	0.04	0.00	137.00	11.82	0.13	11.69
131.90	0.04	0.04	0.00	137.10	14.47	0.13	14.34
132.00	0.04	0.04	0.00	137.20	18.25	0.13	18.12
132.10	0.04	0.04	0.00	137.30	22.77	0.13	22.63
132.20	0.06	0.04	0.03	137.40	27.89	0.13	27.76
132.30	0.10	0.04	0.07	137.50	33.54	0.14	33.41
132.40	0.16	0.04	0.12	137.60	39.66	0.14	39.52
132.50	0.22	0.04	0.18	137.70	46.07	0.14	45.93
132.60	0.27	0.04	0.23	137.80	46.42	0.14	46.28
132.70	0.30	0.04	0.25	137.90	46.77	0.15	46.62
132.80	0.35	0.04	0.31	138.00	47.12	0.15	46.97
132.90	0.40	0.04	0.36	138.10	48.27	0.15	48.12
133.00	0.45	0.04	0.40	138.20	50.17	0.15	50.02
133.10	0.48	0.04	0.44	138.30	52.69	0.16	52.53
133.20	0.52	0.04	0.48	138.40	55.78	0.16	55.63
133.30	0.55	0.04	0.51	138.50	59.60	0.16	59.44
133.40	0.59	0.04	0.54	138.60	64.10	0.17	63.94
133.50	0.62	0.05	0.57	138.70	68.80	0.17	68.63
133.60	0.65	0.05	0.60	138.80	73.98	0.17	73.81
133.70	0.67	0.05	0.62	138.90	79.66	0.17	79.49
133.80	0.70	0.05	0.65	139.00	85.83	0.18	85.66
133.90	0.73	0.05	0.67				
134.00	0.75	0.06	0.70				
134.10	0.78	0.06	0.72				
134.20	0.80	0.06	0.74				
134.30	0.84	0.06	0.77				
134.40	0.93	0.07	0.86				
134.50	1.08	0.07	1.01				
134.60	1.27	0.07	1.20				
134.70	1.49	0.07	1.42				
134.80	1.72	0.08	1.64				
134.90	1.91	0.08	1.83				
135.00	2.07	0.08	1.99				
135.10	2.21	0.08	2.13				
135.20	2.34	0.09	2.26				
135.30	2.46	0.09	2.38				
135.40	2.58	0.09	2.49				
135.50	2.69	0.09	2.60				
135.60	2.79	0.09	2.70				
135.70	2.89	0.10	2.79				
135.80	2.99	0.10	2.89				
135.90	3.08	0.10	2.98				
136.00	3.17	0.10	3.07				
136.10	3.26	0.10	3.15				
136.20	3.65	0.11	3.54				
136.30	4.29	0.11	4.18				
136.40	5.08	0.11	4.97				
136.50	6.00	0.11	5.88				
136.60	7.01	0.12	6.89				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 82

Stage-Area-Storage for Pond 3P: Bio-Filtration Basin (BF-2B)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
131.50	0.069	0.000	136.70	0.162	0.424
131.60	0.069	0.002	136.80	0.165	0.440
131.70	0.069	0.004	136.90	0.168	0.457
131.80	0.069	0.006	137.00	0.170	0.474
131.90	0.069	0.008	137.10	0.173	0.491
132.00	0.069	0.010	137.20	0.175	0.508
132.10	0.069	0.012	137.30	0.178	0.526
132.20	0.069	0.014	137.40	0.180	0.544
132.30	0.069	0.017	137.50	0.183	0.562
132.40	0.069	0.019	137.60	0.186	0.581
132.50	0.069	0.021	137.70	0.188	0.599
132.60	0.069	0.023	137.80	0.191	0.618
132.70	0.069	0.025	137.90	0.193	0.637
132.80	0.069	0.027	138.00	0.196	0.657
132.90	0.069	0.029	138.10	0.199	0.677
133.00	0.069	0.031	138.20	0.202	0.697
133.10	0.069	0.033	138.30	0.205	0.717
133.20	0.069	0.035	138.40	0.208	0.738
133.30	0.069	0.037	138.50	0.211	0.759
133.40	0.069	0.039	138.60	0.214	0.780
133.50	0.069	0.042	138.70	0.217	0.801
133.60	0.072	0.049	138.80	0.220	0.823
133.70	0.075	0.056	138.90	0.223	0.845
133.80	0.079	0.064	139.00	0.226	0.868
133.90	0.082	0.072			
134.00	0.085	0.080			
134.10	0.089	0.089			
134.20	0.092	0.098			
134.30	0.096	0.108			
134.40	0.099	0.117			
134.50	0.103	0.127			
134.60	0.107	0.138			
134.70	0.110	0.149			
134.80	0.114	0.160			
134.90	0.117	0.171			
135.00	0.121	0.183			
135.10	0.123	0.196			
135.20	0.126	0.208			
135.30	0.128	0.221			
135.40	0.131	0.234			
135.50	0.133	0.247			
135.60	0.135	0.260			
135.70	0.138	0.274			
135.80	0.140	0.288			
135.90	0.143	0.302			
136.00	0.145	0.316			
136.10	0.147	0.331			
136.20	0.150	0.346			
136.30	0.153	0.361			
136.40	0.155	0.376			
136.50	0.157	0.392			
136.60	0.160	0.408			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 2-yr Rainfall=2.70"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 83

Summary for Pond 5P: Wet Pond (WP-3)

Inflow Area = 7.021 ac, 0.00% Impervious, Inflow Depth > 1.27" for 2-yr event
 Inflow = 8.27 cfs @ 12.41 hrs, Volume= 0.743 af
 Outflow = 2.61 cfs @ 12.96 hrs, Volume= 0.623 af, Atten= 68%, Lag= 33.0 min
 Primary = 2.61 cfs @ 12.96 hrs, Volume= 0.623 af
 Routed to Link 6L : Total Discharge North

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 167.16' @ 12.96 hrs Surf.Area= 0.232 ac Storage= 0.372 af

Plug-Flow detention time= 232.9 min calculated for 0.623 af (84% of inflow)
 Center-of-Mass det. time= 174.4 min (1,004.2 - 829.7)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	0.931 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
165.00	0.119	0.000	0.000
166.00	0.165	0.142	0.142
167.00	0.221	0.193	0.335
168.00	0.289	0.255	0.590
169.00	0.393	0.341	0.931

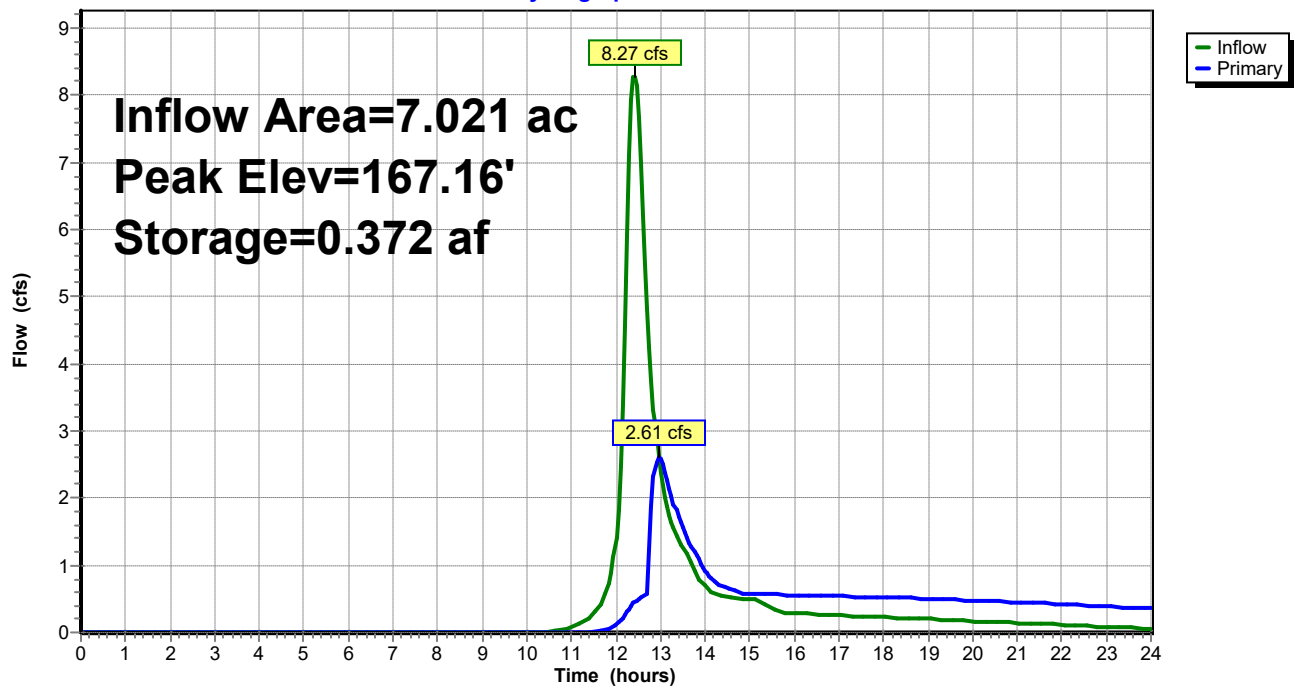
Device	Routing	Invert	Outlet Devices
#1	Primary	162.50'	24.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 162.50' / 161.50' S= 0.0182 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	165.00'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	167.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	168.00'	20.0' long + 4.0 ' SideZ x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.60 cfs @ 12.96 hrs HW=167.16' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 2.60 cfs of 28.95 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.59 cfs @ 6.80 fps)
 3=Orifice/Grate (Weir Controls 2.01 cfs @ 1.32 fps)
 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: Wet Pond (WP-3)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 2-yr Rainfall=2.70"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 85

Hydrograph for Pond 5P: Wet Pond (WP-3)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	165.00	0.00
0.50	0.00	0.000	165.00	0.00
1.00	0.00	0.000	165.00	0.00
1.50	0.00	0.000	165.00	0.00
2.00	0.00	0.000	165.00	0.00
2.50	0.00	0.000	165.00	0.00
3.00	0.00	0.000	165.00	0.00
3.50	0.00	0.000	165.00	0.00
4.00	0.00	0.000	165.00	0.00
4.50	0.00	0.000	165.00	0.00
5.00	0.00	0.000	165.00	0.00
5.50	0.00	0.000	165.00	0.00
6.00	0.00	0.000	165.00	0.00
6.50	0.00	0.000	165.00	0.00
7.00	0.00	0.000	165.00	0.00
7.50	0.00	0.000	165.00	0.00
8.00	0.00	0.000	165.00	0.00
8.50	0.00	0.000	165.00	0.00
9.00	0.00	0.000	165.00	0.00
9.50	0.00	0.000	165.00	0.00
10.00	0.00	0.000	165.00	0.00
10.50	0.00	0.000	165.00	0.00
11.00	0.07	0.001	165.01	0.00
11.50	0.29	0.008	165.06	0.01
12.00	1.41	0.032	165.25	0.12
12.50	7.67	0.243	166.56	0.50
13.00	2.38	0.371	167.16	2.58
13.50	1.26	0.357	167.10	1.55
14.00	0.67	0.346	167.05	0.92
14.50	0.53	0.339	167.02	0.65
15.00	0.50	0.335	167.00	0.57
15.50	0.35	0.330	166.98	0.57
16.00	0.29	0.320	166.93	0.56
16.50	0.27	0.308	166.88	0.55
17.00	0.26	0.297	166.82	0.54
17.50	0.24	0.285	166.77	0.53
18.00	0.23	0.273	166.71	0.52
18.50	0.21	0.260	166.65	0.51
19.00	0.20	0.248	166.58	0.50
19.50	0.19	0.236	166.52	0.49
20.00	0.17	0.223	166.46	0.48
20.50	0.16	0.210	166.39	0.46
21.00	0.14	0.197	166.32	0.45
21.50	0.13	0.185	166.25	0.44
22.00	0.11	0.172	166.18	0.42
22.50	0.10	0.159	166.10	0.41
23.00	0.08	0.146	166.03	0.39
23.50	0.07	0.134	165.95	0.37
24.00	0.05	0.121	165.87	0.35

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 2-yr Rainfall=2.70"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 86

Stage-Discharge for Pond 5P: Wet Pond (WP-3)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
165.00	0.00	166.04	0.39	167.08	1.28	168.12	34.78
165.02	0.00	166.06	0.40	167.10	1.56	168.14	35.45
165.04	0.00	166.08	0.40	167.12	1.87	168.16	36.17
165.06	0.01	166.10	0.41	167.14	2.20	168.18	36.94
165.08	0.02	166.12	0.41	167.16	2.57	168.20	37.74
165.10	0.02	166.14	0.41	167.18	2.95	168.22	38.59
165.12	0.03	166.16	0.42	167.20	3.36	168.24	39.49
165.14	0.04	166.18	0.42	167.22	3.78	168.26	40.42
165.16	0.06	166.20	0.43	167.24	4.23	168.28	41.39
165.18	0.07	166.22	0.43	167.26	4.69	168.30	42.41
165.20	0.08	166.24	0.44	167.28	5.18	168.32	43.45
165.22	0.10	166.26	0.44	167.30	5.68	168.34	44.54
165.24	0.11	166.28	0.44	167.32	6.20	168.36	45.66
165.26	0.13	166.30	0.45	167.34	6.73	168.38	46.82
165.28	0.14	166.32	0.45	167.36	7.28	168.40	48.02
165.30	0.15	166.34	0.46	167.38	7.84	168.42	49.24
165.32	0.17	166.36	0.46	167.40	8.42	168.44	50.49
165.34	0.17	166.38	0.46	167.42	9.02	168.46	51.78
165.36	0.18	166.40	0.47	167.44	9.63	168.48	53.09
165.38	0.19	166.42	0.47	167.46	10.25	168.50	54.44
165.40	0.20	166.44	0.47	167.48	10.89	168.52	55.83
165.42	0.21	166.46	0.48	167.50	11.54	168.54	57.24
165.44	0.22	166.48	0.48	167.52	12.20	168.56	58.68
165.46	0.23	166.50	0.49	167.54	12.88	168.58	60.16
165.48	0.24	166.52	0.49	167.56	13.57	168.60	61.67
165.50	0.24	166.54	0.49	167.58	14.27	168.62	63.14
165.52	0.25	166.56	0.50	167.60	14.98	168.64	64.64
165.54	0.26	166.58	0.50	167.62	15.70	168.66	66.16
165.56	0.26	166.60	0.50	167.64	16.44	168.68	67.70
165.58	0.27	166.62	0.51	167.66	17.19	168.70	69.27
165.60	0.28	166.64	0.51	167.68	17.95	168.72	70.86
165.62	0.28	166.66	0.51	167.70	18.72	168.74	72.47
165.64	0.29	166.68	0.52	167.72	19.50	168.76	74.11
165.66	0.30	166.70	0.52	167.74	20.29	168.78	75.76
165.68	0.30	166.72	0.52	167.76	21.10	168.80	77.44
165.70	0.31	166.74	0.53	167.78	21.91	168.82	79.22
165.72	0.31	166.76	0.53	167.80	22.73	168.84	81.03
165.74	0.32	166.78	0.53	167.82	23.57	168.86	82.87
165.76	0.32	166.80	0.54	167.84	24.41	168.88	84.73
165.78	0.33	166.82	0.54	167.86	25.27	168.90	86.63
165.80	0.33	166.84	0.54	167.88	26.13	168.92	88.55
165.82	0.34	166.86	0.55	167.90	27.01	168.94	90.49
165.84	0.34	166.88	0.55	167.92	27.89	168.96	92.46
165.86	0.35	166.90	0.55	167.94	28.79	168.98	94.46
165.88	0.35	166.92	0.56	167.96	29.69	169.00	96.49
165.90	0.36	166.94	0.56	167.98	30.60		
165.92	0.36	166.96	0.56	168.00	31.53		
165.94	0.37	166.98	0.57	168.02	32.31		
165.96	0.37	167.00	0.57	168.04	32.66		
165.98	0.38	167.02	0.66	168.06	33.10		
166.00	0.38	167.04	0.82	168.08	33.60		
166.02	0.39	167.06	1.03	168.10	34.17		

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 87

Stage-Area-Storage for Pond 5P: Wet Pond (WP-3)

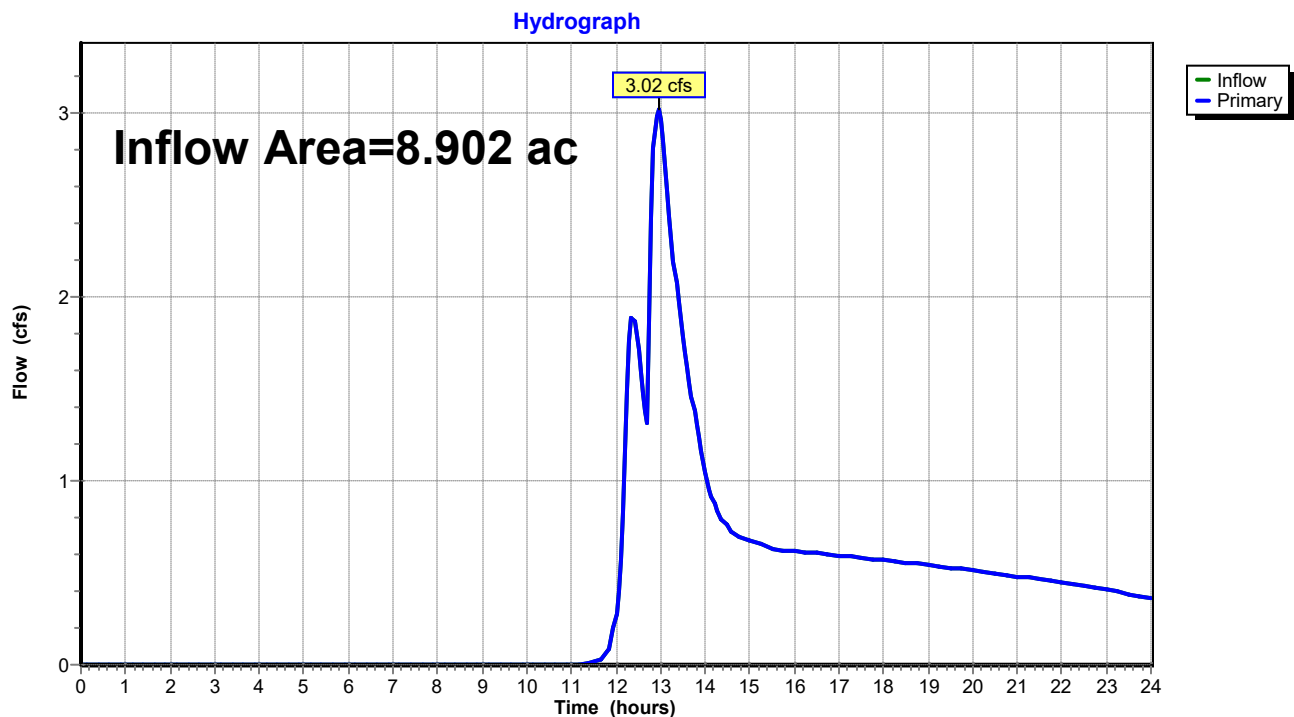
Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
165.00	0.119	0.000	167.60	0.262	0.480
165.05	0.121	0.006	167.65	0.265	0.493
165.10	0.124	0.012	167.70	0.269	0.506
165.15	0.126	0.018	167.75	0.272	0.520
165.20	0.128	0.025	167.80	0.275	0.534
165.25	0.130	0.031	167.85	0.279	0.547
165.30	0.133	0.038	167.90	0.282	0.561
165.35	0.135	0.044	167.95	0.286	0.576
165.40	0.137	0.051	168.00	0.289	0.590
165.45	0.140	0.058	168.05	0.294	0.605
165.50	0.142	0.065	168.10	0.299	0.619
165.55	0.144	0.072	168.15	0.305	0.635
165.60	0.147	0.080	168.20	0.310	0.650
165.65	0.149	0.087	168.25	0.315	0.665
165.70	0.151	0.095	168.30	0.320	0.681
165.75	0.153	0.102	168.35	0.325	0.698
165.80	0.156	0.110	168.40	0.331	0.714
165.85	0.158	0.118	168.45	0.336	0.731
165.90	0.160	0.126	168.50	0.341	0.748
165.95	0.163	0.134	168.55	0.346	0.765
166.00	0.165	0.142	168.60	0.351	0.782
166.05	0.168	0.150	168.65	0.357	0.800
166.10	0.171	0.159	168.70	0.362	0.818
166.15	0.173	0.167	168.75	0.367	0.836
166.20	0.176	0.176	168.80	0.372	0.854
166.25	0.179	0.185	168.85	0.377	0.873
166.30	0.182	0.194	168.90	0.383	0.892
166.35	0.185	0.203	168.95	0.388	0.911
166.40	0.187	0.212	169.00	0.393	0.931
166.45	0.190	0.222			
166.50	0.193	0.231			
166.55	0.196	0.241			
166.60	0.199	0.251			
166.65	0.201	0.261			
166.70	0.204	0.271			
166.75	0.207	0.281			
166.80	0.210	0.292			
166.85	0.213	0.302			
166.90	0.215	0.313			
166.95	0.218	0.324			
167.00	0.221	0.335			
167.05	0.224	0.346			
167.10	0.228	0.357			
167.15	0.231	0.369			
167.20	0.235	0.381			
167.25	0.238	0.392			
167.30	0.241	0.404			
167.35	0.245	0.417			
167.40	0.248	0.429			
167.45	0.252	0.441			
167.50	0.255	0.454			
167.55	0.258	0.467			

Summary for Link 6L: Total Discharge North

Inflow Area = 8.902 ac, 0.00% Impervious, Inflow Depth > 1.01" for 2-yr event
 Inflow = 3.02 cfs @ 12.94 hrs, Volume= 0.751 af
 Primary = 3.02 cfs @ 12.94 hrs, Volume= 0.751 af, Atten= 0%, Lag= 0.0 min
 Routed to Link 8L : Total Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 6L: Total Discharge North



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 89

Hydrograph for Link 6L: Total Discharge North

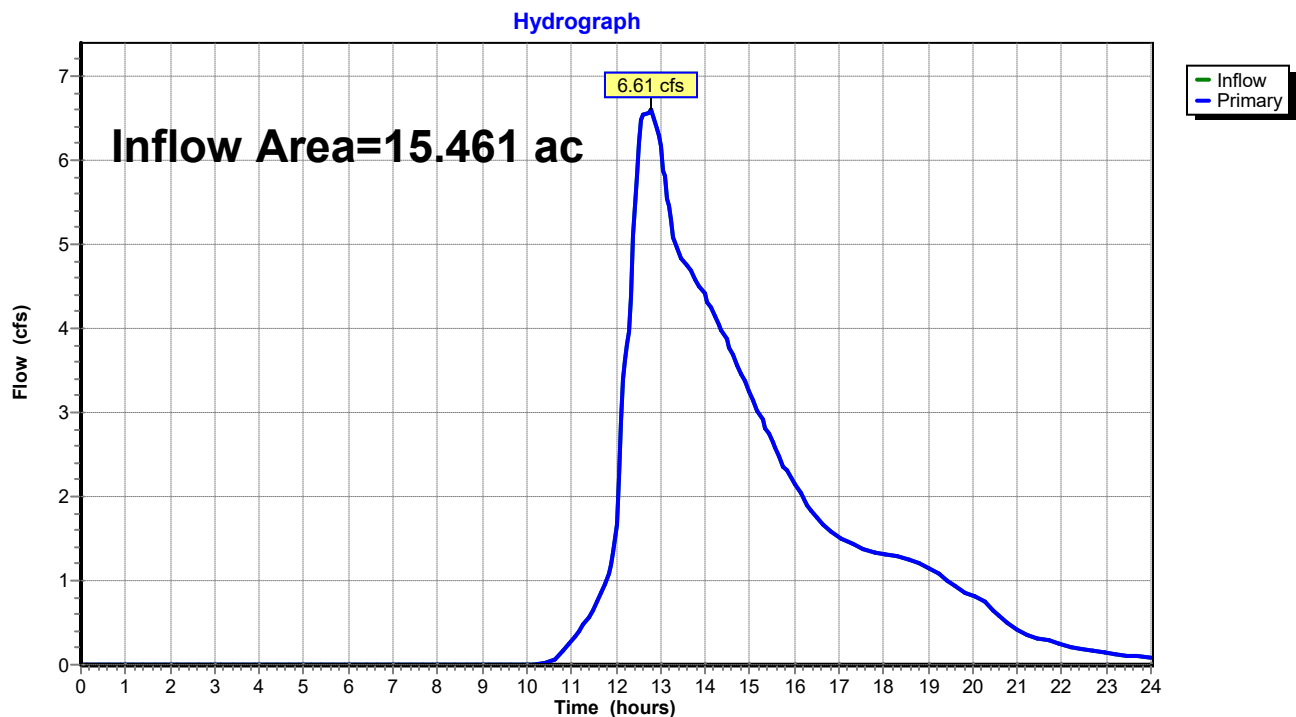
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	2.96	0.00	2.96
0.25	0.00	0.00	0.00	13.25	2.31	0.00	2.31
0.50	0.00	0.00	0.00	13.50	1.78	0.00	1.78
0.75	0.00	0.00	0.00	13.75	1.38	0.00	1.38
1.00	0.00	0.00	0.00	14.00	1.05	0.00	1.05
1.25	0.00	0.00	0.00	14.25	0.85	0.00	0.85
1.50	0.00	0.00	0.00	14.50	0.75	0.00	0.75
1.75	0.00	0.00	0.00	14.75	0.70	0.00	0.70
2.00	0.00	0.00	0.00	15.00	0.67	0.00	0.67
2.25	0.00	0.00	0.00	15.25	0.66	0.00	0.66
2.50	0.00	0.00	0.00	15.50	0.63	0.00	0.63
2.75	0.00	0.00	0.00	15.75	0.62	0.00	0.62
3.00	0.00	0.00	0.00	16.00	0.62	0.00	0.62
3.25	0.00	0.00	0.00	16.25	0.61	0.00	0.61
3.50	0.00	0.00	0.00	16.50	0.61	0.00	0.61
3.75	0.00	0.00	0.00	16.75	0.60	0.00	0.60
4.00	0.00	0.00	0.00	17.00	0.59	0.00	0.59
4.25	0.00	0.00	0.00	17.25	0.59	0.00	0.59
4.50	0.00	0.00	0.00	17.50	0.58	0.00	0.58
4.75	0.00	0.00	0.00	17.75	0.58	0.00	0.58
5.00	0.00	0.00	0.00	18.00	0.57	0.00	0.57
5.25	0.00	0.00	0.00	18.25	0.56	0.00	0.56
5.50	0.00	0.00	0.00	18.50	0.56	0.00	0.56
5.75	0.00	0.00	0.00	18.75	0.55	0.00	0.55
6.00	0.00	0.00	0.00	19.00	0.54	0.00	0.54
6.25	0.00	0.00	0.00	19.25	0.53	0.00	0.53
6.50	0.00	0.00	0.00	19.50	0.53	0.00	0.53
6.75	0.00	0.00	0.00	19.75	0.52	0.00	0.52
7.00	0.00	0.00	0.00	20.00	0.51	0.00	0.51
7.25	0.00	0.00	0.00	20.25	0.50	0.00	0.50
7.50	0.00	0.00	0.00	20.50	0.50	0.00	0.50
7.75	0.00	0.00	0.00	20.75	0.49	0.00	0.49
8.00	0.00	0.00	0.00	21.00	0.48	0.00	0.48
8.25	0.00	0.00	0.00	21.25	0.47	0.00	0.47
8.50	0.00	0.00	0.00	21.50	0.46	0.00	0.46
8.75	0.00	0.00	0.00	21.75	0.45	0.00	0.45
9.00	0.00	0.00	0.00	22.00	0.45	0.00	0.45
9.25	0.00	0.00	0.00	22.25	0.44	0.00	0.44
9.50	0.00	0.00	0.00	22.50	0.43	0.00	0.43
9.75	0.00	0.00	0.00	22.75	0.42	0.00	0.42
10.00	0.00	0.00	0.00	23.00	0.41	0.00	0.41
10.25	0.00	0.00	0.00	23.25	0.40	0.00	0.40
10.50	0.00	0.00	0.00	23.50	0.39	0.00	0.39
10.75	0.00	0.00	0.00	23.75	0.37	0.00	0.37
11.00	0.00	0.00	0.00	24.00	0.36	0.00	0.36
11.25	0.00	0.00	0.00				
11.50	0.01	0.00	0.01				
11.75	0.05	0.00	0.05				
12.00	0.28	0.00	0.28				
12.25	1.50	0.00	1.50				
12.50	1.71	0.00	1.71				
12.75	1.85	0.00	1.85				

Summary for Link 7L: Total Discharge South (Meadowbrook Rd.)

Inflow Area = 15.461 ac, 0.00% Impervious, Inflow Depth > 1.55" for 2-yr event
 Inflow = 6.61 cfs @ 12.78 hrs, Volume= 1.995 af
 Primary = 6.61 cfs @ 12.78 hrs, Volume= 1.995 af, Atten= 0%, Lag= 0.0 min
 Routed to Link 8L : Total Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: Total Discharge South (Meadowbrook Rd.)



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 91

Hydrograph for Link 7L: Total Discharge South (Meadowbrook Rd.)

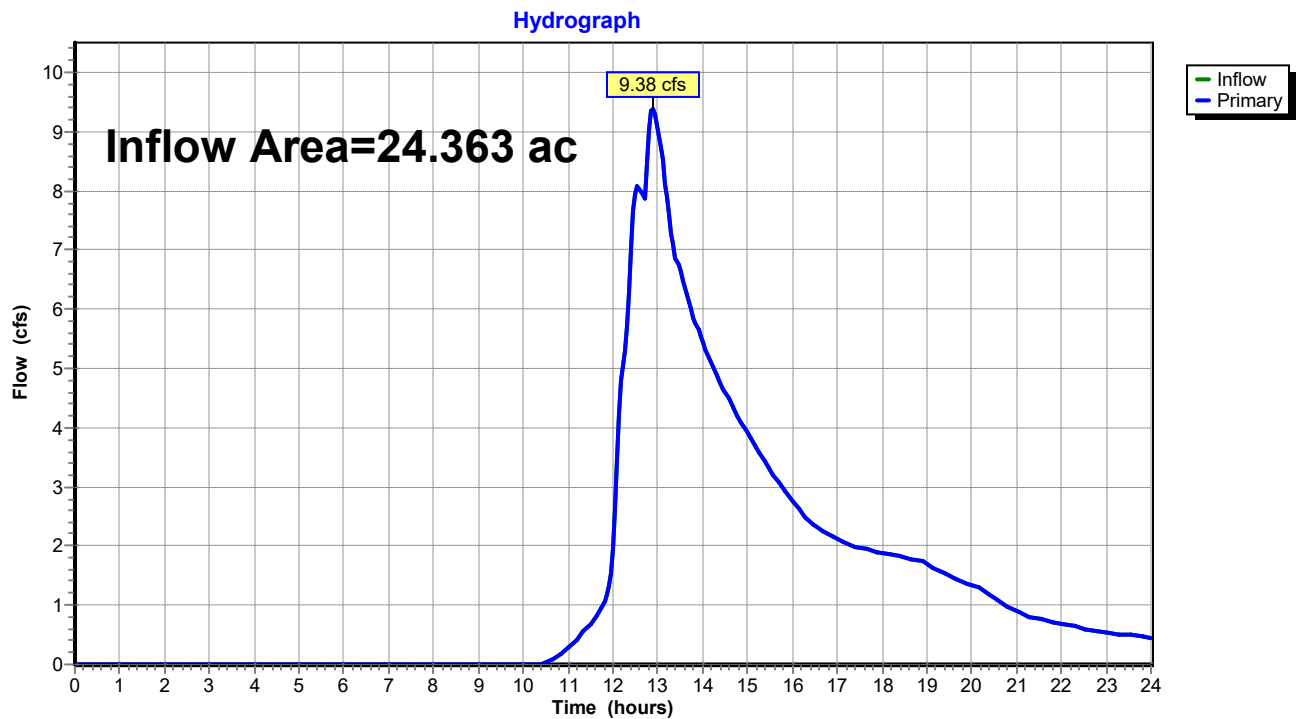
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	6.17	0.00	6.17
0.25	0.00	0.00	0.00	13.25	5.30	0.00	5.30
0.50	0.00	0.00	0.00	13.50	4.83	0.00	4.83
0.75	0.00	0.00	0.00	13.75	4.63	0.00	4.63
1.00	0.00	0.00	0.00	14.00	4.39	0.00	4.39
1.25	0.00	0.00	0.00	14.25	4.13	0.00	4.13
1.50	0.00	0.00	0.00	14.50	3.85	0.00	3.85
1.75	0.00	0.00	0.00	14.75	3.55	0.00	3.55
2.00	0.00	0.00	0.00	15.00	3.23	0.00	3.23
2.25	0.00	0.00	0.00	15.25	2.94	0.00	2.94
2.50	0.00	0.00	0.00	15.50	2.65	0.00	2.65
2.75	0.00	0.00	0.00	15.75	2.36	0.00	2.36
3.00	0.00	0.00	0.00	16.00	2.19	0.00	2.19
3.25	0.00	0.00	0.00	16.25	1.92	0.00	1.92
3.50	0.00	0.00	0.00	16.50	1.76	0.00	1.76
3.75	0.00	0.00	0.00	16.75	1.63	0.00	1.63
4.00	0.00	0.00	0.00	17.00	1.52	0.00	1.52
4.25	0.00	0.00	0.00	17.25	1.45	0.00	1.45
4.50	0.00	0.00	0.00	17.50	1.39	0.00	1.39
4.75	0.00	0.00	0.00	17.75	1.35	0.00	1.35
5.00	0.00	0.00	0.00	18.00	1.32	0.00	1.32
5.25	0.00	0.00	0.00	18.25	1.29	0.00	1.29
5.50	0.00	0.00	0.00	18.50	1.26	0.00	1.26
5.75	0.00	0.00	0.00	18.75	1.22	0.00	1.22
6.00	0.00	0.00	0.00	19.00	1.16	0.00	1.16
6.25	0.00	0.00	0.00	19.25	1.07	0.00	1.07
6.50	0.00	0.00	0.00	19.50	0.98	0.00	0.98
6.75	0.00	0.00	0.00	19.75	0.89	0.00	0.89
7.00	0.00	0.00	0.00	20.00	0.81	0.00	0.81
7.25	0.00	0.00	0.00	20.25	0.76	0.00	0.76
7.50	0.00	0.00	0.00	20.50	0.63	0.00	0.63
7.75	0.00	0.00	0.00	20.75	0.51	0.00	0.51
8.00	0.00	0.00	0.00	21.00	0.42	0.00	0.42
8.25	0.00	0.00	0.00	21.25	0.34	0.00	0.34
8.50	0.00	0.00	0.00	21.50	0.32	0.00	0.32
8.75	0.00	0.00	0.00	21.75	0.28	0.00	0.28
9.00	0.00	0.00	0.00	22.00	0.24	0.00	0.24
9.25	0.00	0.00	0.00	22.25	0.21	0.00	0.21
9.50	0.00	0.00	0.00	22.50	0.18	0.00	0.18
9.75	0.00	0.00	0.00	22.75	0.16	0.00	0.16
10.00	0.00	0.00	0.00	23.00	0.14	0.00	0.14
10.25	0.00	0.00	0.00	23.25	0.13	0.00	0.13
10.50	0.03	0.00	0.03	23.50	0.11	0.00	0.11
10.75	0.13	0.00	0.13	23.75	0.09	0.00	0.09
11.00	0.26	0.00	0.26	24.00	0.08	0.00	0.08
11.25	0.46	0.00	0.46				
11.50	0.67	0.00	0.67				
11.75	0.92	0.00	0.92				
12.00	1.67	0.00	1.67				
12.25	3.81	0.00	3.81				
12.50	6.22	0.00	6.22				
12.75	6.60	0.00	6.60				

Summary for Link 8L: Total Proposed Discharge

Inflow Area = 24.363 ac, 0.00% Impervious, Inflow Depth > 1.35" for 2-yr event
 Inflow = 9.38 cfs @ 12.89 hrs, Volume= 2.746 af
 Primary = 9.38 cfs @ 12.89 hrs, Volume= 2.746 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: Total Proposed Discharge



2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 93

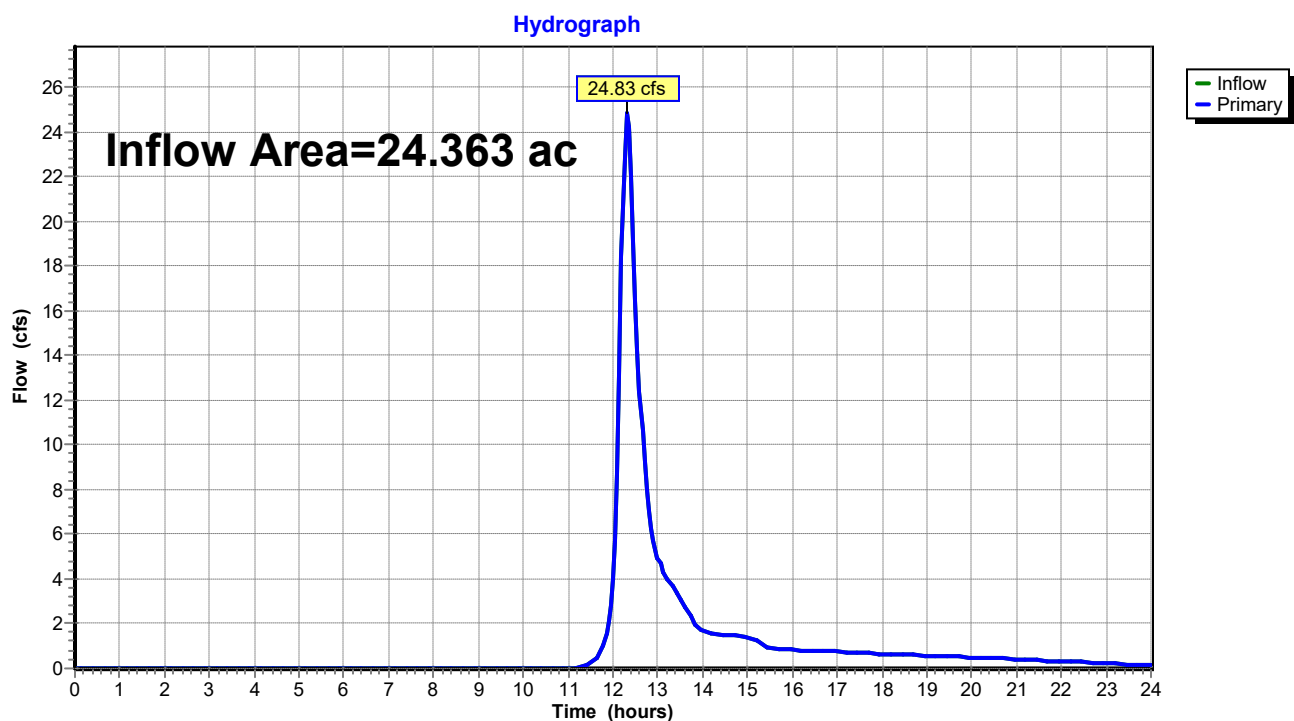
Hydrograph for Link 8L: Total Proposed Discharge

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	9.13	0.00	9.13
0.25	0.00	0.00	0.00	13.25	7.61	0.00	7.61
0.50	0.00	0.00	0.00	13.50	6.61	0.00	6.61
0.75	0.00	0.00	0.00	13.75	6.01	0.00	6.01
1.00	0.00	0.00	0.00	14.00	5.44	0.00	5.44
1.25	0.00	0.00	0.00	14.25	4.98	0.00	4.98
1.50	0.00	0.00	0.00	14.50	4.60	0.00	4.60
1.75	0.00	0.00	0.00	14.75	4.25	0.00	4.25
2.00	0.00	0.00	0.00	15.00	3.91	0.00	3.91
2.25	0.00	0.00	0.00	15.25	3.60	0.00	3.60
2.50	0.00	0.00	0.00	15.50	3.28	0.00	3.28
2.75	0.00	0.00	0.00	15.75	2.98	0.00	2.98
3.00	0.00	0.00	0.00	16.00	2.80	0.00	2.80
3.25	0.00	0.00	0.00	16.25	2.53	0.00	2.53
3.50	0.00	0.00	0.00	16.50	2.37	0.00	2.37
3.75	0.00	0.00	0.00	16.75	2.23	0.00	2.23
4.00	0.00	0.00	0.00	17.00	2.12	0.00	2.12
4.25	0.00	0.00	0.00	17.25	2.03	0.00	2.03
4.50	0.00	0.00	0.00	17.50	1.97	0.00	1.97
4.75	0.00	0.00	0.00	17.75	1.93	0.00	1.93
5.00	0.00	0.00	0.00	18.00	1.89	0.00	1.89
5.25	0.00	0.00	0.00	18.25	1.85	0.00	1.85
5.50	0.00	0.00	0.00	18.50	1.81	0.00	1.81
5.75	0.00	0.00	0.00	18.75	1.77	0.00	1.77
6.00	0.00	0.00	0.00	19.00	1.70	0.00	1.70
6.25	0.00	0.00	0.00	19.25	1.60	0.00	1.60
6.50	0.00	0.00	0.00	19.50	1.50	0.00	1.50
6.75	0.00	0.00	0.00	19.75	1.41	0.00	1.41
7.00	0.00	0.00	0.00	20.00	1.32	0.00	1.32
7.25	0.00	0.00	0.00	20.25	1.26	0.00	1.26
7.50	0.00	0.00	0.00	20.50	1.12	0.00	1.12
7.75	0.00	0.00	0.00	20.75	1.00	0.00	1.00
8.00	0.00	0.00	0.00	21.00	0.90	0.00	0.90
8.25	0.00	0.00	0.00	21.25	0.81	0.00	0.81
8.50	0.00	0.00	0.00	21.50	0.78	0.00	0.78
8.75	0.00	0.00	0.00	21.75	0.73	0.00	0.73
9.00	0.00	0.00	0.00	22.00	0.68	0.00	0.68
9.25	0.00	0.00	0.00	22.25	0.65	0.00	0.65
9.50	0.00	0.00	0.00	22.50	0.61	0.00	0.61
9.75	0.00	0.00	0.00	22.75	0.58	0.00	0.58
10.00	0.00	0.00	0.00	23.00	0.55	0.00	0.55
10.25	0.00	0.00	0.00	23.25	0.52	0.00	0.52
10.50	0.03	0.00	0.03	23.50	0.49	0.00	0.49
10.75	0.13	0.00	0.13	23.75	0.47	0.00	0.47
11.00	0.26	0.00	0.26	24.00	0.44	0.00	0.44
11.25	0.46	0.00	0.46				
11.50	0.68	0.00	0.68				
11.75	0.97	0.00	0.97				
12.00	1.95	0.00	1.95				
12.25	5.31	0.00	5.31				
12.50	7.93	0.00	7.93				
12.75	8.45	0.00	8.45				

Summary for Link 18L: Total Existing Discharge

Inflow Area = 24.363 ac, 0.00% Impervious, Inflow Depth > 0.94" for 2-yr event
Inflow = 24.83 cfs @ 12.31 hrs, Volume= 1.915 af
Primary = 24.83 cfs @ 12.31 hrs, Volume= 1.915 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 18L: Total Existing Discharge

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 2-yr Rainfall=2.70"

Printed 9/18/2025

Page 95

Hydrograph for Link 18L: Total Existing Discharge

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	4.96	0.00	4.96
0.25	0.00	0.00	0.00	13.25	3.88	0.00	3.88
0.50	0.00	0.00	0.00	13.50	3.13	0.00	3.13
0.75	0.00	0.00	0.00	13.75	2.24	0.00	2.24
1.00	0.00	0.00	0.00	14.00	1.68	0.00	1.68
1.25	0.00	0.00	0.00	14.25	1.56	0.00	1.56
1.50	0.00	0.00	0.00	14.50	1.51	0.00	1.51
1.75	0.00	0.00	0.00	14.75	1.46	0.00	1.46
2.00	0.00	0.00	0.00	15.00	1.42	0.00	1.42
2.25	0.00	0.00	0.00	15.25	1.19	0.00	1.19
2.50	0.00	0.00	0.00	15.50	0.91	0.00	0.91
2.75	0.00	0.00	0.00	15.75	0.84	0.00	0.84
3.00	0.00	0.00	0.00	16.00	0.82	0.00	0.82
3.25	0.00	0.00	0.00	16.25	0.80	0.00	0.80
3.50	0.00	0.00	0.00	16.50	0.78	0.00	0.78
3.75	0.00	0.00	0.00	16.75	0.76	0.00	0.76
4.00	0.00	0.00	0.00	17.00	0.74	0.00	0.74
4.25	0.00	0.00	0.00	17.25	0.72	0.00	0.72
4.50	0.00	0.00	0.00	17.50	0.70	0.00	0.70
4.75	0.00	0.00	0.00	17.75	0.68	0.00	0.68
5.00	0.00	0.00	0.00	18.00	0.66	0.00	0.66
5.25	0.00	0.00	0.00	18.25	0.64	0.00	0.64
5.50	0.00	0.00	0.00	18.50	0.62	0.00	0.62
5.75	0.00	0.00	0.00	18.75	0.60	0.00	0.60
6.00	0.00	0.00	0.00	19.00	0.58	0.00	0.58
6.25	0.00	0.00	0.00	19.25	0.56	0.00	0.56
6.50	0.00	0.00	0.00	19.50	0.54	0.00	0.54
6.75	0.00	0.00	0.00	19.75	0.52	0.00	0.52
7.00	0.00	0.00	0.00	20.00	0.49	0.00	0.49
7.25	0.00	0.00	0.00	20.25	0.47	0.00	0.47
7.50	0.00	0.00	0.00	20.50	0.45	0.00	0.45
7.75	0.00	0.00	0.00	20.75	0.43	0.00	0.43
8.00	0.00	0.00	0.00	21.00	0.41	0.00	0.41
8.25	0.00	0.00	0.00	21.25	0.39	0.00	0.39
8.50	0.00	0.00	0.00	21.50	0.37	0.00	0.37
8.75	0.00	0.00	0.00	21.75	0.34	0.00	0.34
9.00	0.00	0.00	0.00	22.00	0.32	0.00	0.32
9.25	0.00	0.00	0.00	22.25	0.30	0.00	0.30
9.50	0.00	0.00	0.00	22.50	0.28	0.00	0.28
9.75	0.00	0.00	0.00	22.75	0.26	0.00	0.26
10.00	0.00	0.00	0.00	23.00	0.23	0.00	0.23
10.25	0.00	0.00	0.00	23.25	0.21	0.00	0.21
10.50	0.00	0.00	0.00	23.50	0.19	0.00	0.19
10.75	0.00	0.00	0.00	23.75	0.17	0.00	0.17
11.00	0.00	0.00	0.00	24.00	0.14	0.00	0.14
11.25	0.06	0.00	0.06				
11.50	0.26	0.00	0.26				
11.75	0.84	0.00	0.84				
12.00	3.97	0.00	3.97				
12.25	22.81	0.00	22.81				
12.50	16.48	0.00	16.48				
12.75	8.02	0.00	8.02				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 96

Summary for Subcatchment 9S: P-1

[47] Hint: Peak is 195% of capacity of segment #3

Runoff = 13.62 cfs @ 12.37 hrs, Volume= 1.199 af, Depth> 2.83"
Routed to Pond 1P : Bio-Filtration Basin (BF-1)

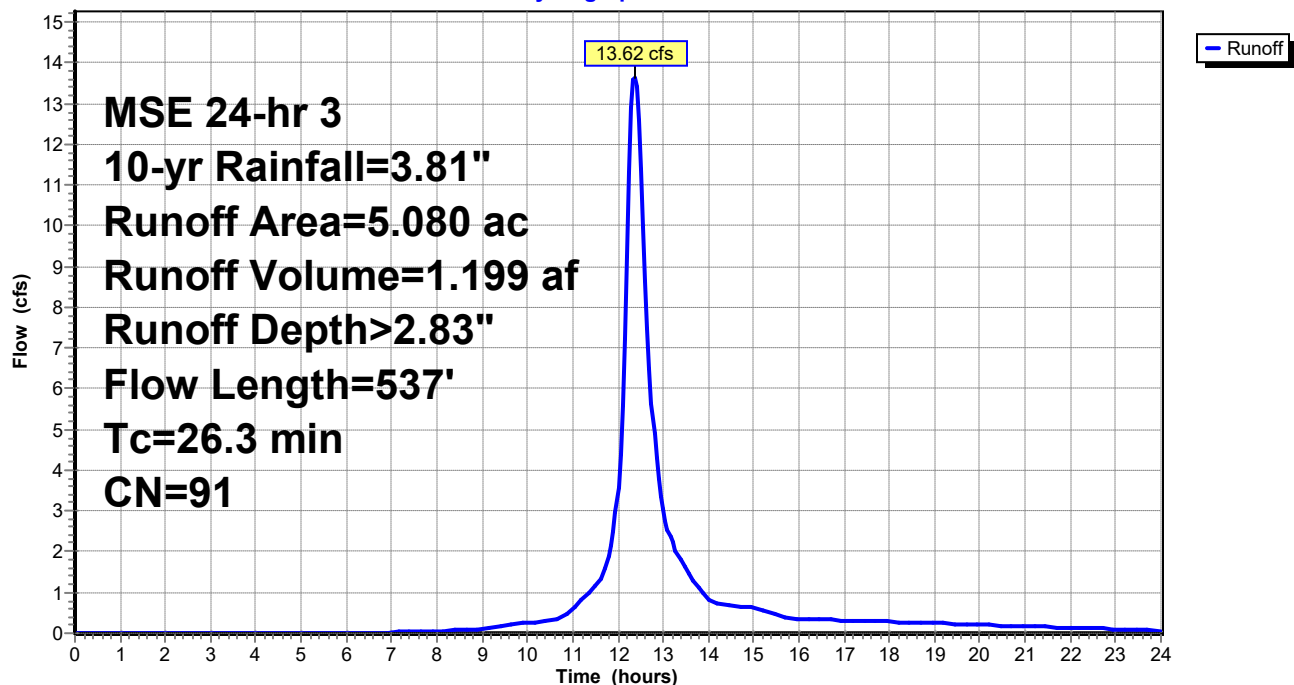
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 5.080	91	
5.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	100	0.0175	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 2.70"
0.5	61	0.0160	2.04		Shallow Concentrated Flow, Shallow Conc. Unpaved Kv= 16.1 fps
1.1	376	0.0100	5.70	7.00	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
26.3	537	Total			

Subcatchment 9S: P-1

Hydrograph



2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 97

Hydrograph for Subcatchment 9S: P-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	2.14	3.03
0.25	0.00	0.00	0.00	13.25	3.15	2.21	2.08
0.50	0.01	0.00	0.00	13.50	3.21	2.27	1.58
0.75	0.01	0.00	0.00	13.75	3.25	2.31	1.17
1.00	0.01	0.00	0.00	14.00	3.29	2.34	0.83
1.25	0.02	0.00	0.00	14.25	3.32	2.37	0.72
1.50	0.02	0.00	0.00	14.50	3.35	2.40	0.67
1.75	0.03	0.00	0.00	14.75	3.39	2.43	0.65
2.00	0.03	0.00	0.00	15.00	3.42	2.46	0.63
2.25	0.04	0.00	0.00	15.25	3.44	2.48	0.56
2.50	0.05	0.00	0.00	15.50	3.46	2.50	0.43
2.75	0.06	0.00	0.00	15.75	3.47	2.52	0.38
3.00	0.06	0.00	0.00	16.00	3.49	2.53	0.36
3.25	0.07	0.00	0.00	16.25	3.51	2.55	0.35
3.50	0.08	0.00	0.00	16.50	3.53	2.56	0.34
3.75	0.09	0.00	0.00	16.75	3.54	2.58	0.33
4.00	0.10	0.00	0.00	17.00	3.56	2.60	0.32
4.25	0.11	0.00	0.00	17.25	3.57	2.61	0.31
4.50	0.12	0.00	0.00	17.50	3.59	2.62	0.30
4.75	0.13	0.00	0.00	17.75	3.60	2.64	0.29
5.00	0.14	0.00	0.00	18.00	3.62	2.65	0.28
5.25	0.16	0.00	0.00	18.25	3.63	2.66	0.27
5.50	0.17	0.00	0.00	18.50	3.64	2.68	0.26
5.75	0.18	0.00	0.00	18.75	3.65	2.69	0.25
6.00	0.19	0.00	0.00	19.00	3.67	2.70	0.25
6.25	0.21	0.00	0.00	19.25	3.68	2.71	0.24
6.50	0.22	0.00	0.00	19.50	3.69	2.72	0.23
6.75	0.24	0.00	0.01	19.75	3.70	2.73	0.22
7.00	0.25	0.00	0.02	20.00	3.71	2.74	0.21
7.25	0.27	0.00	0.03	20.25	3.72	2.75	0.20
7.50	0.28	0.01	0.04	20.50	3.73	2.76	0.19
7.75	0.30	0.01	0.05	20.75	3.74	2.77	0.18
8.00	0.32	0.01	0.06	21.00	3.75	2.78	0.17
8.25	0.34	0.02	0.07	21.25	3.75	2.78	0.16
8.50	0.35	0.02	0.08	21.50	3.76	2.79	0.15
8.75	0.37	0.03	0.09	21.75	3.77	2.80	0.15
9.00	0.39	0.03	0.10	22.00	3.78	2.80	0.14
9.25	0.42	0.04	0.13	22.25	3.78	2.81	0.13
9.50	0.46	0.05	0.19	22.50	3.79	2.81	0.12
9.75	0.49	0.07	0.23	22.75	3.79	2.82	0.11
10.00	0.52	0.08	0.26	23.00	3.80	2.82	0.10
10.25	0.56	0.10	0.29	23.25	3.80	2.83	0.09
10.50	0.60	0.11	0.32	23.50	3.80	2.83	0.08
10.75	0.66	0.15	0.39	23.75	3.81	2.83	0.07
11.00	0.73	0.19	0.61	24.00	3.81	2.84	0.06
11.25	0.83	0.25	0.87				
11.50	0.94	0.32	1.16				
11.75	1.17	0.48	1.66				
12.00	1.76	0.96	3.56				
12.25	2.64	1.74	11.30				
12.50	2.87	1.95	11.38				
12.75	2.98	2.05	5.65				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 98

Summary for Subcatchment 10S: P-2A (Future Commercial)

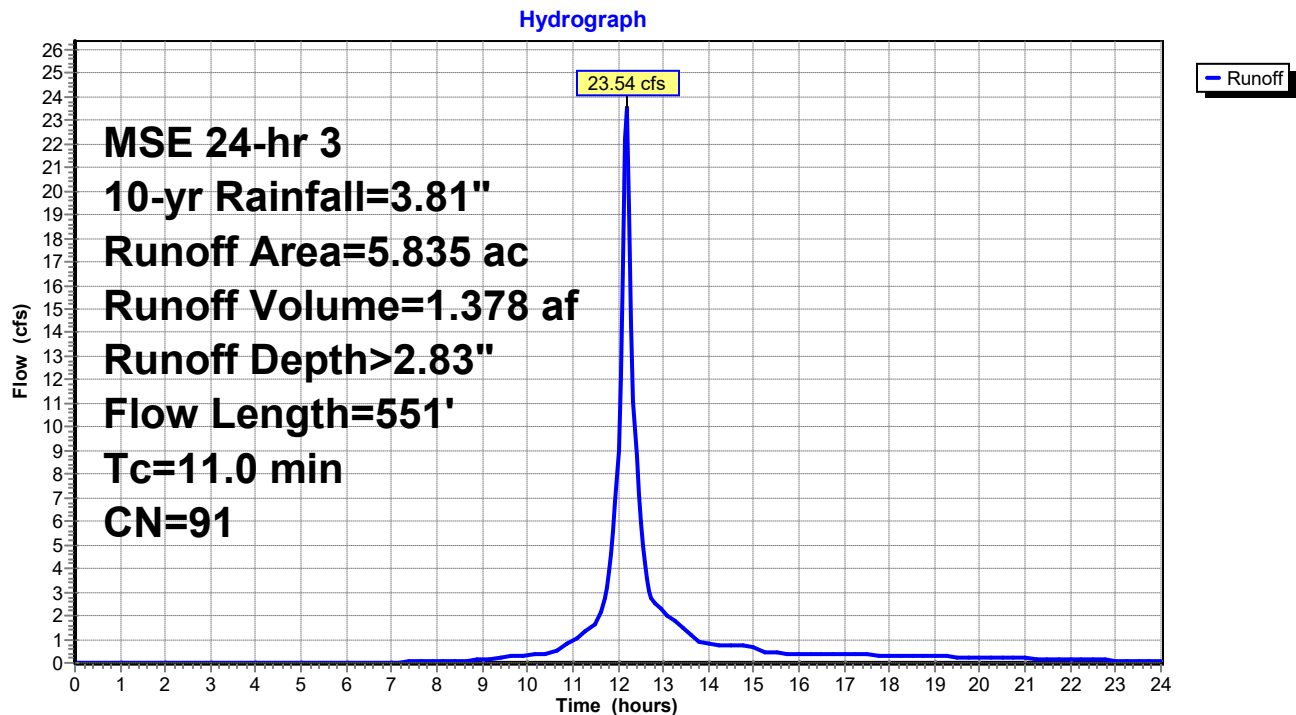
Runoff = 23.54 cfs @ 12.19 hrs, Volume= 1.378 af, Depth> 2.83"
Routed to Pond 2P : Wet Pond (WP-2A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 5.835	91	
5.835		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	25	0.2500	0.22		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
7.1	75	0.0800	0.18		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
2.0	451	0.0640	3.79		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
11.0	551	Total			

Subcatchment 10S: P-2A (Future Commercial)



2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 99

Hydrograph for Subcatchment 10S: P-2A (Future Commercial)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	2.14	2.19
0.25	0.00	0.00	0.00	13.25	3.15	2.21	1.79
0.50	0.01	0.00	0.00	13.50	3.21	2.27	1.40
0.75	0.01	0.00	0.00	13.75	3.25	2.31	0.88
1.00	0.01	0.00	0.00	14.00	3.29	2.34	0.79
1.25	0.02	0.00	0.00	14.25	3.32	2.37	0.77
1.50	0.02	0.00	0.00	14.50	3.35	2.40	0.74
1.75	0.03	0.00	0.00	14.75	3.39	2.43	0.72
2.00	0.03	0.00	0.00	15.00	3.42	2.46	0.70
2.25	0.04	0.00	0.00	15.25	3.44	2.48	0.46
2.50	0.05	0.00	0.00	15.50	3.46	2.50	0.42
2.75	0.06	0.00	0.00	15.75	3.47	2.52	0.41
3.00	0.06	0.00	0.00	16.00	3.49	2.53	0.40
3.25	0.07	0.00	0.00	16.25	3.51	2.55	0.39
3.50	0.08	0.00	0.00	16.50	3.53	2.56	0.38
3.75	0.09	0.00	0.00	16.75	3.54	2.58	0.37
4.00	0.10	0.00	0.00	17.00	3.56	2.60	0.36
4.25	0.11	0.00	0.00	17.25	3.57	2.61	0.35
4.50	0.12	0.00	0.00	17.50	3.59	2.62	0.33
4.75	0.13	0.00	0.00	17.75	3.60	2.64	0.32
5.00	0.14	0.00	0.00	18.00	3.62	2.65	0.31
5.25	0.16	0.00	0.00	18.25	3.63	2.66	0.30
5.50	0.17	0.00	0.00	18.50	3.64	2.68	0.29
5.75	0.18	0.00	0.00	18.75	3.65	2.69	0.28
6.00	0.19	0.00	0.00	19.00	3.67	2.70	0.27
6.25	0.21	0.00	0.00	19.25	3.68	2.71	0.26
6.50	0.22	0.00	0.01	19.50	3.69	2.72	0.25
6.75	0.24	0.00	0.02	19.75	3.70	2.73	0.24
7.00	0.25	0.00	0.03	20.00	3.71	2.74	0.23
7.25	0.27	0.00	0.04	20.25	3.72	2.75	0.22
7.50	0.28	0.01	0.05	20.50	3.73	2.76	0.21
7.75	0.30	0.01	0.06	20.75	3.74	2.77	0.20
8.00	0.32	0.01	0.08	21.00	3.75	2.78	0.19
8.25	0.34	0.02	0.09	21.25	3.75	2.78	0.18
8.50	0.35	0.02	0.10	21.50	3.76	2.79	0.17
8.75	0.37	0.03	0.11	21.75	3.77	2.80	0.16
9.00	0.39	0.03	0.13	22.00	3.78	2.80	0.15
9.25	0.42	0.04	0.22	22.25	3.78	2.81	0.14
9.50	0.46	0.05	0.26	22.50	3.79	2.81	0.13
9.75	0.49	0.07	0.30	22.75	3.79	2.82	0.12
10.00	0.52	0.08	0.33	23.00	3.80	2.82	0.10
10.25	0.56	0.10	0.37	23.25	3.80	2.83	0.09
10.50	0.60	0.11	0.40	23.50	3.80	2.83	0.08
10.75	0.66	0.15	0.66	23.75	3.81	2.83	0.07
11.00	0.73	0.19	0.97	24.00	3.81	2.84	0.06
11.25	0.83	0.25	1.31				
11.50	0.94	0.32	1.68				
11.75	1.17	0.48	3.22				
12.00	1.76	0.96	8.95				
12.25	2.64	1.74	19.27				
12.50	2.87	1.95	5.92				
12.75	2.98	2.05	2.78				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 100

Summary for Subcatchment 11S: P-2

Runoff = 6.54 cfs @ 12.13 hrs, Volume= 0.308 af, Depth> 2.29"
Routed to Pond 2P : Wet Pond (WP-2A)

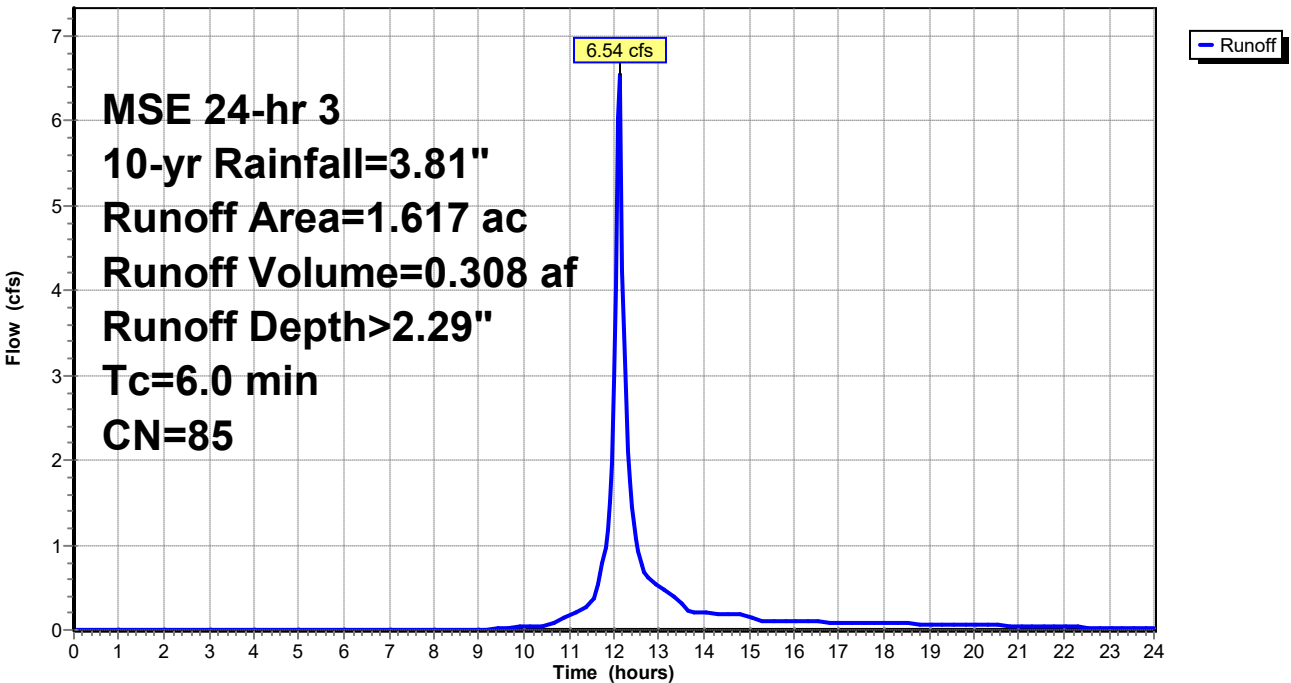
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 1.617	85	
1.617		100.00% Pervious Area

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

Subcatchment 11S: P-2

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 101

Hydrograph for Subcatchment 11S: P-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	1.65	0.52
0.25	0.00	0.00	0.00	13.25	3.15	1.72	0.42
0.50	0.01	0.00	0.00	13.50	3.21	1.77	0.32
0.75	0.01	0.00	0.00	13.75	3.25	1.80	0.20
1.00	0.01	0.00	0.00	14.00	3.29	1.83	0.20
1.25	0.02	0.00	0.00	14.25	3.32	1.86	0.19
1.50	0.02	0.00	0.00	14.50	3.35	1.89	0.19
1.75	0.03	0.00	0.00	14.75	3.39	1.92	0.18
2.00	0.03	0.00	0.00	15.00	3.42	1.94	0.17
2.25	0.04	0.00	0.00	15.25	3.44	1.96	0.11
2.50	0.05	0.00	0.00	15.50	3.46	1.98	0.11
2.75	0.06	0.00	0.00	15.75	3.47	1.99	0.10
3.00	0.06	0.00	0.00	16.00	3.49	2.01	0.10
3.25	0.07	0.00	0.00	16.25	3.51	2.02	0.10
3.50	0.08	0.00	0.00	16.50	3.53	2.04	0.10
3.75	0.09	0.00	0.00	16.75	3.54	2.05	0.09
4.00	0.10	0.00	0.00	17.00	3.56	2.07	0.09
4.25	0.11	0.00	0.00	17.25	3.57	2.08	0.09
4.50	0.12	0.00	0.00	17.50	3.59	2.09	0.08
4.75	0.13	0.00	0.00	17.75	3.60	2.11	0.08
5.00	0.14	0.00	0.00	18.00	3.62	2.12	0.08
5.25	0.16	0.00	0.00	18.25	3.63	2.13	0.08
5.50	0.17	0.00	0.00	18.50	3.64	2.14	0.07
5.75	0.18	0.00	0.00	18.75	3.65	2.15	0.07
6.00	0.19	0.00	0.00	19.00	3.67	2.16	0.07
6.25	0.21	0.00	0.00	19.25	3.68	2.17	0.07
6.50	0.22	0.00	0.00	19.50	3.69	2.18	0.06
6.75	0.24	0.00	0.00	19.75	3.70	2.19	0.06
7.00	0.25	0.00	0.00	20.00	3.71	2.20	0.06
7.25	0.27	0.00	0.00	20.25	3.72	2.21	0.06
7.50	0.28	0.00	0.00	20.50	3.73	2.22	0.05
7.75	0.30	0.00	0.00	20.75	3.74	2.23	0.05
8.00	0.32	0.00	0.00	21.00	3.75	2.23	0.05
8.25	0.34	0.00	0.00	21.25	3.75	2.24	0.04
8.50	0.35	0.00	0.00	21.50	3.76	2.25	0.04
8.75	0.37	0.00	0.00	21.75	3.77	2.25	0.04
9.00	0.39	0.00	0.00	22.00	3.78	2.26	0.04
9.25	0.42	0.00	0.01	22.25	3.78	2.26	0.03
9.50	0.46	0.01	0.02	22.50	3.79	2.27	0.03
9.75	0.49	0.01	0.03	22.75	3.79	2.27	0.03
10.00	0.52	0.02	0.04	23.00	3.80	2.28	0.03
10.25	0.56	0.02	0.04	23.25	3.80	2.28	0.02
10.50	0.60	0.03	0.05	23.50	3.80	2.28	0.02
10.75	0.66	0.04	0.10	23.75	3.81	2.29	0.02
11.00	0.73	0.07	0.16	24.00	3.81	2.29	0.02
11.25	0.83	0.10	0.23				
11.50	0.94	0.15	0.32				
11.75	1.17	0.26	0.78				
12.00	1.76	0.63	2.91				
12.25	2.64	1.29	2.82				
12.50	2.87	1.48	1.06				
12.75	2.98	1.57	0.61				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 102

Summary for Subcatchment 12S: P-2B (Future Residential)

[47] Hint: Peak is 132% of capacity of segment #4

Runoff = 8.55 cfs @ 12.26 hrs, Volume= 0.611 af, Depth> 2.74"
Routed to Pond 2P : Wet Pond (WP-2A)

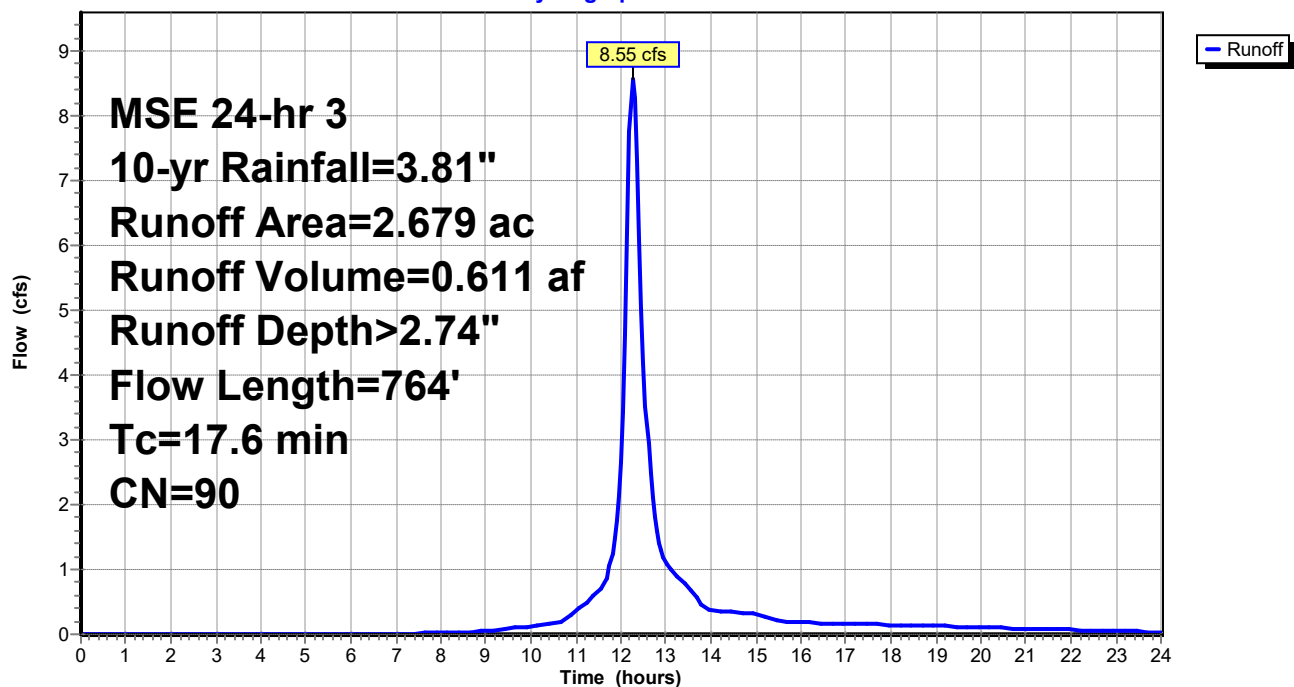
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 2.679	90	
2.679		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
0.2	80	0.2000	7.20		Shallow Concentrated Flow, Shallow Conc. Unpaved Kv= 16.1 fps
0.7	209	0.0690	5.33		Shallow Concentrated Flow, Shallow Conc. Paved Kv= 20.3 fps
1.2	375	0.0100	5.26	6.46	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
17.6	764	Total			

Subcatchment 12S: P-2B (Future Residential)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 103

Hydrograph for Subcatchment 12S: P-2B (Future Residential)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	2.05	1.12
0.25	0.00	0.00	0.00	13.25	3.15	2.13	0.89
0.50	0.01	0.00	0.00	13.50	3.21	2.18	0.71
0.75	0.01	0.00	0.00	13.75	3.25	2.22	0.48
1.00	0.01	0.00	0.00	14.00	3.29	2.25	0.38
1.25	0.02	0.00	0.00	14.25	3.32	2.28	0.35
1.50	0.02	0.00	0.00	14.50	3.35	2.31	0.34
1.75	0.03	0.00	0.00	14.75	3.39	2.34	0.33
2.00	0.03	0.00	0.00	15.00	3.42	2.37	0.32
2.25	0.04	0.00	0.00	15.25	3.44	2.39	0.25
2.50	0.05	0.00	0.00	15.50	3.46	2.41	0.20
2.75	0.06	0.00	0.00	15.75	3.47	2.42	0.19
3.00	0.06	0.00	0.00	16.00	3.49	2.44	0.18
3.25	0.07	0.00	0.00	16.25	3.51	2.46	0.18
3.50	0.08	0.00	0.00	16.50	3.53	2.47	0.17
3.75	0.09	0.00	0.00	16.75	3.54	2.49	0.17
4.00	0.10	0.00	0.00	17.00	3.56	2.50	0.16
4.25	0.11	0.00	0.00	17.25	3.57	2.52	0.16
4.50	0.12	0.00	0.00	17.50	3.59	2.53	0.15
4.75	0.13	0.00	0.00	17.75	3.60	2.54	0.15
5.00	0.14	0.00	0.00	18.00	3.62	2.56	0.14
5.25	0.16	0.00	0.00	18.25	3.63	2.57	0.14
5.50	0.17	0.00	0.00	18.50	3.64	2.58	0.13
5.75	0.18	0.00	0.00	18.75	3.65	2.59	0.13
6.00	0.19	0.00	0.00	19.00	3.67	2.60	0.13
6.25	0.21	0.00	0.00	19.25	3.68	2.62	0.12
6.50	0.22	0.00	0.00	19.50	3.69	2.63	0.12
6.75	0.24	0.00	0.00	19.75	3.70	2.64	0.11
7.00	0.25	0.00	0.00	20.00	3.71	2.65	0.11
7.25	0.27	0.00	0.01	20.25	3.72	2.65	0.10
7.50	0.28	0.00	0.01	20.50	3.73	2.66	0.10
7.75	0.30	0.01	0.02	20.75	3.74	2.67	0.09
8.00	0.32	0.01	0.02	21.00	3.75	2.68	0.09
8.25	0.34	0.01	0.03	21.25	3.75	2.69	0.08
8.50	0.35	0.01	0.03	21.50	3.76	2.69	0.08
8.75	0.37	0.02	0.04	21.75	3.77	2.70	0.07
9.00	0.39	0.02	0.05	22.00	3.78	2.71	0.07
9.25	0.42	0.03	0.07	22.25	3.78	2.71	0.06
9.50	0.46	0.04	0.09	22.50	3.79	2.72	0.06
9.75	0.49	0.05	0.11	22.75	3.79	2.72	0.05
10.00	0.52	0.06	0.13	23.00	3.80	2.73	0.05
10.25	0.56	0.08	0.14	23.25	3.80	2.73	0.04
10.50	0.60	0.09	0.16	23.50	3.80	2.73	0.04
10.75	0.66	0.12	0.22	23.75	3.81	2.74	0.03
11.00	0.73	0.16	0.35	24.00	3.81	2.74	0.03
11.25	0.83	0.22	0.49				
11.50	0.94	0.28	0.65				
11.75	1.17	0.44	1.06				
12.00	1.76	0.90	2.66				
12.25	2.64	1.65	8.52				
12.50	2.87	1.86	4.17				
12.75	2.98	1.96	1.81				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 104

Summary for Subcatchment 13S: P-3

[47] Hint: Peak is 206% of capacity of segment #4

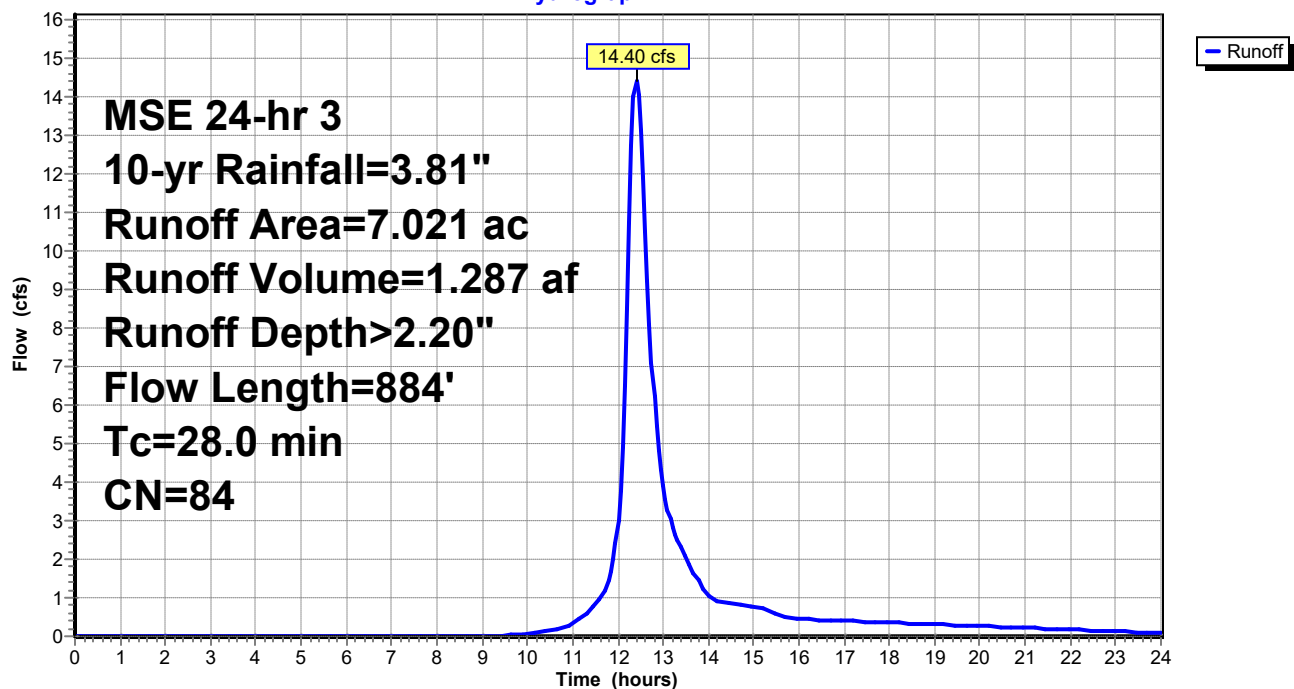
Runoff = 14.40 cfs @ 12.40 hrs, Volume= 1.287 af, Depth> 2.20"
Routed to Pond 5P : Wet Pond (WP-3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description			
* 7.021	84				
7.021		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	50	0.0125	0.05		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 2.70"
8.9	50	0.0200	0.09		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
0.9	91	0.0125	1.68		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
2.0	693	0.0100	5.70	7.00	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
28.0	884	Total			

Subcatchment 13S: P-3

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 105

Hydrograph for Subcatchment 13S: P-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	1.58	3.89
0.25	0.00	0.00	0.00	13.25	3.15	1.64	2.65
0.50	0.01	0.00	0.00	13.50	3.21	1.69	2.01
0.75	0.01	0.00	0.00	13.75	3.25	1.72	1.49
1.00	0.01	0.00	0.00	14.00	3.29	1.75	1.06
1.25	0.02	0.00	0.00	14.25	3.32	1.78	0.90
1.50	0.02	0.00	0.00	14.50	3.35	1.81	0.84
1.75	0.03	0.00	0.00	14.75	3.39	1.84	0.81
2.00	0.03	0.00	0.00	15.00	3.42	1.87	0.78
2.25	0.04	0.00	0.00	15.25	3.44	1.88	0.71
2.50	0.05	0.00	0.00	15.50	3.46	1.90	0.55
2.75	0.06	0.00	0.00	15.75	3.47	1.91	0.47
3.00	0.06	0.00	0.00	16.00	3.49	1.93	0.45
3.25	0.07	0.00	0.00	16.25	3.51	1.94	0.43
3.50	0.08	0.00	0.00	16.50	3.53	1.96	0.42
3.75	0.09	0.00	0.00	16.75	3.54	1.97	0.41
4.00	0.10	0.00	0.00	17.00	3.56	1.99	0.40
4.25	0.11	0.00	0.00	17.25	3.57	2.00	0.39
4.50	0.12	0.00	0.00	17.50	3.59	2.01	0.38
4.75	0.13	0.00	0.00	17.75	3.60	2.02	0.37
5.00	0.14	0.00	0.00	18.00	3.62	2.04	0.35
5.25	0.16	0.00	0.00	18.25	3.63	2.05	0.34
5.50	0.17	0.00	0.00	18.50	3.64	2.06	0.33
5.75	0.18	0.00	0.00	18.75	3.65	2.07	0.32
6.00	0.19	0.00	0.00	19.00	3.67	2.08	0.31
6.25	0.21	0.00	0.00	19.25	3.68	2.09	0.30
6.50	0.22	0.00	0.00	19.50	3.69	2.10	0.29
6.75	0.24	0.00	0.00	19.75	3.70	2.11	0.28
7.00	0.25	0.00	0.00	20.00	3.71	2.12	0.26
7.25	0.27	0.00	0.00	20.25	3.72	2.13	0.25
7.50	0.28	0.00	0.00	20.50	3.73	2.13	0.24
7.75	0.30	0.00	0.00	20.75	3.74	2.14	0.23
8.00	0.32	0.00	0.00	21.00	3.75	2.15	0.22
8.25	0.34	0.00	0.00	21.25	3.75	2.16	0.21
8.50	0.35	0.00	0.00	21.50	3.76	2.16	0.20
8.75	0.37	0.00	0.00	21.75	3.77	2.17	0.18
9.00	0.39	0.00	0.00	22.00	3.78	2.17	0.17
9.25	0.42	0.00	0.00	22.25	3.78	2.18	0.16
9.50	0.46	0.00	0.02	22.50	3.79	2.18	0.15
9.75	0.49	0.01	0.05	22.75	3.79	2.19	0.14
10.00	0.52	0.01	0.08	23.00	3.80	2.19	0.13
10.25	0.56	0.02	0.11	23.25	3.80	2.20	0.12
10.50	0.60	0.02	0.14	23.50	3.80	2.20	0.10
10.75	0.66	0.03	0.20	23.75	3.81	2.20	0.09
11.00	0.73	0.06	0.34	24.00	3.81	2.20	0.08
11.25	0.83	0.09	0.55				
11.50	0.94	0.13	0.81				
11.75	1.17	0.23	1.27				
12.00	1.76	0.58	2.99				
12.25	2.64	1.22	10.73				
12.50	2.87	1.41	13.15				
12.75	2.98	1.50	7.09				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 106

Summary for Subcatchment 15S: UD-1

Runoff = 3.07 cfs @ 12.35 hrs, Volume= 0.249 af, Depth> 1.59"
Routed to Link 6L : Total Discharge North

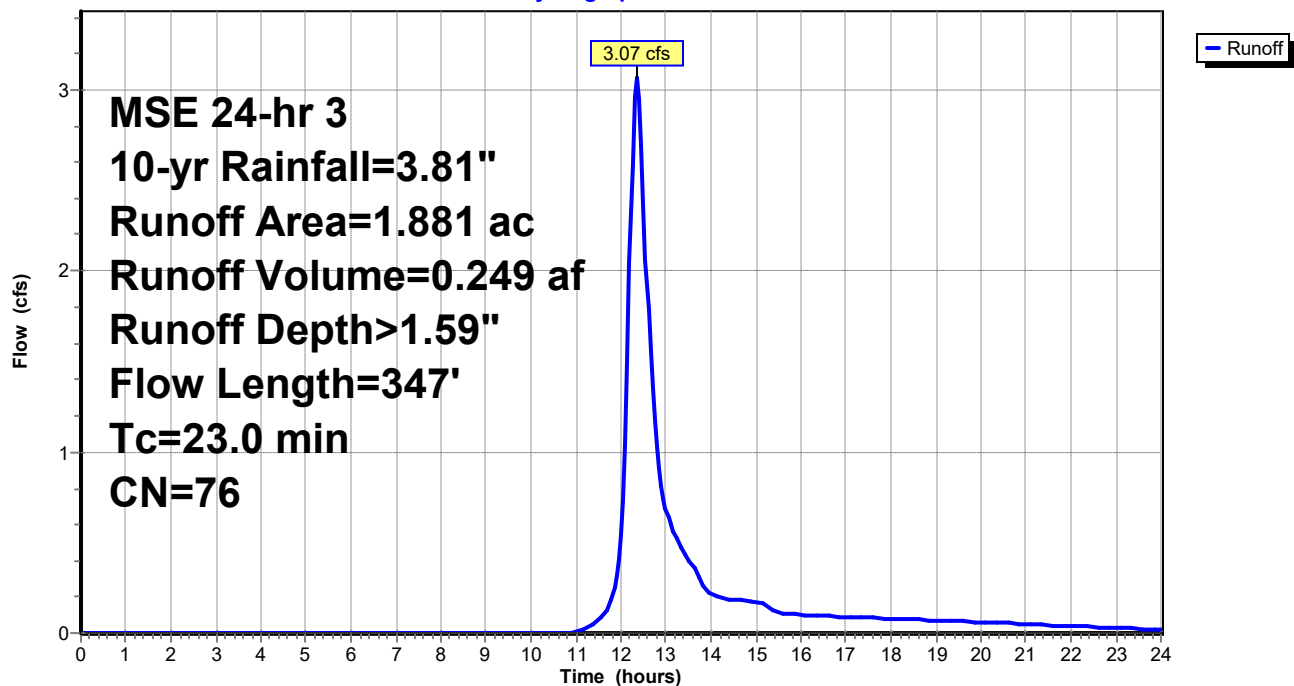
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 1.881	76	
1.881		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
2.5	247	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
23.0	347	Total			

Subcatchment 15S: UD-1

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 107

Hydrograph for Subcatchment 15S: UD-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	1.07	0.68
0.25	0.00	0.00	0.00	13.25	3.15	1.12	0.51
0.50	0.01	0.00	0.00	13.50	3.21	1.16	0.40
0.75	0.01	0.00	0.00	13.75	3.25	1.19	0.30
1.00	0.01	0.00	0.00	14.00	3.29	1.21	0.22
1.25	0.02	0.00	0.00	14.25	3.32	1.24	0.19
1.50	0.02	0.00	0.00	14.50	3.35	1.26	0.18
1.75	0.03	0.00	0.00	14.75	3.39	1.28	0.18
2.00	0.03	0.00	0.00	15.00	3.42	1.31	0.17
2.25	0.04	0.00	0.00	15.25	3.44	1.32	0.15
2.50	0.05	0.00	0.00	15.50	3.46	1.33	0.11
2.75	0.06	0.00	0.00	15.75	3.47	1.35	0.10
3.00	0.06	0.00	0.00	16.00	3.49	1.36	0.10
3.25	0.07	0.00	0.00	16.25	3.51	1.37	0.10
3.50	0.08	0.00	0.00	16.50	3.53	1.38	0.09
3.75	0.09	0.00	0.00	16.75	3.54	1.40	0.09
4.00	0.10	0.00	0.00	17.00	3.56	1.41	0.09
4.25	0.11	0.00	0.00	17.25	3.57	1.42	0.09
4.50	0.12	0.00	0.00	17.50	3.59	1.43	0.09
4.75	0.13	0.00	0.00	17.75	3.60	1.44	0.08
5.00	0.14	0.00	0.00	18.00	3.62	1.45	0.08
5.25	0.16	0.00	0.00	18.25	3.63	1.46	0.08
5.50	0.17	0.00	0.00	18.50	3.64	1.47	0.08
5.75	0.18	0.00	0.00	18.75	3.65	1.48	0.07
6.00	0.19	0.00	0.00	19.00	3.67	1.49	0.07
6.25	0.21	0.00	0.00	19.25	3.68	1.50	0.07
6.50	0.22	0.00	0.00	19.50	3.69	1.50	0.07
6.75	0.24	0.00	0.00	19.75	3.70	1.51	0.06
7.00	0.25	0.00	0.00	20.00	3.71	1.52	0.06
7.25	0.27	0.00	0.00	20.25	3.72	1.53	0.06
7.50	0.28	0.00	0.00	20.50	3.73	1.53	0.05
7.75	0.30	0.00	0.00	20.75	3.74	1.54	0.05
8.00	0.32	0.00	0.00	21.00	3.75	1.55	0.05
8.25	0.34	0.00	0.00	21.25	3.75	1.55	0.05
8.50	0.35	0.00	0.00	21.50	3.76	1.56	0.04
8.75	0.37	0.00	0.00	21.75	3.77	1.56	0.04
9.00	0.39	0.00	0.00	22.00	3.78	1.57	0.04
9.25	0.42	0.00	0.00	22.25	3.78	1.57	0.04
9.50	0.46	0.00	0.00	22.50	3.79	1.58	0.03
9.75	0.49	0.00	0.00	22.75	3.79	1.58	0.03
10.00	0.52	0.00	0.00	23.00	3.80	1.58	0.03
10.25	0.56	0.00	0.00	23.25	3.80	1.59	0.03
10.50	0.60	0.00	0.00	23.50	3.80	1.59	0.02
10.75	0.66	0.00	0.00	23.75	3.81	1.59	0.02
11.00	0.73	0.00	0.01	24.00	3.81	1.59	0.02
11.25	0.83	0.01	0.03				
11.50	0.94	0.03	0.07				
11.75	1.17	0.08	0.16				
12.00	1.76	0.30	0.54				
12.25	2.64	0.78	2.59				
12.50	2.87	0.93	2.37				
12.75	2.98	1.00	1.18				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 108

Summary for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

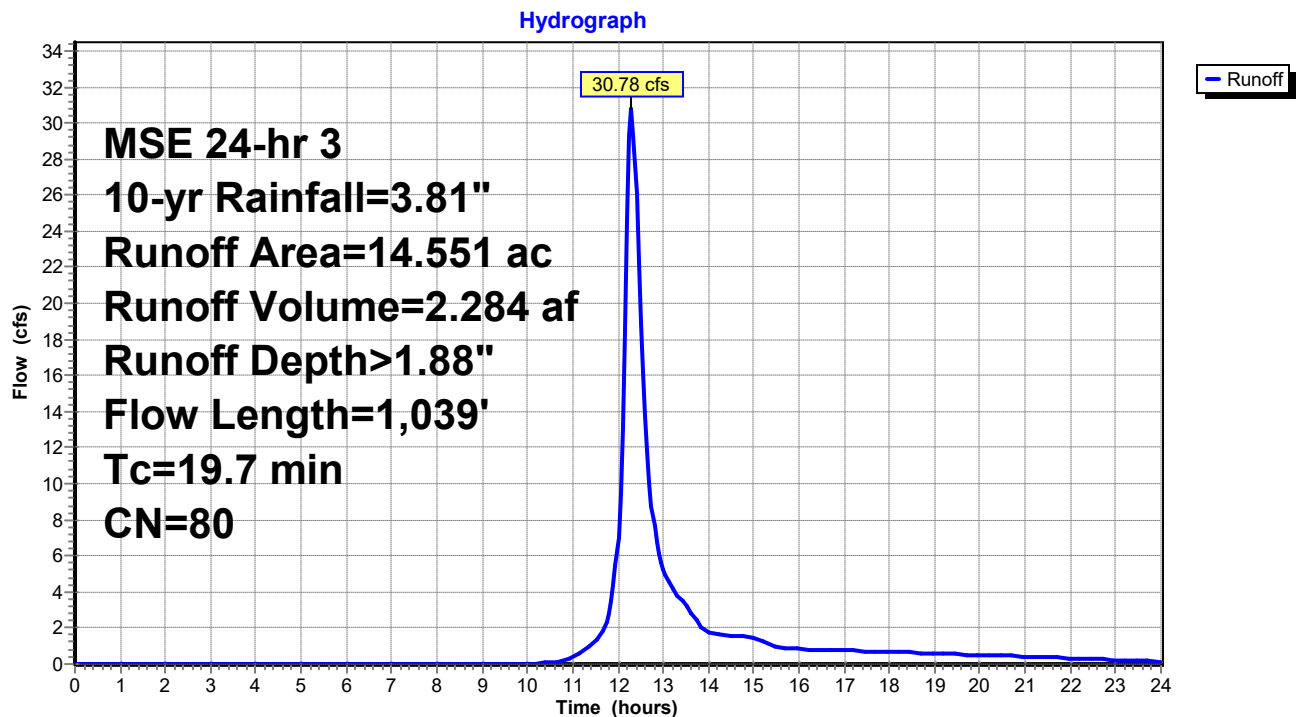
Runoff = 30.78 cfs @ 12.30 hrs, Volume= 2.284 af, Depth> 1.88"
Routed to Link 18L : Total Existing Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 14.551	80	
14.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0200	0.14		Sheet Flow, Sheet Flow
					Cultivated: Residue>20% n= 0.170 P2= 2.70"
7.9	939	0.0485	1.98		Shallow Concentrated Flow, Shallow Conc.
					Cultivated Straight Rows Kv= 9.0 fps
19.7	1,039	Total			

Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)



2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 109

Hydrograph for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	1.31	5.29
0.25	0.00	0.00	0.00	13.25	3.15	1.37	4.09
0.50	0.01	0.00	0.00	13.50	3.21	1.41	3.28
0.75	0.01	0.00	0.00	13.75	3.25	1.44	2.32
1.00	0.01	0.00	0.00	14.00	3.29	1.47	1.75
1.25	0.02	0.00	0.00	14.25	3.32	1.50	1.61
1.50	0.02	0.00	0.00	14.50	3.35	1.52	1.56
1.75	0.03	0.00	0.00	14.75	3.39	1.55	1.51
2.00	0.03	0.00	0.00	15.00	3.42	1.57	1.47
2.25	0.04	0.00	0.00	15.25	3.44	1.59	1.21
2.50	0.05	0.00	0.00	15.50	3.46	1.60	0.93
2.75	0.06	0.00	0.00	15.75	3.47	1.62	0.87
3.00	0.06	0.00	0.00	16.00	3.49	1.63	0.84
3.25	0.07	0.00	0.00	16.25	3.51	1.64	0.82
3.50	0.08	0.00	0.00	16.50	3.53	1.66	0.80
3.75	0.09	0.00	0.00	16.75	3.54	1.67	0.78
4.00	0.10	0.00	0.00	17.00	3.56	1.68	0.76
4.25	0.11	0.00	0.00	17.25	3.57	1.69	0.73
4.50	0.12	0.00	0.00	17.50	3.59	1.71	0.71
4.75	0.13	0.00	0.00	17.75	3.60	1.72	0.69
5.00	0.14	0.00	0.00	18.00	3.62	1.73	0.67
5.25	0.16	0.00	0.00	18.25	3.63	1.74	0.65
5.50	0.17	0.00	0.00	18.50	3.64	1.75	0.63
5.75	0.18	0.00	0.00	18.75	3.65	1.76	0.61
6.00	0.19	0.00	0.00	19.00	3.67	1.77	0.59
6.25	0.21	0.00	0.00	19.25	3.68	1.78	0.56
6.50	0.22	0.00	0.00	19.50	3.69	1.79	0.54
6.75	0.24	0.00	0.00	19.75	3.70	1.80	0.52
7.00	0.25	0.00	0.00	20.00	3.71	1.81	0.50
7.25	0.27	0.00	0.00	20.25	3.72	1.81	0.48
7.50	0.28	0.00	0.00	20.50	3.73	1.82	0.46
7.75	0.30	0.00	0.00	20.75	3.74	1.83	0.43
8.00	0.32	0.00	0.00	21.00	3.75	1.83	0.41
8.25	0.34	0.00	0.00	21.25	3.75	1.84	0.39
8.50	0.35	0.00	0.00	21.50	3.76	1.85	0.37
8.75	0.37	0.00	0.00	21.75	3.77	1.85	0.35
9.00	0.39	0.00	0.00	22.00	3.78	1.86	0.32
9.25	0.42	0.00	0.00	22.25	3.78	1.86	0.30
9.50	0.46	0.00	0.00	22.50	3.79	1.87	0.28
9.75	0.49	0.00	0.00	22.75	3.79	1.87	0.26
10.00	0.52	0.00	0.00	23.00	3.80	1.87	0.23
10.25	0.56	0.00	0.03	23.25	3.80	1.88	0.21
10.50	0.60	0.00	0.08	23.50	3.80	1.88	0.19
10.75	0.66	0.01	0.19	23.75	3.81	1.88	0.17
11.00	0.73	0.02	0.42	24.00	3.81	1.89	0.14
11.25	0.83	0.04	0.77				
11.50	0.94	0.07	1.26				
11.75	1.17	0.14	2.36				
12.00	1.76	0.42	7.04				
12.25	2.64	0.99	29.28				
12.50	2.87	1.15	18.95				
12.75	2.98	1.23	8.75				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 110

Summary for Subcatchment 17S: E-2 (Ex. Discharge North)

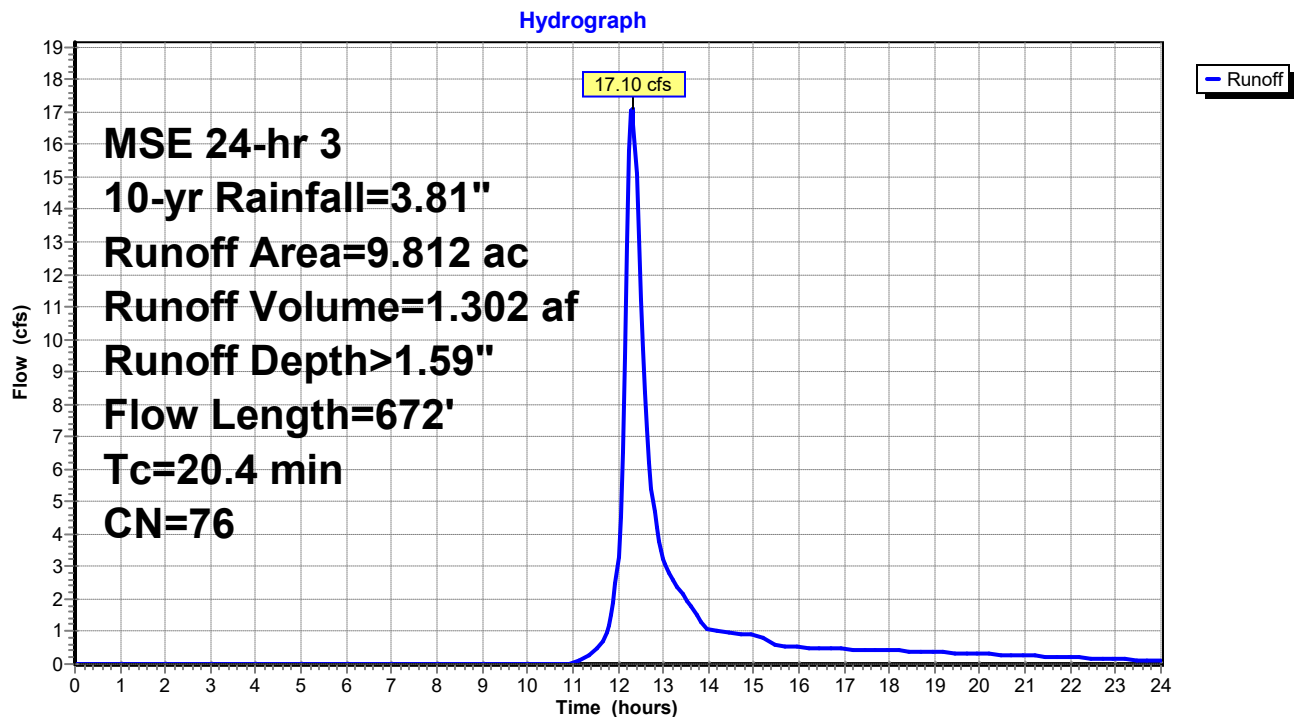
Runoff = 17.10 cfs @ 12.31 hrs, Volume= 1.302 af, Depth> 1.59"
Routed to Link 18L : Total Existing Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 9.812	76	
9.812		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0150	0.13		Sheet Flow, Sheet Flow
					Cultivated: Residue>20% n= 0.170 P2= 2.70"
7.2	572	0.0219	1.33		Shallow Concentrated Flow, Shallow Conc.
					Cultivated Straight Rows Kv= 9.0 fps
20.4	672	Total			

Subcatchment 17S: E-2 (Ex. Discharge North)



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 111

Hydrograph for Subcatchment 17S: E-2 (Ex. Discharge North)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	1.07	3.26
0.25	0.00	0.00	0.00	13.25	3.15	1.12	2.51
0.50	0.01	0.00	0.00	13.50	3.21	1.16	2.01
0.75	0.01	0.00	0.00	13.75	3.25	1.19	1.45
1.00	0.01	0.00	0.00	14.00	3.29	1.21	1.08
1.25	0.02	0.00	0.00	14.25	3.32	1.24	0.99
1.50	0.02	0.00	0.00	14.50	3.35	1.26	0.96
1.75	0.03	0.00	0.00	14.75	3.39	1.28	0.93
2.00	0.03	0.00	0.00	15.00	3.42	1.31	0.90
2.25	0.04	0.00	0.00	15.25	3.44	1.32	0.76
2.50	0.05	0.00	0.00	15.50	3.46	1.33	0.58
2.75	0.06	0.00	0.00	15.75	3.47	1.35	0.53
3.00	0.06	0.00	0.00	16.00	3.49	1.36	0.52
3.25	0.07	0.00	0.00	16.25	3.51	1.37	0.50
3.50	0.08	0.00	0.00	16.50	3.53	1.38	0.49
3.75	0.09	0.00	0.00	16.75	3.54	1.40	0.48
4.00	0.10	0.00	0.00	17.00	3.56	1.41	0.47
4.25	0.11	0.00	0.00	17.25	3.57	1.42	0.45
4.50	0.12	0.00	0.00	17.50	3.59	1.43	0.44
4.75	0.13	0.00	0.00	17.75	3.60	1.44	0.43
5.00	0.14	0.00	0.00	18.00	3.62	1.45	0.42
5.25	0.16	0.00	0.00	18.25	3.63	1.46	0.40
5.50	0.17	0.00	0.00	18.50	3.64	1.47	0.39
5.75	0.18	0.00	0.00	18.75	3.65	1.48	0.38
6.00	0.19	0.00	0.00	19.00	3.67	1.49	0.36
6.25	0.21	0.00	0.00	19.25	3.68	1.50	0.35
6.50	0.22	0.00	0.00	19.50	3.69	1.50	0.34
6.75	0.24	0.00	0.00	19.75	3.70	1.51	0.32
7.00	0.25	0.00	0.00	20.00	3.71	1.52	0.31
7.25	0.27	0.00	0.00	20.25	3.72	1.53	0.30
7.50	0.28	0.00	0.00	20.50	3.73	1.53	0.28
7.75	0.30	0.00	0.00	20.75	3.74	1.54	0.27
8.00	0.32	0.00	0.00	21.00	3.75	1.55	0.26
8.25	0.34	0.00	0.00	21.25	3.75	1.55	0.24
8.50	0.35	0.00	0.00	21.50	3.76	1.56	0.23
8.75	0.37	0.00	0.00	21.75	3.77	1.56	0.22
9.00	0.39	0.00	0.00	22.00	3.78	1.57	0.20
9.25	0.42	0.00	0.00	22.25	3.78	1.57	0.19
9.50	0.46	0.00	0.00	22.50	3.79	1.58	0.17
9.75	0.49	0.00	0.00	22.75	3.79	1.58	0.16
10.00	0.52	0.00	0.00	23.00	3.80	1.58	0.15
10.25	0.56	0.00	0.00	23.25	3.80	1.59	0.13
10.50	0.60	0.00	0.00	23.50	3.80	1.59	0.12
10.75	0.66	0.00	0.00	23.75	3.81	1.59	0.10
11.00	0.73	0.00	0.04	24.00	3.81	1.59	0.09
11.25	0.83	0.01	0.18				
11.50	0.94	0.03	0.42				
11.75	1.17	0.08	0.95				
12.00	1.76	0.30	3.29				
12.25	2.64	0.78	15.81				
12.50	2.87	0.93	11.24				
12.75	2.98	1.00	5.39				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 112

Summary for Subcatchment 19S: UD-2

Runoff = 0.85 cfs @ 12.13 hrs, Volume= 0.039 af, Depth> 1.89"

Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

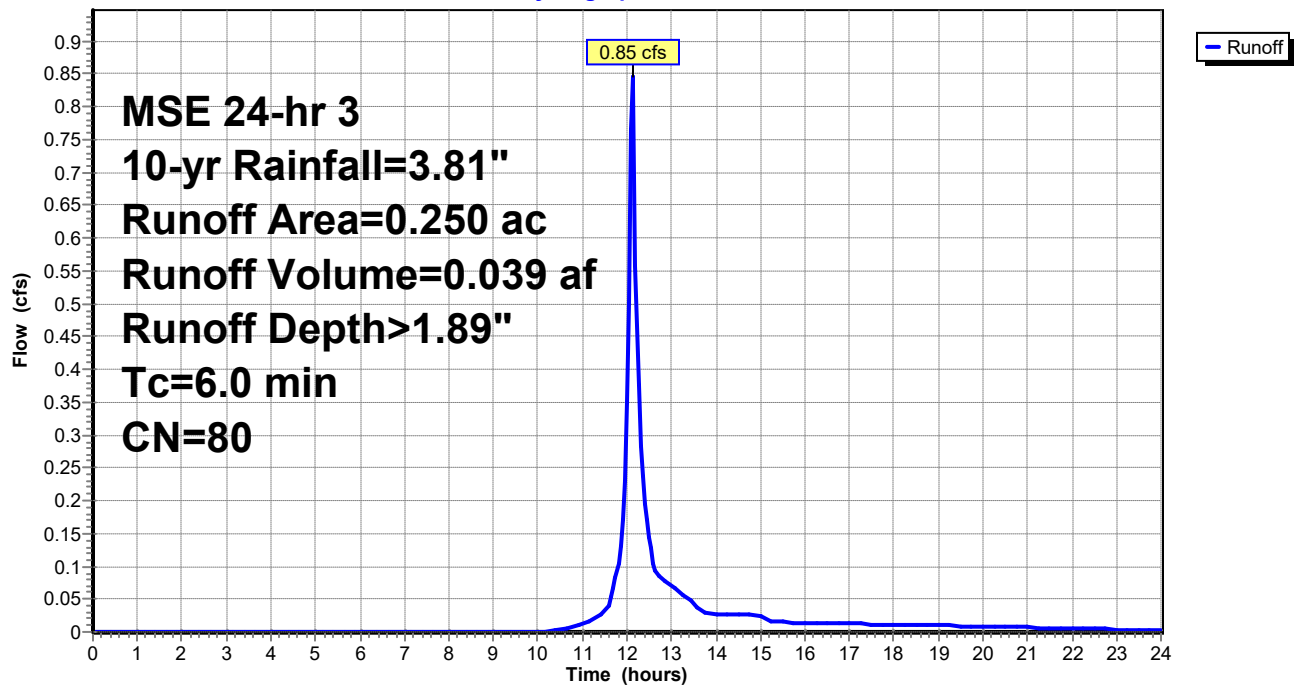
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 0.250	80	
0.250		100.00% Pervious Area

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

Subcatchment 19S: UD-2

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 113

Hydrograph for Subcatchment 19S: UD-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	3.08	1.31	0.07
0.25	0.00	0.00	0.00	13.25	3.15	1.37	0.06
0.50	0.01	0.00	0.00	13.50	3.21	1.41	0.04
0.75	0.01	0.00	0.00	13.75	3.25	1.44	0.03
1.00	0.01	0.00	0.00	14.00	3.29	1.47	0.03
1.25	0.02	0.00	0.00	14.25	3.32	1.50	0.03
1.50	0.02	0.00	0.00	14.50	3.35	1.52	0.03
1.75	0.03	0.00	0.00	14.75	3.39	1.55	0.03
2.00	0.03	0.00	0.00	15.00	3.42	1.57	0.02
2.25	0.04	0.00	0.00	15.25	3.44	1.59	0.02
2.50	0.05	0.00	0.00	15.50	3.46	1.60	0.01
2.75	0.06	0.00	0.00	15.75	3.47	1.62	0.01
3.00	0.06	0.00	0.00	16.00	3.49	1.63	0.01
3.25	0.07	0.00	0.00	16.25	3.51	1.64	0.01
3.50	0.08	0.00	0.00	16.50	3.53	1.66	0.01
3.75	0.09	0.00	0.00	16.75	3.54	1.67	0.01
4.00	0.10	0.00	0.00	17.00	3.56	1.68	0.01
4.25	0.11	0.00	0.00	17.25	3.57	1.69	0.01
4.50	0.12	0.00	0.00	17.50	3.59	1.71	0.01
4.75	0.13	0.00	0.00	17.75	3.60	1.72	0.01
5.00	0.14	0.00	0.00	18.00	3.62	1.73	0.01
5.25	0.16	0.00	0.00	18.25	3.63	1.74	0.01
5.50	0.17	0.00	0.00	18.50	3.64	1.75	0.01
5.75	0.18	0.00	0.00	18.75	3.65	1.76	0.01
6.00	0.19	0.00	0.00	19.00	3.67	1.77	0.01
6.25	0.21	0.00	0.00	19.25	3.68	1.78	0.01
6.50	0.22	0.00	0.00	19.50	3.69	1.79	0.01
6.75	0.24	0.00	0.00	19.75	3.70	1.80	0.01
7.00	0.25	0.00	0.00	20.00	3.71	1.81	0.01
7.25	0.27	0.00	0.00	20.25	3.72	1.81	0.01
7.50	0.28	0.00	0.00	20.50	3.73	1.82	0.01
7.75	0.30	0.00	0.00	20.75	3.74	1.83	0.01
8.00	0.32	0.00	0.00	21.00	3.75	1.83	0.01
8.25	0.34	0.00	0.00	21.25	3.75	1.84	0.01
8.50	0.35	0.00	0.00	21.50	3.76	1.85	0.01
8.75	0.37	0.00	0.00	21.75	3.77	1.85	0.01
9.00	0.39	0.00	0.00	22.00	3.78	1.86	0.01
9.25	0.42	0.00	0.00	22.25	3.78	1.86	0.00
9.50	0.46	0.00	0.00	22.50	3.79	1.87	0.00
9.75	0.49	0.00	0.00	22.75	3.79	1.87	0.00
10.00	0.52	0.00	0.00	23.00	3.80	1.87	0.00
10.25	0.56	0.00	0.00	23.25	3.80	1.88	0.00
10.50	0.60	0.00	0.00	23.50	3.80	1.88	0.00
10.75	0.66	0.01	0.01	23.75	3.81	1.88	0.00
11.00	0.73	0.02	0.01	24.00	3.81	1.89	0.00
11.25	0.83	0.04	0.02				
11.50	0.94	0.07	0.03				
11.75	1.17	0.14	0.08				
12.00	1.76	0.42	0.35				
12.25	2.64	0.99	0.38				
12.50	2.87	1.15	0.15				
12.75	2.98	1.23	0.08				

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 114

Summary for Pond 1P: Bio-Filtration Basin (BF-1)

Inflow Area = 5.080 ac, 0.00% Impervious, Inflow Depth > 2.83" for 10-yr event
 Inflow = 13.62 cfs @ 12.37 hrs, Volume= 1.199 af
 Outflow = 7.53 cfs @ 12.65 hrs, Volume= 1.175 af, Atten= 45%, Lag= 17.3 min
 Discarded = 0.16 cfs @ 12.65 hrs, Volume= 0.116 af
 Primary = 7.37 cfs @ 12.65 hrs, Volume= 1.059 af
 Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 172.68' @ 12.65 hrs Surf.Area= 0.201 ac Storage= 0.467 af

Plug-Flow detention time= 98.8 min calculated for 1.175 af (98% of inflow)
 Center-of-Mass det. time= 87.7 min (887.0 - 799.2)

Volume	Invert	Avail.Storage	Storage Description	
#1	168.00'	1.047 af	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (acres)	Voids (%)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.105	0.0	0.000	0.000
168.01	0.105	30.0	0.000	0.000
169.99	0.105	30.0	0.062	0.063
170.00	0.105	100.0	0.001	0.064
171.00	0.137	100.0	0.121	0.185
172.00	0.173	100.0	0.155	0.340
173.00	0.214	100.0	0.194	0.533
174.00	0.257	100.0	0.236	0.769
175.00	0.299	100.0	0.278	1.047

Device	Routing	Invert	Outlet Devices
#1	Primary	168.00'	15.0" Round Culvert L= 70.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 168.00' / 167.00' S= 0.0142 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Discarded	168.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 163.00'
#3	Device 1	168.50'	6.0" Round Underdrain L= 121.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 168.50' / 168.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 1	171.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	172.00'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#6	Device 1	173.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	174.00'	15.0' long + 5.5 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 115

Discarded OutFlow Max=0.16 cfs @ 12.65 hrs HW=172.68' (Free Discharge)

↳ **2=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=7.36 cfs @ 12.65 hrs HW=172.68' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 7.36 cfs of 11.90 cfs potential flow)

↳ **3=Underdrain** (Barrel Controls 0.97 cfs @ 4.94 fps)

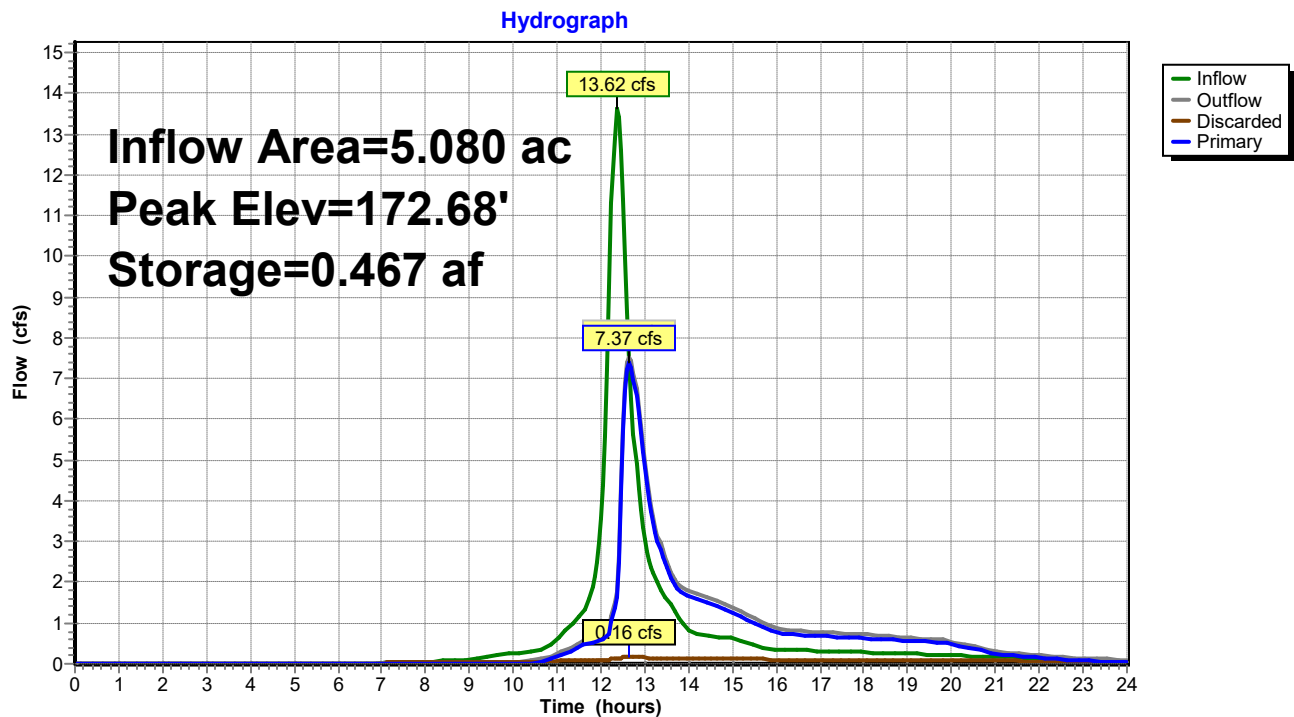
↳ **4=Orifice/Grate** (Orifice Controls 1.13 cfs @ 5.76 fps)

↳ **5=Sharp-Crested Rectangular Weir** (Weir Controls 5.26 cfs @ 2.70 fps)

↳ **6=Orifice/Grate** (Controls 0.00 cfs)

↳ **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Bio-Filtration Basin (BF-1)



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 116

Hydrograph for Pond 1P: Bio-Filtration Basin (BF-1)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	168.00	0.00	0.00	0.00
0.50	0.00	0.000	168.00	0.00	0.00	0.00
1.00	0.00	0.000	168.00	0.00	0.00	0.00
1.50	0.00	0.000	168.00	0.00	0.00	0.00
2.00	0.00	0.000	168.00	0.00	0.00	0.00
2.50	0.00	0.000	168.00	0.00	0.00	0.00
3.00	0.00	0.000	168.00	0.00	0.00	0.00
3.50	0.00	0.000	168.00	0.00	0.00	0.00
4.00	0.00	0.000	168.00	0.00	0.00	0.00
4.50	0.00	0.000	168.00	0.00	0.00	0.00
5.00	0.00	0.000	168.00	0.00	0.00	0.00
5.50	0.00	0.000	168.00	0.00	0.00	0.00
6.00	0.00	0.000	168.00	0.00	0.00	0.00
6.50	0.00	0.000	168.00	0.00	0.00	0.00
7.00	0.02	0.000	168.00	0.02	0.02	0.00
7.50	0.04	0.000	168.00	0.04	0.04	0.00
8.00	0.06	0.000	168.00	0.05	0.05	0.00
8.50	0.08	0.001	168.02	0.05	0.05	0.00
9.00	0.10	0.002	168.07	0.05	0.05	0.00
9.50	0.19	0.005	168.17	0.05	0.05	0.00
10.00	0.26	0.012	168.39	0.06	0.06	0.00
10.50	0.32	0.022	168.69	0.08	0.06	0.02
11.00	0.61	0.033	169.05	0.25	0.06	0.18
11.50	1.16	0.054	169.72	0.50	0.07	0.43
12.00	3.56	0.108	170.39	0.68	0.08	0.60
12.50	11.38	0.438	172.53	5.86	0.15	5.71
13.00	3.03	0.421	172.44	4.94	0.15	4.80
13.50	1.58	0.366	172.15	2.49	0.14	2.35
14.00	0.83	0.331	171.95	1.79	0.13	1.66
14.50	0.67	0.291	171.71	1.60	0.12	1.47
15.00	0.63	0.256	171.49	1.38	0.12	1.26
15.50	0.43	0.227	171.30	1.10	0.11	0.99
16.00	0.36	0.202	171.12	0.89	0.11	0.78
16.50	0.34	0.182	170.98	0.81	0.10	0.71
17.00	0.32	0.162	170.83	0.78	0.10	0.68
17.50	0.30	0.143	170.69	0.75	0.09	0.66
18.00	0.28	0.125	170.54	0.72	0.09	0.63
18.50	0.26	0.107	170.39	0.68	0.08	0.60
19.00	0.25	0.091	170.25	0.65	0.08	0.56
19.50	0.23	0.074	170.10	0.61	0.08	0.53
20.00	0.21	0.059	169.88	0.55	0.07	0.47
20.50	0.19	0.047	169.50	0.43	0.07	0.36
21.00	0.17	0.039	169.25	0.32	0.07	0.25
21.50	0.15	0.034	169.09	0.27	0.06	0.20
22.00	0.14	0.031	168.97	0.21	0.06	0.15
22.50	0.12	0.028	168.90	0.17	0.06	0.10
23.00	0.10	0.026	168.84	0.14	0.06	0.08
23.50	0.08	0.025	168.79	0.12	0.06	0.05
24.00	0.06	0.024	168.75	0.10	0.06	0.04

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 117

Stage-Discharge for Pond 1P: Bio-Filtration Basin (BF-1)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
168.00	0.00	0.00	0.00	173.20	12.82	0.18	12.64
168.10	0.05	0.05	0.00	173.30	12.96	0.18	12.78
168.20	0.06	0.06	0.00	173.40	13.10	0.19	12.91
168.30	0.06	0.06	0.00	173.50	13.24	0.19	13.05
168.40	0.06	0.06	0.00	173.60	13.37	0.19	13.18
168.50	0.06	0.06	0.00	173.70	13.51	0.20	13.31
168.60	0.06	0.06	0.00	173.80	13.64	0.20	13.44
168.70	0.08	0.06	0.02	173.90	13.78	0.21	13.57
168.80	0.12	0.06	0.06	174.00	13.91	0.21	13.70
168.90	0.17	0.06	0.11	174.10	15.35	0.21	15.13
169.00	0.22	0.06	0.16	174.20	17.98	0.22	17.76
169.10	0.27	0.06	0.20	174.30	21.51	0.22	21.29
169.20	0.29	0.07	0.23	174.40	25.87	0.23	25.65
169.30	0.34	0.07	0.28	174.50	30.97	0.23	30.74
169.40	0.39	0.07	0.32	174.60	36.81	0.23	36.58
169.50	0.43	0.07	0.36	174.70	43.07	0.24	42.84
169.60	0.46	0.07	0.39	174.80	49.91	0.24	49.67
169.70	0.49	0.07	0.42	174.90	57.70	0.25	57.46
169.80	0.52	0.07	0.45	175.00	66.19	0.25	65.94
169.90	0.55	0.07	0.48				
170.00	0.58	0.07	0.51				
170.10	0.61	0.08	0.53				
170.20	0.63	0.08	0.55				
170.30	0.66	0.08	0.58				
170.40	0.68	0.08	0.60				
170.50	0.71	0.09	0.62				
170.60	0.73	0.09	0.64				
170.70	0.75	0.09	0.66				
170.80	0.77	0.10	0.68				
170.90	0.80	0.10	0.70				
171.00	0.82	0.10	0.72				
171.10	0.87	0.10	0.76				
171.20	0.97	0.11	0.86				
171.30	1.11	0.11	1.00				
171.40	1.26	0.11	1.15				
171.50	1.39	0.12	1.27				
171.60	1.50	0.12	1.37				
171.70	1.59	0.12	1.47				
171.80	1.67	0.13	1.55				
171.90	1.75	0.13	1.62				
172.00	1.83	0.13	1.69				
172.10	2.21	0.14	2.07				
172.20	2.83	0.14	2.69				
172.30	3.61	0.14	3.47				
172.40	4.51	0.15	4.36				
172.50	5.51	0.15	5.36				
172.60	6.59	0.16	6.43				
172.70	7.75	0.16	7.59				
172.80	8.97	0.16	8.81				
172.90	10.25	0.17	10.09				
173.00	11.59	0.17	11.42				
173.10	12.67	0.17	12.50				

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 118

Stage-Area-Storage for Pond 1P: Bio-Filtration Basin (BF-1)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
168.00	0.105	0.000	173.20	0.223	0.577
168.10	0.105	0.003	173.30	0.227	0.599
168.20	0.105	0.006	173.40	0.231	0.622
168.30	0.105	0.009	173.50	0.236	0.646
168.40	0.105	0.013	173.60	0.240	0.669
168.50	0.105	0.016	173.70	0.244	0.694
168.60	0.105	0.019	173.80	0.248	0.718
168.70	0.105	0.022	173.90	0.253	0.743
168.80	0.105	0.025	174.00	0.257	0.769
168.90	0.105	0.028	174.10	0.261	0.795
169.00	0.105	0.032	174.20	0.265	0.821
169.10	0.105	0.035	174.30	0.270	0.848
169.20	0.105	0.038	174.40	0.274	0.875
169.30	0.105	0.041	174.50	0.278	0.902
169.40	0.105	0.044	174.60	0.282	0.930
169.50	0.105	0.047	174.70	0.286	0.959
169.60	0.105	0.050	174.80	0.291	0.988
169.70	0.105	0.054	174.90	0.295	1.017
169.80	0.105	0.057	175.00	0.299	1.047
169.90	0.105	0.060			
170.00	0.105	0.064			
170.10	0.108	0.074			
170.20	0.111	0.085			
170.30	0.115	0.097			
170.40	0.118	0.108			
170.50	0.121	0.120			
170.60	0.124	0.132			
170.70	0.127	0.145			
170.80	0.131	0.158			
170.90	0.134	0.171			
171.00	0.137	0.185			
171.10	0.141	0.199			
171.20	0.144	0.213			
171.30	0.148	0.227			
171.40	0.151	0.242			
171.50	0.155	0.258			
171.60	0.159	0.273			
171.70	0.162	0.289			
171.80	0.166	0.306			
171.90	0.169	0.323			
172.00	0.173	0.340			
172.10	0.177	0.357			
172.20	0.181	0.375			
172.30	0.185	0.393			
172.40	0.189	0.412			
172.50	0.194	0.431			
172.60	0.198	0.451			
172.70	0.202	0.471			
172.80	0.206	0.491			
172.90	0.210	0.512			
173.00	0.214	0.533			
173.10	0.218	0.555			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 119

Summary for Pond 2P: Wet Pond (WP-2A)

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=64)

Inflow Area = 10.131 ac, 0.00% Impervious, Inflow Depth > 2.72" for 10-yr event
 Inflow = 35.70 cfs @ 12.18 hrs, Volume= 2.298 af
 Outflow = 20.24 cfs @ 12.19 hrs, Volume= 2.293 af, Atten= 43%, Lag= 0.4 min
 Primary = 20.24 cfs @ 12.19 hrs, Volume= 2.293 af
 Routed to Pond 3P : Bio-Filtration Basin (BF-2B)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 137.12' @ 12.45 hrs Surf.Area= 0.170 ac Storage= 0.408 af

Plug-Flow detention time= 31.5 min calculated for 2.289 af (100% of inflow)
 Center-of-Mass det. time= 30.3 min (819.9 - 789.6)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	0.775 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
134.00	0.087	0.000	0.000
135.00	0.118	0.102	0.102
136.00	0.142	0.130	0.233
137.00	0.167	0.155	0.387
138.00	0.194	0.180	0.568
139.00	0.221	0.208	0.775

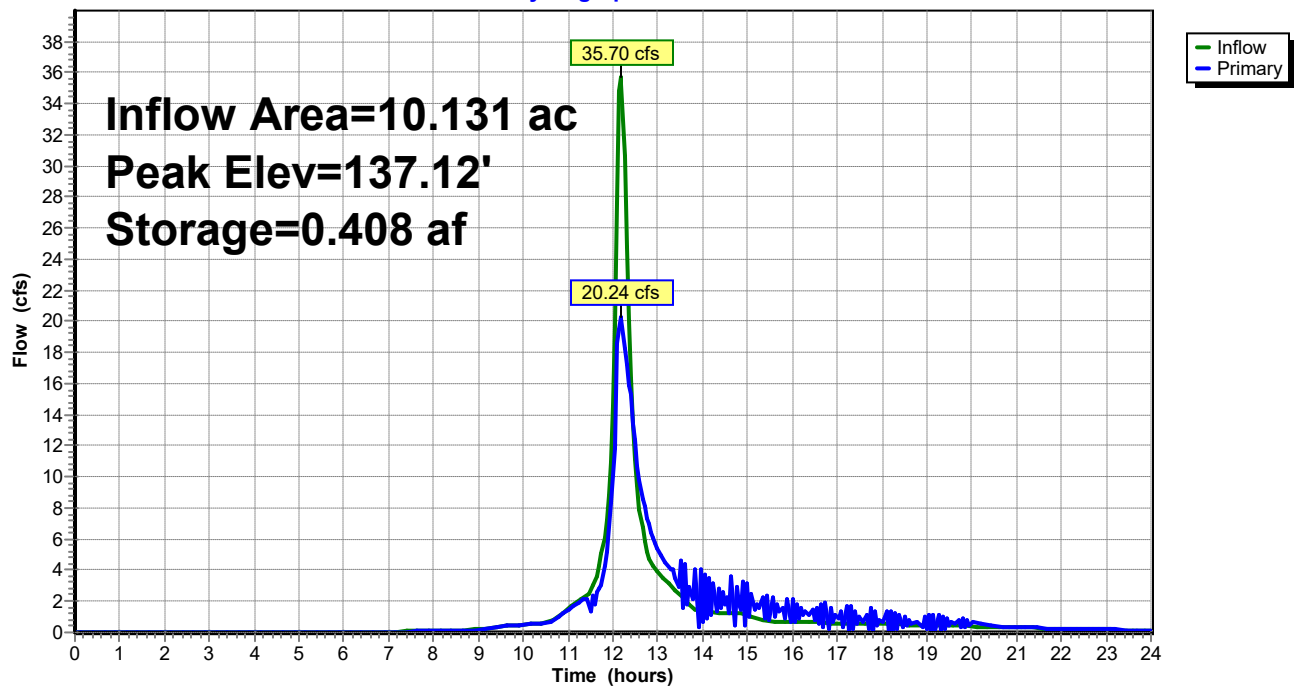
Device	Routing	Invert	Outlet Devices
#1	Primary	134.00'	43.0' long + 4.0 ' SideZ x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 12.19 hrs HW=136.16' TW=136.55' (Dynamic Tailwater)

↑1=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Wet Pond (WP-2A)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 121

Hydrograph for Pond 2P: Wet Pond (WP-2A)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	134.00	0.00
0.50	0.00	0.000	134.00	0.00
1.00	0.00	0.000	134.00	0.00
1.50	0.00	0.000	134.00	0.00
2.00	0.00	0.000	134.00	0.00
2.50	0.00	0.000	134.00	0.00
3.00	0.00	0.000	134.00	0.00
3.50	0.00	0.000	134.00	0.00
4.00	0.00	0.000	134.00	0.00
4.50	0.00	0.000	134.00	0.00
5.00	0.00	0.000	134.00	0.00
5.50	0.00	0.000	134.00	0.00
6.00	0.00	0.000	134.00	0.00
6.50	0.01	0.000	134.00	0.00
7.00	0.03	0.000	134.00	0.03
7.50	0.07	0.001	134.01	0.06
8.00	0.10	0.001	134.01	0.09
8.50	0.14	0.001	134.01	0.13
9.00	0.18	0.001	134.01	0.17
9.50	0.38	0.002	134.02	0.36
10.00	0.49	0.002	134.03	0.49
10.50	0.62	0.003	134.03	0.61
11.00	1.48	0.005	134.06	1.42
11.50	2.65	0.012	134.14	1.30
12.00	14.53	0.100	134.98	10.34
12.50	11.15	0.405	137.11	12.44
13.00	3.83	0.328	136.63	5.40
13.50	2.43	0.278	136.31	4.59
14.00	1.37	0.241	136.06	0.64
14.50	1.27	0.204	135.80	1.84
15.00	1.19	0.171	135.55	3.17
15.50	0.72	0.136	135.28	0.83
16.00	0.68	0.105	135.02	2.09
16.50	0.64	0.080	134.80	0.80
17.00	0.61	0.061	134.63	1.01
17.50	0.57	0.049	134.52	0.99
18.00	0.54	0.039	134.42	0.89
18.50	0.50	0.032	134.34	0.99
19.00	0.47	0.024	134.27	0.24
19.50	0.43	0.017	134.19	0.41
20.00	0.39	0.009	134.10	0.63
20.50	0.36	0.002	134.03	0.43
21.00	0.32	0.002	134.02	0.33
21.50	0.29	0.002	134.02	0.29
22.00	0.25	0.002	134.02	0.25
22.50	0.22	0.001	134.02	0.22
23.00	0.18	0.001	134.01	0.18
23.50	0.14	0.001	134.01	0.15
24.00	0.11	0.001	134.01	0.11

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 122

Stage-Discharge for Pond 2P: Wet Pond (WP-2A)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
134.00	0.00	136.60	572.31
134.05	1.14	136.65	590.73
134.10	3.25	136.70	609.42
134.15	5.99	136.75	628.36
134.20	9.25	136.80	647.57
134.25	13.17	136.85	667.04
134.30	17.63	136.90	686.77
134.35	22.61	136.95	706.77
134.40	28.12	137.00	727.02
134.45	34.31	137.05	747.82
134.50	41.08	137.10	768.90
134.55	48.43	137.15	790.26
134.60	56.37	137.20	811.89
134.65	63.67	137.25	833.80
134.70	71.27	137.30	856.00
134.75	79.18	137.35	878.47
134.80	87.37	137.40	901.22
134.85	96.02	137.45	924.26
134.90	104.98	137.50	947.57
134.95	114.25	137.55	971.53
135.00	123.82	137.60	995.80
135.05	133.55	137.65	1,020.36
135.10	143.57	137.70	1,045.23
135.15	153.85	137.75	1,070.40
135.20	164.40	137.80	1,095.87
135.25	175.05	137.85	1,121.65
135.30	185.94	137.90	1,147.73
135.35	197.07	137.95	1,174.12
135.40	208.42	138.00	1,200.82
135.45	220.43	138.05	1,228.28
135.50	232.71	138.10	1,256.07
135.55	245.26	138.15	1,284.19
135.60	258.08	138.20	1,312.64
135.65	271.17	138.25	1,341.43
135.70	284.53	138.30	1,370.55
135.75	298.15	138.35	1,400.00
135.80	312.05	138.40	1,429.79
135.85	326.20	138.45	1,459.92
135.90	340.63	138.50	1,490.39
135.95	355.32	138.55	1,521.76
136.00	370.27	138.60	1,553.49
136.05	385.63	138.65	1,585.58
136.10	401.27	138.70	1,618.04
136.15	417.18	138.75	1,650.87
136.20	433.36	138.80	1,684.07
136.25	449.82	138.85	1,717.65
136.30	466.56	138.90	1,751.59
136.35	483.57	138.95	1,785.91
136.40	500.85	139.00	1,820.61
136.45	518.41		
136.50	536.24		
136.55	554.14		

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 123

Stage-Area-Storage for Pond 2P: Wet Pond (WP-2A)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
134.00	0.087	0.000	136.60	0.157	0.322
134.05	0.089	0.004	136.65	0.158	0.330
134.10	0.090	0.009	136.70	0.159	0.338
134.15	0.092	0.013	136.75	0.161	0.346
134.20	0.093	0.018	136.80	0.162	0.354
134.25	0.095	0.023	136.85	0.163	0.362
134.30	0.096	0.027	136.90	0.165	0.370
134.35	0.098	0.032	136.95	0.166	0.379
134.40	0.099	0.037	137.00	0.167	0.387
134.45	0.101	0.042	137.05	0.168	0.395
134.50	0.102	0.047	137.10	0.170	0.404
134.55	0.104	0.053	137.15	0.171	0.412
134.60	0.106	0.058	137.20	0.172	0.421
134.65	0.107	0.063	137.25	0.174	0.430
134.70	0.109	0.068	137.30	0.175	0.438
134.75	0.110	0.074	137.35	0.176	0.447
134.80	0.112	0.080	137.40	0.178	0.456
134.85	0.113	0.085	137.45	0.179	0.465
134.90	0.115	0.091	137.50	0.180	0.474
134.95	0.116	0.097	137.55	0.182	0.483
135.00	0.118	0.102	137.60	0.183	0.492
135.05	0.119	0.108	137.65	0.185	0.501
135.10	0.120	0.114	137.70	0.186	0.511
135.15	0.122	0.120	137.75	0.187	0.520
135.20	0.123	0.127	137.80	0.189	0.529
135.25	0.124	0.133	137.85	0.190	0.539
135.30	0.125	0.139	137.90	0.191	0.548
135.35	0.126	0.145	137.95	0.193	0.558
135.40	0.128	0.152	138.00	0.194	0.568
135.45	0.129	0.158	138.05	0.195	0.577
135.50	0.130	0.164	138.10	0.197	0.587
135.55	0.131	0.171	138.15	0.198	0.597
135.60	0.132	0.178	138.20	0.199	0.607
135.65	0.134	0.184	138.25	0.201	0.617
135.70	0.135	0.191	138.30	0.202	0.627
135.75	0.136	0.198	138.35	0.203	0.637
135.80	0.137	0.205	138.40	0.205	0.647
135.85	0.138	0.211	138.45	0.206	0.658
135.90	0.140	0.218	138.50	0.208	0.668
135.95	0.141	0.225	138.55	0.209	0.678
136.00	0.142	0.233	138.60	0.210	0.689
136.05	0.143	0.240	138.65	0.212	0.699
136.10	0.144	0.247	138.70	0.213	0.710
136.15	0.146	0.254	138.75	0.214	0.721
136.20	0.147	0.261	138.80	0.216	0.731
136.25	0.148	0.269	138.85	0.217	0.742
136.30	0.150	0.276	138.90	0.218	0.753
136.35	0.151	0.284	138.95	0.220	0.764
136.40	0.152	0.291	139.00	0.221	0.775
136.45	0.153	0.299			
136.50	0.155	0.307			
136.55	0.156	0.314			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 124

Summary for Pond 3P: Bio-Filtration Basin (BF-2B)

[80] Warning: Exceeded Pond 2P by 0.44' @ 12.15 hrs (285.08 cfs 9.264 af)

Inflow Area = 10.131 ac, 0.00% Impervious, Inflow Depth > 2.72" for 10-yr event
 Inflow = 20.24 cfs @ 12.19 hrs, Volume= 2.293 af
 Outflow = 15.28 cfs @ 12.40 hrs, Volume= 2.275 af, Atten= 25%, Lag= 12.6 min
 Discarded = 0.13 cfs @ 12.40 hrs, Volume= 0.090 af
 Primary = 15.15 cfs @ 12.40 hrs, Volume= 2.185 af
 Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 137.12' @ 12.40 hrs Surf.Area= 0.173 ac Storage= 0.495 af

Plug-Flow detention time= 55.4 min calculated for 2.270 af (99% of inflow)
 Center-of-Mass det. time= 50.9 min (870.8 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1	131.50'	0.868 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Voids (%)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
131.50	0.069	0.0	0.000	0.000
131.51	0.069	30.0	0.000	0.000
133.49	0.069	30.0	0.041	0.041
133.50	0.069	100.0	0.001	0.042
134.00	0.085	100.0	0.038	0.080
135.00	0.121	100.0	0.103	0.183
136.00	0.145	100.0	0.133	0.316
137.00	0.170	100.0	0.157	0.474
138.00	0.196	100.0	0.183	0.657
139.00	0.226	100.0	0.211	0.868

Device	Routing	Invert	Outlet Devices
#1	Primary	129.50'	24.0" Round Culvert L= 70.1' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.50' / 129.15' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Discarded	131.50'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 125.00'
#3	Device 1	132.00'	6.0" Round Underdrain L= 91.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 132.00' / 132.00' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 1	134.25'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	136.10'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#6	Device 1	137.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	138.00'	10.0' long + 4.0' /' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 125

Discarded OutFlow Max=0.13 cfs @ 12.40 hrs HW=137.12' (Free Discharge)

↳ **2=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=15.12 cfs @ 12.40 hrs HW=137.12' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 15.12 cfs of 43.86 cfs potential flow)

↳ **3=Underdrain** (Barrel Controls 1.22 cfs @ 6.24 fps)

↳ **4=Orifice/Grate** (Orifice Controls 2.68 cfs @ 7.67 fps)

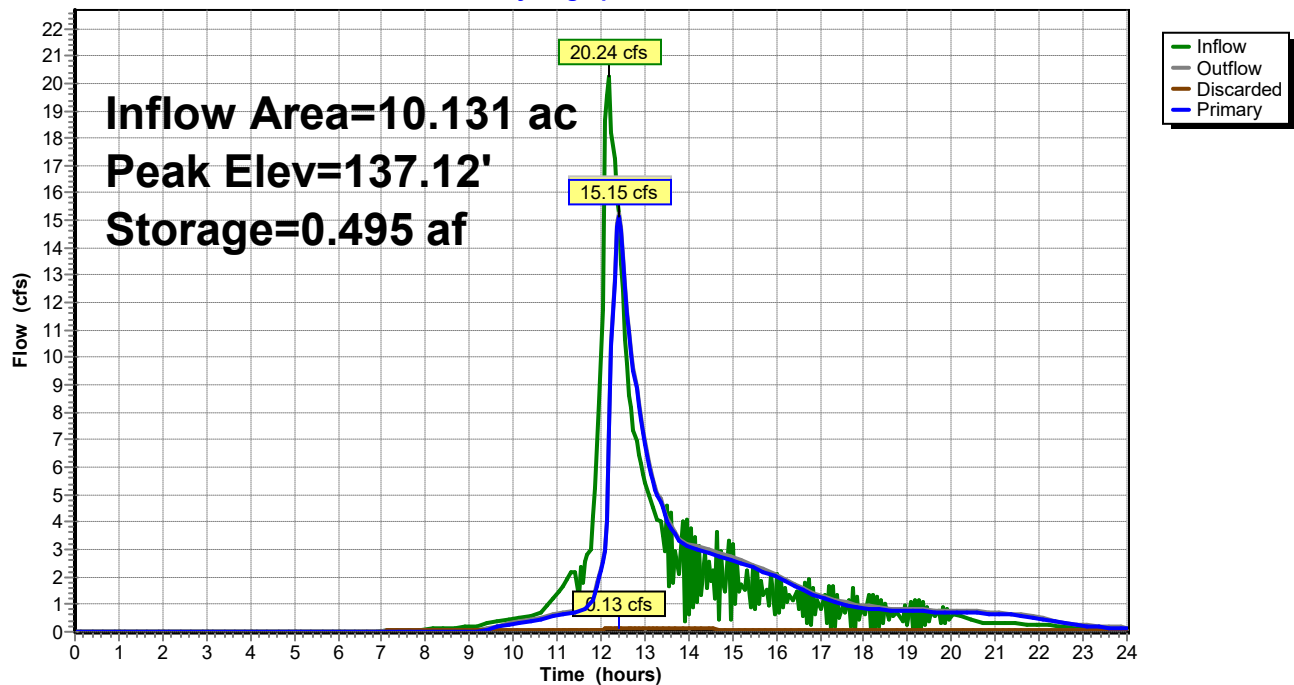
↳ **5=Sharp-Crested Rectangular Weir** (Weir Controls 9.45 cfs @ 3.31 fps)

↳ **6=Orifice/Grate** (Weir Controls 1.76 cfs @ 1.14 fps)

↳ **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Bio-Filtration Basin (BF-2B)

Hydrograph



2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 126

Hydrograph for Pond 3P: Bio-Filtration Basin (BF-2B)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	131.50	0.00	0.00	0.00
0.50	0.00	0.000	131.50	0.00	0.00	0.00
1.00	0.00	0.000	131.50	0.00	0.00	0.00
1.50	0.00	0.000	131.50	0.00	0.00	0.00
2.00	0.00	0.000	131.50	0.00	0.00	0.00
2.50	0.00	0.000	131.50	0.00	0.00	0.00
3.00	0.00	0.000	131.50	0.00	0.00	0.00
3.50	0.00	0.000	131.50	0.00	0.00	0.00
4.00	0.00	0.000	131.50	0.00	0.00	0.00
4.50	0.00	0.000	131.50	0.00	0.00	0.00
5.00	0.00	0.000	131.50	0.00	0.00	0.00
5.50	0.00	0.000	131.50	0.00	0.00	0.00
6.00	0.00	0.000	131.50	0.00	0.00	0.00
6.50	0.00	0.000	131.50	0.00	0.00	0.00
7.00	0.03	0.000	131.50	0.03	0.03	0.00
7.50	0.06	0.000	131.52	0.03	0.03	0.00
8.00	0.09	0.002	131.60	0.04	0.04	0.00
8.50	0.13	0.005	131.76	0.04	0.04	0.00
9.00	0.17	0.010	131.99	0.04	0.04	0.00
9.50	0.36	0.018	132.38	0.15	0.04	0.11
10.00	0.49	0.026	132.74	0.32	0.04	0.28
10.50	0.61	0.032	133.04	0.46	0.04	0.42
11.00	1.42	0.048	133.59	0.64	0.05	0.59
11.50	1.30	0.096	134.17	0.80	0.06	0.74
12.00	10.34	0.206	135.19	2.33	0.09	2.24
12.50	12.44	0.487	137.08	13.72	0.13	13.59
13.00	5.40	0.407	136.59	6.94	0.12	6.82
13.50	4.59	0.360	136.30	4.25	0.11	4.14
14.00	0.64	0.321	136.03	3.20	0.10	3.09
14.50	1.84	0.284	135.78	2.96	0.10	2.87
15.00	3.17	0.250	135.52	2.71	0.09	2.62
15.50	0.83	0.215	135.25	2.41	0.09	2.32
16.00	2.09	0.183	135.00	2.06	0.08	1.98
16.50	0.80	0.158	134.78	1.68	0.08	1.60
17.00	1.01	0.141	134.62	1.32	0.07	1.25
17.50	0.99	0.128	134.50	1.09	0.07	1.02
18.00	0.89	0.119	134.42	0.95	0.07	0.88
18.50	0.99	0.111	134.33	0.86	0.06	0.80
19.00	0.24	0.104	134.26	0.82	0.06	0.76
19.50	0.41	0.096	134.18	0.80	0.06	0.74
20.00	0.63	0.088	134.09	0.78	0.06	0.72
20.50	0.43	0.079	133.99	0.75	0.06	0.69
21.00	0.33	0.064	133.80	0.70	0.05	0.65
21.50	0.29	0.049	133.60	0.64	0.05	0.60
22.00	0.25	0.035	133.20	0.52	0.04	0.48
22.50	0.22	0.027	132.81	0.36	0.04	0.31
23.00	0.18	0.023	132.61	0.27	0.04	0.23
23.50	0.15	0.020	132.47	0.20	0.04	0.16
24.00	0.11	0.018	132.38	0.15	0.04	0.11

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 9/18/2025

Page 127

Stage-Discharge for Pond 3P: Bio-Filtration Basin (BF-2B)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
131.50	0.00	0.00	0.00	136.70	8.11	0.12	7.99
131.60	0.04	0.04	0.00	136.80	9.28	0.12	9.16
131.70	0.04	0.04	0.00	136.90	10.52	0.12	10.40
131.80	0.04	0.04	0.00	137.00	11.82	0.13	11.69
131.90	0.04	0.04	0.00	137.10	14.47	0.13	14.34
132.00	0.04	0.04	0.00	137.20	18.25	0.13	18.12
132.10	0.04	0.04	0.00	137.30	22.77	0.13	22.63
132.20	0.06	0.04	0.03	137.40	27.89	0.13	27.76
132.30	0.10	0.04	0.07	137.50	33.54	0.14	33.41
132.40	0.16	0.04	0.12	137.60	39.66	0.14	39.52
132.50	0.22	0.04	0.18	137.70	46.07	0.14	45.93
132.60	0.27	0.04	0.23	137.80	46.42	0.14	46.28
132.70	0.30	0.04	0.25	137.90	46.77	0.15	46.62
132.80	0.35	0.04	0.31	138.00	47.12	0.15	46.97
132.90	0.40	0.04	0.36	138.10	48.27	0.15	48.12
133.00	0.45	0.04	0.40	138.20	50.17	0.15	50.02
133.10	0.48	0.04	0.44	138.30	52.69	0.16	52.53
133.20	0.52	0.04	0.48	138.40	55.78	0.16	55.63
133.30	0.55	0.04	0.51	138.50	59.60	0.16	59.44
133.40	0.59	0.04	0.54	138.60	64.10	0.17	63.94
133.50	0.62	0.05	0.57	138.70	68.80	0.17	68.63
133.60	0.65	0.05	0.60	138.80	73.98	0.17	73.81
133.70	0.67	0.05	0.62	138.90	79.66	0.17	79.49
133.80	0.70	0.05	0.65	139.00	85.83	0.18	85.66
133.90	0.73	0.05	0.67				
134.00	0.75	0.06	0.70				
134.10	0.78	0.06	0.72				
134.20	0.80	0.06	0.74				
134.30	0.84	0.06	0.77				
134.40	0.93	0.07	0.86				
134.50	1.08	0.07	1.01				
134.60	1.27	0.07	1.20				
134.70	1.49	0.07	1.42				
134.80	1.72	0.08	1.64				
134.90	1.91	0.08	1.83				
135.00	2.07	0.08	1.99				
135.10	2.21	0.08	2.13				
135.20	2.34	0.09	2.26				
135.30	2.46	0.09	2.38				
135.40	2.58	0.09	2.49				
135.50	2.69	0.09	2.60				
135.60	2.79	0.09	2.70				
135.70	2.89	0.10	2.79				
135.80	2.99	0.10	2.89				
135.90	3.08	0.10	2.98				
136.00	3.17	0.10	3.07				
136.10	3.26	0.10	3.15				
136.20	3.65	0.11	3.54				
136.30	4.29	0.11	4.18				
136.40	5.08	0.11	4.97				
136.50	6.00	0.11	5.88				
136.60	7.01	0.12	6.89				

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 128

Stage-Area-Storage for Pond 3P: Bio-Filtration Basin (BF-2B)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
131.50	0.069	0.000	136.70	0.162	0.424
131.60	0.069	0.002	136.80	0.165	0.440
131.70	0.069	0.004	136.90	0.168	0.457
131.80	0.069	0.006	137.00	0.170	0.474
131.90	0.069	0.008	137.10	0.173	0.491
132.00	0.069	0.010	137.20	0.175	0.508
132.10	0.069	0.012	137.30	0.178	0.526
132.20	0.069	0.014	137.40	0.180	0.544
132.30	0.069	0.017	137.50	0.183	0.562
132.40	0.069	0.019	137.60	0.186	0.581
132.50	0.069	0.021	137.70	0.188	0.599
132.60	0.069	0.023	137.80	0.191	0.618
132.70	0.069	0.025	137.90	0.193	0.637
132.80	0.069	0.027	138.00	0.196	0.657
132.90	0.069	0.029	138.10	0.199	0.677
133.00	0.069	0.031	138.20	0.202	0.697
133.10	0.069	0.033	138.30	0.205	0.717
133.20	0.069	0.035	138.40	0.208	0.738
133.30	0.069	0.037	138.50	0.211	0.759
133.40	0.069	0.039	138.60	0.214	0.780
133.50	0.069	0.042	138.70	0.217	0.801
133.60	0.072	0.049	138.80	0.220	0.823
133.70	0.075	0.056	138.90	0.223	0.845
133.80	0.079	0.064	139.00	0.226	0.868
133.90	0.082	0.072			
134.00	0.085	0.080			
134.10	0.089	0.089			
134.20	0.092	0.098			
134.30	0.096	0.108			
134.40	0.099	0.117			
134.50	0.103	0.127			
134.60	0.107	0.138			
134.70	0.110	0.149			
134.80	0.114	0.160			
134.90	0.117	0.171			
135.00	0.121	0.183			
135.10	0.123	0.196			
135.20	0.126	0.208			
135.30	0.128	0.221			
135.40	0.131	0.234			
135.50	0.133	0.247			
135.60	0.135	0.260			
135.70	0.138	0.274			
135.80	0.140	0.288			
135.90	0.143	0.302			
136.00	0.145	0.316			
136.10	0.147	0.331			
136.20	0.150	0.346			
136.30	0.153	0.361			
136.40	0.155	0.376			
136.50	0.157	0.392			
136.60	0.160	0.408			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 129

Summary for Pond 5P: Wet Pond (WP-3)

Inflow Area = 7.021 ac, 0.00% Impervious, Inflow Depth > 2.20" for 10-yr event
 Inflow = 14.40 cfs @ 12.40 hrs, Volume= 1.287 af
 Outflow = 10.59 cfs @ 12.60 hrs, Volume= 1.117 af, Atten= 26%, Lag= 12.2 min
 Primary = 10.59 cfs @ 12.60 hrs, Volume= 1.117 af
 Routed to Link 6L : Total Discharge North

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 167.47' @ 12.60 hrs Surf.Area= 0.253 ac Storage= 0.447 af

Plug-Flow detention time= 146.6 min calculated for 1.117 af (87% of inflow)
 Center-of-Mass det. time= 96.3 min (915.0 - 818.7)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	0.931 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
165.00	0.119	0.000	0.000
166.00	0.165	0.142	0.142
167.00	0.221	0.193	0.335
168.00	0.289	0.255	0.590
169.00	0.393	0.341	0.931

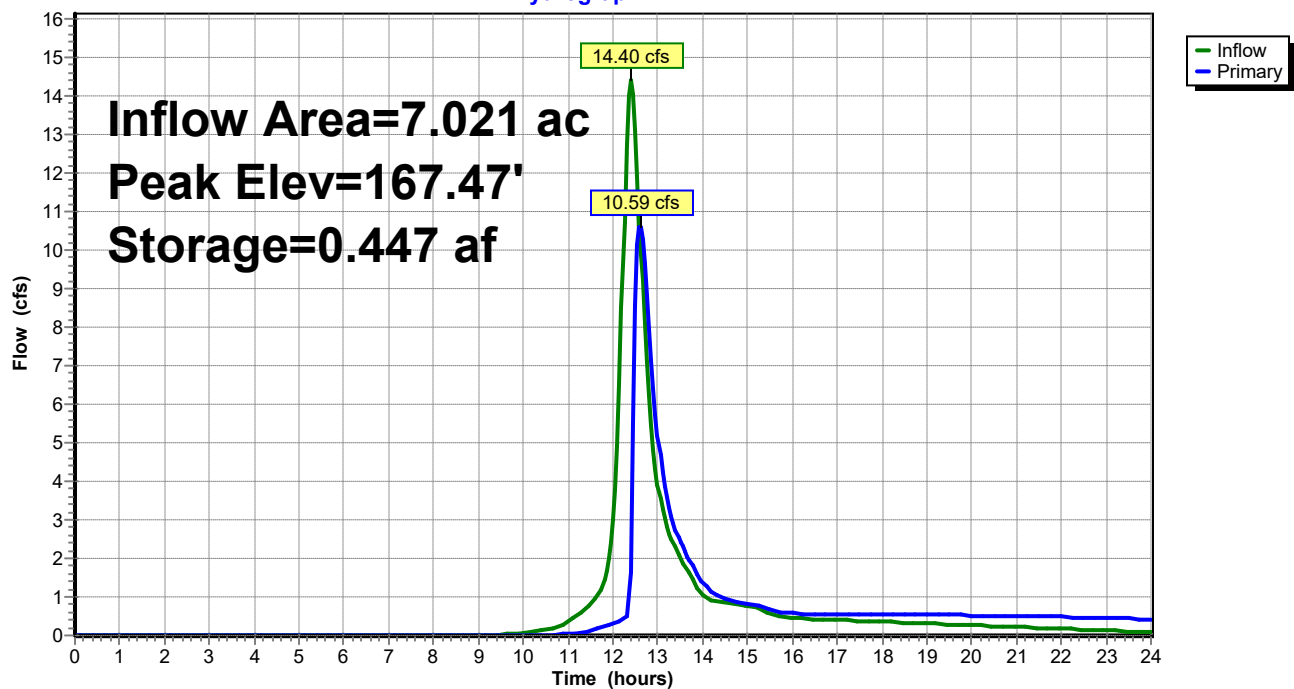
Device	Routing	Invert	Outlet Devices
#1	Primary	162.50'	24.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 162.50' / 161.50' S= 0.0182 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	165.00'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	167.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	168.00'	20.0' long + 4.0 ' SideZ x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.55 cfs @ 12.60 hrs HW=167.47' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 10.55 cfs of 30.14 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.64 cfs @ 7.31 fps)
 3=Orifice/Grate (Weir Controls 9.92 cfs @ 2.24 fps)
 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: Wet Pond (WP-3)

Hydrograph



2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 131

Hydrograph for Pond 5P: Wet Pond (WP-3)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	165.00	0.00
0.50	0.00	0.000	165.00	0.00
1.00	0.00	0.000	165.00	0.00
1.50	0.00	0.000	165.00	0.00
2.00	0.00	0.000	165.00	0.00
2.50	0.00	0.000	165.00	0.00
3.00	0.00	0.000	165.00	0.00
3.50	0.00	0.000	165.00	0.00
4.00	0.00	0.000	165.00	0.00
4.50	0.00	0.000	165.00	0.00
5.00	0.00	0.000	165.00	0.00
5.50	0.00	0.000	165.00	0.00
6.00	0.00	0.000	165.00	0.00
6.50	0.00	0.000	165.00	0.00
7.00	0.00	0.000	165.00	0.00
7.50	0.00	0.000	165.00	0.00
8.00	0.00	0.000	165.00	0.00
8.50	0.00	0.000	165.00	0.00
9.00	0.00	0.000	165.00	0.00
9.50	0.02	0.000	165.00	0.00
10.00	0.08	0.002	165.02	0.00
10.50	0.14	0.007	165.06	0.01
11.00	0.34	0.015	165.12	0.03
11.50	0.81	0.035	165.28	0.14
12.00	2.99	0.087	165.65	0.29
12.50	13.15	0.430	167.40	8.55
13.00	3.89	0.399	167.28	5.16
13.50	2.01	0.369	167.15	2.42
14.00	1.06	0.355	167.09	1.38
14.50	0.84	0.347	167.05	0.94
15.00	0.78	0.344	167.04	0.82
15.50	0.55	0.341	167.02	0.69
16.00	0.45	0.335	167.00	0.57
16.50	0.42	0.329	166.97	0.57
17.00	0.40	0.323	166.95	0.56
17.50	0.38	0.316	166.91	0.56
18.00	0.35	0.308	166.88	0.55
18.50	0.33	0.300	166.84	0.54
19.00	0.31	0.291	166.80	0.54
19.50	0.29	0.281	166.75	0.53
20.00	0.26	0.271	166.70	0.52
20.50	0.24	0.260	166.65	0.51
21.00	0.22	0.249	166.59	0.50
21.50	0.20	0.237	166.53	0.49
22.00	0.17	0.224	166.46	0.48
22.50	0.15	0.212	166.40	0.47
23.00	0.13	0.198	166.32	0.45
23.50	0.10	0.185	166.25	0.44
24.00	0.08	0.171	166.17	0.42

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 132

Stage-Discharge for Pond 5P: Wet Pond (WP-3)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
165.00	0.00	166.04	0.39	167.08	1.28	168.12	34.78
165.02	0.00	166.06	0.40	167.10	1.56	168.14	35.45
165.04	0.00	166.08	0.40	167.12	1.87	168.16	36.17
165.06	0.01	166.10	0.41	167.14	2.20	168.18	36.94
165.08	0.02	166.12	0.41	167.16	2.57	168.20	37.74
165.10	0.02	166.14	0.41	167.18	2.95	168.22	38.59
165.12	0.03	166.16	0.42	167.20	3.36	168.24	39.49
165.14	0.04	166.18	0.42	167.22	3.78	168.26	40.42
165.16	0.06	166.20	0.43	167.24	4.23	168.28	41.39
165.18	0.07	166.22	0.43	167.26	4.69	168.30	42.41
165.20	0.08	166.24	0.44	167.28	5.18	168.32	43.45
165.22	0.10	166.26	0.44	167.30	5.68	168.34	44.54
165.24	0.11	166.28	0.44	167.32	6.20	168.36	45.66
165.26	0.13	166.30	0.45	167.34	6.73	168.38	46.82
165.28	0.14	166.32	0.45	167.36	7.28	168.40	48.02
165.30	0.15	166.34	0.46	167.38	7.84	168.42	49.24
165.32	0.17	166.36	0.46	167.40	8.42	168.44	50.49
165.34	0.17	166.38	0.46	167.42	9.02	168.46	51.78
165.36	0.18	166.40	0.47	167.44	9.63	168.48	53.09
165.38	0.19	166.42	0.47	167.46	10.25	168.50	54.44
165.40	0.20	166.44	0.47	167.48	10.89	168.52	55.83
165.42	0.21	166.46	0.48	167.50	11.54	168.54	57.24
165.44	0.22	166.48	0.48	167.52	12.20	168.56	58.68
165.46	0.23	166.50	0.49	167.54	12.88	168.58	60.16
165.48	0.24	166.52	0.49	167.56	13.57	168.60	61.67
165.50	0.24	166.54	0.49	167.58	14.27	168.62	63.14
165.52	0.25	166.56	0.50	167.60	14.98	168.64	64.64
165.54	0.26	166.58	0.50	167.62	15.70	168.66	66.16
165.56	0.26	166.60	0.50	167.64	16.44	168.68	67.70
165.58	0.27	166.62	0.51	167.66	17.19	168.70	69.27
165.60	0.28	166.64	0.51	167.68	17.95	168.72	70.86
165.62	0.28	166.66	0.51	167.70	18.72	168.74	72.47
165.64	0.29	166.68	0.52	167.72	19.50	168.76	74.11
165.66	0.30	166.70	0.52	167.74	20.29	168.78	75.76
165.68	0.30	166.72	0.52	167.76	21.10	168.80	77.44
165.70	0.31	166.74	0.53	167.78	21.91	168.82	79.22
165.72	0.31	166.76	0.53	167.80	22.73	168.84	81.03
165.74	0.32	166.78	0.53	167.82	23.57	168.86	82.87
165.76	0.32	166.80	0.54	167.84	24.41	168.88	84.73
165.78	0.33	166.82	0.54	167.86	25.27	168.90	86.63
165.80	0.33	166.84	0.54	167.88	26.13	168.92	88.55
165.82	0.34	166.86	0.55	167.90	27.01	168.94	90.49
165.84	0.34	166.88	0.55	167.92	27.89	168.96	92.46
165.86	0.35	166.90	0.55	167.94	28.79	168.98	94.46
165.88	0.35	166.92	0.56	167.96	29.69	169.00	96.49
165.90	0.36	166.94	0.56	167.98	30.60		
165.92	0.36	166.96	0.56	168.00	31.53		
165.94	0.37	166.98	0.57	168.02	32.31		
165.96	0.37	167.00	0.57	168.04	32.66		
165.98	0.38	167.02	0.66	168.06	33.10		
166.00	0.38	167.04	0.82	168.08	33.60		
166.02	0.39	167.06	1.03	168.10	34.17		

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 133

Stage-Area-Storage for Pond 5P: Wet Pond (WP-3)

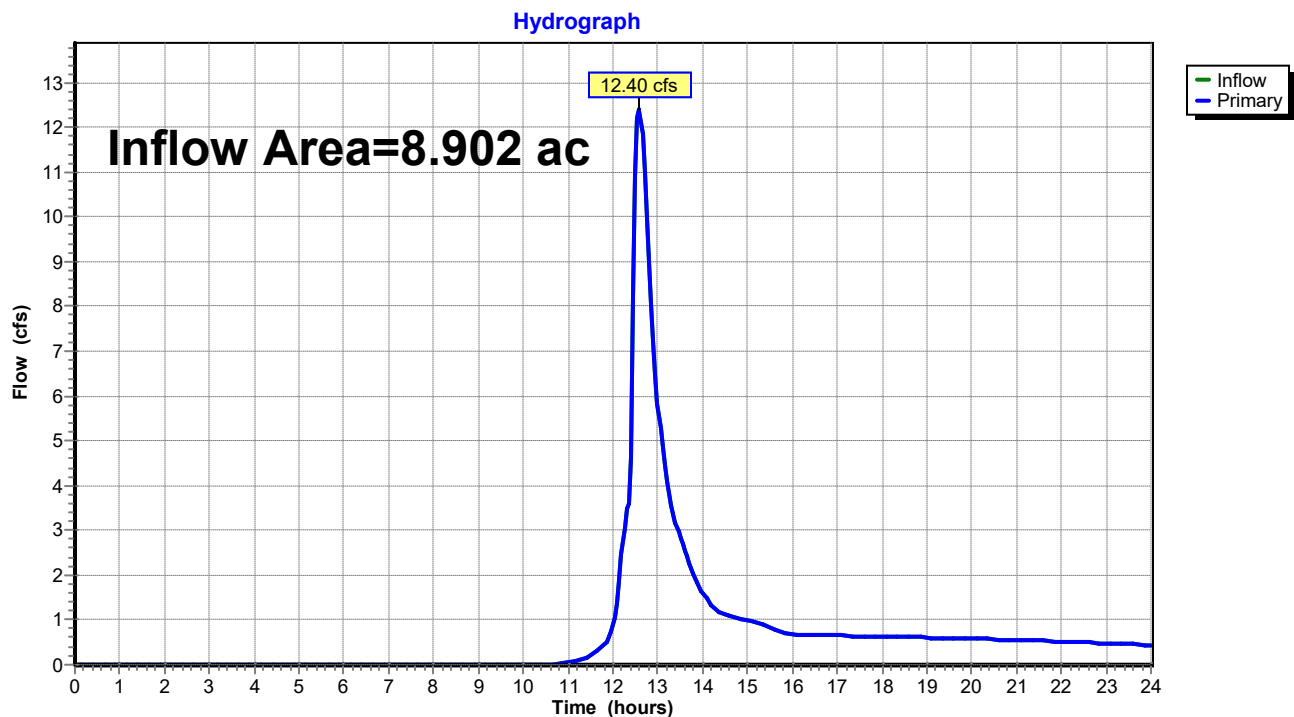
Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
165.00	0.119	0.000	167.60	0.262	0.480
165.05	0.121	0.006	167.65	0.265	0.493
165.10	0.124	0.012	167.70	0.269	0.506
165.15	0.126	0.018	167.75	0.272	0.520
165.20	0.128	0.025	167.80	0.275	0.534
165.25	0.130	0.031	167.85	0.279	0.547
165.30	0.133	0.038	167.90	0.282	0.561
165.35	0.135	0.044	167.95	0.286	0.576
165.40	0.137	0.051	168.00	0.289	0.590
165.45	0.140	0.058	168.05	0.294	0.605
165.50	0.142	0.065	168.10	0.299	0.619
165.55	0.144	0.072	168.15	0.305	0.635
165.60	0.147	0.080	168.20	0.310	0.650
165.65	0.149	0.087	168.25	0.315	0.665
165.70	0.151	0.095	168.30	0.320	0.681
165.75	0.153	0.102	168.35	0.325	0.698
165.80	0.156	0.110	168.40	0.331	0.714
165.85	0.158	0.118	168.45	0.336	0.731
165.90	0.160	0.126	168.50	0.341	0.748
165.95	0.163	0.134	168.55	0.346	0.765
166.00	0.165	0.142	168.60	0.351	0.782
166.05	0.168	0.150	168.65	0.357	0.800
166.10	0.171	0.159	168.70	0.362	0.818
166.15	0.173	0.167	168.75	0.367	0.836
166.20	0.176	0.176	168.80	0.372	0.854
166.25	0.179	0.185	168.85	0.377	0.873
166.30	0.182	0.194	168.90	0.383	0.892
166.35	0.185	0.203	168.95	0.388	0.911
166.40	0.187	0.212	169.00	0.393	0.931
166.45	0.190	0.222			
166.50	0.193	0.231			
166.55	0.196	0.241			
166.60	0.199	0.251			
166.65	0.201	0.261			
166.70	0.204	0.271			
166.75	0.207	0.281			
166.80	0.210	0.292			
166.85	0.213	0.302			
166.90	0.215	0.313			
166.95	0.218	0.324			
167.00	0.221	0.335			
167.05	0.224	0.346			
167.10	0.228	0.357			
167.15	0.231	0.369			
167.20	0.235	0.381			
167.25	0.238	0.392			
167.30	0.241	0.404			
167.35	0.245	0.417			
167.40	0.248	0.429			
167.45	0.252	0.441			
167.50	0.255	0.454			
167.55	0.258	0.467			

Summary for Link 6L: Total Discharge North

Inflow Area = 8.902 ac, 0.00% Impervious, Inflow Depth > 1.84" for 10-yr event
 Inflow = 12.40 cfs @ 12.59 hrs, Volume= 1.367 af
 Primary = 12.40 cfs @ 12.59 hrs, Volume= 1.367 af, Atten= 0%, Lag= 0.0 min
 Routed to Link 8L : Total Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 6L: Total Discharge North



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 135

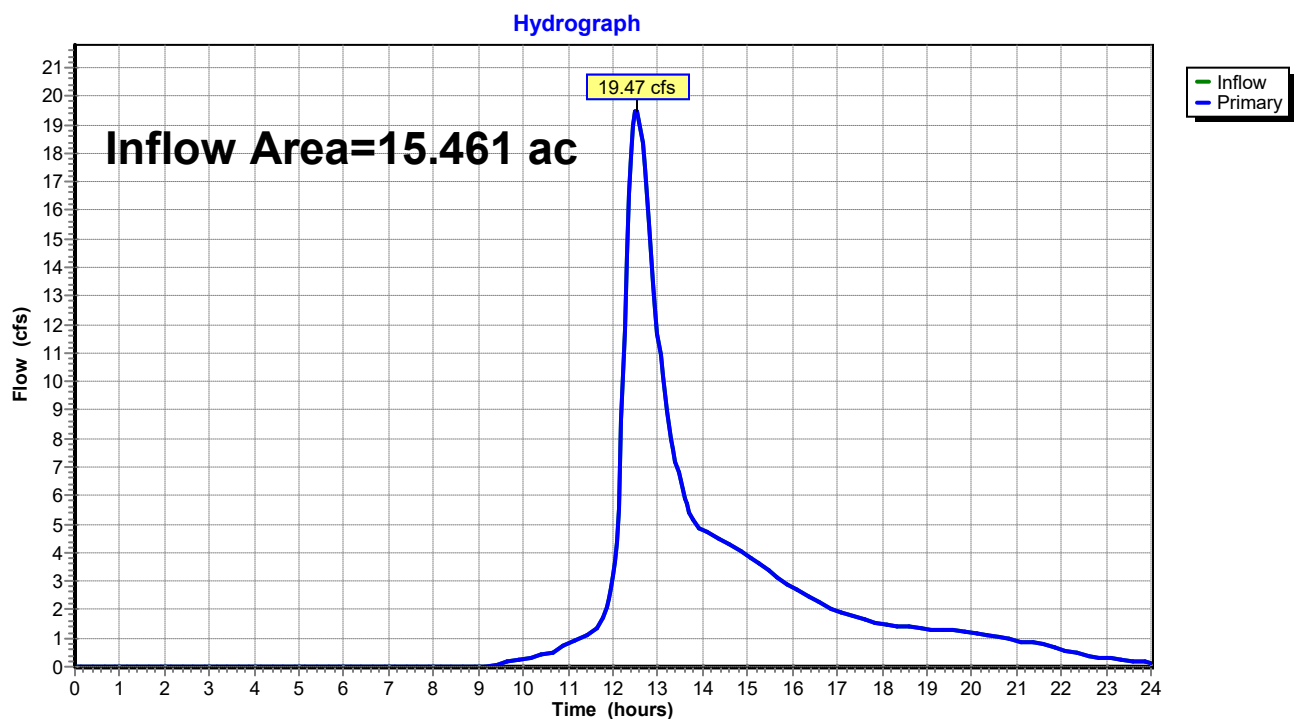
Hydrograph for Link 6L: Total Discharge North

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	5.84	0.00	5.84
0.25	0.00	0.00	0.00	13.25	3.82	0.00	3.82
0.50	0.00	0.00	0.00	13.50	2.83	0.00	2.83
0.75	0.00	0.00	0.00	13.75	2.15	0.00	2.15
1.00	0.00	0.00	0.00	14.00	1.59	0.00	1.59
1.25	0.00	0.00	0.00	14.25	1.28	0.00	1.28
1.50	0.00	0.00	0.00	14.50	1.13	0.00	1.13
1.75	0.00	0.00	0.00	14.75	1.05	0.00	1.05
2.00	0.00	0.00	0.00	15.00	1.00	0.00	1.00
2.25	0.00	0.00	0.00	15.25	0.93	0.00	0.93
2.50	0.00	0.00	0.00	15.50	0.81	0.00	0.81
2.75	0.00	0.00	0.00	15.75	0.71	0.00	0.71
3.00	0.00	0.00	0.00	16.00	0.67	0.00	0.67
3.25	0.00	0.00	0.00	16.25	0.66	0.00	0.66
3.50	0.00	0.00	0.00	16.50	0.66	0.00	0.66
3.75	0.00	0.00	0.00	16.75	0.66	0.00	0.66
4.00	0.00	0.00	0.00	17.00	0.65	0.00	0.65
4.25	0.00	0.00	0.00	17.25	0.65	0.00	0.65
4.50	0.00	0.00	0.00	17.50	0.64	0.00	0.64
4.75	0.00	0.00	0.00	17.75	0.64	0.00	0.64
5.00	0.00	0.00	0.00	18.00	0.63	0.00	0.63
5.25	0.00	0.00	0.00	18.25	0.62	0.00	0.62
5.50	0.00	0.00	0.00	18.50	0.62	0.00	0.62
5.75	0.00	0.00	0.00	18.75	0.61	0.00	0.61
6.00	0.00	0.00	0.00	19.00	0.61	0.00	0.61
6.25	0.00	0.00	0.00	19.25	0.60	0.00	0.60
6.50	0.00	0.00	0.00	19.50	0.59	0.00	0.59
6.75	0.00	0.00	0.00	19.75	0.59	0.00	0.59
7.00	0.00	0.00	0.00	20.00	0.58	0.00	0.58
7.25	0.00	0.00	0.00	20.25	0.57	0.00	0.57
7.50	0.00	0.00	0.00	20.50	0.57	0.00	0.57
7.75	0.00	0.00	0.00	20.75	0.56	0.00	0.56
8.00	0.00	0.00	0.00	21.00	0.55	0.00	0.55
8.25	0.00	0.00	0.00	21.25	0.54	0.00	0.54
8.50	0.00	0.00	0.00	21.50	0.53	0.00	0.53
8.75	0.00	0.00	0.00	21.75	0.53	0.00	0.53
9.00	0.00	0.00	0.00	22.00	0.52	0.00	0.52
9.25	0.00	0.00	0.00	22.25	0.51	0.00	0.51
9.50	0.00	0.00	0.00	22.50	0.50	0.00	0.50
9.75	0.00	0.00	0.00	22.75	0.49	0.00	0.49
10.00	0.00	0.00	0.00	23.00	0.48	0.00	0.48
10.25	0.00	0.00	0.00	23.25	0.47	0.00	0.47
10.50	0.01	0.00	0.01	23.50	0.46	0.00	0.46
10.75	0.02	0.00	0.02	23.75	0.45	0.00	0.45
11.00	0.04	0.00	0.04	24.00	0.44	0.00	0.44
11.25	0.10	0.00	0.10				
11.50	0.21	0.00	0.21				
11.75	0.37	0.00	0.37				
12.00	0.83	0.00	0.83				
12.25	3.05	0.00	3.05				
12.50	10.92	0.00	10.92				
12.75	9.98	0.00	9.98				

Summary for Link 7L: Total Discharge South (Meadowbrook Rd.)

Inflow Area = 15.461 ac, 0.00% Impervious, Inflow Depth > 2.55" for 10-yr event
Inflow = 19.47 cfs @ 12.52 hrs, Volume= 3.283 af
Primary = 19.47 cfs @ 12.52 hrs, Volume= 3.283 af, Atten= 0%, Lag= 0.0 min
Routed to Link 8L : Total Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: Total Discharge South (Meadowbrook Rd.)

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 137

Hydrograph for Link 7L: Total Discharge South (Meadowbrook Rd.)

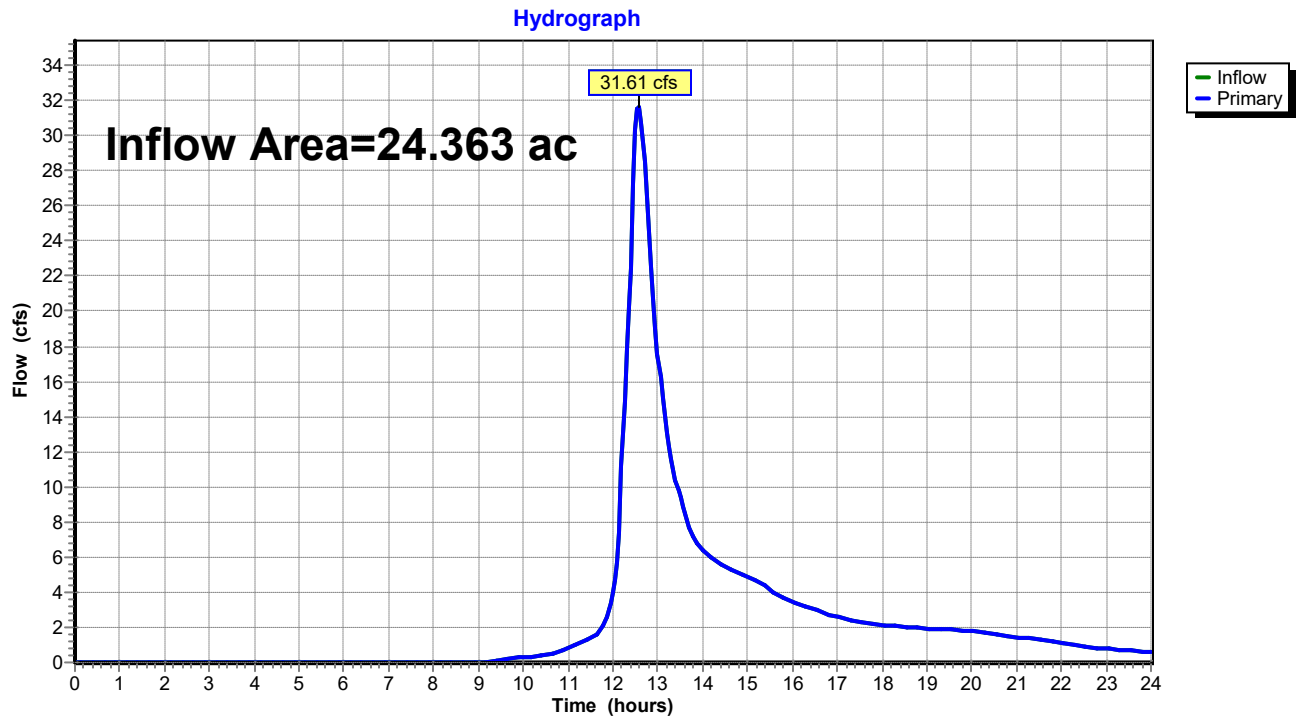
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	11.69	0.00	11.69
0.25	0.00	0.00	0.00	13.25	8.48	0.00	8.48
0.50	0.00	0.00	0.00	13.50	6.54	0.00	6.54
0.75	0.00	0.00	0.00	13.75	5.25	0.00	5.25
1.00	0.00	0.00	0.00	14.00	4.78	0.00	4.78
1.25	0.00	0.00	0.00	14.25	4.57	0.00	4.57
1.50	0.00	0.00	0.00	14.50	4.36	0.00	4.36
1.75	0.00	0.00	0.00	14.75	4.13	0.00	4.13
2.00	0.00	0.00	0.00	15.00	3.90	0.00	3.90
2.25	0.00	0.00	0.00	15.25	3.63	0.00	3.63
2.50	0.00	0.00	0.00	15.50	3.33	0.00	3.33
2.75	0.00	0.00	0.00	15.75	3.04	0.00	3.04
3.00	0.00	0.00	0.00	16.00	2.78	0.00	2.78
3.25	0.00	0.00	0.00	16.25	2.56	0.00	2.56
3.50	0.00	0.00	0.00	16.50	2.33	0.00	2.33
3.75	0.00	0.00	0.00	16.75	2.12	0.00	2.12
4.00	0.00	0.00	0.00	17.00	1.95	0.00	1.95
4.25	0.00	0.00	0.00	17.25	1.80	0.00	1.80
4.50	0.00	0.00	0.00	17.50	1.68	0.00	1.68
4.75	0.00	0.00	0.00	17.75	1.60	0.00	1.60
5.00	0.00	0.00	0.00	18.00	1.52	0.00	1.52
5.25	0.00	0.00	0.00	18.25	1.46	0.00	1.46
5.50	0.00	0.00	0.00	18.50	1.40	0.00	1.40
5.75	0.00	0.00	0.00	18.75	1.36	0.00	1.36
6.00	0.00	0.00	0.00	19.00	1.33	0.00	1.33
6.25	0.00	0.00	0.00	19.25	1.30	0.00	1.30
6.50	0.00	0.00	0.00	19.50	1.28	0.00	1.28
6.75	0.00	0.00	0.00	19.75	1.25	0.00	1.25
7.00	0.00	0.00	0.00	20.00	1.20	0.00	1.20
7.25	0.00	0.00	0.00	20.25	1.13	0.00	1.13
7.50	0.00	0.00	0.00	20.50	1.06	0.00	1.06
7.75	0.00	0.00	0.00	20.75	0.98	0.00	0.98
8.00	0.00	0.00	0.00	21.00	0.91	0.00	0.91
8.25	0.00	0.00	0.00	21.25	0.84	0.00	0.84
8.50	0.00	0.00	0.00	21.50	0.80	0.00	0.80
8.75	0.00	0.00	0.00	21.75	0.75	0.00	0.75
9.00	0.00	0.00	0.00	22.00	0.63	0.00	0.63
9.25	0.01	0.00	0.01	22.25	0.52	0.00	0.52
9.50	0.11	0.00	0.11	22.50	0.42	0.00	0.42
9.75	0.22	0.00	0.22	22.75	0.34	0.00	0.34
10.00	0.28	0.00	0.28	23.00	0.31	0.00	0.31
10.25	0.36	0.00	0.36	23.25	0.26	0.00	0.26
10.50	0.44	0.00	0.44	23.50	0.22	0.00	0.22
10.75	0.58	0.00	0.58	23.75	0.18	0.00	0.18
11.00	0.79	0.00	0.79	24.00	0.15	0.00	0.15
11.25	0.98	0.00	0.98				
11.50	1.20	0.00	1.20				
11.75	1.59	0.00	1.59				
12.00	3.19	0.00	3.19				
12.25	11.82	0.00	11.82				
12.50	19.44	0.00	19.44				
12.75	16.55	0.00	16.55				

Summary for Link 8L: Total Proposed Discharge

Inflow Area = 24.363 ac, 0.00% Impervious, Inflow Depth > 2.29" for 10-yr event
 Inflow = 31.61 cfs @ 12.57 hrs, Volume= 4.650 af
 Primary = 31.61 cfs @ 12.57 hrs, Volume= 4.650 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: Total Proposed Discharge



2025-09-16_HydroCAD Calculation

MSE 24-hr 3 10-yr Rainfall=3.81"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 139

Hydrograph for Link 8L: Total Proposed Discharge

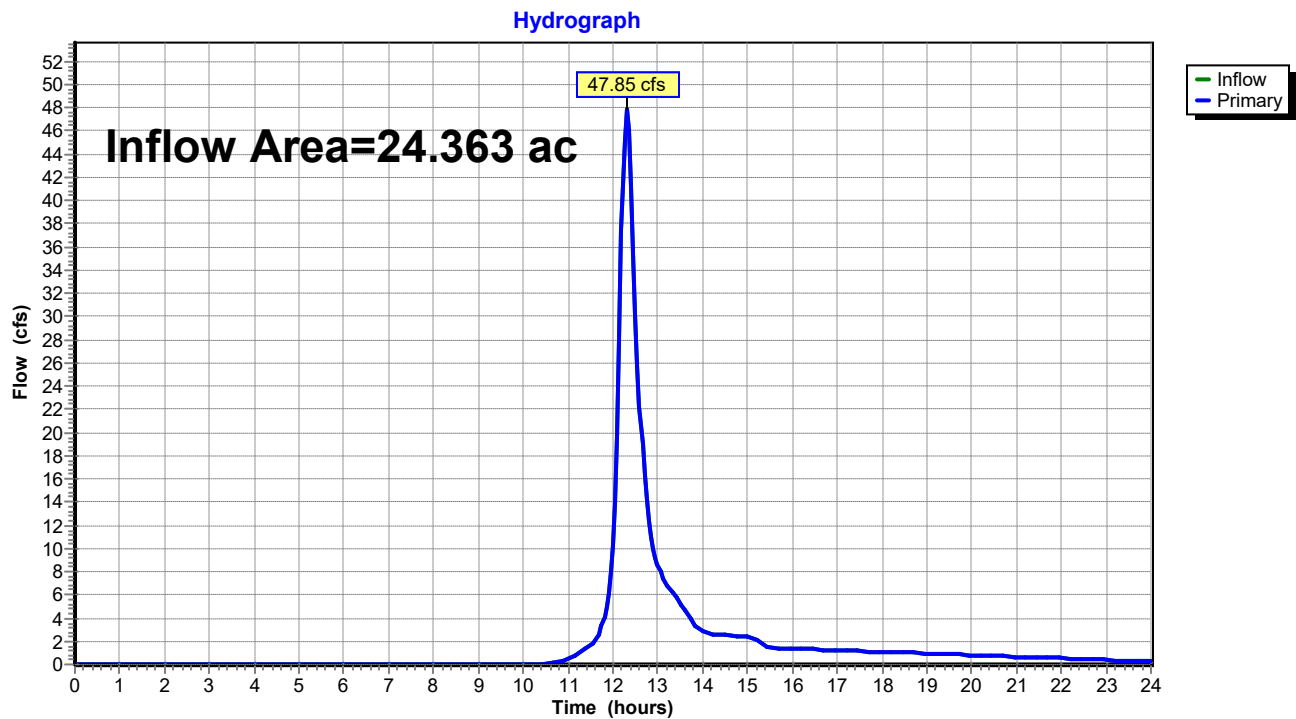
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	17.53	0.00	17.53
0.25	0.00	0.00	0.00	13.25	12.31	0.00	12.31
0.50	0.00	0.00	0.00	13.50	9.36	0.00	9.36
0.75	0.00	0.00	0.00	13.75	7.39	0.00	7.39
1.00	0.00	0.00	0.00	14.00	6.37	0.00	6.37
1.25	0.00	0.00	0.00	14.25	5.85	0.00	5.85
1.50	0.00	0.00	0.00	14.50	5.49	0.00	5.49
1.75	0.00	0.00	0.00	14.75	5.17	0.00	5.17
2.00	0.00	0.00	0.00	15.00	4.90	0.00	4.90
2.25	0.00	0.00	0.00	15.25	4.57	0.00	4.57
2.50	0.00	0.00	0.00	15.50	4.13	0.00	4.13
2.75	0.00	0.00	0.00	15.75	3.75	0.00	3.75
3.00	0.00	0.00	0.00	16.00	3.45	0.00	3.45
3.25	0.00	0.00	0.00	16.25	3.22	0.00	3.22
3.50	0.00	0.00	0.00	16.50	2.99	0.00	2.99
3.75	0.00	0.00	0.00	16.75	2.78	0.00	2.78
4.00	0.00	0.00	0.00	17.00	2.60	0.00	2.60
4.25	0.00	0.00	0.00	17.25	2.45	0.00	2.45
4.50	0.00	0.00	0.00	17.50	2.33	0.00	2.33
4.75	0.00	0.00	0.00	17.75	2.23	0.00	2.23
5.00	0.00	0.00	0.00	18.00	2.15	0.00	2.15
5.25	0.00	0.00	0.00	18.25	2.08	0.00	2.08
5.50	0.00	0.00	0.00	18.50	2.02	0.00	2.02
5.75	0.00	0.00	0.00	18.75	1.98	0.00	1.98
6.00	0.00	0.00	0.00	19.00	1.94	0.00	1.94
6.25	0.00	0.00	0.00	19.25	1.90	0.00	1.90
6.50	0.00	0.00	0.00	19.50	1.87	0.00	1.87
6.75	0.00	0.00	0.00	19.75	1.84	0.00	1.84
7.00	0.00	0.00	0.00	20.00	1.78	0.00	1.78
7.25	0.00	0.00	0.00	20.25	1.70	0.00	1.70
7.50	0.00	0.00	0.00	20.50	1.63	0.00	1.63
7.75	0.00	0.00	0.00	20.75	1.54	0.00	1.54
8.00	0.00	0.00	0.00	21.00	1.46	0.00	1.46
8.25	0.00	0.00	0.00	21.25	1.38	0.00	1.38
8.50	0.00	0.00	0.00	21.50	1.34	0.00	1.34
8.75	0.00	0.00	0.00	21.75	1.27	0.00	1.27
9.00	0.00	0.00	0.00	22.00	1.14	0.00	1.14
9.25	0.01	0.00	0.01	22.25	1.03	0.00	1.03
9.50	0.11	0.00	0.11	22.50	0.92	0.00	0.92
9.75	0.22	0.00	0.22	22.75	0.83	0.00	0.83
10.00	0.28	0.00	0.28	23.00	0.79	0.00	0.79
10.25	0.36	0.00	0.36	23.25	0.73	0.00	0.73
10.50	0.45	0.00	0.45	23.50	0.68	0.00	0.68
10.75	0.60	0.00	0.60	23.75	0.63	0.00	0.63
11.00	0.83	0.00	0.83	24.00	0.59	0.00	0.59
11.25	1.08	0.00	1.08				
11.50	1.41	0.00	1.41				
11.75	1.95	0.00	1.95				
12.00	4.01	0.00	4.01				
12.25	14.87	0.00	14.87				
12.50	30.36	0.00	30.36				
12.75	26.53	0.00	26.53				

Summary for Link 18L: Total Existing Discharge

Inflow Area = 24.363 ac, 0.00% Impervious, Inflow Depth > 1.77" for 10-yr event
 Inflow = 47.85 cfs @ 12.31 hrs, Volume= 3.585 af
 Primary = 47.85 cfs @ 12.31 hrs, Volume= 3.585 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 18L: Total Existing Discharge



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 10-yr Rainfall=3.81"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 141

Hydrograph for Link 18L: Total Existing Discharge

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	8.55	0.00	8.55
0.25	0.00	0.00	0.00	13.25	6.60	0.00	6.60
0.50	0.00	0.00	0.00	13.50	5.29	0.00	5.29
0.75	0.00	0.00	0.00	13.75	3.77	0.00	3.77
1.00	0.00	0.00	0.00	14.00	2.82	0.00	2.82
1.25	0.00	0.00	0.00	14.25	2.61	0.00	2.61
1.50	0.00	0.00	0.00	14.50	2.52	0.00	2.52
1.75	0.00	0.00	0.00	14.75	2.44	0.00	2.44
2.00	0.00	0.00	0.00	15.00	2.37	0.00	2.37
2.25	0.00	0.00	0.00	15.25	1.97	0.00	1.97
2.50	0.00	0.00	0.00	15.50	1.51	0.00	1.51
2.75	0.00	0.00	0.00	15.75	1.40	0.00	1.40
3.00	0.00	0.00	0.00	16.00	1.36	0.00	1.36
3.25	0.00	0.00	0.00	16.25	1.32	0.00	1.32
3.50	0.00	0.00	0.00	16.50	1.29	0.00	1.29
3.75	0.00	0.00	0.00	16.75	1.26	0.00	1.26
4.00	0.00	0.00	0.00	17.00	1.22	0.00	1.22
4.25	0.00	0.00	0.00	17.25	1.19	0.00	1.19
4.50	0.00	0.00	0.00	17.50	1.16	0.00	1.16
4.75	0.00	0.00	0.00	17.75	1.12	0.00	1.12
5.00	0.00	0.00	0.00	18.00	1.09	0.00	1.09
5.25	0.00	0.00	0.00	18.25	1.05	0.00	1.05
5.50	0.00	0.00	0.00	18.50	1.02	0.00	1.02
5.75	0.00	0.00	0.00	18.75	0.99	0.00	0.99
6.00	0.00	0.00	0.00	19.00	0.95	0.00	0.95
6.25	0.00	0.00	0.00	19.25	0.91	0.00	0.91
6.50	0.00	0.00	0.00	19.50	0.88	0.00	0.88
6.75	0.00	0.00	0.00	19.75	0.85	0.00	0.85
7.00	0.00	0.00	0.00	20.00	0.81	0.00	0.81
7.25	0.00	0.00	0.00	20.25	0.77	0.00	0.77
7.50	0.00	0.00	0.00	20.50	0.74	0.00	0.74
7.75	0.00	0.00	0.00	20.75	0.70	0.00	0.70
8.00	0.00	0.00	0.00	21.00	0.67	0.00	0.67
8.25	0.00	0.00	0.00	21.25	0.63	0.00	0.63
8.50	0.00	0.00	0.00	21.50	0.60	0.00	0.60
8.75	0.00	0.00	0.00	21.75	0.56	0.00	0.56
9.00	0.00	0.00	0.00	22.00	0.52	0.00	0.52
9.25	0.00	0.00	0.00	22.25	0.49	0.00	0.49
9.50	0.00	0.00	0.00	22.50	0.45	0.00	0.45
9.75	0.00	0.00	0.00	22.75	0.42	0.00	0.42
10.00	0.00	0.00	0.00	23.00	0.38	0.00	0.38
10.25	0.03	0.00	0.03	23.25	0.34	0.00	0.34
10.50	0.08	0.00	0.08	23.50	0.31	0.00	0.31
10.75	0.19	0.00	0.19	23.75	0.27	0.00	0.27
11.00	0.46	0.00	0.46	24.00	0.24	0.00	0.24
11.25	0.95	0.00	0.95				
11.50	1.68	0.00	1.68				
11.75	3.31	0.00	3.31				
12.00	10.33	0.00	10.33				
12.25	45.09	0.00	45.09				
12.50	30.19	0.00	30.19				
12.75	14.14	0.00	14.14				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 142

Summary for Subcatchment 9S: P-1

[47] Hint: Peak is 343% of capacity of segment #3

Runoff = 23.99 cfs @ 12.36 hrs, Volume= 2.170 af, Depth> 5.13"
Routed to Pond 1P : Bio-Filtration Basin (BF-1)

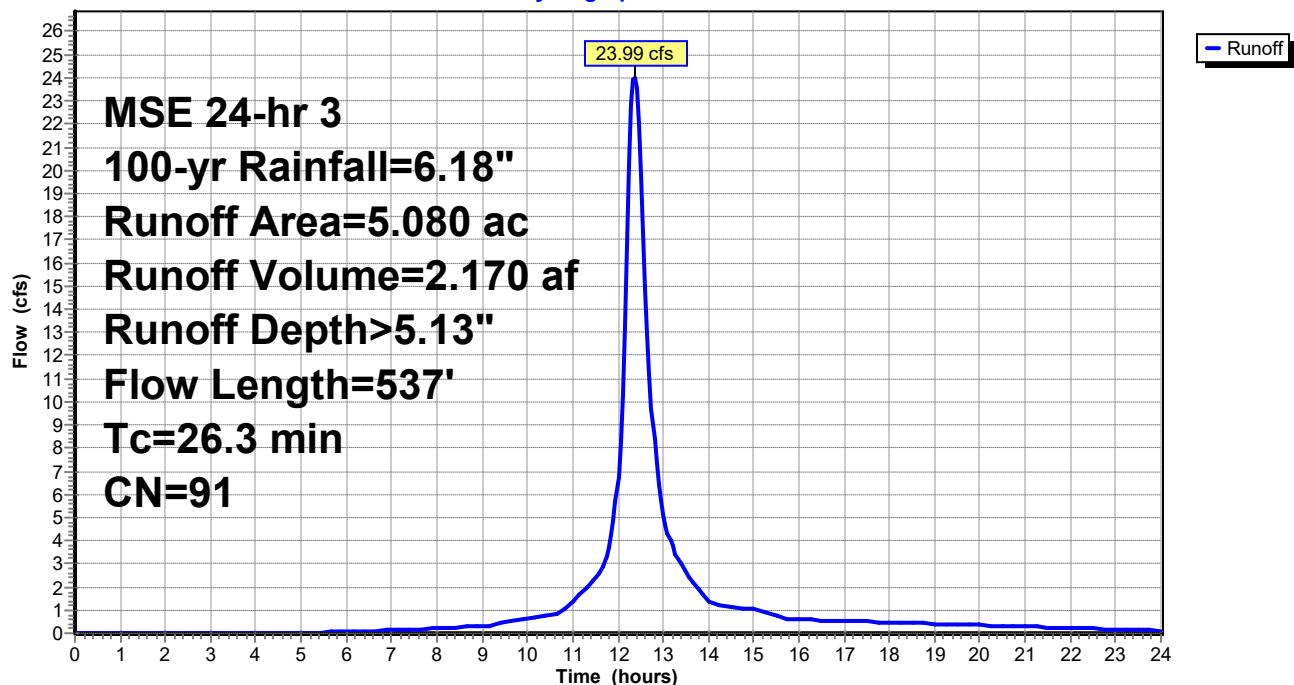
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 5.080	91	
5.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	100	0.0175	0.07		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 2.70"
0.5	61	0.0160	2.04		Shallow Concentrated Flow, Shallow Conc. Unpaved Kv= 16.1 fps
1.1	376	0.0100	5.70	7.00	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
26.3	537	Total			

Subcatchment 9S: P-1

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 143

Hydrograph for Subcatchment 9S: P-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	3.97	5.17
0.25	0.00	0.00	0.00	13.25	5.12	4.09	3.53
0.50	0.01	0.00	0.00	13.50	5.21	4.19	2.66
0.75	0.02	0.00	0.00	13.75	5.27	4.25	1.97
1.00	0.02	0.00	0.00	14.00	5.33	4.30	1.40
1.25	0.03	0.00	0.00	14.25	5.39	4.36	1.20
1.50	0.04	0.00	0.00	14.50	5.44	4.41	1.13
1.75	0.05	0.00	0.00	14.75	5.49	4.46	1.08
2.00	0.06	0.00	0.00	15.00	5.54	4.51	1.05
2.25	0.07	0.00	0.00	15.25	5.57	4.54	0.94
2.50	0.08	0.00	0.00	15.50	5.60	4.57	0.72
2.75	0.09	0.00	0.00	15.75	5.63	4.60	0.63
3.00	0.10	0.00	0.00	16.00	5.66	4.63	0.60
3.25	0.12	0.00	0.00	16.25	5.69	4.65	0.58
3.50	0.13	0.00	0.00	16.50	5.72	4.68	0.56
3.75	0.15	0.00	0.00	16.75	5.74	4.71	0.55
4.00	0.16	0.00	0.00	17.00	5.77	4.73	0.53
4.25	0.18	0.00	0.00	17.25	5.79	4.76	0.52
4.50	0.20	0.00	0.00	17.50	5.82	4.78	0.50
4.75	0.21	0.00	0.00	17.75	5.84	4.80	0.49
5.00	0.23	0.00	0.01	18.00	5.87	4.83	0.47
5.25	0.25	0.00	0.02	18.25	5.89	4.85	0.46
5.50	0.27	0.01	0.03	18.50	5.91	4.87	0.44
5.75	0.29	0.01	0.05	18.75	5.93	4.89	0.43
6.00	0.31	0.01	0.06	19.00	5.95	4.91	0.41
6.25	0.34	0.02	0.08	19.25	5.97	4.92	0.39
6.50	0.36	0.02	0.10	19.50	5.98	4.94	0.38
6.75	0.39	0.03	0.12	19.75	6.00	4.96	0.36
7.00	0.41	0.04	0.14	20.00	6.02	4.98	0.35
7.25	0.44	0.05	0.15	20.25	6.03	4.99	0.33
7.50	0.46	0.06	0.17	20.50	6.05	5.01	0.32
7.75	0.49	0.07	0.19	20.75	6.06	5.02	0.30
8.00	0.52	0.08	0.22	21.00	6.08	5.03	0.29
8.25	0.55	0.09	0.24	21.25	6.09	5.05	0.27
8.50	0.58	0.10	0.26	21.50	6.10	5.06	0.26
8.75	0.61	0.12	0.28	21.75	6.11	5.07	0.24
9.00	0.64	0.13	0.30	22.00	6.12	5.08	0.23
9.25	0.69	0.16	0.36	22.25	6.13	5.09	0.21
9.50	0.74	0.19	0.51	22.50	6.14	5.10	0.20
9.75	0.79	0.22	0.59	22.75	6.15	5.10	0.18
10.00	0.85	0.26	0.65	23.00	6.16	5.11	0.17
10.25	0.91	0.30	0.71	23.25	6.16	5.12	0.15
10.50	0.97	0.34	0.76	23.50	6.17	5.12	0.14
10.75	1.06	0.40	0.90	23.75	6.18	5.13	0.12
11.00	1.19	0.50	1.34	24.00	6.18	5.13	0.10
11.25	1.35	0.62	1.85				
11.50	1.53	0.77	2.40				
11.75	1.90	1.08	3.31				
12.00	2.86	1.94	6.76				
12.25	4.28	3.29	20.20				
12.50	4.65	3.64	19.81				
12.75	4.83	3.82	9.71				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 144

Summary for Subcatchment 10S: P-2A (Future Commercial)

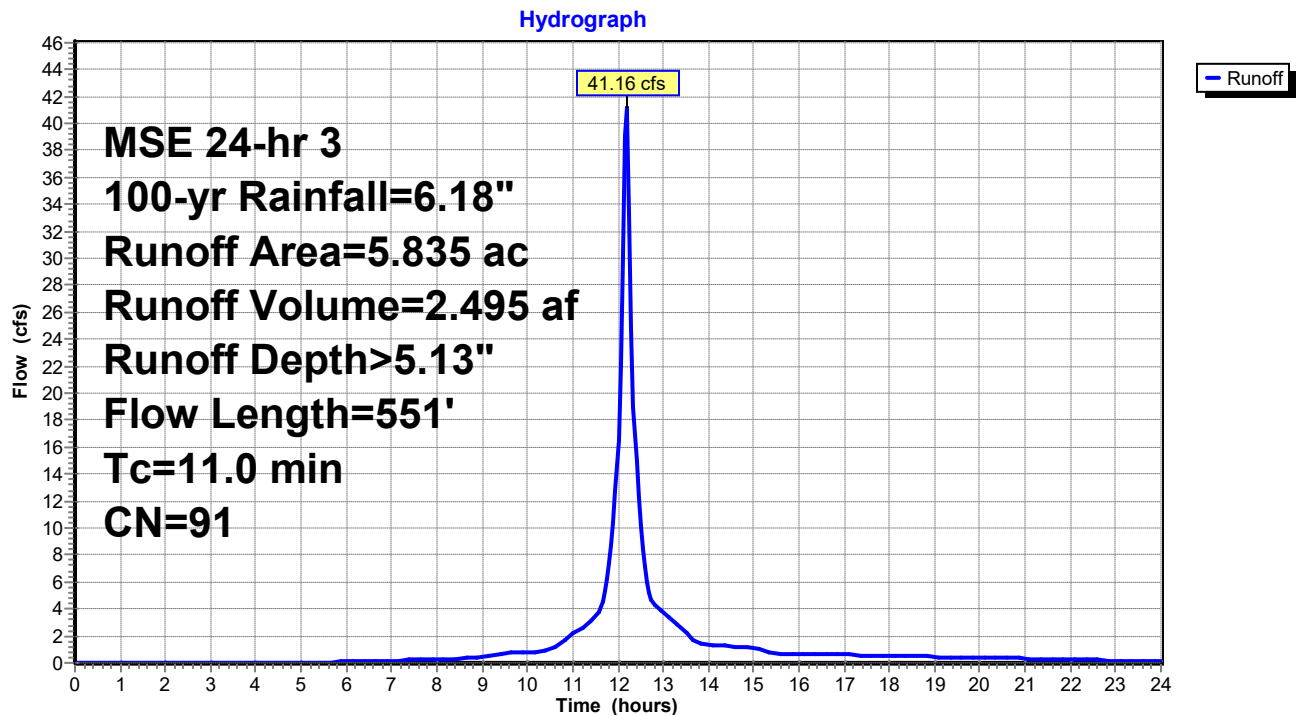
Runoff = 41.16 cfs @ 12.18 hrs, Volume= 2.495 af, Depth> 5.13"
Routed to Pond 2P : Wet Pond (WP-2A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 5.835	91	
5.835		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	25	0.2500	0.22		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
7.1	75	0.0800	0.18		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
2.0	451	0.0640	3.79		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
11.0	551	Total			

Subcatchment 10S: P-2A (Future Commercial)



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 145

Hydrograph for Subcatchment 10S: P-2A (Future Commercial)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	3.97	3.69
0.25	0.00	0.00	0.00	13.25	5.12	4.09	3.02
0.50	0.01	0.00	0.00	13.50	5.21	4.19	2.36
0.75	0.02	0.00	0.00	13.75	5.27	4.25	1.47
1.00	0.02	0.00	0.00	14.00	5.33	4.30	1.33
1.25	0.03	0.00	0.00	14.25	5.39	4.36	1.29
1.50	0.04	0.00	0.00	14.50	5.44	4.41	1.25
1.75	0.05	0.00	0.00	14.75	5.49	4.46	1.21
2.00	0.06	0.00	0.00	15.00	5.54	4.51	1.17
2.25	0.07	0.00	0.00	15.25	5.57	4.54	0.78
2.50	0.08	0.00	0.00	15.50	5.60	4.57	0.70
2.75	0.09	0.00	0.00	15.75	5.63	4.60	0.68
3.00	0.10	0.00	0.00	16.00	5.66	4.63	0.66
3.25	0.12	0.00	0.00	16.25	5.69	4.65	0.65
3.50	0.13	0.00	0.00	16.50	5.72	4.68	0.63
3.75	0.15	0.00	0.00	16.75	5.74	4.71	0.61
4.00	0.16	0.00	0.00	17.00	5.77	4.73	0.59
4.25	0.18	0.00	0.00	17.25	5.79	4.76	0.58
4.50	0.20	0.00	0.00	17.50	5.82	4.78	0.56
4.75	0.21	0.00	0.00	17.75	5.84	4.80	0.54
5.00	0.23	0.00	0.02	18.00	5.87	4.83	0.52
5.25	0.25	0.00	0.04	18.25	5.89	4.85	0.51
5.50	0.27	0.01	0.05	18.50	5.91	4.87	0.49
5.75	0.29	0.01	0.07	18.75	5.93	4.89	0.47
6.00	0.31	0.01	0.09	19.00	5.95	4.91	0.46
6.25	0.34	0.02	0.11	19.25	5.97	4.92	0.44
6.50	0.36	0.02	0.13	19.50	5.98	4.94	0.42
6.75	0.39	0.03	0.15	19.75	6.00	4.96	0.40
7.00	0.41	0.04	0.18	20.00	6.02	4.98	0.38
7.25	0.44	0.05	0.20	20.25	6.03	4.99	0.37
7.50	0.46	0.06	0.22	20.50	6.05	5.01	0.35
7.75	0.49	0.07	0.25	20.75	6.06	5.02	0.33
8.00	0.52	0.08	0.27	21.00	6.08	5.03	0.31
8.25	0.55	0.09	0.29	21.25	6.09	5.05	0.30
8.50	0.58	0.10	0.32	21.50	6.10	5.06	0.28
8.75	0.61	0.12	0.34	21.75	6.11	5.07	0.26
9.00	0.64	0.13	0.37	22.00	6.12	5.08	0.24
9.25	0.69	0.16	0.60	22.25	6.13	5.09	0.23
9.50	0.74	0.19	0.69	22.50	6.14	5.10	0.21
9.75	0.79	0.22	0.75	22.75	6.15	5.10	0.19
10.00	0.85	0.26	0.81	23.00	6.16	5.11	0.17
10.25	0.91	0.30	0.87	23.25	6.16	5.12	0.16
10.50	0.97	0.34	0.93	23.50	6.17	5.12	0.14
10.75	1.06	0.40	1.48	23.75	6.18	5.13	0.12
11.00	1.19	0.50	2.08	24.00	6.18	5.13	0.10
11.25	1.35	0.62	2.71				
11.50	1.53	0.77	3.38				
11.75	1.90	1.08	6.23				
12.00	2.86	1.94	16.43				
12.25	4.28	3.29	33.43				
12.50	4.65	3.64	10.07				
12.75	4.83	3.82	4.70				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 146

Summary for Subcatchment 11S: P-2

Runoff = 12.37 cfs @ 12.13 hrs, Volume= 0.603 af, Depth> 4.47"
Routed to Pond 2P : Wet Pond (WP-2A)

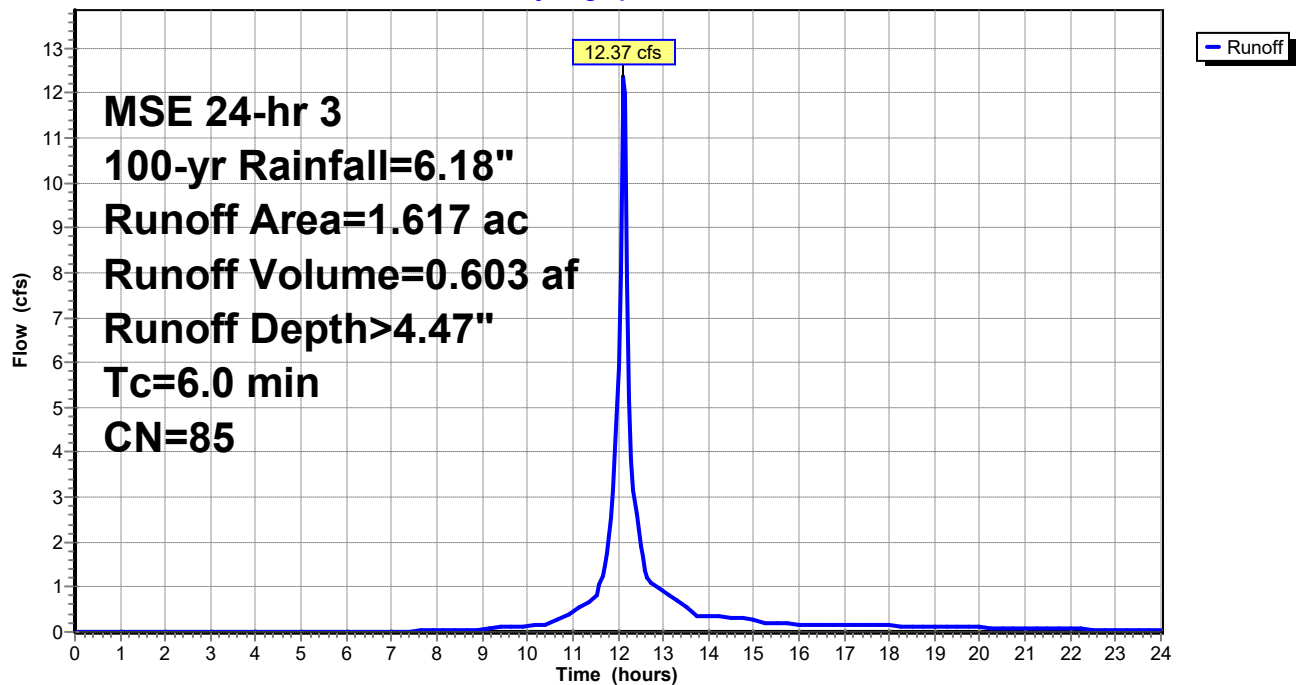
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 1.617	85	
1.617		100.00% Pervious Area

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

Subcatchment 11S: P-2

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 147

Hydrograph for Subcatchment 11S: P-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	3.36	0.92
0.25	0.00	0.00	0.00	13.25	5.12	3.47	0.75
0.50	0.01	0.00	0.00	13.50	5.21	3.57	0.57
0.75	0.02	0.00	0.00	13.75	5.27	3.62	0.36
1.00	0.02	0.00	0.00	14.00	5.33	3.67	0.35
1.25	0.03	0.00	0.00	14.25	5.39	3.73	0.34
1.50	0.04	0.00	0.00	14.50	5.44	3.78	0.33
1.75	0.05	0.00	0.00	14.75	5.49	3.83	0.32
2.00	0.06	0.00	0.00	15.00	5.54	3.87	0.31
2.25	0.07	0.00	0.00	15.25	5.57	3.90	0.19
2.50	0.08	0.00	0.00	15.50	5.60	3.93	0.18
2.75	0.09	0.00	0.00	15.75	5.63	3.96	0.18
3.00	0.10	0.00	0.00	16.00	5.66	3.99	0.18
3.25	0.12	0.00	0.00	16.25	5.69	4.01	0.17
3.50	0.13	0.00	0.00	16.50	5.72	4.04	0.17
3.75	0.15	0.00	0.00	16.75	5.74	4.06	0.16
4.00	0.16	0.00	0.00	17.00	5.77	4.09	0.16
4.25	0.18	0.00	0.00	17.25	5.79	4.11	0.15
4.50	0.20	0.00	0.00	17.50	5.82	4.13	0.15
4.75	0.21	0.00	0.00	17.75	5.84	4.15	0.14
5.00	0.23	0.00	0.00	18.00	5.87	4.18	0.14
5.25	0.25	0.00	0.00	18.25	5.89	4.20	0.13
5.50	0.27	0.00	0.00	18.50	5.91	4.22	0.13
5.75	0.29	0.00	0.00	18.75	5.93	4.24	0.12
6.00	0.31	0.00	0.00	19.00	5.95	4.25	0.12
6.25	0.34	0.00	0.00	19.25	5.97	4.27	0.12
6.50	0.36	0.00	0.00	19.50	5.98	4.29	0.11
6.75	0.39	0.00	0.00	19.75	6.00	4.30	0.11
7.00	0.41	0.00	0.01	20.00	6.02	4.32	0.10
7.25	0.44	0.00	0.01	20.25	6.03	4.34	0.10
7.50	0.46	0.01	0.02	20.50	6.05	4.35	0.09
7.75	0.49	0.01	0.02	20.75	6.06	4.36	0.09
8.00	0.52	0.01	0.03	21.00	6.08	4.38	0.08
8.25	0.55	0.02	0.03	21.25	6.09	4.39	0.08
8.50	0.58	0.02	0.04	21.50	6.10	4.40	0.07
8.75	0.61	0.03	0.04	21.75	6.11	4.41	0.07
9.00	0.64	0.04	0.05	22.00	6.12	4.42	0.06
9.25	0.69	0.05	0.09	22.25	6.13	4.43	0.06
9.50	0.74	0.07	0.11	22.50	6.14	4.44	0.05
9.75	0.79	0.09	0.12	22.75	6.15	4.44	0.05
10.00	0.85	0.11	0.14	23.00	6.16	4.45	0.05
10.25	0.91	0.13	0.15	23.25	6.16	4.46	0.04
10.50	0.97	0.16	0.17	23.50	6.17	4.46	0.04
10.75	1.06	0.20	0.31	23.75	6.18	4.47	0.03
11.00	1.19	0.27	0.45	24.00	6.18	4.47	0.03
11.25	1.35	0.36	0.60				
11.50	1.53	0.47	0.77				
11.75	1.90	0.72	1.74				
12.00	2.86	1.47	5.91				
12.25	4.28	2.71	5.18				
12.50	4.65	3.04	1.91				
12.75	4.83	3.21	1.09				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 148

Summary for Subcatchment 12S: P-2B (Future Residential)

[47] Hint: Peak is 236% of capacity of segment #4

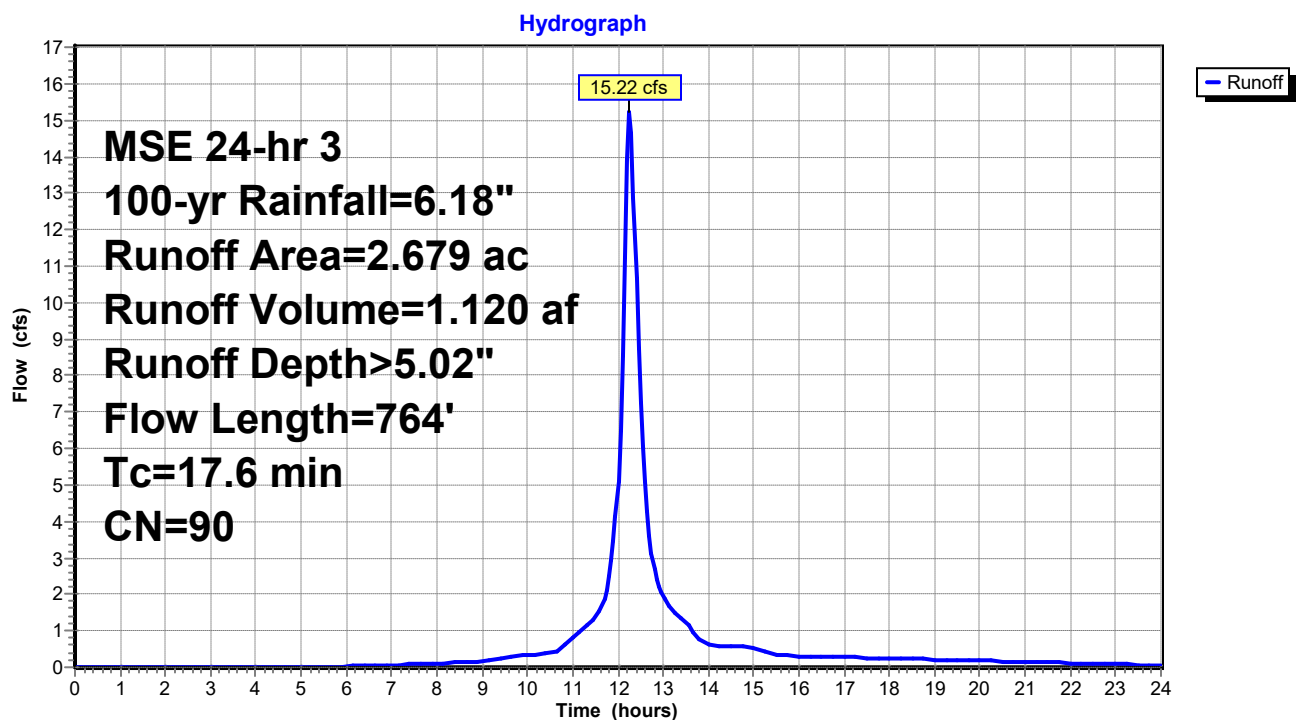
Runoff = 15.22 cfs @ 12.26 hrs, Volume= 1.120 af, Depth> 5.02"
Routed to Pond 2P : Wet Pond (WP-2A)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 2.679	90	
2.679		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	100	0.0200	0.11		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
0.2	80	0.2000	7.20		Shallow Concentrated Flow, Shallow Conc. Unpaved Kv= 16.1 fps
0.7	209	0.0690	5.33		Shallow Concentrated Flow, Shallow Conc. Paved Kv= 20.3 fps
1.2	375	0.0100	5.26	6.46	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
17.6	764	Total			

Subcatchment 12S: P-2B (Future Residential)



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 149

Hydrograph for Subcatchment 12S: P-2B (Future Residential)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	3.87	1.91
0.25	0.00	0.00	0.00	13.25	5.12	3.99	1.51
0.50	0.01	0.00	0.00	13.50	5.21	4.08	1.20
0.75	0.02	0.00	0.00	13.75	5.27	4.14	0.82
1.00	0.02	0.00	0.00	14.00	5.33	4.20	0.64
1.25	0.03	0.00	0.00	14.25	5.39	4.25	0.60
1.50	0.04	0.00	0.00	14.50	5.44	4.30	0.58
1.75	0.05	0.00	0.00	14.75	5.49	4.35	0.56
2.00	0.06	0.00	0.00	15.00	5.54	4.40	0.54
2.25	0.07	0.00	0.00	15.25	5.57	4.43	0.43
2.50	0.08	0.00	0.00	15.50	5.60	4.46	0.33
2.75	0.09	0.00	0.00	15.75	5.63	4.49	0.32
3.00	0.10	0.00	0.00	16.00	5.66	4.52	0.31
3.25	0.12	0.00	0.00	16.25	5.69	4.54	0.30
3.50	0.13	0.00	0.00	16.50	5.72	4.57	0.29
3.75	0.15	0.00	0.00	16.75	5.74	4.60	0.28
4.00	0.16	0.00	0.00	17.00	5.77	4.62	0.27
4.25	0.18	0.00	0.00	17.25	5.79	4.65	0.27
4.50	0.20	0.00	0.00	17.50	5.82	4.67	0.26
4.75	0.21	0.00	0.00	17.75	5.84	4.69	0.25
5.00	0.23	0.00	0.00	18.00	5.87	4.71	0.24
5.25	0.25	0.00	0.00	18.25	5.89	4.74	0.23
5.50	0.27	0.00	0.01	18.50	5.91	4.76	0.23
5.75	0.29	0.00	0.02	18.75	5.93	4.78	0.22
6.00	0.31	0.01	0.03	19.00	5.95	4.80	0.21
6.25	0.34	0.01	0.03	19.25	5.97	4.81	0.20
6.50	0.36	0.02	0.04	19.50	5.98	4.83	0.19
6.75	0.39	0.02	0.05	19.75	6.00	4.85	0.19
7.00	0.41	0.03	0.06	20.00	6.02	4.86	0.18
7.25	0.44	0.03	0.07	20.25	6.03	4.88	0.17
7.50	0.46	0.04	0.08	20.50	6.05	4.89	0.16
7.75	0.49	0.05	0.09	20.75	6.06	4.91	0.15
8.00	0.52	0.06	0.10	21.00	6.08	4.92	0.15
8.25	0.55	0.07	0.11	21.25	6.09	4.93	0.14
8.50	0.58	0.09	0.13	21.50	6.10	4.95	0.13
8.75	0.61	0.10	0.14	21.75	6.11	4.96	0.12
9.00	0.64	0.11	0.15	22.00	6.12	4.97	0.11
9.25	0.69	0.14	0.21	22.25	6.13	4.98	0.11
9.50	0.74	0.16	0.27	22.50	6.14	4.98	0.10
9.75	0.79	0.19	0.30	22.75	6.15	4.99	0.09
10.00	0.85	0.23	0.33	23.00	6.16	5.00	0.08
10.25	0.91	0.26	0.36	23.25	6.16	5.01	0.07
10.50	0.97	0.30	0.39	23.50	6.17	5.01	0.07
10.75	1.06	0.36	0.53	23.75	6.18	5.02	0.06
11.00	1.19	0.45	0.80	24.00	6.18	5.02	0.05
11.25	1.35	0.57	1.07				
11.50	1.53	0.71	1.37				
11.75	1.90	1.01	2.13				
12.00	2.86	1.86	5.07				
12.25	4.28	3.18	15.19				
12.50	4.65	3.54	7.26				
12.75	4.83	3.71	3.10				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 150

Summary for Subcatchment 13S: P-3

[47] Hint: Peak is 402% of capacity of segment #4

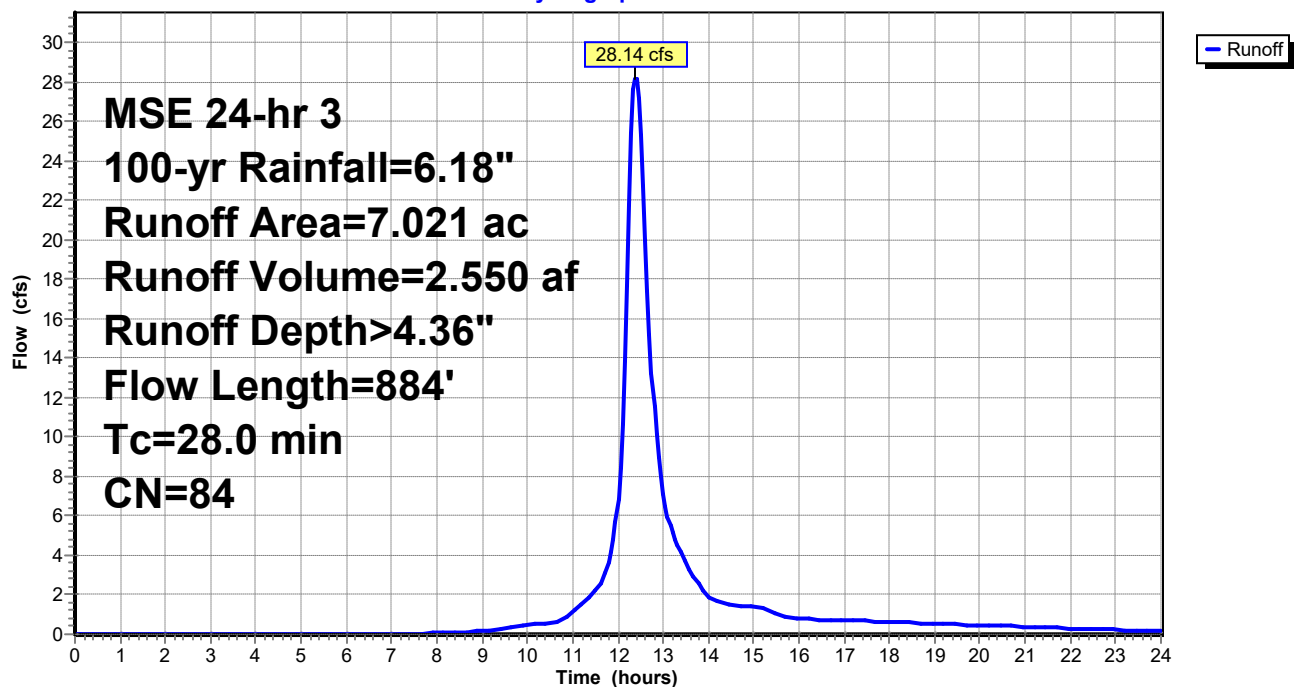
Runoff = 28.14 cfs @ 12.39 hrs, Volume= 2.550 af, Depth> 4.36"
Routed to Pond 5P : Wet Pond (WP-3)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description			
* 7.021	84				
7.021		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	50	0.0125	0.05		Sheet Flow, Sheet Flow Woods: Light underbrush n= 0.400 P2= 2.70"
8.9	50	0.0200	0.09		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
0.9	91	0.0125	1.68		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
2.0	693	0.0100	5.70	7.00	Pipe Channel, Pipe Flow 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
28.0	884	Total			

Subcatchment 13S: P-3

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 151

Hydrograph for Subcatchment 13S: P-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	3.26	7.14
0.25	0.00	0.00	0.00	13.25	5.12	3.38	4.80
0.50	0.01	0.00	0.00	13.50	5.21	3.47	3.61
0.75	0.02	0.00	0.00	13.75	5.27	3.52	2.67
1.00	0.02	0.00	0.00	14.00	5.33	3.57	1.89
1.25	0.03	0.00	0.00	14.25	5.39	3.63	1.60
1.50	0.04	0.00	0.00	14.50	5.44	3.68	1.49
1.75	0.05	0.00	0.00	14.75	5.49	3.72	1.43
2.00	0.06	0.00	0.00	15.00	5.54	3.77	1.38
2.25	0.07	0.00	0.00	15.25	5.57	3.80	1.26
2.50	0.08	0.00	0.00	15.50	5.60	3.83	0.96
2.75	0.09	0.00	0.00	15.75	5.63	3.86	0.84
3.00	0.10	0.00	0.00	16.00	5.66	3.88	0.79
3.25	0.12	0.00	0.00	16.25	5.69	3.91	0.76
3.50	0.13	0.00	0.00	16.50	5.72	3.93	0.74
3.75	0.15	0.00	0.00	16.75	5.74	3.96	0.72
4.00	0.16	0.00	0.00	17.00	5.77	3.98	0.70
4.25	0.18	0.00	0.00	17.25	5.79	4.00	0.68
4.50	0.20	0.00	0.00	17.50	5.82	4.03	0.66
4.75	0.21	0.00	0.00	17.75	5.84	4.05	0.64
5.00	0.23	0.00	0.00	18.00	5.87	4.07	0.62
5.25	0.25	0.00	0.00	18.25	5.89	4.09	0.60
5.50	0.27	0.00	0.00	18.50	5.91	4.11	0.58
5.75	0.29	0.00	0.00	18.75	5.93	4.13	0.56
6.00	0.31	0.00	0.00	19.00	5.95	4.15	0.54
6.25	0.34	0.00	0.00	19.25	5.97	4.17	0.52
6.50	0.36	0.00	0.00	19.50	5.98	4.18	0.50
6.75	0.39	0.00	0.00	19.75	6.00	4.20	0.48
7.00	0.41	0.00	0.00	20.00	6.02	4.21	0.46
7.25	0.44	0.00	0.01	20.25	6.03	4.23	0.44
7.50	0.46	0.00	0.03	20.50	6.05	4.24	0.42
7.75	0.49	0.01	0.05	20.75	6.06	4.26	0.40
8.00	0.52	0.01	0.07	21.00	6.08	4.27	0.38
8.25	0.55	0.01	0.09	21.25	6.09	4.28	0.36
8.50	0.58	0.02	0.11	21.50	6.10	4.29	0.34
8.75	0.61	0.02	0.13	21.75	6.11	4.30	0.32
9.00	0.64	0.03	0.16	22.00	6.12	4.31	0.30
9.25	0.69	0.04	0.20	22.25	6.13	4.32	0.28
9.50	0.74	0.06	0.30	22.50	6.14	4.33	0.26
9.75	0.79	0.07	0.39	22.75	6.15	4.34	0.24
10.00	0.85	0.09	0.46	23.00	6.16	4.34	0.22
10.25	0.91	0.11	0.52	23.25	6.16	4.35	0.20
10.50	0.97	0.14	0.59	23.50	6.17	4.36	0.18
10.75	1.06	0.18	0.72	23.75	6.18	4.36	0.16
11.00	1.19	0.24	1.12	24.00	6.18	4.37	0.14
11.25	1.35	0.33	1.63				
11.50	1.53	0.43	2.24				
11.75	1.90	0.67	3.22				
12.00	2.86	1.40	6.86				
12.25	4.28	2.62	21.79				
12.50	4.65	2.95	25.28				
12.75	4.83	3.12	13.26				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 152

Summary for Subcatchment 15S: UD-1

Runoff = 6.89 cfs @ 12.34 hrs, Volume= 0.553 af, Depth> 3.53"
Routed to Link 6L : Total Discharge North

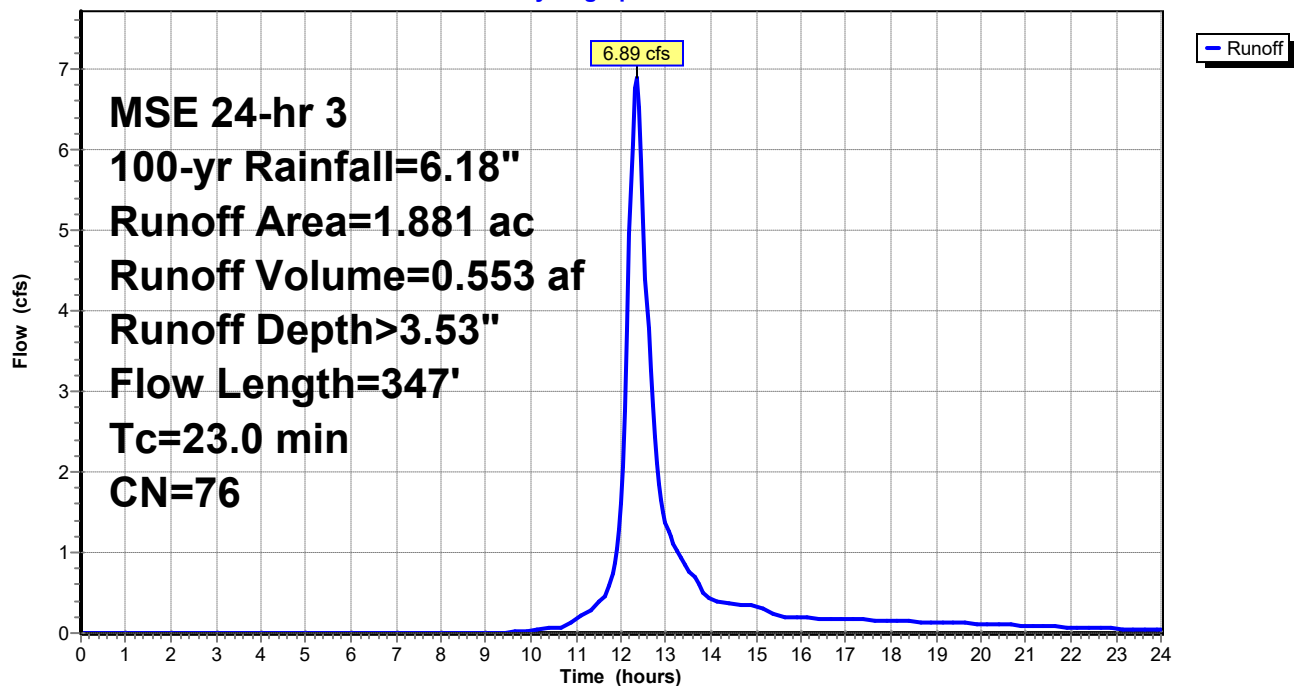
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 1.881	76	
1.881		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0100	0.08		Sheet Flow, Sheet Flow Grass: Dense n= 0.240 P2= 2.70"
2.5	247	0.0120	1.64		Shallow Concentrated Flow, Shallow Conc. Grassed Waterway Kv= 15.0 fps
23.0	347	Total			

Subcatchment 15S: UD-1

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 153

Hydrograph for Subcatchment 15S: UD-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	2.53	1.37
0.25	0.00	0.00	0.00	13.25	5.12	2.63	1.00
0.50	0.01	0.00	0.00	13.50	5.21	2.71	0.79
0.75	0.02	0.00	0.00	13.75	5.27	2.76	0.58
1.00	0.02	0.00	0.00	14.00	5.33	2.81	0.42
1.25	0.03	0.00	0.00	14.25	5.39	2.86	0.37
1.50	0.04	0.00	0.00	14.50	5.44	2.90	0.36
1.75	0.05	0.00	0.00	14.75	5.49	2.95	0.34
2.00	0.06	0.00	0.00	15.00	5.54	2.99	0.33
2.25	0.07	0.00	0.00	15.25	5.57	3.02	0.29
2.50	0.08	0.00	0.00	15.50	5.60	3.04	0.22
2.75	0.09	0.00	0.00	15.75	5.63	3.07	0.20
3.00	0.10	0.00	0.00	16.00	5.66	3.09	0.19
3.25	0.12	0.00	0.00	16.25	5.69	3.11	0.19
3.50	0.13	0.00	0.00	16.50	5.72	3.14	0.18
3.75	0.15	0.00	0.00	16.75	5.74	3.16	0.18
4.00	0.16	0.00	0.00	17.00	5.77	3.18	0.17
4.25	0.18	0.00	0.00	17.25	5.79	3.20	0.17
4.50	0.20	0.00	0.00	17.50	5.82	3.22	0.16
4.75	0.21	0.00	0.00	17.75	5.84	3.24	0.16
5.00	0.23	0.00	0.00	18.00	5.87	3.26	0.15
5.25	0.25	0.00	0.00	18.25	5.89	3.28	0.15
5.50	0.27	0.00	0.00	18.50	5.91	3.30	0.14
5.75	0.29	0.00	0.00	18.75	5.93	3.32	0.14
6.00	0.31	0.00	0.00	19.00	5.95	3.34	0.13
6.25	0.34	0.00	0.00	19.25	5.97	3.35	0.13
6.50	0.36	0.00	0.00	19.50	5.98	3.37	0.12
6.75	0.39	0.00	0.00	19.75	6.00	3.38	0.12
7.00	0.41	0.00	0.00	20.00	6.02	3.40	0.11
7.25	0.44	0.00	0.00	20.25	6.03	3.41	0.11
7.50	0.46	0.00	0.00	20.50	6.05	3.42	0.10
7.75	0.49	0.00	0.00	20.75	6.06	3.44	0.10
8.00	0.52	0.00	0.00	21.00	6.08	3.45	0.09
8.25	0.55	0.00	0.00	21.25	6.09	3.46	0.09
8.50	0.58	0.00	0.00	21.50	6.10	3.47	0.08
8.75	0.61	0.00	0.00	21.75	6.11	3.48	0.08
9.00	0.64	0.00	0.00	22.00	6.12	3.49	0.07
9.25	0.69	0.00	0.00	22.25	6.13	3.50	0.07
9.50	0.74	0.00	0.01	22.50	6.14	3.50	0.06
9.75	0.79	0.01	0.02	22.75	6.15	3.51	0.06
10.00	0.85	0.01	0.03	23.00	6.16	3.52	0.05
10.25	0.91	0.02	0.05	23.25	6.16	3.52	0.05
10.50	0.97	0.03	0.06	23.50	6.17	3.53	0.04
10.75	1.06	0.05	0.09	23.75	6.18	3.53	0.04
11.00	1.19	0.08	0.16	24.00	6.18	3.54	0.03
11.25	1.35	0.13	0.26				
11.50	1.53	0.20	0.38				
11.75	1.90	0.36	0.62				
12.00	2.86	0.92	1.60				
12.25	4.28	1.96	6.07				
12.50	4.65	2.25	5.10				
12.75	4.83	2.40	2.43				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 154

Summary for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

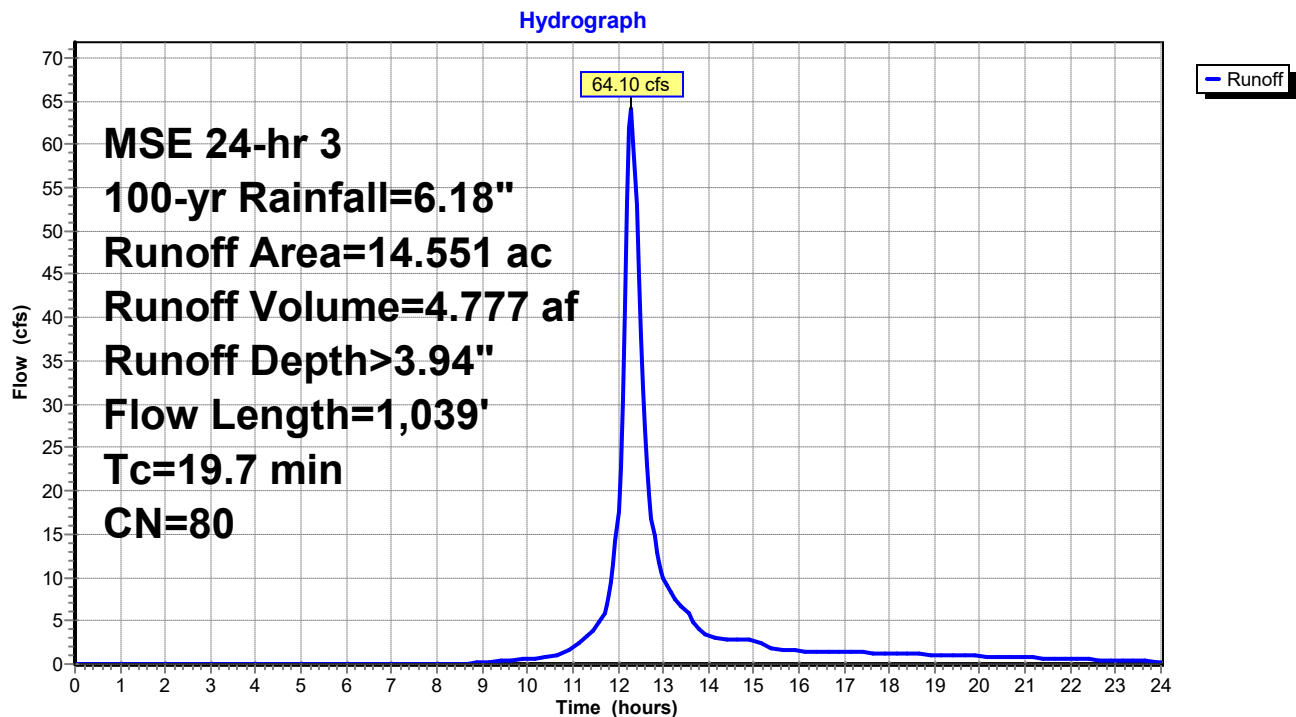
Runoff = 64.10 cfs @ 12.29 hrs, Volume= 4.777 af, Depth> 3.94"
Routed to Link 18L : Total Existing Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 14.551	80	
14.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	100	0.0200	0.14		Sheet Flow, Sheet Flow
					Cultivated: Residue>20% n= 0.170 P2= 2.70"
7.9	939	0.0485	1.98		Shallow Concentrated Flow, Shallow Conc.
					Cultivated Straight Rows Kv= 9.0 fps
19.7	1,039	Total			

Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 155

Hydrograph for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	2.88	10.00
0.25	0.00	0.00	0.00	13.25	5.12	2.99	7.65
0.50	0.01	0.00	0.00	13.50	5.21	3.08	6.10
0.75	0.02	0.00	0.00	13.75	5.27	3.13	4.31
1.00	0.02	0.00	0.00	14.00	5.33	3.18	3.23
1.25	0.03	0.00	0.00	14.25	5.39	3.23	2.98
1.50	0.04	0.00	0.00	14.50	5.44	3.28	2.87
1.75	0.05	0.00	0.00	14.75	5.49	3.33	2.79
2.00	0.06	0.00	0.00	15.00	5.54	3.37	2.70
2.25	0.07	0.00	0.00	15.25	5.57	3.40	2.23
2.50	0.08	0.00	0.00	15.50	5.60	3.43	1.71
2.75	0.09	0.00	0.00	15.75	5.63	3.45	1.59
3.00	0.10	0.00	0.00	16.00	5.66	3.48	1.54
3.25	0.12	0.00	0.00	16.25	5.69	3.50	1.50
3.50	0.13	0.00	0.00	16.50	5.72	3.53	1.46
3.75	0.15	0.00	0.00	16.75	5.74	3.55	1.42
4.00	0.16	0.00	0.00	17.00	5.77	3.57	1.38
4.25	0.18	0.00	0.00	17.25	5.79	3.60	1.34
4.50	0.20	0.00	0.00	17.50	5.82	3.62	1.30
4.75	0.21	0.00	0.00	17.75	5.84	3.64	1.26
5.00	0.23	0.00	0.00	18.00	5.87	3.66	1.22
5.25	0.25	0.00	0.00	18.25	5.89	3.68	1.18
5.50	0.27	0.00	0.00	18.50	5.91	3.70	1.14
5.75	0.29	0.00	0.00	18.75	5.93	3.72	1.10
6.00	0.31	0.00	0.00	19.00	5.95	3.73	1.06
6.25	0.34	0.00	0.00	19.25	5.97	3.75	1.02
6.50	0.36	0.00	0.00	19.50	5.98	3.77	0.99
6.75	0.39	0.00	0.00	19.75	6.00	3.78	0.95
7.00	0.41	0.00	0.00	20.00	6.02	3.80	0.90
7.25	0.44	0.00	0.00	20.25	6.03	3.81	0.87
7.50	0.46	0.00	0.00	20.50	6.05	3.83	0.83
7.75	0.49	0.00	0.00	20.75	6.06	3.84	0.78
8.00	0.52	0.00	0.00	21.00	6.08	3.85	0.75
8.25	0.55	0.00	0.02	21.25	6.09	3.86	0.71
8.50	0.58	0.00	0.05	21.50	6.10	3.87	0.66
8.75	0.61	0.00	0.09	21.75	6.11	3.88	0.62
9.00	0.64	0.01	0.13	22.00	6.12	3.89	0.58
9.25	0.69	0.01	0.23	22.25	6.13	3.90	0.54
9.50	0.74	0.02	0.37	22.50	6.14	3.91	0.50
9.75	0.79	0.03	0.50	22.75	6.15	3.92	0.46
10.00	0.85	0.04	0.62	23.00	6.16	3.92	0.42
10.25	0.91	0.06	0.74	23.25	6.16	3.93	0.38
10.50	0.97	0.07	0.87	23.50	6.17	3.94	0.34
10.75	1.06	0.10	1.23	23.75	6.18	3.94	0.30
11.00	1.19	0.15	2.04	24.00	6.18	3.94	0.26
11.25	1.35	0.21	3.01				
11.50	1.53	0.30	4.19				
11.75	1.90	0.50	6.83				
12.00	2.86	1.15	17.57				
12.25	4.28	2.27	61.95				
12.50	4.65	2.59	37.75				
12.75	4.83	2.75	16.87				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 156

Summary for Subcatchment 17S: E-2 (Ex. Discharge North)

Runoff = 38.39 cfs @ 12.30 hrs, Volume= 2.887 af, Depth> 3.53"
Routed to Link 18L : Total Existing Discharge

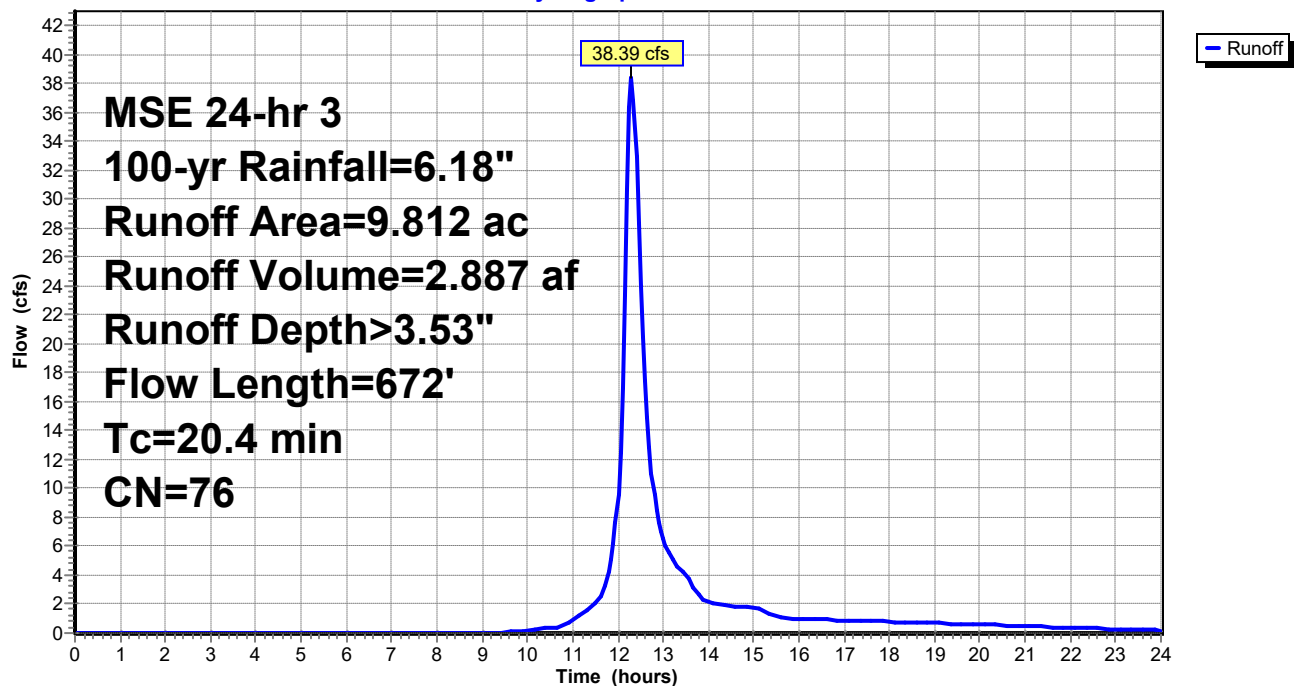
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 9.812	76	
9.812		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0150	0.13		Sheet Flow, Sheet Flow
					Cultivated: Residue>20% n= 0.170 P2= 2.70"
7.2	572	0.0219	1.33		Shallow Concentrated Flow, Shallow Conc.
					Cultivated Straight Rows Kv= 9.0 fps
20.4	672	Total			

Subcatchment 17S: E-2 (Ex. Discharge North)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 157

Hydrograph for Subcatchment 17S: E-2 (Ex. Discharge North)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	2.53	6.48
0.25	0.00	0.00	0.00	13.25	5.12	2.63	4.93
0.50	0.01	0.00	0.00	13.50	5.21	2.71	3.93
0.75	0.02	0.00	0.00	13.75	5.27	2.76	2.81
1.00	0.02	0.00	0.00	14.00	5.33	2.81	2.09
1.25	0.03	0.00	0.00	14.25	5.39	2.86	1.91
1.50	0.04	0.00	0.00	14.50	5.44	2.90	1.84
1.75	0.05	0.00	0.00	14.75	5.49	2.95	1.79
2.00	0.06	0.00	0.00	15.00	5.54	2.99	1.73
2.25	0.07	0.00	0.00	15.25	5.57	3.02	1.45
2.50	0.08	0.00	0.00	15.50	5.60	3.04	1.10
2.75	0.09	0.00	0.00	15.75	5.63	3.07	1.02
3.00	0.10	0.00	0.00	16.00	5.66	3.09	0.99
3.25	0.12	0.00	0.00	16.25	5.69	3.11	0.96
3.50	0.13	0.00	0.00	16.50	5.72	3.14	0.94
3.75	0.15	0.00	0.00	16.75	5.74	3.16	0.91
4.00	0.16	0.00	0.00	17.00	5.77	3.18	0.89
4.25	0.18	0.00	0.00	17.25	5.79	3.20	0.86
4.50	0.20	0.00	0.00	17.50	5.82	3.22	0.84
4.75	0.21	0.00	0.00	17.75	5.84	3.24	0.81
5.00	0.23	0.00	0.00	18.00	5.87	3.26	0.79
5.25	0.25	0.00	0.00	18.25	5.89	3.28	0.76
5.50	0.27	0.00	0.00	18.50	5.91	3.30	0.74
5.75	0.29	0.00	0.00	18.75	5.93	3.32	0.71
6.00	0.31	0.00	0.00	19.00	5.95	3.34	0.69
6.25	0.34	0.00	0.00	19.25	5.97	3.35	0.66
6.50	0.36	0.00	0.00	19.50	5.98	3.37	0.64
6.75	0.39	0.00	0.00	19.75	6.00	3.38	0.61
7.00	0.41	0.00	0.00	20.00	6.02	3.40	0.58
7.25	0.44	0.00	0.00	20.25	6.03	3.41	0.56
7.50	0.46	0.00	0.00	20.50	6.05	3.42	0.53
7.75	0.49	0.00	0.00	20.75	6.06	3.44	0.51
8.00	0.52	0.00	0.00	21.00	6.08	3.45	0.48
8.25	0.55	0.00	0.00	21.25	6.09	3.46	0.46
8.50	0.58	0.00	0.00	21.50	6.10	3.47	0.43
8.75	0.61	0.00	0.00	21.75	6.11	3.48	0.40
9.00	0.64	0.00	0.00	22.00	6.12	3.49	0.38
9.25	0.69	0.00	0.01	22.25	6.13	3.50	0.35
9.50	0.74	0.00	0.06	22.50	6.14	3.50	0.33
9.75	0.79	0.01	0.12	22.75	6.15	3.51	0.30
10.00	0.85	0.01	0.19	23.00	6.16	3.52	0.27
10.25	0.91	0.02	0.26	23.25	6.16	3.52	0.25
10.50	0.97	0.03	0.34	23.50	6.17	3.53	0.22
10.75	1.06	0.05	0.51	23.75	6.18	3.53	0.20
11.00	1.19	0.08	0.91	24.00	6.18	3.54	0.17
11.25	1.35	0.13	1.43				
11.50	1.53	0.20	2.10				
11.75	1.90	0.36	3.55				
12.00	2.86	0.92	9.58				
12.25	4.28	1.96	36.38				
12.50	4.65	2.25	23.94				
12.75	4.83	2.40	11.02				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 158

Summary for Subcatchment 19S: UD-2

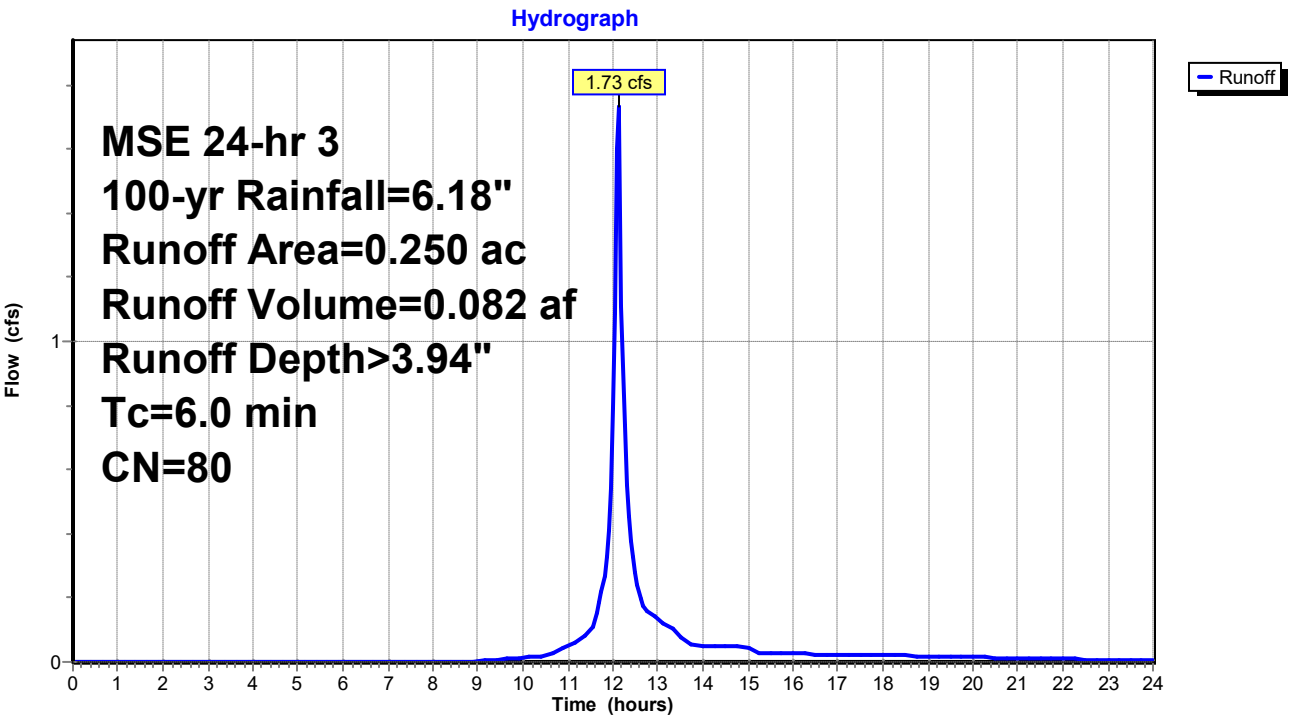
Runoff = 1.73 cfs @ 12.13 hrs, Volume= 0.082 af, Depth> 3.94"
Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 0.250	80	
0.250		100.00% Pervious Area

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

Subcatchment 19S: UD-2



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 159

Hydrograph for Subcatchment 19S: UD-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	13.00	4.99	2.88	0.13
0.25	0.00	0.00	0.00	13.25	5.12	2.99	0.11
0.50	0.01	0.00	0.00	13.50	5.21	3.08	0.08
0.75	0.02	0.00	0.00	13.75	5.27	3.13	0.05
1.00	0.02	0.00	0.00	14.00	5.33	3.18	0.05
1.25	0.03	0.00	0.00	14.25	5.39	3.23	0.05
1.50	0.04	0.00	0.00	14.50	5.44	3.28	0.05
1.75	0.05	0.00	0.00	14.75	5.49	3.33	0.05
2.00	0.06	0.00	0.00	15.00	5.54	3.37	0.05
2.25	0.07	0.00	0.00	15.25	5.57	3.40	0.03
2.50	0.08	0.00	0.00	15.50	5.60	3.43	0.03
2.75	0.09	0.00	0.00	15.75	5.63	3.45	0.03
3.00	0.10	0.00	0.00	16.00	5.66	3.48	0.03
3.25	0.12	0.00	0.00	16.25	5.69	3.50	0.03
3.50	0.13	0.00	0.00	16.50	5.72	3.53	0.02
3.75	0.15	0.00	0.00	16.75	5.74	3.55	0.02
4.00	0.16	0.00	0.00	17.00	5.77	3.57	0.02
4.25	0.18	0.00	0.00	17.25	5.79	3.60	0.02
4.50	0.20	0.00	0.00	17.50	5.82	3.62	0.02
4.75	0.21	0.00	0.00	17.75	5.84	3.64	0.02
5.00	0.23	0.00	0.00	18.00	5.87	3.66	0.02
5.25	0.25	0.00	0.00	18.25	5.89	3.68	0.02
5.50	0.27	0.00	0.00	18.50	5.91	3.70	0.02
5.75	0.29	0.00	0.00	18.75	5.93	3.72	0.02
6.00	0.31	0.00	0.00	19.00	5.95	3.73	0.02
6.25	0.34	0.00	0.00	19.25	5.97	3.75	0.02
6.50	0.36	0.00	0.00	19.50	5.98	3.77	0.02
6.75	0.39	0.00	0.00	19.75	6.00	3.78	0.02
7.00	0.41	0.00	0.00	20.00	6.02	3.80	0.01
7.25	0.44	0.00	0.00	20.25	6.03	3.81	0.01
7.50	0.46	0.00	0.00	20.50	6.05	3.83	0.01
7.75	0.49	0.00	0.00	20.75	6.06	3.84	0.01
8.00	0.52	0.00	0.00	21.00	6.08	3.85	0.01
8.25	0.55	0.00	0.00	21.25	6.09	3.86	0.01
8.50	0.58	0.00	0.00	21.50	6.10	3.87	0.01
8.75	0.61	0.00	0.00	21.75	6.11	3.88	0.01
9.00	0.64	0.01	0.00	22.00	6.12	3.89	0.01
9.25	0.69	0.01	0.01	22.25	6.13	3.90	0.01
9.50	0.74	0.02	0.01	22.50	6.14	3.91	0.01
9.75	0.79	0.03	0.01	22.75	6.15	3.92	0.01
10.00	0.85	0.04	0.01	23.00	6.16	3.92	0.01
10.25	0.91	0.06	0.01	23.25	6.16	3.93	0.01
10.50	0.97	0.07	0.02	23.50	6.17	3.94	0.01
10.75	1.06	0.10	0.03	23.75	6.18	3.94	0.00
11.00	1.19	0.15	0.05	24.00	6.18	3.94	0.00
11.25	1.35	0.21	0.07				
11.50	1.53	0.30	0.09				
11.75	1.90	0.50	0.22				
12.00	2.86	1.15	0.79				
12.25	4.28	2.27	0.74				
12.50	4.65	2.59	0.28				
12.75	4.83	2.75	0.16				

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 100-yr Rainfall=6.18"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 160

Summary for Pond 1P: Bio-Filtration Basin (BF-1)

Inflow Area = 5.080 ac, 0.00% Impervious, Inflow Depth > 5.13" for 100-yr event
 Inflow = 23.99 cfs @ 12.36 hrs, Volume= 2.170 af
 Outflow = 13.57 cfs @ 12.64 hrs, Volume= 2.141 af, Atten= 43%, Lag= 16.4 min
 Discarded = 0.20 cfs @ 12.64 hrs, Volume= 0.141 af
 Primary = 13.37 cfs @ 12.64 hrs, Volume= 2.000 af
 Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 173.74' @ 12.64 hrs Surf.Area= 0.246 ac Storage= 0.704 af

Plug-Flow detention time= 77.7 min calculated for 2.141 af (99% of inflow)
 Center-of-Mass det. time= 69.6 min (857.3 - 787.7)

Volume	Invert	Avail.Storage	Storage Description	
#1	168.00'	1.047 af	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (acres)	Voids (%)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
168.00	0.105	0.0	0.000	0.000
168.01	0.105	30.0	0.000	0.000
169.99	0.105	30.0	0.062	0.063
170.00	0.105	100.0	0.001	0.064
171.00	0.137	100.0	0.121	0.185
172.00	0.173	100.0	0.155	0.340
173.00	0.214	100.0	0.194	0.533
174.00	0.257	100.0	0.236	0.769
175.00	0.299	100.0	0.278	1.047

Device	Routing	Invert	Outlet Devices
#1	Primary	168.00'	15.0" Round Culvert L= 70.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 168.00' / 167.00' S= 0.0142 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Discarded	168.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 163.00'
#3	Device 1	168.50'	6.0" Round Underdrain L= 121.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 168.50' / 168.50' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 1	171.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	172.00'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#6	Device 1	173.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	174.00'	15.0' long + 5.5 '/' SideZ x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 161

Discarded OutFlow Max=0.20 cfs @ 12.64 hrs HW=173.74' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=13.36 cfs @ 12.64 hrs HW=173.74' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 13.36 cfs @ 10.89 fps)

↑ **3=Underdrain** (Passes < 1.10 cfs potential flow)

↑ **4=Orifice/Grate** (Passes < 1.49 cfs potential flow)

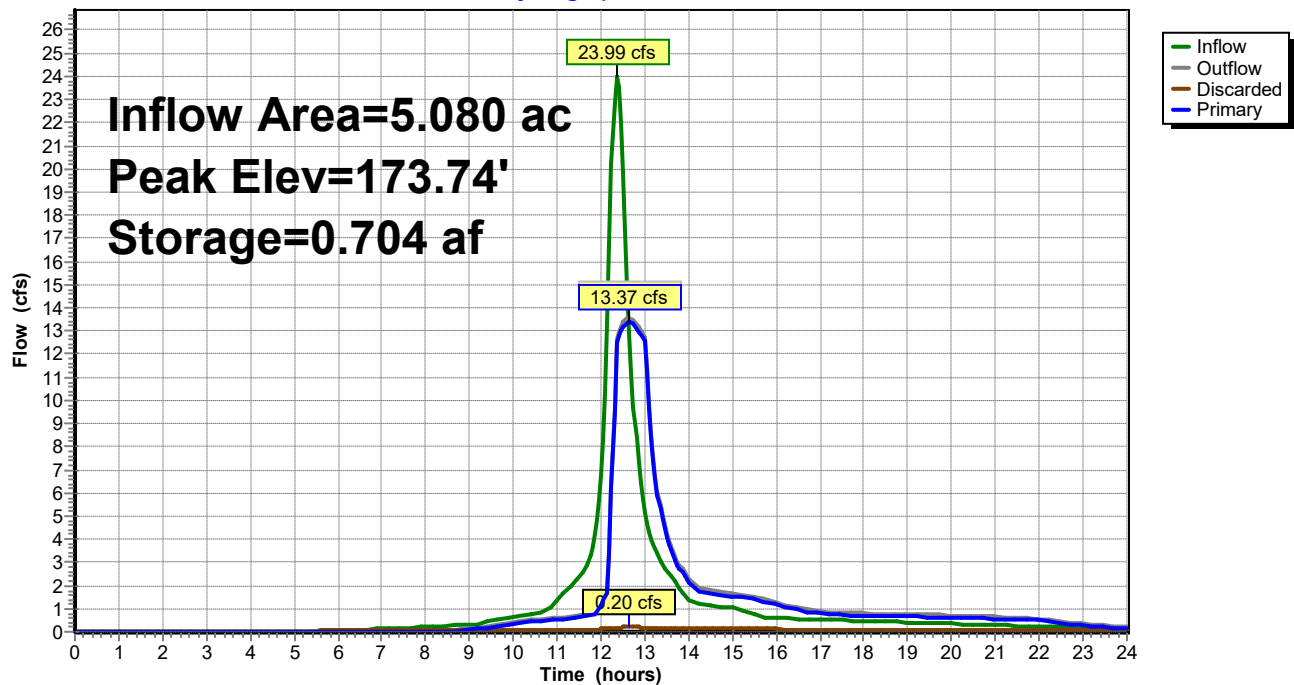
↑ **5=Sharp-Crested Rectangular Weir** (Passes < 19.89 cfs potential flow)

↑ **6=Orifice/Grate** (Passes < 26.12 cfs potential flow)

↑ **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Bio-Filtration Basin (BF-1)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 162

Hydrograph for Pond 1P: Bio-Filtration Basin (BF-1)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	168.00	0.00	0.00	0.00
0.50	0.00	0.000	168.00	0.00	0.00	0.00
1.00	0.00	0.000	168.00	0.00	0.00	0.00
1.50	0.00	0.000	168.00	0.00	0.00	0.00
2.00	0.00	0.000	168.00	0.00	0.00	0.00
2.50	0.00	0.000	168.00	0.00	0.00	0.00
3.00	0.00	0.000	168.00	0.00	0.00	0.00
3.50	0.00	0.000	168.00	0.00	0.00	0.00
4.00	0.00	0.000	168.00	0.00	0.00	0.00
4.50	0.00	0.000	168.00	0.00	0.00	0.00
5.00	0.01	0.000	168.00	0.01	0.01	0.00
5.50	0.03	0.000	168.00	0.03	0.03	0.00
6.00	0.06	0.000	168.00	0.05	0.05	0.00
6.50	0.10	0.001	168.04	0.05	0.05	0.00
7.00	0.14	0.004	168.12	0.05	0.05	0.00
7.50	0.17	0.008	168.25	0.06	0.06	0.00
8.00	0.22	0.014	168.43	0.06	0.06	0.00
8.50	0.26	0.021	168.66	0.07	0.06	0.01
9.00	0.30	0.028	168.88	0.16	0.06	0.10
9.50	0.51	0.035	169.10	0.27	0.06	0.20
10.00	0.65	0.045	169.44	0.40	0.07	0.33
10.50	0.76	0.055	169.76	0.51	0.07	0.44
11.00	1.34	0.072	170.08	0.60	0.08	0.52
11.50	2.40	0.122	170.51	0.71	0.09	0.62
12.00	6.76	0.242	171.40	1.25	0.11	1.14
12.50	19.81	0.670	173.60	13.38	0.19	13.18
13.00	5.17	0.560	173.12	12.71	0.18	12.53
13.50	2.66	0.407	172.37	4.24	0.15	4.09
14.00	1.40	0.360	172.12	2.29	0.14	2.15
14.50	1.13	0.330	171.94	1.79	0.13	1.66
15.00	1.05	0.304	171.79	1.66	0.13	1.54
15.50	0.72	0.276	171.61	1.51	0.12	1.39
16.00	0.60	0.244	171.41	1.28	0.11	1.16
16.50	0.56	0.221	171.25	1.04	0.11	0.93
17.00	0.53	0.203	171.13	0.90	0.11	0.79
17.50	0.50	0.189	171.03	0.83	0.10	0.72
18.00	0.47	0.176	170.93	0.80	0.10	0.70
18.50	0.44	0.162	170.83	0.78	0.10	0.68
19.00	0.41	0.148	170.72	0.76	0.09	0.66
19.50	0.38	0.133	170.61	0.73	0.09	0.64
20.00	0.35	0.119	170.49	0.70	0.09	0.62
20.50	0.32	0.104	170.36	0.67	0.08	0.59
21.00	0.29	0.089	170.23	0.64	0.08	0.56
21.50	0.26	0.075	170.10	0.61	0.08	0.53
22.00	0.23	0.060	169.92	0.56	0.07	0.48
22.50	0.20	0.049	169.54	0.44	0.07	0.37
23.00	0.17	0.040	169.27	0.33	0.07	0.26
23.50	0.14	0.034	169.09	0.27	0.06	0.20
24.00	0.10	0.030	168.95	0.19	0.06	0.13

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 163

Stage-Discharge for Pond 1P: Bio-Filtration Basin (BF-1)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
168.00	0.00	0.00	0.00	173.20	12.82	0.18	12.64
168.10	0.05	0.05	0.00	173.30	12.96	0.18	12.78
168.20	0.06	0.06	0.00	173.40	13.10	0.19	12.91
168.30	0.06	0.06	0.00	173.50	13.24	0.19	13.05
168.40	0.06	0.06	0.00	173.60	13.37	0.19	13.18
168.50	0.06	0.06	0.00	173.70	13.51	0.20	13.31
168.60	0.06	0.06	0.00	173.80	13.64	0.20	13.44
168.70	0.08	0.06	0.02	173.90	13.78	0.21	13.57
168.80	0.12	0.06	0.06	174.00	13.91	0.21	13.70
168.90	0.17	0.06	0.11	174.10	15.35	0.21	15.13
169.00	0.22	0.06	0.16	174.20	17.98	0.22	17.76
169.10	0.27	0.06	0.20	174.30	21.51	0.22	21.29
169.20	0.29	0.07	0.23	174.40	25.87	0.23	25.65
169.30	0.34	0.07	0.28	174.50	30.97	0.23	30.74
169.40	0.39	0.07	0.32	174.60	36.81	0.23	36.58
169.50	0.43	0.07	0.36	174.70	43.07	0.24	42.84
169.60	0.46	0.07	0.39	174.80	49.91	0.24	49.67
169.70	0.49	0.07	0.42	174.90	57.70	0.25	57.46
169.80	0.52	0.07	0.45	175.00	66.19	0.25	65.94
169.90	0.55	0.07	0.48				
170.00	0.58	0.07	0.51				
170.10	0.61	0.08	0.53				
170.20	0.63	0.08	0.55				
170.30	0.66	0.08	0.58				
170.40	0.68	0.08	0.60				
170.50	0.71	0.09	0.62				
170.60	0.73	0.09	0.64				
170.70	0.75	0.09	0.66				
170.80	0.77	0.10	0.68				
170.90	0.80	0.10	0.70				
171.00	0.82	0.10	0.72				
171.10	0.87	0.10	0.76				
171.20	0.97	0.11	0.86				
171.30	1.11	0.11	1.00				
171.40	1.26	0.11	1.15				
171.50	1.39	0.12	1.27				
171.60	1.50	0.12	1.37				
171.70	1.59	0.12	1.47				
171.80	1.67	0.13	1.55				
171.90	1.75	0.13	1.62				
172.00	1.83	0.13	1.69				
172.10	2.21	0.14	2.07				
172.20	2.83	0.14	2.69				
172.30	3.61	0.14	3.47				
172.40	4.51	0.15	4.36				
172.50	5.51	0.15	5.36				
172.60	6.59	0.16	6.43				
172.70	7.75	0.16	7.59				
172.80	8.97	0.16	8.81				
172.90	10.25	0.17	10.09				
173.00	11.59	0.17	11.42				
173.10	12.67	0.17	12.50				

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 164

Stage-Area-Storage for Pond 1P: Bio-Filtration Basin (BF-1)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
168.00	0.105	0.000	173.20	0.223	0.577
168.10	0.105	0.003	173.30	0.227	0.599
168.20	0.105	0.006	173.40	0.231	0.622
168.30	0.105	0.009	173.50	0.236	0.646
168.40	0.105	0.013	173.60	0.240	0.669
168.50	0.105	0.016	173.70	0.244	0.694
168.60	0.105	0.019	173.80	0.248	0.718
168.70	0.105	0.022	173.90	0.253	0.743
168.80	0.105	0.025	174.00	0.257	0.769
168.90	0.105	0.028	174.10	0.261	0.795
169.00	0.105	0.032	174.20	0.265	0.821
169.10	0.105	0.035	174.30	0.270	0.848
169.20	0.105	0.038	174.40	0.274	0.875
169.30	0.105	0.041	174.50	0.278	0.902
169.40	0.105	0.044	174.60	0.282	0.930
169.50	0.105	0.047	174.70	0.286	0.959
169.60	0.105	0.050	174.80	0.291	0.988
169.70	0.105	0.054	174.90	0.295	1.017
169.80	0.105	0.057	175.00	0.299	1.047
169.90	0.105	0.060			
170.00	0.105	0.064			
170.10	0.108	0.074			
170.20	0.111	0.085			
170.30	0.115	0.097			
170.40	0.118	0.108			
170.50	0.121	0.120			
170.60	0.124	0.132			
170.70	0.127	0.145			
170.80	0.131	0.158			
170.90	0.134	0.171			
171.00	0.137	0.185			
171.10	0.141	0.199			
171.20	0.144	0.213			
171.30	0.148	0.227			
171.40	0.151	0.242			
171.50	0.155	0.258			
171.60	0.159	0.273			
171.70	0.162	0.289			
171.80	0.166	0.306			
171.90	0.169	0.323			
172.00	0.173	0.340			
172.10	0.177	0.357			
172.20	0.181	0.375			
172.30	0.185	0.393			
172.40	0.189	0.412			
172.50	0.194	0.431			
172.60	0.198	0.451			
172.70	0.202	0.471			
172.80	0.206	0.491			
172.90	0.210	0.512			
173.00	0.214	0.533			
173.10	0.218	0.555			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 100-yr Rainfall=6.18"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 165

Summary for Pond 2P: Wet Pond (WP-2A)

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=74)

Inflow Area = 10.131 ac, 0.00% Impervious, Inflow Depth > 5.00" for 100-yr event
 Inflow = 63.51 cfs @ 12.18 hrs, Volume= 4.218 af
 Outflow = 51.99 cfs @ 12.21 hrs, Volume= 4.212 af, Atten= 18%, Lag= 1.8 min
 Primary = 51.99 cfs @ 12.21 hrs, Volume= 4.212 af
 Routed to Pond 3P : Bio-Filtration Basin (BF-2B)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 137.80' @ 12.31 hrs Surf.Area= 0.189 ac Storage= 0.529 af

Plug-Flow detention time= 24.6 min calculated for 4.212 af (100% of inflow)
 Center-of-Mass det. time= 23.8 min (801.5 - 777.8)

Volume	Invert	Avail.Storage	Storage Description
#1	134.00'	0.775 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
134.00	0.087	0.000	0.000
135.00	0.118	0.102	0.102
136.00	0.142	0.130	0.233
137.00	0.167	0.155	0.387
138.00	0.194	0.180	0.568
139.00	0.221	0.208	0.775

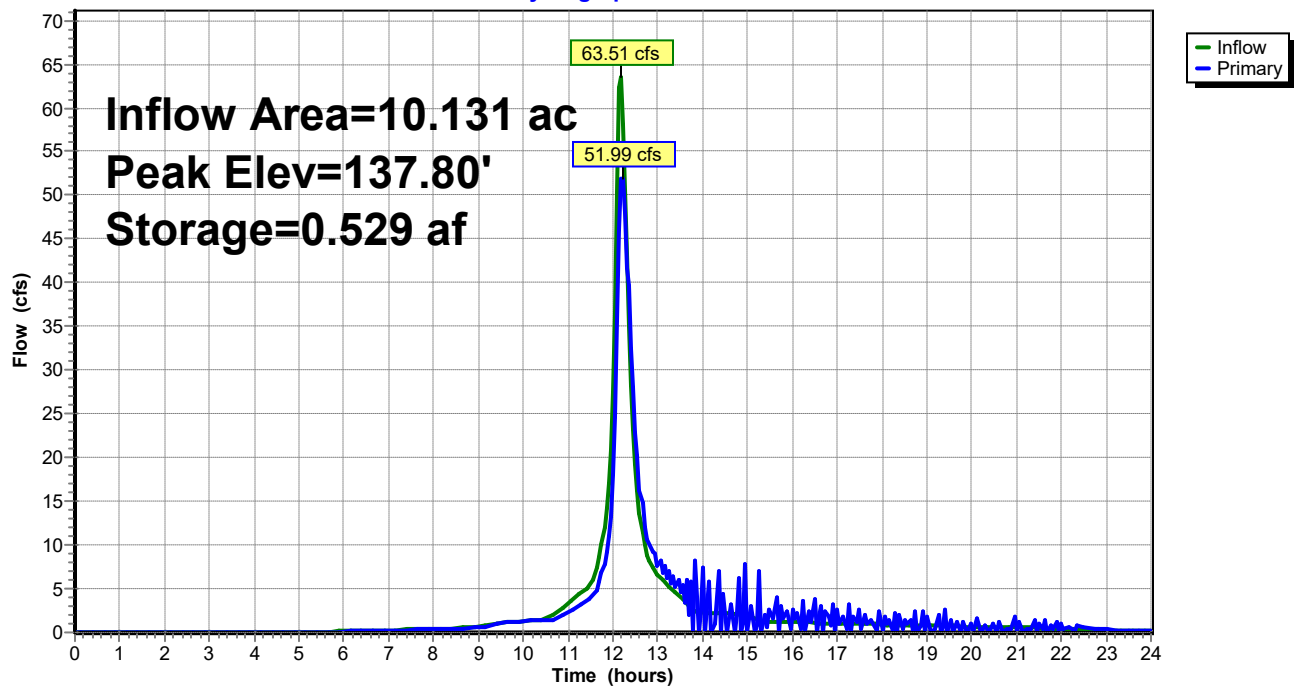
Device	Routing	Invert	Outlet Devices
#1	Primary	134.00'	43.0' long + 4.0 ' SideZ x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 12.21 hrs HW=137.55' TW=137.72' (Dynamic Tailwater)

↑1=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Wet Pond (WP-2A)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 167

Hydrograph for Pond 2P: Wet Pond (WP-2A)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	134.00	0.00
0.50	0.00	0.000	134.00	0.00
1.00	0.00	0.000	134.00	0.00
1.50	0.00	0.000	134.00	0.00
2.00	0.00	0.000	134.00	0.00
2.50	0.00	0.000	134.00	0.00
3.00	0.00	0.000	134.00	0.00
3.50	0.00	0.000	134.00	0.00
4.00	0.00	0.000	134.00	0.00
4.50	0.00	0.000	134.00	0.00
5.00	0.02	0.000	134.00	0.01
5.50	0.06	0.001	134.01	0.05
6.00	0.12	0.001	134.01	0.11
6.50	0.18	0.001	134.01	0.17
7.00	0.25	0.002	134.02	0.24
7.50	0.32	0.002	134.02	0.32
8.00	0.40	0.002	134.02	0.39
8.50	0.48	0.002	134.03	0.48
9.00	0.57	0.003	134.03	0.56
9.50	1.07	0.004	134.05	1.05
10.00	1.28	0.005	134.05	1.27
10.50	1.49	0.007	134.08	1.11
11.00	3.33	0.036	134.39	2.16
11.50	5.52	0.094	134.93	3.77
12.00	27.41	0.261	136.20	17.99
12.50	19.24	0.468	137.47	22.78
13.00	6.52	0.367	136.88	7.65
13.50	4.12	0.314	136.55	4.57
14.00	2.31	0.267	136.23	7.38
14.50	2.15	0.239	136.05	8.48
15.00	2.01	0.212	135.85	0.00
15.50	1.22	0.192	135.71	2.64
16.00	1.14	0.159	135.46	2.70
16.50	1.09	0.130	135.23	3.78
17.00	1.03	0.107	135.04	2.56
17.50	0.97	0.087	134.86	2.51
18.00	0.90	0.071	134.72	0.12
18.50	0.85	0.061	134.63	1.42
19.00	0.79	0.053	134.56	0.02
19.50	0.73	0.045	134.48	0.00
20.00	0.66	0.038	134.41	2.15
20.50	0.61	0.032	134.35	2.07
21.00	0.54	0.026	134.28	0.00
21.50	0.48	0.021	134.23	0.94
22.00	0.42	0.014	134.15	1.05
22.50	0.36	0.006	134.06	0.71
23.00	0.30	0.002	134.02	0.31
23.50	0.24	0.002	134.02	0.25
24.00	0.18	0.001	134.02	0.19

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 168

Stage-Discharge for Pond 2P: Wet Pond (WP-2A)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
134.00	0.00	136.60	572.31
134.05	1.14	136.65	590.73
134.10	3.25	136.70	609.42
134.15	5.99	136.75	628.36
134.20	9.25	136.80	647.57
134.25	13.17	136.85	667.04
134.30	17.63	136.90	686.77
134.35	22.61	136.95	706.77
134.40	28.12	137.00	727.02
134.45	34.31	137.05	747.82
134.50	41.08	137.10	768.90
134.55	48.43	137.15	790.26
134.60	56.37	137.20	811.89
134.65	63.67	137.25	833.80
134.70	71.27	137.30	856.00
134.75	79.18	137.35	878.47
134.80	87.37	137.40	901.22
134.85	96.02	137.45	924.26
134.90	104.98	137.50	947.57
134.95	114.25	137.55	971.53
135.00	123.82	137.60	995.80
135.05	133.55	137.65	1,020.36
135.10	143.57	137.70	1,045.23
135.15	153.85	137.75	1,070.40
135.20	164.40	137.80	1,095.87
135.25	175.05	137.85	1,121.65
135.30	185.94	137.90	1,147.73
135.35	197.07	137.95	1,174.12
135.40	208.42	138.00	1,200.82
135.45	220.43	138.05	1,228.28
135.50	232.71	138.10	1,256.07
135.55	245.26	138.15	1,284.19
135.60	258.08	138.20	1,312.64
135.65	271.17	138.25	1,341.43
135.70	284.53	138.30	1,370.55
135.75	298.15	138.35	1,400.00
135.80	312.05	138.40	1,429.79
135.85	326.20	138.45	1,459.92
135.90	340.63	138.50	1,490.39
135.95	355.32	138.55	1,521.76
136.00	370.27	138.60	1,553.49
136.05	385.63	138.65	1,585.58
136.10	401.27	138.70	1,618.04
136.15	417.18	138.75	1,650.87
136.20	433.36	138.80	1,684.07
136.25	449.82	138.85	1,717.65
136.30	466.56	138.90	1,751.59
136.35	483.57	138.95	1,785.91
136.40	500.85	139.00	1,820.61
136.45	518.41		
136.50	536.24		
136.55	554.14		

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 169

Stage-Area-Storage for Pond 2P: Wet Pond (WP-2A)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
134.00	0.087	0.000	136.60	0.157	0.322
134.05	0.089	0.004	136.65	0.158	0.330
134.10	0.090	0.009	136.70	0.159	0.338
134.15	0.092	0.013	136.75	0.161	0.346
134.20	0.093	0.018	136.80	0.162	0.354
134.25	0.095	0.023	136.85	0.163	0.362
134.30	0.096	0.027	136.90	0.165	0.370
134.35	0.098	0.032	136.95	0.166	0.379
134.40	0.099	0.037	137.00	0.167	0.387
134.45	0.101	0.042	137.05	0.168	0.395
134.50	0.102	0.047	137.10	0.170	0.404
134.55	0.104	0.053	137.15	0.171	0.412
134.60	0.106	0.058	137.20	0.172	0.421
134.65	0.107	0.063	137.25	0.174	0.430
134.70	0.109	0.068	137.30	0.175	0.438
134.75	0.110	0.074	137.35	0.176	0.447
134.80	0.112	0.080	137.40	0.178	0.456
134.85	0.113	0.085	137.45	0.179	0.465
134.90	0.115	0.091	137.50	0.180	0.474
134.95	0.116	0.097	137.55	0.182	0.483
135.00	0.118	0.102	137.60	0.183	0.492
135.05	0.119	0.108	137.65	0.185	0.501
135.10	0.120	0.114	137.70	0.186	0.511
135.15	0.122	0.120	137.75	0.187	0.520
135.20	0.123	0.127	137.80	0.189	0.529
135.25	0.124	0.133	137.85	0.190	0.539
135.30	0.125	0.139	137.90	0.191	0.548
135.35	0.126	0.145	137.95	0.193	0.558
135.40	0.128	0.152	138.00	0.194	0.568
135.45	0.129	0.158	138.05	0.195	0.577
135.50	0.130	0.164	138.10	0.197	0.587
135.55	0.131	0.171	138.15	0.198	0.597
135.60	0.132	0.178	138.20	0.199	0.607
135.65	0.134	0.184	138.25	0.201	0.617
135.70	0.135	0.191	138.30	0.202	0.627
135.75	0.136	0.198	138.35	0.203	0.637
135.80	0.137	0.205	138.40	0.205	0.647
135.85	0.138	0.211	138.45	0.206	0.658
135.90	0.140	0.218	138.50	0.208	0.668
135.95	0.141	0.225	138.55	0.209	0.678
136.00	0.142	0.233	138.60	0.210	0.689
136.05	0.143	0.240	138.65	0.212	0.699
136.10	0.144	0.247	138.70	0.213	0.710
136.15	0.146	0.254	138.75	0.214	0.721
136.20	0.147	0.261	138.80	0.216	0.731
136.25	0.148	0.269	138.85	0.217	0.742
136.30	0.150	0.276	138.90	0.218	0.753
136.35	0.151	0.284	138.95	0.220	0.764
136.40	0.152	0.291	139.00	0.221	0.775
136.45	0.153	0.299			
136.50	0.155	0.307			
136.55	0.156	0.314			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 100-yr Rainfall=6.18"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 170

Summary for Pond 3P: Bio-Filtration Basin (BF-2B)

[80] Warning: Exceeded Pond 2P by 0.38' @ 12.10 hrs (431.40 cfs 25.846 af)

Inflow Area = 10.131 ac, 0.00% Impervious, Inflow Depth > 4.99" for 100-yr event
 Inflow = 51.99 cfs @ 12.21 hrs, Volume= 4.212 af
 Outflow = 46.41 cfs @ 12.26 hrs, Volume= 4.176 af, Atten= 11%, Lag= 3.3 min
 Discarded = 0.14 cfs @ 12.26 hrs, Volume= 0.109 af
 Primary = 46.27 cfs @ 12.26 hrs, Volume= 4.066 af
 Routed to Link 7L : Total Discharge South (Meadowbrook Rd.)

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 137.80' @ 12.26 hrs Surf.Area= 0.191 ac Storage= 0.618 af

Plug-Flow detention time= 41.1 min calculated for 4.167 af (99% of inflow)
 Center-of-Mass det. time= 36.1 min (837.6 - 801.5)

Volume	Invert	Avail.Storage	Storage Description	
#1	131.50'	0.868 af	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (acres)	Voids (%)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
131.50	0.069	0.0	0.000	0.000
131.51	0.069	30.0	0.000	0.000
133.49	0.069	30.0	0.041	0.041
133.50	0.069	100.0	0.001	0.042
134.00	0.085	100.0	0.038	0.080
135.00	0.121	100.0	0.103	0.183
136.00	0.145	100.0	0.133	0.316
137.00	0.170	100.0	0.157	0.474
138.00	0.196	100.0	0.183	0.657
139.00	0.226	100.0	0.211	0.868

Device	Routing	Invert	Outlet Devices
#1	Primary	129.50'	24.0" Round Culvert L= 70.1' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 129.50' / 129.15' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Discarded	131.50'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 125.00'
#3	Device 1	132.00'	6.0" Round Underdrain L= 91.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 132.00' / 132.00' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#4	Device 1	134.25'	8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Device 1	136.10'	3.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#6	Device 1	137.00'	48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#7	Primary	138.00'	10.0' long + 4.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 171

Discarded OutFlow Max=0.14 cfs @ 12.26 hrs HW=137.79' (Free Discharge)

↑ **2=Exfiltration** (Controls 0.14 cfs)

Primary OutFlow Max=46.24 cfs @ 12.26 hrs HW=137.79' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 46.24 cfs @ 14.72 fps)

↑ **3=Underdrain** (Passes < 1.31 cfs potential flow)

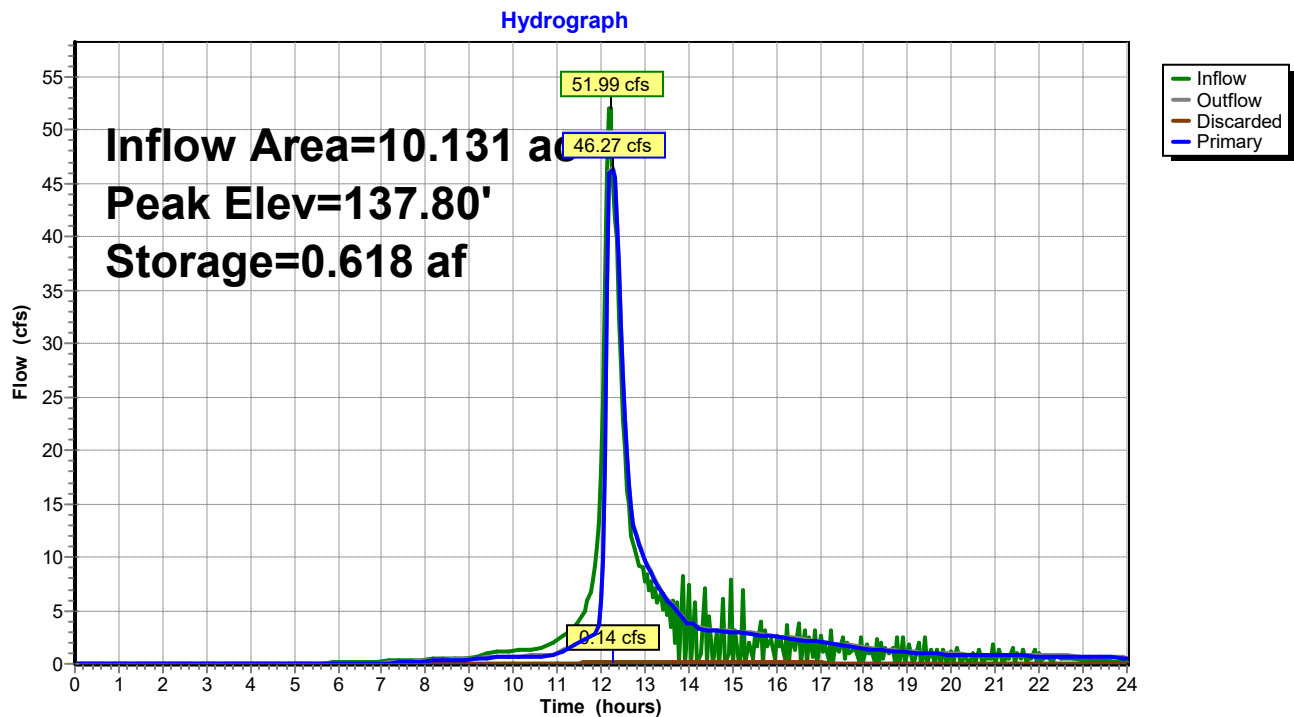
↑ **4=Orifice/Grate** (Passes < 3.01 cfs potential flow)

↑ **5=Sharp-Crested Rectangular Weir** (Passes < 19.10 cfs potential flow)

↑ **6=Orifice/Grate** (Passes < 28.76 cfs potential flow)

↑ **7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Bio-Filtration Basin (BF-2B)



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 172

Hydrograph for Pond 3P: Bio-Filtration Basin (BF-2B)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0.000	131.50	0.00	0.00	0.00
0.50	0.00	0.000	131.50	0.00	0.00	0.00
1.00	0.00	0.000	131.50	0.00	0.00	0.00
1.50	0.00	0.000	131.50	0.00	0.00	0.00
2.00	0.00	0.000	131.50	0.00	0.00	0.00
2.50	0.00	0.000	131.50	0.00	0.00	0.00
3.00	0.00	0.000	131.50	0.00	0.00	0.00
3.50	0.00	0.000	131.50	0.00	0.00	0.00
4.00	0.00	0.000	131.50	0.00	0.00	0.00
4.50	0.00	0.000	131.50	0.00	0.00	0.00
5.00	0.01	0.000	131.50	0.01	0.01	0.00
5.50	0.05	0.000	131.51	0.03	0.03	0.00
6.00	0.11	0.002	131.60	0.04	0.04	0.00
6.50	0.17	0.006	131.81	0.04	0.04	0.00
7.00	0.24	0.013	132.14	0.05	0.04	0.01
7.50	0.32	0.020	132.46	0.19	0.04	0.15
8.00	0.39	0.024	132.67	0.28	0.04	0.23
8.50	0.48	0.028	132.86	0.39	0.04	0.34
9.00	0.56	0.032	133.05	0.46	0.04	0.42
9.50	1.05	0.044	133.52	0.62	0.05	0.58
10.00	1.27	0.064	133.80	0.70	0.05	0.65
10.50	1.11	0.088	134.09	0.78	0.06	0.72
11.00	2.16	0.121	134.44	0.98	0.07	0.91
11.50	3.77	0.182	134.99	2.05	0.08	1.97
12.00	17.99	0.391	136.49	5.91	0.11	5.79
12.50	22.78	0.540	137.38	26.82	0.13	26.69
13.00	7.65	0.447	136.84	9.74	0.12	9.61
13.50	4.57	0.395	136.52	6.20	0.11	6.09
14.00	7.38	0.356	136.26	4.04	0.11	3.93
14.50	8.48	0.328	136.08	3.24	0.10	3.14
15.00	0.00	0.311	135.97	3.14	0.10	3.04
15.50	2.64	0.270	135.67	2.86	0.10	2.76
16.00	2.70	0.237	135.43	2.61	0.09	2.52
16.50	3.78	0.210	135.22	2.37	0.09	2.28
17.00	2.56	0.185	135.01	2.08	0.08	2.00
17.50	2.51	0.165	134.85	1.82	0.08	1.74
18.00	0.12	0.151	134.72	1.53	0.07	1.46
18.50	1.42	0.139	134.61	1.30	0.07	1.22
19.00	0.02	0.129	134.52	1.11	0.07	1.04
19.50	0.00	0.123	134.46	1.01	0.07	0.94
20.00	2.15	0.118	134.41	0.94	0.07	0.88
20.50	2.07	0.113	134.35	0.88	0.07	0.81
21.00	0.00	0.108	134.30	0.84	0.06	0.77
21.50	0.94	0.100	134.22	0.81	0.06	0.75
22.00	1.05	0.093	134.14	0.79	0.06	0.73
22.50	0.71	0.085	134.05	0.77	0.06	0.71
23.00	0.31	0.071	133.89	0.73	0.05	0.67
23.50	0.25	0.054	133.67	0.66	0.05	0.62
24.00	0.19	0.037	133.29	0.55	0.04	0.51

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 173

Stage-Discharge for Pond 3P: Bio-Filtration Basin (BF-2B)

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)
131.50	0.00	0.00	0.00	136.70	8.11	0.12	7.99
131.60	0.04	0.04	0.00	136.80	9.28	0.12	9.16
131.70	0.04	0.04	0.00	136.90	10.52	0.12	10.40
131.80	0.04	0.04	0.00	137.00	11.82	0.13	11.69
131.90	0.04	0.04	0.00	137.10	14.47	0.13	14.34
132.00	0.04	0.04	0.00	137.20	18.25	0.13	18.12
132.10	0.04	0.04	0.00	137.30	22.77	0.13	22.63
132.20	0.06	0.04	0.03	137.40	27.89	0.13	27.76
132.30	0.10	0.04	0.07	137.50	33.54	0.14	33.41
132.40	0.16	0.04	0.12	137.60	39.66	0.14	39.52
132.50	0.22	0.04	0.18	137.70	46.07	0.14	45.93
132.60	0.27	0.04	0.23	137.80	46.42	0.14	46.28
132.70	0.30	0.04	0.25	137.90	46.77	0.15	46.62
132.80	0.35	0.04	0.31	138.00	47.12	0.15	46.97
132.90	0.40	0.04	0.36	138.10	48.27	0.15	48.12
133.00	0.45	0.04	0.40	138.20	50.17	0.15	50.02
133.10	0.48	0.04	0.44	138.30	52.69	0.16	52.53
133.20	0.52	0.04	0.48	138.40	55.78	0.16	55.63
133.30	0.55	0.04	0.51	138.50	59.60	0.16	59.44
133.40	0.59	0.04	0.54	138.60	64.10	0.17	63.94
133.50	0.62	0.05	0.57	138.70	68.80	0.17	68.63
133.60	0.65	0.05	0.60	138.80	73.98	0.17	73.81
133.70	0.67	0.05	0.62	138.90	79.66	0.17	79.49
133.80	0.70	0.05	0.65	139.00	85.83	0.18	85.66
133.90	0.73	0.05	0.67				
134.00	0.75	0.06	0.70				
134.10	0.78	0.06	0.72				
134.20	0.80	0.06	0.74				
134.30	0.84	0.06	0.77				
134.40	0.93	0.07	0.86				
134.50	1.08	0.07	1.01				
134.60	1.27	0.07	1.20				
134.70	1.49	0.07	1.42				
134.80	1.72	0.08	1.64				
134.90	1.91	0.08	1.83				
135.00	2.07	0.08	1.99				
135.10	2.21	0.08	2.13				
135.20	2.34	0.09	2.26				
135.30	2.46	0.09	2.38				
135.40	2.58	0.09	2.49				
135.50	2.69	0.09	2.60				
135.60	2.79	0.09	2.70				
135.70	2.89	0.10	2.79				
135.80	2.99	0.10	2.89				
135.90	3.08	0.10	2.98				
136.00	3.17	0.10	3.07				
136.10	3.26	0.10	3.15				
136.20	3.65	0.11	3.54				
136.30	4.29	0.11	4.18				
136.40	5.08	0.11	4.97				
136.50	6.00	0.11	5.88				
136.60	7.01	0.12	6.89				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

MSE 24-hr 3 100-yr Rainfall=6.18"

Printed 9/18/2025

Page 174

Stage-Area-Storage for Pond 3P: Bio-Filtration Basin (BF-2B)

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
131.50	0.069	0.000	136.70	0.162	0.424
131.60	0.069	0.002	136.80	0.165	0.440
131.70	0.069	0.004	136.90	0.168	0.457
131.80	0.069	0.006	137.00	0.170	0.474
131.90	0.069	0.008	137.10	0.173	0.491
132.00	0.069	0.010	137.20	0.175	0.508
132.10	0.069	0.012	137.30	0.178	0.526
132.20	0.069	0.014	137.40	0.180	0.544
132.30	0.069	0.017	137.50	0.183	0.562
132.40	0.069	0.019	137.60	0.186	0.581
132.50	0.069	0.021	137.70	0.188	0.599
132.60	0.069	0.023	137.80	0.191	0.618
132.70	0.069	0.025	137.90	0.193	0.637
132.80	0.069	0.027	138.00	0.196	0.657
132.90	0.069	0.029	138.10	0.199	0.677
133.00	0.069	0.031	138.20	0.202	0.697
133.10	0.069	0.033	138.30	0.205	0.717
133.20	0.069	0.035	138.40	0.208	0.738
133.30	0.069	0.037	138.50	0.211	0.759
133.40	0.069	0.039	138.60	0.214	0.780
133.50	0.069	0.042	138.70	0.217	0.801
133.60	0.072	0.049	138.80	0.220	0.823
133.70	0.075	0.056	138.90	0.223	0.845
133.80	0.079	0.064	139.00	0.226	0.868
133.90	0.082	0.072			
134.00	0.085	0.080			
134.10	0.089	0.089			
134.20	0.092	0.098			
134.30	0.096	0.108			
134.40	0.099	0.117			
134.50	0.103	0.127			
134.60	0.107	0.138			
134.70	0.110	0.149			
134.80	0.114	0.160			
134.90	0.117	0.171			
135.00	0.121	0.183			
135.10	0.123	0.196			
135.20	0.126	0.208			
135.30	0.128	0.221			
135.40	0.131	0.234			
135.50	0.133	0.247			
135.60	0.135	0.260			
135.70	0.138	0.274			
135.80	0.140	0.288			
135.90	0.143	0.302			
136.00	0.145	0.316			
136.10	0.147	0.331			
136.20	0.150	0.346			
136.30	0.153	0.361			
136.40	0.155	0.376			
136.50	0.157	0.392			
136.60	0.160	0.408			

2025-09-16_HydroCAD Calculation

MSE 24-hr 3 100-yr Rainfall=6.18"

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 175

Summary for Pond 5P: Wet Pond (WP-3)

Inflow Area = 7.021 ac, 0.00% Impervious, Inflow Depth > 4.36" for 100-yr event
 Inflow = 28.14 cfs @ 12.39 hrs, Volume= 2.550 af
 Outflow = 26.22 cfs @ 12.48 hrs, Volume= 2.299 af, Atten= 7%, Lag= 5.2 min
 Primary = 26.22 cfs @ 12.48 hrs, Volume= 2.299 af
 Routed to Link 6L : Total Discharge North

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 167.88' @ 12.48 hrs Surf.Area= 0.281 ac Storage= 0.556 af

Plug-Flow detention time= 84.4 min calculated for 2.299 af (90% of inflow)
 Center-of-Mass det. time= 43.6 min (848.8 - 805.2)

Volume	Invert	Avail.Storage	Storage Description
#1	165.00'	0.931 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
165.00	0.119	0.000	0.000
166.00	0.165	0.142	0.142
167.00	0.221	0.193	0.335
168.00	0.289	0.255	0.590
169.00	0.393	0.341	0.931

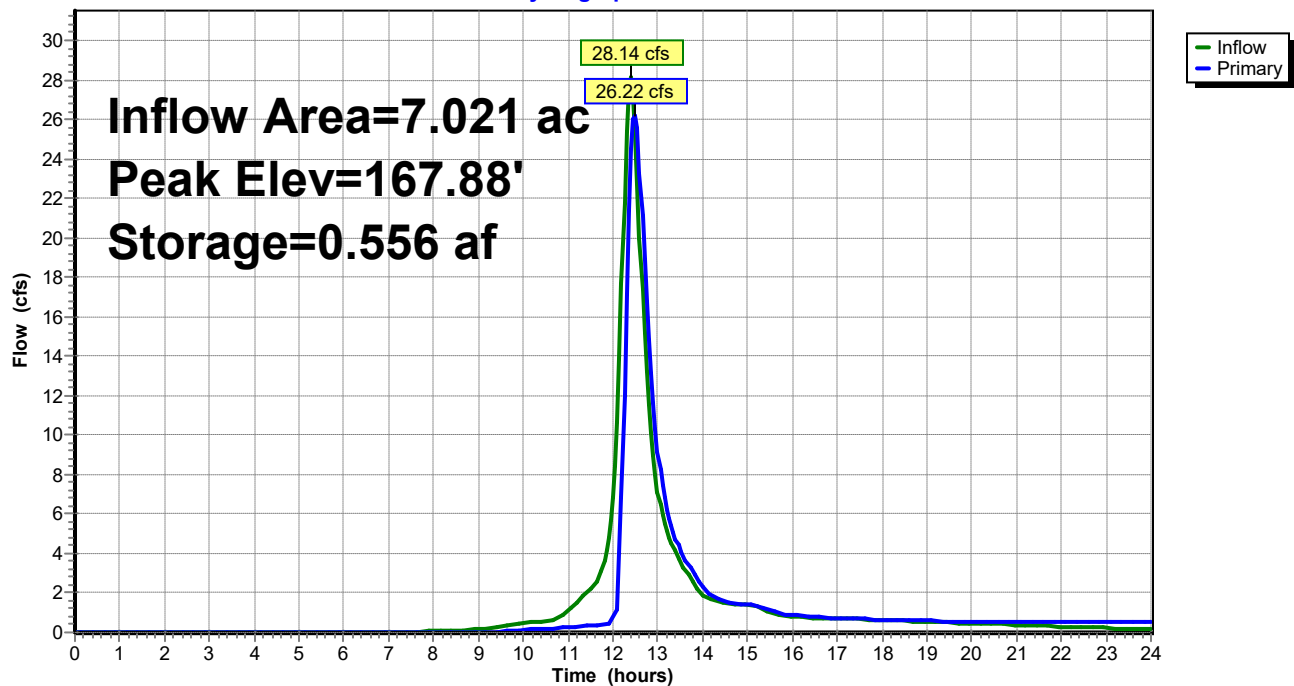
Device	Routing	Invert	Outlet Devices
#1	Primary	162.50'	24.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 162.50' / 161.50' S= 0.0182 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	165.00'	4.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	167.00'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	168.00'	20.0' long + 4.0 ' SideZ x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=26.08 cfs @ 12.48 hrs HW=167.88' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 26.08 cfs of 31.65 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.69 cfs @ 7.93 fps)
 3=Orifice/Grate (Weir Controls 25.39 cfs @ 3.07 fps)
 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P: Wet Pond (WP-3)

Hydrograph



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 177

Hydrograph for Pond 5P: Wet Pond (WP-3)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	165.00	0.00
0.50	0.00	0.000	165.00	0.00
1.00	0.00	0.000	165.00	0.00
1.50	0.00	0.000	165.00	0.00
2.00	0.00	0.000	165.00	0.00
2.50	0.00	0.000	165.00	0.00
3.00	0.00	0.000	165.00	0.00
3.50	0.00	0.000	165.00	0.00
4.00	0.00	0.000	165.00	0.00
4.50	0.00	0.000	165.00	0.00
5.00	0.00	0.000	165.00	0.00
5.50	0.00	0.000	165.00	0.00
6.00	0.00	0.000	165.00	0.00
6.50	0.00	0.000	165.00	0.00
7.00	0.00	0.000	165.00	0.00
7.50	0.03	0.001	165.00	0.00
8.00	0.07	0.002	165.02	0.00
8.50	0.11	0.006	165.05	0.01
9.00	0.16	0.011	165.09	0.02
9.50	0.30	0.018	165.15	0.05
10.00	0.46	0.031	165.25	0.12
10.50	0.59	0.046	165.36	0.19
11.00	1.12	0.069	165.53	0.25
11.50	2.24	0.125	165.89	0.36
12.00	6.86	0.258	166.64	0.51
12.50	25.28	0.556	167.88	26.12
13.00	7.14	0.435	167.43	9.18
13.50	3.61	0.390	167.24	4.21
14.00	1.89	0.368	167.15	2.33
14.50	1.49	0.358	167.10	1.60
15.00	1.38	0.355	167.09	1.42
15.50	0.96	0.351	167.07	1.16
16.00	0.79	0.345	167.05	0.87
16.50	0.74	0.343	167.04	0.78
17.00	0.70	0.342	167.03	0.73
17.50	0.66	0.340	167.02	0.69
18.00	0.62	0.339	167.02	0.65
18.50	0.58	0.338	167.01	0.62
19.00	0.54	0.336	167.01	0.58
19.50	0.50	0.334	167.00	0.57
20.00	0.46	0.331	166.98	0.57
20.50	0.42	0.326	166.96	0.56
21.00	0.38	0.319	166.93	0.56
21.50	0.34	0.311	166.89	0.55
22.00	0.30	0.302	166.85	0.54
22.50	0.26	0.291	166.80	0.54
23.00	0.22	0.279	166.74	0.53
23.50	0.18	0.266	166.68	0.52
24.00	0.14	0.252	166.60	0.50

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 178

Stage-Discharge for Pond 5P: Wet Pond (WP-3)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
165.00	0.00	166.04	0.39	167.08	1.28	168.12	34.78
165.02	0.00	166.06	0.40	167.10	1.56	168.14	35.45
165.04	0.00	166.08	0.40	167.12	1.87	168.16	36.17
165.06	0.01	166.10	0.41	167.14	2.20	168.18	36.94
165.08	0.02	166.12	0.41	167.16	2.57	168.20	37.74
165.10	0.02	166.14	0.41	167.18	2.95	168.22	38.59
165.12	0.03	166.16	0.42	167.20	3.36	168.24	39.49
165.14	0.04	166.18	0.42	167.22	3.78	168.26	40.42
165.16	0.06	166.20	0.43	167.24	4.23	168.28	41.39
165.18	0.07	166.22	0.43	167.26	4.69	168.30	42.41
165.20	0.08	166.24	0.44	167.28	5.18	168.32	43.45
165.22	0.10	166.26	0.44	167.30	5.68	168.34	44.54
165.24	0.11	166.28	0.44	167.32	6.20	168.36	45.66
165.26	0.13	166.30	0.45	167.34	6.73	168.38	46.82
165.28	0.14	166.32	0.45	167.36	7.28	168.40	48.02
165.30	0.15	166.34	0.46	167.38	7.84	168.42	49.24
165.32	0.17	166.36	0.46	167.40	8.42	168.44	50.49
165.34	0.17	166.38	0.46	167.42	9.02	168.46	51.78
165.36	0.18	166.40	0.47	167.44	9.63	168.48	53.09
165.38	0.19	166.42	0.47	167.46	10.25	168.50	54.44
165.40	0.20	166.44	0.47	167.48	10.89	168.52	55.83
165.42	0.21	166.46	0.48	167.50	11.54	168.54	57.24
165.44	0.22	166.48	0.48	167.52	12.20	168.56	58.68
165.46	0.23	166.50	0.49	167.54	12.88	168.58	60.16
165.48	0.24	166.52	0.49	167.56	13.57	168.60	61.67
165.50	0.24	166.54	0.49	167.58	14.27	168.62	63.14
165.52	0.25	166.56	0.50	167.60	14.98	168.64	64.64
165.54	0.26	166.58	0.50	167.62	15.70	168.66	66.16
165.56	0.26	166.60	0.50	167.64	16.44	168.68	67.70
165.58	0.27	166.62	0.51	167.66	17.19	168.70	69.27
165.60	0.28	166.64	0.51	167.68	17.95	168.72	70.86
165.62	0.28	166.66	0.51	167.70	18.72	168.74	72.47
165.64	0.29	166.68	0.52	167.72	19.50	168.76	74.11
165.66	0.30	166.70	0.52	167.74	20.29	168.78	75.76
165.68	0.30	166.72	0.52	167.76	21.10	168.80	77.44
165.70	0.31	166.74	0.53	167.78	21.91	168.82	79.22
165.72	0.31	166.76	0.53	167.80	22.73	168.84	81.03
165.74	0.32	166.78	0.53	167.82	23.57	168.86	82.87
165.76	0.32	166.80	0.54	167.84	24.41	168.88	84.73
165.78	0.33	166.82	0.54	167.86	25.27	168.90	86.63
165.80	0.33	166.84	0.54	167.88	26.13	168.92	88.55
165.82	0.34	166.86	0.55	167.90	27.01	168.94	90.49
165.84	0.34	166.88	0.55	167.92	27.89	168.96	92.46
165.86	0.35	166.90	0.55	167.94	28.79	168.98	94.46
165.88	0.35	166.92	0.56	167.96	29.69	169.00	96.49
165.90	0.36	166.94	0.56	167.98	30.60		
165.92	0.36	166.96	0.56	168.00	31.53		
165.94	0.37	166.98	0.57	168.02	32.31		
165.96	0.37	167.00	0.57	168.04	32.66		
165.98	0.38	167.02	0.66	168.06	33.10		
166.00	0.38	167.04	0.82	168.08	33.60		
166.02	0.39	167.06	1.03	168.10	34.17		

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 179

Stage-Area-Storage for Pond 5P: Wet Pond (WP-3)

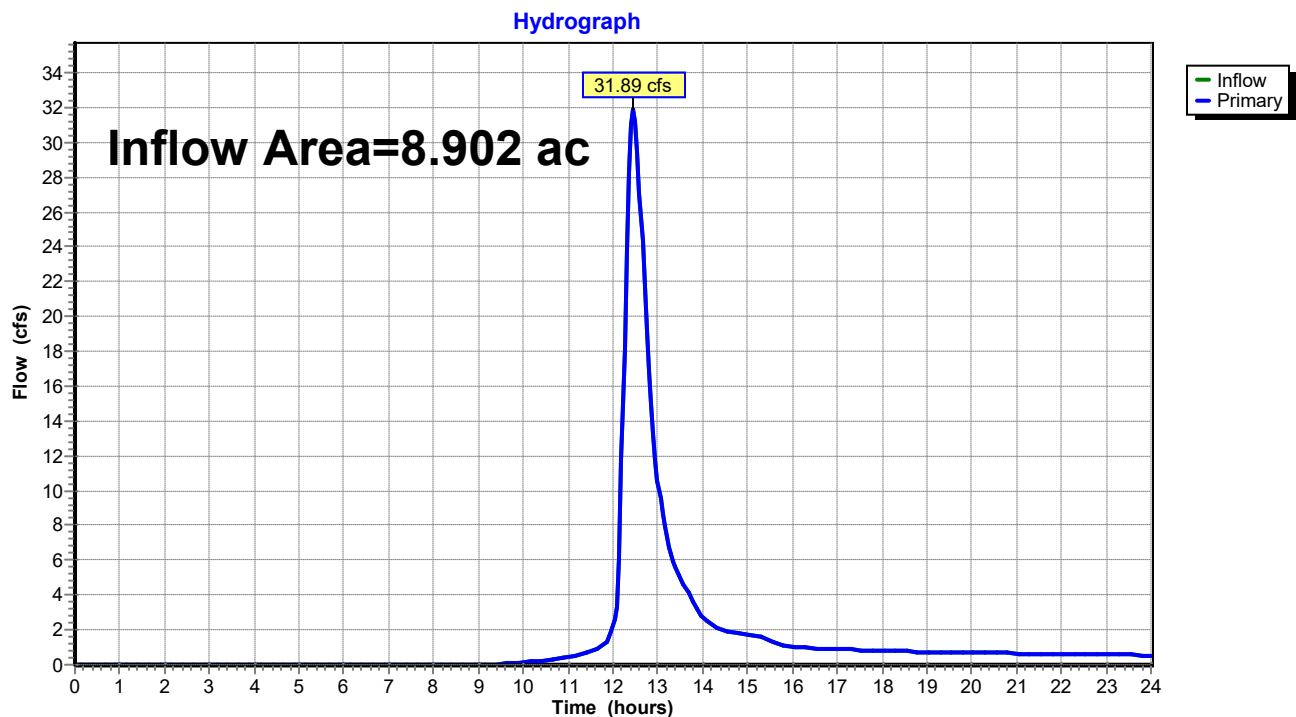
Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
165.00	0.119	0.000	167.60	0.262	0.480
165.05	0.121	0.006	167.65	0.265	0.493
165.10	0.124	0.012	167.70	0.269	0.506
165.15	0.126	0.018	167.75	0.272	0.520
165.20	0.128	0.025	167.80	0.275	0.534
165.25	0.130	0.031	167.85	0.279	0.547
165.30	0.133	0.038	167.90	0.282	0.561
165.35	0.135	0.044	167.95	0.286	0.576
165.40	0.137	0.051	168.00	0.289	0.590
165.45	0.140	0.058	168.05	0.294	0.605
165.50	0.142	0.065	168.10	0.299	0.619
165.55	0.144	0.072	168.15	0.305	0.635
165.60	0.147	0.080	168.20	0.310	0.650
165.65	0.149	0.087	168.25	0.315	0.665
165.70	0.151	0.095	168.30	0.320	0.681
165.75	0.153	0.102	168.35	0.325	0.698
165.80	0.156	0.110	168.40	0.331	0.714
165.85	0.158	0.118	168.45	0.336	0.731
165.90	0.160	0.126	168.50	0.341	0.748
165.95	0.163	0.134	168.55	0.346	0.765
166.00	0.165	0.142	168.60	0.351	0.782
166.05	0.168	0.150	168.65	0.357	0.800
166.10	0.171	0.159	168.70	0.362	0.818
166.15	0.173	0.167	168.75	0.367	0.836
166.20	0.176	0.176	168.80	0.372	0.854
166.25	0.179	0.185	168.85	0.377	0.873
166.30	0.182	0.194	168.90	0.383	0.892
166.35	0.185	0.203	168.95	0.388	0.911
166.40	0.187	0.212	169.00	0.393	0.931
166.45	0.190	0.222			
166.50	0.193	0.231			
166.55	0.196	0.241			
166.60	0.199	0.251			
166.65	0.201	0.261			
166.70	0.204	0.271			
166.75	0.207	0.281			
166.80	0.210	0.292			
166.85	0.213	0.302			
166.90	0.215	0.313			
166.95	0.218	0.324			
167.00	0.221	0.335			
167.05	0.224	0.346			
167.10	0.228	0.357			
167.15	0.231	0.369			
167.20	0.235	0.381			
167.25	0.238	0.392			
167.30	0.241	0.404			
167.35	0.245	0.417			
167.40	0.248	0.429			
167.45	0.252	0.441			
167.50	0.255	0.454			
167.55	0.258	0.467			

Summary for Link 6L: Total Discharge North

Inflow Area = 8.902 ac, 0.00% Impervious, Inflow Depth > 3.84" for 100-yr event
 Inflow = 31.89 cfs @ 12.45 hrs, Volume= 2.852 af
 Primary = 31.89 cfs @ 12.45 hrs, Volume= 2.852 af, Atten= 0%, Lag= 0.0 min
 Routed to Link 8L : Total Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 6L: Total Discharge North



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 181

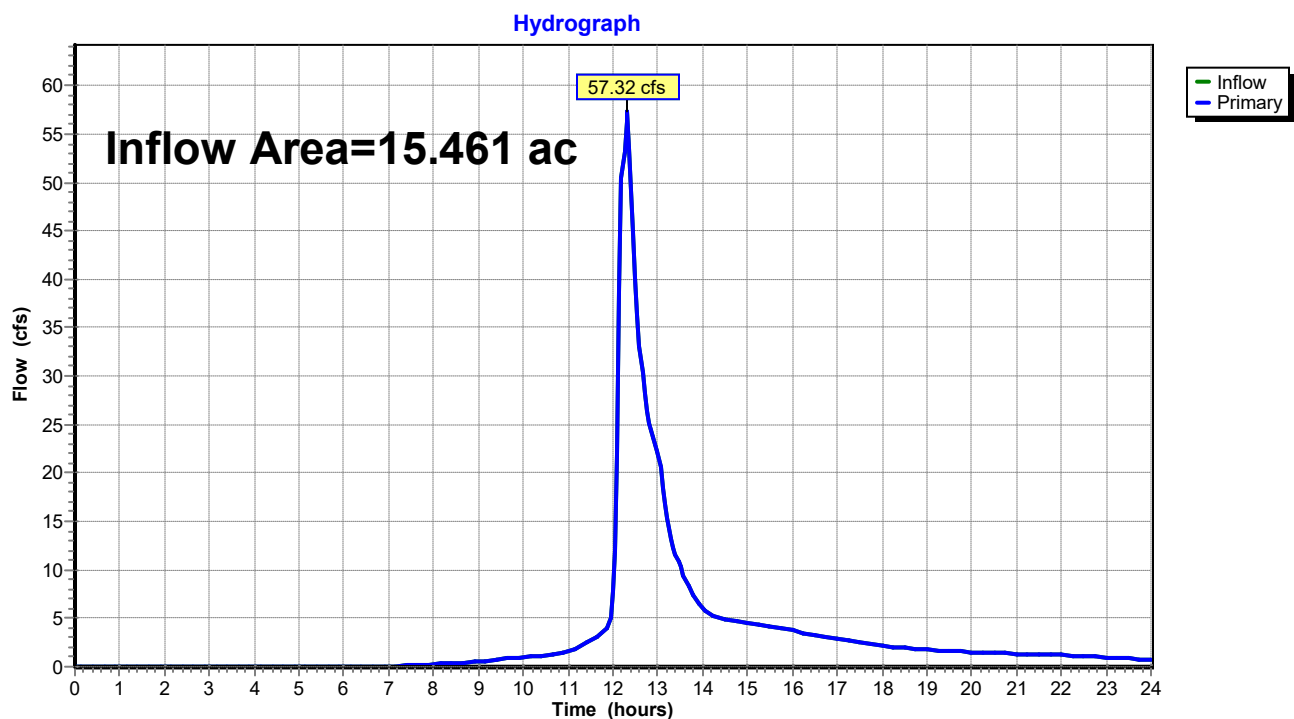
Hydrograph for Link 6L: Total Discharge North

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	10.55	0.00	10.55
0.25	0.00	0.00	0.00	13.25	6.79	0.00	6.79
0.50	0.00	0.00	0.00	13.50	4.99	0.00	4.99
0.75	0.00	0.00	0.00	13.75	3.76	0.00	3.76
1.00	0.00	0.00	0.00	14.00	2.75	0.00	2.75
1.25	0.00	0.00	0.00	14.25	2.20	0.00	2.20
1.50	0.00	0.00	0.00	14.50	1.96	0.00	1.96
1.75	0.00	0.00	0.00	14.75	1.84	0.00	1.84
2.00	0.00	0.00	0.00	15.00	1.76	0.00	1.76
2.25	0.00	0.00	0.00	15.25	1.64	0.00	1.64
2.50	0.00	0.00	0.00	15.50	1.38	0.00	1.38
2.75	0.00	0.00	0.00	15.75	1.18	0.00	1.18
3.00	0.00	0.00	0.00	16.00	1.06	0.00	1.06
3.25	0.00	0.00	0.00	16.25	1.00	0.00	1.00
3.50	0.00	0.00	0.00	16.50	0.96	0.00	0.96
3.75	0.00	0.00	0.00	16.75	0.93	0.00	0.93
4.00	0.00	0.00	0.00	17.00	0.90	0.00	0.90
4.25	0.00	0.00	0.00	17.25	0.88	0.00	0.88
4.50	0.00	0.00	0.00	17.50	0.85	0.00	0.85
4.75	0.00	0.00	0.00	17.75	0.83	0.00	0.83
5.00	0.00	0.00	0.00	18.00	0.80	0.00	0.80
5.25	0.00	0.00	0.00	18.25	0.78	0.00	0.78
5.50	0.00	0.00	0.00	18.50	0.76	0.00	0.76
5.75	0.00	0.00	0.00	18.75	0.74	0.00	0.74
6.00	0.00	0.00	0.00	19.00	0.72	0.00	0.72
6.25	0.00	0.00	0.00	19.25	0.70	0.00	0.70
6.50	0.00	0.00	0.00	19.50	0.69	0.00	0.69
6.75	0.00	0.00	0.00	19.75	0.69	0.00	0.69
7.00	0.00	0.00	0.00	20.00	0.68	0.00	0.68
7.25	0.00	0.00	0.00	20.25	0.67	0.00	0.67
7.50	0.00	0.00	0.00	20.50	0.67	0.00	0.67
7.75	0.00	0.00	0.00	20.75	0.66	0.00	0.66
8.00	0.00	0.00	0.00	21.00	0.65	0.00	0.65
8.25	0.00	0.00	0.00	21.25	0.64	0.00	0.64
8.50	0.01	0.00	0.01	21.50	0.64	0.00	0.64
8.75	0.01	0.00	0.01	21.75	0.63	0.00	0.63
9.00	0.02	0.00	0.02	22.00	0.62	0.00	0.62
9.25	0.03	0.00	0.03	22.25	0.61	0.00	0.61
9.50	0.06	0.00	0.06	22.50	0.60	0.00	0.60
9.75	0.10	0.00	0.10	22.75	0.59	0.00	0.59
10.00	0.15	0.00	0.15	23.00	0.58	0.00	0.58
10.25	0.20	0.00	0.20	23.25	0.57	0.00	0.57
10.50	0.25	0.00	0.25	23.50	0.56	0.00	0.56
10.75	0.31	0.00	0.31	23.75	0.55	0.00	0.55
11.00	0.41	0.00	0.41	24.00	0.54	0.00	0.54
11.25	0.56	0.00	0.56				
11.50	0.74	0.00	0.74				
11.75	1.04	0.00	1.04				
12.00	2.11	0.00	2.11				
12.25	18.09	0.00	18.09				
12.50	31.23	0.00	31.23				
12.75	19.19	0.00	19.19				

Summary for Link 7L: Total Discharge South (Meadowbrook Rd.)

Inflow Area = 15.461 ac, 0.00% Impervious, Inflow Depth > 4.77" for 100-yr event
Inflow = 57.32 cfs @ 12.33 hrs, Volume= 6.149 af
Primary = 57.32 cfs @ 12.33 hrs, Volume= 6.149 af, Atten= 0%, Lag= 0.0 min
Routed to Link 8L : Total Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 7L: Total Discharge South (Meadowbrook Rd.)

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 183

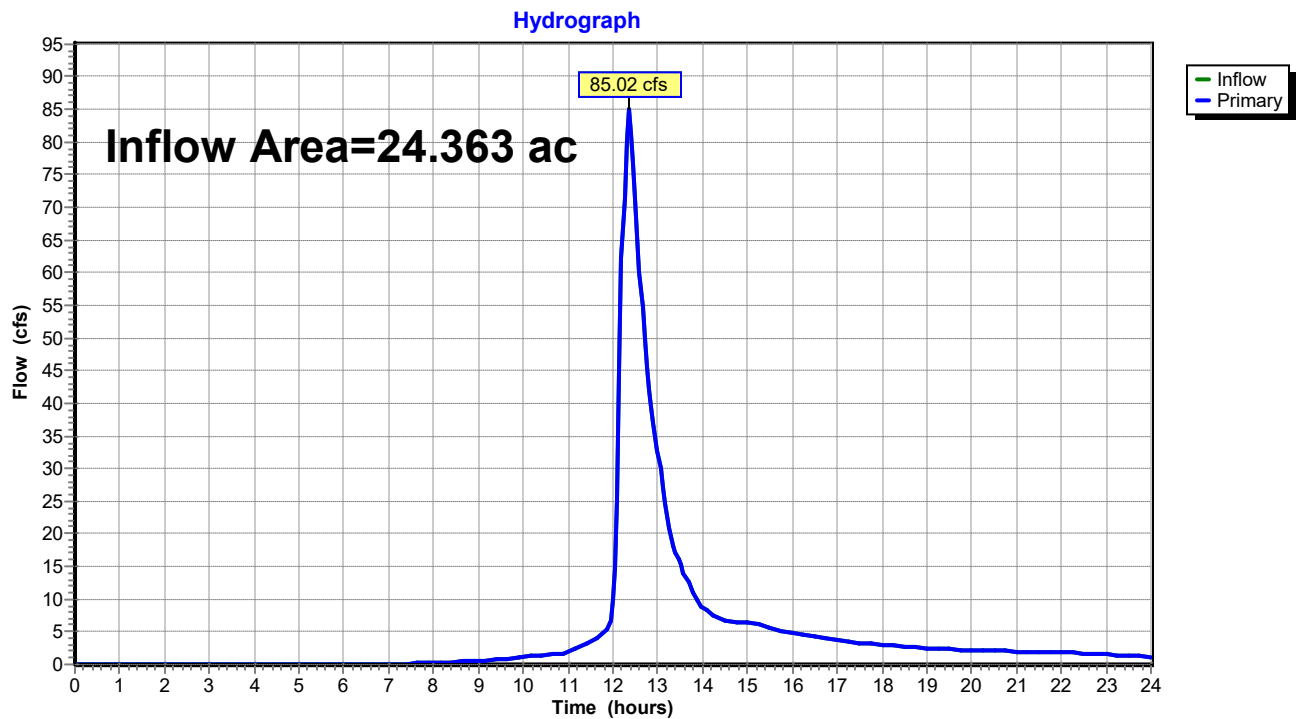
Hydrograph for Link 7L: Total Discharge South (Meadowbrook Rd.)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	22.28	0.00	22.28
0.25	0.00	0.00	0.00	13.25	14.25	0.00	14.25
0.50	0.00	0.00	0.00	13.50	10.26	0.00	10.26
0.75	0.00	0.00	0.00	13.75	7.70	0.00	7.70
1.00	0.00	0.00	0.00	14.00	6.14	0.00	6.14
1.25	0.00	0.00	0.00	14.25	5.14	0.00	5.14
1.50	0.00	0.00	0.00	14.50	4.84	0.00	4.84
1.75	0.00	0.00	0.00	14.75	4.67	0.00	4.67
2.00	0.00	0.00	0.00	15.00	4.62	0.00	4.62
2.25	0.00	0.00	0.00	15.25	4.41	0.00	4.41
2.50	0.00	0.00	0.00	15.50	4.18	0.00	4.18
2.75	0.00	0.00	0.00	15.75	3.95	0.00	3.95
3.00	0.00	0.00	0.00	16.00	3.71	0.00	3.71
3.25	0.00	0.00	0.00	16.25	3.46	0.00	3.46
3.50	0.00	0.00	0.00	16.50	3.23	0.00	3.23
3.75	0.00	0.00	0.00	16.75	3.00	0.00	3.00
4.00	0.00	0.00	0.00	17.00	2.82	0.00	2.82
4.25	0.00	0.00	0.00	17.25	2.65	0.00	2.65
4.50	0.00	0.00	0.00	17.50	2.49	0.00	2.49
4.75	0.00	0.00	0.00	17.75	2.33	0.00	2.33
5.00	0.00	0.00	0.00	18.00	2.18	0.00	2.18
5.25	0.00	0.00	0.00	18.25	2.04	0.00	2.04
5.50	0.00	0.00	0.00	18.50	1.93	0.00	1.93
5.75	0.00	0.00	0.00	18.75	1.84	0.00	1.84
6.00	0.00	0.00	0.00	19.00	1.72	0.00	1.72
6.25	0.00	0.00	0.00	19.25	1.69	0.00	1.69
6.50	0.00	0.00	0.00	19.50	1.60	0.00	1.60
6.75	0.00	0.00	0.00	19.75	1.59	0.00	1.59
7.00	0.01	0.00	0.01	20.00	1.51	0.00	1.51
7.25	0.07	0.00	0.07	20.25	1.47	0.00	1.47
7.50	0.15	0.00	0.15	20.50	1.42	0.00	1.42
7.75	0.22	0.00	0.22	20.75	1.38	0.00	1.38
8.00	0.23	0.00	0.23	21.00	1.35	0.00	1.35
8.25	0.30	0.00	0.30	21.25	1.31	0.00	1.31
8.50	0.36	0.00	0.36	21.50	1.29	0.00	1.29
8.75	0.44	0.00	0.44	21.75	1.26	0.00	1.26
9.00	0.52	0.00	0.52	22.00	1.22	0.00	1.22
9.25	0.63	0.00	0.63	22.25	1.16	0.00	1.16
9.50	0.79	0.00	0.79	22.50	1.09	0.00	1.09
9.75	0.89	0.00	0.89	22.75	1.02	0.00	1.02
10.00	1.00	0.00	1.00	23.00	0.94	0.00	0.94
10.25	1.09	0.00	1.09	23.25	0.86	0.00	0.86
10.50	1.18	0.00	1.18	23.50	0.82	0.00	0.82
10.75	1.27	0.00	1.27	23.75	0.75	0.00	0.75
11.00	1.48	0.00	1.48	24.00	0.64	0.00	0.64
11.25	2.06	0.00	2.06				
11.50	2.69	0.00	2.69				
11.75	3.43	0.00	3.43				
12.00	7.72	0.00	7.72				
12.25	53.22	0.00	53.22				
12.50	40.15	0.00	40.15				
12.75	26.46	0.00	26.46				

Summary for Link 8L: Total Proposed Discharge

Inflow Area = 24.363 ac, 0.00% Impervious, Inflow Depth > 4.43" for 100-yr event
Inflow = 85.02 cfs @ 12.35 hrs, Volume= 9.001 af
Primary = 85.02 cfs @ 12.35 hrs, Volume= 9.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: Total Proposed Discharge

2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 185

Hydrograph for Link 8L: Total Proposed Discharge

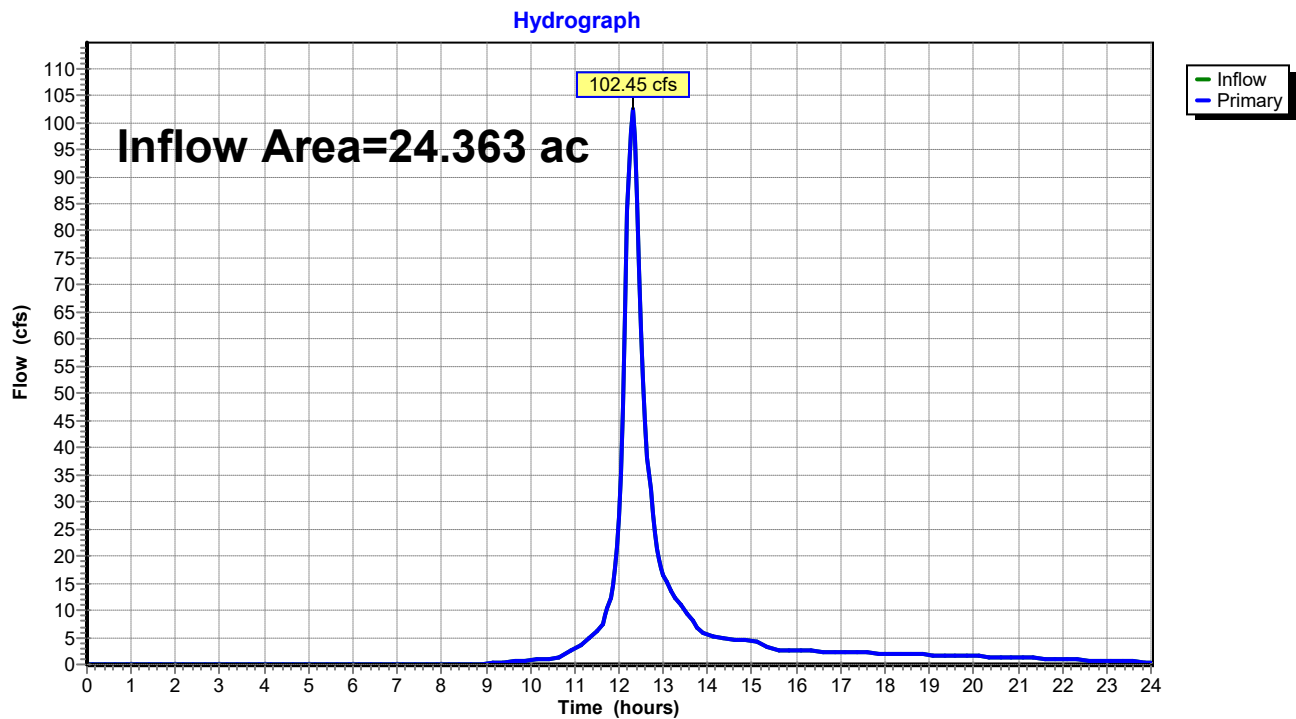
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	32.83	0.00	32.83
0.25	0.00	0.00	0.00	13.25	21.04	0.00	21.04
0.50	0.00	0.00	0.00	13.50	15.26	0.00	15.26
0.75	0.00	0.00	0.00	13.75	11.47	0.00	11.47
1.00	0.00	0.00	0.00	14.00	8.89	0.00	8.89
1.25	0.00	0.00	0.00	14.25	7.35	0.00	7.35
1.50	0.00	0.00	0.00	14.50	6.80	0.00	6.80
1.75	0.00	0.00	0.00	14.75	6.51	0.00	6.51
2.00	0.00	0.00	0.00	15.00	6.38	0.00	6.38
2.25	0.00	0.00	0.00	15.25	6.06	0.00	6.06
2.50	0.00	0.00	0.00	15.50	5.56	0.00	5.56
2.75	0.00	0.00	0.00	15.75	5.13	0.00	5.13
3.00	0.00	0.00	0.00	16.00	4.77	0.00	4.77
3.25	0.00	0.00	0.00	16.25	4.46	0.00	4.46
3.50	0.00	0.00	0.00	16.50	4.19	0.00	4.19
3.75	0.00	0.00	0.00	16.75	3.93	0.00	3.93
4.00	0.00	0.00	0.00	17.00	3.72	0.00	3.72
4.25	0.00	0.00	0.00	17.25	3.53	0.00	3.53
4.50	0.00	0.00	0.00	17.50	3.34	0.00	3.34
4.75	0.00	0.00	0.00	17.75	3.16	0.00	3.16
5.00	0.00	0.00	0.00	18.00	2.99	0.00	2.99
5.25	0.00	0.00	0.00	18.25	2.82	0.00	2.82
5.50	0.00	0.00	0.00	18.50	2.69	0.00	2.69
5.75	0.00	0.00	0.00	18.75	2.58	0.00	2.58
6.00	0.00	0.00	0.00	19.00	2.44	0.00	2.44
6.25	0.00	0.00	0.00	19.25	2.39	0.00	2.39
6.50	0.00	0.00	0.00	19.50	2.29	0.00	2.29
6.75	0.00	0.00	0.00	19.75	2.27	0.00	2.27
7.00	0.01	0.00	0.01	20.00	2.19	0.00	2.19
7.25	0.07	0.00	0.07	20.25	2.14	0.00	2.14
7.50	0.15	0.00	0.15	20.50	2.08	0.00	2.08
7.75	0.22	0.00	0.22	20.75	2.03	0.00	2.03
8.00	0.24	0.00	0.24	21.00	2.00	0.00	2.00
8.25	0.30	0.00	0.30	21.25	1.95	0.00	1.95
8.50	0.37	0.00	0.37	21.50	1.92	0.00	1.92
8.75	0.45	0.00	0.45	21.75	1.89	0.00	1.89
9.00	0.54	0.00	0.54	22.00	1.84	0.00	1.84
9.25	0.67	0.00	0.67	22.25	1.77	0.00	1.77
9.50	0.85	0.00	0.85	22.50	1.69	0.00	1.69
9.75	0.99	0.00	0.99	22.75	1.61	0.00	1.61
10.00	1.15	0.00	1.15	23.00	1.52	0.00	1.52
10.25	1.30	0.00	1.30	23.25	1.43	0.00	1.43
10.50	1.42	0.00	1.42	23.50	1.38	0.00	1.38
10.75	1.57	0.00	1.57	23.75	1.30	0.00	1.30
11.00	1.90	0.00	1.90	24.00	1.18	0.00	1.18
11.25	2.61	0.00	2.61				
11.50	3.42	0.00	3.42				
11.75	4.47	0.00	4.47				
12.00	9.83	0.00	9.83				
12.25	71.30	0.00	71.30				
12.50	71.38	0.00	71.38				
12.75	45.64	0.00	45.64				

Summary for Link 18L: Total Existing Discharge

Inflow Area = 24.363 ac, 0.00% Impervious, Inflow Depth > 3.78" for 100-yr event
 Inflow = 102.45 cfs @ 12.30 hrs, Volume= 7.664 af
 Primary = 102.45 cfs @ 12.30 hrs, Volume= 7.664 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 18L: Total Existing Discharge



2025-09-16_HydroCAD Calculation*MSE 24-hr 3 100-yr Rainfall=6.18"*

Prepared by Trio Engineering

Printed 9/18/2025

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Page 187

Hydrograph for Link 18L: Total Existing Discharge

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	13.00	16.49	0.00	16.49
0.25	0.00	0.00	0.00	13.25	12.58	0.00	12.58
0.50	0.00	0.00	0.00	13.50	10.03	0.00	10.03
0.75	0.00	0.00	0.00	13.75	7.12	0.00	7.12
1.00	0.00	0.00	0.00	14.00	5.32	0.00	5.32
1.25	0.00	0.00	0.00	14.25	4.90	0.00	4.90
1.50	0.00	0.00	0.00	14.50	4.72	0.00	4.72
1.75	0.00	0.00	0.00	14.75	4.57	0.00	4.57
2.00	0.00	0.00	0.00	15.00	4.43	0.00	4.43
2.25	0.00	0.00	0.00	15.25	3.68	0.00	3.68
2.50	0.00	0.00	0.00	15.50	2.81	0.00	2.81
2.75	0.00	0.00	0.00	15.75	2.61	0.00	2.61
3.00	0.00	0.00	0.00	16.00	2.52	0.00	2.52
3.25	0.00	0.00	0.00	16.25	2.46	0.00	2.46
3.50	0.00	0.00	0.00	16.50	2.39	0.00	2.39
3.75	0.00	0.00	0.00	16.75	2.33	0.00	2.33
4.00	0.00	0.00	0.00	17.00	2.27	0.00	2.27
4.25	0.00	0.00	0.00	17.25	2.20	0.00	2.20
4.50	0.00	0.00	0.00	17.50	2.14	0.00	2.14
4.75	0.00	0.00	0.00	17.75	2.08	0.00	2.08
5.00	0.00	0.00	0.00	18.00	2.01	0.00	2.01
5.25	0.00	0.00	0.00	18.25	1.94	0.00	1.94
5.50	0.00	0.00	0.00	18.50	1.88	0.00	1.88
5.75	0.00	0.00	0.00	18.75	1.82	0.00	1.82
6.00	0.00	0.00	0.00	19.00	1.75	0.00	1.75
6.25	0.00	0.00	0.00	19.25	1.69	0.00	1.69
6.50	0.00	0.00	0.00	19.50	1.62	0.00	1.62
6.75	0.00	0.00	0.00	19.75	1.56	0.00	1.56
7.00	0.00	0.00	0.00	20.00	1.49	0.00	1.49
7.25	0.00	0.00	0.00	20.25	1.43	0.00	1.43
7.50	0.00	0.00	0.00	20.50	1.36	0.00	1.36
7.75	0.00	0.00	0.00	20.75	1.29	0.00	1.29
8.00	0.00	0.00	0.00	21.00	1.23	0.00	1.23
8.25	0.02	0.00	0.02	21.25	1.16	0.00	1.16
8.50	0.05	0.00	0.05	21.50	1.10	0.00	1.10
8.75	0.09	0.00	0.09	21.75	1.03	0.00	1.03
9.00	0.13	0.00	0.13	22.00	0.96	0.00	0.96
9.25	0.24	0.00	0.24	22.25	0.90	0.00	0.90
9.50	0.43	0.00	0.43	22.50	0.83	0.00	0.83
9.75	0.62	0.00	0.62	22.75	0.76	0.00	0.76
10.00	0.80	0.00	0.80	23.00	0.70	0.00	0.70
10.25	1.00	0.00	1.00	23.25	0.63	0.00	0.63
10.50	1.20	0.00	1.20	23.50	0.56	0.00	0.56
10.75	1.74	0.00	1.74	23.75	0.50	0.00	0.50
11.00	2.95	0.00	2.95	24.00	0.43	0.00	0.43
11.25	4.44	0.00	4.44				
11.50	6.28	0.00	6.28				
11.75	10.38	0.00	10.38				
12.00	27.15	0.00	27.15				
12.25	98.33	0.00	98.33				
12.50	61.69	0.00	61.69				
12.75	27.89	0.00	27.89				

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 188

Events for Subcatchment 9S: P-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	7.43	0.642	1.52
2-yr	2.70	8.74	0.758	1.79
10-yr	3.81	13.62	1.199	2.83
100-yr	6.18	23.99	2.170	5.13

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 189

Events for Subcatchment 10S: P-2A (Future Commercial)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	12.97	0.739	1.52
2-yr	2.70	15.21	0.872	1.79
10-yr	3.81	23.54	1.378	2.83
100-yr	6.18	41.16	2.495	5.13

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 190

Events for Subcatchment 11S: P-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	3.19	0.148	1.10
2-yr	2.70	3.88	0.180	1.34
10-yr	3.81	6.54	0.308	2.29
100-yr	6.18	12.37	0.603	4.47

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 191

Events for Subcatchment 12S: P-2B (Future Residential)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	4.59	0.322	1.44
2-yr	2.70	5.42	0.382	1.71
10-yr	3.81	8.55	0.611	2.74
100-yr	6.18	15.22	1.120	5.02

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 192

Events for Subcatchment 13S: P-3

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	6.70	0.607	1.04
2-yr	2.70	8.27	0.743	1.27
10-yr	3.81	14.40	1.287	2.20
100-yr	6.18	28.14	2.550	4.36

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 193

Events for Subcatchment 15S: UD-1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	1.13	0.099	0.63
2-yr	2.70	1.50	0.128	0.82
10-yr	3.81	3.07	0.249	1.59
100-yr	6.18	6.89	0.553	3.53

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 194

Events for Subcatchment 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	12.94	0.993	0.82
2-yr	2.70	16.48	1.247	1.03
10-yr	3.81	30.78	2.284	1.88
100-yr	6.18	64.10	4.777	3.94

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 195

Events for Subcatchment 17S: E-2 (Ex. Discharge North)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	6.27	0.518	0.63
2-yr	2.70	8.38	0.668	0.82
10-yr	3.81	17.10	1.302	1.59
100-yr	6.18	38.39	2.887	3.53

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 196

Events for Subcatchment 19S: UD-2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.40	0.37	0.017	0.82
2-yr	2.70	0.46	0.021	1.03
10-yr	3.81	0.85	0.039	1.89
100-yr	6.18	1.73	0.082	3.94

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 197

Events for Pond 1P: Bio-Filtration Basin (BF-1)

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	7.43	1.70	0.13	1.57	171.84	0.312
2-yr	8.74	2.39	0.14	2.25	172.13	0.363
10-yr	13.62	7.53	0.16	7.37	172.68	0.467
100-yr	23.99	13.57	0.20	13.37	173.74	0.704

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 198

Events for Pond 2P: Wet Pond (WP-2A)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	19.20	12.25	136.09	0.246
2-yr	22.68	12.56	136.39	0.290
10-yr	35.70	20.24	137.12	0.408
100-yr	63.51	51.99	137.80	0.529

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 199

Events for Pond 3P: Bio-Filtration Basin (BF-2B)

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	12.25	3.26	0.10	3.15	136.10	0.332
2-yr	12.56	5.02	0.11	4.91	136.39	0.375
10-yr	20.24	15.28	0.13	15.15	137.12	0.495
100-yr	51.99	46.41	0.14	46.27	137.80	0.618

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 200

Events for Pond 5P: Wet Pond (WP-3)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	6.70	1.04	167.06	0.349
2-yr	8.27	2.61	167.16	0.372
10-yr	14.40	10.59	167.47	0.447
100-yr	28.14	26.22	167.88	0.556

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 201

Events for Link 6L: Total Discharge North

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
1-yr	1.49	1.49	0.00
2-yr	3.02	3.02	0.00
10-yr	12.40	12.40	0.00
100-yr	31.89	31.89	0.00

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 202

Events for Link 7L: Total Discharge South (Meadowbrook Rd.)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
1-yr	4.76	4.76	0.00
2-yr	6.61	6.61	0.00
10-yr	19.47	19.47	0.00
100-yr	57.32	57.32	0.00

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 203

Events for Link 8L: Total Proposed Discharge

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
1-yr	5.74	5.74	0.00
2-yr	9.38	9.38	0.00
10-yr	31.61	31.61	0.00
100-yr	85.02	85.02	0.00

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Multi-Event Tables

Printed 9/18/2025

Page 204

Events for Link 18L: Total Existing Discharge

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
1-yr	19.20	19.20	0.00
2-yr	24.83	24.83	0.00
10-yr	47.85	47.85	0.00
100-yr	102.45	102.45	0.00

TABLE OF CONTENTS**Project Reports**

- 1 Routing Diagram
- 2 Rainfall Events Listing
- 3 Area Listing (all nodes)

1-yr Event

- 4 Subcat 9S: P-1
- 6 Subcat 10S: P-2A (Future Commercial)
- 8 Subcat 11S: P-2
- 10 Subcat 12S: P-2B (Future Residential)
- 12 Subcat 13S: P-3
- 14 Subcat 15S: UD-1
- 16 Subcat 16S: E-1 Ex. Discharge South(Meadowbrook Rd.))
- 18 Subcat 17S: E-2 (Ex. Discharge North)
- 20 Subcat 19S: UD-2
- 22 Pond 1P: Bio-Filtration Basin (BF-1)
- 27 Pond 2P: Wet Pond (WP-2A)
- 32 Pond 3P: Bio-Filtration Basin (BF-2B)
- 37 Pond 5P: Wet Pond (WP-3)
- 42 Link 6L: Total Discharge North
- 44 Link 7L: Total Discharge South (Meadowbrook Rd.)
- 46 Link 8L: Total Proposed Discharge
- 48 Link 18L: Total Existing Discharge

2-yr Event

- 50 Subcat 9S: P-1
- 52 Subcat 10S: P-2A (Future Commercial)
- 54 Subcat 11S: P-2
- 56 Subcat 12S: P-2B (Future Residential)
- 58 Subcat 13S: P-3
- 60 Subcat 15S: UD-1
- 62 Subcat 16S: E-1 Ex. Discharge South(Meadowbrook Rd.))
- 64 Subcat 17S: E-2 (Ex. Discharge North)
- 66 Subcat 19S: UD-2
- 68 Pond 1P: Bio-Filtration Basin (BF-1)
- 73 Pond 2P: Wet Pond (WP-2A)
- 78 Pond 3P: Bio-Filtration Basin (BF-2B)
- 83 Pond 5P: Wet Pond (WP-3)
- 88 Link 6L: Total Discharge North
- 90 Link 7L: Total Discharge South (Meadowbrook Rd.)
- 92 Link 8L: Total Proposed Discharge
- 94 Link 18L: Total Existing Discharge

10-yr Event

- 96 Subcat 9S: P-1
- 98 Subcat 10S: P-2A (Future Commercial)
- 100 Subcat 11S: P-2
- 102 Subcat 12S: P-2B (Future Residential)
- 104 Subcat 13S: P-3
- 106 Subcat 15S: UD-1

2025-09-16_HydroCAD Calculation

Prepared by Trio Engineering

HydroCAD® 10.20-6a s/n 11571 © 2024 HydroCAD Software Solutions LLC

Table of Contents

Printed 9/18/2025

108 Subcat 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)
110 Subcat 17S: E-2 (Ex. Discharge North)
112 Subcat 19S: UD-2
114 Pond 1P: Bio-Filtration Basin (BF-1)
119 Pond 2P: Wet Pond (WP-2A)
124 Pond 3P: Bio-Filtration Basin (BF-2B)
129 Pond 5P: Wet Pond (WP-3)
134 Link 6L: Total Discharge North
136 Link 7L: Total Discharge South (Meadowbrook Rd.)
138 Link 8L: Total Proposed Discharge
140 Link 18L: Total Existing Discharge

100-yr Event

142 Subcat 9S: P-1
144 Subcat 10S: P-2A (Future Commercial)
146 Subcat 11S: P-2
148 Subcat 12S: P-2B (Future Residential)
150 Subcat 13S: P-3
152 Subcat 15S: UD-1
154 Subcat 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)
156 Subcat 17S: E-2 (Ex. Discharge North)
158 Subcat 19S: UD-2
160 Pond 1P: Bio-Filtration Basin (BF-1)
165 Pond 2P: Wet Pond (WP-2A)
170 Pond 3P: Bio-Filtration Basin (BF-2B)
175 Pond 5P: Wet Pond (WP-3)
180 Link 6L: Total Discharge North
182 Link 7L: Total Discharge South (Meadowbrook Rd.)
184 Link 8L: Total Proposed Discharge
186 Link 18L: Total Existing Discharge

Multi-Event Tables

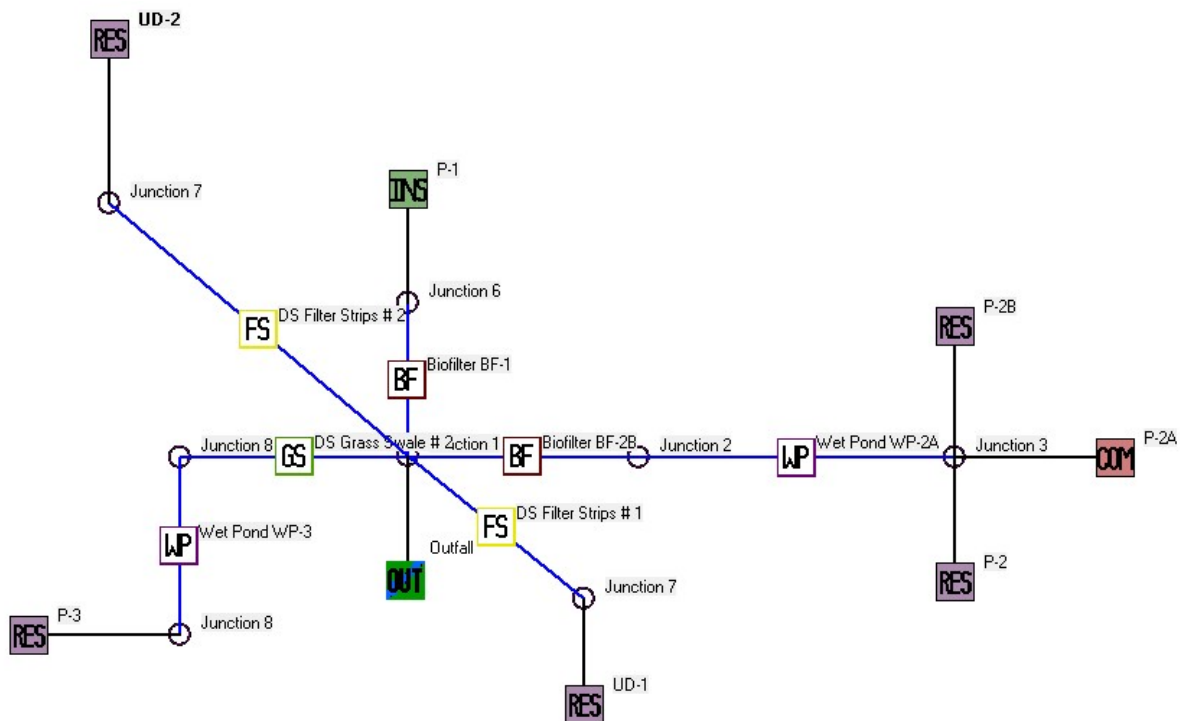
188 Subcat 9S: P-1
189 Subcat 10S: P-2A (Future Commercial)
190 Subcat 11S: P-2
191 Subcat 12S: P-2B (Future Residential)
192 Subcat 13S: P-3
193 Subcat 15S: UD-1
194 Subcat 16S: E-1 Ex. Discharge South(Meadowbrook Rd.)
195 Subcat 17S: E-2 (Ex. Discharge North)
196 Subcat 19S: UD-2
197 Pond 1P: Bio-Filtration Basin (BF-1)
198 Pond 2P: Wet Pond (WP-2A)
199 Pond 3P: Bio-Filtration Basin (BF-2B)
200 Pond 5P: Wet Pond (WP-3)
201 Link 6L: Total Discharge North
202 Link 7L: Total Discharge South (Meadowbrook Rd.)
203 Link 8L: Total Proposed Discharge
204 Link 18L: Total Existing Discharge

APPENDIX 4

WinSlamm Calculations

Tukka Meadowbrook Road Development

The following is a schematic of the WinSLAMM model.



INPUT DATA

Data file name: L:\LOBBYS\WPDOCS\DOCUMENT\889\05006-01\284-Storm Water Management Plan\Tukka Site\WinSlamm\2025-09-16_WinSlamm Calc.mdb

WinSLAMM Version 10.4.1

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

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

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

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

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

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

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx

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

Cost Data file name:

Seed for random number generator: -42

Study period starting date: 01/05/69 Study period ending date: 12/31/69

Start of Winter Season: 12/06 End of Winter Season: 03/28

Date: 09-17-2025 Time: 14:10:00

Site information:

LU# 1 - Institutional: P-1 Total area (ac): 5.080

1 - Roofs 1: 1.370 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 1.290 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.344 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 2.076 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Residential: P-3 Total area (ac): 7.021

1 - Roofs 1: 1.700 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 1.057 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
26 - Driveways 2: 0.320 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.191 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.433 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
46 - Large Landscaped Areas 2: 0.080 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
47 - Large Landscaped Areas 3: 0.750 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
48 - Large Landscaped Areas 4: 0.980 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
49 - Large Landscaped Areas 5: 0.240 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.270 ac. Source Area PSD File:

LU# 3 - Commercial: P-2A Total area (ac): 5.836

1 - Roofs 1: 0.769 ac. Flat Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 2.502 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 0.270 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.079 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets1: 0.181 ac. Smooth Street Length = 0.0571928 curb-mi Street Width (assuming two curb-mi per street mile) = 52.36224 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
38 - Streets 2: 0.467 ac. Intermediate Street Length = 0.1476508 curb-mi Street Width (assuming two curb-mi per street mile) = 52.17392 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.095 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
46 - Large Landscaped Areas 2: 0.245 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.297 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
52 - Small Landscaped Areas 2: 0.764 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
71 - Other Pervious Areas 1: 0.037 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
72 - Other Pervious Areas 2: 0.096 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
78 - Other Part Con Imp Areas 1: 0.009 ac. Disconnected Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
79 - Other Part Con Imp Areas 2: 0.024 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Residential: P-2B Total area (ac): 2.679

1 - Roofs 1: 0.496 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 0.331 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.172 ac. Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
37 - Streets 1: 0.545 ac. Smooth Street Length = 0.231 curb-mi Street Width (assuming two curb-mi per street mile) = 38.92857 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 1.135 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 5 - Residential: P-2 Total area (ac): 1.617

31 - Sidewalks 1: 0.177 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 0.630 ac. Smooth Street Length = 0.267 curb-mi Street Width (assuming two curb-mi per street mile) = 38.93259 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.300 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

46 - Large Landscaped Areas 2: 0.510 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 6 - Residential: UD-1 Total area (ac): 1.881

1 - Roofs 1: 0.230 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.368 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

46 - Large Landscaped Areas 2: 0.684 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

47 - Large Landscaped Areas 3: 0.599 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 7 - Residential: UD-2 Total area (ac): 0.250

45 - Large Landscaped Areas 1: 0.250 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - Wet Pond WP-2A

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 43

2. Weir crest width (ft): 6

3. Height from datum to bottom of weir opening: 5

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.0103	0.00	0.00
2	1.00	0.0164	0.00	0.00
3	2.00	0.0234	0.00	0.00
4	3.00	0.0308	0.00	0.00
5	4.00	0.0387	0.00	0.00
6	5.00	0.0870	0.00	0.00
7	6.00	0.1180	0.00	0.00
8	7.00	0.1420	0.00	0.00
9	8.00	0.1670	0.00	0.00
10	9.00	0.1940	0.00	0.00
11	10.00	0.2210	0.00	0.00

Control Practice 2: Wet Detention Pond CP# 2 (DS) - Wet Pond WP-3

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.33
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
2. Weir crest width (ft): 15
3. Height from datum to bottom of weir opening: 8

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 7

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.0101	0.00	0.00
2	1.00	0.0160	0.00	0.00
3	2.00	0.0238	0.00	0.00
4	3.00	0.0329	0.00	0.00
5	4.00	0.0436	0.00	0.00
6	5.00	0.1188	0.00	0.00
7	6.00	0.1652	0.00	0.00
8	7.00	0.2207	0.00	0.00
9	8.00	0.2890	0.00	0.00
10	9.00	0.3934	0.00	0.00

Control Practice 3: Biofilter CP# 1 (DS) - Biofilter BF-1

1. Top area (square feet) = 13024
2. Bottom area (square feet) = 4574
3. Depth (ft): 7
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
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: 3.6
12. Engineered soil depth (ft) = 2
13. Engineered soil porosity = 0.3
14. Percent solids reduction due to flow through engineered soil = 80
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil
User-Defined Soil Type 1.000
Saturation water content percent (Porosity) = 0
Biofilter Outlet/Discharge Characteristics:
Outlet type: Sharp Crested Weir
 1. Weir length (ft): 3
 2. Invert elevation above datum (ft): 4
Outlet type: Broad Crested Weir
 1. Weir crest length (ft): 15
 2. Weir crest width (ft): 15
 3. Height of datum to bottom of weir opening: 6
Outlet type: Vertical Stand Pipe
 1. Stand pipe diameter (ft): 3
 2. Stand pipe height above datum (ft): 5
Outlet type: Surface Discharge Pipe
 1. Surface discharge pipe outlet diameter (ft): 0.5
 2. Pipe invert elevation above datum (ft): 3
 3. Number of surface pipe outlets: 1
Outlet type: Drain Tile/Underdrain
 1. Underdrain outlet diameter (ft): 0.5
 2. Invert elevation above datum (ft): 0.5
 3. Number of underdrain outlets: 1

Control Practice 4: Biofilter CP# 2 (DS) - Biofilter BF-2B
1. Top area (square feet) = 7405
2. Bottom area (square feet) = 3006
3. Depth (ft): 7.5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
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: 3.6
12. Engineered soil depth (ft) = 2
13. Engineered soil porosity = 0.3
14. Percent solids reduction due to flow through engineered soil = 80
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil
User-Defined Soil Type 1.000
Biofilter Outlet/Discharge Characteristics:
Outlet type: Sharp Crested Weir
 1. Weir length (ft): 3
 2. Invert elevation above datum (ft): 4.6
Outlet type: Broad Crested Weir
 1. Weir crest length (ft): 10
 2. Weir crest width (ft): 10
 3. Height of datum to bottom of weir opening: 6.5

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 5.5

Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 0.67
2. Pipe invert elevation above datum (ft): 2.75
3. Number of surface pipe outlets: 1

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 0.5
3. Number of underdrain outlets: 2

Control Practice 5: Filter Strip CP# 1 (DS) - DS Filter Strips # 1

Total drainage area (acres)= 1.881
Fraction of drainage area served by filter strips (ac) = 1.00
Total filter strip width (ft) = 1350.0
Effective flow length (ft) = 25
Infiltration rate (in/hr)= 0.150
Typical longitudinal slope (ft.H/ft.V) = 0.250
Typical grass height (in) = 6.0
Swale retardance factor = D
Use stochastic analysis to determine infiltration rate: False
Infiltration rate coefficient of variation (COV) = 0.00
Particle size distribution file name: Not needed - calculated by program
Surface Clogging Load (lbs/sf) = 3.50

Control Practice 6: Filter Strip CP# 2 (DS) - DS Filter Strips # 2

Total drainage area (acres)= 0.250
Fraction of drainage area served by filter strips (ac) = 1.00
Total filter strip width (ft) = 230.0
Effective flow length (ft) = 25
Infiltration rate (in/hr)= 0.250
Typical longitudinal slope (ft.H/ft.V) = 0.200
Typical grass height (in) = 6.0
Swale retardance factor = D
Use stochastic analysis to determine infiltration rate: False
Infiltration rate coefficient of variation (COV) = 0.00
Particle size distribution file name: Not needed - calculated by program
Surface Clogging Load (lbs/sf) = 3.50

Control Practice 7: Grass Swale CP# 1 (DS) - DS Grass Swale # 2

Total drainage area (acres)= 7.021
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 54.17
Total swale length (ft) = 390
Average swale length to outlet (ft)= 350
Typical bottom width (ft) = 3.0
Typical swale side slope (H:1V) = 0.3
Typical longitudinal slope (ft.H/ft.V) = 0.020
Swale retardance factor: D

Typical grass height (in) = 6.0
 Swale dynamic infiltration rate (in/hr)= 0.150
 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

OUTPUT SUMMARY

SLAMM for Windows Version 10.4.1

(c) Copyright Robert Pitt and John Voorhees 2019, All Rights Reserved

Data file name: L:\LOBBYS\WPDOCS\DOCUMENT\889\05006-01\284-Storm Water Management Plan\Tukka Site\WinSlamm\2025-09-16_WinSlamm Calc.mdb

Data file description:

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

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_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

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

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

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

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

Cost Data file name:

Seed for random number generator: -42

Start of Winter Season: 12/06 End of Winter Season: 03/28

Model Run Start Date: 01/05/69 Model Run End Date: 12/31/69

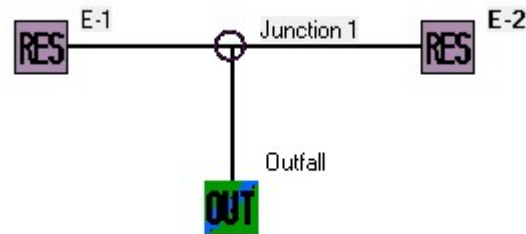
Date of run: 09-17-2025 Time of run: 14:09:48

Total Area Modeled (acres): 24.364

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:	931412	-	118.5	6892	-
Outfall Total with Controls:	689404	25.98%	31.92	1374	80.06%
Annualized Total After Outfall Controls:	698979			1393	

Existing Conditions - Tukka Meadowbrook Road Development



INPUT DATA

Data file name: L:\LOBBYS\WPDOCS\DOCUMENT\889\05006-01\284-Storm Water Management Plan\Tukka Site\WinSlamm\2025-08-04_WinSlamm Calc_Existing Conditions.mdb

WinSLAMM Version 10.4.1

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

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

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

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

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

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

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdX

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

Cost Data file name:

Seed for random number generator: -42

Study period starting date: 01/05/69 Study period ending date: 12/31/69

Date: 09-17-2025 Time: 14:13:07

Site information:

LU# 1 - Residential: E-1 Total area (ac): 14.551

45 - Large Landscaped Areas 1: 2.270 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

46 - Large Landscaped Areas 2: 10.191 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

47 - Large Landscaped Areas 3: 0.170 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

48 - Large Landscaped Areas 4: 1.920 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Residential: E-2 Total area (ac): 9.812

45 - Large Landscaped Areas 1: 2.660 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

46 - Large Landscaped Areas 2: 1.270 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

47 - Large Landscaped Areas 3: 4.524 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

48 - Large Landscaped Areas 4: 0.750 ac. Normal Sandy Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

49 - Large Landscaped Areas 5: 0.139 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

50 - Large Landscaped Areas 6: 0.469 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

OUTPUT SUMMARY

SLAMM for Windows Version 10.4.1

(c) Copyright Robert Pitt and John Voorhees 2019, All Rights Reserved

Data file name: L:\LOBBYS\WPDOCS\DOCUMENT\889\05006-01\284-Storm Water Management Plan\Tukka Site\WinSlamm\2025-08-04_WinSlamm Calc_Existing Conditions.mdb

Data file description:

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppx

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

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

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

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

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

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

Cost Data file name:

Seed for random number generator: -42

Model Run Start Date: 01/05/69 Model Run End Date: 12/31/69

Date of run: 09-17-2025 Time of run: 14:12:53

Total Area Modeled (acres): 24.363

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:	108653	-	227.0	1540	-
Outfall Total with Controls:	108654	0.00%	227.0	1540	0.00%
Annualized Total After Outfall Controls:	110163			1561	