STORMWATER MANAGEMENT PLAN

YORKSHIRE HIGHLANDS DEVELOPMENT

(YORKVILLE 50TH ROAD)

Village of Yorkville, Racine County, Wisconsin

PEG Project Number: 1335.00-WI

Prepared for:

TNG10, LLC

07/14/2021

11/08/2021

PINNACLE ENGINEERING GROUP
20725 W. Watertown Road | Suite 100 | Brookfield, WI 53186
www.pinnacle-engr.com

TABLE OF CONTENTS

APPENDICIES

Questions and comments can be directed to:

Aaron E. Koch, P.E.
Principal
Phone: 262.754.8888 | Fax: 262.754.8850
aekoch@pinnacle-engr.com

PINNACLE ENGINEERING GROUP
20725 Watertown Road | Suite 100
Brookfield, WI 53186
www.pinnacle-engr.com

INTRODUCTION

The proposed project is generally located in the SW ¼ of Section 1, Township 3 North, Range 21 East in the Village of Yorkville, Racine County, Wisconsin. The existing subject property is approximately 87 acres in size. The proposed development consists of a single-family development with 15 lots along with three wet ponds. A location map that illustrates the tract of land is included in **Appendix 1**.

DESIGN CRITERIA

Village of Yorkville..... Chapter 10, Code of Ordinances

Wisconsin Department of Natural Resources.....NR 216 & NR 151

Water Quantity: The Village Ordinance and NR 151 require that the post-construction peak runoff discharge rates do not exceed the pre-development peak runoff discharge rates for the 1-year/24-hour and 2-year/24-hour storm events. The Village Ordinance also requires that the post-construction peak runoff discharge rate for the 100-year/24-hour storm event be reduced to the pre-development peak runoff discharge rate for the 10-year/24-hour storm event.

Water Quality: Both the Village Ordinance and NR 151 require removal of 80% of the annual total suspended solids (TSS) load for new development.

Infiltration: It is anticipated that the site is exempt from infiltration per Sec. 10-383 (d)(3)d2(c)i and NR 151.124(4)(c)1. Infiltration is not required for sites containing soils unsuitable for infiltration, in this case the soil is not suitable for infiltration.

Protective Areas: There are five less susceptible wetland areas on-site, three have been classified as artificial exempt. NR 151 requires a setback for less susceptible wetlands that is 10% of the average width no less than 10' nor greater than 30'. There is a 20' protective area around one wetland behind lots 7 and 8. The majority of the impervious area from these lots has sufficient distance to this protective area and should not affect the lots.

PRE-DEVELOPMENT CONDITIONS

Soils on the site are predominantly classified as Ashkum silty clay loam (C/D), Aztalan loam (C/D), Elliott silty clay loam (C/D), Markham silt loam (C), and Varna silt loam (C). Type C soils are being used for this analysis. Hydrologic soil group characteristics can be found in **Appendix1**.

The existing site is comprised of mostly open farmland along with a gravel drive and is directly east of the East Branch of the Root River. Floodplain, secondary environmental corridor and three wetlands (delineated by Heartland Ecological) are present on the site. Wetlands that will be impacted are anticipated to be considered artificial wetlands. Secondary environmental corridor impacts are generally cropland that are currently impacted. The site generally slopes to the west towards the East Branch of the Root River.

POST-DEVELOPMENT CONDITIONS

It is proposed to construct a single-family residential subdivision with 15 lots. Stormwater will be managed by constructing three wet detention ponds. There is significant offsite water that flows to the creek form the east. The proposed drainage is created in such a way as to bypass the majority of the water via swales and culverts. Only a small amount of offsite water will come onto the site stormwater system on the north side. A Post-Development Hydrology Exhibit and Modeling can be found in **Appendix 3**.

ANALYSIS METHODS

HydroCAD® (Version 10.00) software has been used to analyze stormwater characteristics for this stormwater management plan. HydroCAD uses the accepted TR-55 methodology for determining peak discharge runoff rates. Rainfall depths for the 1, 2, 10, and 100-year storm events are 2.35, 2.67, 3.77, and 5.92 inches in accordance with the Village of Yorkville rainfall depths. The MSE3, 24-hour rainfall distribution was used. The rainfall data can be found in **Appendix 1**.

TSS reduction characteristics for the proposed water quality facilities were determined using WinSLAMM® (Version 10.4.0) Source Loading and Management Model.

SUMMARY OF RESULTS

Pre-Development Conditions

The entire site drains to the creek and is modeled as one area. The offsite that drains onto the site is modeled as a second. For the 1 and 2-year allowable discharges, the two are combined in the model. For the 10-year allowable, the 100-year offsite is combined manually since the offsite area does not need to be detained and can be passed through.

Allowable Peak Flows

Drainage Area	Area (ac)	CN	Tc (min)	Peak Flows 1-year (cfs)	Peak Flows 2-year (cfs)	Peak Flows 10-year (cfs)	Peak Flows 100-year (cfs)
EXISTING SITE	29.9	71	17.3	12.0	17.9	*42.6*	101.8
OFFSITE AREA	3.0	71	17.3	1.2	1.8	4.3	*10.2*
ALLOWABLE DISC.	32.9			**13.2**	**19.7**	N/A	**52.8**

Post-Development Conditions

Allowable Peak Flows

Drainage Area	Area (ac)	CN	Tc (min)	Peak Flows 1-year (cfs)	Peak Flows 2-year (cfs)	Peak Flows 100-year (cfs)
SOUTH POND AREA	4.5	78	7.6	5.1	6.7	26.5
MIDDLE POND AREA	5.2	79	7.5	6.4	8.4	31.7
NORTH POND AREA	17.8	77	13.7	14.4	19.4	81.2
SOUTH AFTER DETENTION				0.3	0.3	3.4
MIDDLE AFTER DETENTION				0.3	0.4	3.9
NORTH AFTER DETENTION				0.5	1.0	31.2
UNDETAINED	2.4	78	6.0	2.9	3.8	14.9
PROPOSED SITE DISCHARGE	32.9			**3.2**	**4.3**	**40.9**

Wet Pond Data

Pond	Normal Water Elev.	Peak W.S. Elev. 1-year	Peak W.S. Elev. 2-year	Peak W.S. Elev. 100-year	Spillway Elev.	Top of Berm Elev.
SOUTH	715.9	716.5	716.7	718.3	718.4	719.4
MIDDLE	715.9	716.7	716.9	718.7	718.8	719.8
NORTH	716.0	717.3	717.6	719.5	719.6	720.6

A comparison of the peak flows from the site versus the allowable flows indicated that all of the flows have been detain to below allowable levels.

Runoff Water Quality

Post-development water quality will be obtained within the wet detention basins (see the Post-Development Hydrology Exhibit in **Appendix 3**).

Water Quality Summary

Area or Pond	Pounds of TSS Generated (No Controls)	Pounds of TSS Remaining (w/ Controls)	Percent Removal
SOUTH POND	597	76	87%
MIDDLE POND	827	111	87%
NORTH POND	2289	246	89%
UNDETAINED	383	383	0%
SITE TOTAL	**4095**	**816**	**80%**

This site will exceed the minimum 80% required TSS removal. Refer to **Appendix 4** for SLAMM modeling summary. A copy of the model data can be provided electronically upon request.

Infiltration

Infiltration is not required due to the lack of soils suitable for infiltration. Per NR 151 any soils containing clay are exempt from infiltration.

Protective Areas

There are five wetlands on the site classified as less susceptible. Three of the wetlands have been deemed Artificial exempt by the WDNR. Per NR151 a protective area will apply that is 10% of the average width, being no less than 10' or greater than 30'. The protective area is 20' around the wetland located behind lots 7 and 8. This protective area will not affect the lots as there is sufficient separation between potential impervious surfaces and the protective area.

CONCLUSION

The stormwater management features for the development have been designed to comply with the Village of Yorkville ordinance and WDNR NR216/151 requirements. Post-Development peak flows are less than pre-development peak flows for the 1-year/24-hour and 2-year/24-hour storm events. The post-development peak flow for the 100-year/24-hour storm event is less than the pre-development peak flow for the 10-year/24-hour storm event. Storm water runoff from the site will be treated to remove in excess of the required total suspended solids annually through the wet detention basins. Offsite areas have been accommodated in the design. The site is anticipated to be exempt from the infiltration requirement. A Stormwater Maintenance Agreement can be found in **Appendix 6**.

APPENDIX 1
MAPS

Surface Water Data Viewer Map

Legend

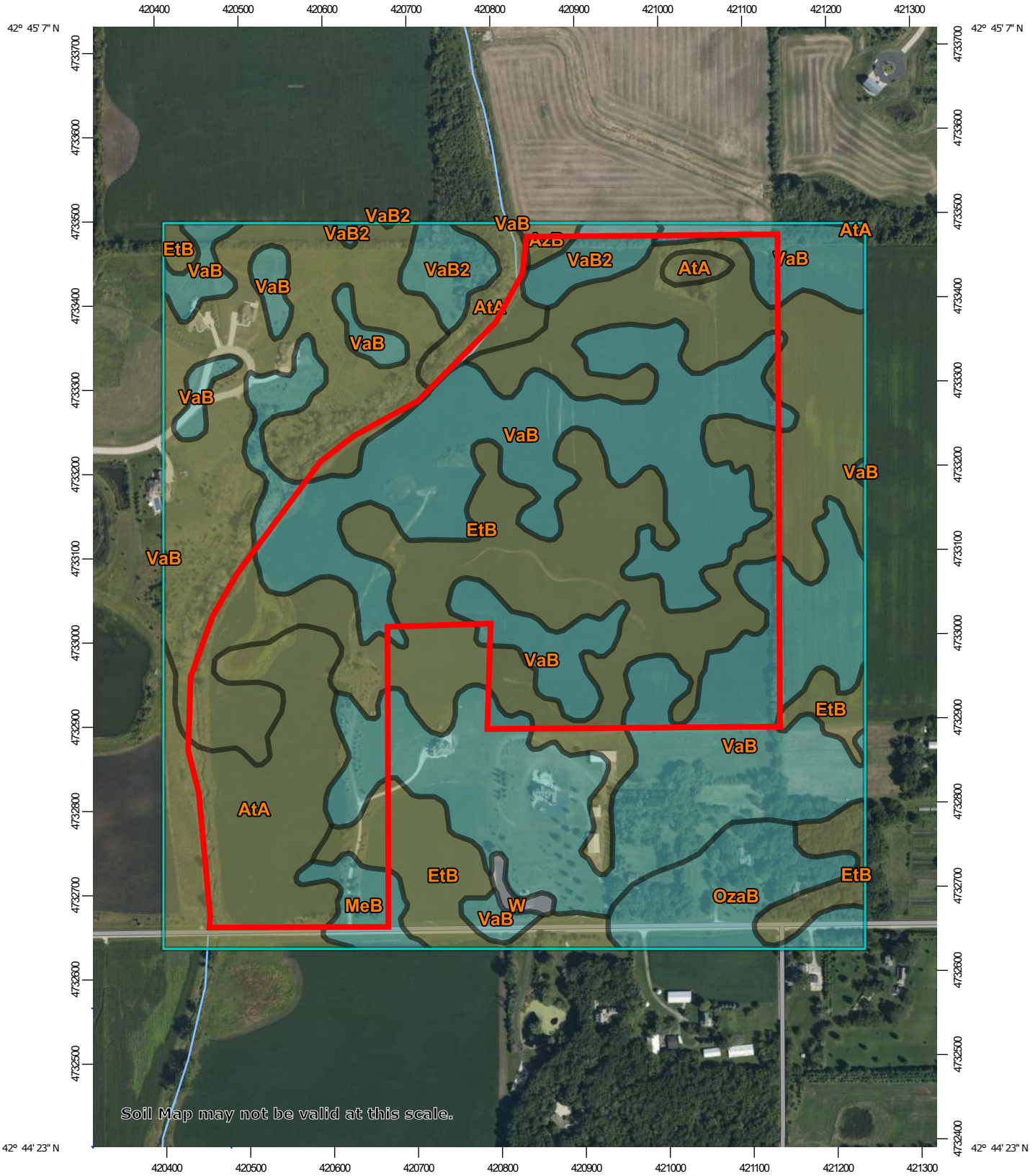
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Index to EN_Image_Basemap_Leaf_Off

Notes

0.3 0 0.13 0.3 Miles

NAD_1983_HARN_Wisconsin_TM

1: 7,920



Map Scale: 1:6,480 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 300 600 1200 1800

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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: Kenosha and Racine Counties, Wisconsin
Survey Area Data: Version 17, Jun 8, 2020

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

Date(s) aerial images were photographed: Aug 24, 2019—Aug 28, 2019

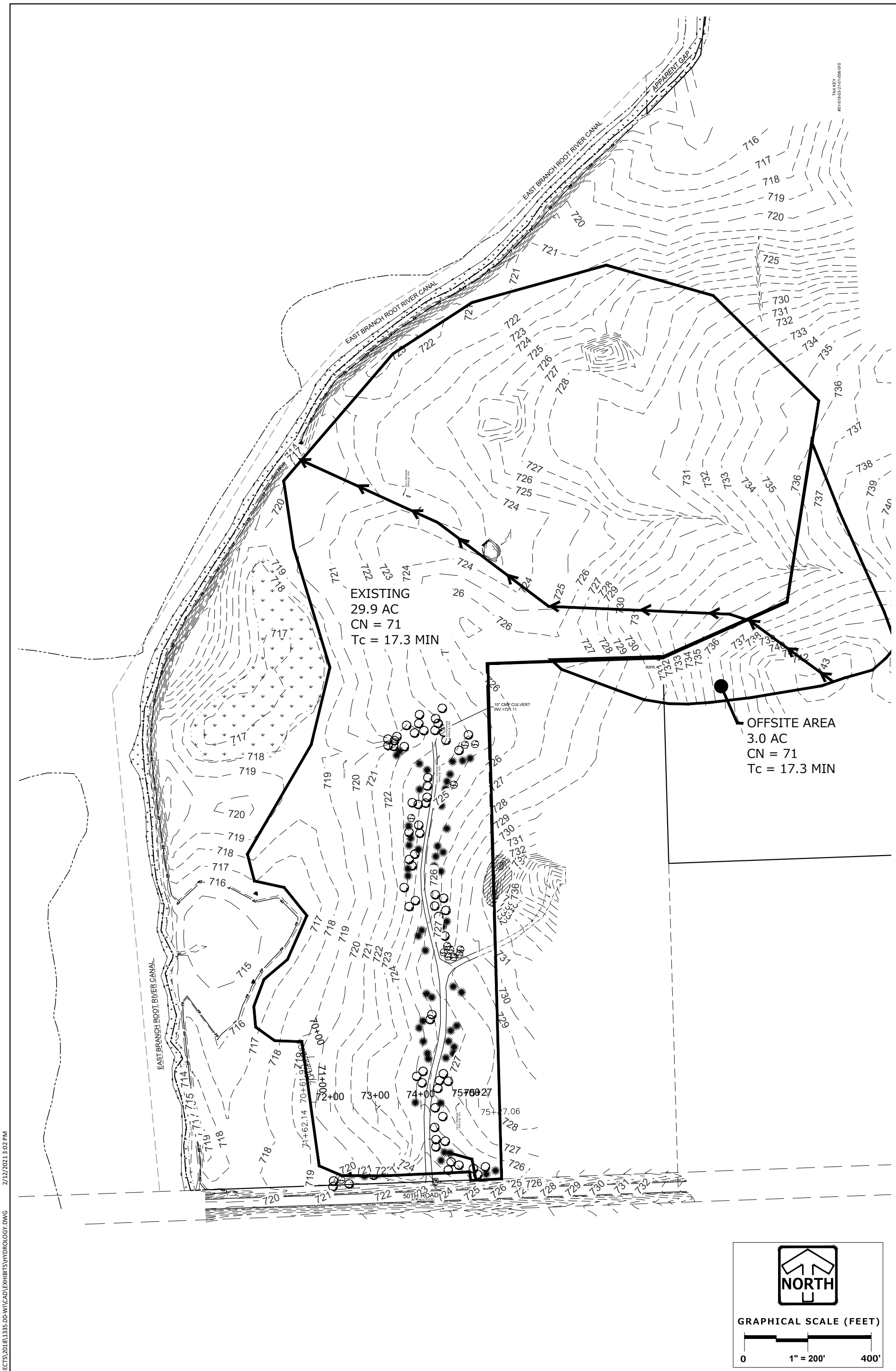
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AtA	Ashkum silty clay loam, 0 to 2 percent slopes	C/D	19.0	10.6%
AzB	Aztalan loam, 2 to 6 percent slopes	C/D	0.6	0.4%
EtB	Elliott silty clay loam, 2 to 6 percent slopes	C/D	76.8	42.9%
MeB	Markham silt loam, 2 to 6 percent slopes	C	2.3	1.3%
OzaB	Ozaukee silt loam, 2 to 6 percent slopes	C	7.4	4.1%
VaB	Varna silt loam, 2 to 6 percent slopes	C	67.6	37.8%
VaB2	Varna silt loam, 2 to 6 percent slopes, eroded	C	4.6	2.6%
W	Water		0.5	0.3%
Totals for Area of Interest			**178.8**	**100.0%**

APPENDIX 2
PRE-DEVELOPMENT CONDITIONS INFORMATION

PINNACLE ENGINEERING GROUP



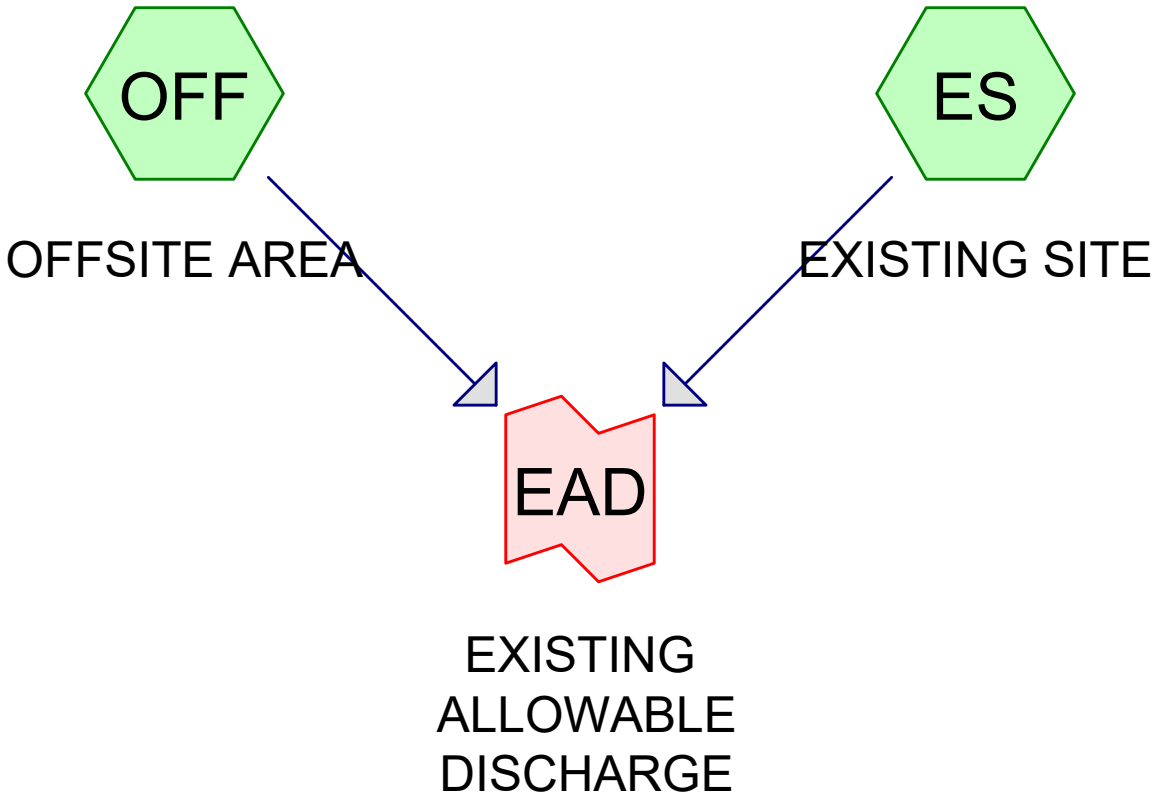
Z:\PROJECTS\2018\1335.00-WI\CAD\EXHIBITS\HYDROLOGY.DWG 2/12/2021 3:02 PM

HYDROLOGY EXHIBIT - EXISTING

2-12-21

PINNACLE ENGINEERING GROUP 20725 WATERTOWN ROAD | SUITE 100 | BROOKFIELD, WI 53186 | WWW.PINNACLE-ENGR.COM

PLAN | DESIGN | DELIVER **PEG JOB#** 1335.00



Subcat Reach Pond Link

Routing Diagram for YORKVILLE
Prepared by Pinnacle Engineering Group, Printed 6/29/2021

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentES: EXISTING SITE Runoff Area=29.900 ac 0.00% Impervious Runoff Depth>0.39"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=12.00 cfs 0.964 af

SubcatchmentOFF: OFFSITE AREA Runoff Area=3.000 ac 0.00% Impervious Runoff Depth>0.39"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=1.20 cfs 0.097 af

Link EAD: EXISTING ALLOWABLE DISCHARGE Inflow=13.20 cfs 1.061 af
Primary=13.20 cfs 1.061 af

Total Runoff Area = 32.900 ac Runoff Volume = 1.061 af Average Runoff Depth = 0.39"
100.00% Pervious = 32.900 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment ES: EXISTING SITE

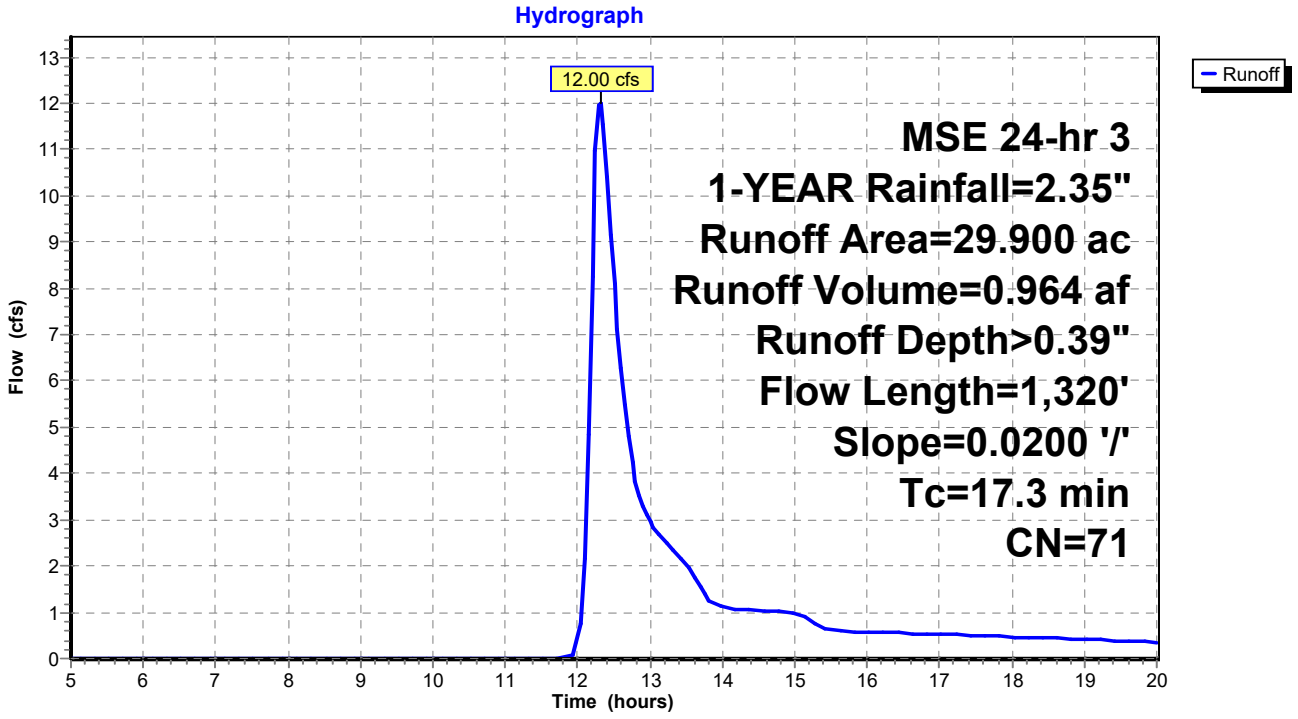
Runoff = 12.00 cfs @ 12.31 hrs, Volume= 0.964 af, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-YEAR Rainfall=2.35"

	Area (ac)	CN	Description
*	29.600	71	AG LANDS
*	0.300	89	GRAVEL DRIVEWAY
	29.900	71	Weighted Average
	29.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment ES: EXISTING SITE



Summary for Subcatchment OFF: OFFSITE AREA

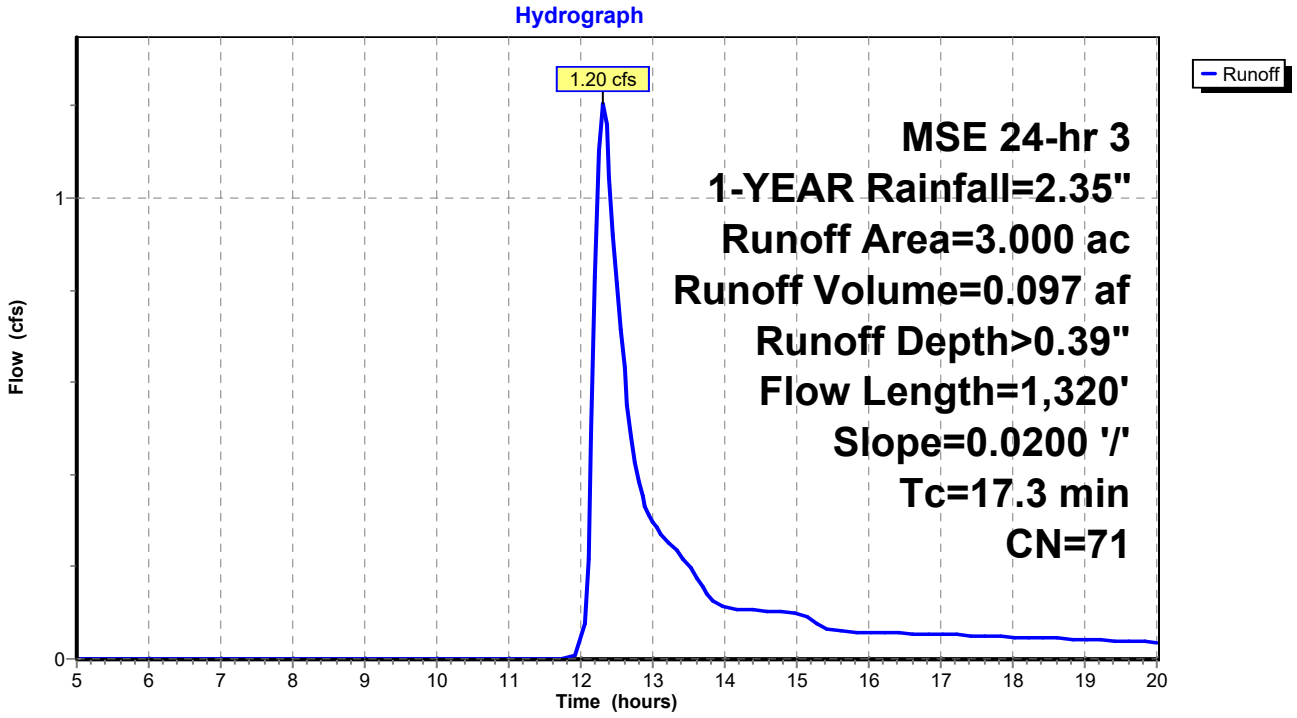
Runoff = 1.20 cfs @ 12.31 hrs, Volume= 0.097 af, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-YEAR Rainfall=2.35"

	Area (ac)	CN	Description
*	3.000	71	AG LANDS
	3.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment OFF: OFFSITE AREA

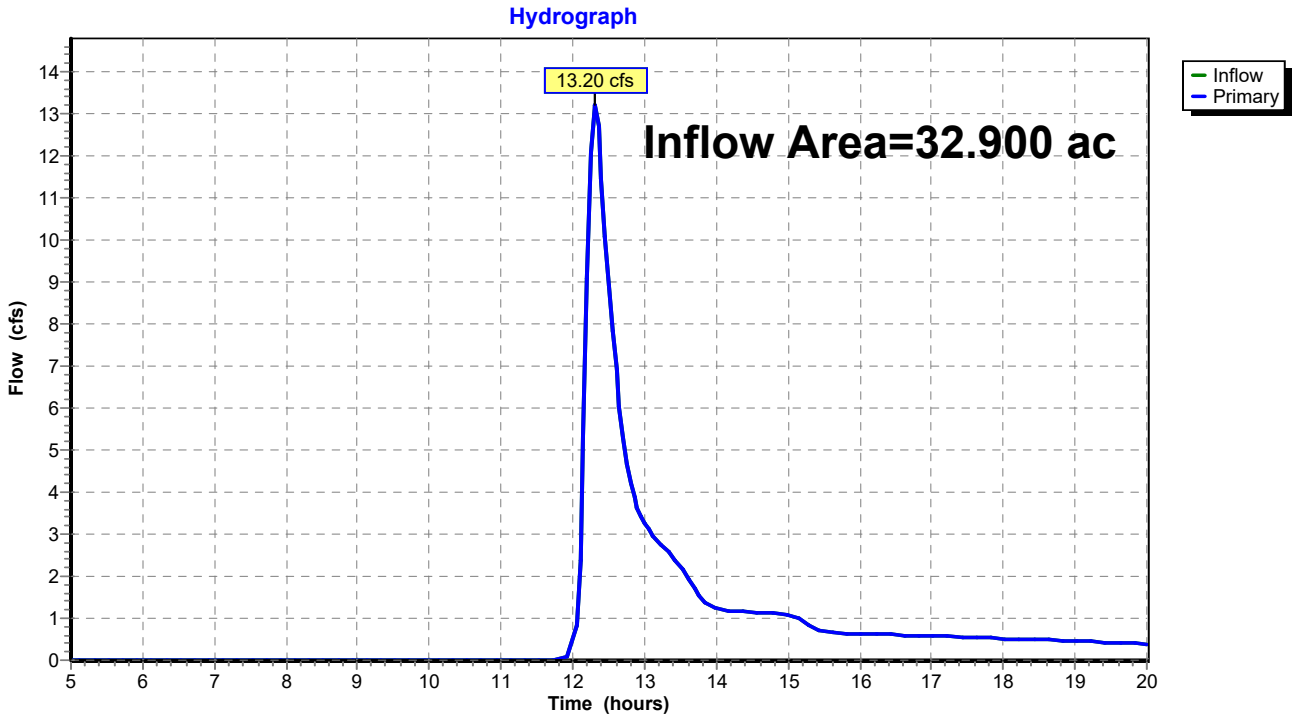


Summary for Link EAD: EXISTING ALLOWABLE DISCHARGE

Inflow Area = 32.900 ac, 0.00% Impervious, Inflow Depth > 0.39" for 1-YEAR event
Inflow = 13.20 cfs @ 12.31 hrs, Volume= 1.061 af
Primary = 13.20 cfs @ 12.31 hrs, Volume= 1.061 af, Atten= 0%, Lag= 0.0 min

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

Link EAD: EXISTING ALLOWABLE DISCHARGE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentES: EXISTING SITE Runoff Area=29.900 ac 0.00% Impervious Runoff Depth>0.54"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=17.93 cfs 1.342 af

SubcatchmentOFF: OFFSITE AREA Runoff Area=3.000 ac 0.00% Impervious Runoff Depth>0.54"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=1.80 cfs 0.135 af

Link EAD: EXISTING ALLOWABLE DISCHARGE Inflow=19.73 cfs 1.476 af
Primary=19.73 cfs 1.476 af

Total Runoff Area = 32.900 ac Runoff Volume = 1.476 af Average Runoff Depth = 0.54"
100.00% Pervious = 32.900 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment ES: EXISTING SITE

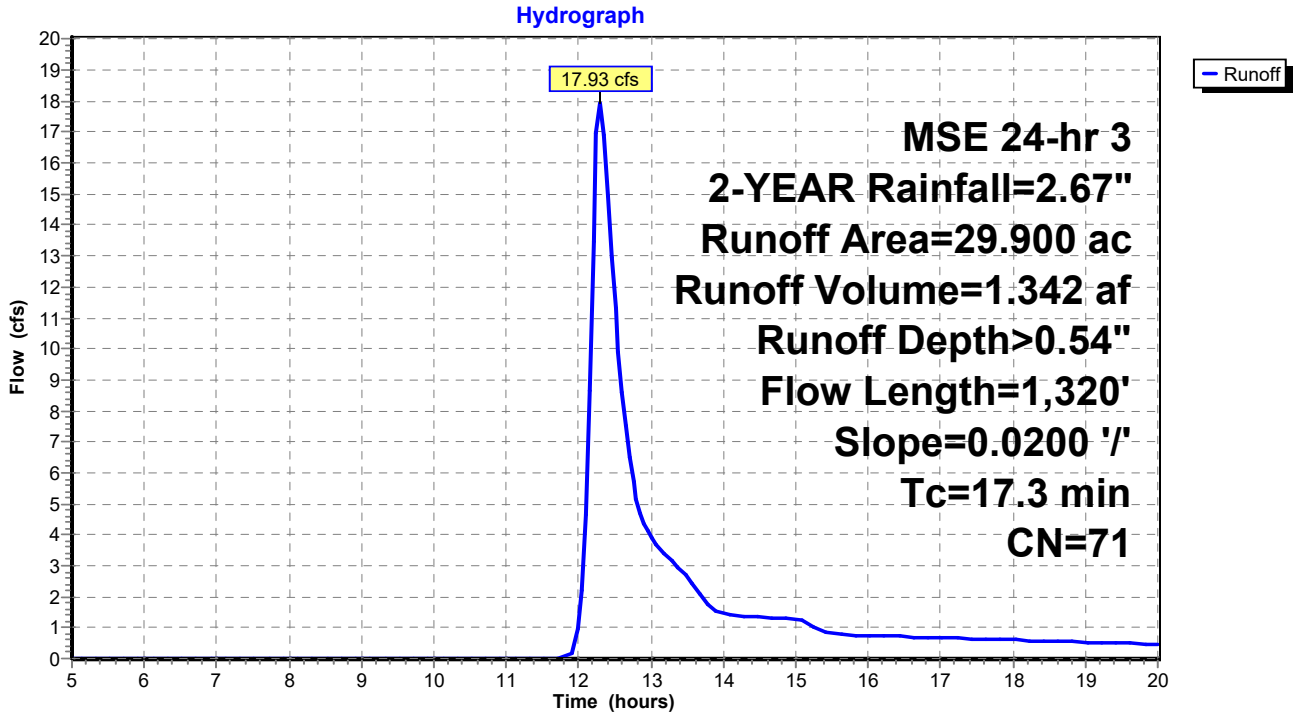
Runoff = 17.93 cfs @ 12.30 hrs, Volume= 1.342 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YEAR Rainfall=2.67"

	Area (ac)	CN	Description
*	29.600	71	AG LANDS
*	0.300	89	GRAVEL DRIVEWAY
	29.900	71	Weighted Average
	29.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment ES: EXISTING SITE



Summary for Subcatchment OFF: OFFSITE AREA

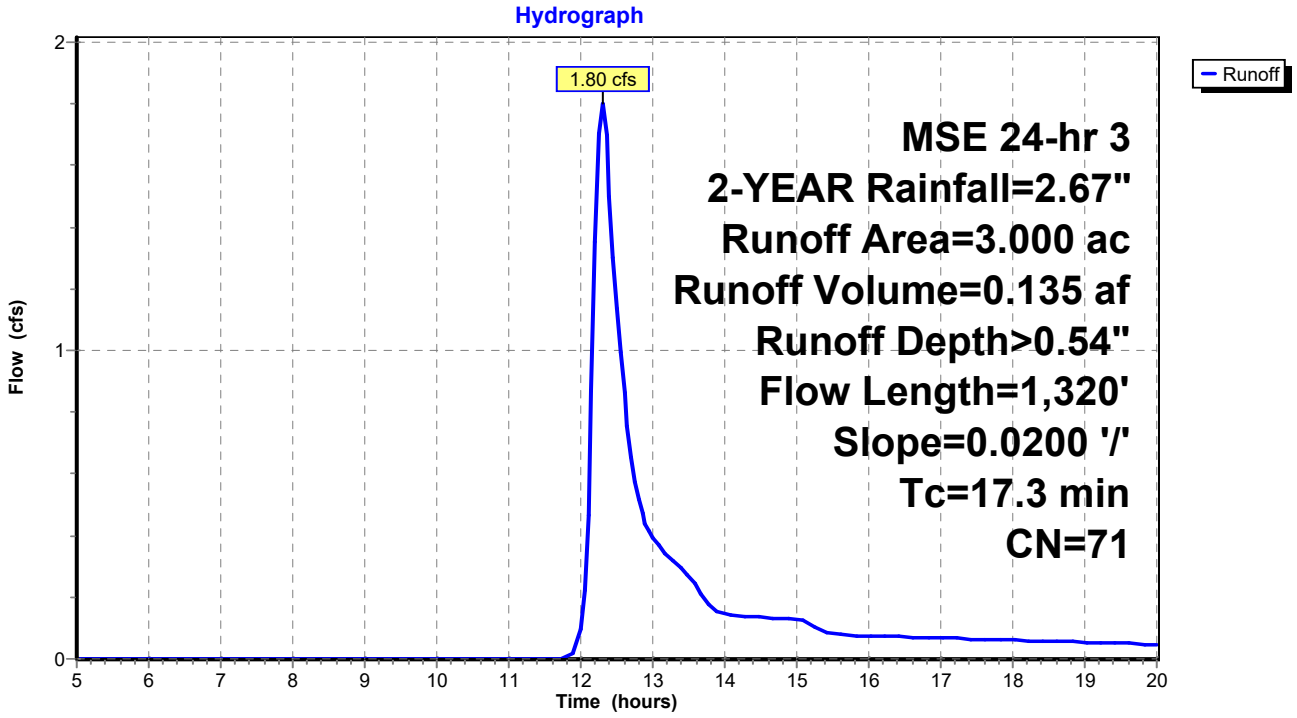
Runoff = 1.80 cfs @ 12.30 hrs, Volume= 0.135 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YEAR Rainfall=2.67"

	Area (ac)	CN	Description
*	3.000	71	AG LANDS
	3.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED**
					Cultivated Straight Rows Kv= 9.0 fps

Subcatchment OFF: OFFSITE AREA

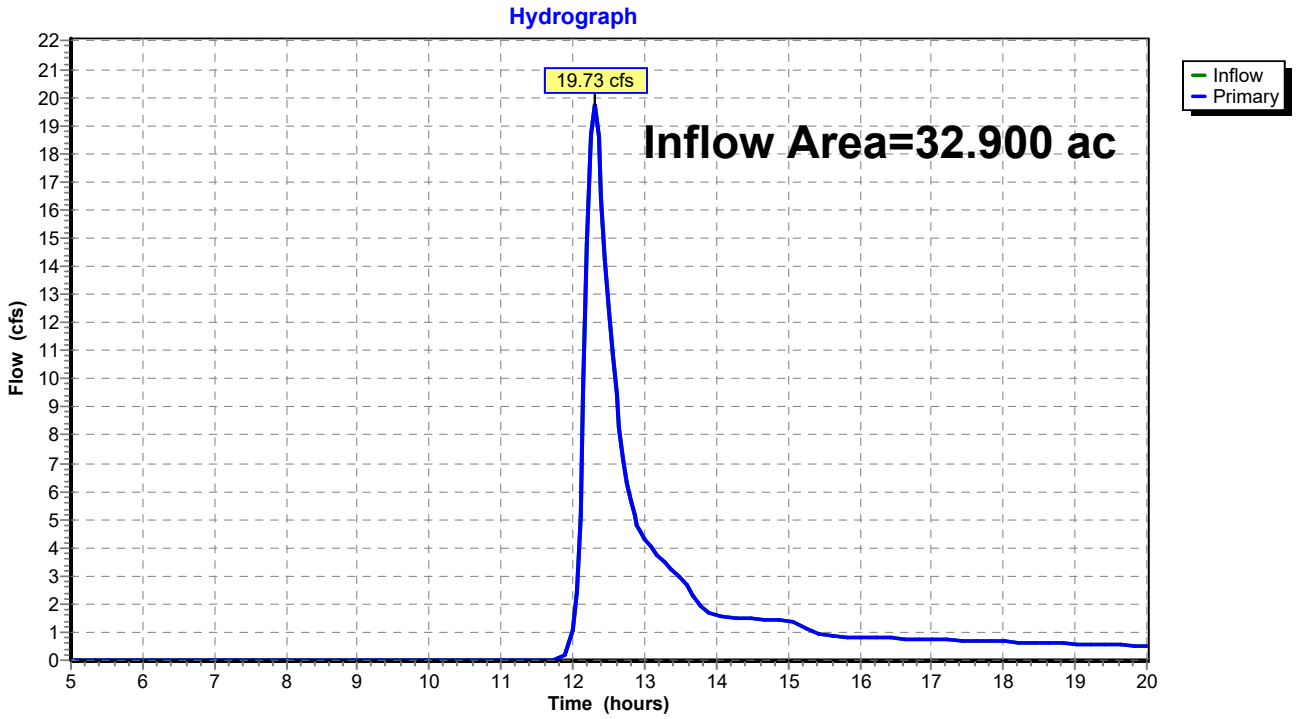


Summary for Link EAD: EXISTING ALLOWABLE DISCHARGE

Inflow Area = 32.900 ac, 0.00% Impervious, Inflow Depth > 0.54" for 2-YEAR event
Inflow = 19.73 cfs @ 12.30 hrs, Volume= 1.476 af
Primary = 19.73 cfs @ 12.30 hrs, Volume= 1.476 af, Atten= 0%, Lag= 0.0 min

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

Link EAD: EXISTING ALLOWABLE DISCHARGE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentES: EXISTING SITE Runoff Area=29.900 ac 0.00% Impervious Runoff Depth>1.17"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=42.59 cfs 2.910 af

SubcatchmentOFF: OFFSITE AREA Runoff Area=3.000 ac 0.00% Impervious Runoff Depth>1.17"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=4.27 cfs 0.292 af

Link EAD: EXISTING ALLOWABLE DISCHARGE Inflow=46.87 cfs 3.202 af
Primary=46.87 cfs 3.202 af

Total Runoff Area = 32.900 ac Runoff Volume = 3.202 af Average Runoff Depth = 1.17"
100.00% Pervious = 32.900 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment ES: EXISTING SITE

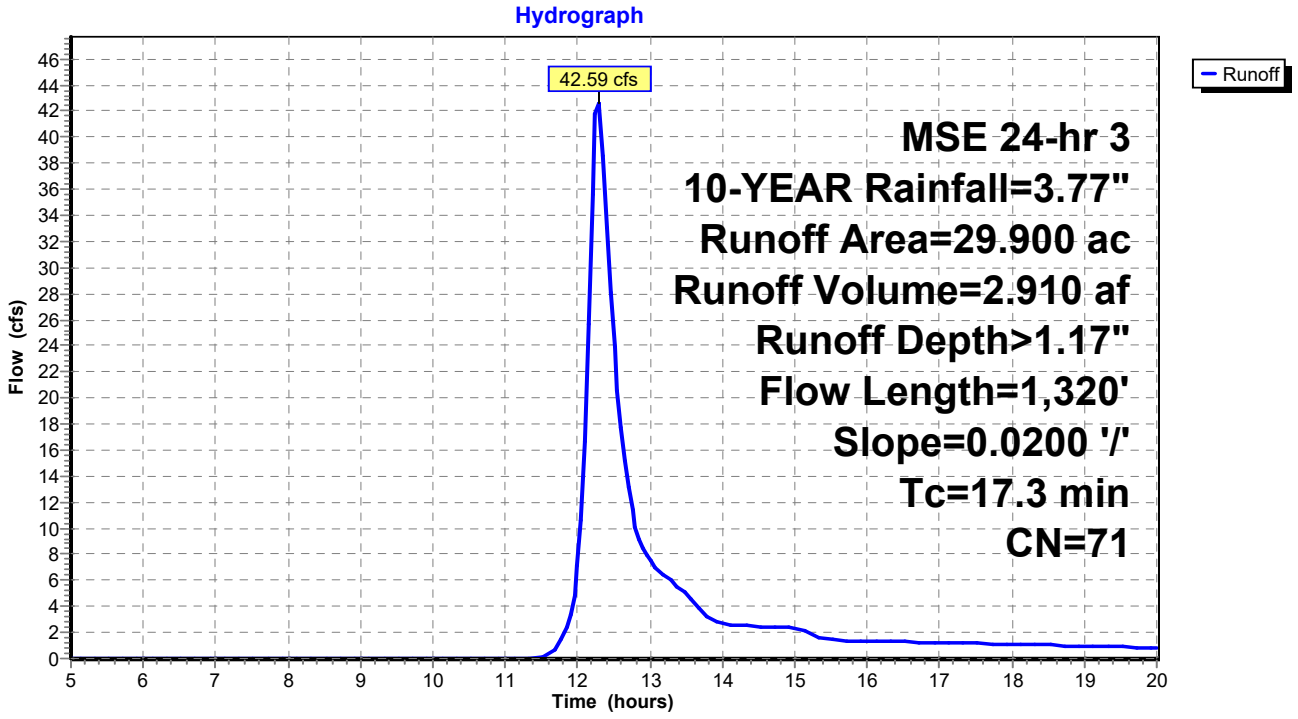
Runoff = 42.59 cfs @ 12.28 hrs, Volume= 2.910 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YEAR Rainfall=3.77"

	Area (ac)	CN	Description
*	29.600	71	AG LANDS
*	0.300	89	GRAVEL DRIVEWAY
	29.900	71	Weighted Average
	29.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED**
					Cultivated Straight Rows Kv= 9.0 fps

Subcatchment ES: EXISTING SITE



Summary for Subcatchment OFF: OFFSITE AREA

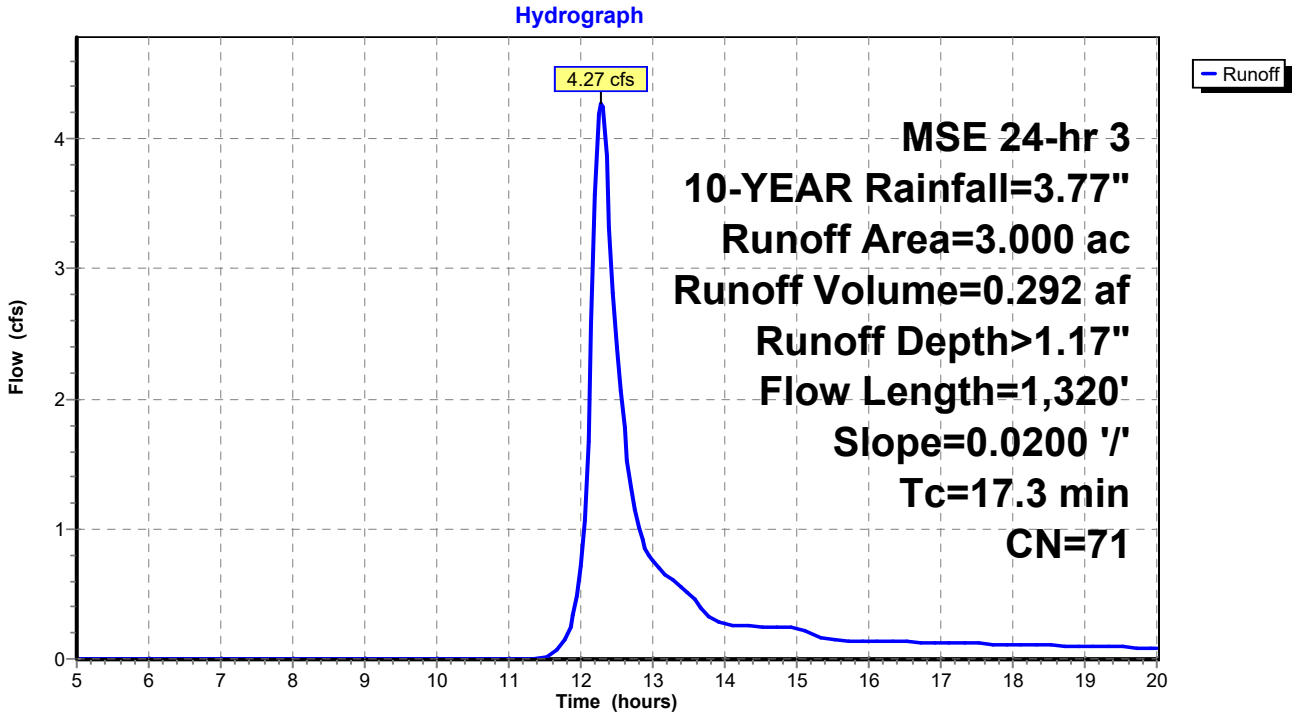
Runoff = 4.27 cfs @ 12.28 hrs, Volume= 0.292 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YEAR Rainfall=3.77"

	Area (ac)	CN	Description
*	3.000	71	AG LANDS
	3.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment OFF: OFFSITE AREA

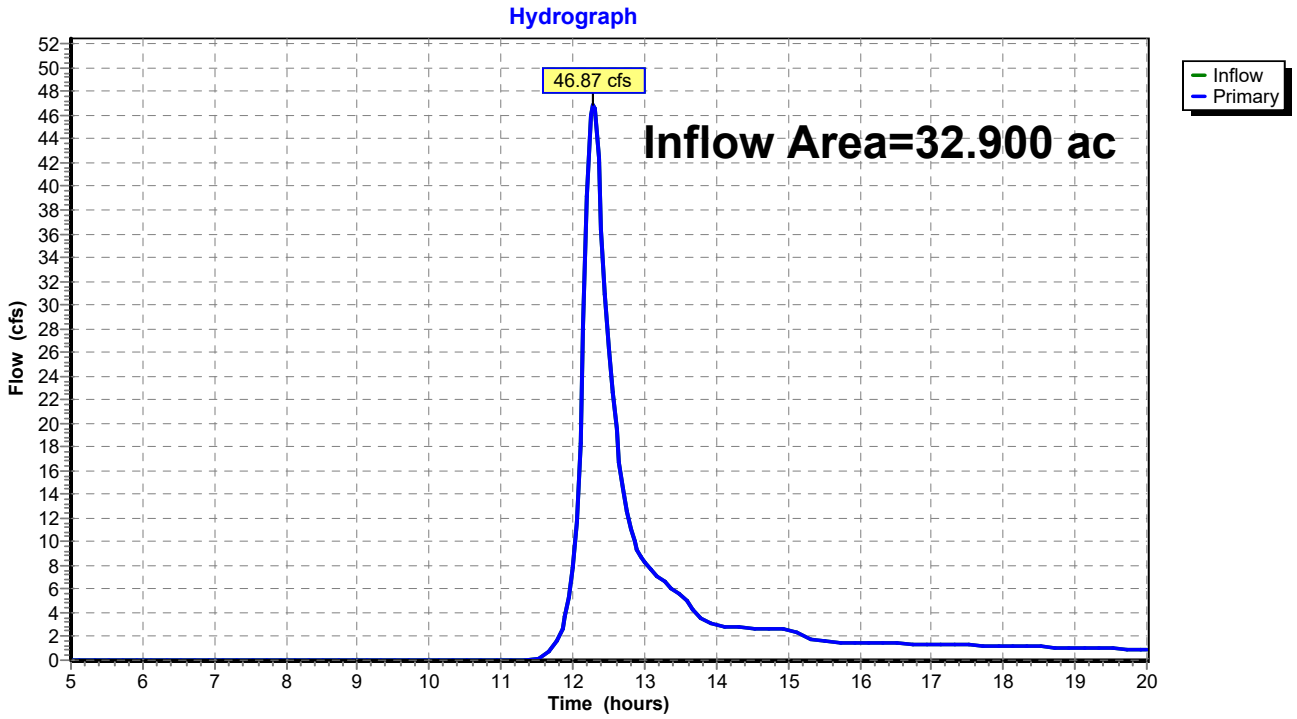


Summary for Link EAD: EXISTING ALLOWABLE DISCHARGE

Inflow Area = 32.900 ac, 0.00% Impervious, Inflow Depth > 1.17" for 10-YEAR event
Inflow = 46.87 cfs @ 12.28 hrs, Volume= 3.202 af
Primary = 46.87 cfs @ 12.28 hrs, Volume= 3.202 af, Atten= 0%, Lag= 0.0 min

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

Link EAD: EXISTING ALLOWABLE DISCHARGE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentES: EXISTING SITE Runoff Area=29.900 ac 0.00% Impervious Runoff Depth>2.70"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=101.75 cfs 6.724 af

SubcatchmentOFF: OFFSITE AREA Runoff Area=3.000 ac 0.00% Impervious Runoff Depth>2.70"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=10.21 cfs 0.675 af

Link EAD: EXISTING ALLOWABLE DISCHARGE Inflow=111.96 cfs 7.399 af
Primary=111.96 cfs 7.399 af

Total Runoff Area = 32.900 ac Runoff Volume = 7.399 af Average Runoff Depth = 2.70"
100.00% Pervious = 32.900 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment ES: EXISTING SITE

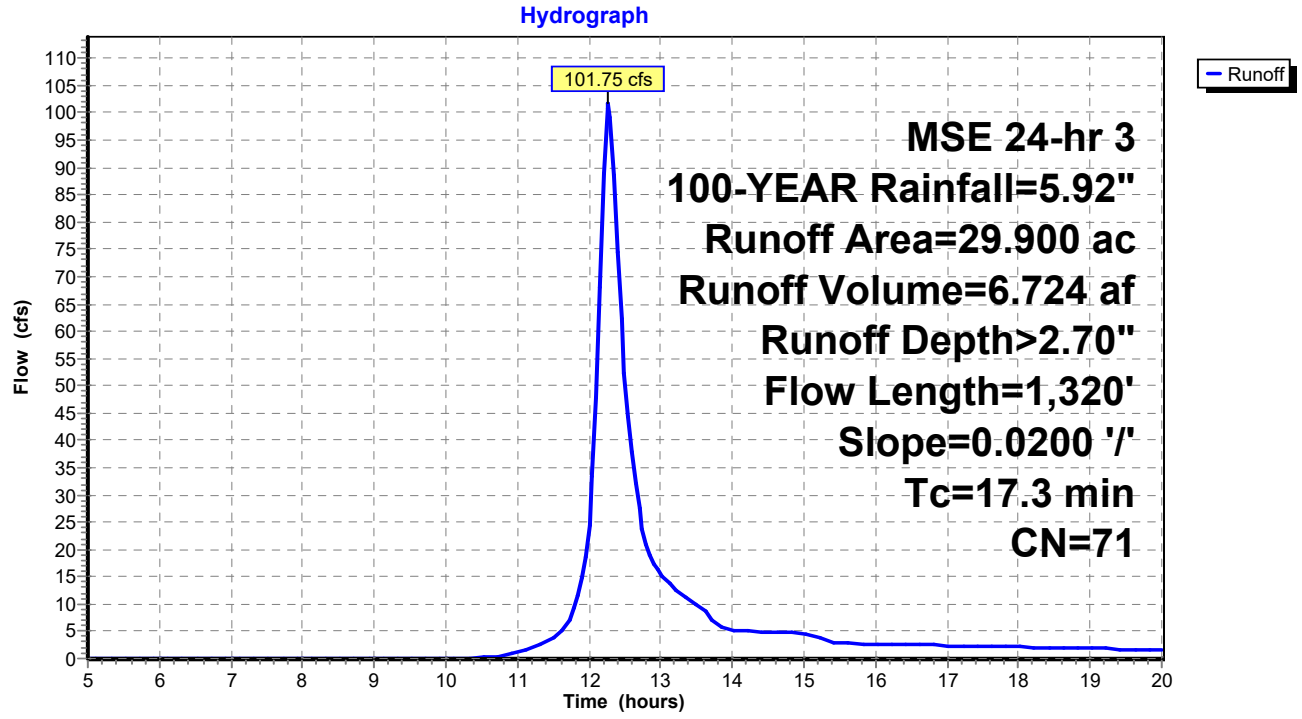
Runoff = 101.75 cfs @ 12.27 hrs, Volume= 6.724 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YEAR Rainfall=5.92"

	Area (ac)	CN	Description
*	29.600	71	AG LANDS
*	0.300	89	GRAVEL DRIVEWAY
	29.900	71	Weighted Average
	29.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment ES: EXISTING SITE



Summary for Subcatchment OFF: OFFSITE AREA

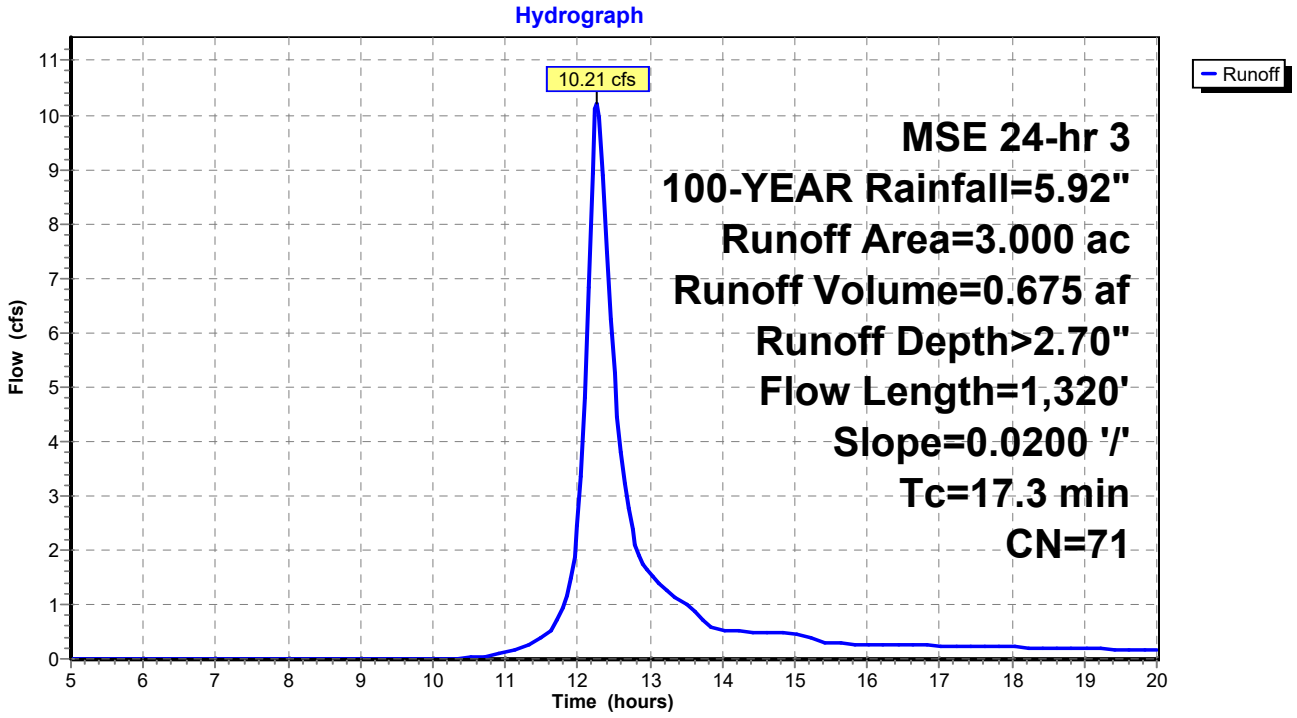
Runoff = 10.21 cfs @ 12.27 hrs, Volume= 0.675 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YEAR Rainfall=5.92"

	Area (ac)	CN	Description
*	3.000	71	AG LANDS
	3.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment OFF: OFFSITE AREA

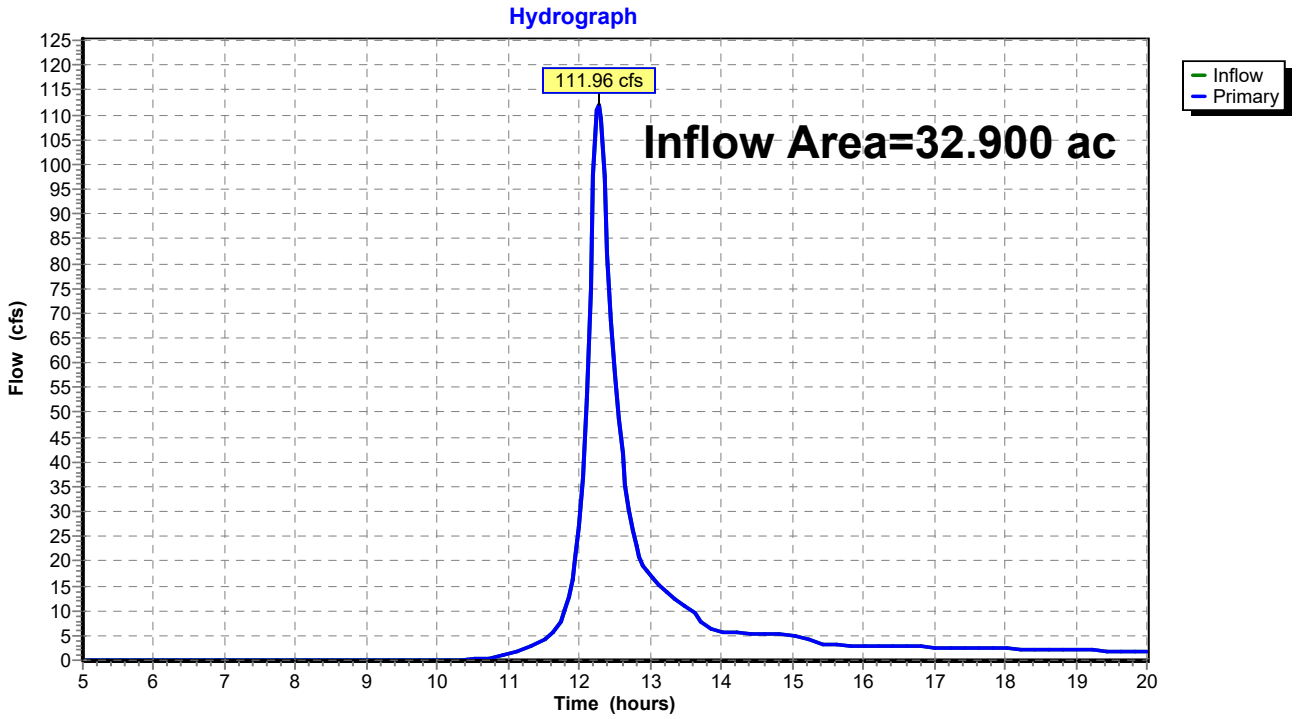


Summary for Link EAD: EXISTING ALLOWABLE DISCHARGE

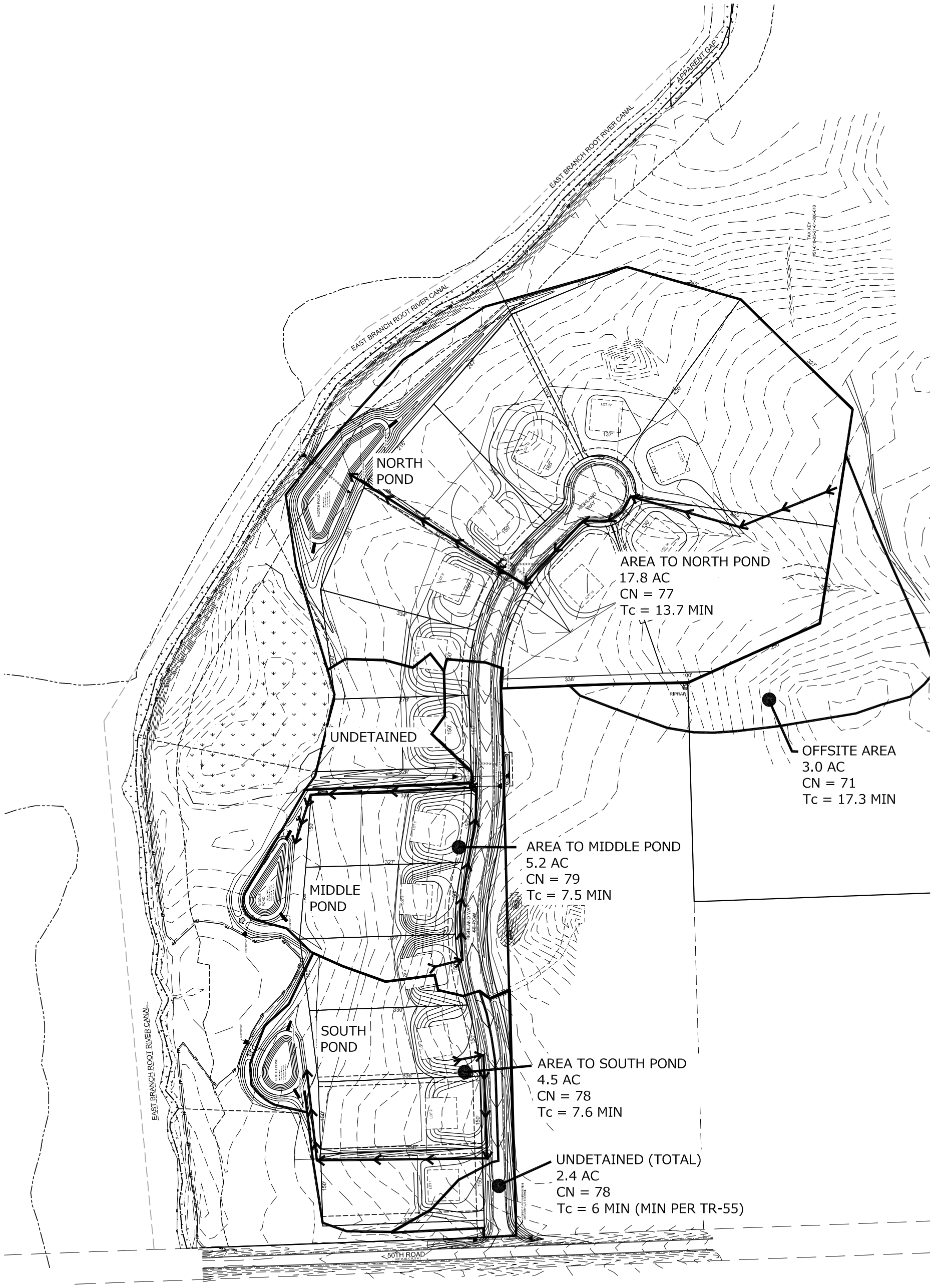
Inflow Area = 32.900 ac, 0.00% Impervious, Inflow Depth > 2.70" for 100-YEAR event
Inflow = 111.96 cfs @ 12.27 hrs, Volume= 7.399 af
Primary = 111.96 cfs @ 12.27 hrs, Volume= 7.399 af, Atten= 0%, Lag= 0.0 min

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

Link EAD: EXISTING ALLOWABLE DISCHARGE



APPENDIX 3
POST-DEVELOPMENT CONDITIONS INFORMATION (RATE ATTENUATION)



Z:\PROJECTS\2018\1335.00-WI\CAD\EXHIBITS\HYDROLOGY.DWG 6/29/2021 11:46 AM

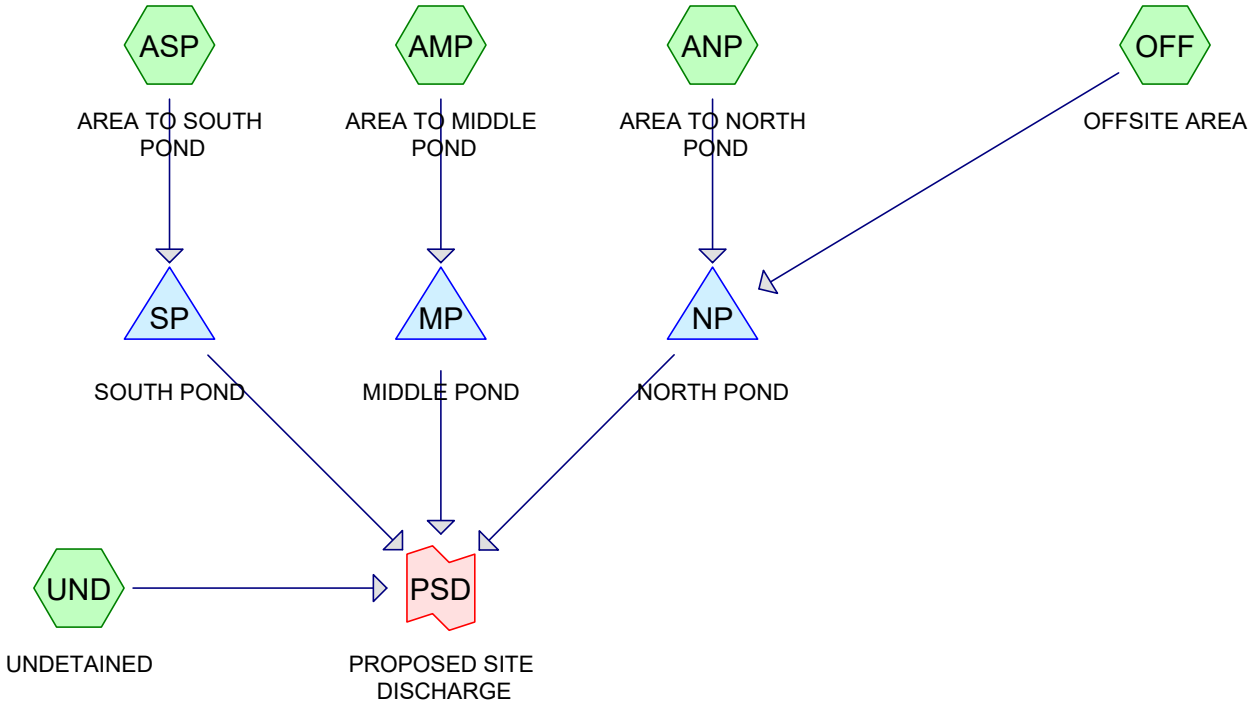
HYDROLOGY EXHIBIT - PROPOSED

6-29-21

PINNACLE ENGINEERING GROUP 20725 WATERTOWN ROAD | SUITE 100 | BROOKFIELD, WI 53186 | WWW.PINNACLE-ENGR.COM

PLAN | DESIGN | DELIVER

PEG JOB# 1335.00



Subcat Reach Pond Link

Routing Diagram for YORKVILLE
Prepared by Pinnacle Engineering Group, Printed 7/13/2021

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentAMP: AREA TO MIDDLE Runoff Area=5.200 ac 19.23% Impervious Runoff Depth>0.70"
Flow Length=872' Tc=7.5 min CN=79 Runoff=6.41 cfs 0.302 af

SubcatchmentANP: AREA TO NORTH Runoff Area=17.800 ac 10.67% Impervious Runoff Depth>0.61"
Flow Length=1,190' Tc=13.7 min CN=77 Runoff=14.38 cfs 0.903 af

SubcatchmentASP: AREA TO SOUTH Runoff Area=4.500 ac 15.56% Impervious Runoff Depth>0.65"
Flow Length=803' Tc=7.6 min CN=78 Runoff=5.10 cfs 0.245 af

SubcatchmentOFF: OFFSITE AREA Runoff Area=3.000 ac 0.00% Impervious Runoff Depth>0.39"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=1.20 cfs 0.097 af

SubcatchmentUND: UNDETAINED Runoff Area=2.400 ac 16.67% Impervious Runoff Depth>0.65"
Tc=6.0 min CN=78 Runoff=2.91 cfs 0.131 af

Pond MP: MIDDLE POND Peak Elev=716.65' Storage=0.186 af Inflow=6.41 cfs 0.302 af
Outflow=0.32 cfs 0.187 af

Pond NP: NORTH POND Peak Elev=717.31' Storage=32,069 cf Inflow=15.45 cfs 1.000 af
Outflow=0.45 cfs 0.280 af

Pond SP: SOUTH POND Peak Elev=716.52' Storage=0.146 af Inflow=5.10 cfs 0.245 af
Outflow=0.28 cfs 0.160 af

Link PSD: PROPOSED SITE DISCHARGE Inflow=3.20 cfs 0.758 af
Primary=3.20 cfs 0.758 af

Total Runoff Area = 32.900 ac Runoff Volume = 1.678 af Average Runoff Depth = 0.61"
87.84% Pervious = 28.900 ac 12.16% Impervious = 4.000 ac

Summary for Subcatchment AMP: AREA TO MIDDLE POND

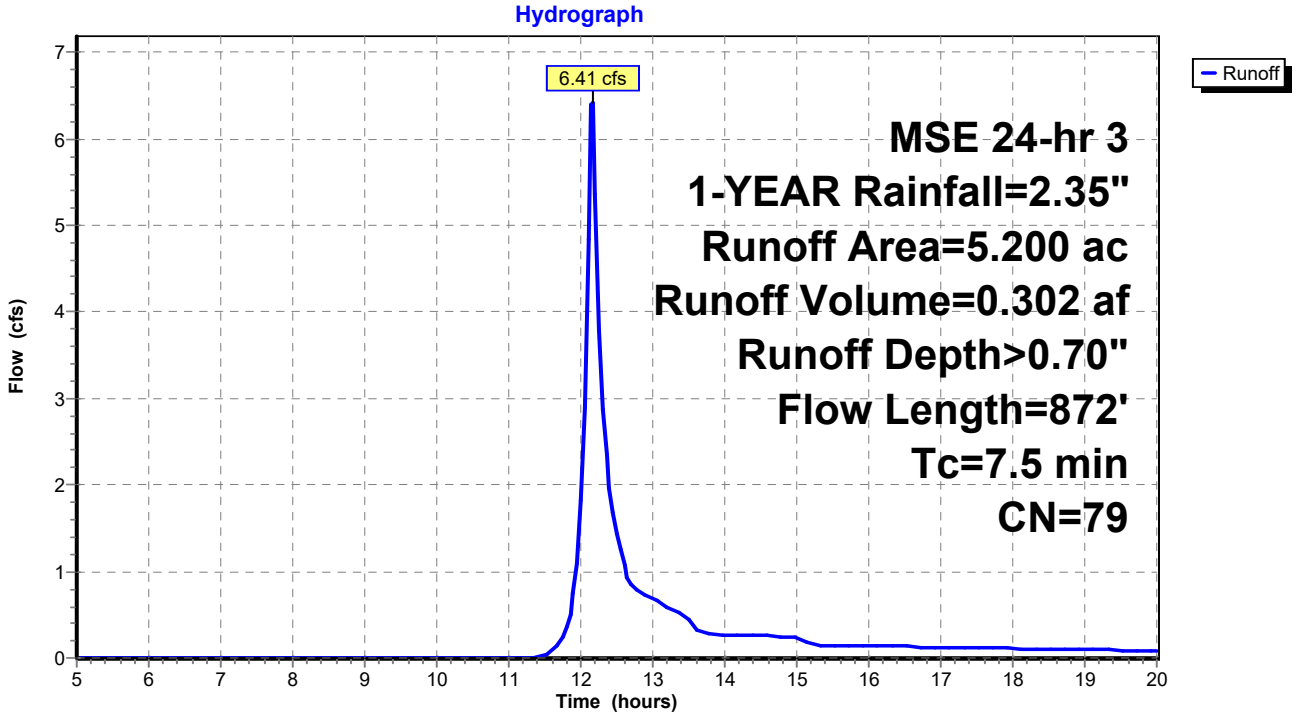
Runoff = 6.41 cfs @ 12.16 hrs, Volume= 0.302 af, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-YEAR Rainfall=2.35"

	Area (ac)	CN	Description
*	0.300	98	ROOF
*	0.500	98	PAVEMENT
*	0.200	99	WATER SURFACE
*	4.200	74	GRASS
	5.200	79	Weighted Average
	4.200		80.77% Pervious Area
	1.000		19.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	60	0.0500	0.20		**Sheet Flow, SHEET** Grass: Short n= 0.150 P2= 2.67"
2.6	812	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Ditch** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
7.5	872	Total			

Subcatchment AMP: AREA TO MIDDLE POND



Summary for Subcatchment ANP: AREA TO NORTH POND

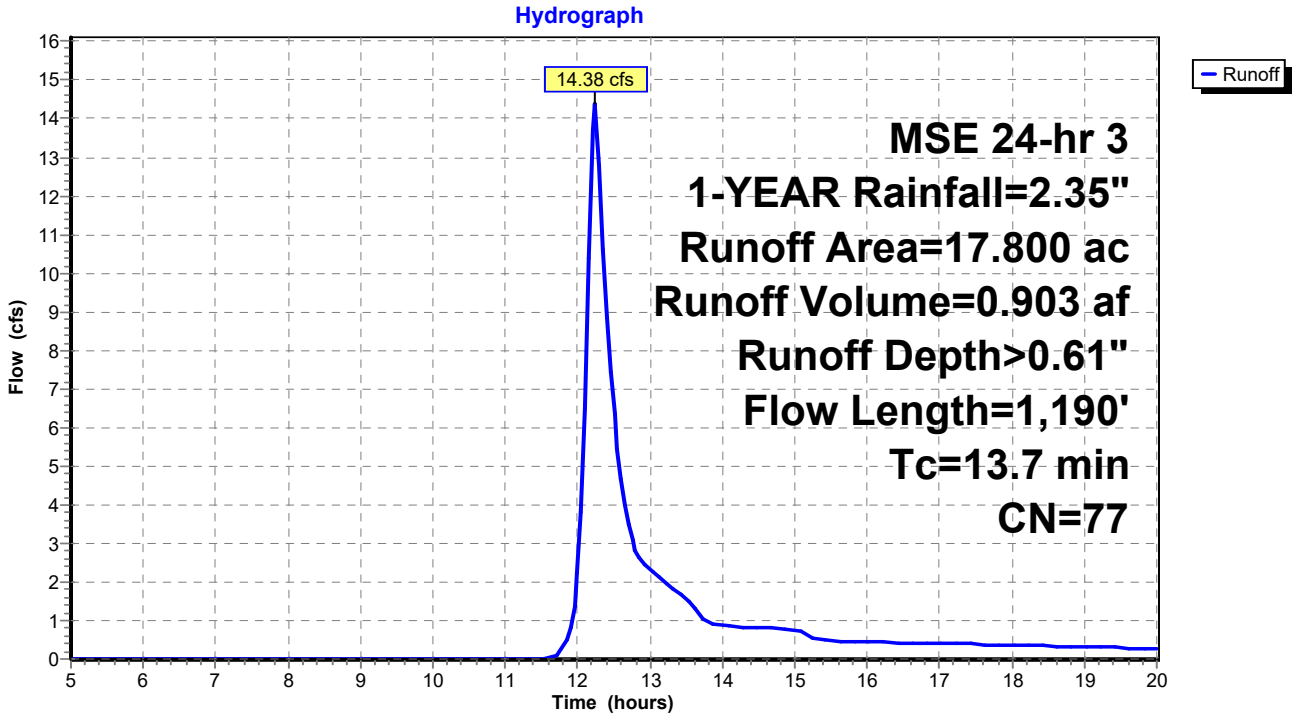
Runoff = 14.38 cfs @ 12.24 hrs, Volume= 0.903 af, Depth> 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-YEAR Rainfall=2.35"

	Area (ac)	CN	Description
*	0.700	98	ROOF
*	0.700	98	PAVEMENT
*	0.500	99	WATER SURFACE
*	15.900	74	GRASS
	17.800	77	Weighted Average
	15.900		89.33% Pervious Area
	1.900		10.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	220	0.0220	0.39		**Sheet Flow, Sheet** Cultivated: Residue<=20% n= 0.060 P2= 2.67"
2.0	235	0.0170	1.96		**Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps
2.4	735	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Swale** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
13.7	1,190	Total			

Subcatchment ANP: AREA TO NORTH POND



Summary for Subcatchment ASP: AREA TO SOUTH POND

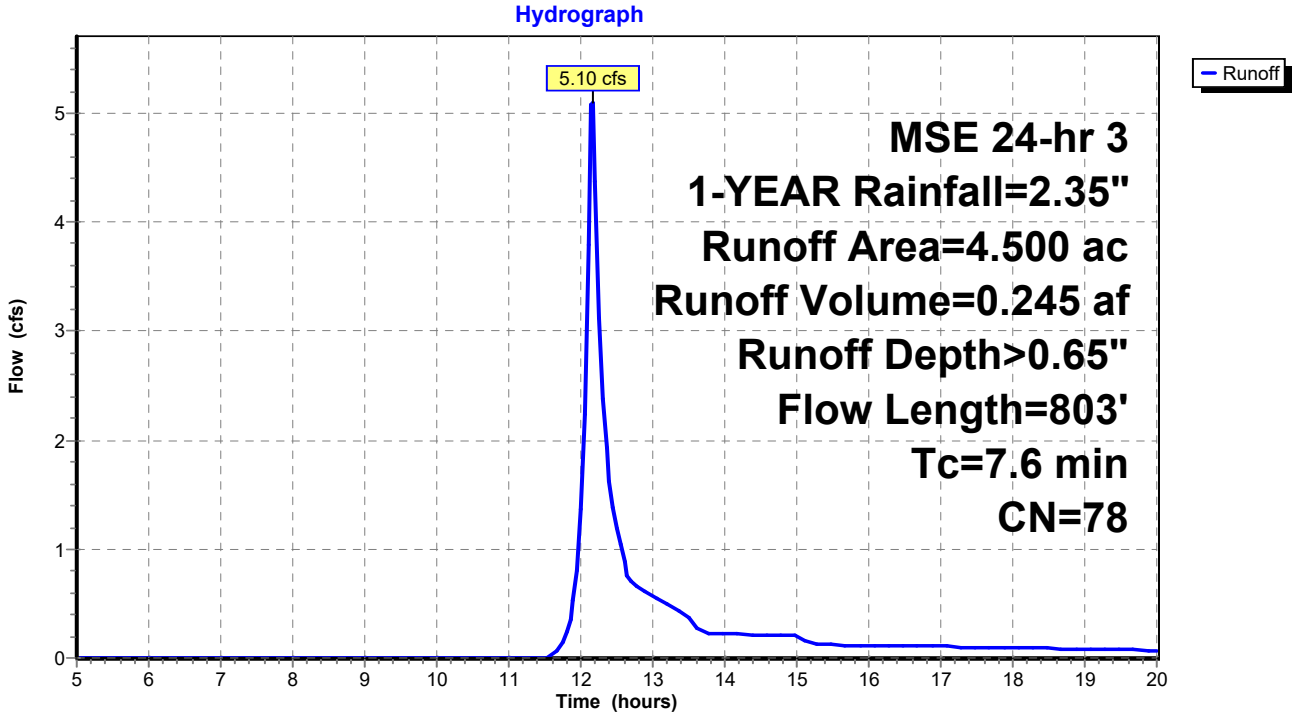
Runoff = 5.10 cfs @ 12.16 hrs, Volume= 0.245 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-YEAR Rainfall=2.35"

	Area (ac)	CN	Description
*	0.300	98	ROOF
*	0.200	98	PAVEMENT
*	0.200	99	WATER SURFACE
*	3.800	74	GRASS
	4.500	78	Weighted Average
	3.800		84.44% Pervious Area
	0.700		15.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	64	0.0500	0.21		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.67"
2.4	739	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Ditch** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
7.6	803	Total			

Subcatchment ASP: AREA TO SOUTH POND



Summary for Subcatchment OFF: OFFSITE AREA

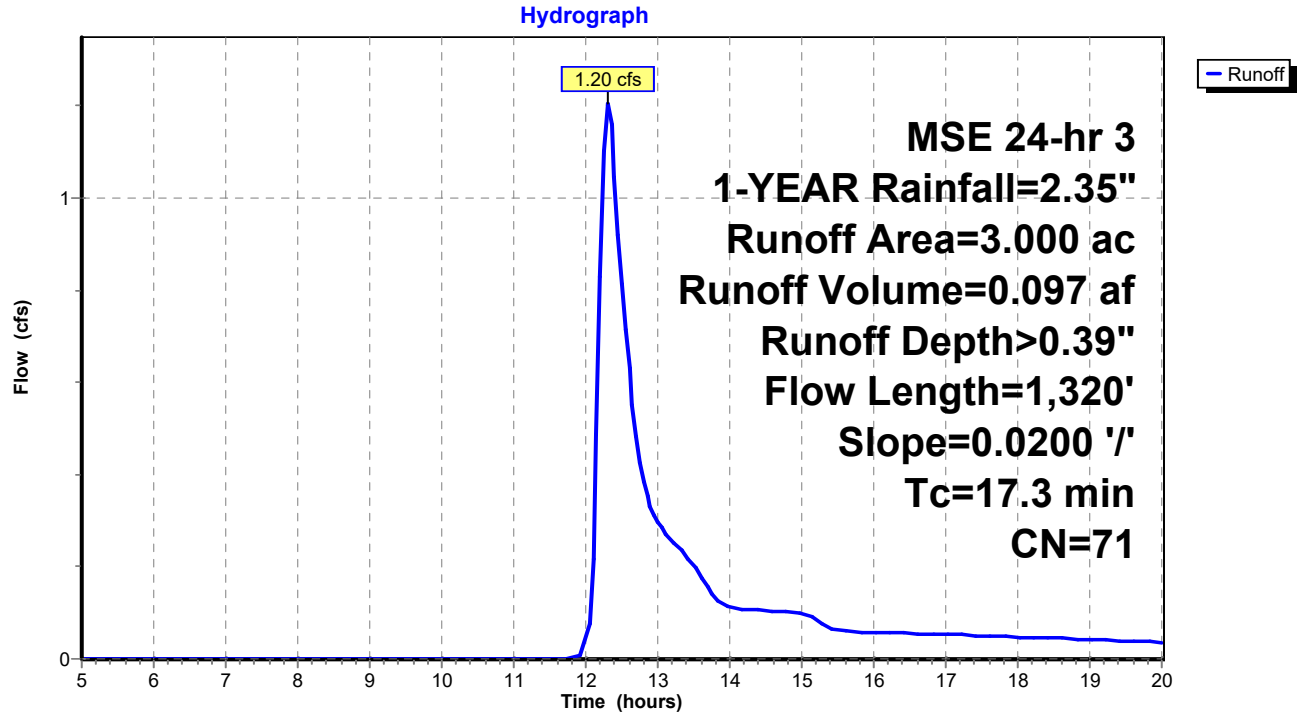
Runoff = 1.20 cfs @ 12.31 hrs, Volume= 0.097 af, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-YEAR Rainfall=2.35"

	Area (ac)	CN	Description
*	3.000	71	AG LANDS
	3.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED**
					Cultivated Straight Rows Kv= 9.0 fps

Subcatchment OFF: OFFSITE AREA



Summary for Subcatchment UND: UNDETAINED

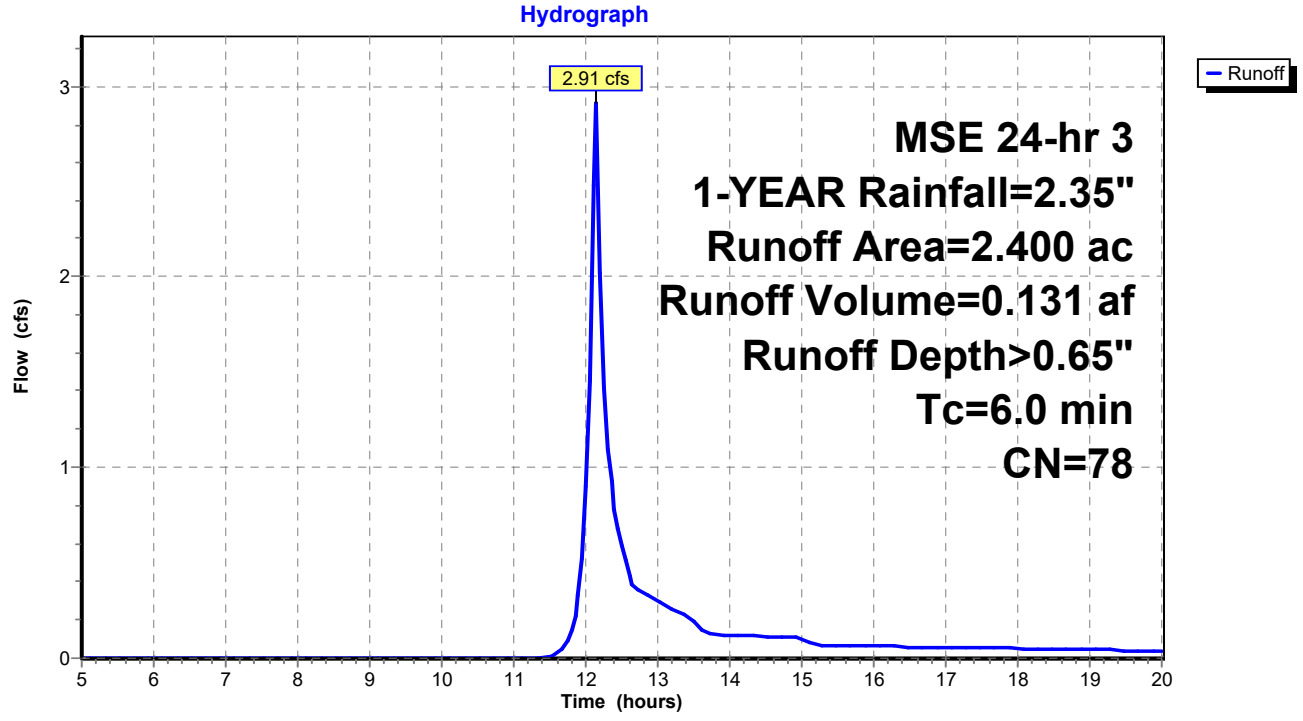
Runoff = 2.91 cfs @ 12.14 hrs, Volume= 0.131 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-YEAR Rainfall=2.35"

	Area (ac)	CN	Description
*	0.200	98	ROOF
*	0.200	98	PAVEMENT
*	2.000	74	GRASS
	2.400	78	Weighted Average
	2.000		83.33% Pervious Area
	0.400		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN PER TR-55**

Subcatchment UND: UNDETAINED



Summary for Pond MP: MIDDLE POND

Inflow Area = 5.200 ac, 19.23% Impervious, Inflow Depth > 0.70" for 1-YEAR event
Inflow = 6.41 cfs @ 12.16 hrs, Volume= 0.302 af
Outflow = 0.32 cfs @ 13.64 hrs, Volume= 0.187 af, Atten= 95%, Lag= 89.2 min
Primary = 0.32 cfs @ 13.64 hrs, Volume= 0.187 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 716.65' @ 13.64 hrs Surf.Area= 0.262 ac Storage= 0.186 af

Plug-Flow detention time= 220.2 min calculated for 0.187 af (62% of inflow)
Center-of-Mass det. time= 151.8 min (955.6 - 803.8)

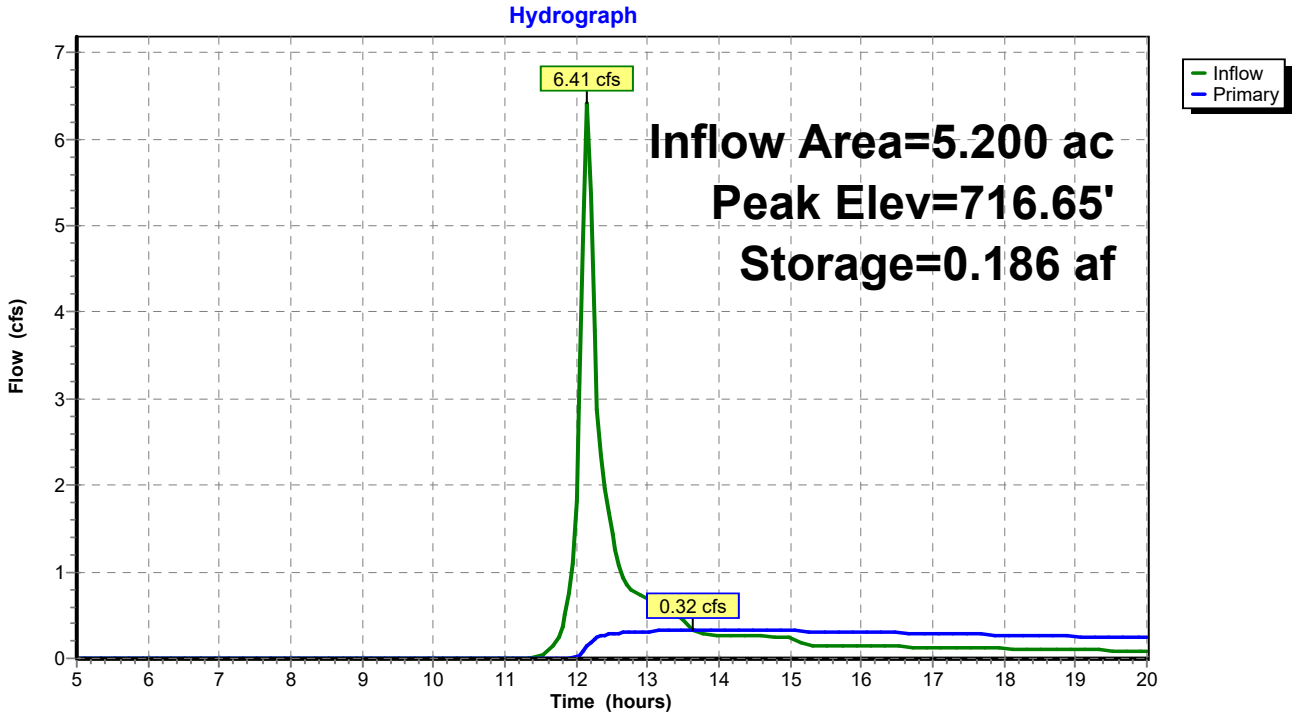
Volume	Invert	Avail.Storage	Storage Description
#1	715.90'	0.959 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
715.90	0.232	0.000	0.000
716.00	0.235	0.023	0.023
717.00	0.277	0.256	0.279
718.00	0.340	0.308	0.588
719.00	0.402	0.371	0.959

Device	Routing	Invert	Outlet Devices
#1	Primary	715.90'	**12.0" Round Culvert** L= 37.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 715.90' / 715.81' S= 0.0024 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	715.90'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.20'	**10.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (69% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.32 cfs @ 13.64 hrs HW=716.65' (Free Discharge)
└**1=Culvert** (Passes 0.32 cfs of 1.21 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.32 cfs @ 3.68 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond MP: MIDDLE POND



Summary for Pond NP: NORTH POND

Inflow Area = 20.800 ac, 9.13% Impervious, Inflow Depth > 0.58" for 1-YEAR event
Inflow = 15.45 cfs @ 12.24 hrs, Volume= 1.000 af
Outflow = 0.45 cfs @ 17.19 hrs, Volume= 0.280 af, Atten= 97%, Lag= 296.9 min
Primary = 0.45 cfs @ 17.19 hrs, Volume= 0.280 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 717.31' @ 17.19 hrs Surf.Area= 27,516 sf Storage= 32,069 cf

Plug-Flow detention time= 242.4 min calculated for 0.279 af (28% of inflow)
Center-of-Mass det. time= 159.0 min (973.9 - 814.9)

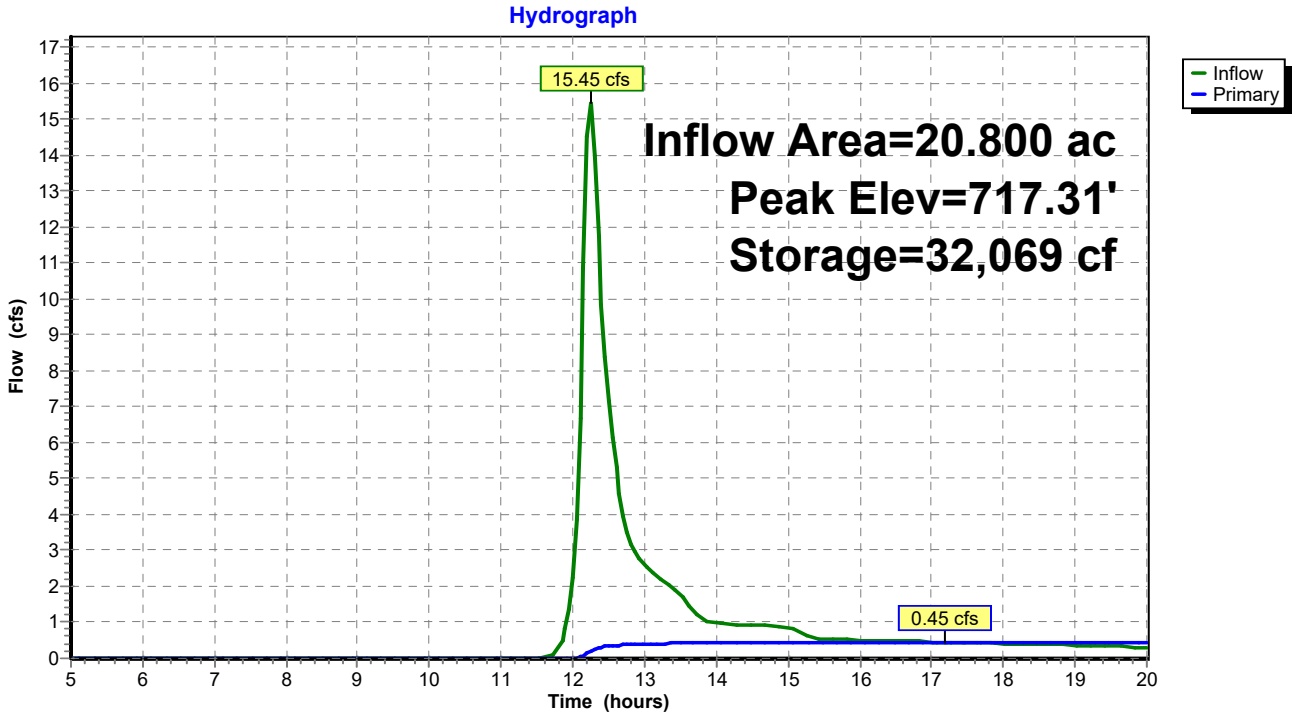
Volume	Invert	Avail.Storage	Storage Description
#1	716.00'	128,850 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.00	21,700	0	0
717.00	25,800	23,750	23,750
718.00	31,300	28,550	52,300
719.00	37,700	34,500	86,800
720.00	46,400	42,050	128,850

Device	Routing	Invert	Outlet Devices
#1	Primary	716.00'	**30.0" Round Culvert** L= 38.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 716.00' / 715.81' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	716.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.50'	**127.0 deg x 3.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Primary OutFlow Max=0.45 cfs @ 17.19 hrs HW=717.31' (Free Discharge)
└**1=Culvert** (Passes 0.45 cfs of 7.44 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.45 cfs @ 5.15 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond NP: NORTH POND



Summary for Pond SP: SOUTH POND

Inflow Area = 4.500 ac, 15.56% Impervious, Inflow Depth > 0.65" for 1-YEAR event
Inflow = 5.10 cfs @ 12.16 hrs, Volume= 0.245 af
Outflow = 0.28 cfs @ 13.62 hrs, Volume= 0.160 af, Atten= 94%, Lag= 87.6 min
Primary = 0.28 cfs @ 13.62 hrs, Volume= 0.160 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 716.52' @ 13.62 hrs Surf.Area= 0.249 ac Storage= 0.146 af

Plug-Flow detention time= 213.7 min calculated for 0.160 af (66% of inflow)
Center-of-Mass det. time= 146.6 min (952.8 - 806.1)

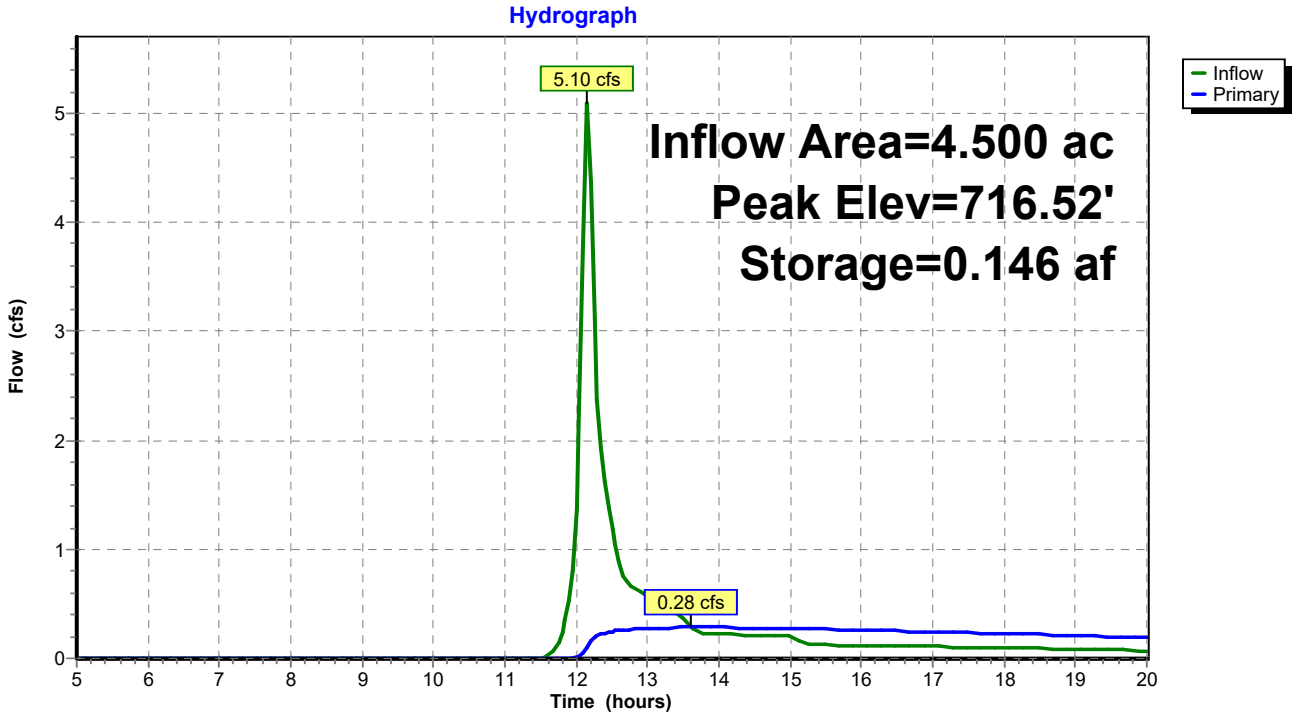
Volume	Invert	Avail.Storage	Storage Description
#1	715.90'	0.970 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
715.90	0.222	0.000	0.000
716.00	0.225	0.022	0.022
717.00	0.271	0.248	0.270
718.00	0.339	0.305	0.575
719.00	0.450	0.394	0.970

Device	Routing	Invert	Outlet Devices
#1	Primary	715.90'	**12.0" Round Culvert** L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 715.90' / 715.81' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	715.90'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.20'	**10.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (69% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.28 cfs @ 13.62 hrs HW=716.52' (Free Discharge)
└**1=Culvert** (Passes 0.28 cfs of 0.87 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 3.25 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond SP: SOUTH POND

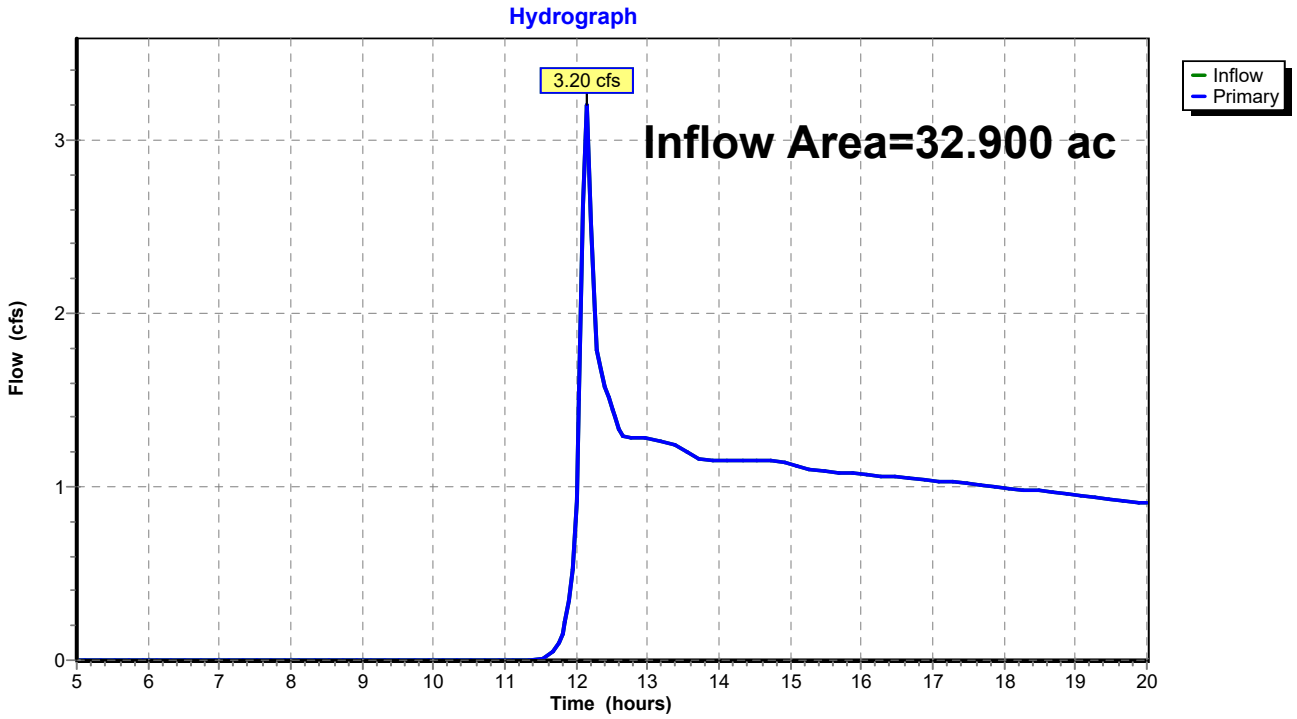


Summary for Link PSD: PROPOSED SITE DISCHARGE

Inflow Area = 32.900 ac, 12.16% Impervious, Inflow Depth > 0.28" for 1-YEAR event
Inflow = 3.20 cfs @ 12.15 hrs, Volume= 0.758 af
Primary = 3.20 cfs @ 12.15 hrs, Volume= 0.758 af, Atten= 0%, Lag= 0.0 min

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

Link PSD: PROPOSED SITE DISCHARGE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentAMP: AREA TO MIDDLE Runoff Area=5.200 ac 19.23% Impervious Runoff Depth>0.90"
Flow Length=872' Tc=7.5 min CN=79 Runoff=8.39 cfs 0.392 af

SubcatchmentANP: AREA TO NORTH Runoff Area=17.800 ac 10.67% Impervious Runoff Depth>0.80"
Flow Length=1,190' Tc=13.7 min CN=77 Runoff=19.35 cfs 1.187 af

SubcatchmentASP: AREA TO SOUTH Runoff Area=4.500 ac 15.56% Impervious Runoff Depth>0.85"
Flow Length=803' Tc=7.6 min CN=78 Runoff=6.74 cfs 0.319 af

SubcatchmentOFF: OFFSITE AREA Runoff Area=3.000 ac 0.00% Impervious Runoff Depth>0.54"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=1.80 cfs 0.135 af

SubcatchmentUND: UNDETAINED Runoff Area=2.400 ac 16.67% Impervious Runoff Depth>0.85"
Tc=6.0 min CN=78 Runoff=3.84 cfs 0.170 af

Pond MP: MIDDLE POND Peak Elev=716.89' Storage=0.249 af Inflow=8.39 cfs 0.392 af
Outflow=0.38 cfs 0.228 af

Pond NP: NORTH POND Peak Elev=717.63' Storage=41,046 cf Inflow=20.99 cfs 1.322 af
Outflow=0.97 cfs 0.448 af

Pond SP: SOUTH POND Peak Elev=716.73' Storage=0.198 af Inflow=6.74 cfs 0.319 af
Outflow=0.34 cfs 0.199 af

Link PSD: PROPOSED SITE DISCHARGE Inflow=4.32 cfs 1.046 af
Primary=4.32 cfs 1.046 af

Total Runoff Area = 32.900 ac Runoff Volume = 2.204 af Average Runoff Depth = 0.80"
87.84% Pervious = 28.900 ac 12.16% Impervious = 4.000 ac

Summary for Subcatchment AMP: AREA TO MIDDLE POND

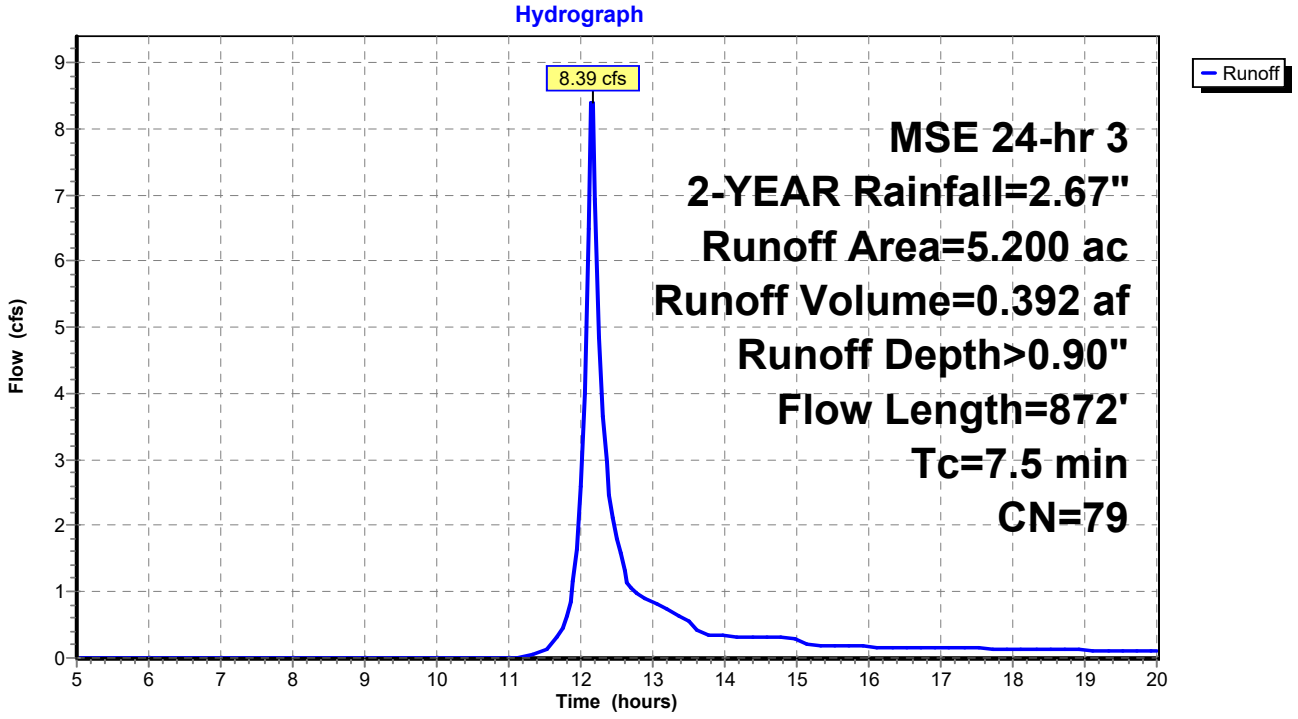
Runoff = 8.39 cfs @ 12.15 hrs, Volume= 0.392 af, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YEAR Rainfall=2.67"

	Area (ac)	CN	Description
*	0.300	98	ROOF
*	0.500	98	PAVEMENT
*	0.200	99	WATER SURFACE
*	4.200	74	GRASS
	5.200	79	Weighted Average
	4.200		80.77% Pervious Area
	1.000		19.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	60	0.0500	0.20		**Sheet Flow, SHEET** Grass: Short n= 0.150 P2= 2.67"
2.6	812	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Ditch** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
7.5	872	Total			

Subcatchment AMP: AREA TO MIDDLE POND



Summary for Subcatchment ANP: AREA TO NORTH POND

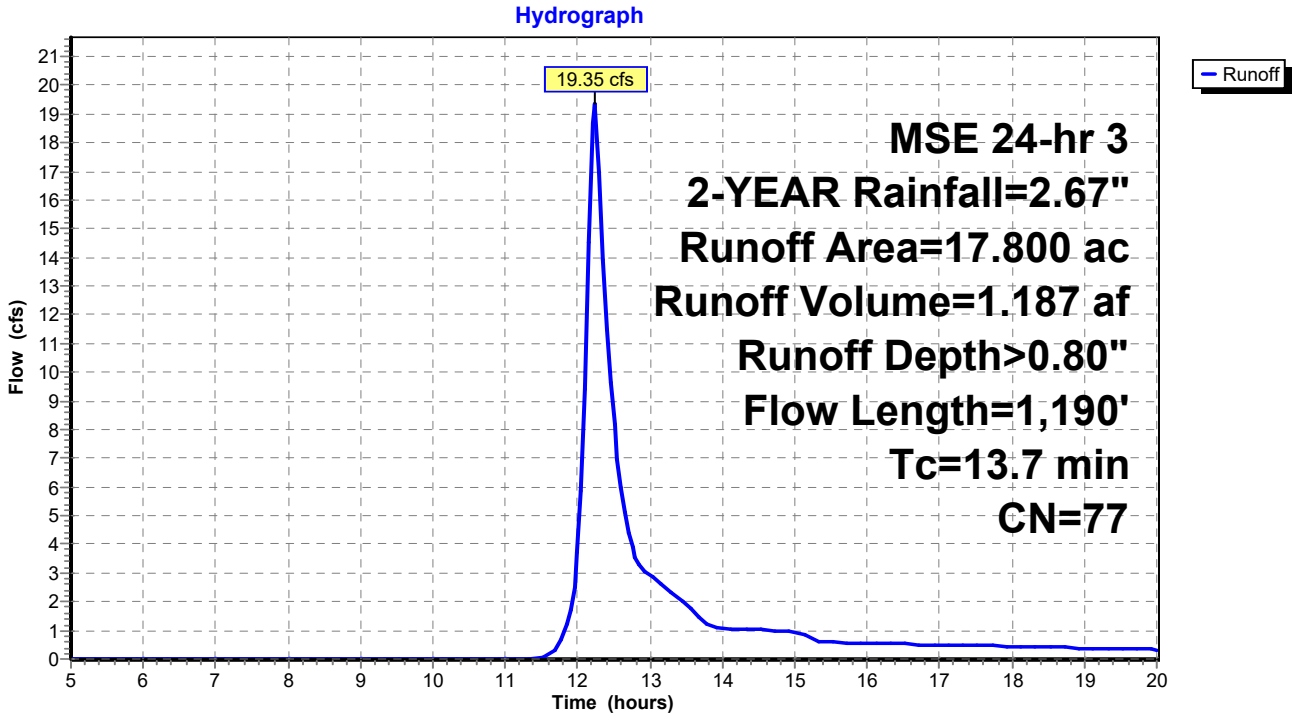
Runoff = 19.35 cfs @ 12.23 hrs, Volume= 1.187 af, Depth> 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YEAR Rainfall=2.67"

	Area (ac)	CN	Description
*	0.700	98	ROOF
*	0.700	98	PAVEMENT
*	0.500	99	WATER SURFACE
*	15.900	74	GRASS
	17.800	77	Weighted Average
	15.900		89.33% Pervious Area
	1.900		10.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	220	0.0220	0.39		**Sheet Flow, Sheet** Cultivated: Residue<=20% n= 0.060 P2= 2.67"
2.0	235	0.0170	1.96		**Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps
2.4	735	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Swale** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
13.7	1,190	Total			

Subcatchment ANP: AREA TO NORTH POND



Summary for Subcatchment ASP: AREA TO SOUTH POND

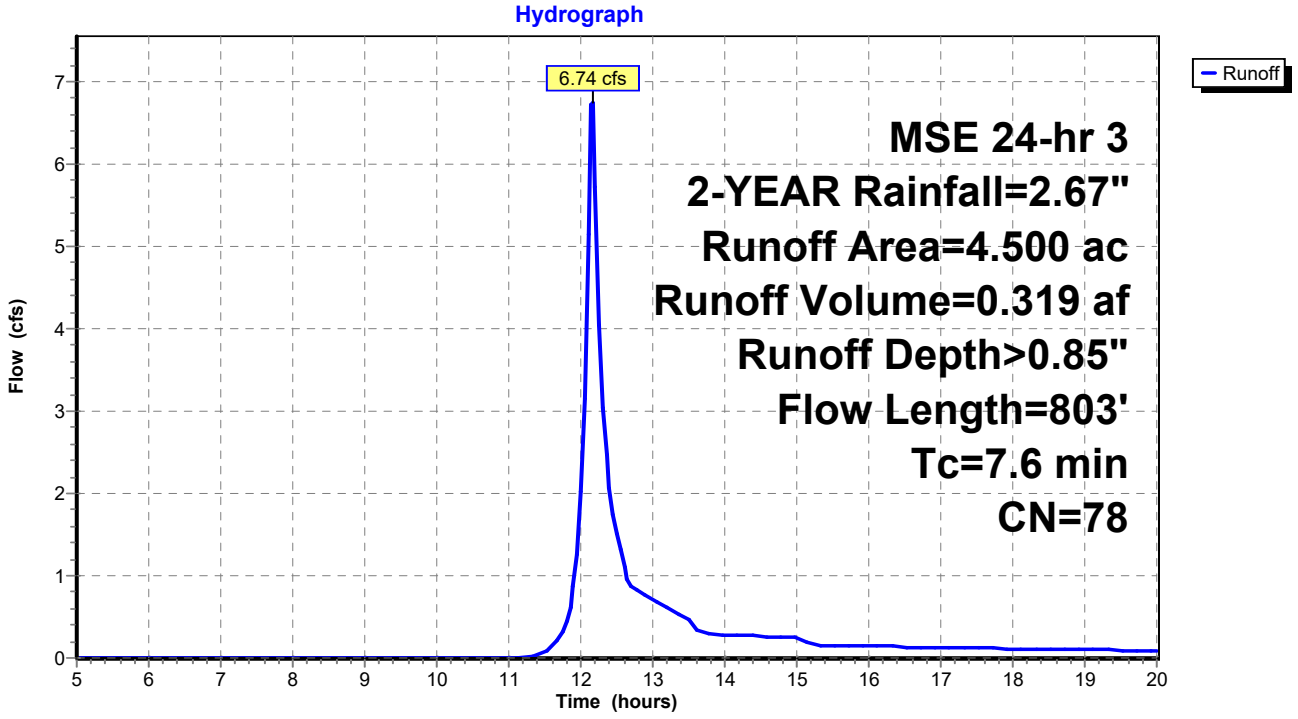
Runoff = 6.74 cfs @ 12.16 hrs, Volume= 0.319 af, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YEAR Rainfall=2.67"

	Area (ac)	CN	Description
*	0.300	98	ROOF
*	0.200	98	PAVEMENT
*	0.200	99	WATER SURFACE
*	3.800	74	GRASS
	4.500	78	Weighted Average
	3.800		84.44% Pervious Area
	0.700		15.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	64	0.0500	0.21		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.67"
2.4	739	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Ditch** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
7.6	803	Total			

Subcatchment ASP: AREA TO SOUTH POND



Summary for Subcatchment OFF: OFFSITE AREA

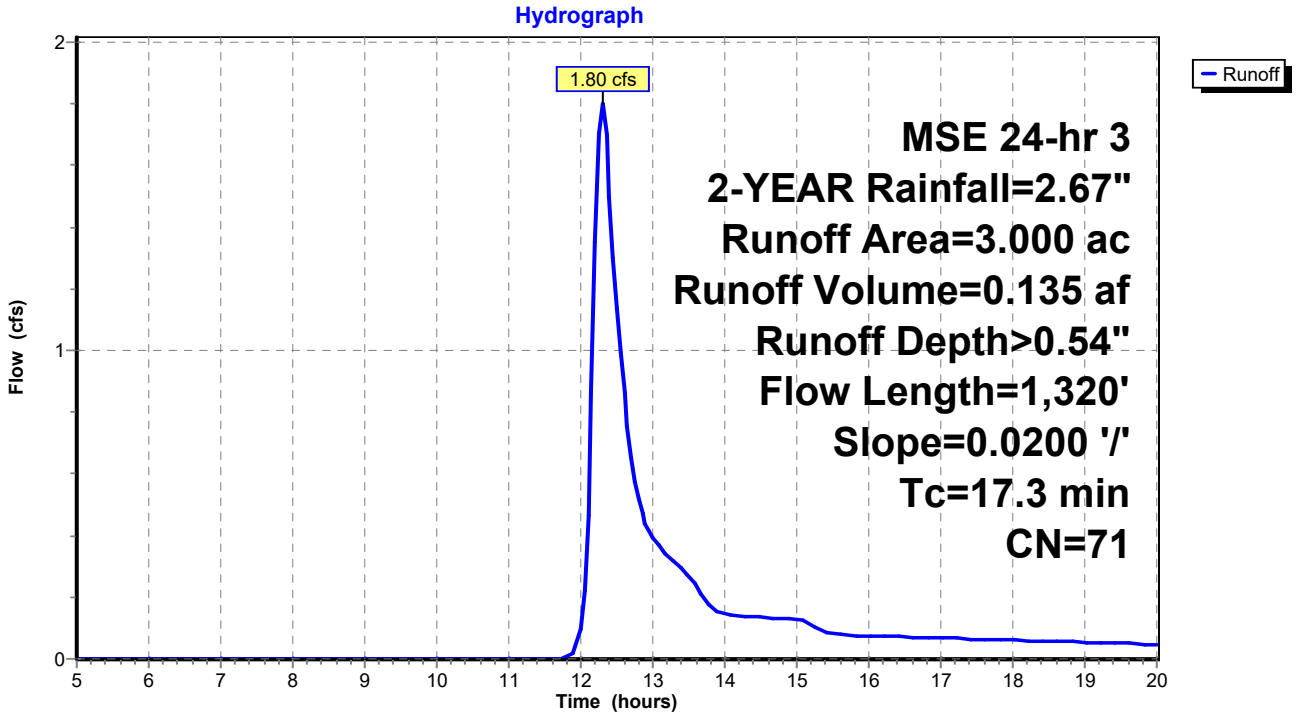
Runoff = 1.80 cfs @ 12.30 hrs, Volume= 0.135 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YEAR Rainfall=2.67"

	Area (ac)	CN	Description
*	3.000	71	AG LANDS
	3.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment OFF: OFFSITE AREA



Summary for Subcatchment UND: UNDETAINED

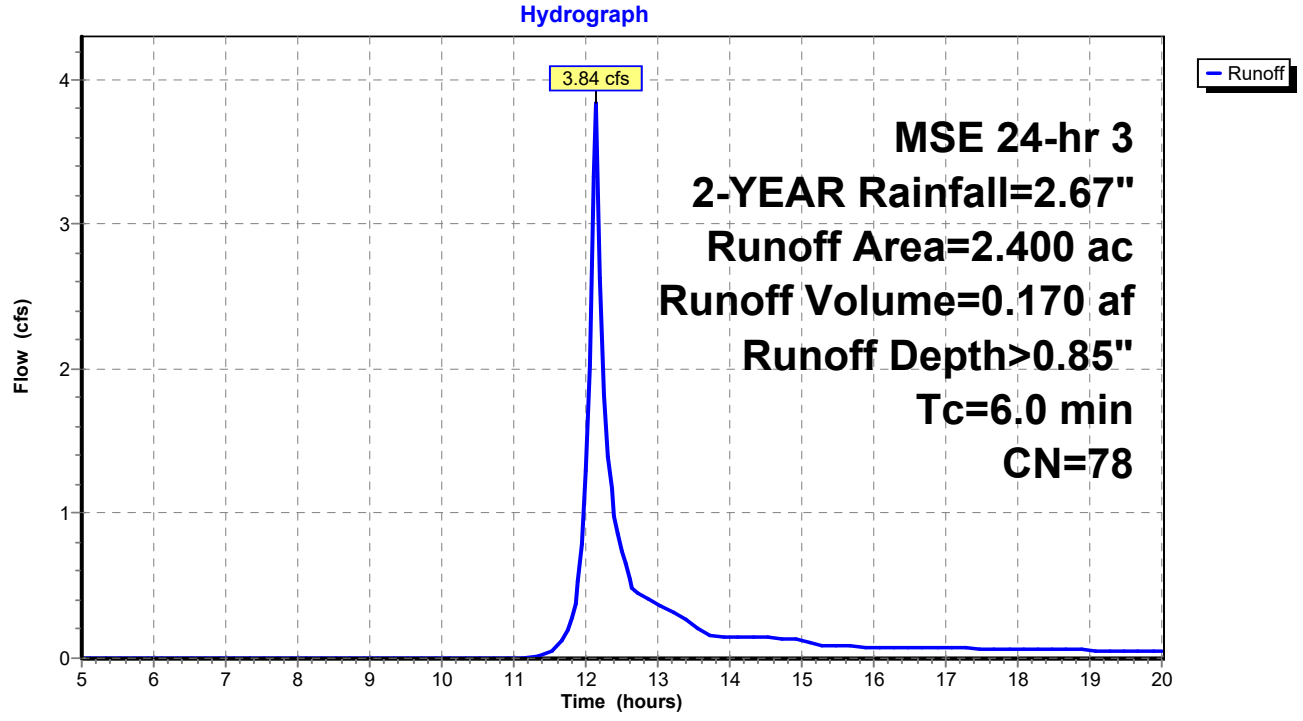
Runoff = 3.84 cfs @ 12.14 hrs, Volume= 0.170 af, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-YEAR Rainfall=2.67"

	Area (ac)	CN	Description
*	0.200	98	ROOF
*	0.200	98	PAVEMENT
*	2.000	74	GRASS
	2.400	78	Weighted Average
	2.000		83.33% Pervious Area
	0.400		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN PER TR-55**

Subcatchment UND: UNDETAINED



Summary for Pond MP: MIDDLE POND

Inflow Area = 5.200 ac, 19.23% Impervious, Inflow Depth > 0.90" for 2-YEAR event
Inflow = 8.39 cfs @ 12.15 hrs, Volume= 0.392 af
Outflow = 0.38 cfs @ 13.66 hrs, Volume= 0.228 af, Atten= 95%, Lag= 90.4 min
Primary = 0.38 cfs @ 13.66 hrs, Volume= 0.228 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 716.89' @ 13.66 hrs Surf.Area= 0.272 ac Storage= 0.249 af

Plug-Flow detention time= 226.0 min calculated for 0.228 af (58% of inflow)
Center-of-Mass det. time= 157.8 min (957.1 - 799.3)

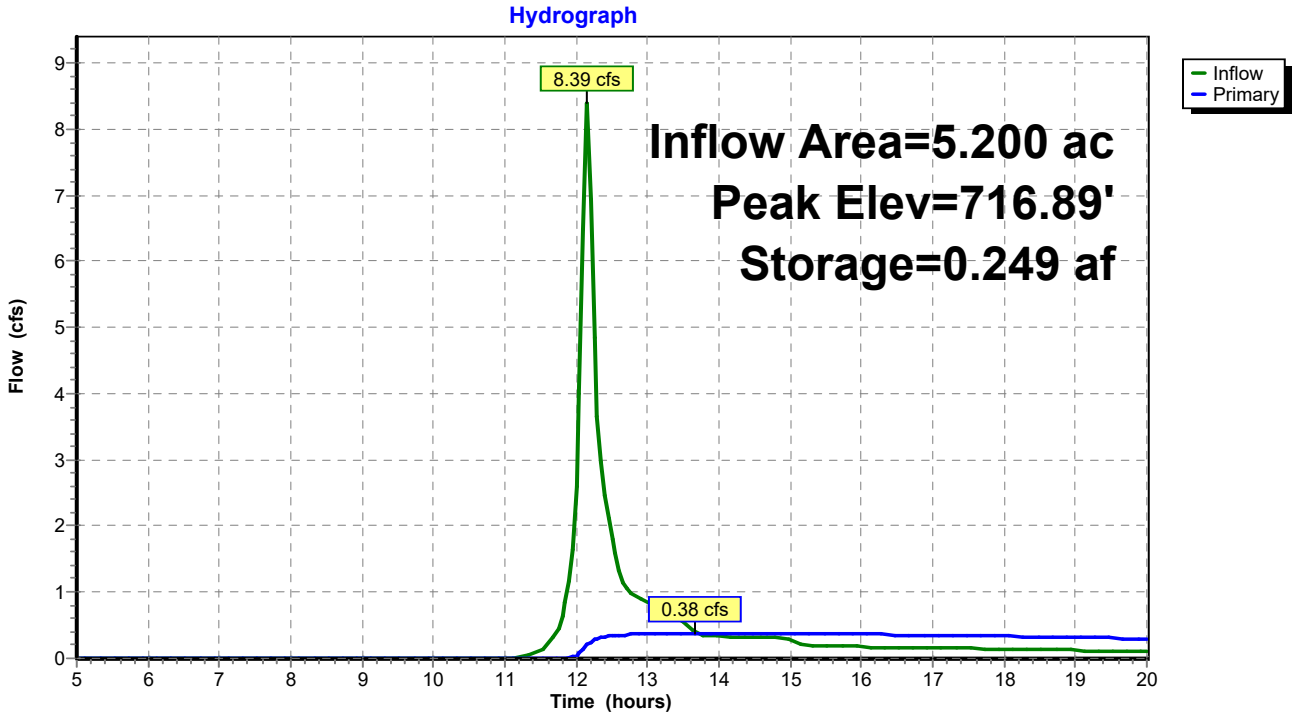
Volume	Invert	Avail.Storage	Storage Description
#1	715.90'	0.959 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
715.90	0.232	0.000	0.000
716.00	0.235	0.023	0.023
717.00	0.277	0.256	0.279
718.00	0.340	0.308	0.588
719.00	0.402	0.371	0.959

Device	Routing	Invert	Outlet Devices
#1	Primary	715.90'	**12.0" Round Culvert** L= 37.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 715.90' / 715.81' S= 0.0024 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	715.90'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.20'	**10.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (69% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.38 cfs @ 13.66 hrs HW=716.89' (Free Discharge)
└**1=Culvert** (Passes 0.38 cfs of 1.88 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.38 cfs @ 4.37 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond MP: MIDDLE POND



Summary for Pond NP: NORTH POND

Inflow Area = 20.800 ac, 9.13% Impervious, Inflow Depth > 0.76" for 2-YEAR event
Inflow = 20.99 cfs @ 12.24 hrs, Volume= 1.322 af
Outflow = 0.97 cfs @ 15.15 hrs, Volume= 0.448 af, Atten= 95%, Lag= 174.3 min
Primary = 0.97 cfs @ 15.15 hrs, Volume= 0.448 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 717.63' @ 15.15 hrs Surf.Area= 29,256 sf Storage= 41,046 cf

Plug-Flow detention time= 235.0 min calculated for 0.446 af (34% of inflow)
Center-of-Mass det. time= 156.6 min (966.5 - 809.9)

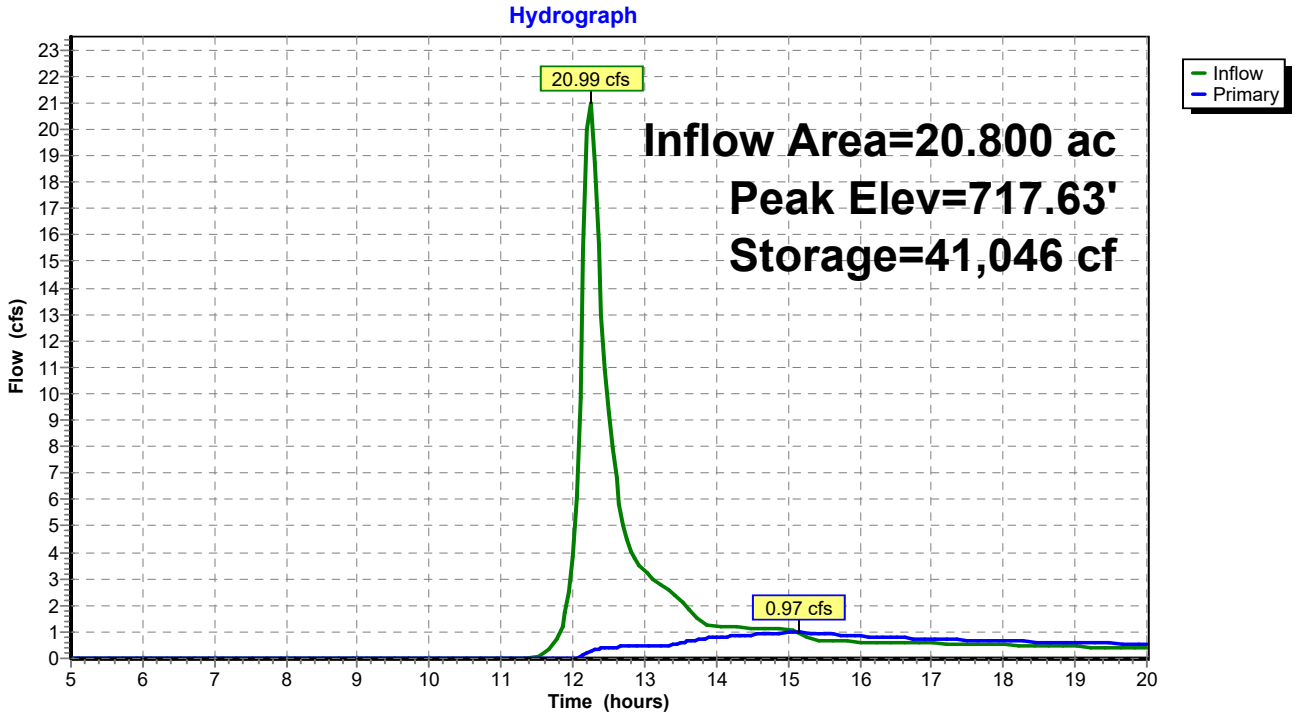
Volume	Invert	Avail.Storage	Storage Description
#1	716.00'	128,850 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.00	21,700	0	0
717.00	25,800	23,750	23,750
718.00	31,300	28,550	52,300
719.00	37,700	34,500	86,800
720.00	46,400	42,050	128,850

Device	Routing	Invert	Outlet Devices
#1	Primary	716.00'	**30.0" Round Culvert** L= 38.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 716.00' / 715.81' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	716.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.50'	**127.0 deg x 3.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Primary OutFlow Max=0.96 cfs @ 15.15 hrs HW=717.63' (Free Discharge)
└**1=Culvert** (Passes 0.96 cfs of 10.84 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.51 cfs @ 5.82 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.46 cfs @ 1.09 fps)

Pond NP: NORTH POND



Summary for Pond SP: SOUTH POND

Inflow Area = 4.500 ac, 15.56% Impervious, Inflow Depth > 0.85" for 2-YEAR event
Inflow = 6.74 cfs @ 12.16 hrs, Volume= 0.319 af
Outflow = 0.34 cfs @ 13.63 hrs, Volume= 0.199 af, Atten= 95%, Lag= 88.5 min
Primary = 0.34 cfs @ 13.63 hrs, Volume= 0.199 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 716.73' @ 13.63 hrs Surf.Area= 0.258 ac Storage= 0.198 af

Plug-Flow detention time= 220.6 min calculated for 0.199 af (62% of inflow)
Center-of-Mass det. time= 153.6 min (955.0 - 801.4)

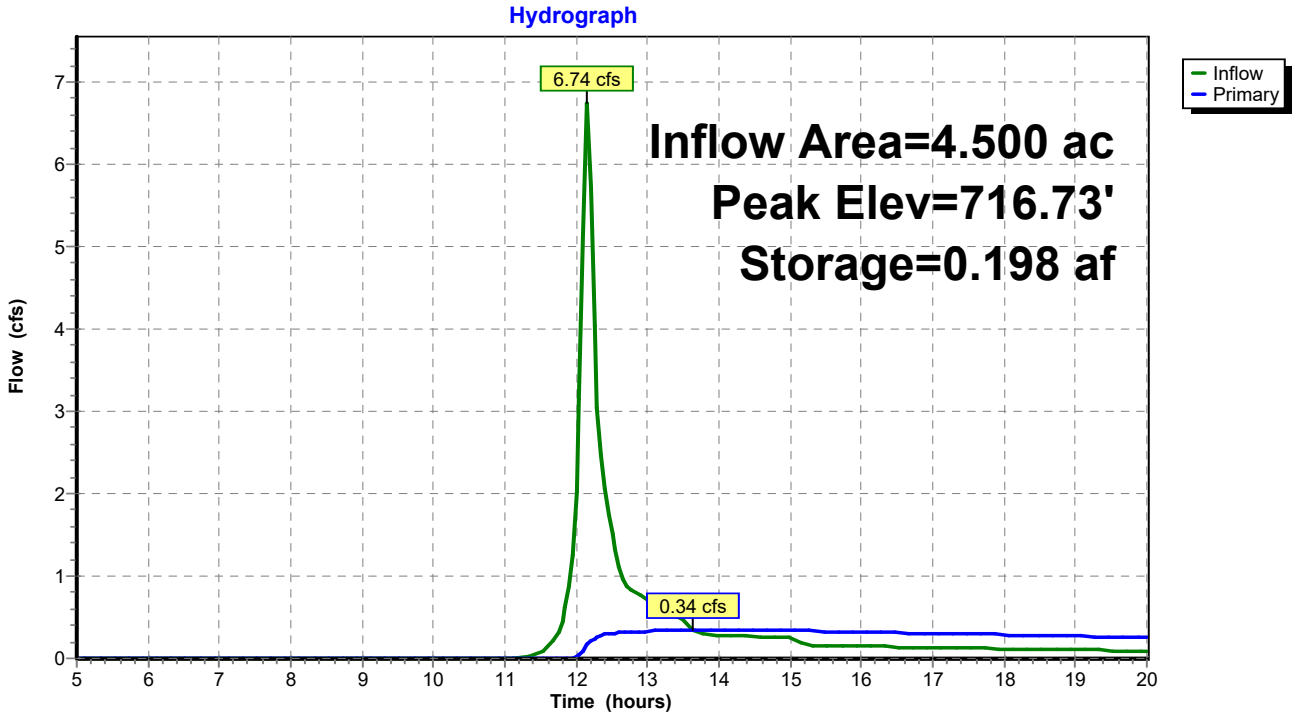
Volume	Invert	Avail.Storage	Storage Description
#1	715.90'	0.970 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
715.90	0.222	0.000	0.000
716.00	0.225	0.022	0.022
717.00	0.271	0.248	0.270
718.00	0.339	0.305	0.575
719.00	0.450	0.394	0.970

Device	Routing	Invert	Outlet Devices
#1	Primary	715.90'	**12.0" Round Culvert** L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 715.90' / 715.81' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	715.90'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.20'	**10.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (69% open area) Limited to weir flow at low heads

Primary OutFlow Max=0.34 cfs @ 13.63 hrs HW=716.73' (Free Discharge)
└**1=Culvert** (Passes 0.34 cfs of 1.42 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.34 cfs @ 3.91 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond SP: SOUTH POND

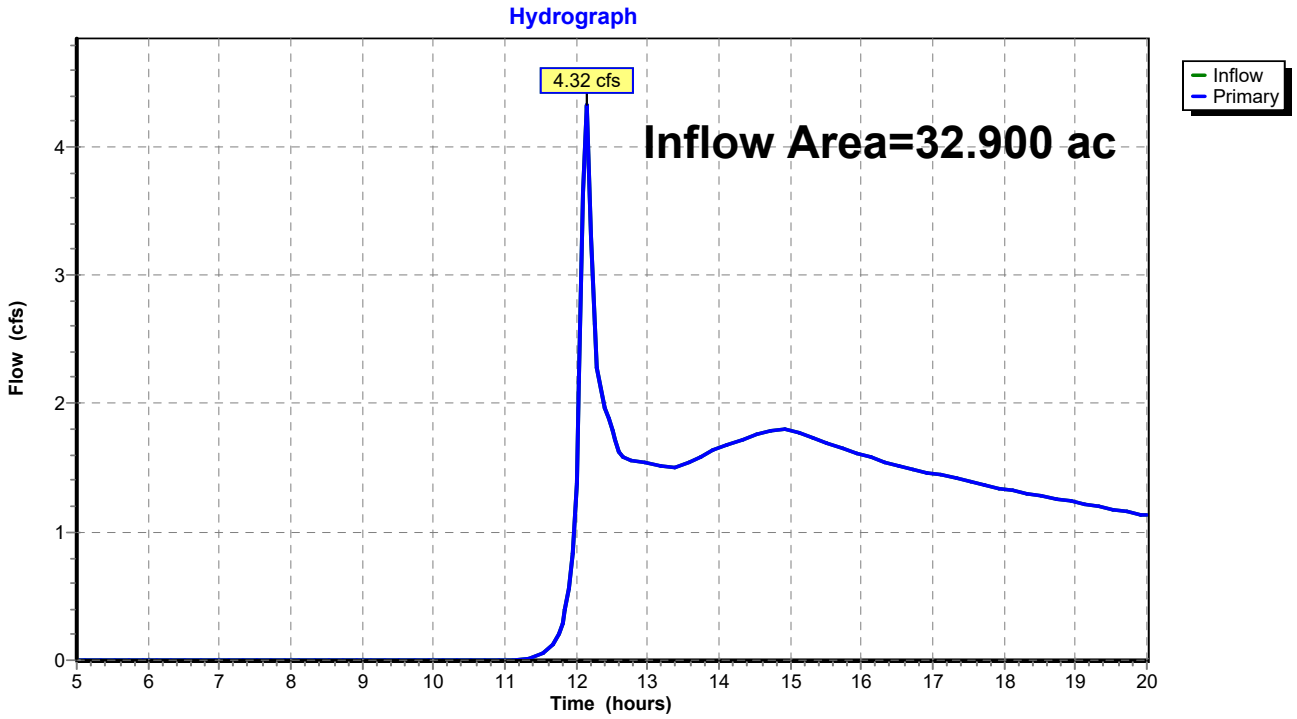


Summary for Link PSD: PROPOSED SITE DISCHARGE

Inflow Area = 32.900 ac, 12.16% Impervious, Inflow Depth > 0.38" for 2-YEAR event
Inflow = 4.32 cfs @ 12.14 hrs, Volume= 1.046 af
Primary = 4.32 cfs @ 12.14 hrs, Volume= 1.046 af, Atten= 0%, Lag= 0.0 min

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

Link PSD: PROPOSED SITE DISCHARGE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentAMP: AREA TO MIDDLE Runoff Area=5.200 ac 19.23% Impervious Runoff Depth>1.70"
Flow Length=872' Tc=7.5 min CN=79 Runoff=15.85 cfs 0.736 af

SubcatchmentANP: AREA TO NORTH Runoff Area=17.800 ac 10.67% Impervious Runoff Depth>1.55"
Flow Length=1,190' Tc=13.7 min CN=77 Runoff=38.54 cfs 2.304 af

SubcatchmentASP: AREA TO SOUTH Runoff Area=4.500 ac 15.56% Impervious Runoff Depth>1.63"
Flow Length=803' Tc=7.6 min CN=78 Runoff=13.01 cfs 0.610 af

SubcatchmentOFF: OFFSITE AREA Runoff Area=3.000 ac 0.00% Impervious Runoff Depth>1.17"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=4.27 cfs 0.292 af

SubcatchmentUND: UNDETAINED Runoff Area=2.400 ac 16.67% Impervious Runoff Depth>1.63"
Tc=6.0 min CN=78 Runoff=7.36 cfs 0.325 af

Pond MP: MIDDLE POND Peak Elev=717.48' Storage=0.419 af Inflow=15.85 cfs 0.736 af
Outflow=1.75 cfs 0.463 af

Pond NP: NORTH POND Peak Elev=718.22' Storage=59,256 cf Inflow=42.53 cfs 2.596 af
Outflow=8.43 cfs 1.674 af

Pond SP: SOUTH POND Peak Elev=717.36' Storage=0.373 af Inflow=13.01 cfs 0.610 af
Outflow=1.04 cfs 0.363 af

Link PSD: PROPOSED SITE DISCHARGE Inflow=11.80 cfs 2.825 af
Primary=11.80 cfs 2.825 af

Total Runoff Area = 32.900 ac Runoff Volume = 4.267 af Average Runoff Depth = 1.56"
87.84% Pervious = 28.900 ac 12.16% Impervious = 4.000 ac

Summary for Subcatchment AMP: AREA TO MIDDLE POND

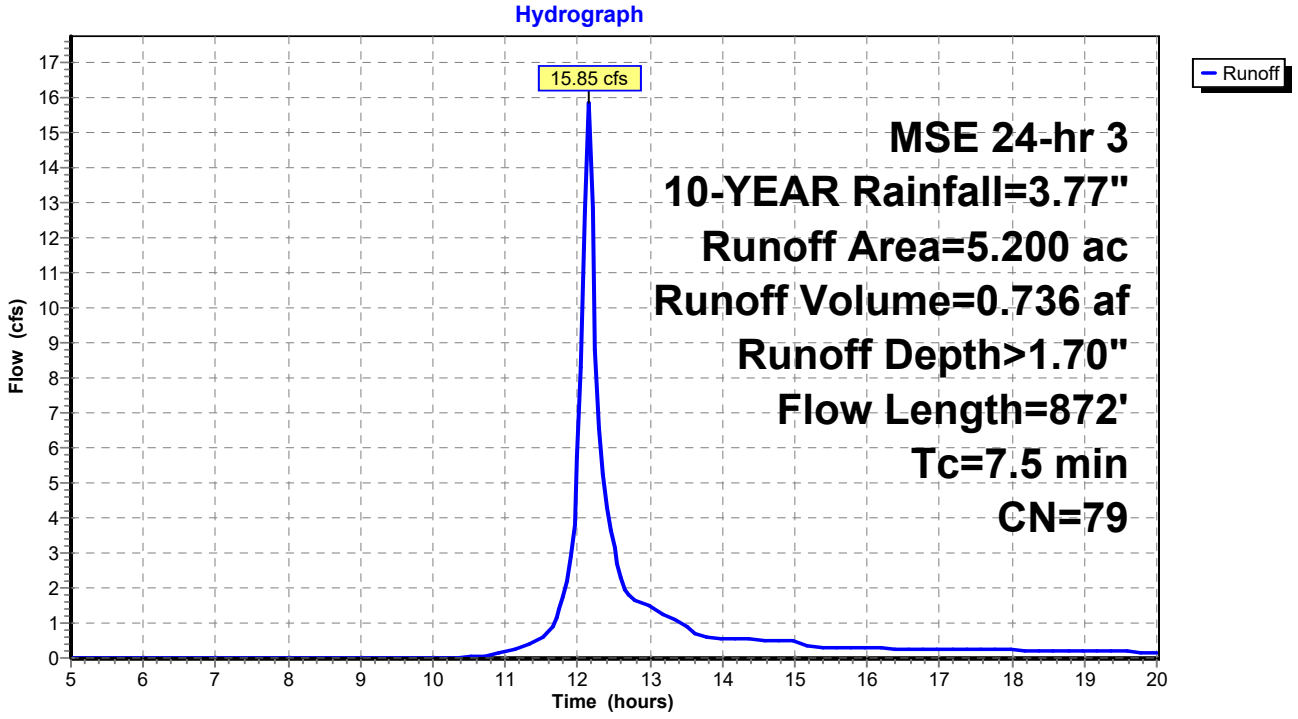
Runoff = 15.85 cfs @ 12.15 hrs, Volume= 0.736 af, Depth> 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YEAR Rainfall=3.77"

	Area (ac)	CN	Description
*	0.300	98	ROOF
*	0.500	98	PAVEMENT
*	0.200	99	WATER SURFACE
*	4.200	74	GRASS
	5.200	79	Weighted Average
	4.200		80.77% Pervious Area
	1.000		19.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	60	0.0500	0.20		**Sheet Flow, SHEET** Grass: Short n= 0.150 P2= 2.67"
2.6	812	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Ditch** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
7.5	872	Total			

Subcatchment AMP: AREA TO MIDDLE POND



Summary for Subcatchment ANP: AREA TO NORTH POND

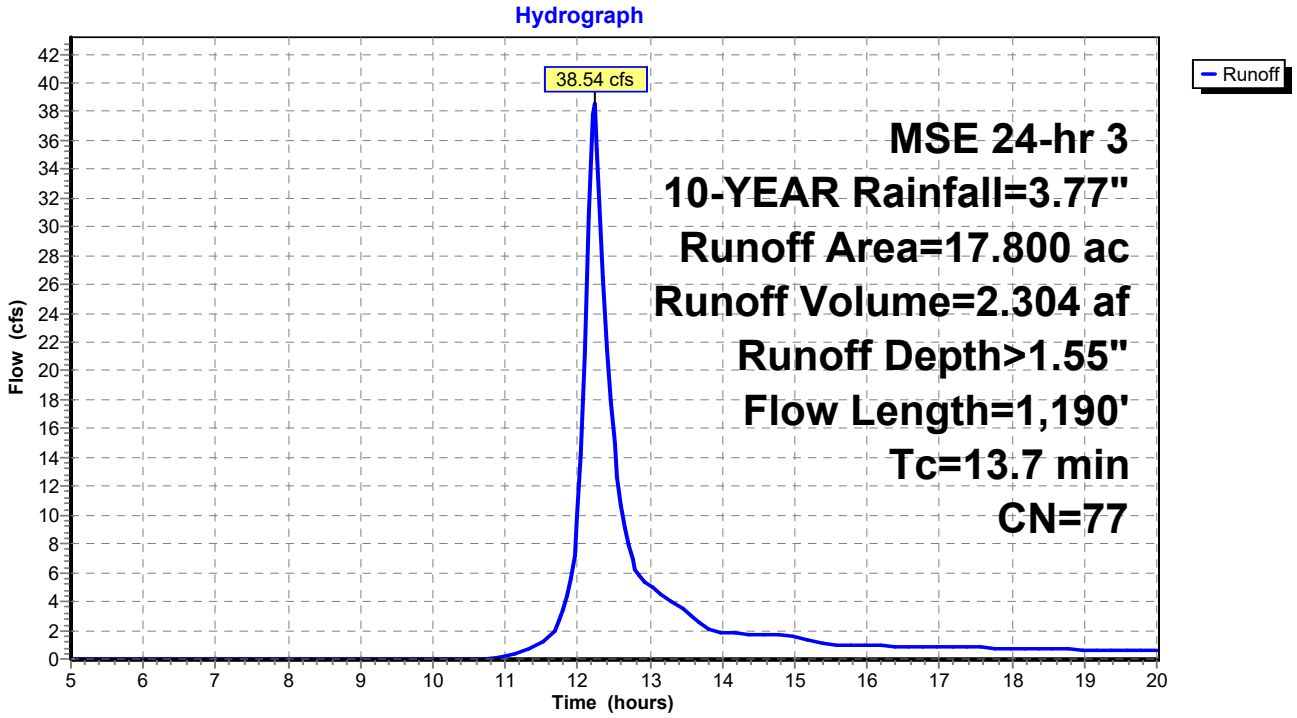
Runoff = 38.54 cfs @ 12.23 hrs, Volume= 2.304 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YEAR Rainfall=3.77"

	Area (ac)	CN	Description
*	0.700	98	ROOF
*	0.700	98	PAVEMENT
*	0.500	99	WATER SURFACE
*	15.900	74	GRASS
	17.800	77	Weighted Average
	15.900		89.33% Pervious Area
	1.900		10.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	220	0.0220	0.39		**Sheet Flow, Sheet** Cultivated: Residue<=20% n= 0.060 P2= 2.67"
2.0	235	0.0170	1.96		**Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps
2.4	735	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Swale** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
13.7	1,190	Total			

Subcatchment ANP: AREA TO NORTH POND



Summary for Subcatchment ASP: AREA TO SOUTH POND

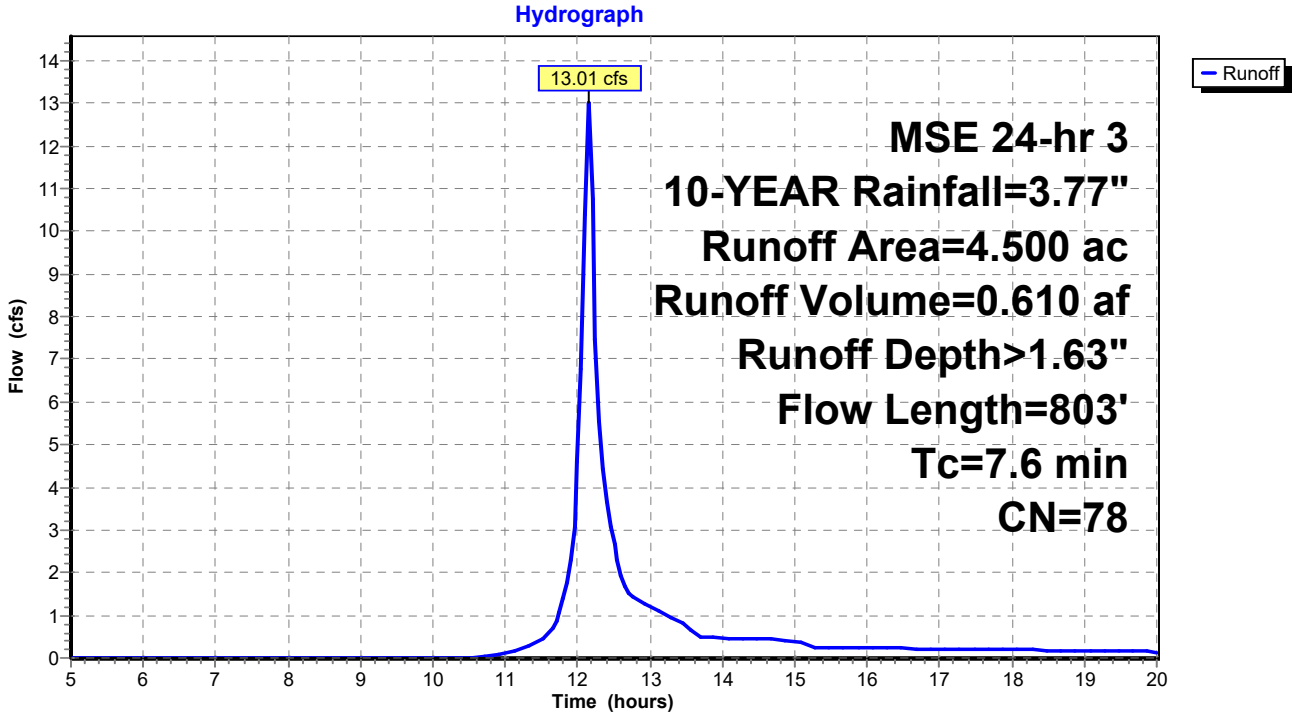
Runoff = 13.01 cfs @ 12.15 hrs, Volume= 0.610 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YEAR Rainfall=3.77"

	Area (ac)	CN	Description
*	0.300	98	ROOF
*	0.200	98	PAVEMENT
*	0.200	99	WATER SURFACE
*	3.800	74	GRASS
	4.500	78	Weighted Average
	3.800		84.44% Pervious Area
	0.700		15.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	64	0.0500	0.21		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.67"
2.4	739	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Ditch** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
7.6	803	Total			

Subcatchment ASP: AREA TO SOUTH POND



Summary for Subcatchment OFF: OFFSITE AREA

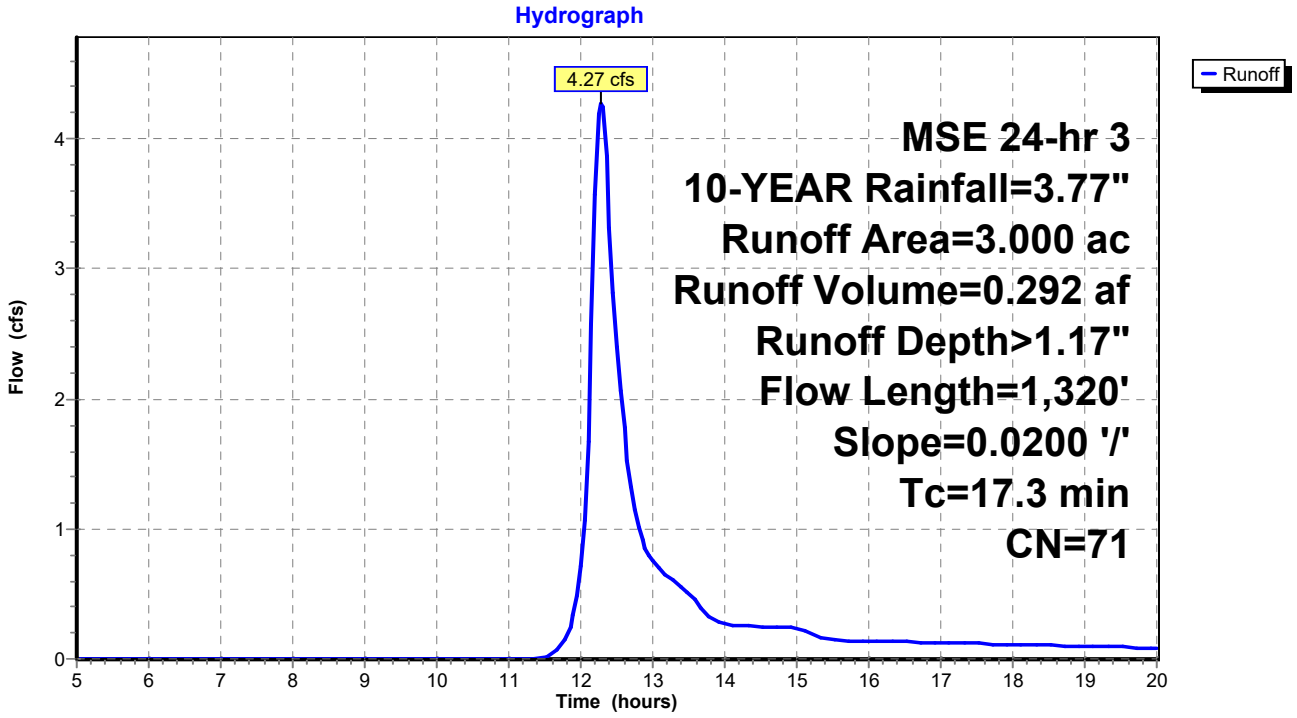
Runoff = 4.27 cfs @ 12.28 hrs, Volume= 0.292 af, Depth> 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YEAR Rainfall=3.77"

	Area (ac)	CN	Description
*	3.000	71	AG LANDS
	3.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment OFF: OFFSITE AREA



Summary for Subcatchment UND: UNDETAINED

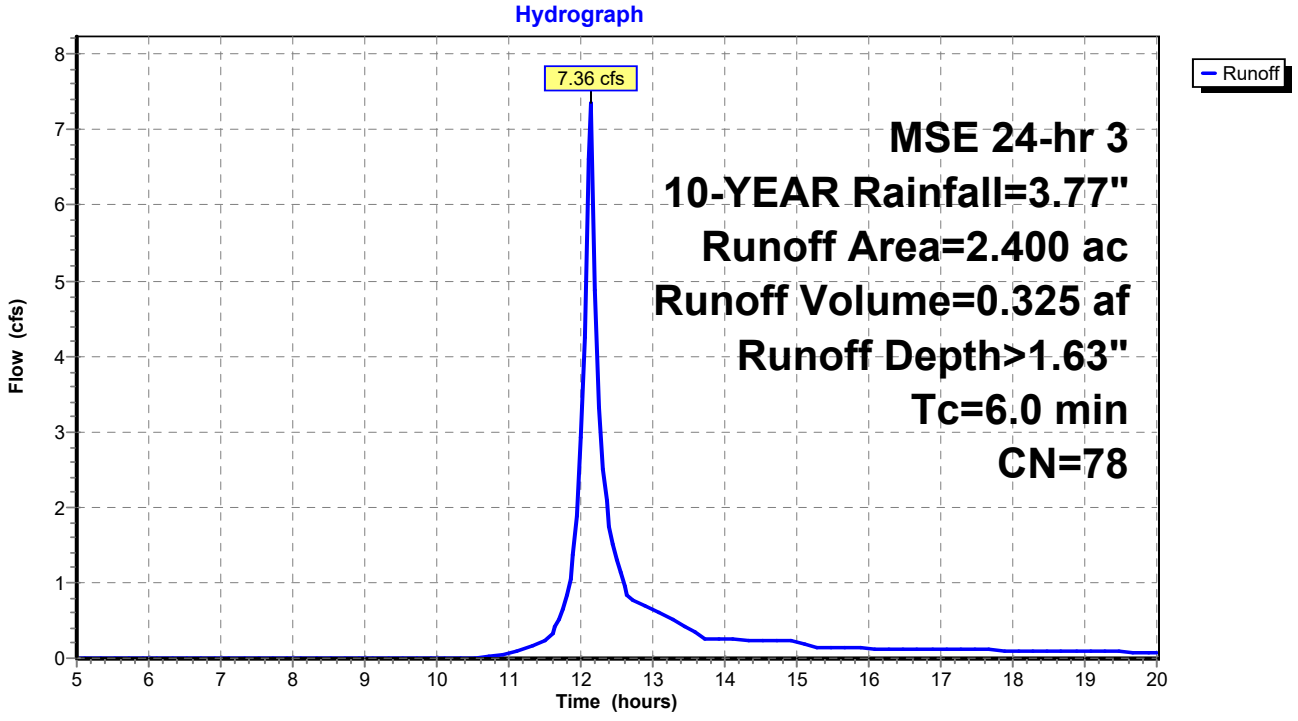
Runoff = 7.36 cfs @ 12.14 hrs, Volume= 0.325 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-YEAR Rainfall=3.77"

	Area (ac)	CN	Description
*	0.200	98	ROOF
*	0.200	98	PAVEMENT
*	2.000	74	GRASS
	2.400	78	Weighted Average
	2.000		83.33% Pervious Area
	0.400		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN PER TR-55**

Subcatchment UND: UNDETAINED



Summary for Pond MP: MIDDLE POND

Inflow Area = 5.200 ac, 19.23% Impervious, Inflow Depth > 1.70" for 10-YEAR event
Inflow = 15.85 cfs @ 12.15 hrs, Volume= 0.736 af
Outflow = 1.75 cfs @ 12.74 hrs, Volume= 0.463 af, Atten= 89%, Lag= 35.3 min
Primary = 1.75 cfs @ 12.74 hrs, Volume= 0.463 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 717.48' @ 12.74 hrs Surf.Area= 0.307 ac Storage= 0.419 af

Plug-Flow detention time= 172.4 min calculated for 0.463 af (63% of inflow)
Center-of-Mass det. time= 111.2 min (900.0 - 788.8)

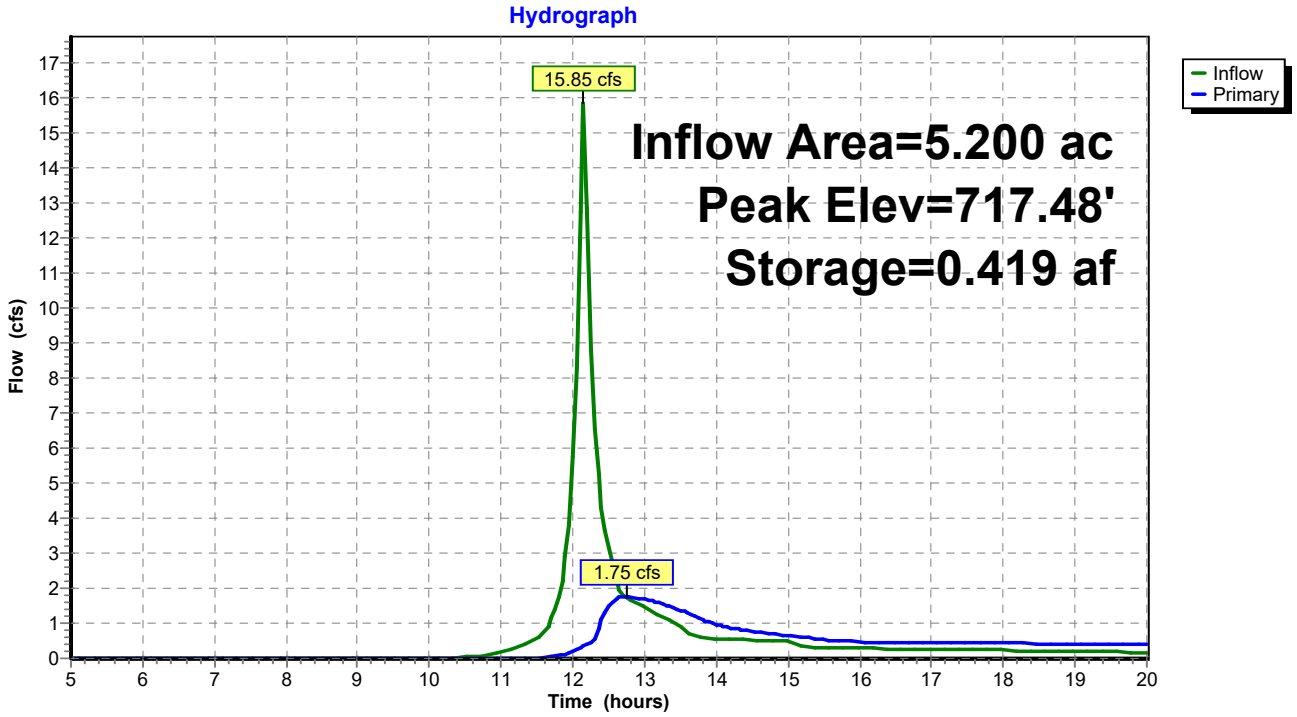
Volume	Invert	Avail.Storage	Storage Description
#1	715.90'	0.959 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
715.90	0.232	0.000	0.000
716.00	0.235	0.023	0.023
717.00	0.277	0.256	0.279
718.00	0.340	0.308	0.588
719.00	0.402	0.371	0.959

Device	Routing	Invert	Outlet Devices
#1	Primary	715.90'	**12.0" Round Culvert** L= 37.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 715.90' / 715.81' S= 0.0024 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	715.90'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.20'	**10.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (69% open area) Limited to weir flow at low heads

Primary OutFlow Max=1.74 cfs @ 12.74 hrs HW=717.48' (Free Discharge)
└**1=Culvert** (Passes 1.74 cfs of 3.15 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.50 cfs @ 5.72 fps)
  └**3=Orifice/Grate** (Weir Controls 1.25 cfs @ 1.72 fps)

Pond MP: MIDDLE POND



Summary for Pond NP: NORTH POND

Inflow Area = 20.800 ac, 9.13% Impervious, Inflow Depth > 1.50" for 10-YEAR event
Inflow = 42.53 cfs @ 12.23 hrs, Volume= 2.596 af
Outflow = 8.43 cfs @ 12.74 hrs, Volume= 1.674 af, Atten= 80%, Lag= 30.3 min
Primary = 8.43 cfs @ 12.74 hrs, Volume= 1.674 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 718.22' @ 12.74 hrs Surf.Area= 32,691 sf Storage= 59,256 cf

Plug-Flow detention time= 137.1 min calculated for 1.668 af (64% of inflow)
Center-of-Mass det. time= 76.5 min (875.0 - 798.5)

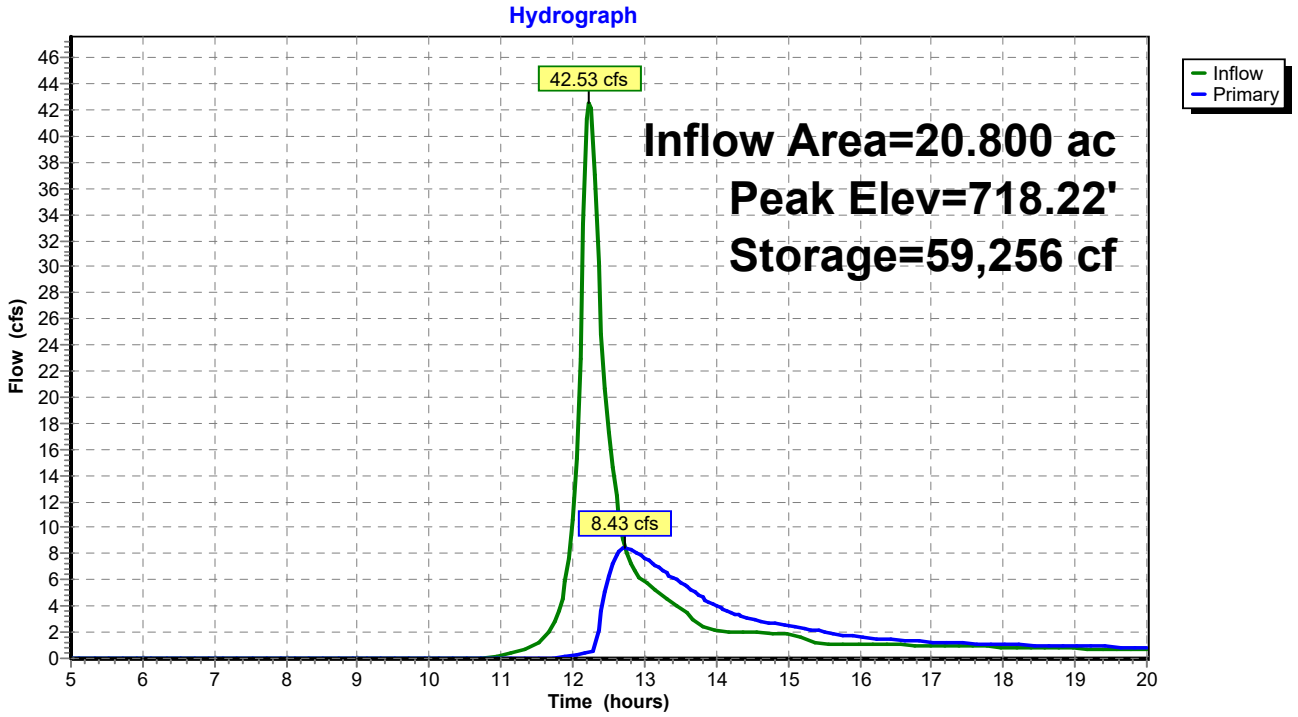
Volume	Invert	Avail.Storage	Storage Description
#1	716.00'	128,850 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.00	21,700	0	0
717.00	25,800	23,750	23,750
718.00	31,300	28,550	52,300
719.00	37,700	34,500	86,800
720.00	46,400	42,050	128,850

Device	Routing	Invert	Outlet Devices
#1	Primary	716.00'	**30.0" Round Culvert** L= 38.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 716.00' / 715.81' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	716.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.50'	**127.0 deg x 3.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Primary OutFlow Max=8.41 cfs @ 12.74 hrs HW=718.22' (Free Discharge)
└**1=Culvert** (Passes 8.41 cfs of 17.95 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.89 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 7.81 cfs @ 2.45 fps)

Pond NP: NORTH POND



Summary for Pond SP: SOUTH POND

Inflow Area = 4.500 ac, 15.56% Impervious, Inflow Depth > 1.63" for 10-YEAR event
Inflow = 13.01 cfs @ 12.15 hrs, Volume= 0.610 af
Outflow = 1.04 cfs @ 13.21 hrs, Volume= 0.363 af, Atten= 92%, Lag= 63.5 min
Primary = 1.04 cfs @ 13.21 hrs, Volume= 0.363 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 717.36' @ 13.21 hrs Surf.Area= 0.296 ac Storage= 0.373 af

Plug-Flow detention time= 199.0 min calculated for 0.363 af (59% of inflow)
Center-of-Mass det. time= 135.6 min (926.2 - 790.6)

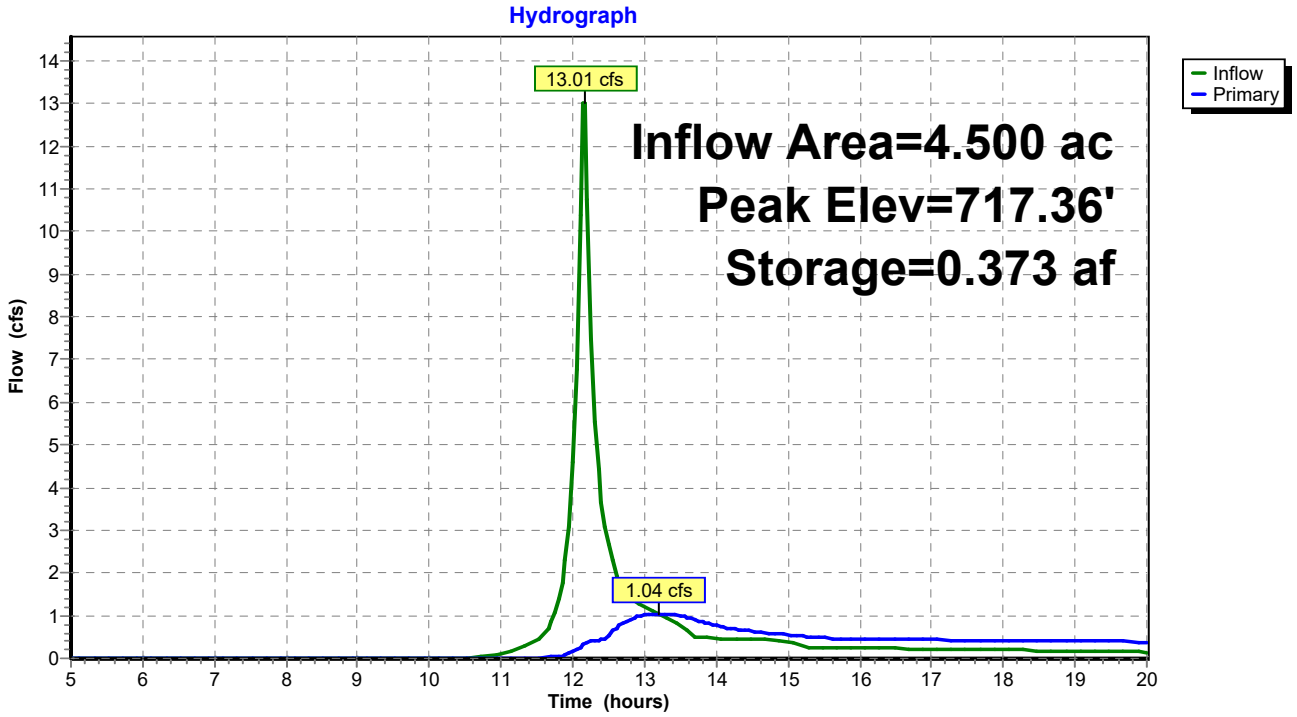
Volume	Invert	Avail.Storage	Storage Description
#1	715.90'	0.970 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
715.90	0.222	0.000	0.000
716.00	0.225	0.022	0.022
717.00	0.271	0.248	0.270
718.00	0.339	0.305	0.575
719.00	0.450	0.394	0.970

Device	Routing	Invert	Outlet Devices
#1	Primary	715.90'	**12.0" Round Culvert** L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 715.90' / 715.81' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	715.90'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.20'	**10.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (69% open area) Limited to weir flow at low heads

Primary OutFlow Max=1.04 cfs @ 13.21 hrs HW=717.36' (Free Discharge)
└**1=Culvert** (Passes 1.04 cfs of 2.89 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.48 cfs @ 5.48 fps)
  └**3=Orifice/Grate** (Weir Controls 0.56 cfs @ 1.32 fps)

Pond SP: SOUTH POND

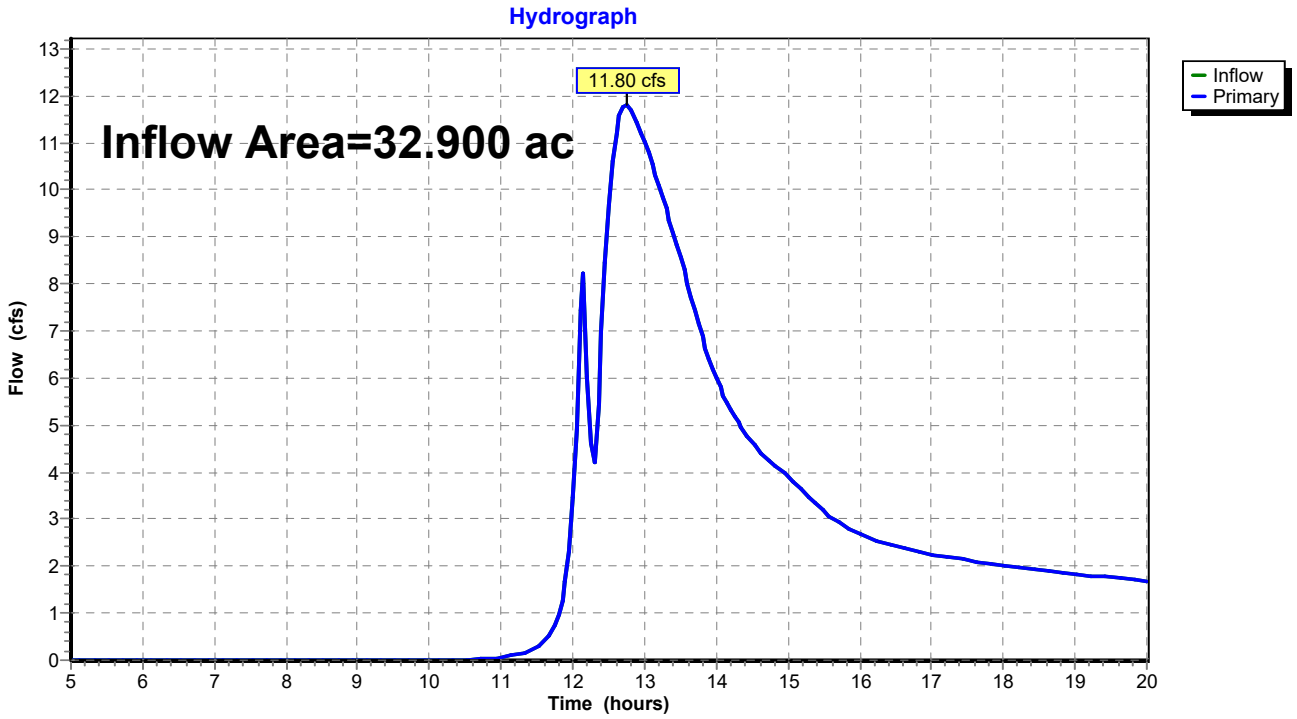


Summary for Link PSD: PROPOSED SITE DISCHARGE

Inflow Area = 32.900 ac, 12.16% Impervious, Inflow Depth > 1.03" for 10-YEAR event
Inflow = 11.80 cfs @ 12.74 hrs, Volume= 2.825 af
Primary = 11.80 cfs @ 12.74 hrs, Volume= 2.825 af, Atten= 0%, Lag= 0.0 min

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

Link PSD: PROPOSED SITE DISCHARGE



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentAMP: AREA TO MIDDLE Runoff Area=5.200 ac 19.23% Impervious Runoff Depth>3.47"
Flow Length=872' Tc=7.5 min CN=79 Runoff=31.73 cfs 1.502 af

SubcatchmentANP: AREA TO NORTH Runoff Area=17.800 ac 10.67% Impervious Runoff Depth>3.26"
Flow Length=1,190' Tc=13.7 min CN=77 Runoff=81.19 cfs 4.843 af

SubcatchmentASP: AREA TO SOUTH Runoff Area=4.500 ac 15.56% Impervious Runoff Depth>3.37"
Flow Length=803' Tc=7.6 min CN=78 Runoff=26.50 cfs 1.263 af

SubcatchmentOFF: OFFSITE AREA Runoff Area=3.000 ac 0.00% Impervious Runoff Depth>2.70"
Flow Length=1,320' Slope=0.0200 '/' Tc=17.3 min CN=71 Runoff=10.21 cfs 0.675 af

SubcatchmentUND: UNDETAINED Runoff Area=2.400 ac 16.67% Impervious Runoff Depth>3.37"
Tc=6.0 min CN=78 Runoff=14.91 cfs 0.674 af

Pond MP: MIDDLE POND Peak Elev=718.69' Storage=0.838 af Inflow=31.73 cfs 1.502 af
Outflow=3.89 cfs 1.175 af

Pond NP: NORTH POND Peak Elev=719.47' Storage=105,652 cf Inflow=90.75 cfs 5.518 af
Outflow=31.23 cfs 4.534 af

Pond SP: SOUTH POND Peak Elev=718.34' Storage=0.697 af Inflow=26.50 cfs 1.263 af
Outflow=3.44 cfs 0.959 af

Link PSD: PROPOSED SITE DISCHARGE Inflow=40.91 cfs 7.341 af
Primary=40.91 cfs 7.341 af

Total Runoff Area = 32.900 ac Runoff Volume = 8.956 af Average Runoff Depth = 3.27"
87.84% Pervious = 28.900 ac 12.16% Impervious = 4.000 ac

Summary for Subcatchment AMP: AREA TO MIDDLE POND

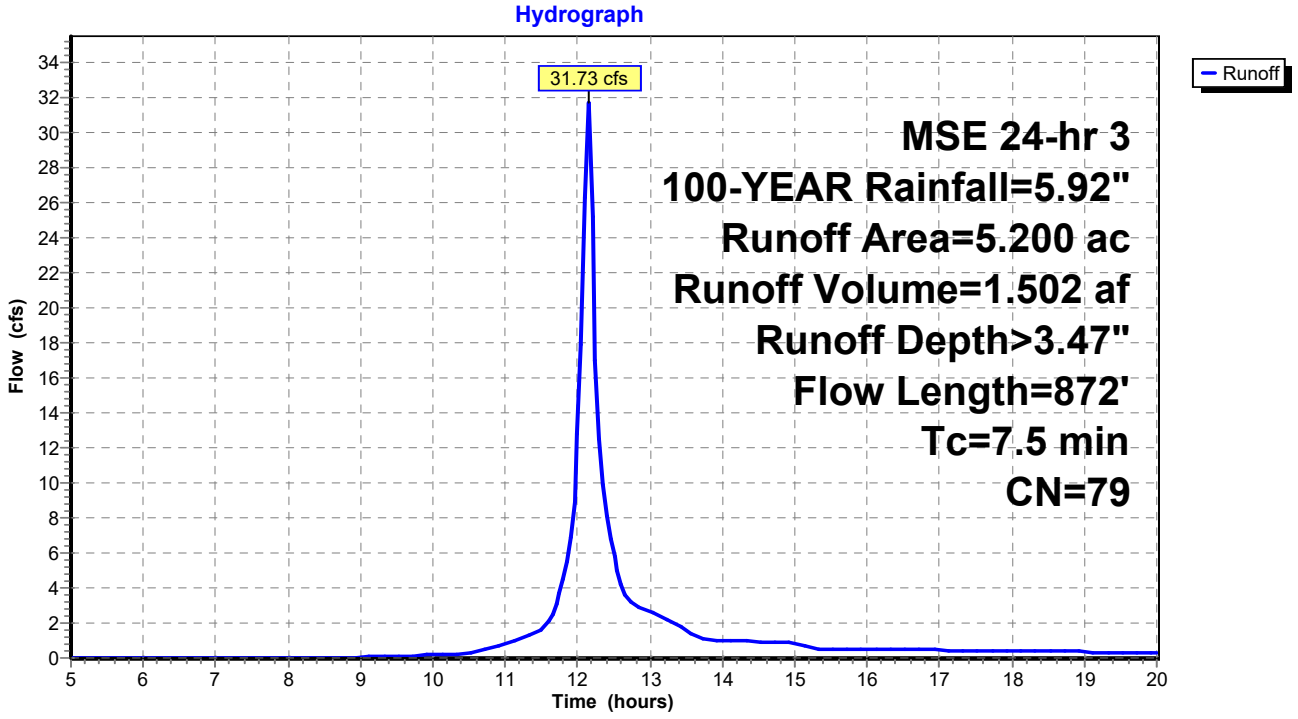
Runoff = 31.73 cfs @ 12.15 hrs, Volume= 1.502 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YEAR Rainfall=5.92"

	Area (ac)	CN	Description
*	0.300	98	ROOF
*	0.500	98	PAVEMENT
*	0.200	99	WATER SURFACE
*	4.200	74	GRASS
	5.200	79	Weighted Average
	4.200		80.77% Pervious Area
	1.000		19.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	60	0.0500	0.20		**Sheet Flow, SHEET** Grass: Short n= 0.150 P2= 2.67"
2.6	812	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Ditch** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
7.5	872	Total			

Subcatchment AMP: AREA TO MIDDLE POND



Summary for Subcatchment ANP: AREA TO NORTH POND

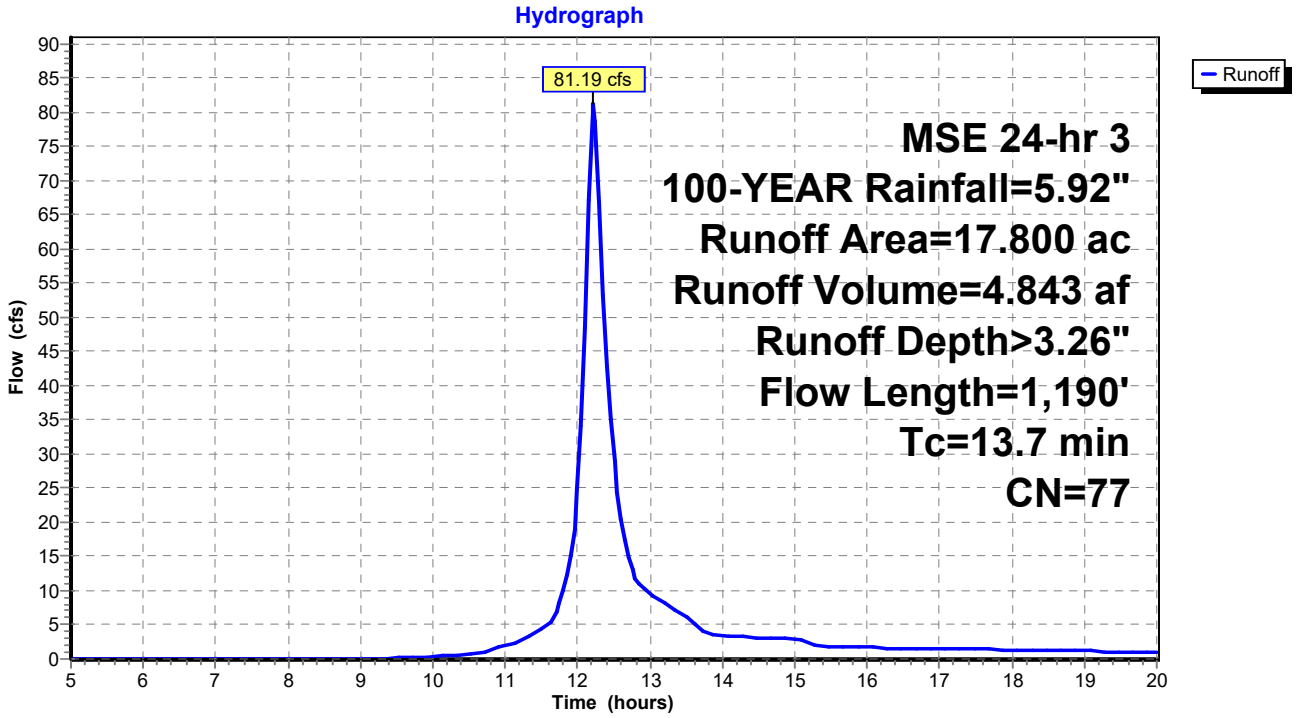
Runoff = 81.19 cfs @ 12.22 hrs, Volume= 4.843 af, Depth> 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YEAR Rainfall=5.92"

	Area (ac)	CN	Description
*	0.700	98	ROOF
*	0.700	98	PAVEMENT
*	0.500	99	WATER SURFACE
*	15.900	74	GRASS
	17.800	77	Weighted Average
	15.900		89.33% Pervious Area
	1.900		10.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	220	0.0220	0.39		**Sheet Flow, Sheet** Cultivated: Residue<=20% n= 0.060 P2= 2.67"
2.0	235	0.0170	1.96		**Shallow Concentrated Flow, Shallow** Grassed Waterway Kv= 15.0 fps
2.4	735	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Swale** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
13.7	1,190	Total			

Subcatchment ANP: AREA TO NORTH POND



Summary for Subcatchment ASP: AREA TO SOUTH POND

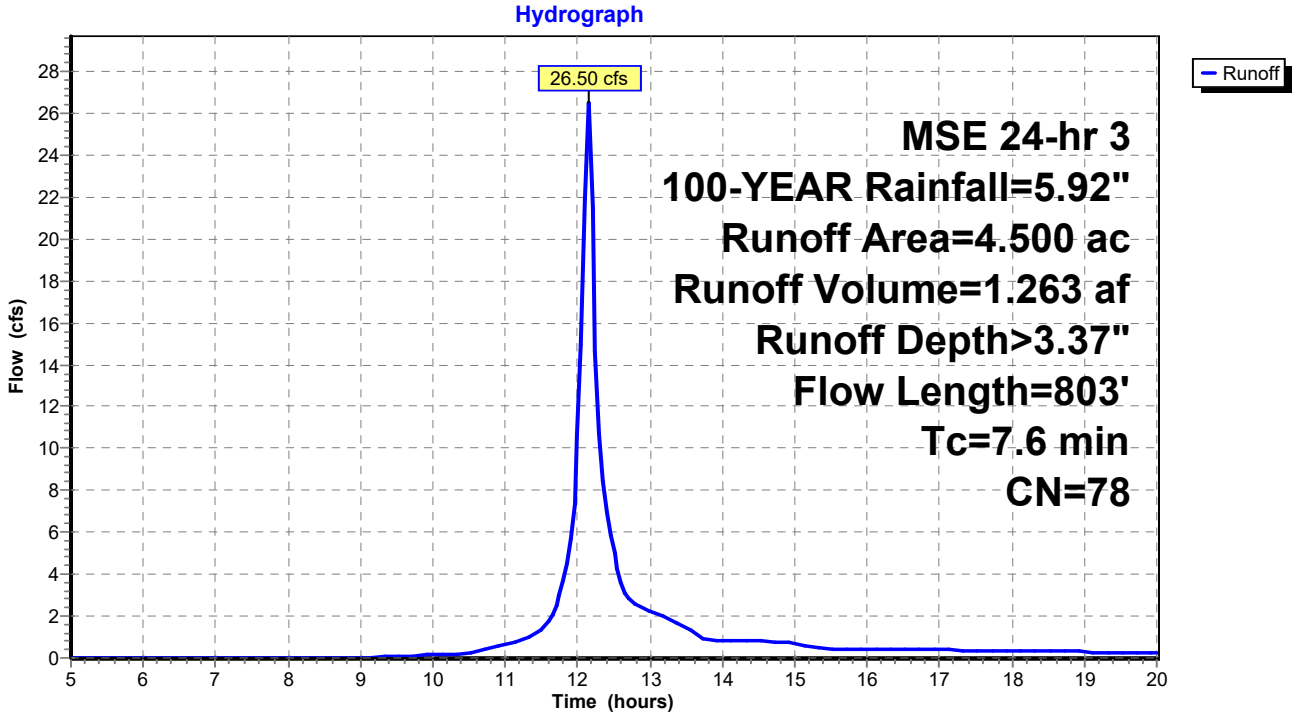
Runoff = 26.50 cfs @ 12.15 hrs, Volume= 1.263 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YEAR Rainfall=5.92"

	Area (ac)	CN	Description
*	0.300	98	ROOF
*	0.200	98	PAVEMENT
*	0.200	99	WATER SURFACE
*	3.800	74	GRASS
	4.500	78	Weighted Average
	3.800		84.44% Pervious Area
	0.700		15.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	64	0.0500	0.21		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.67"
2.4	739	0.0150	5.16	54.22	**Trap/Vee/Rect Channel Flow, Ditch** Bot.W=1.00' D=1.50' Z= 4.0 '/' Top.W=13.00' n= 0.030 Earth, grassed & winding
7.6	803	Total			

Subcatchment ASP: AREA TO SOUTH POND



Summary for Subcatchment OFF: OFFSITE AREA

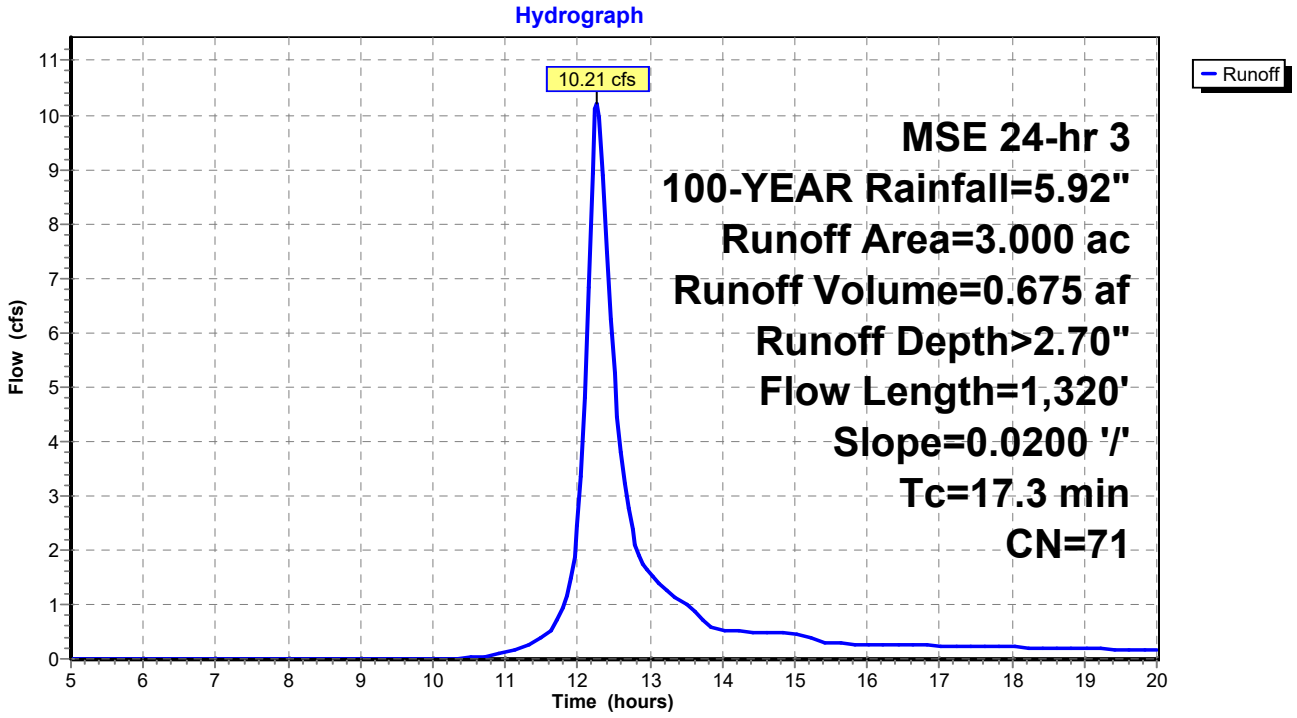
Runoff = 10.21 cfs @ 12.27 hrs, Volume= 0.675 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YEAR Rainfall=5.92"

	Area (ac)	CN	Description
*	3.000	71	AG LANDS
	3.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	1,320	0.0200	1.27		**Shallow Concentrated Flow, SHALLOW CONCENTRATED** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment OFF: OFFSITE AREA



Summary for Subcatchment UND: UNDETAINED

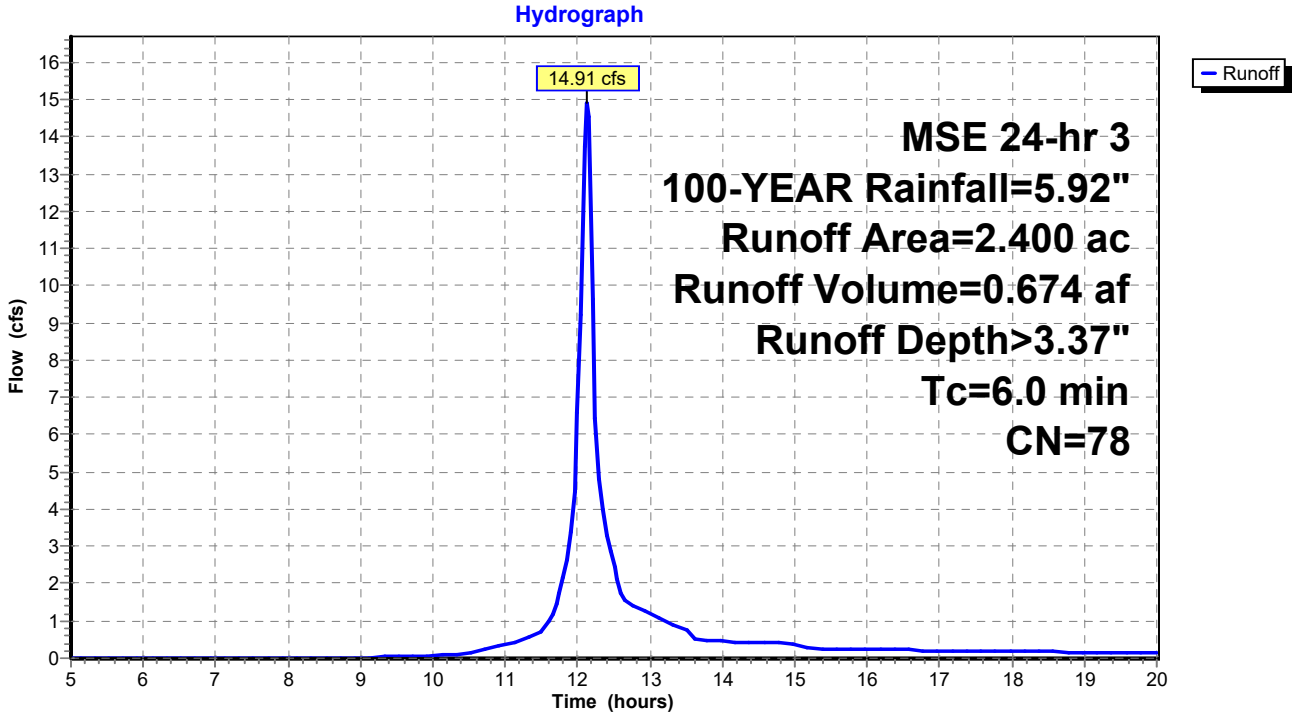
Runoff = 14.91 cfs @ 12.13 hrs, Volume= 0.674 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-YEAR Rainfall=5.92"

	Area (ac)	CN	Description
*	0.200	98	ROOF
*	0.200	98	PAVEMENT
*	2.000	74	GRASS
	2.400	78	Weighted Average
	2.000		83.33% Pervious Area
	0.400		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, MIN PER TR-55**

Subcatchment UND: UNDETAINED



Summary for Pond MP: MIDDLE POND

Inflow Area = 5.200 ac, 19.23% Impervious, Inflow Depth > 3.47" for 100-YEAR event
Inflow = 31.73 cfs @ 12.15 hrs, Volume= 1.502 af
Outflow = 3.89 cfs @ 12.63 hrs, Volume= 1.175 af, Atten= 88%, Lag= 29.0 min
Primary = 3.89 cfs @ 12.63 hrs, Volume= 1.175 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 718.69' @ 12.63 hrs Surf.Area= 0.383 ac Storage= 0.838 af

Plug-Flow detention time= 134.5 min calculated for 1.175 af (78% of inflow)
Center-of-Mass det. time= 86.9 min (864.0 - 777.1)

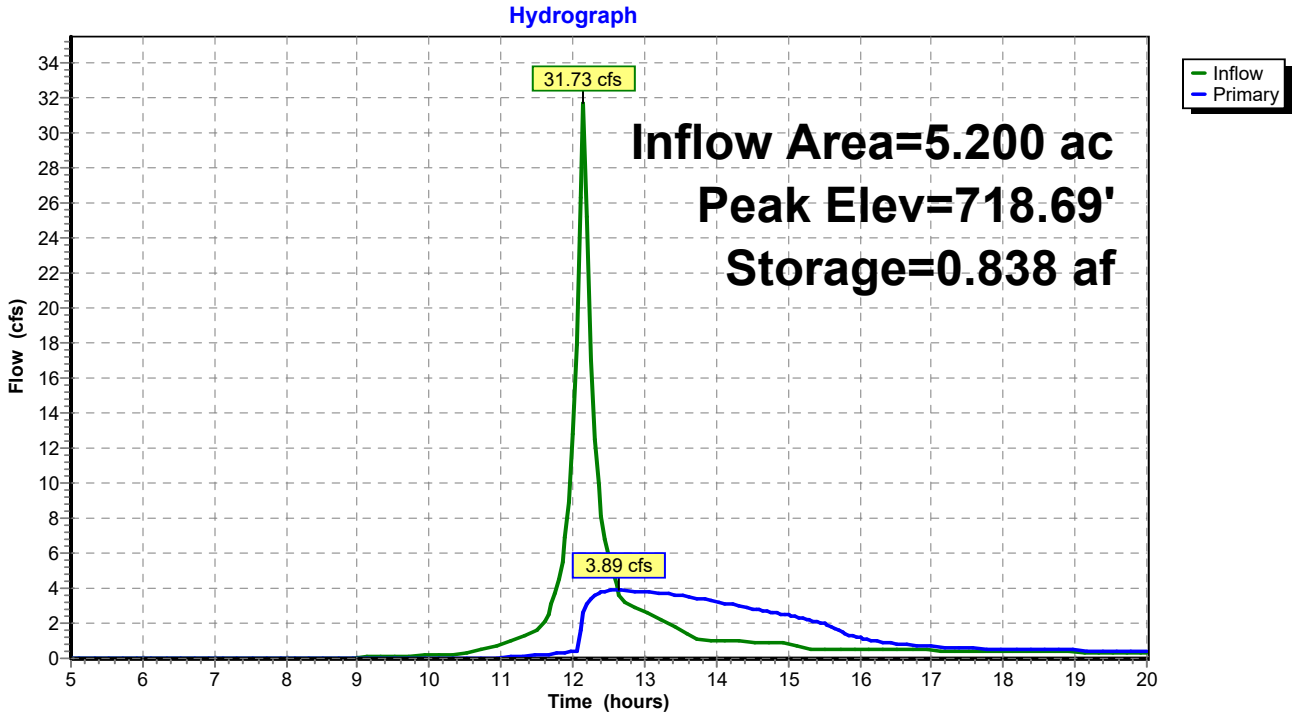
Volume	Invert	Avail.Storage	Storage Description
#1	715.90'	0.959 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
715.90	0.232	0.000	0.000
716.00	0.235	0.023	0.023
717.00	0.277	0.256	0.279
718.00	0.340	0.308	0.588
719.00	0.402	0.371	0.959

Device	Routing	Invert	Outlet Devices
#1	Primary	715.90'	**12.0" Round Culvert** L= 37.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 715.90' / 715.81' S= 0.0024 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	715.90'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.20'	**10.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (69% open area) Limited to weir flow at low heads

Primary OutFlow Max=3.89 cfs @ 12.63 hrs HW=718.69' (Free Discharge)
└**1=Culvert** (Passes 3.89 cfs of 5.30 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 7.80 fps)
  └**3=Orifice/Grate** (Orifice Controls 3.21 cfs @ 5.88 fps)

Pond MP: MIDDLE POND



Summary for Pond NP: NORTH POND

Inflow Area = 20.800 ac, 9.13% Impervious, Inflow Depth > 3.18" for 100-YEAR event
Inflow = 90.75 cfs @ 12.22 hrs, Volume= 5.518 af
Outflow = 31.23 cfs @ 12.53 hrs, Volume= 4.534 af, Atten= 66%, Lag= 18.3 min
Primary = 31.23 cfs @ 12.53 hrs, Volume= 4.534 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 719.47' @ 12.53 hrs Surf.Area= 41,825 sf Storage= 105,652 cf

Plug-Flow detention time= 89.9 min calculated for 4.534 af (82% of inflow)
Center-of-Mass det. time= 46.4 min (832.8 - 786.4)

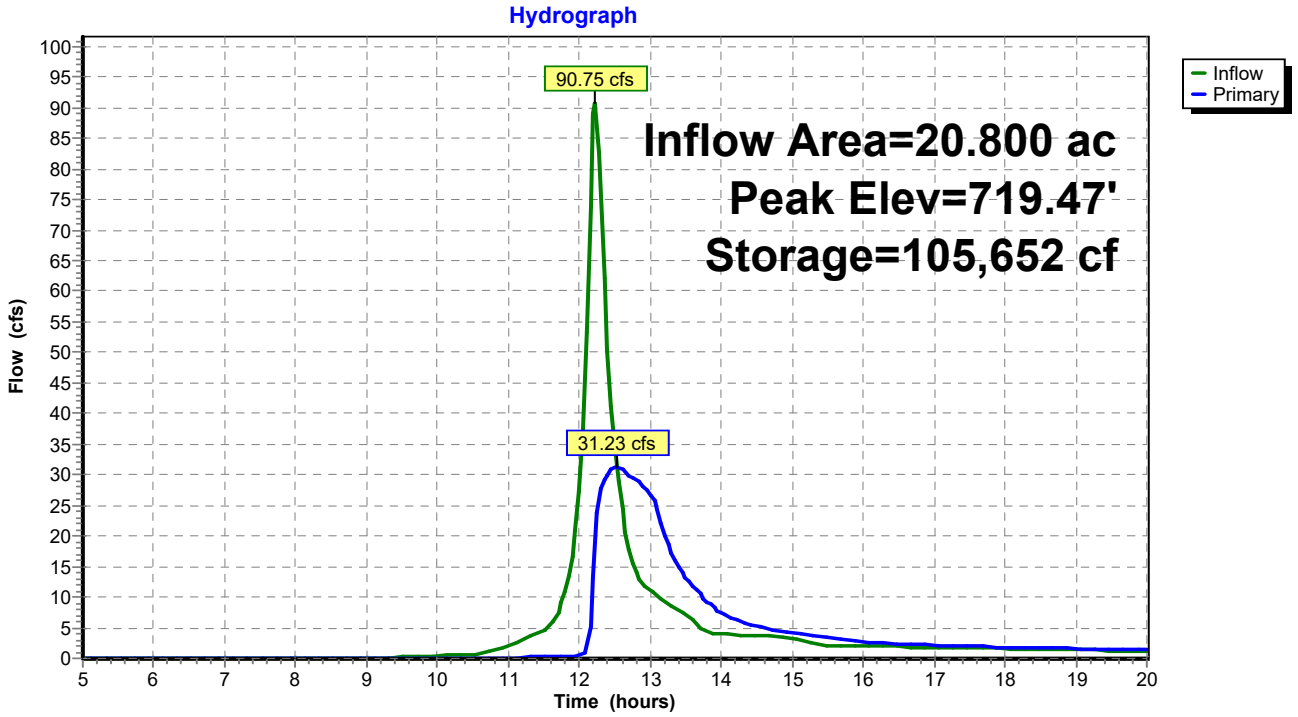
Volume	Invert	Avail.Storage	Storage Description
#1	716.00'	128,850 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
716.00	21,700	0	0
717.00	25,800	23,750	23,750
718.00	31,300	28,550	52,300
719.00	37,700	34,500	86,800
720.00	46,400	42,050	128,850

Device	Routing	Invert	Outlet Devices
#1	Primary	716.00'	**30.0" Round Culvert** L= 38.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 716.00' / 715.81' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#2	Device 1	716.00'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.50'	**127.0 deg x 3.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Primary OutFlow Max=31.20 cfs @ 12.53 hrs HW=719.47' (Free Discharge)
└**1=Culvert** (Barrel Controls 31.20 cfs @ 6.36 fps)
└**2=Orifice/Grate** (Passes < 0.76 cfs potential flow)
└**3=Sharp-Crested Vee/Trap Weir** (Passes < 43.08 cfs potential flow)

Pond NP: NORTH POND



Summary for Pond SP: SOUTH POND

Inflow Area = 4.500 ac, 15.56% Impervious, Inflow Depth > 3.37" for 100-YEAR event
Inflow = 26.50 cfs @ 12.15 hrs, Volume= 1.263 af
Outflow = 3.44 cfs @ 12.62 hrs, Volume= 0.959 af, Atten= 87%, Lag= 28.2 min
Primary = 3.44 cfs @ 12.62 hrs, Volume= 0.959 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 718.34' @ 12.62 hrs Surf.Area= 0.377 ac Storage= 0.697 af

Plug-Flow detention time= 133.5 min calculated for 0.959 af (76% of inflow)
Center-of-Mass det. time= 83.7 min (862.3 - 778.6)

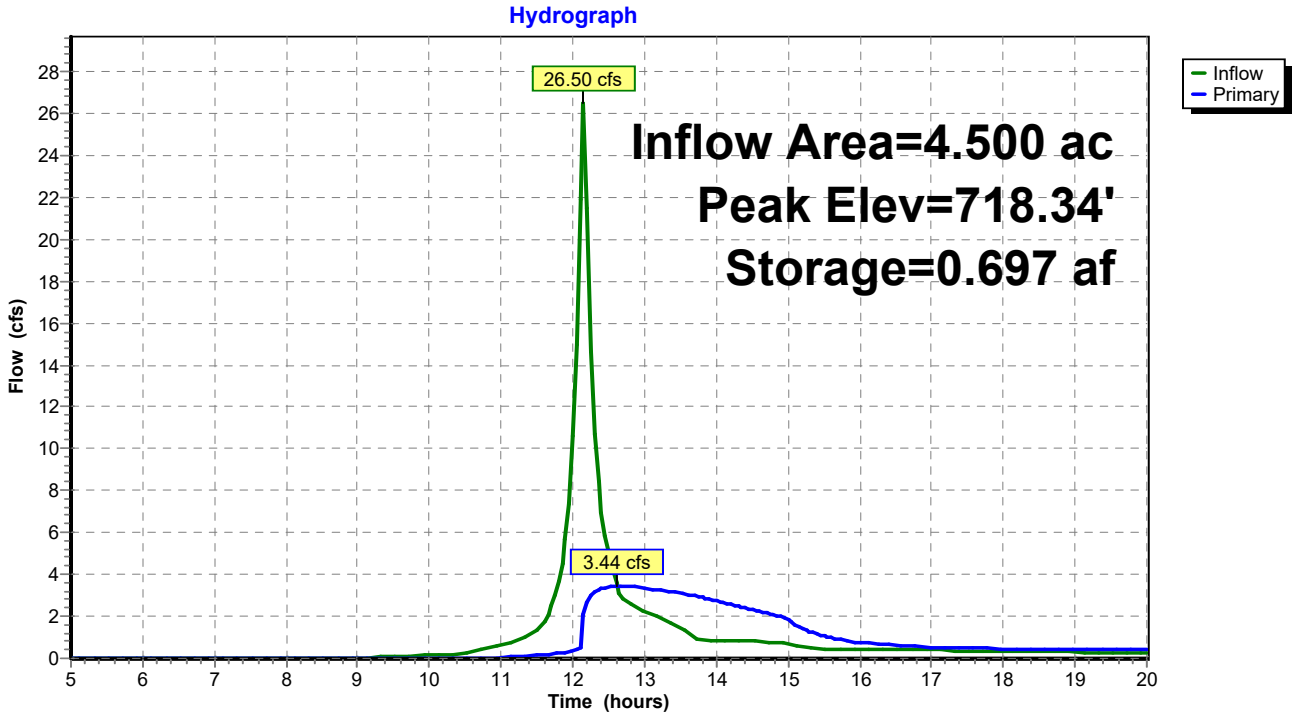
Volume	Invert	Avail.Storage	Storage Description
#1	715.90'	0.970 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
715.90	0.222	0.000	0.000
716.00	0.225	0.022	0.022
717.00	0.271	0.248	0.270
718.00	0.339	0.305	0.575
719.00	0.450	0.394	0.970

Device	Routing	Invert	Outlet Devices
#1	Primary	715.90'	**12.0" Round Culvert** L= 36.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 715.90' / 715.81' S= 0.0025 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	715.90'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	717.20'	**10.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (69% open area) Limited to weir flow at low heads

Primary OutFlow Max=3.44 cfs @ 12.62 hrs HW=718.34' (Free Discharge)
└**1=Culvert** (Passes 3.44 cfs of 4.81 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.63 cfs @ 7.26 fps)
  └**3=Orifice/Grate** (Orifice Controls 2.80 cfs @ 5.14 fps)

Pond SP: SOUTH POND

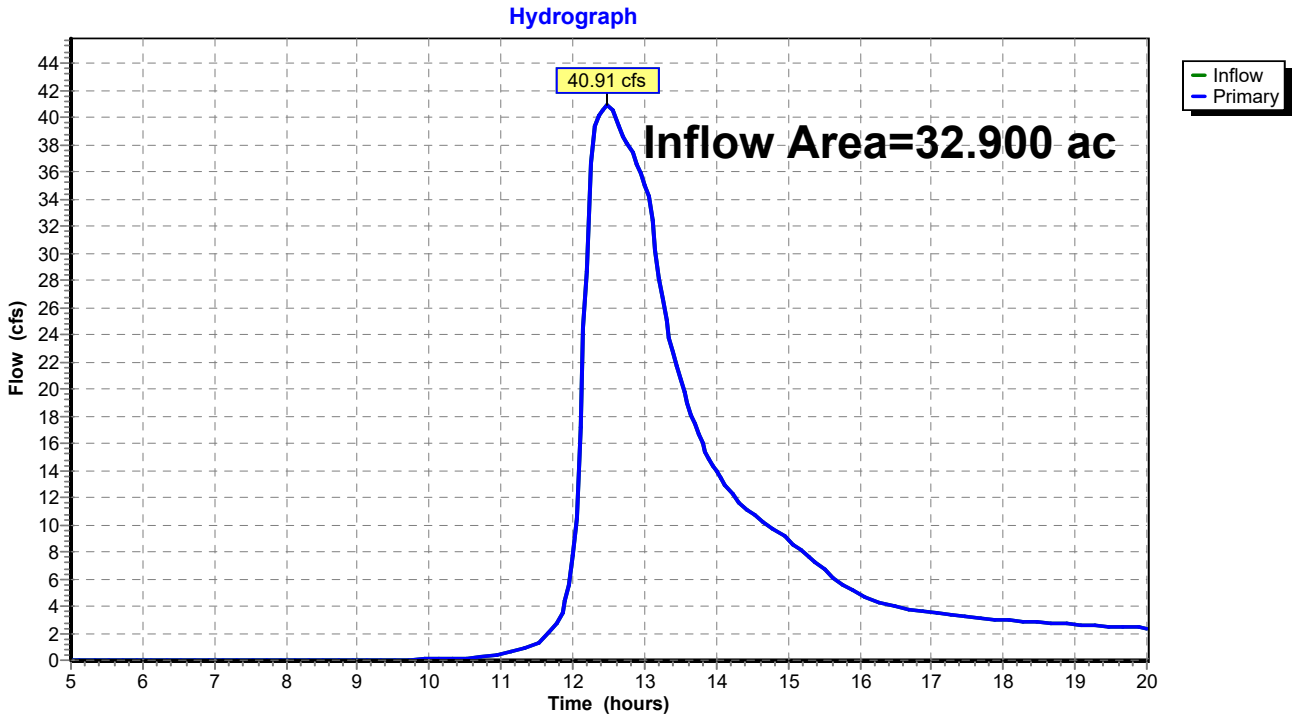


Summary for Link PSD: PROPOSED SITE DISCHARGE

Inflow Area = 32.900 ac, 12.16% Impervious, Inflow Depth > 2.68" for 100-YEAR event
Inflow = 40.91 cfs @ 12.48 hrs, Volume= 7.341 af
Primary = 40.91 cfs @ 12.48 hrs, Volume= 7.341 af, Atten= 0%, Lag= 0.0 min

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

Link PSD: PROPOSED SITE DISCHARGE



Weir Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Nov 8 2021

NORTH POND EMERGENCY SPILLWAY - 100 YR

Rectangular Weir

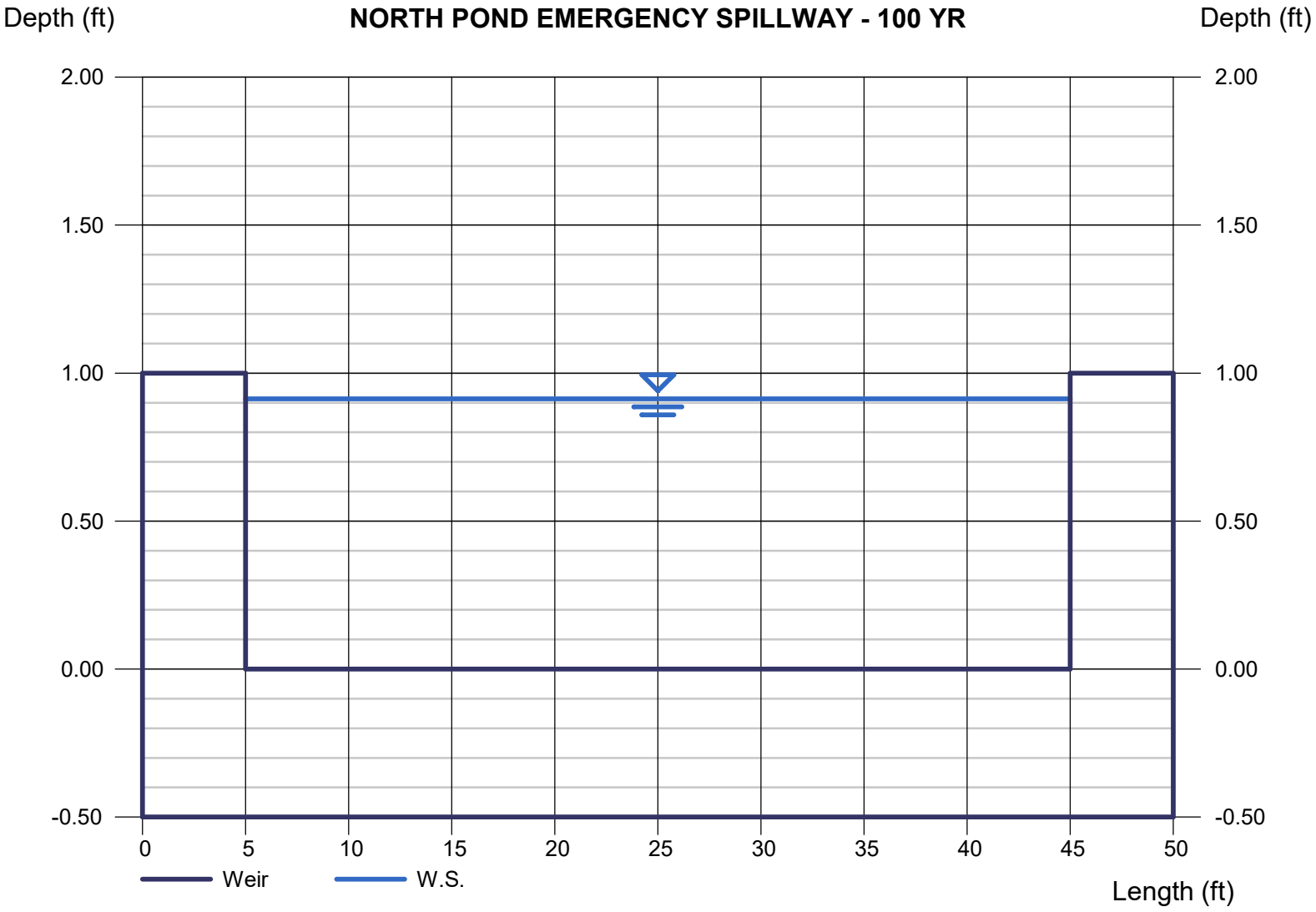
Crest	= Broad
Bottom Length (ft)	= 40.00
Total Depth (ft)	= 1.00

Calculations

Weir Coeff. Cw	= 2.60
Compute by:	Known Q
Known Q (cfs)	= 90.75

Highlighted

Depth (ft)	= 0.91
Q (cfs)	= 90.75
Area (sqft)	= 36.52
Velocity (ft/s)	= 2.48
Top Width (ft)	= 40.00



Weir Report

MIDDLE POND EMERGENCY SPILLWAY - 100 YR

Rectangular Weir

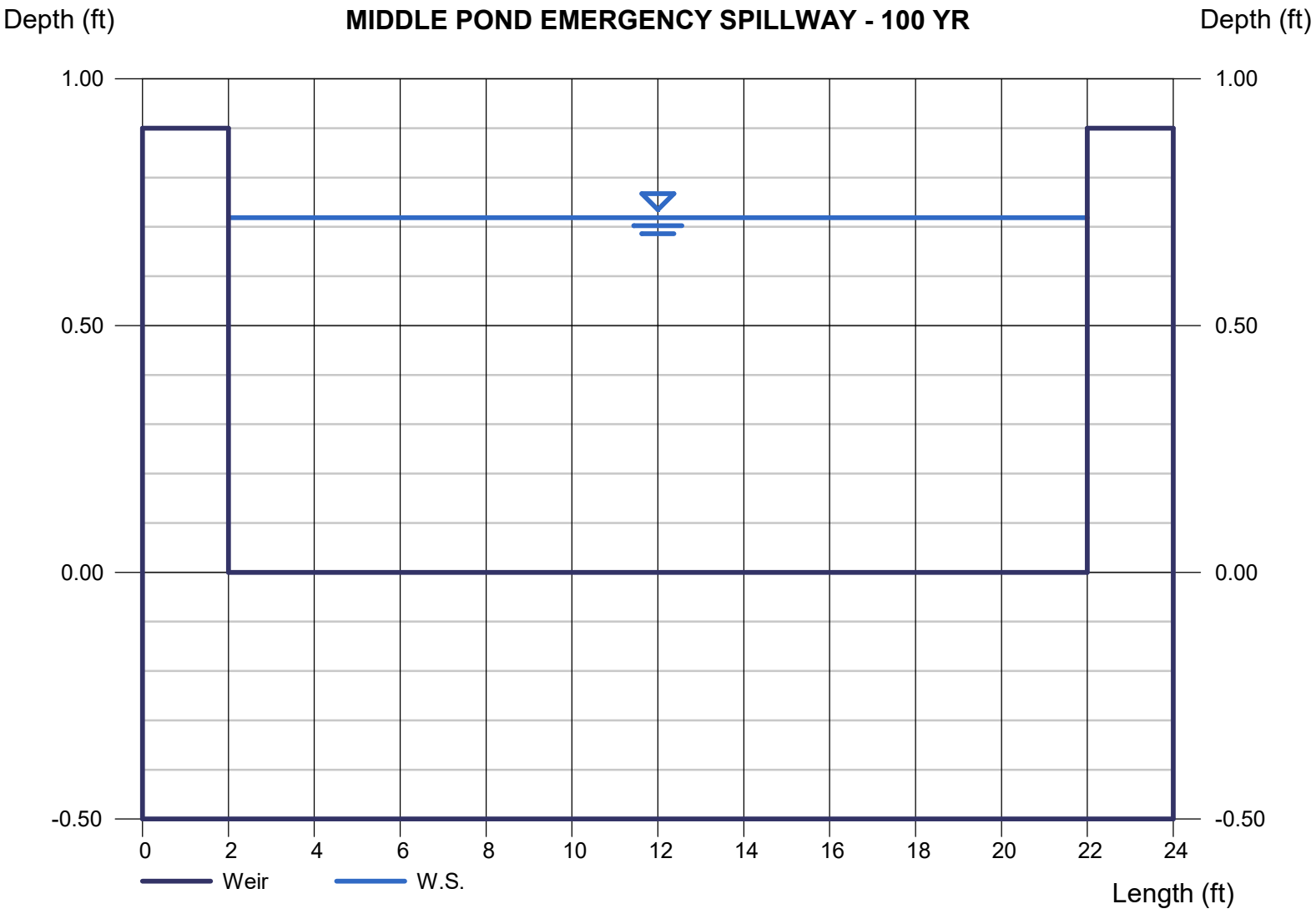
Crest	= Broad
Bottom Length (ft)	= 20.00
Total Depth (ft)	= 0.90

Calculations

Weir Coeff. Cw	= 2.60
Compute by:	Known Q
Known Q (cfs)	= 31.70

Highlighted

Depth (ft)	= 0.72
Q (cfs)	= 31.70
Area (sqft)	= 14.38
Velocity (ft/s)	= 2.20
Top Width (ft)	= 20.00



Weir Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Apr 20 2021

SOUTH POND EMERGENCY SPILLWAY - 100 YR

Rectangular Weir

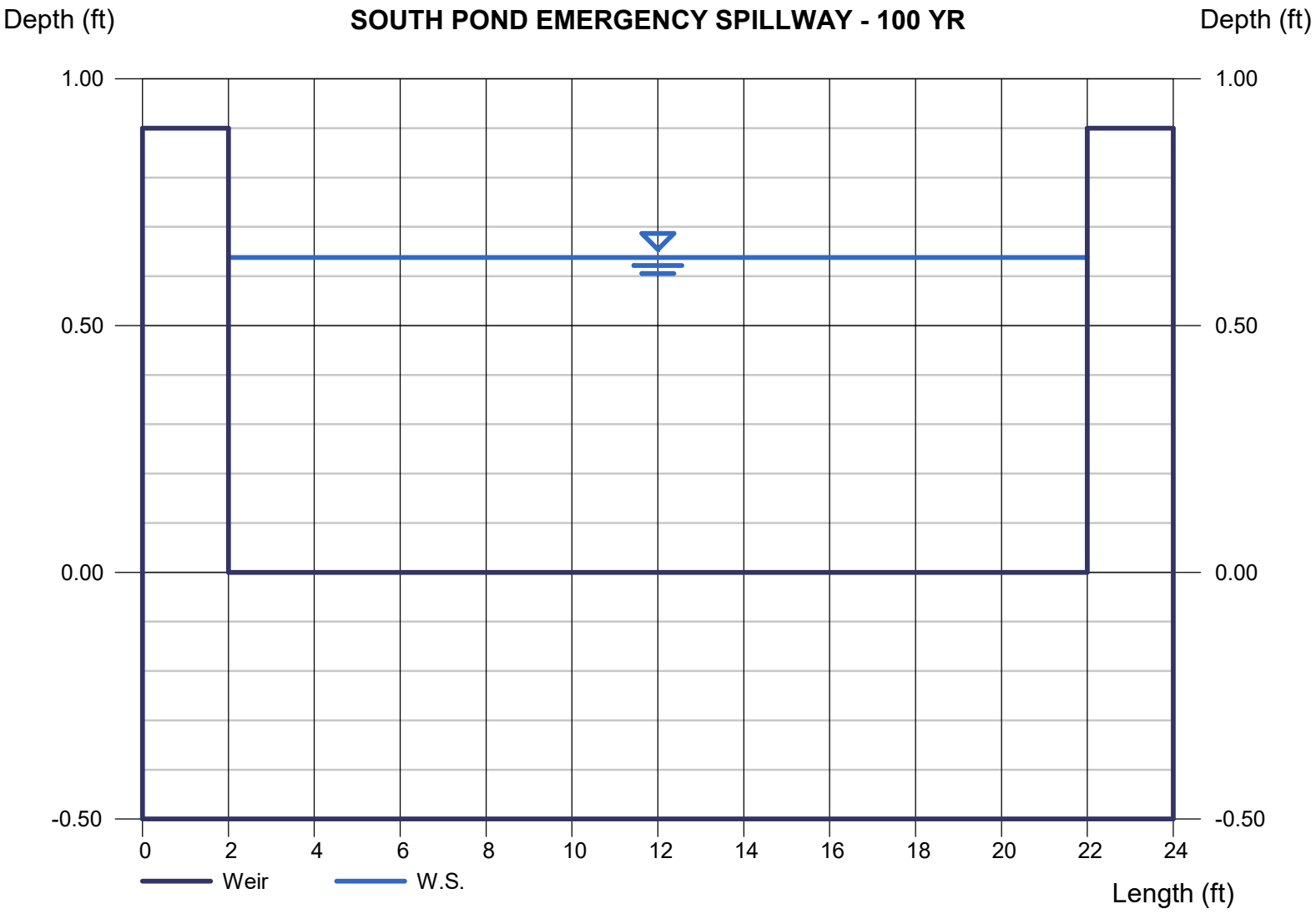
Crest	= Broad
Bottom Length (ft)	= 20.00
Total Depth (ft)	= 0.90

Calculations

Weir Coeff. Cw	= 2.60
Compute by:	Known Q
Known Q (cfs)	= 26.50

Highlighted

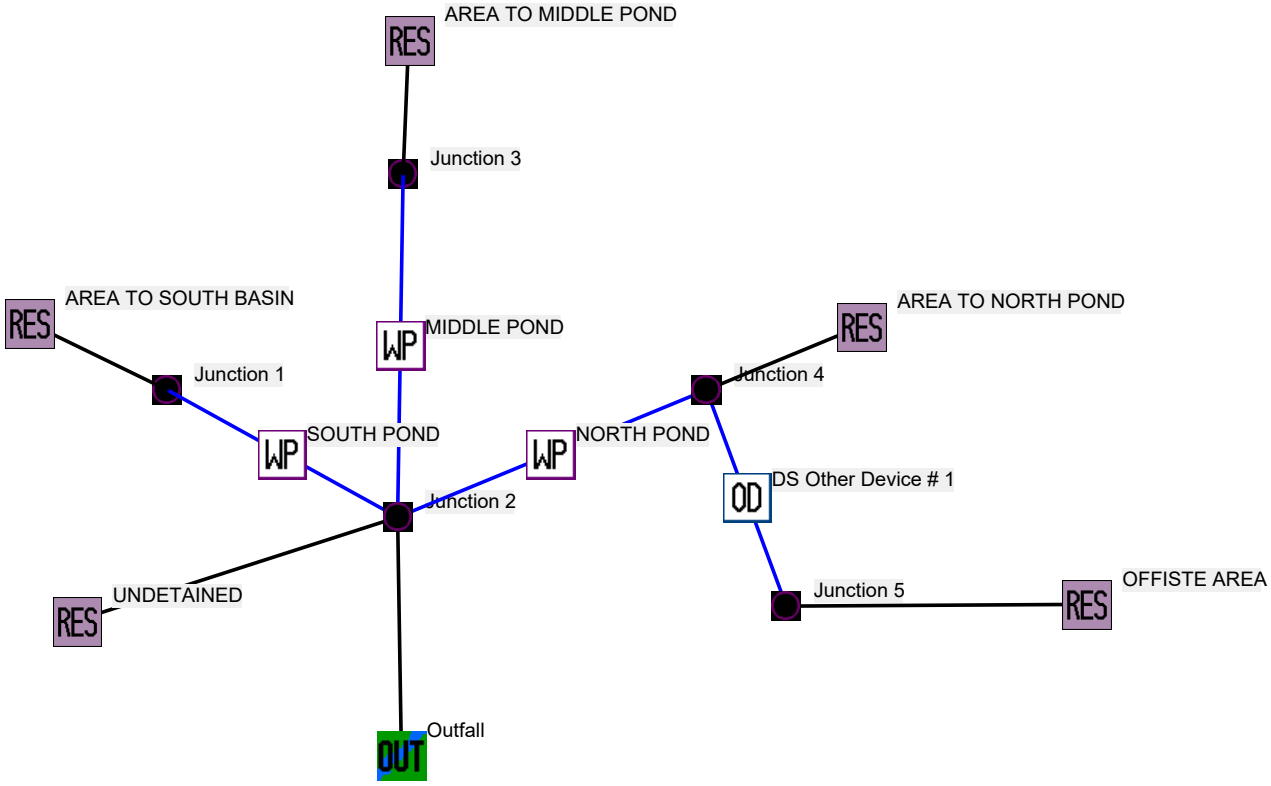
Depth (ft)	= 0.64
Q (cfs)	= 26.50
Area (sqft)	= 12.76
Velocity (ft/s)	= 2.08
Top Width (ft)	= 20.00



APPENDIX 4
POST-DEVELOPMENT CONDITIONS INFORMATION (WATER QUALITY)

PINNACLE ENGINEERING GROUP

SLAMM NODE LAYOUT



Data file name: Z:\Projects\2018\1335.00-WI\DESIGN\SWMP\SLAMM\YORKVILLE.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WI Milwaukee 69.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:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/06 End of Winter Season: 03/28
Date: 07-14-2021 Time: 13:59:55
Site information: YORKVILLE

LU# 1 - Residential: AREA TO SOUTH BASIN Total area (ac): 4.500
1 - Roofs 1: 0.300 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.200 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 3.800 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.200 ac. PSD File:

LU# 2 - Residential: AREA TO MIDDLE POND Total area (ac): 5.200
1 - Roofs 1: 0.300 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.500 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 4.200 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.200 ac. PSD File:

LU# 3 - Residential: AREA TO NORTH POND Total area (ac): 17.800
1 - Roofs 1: 0.700 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.700 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 15.900 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.500 ac. PSD File:

LU# 4 - Residential: UNDETAINED Total area (ac): 2.400
1 - Roofs 1: 0.200 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.200 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 2.000 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 5 - Residential: OFFISTE AREA Total area (ac): 3.000
45 - Large Landscaped Areas 1: 3.000 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - SOUTH POND
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): 10
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 7.5
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 1
2. Stand pipe height above datum (ft): 6.3
Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0700	0.00	0.00
2	1.00	0.0900	0.00	0.00
3	4.00	0.1500	0.00	0.00
4	5.00	0.2220	0.00	0.00
5	5.10	0.2250	0.00	0.00
6	6.10	0.2710	0.00	0.00
7	7.10	0.3390	0.00	0.00
8	8.10	0.4500	0.00	0.00
9	8.50	0.5060	0.00	0.00

Control Practice 2: Wet Detention Pond CP# 2 (DS) - MIDDLE POND

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): 10
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 7.5

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 1
2. Stand pipe height above datum (ft): 6.3

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0600	0.00	0.00
2	1.00	0.0700	0.00	0.00
3	4.00	0.1400	0.00	0.00
4	5.00	0.2320	0.00	0.00
5	5.10	0.2350	0.00	0.00
6	6.10	0.2770	0.00	0.00
7	7.10	0.3400	0.00	0.00
8	8.10	0.4020	0.00	0.00
9	8.50	0.4800	0.00	0.00

Control Practice 3: Wet Detention Pond CP# 3 (DS) - NORTH POND

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): 20
3. Height from datum to bottom of weir opening: 8.5

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 6.5

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	0.01	0.1600	0.00	0.00
2	1.00	0.1900	0.00	0.00
3	4.00	0.3100	0.00	0.00
4	5.00	0.4980	0.00	0.00
5	6.00	0.5920	0.00	0.00
6	7.00	0.7190	0.00	0.00
7	8.00	0.8650	0.00	0.00
8	9.00	1.0650	0.00	0.00

Control Practice 4: Other Device CP# 1 (DS) - DS Other Device # 1

Fraction of drainage area served by device (ac) = 1.00
Particulate Concentration reduction fraction = 1.00
Filterable Concentration reduction fraction = 0.00
Runoff volume reduction fraction = 0

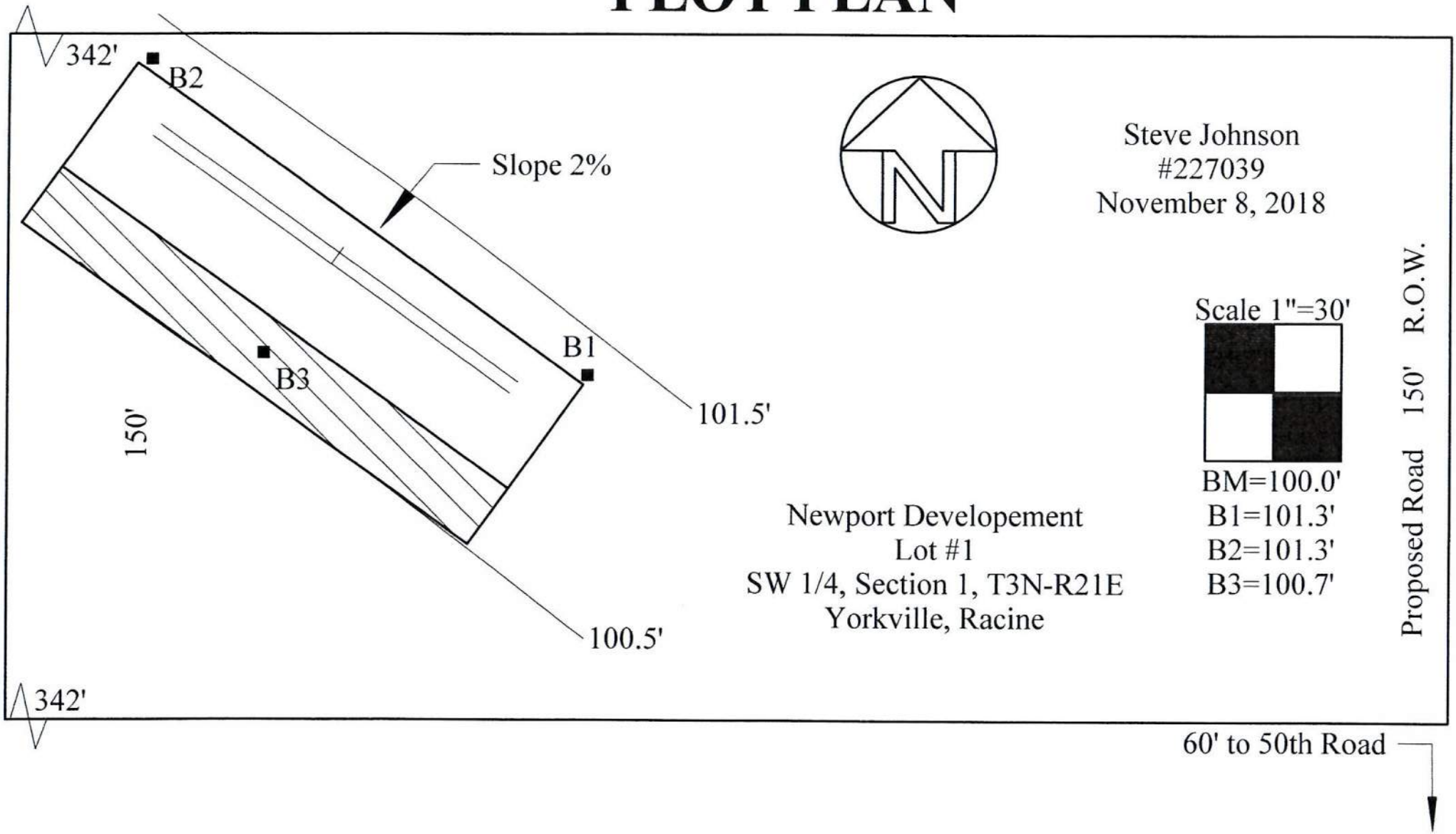
SLAMM for Windows Version 10.4.1

Data file name: Z:\Projects\2018\1335.00-WI\DESIGN\SWMP\SLAMM\YORKVILLE.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WI Milwaukee 69.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:
If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/05/69 Study period ending date: 12/31/69
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: 07-14-2021 Time of run: 14:02:55
Total Area Modeled (acres): 32.900
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:	580543	-	113.0	4095	-
Outfall Total with Controls:	581019	-0.08%	22.49	815.9	80.08%
Annualized Total After Outfall Controls:	589089			827.2	

APPENDIX 5
GEOTECHNICAL DATA

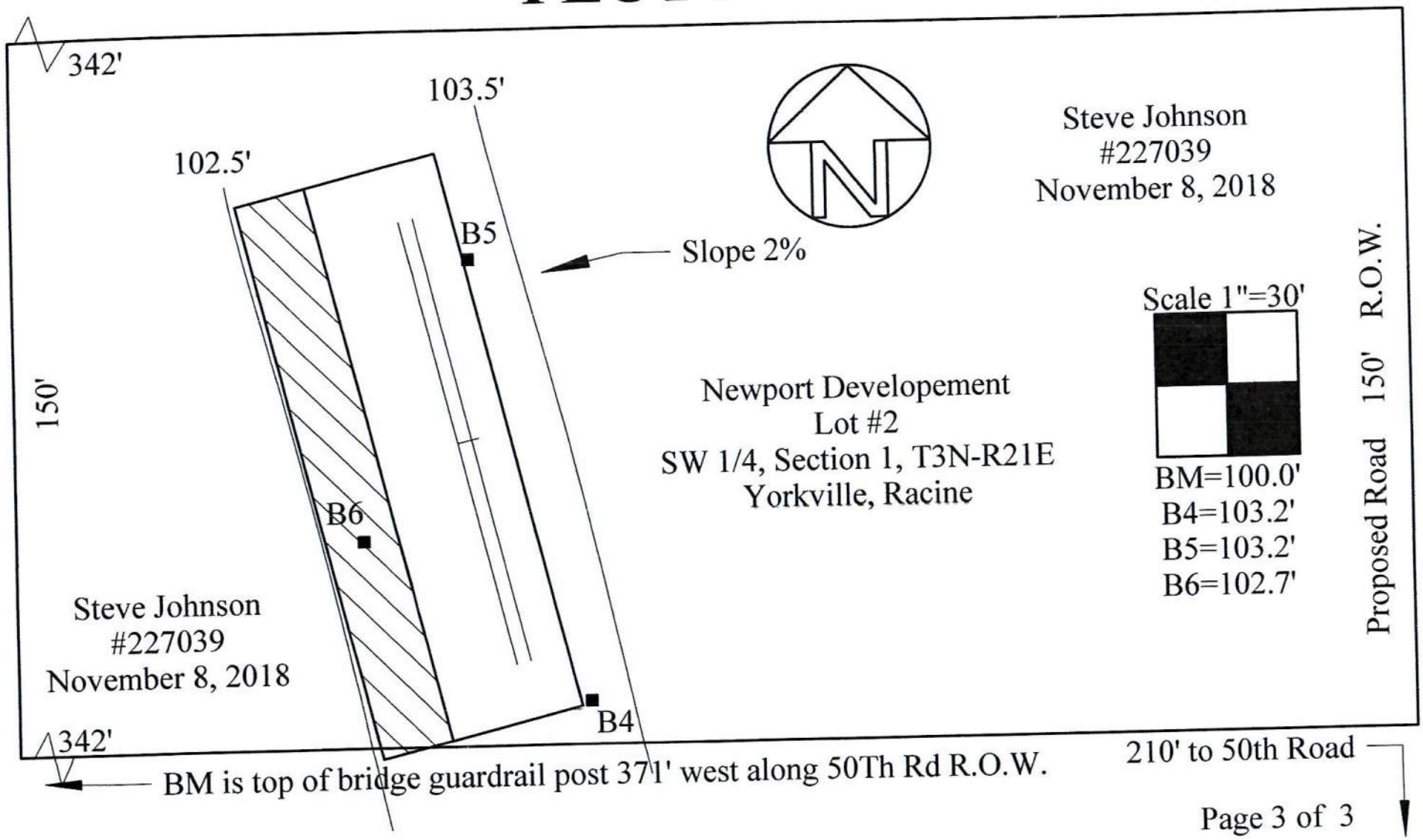
PLOT PLAN



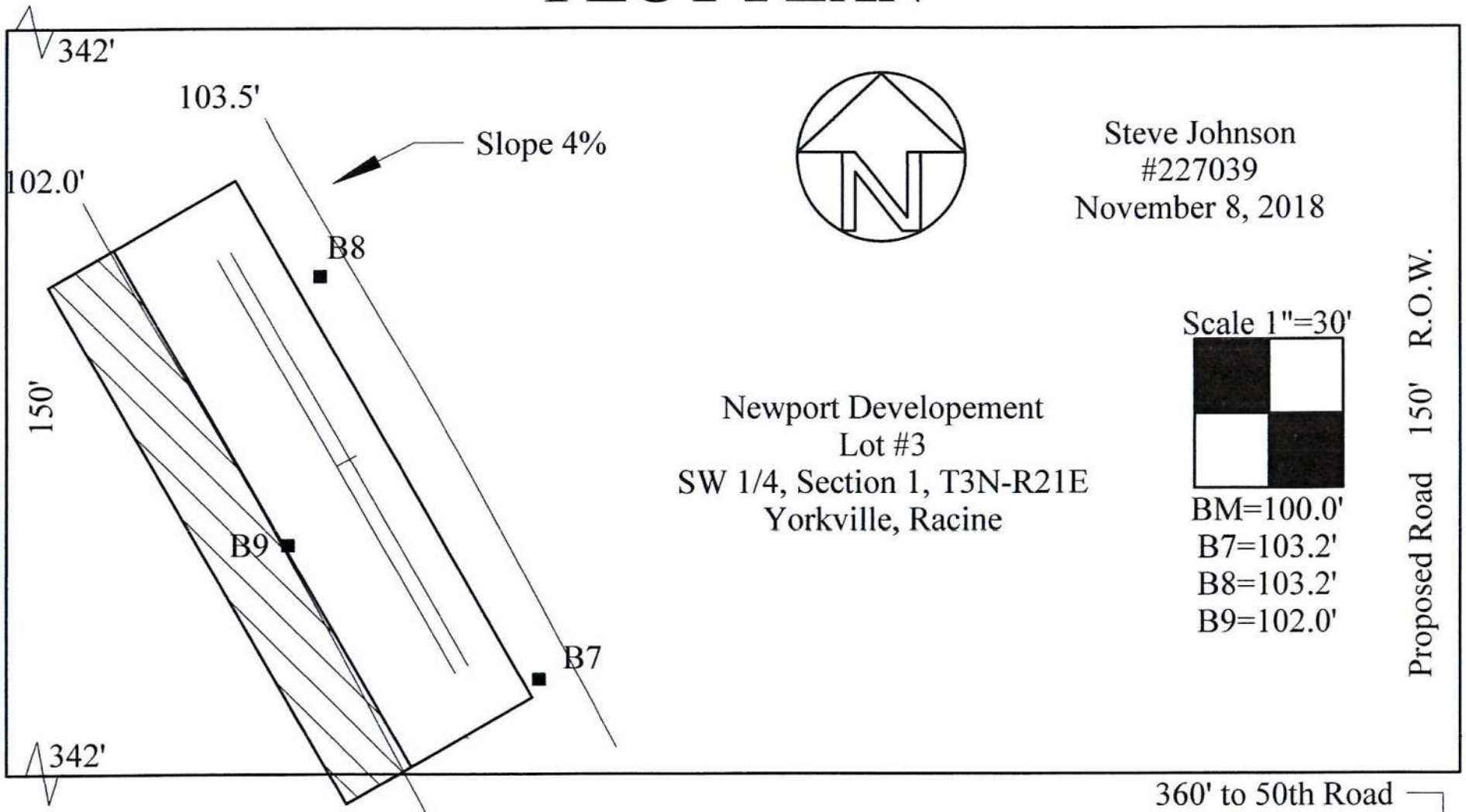
BM is top of bridge guardrail post 371' west

50Th Road R.O.W.

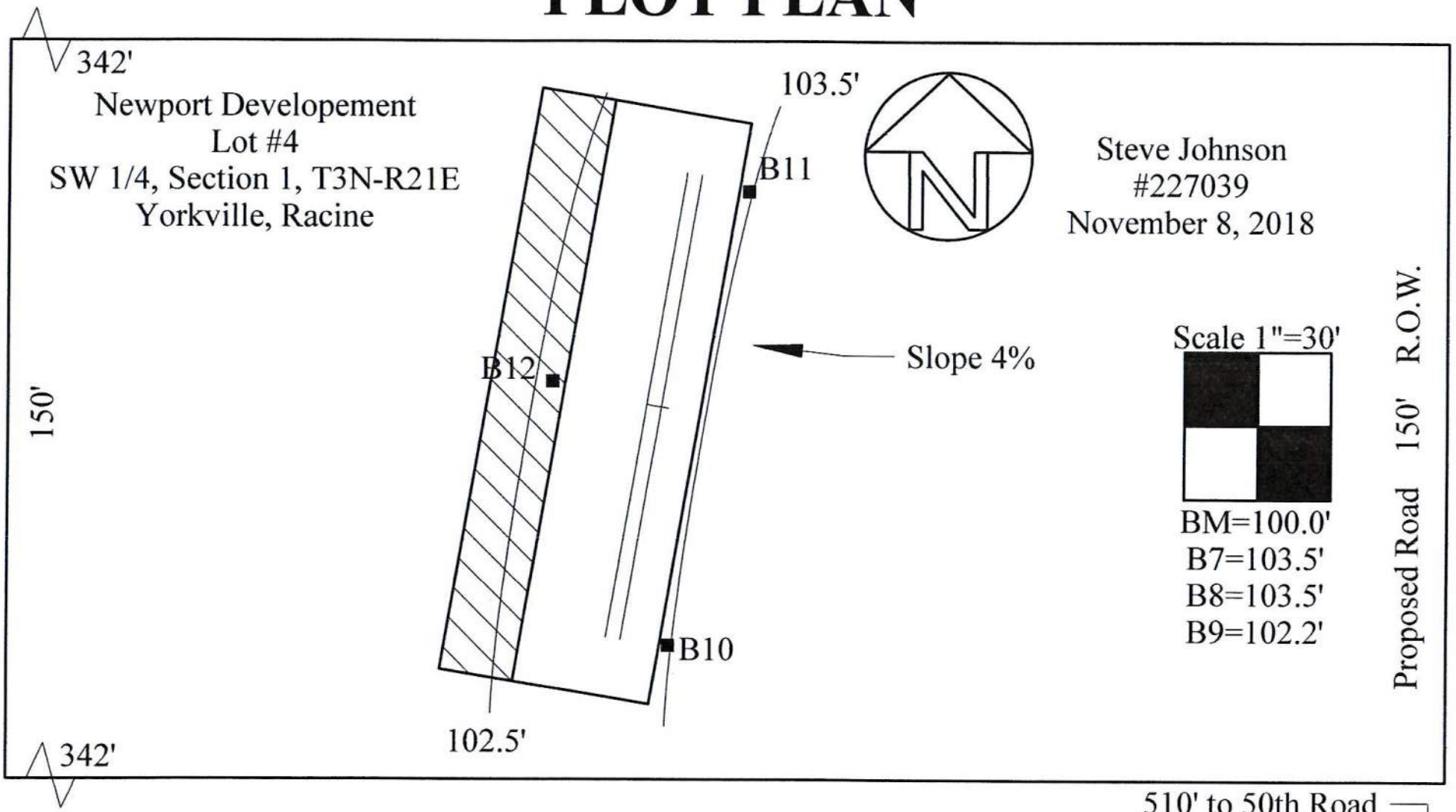
PLOT PLAN


342'
103.5'
102.5'
B5
Slope 2%
Steve Johnson
#227039
November 8, 2018
Scale 1"=30'
150'
Newport Developement
Lot #2
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine
BM=100.0'
B4=103.2'
B5=103.2'
B6=102.7'
Proposed Road 150' R.O.W.
B6
Steve Johnson
#227039
November 8, 2018
B4
342'
BM is top of bridge guardrail post 371' west along 50Th Rd R.O.W.
210' to 50th Road

PLOT PLAN

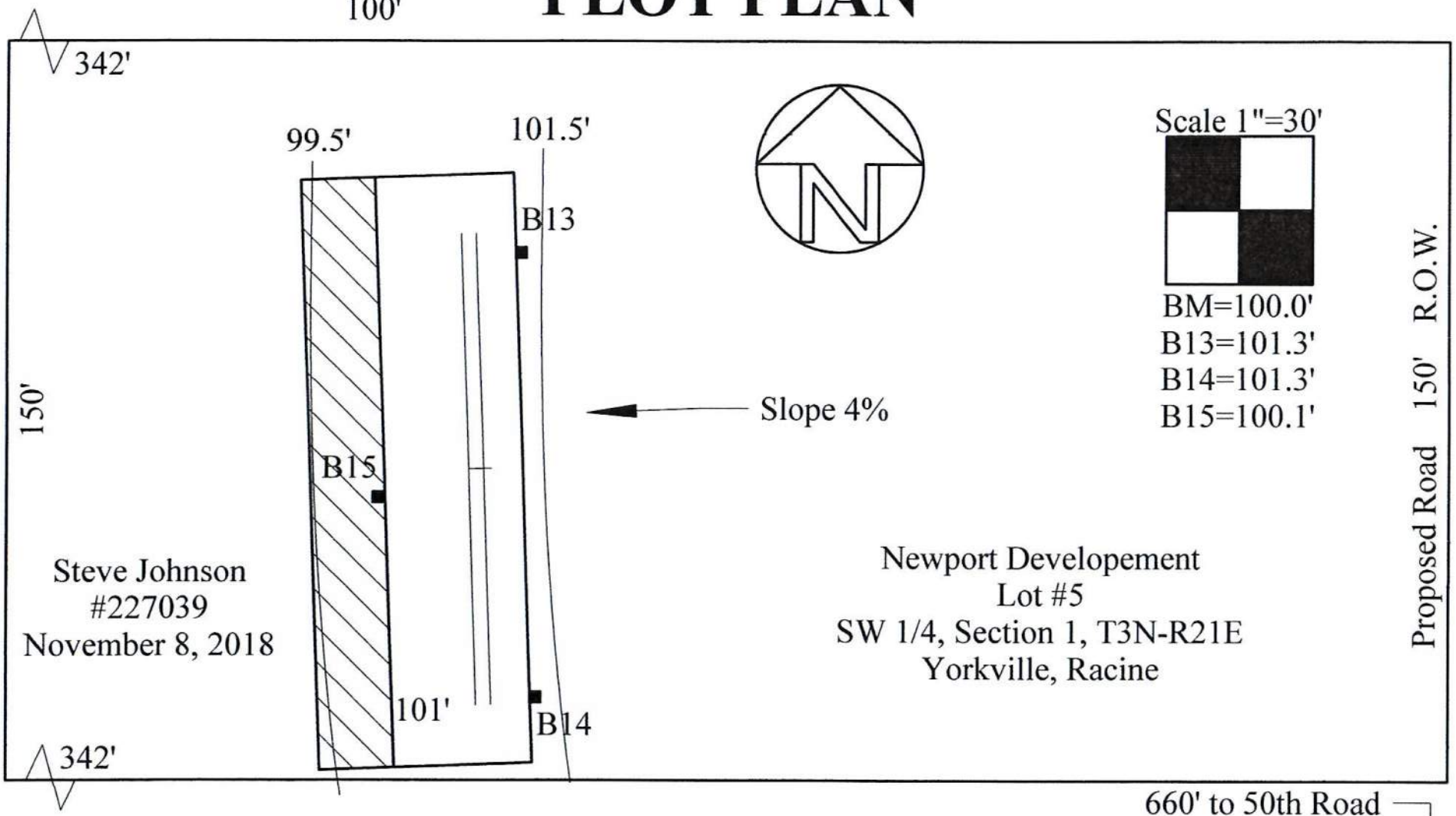

342'
103.5'
Slope 4%
102.0'
B8
150'
B9
B7
342'
Steve Johnson
#227039
November 8, 2018
Scale 1"=30'
Newport Developement
Lot #3
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine
BM=100.0'
B7=103.2'
B8=103.2'
B9=102.0'
Proposed Road 150' R.O.W.
360' to 50th Road
BM is top of bridge guardrail post 371' west along 50Th Rd R.O.W.

PLOT PLAN

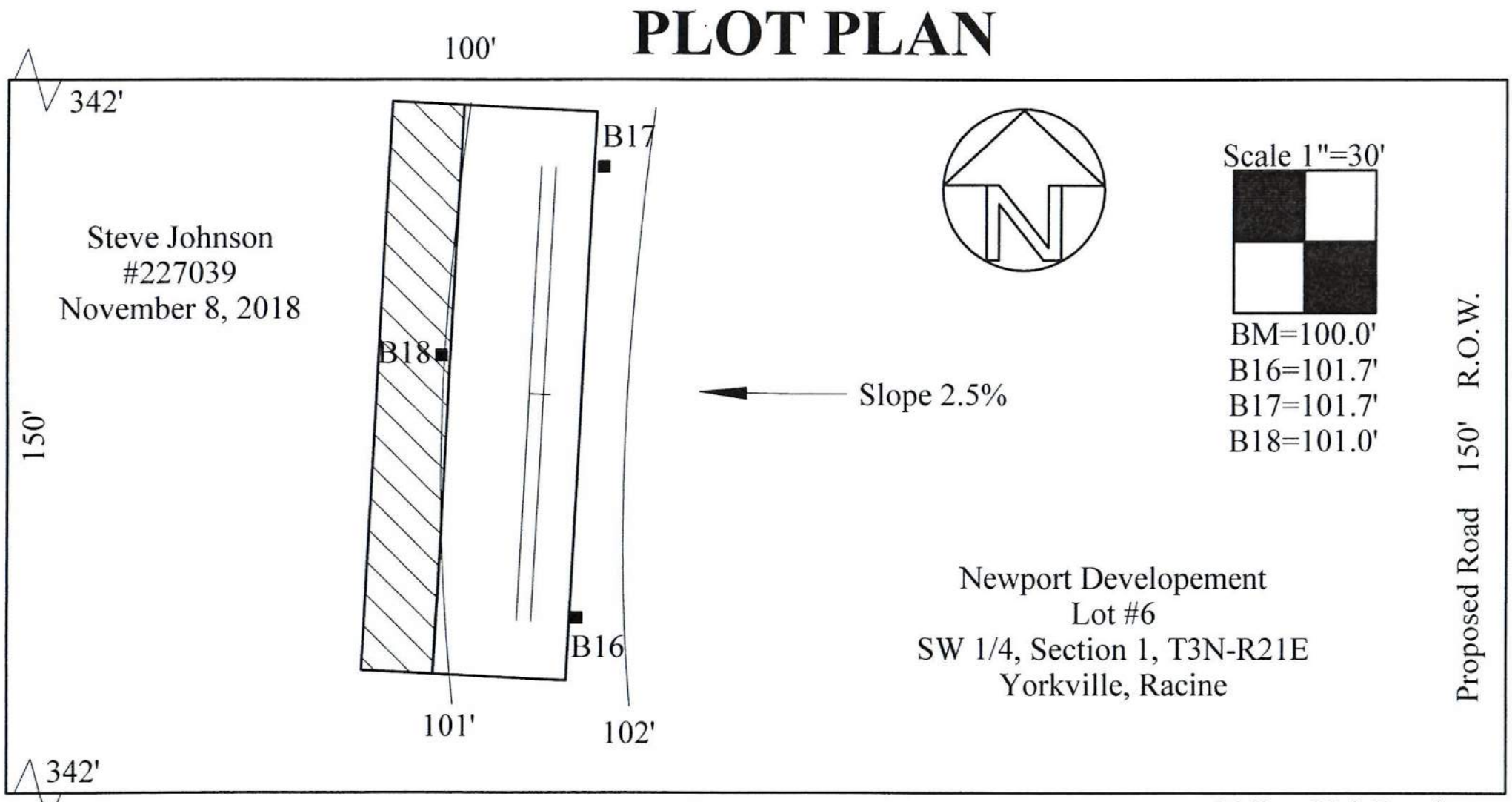


BM is top of bridge guardrail post 371' west along 50Th Rd R.O.W.

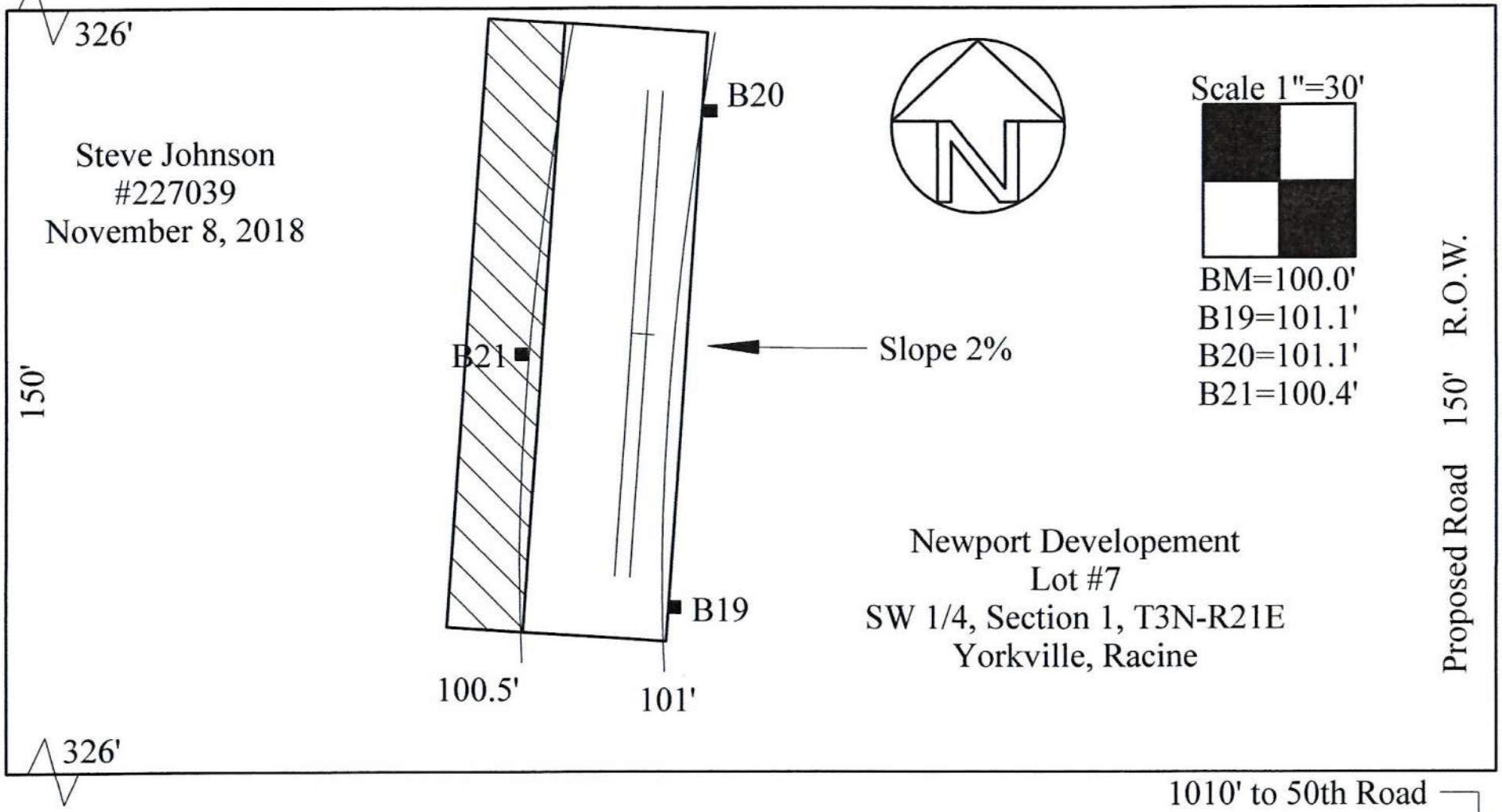
PLOT PLAN


100'
342'
99.5'
101.5'
B13
B15
B14
101'
342'
150'
Slope 4%
Scale 1"=30'
BM=100.0'
B13=101.3'
B14=101.3'
B15=100.1'
Proposed Road 150' R.O.W.
Steve Johnson
#227039
November 8, 2018
Newport Developement
Lot #5
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine
660' to 50th Road
BM is top of bridge guardrail post 371' west along 50Th Rd R.O.W.

PLOT PLAN


100'
342'
B17
B18
B16
Steve Johnson
#227039
November 8, 2018
Slope 2.5%
Scale 1"=30'
BM=100.0'
B16=101.7'
B17=101.7'
B18=101.0'
150'
Proposed Road 150' R.O.W.
Newport Developement
Lot #6
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine
101'
102'
342'
810' to 50th Road
BM is top of bridge guardrail post 371' west along 50Th Rd R.O.W.

PLOT PLAN


100'
326'
Steve Johnson
#227039
November 8, 2018
B20
B21
Slope 2%
B19
100.5'
101'
150'
Scale 1"=30'
BM=100.0'
B19=101.1'
B20=101.1'
B21=100.4'
Newport Developement
Lot #7
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine
Proposed Road 150' R.O.W.
326'
1010' to 50th Road
BM is top of bridge guardrail post 371' west along 50Th Rd R.O.W.

Plot Plan

NE corner of lot 11

344.08'

Slope 4%

724'

725'

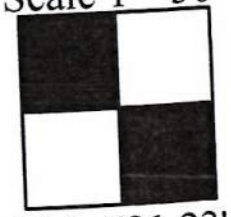
B2

B3

B1

Newport Developement
Lot #8
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine

Scale 1"=30'



BM=721.23'
B1=724.08'
B2=724.08'
B3=725.08'

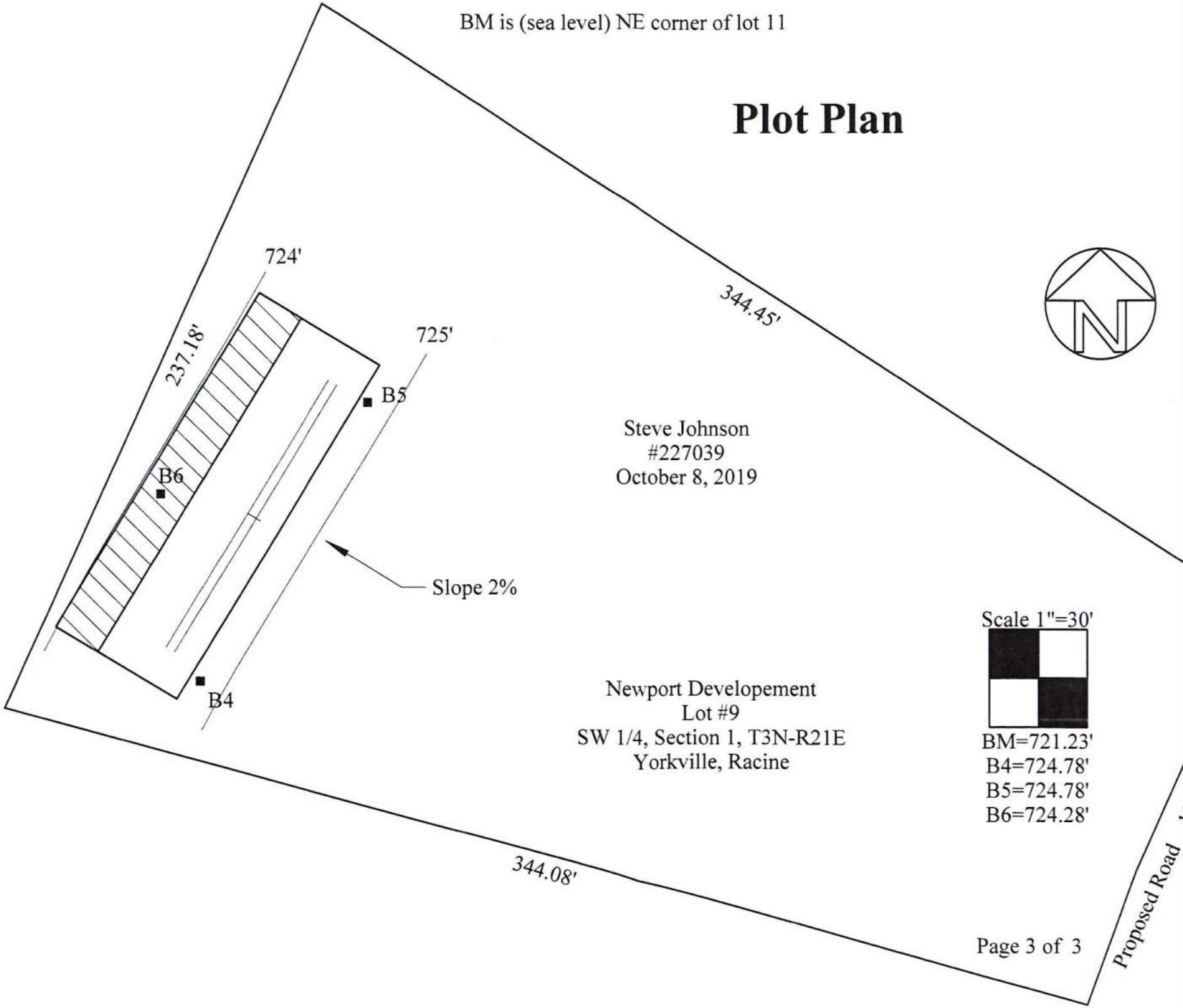
Proposed Road 132.88' R.O.W.

Johnson
27039
er 7, 2019

326.85'

BM is (sea level) NE corner of lot 11

Plot Plan



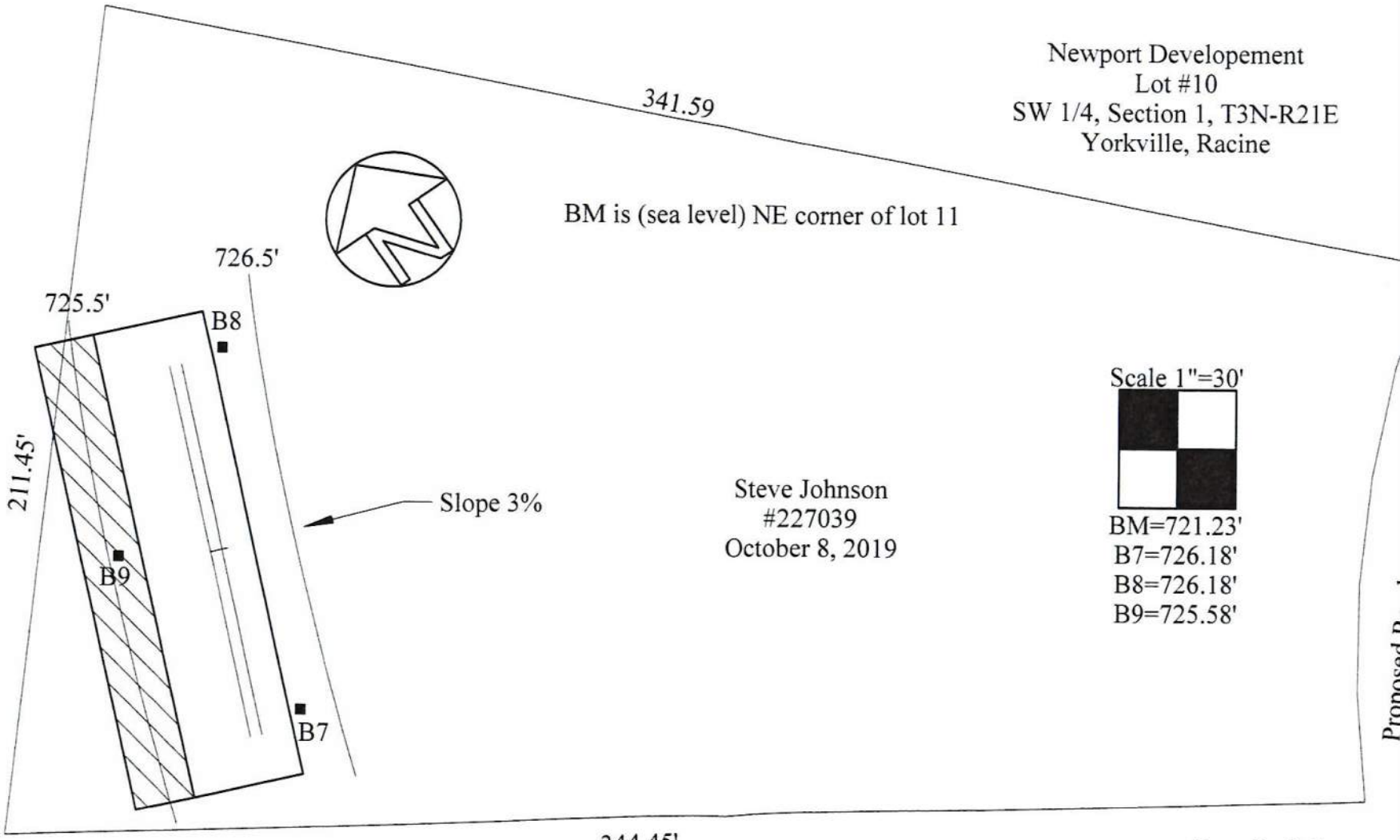
Steve Johnson
#227039
October 8, 2019

Newport Developement
Lot #9
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine

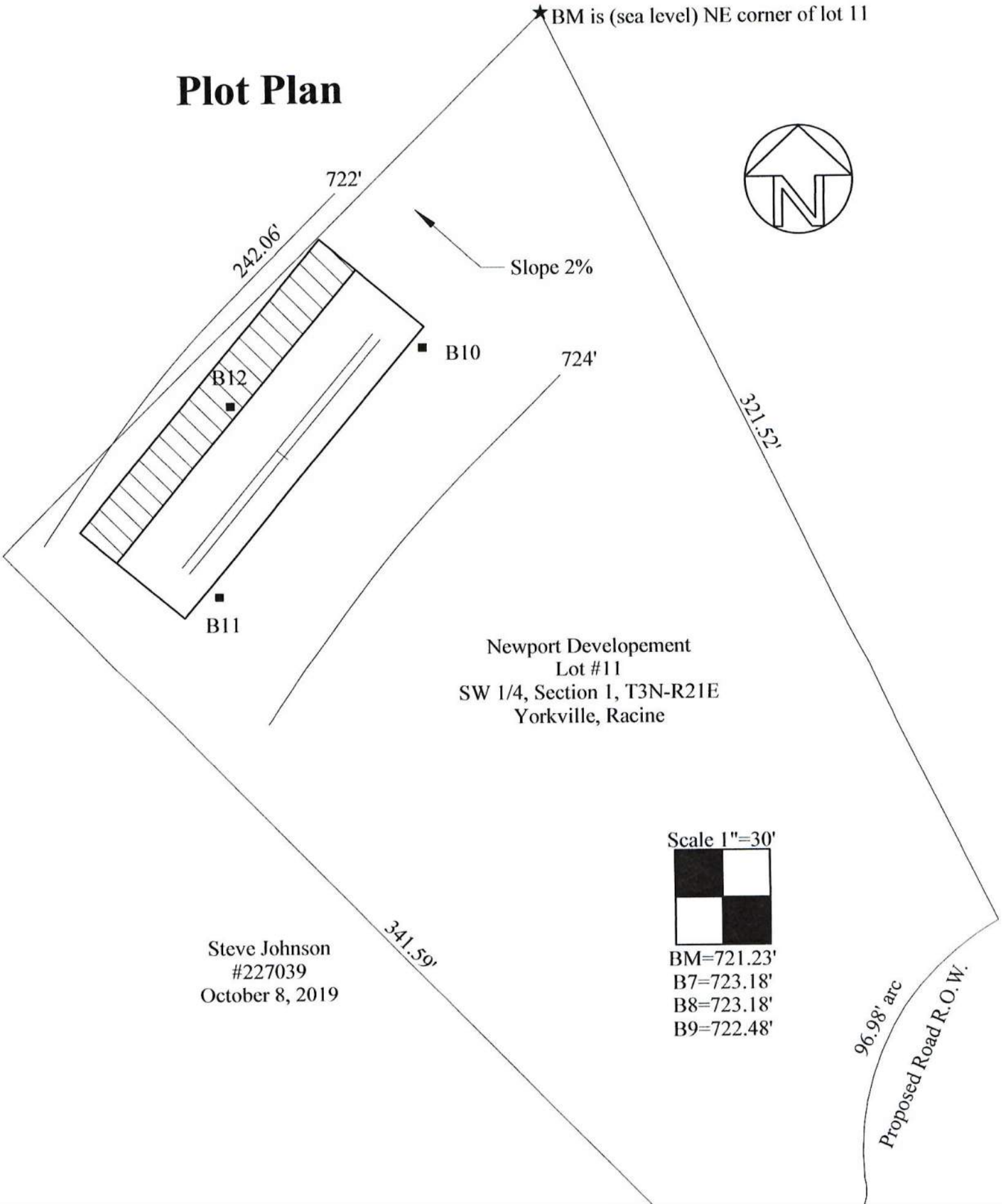
Scale 1"=30'

BM=721.23'
B4=724.78'
B5=724.78'
B6=724.28'

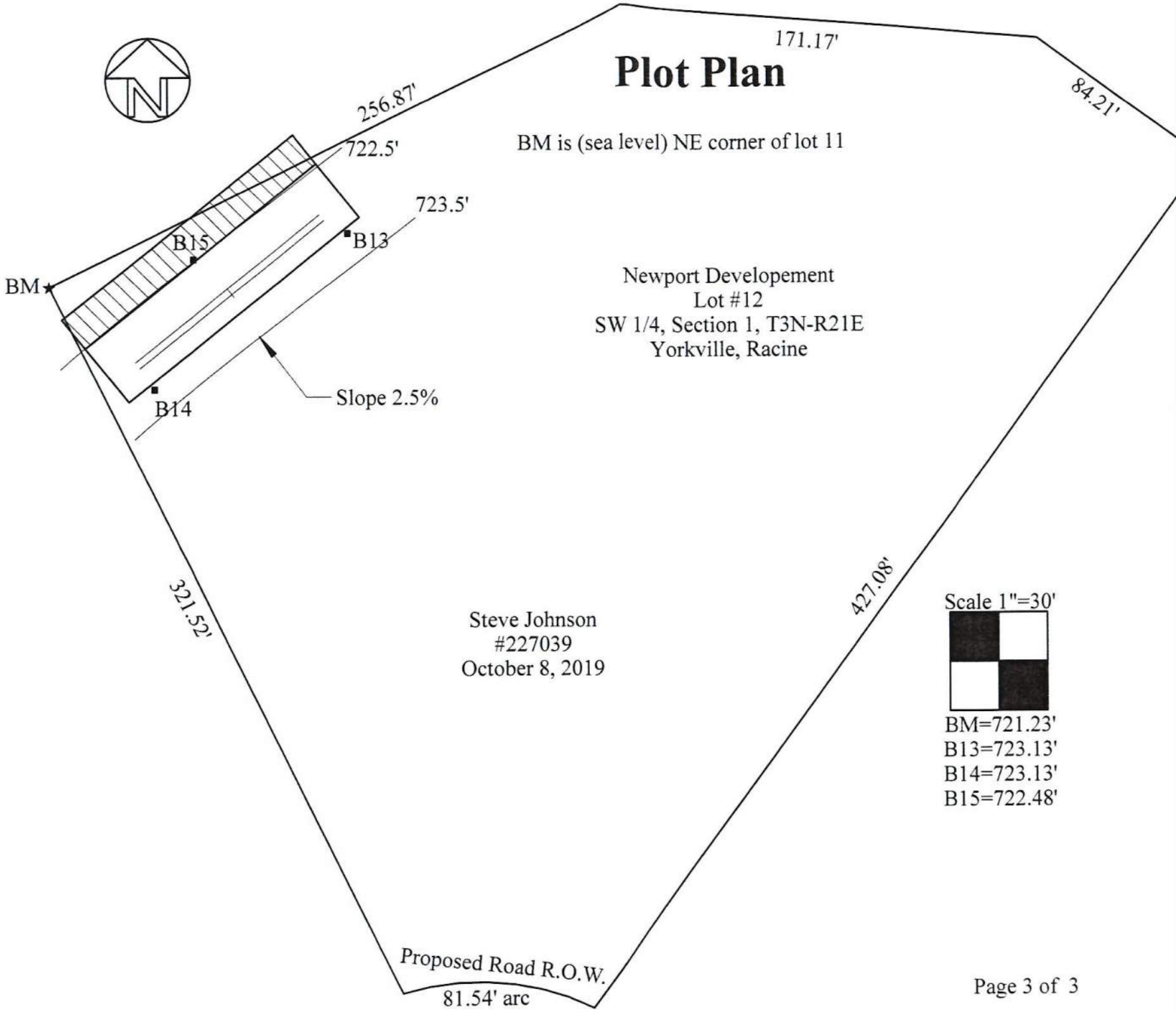
Plot Plan


341.59
Newport Developement
Lot #10
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine
BM is (sea level) NE corner of lot 11
726.5'
725.5'
B8
211.45'
Slope 3%
B9
B7
344.45'
Steve Johnson
#227039
October 8, 2019
Scale 1"=30'
BM=721.23'
B7=726.18'
B8=726.18'
B9=725.58'

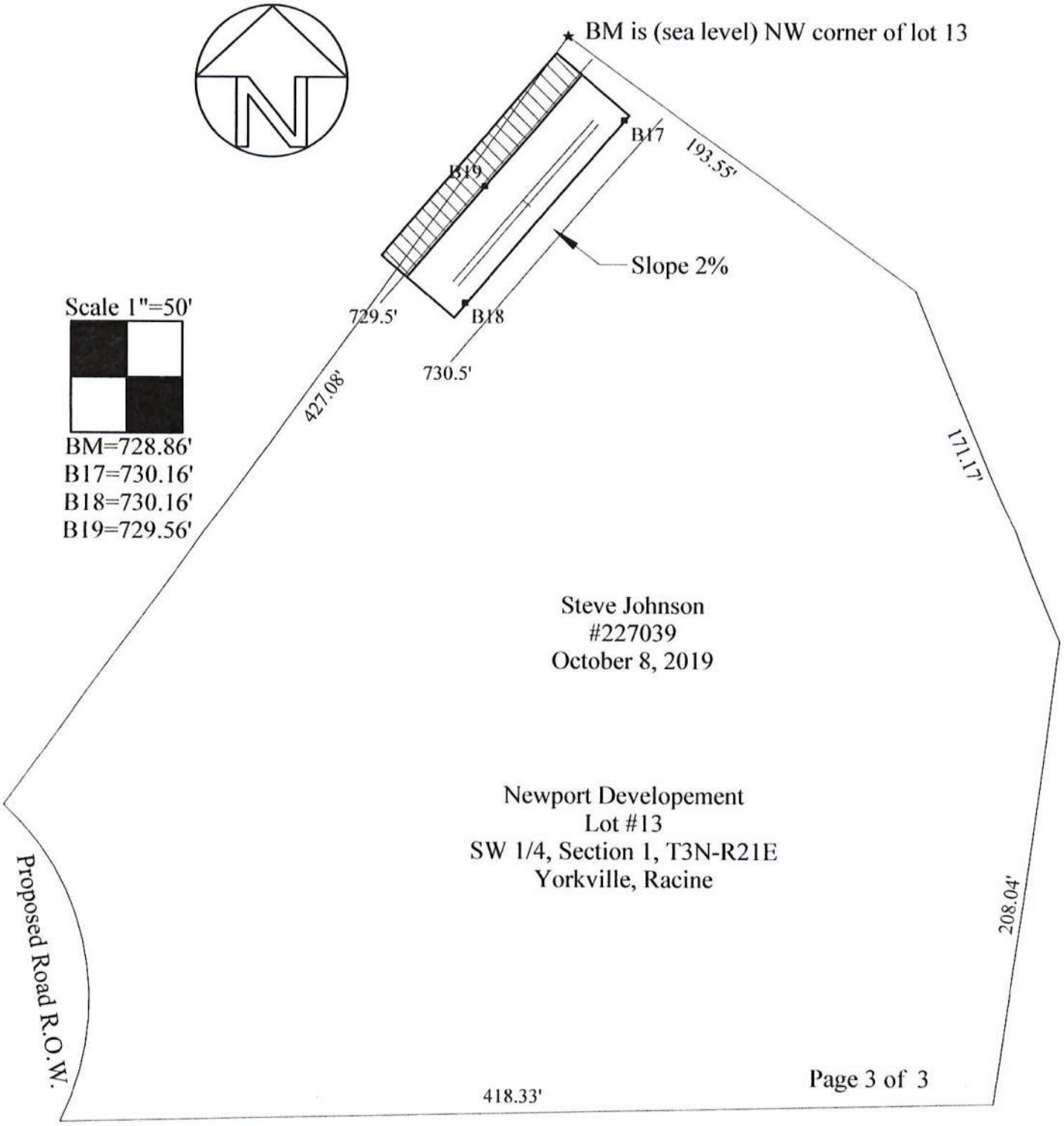
Plot Plan


★BM is (sea level) NE corner of lot 11
722'
242.06'
Slope 2%
B10
724'
B12
321.52'
B11
Newport Developement
Lot #11
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine
Scale 1"=30'
341.59'
Steve Johnson
#227039
October 8, 2019
BM=721.23'
B7=723.18'
B8=723.18'
B9=722.48'
96.98' arc
Proposed Road R.O.W.

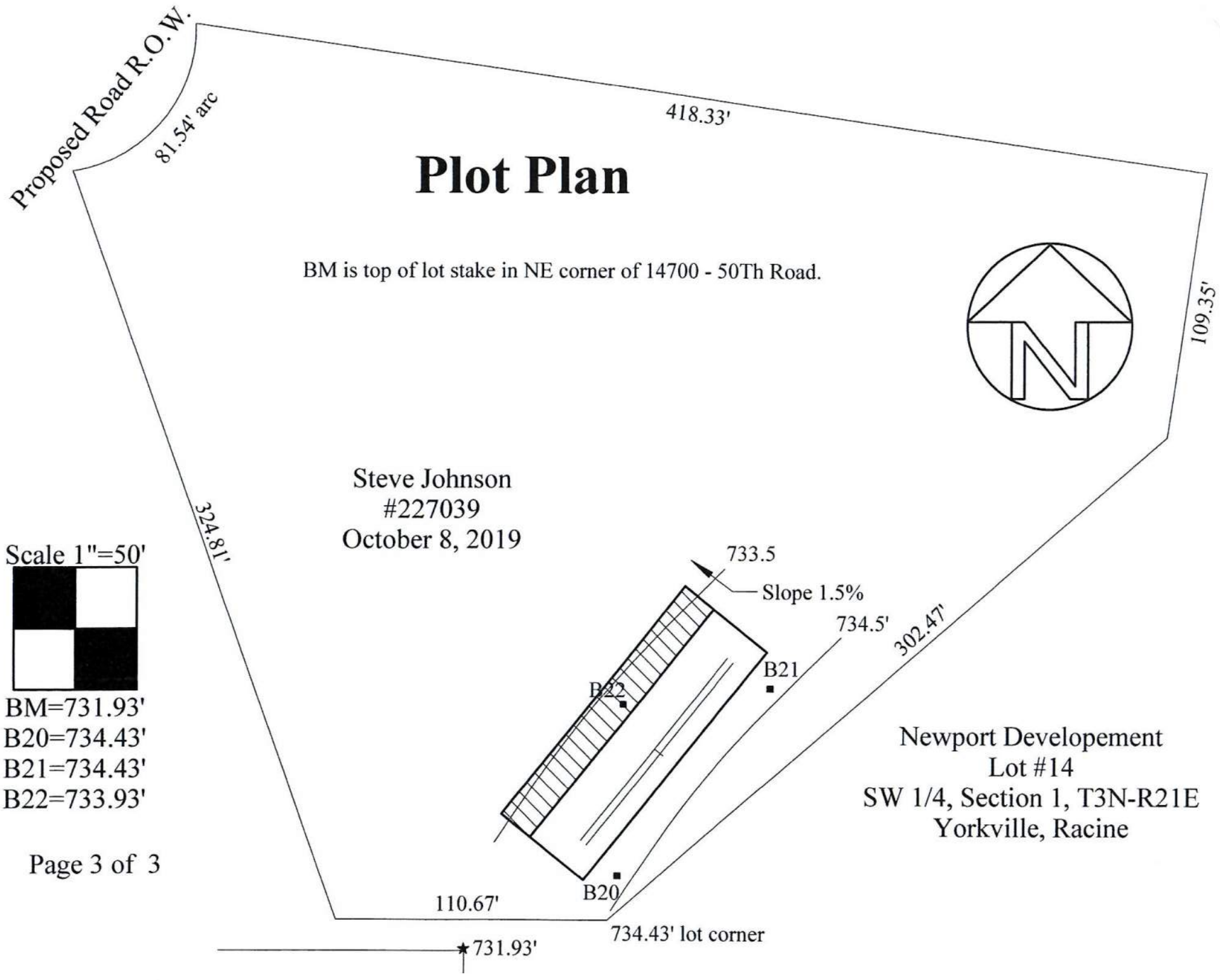
Plot Plan


171.17'
84.21'
256.87'
722.5'
723.5'
BM is (sea level) NE corner of lot 11
B15
B13
BM
Newport Developement
Lot #12
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine
B14
Slope 2.5%
321.52'
427.08'
Steve Johnson
#227039
October 8, 2019
Scale 1"=30'
BM=721.23'
B13=723.13'
B14=723.13'
B15=722.48'
Proposed Road R.O.W.
81.54' arc

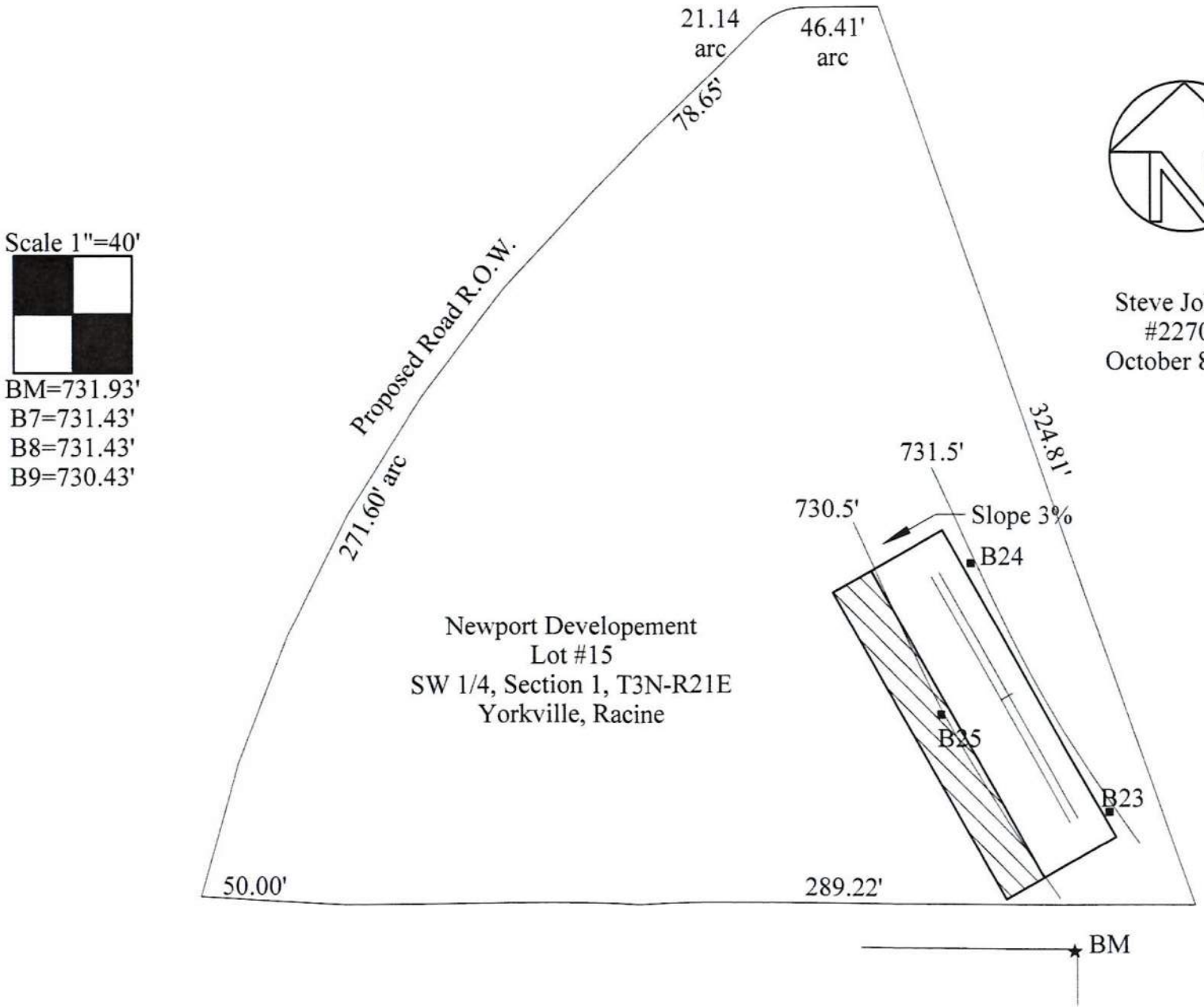
Plot Plan


BM is (sea level) NW corner of lot 13
B17
193.55'
B19
Slope 2%
729.5'
B18
730.5'
427.08'
171.17'
208.04'
418.33'
Proposed Road R.O.W.
Scale 1"=50'
BM=728.86'
B17=730.16'
B18=730.16'
B19=729.56'
Steve Johnson
#227039
October 8, 2019
Newport Developement
Lot #13
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine

Plot Plan


Proposed Road R.O.W.
81.54' arc
418.33'
109.35'
BM is top of lot stake in NE corner of 14700 - 50Th Road.
N
Steve Johnson
#227039
October 8, 2019
324.81'
733.5
Slope 1.5%
734.5'
302.47'
B21
B22
B20
110.67'
734.43' lot corner
731.93'
Scale 1"=50'
BM=731.93'
B20=734.43'
B21=734.43'
B22=733.93'
Newport Developement
Lot #14
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine

Plot Plan



Scale 1"=40'

BM=731.93'
B7=731.43'
B8=731.43'
B9=730.43'

Newport Developement
Lot #15
SW 1/4, Section 1, T3N-R21E
Yorkville, Racine

Steve Johnson
#227039
October 8, 2019