



AGENDA

Rogers Planning Commission

January 6, 2025 - 7:00 PM

1. CALL TO ORDER AND PLEDGE OF ALLEGIANCE

2. APPROVE AGENDA

Council members may add items to the agenda for discussion purposes or staff direction only. The Council will not normally take official action on items added to the agenda.

3. CONSENT AGENDA

These items are considered to be routine and will be enacted by one motion. There will be no separate discussion of these items unless a Councilmember so requests, in which event the item will be removed from the Consent Agenda and placed elsewhere on the agenda.

4. PUBLIC HEARINGS

4.1 Consider Application by Summergate Development for Preliminary Plat of Northview Preserve - 75 lot Single-Family Development

5. NEW BUSINESS

6. OTHER BUSINESS

6.1 Conduct Planning Commissioner Interviews for Vacant Seats

6.2 Annual Appointment of Chair and Vice Chair

7. ADJOURN



STAFF REPORT

ROGERS PLANNING COMMISSION

Meeting Date: January 6, 2025

Agenda Item: 4.1

Subject: Consider Application by Summergate Development for Preliminary Plat of Northview Preserve - 75 lot Single-Family Development

Prepared By: Alec Henderson, City Planner

Recommended Council Action

Overview / Background / Analysis

Summergate Development has submitted a Preliminary Plat application, requesting City review and approval for proposed residential subdivision on the south side of Territorial Road, west of Lennar's Skye Meadows subdivision on the Knapp family property with PID 27-120-23-22-0004. The proposed development would have road access directly across from the Big Woods development as well as Wood Lane to the south. The development site will be approximately 31 acres.

The plan proposes a by-right R2, Single Family development consisting of 75 single family lots, public infrastructure to be constructed by the developer, and stormwater management improvements. The proposed development is consistent with the current R2 zoning and proposes no deviations to lot sizes, nor setbacks. Staff recommends approval of the proposed preliminary plat with conditions.

A public hearing was published in the paper and mailed to nearby properties.

Primary Issues to Consider

- Land Use and Zoning Compliance
- Site Development Plans

Analysis of Primary Issues

Land Use and Zoning

The entire development area is guided as **Low Density Residential** and **Single-Family Residential (R2)**. Land guided as **Low Density Residential** has a net density range of 2.0 to 5.0 units per net acre.

The proposed unit count of 75 units would create a development density of between 2.47 u/ac. The proposed density would be in line with the guided and zoned use.

Single-family homes are the only permitted residential dwelling types by **R2** zoning. The proposed development consists of single family homes which are on average 11,266

square feet in size. Additionally the standards lot width in the development is 70 ft wide at setback, exceeding the 65 ft minimum of the R2 district. The subdivision also adheres to the front (25 ft), rear (20 ft) and side setback (10 ft) requirements.

The project also aligns with the comprehensive plan. The subdivision is consistent with the Low-Density Residential land use and addresses demand for single-family homes in the city, conserves wetlands and provides wetland buffers, and includes stormwater management facilities. Additionally, the development proposes to internal sidewalks and should include a crossing into the Big Woods development to connect to adjacent neighborhoods across Territorial Road (subject to County review).

Northview Preserve is compliant with the existing zoning, and existing land use plan/comprehensive plan.

Site Development Plans

The proposed development plans' approvals are contingent on meeting engineering standards in the City of Rogers, access permitting by Hennepin County, and stormwater management review by Elm Creek Watershed Management Commission. These are typical of residential subdivision approvals at this stage as the Preliminary Plat plans are preliminary drawings of the development. Final Construction Plans are submitted with Final Plat applications and are subject to further review by the City Engineer and must be consistent with the Preliminary Plans. At this stage there are no major issues with zoning or subdivision compliance that would prevent conditional approval of the Preliminary Plat.

Landscaping and Tree Preservation

Tree preservation plans and landscaping plans have been submitted. The proposed tree removals are consistent with City Code and minimize removals based on required improvements. The proposed landscape plan also conforms to code and proposes a variety of overstory and understory trees of adequate size or height. Additionally, wetland buffers and perimeter landscaping meet buffer and screening standards. Staff would encourage the Developer to explore filling in gaps in the existing tree line along the south boundary of the site should grading and stormwater management facility access allow.

Access and Transportation

The proposed main entrance is at Territorial Road, under County Jurisdiction. The access point is directly across from the Big Woods entrance at Territorial Road. The County Road access will be subject to review, approval, and permitting by Hennepin County. A safe pedestrian crossing to Big Woods should be considered and may be required by the County. The plan provides internal circulation with public roads and provides three road stubs: two stubs for property to the north, and a road stub for properties to the west. The upland in the property to the east is provided a route to redevelopment with the inclusion of utility access, and private road access.

One note is that the plans currently show access to Wood Lane. Wood Lane is an urban section of road way within Sky Meadows and then shifts back to gravel through this section to Tucker Road. The developer is not showing upgrading Wood Lane at this time due to the lack of frontage along Wood Lane. Additional Wood Lane upgrades may be a combination of other properties developing and City projects.

Utilities

The developer proposes to construct sewer and water utilities throughout the development and to the stubs of developable property to the north, west, and east. Utilities stubs to the west are sized for development of the large green fields along Tucker Road. Engineering is recommending a couple additional extensions to provide water looping (along the possible private drive to the townhomes' private drive to the east, and to Wood Lane to facilitate looping for future Wood Lane improvements). Construction costs for offsite or trunk improvements are eligible for credit against development fees.

Grading and Stormwater

Plans have been submitted to the Elm Creek Watershed Management Commission and will be subject to review and approval by ECWMC. Some minor wetland fill is proposed in the southwest part of the site. Wetlands along the east and northeast parts of the site are proposed and are provided buffers of sufficient width to meet code requirements.

Fire review

No outstanding comments currently remain for fire department review. Updated plans will still require review and approval by the Fire Marshall.

Revised Civil Plans shall be consistent with Departments' Review.

Staff Recommendation

This is a public hearing.

Staff Recommends approval of the Northview Preserve Preliminary Plat with the following conditions:

1. The Developer shall comply with the plat opinion and complete revisions to the Plat as may be required by the City Attorney prior to the recording of the future final plat.
2. The subdivision will be subject to the review, comments, and intersection permitting by Hennepin County. The developers shall coordinate with the county regarding safe pedestrian crossing across Territorial Road.
3. The Developer shall adequately address comments from the City Engineer and make plans changes as deemed necessary by the City Engineer and Public Works department.
4. The Developer shall satisfy comments from the Fire Chief and/or Fire Marshal.
5. The Stormwater and Grading Plans shall be subject to review and approval by the Elm Creek Watershed Commission and City Engineer.
6. The Developer and City of Rogers shall execute a Subdivision Agreement for the development, identifying the terms and conditions of the development and fees, escrows, and financial security obligations required of the Developer at time of Final Plat.
7. A stormwater maintenance agreement may be required by the Public Works Department and/or Elm Creek Watershed Commission to determine the disposition and maintenance of the stormwater ponds.

Financial Impact: NA

Source Fund: NA

Budgeted? N/A

Supporting Documentation

- A. Location Map
- B. Northview Preserve Narrative
- C. Northview Preserve Preliminary Civil Plans
- D. Northview Preserve Storm Water Report
- E. DRAFT Resolution No. 2025-XX Preliminary_NORTHVIEW PRESERVE



Hennepin County Property Map

Date: 1/3/2025



PARCEL ID: 2712023220004

OWNER NAME: Jerry & Linda Knapp

PARCEL ADDRESS: 92 Address Unassigned,Rogers MN 00000

PARCEL AREA: 30.75 acres, 1,339,400 sq ft

A-T-B: Abstract

SALE PRICE:

SALE DATE:

SALE CODE:

ASSESSED 2023, PAYABLE 2024

PROPERTY TYPE: Farm

HOMESTEAD: Non-Homestead

MARKET VALUE: \$262,800

TAX TOTAL: \$2,377.54

ASSESSED 2024, PAYABLE 2025

PROPERTY TYPE: Farm

HOMESTEAD: Non-Homestead

MARKET VALUE: \$298,700

Comments:

This data (i) is furnished 'AS IS' with no representation as to completeness or accuracy; (ii) is furnished with no warranty of any kind; and (iii) is not suitable for legal, engineering or surveying purposes. Hennepin County shall not be liable for any damage, injury or loss resulting from this data.

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COUNTY 2025



KNAPP PROPERTY – NORTHVIEW PRESERVE

Summertime Development is proposing the development of Northview Preserve, to consist of 75 single family lots located on a 31.3-acre site in the 22800 block of Territorial Road. The preliminary plat is designed to meet underlying R-2 District standards and will be accessed to the north from Territorial Road and to the south from Wood Lane. The plat accommodates future road connections to the north and west, along with an easement to provide access to developable property between proposed Northview Preserve and Skye Meadows to the east. The anticipated construction schedule includes a single phase with grading to commence in Spring 2025, with completion by the end of the year. No specific homebuilder has been chosen for the project at this time.

Summertime Development LLC is currently developing properties in Cottage Grove, Lakeville, Shakopee, Victoria, and Farmington and is looking forward to working with staff, the Planning Commission, and City Council to bring this new single-family development into the City of Rogers.

PRELIMINARY PLANS

FOR

PRELIMINARY PLAT, GRADING, STREETS,
UTILITIES, TREE PRESERVATION AND
LANDSCAPE

FOR

NORTHVIEW PRESERVE

ROGERS, MN

PREPARED FOR:

SUMMERGATE COMPANIES LLC

17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044
CONTACT: BRYAN TUCKER
PHONE: 612-490-0982
EMAIL: BRYANT@SUMMER-GATE.COM

PREPARED BY:

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300

Fax (952) 937-5822 Minnetonka, MN 55343

Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

PROJECT NUMBER: 0033874.00

CONTACT: THOMAS D. DESUTTER

SHEET INDEX

Sheet List Table	
Sheet Number	Sheet Title
01	Cover
02	Existing Conditions
03	Preliminary Plat
04	Overall Preliminary Grading Drainage & Erosion Control
05	Preliminary Grading Drainage & Erosion Control
06	Preliminary Grading Drainage & Erosion Control
07	Preliminary Grading Drainage & Erosion Control
08	Preliminary Street & Utility Plan
09	Preliminary Street & Utility Plan
10	Preliminary Street & Utility Plan
11	Street Profiles
12	Details
13	Details
14	Details
15	Details
16	Details
17	Details
18	Overall Tree Preservation Plan
19	Tree Preservation Plan
20	Tree Preservation Plan
21	Tree Preservation Plan
22	Tree Preservation Data
23	Overall Preliminary Landscape Plan
24	Preliminary Landscape Plan
25	Preliminary Landscape Plan
26	Preliminary Landscape Plan



Vicinity Map
(NOT TO SCALE)

NO.	DATE	REVISION	SHEETS
-	-	-	-
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PRELIMINARY PLANS

FOR

PRELIMINARY PLAT, GRADING, STREETS,
UTILITIES, TREE PRESERVATION AND
LANDSCAPE

FOR

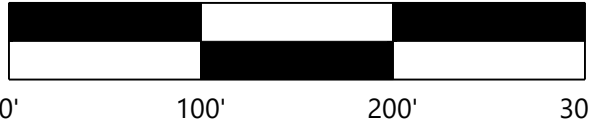
NORTHVIEW PRESERVE
ROGERS, MN

The East 385.80 feet of the Southwest Quarter of the Southwest Quarter of Section 22, Township 120, Range 23, Hennepin County, Minnesota lying southerly of the centerline of County State Aid Highway No. 116 and the Northwest Quarter of the Northwest Quarter of Section 27, Township 120, Range 23, Hennepin County, Minnesota except the South 928.10 feet of the East 207.50 feet of said Northwest Quarter of the Northwest Quarter and except the North 247.50 feet of said Northwest Quarter of the Northwest Quarter lying West of the East 385.80 feet of said Northwest Quarter of the Northwest Quarter.

Abstract Property

WETLAND DELINEATION FOR THIS PROJECT WAS CONDUCTED BY MATTHEW VOLLBRECHT OF WESTWOOD PROFESSIONAL SERVICES ON SEPTEMBER 24, 2021. THE NOTICE OF DELINEATION WAS ISSUED ON DECEMBER 22, 2021.

	CATCH BASIN		BOUNDARY LINE
	FLARED END SECTION		RIGHT-OF-WAY LINE
	ELECTRIC BOX		LOT LINE
	ELECTRIC METER		EASEMENT LINE
	STREET LIGHT		SECTION LINE
	GUY WIRE		TREE LINE
	POWER POLE		GAS LINE
	TELEPHONE BOX		POWER OVERHEAD
	FIBER OPTIC PEDESTAL		POWER UNDERGROUND
	NATURAL GAS VALVE		STORM SEWER
	STEEL/WOOD POST		TELEPHONE UNDERGROUND
	SIGN		FIBER OPTIC
			FENCE LINE
			CURB & GUTTER
			CONCRETE SURFACE
			BITUMINOUS SURFACE
			GRAVEL SURFACE
			WETLAND
			FOUND MONUMENT (SEE LABEL)
			CAST IRON MONUMENT (SEE LABEL)


$$1'' = 100$$


NOT FOR CONSTRUCTION

SHEET NUMBER:

02 OF 28

DATE: 11/15/24

EXISTING CONDITIONS

PROJECT NUMBER: 0033874.00

© 2024 Westwood Professional Services, Inc.

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NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	100'
VERTICAL SCALE:	20' OR 10'

INITIAL ISSUE: 11/15/24
REVISIONS:

△ . .

△ . .

△ . .

△ . .

△ . .

PREPARED FOR:

SUMMERGATE COMPANIES LLC

17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION AND THAT I AM A
DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE
STATE OF MINNESOTA

MATT WELINSKI
DATE: 11/15/24 LICENSE NO. 53596

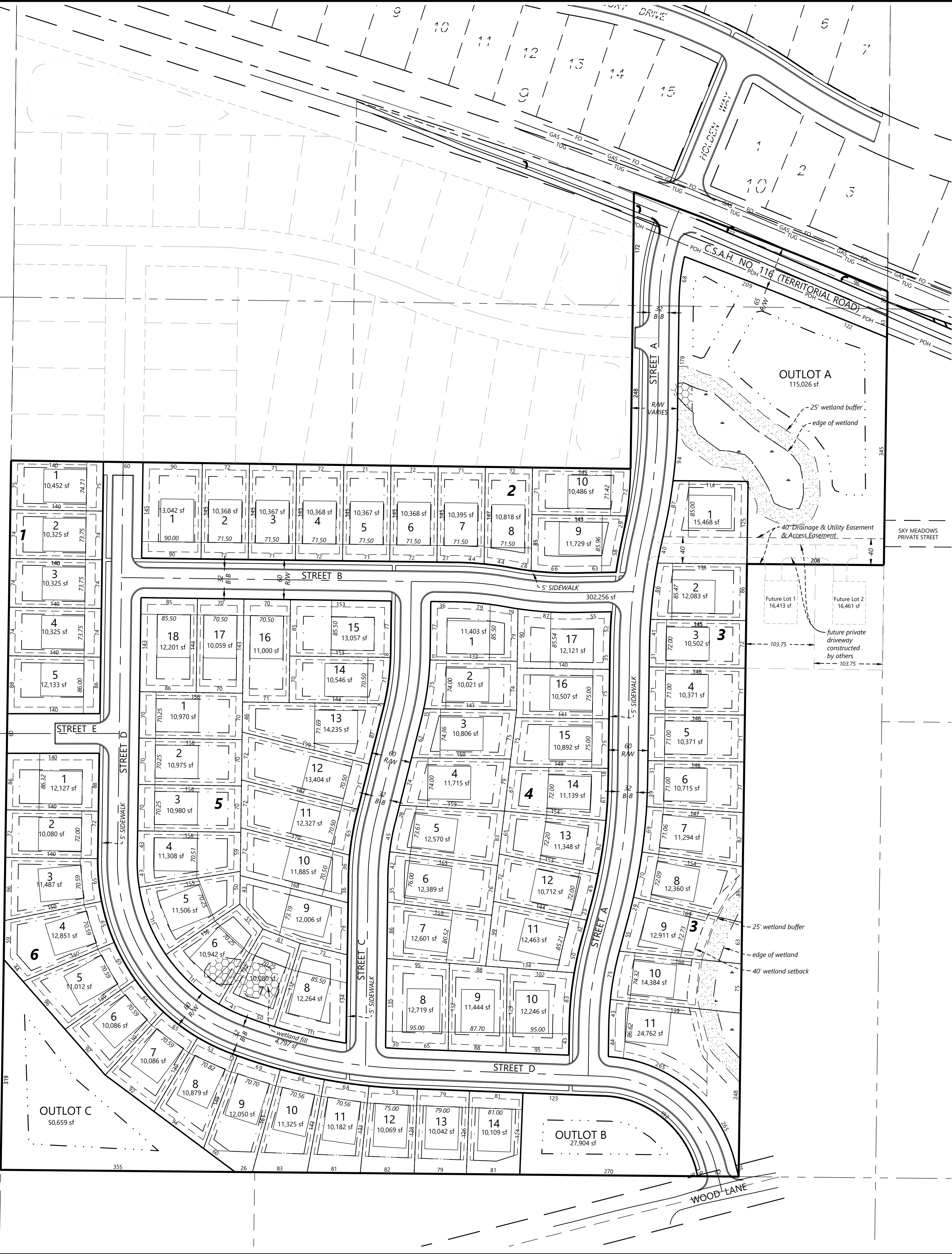
NORTHVIEW PRESERVE

ROGERS, MN

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 **westwoodps.com**

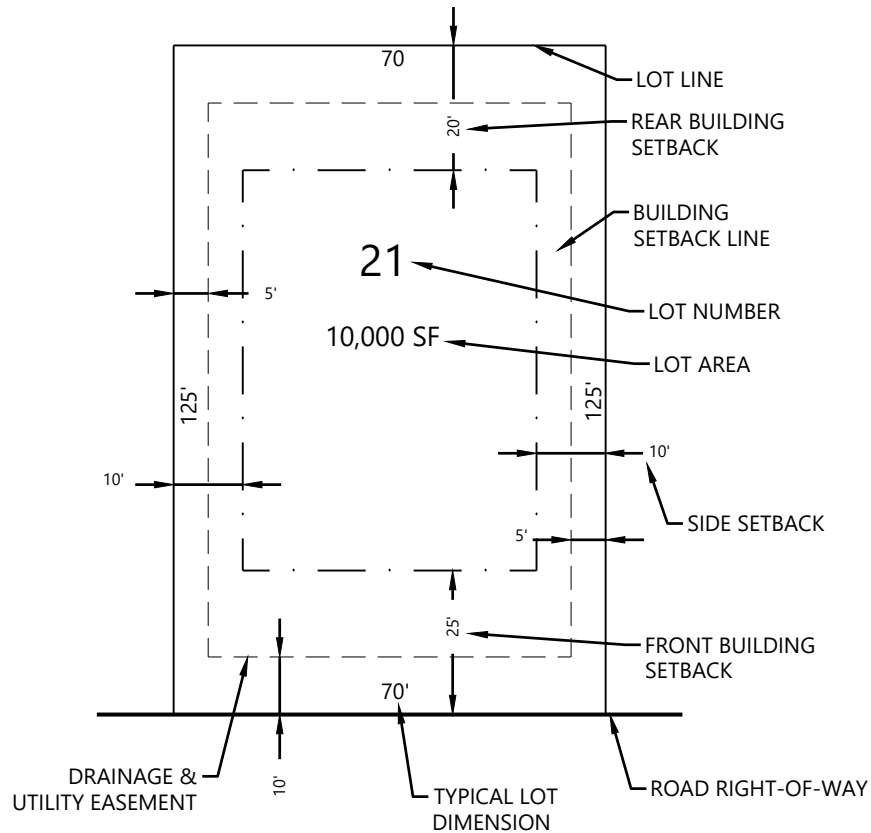
Westwood Professional Services, Inc.



SITE DEVELOPMENT DATA

EXISTING ZONING:	R-2
2040 COMPREHENSIVE PLAN:	LOW RES.
PROPOSED ZONING:	R-2
GROSS SITE AREA:	31.27 AC
MAJOR R/W (TERRITORIAL ROAD):	0.62 AC
EXISTING WETLANDS TO REMAIN:	0.41 AC
NET SITE AREA:	30.24 AC
DEVELOPMENT SUMMARY	
70' SINGLE FAMILY HOMES:	75 LOTS
PROJECT DENSITY:	
GROSS: (75 un / 31.27 gross acres):	±2.40 UN/AC
NET: (75 un / 30.24 net acres):	±2.48 UN/AC

TYPICAL 70' SINGLE FAMILY



SITE LEGEND

EXISTING	PROPOSED	
		PROPERTY LINE
		LOT LINE
		SETBACK LINE
		EASEMENT LINE
		CURB AND GUTTER
		TIP-OUT CURB AND GUTTER
		POND NORMAL WATER LEVEL
		RETAINING WALL

LOT STANDARDS SF (R-2 DISTRICT)

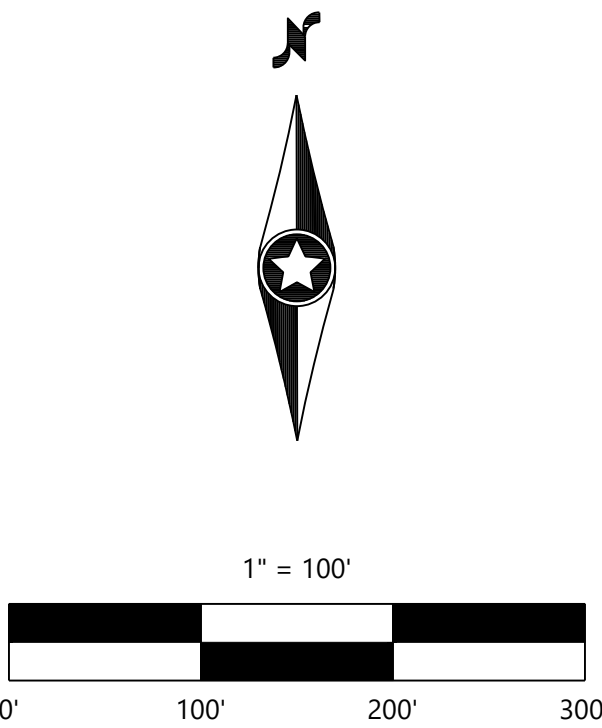
STANDARD	
MINIMUM LOT AREA	10,010 SF (10,000 sf required)
AVERAGE LOT AREA	11,266 SF
MINIMUM LOT WIDTH	70' @ FRT SBK (65' @ FRT SBK MIN. REQUIRED)
MINIMUM LOT DEPTH	124'
SETBACKS	
FRONT (TO R/W)	25'
SIDE INTERIOR LOT	10' / 10'; 20' TOTAL
SIDE CORNER LOT	25'
REAR	20'
WETLAND	40'

OUTLOT TABLE

OUTLOT	USE	OWNERSHIP	GROSS AREA
A	PONDING / WETLAND	CITY	2.64 AC
B	PONDING	CITY	0.64 AC
C	PONDING	CITY	1.16 AC

DEVELOPMENT NOTES

- ALL LOT DIMENSIONS ARE ROUNDED TO THE NEAREST FOOT.
- ALL AREAS ARE ROUNDED TO THE NEAREST SQUARE FOOT.
- STREET NAMES ARE SUBJECT TO APPROVAL BY THE CITY.
- DRAINAGE AND UTILITY EASEMENTS SHALL BE PROVIDED AS REQUIRED.
- STREET WIDTHS ARE SHOWN FROM BACK OF CURB TO BACK OF CURB.



NOT FOR CONSTRUCTION

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	100'
VERTICAL SCALE:	20' OR 10'

INITIAL ISSUE:	11/15/24
REVISIONS:	

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION AND THAT I AM A
DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS
OF THE STATE OF MINNESOTA
CORY L. MEYER
DATE: 11/15/24 LICENSE NO. 26971

NORTHVIEW PRESERVE
ROGERS, MN

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

PRELIMINARY PLAT

PROJECT NUMBER: 003874.00

SHEET NUMBER:

03 OF 28

DATE: 11/15/24

1. ALL CONTOURS AND SPOT ELEVATIONS ARE SHOWN TO FINISHED SURFACE/GUTTER GRADES UNLESS OTHERWISE NOTED.
2. REFER TO THE SITE PLAN/RECORD PLAT FOR MOST CURRENT HORIZONTAL SITE DIMENSIONS AND LAYOUT.
3. THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING UTILITIES AND TOPOGRAPHICAL FEATURES WITH THE OWNERS AND FIELD-VERIFY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
4. ALL CONSTRUCTION SHALL CONFORM TO LOCAL RULES.
5. POSITIVE DRAINAGE FROM THE SITE MUST BE PROVIDED AT ALL TIMES.

1. ALL SILT FENCE AND OTHER EROSION CONTROL FEATURES SHALL BE IN-PLACE PRIOR TO ANY EXCAVATION/CONSTRUCTION AND SHALL BE MAINTAINED UNTIL VIABLE TURF OR GROUND COVER HAS BEEN ESTABLISHED. EXISTING SILT FENCE ON-SITE SHALL BE MAINTAINED AND OR REMOVED AND SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONTRACT. IT IS OF EXTREME IMPORTANCE TO BE AWARE OF CURRENT FIELD CONDITIONS WITH RESPECT TO EROSION CONTROL. TEMPORARY PONDING, DIKES, HAY BALES, ETC., REQUIRED BY THE CITY SHALL BE INCIDENTAL TO THE GRADING CONTRACT.
2. ALL STREETS DISTURBED DURING WORKING HOURS MUST BE CLEANED AT THE END OF EACH WORKING DAY. A ROCK ENTRANCE TO THE SITE MUST BE PROVIDED ACCORDING TO DETAILS TO REDUCE TRACKING OF DIRT ONTO PUBLIC STREETS.
3. REDUNDANT PERIMETER SEDIMENT CONTROLS ARE NECESSARY WHEN SOIL DISTURBANCE IS WITHIN 50 FEET OF SURFACE WATERS. REDUNDANT SEDIMENT CONTROLS COULD INCLUDE:
 - 3.1. TWO ROWS OF SILT FENCE (SEPARATED BY 8 FEET); OR
 - 3.2. SILT FENCE AND A TOPSOIL BERM (STABILIZE BERM WITH MULCH); OR
 - 3.3. SILT FENCE AND FIBER LOGS; OR
 - 3.4. TOPSOIL BERM AND FIBER LOGS (STABILIZE BERM WITH MULCH).
4. REDUNDANT SEDIMENT CONTROLS MUST BE INSTALLED PRIOR TO DISTURBING WITHIN 50 FEET OF THE SURFACE WATER.



LOT TABULATION	
LOT STYLE	QUANTITY
SE/SOG	6
LO	13
WO	2
R	54



NOT FOR CONSTRUCTION

NORTHVIEW PRESERVE

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	120'
VERTICAL SCALE:	24' OR 12'

△ . .

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17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

THOMAS D. DESUTTER
DATE: 11/15/24 LICENSE NO. 59640

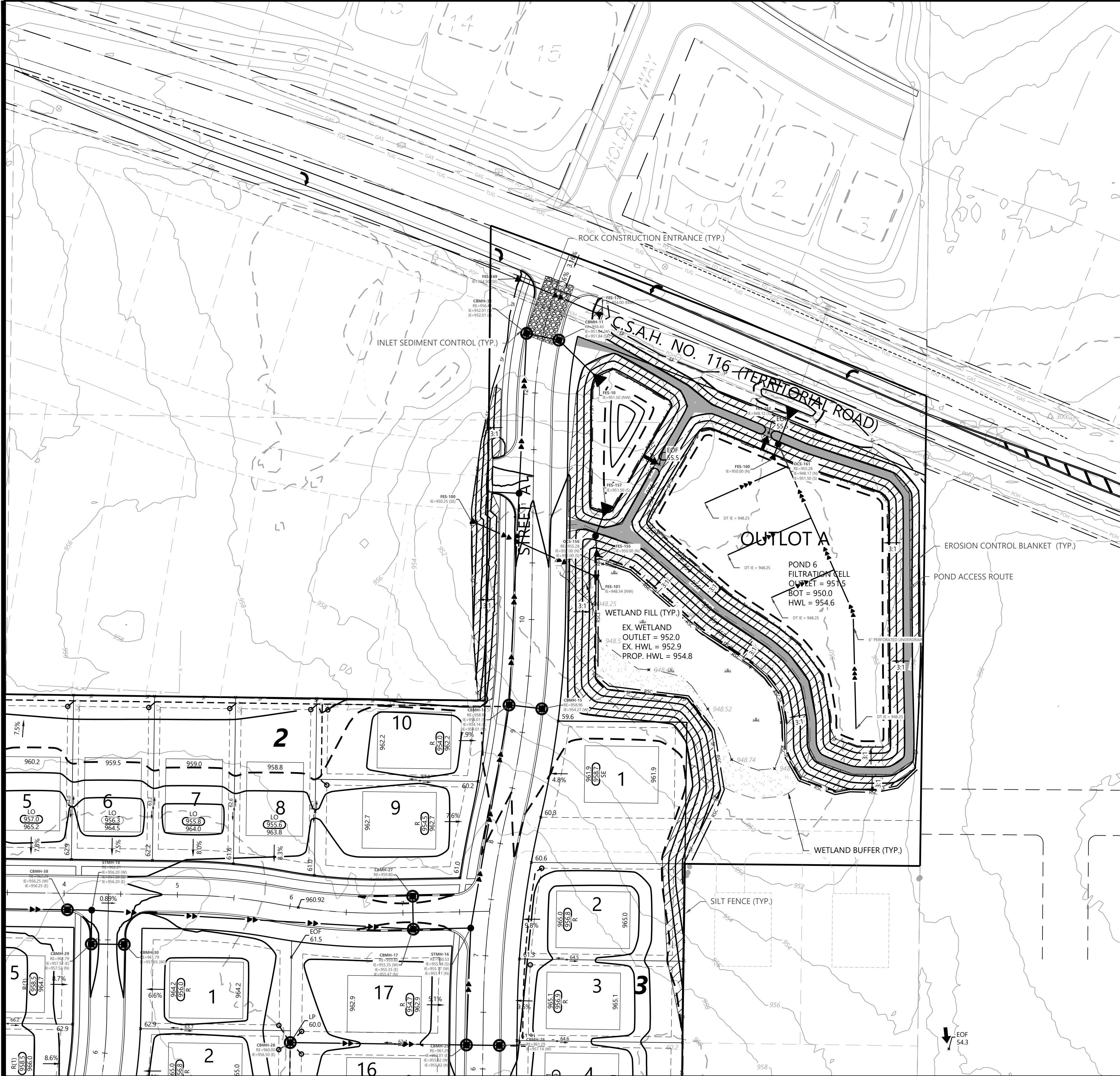
ROGERS, MN

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 **westwoodps.com**

Westwood Professional Services, Inc.

PROJECT NUMBER: 0033874.00

DATE: 11/15/24



GRADING & DRAINAGE NOTES

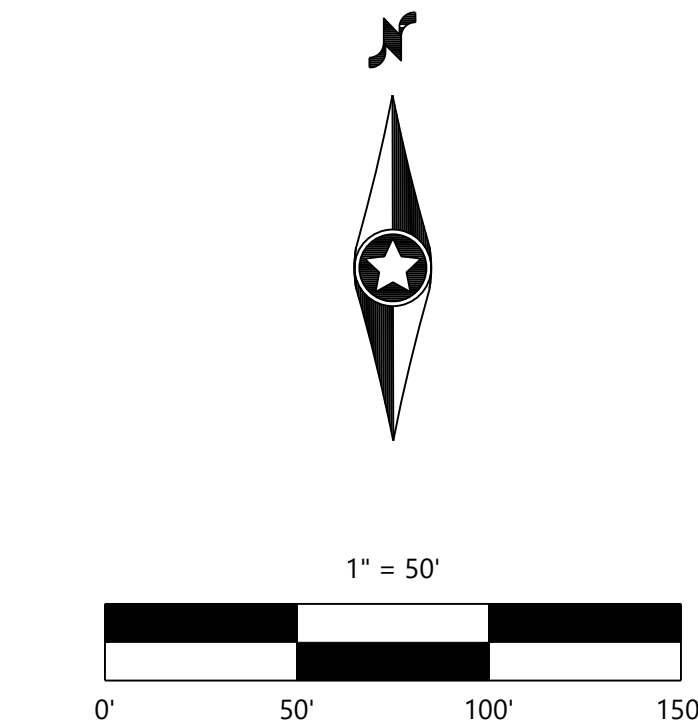
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EROSION CONTROL NOTES

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- REDUNDANT SEDIMENT CONTROLS MUST BE INSTALLED PRIOR TO DISTURBING WITHIN 50 FEET OF THE SURFACE WATER.

GRADING & EROSION CONTROL LEGEND

EXISTING	PROPOSED	
		PROPERTY LINE
		SOIL BORING LOCATION
		INDEX CONTOUR
		INTERVAL CONTOUR
		SPOT ELEVATION
		HIGH/LOW POINT
		CL-CL ELEVATION
		FLOW DIRECTION
		TOP AND BOTTOM OF RETAINING WALL
		EMERGENCY OVERFLOW
		PROPOSED STREET PROFILE GRADE
		STORM SEWER
		TREE LINE
		TREE PROTECTION FENCE
		RETAINING WALL (MODULAR BLOCK)
		GRADING LIMITS
		SILT FENCE
		SILT FENCE-POST GRADING
		HEAVY DUTY SILT FENCE
		REDUNDANT SEDIMENT CONTROL
		INLET PROTECTION
		EROSION CONTROL CHECKS/BIOROLLS
		ROCK CONSTRUCTION ENTRANCE
		EROSION CONTROL BLANKET
		TURF REINFORCEMENT MAT
		POND NORMAL WATER LEVEL
		WETLAND LINE
		WETLAND FILL
		WETLAND BUFFER
		POND ACCESS MAINTENANCE BENCH
		WETLAND BUFFER LIMITS
		WETLAND BUFFER MONUMENT
		DO NOT DISTURB
		POND ACCESS ROUTE



DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
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DATE: 11/15/24 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

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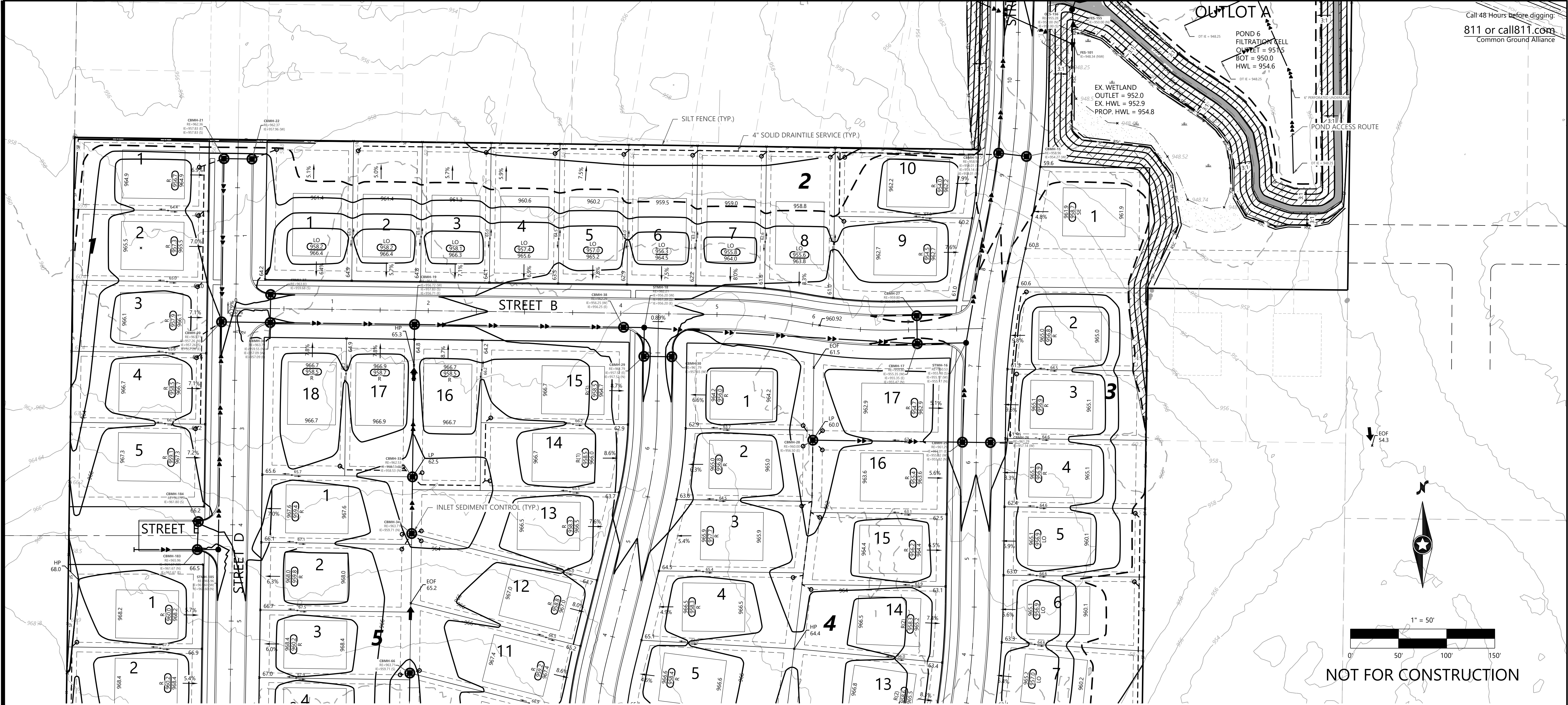
PRELIMINARY GRADING
DRAINAGE & EROSION
CONTROL

PROJECT NUMBER: 0033874.00

SHEET NUMBER:

05 OF 28

DATE: 11/15/24



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

GRADING & EROSION CONTROL LEGEND

EXISTING	PROPOSED	EXISTING	PROPOSED

STORM SEWER
TREE LINE
TREE PROTECTION FENCE
RETAINING WALL (MODULAR
BLOCK)
GRADING LIMITS
SILT FENCE
SILT FENCE-POST GRADING
HEAVY DUTY SILT FENCE
REDUNDANT SEDIMENT
CONTROL
INLET PROTECTION
EROSION CONTROL
CHECKS/BIOROLLS
ROCK CONSTRUCTION
ENTRANCE
EROSION CONTROL BLANKET
TURF REINFORCEMENT MAT

EXISTING	PROPOSED

POND NORMAL WATER LEVEL
WETLAND LINE
WETLAND FILL
WETLAND BUFFER
POND ACCESS MAINTENANCE
BENCH
WETLAND BUFFER LIMITS
WETLAND BUFFER MONUMENT
DO NOT DISTURB
POND ACCESS ROUTE

GRADING & DRAINAGE NOTES

- ALL CONTOURS AND SPOT ELEVATIONS ARE SHOWN TO FINISHED SURFACE/GUTTER GRADES UNLESS OTHERWISE NOTED.
- REFER TO THE SITE PLAN/RECORD PLAT FOR MOST CURRENT HORIZONTAL SITE DIMENSIONS AND LAYOUT.
- THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF EXISTING UTILITIES AND TOPOGRAPHICAL FEATURES WITH THE OWNERS AND FIELD-VERIFY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
- ALL CONSTRUCTION SHALL CONFORM TO LOCAL RULES.
- POSITIVE DRAINAGE FROM THE SITE MUST BE PROVIDED AT ALL TIMES.

EROSION CONTROL NOTES

- ALL SILT FENCE AND OTHER EROSION CONTROL FEATURES SHALL BE IN-PLACE PRIOR TO ANY EXCAVATION/CONSTRUCTION AND SHALL BE MAINTAINED UNTIL VIABLE TURF OR GROUND COVER HAS BEEN ESTABLISHED. EXISTING SILT FENCE ON-SITE SHALL BE MAINTAINED AND OR REMOVED AND SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONTRACT. IT IS OF EXTREME IMPORTANCE TO BE AWARE OF CURRENT FIELD CONDITIONS WITH RESPECT TO EROSION CONTROL. TEMPORARY PONDING, DIKES, HAY BALES, ETC., REQUIRED BY THE CITY SHALL BE INCIDENTAL TO THE GRADING CONTRACT.
- ALL STREETS DISTURBED DURING WORKING HOURS MUST BE CLEANED AT THE END OF EACH WORKING DAY. A ROCK ENTRANCE TO THE SITE MUST BE PROVIDED ACCORDING TO DETAILS TO REDUCE TRACKING OF DIRT ONTO PUBLIC STREETS.
- REDUNDANT PERIMETER SEDIMENT CONTROLS ARE NECESSARY WHEN SOIL DISTURBANCE IS WITHIN 50 FEET OF SURFACE WATERS. REDUNDANT SEDIMENT CONTROLS COULD INCLUDE:
 - TWO ROWS OF SILT FENCE (SEPARATED BY 8 FEET); OR
 - SILT FENCE AND A TOPSOIL BERM (STABILIZE BERM WITH MULCH); OR
 - SILT FENCE AND FIBER LOGS; OR
 - TOPSOIL BERM AND FIBER LOGS (STABILIZE BERM WITH MULCH).
- REDUNDANT SEDIMENT CONTROLS MUST BE INSTALLED PRIOR TO DISTURBING WITHIN 50 FEET OF THE SURFACE WATER.

DESIGNED: TOD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:

PREPARED FOR:

SUMMERGATE COMPANIES LLC

17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION AND THAT I AM A
DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS
OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 11/15/24 LICENSE NO. 59640

NORTHVIEW PRESERVE

ROGERS, MN

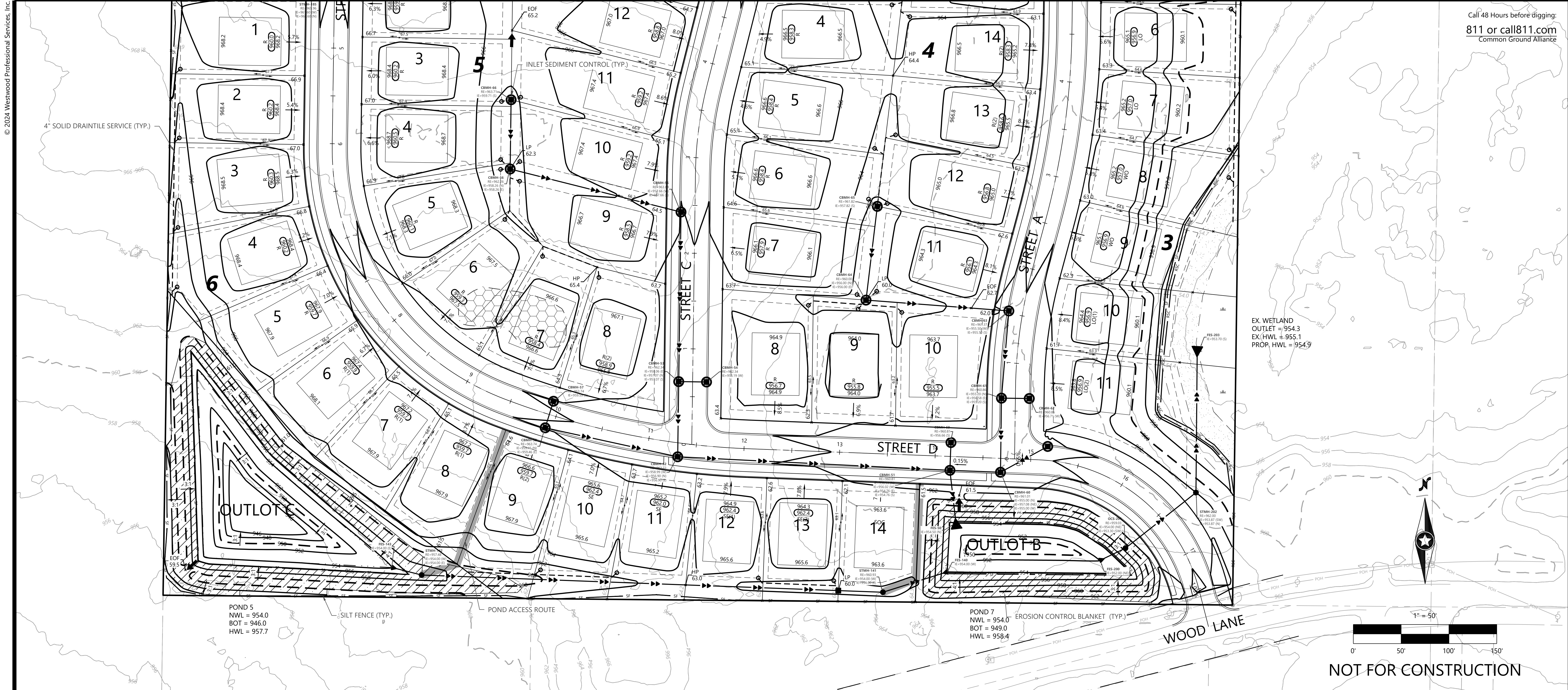
Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

PRELIMINARY GRADING
DRAINAGE & EROSION
CONTROL
PROJECT NUMBER: 003874.00

SHEET NUMBER:

06 OF 28
DATE: 11/15/24



GRADING & EROSION CONTROL LEGEND

EXISTING	PROPOSED	
		PROPERTY LINE
		SOIL BORING LOCATION
		INDEX CONTOUR
		INTERVAL CONTOUR
		SPOT ELEVATION
		SPOT ELEVATION
		HIGH/LOW POINT
		CL-CL ELEVATION
		FLOW DIRECTION
		TOP AND BOTTOM OF RETAINING WALL
		EMERGENCY OVERFLOW
		PROPOSED STREET PROFILE GRADE

EXISTING	PROPOSED	
		STORM SEWER
		TREE LINE
		TREE PROTECTION FENCE RETAINING WALL (MODULAR BLOCK)
		GRADING LIMITS
		SILT FENCE
		SILT FENCE-POST GRADING
		HEAVY DUTY SILT FENCE
		REDUNDANT SEDIMENT CONTROL
		INLET PROTECTION
		EROSION CONTROL CHECKS/BIOROLLS
		ROCK CONSTRUCTION ENTRANCE
		EROSION CONTROL BLANKET
		TURF REINFORCEMENT MAT

EXISTING	PROPOSED	
		POND NORMAL WATER LEVEL
		WETLAND LINE
		WETLAND FILL
		WETLAND BUFFER
		POND ACCESS MAINTENANCE BENCH
		WETLAND BUFFER LIMITS
		WETLAND BUFFER MONUMENT
		DO NOT DISTURB
		POND ACCESS ROUTE

GRADING & DRAINAGE NOTES

- ALL CONTOURS AND SPOT ELEVATIONS ARE SHOWN TO FINISHED SURFACE/GUTTER GRADES UNLESS OTHERWISE NOTED.
- REFER TO THE SITE PLAN/RECORD PLAT FOR MOST CURRENT HORIZONTAL SITE DIMENSIONS AND LAYOUT.
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- ALL CONSTRUCTION SHALL CONFORM TO LOCAL RULES.
- POSITIVE DRAINAGE FROM THE SITE MUST BE PROVIDED AT ALL TIMES.

EROSION CONTROL NOTES

- ALL SILT FENCE AND OTHER EROSION CONTROL FEATURES SHALL BE IN-PLACE PRIOR TO ANY EXCAVATION/CONSTRUCTION AND SHALL BE MAINTAINED UNTIL VIABLE TURF OR GROUND COVER HAS BEEN ESTABLISHED. EXISTING SILT FENCE ON-SITE SHALL BE MAINTAINED AND OR REMOVED AND SHALL BE CONSIDERED INCIDENTAL TO THE GRADING CONTRACT. IT IS OF EXTREME IMPORTANCE TO BE AWARE OF CURRENT FIELD CONDITIONS WITH RESPECT TO EROSION CONTROL. TEMPORARY PONDING, DIKES, HAY BALES, ETC., REQUIRED BY THE CITY SHALL BE INCIDENTAL TO THE GRADING CONTRACT.
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DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	1"=50'
VERTICAL SCALE:	

INITIAL ISSUE:	11/15/24
REVISIONS:	

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
THOMAS D. DESUTTER
DATE: 11/15/24 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

**PRELIMINARY GRADING
DRAINAGE & EROSION
CONTROL**
PROJECT NUMBER: 0033874.00

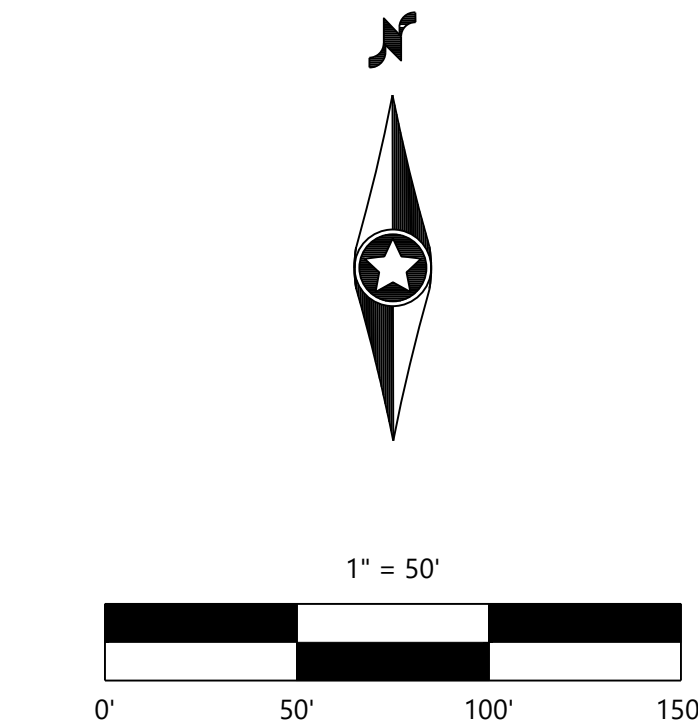
SHEET NUMBER:
07 OF **28**
DATE: 11/15/24

GENERAL UTILITY NOTES

- THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY THE OWNER OF ANY DIFFERENCES.
- UNLESS OTHERWISE NOTED, ALL MATERIALS, CONST. TECHNIQUES AND TESTING SHALL CONFORM TO THE 2023 ED. OF THE "STANDARD UTILITIES SPECIFICATIONS FOR WATER MAIN AND SERVICE LINE INSTALLATION AND SANITARY SEWER AND STORM SEWER INSTALLATION BY THE CITY ENGINEERING ASSOCIATION OF MINN." AND TO THE "STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION" MINN. DEPT. OF TRANS, 2020 EDITION AND SUPPLEMENTAL SPECIFICATIONS SEPTEMBER 2022. THE CONTRACTOR SHALL BE REQUIRED TO FOLLOW ALL PROCEDURES AS OUTLINED BY THE LOCAL AGENCY.
- THE CONTRACTOR SHALL RECEIVE THE NECESSARY PERMITS FOR ALL WORK OUTSIDE OF THE PROPERTY LIMITS.
- VERIFY EXISTING INVERT LOCATION & ELEVATION PRIOR TO BEGINNING CONSTRUCTION.
- THE CONTRACTOR SHALL CONTACT "GOPHER STATE ONE CALL" FOR FOR UTILITY LOCATIONS PRIOR TO UTILITY INSTALLATION.

UTILITY LEGEND

EXISTING	PROPOSED	
SAN	SANITARY SEWER	
STO	STORM SEWER	
DT	DRAIN TILE	
WAT	WATER MAIN	
WAT	HYDRANT	
		STREET LIGHT



NOT FOR CONSTRUCTION

DESIGNED: TOD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:
△
△
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PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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**PRELIMINARY STREET &
UTILITY PLAN**

PROJECT NUMBER: 0033874.00

SHEET NUMBER:

08 OF **28**

DATE: 11/15/24

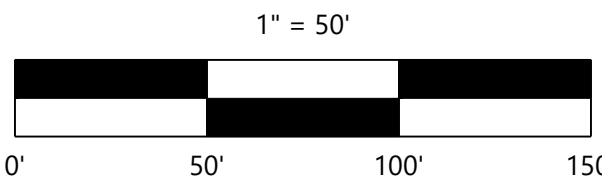


UTILITY LEGEND

EXISTING	PROPOSED	
		SANITARY SEWER
		STORM SEWER
		DRAIN TILE
		WATER MAIN
		HYDRANT
		STREET LIGHT

GENERAL UTILITY NOTES

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4. VERIFY EXISTING INVERT LOCATION & ELEVATION PRIOR TO BEGINNING CONSTRUCTION.
5. THE CONTRACTOR SHALL CONTACT "GOPHER STATE ONE CALL" FOR FOR UTILITY LOCATIONS PRIOR TO UTILITY INSTALLATION.



NOT FOR CONSTRUCTION

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:
△
△
△
△
△

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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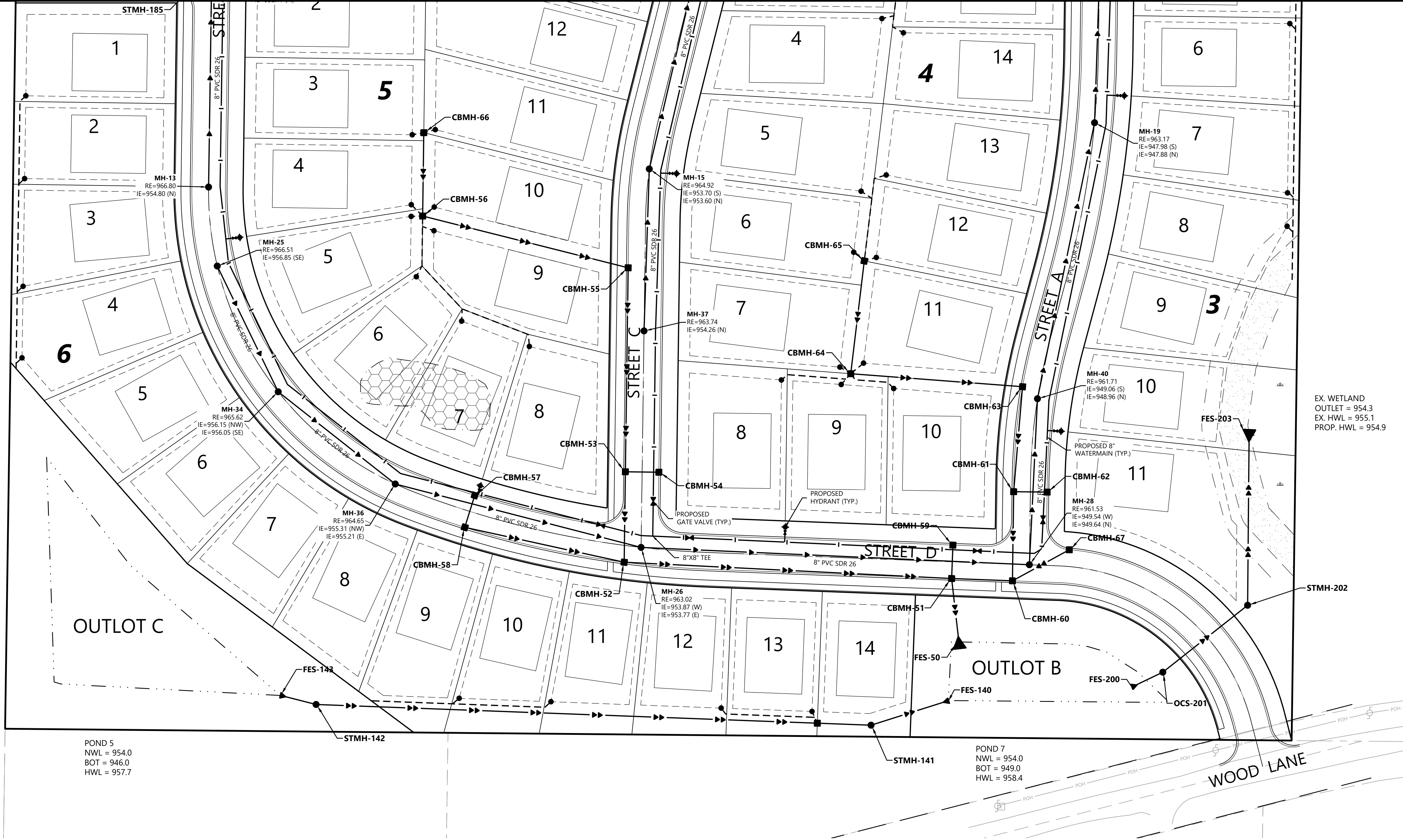
PRELIMINARY STREET &
UTILITY PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER:

09 OF 28

DATE: 11/15/24



EX. WETLAND
OUTLET = 954.3
EX. HWL = 955.1
PROP. HWL = 954.9

POND 5
NWL = 954.0
BOT = 946.0
HWL = 957.7

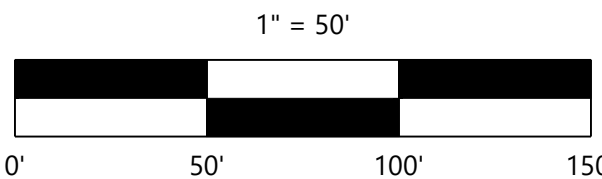
POND 7
NWL = 954.0
BOT = 949.0
HWL = 958.4

UTILITY LEGEND

EXISTING	PROPOSED	
		SANITARY SEWER
		STORM SEWER
		DRAIN TILE
		WATER MAIN
		HYDRANT
		STREET LIGHT

GENERAL UTILITY NOTES

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NOT FOR CONSTRUCTION

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	1"=50'
VERTICAL SCALE:	

INITIAL ISSUE:	11/15/24
REVISIONS:	

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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THOMAS D. DESUTTER
DATE: 11/15/24 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
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Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

PRELIMINARY STREET &
UTILITY PLAN

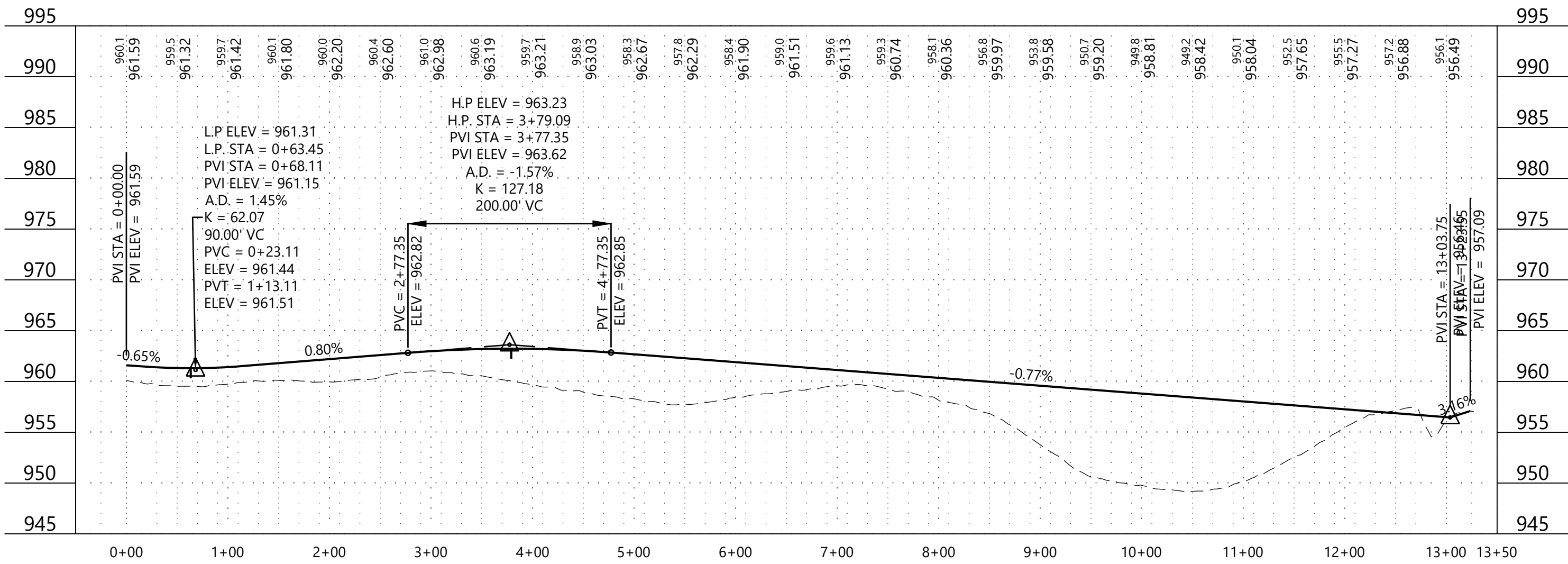
PROJECT NUMBER: 0033874.00

SHEET NUMBER:

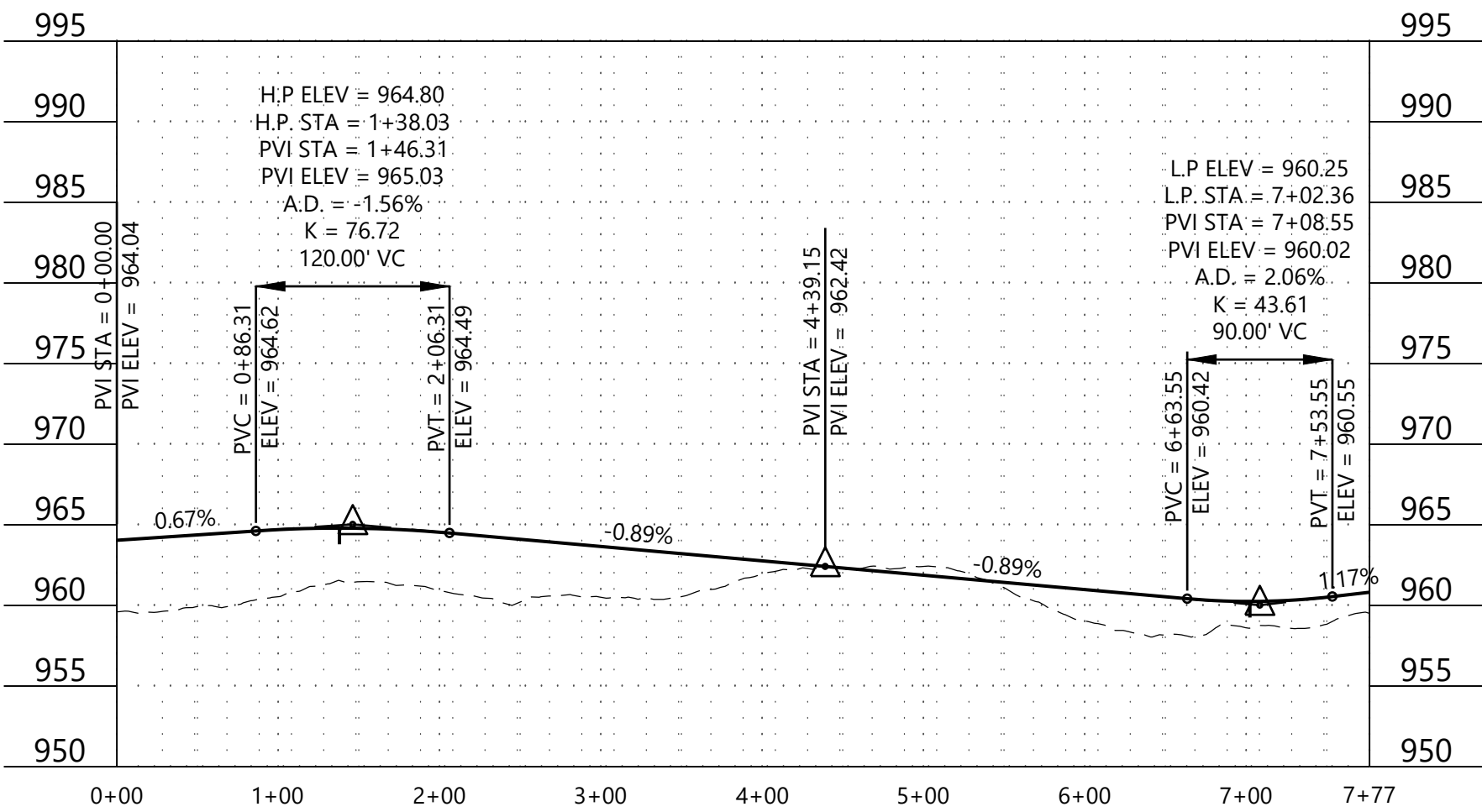
10 OF 28

DATE: 11/15/24

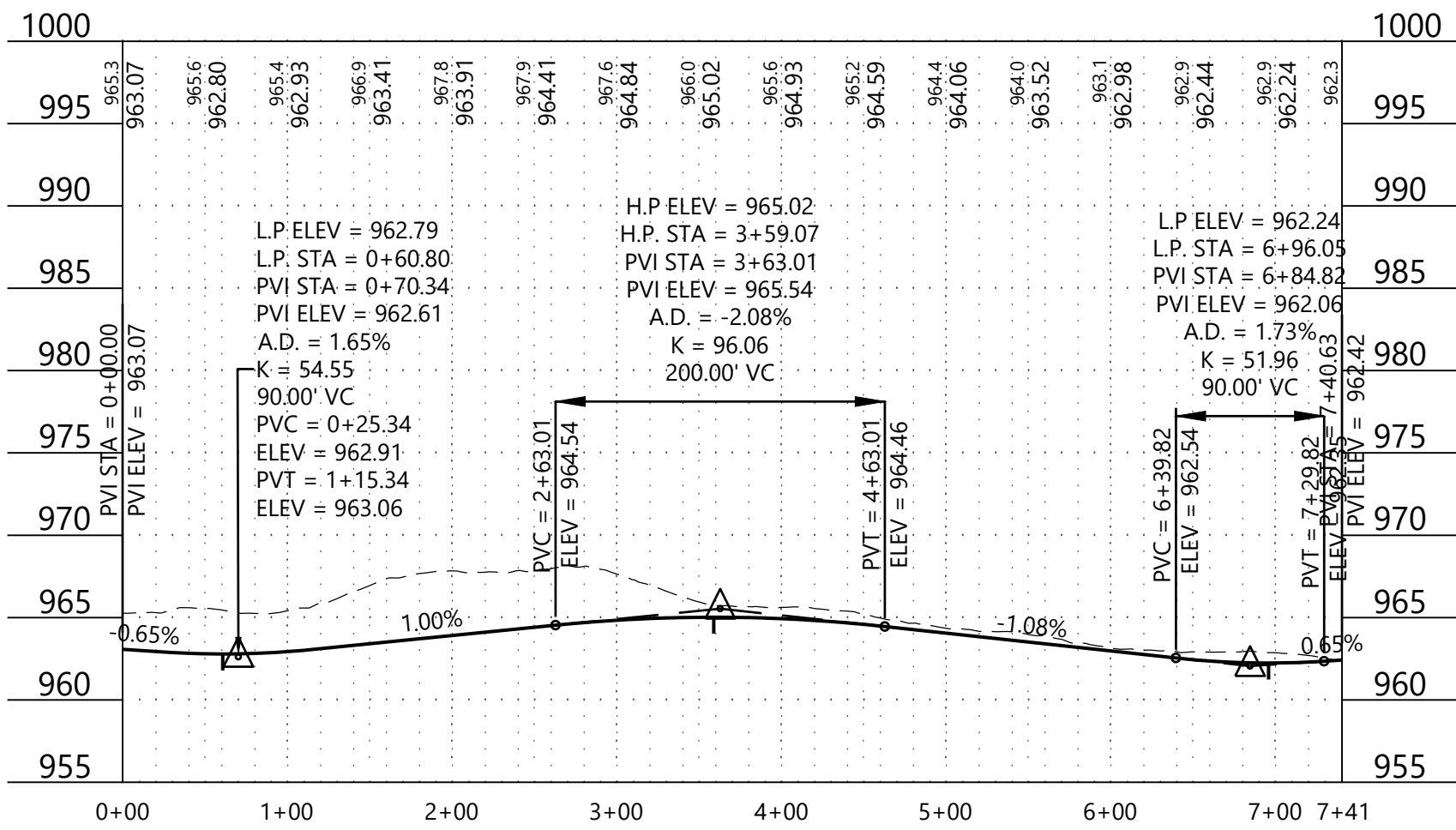
STREET A



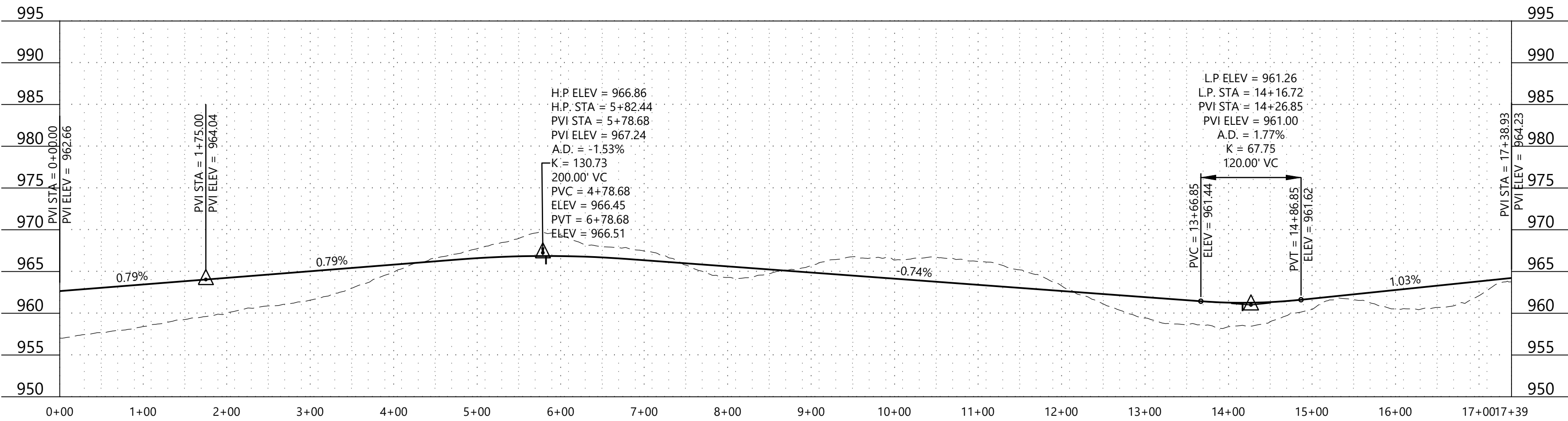
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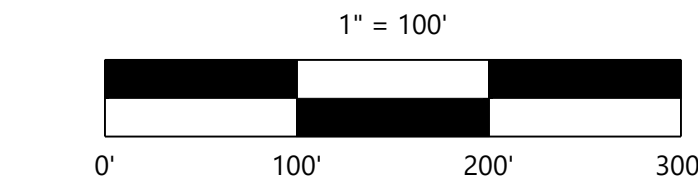
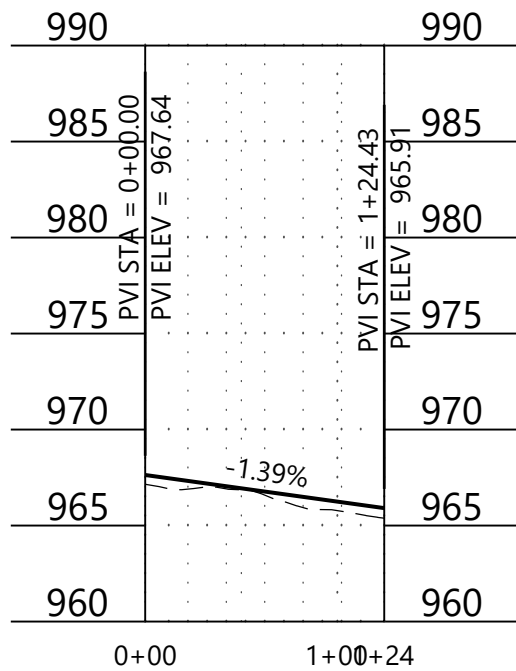
STREET C



STREET D



STREET E



NOT FOR CONSTRUCTION

Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance

DESIGNED: TODD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:
1
2
3
4
5

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME
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THOMAS D. DESUTTER
DATE: 11/15/24 LICENSE NO. 59640

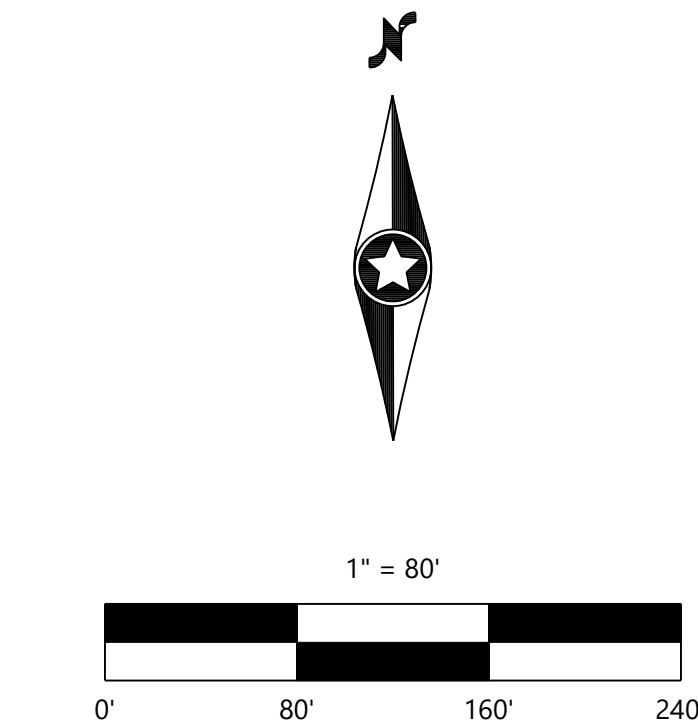
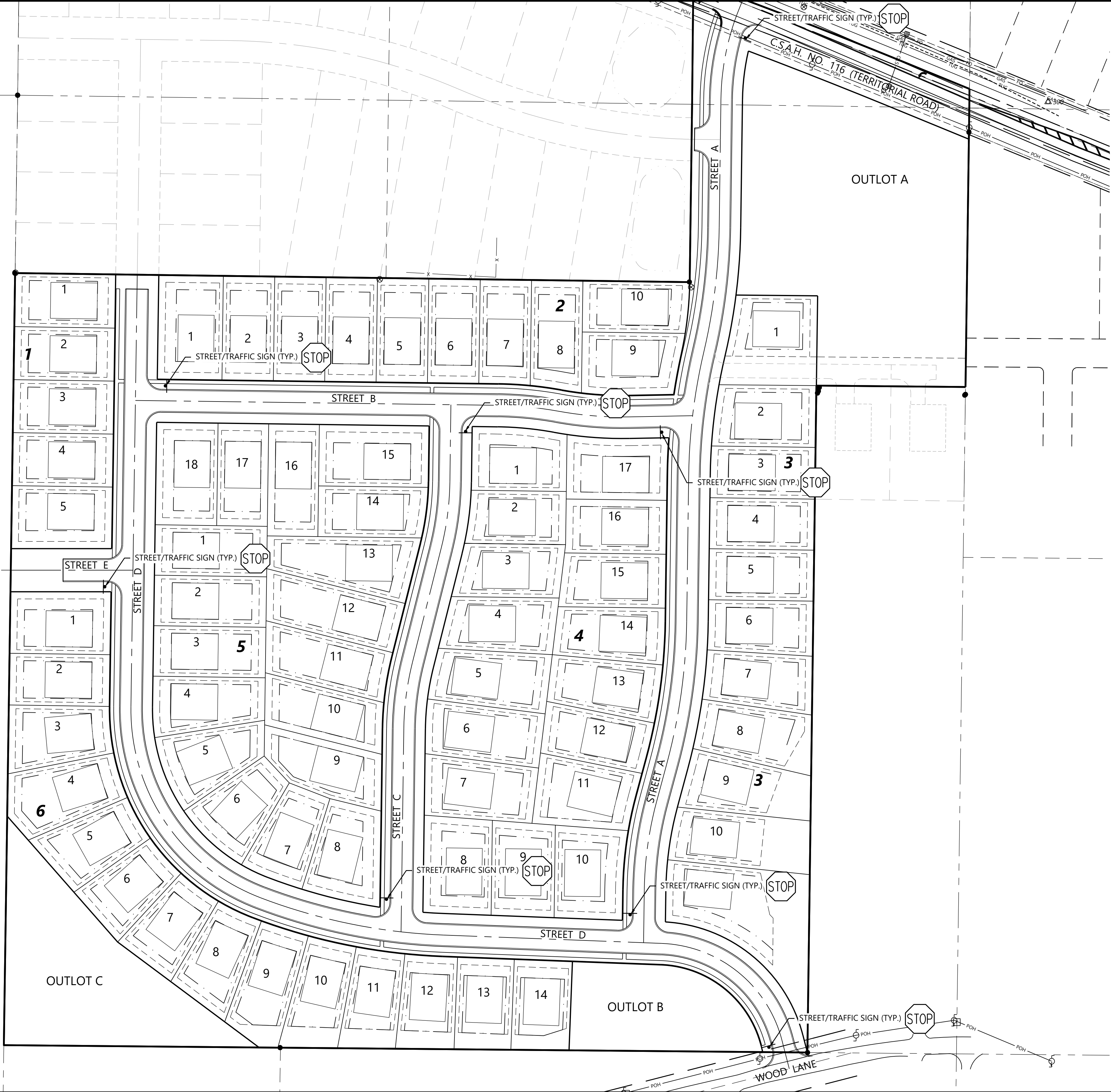
NORTHVIEW PRESERVE
ROGERS, MN

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Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
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STREET PROFILES

PROJECT NUMBER: 0033874.00

SHEET NUMBER:
11 OF **28**
DATE: 11/15/24



DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	80'
VERTICAL SCALE:	16' OR 8'

INITIAL ISSUE:	11/15/24
REVISIONS:	
△	-
△	-
△	-
△	-
△	-

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

SIGNAGE PLAN

PROJECT NUMBER: 0033874.00

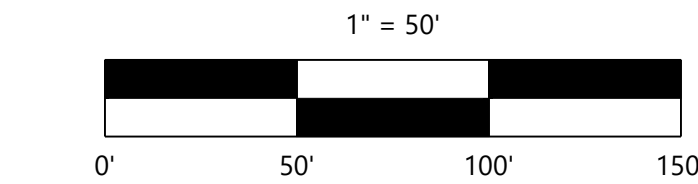
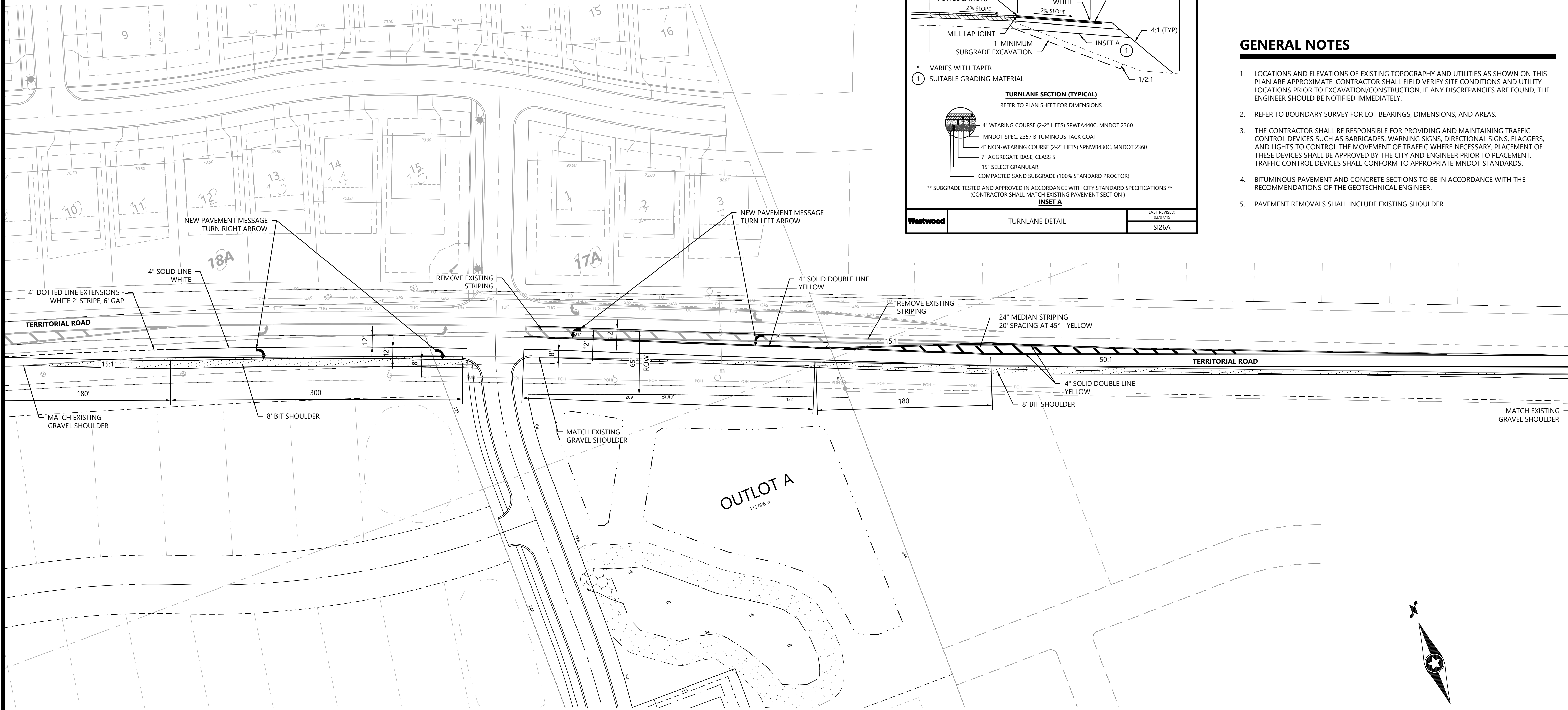
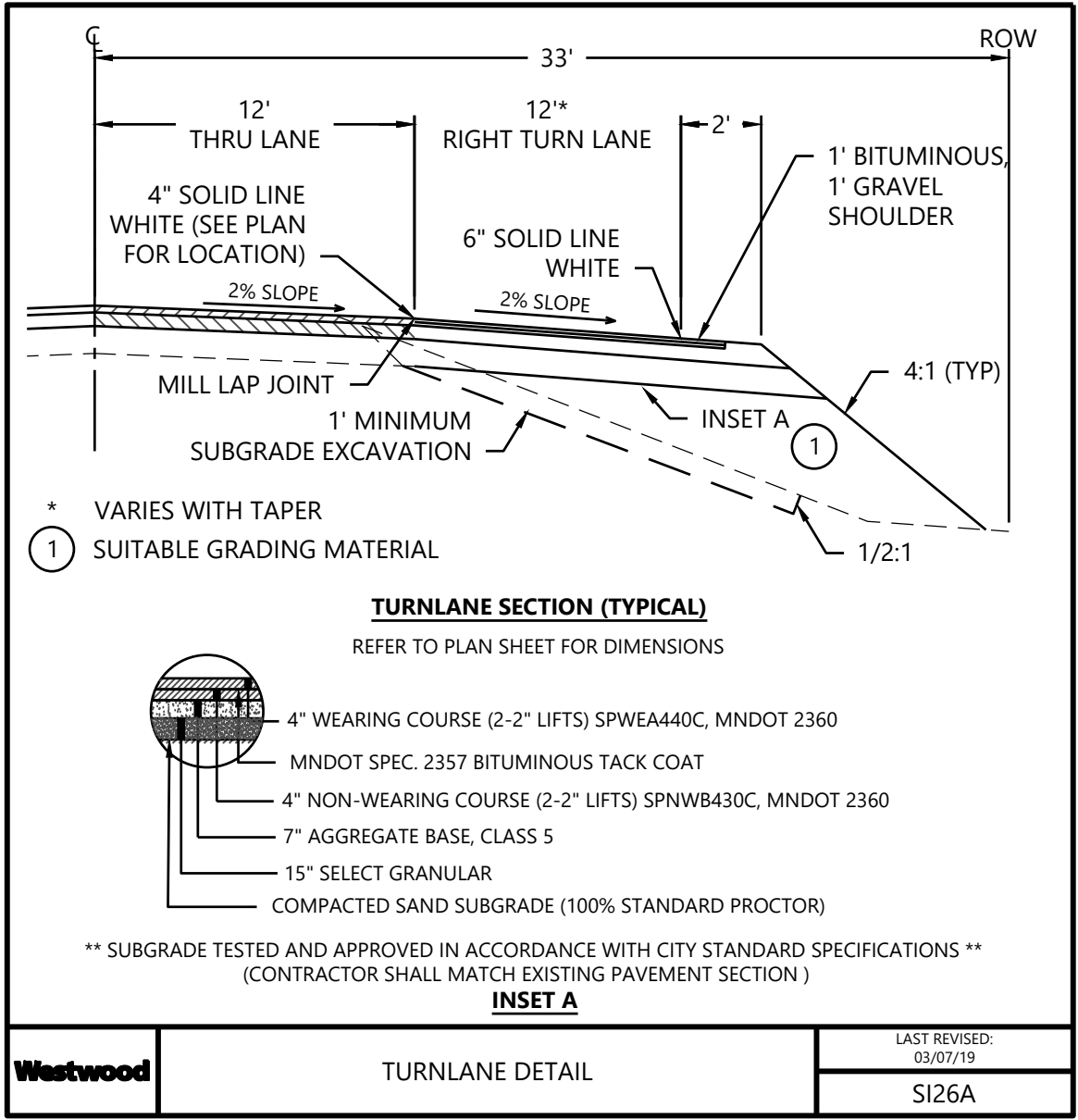
SHEET NUMBER:
12 OF 28
DATE: 11/15/24

LEGEND

FULL DEPTH NEW PAVEMENT SECTION

GENERAL NOTES

- LOCATIONS AND ELEVATIONS OF EXISTING TOPOGRAPHY AND UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY SITE CONDITIONS AND UTILITY LOCATIONS PRIOR TO EXCAVATION/CONSTRUCTION. IF ANY DISCREPANCIES ARE FOUND, THE ENGINEER SHOULD BE NOTIFIED IMMEDIATELY.
- REFER TO BOUNDARY SURVEY FOR LOT BEARINGS, DIMENSIONS, AND AREAS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING TRAFFIC CONTROL DEVICES SUCH AS BARRICADES, WARNING SIGNS, DIRECTIONAL SIGNS, FLAGGERS, AND LIGHTS TO CONTROL THE MOVEMENT OF TRAFFIC WHERE NECESSARY. PLACEMENT OF THESE DEVICES SHALL BE APPROVED BY THE CITY AND ENGINEER PRIOR TO PLACEMENT. TRAFFIC CONTROL DEVICES SHALL CONFORM TO APPROPRIATE MNDOT STANDARDS.
- BITUMINOUS PAVEMENT AND CONCRETE SECTIONS TO BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.
- PAVEMENT REMOVALS SHALL INCLUDE EXISTING SHOULDER



NOT FOR CONSTRUCTION

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 50.000002"
VERTICAL SCALE: 10' OR 5'

INITIAL ISSUE: 11/15/24
REVISIONS:

△	.	.
△	.	.
△	.	.
△	.	.
△	.	.

PREPARED FOR:

SUMMERGATE COMPANIES LLC

17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME
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OF THE STATE OF MINNESOTA

THOMAS D. DESUTTER
DATE: 11/15/24 LICENSE NO. 59640

NORTHVIEW PRESERVE

ROGERS, MN

Westwood

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Fax (952) 937-5822 Minnetonka, MN 55343
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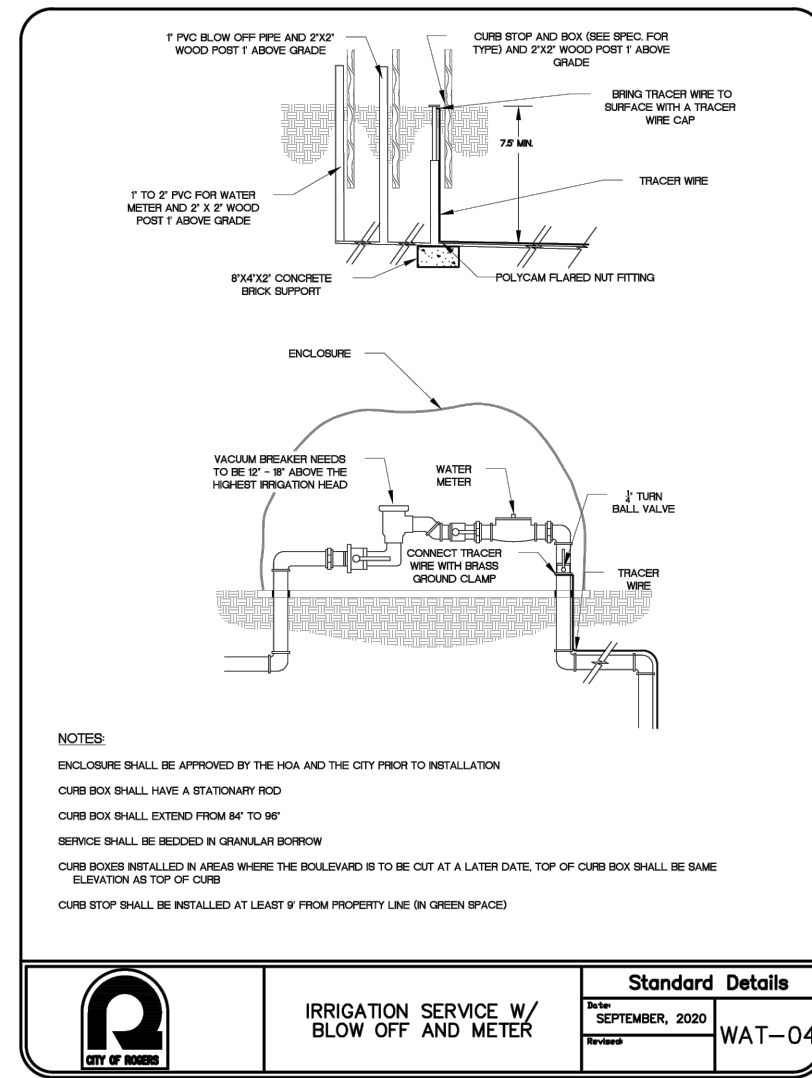
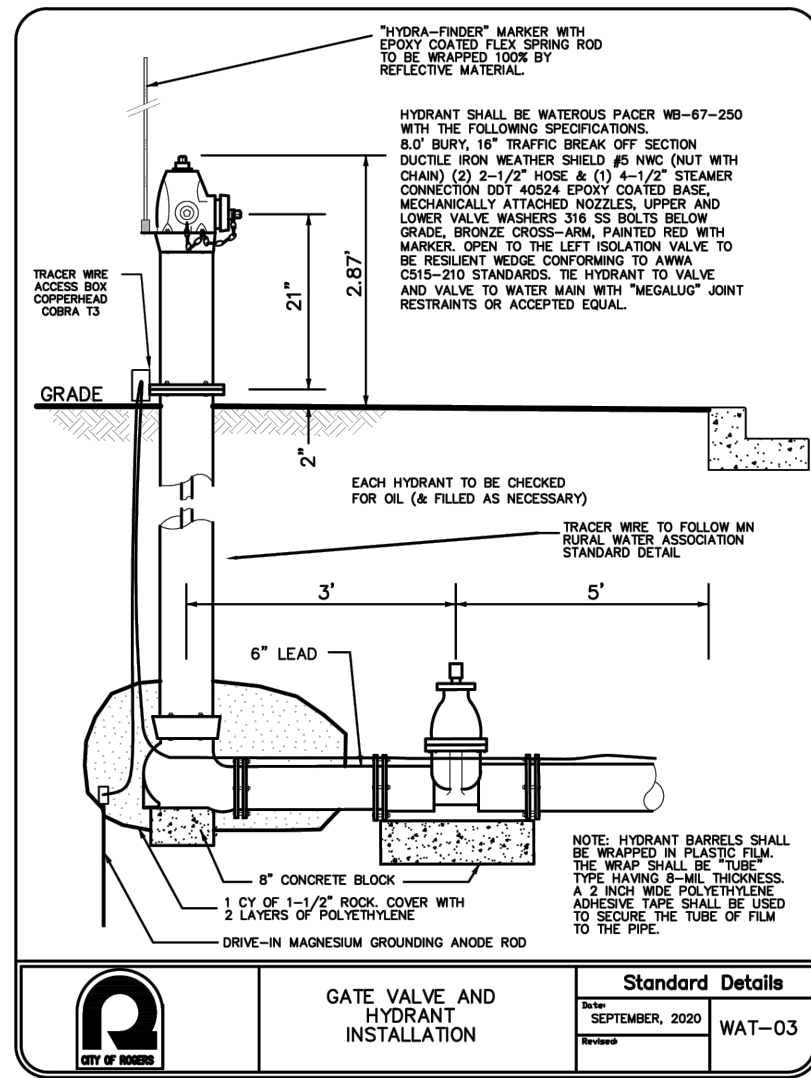
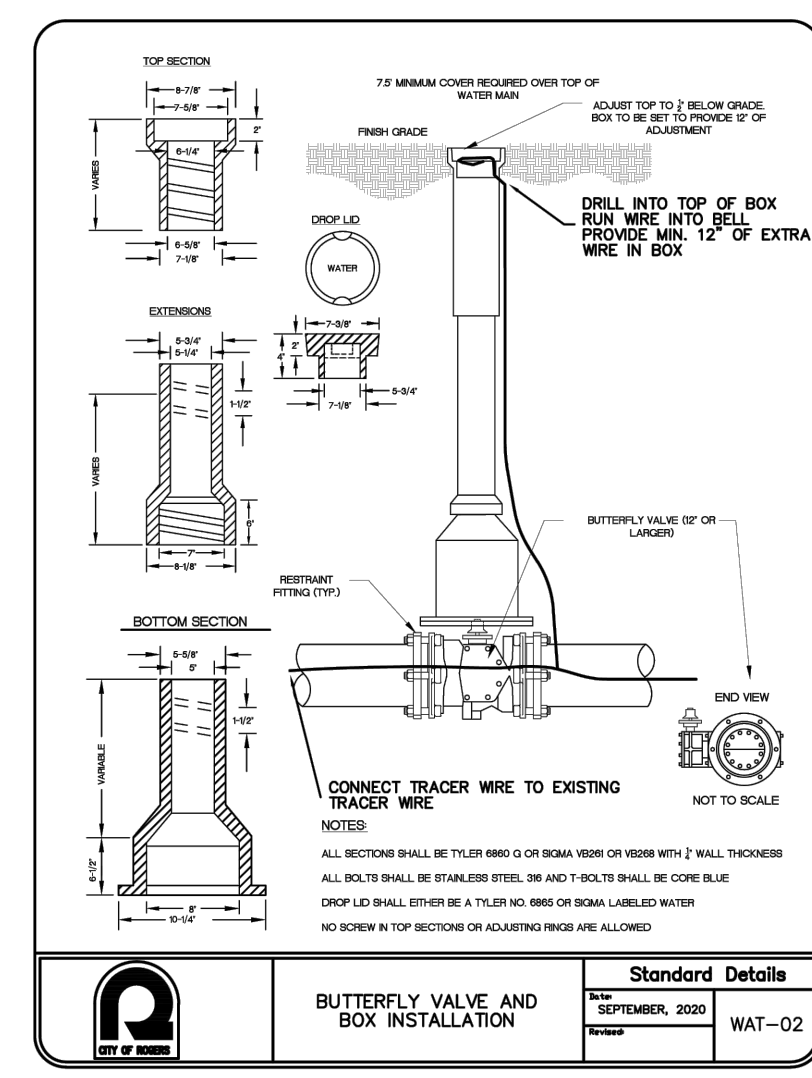
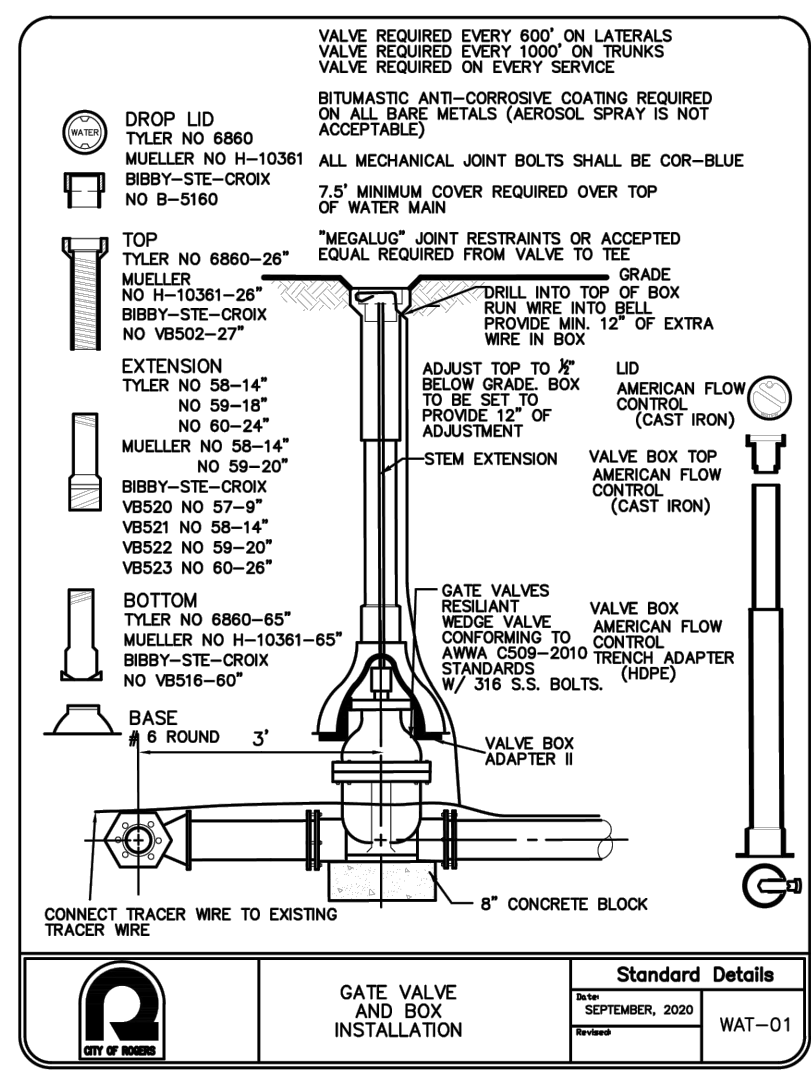
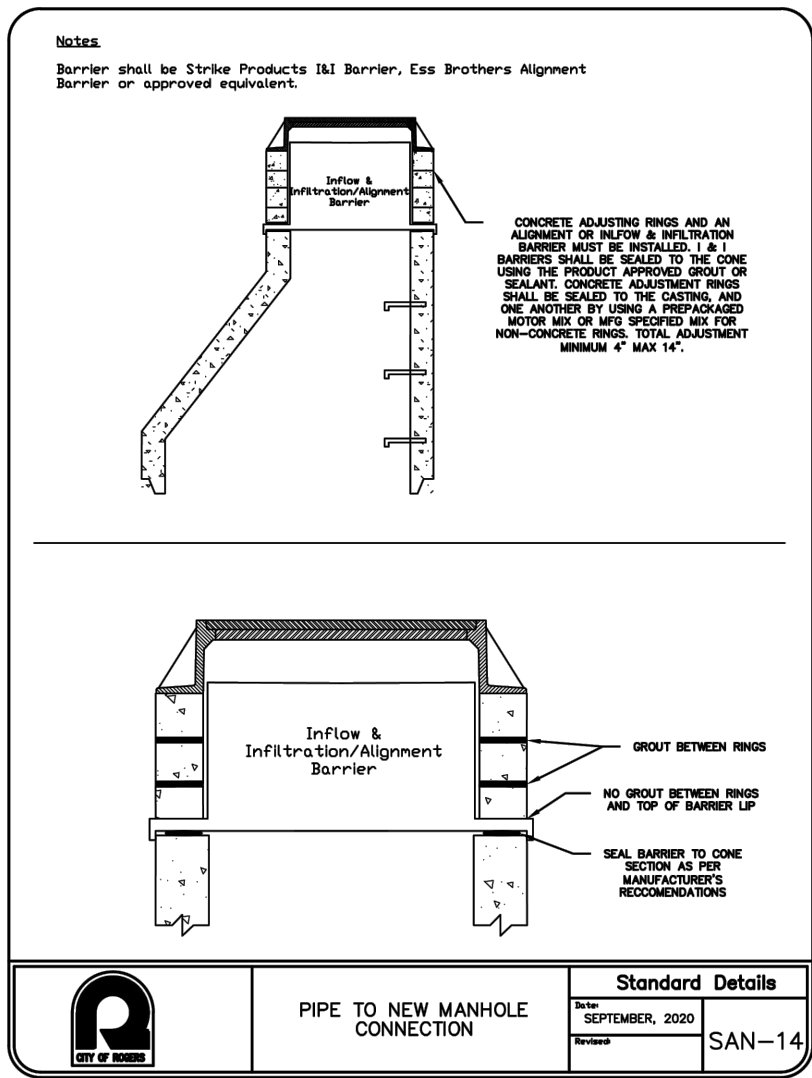
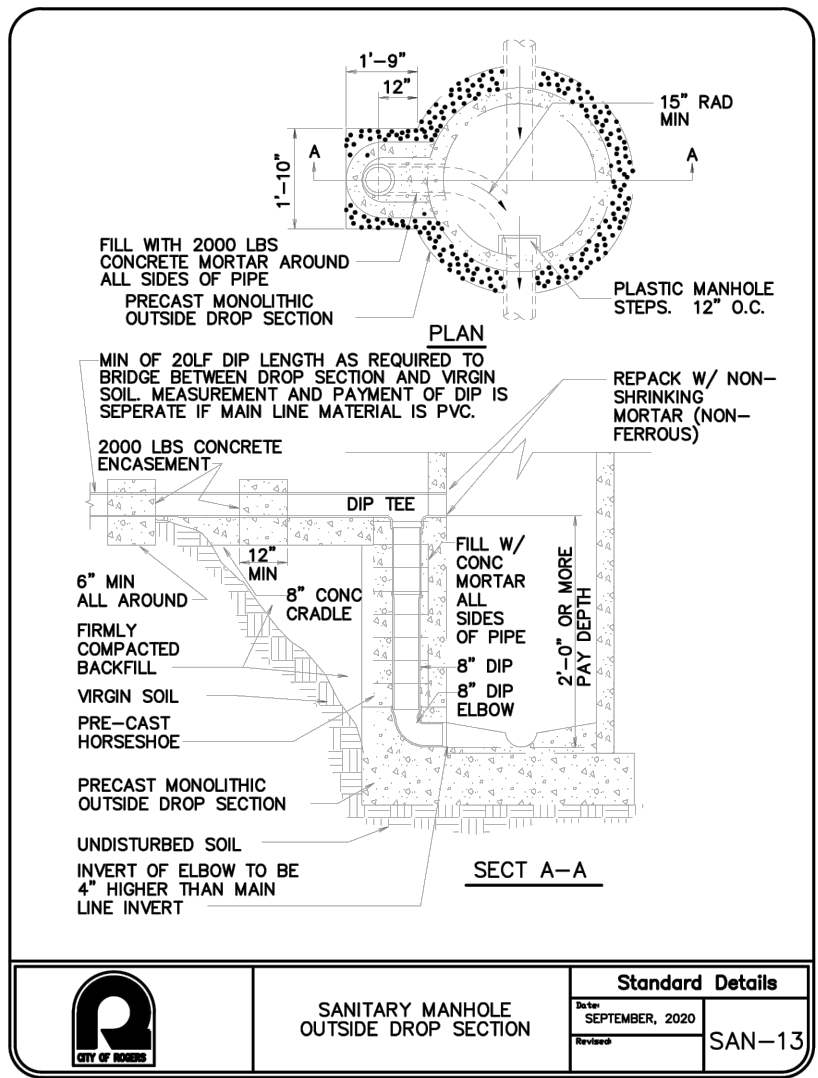
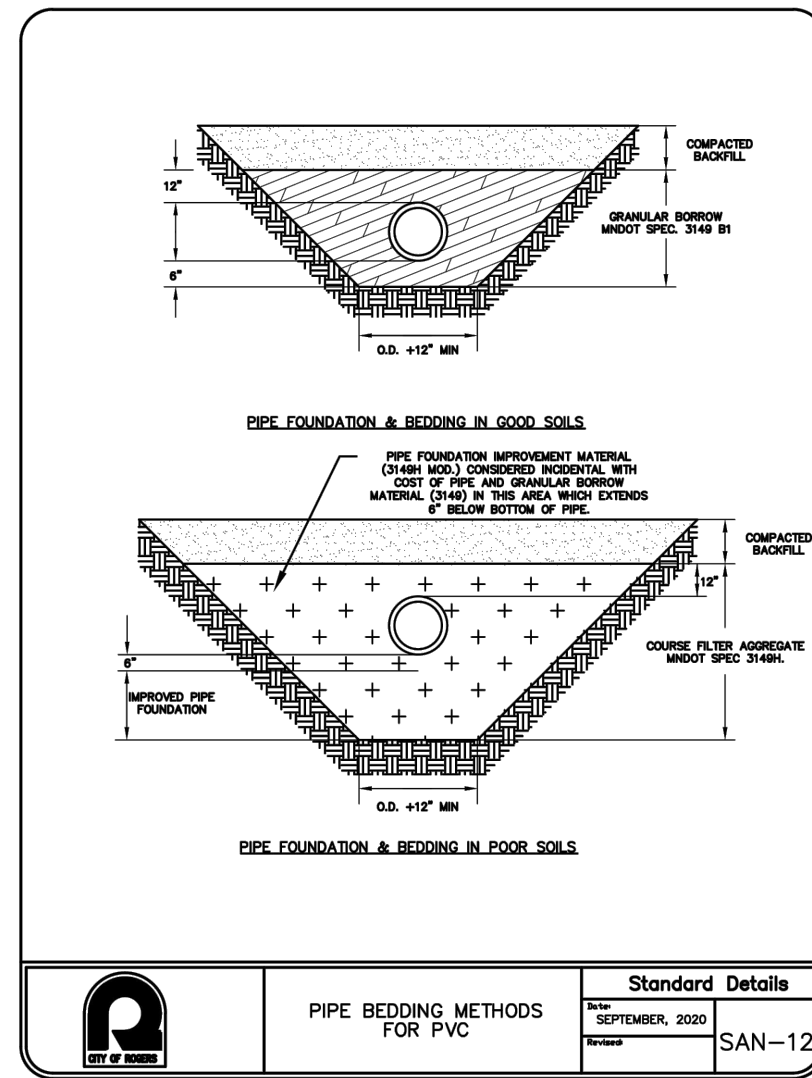
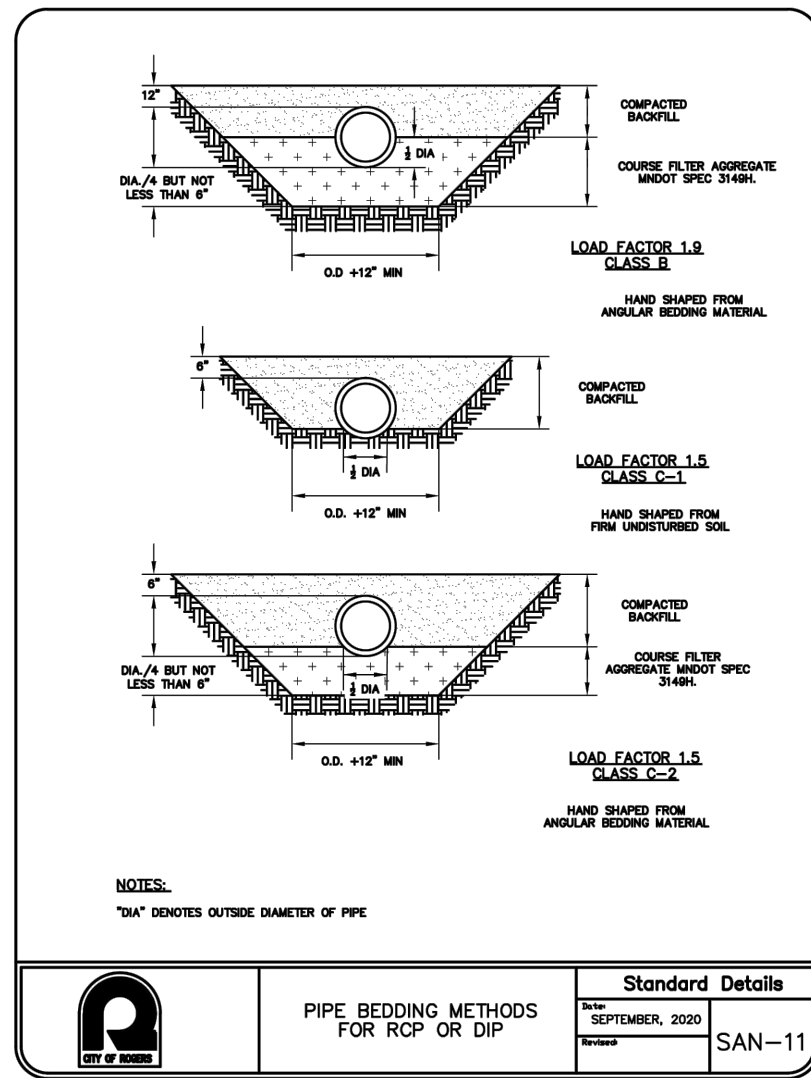
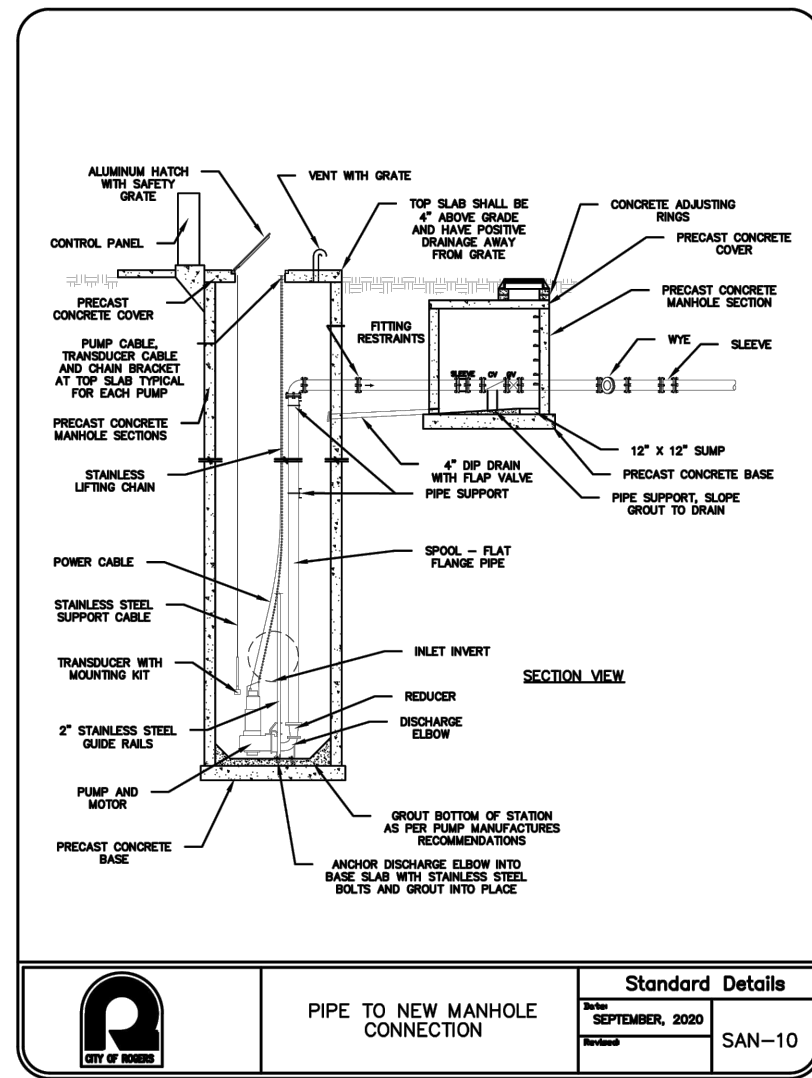
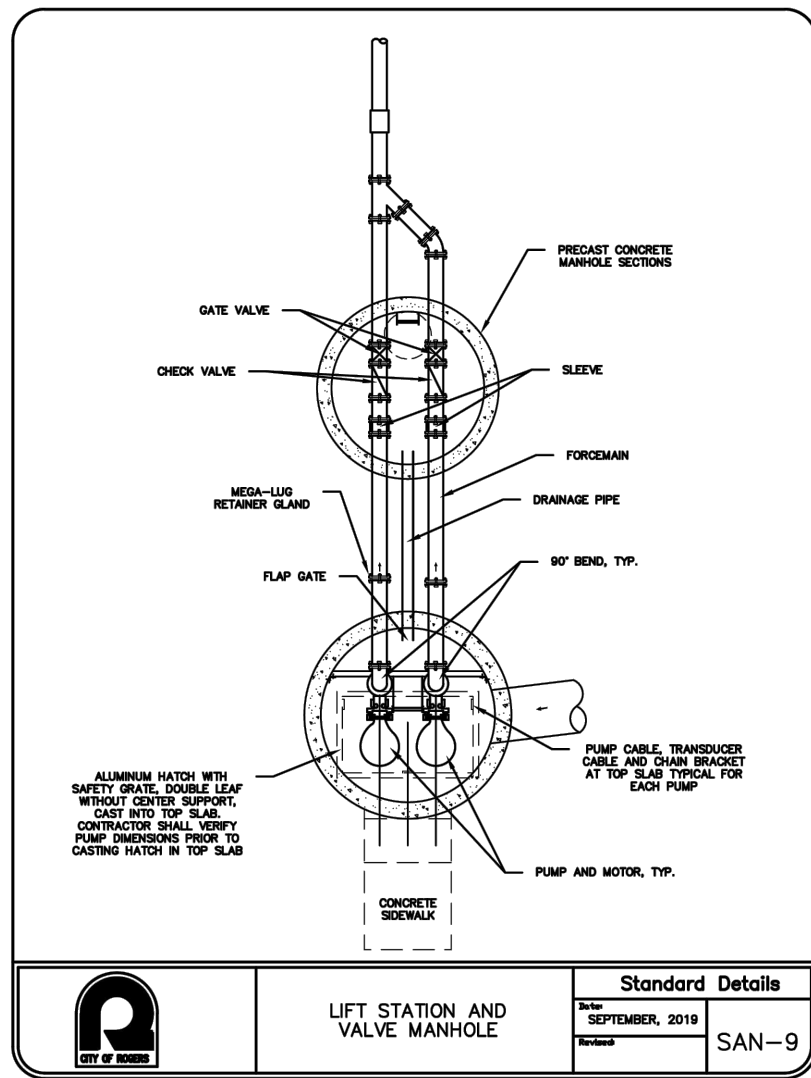
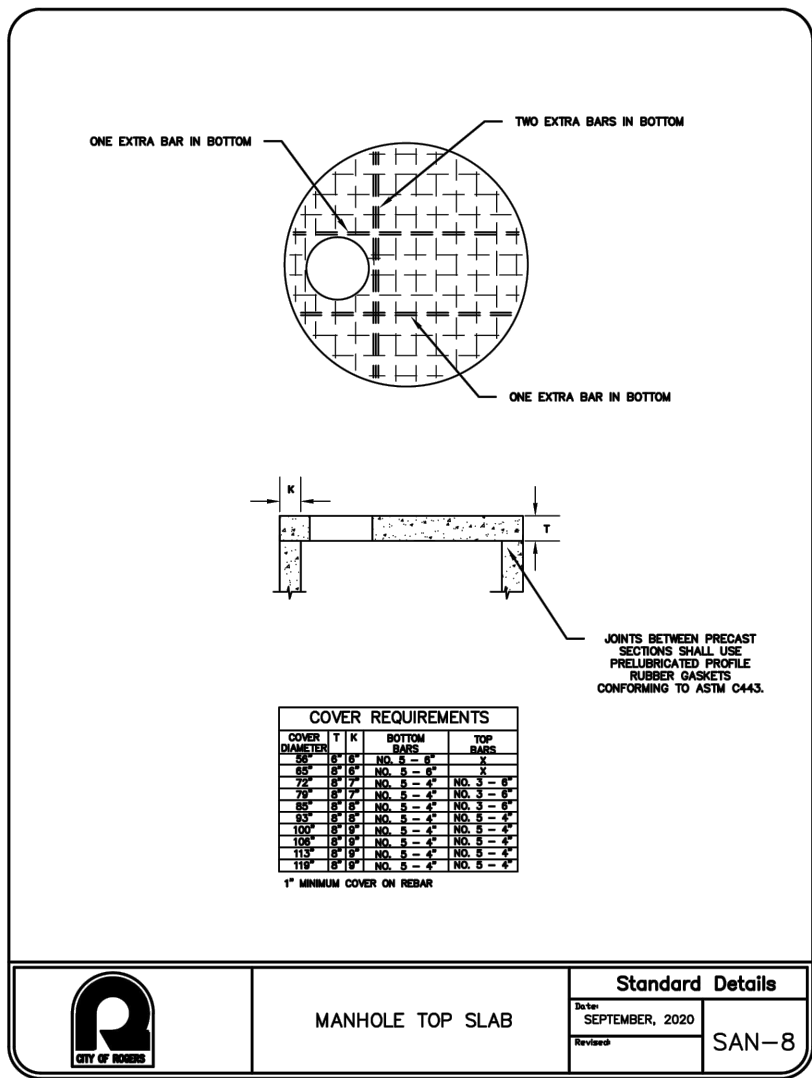
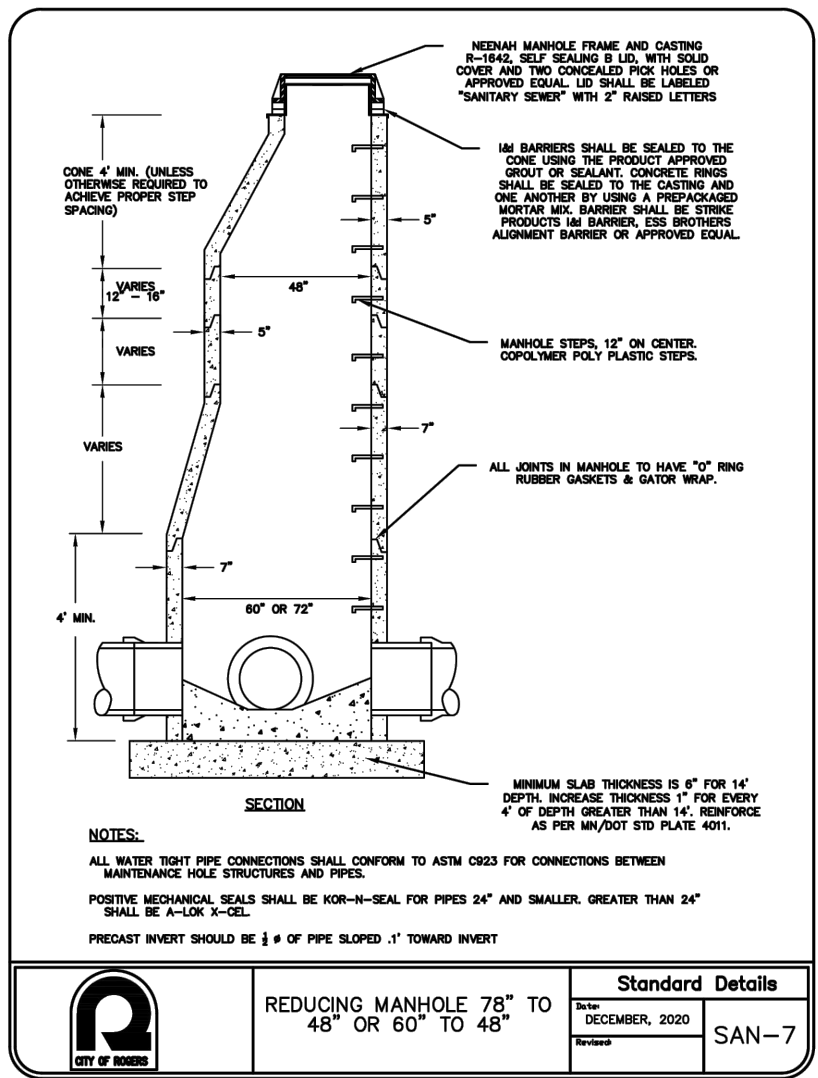
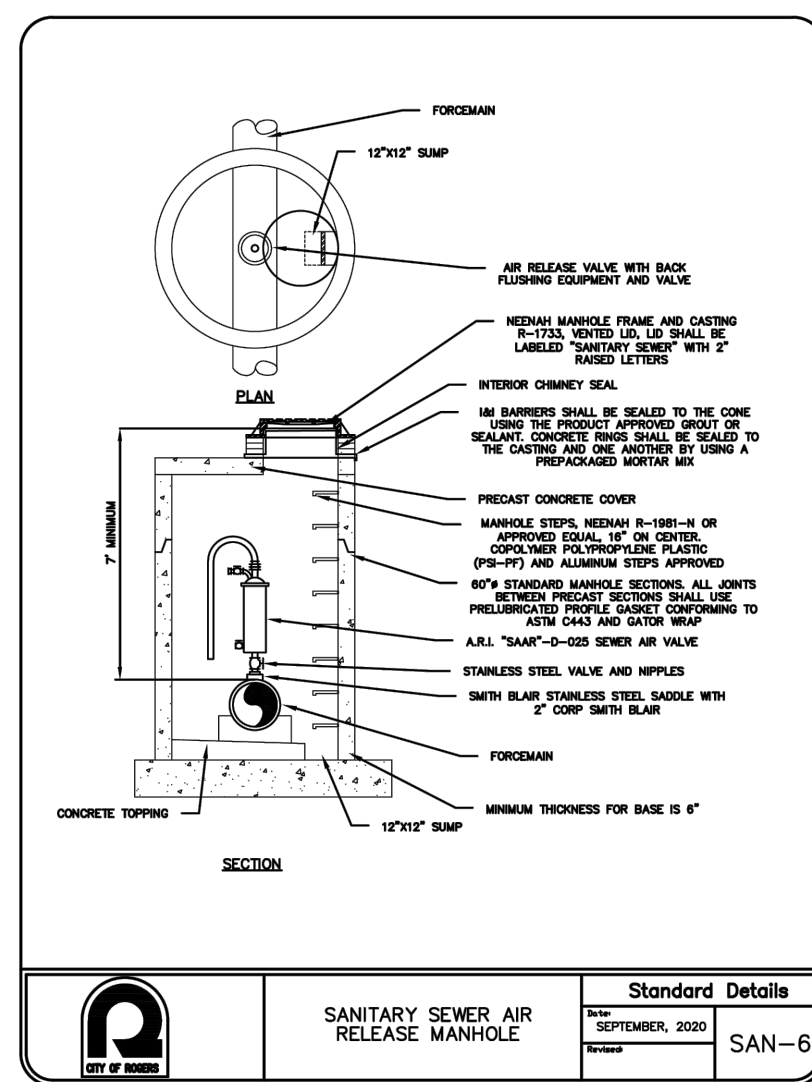
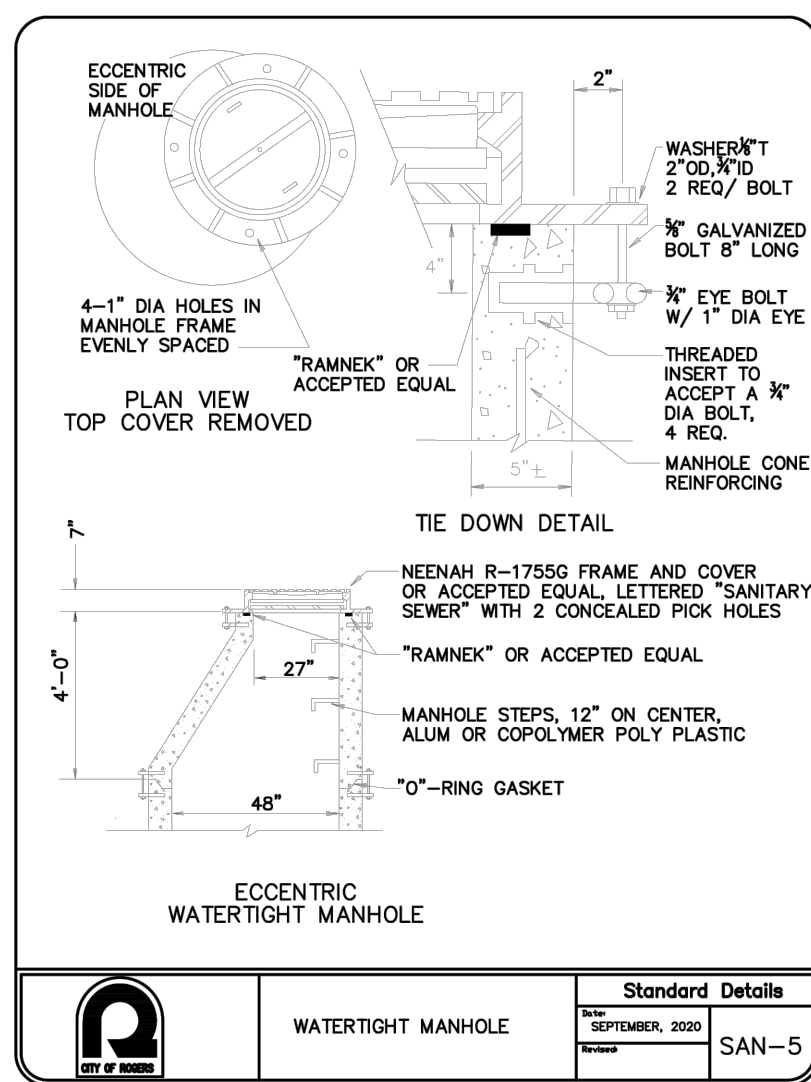
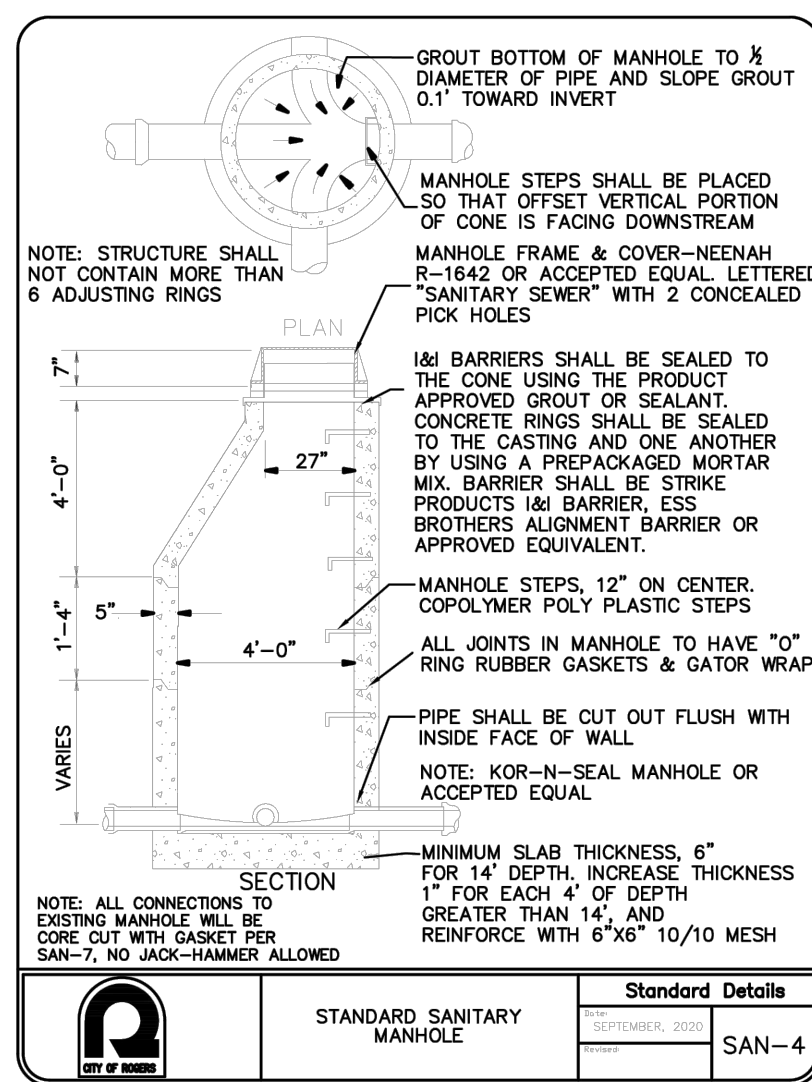
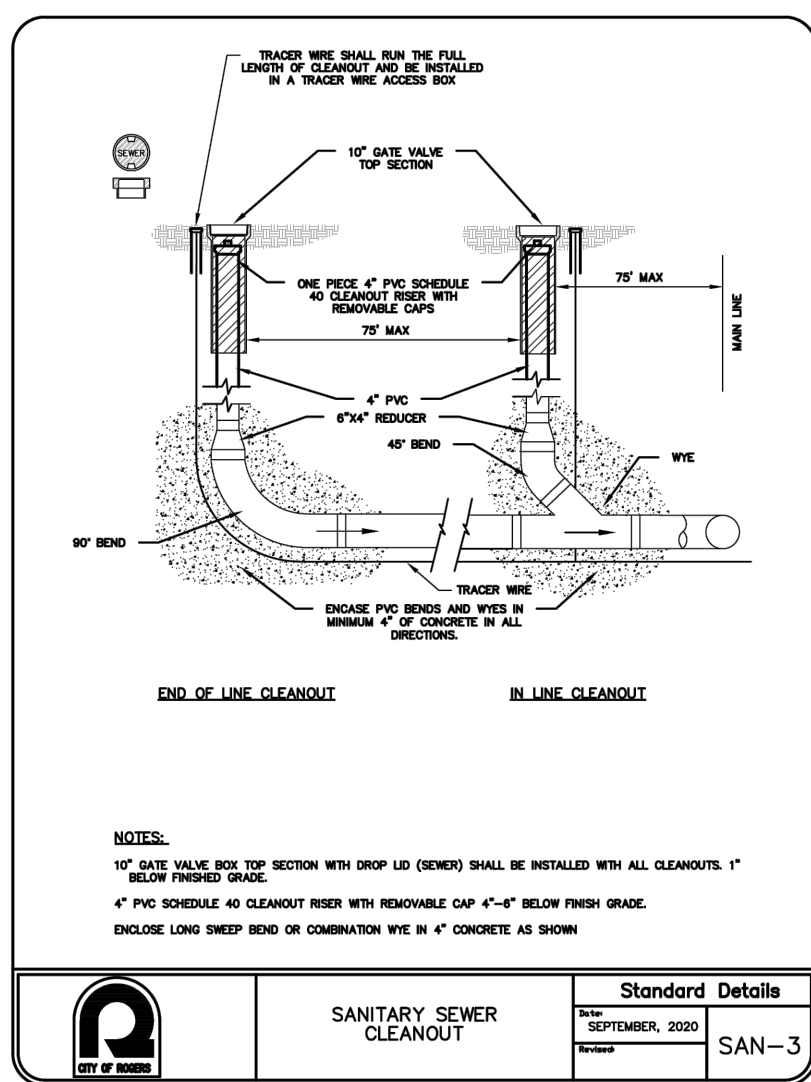
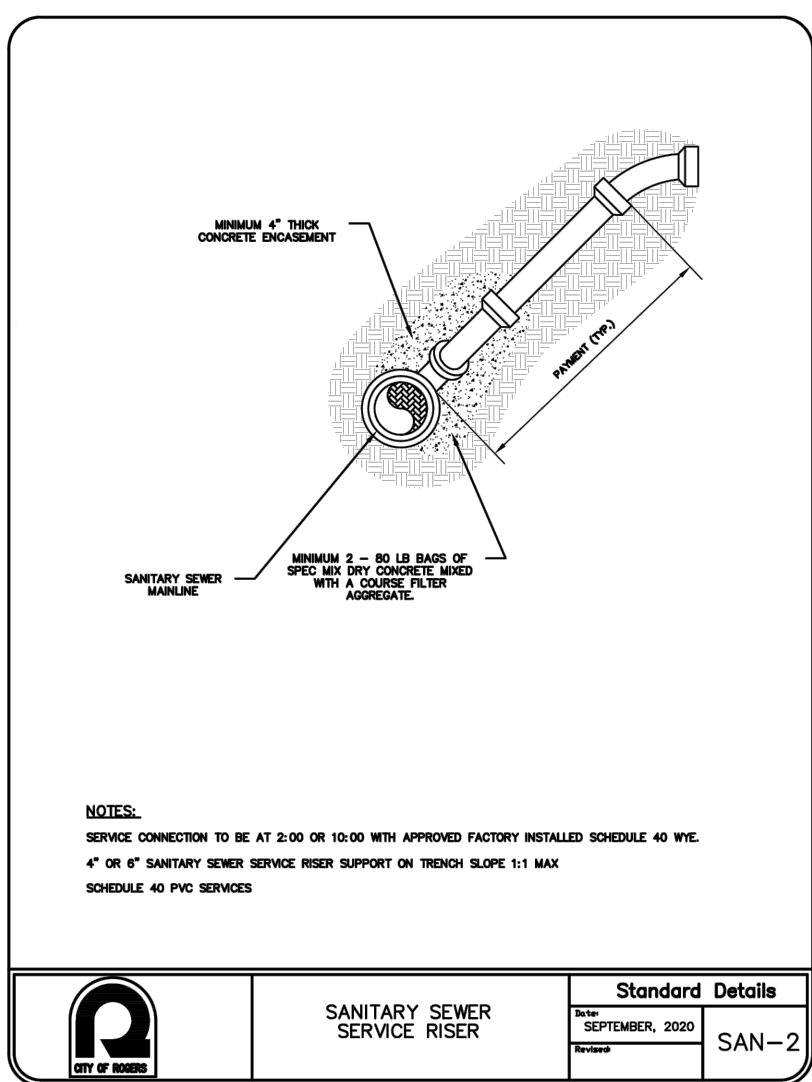
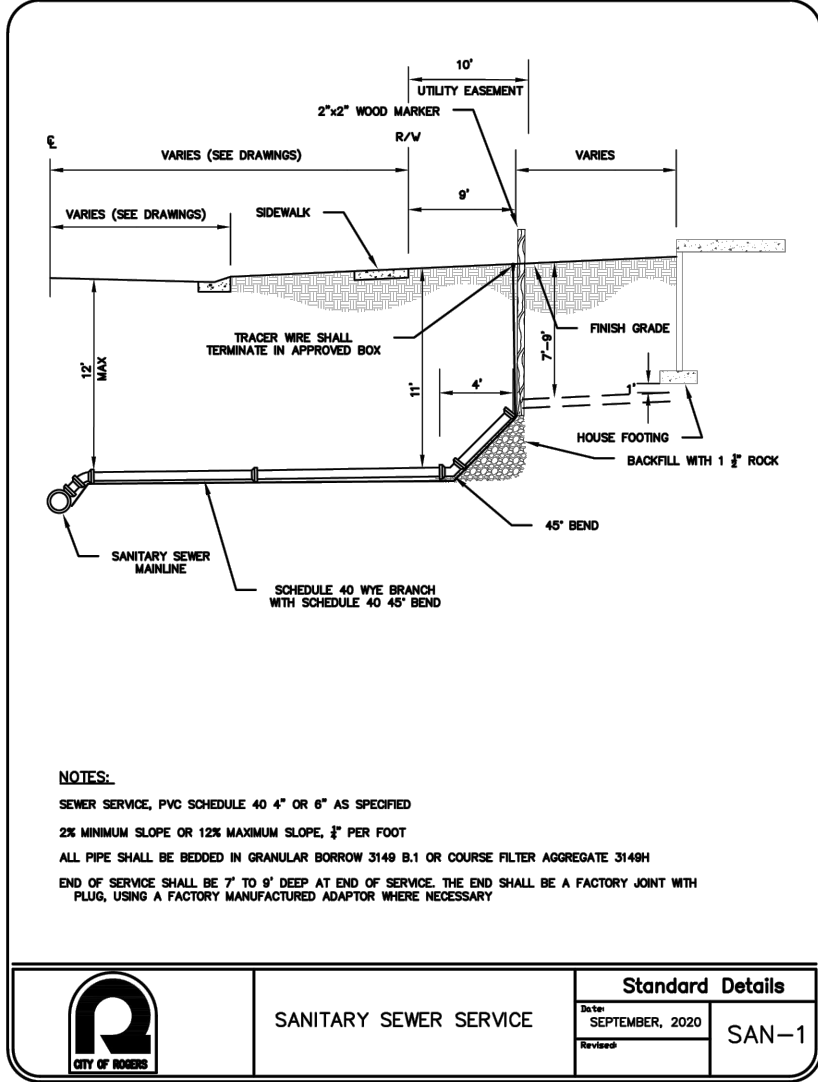
TURN LANE DETAILS

PROJECT NUMBER: 0033874.00

SHEET NUMBER:

13 OF 28

DATE: 11/15/24



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DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	###
VERTICAL SCALE:	### OR ##

INITIAL ISSUE:	11/15/24
REVISIONS:	

PREPARED FOR:	SUMMERGATE COMPANIES LLC
	17305 CEDAR AVENUE, SUITE 200 LAKEVILLE, MN 55044
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA	
THOMAS D. DESUTTER	
DATE: 11/15/24	LICENSE NO. 59640

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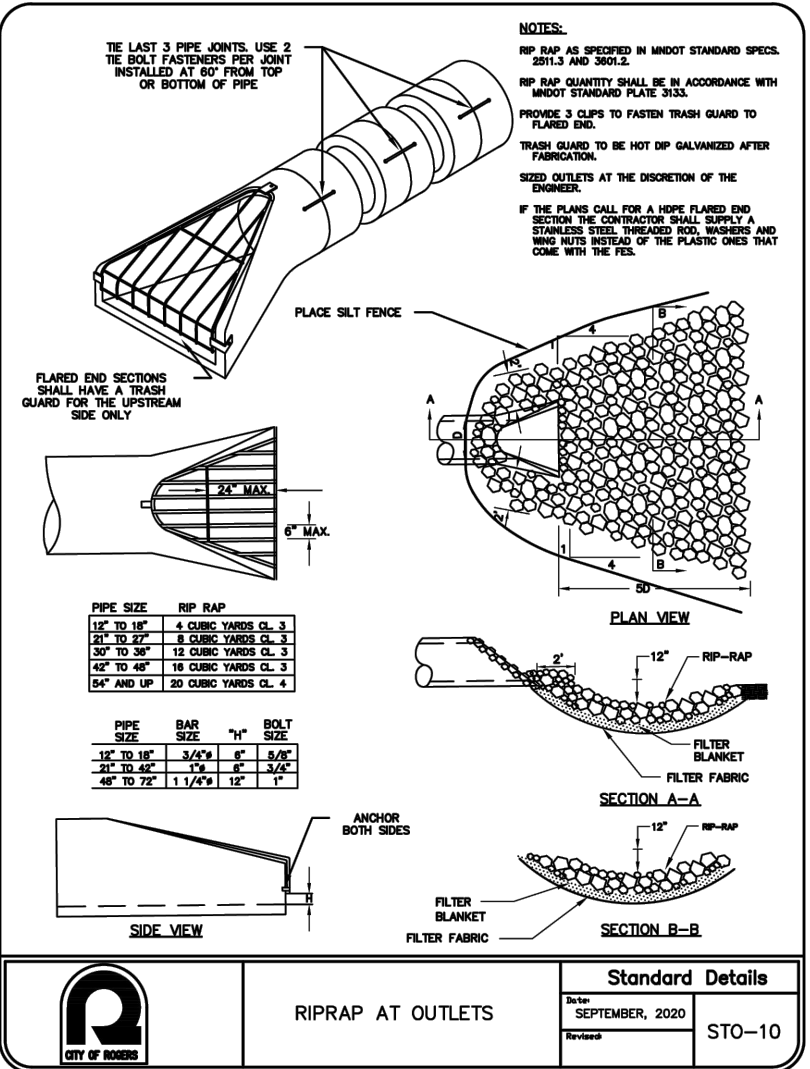
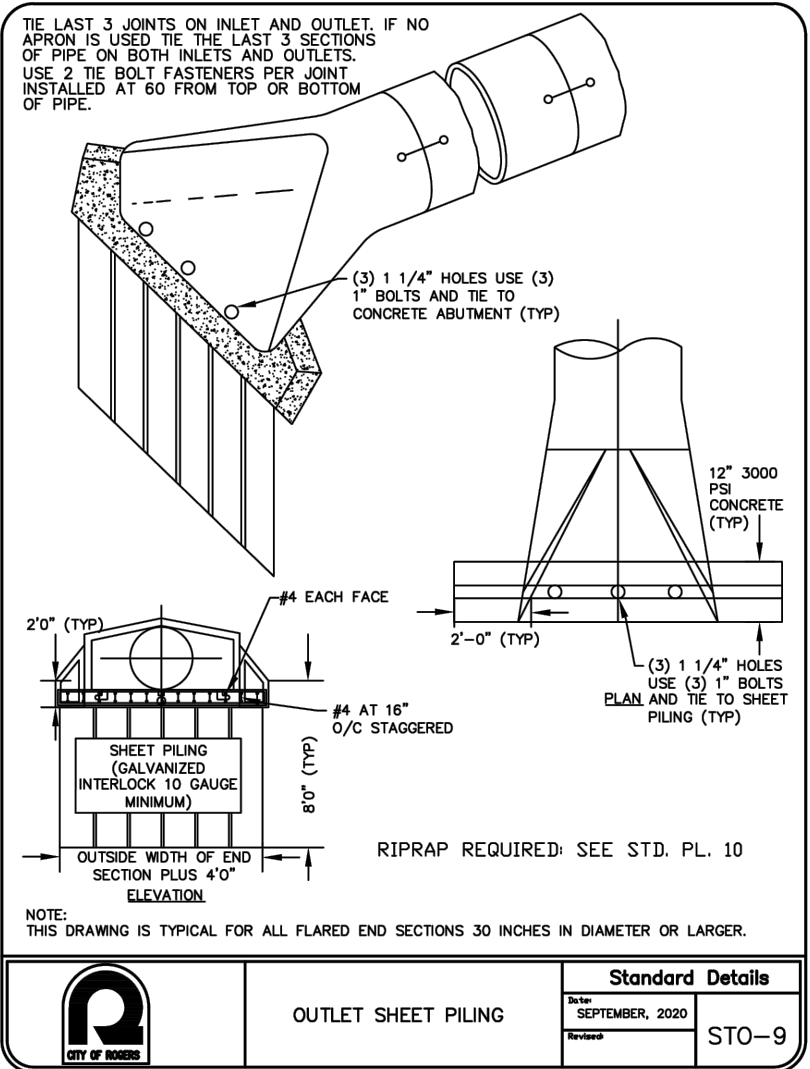
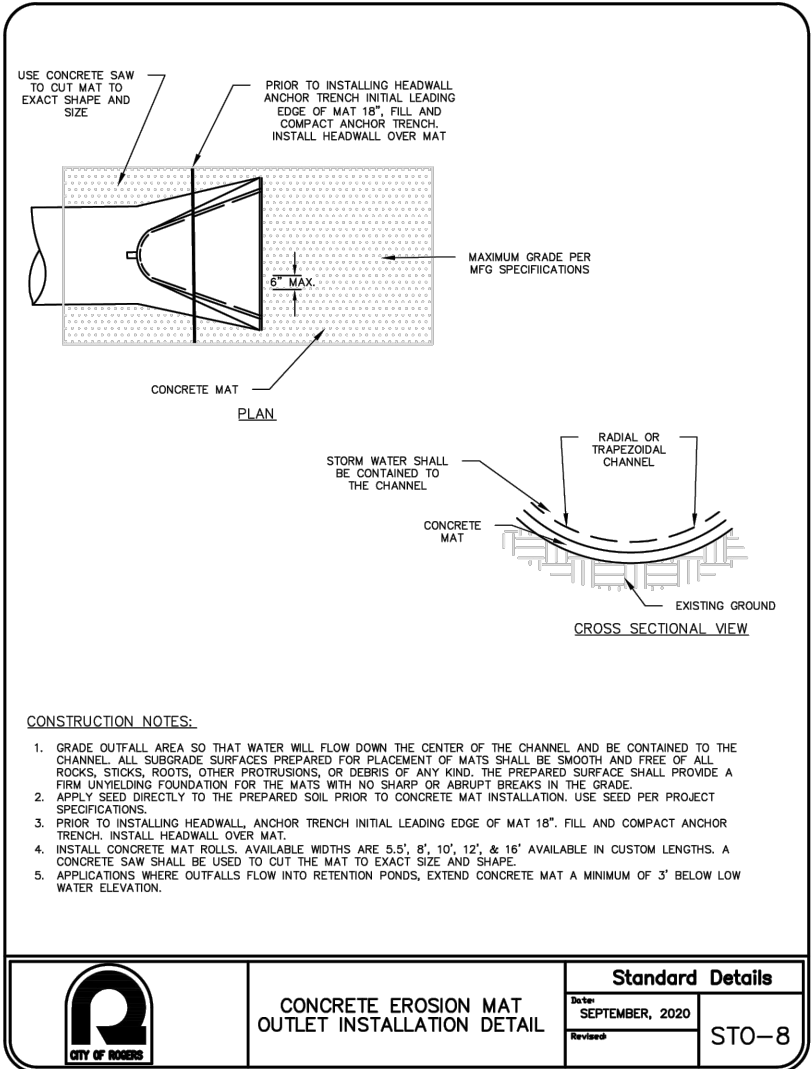
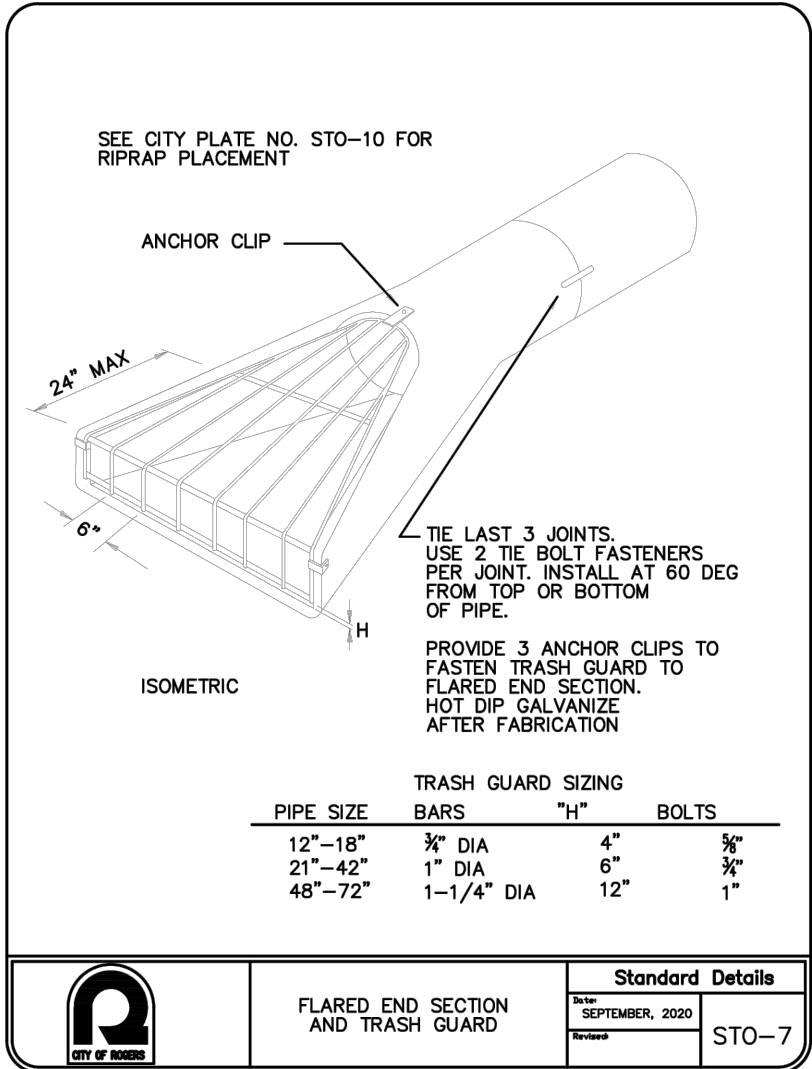
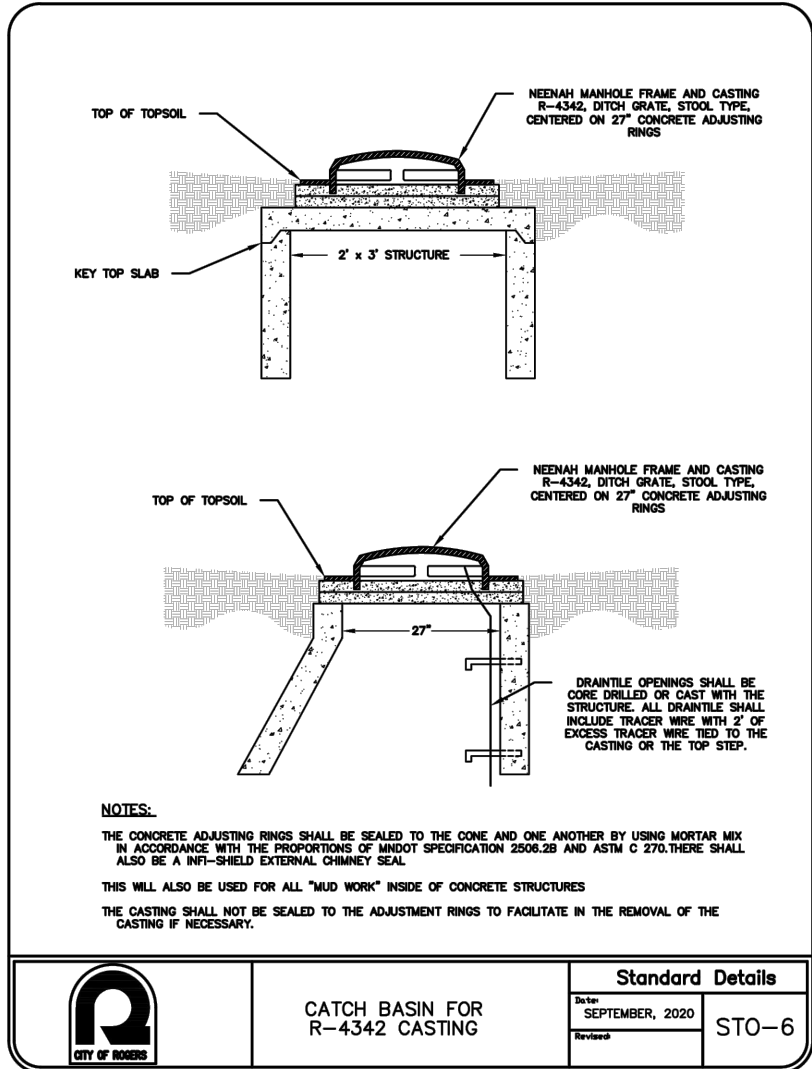
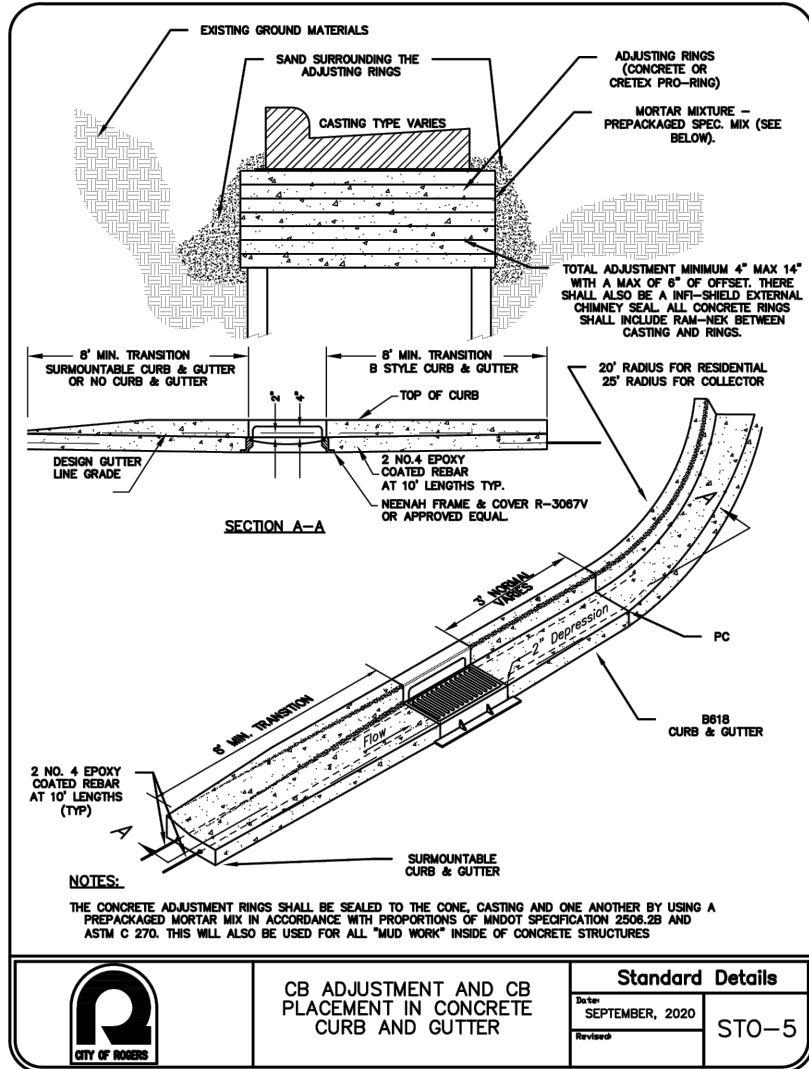
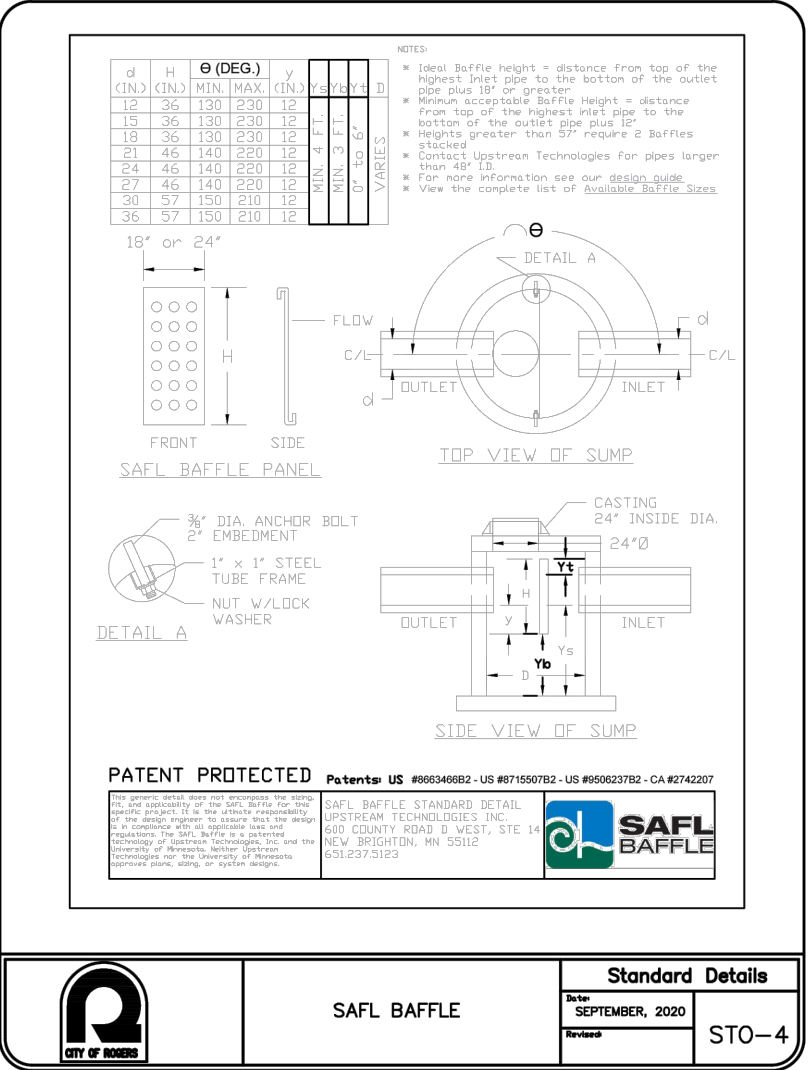
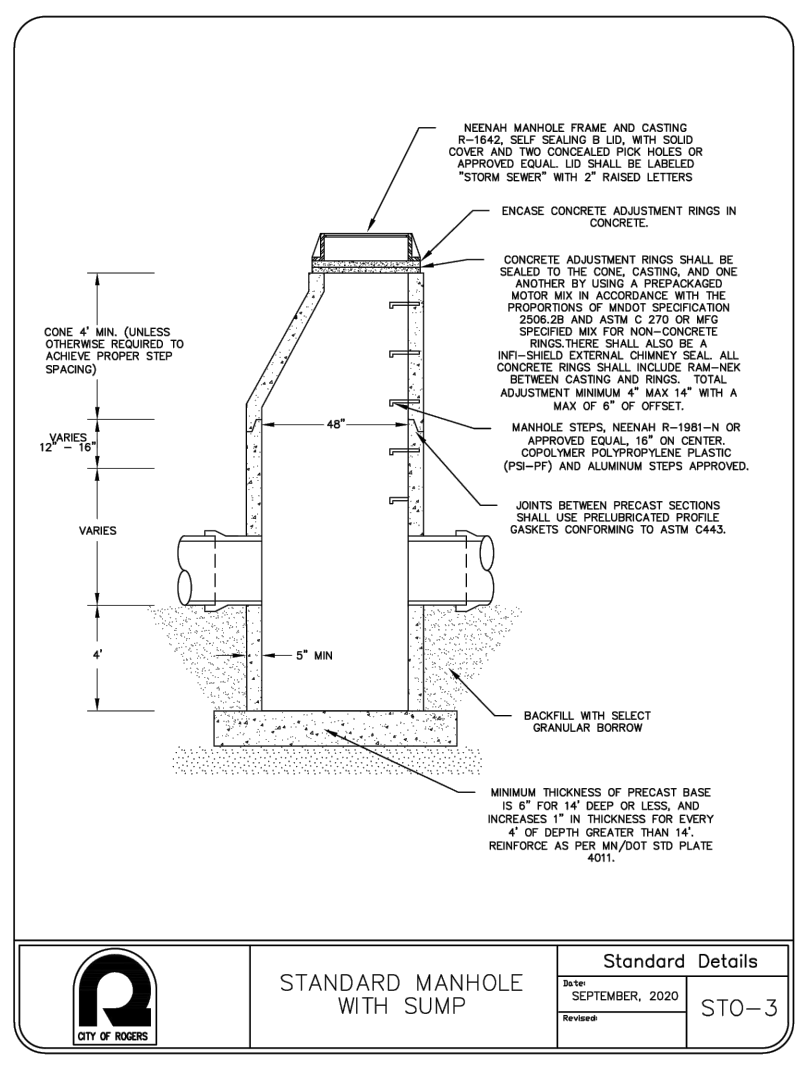
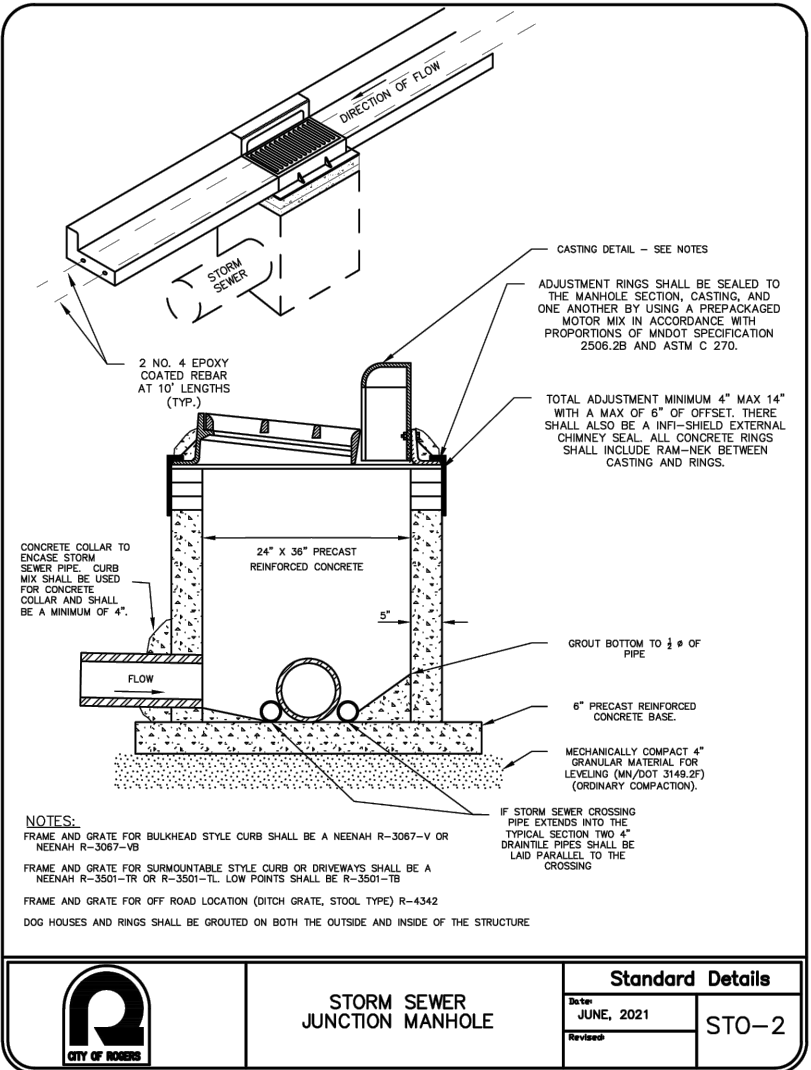
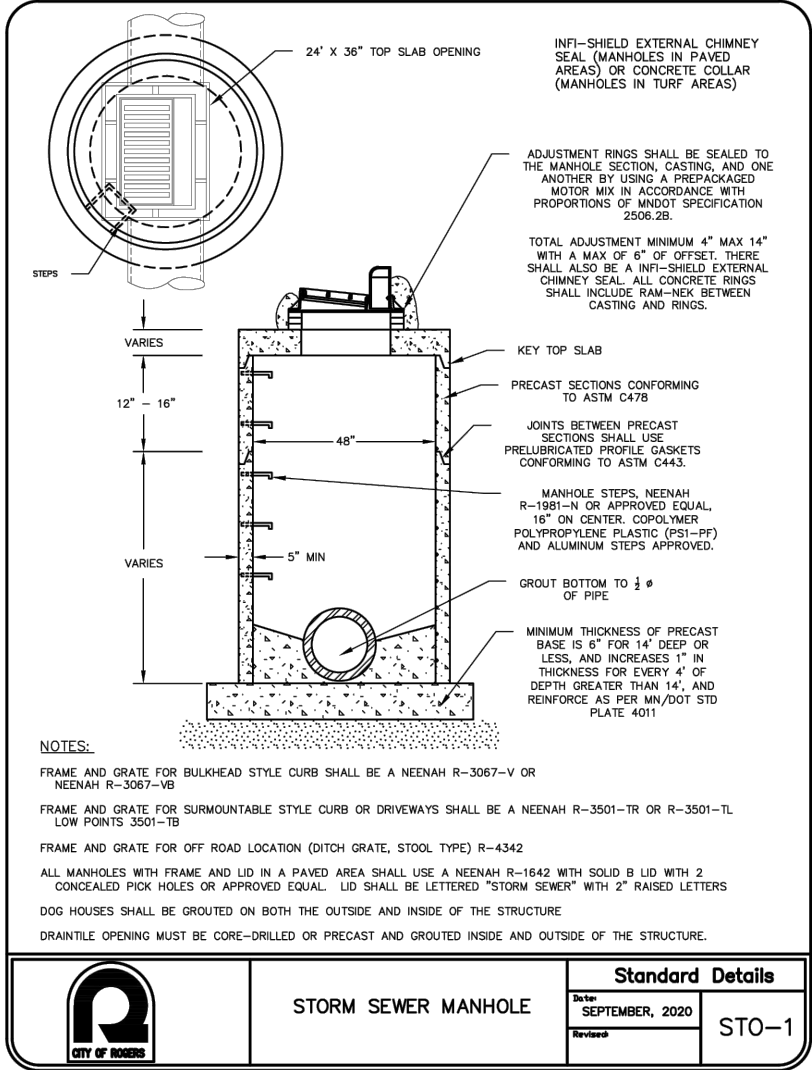
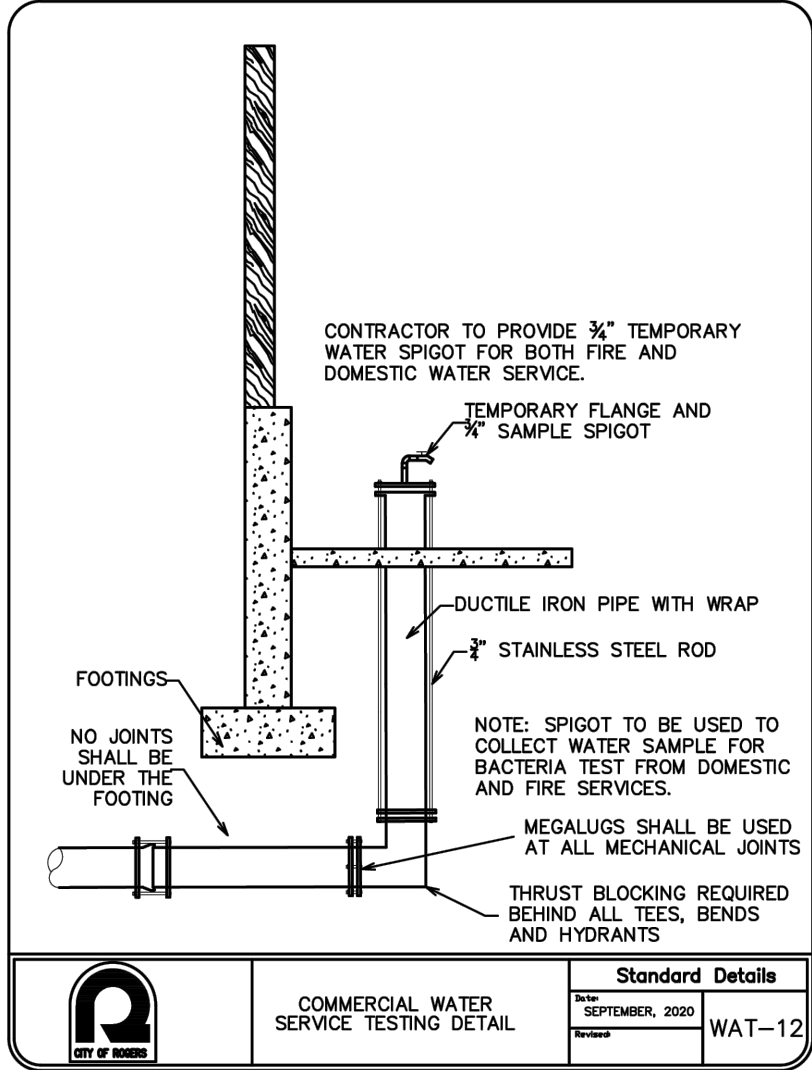
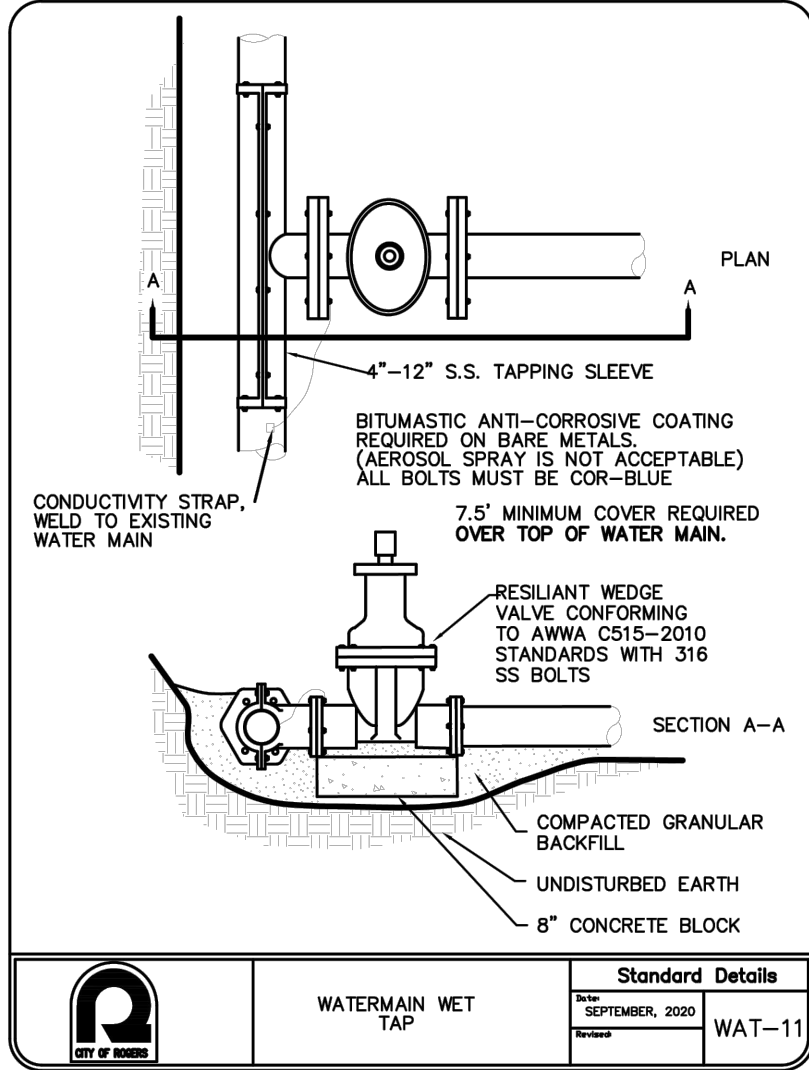
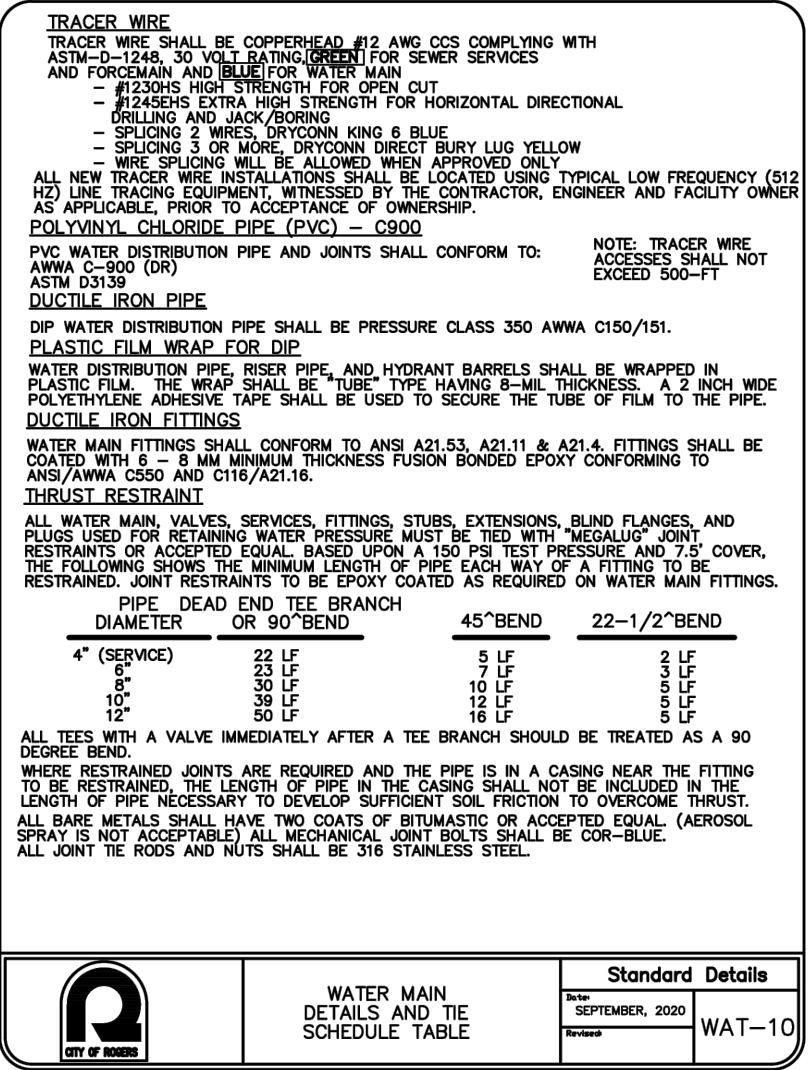
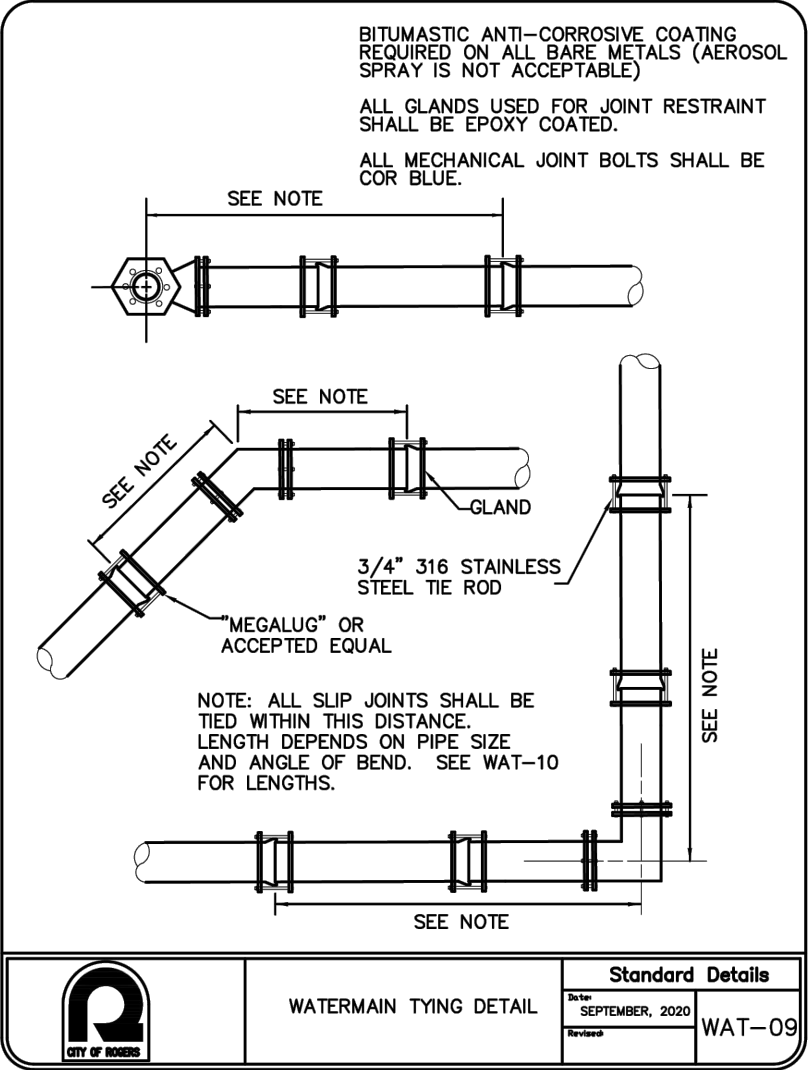
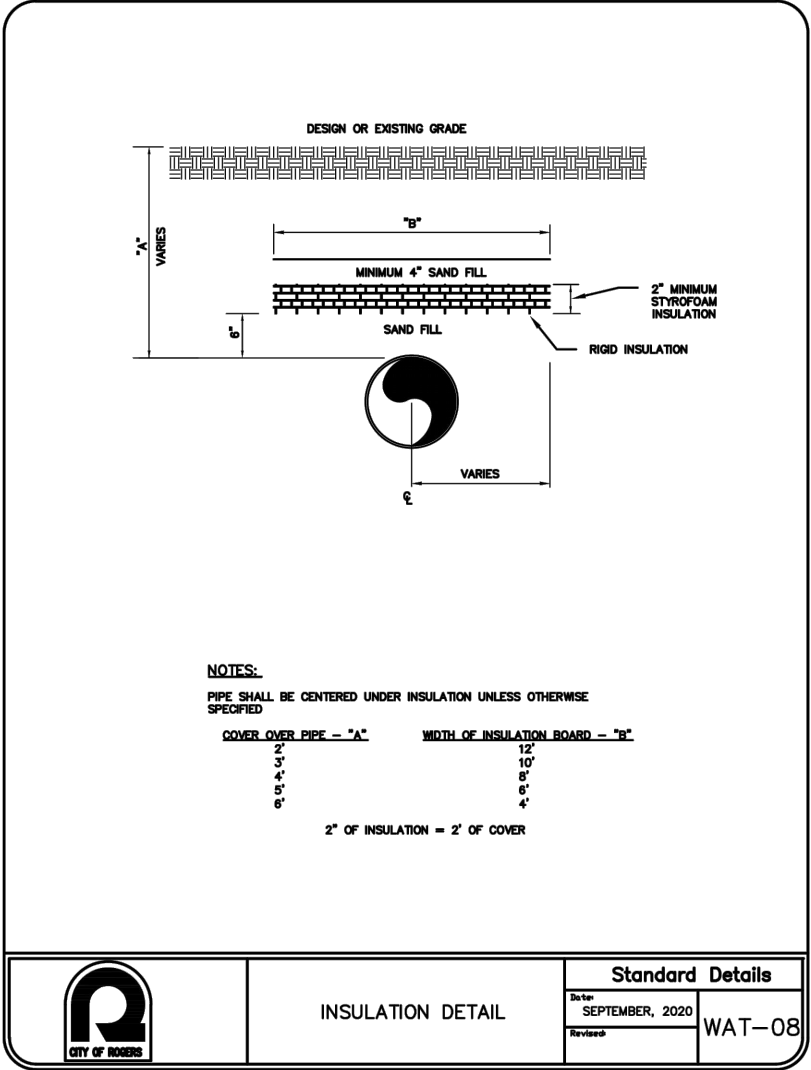
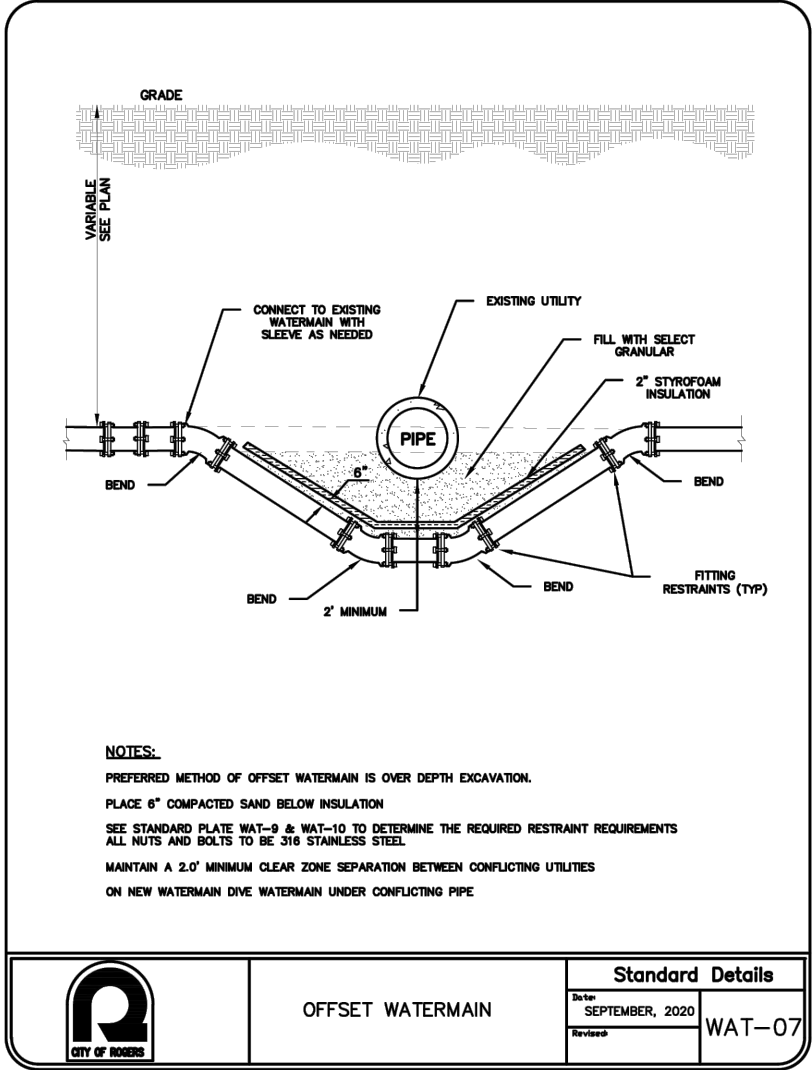
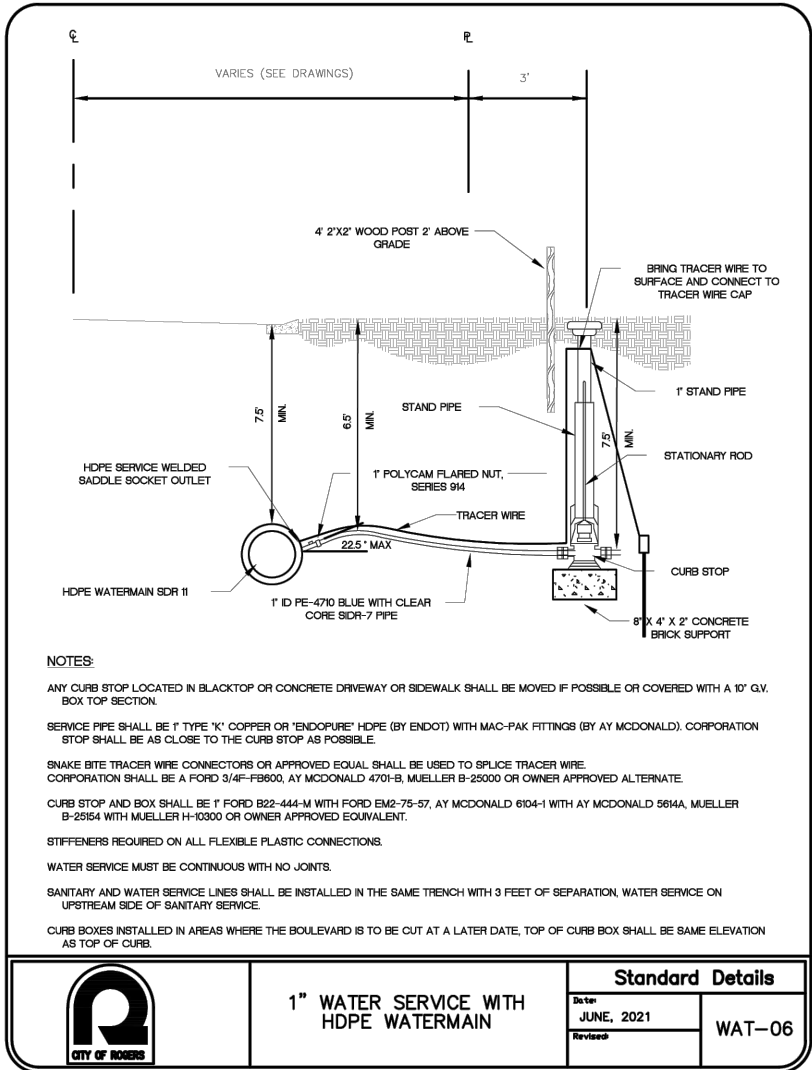
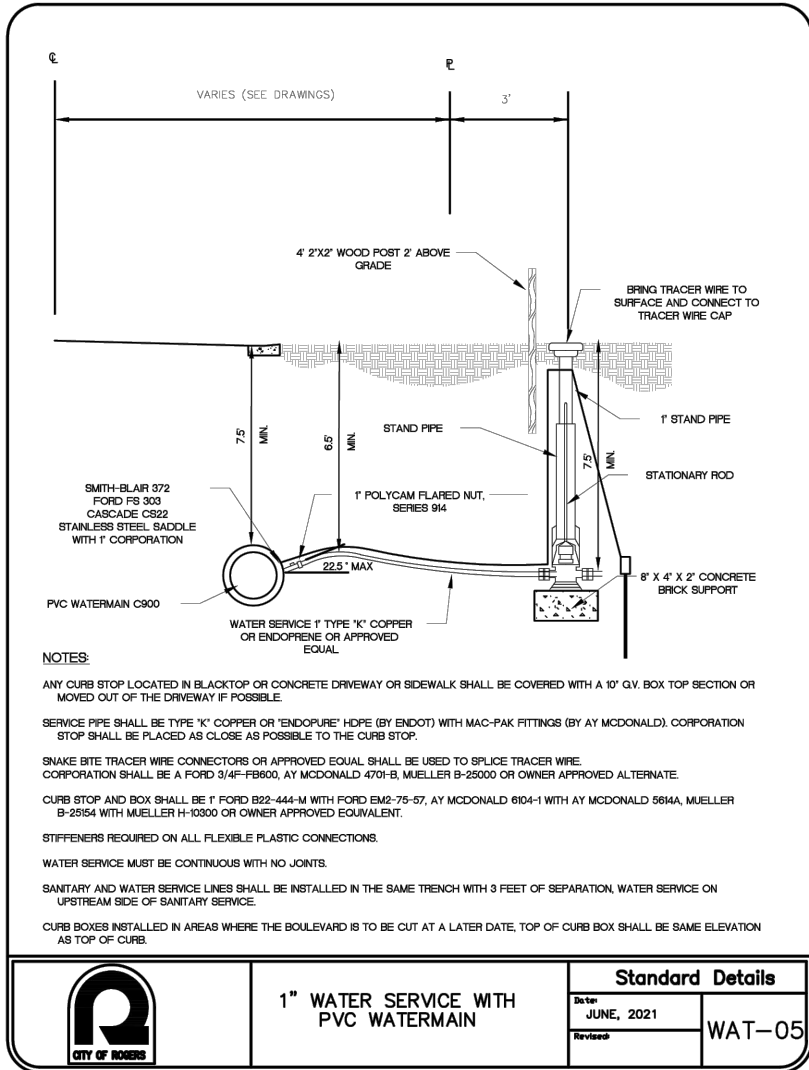
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14 OF 28

DETAILS

PROJECT NUMBER: 0033874.00

DATE: 11/15/24

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THOMAS D. DESUTTER
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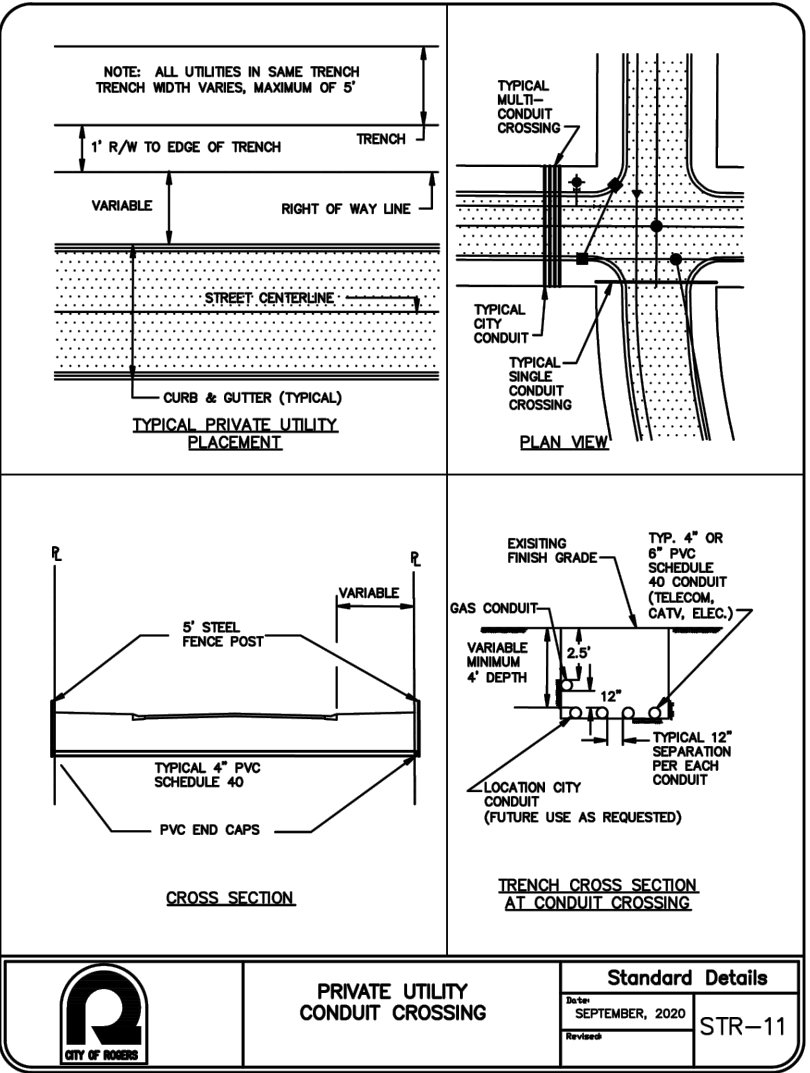
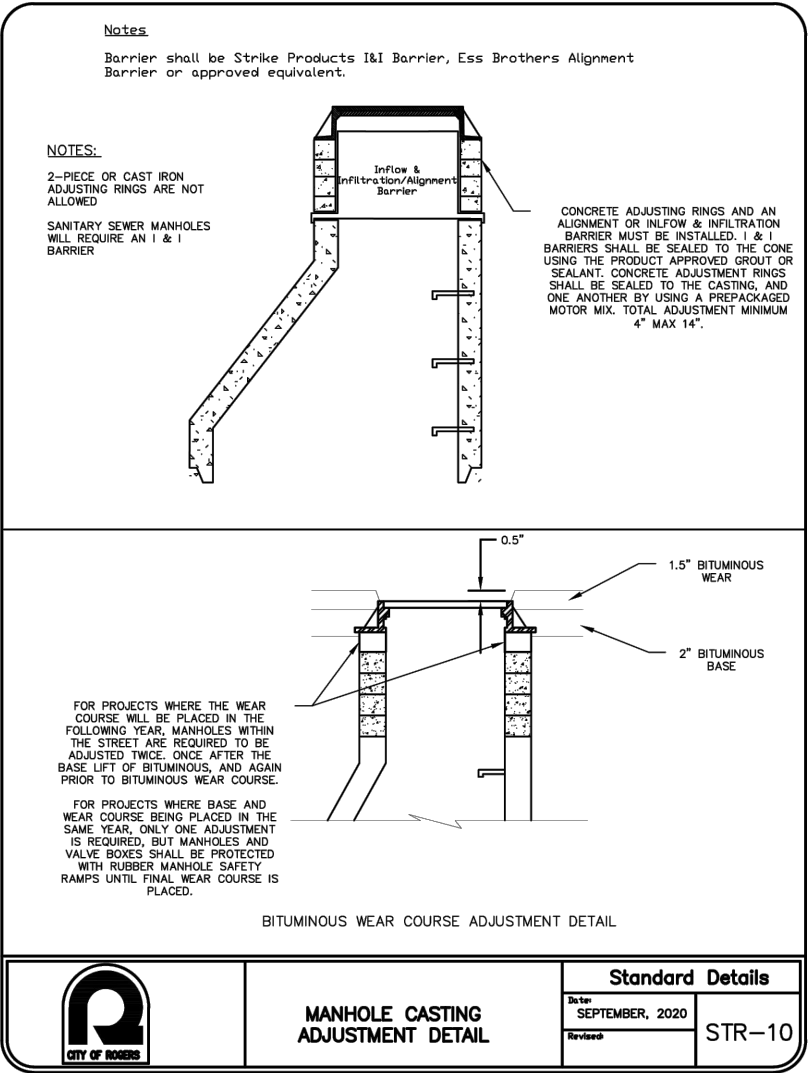
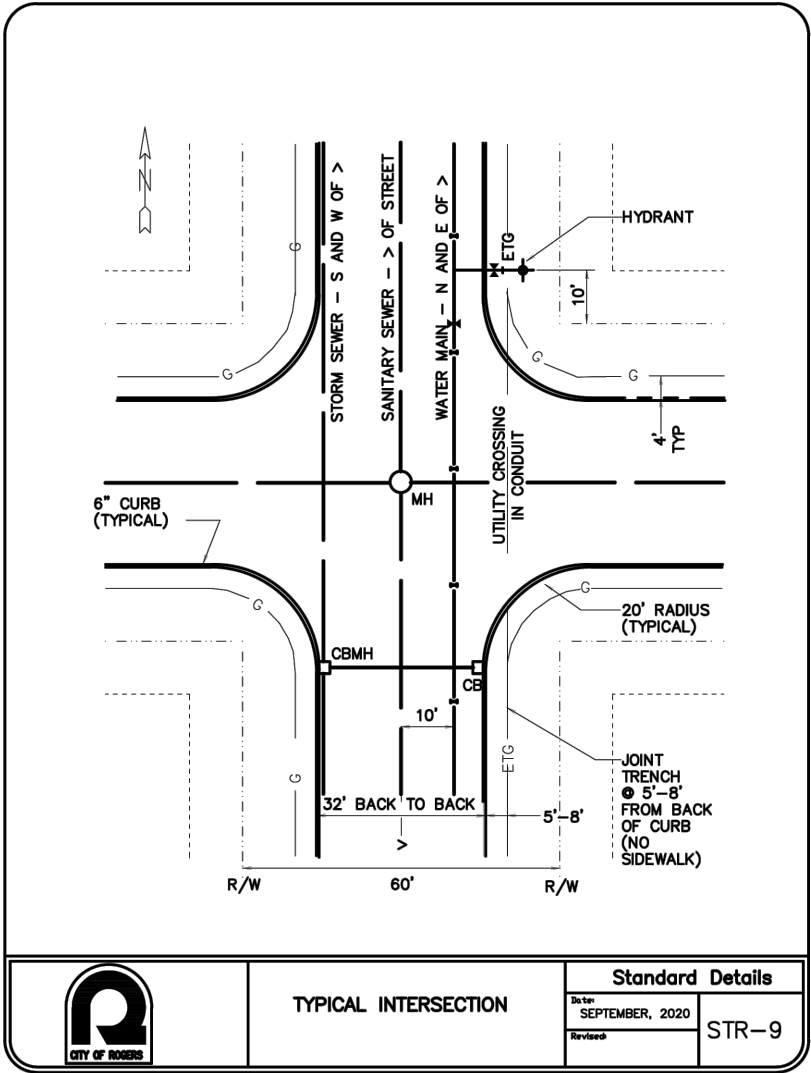
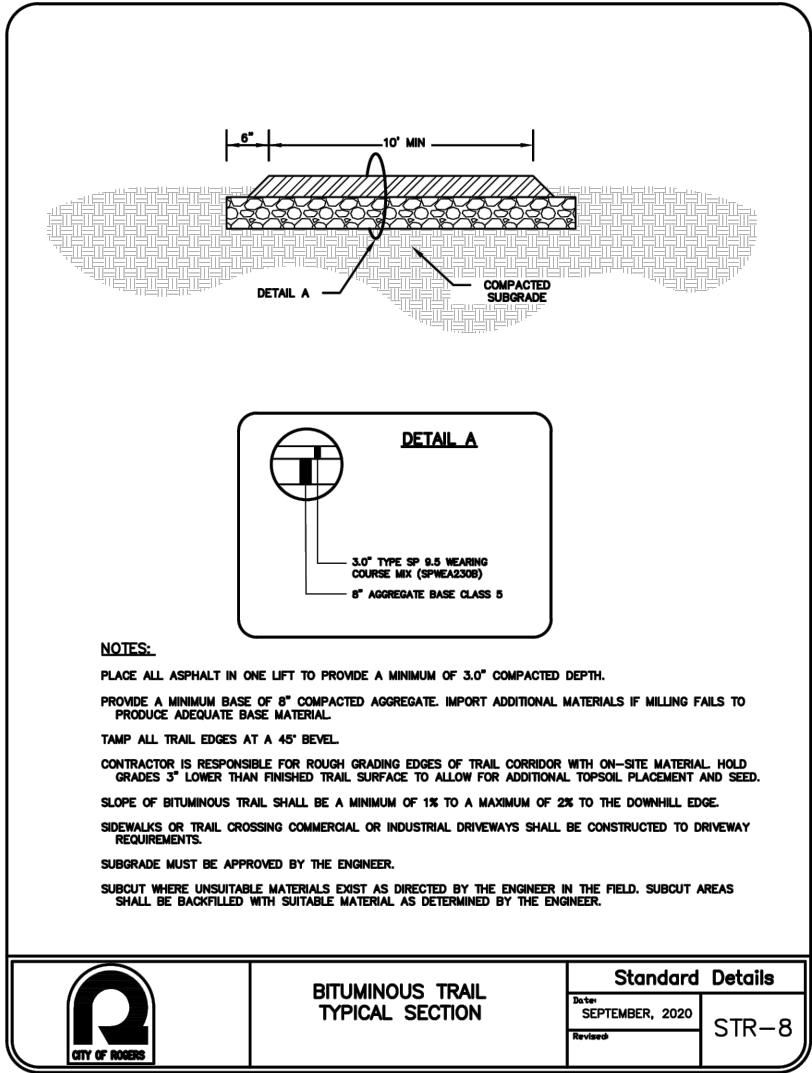
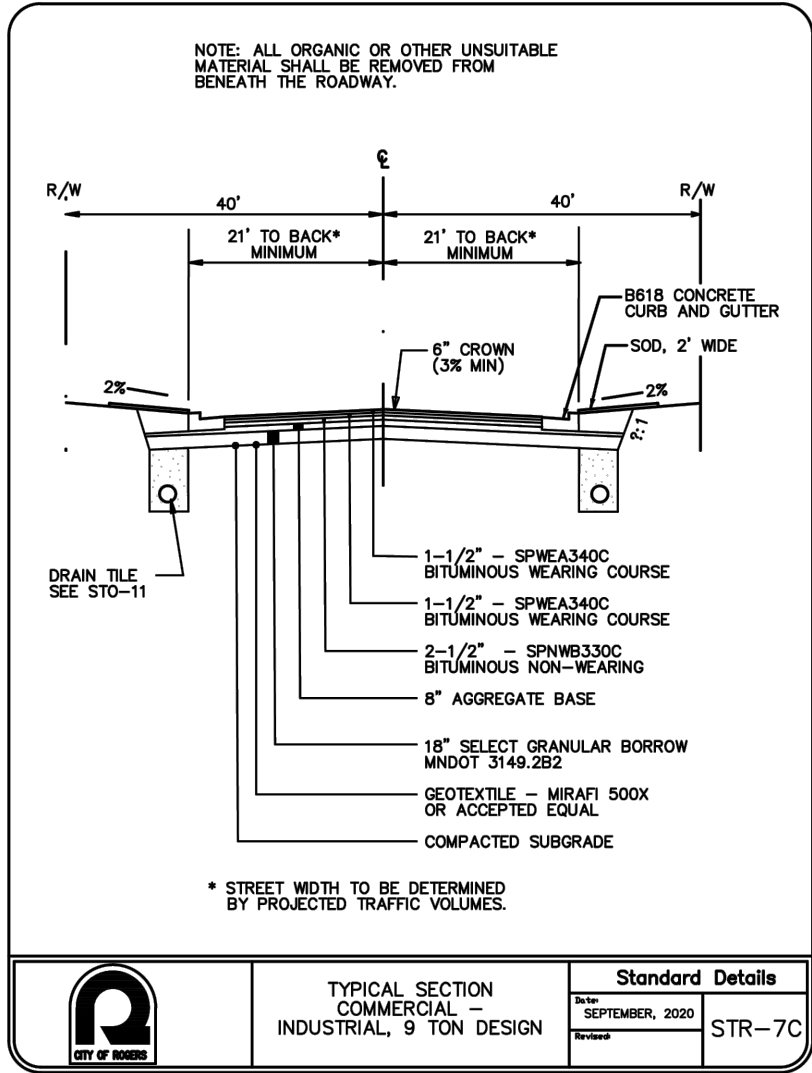
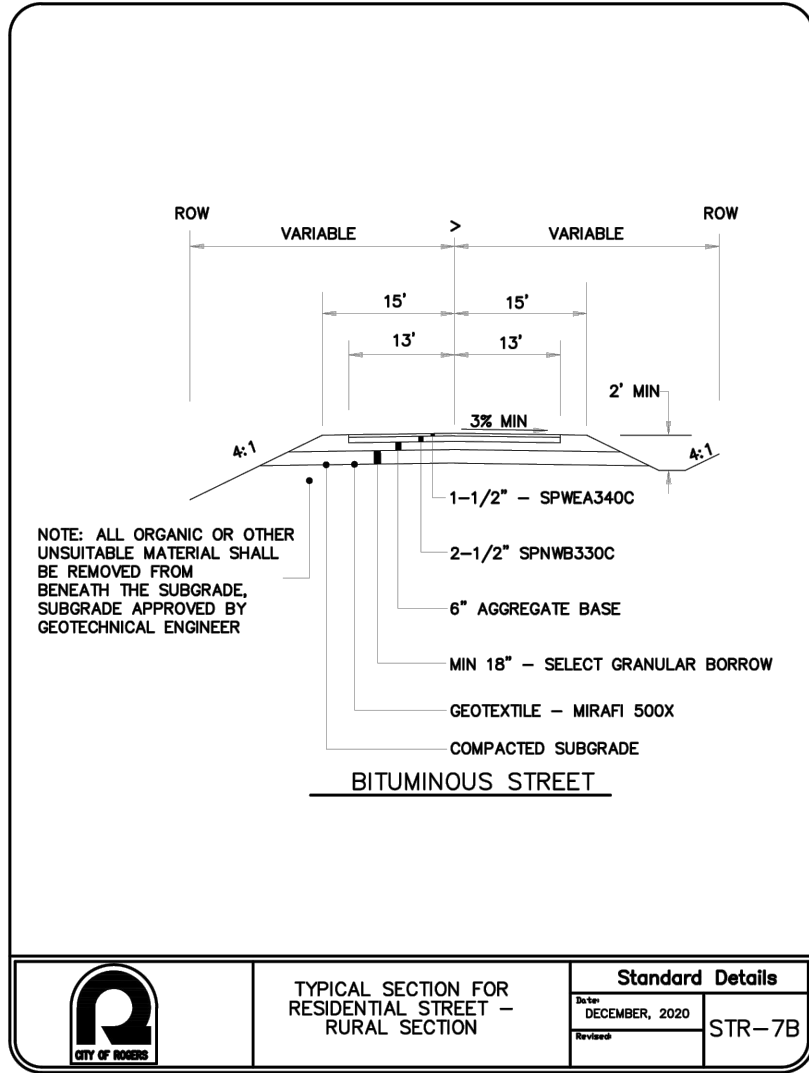
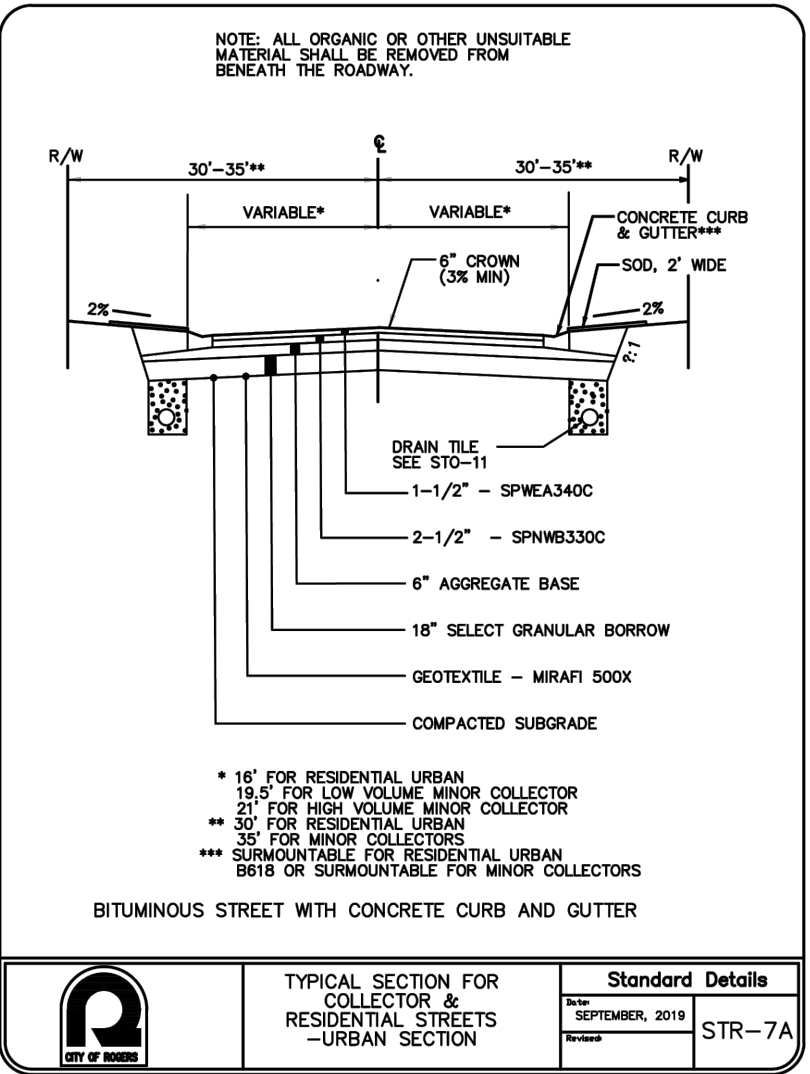
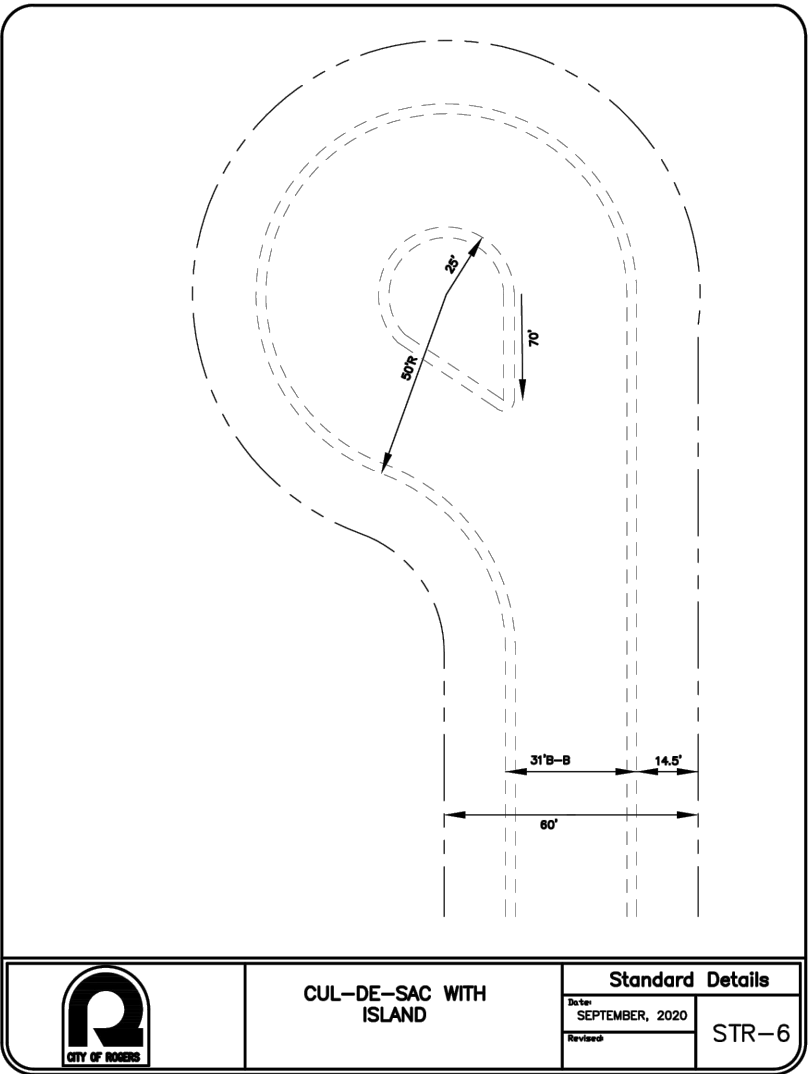
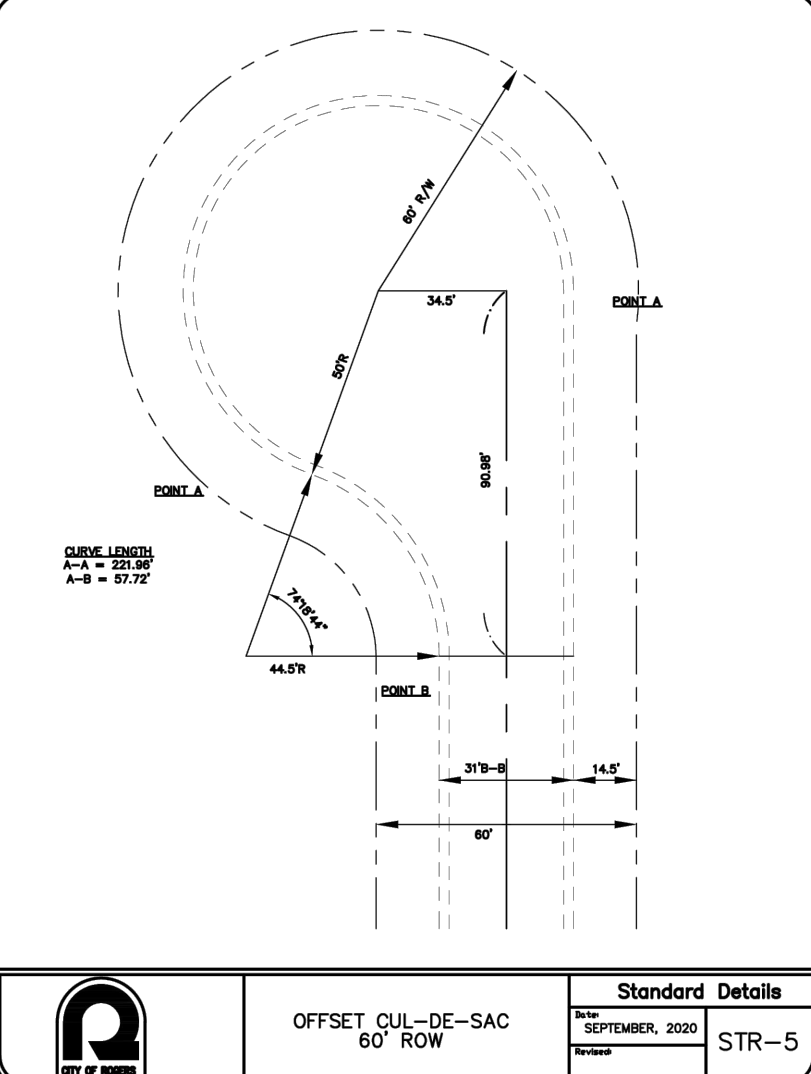
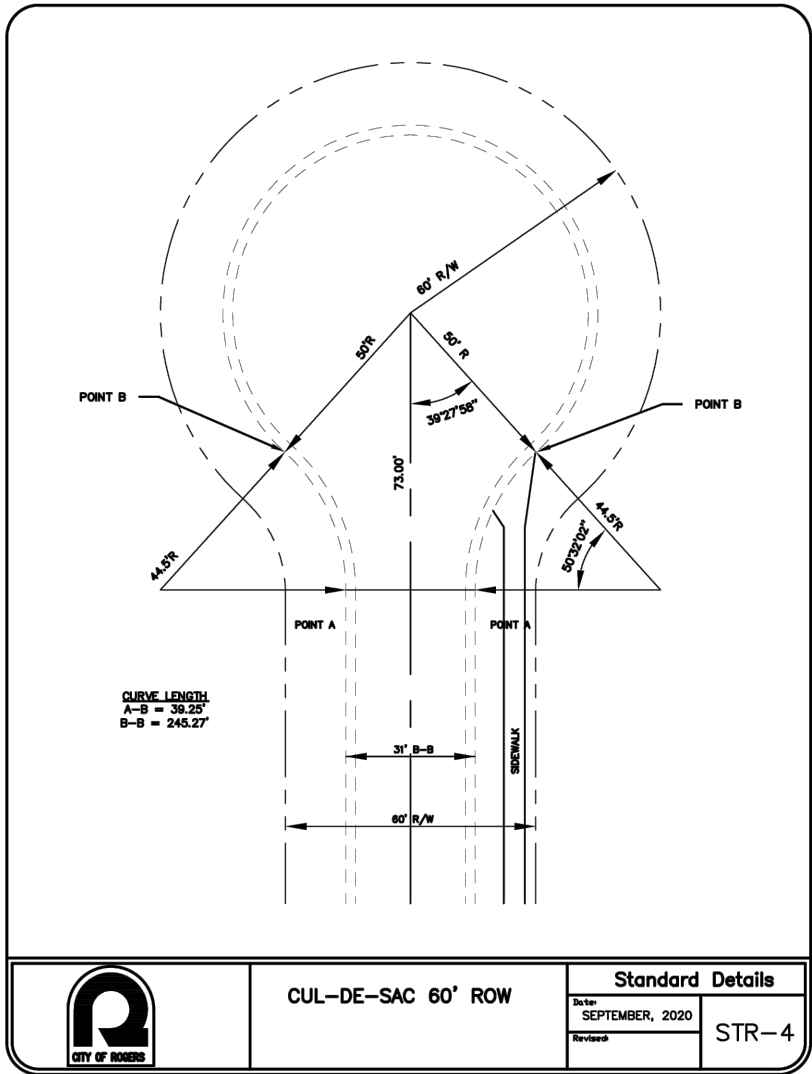
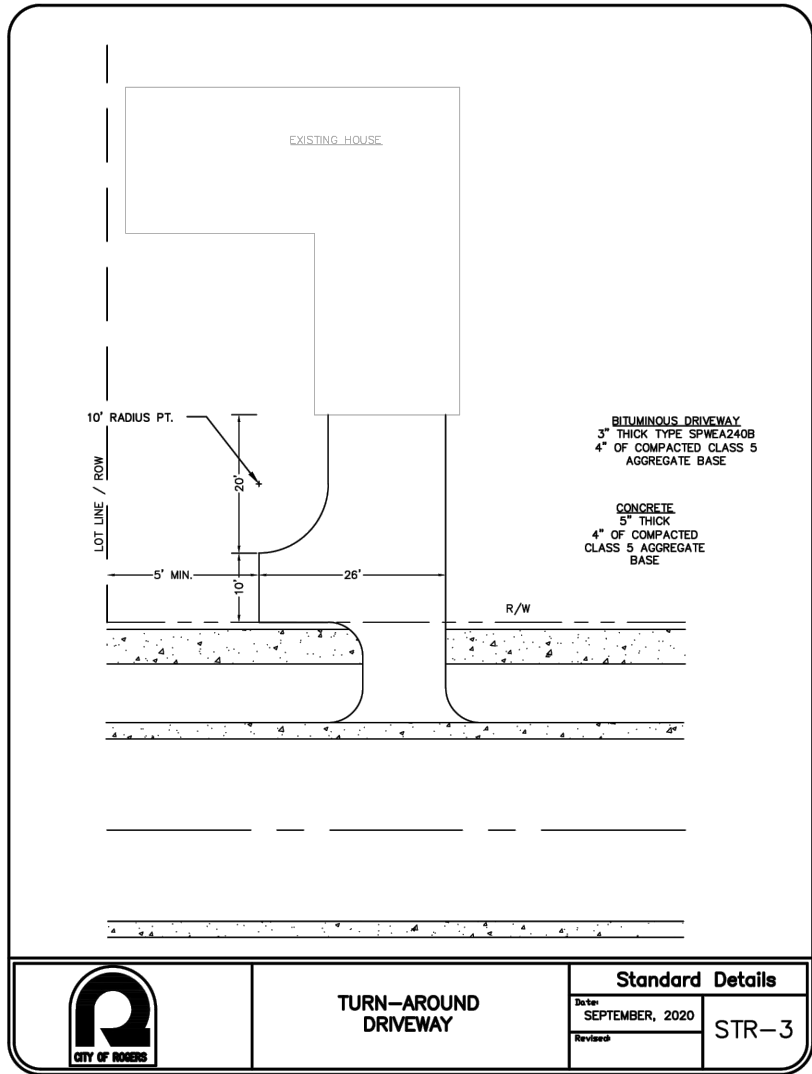
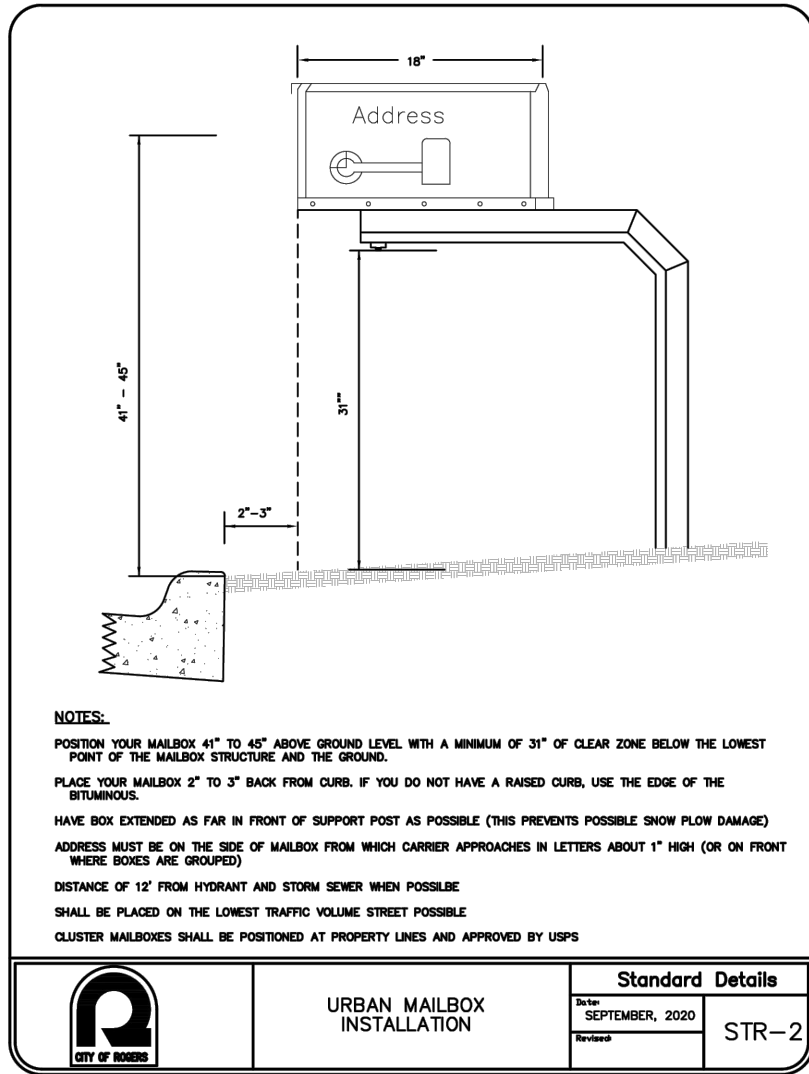
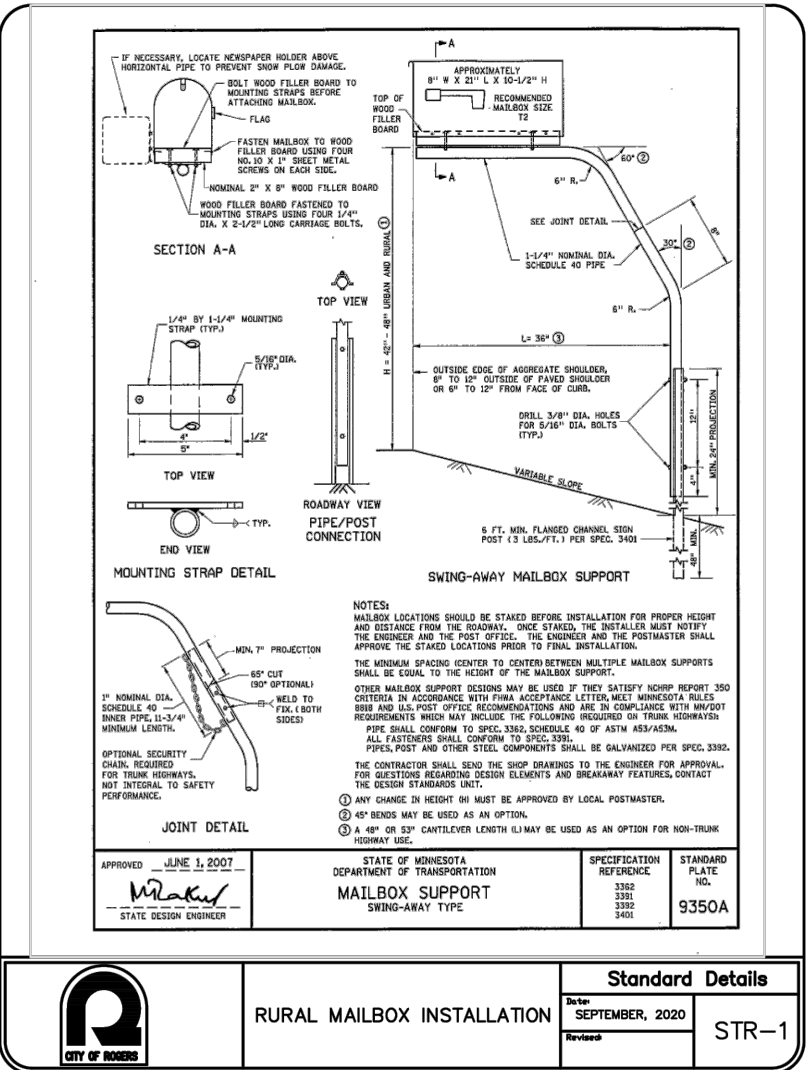
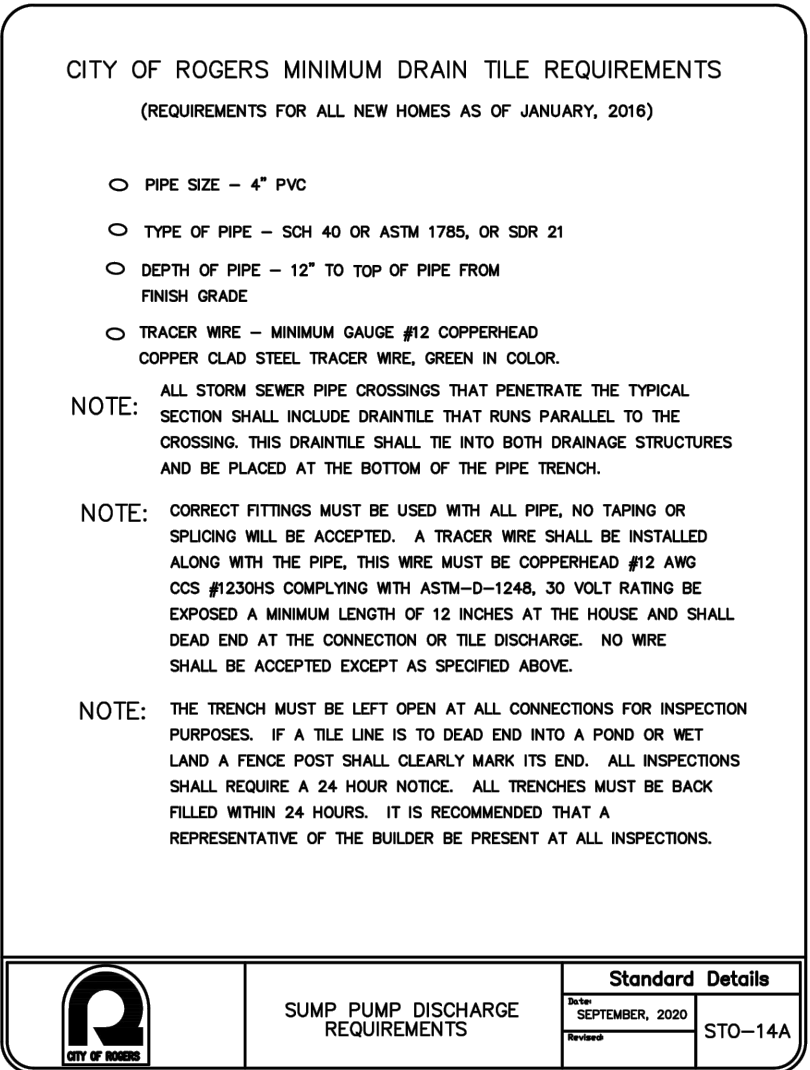
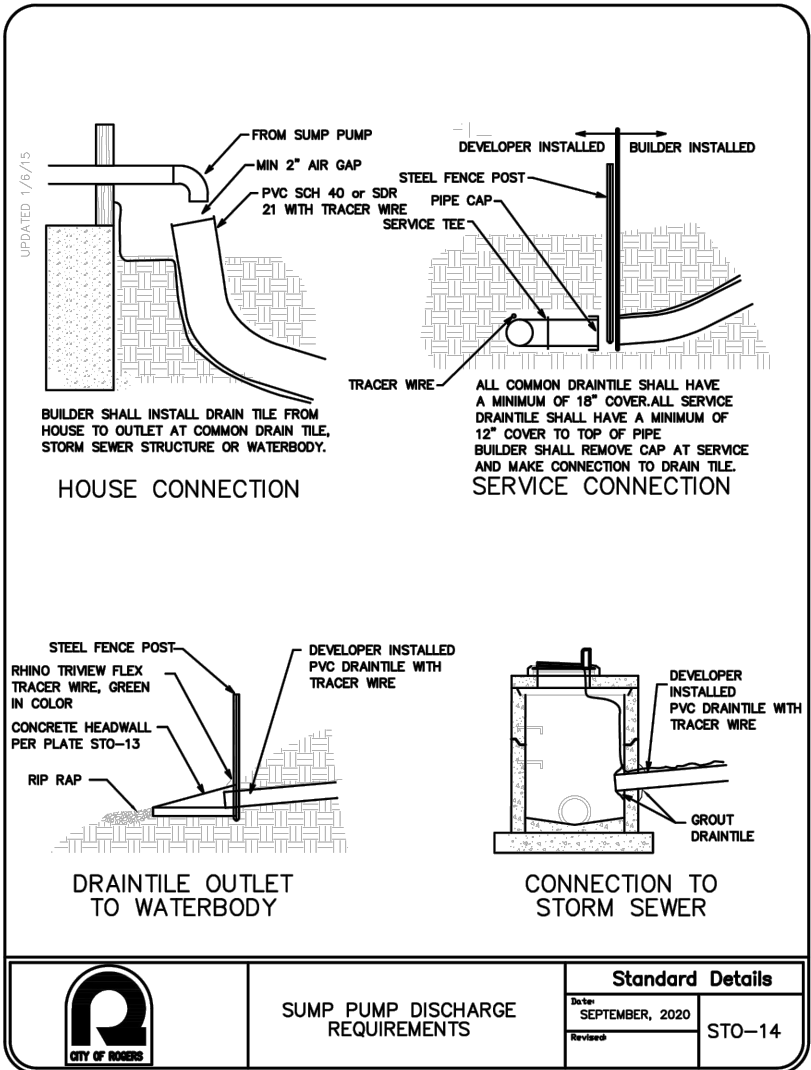
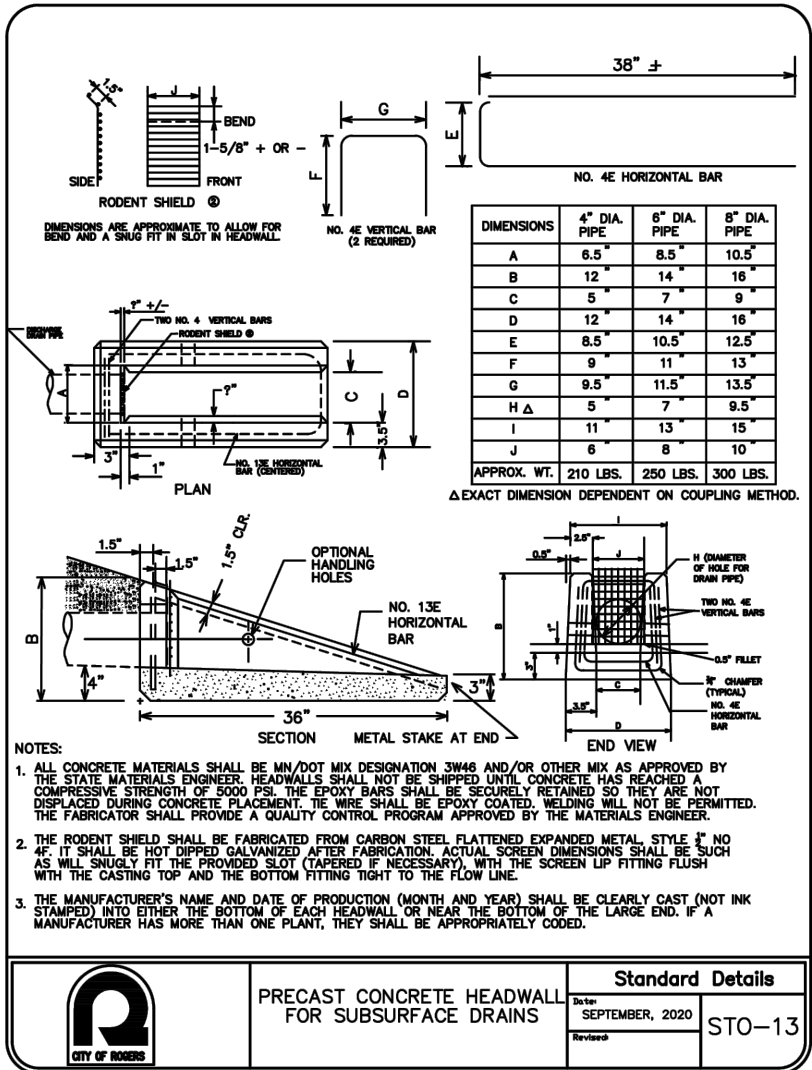
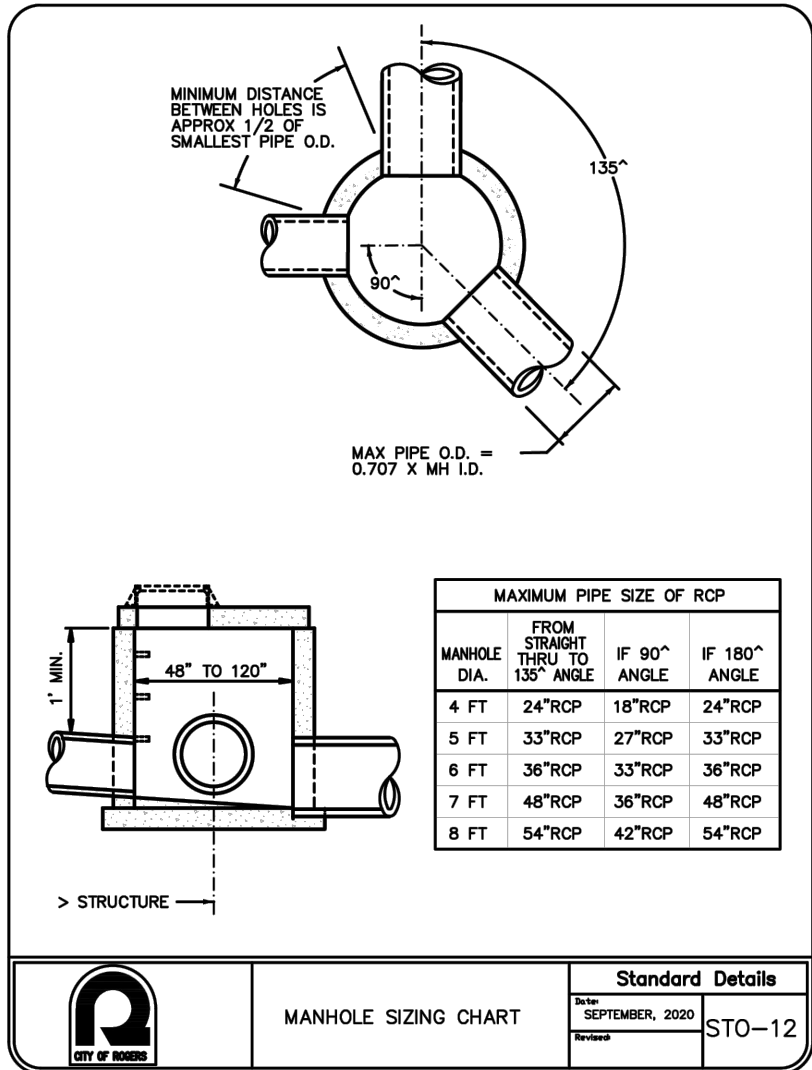
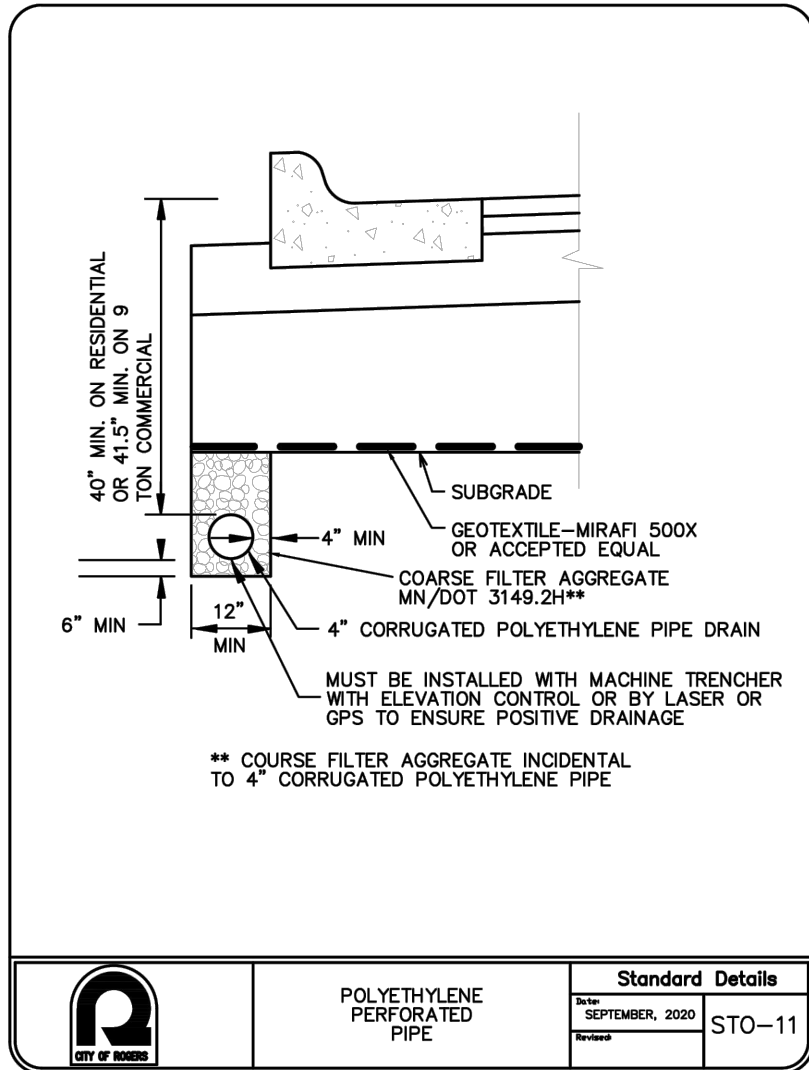
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OF

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PROJECT NUMBER: 0033874.00

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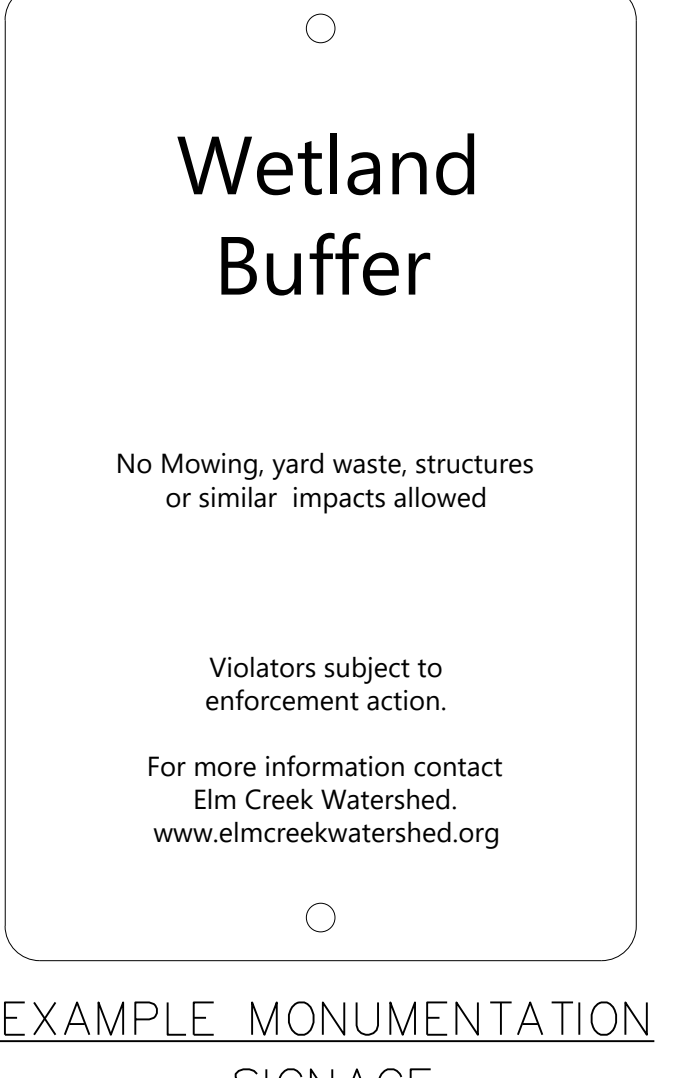
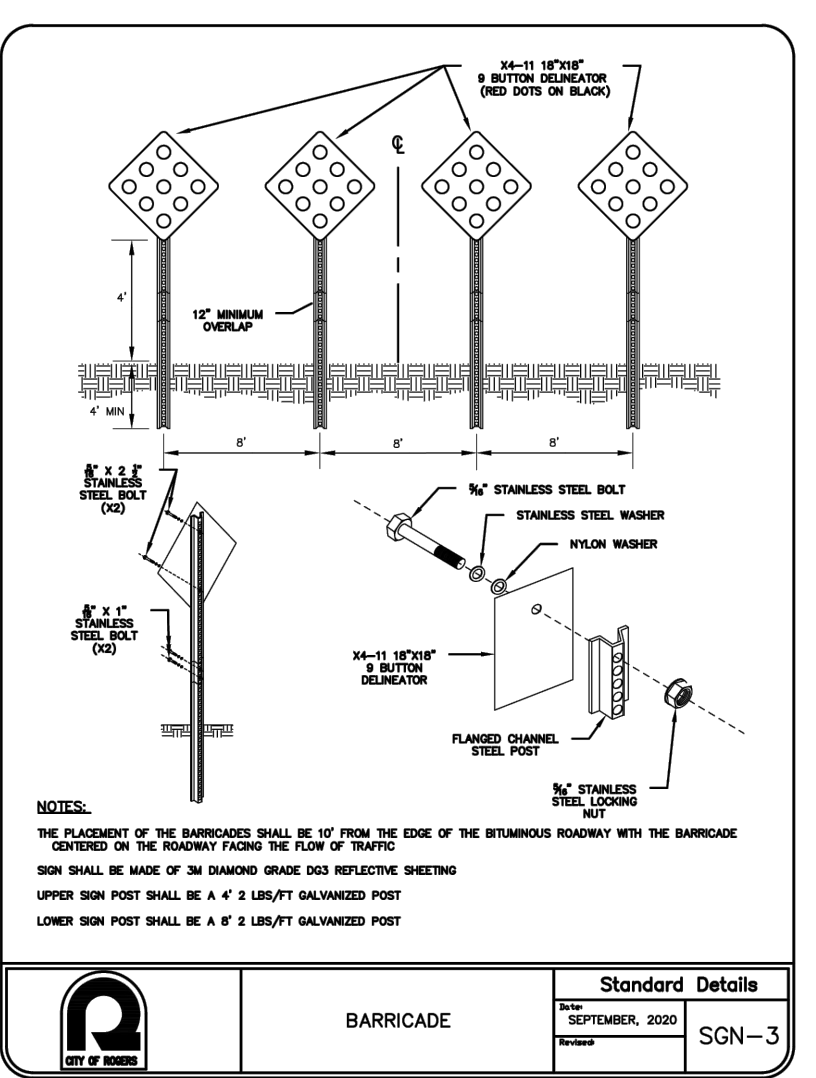
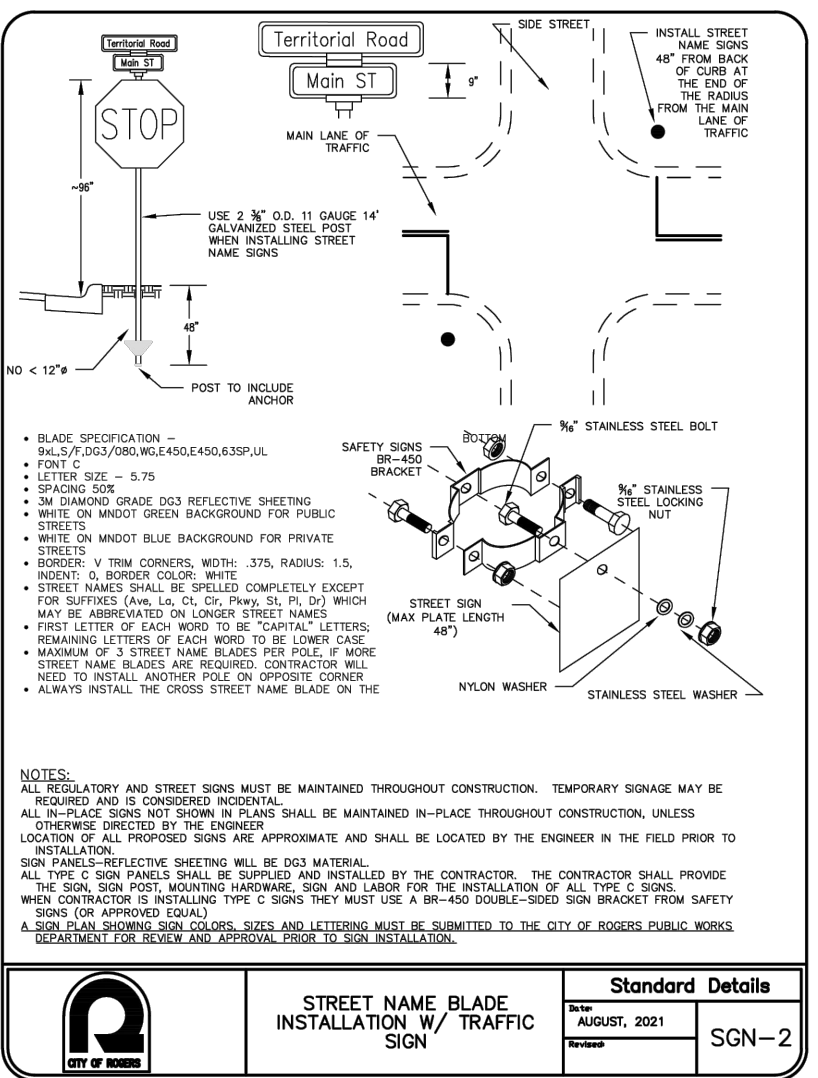
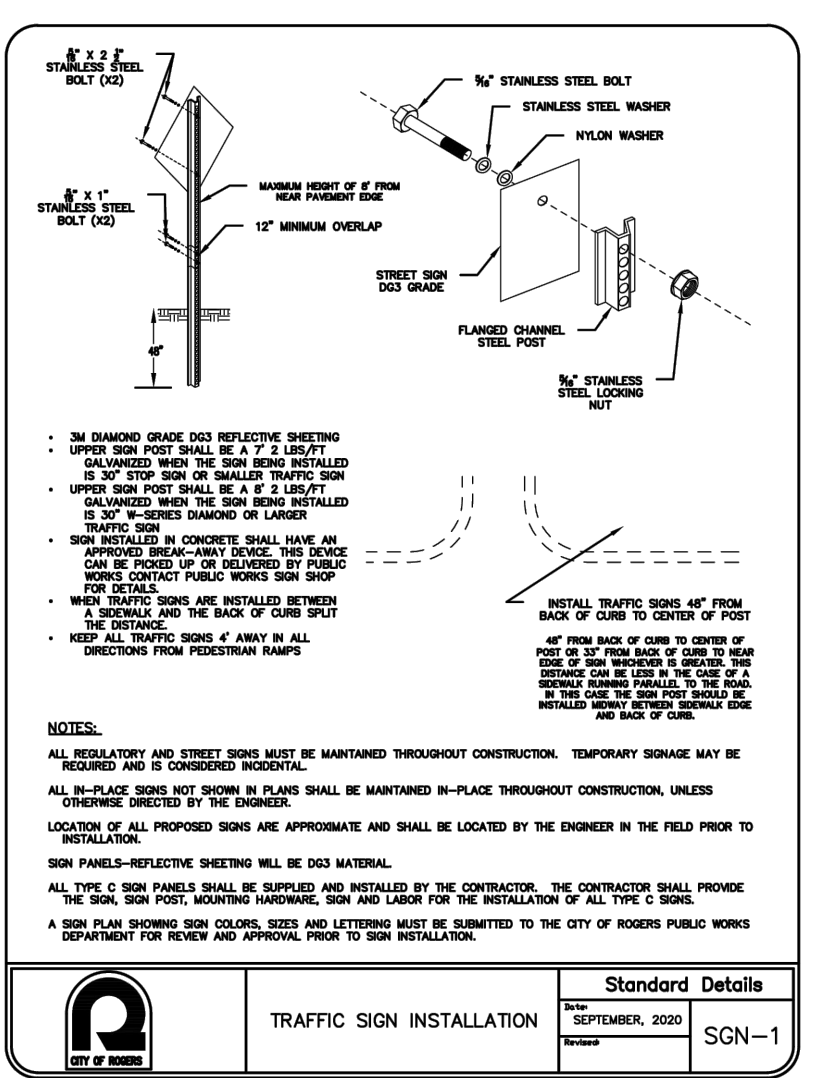
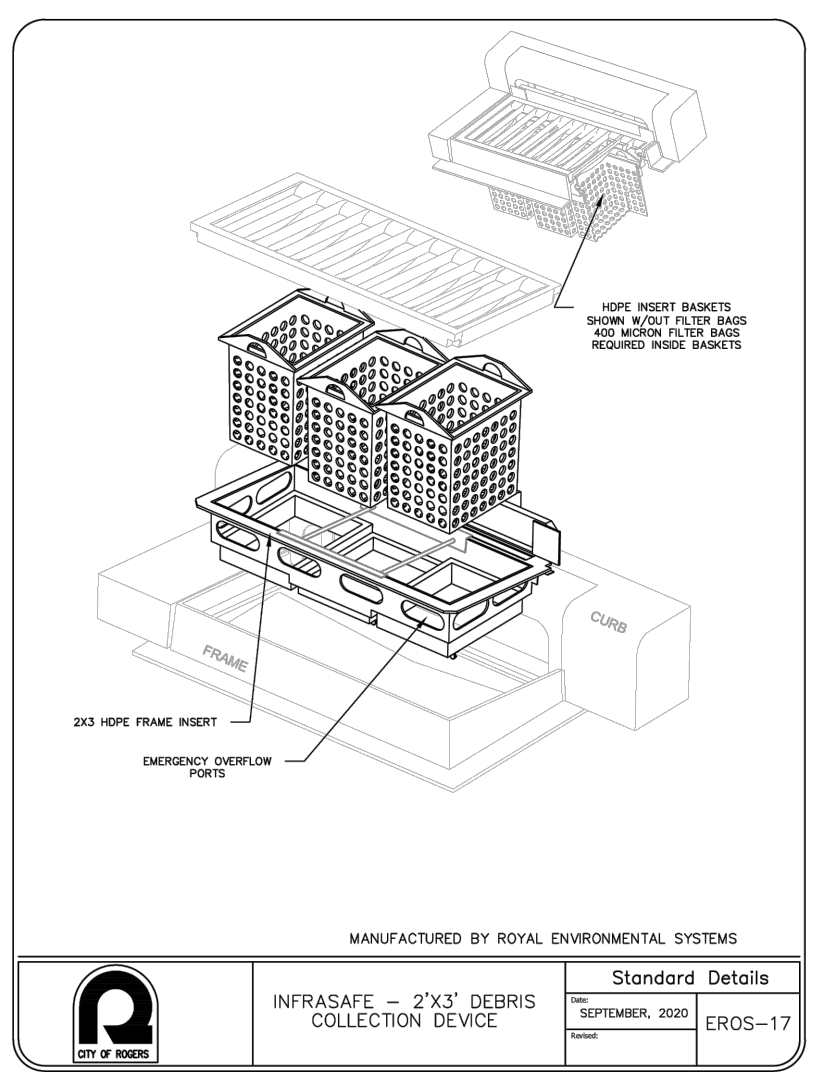
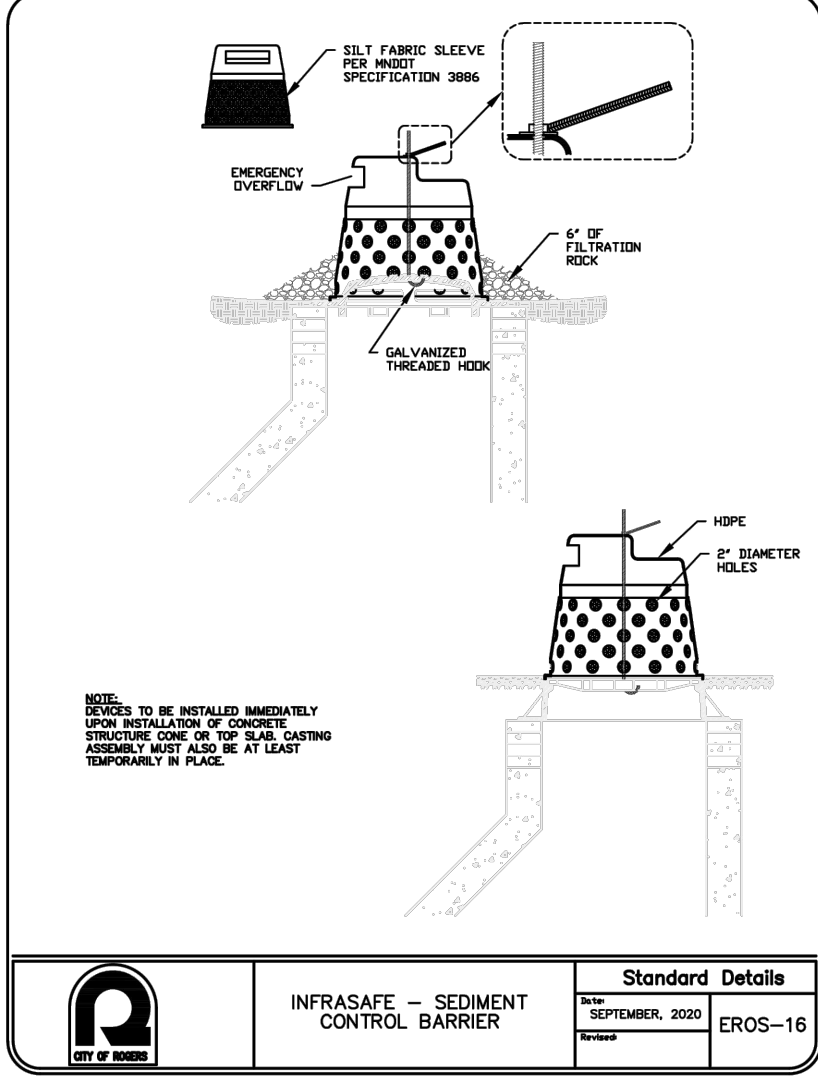
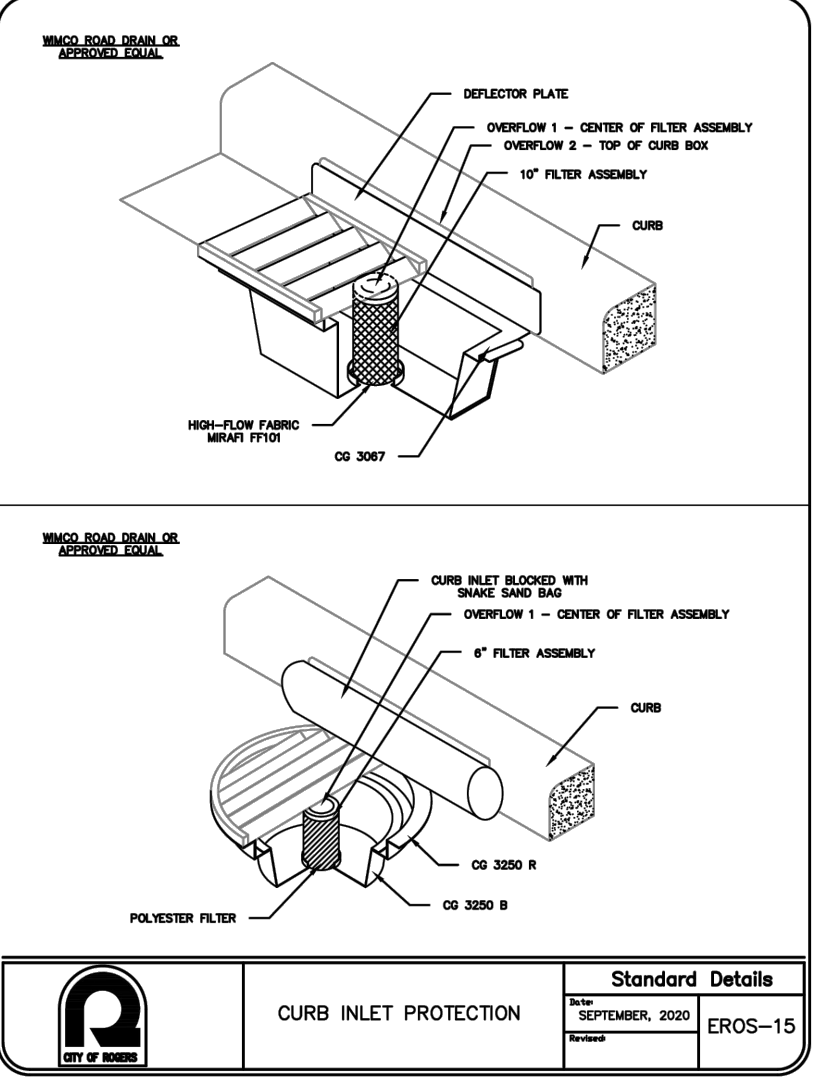
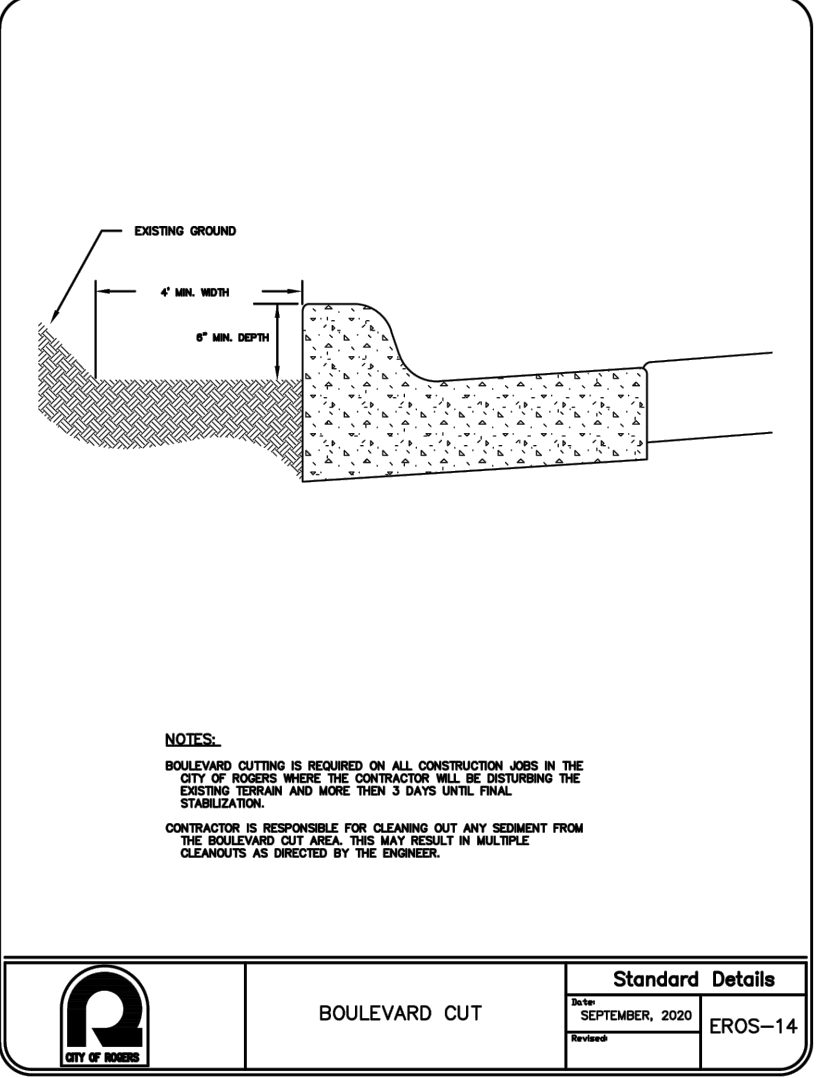
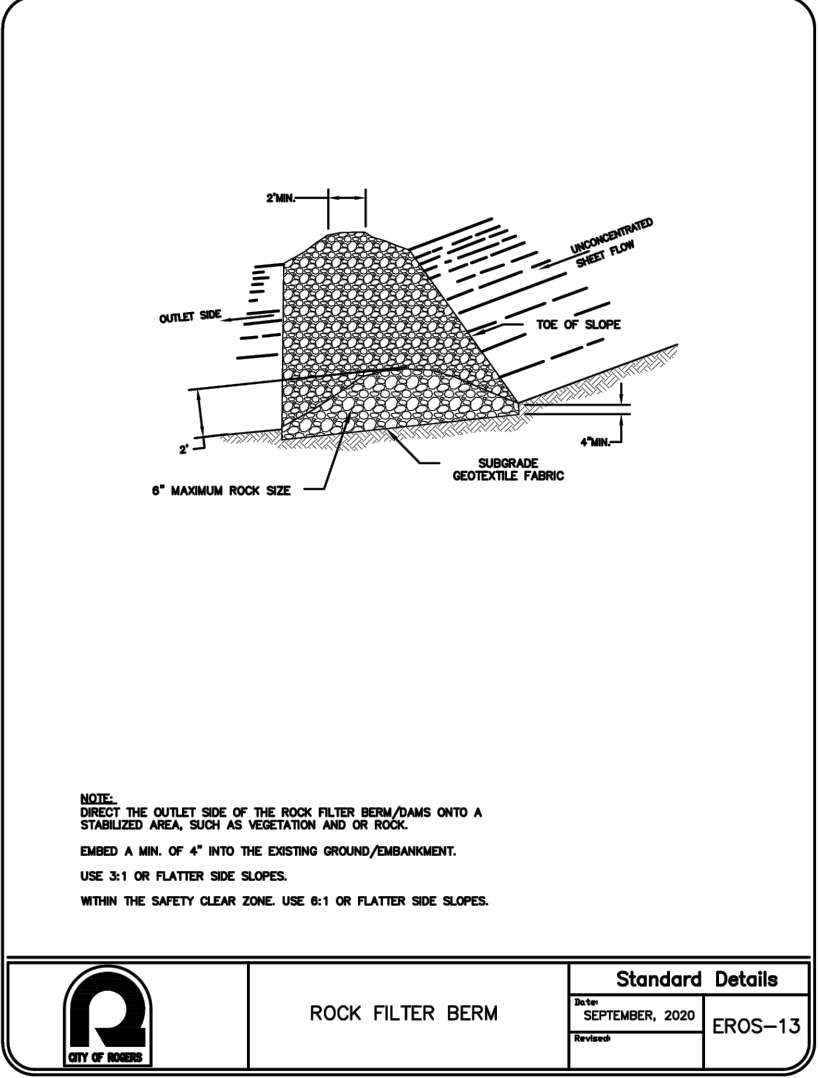
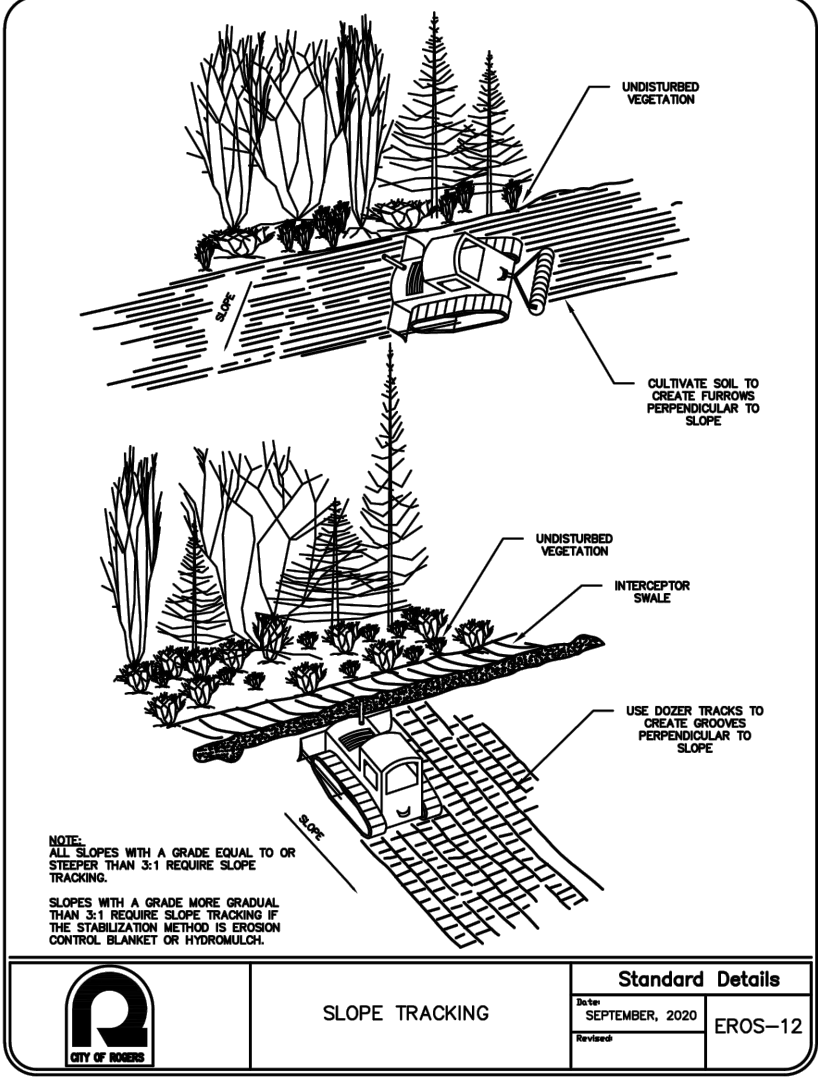
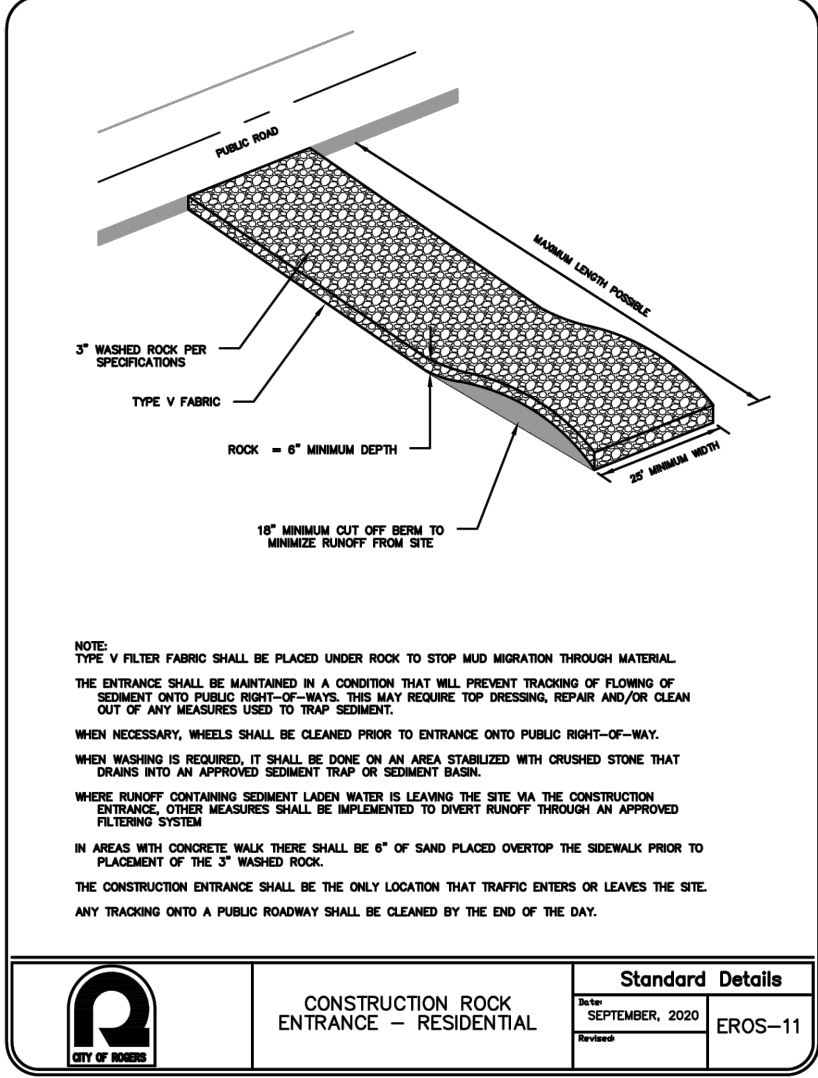
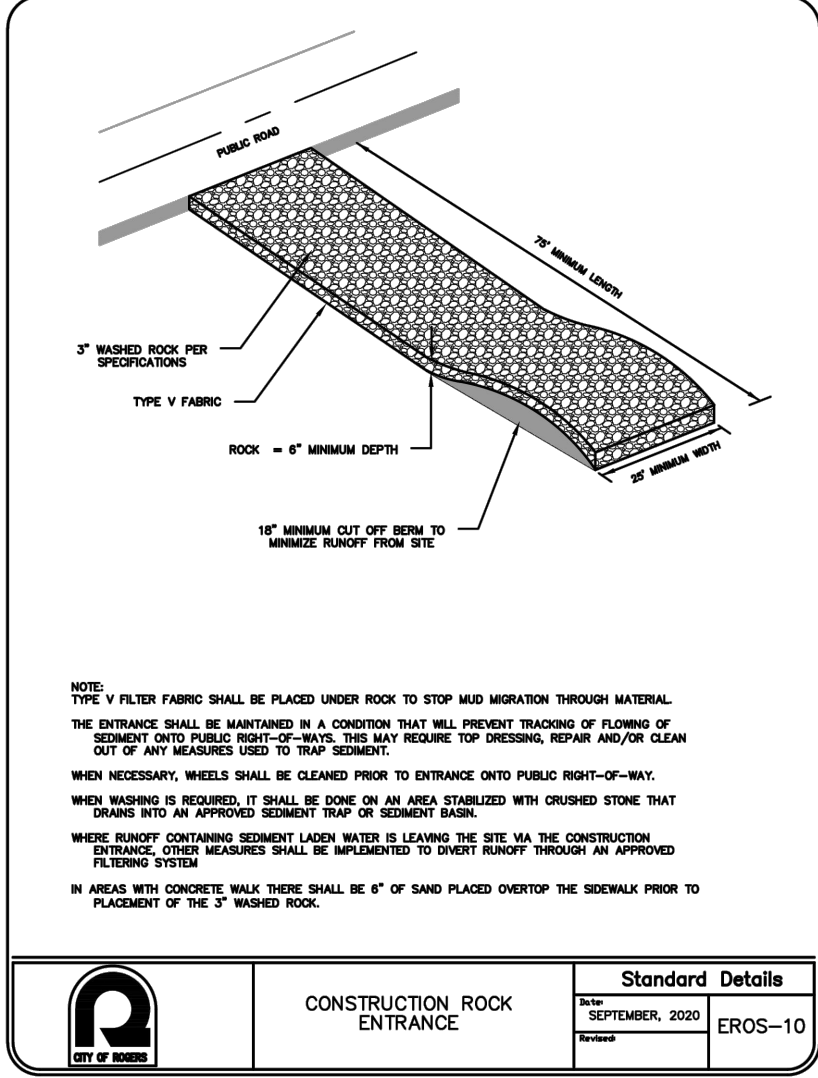
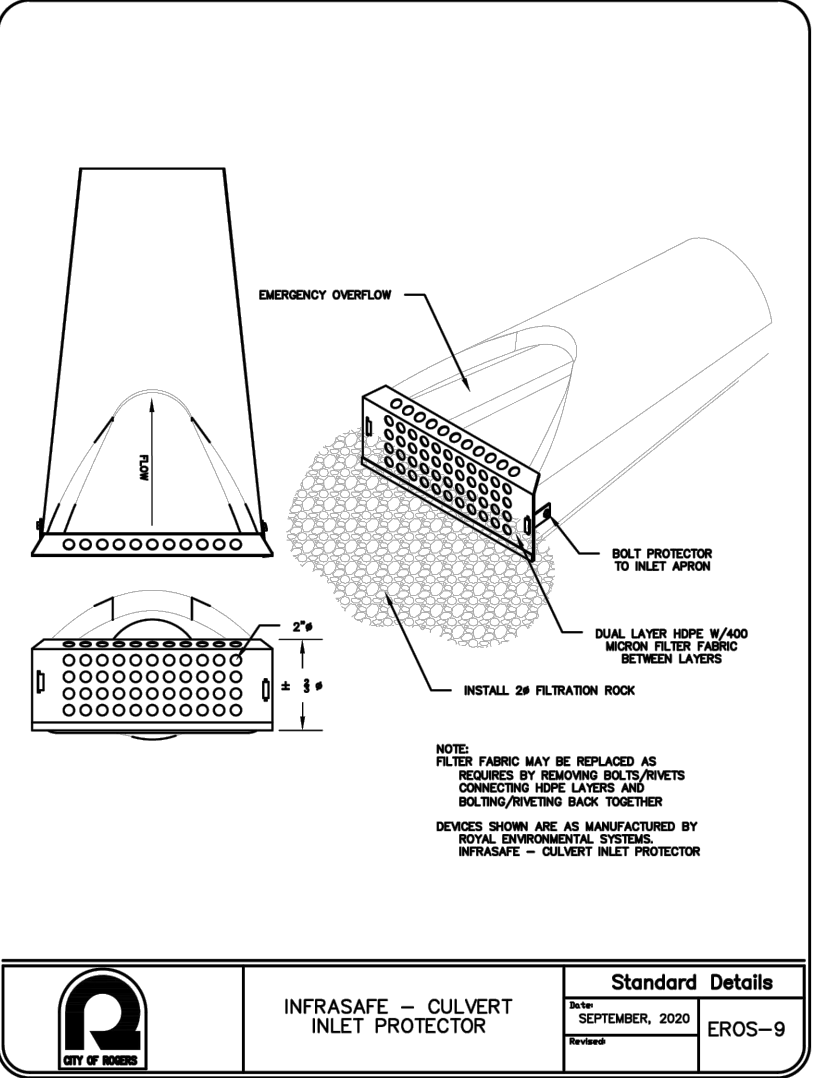
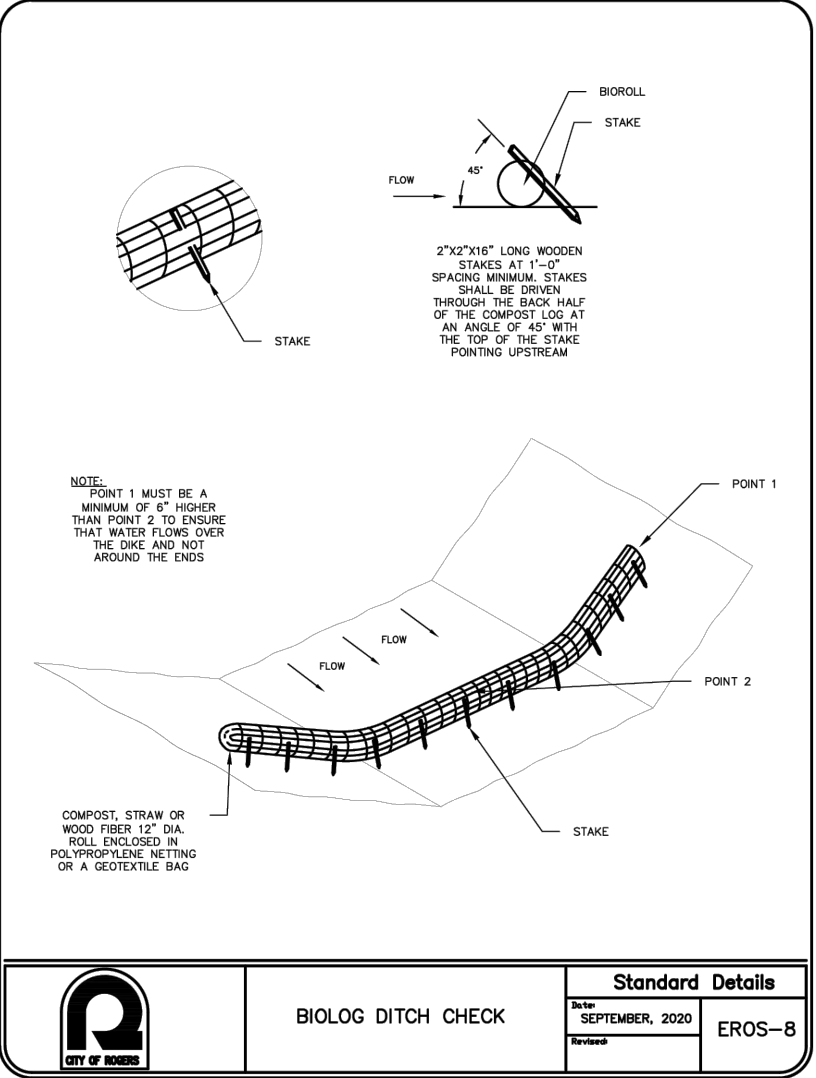
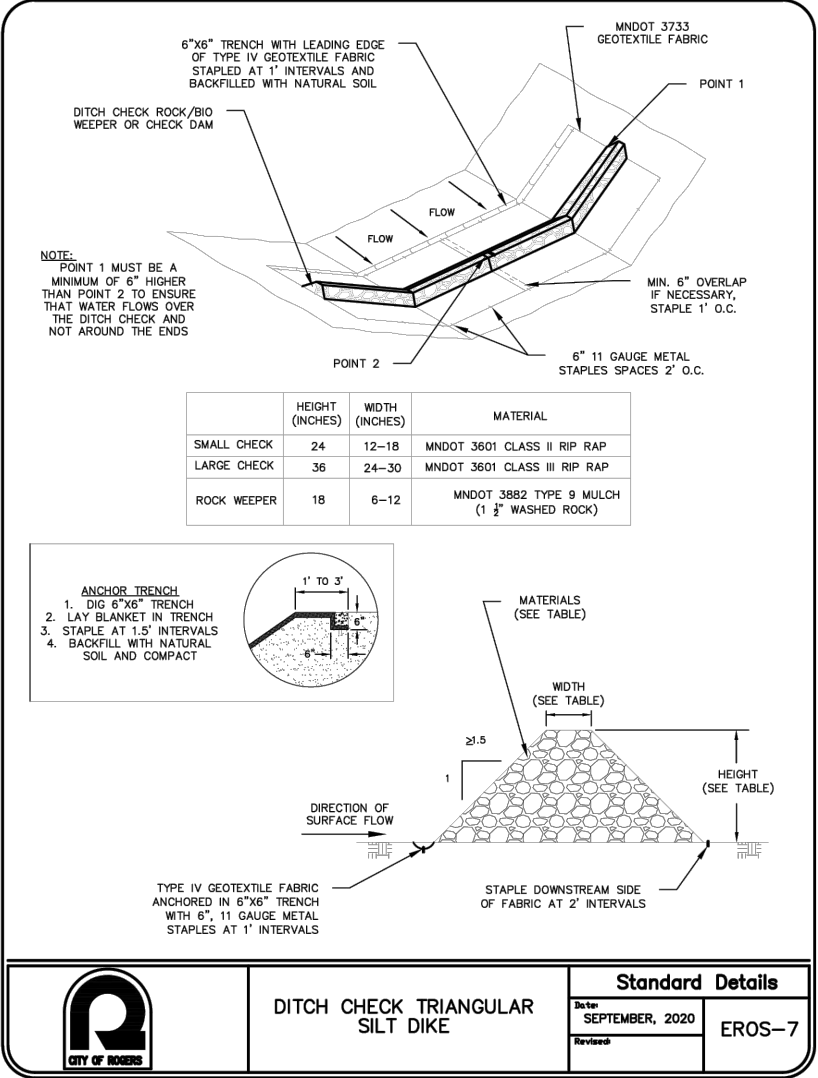
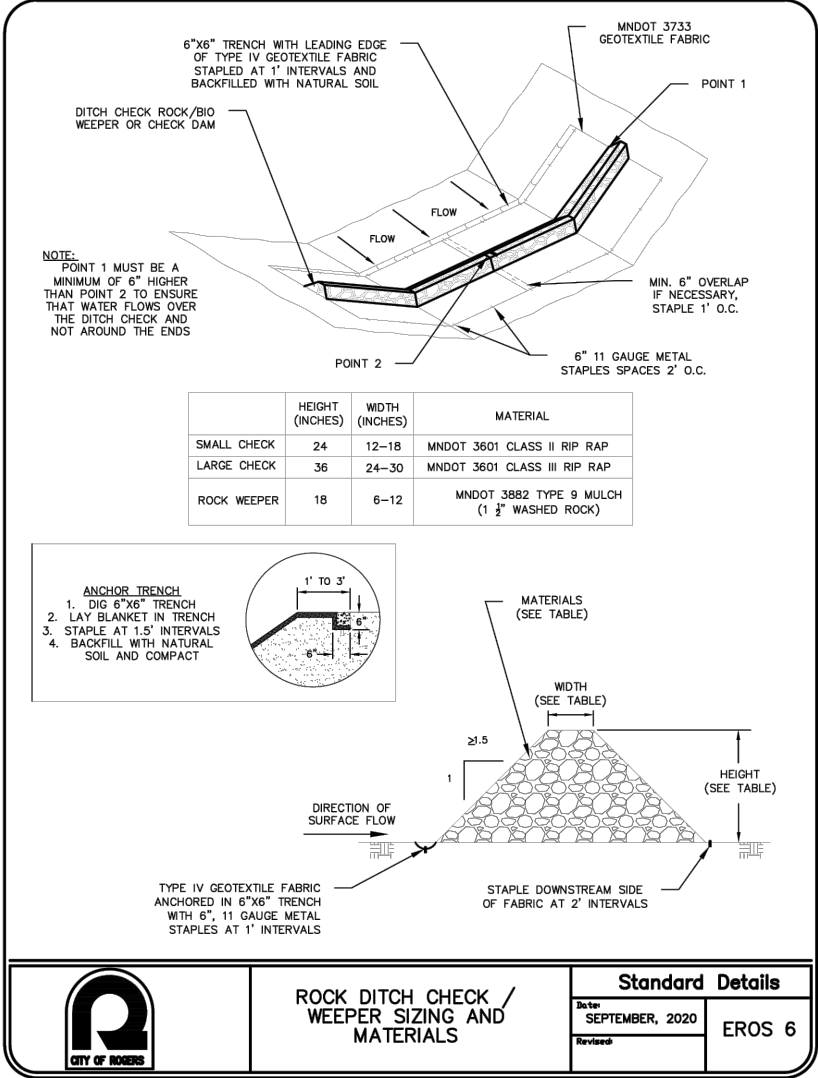
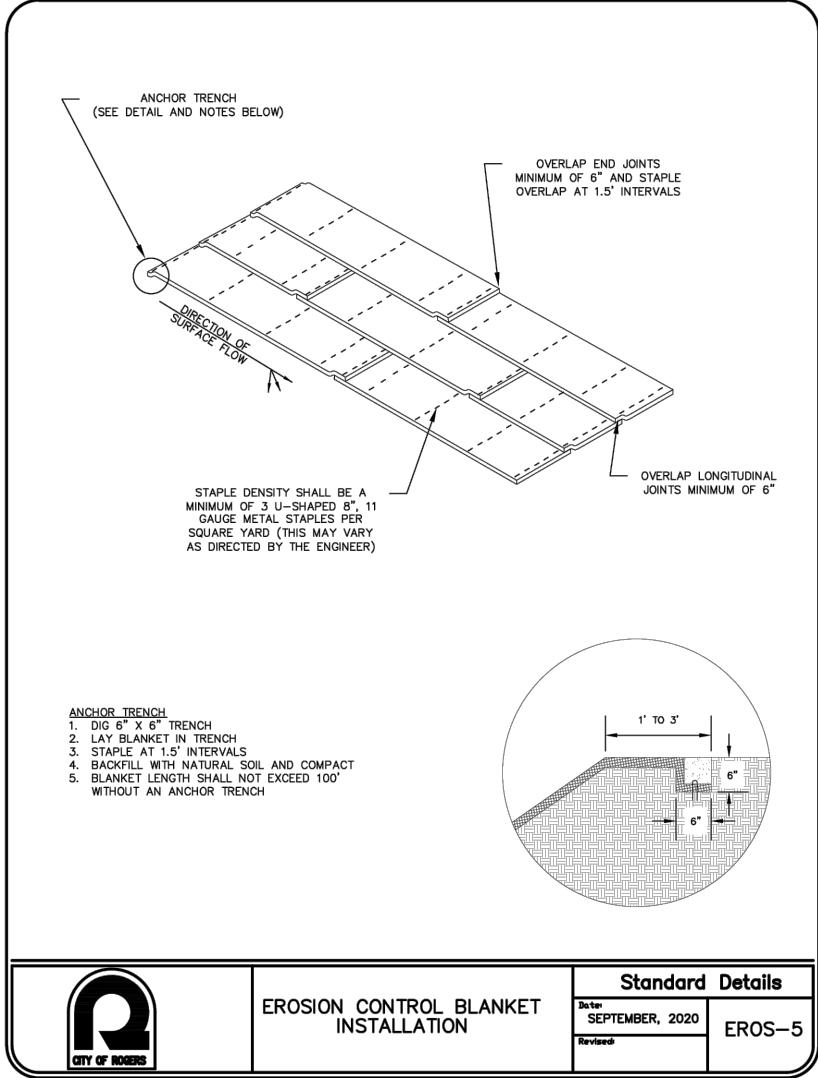
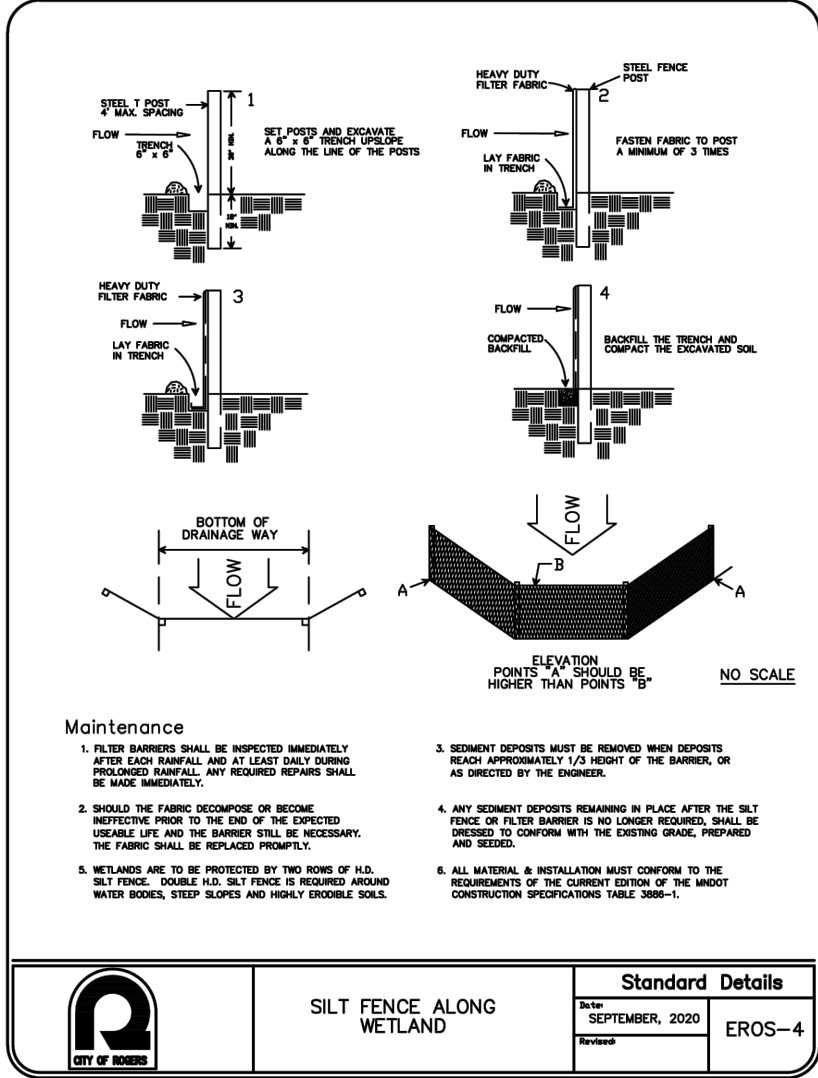
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REVISIONS:	

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LAKEVILLE, MN 55044

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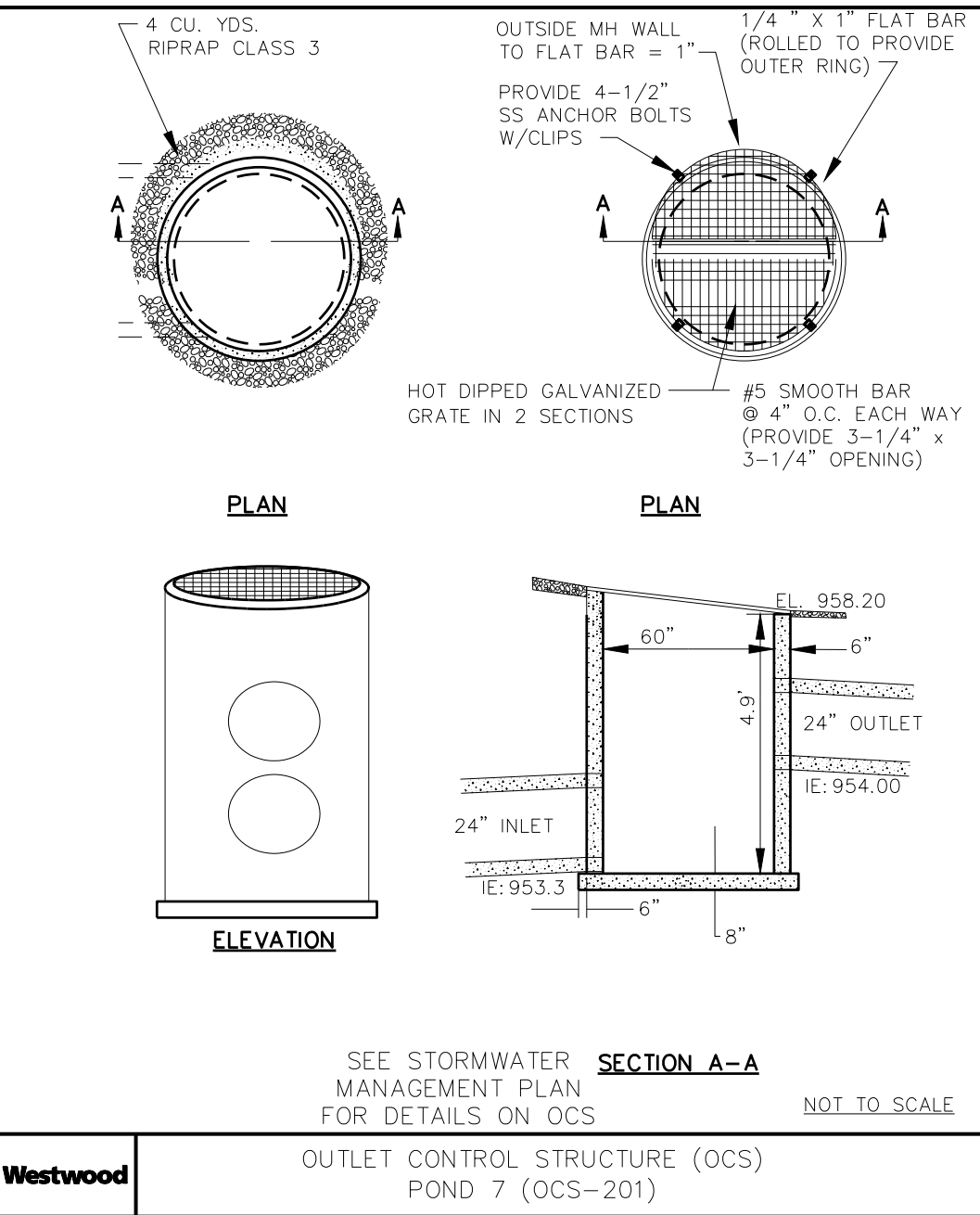
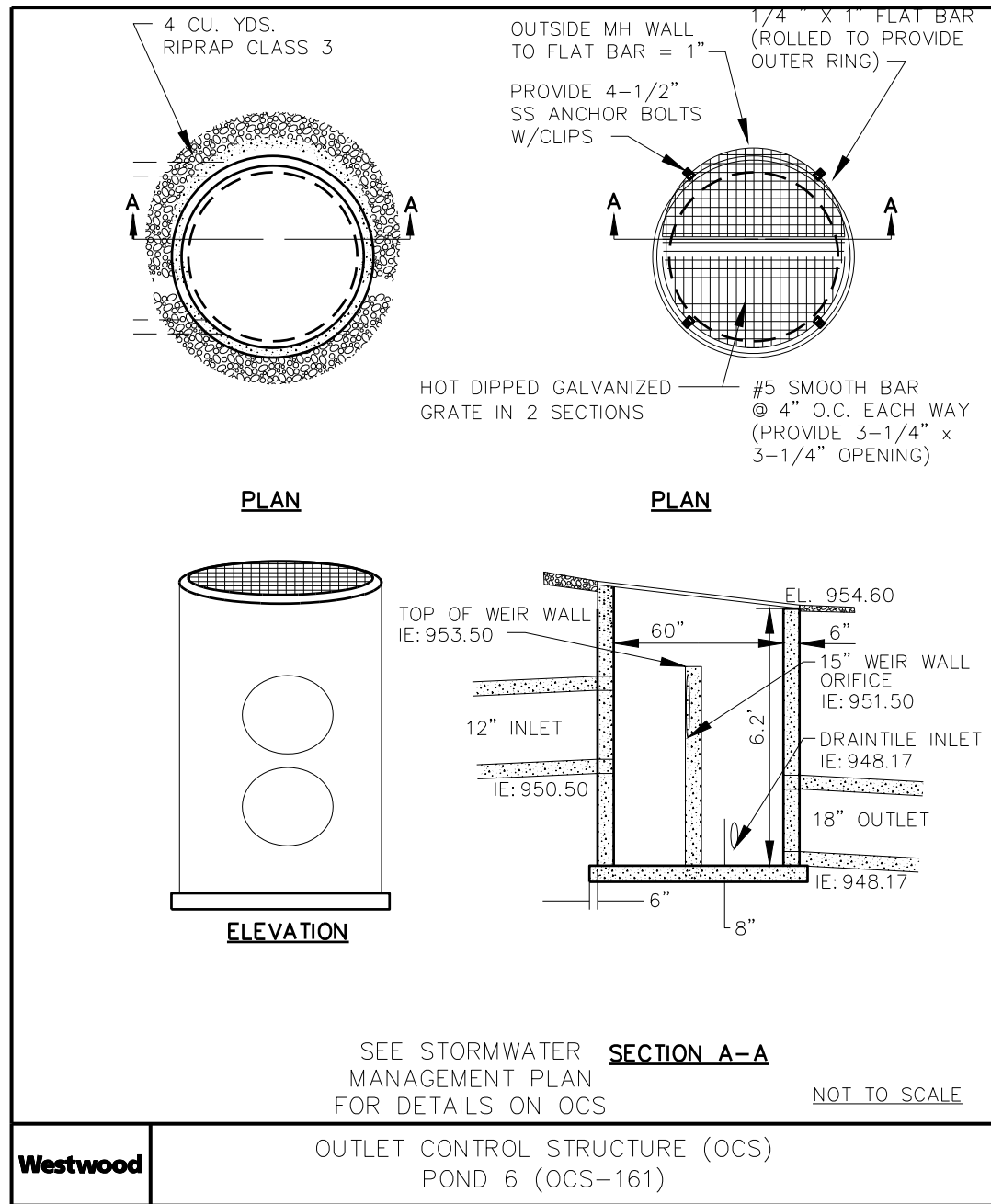
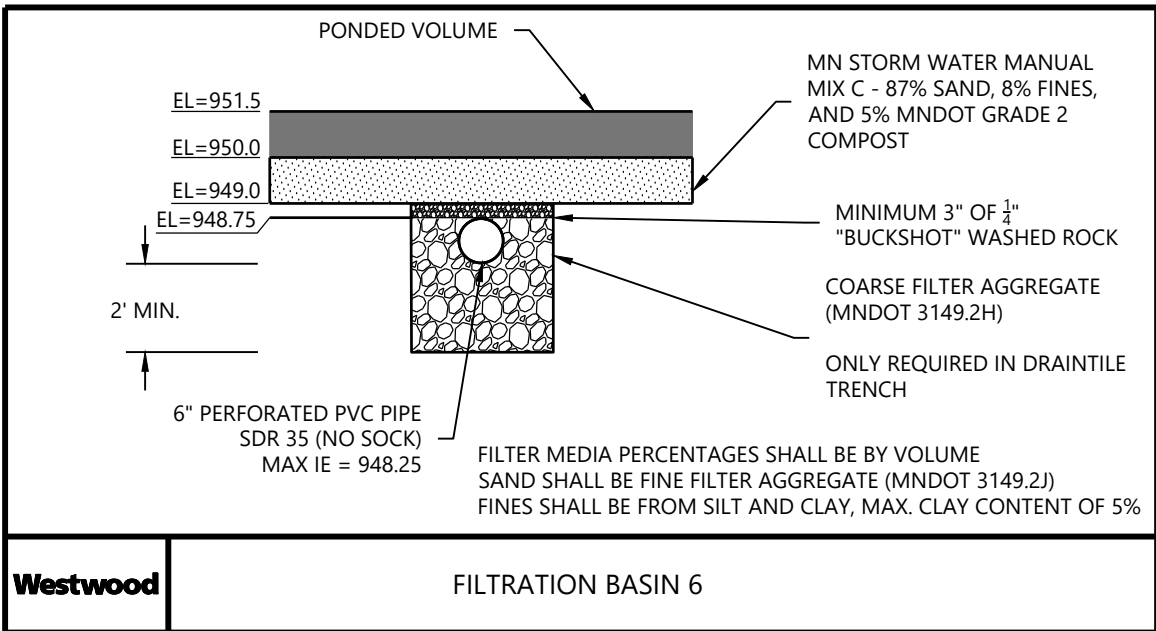
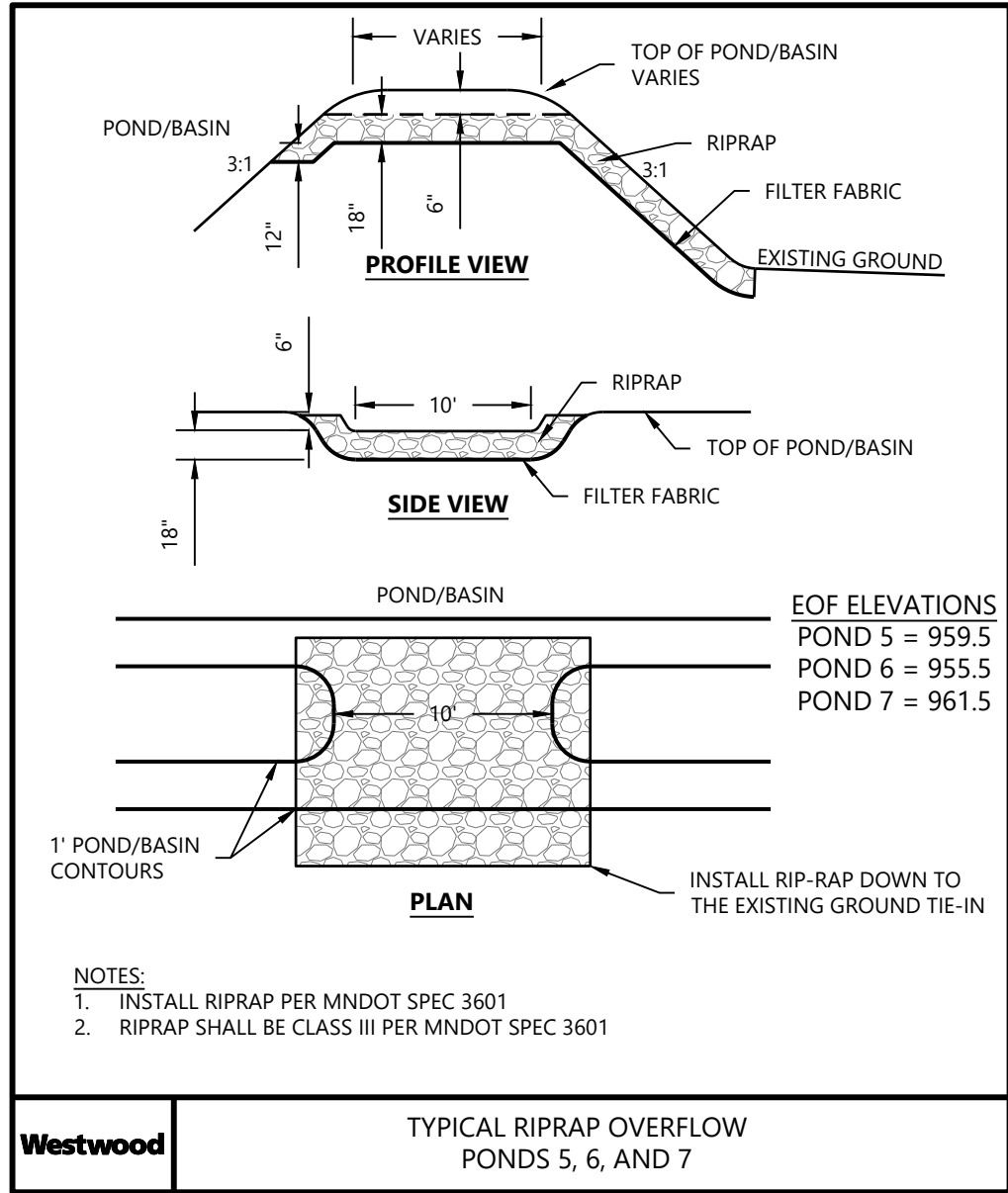
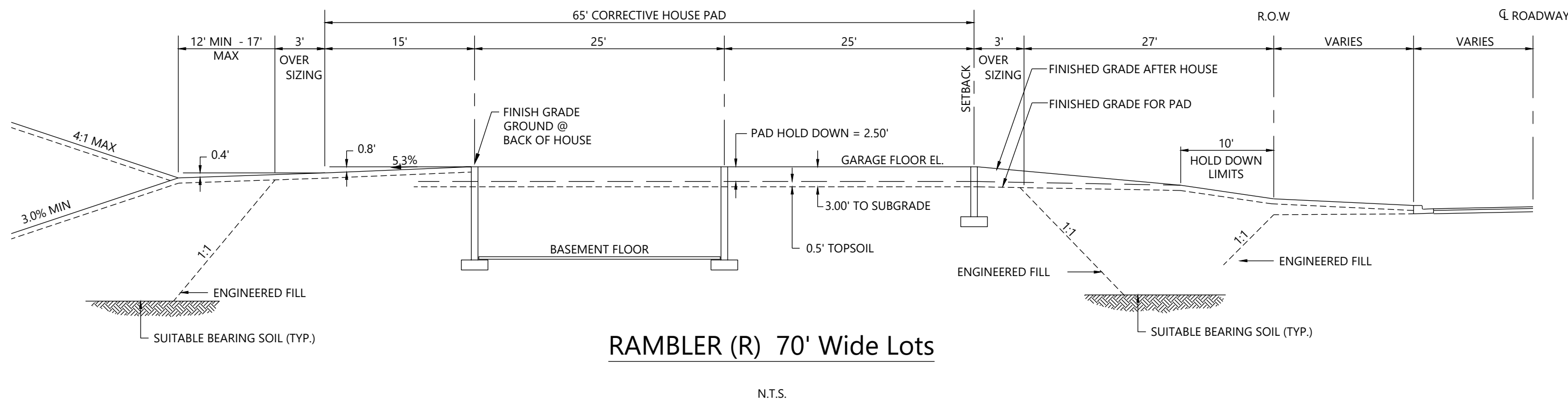
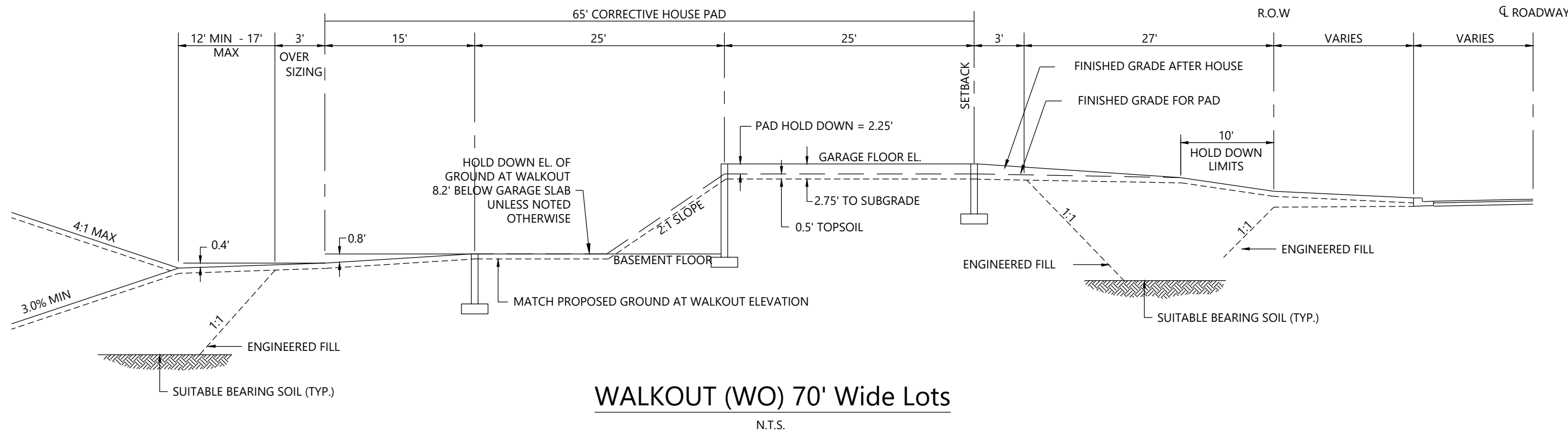
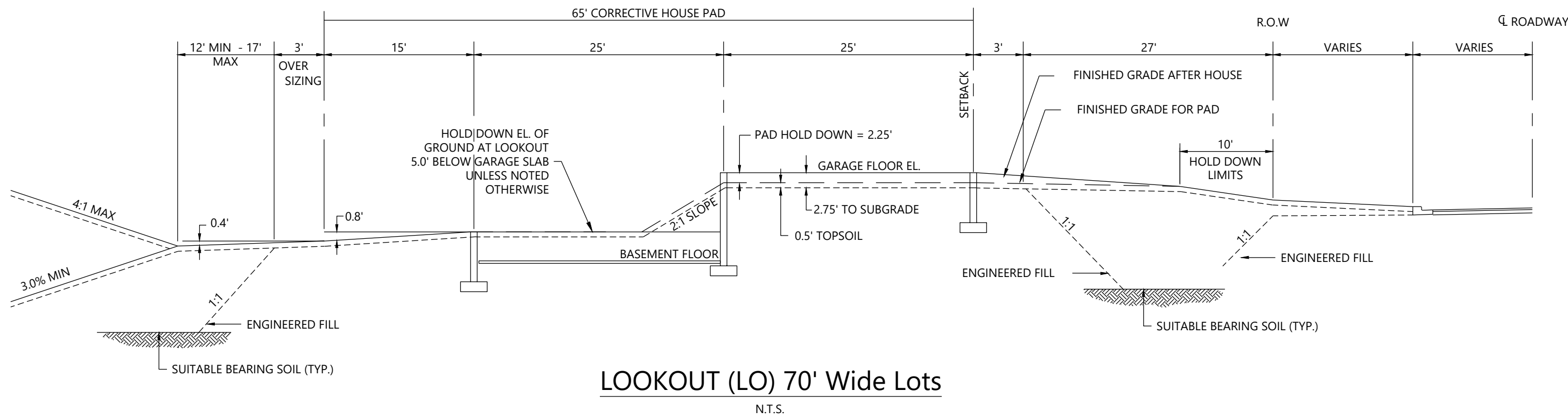
THOMAS D. DESUTTER
DATE: 11/15/24 LICENSE NO. 59640

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ROGERS, MN

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SHEET NUMBER:
18 OF **28**
DATE: 11/15/24
PROJECT NUMBER: 0033874.00



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17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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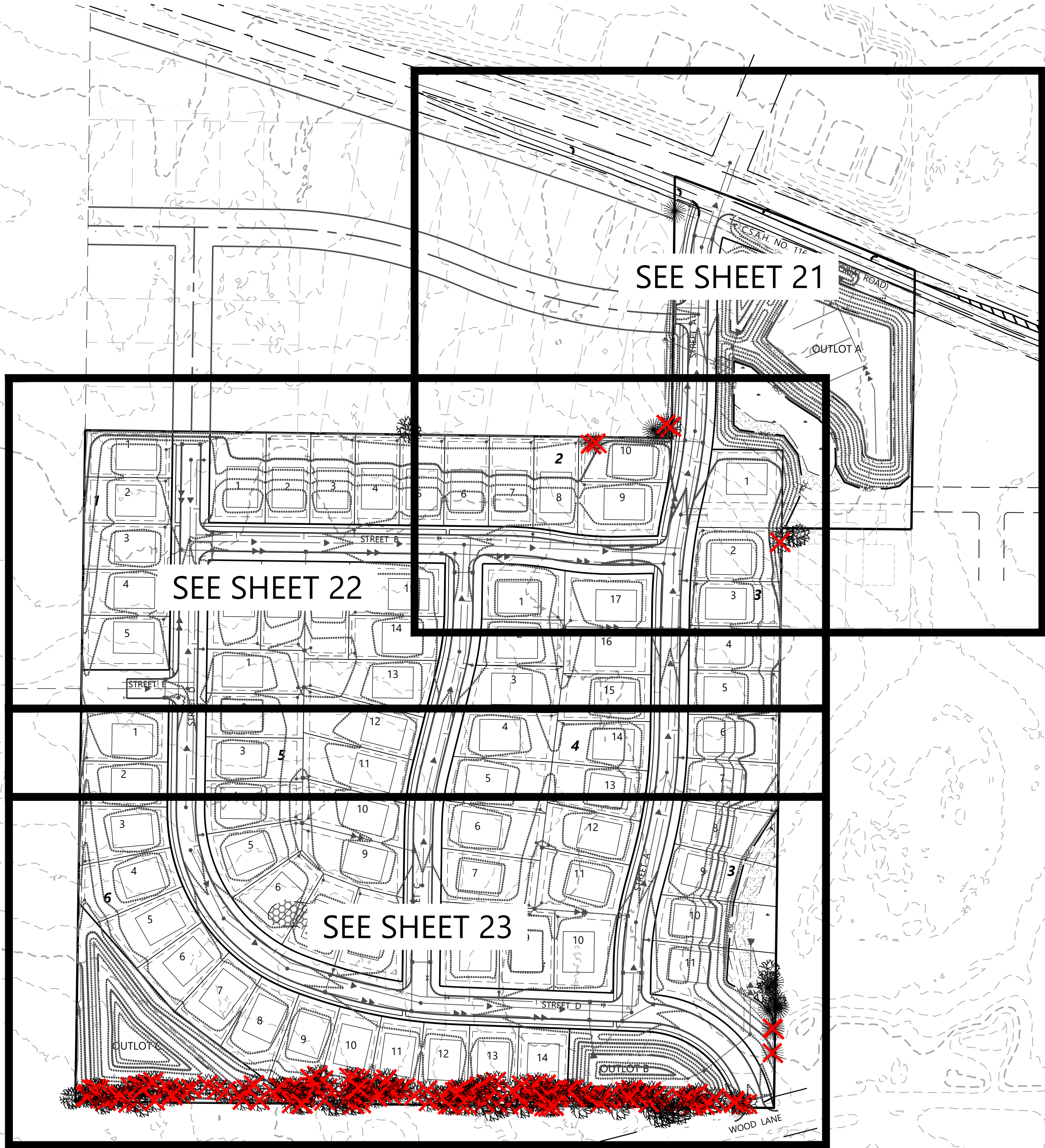
DETAILS

PROJECT NUMBER: 003874.00

SHEET NUMBER:

19 OF 28

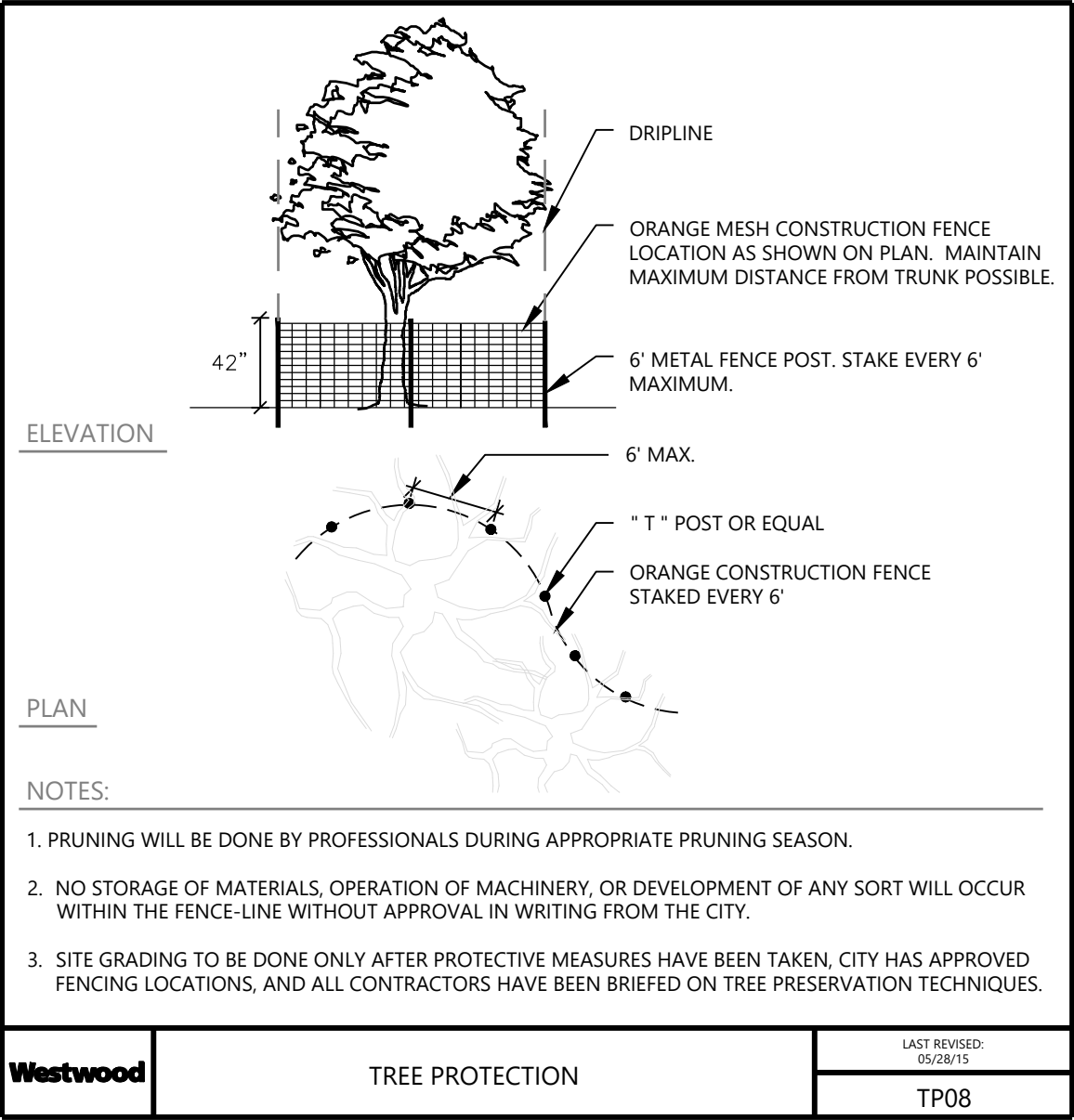
DATE: 11/15/24



TREE PRESERVATION REQUIREMENTS

- (B) TREE AND WOODLAND PRESERVATION
THE FOLLOWING RESTRICTIONS SHALL APPLY TO ALL RESIDENTIAL DEVELOPMENT OCCURRING IN WOODED AREAS:
- (1) STRUCTURES SHALL BE LOCATED IN SUCH A MANNER THAT THE MAXIMUM NUMBER OF TREES SHALL BE PRESERVED
- (2) PRIOR TO THE GRANTING OF A BUILDING PERMIT, IT SHALL BE THE DUTY OF THE PERSON SEEKING THE PERMIT TO DEMONSTRATE THAT THERE ARE NO FEASIBLE OR PRUDENT ALTERNATIVES TO THE CLEAR-CUTTING OF TREES ON THE SITE AND THAT IF TREES ARE CUT, THE PERSON WILL RESTORE THE DENSITY OF TREES TO THAT WHICH EXISTED BEFORE DEVELOPMENT BUT IN NO CASE SHALL THE PERSON BE COMPELLED TO RAISE THE DENSITY ABOVE 10 TREES PER ACRE
- (3) FORESTATION, REFORESTATION OR LANDSCAPING SHALL UTILIZE A VARIETY OF TREE SPECIES AND SHALL NOT UTILIZE ANY SPECIES PRESENTLY UNDER DISEASE EPIDEMIC. SPECIES PLANTED SHALL BE HARDY UNDER LOCAL CONDITIONS AND COMPATIBLE WITH THE LOCAL LANDSCAPE.
- (4) A TREE INVENTORY WILL BE PREPARED.

TREE PROTECTION DETAIL

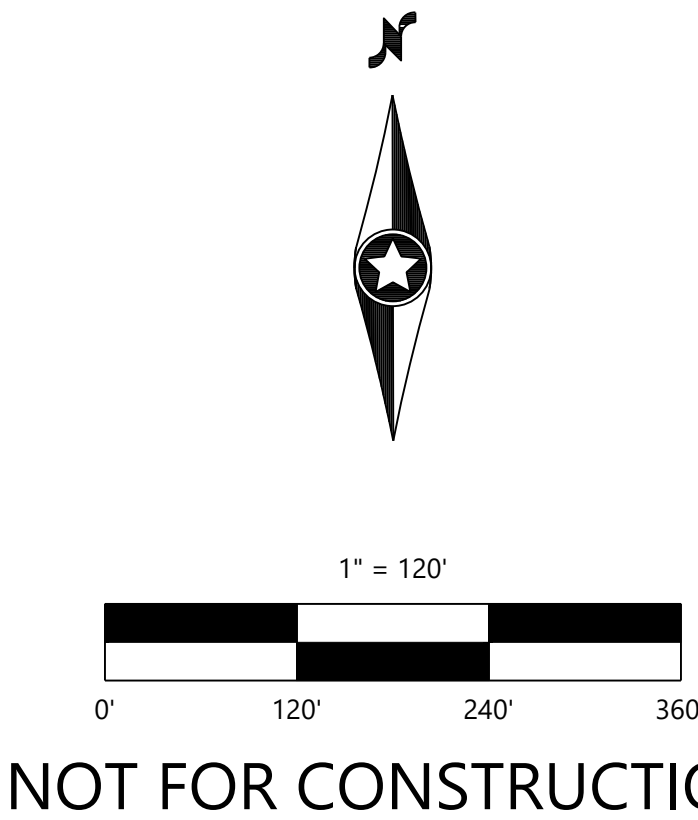


TREE INVENTORY CALCULATIONS

TREE INVENTORY CALCULATIONS	
TOTAL ON-SITE SIGNIFICANT CALIPER INCHES	2,129 INCHES
HEALTHY SIGNIFICANT TREE REMOVAL ON-SITE	1,004 INCHES
OTHER SIGNIFICANT TREE REMOVAL ON-SITE	1,014 INCHES
TOTAL CALIPER INCHES TO BE REMOVED	2,018 INCHES
TOTAL CALIPER INCHES TO BE SAVED	94 INCHES
TOTAL TREES ON-SITE	196 TREES
TOTAL TREES REMOVED	187 TREES
TOTAL TREES SAVED (8 HEALTHY, 1 UNHEALTHY)	9 TREES
TOTAL TREES OFF-SITE	30 TREES

LEGEND

- DENOTES EXISTING DECIDUOUS TREE TO REMAIN
- DENOTES EXISTING DECIDUOUS TREE TO BE REMOVED
- DENOTES EXISTING CONIFEROUS TREE TO REMAIN
- DENOTES EXISTING CONIFEROUS TREE TO BE REMOVED
- DENOTES SILT FENCE / GRADING & DISTURBANCE LIMIT



DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	120'
VERTICAL SCALE:	24' OR 12'

INITIAL ISSUE:	11/15/24
REVISIONS:	

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA
CORY L. MEYER
DATE: 11/15/24 LICENSE NO. 26971

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

OVERALL TREE
PRESERVATION PLAN

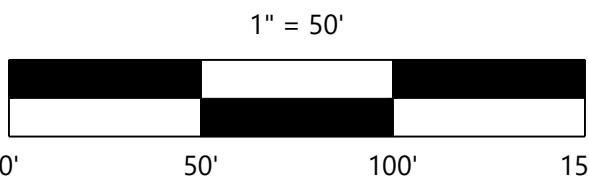
PROJECT NUMBER: 0033874.00

SHEET NUMBER:
20 OF **28**
DATE: 11/15/24



LEGEND

-  DENOTES EXISTING DECIDUOUS TREE TO REMAIN
-  DENOTES EXISTING DECIDUOUS TREE TO BE REMOVED
-  DENOTES EXISTING CONIFEROUS TREE TO REMAIN
-  DENOTES EXISTING CONIFEROUS TREE TO BE REMOVED
-  DENOTES SILT FENCE / GRADING & DISTURBANCE LIMIT



NOT FOR CONSTRUCTION

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:
△
△
△
△
△

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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**TREE PRESERVATION
PLAN**

PROJECT NUMBER: 0033874.00

SHEET NUMBER:

21 OF 28

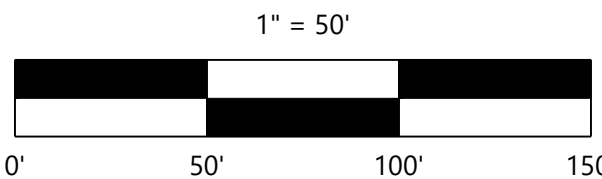
DATE: 11/15/24



SILT FENCE
DENOTES
GRADING &
DISTURBANCE
LIMITS

LEGEND

- DENOTES EXISTING DECIDUOUS TREE TO REMAIN
- DENOTES EXISTING DECIDUOUS TREE TO BE REMOVED
- DENOTES EXISTING CONIFEROUS TREE TO REMAIN
- DENOTES EXISTING CONIFEROUS TREE TO BE REMOVED
- DENOTES SILT FENCE / GRADING & DISTURBANCE LIMIT



NOT FOR CONSTRUCTION

DESIGNED: TOD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:
△
△
△
△
△

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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CORY L. MEYER
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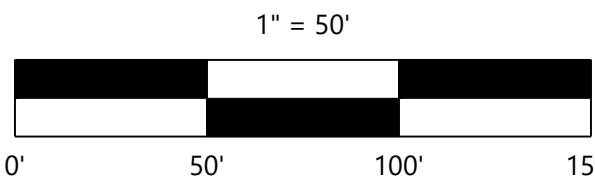
**TREE PRESERVATION
PLAN**

SHEET NUMBER:
22 OF **28**
DATE: 11/15/24
PROJECT NUMBER: 0033874.00



LEGEND

- DENOTES EXISTING DECIDUOUS TREE TO REMAIN
- DENOTES EXISTING DECIDUOUS TREE TO BE REMOVED
- DENOTES EXISTING CONIFEROUS TREE TO REMAIN
- DENOTES EXISTING CONIFEROUS TREE TO BE REMOVED
- DENOTES SILT FENCE / GRADING & DISTURBANCE LIMIT



NOT FOR CONSTRUCTION

DESIGNED: TOD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:
△
△
△
△
△

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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**TREE PRESERVATION
PLAN**

PROJECT NUMBER: 0033874.00

SHEET NUMBER:

23 OF **28**

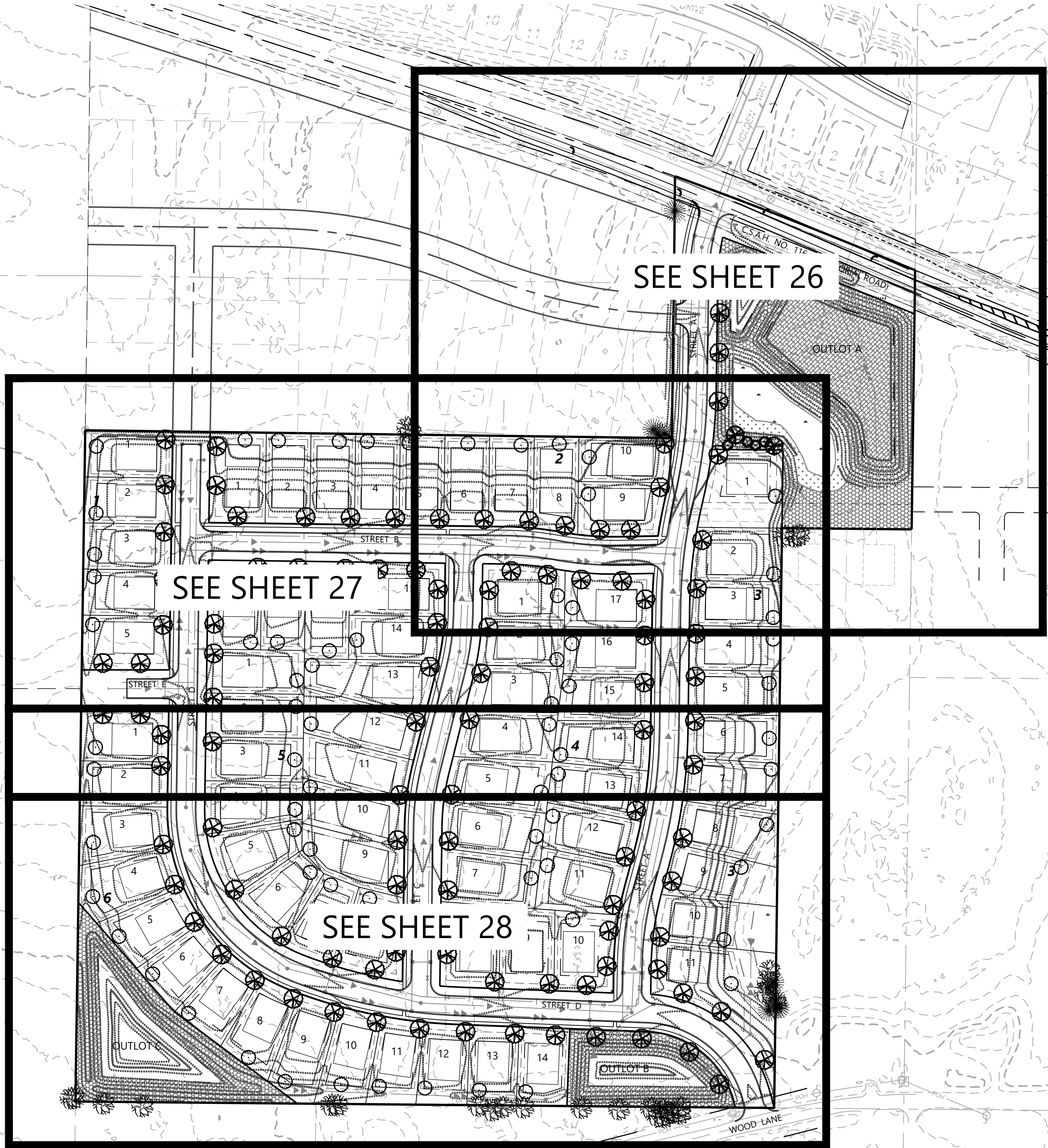
DATE: 11/15/24

TREE DATA

TREE TAG	SPECIES	SIZE (DBH)	MULTI	NOTES	TREE TYPE	STATUS
7160	Green & White Ash	9	bd 30%		Deciduous	Removed-Exempt-Unhealthy
7161	Sugar Maple	7			Deciduous	Removed
7162	American Elm	7			Deciduous	Removed
7163	Boxelder	9			Deciduous	Removed
7164	Green & White Ash	16	bd 40%		Deciduous	Removed-Exempt-Unhealthy
7165	Green & White Ash	8			Deciduous	Removed-Exempt-EAB
7166	Sugar Maple	20	bd pd 50%, missing prominent trunk.& bark , hollow part of trunk		Deciduous	Removed-Exempt-Unhealthy
7167	Red Oak	15			Deciduous	Removed
7168	Basswood	7			Deciduous	Removed
7169	Green & White Ash	10	bd pd 20%		Deciduous	Removed-Exempt-EAB
7170	Ironwood	6			Deciduous	Removed
7171	Green & White Ash	10	bd 20%		Deciduous	Removed-Exempt-EAB
7172	Sugar Maple	9			Deciduous	Removed
7173	Sugar Maple	9			Deciduous	Removed
7174	Red Oak	36			Deciduous	Offsite
7175	Green & White Ash	21	bd 40%		Deciduous	Offsite
7176	Green & White Ash	7	bd 40%		Deciduous	Removed-Exempt-Unhealthy
7177	Red Oak	13			Deciduous	Removed
7178	Basswood	9			Deciduous	Offsite
7179	Bitternut Hickory	8			Deciduous	Offsite
7180	Sugar Maple	6			Deciduous	Offsite
7181	Sugar Maple	8	bd pd 50%, missing bark, boring holes		Deciduous	Offsite
7182	Sugar Maple	14	bd pd 60%, missing bark, boring holes		Deciduous	Removed-Exempt-Unhealthy
7183	Green & White Ash	16	bd 70%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7184	Green & White Ash	15			Deciduous	Removed-Exempt-EAB
7185	Bitternut Hickory	7			Deciduous	Offsite
7186	Sugar Maple	6			Deciduous	Offsite
7187	Green & White Ash	9	bd 30%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7188	Green & White Ash	10	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7189	Sugar Maple	8			Deciduous	Removed
7190	Green & White Ash	7	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7191	Green & White Ash	12	bd 50%, missing bark and dead braches		Deciduous	Removed-Exempt-Unhealthy
7192	Sugar Maple	12			Deciduous	Removed
7193	Green & White Ash	11	bd 70%, missing bark and dead braches		Deciduous	Removed-Exempt-Unhealthy
7194	Green & White Ash	12	bd 70%, missing bark and dead braches		Deciduous	Removed-Exempt-Unhealthy
7195	Sugar Maple	6			Deciduous	Removed
7196	Sugar Maple	12			Deciduous	Removed
7197	Sugar Maple	6	bd 50%, deformed bark		Deciduous	Offsite
7198	Basswood	21	x		Deciduous	Removed
7199	Green & White Ash	10	bd 20%, dead branches		Deciduous	Removed-Exempt-EAB
7200	Green & White Ash	13	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7201	Green & White Ash	8	bd 20%, dead branches		Deciduous	Removed-Exempt-EAB
7202	Green & White Ash	12	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7203	Sugar Maple	6			Deciduous	Removed
7204	Green & White Ash	20	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7205	Green & White Ash	8	bd 60%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7206	American Elm	17			Deciduous	Offsite
7207	Sugar Maple	7			Deciduous	Removed
7208	Green & White Ash	13			Deciduous	Removed-Exempt-EAB
7209	Green & White Ash	11	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7210	Green & White Ash	14	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7211	Sugar Maple	6			Deciduous	Removed
7212	Sugar Maple	11			Deciduous	Removed
7213	Green & White Ash	12			Deciduous	Removed-Exempt-EAB
7214	Green & White Ash	6	bd 70%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7215	Green & White Ash	6	bd 70%, dead prominent trunk, boring holes		Deciduous	Removed-Exempt-Unhealthy
7216	Boxelder	13	bd 30%, deformed bark		Deciduous	Removed-Exempt-Unhealthy
7217	Sugar Maple	6	bd 30%, deformed bark		Deciduous	Removed-Exempt-Unhealthy
7218	Green & White Ash	9	bd 40%, deformed bark and dead branches		Deciduous	Removed-Exempt-Unhealthy
7219	Green & White Ash	7			Deciduous	Removed-Exempt-EAB
7220	Green & White Ash	8	bd 70%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7221	Ironwood	9			Deciduous	Removed
7222	Sugar Maple	7			Deciduous	Removed
7223	Sugar Maple	7			Deciduous	Removed
7224	Sugar Maple	9			Deciduous	Removed
7225	Sugar Maple	15			Deciduous	Removed
7226	Sugar Maple	14	x		Deciduous	Offsite
7227	Red Oak	22			Deciduous	Removed
7228	Sugar Maple	13			Deciduous	Removed
7229	Green & White Ash	8			Deciduous	Removed-Exempt-EAB
7230	Green & White Ash	6			Deciduous	Removed-Exempt-EAB
7231	Sugar Maple	7			Deciduous	Removed
7232	Green & White Ash	8			Deciduous	Removed-Exempt-EAB
7233	Basswood	15	x		Deciduous	Removed
7234	Boxelder	12			Deciduous	Removed
7235	American Elm	6			Deciduous	Removed
7236	Basswood	13			Deciduous	Removed
7237	American Elm	7			Deciduous	Offsite
7238	American Elm	8			Deciduous	Removed
7239	Green & White Ash	17			Deciduous	Offsite
7240	Green & White Ash	20	x		Deciduous	Removed-Exempt-EAB
7241	Sugar Maple	7			Deciduous	Removed
7242	Green & White Ash	6	bd 40%, deformed bark		Deciduous	Removed-Exempt-Unhealthy
7243	American Elm	13			Deciduous	Removed
7244	Boxelder	12			Deciduous	Removed
7245	Boxelder	6			Deciduous	Removed
7246	American Elm	6	bd 20% rotting trunk		Deciduous	Removed
7247	Sugar Maple	7			Deciduous	Removed
7248	Red Oak	18			Deciduous	Removed
7249	American Elm	6			Deciduous	Offsite
7250	Red Oak	11			Deciduous	Removed
7251	Basswood	9			Deciduous	Removed
7252	Basswood	9	x		Deciduous	Removed
7253	Green & White Ash	13	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7254	Sugar Maple	9	bd 30%, deformed bark		Deciduous	Removed-Exempt-Unhealthy
7255	Green & White Ash	16	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7256	Basswood	6			Deciduous	Removed
7257	Aspen	7			Deciduous	Removed
7258	Aspen	14			Deciduous	Removed
7259	Green & White Ash	11	bd 70%, dead branches		Deciduous	Removed-Exempt-Unhealthy

TREE TAG	SPECIES	SIZE (DBH)	MULTI	NOTES	TREE TYPE	STATUS
7260	Bitternut Hickory	13			Deciduous	Removed
7261	Sugar Maple	26			Deciduous	Removed
7262	Boxelder	22			Deciduous	Removed
7263	Sugar Maple	14	bd 40%, deformed bark		Deciduous	Removed-Exempt-Unhealthy
7264	Green & White Ash	9	x		Deciduous	Removed-Exempt-EAB
7265	Green & White Ash	10	bd 70%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7266	Green & White Ash	9	x		Deciduous	Removed-Exempt-EAB
7267	Green & White Ash	12	bd 20%, dead branches		Deciduous	Removed-Exempt-EAB
7268	Green & White Ash	9	bd 20%, dead branches		Deciduous	Removed-Exempt-EAB
7269	Green & White Ash	14	bd 50%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7270	Green & White Ash	11	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7271	Green & White Ash	10			Deciduous	Removed-Exempt-EAB
7272	Green & White Ash	9			Deciduous	Removed-Exempt-EAB
7273	Green & White Ash	12	bd 30%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7274	Green & White Ash	9	bd 30%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7275	Black Cherry	9			Deciduous	Removed
7276	Green & White Ash	14	x	bd 40%, dead prominent trunk	Deciduous	Removed-Exempt-Unhealthy
7277	Green & White Ash	7		bd 40%, dead branches	Deciduous	Removed-Exempt-Unhealthy
7278	Boxelder	15	x	bd 40%, dead branches	Deciduous	Removed-Exempt-Unhealthy
7279	Sugar Maple	9			Deciduous	Removed
7280	Colorado Spruce	4	15 ft		Coniferous	Removed
7281	Sugar Maple	7	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7282	Green & White Ash	11			Deciduous	Removed-Exempt-EAB
7283	Boxelder	16			Deciduous	Removed
7284	American Elm	6			Deciduous	Removed
7285	Sugar Maple	6			Deciduous	Removed
7286	Boxelder	9			Deciduous	Removed
7287	Black Cherry	6			Deciduous	Removed
7288	Black Cherry	8			Deciduous	Removed
7289	Green & White Ash	7			Deciduous	Removed-Exempt-EAB
7290	Boxelder	7	bd 50%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7291	Black Cherry	20			Deciduous	Removed
7292	Green & White Ash	19			Deciduous	Removed-Exempt-EAB
7293	Sugar Maple	22			Deciduous	Offsite
7294	Green & White Ash	16	bd 30%, dead branches		Deciduous	Offsite
7295	Green & White Ash	9	bd 60%, dead branches, deformed bark		Deciduous	Removed-Exempt-EAB
7296	Green & White Ash	9			Deciduous	Removed-Exempt-EAB
7297	Black Cherry	14			Deciduous	Removed
7298	Green & White Ash	7	bd 70%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7299	Green & White Ash	12	bd 30%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7300	Sugar Maple	7			Deciduous	Removed
7301	Green & White Ash	15			Deciduous	Removed-Exempt-EAB
7302	American Elm	6			Deciduous	Removed
7303	Green & White Ash	7	bd 40%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7304	Green & White Ash	10	bd 30%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7305	Green & White Ash	12	bd 30%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7306	Hackberry	15	bd 30%, dead branches		Deciduous	Removed-Exempt-Unhealthy
7307	Green & White Ash	7	bd 70%, dead branches, stripped bark		Deciduous	Removed-Exempt-Unhealthy
7308	Green & White Ash	11			Deciduous	Removed-Exempt-EAB
7309	Boxelder	7			Deciduous	Removed
7310	Green & White Ash	12	bd 70%, dead branches and stripped bark		Deciduous	Removed-Exempt-Unhealthy
7311	Green & White Ash	9	bd 30, stripped bark		Deciduous	Removed-Exempt-Unhealthy
7312	Green & White Ash	12	bd 30%, stripped bark		Deciduous	Removed-Exempt-Unhealthy
7313	Boxelder	11	bd 30%, stripped bark		Deciduous	Removed-Exempt-Unhealthy
7314	Boxelder	7			Deciduous	Removed
7315	Green & White Ash	13	bd 70%, dead branches and stripped bark		Deciduous	Offsite
7316	Green & White Ash	7	bd 70%, dead branches and stripped bark		Deciduous	Offsite
7317	Boxelder	12			Deciduous	Removed
7318	Green & White Ash	8	bd 50%, stripped bark		Deciduous	Removed-Exempt-Unhealthy
7319	Green & White Ash	14	bd 50%, stripped bark		Deciduous	Removed-Exempt-Unhealthy
7320	American Elm	8			Deciduous	Removed
7321	Boxelder	8			Deciduous	Removed
7322	American Elm	12			Deciduous	Removed
7323	Green & White Ash	11	bd 40%, stripped bark and dead branches		Deciduous	Removed-Exempt-Unhealthy
7324	Green & White Ash	12	bd 80%, stripped bark and dead branches		Deciduous	Removed-Exempt-Unhealthy
7325	Boxelder	10			Deciduous	Saved
7326	Basswood	6			Deciduous	Removed
7327	Basswood	8			Deciduous	Removed
7328	Boxelder	9			Deciduous	Removed
7329	Green & White Ash	16			Deciduous	Removed-Exempt-EAB
7330	American Elm	13	bd 30%, deformed bark		Deciduous	Removed-Exempt-Unhealthy
7331	Green & White Ash	17	bd 30%, dead branches and stripped bark		Deciduous	Removed-Exempt-Unhealthy
7332	Green & White Ash	16	bd 30%, dead branches and stripped bark		Deciduous	Removed-Exempt-Unhealthy
7333	Green & White Ash	24	bd 60%, dead branches and stripped bark		Deciduous	Offsite
7334	Boxelder	8			Deciduous	Removed
7335	American Elm	8			Deciduous	Removed
7336	Green & White Ash	10	bd 50%, stripped bark		Deciduous	Removed-Exempt-Unhealthy
7337	Green & White Ash	9	bd 80%, stripped bark		Deciduous	Removed-Exempt-Unhealthy
7338	Boxelder	8			Deciduous	Removed
7339	American Elm	6	pd 20%, other tree leaning on it		Deciduous	Removed
7340	Green & White Ash	9	bd 60%, stripped and deformed bark		Deciduous	Removed-Exempt-Unhealthy
7341	Green & White Ash	15			Deciduous	Removed-Exempt-EAB
7342	American Elm	9			Deciduous	Removed
7343	Boxelder	24			Deciduous	Removed
7344	American Elm	8			Deciduous	Removed
7345	Boxelder	16			Deciduous	Removed
7346	Green & White Ash	6	bd 60%, dead branches and deformed bark		Deciduous	Removed-Exempt-Unhealthy
7347	Boxelder	13			Deciduous	Removed
7348	Aspen	9			Deciduous	Removed
7349	Aspen	15			Deciduous	Removed
7350	Boxelder	12			Deciduous	Removed
7351	Sugar Maple	16			Deciduous	Removed
7352	Boxelder	18			Deciduous	Removed
7353	Green & White Ash	9			Deciduous	Removed-Exempt-EAB
7354	American Elm	6			Deciduous	Removed
7355	Boxelder	28	x		Deciduous	Removed
7356	Green & White Ash	22	bd 50%, dead branches		Deciduous	Removed-Exempt-EAB
7357	American Elm	9			Deciduous	Removed
7358	American Elm	13			Deciduous	Removed
7359	Silver Maple	24	bd 40%, stripped bark		Deciduous	Offsite

TREE TAG	SPECIES	SIZE (DBH)	MULTI	NOTES	TREE TYPE	STATUS
7960	Silver Maple	17			Deciduous	Offsite
7961	Colorado Spruce	22		30 ft, didn't physically tag	Coniferous	Removed
7962	Colorado Spruce	22		30 ft,	Coniferous	Removed
7963	Eastern Red Cedar	9	x	30 ft	Coniferous	Offsite
7964	Eastern Red Cedar	9		20 ft	Coniferous	Offsite
7965	Eastern Red Cedar	10		20 ft	Coniferous	Offsite
7966	Boxelder	10			Deciduous	Removed
7967	Eastern Red Cedar	4	x	bd pd 50%, hollow main trunk	Coniferous	Removed-Exempt-Unhealthy
7968	Colorado Spruce	17		35 ft	Coniferous	Saved
7969	Cottonwood	15			Deciduous	Offsite
7970	Cottonwood	13			Deciduous	Offsite
7971	Cottonwood	10	x		Deciduous	Offsite
7972	Cottonwood	10			Deciduous	Removed
7973	Boxelder	8			Deciduous	Saved
7974	Boxelder	8		bd 40% biological damage, dead branches	Deciduous	Saved-Exempt-Unhealthy
7975	Colorado Spruce	3		12 ft	Coniferous	Saved
7976	Boxelder	7			Deciduous	Saved
7977	White Pine	20	x		Coniferous	Saved
7978	White Pine	9		30 ft	Coniferous	Saved
7979	Boxelder	12			Deciduous	Offsite
7980	White Spruce	1		12 ft	Coniferous	Offsite
7981	White Spruce	1		12 ft	Coniferous	Offsite
7982	White Pine	20		35 ft tall	Coniferous	Saved
7983	White Spruce	6		20 ft tall, unable to physically tag	Coniferous	Removed
7984	White Spruce	6		20 ft tall, unable to physically tag	Coniferous	Removed
7985	White Spruce	8			Coniferous	Removed



PRELIMINARY LANDSCAPE SCHEDULE

CODE	COMMON / BOTANICAL NAME	SIZE	ROOT	SPACING O.C.	MATURE SIZE
DECIDUOUS TREES - 110					
ACE	ACCOLADE ELM / ULMUS JAPONICA X WILSONIANA 'MORTON'	2.5" CAL	B&B	AS SHOWN	H 70' W 40'-50"
KEC	DECAF KENTUCKY COFFEETREE / GYMNOCLADUS DIOICUS 'MCKBRANCHED'	2.5" CAL	B&B	AS SHOWN	H 50' W 40'
FFM	FALL FIESTA MAPLE / ACER SACCHARUM 'BAILSTA'	2.5" CAL	B&B	AS SHOWN	H 50'-75' W 50'
FYL	FRONTYARD LINDEN / TILIA AMERICANA 'BAILYARD'	2.5" CAL	B&B	AS SHOWN	H 60'-70' W 30'-40'
HAK	HACKBERRY / CELTIS OCCIDENTALIS	2.5" CAL	B&B	AS SHOWN	H 50'-75' W 50'
PRE	PRINCETON ELM / ULMUS AMERICANA 'PRINCETON'	2.5" CAL	B&B	AS SHOWN	H 60'-80' W 40'-60"
REO	RED OAK / QUERCUS RUBRA	2.5" CAL	B&B	AS SHOWN	H 50'-70' W 40'-50"
RSM	RED SUNSET MAPLE / ACER RUBRUM 'FRANKSRED'	2.5" CAL	B&B	AS SHOWN	H 45' W 35'
REL	REDMOND LINDEN / TILIA AMERICANA 'REDMOND'	2.5" CAL	B&B	AS SHOWN	H 40'-60' W 30'-40"
RVB	RIVER BIRCH / BETULA NIGRA	2.5" CAL	B&B	AS SHOWN	H 50'-75' W 50'
SGM	SIENNA GLEN MAPLE / ACER X FREEMANII 'SIENNA'	2.5" CAL	B&B	AS SHOWN	H 40'-50' W 35'-40"
SKH	SKYLINE HONEY LOCUST / GLEDITSIA TRIACANTHOS INERMIS 'SKYCOLE'	2.5" CAL	B&B	AS SHOWN	H 50' W 30'-35'
SWO	SWAMP WHITE OAK / QUERCUS BICOLOR	2.5" CAL	B&B	AS SHOWN	H 50'-60' W 60'-80"
VFE	VALLEY FORGE ELM / ULMUS AMERICANA 'VALLEY FORGE'	2.5" CAL	B&B	AS SHOWN	H 70' W 40'-60"
EVERGREEN TREES - 4					
BHS	BLACK HILLS SPRUCE / PICEA GLAUCA DENSATA	6' HT.	B&B	AS SHOWN	H 35'-45' W 20'-25'
COS	COLORADO SPRUCE / PICEA PUNGENS	6' HT.	B&B	AS SHOWN	H 40'-60' W 15'-30'
CCF	CONCOLOR FIR / ABIES CONCOLOR	6' HT.	B&B	AS SHOWN	H 40'-50' W 15'-30'
NOS	NORWAY SPRUCE / PICEA ABIES	6' HT.	B&B	AS SHOWN	H 50'-70' W 25'-30'
POP	PONDEROSA PINE / PINUS PONDEROSA	6' HT.	B&B	AS SHOWN	H 60'-80' W 25'-30'
WHP	WHITE PINE / PINUS STROBUS	6' HT.	B&B	AS SHOWN	H 50'-80' W 25'-40"

ABBREVIATIONS: B.B. = BALLED AND BURLAPPED CAL = CALIPER HT. = HEIGHT MIN. = MINIMUM O.C. = ON CENTER SP. = SPREAD QTY. = QUANTITY CONT. = CONTAINER
NOTES: QUANTITIES ON PLAN SUPERSEDE LIST QUANTITIES IN THE EVENT OF A DISCREPANCY.

LANDSCAPE REQUIREMENTS & PROVISIONS

LANDSCAPING DESIGN REQUIREMENTS - CITY OF ROGERS, MINNESOTA			
SITE DESCRIPTION			
ZONING DISTRICT: R-2 (PROPOSED)			
TOTAL GROSS ACRES: 31.28 AC.			
SINGLE FAMILY RESIDENTIAL REQUIREMENTS:	REQUIRED	PROVIDED	NOTES
B. THE FRONT, SIDE, AND REAR YARDS OF EACH SITE NOT UTILIZED FOR BUILDING, PARKING (WHERE PERMITTED) OR OTHER IMPROVEMENTS SHALL BE LANDSCAPED UTILIZING AN EFFECTIVE COMBINATION OF STREET TREES, GRASS, GROUND COVER AND SHRUBBERY. UNDEVELOPED AREAS IN THE INTERIOR OF THE SITE SHALL BE SEEDDED WITH APPROPRIATE GRASSES AND MAINTAINED NEAT AND ORDERLY SO AS TO CONTROL DUST ON SITES. ALL TREE TRIMMINGS, STUMPS, AND CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED AND NOT BE ACCUMULATED OR STORED ON SITE.	NA	188 TOTAL TREES	TREES TO BE DISTRIBUTED BETWEEN FRONT YARD & REAR YARDS OF SINGLE FAMILY LOTS, IN ADDITION TO OUTLOTS FOR STREET TREE & BUFFERING PURPOSES
		108 OVERSTORY STREET TREES	
		2 OVERSTORY DECIDUOUS TREES	
		4 EVERGREEN TREES	
		74 DECID. YARD TREES (BY HOME BUILDER)	
SCREENING REQUIREMENTS:	REQUIRED	PROVIDED	NOTES
(7) THERE SHALL BE NO RESTRICTIONS ON NATURAL HEDGES OR PLANTINGS UTILIZED AS FENCES IN ANY RESIDENTIAL ZONING DISTRICT (R1, R2, R3, R4, R5), EXCEPT THAT NO SUCH HEDGES OR PLANTINGS SHALL BE LOCATED WITHIN THE SIGHT VISIBILITY TRIANGLE AND THE SPECIES SHALL NOT BE AN INVASIVE SPECIES.	NA	NA	TREES TO BE LOCATED OUTSIDE THE 50' VISIBILITY TRIANGLE AS NOTED ON THE PLANS.
REFORESTATION & LANDSCAPING	REQUIRED	PROVIDED	NOTES
TREE REFORESTATION SHALL BE RESTORE THE DENSITY OF TREES TO THAT WHICH EXISTED BEFORE DEVELOPMENT BUT IN NO CASE SHALL THE PERSON BE COMPELLED TO RAISE THE DENSITY ABOVE TEN TREES PER ACRE. TOTAL SITE AREA: 31.28 AC. TOTAL NUMBER OF EXISTING TREES ON SITE: 193 TREES CURRENT TREE DENSITY: (193 TREES / 31.28 AC.) = 6.2 TREE/AC.	6.2 TREES/AC.	196 TOTAL TREES	PROPOSED REFOREST TREES PART OF SINGLE FAMILY RESIDENTIAL REQUIREMENTS. TREES TO PLANTED IN INDIVIDUAL LOTS & OUTLOTS.
		8 SAVED EXISTING TREES	
		188 PROPOSED TREES	
		6.27 TREES/AC.	
		(196 TREES / 31.28 AC.)	

PLANT LEGEND

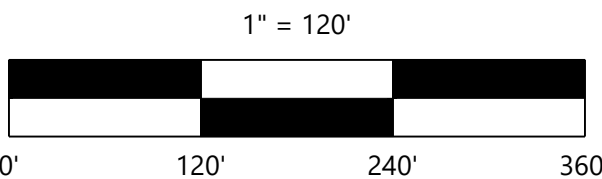
- OVERSTORY DECIDUOUS STREET TREES
- DECIDUOUS YARD TREES (BY HOME BUILDER)
- DECIDUOUS OVERSTORY TREES
- EVERGREEN TREES
- SMALL OVERSTORY TREES
- EXISTING CONIFEROUS TREE TO REMAIN
- EXISTING DECIDUOUS TREE TO REMAIN

NOTES

- STREET TREE LOCATIONS AND SPACING ARE SUBJECT TO CHANGE BASED ON CONSTRUCTED DRIVEWAY AND UTILITY LOCATIONS.
- STREET TREES TO BE PLANTED 25' FROM BACK OF CURB, AND OUTSIDE THE D&U EASEMENT. NO TREES ARE ALLOWED WITHIN THE RIGHT-OF-WAY.
- NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
- TREES LOCATED AT FRONT OF INDIVIDUAL LOTS SHALL BE PLANTED IN A LOCATION THAT DOES NOT INTERFERE WITH CURBSTOPS OR INDIVIDUAL SEWER & WATER CONNECTIONS.
- LOT YARD TREES WILL BE PLANTED BY BUILDER AFTER CONSTRUCTION ON LOTS IS COMPLETE. TIMING OF INSTALLATION WILL BE DEPENDENT UPON SEASON AND PLANT AVAILABILITY.
- YARD TREE SPECIES WILL BE SELECTED FROM APPROVED SPECIES LIST.
- NO STREET TREES OR YARD TREES ARE ALLOWED WITHIN THE 50' SIGHT TRIANGLES.

NATIVE SEEDING LEGEND

- MINDOT SOUTHERN TALLGRASS ROADSIDE (STR) SEED MIX
TOTAL AREA (1.7 AC)
- MINDOT WET DITCH (WD) SEED MIX
TOTAL AREA (1.4 AC)
- MINDOT WET MEADOW S & W SEED MIX (34-271)
TOTAL AREA (0.4 AC)
- * ALL DISTURBED AREAS TO BE SODDED UNLESS NOTED OTHERWISE
- * ALL DISTURBED AREAS WITHIN CITY ROW ALONG TERRITORIAL ROAD & WOOD LANE TO BE SEEDDED WITH MESIC GENERAL ROADSIDE MIX (25-141)



NOT FOR CONSTRUCTION

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 120'
VERTICAL SCALE: 24' OR 12'

INITIAL ISSUE: 11/15/24
REVISIONS:
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△
△
△

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA
CORY L. MEYER
DATE: 11/15/24 LICENSE NO. 26971

NORTHVIEW PRESERVE
ROGERS, MN

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
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Westwood Professional Services, Inc.

OVERALL PRELIMINARY
LANDSCAPE PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER:
25 OF 28
DATE: 11/15/24



PLANT LEGEND

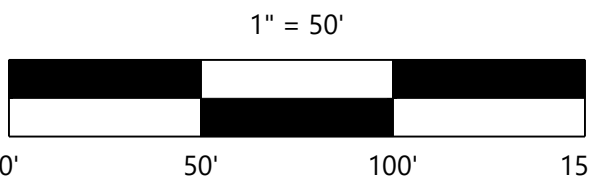
- OVERSTORY DECIDUOUS STREET TREES
- DECIDUOUS YARD TREES (BY HOME BUILDER)
- DECIDUOUS OVERSTORY TREES
- EVERGREEN TREES
- SMALL OVERSTORY TREES
- EXISTING CONIFEROUS TREE TO REMAIN
- EXISTING DECIDUOUS TREE TO REMAIN

NATIVE SEEDING LEGEND

- MNDOT SOUTHERN TALLGRASS ROADSIDE (STR) SEED MIX TOTAL AREA (1.7 AC)
- MNDOT WET DITCH (WD) SEED MIX TOTAL AREA (1.4 AC)
- MNDOT WET MEADOW S & W SEED MIX (34-271) TOTAL AREA (0.4 AC)

* ALL DISTURBED AREAS TO BE SODDED UNLESS NOTED OTHERWISE

* ALL DISTURBED AREAS WITHIN CITY ROW ALONG TERRITORIAL ROAD & WOOD LANE TO BE SEEDED WITH MESIC GENERAL ROADSIDE MIX (25-141)



NOT FOR CONSTRUCTION

DESIGNED:	TDD
CHECKED:	CHF
DRAWN:	DJW
HORIZONTAL SCALE:	1"=50'
VERTICAL SCALE:	

INITIAL ISSUE:	11/15/24
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PREPARED FOR:

SUMMERGATE COMPANIES LLC

17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

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CORY L. MEYER
DATE: 11/15/24 LICENSE NO. 26971

NORTHVIEW PRESERVE

ROGERS, MN

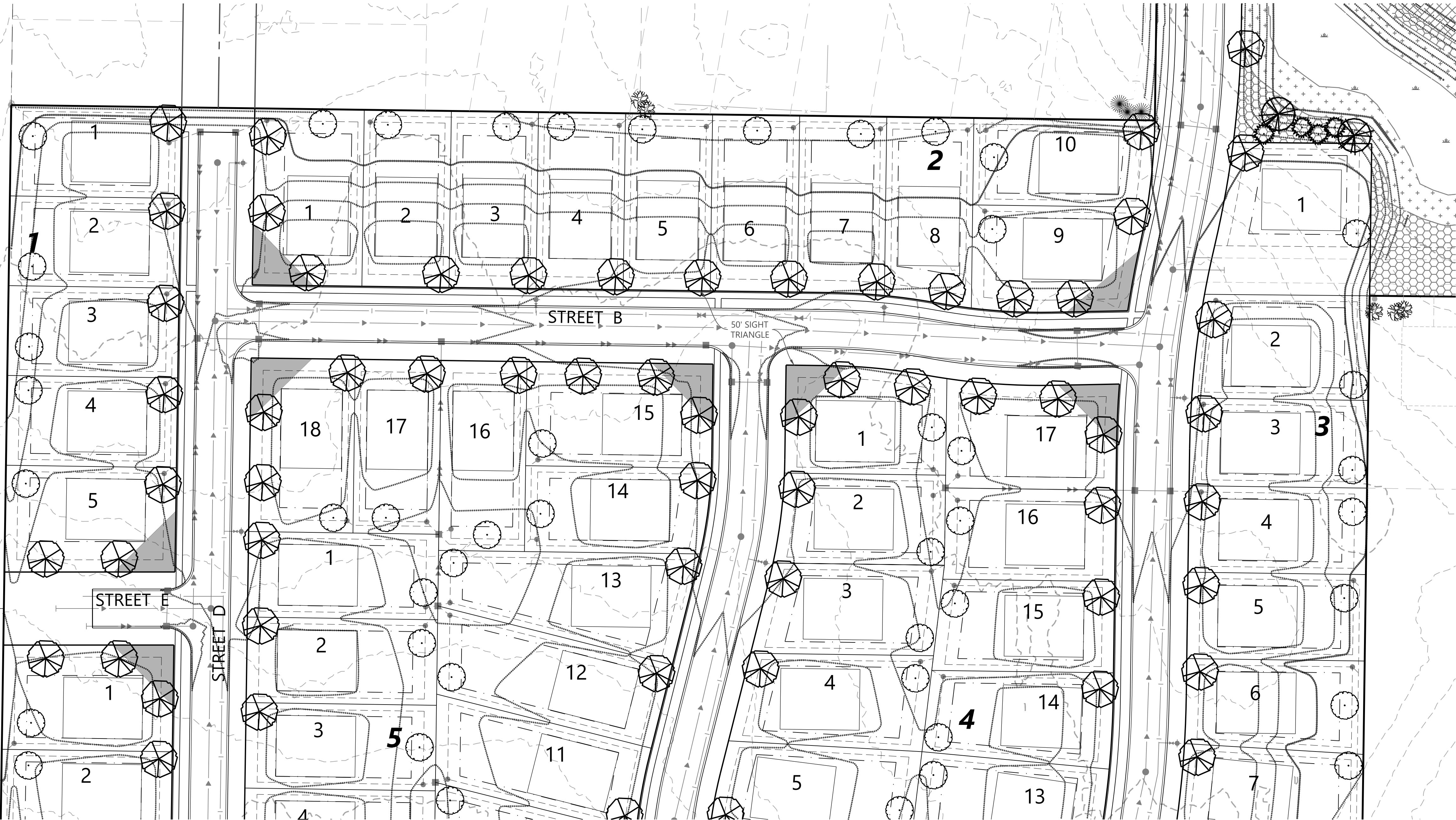
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Westwood Professional Services, Inc.

PRELIMINARY
LANDSCAPE PLAN

PROJECT NUMBER: 0033874.00

SHEET NUMBER:
26 OF 28
DATE: 11/15/24



PLANT LEGEND

- OVERSTORY DECIDUOUS STREET TREES
- DECIDUOUS YARD TREES (BY HOME BUILDER)
- DECIDUOUS OVERSTORY TREES
- EVERGREEN TREES
- SMALL OVERSTORY TREES
- EXISTING CONIFEROUS TREE TO REMAIN
- EXISTING DECIDUOUS TREE TO REMAIN

NATIVE SEEDING LEGEND

- MNDOT SOUTHERN TALLGRASS ROADSIDE (STR) SEED MIX TOTAL AREA (1.7 AC)
- MNDOT WET DITCH (WD) SEED MIX TOTAL AREA (1.4 AC)
- MNDOT WET MEADOW S & W SEED MIX (34-271) TOTAL AREA (0.4 AC)

* ALL DISTURBED AREAS TO BE SODDED UNLESS NOTED OTHERWISE

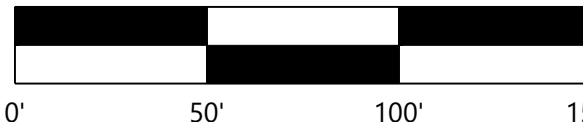
* ALL DISTURBED AREAS WITHIN CITY ROW ALONG TERRITORIAL ROAD & WOOD LANE TO BE SEEDED WITH MESIC GENERAL ROADSIDE MIX (25-141)

PLANTING NOTES

- CONTRACTOR SHALL CONTACT COMMON GROUND ALLIANCE AT 811 OR CALL811.COM TO VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY PLANTS OR LANDSCAPE MATERIAL.
- ACTUAL LOCATION OF PLANT MATERIAL IS SUBJECT TO FIELD AND SITE CONDITIONS.
- NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
- ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SUBMISSION OF ANY BID AND/OR QUOTE BY THE LANDSCAPE CONTRACTOR.
- CONTRACTOR SHALL PROVIDE TWO YEAR GUARANTEE OF ALL PLANT MATERIALS. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNER'S WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
- ALL PLANTS TO BE SPECIMEN GRADE, MINNESOTA-GROWN AND/OR HARDY. SPECIMEN GRADE SHALL ADHERE TO, BUT IS NOT LIMITED BY, THE FOLLOWING STANDARDS:
 - ALL PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, SCARS, ETC.
 - ALL PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES.
 - ALL PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES.
 - ALL PLANTS SHALL HAVE HEAVY, HEALTHY BRANCHING AND LEAFING.
- CONIFEROUS TREES SHALL HAVE AN ESTABLISHED MAIN LEADER AND A HEIGHT TO WIDTH RATIO OF NO LESS THAN 5:3.
- PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
- PLANTS TO BE INSTALLED AS PER MNLA & ANSI STANDARD PLANTING PRACTICES.
- PLANTS SHALL BE IMMEDIATELY PLANTED UPON ARRIVAL AT SITE. PROPERLY HEEL-IN MATERIALS IF NECESSARY; TEMPORARY ONLY.
- PRIOR TO PLANTING, FIELD VERIFY THAT THE ROOT COLLAR/ROOT FLAIR IS LOCATED AT THE TOP OF THE BALLED & BURLAP TREE. IF THIS IS NOT THE CASE, SOIL SHALL BE REMOVED DOWN TO THE ROOT COLLAR/ROOT FLAIR. WHEN THE BALLED & BURLAP TREE IS PLANTED, THE ROOT COLLAR/ROOT FLAIR SHALL BE EVEN OR SLIGHTLY ABOVE FINISHED GRADE.
- OPEN TOP OF BURLAP ON BB MATERIALS; REMOVE POT ON POTTED PLANTS; SPLIT AND BREAK APART PEAT POTS.
- PRUNE PLANTS AS NECESSARY - PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
- WRAP ALL SMOOTH-BARKED TREES - FASTEN TOP AND BOTTOM. REMOVE BY APRIL 1ST.
- STAKING OF TREES AS REQUIRED; REPOSITION, PLUMB AND STAKE IF NOT PLUMB AFTER ONE YEAR.
- THE NEED FOR SOIL AMENDMENTS SHALL BE DETERMINED UPON SITE SOIL CONDITIONS PRIOR TO PLANTING. LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT FOR THE NEED OF ANY SOIL AMENDMENTS.
- BACKFILL SOIL AND TOPSOIL TO ADHERE TO MN/DOT STANDARD SPECIFICATION 3877 (SELECT TOPSOIL BORROW) AND TO BE EXISTING TOP SOIL FROM SITE FREE OF ROOTS, ROCKS LARGER THAN ONE INCH, SUBSOIL DEBRIS, AND LARGE WEEDS UNLESS SPECIFIED OTHERWISE. MINIMUM 4" DEPTH TOPSOIL FOR ALL LAWN GRASS AREAS AND 12" DEPTH TOPSOIL FOR TREE, SHRUBS, AND PERENNIALS.
- MULCH TO BE AT ALL TREE, SHRUB, PERENNIAL, AND MAINTENANCE AREAS. TREE AND SHRUB PLANTING BEDS SHALL HAVE 4" DEPTH OF SHREDDED HARDWOOD MULCH. SHREDDED HARDWOOD MULCH TO BE USED AROUND ALL PLANTS WITHIN TURF AREAS. PERENNIAL AND ORNAMENTAL GRASS BEDS SHALL HAVE 2" DEPTH SHREDDED HARDWOOD MULCH. MULCH TO BE FREE OF DELETERIOUS MATERIAL. ROCK MULCH TO BE BUFF LIMESTONE, 1 1/2" TO 3" DIAMETER, AT MINIMUM 3" DEPTH, OR APPROVED EQUAL. ROCK MULCH TO BE ON COMMERCIAL GRADE FILTER FABRIC, BY TYPAR, OR APPROVED EQUAL WITH NO EXPOSURE. MULCH AND FABRIC TO BE APPROVED BY OWNER PRIOR TO INSTALLATION. MULCH TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).
- EDGING TO BE COMMERCIAL GRADE VALLEY-VIEW BLACK DIAMOND (OR EQUAL) POLY EDGING OR SPADED EDGE, AS INDICATED. POLY EDGING SHALL BE PLACED WITH SMOOTH CURVES AND STAKED WITH METAL SPIKES NO GREATER THAN 4 FOOT ON CENTER WITH BASE OF TOP BEAD AT GRADE, FOR MOWERS TO CUT ABOVE WITHOUT DAMAGE. UTILIZE CURBS AND SIDEWALKS FOR EDGING WHERE POSSIBLE. SPADED EDGE TO PROVIDE V-SHAPED DEPTH AND WIDTH TO CREATE SEPARATION BETWEEN MULCH AND GRASS. INDIVIDUAL TREE, SHRUB, OR RAIN-GARDEN BEDS TO BE SPADED EDGE, UNLESS NOTED OTHERWISE. EDGING TO MATCH EXISTING CONDITIONS (WHERE APPLICABLE).
- ALL DISTURBED AREAS TO BE SODDED OR SEEDED, UNLESS OTHERWISE NOTED. PARKING LOT ISLANDS TO BE SODDED WITH SHREDDED HARDWOOD MULCH AROUND ALL TREES AND SHRUBS. SOD TO BE STANDARD MINNESOTA GROWN AND HARDY BLUEGRASS MIX, FREE OF LAWN WEEDS. ALL TOPSOIL AREAS TO BE RAKED TO REMOVE DEBRIS AND ENSURE DRAINAGE. SLOPES OF 3:1 OR GREATER SHALL BE STAKED. SEED AS SPECIFIED AND PER MN/DOT SPECIFICATIONS. IF NOT INDICATED ON LANDSCAPE PLAN, SEE EROSION CONTROL PLAN.
- PROVIDE IRRIGATION TO ALL PLANTED AREAS ON SITE. IRRIGATION SYSTEM TO BE DESIGN/BUILD BY LANDSCAPE CONTRACTOR. LANDSCAPE CONTRACTOR TO PROVIDE SHOP DRAWINGS TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION OF IRRIGATION SYSTEM. CONTRACTOR TO PROVIDE OPERATION MANUALS, AS-BUILT PLANS, AND NORMAL PROGRAMMING. SYSTEM SHALL BE WINTERIZED AND HAVE SPRING STARTUP DURING FIRST YEAR OF OPERATION. SYSTEM SHALL HAVE ONE-YEAR WARRANTY ON ALL PARTS AND LABOR. ALL INFORMATION ABOUT INSTALLATION AND SCHEDULING CAN BE OBTAINED FROM THE GENERAL CONTRACTOR.
- CONTRACTOR SHALL PROVIDE NECESSARY WATERING OF PLANT MATERIALS UNTIL THE PLANT IS FULLY ESTABLISHED OR IRRIGATION SYSTEM IS OPERATIONAL. OWNER WILL NOT PROVIDE WATER FOR CONTRACTOR.
- REPAIR, REPLACE, OR PROVIDE SOD/SEED AS REQUIRED FOR ANY ROADWAY BOULEVARD AREAS ADJACENT TO THE SITE DISTURBED DURING CONSTRUCTION.
- REPAIR ALL DAMAGE TO PROPERTY FROM PLANTING OPERATIONS AT NO COST TO OWNER.



1" = 50'



NOT FOR CONSTRUCTION

DESIGNED: TODD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
REVISIONS:
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△

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA
CORY L. MEYER
DATE: 11/15/24 LICENSE NO. 26971

NORTHVIEW PRESERVE
ROGERS, MN

Westwood

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PRELIMINARY
LANDSCAPE PLAN

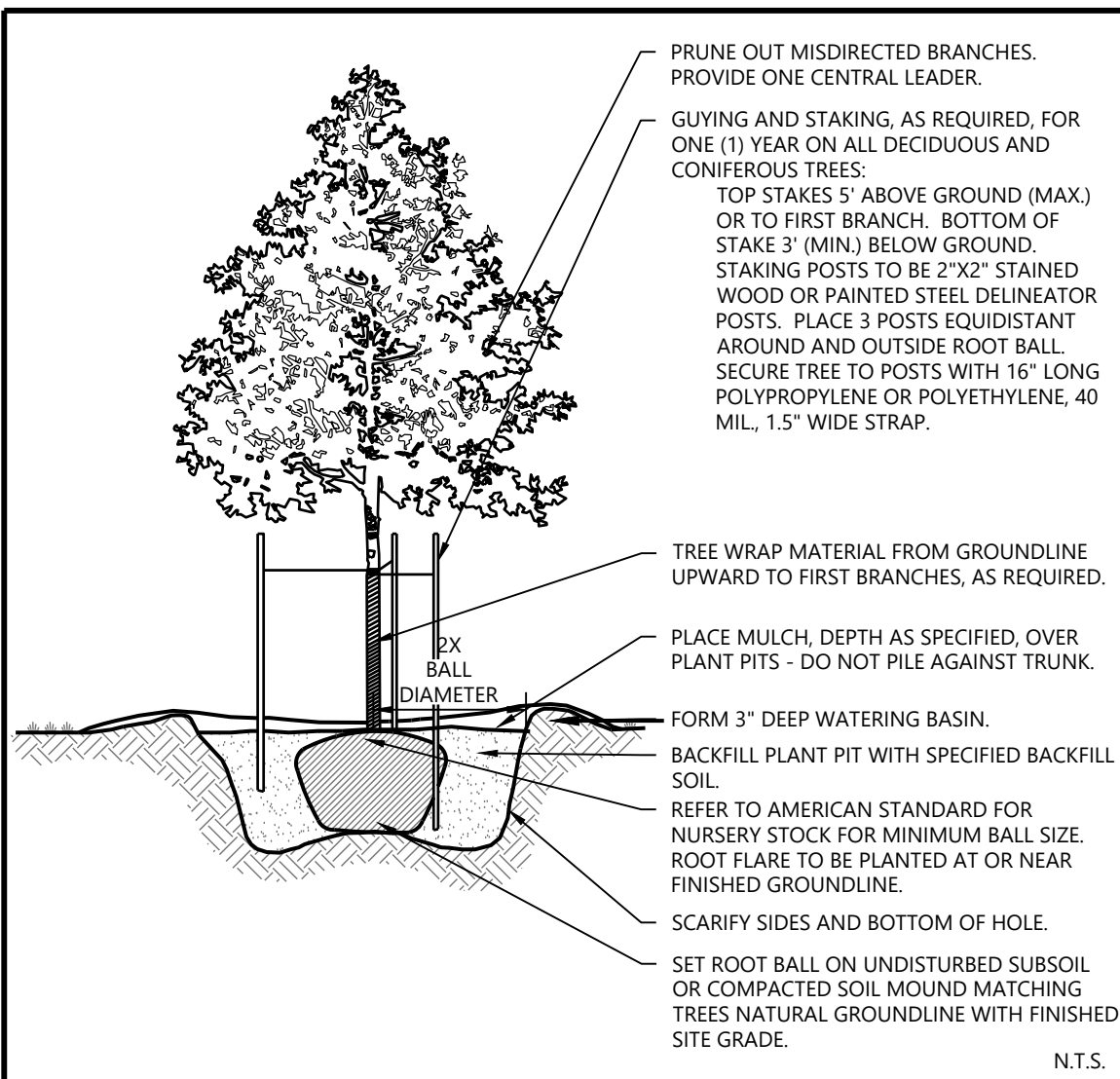
PROJECT NUMBER: 003874.00

SHEET NUMBER:

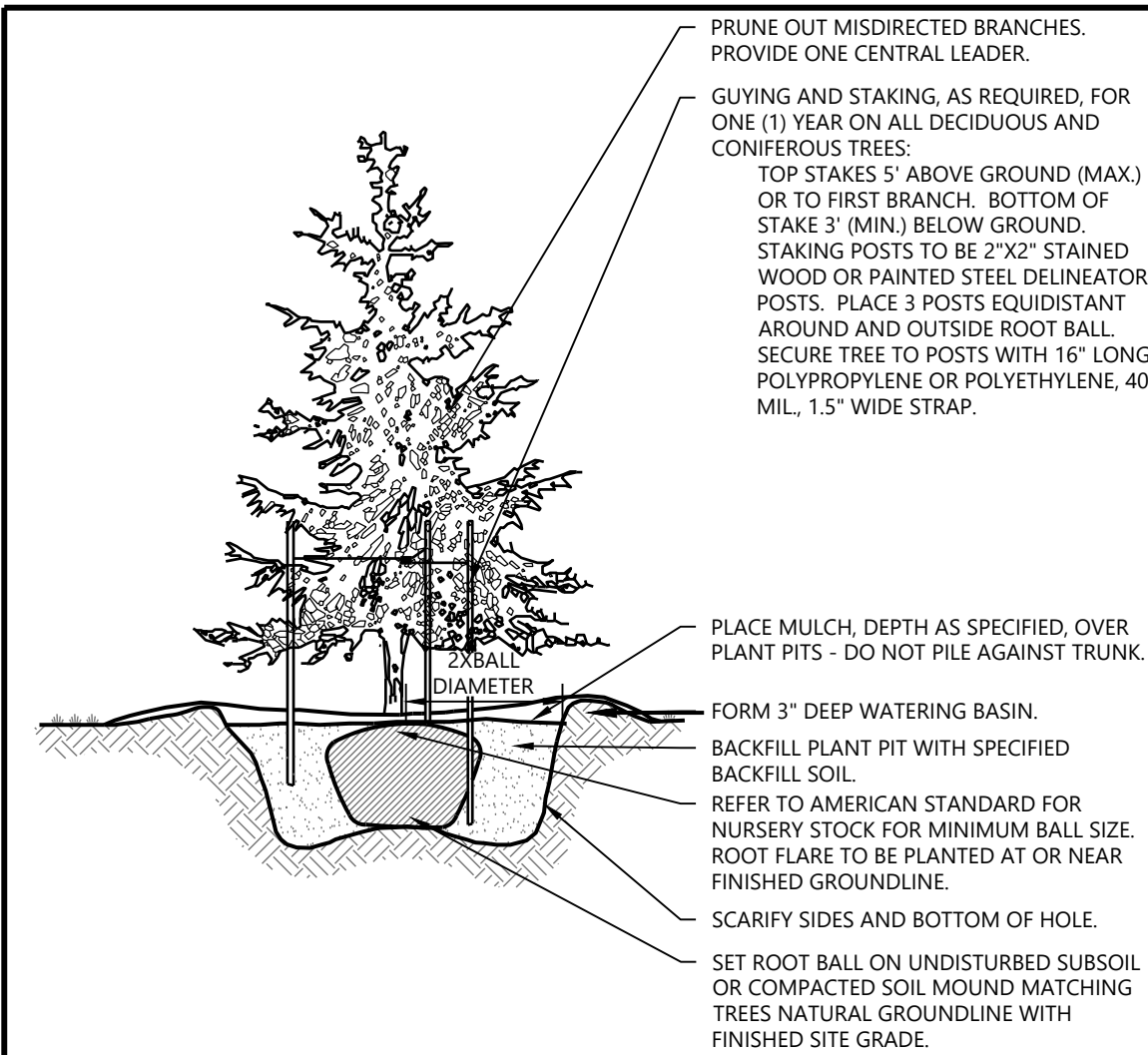
27 OF 28

DATE: 11/15/24

PLANTING DETAILS



Westwood	DECIDUOUS TREE PLANTING	LAST REVISED: 10/19/18
		LA28



Westwood	EVERGREEN TREE PLANTING	LAST REVISED: 10/19/18
		LA29

PLANT LEGEND

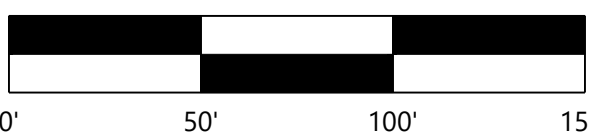
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- SMALL OVERSTORY TREES
- EXISTING CONIFEROUS TREE TO REMAIN
- EXISTING DECIDUOUS TREE TO REMAIN

NATIVE SEEDING LEGEND

- MNDOT SOUTHERN TALLGRASS ROADSIDE (STR) SEED MIX
TOTAL AREA (1.7 AC)
- MNDOT WET DITCH (WD) SEED MIX
TOTAL AREA (1.4 AC)
- MNDOT WET MEADOW S & W SEED MIX (34-271)
TOTAL AREA (0.4 AC)
- * ALL DISTURBED AREAS TO BE SODDED UNLESS NOTED OTHERWISE
- * ALL DISTURBED AREAS WITHIN CITY ROW ALONG TERRITORIAL ROAD & WOOD LANE TO BE SEEDDED WITH MESIC GENERAL ROADSIDE MIX (25-141)



1" = 50'



NOT FOR CONSTRUCTION

NORTHVIEW PRESERVE

DESIGNED: TOD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE:

INITIAL ISSUE: 11/15/24
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PREPARED FOR:
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LAKEVILLE, MN 55044

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NORTHVIEW PRESERVE
ROGERS, MN

Westwood

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PRELIMINARY
LANDSCAPE PLAN

PROJECT NUMBER: 003874.00

SHEET NUMBER:
28 OF 28
DATE: 11/15/24

Stormwater Management Plan for

Northview Preserve

Rogers, MN

Prepared for:

Summergeate Companies, LLC.
17305 Cedar Avenue, Suite 200
Lakeville, MN 55044

Prepared by:

Westwood Professional Services
12701 Whitewater Drive, Suite #300
Minnetonka, MN 55343
(952) 937-5150

Project Number: 0033874.00

Revised Date: 11/15/24

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EXHIBITS

- Exhibit 1: Existing Drainage Map
- Exhibit 2: Proposed Drainage Map
- Exhibit 3: HydroCAD Report for Existing and Proposed Conditions
- Exhibit 4: Geotechnical Evaluation
- Exhibit 5: Pond Volume Summary
- Exhibit 6: P8 Output

INTRODUCTION

This drainage study summarizes the stormwater analysis for the proposed Northview Preserve residential project located South and East of the intersection of Territorial Road and Tucker Road in Rogers, Minnesota. The proposed project consists of approximately 31.3 acres of primarily row crops. There are three wetlands on the property, one of which will not be impacted. The proposed development will consist of a total of 75 single family residential homes with associated streets and utility infrastructure.

An existing drainage map is shown in Exhibit 1. The proposed drainage map is shown in Exhibit 2. The site is modeled in HydroCAD to analyze the existing conditions and proposed conditions. HydroCAD output is included in Exhibit 3.

REGULATIONS

The project site is under the regulatory authority of the City of Rogers, Elm Creek Watershed District and the MPCA. The project site is located outside any FEMA zones.

Rate Control

The Elm Creek Watershed District and City of Rogers require the peak runoff rates not to exceed the existing conditions or the capacity of downstream conveyance facilities or contribute to flooding or streambank erosion. This requirement applies to the 2, 10, and 100-year critical storm events.

Volume Control

The Elm Creek Watershed District and City of Rogers require a stormwater runoff volume to be infiltrated/abstracted onsite in the amount equivalent to one point one inch (1.1") of runoff generated from new impervious surface.

Water Quality

The Elm Creek Watershed District and City of Rogers require that there shall be no net increase in total phosphorus (TP) or total suspended solids (TSS) from pre-development land cover to post-development land cover.

EXISTING CONDITIONS

The existing site consists of predominantly agricultural land and some low areas and wetlands. The soils borings show type D soils onsite, see Exhibit 4.

The existing site drains in three directions. The north portions of the site drain north to different outlets, ultimately draining across Territorial into the Big Woods property. The southwest portion drains overland into the adjacent property. The southeast portion drains into the existing wetland/low area in the southeast adjacent property. See the Existing Drainage Area Map Included in Exhibit 1 for further detail.

The rainfall distributions and depths that were used in the HydroCAD analysis are from NOAA Atlas 14, MSE-3 distribution. The existing HydroCAD analysis was used to evaluate wetlands and current site conditions and high-water levels (Exhibit 3).

PROPOSED CONDITIONS

The proposed site consists of 75 single family residential homes with the associated streets and utility infrastructure. Proposed conditions cover is presented in Table 1.

Table 1: Proposed Conditions Cover

Cover	Area [ac]
Impervious	11.0
Pervious	20.3
Total	30.3

Impervious surfaces for the model were calculated individually for each house, driveway and street.

The proposed site maintains the existing drainage patterns. The proposed site consists of 9 overall drainage areas. Some of these areas are split into two areas (e.g. 1p and 1Ex) to accurately model the impact of the proposed conditions on the existing outlets. Most of the proposed site is split between drainage areas 6P and 7P which are directed north and south to ponds 6PP and 7PP, respectively. Some of the smaller drainage areas containing backyard drainage are also modelled including drainage areas 1P, 2P, 4P, and 9P. Other offsite drainage areas were also modelled because they will be captured onsite, matching the existing conditions. These drainage areas include 3Ex, 4Ex, and 8Ex.

The proposed site contains three stormwater ponds. Ponds 5PP and 7PP, which are connected through a stormwater pipe running at equilibrium, will act as one NURP pond and will treat

runoff from the southern half of the site. Pond 6PP will include pretreatment and filtration, this will treat runoff from the northern half of the site. The three ponds act in sequence with the existing wetlands, matching the existing conditions. Ponds 5PP/7PP will outlet into the existing wetland in the southwest, Pond 4PP. This existing wetland overflows into the existing wetland in the north, Pond 3PP, and will outlet into Proposed Pond 6PP to be treated before ultimately discharging north to the Big Woods property.

RATE CONTROL

The Elm Creek Watershed District and City of Rogers have a rate control standard where peak rates shall not increase from existing conditions for the 2, 10 and 100-year critical storm events. The proposed improvements reduce the runoff rate for all discharge points. Tables 2a-2c show a summary of the runoff rates. Complete HydroCAD calculations can be found in Exhibit 3.

Table 2a: Peak Discharge Rate-100 Year Event

Discharge Location	Existing (cfs)	Proposed (cfs)
Big Woods Southwest Wetland Complex	45.29	43.43
Existing Overflow Offsite North	57.38	43.49
Big Woods Southeast Wetland Complex	16.67	13.38

Table 2b: Peak Discharge Rate-10 Year Event

Discharge Location	Existing (cfs)	Proposed (cfs)
Big Woods Southwest Wetland Complex	38.23	35.98
Existing Overflow Offsite North	14.83	10.99
Big Woods Southeast Wetland Complex	10.75	8.19

Table 2c: Peak Discharge Rate-2 Year Event

Discharge Location	Existing (cfs)	Proposed (cfs)
Big Woods Southwest Wetland Complex	29.50	27.03
Existing Overflow Offsite North	3.68	1.13
Big Woods Southeast Wetland Complex	5.13	4.63

VOLUME CONTROL

The site is required to infiltrate/abstract 1.1" of runoff from the proposed impervious surfaces. Soil borings have been completed, see Exhibit 4, and the site consists primarily of clayey soils, thus infiltration was not considered as a practice to meet the volume control requirement. The volume reduction has been accomplished using a filtration basin with an underdrain system. A volume control summary can be found in Table 4. Provided volumes are calculated using the filtration depths and the volume of the basins below the outlet elevations. A conservative filtration rate of 1.0 in/hour was assumed for the filtration media.

Table 4: Proposed Conditions Volume Control

Volume Control	Total Proposed Site
Impervious Area (AC)	11.0
Required Vol (1.1") (CF)	44,025
Provided Vol (CF)	44,077

WATER QUALITY

The Elm Creek Watershed requires that there shall be no net increase in TP and TSS from pre-development land cover to post-development land cover. The proposed improvements were chosen for their ability to meet this requirement. The proposed ponds are designed to meet NURP standards, and the filtration basin is included to meet and exceed the City and Watershed water quality standards. A P8 model has been prepared to confirm that the water quality standard has been met. See Table 5 below summarizing pre and post development water quality conditions.

Table 5: Water Quality – P8 Calculations

Pollutant	Existing	Proposed
TP (lb/yr)	16.9	16.8
TSS (lb/yr)	2,044.3	1,338.2

See Exhibit 5 for NURP runoff calculations along with pond dead storage volume calculations. See Exhibit 6 for P8 output.

BASIN SUMMARY

High water levels for the 100-year critical storm event are calculated using HydroCAD and are shown in the grading and utility plans. High water levels in the existing and proposed conditions are shown for the wetlands onsite.

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A drawdown time of 48 hours is required for all filtration/infiltration practices. A filtration rate of 1.00 in/hour has been assumed for the filtration basin. The filtration depth of the proposed basin is 1.5'. Given the assumed infiltration rate of 1.00 in/hour, the basin has the ability to drawdown 4.0' in 48 hours, thus meeting the drawdown requirement.

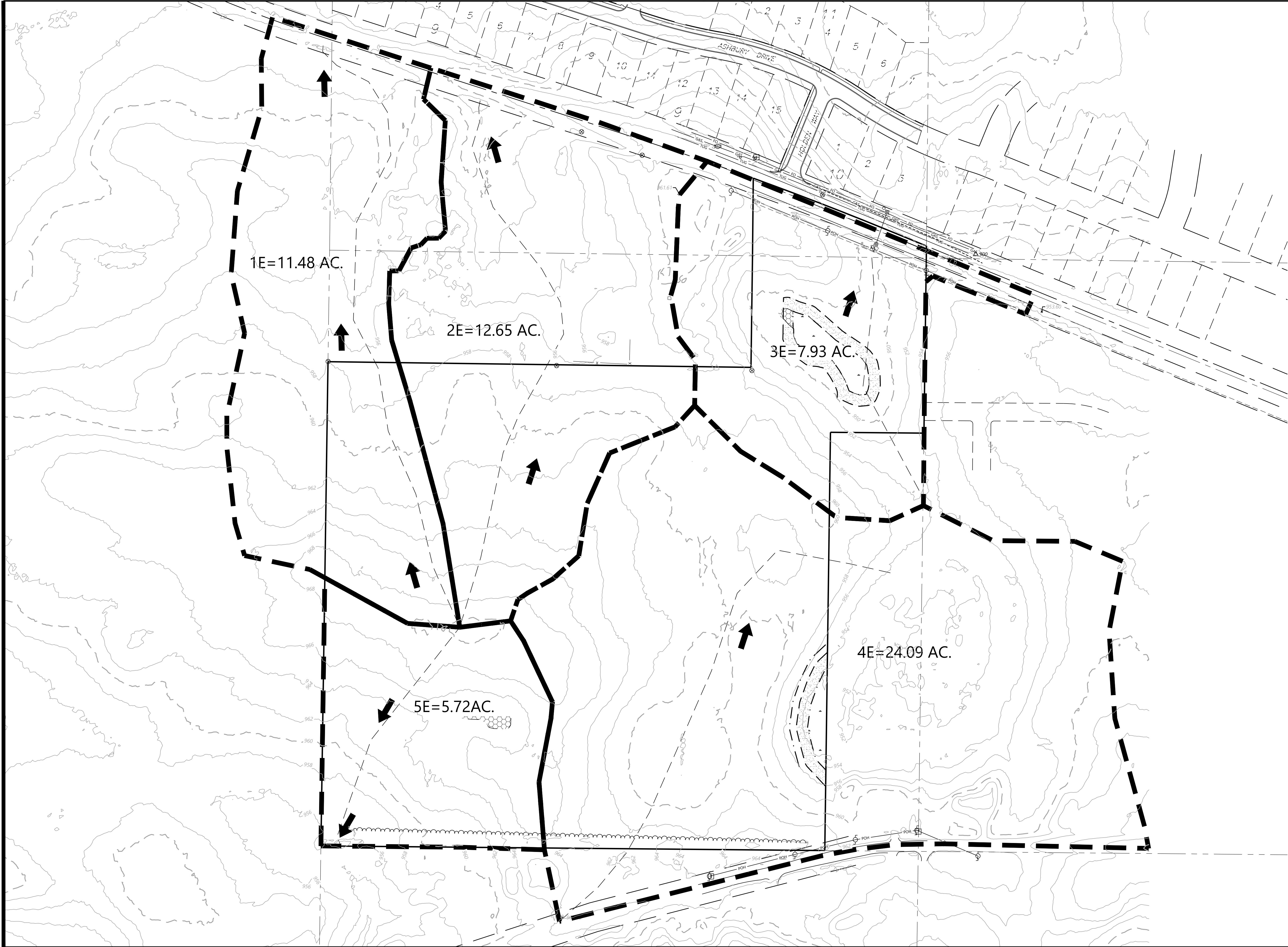
CONCLUSIONS

The proposed site meets all requirements of the State of Minnesota, The City of Rogers, and the Elm Creek Watershed for rate control, volume control and water quality.

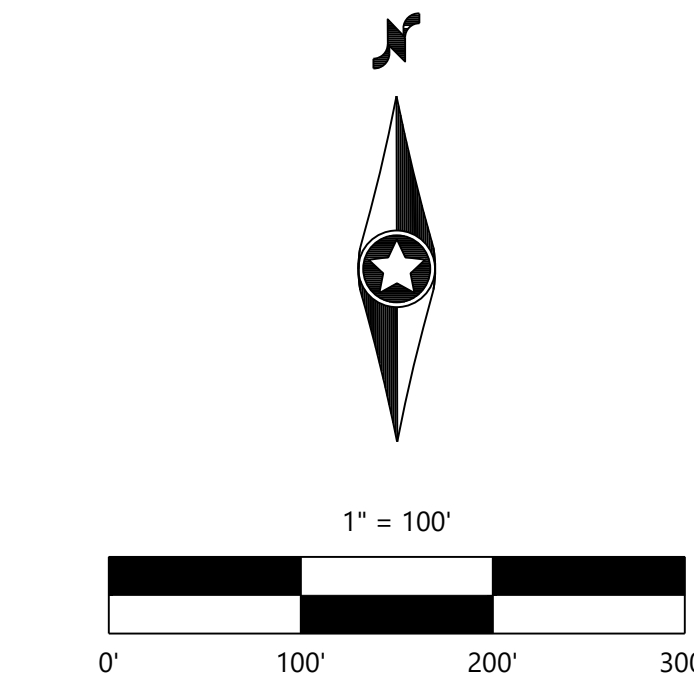
EXHIBIT 1

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N:\0033874\DWG\0033874C-DRAIN.DWG



Call 48 Hours before digging:
811 or call811.com
Common Ground Alliance



NOT FOR CONSTRUCTION

DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 100'
VERTICAL SCALE: 20' or 10'

INITIAL ISSUE: 08/23/24
REVISIONS:
△
△
△
△
△

PREPARED FOR:

SUMMERGATE COMPANIES LLC

17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION AND THAT I AM A
DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS
OF THE STATE OF MINNESOTA.

THOMAS D. DESUTTER
DATE: 08/23/24 LICENSE NO. 59640

NORTHVIEW PRESERVE

ROGERS, MN

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
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EXISTING DRAINAGE MAP

SHEET NUMBER:

1

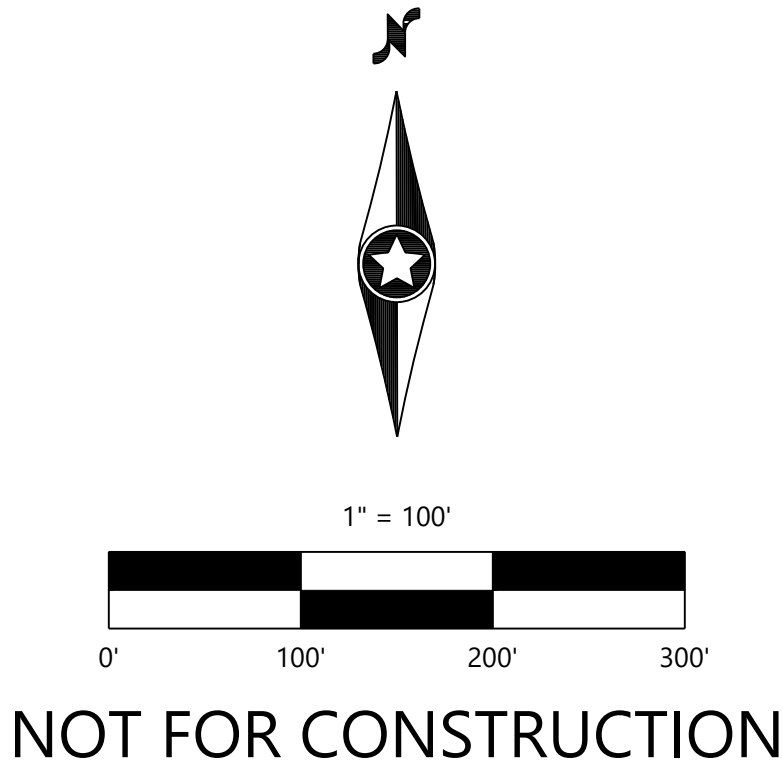
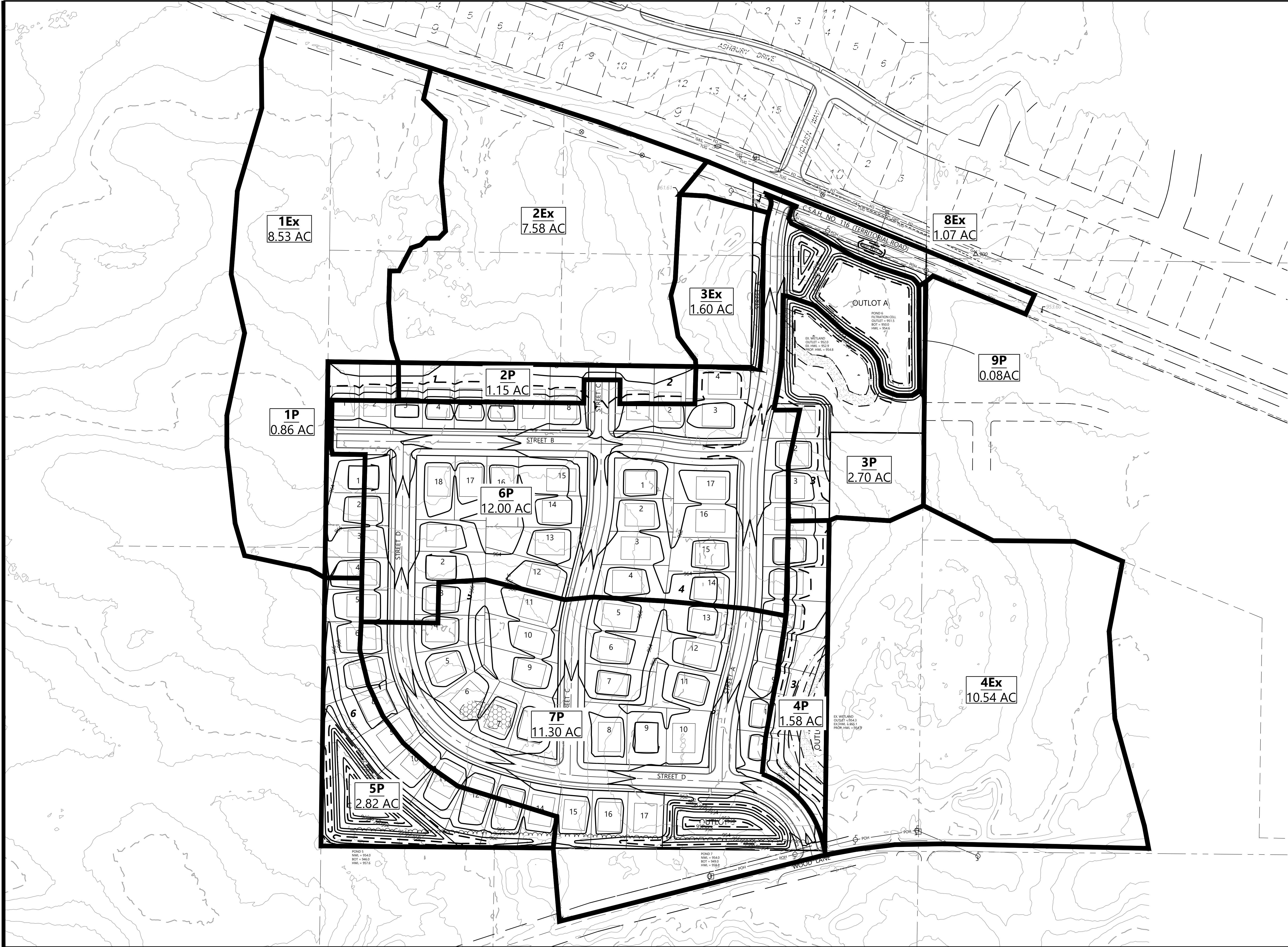
OF

1

PROJECT NUMBER: 0033874.00

DATE: 08/23/24

EXHIBIT 2



DESIGNED: TDD
CHECKED: CHF
DRAWN: DJW
HORIZONTAL SCALE: 100'
VERTICAL SCALE: 20' or 10'

INITIAL ISSUE: 08/23/24
REVISIONS:
△
△
△
△
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△

PREPARED FOR:
SUMMERGATE COMPANIES LLC
17305 CEDAR AVENUE, SUITE 200
LAKEVILLE, MN 55044

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME
OR UNDER MY DIRECT SUPERVISION AND THAT I AM A
DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS
OF THE STATE OF MINNESOTA.
THOMAS D. DESUTTER
DATE: 08/23/24 LICENSE NO. 59640

NORTHVIEW PRESERVE
ROGERS, MN

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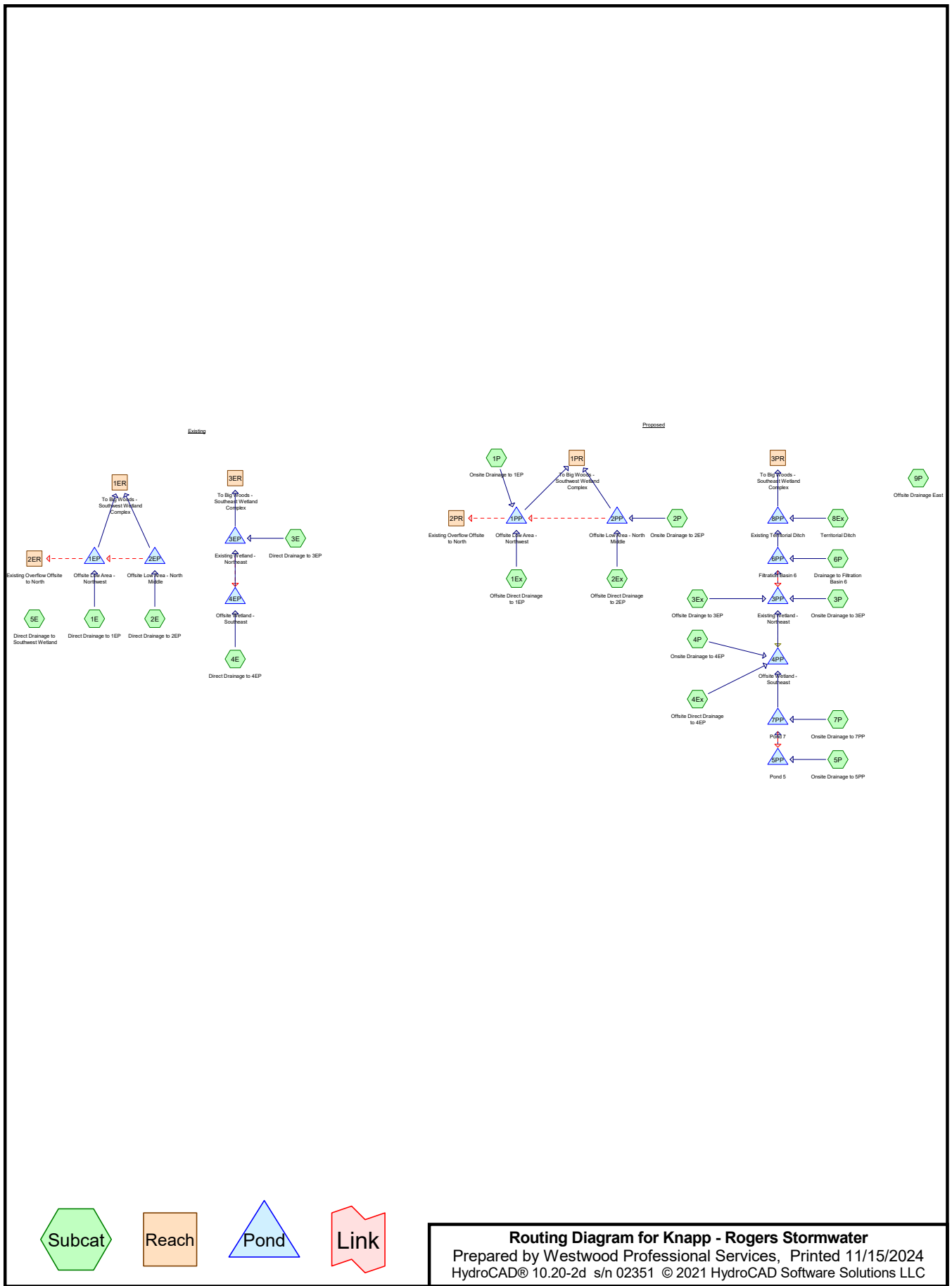
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Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
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**PROPOSED DRAINAGE
MAP**

PROJECT NUMBER: 0033874.00

SHEET NUMBER:
1 OF
1
DATE: 08/23/24

EXHIBIT 3



Knapp - Rogers Stormwater

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Project Notes

Rainfall events imported from "Forestar - Rogers Stormwater.hcp"

Knapp - Rogers Stormwater

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	MSE 24-hr	3	Default	24.00	1	2.86	2
2	10-yr	MSE 24-hr	3	Default	24.00	1	4.26	2
3	100-yr	MSE 24-hr	3	Default	24.00	1	7.49	2
4	100-yr Rogers	MSE 24-hr	3	Default	24.00	1	6.87	2
5	NURP	MSE 24-hr	3	Default	24.00	1	2.50	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
56.027	80	>75% Grass cover, Good, HSG D (1E, 1Ex, 1P, 2E, 2Ex, 2P, 3E, 3Ex, 3P, 4E, 4Ex, 4P, 5P, 6P, 7P, 8Ex, 9P)
3.650	98	Existing Impervious (1E, 1Ex, 2E, 2Ex, 3E, 4E, 4Ex, 8Ex)
4.973	98	Paved parking, HSG D (4P, 6P)
4.690	98	Proposed Impervious (1P, 2P, 3Ex, 3P, 5P, 7P)
54.340	87	Small grain, straight row, Good, HSG D (1E, 1Ex, 2E, 2Ex, 3E, 4E, 4Ex, 5E)
123.680	85	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
115.340	HSG D	1E, 1Ex, 1P, 2E, 2Ex, 2P, 3E, 3Ex, 3P, 4E, 4Ex, 4P, 5E, 5P, 6P, 7P, 8Ex, 9P
8.340	Other	1E, 1Ex, 1P, 2E, 2Ex, 2P, 3E, 3Ex, 3P, 4E, 4Ex, 5P, 7P, 8Ex
123.680		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	56.027	0.000	56.027	>75% Grass cover, Good	1E, 1E x, 1P, 2E, 2E x, 2P, 3E, 3E x, 3P, 4E, 4E x, 4P, 5P, 6P, 7P, 8E x, 9P
0.000	0.000	0.000	0.000	3.650	3.650	Existing Impervious	1E, 1E x, 2E, 2E x, 3E, 4E,

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Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	4.973	0.000	4.973	Paved parking	4P, 6P
0.000	0.000	0.000	0.000	4.690	4.690	Proposed Impervious	1P, 2P, 3E x, 3P, 5P, 7P
0.000	0.000	0.000	54.340	0.000	54.340	Small grain, straight row, Good	1E, 1E x, 2E, 2E x, 3E, 4E, 4E x, 5E
0.000	0.000	0.000	115.340	8.340	123.680	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	1EP	944.64	943.27	55.7	0.0246	0.012	0.0	18.0	0.0
2	1PP	944.64	943.27	55.7	0.0246	0.012	0.0	18.0	0.0
3	2EP	945.75	944.95	73.4	0.0109	0.012	0.0	24.0	0.0
4	2PP	945.75	944.95	73.4	0.0109	0.012	0.0	24.0	0.0
5	3EP	948.12	946.68	97.0	0.0148	0.013	0.0	18.0	0.0
6	3PP	952.00	951.50	24.0	0.0208	0.013	0.0	24.0	0.0
7	5PP	954.00	954.00	560.0	0.0000	0.013	0.0	30.0	0.0
8	6PP	948.17	948.12	38.0	0.0013	0.013	0.0	18.0	0.0
9	6PP	948.25	948.17	265.0	0.0003	0.011	0.0	6.0	0.0
10	6PP	951.50	952.00	25.0	-0.0200	0.013	0.0	24.0	0.0
11	7PP	954.00	953.70	230.0	0.0013	0.013	0.0	30.0	0.0
12	7PP	954.00	954.00	560.0	0.0000	0.013	0.0	30.0	0.0
13	8PP	948.12	946.68	97.0	0.0148	0.013	0.0	18.0	0.0

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Time span=0.00-300.00 hrs, dt=0.01 hrs, 30001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1E: Direct Drainage to 1EP Runoff Area=11.480 ac 5.40% Impervious Runoff Depth=1.62"
Flow Length=1,422' Slope=0.0170 '/' Tc=25.5 min CN=87 Runoff=18.27 cfs 1.547 af

Subcatchment 1Ex: Offsite Direct Drainage Runoff Area=8.530 ac 7.27% Impervious Runoff Depth=1.62"
Flow Length=1,180' Slope=0.0180 '/' Tc=21.3 min CN=87 Runoff=14.92 cfs 1.150 af

Subcatchment 1P: Onsite Drainage to 1EP Runoff Area=0.863 ac 24.33% Impervious Runoff Depth=1.40"
Tc=5.0 min CN=84 Runoff=2.37 cfs 0.101 af

Subcatchment 2E: Direct Drainage to 2EP Runoff Area=12.650 ac 2.37% Impervious Runoff Depth=1.47"
Flow Length=1,273' Slope=0.0170 '/' Tc=25.1 min CN=85 Runoff=18.48 cfs 1.551 af

Subcatchment 2Ex: Offsite Direct Drainage Runoff Area=7.580 ac 3.96% Impervious Runoff Depth=1.33"
Flow Length=655' Slope=0.1400 '/' Tc=5.5 min CN=83 Runoff=19.40 cfs 0.843 af

Subcatchment 2P: Onsite Drainage to 2EP Runoff Area=1.150 ac 22.61% Impervious Runoff Depth=1.40"
Tc=5.0 min CN=84 Runoff=3.16 cfs 0.134 af

Subcatchment 3E: Direct Drainage to 3EP Runoff Area=7.930 ac 6.31% Impervious Runoff Depth=1.47"
Flow Length=605' Slope=0.0071 '/' Tc=21.4 min CN=85 Runoff=12.57 cfs 0.972 af

Subcatchment 3Ex: Offsite Drainage to 3EP Runoff Area=1.600 ac 6.25% Impervious Runoff Depth=1.21"
Tc=12.0 min CN=81 Runoff=2.77 cfs 0.161 af

Subcatchment 3P: Onsite Drainage to 3EP Runoff Area=2.700 ac 3.70% Impervious Runoff Depth=1.21"
Flow Length=605' Slope=0.0071 '/' Tc=24.4 min CN=81 Runoff=3.23 cfs 0.272 af

Subcatchment 4E: Direct Drainage to 4EP Runoff Area=24.090 ac 2.08% Impervious Runoff Depth=1.47"
Flow Length=1,227' Slope=0.0081 '/' Tc=35.3 min CN=85 Runoff=28.85 cfs 2.954 af

Subcatchment 4Ex: Offsite Direct Drainage Runoff Area=10.540 ac 4.74% Impervious Runoff Depth=1.27"
Flow Length=651' Slope=0.0100 '/' Tc=21.1 min CN=82 Runoff=14.51 cfs 1.115 af

Subcatchment 4P: Onsite Drainage to 4EP Runoff Area=1.577 ac 17.31% Impervious Runoff Depth=1.33"
Tc=5.0 min CN=83 Runoff=4.13 cfs 0.175 af

Subcatchment 5E: Direct Drainage to Runoff Area=5.720 ac 0.00% Impervious Runoff Depth=1.62"
Flow Length=560' Slope=0.0240 '/' Tc=10.2 min CN=87 Runoff=14.28 cfs 0.771 af

Subcatchment 5P: Onsite Drainage to 5PP Runoff Area=2.820 ac 11.35% Impervious Runoff Depth=1.27"
Tc=10.0 min CN=82 Runoff=5.57 cfs 0.298 af

Subcatchment 6P: Drainage to Filtration Runoff Area=12.000 ac 39.17% Impervious Runoff Depth=1.62"
Tc=10.0 min CN=87 Runoff=30.13 cfs 1.617 af

Subcatchment 7P: Onsite Drainage to 7PP Runoff Area=11.300 ac 32.74% Impervious Runoff Depth=1.54"
Tc=15.0 min CN=86 Runoff=22.72 cfs 1.453 af

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Subcatchment 8Ex: Territorial Ditch	Runoff Area=1.070 ac 28.97% Impervious Runoff Depth=1.47" Tc=5.0 min CN=85 Runoff=3.08 cfs 0.131 af
Subcatchment 9P: Offsite Drainage East	Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=1.15" Tc=5.0 min CN=80 Runoff=0.18 cfs 0.008 af
Reach 1ER: To Big Woods - Southwest Wetland Complex	Inflow=29.50 cfs 3.024 af Outflow=29.50 cfs 3.024 af
Reach 1PR: To Big Woods - Southwest Wetland Complex	Inflow=27.03 cfs 2.214 af Outflow=27.03 cfs 2.214 af
Reach 2ER: Existing Overflow Offsite to North	Inflow=3.68 cfs 0.073 af Outflow=3.68 cfs 0.073 af
Reach 2PR: Existing Overflow Offsite to North	Inflow=1.13 cfs 0.013 af Outflow=1.13 cfs 0.013 af
Reach 3ER: To Big Woods - Southeast Wetland Complex	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 3PR: To Big Woods - Southeast Wetland Complex	Inflow=4.63 cfs 8.866 af Outflow=4.63 cfs 8.866 af
Pond 1EP: Offsite Low Area - Northwest	Peak Elev=947.27' Storage=0.182 af Inflow=18.27 cfs 1.547 af Primary=11.65 cfs 1.473 af Secondary=3.68 cfs 0.073 af Outflow=15.33 cfs 1.547 af
Pond 1PP: Offsite Low Area - Northwest	Peak Elev=947.12' Storage=0.152 af Inflow=15.56 cfs 1.251 af Primary=11.20 cfs 1.237 af Secondary=1.13 cfs 0.013 af Outflow=12.33 cfs 1.250 af
Pond 2EP: Offsite Low Area - North Middle	Peak Elev=948.17' Storage=0.029 af Inflow=18.48 cfs 1.551 af Primary=18.00 cfs 1.551 af Secondary=0.00 cfs 0.000 af Outflow=18.00 cfs 1.551 af
Pond 2PP: Offsite Low Area - North Middle	Peak Elev=948.37' Storage=0.041 af Inflow=22.55 cfs 0.977 af Primary=19.25 cfs 0.977 af Secondary=0.00 cfs 0.000 af Outflow=19.25 cfs 0.977 af
Pond 3EP: Existing Wetland - Northeast	Peak Elev=951.09' Storage=2.659 af Inflow=12.57 cfs 2.659 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond 3PP: Existing Wetland - Northeast	Peak Elev=952.05' Storage=92,847 cf Inflow=5.80 cfs 2.160 af Primary=0.02 cfs 0.065 af Tertiary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.065 af
Pond 4EP: Offsite Wetland - Southeast	Peak Elev=954.44' Storage=1.896 af Inflow=28.85 cfs 2.954 af Outflow=4.01 cfs 1.686 af
Pond 4PP: Offsite Wetland - Southeast	Peak Elev=954.40' Storage=1.710 af Inflow=24.82 cfs 2.864 af Outflow=2.38 cfs 1.596 af
Pond 5PP: Pond 5	Peak Elev=955.06' Storage=19,531 cf Inflow=8.29 cfs 0.552 af 30.0" Round Culvert n=0.013 L=560.0' S=0.0000 ' Outflow=0.99 cfs 0.431 af

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Pond 6PP: Filtration Basin 6

Peak Elev=952.49' Storage=32,063 cf Inflow=30.13 cfs 1.683 af
Primary=4.21 cfs 8.740 af Secondary=1.40 cfs 0.131 af Outflow=5.61 cfs 8.871 af

Pond 7PP: Pond 7

Peak Elev=955.75' Storage=16,572 cf Inflow=22.72 cfs 1.884 af
Primary=9.58 cfs 1.573 af Secondary=5.46 cfs 0.254 af Outflow=15.03 cfs 1.827 af

Pond 8PP: Existing Territorial Ditch

Peak Elev=949.17' Storage=786 cf Inflow=4.64 cfs 8.871 af
18.0" Round Culvert n=0.013 L=97.0' S=0.0148 '/' Outflow=4.63 cfs 8.867 af

Total Runoff Area = 123.680 ac Runoff Volume = 15.255 af Average Runoff Depth = 1.48"

89.24% Pervious = 110.367 ac 10.76% Impervious = 13.313 ac

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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Subcatchment 1E: Direct Drainage to 1EP

Runoff = 18.27 cfs @ 12.38 hrs, Volume= 1.547 af, Depth= 1.62"
Routed to Pond 1EP : Offsite Low Area - Northwest

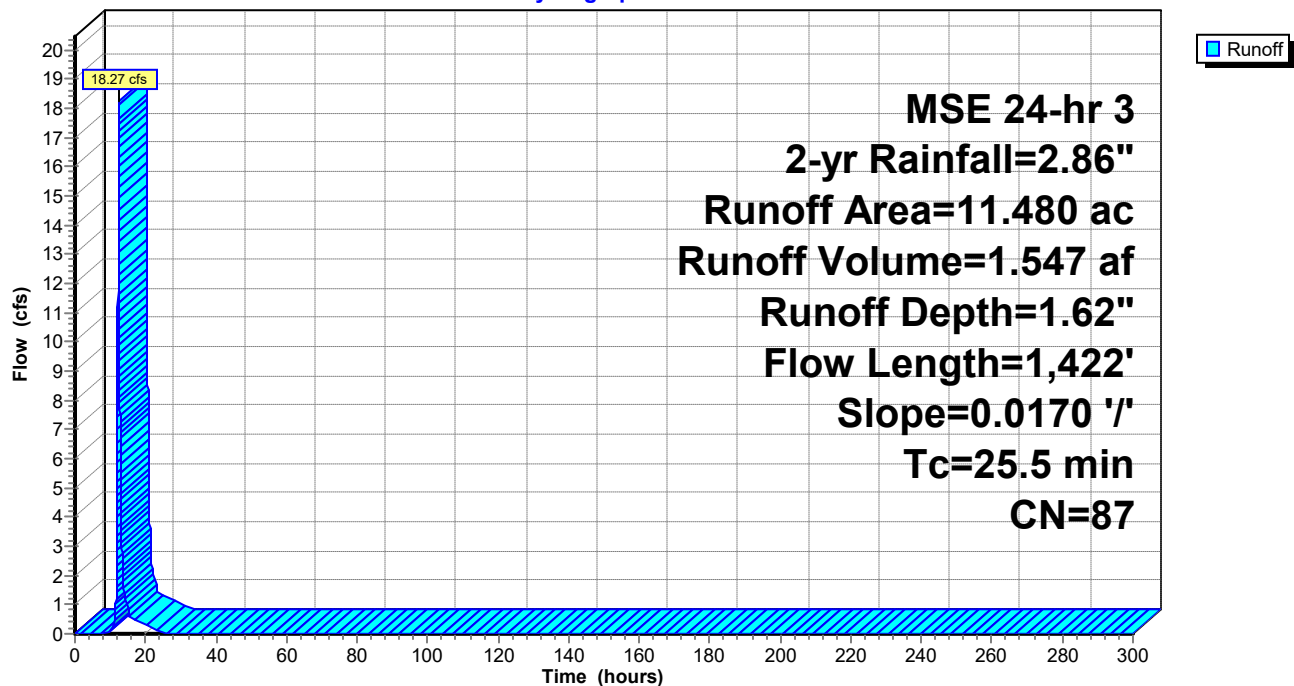
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
10.110	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
11.480	87	Weighted Average
10.860		94.60% Pervious Area
0.620		5.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.5	1,422	0.0170	0.93		Lag/CN Method,

Subcatchment 1E: Direct Drainage to 1EP

Hydrograph



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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Runoff = 14.92 cfs @ 12.31 hrs, Volume= 1.150 af, Depth= 1.62"
Routed to Pond 1PP : Offsite Low Area - Northwest

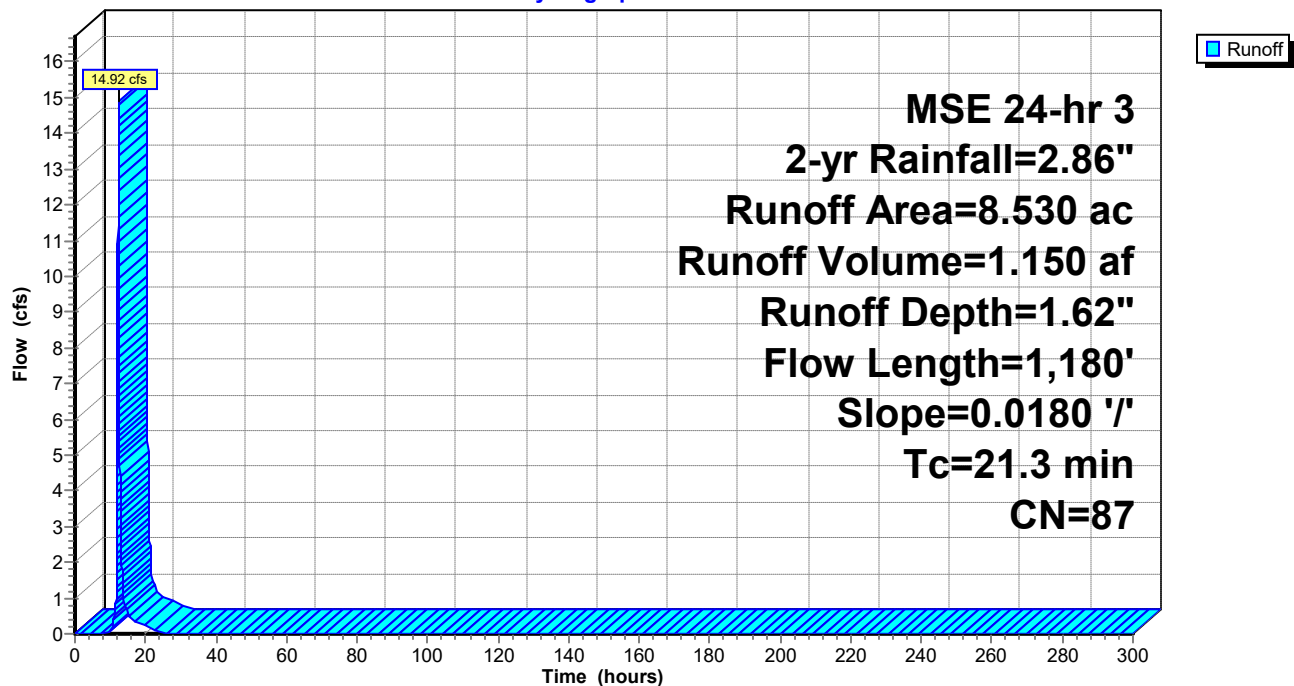
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
7.160	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
8.530	87	Weighted Average
7.910		92.73% Pervious Area
0.620		7.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	1,180	0.0180	0.92		Lag/CN Method,

Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Hydrograph



Summary for Subcatchment 1P: Onsite Drainage to 1EP

Runoff = 2.37 cfs @ 12.13 hrs, Volume= 0.101 af, Depth= 1.40"
 Routed to Pond 1PP : Offsite Low Area - Northwest

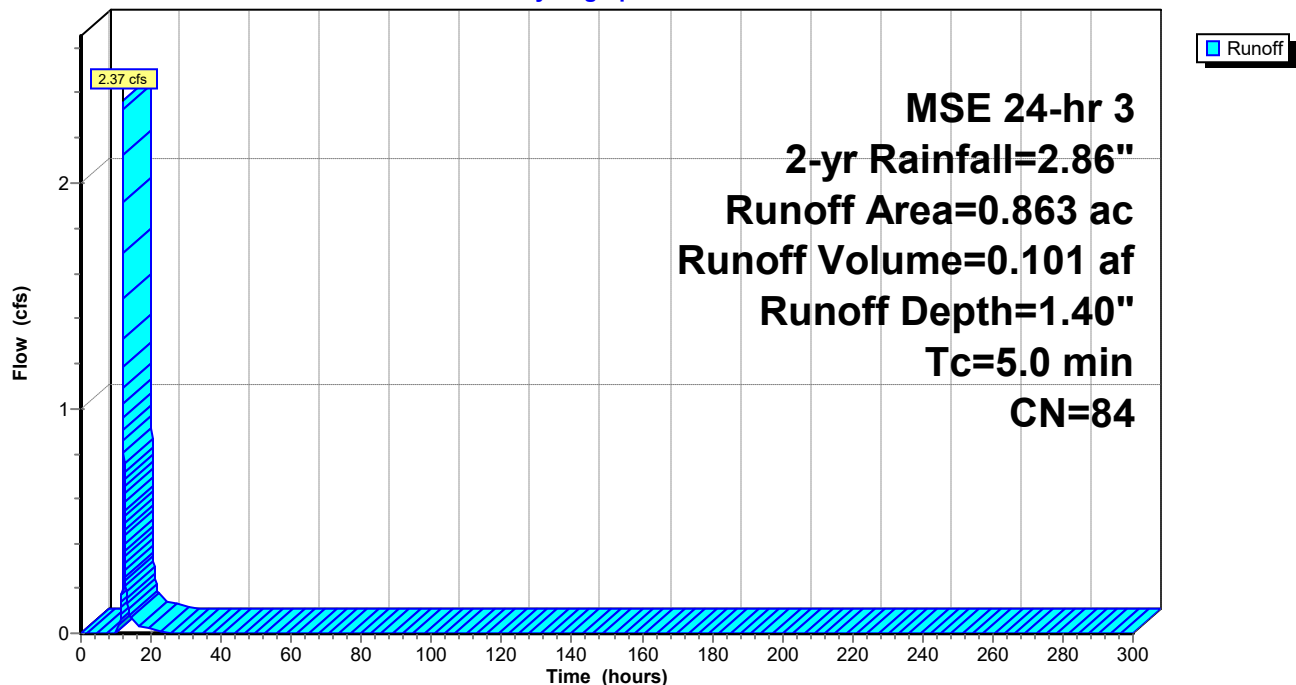
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.210	98	Proposed Impervious
0.653	80	>75% Grass cover, Good, HSG D
0.863	84	Weighted Average
0.653		75.67% Pervious Area
0.210		24.33% Impervious Area

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

Subcatchment 1P: Onsite Drainage to 1EP

Hydrograph



Summary for Subcatchment 2E: Direct Drainage to 2EP

Runoff = 18.48 cfs @ 12.36 hrs, Volume= 1.551 af, Depth= 1.47"
 Routed to Pond 2EP : Offsite Low Area - North Middle

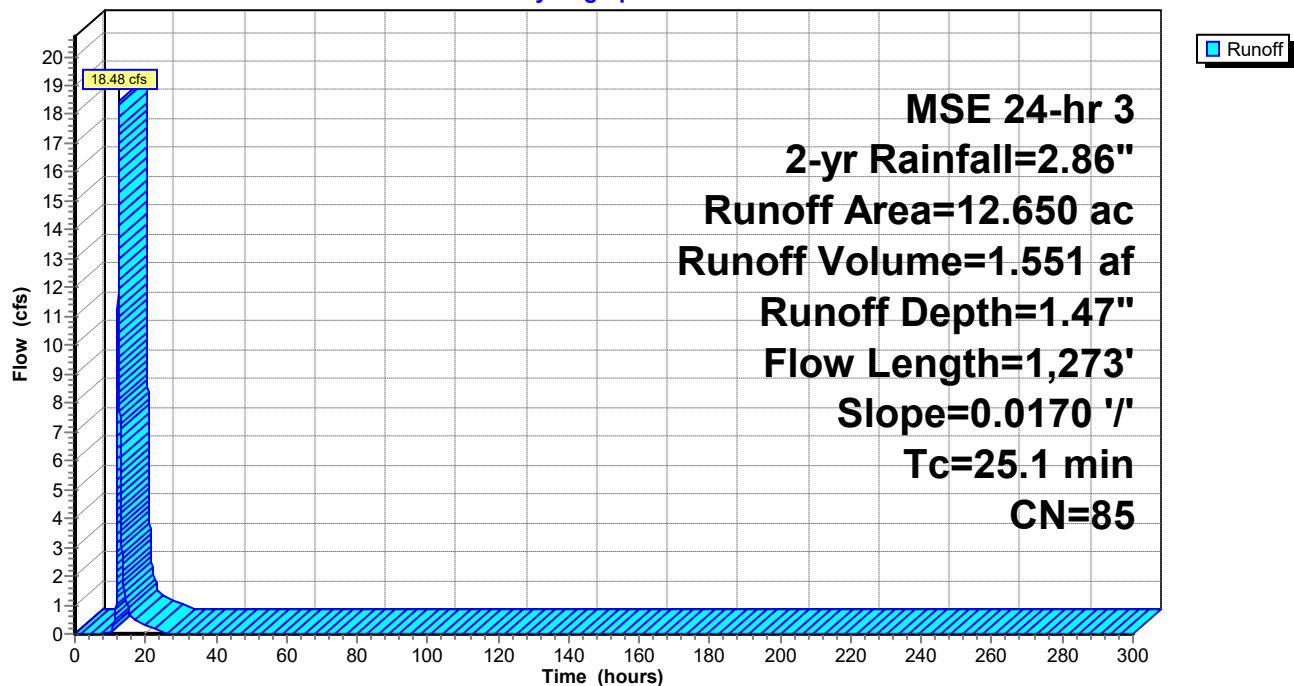
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
7.540	87	Small grain, straight row, Good, HSG D
12.650	85	Weighted Average
12.350		97.63% Pervious Area
0.300		2.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.1	1,273	0.0170	0.85		Lag/CN Method,

Subcatchment 2E: Direct Drainage to 2EP

Hydrograph



Summary for Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Runoff = 19.40 cfs @ 12.13 hrs, Volume= 0.843 af, Depth= 1.33"
Routed to Pond 2PP : Offsite Low Area - North Middle

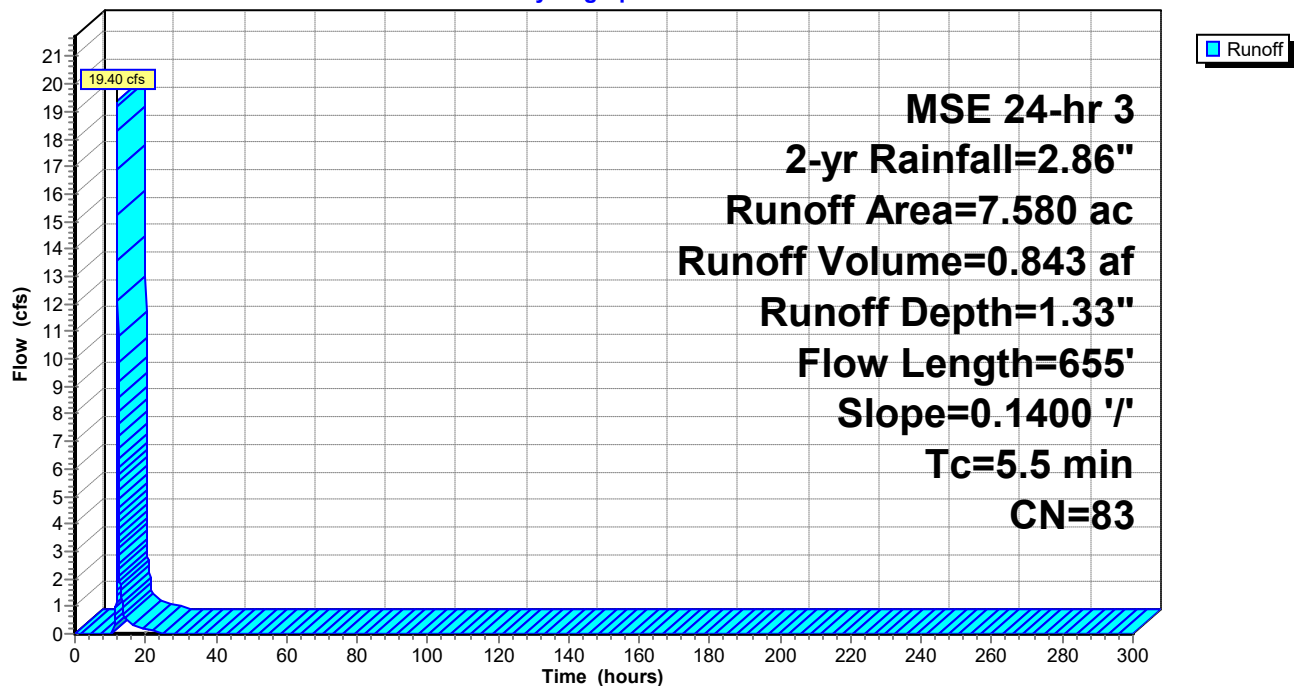
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
2.470	87	Small grain, straight row, Good, HSG D
7.580	83	Weighted Average
7.280		96.04% Pervious Area
0.300		3.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	655	0.1400	1.99		Lag/CN Method,

Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Hydrograph



Summary for Subcatchment 2P: Onsite Drainage to 2EP

Runoff = 3.16 cfs @ 12.13 hrs, Volume= 0.134 af, Depth= 1.40"
 Routed to Pond 2PP : Offsite Low Area - North Middle

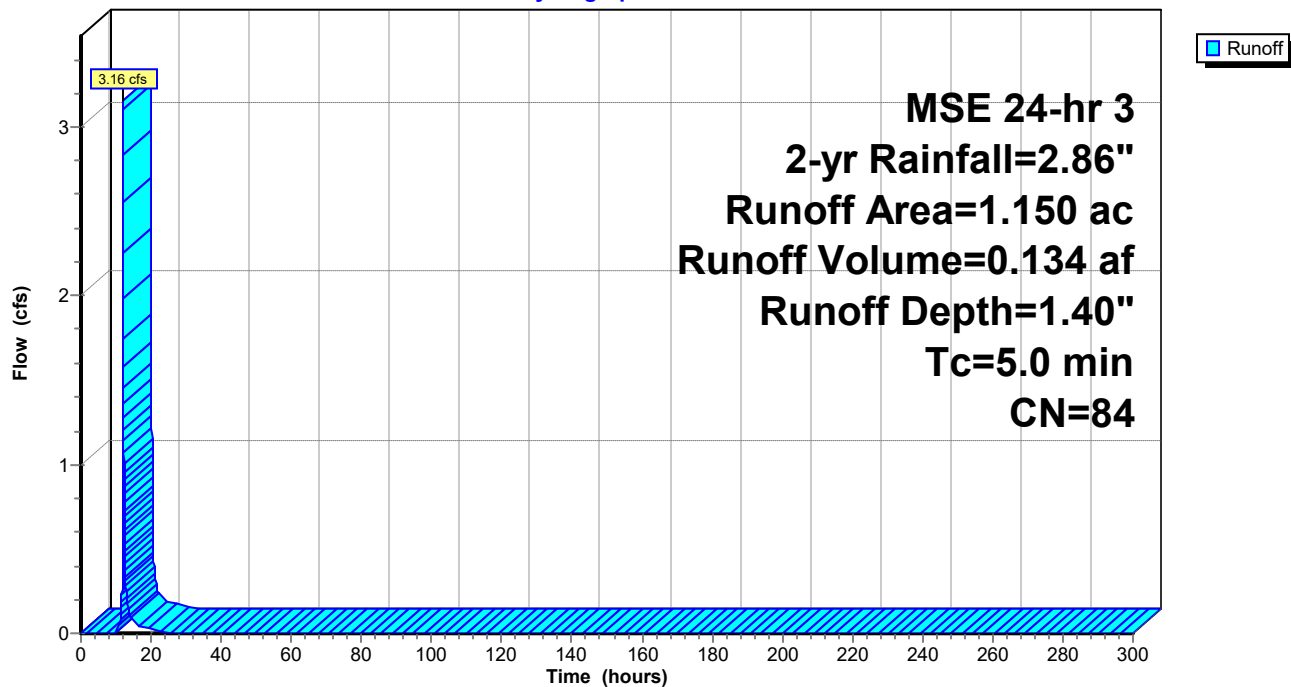
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.260	98	Proposed Impervious
0.890	80	>75% Grass cover, Good, HSG D
1.150	84	Weighted Average
0.890		77.39% Pervious Area
0.260		22.61% Impervious Area

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

Subcatchment 2P: Onsite Drainage to 2EP

Hydrograph



Summary for Subcatchment 3E: Direct Drainage to 3EP

Runoff = 12.57 cfs @ 12.32 hrs, Volume= 0.972 af, Depth= 1.47"

Routed to Pond 3EP : Existing Wetland - Northeast

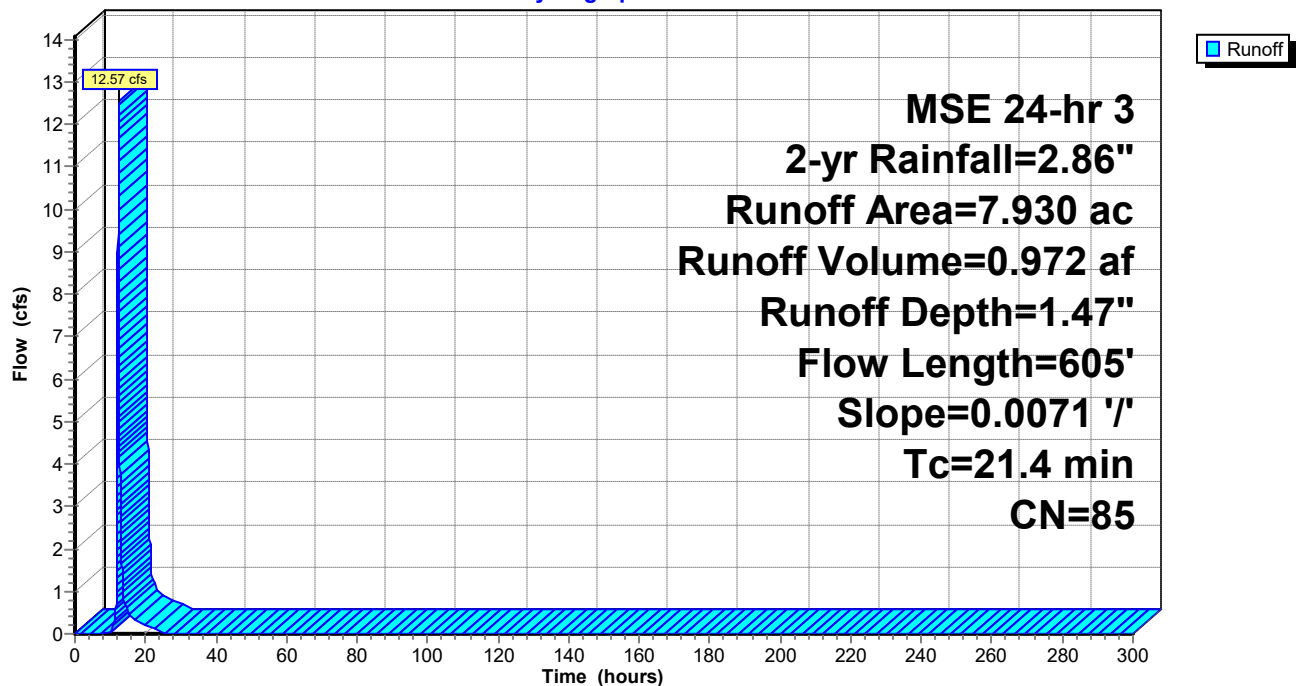
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
2.780	80	>75% Grass cover, Good, HSG D
4.650	87	Small grain, straight row, Good, HSG D
7.930	85	Weighted Average
7.430		93.69% Pervious Area
0.500		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	605	0.0071	0.47		Lag/CN Method,

Subcatchment 3E: Direct Drainage to 3EP

Hydrograph



Summary for Subcatchment 3Ex: Offsite Drainage to 3EP

Runoff = 2.77 cfs @ 12.20 hrs, Volume= 0.161 af, Depth= 1.21"

Routed to Pond 3PP : Existing Wetland - Northeast

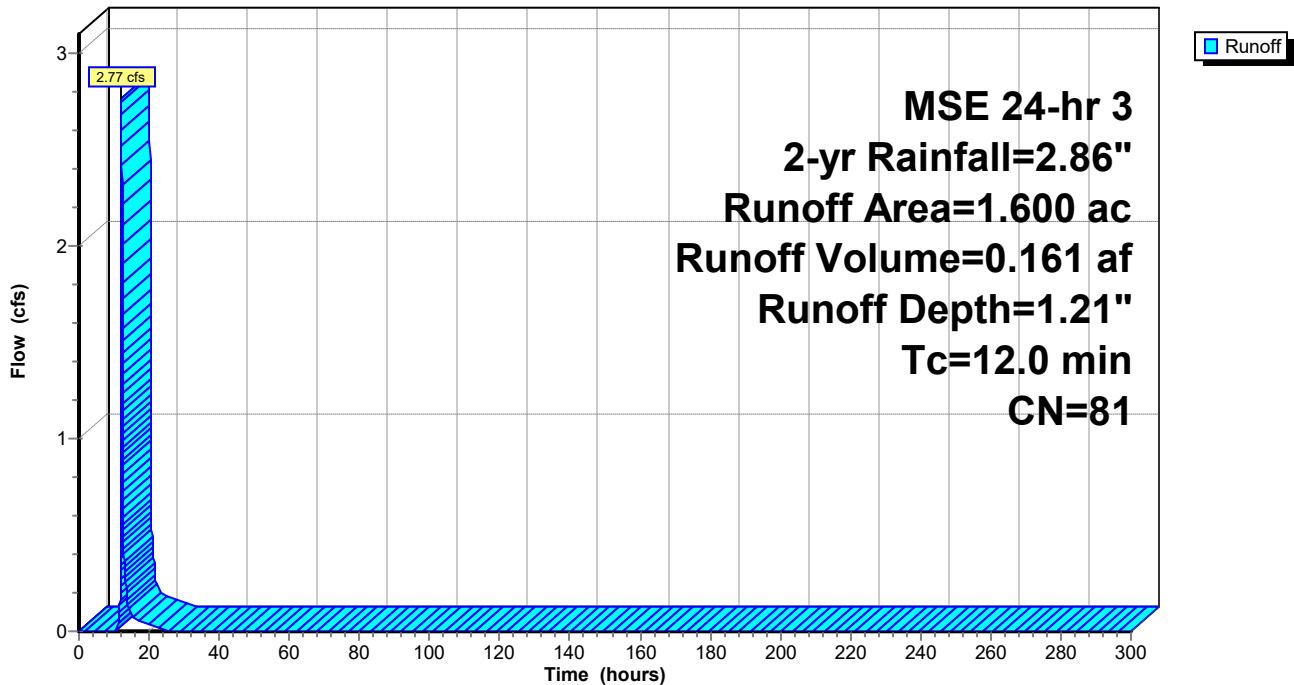
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
1.500	80	>75% Grass cover, Good, HSG D
1.600	81	Weighted Average
1.500		93.75% Pervious Area
0.100		6.25% Impervious Area

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

Subcatchment 3Ex: Offsite Drainage to 3EP

Hydrograph



Summary for Subcatchment 3P: Onsite Drainage to 3EP

Runoff = 3.23 cfs @ 12.36 hrs, Volume= 0.272 af, Depth= 1.21"

Routed to Pond 3PP : Existing Wetland - Northeast

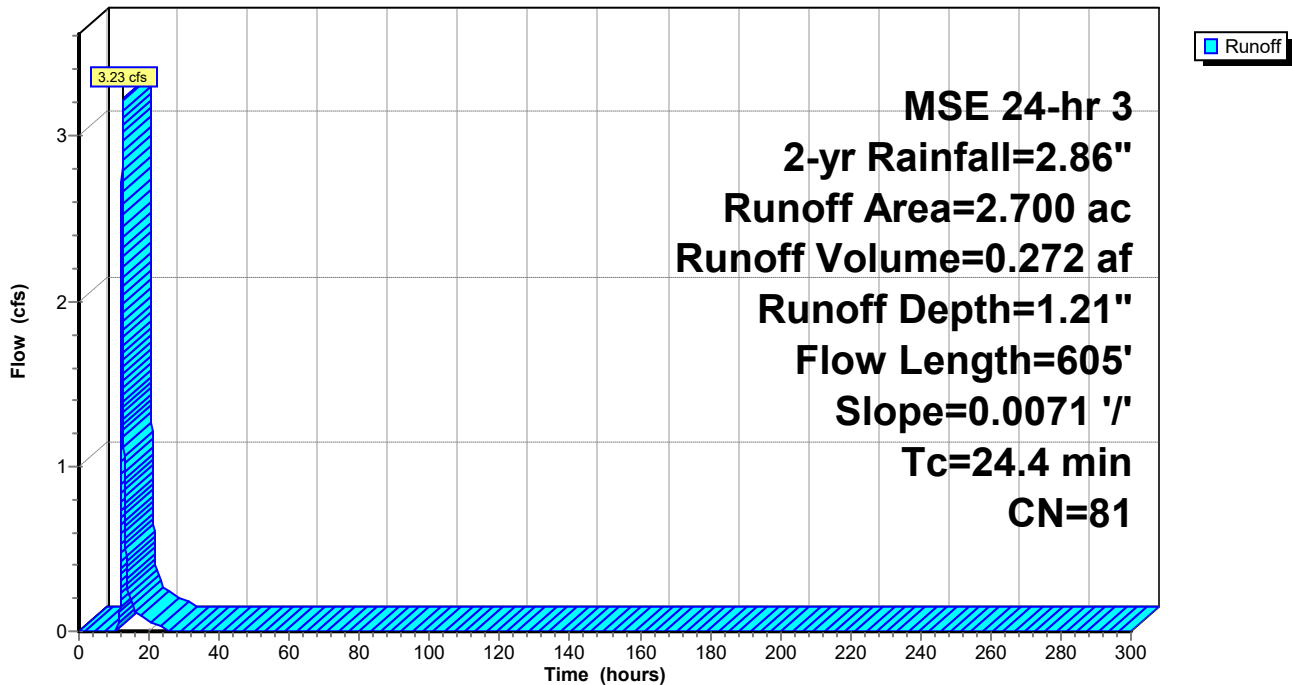
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
2.600	80	>75% Grass cover, Good, HSG D
2.700	81	Weighted Average
2.600		96.30% Pervious Area
0.100		3.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.4	605	0.0071	0.41		Lag/CN Method,

Subcatchment 3P: Onsite Drainage to 3EP

Hydrograph



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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Subcatchment 4E: Direct Drainage to 4EP

Runoff = 28.85 cfs @ 12.51 hrs, Volume= 2.954 af, Depth= 1.47"
Routed to Pond 4EP : Offsite Wetland - Southeast

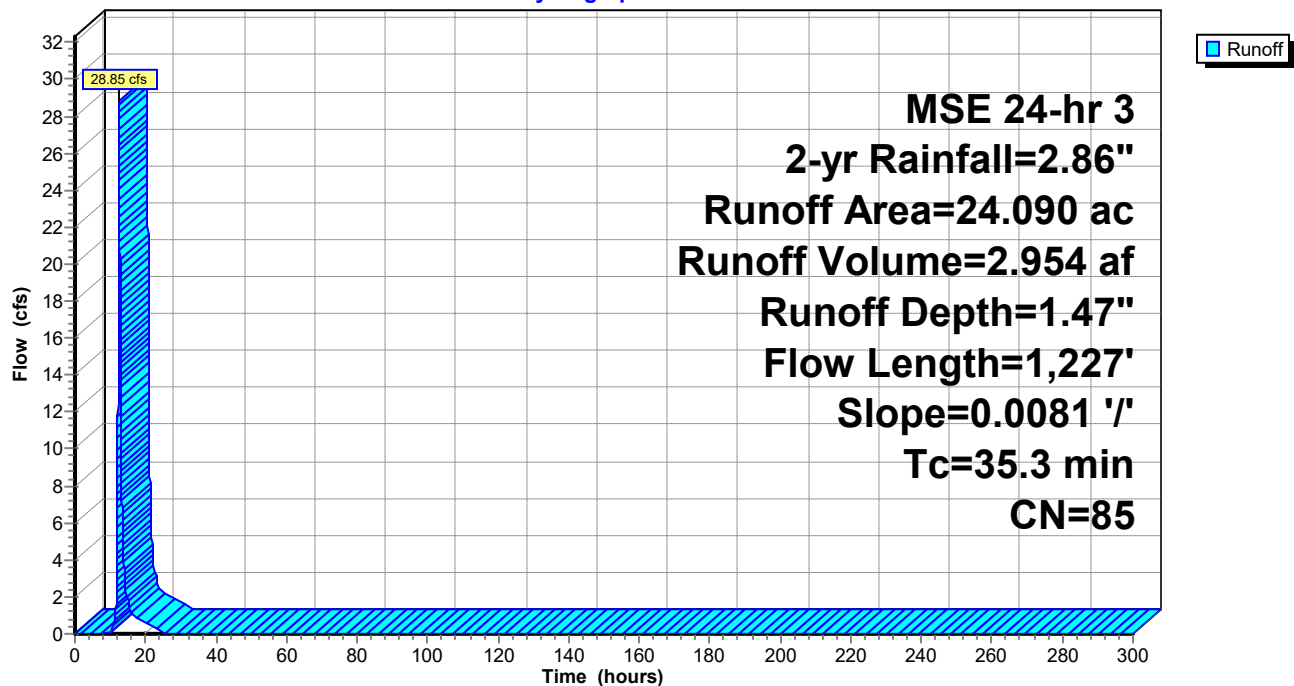
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
8.950	80	>75% Grass cover, Good, HSG D
14.640	87	Small grain, straight row, Good, HSG D
24.090	85	Weighted Average
23.590		97.92% Pervious Area
0.500		2.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	1,227	0.0081	0.58		Lag/CN Method,

Subcatchment 4E: Direct Drainage to 4EP

Hydrograph



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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Runoff = 14.51 cfs @ 12.31 hrs, Volume= 1.115 af, Depth= 1.27"
Routed to Pond 4PP : Offsite Wetland - Southeast

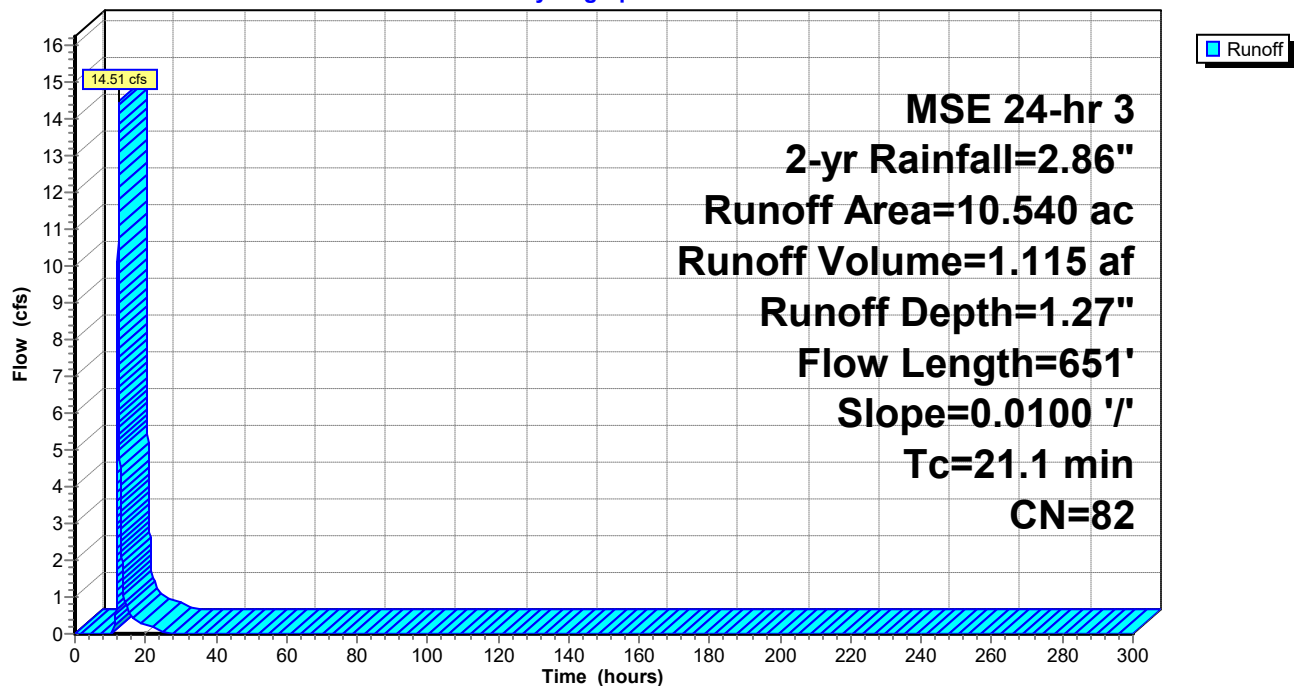
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
7.990	80	>75% Grass cover, Good, HSG D
2.050	87	Small grain, straight row, Good, HSG D
10.540	82	Weighted Average
10.040		95.26% Pervious Area
0.500		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.1	651	0.0100	0.51		Lag/CN Method,

Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Hydrograph



Summary for Subcatchment 4P: Onsite Drainage to 4EP

Runoff = 4.13 cfs @ 12.13 hrs, Volume= 0.175 af, Depth= 1.33"
 Routed to Pond 4PP : Offsite Wetland - Southeast

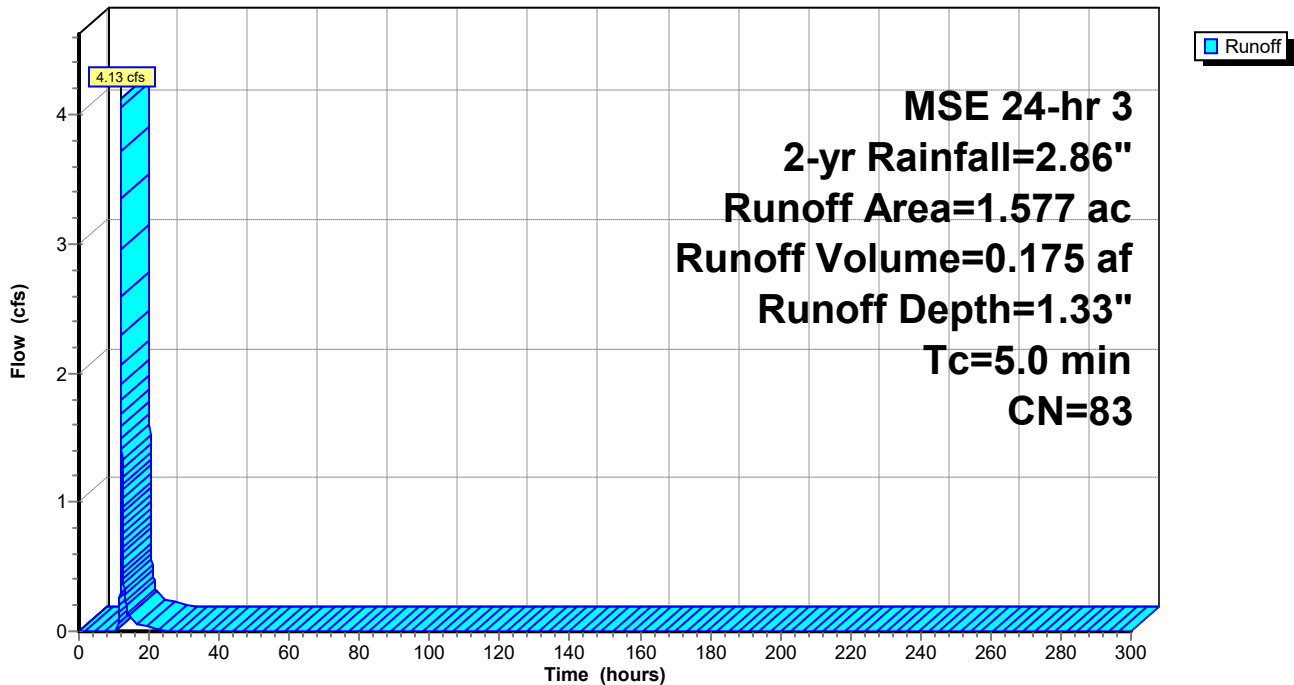
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
0.273	98	Paved parking, HSG D
1.304	80	>75% Grass cover, Good, HSG D
1.577	83	Weighted Average
1.304		82.69% Pervious Area
0.273		17.31% Impervious Area

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

Subcatchment 4P: Onsite Drainage to 4EP

Hydrograph



Summary for Subcatchment 5E: Direct Drainage to Southwest Wetland

Runoff = 14.28 cfs @ 12.18 hrs, Volume= 0.771 af, Depth= 1.62"

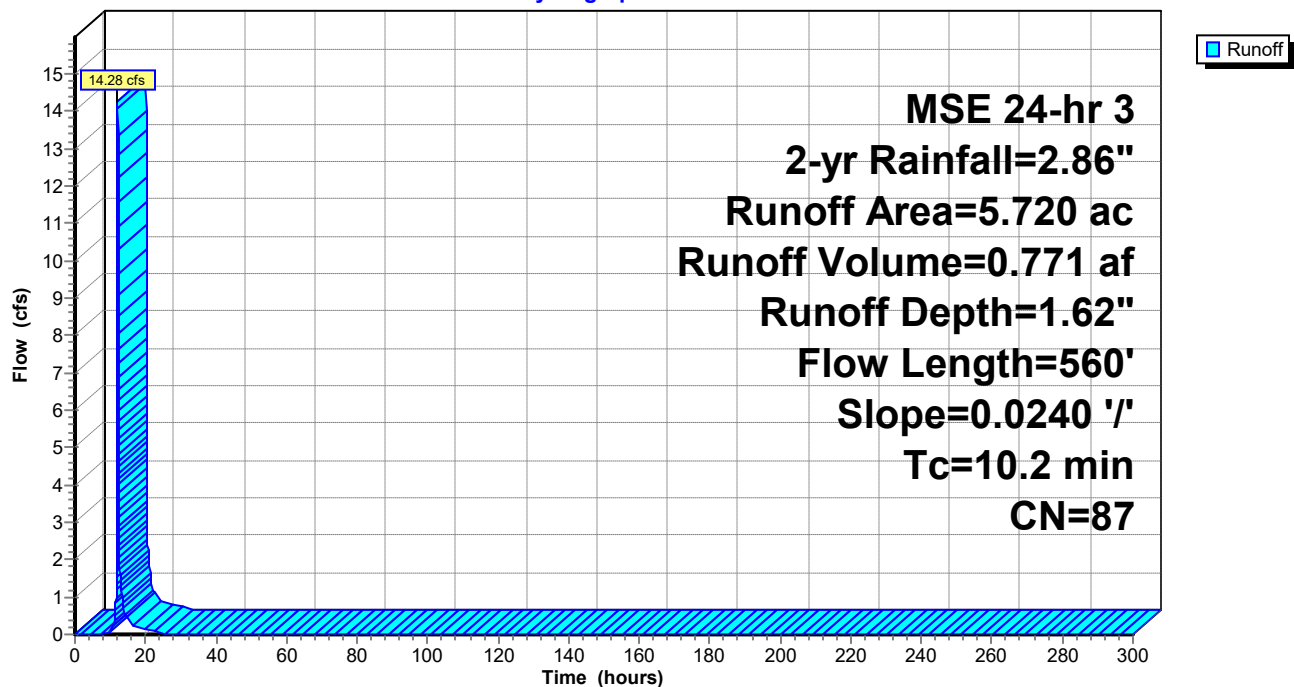
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
5.720	87	Small grain, straight row, Good, HSG D
5.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	560	0.0240	0.92		Lag/CN Method,

Subcatchment 5E: Direct Drainage to Southwest Wetland

Hydrograph



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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Subcatchment 5P: Onsite Drainage to 5PP

Runoff = 5.57 cfs @ 12.18 hrs, Volume= 0.298 af, Depth= 1.27"
Routed to Pond 5PP : Pond 5

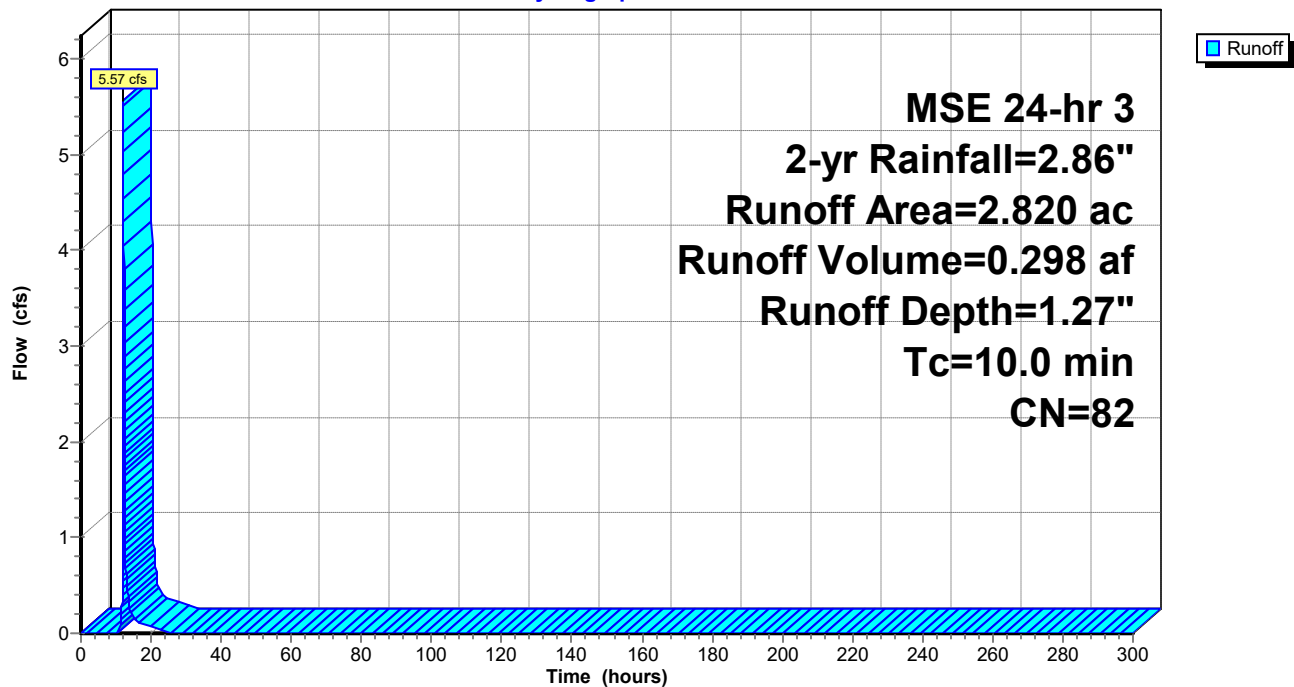
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.320	98	Proposed Impervious
2.500	80	>75% Grass cover, Good, HSG D
2.820	82	Weighted Average
2.500		88.65% Pervious Area
0.320		11.35% Impervious Area

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

Subcatchment 5P: Onsite Drainage to 5PP

Hydrograph



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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Subcatchment 6P: Drainage to Filtration Basin 6

Runoff = 30.13 cfs @ 12.18 hrs, Volume= 1.617 af, Depth= 1.62"
Routed to Pond 6PP : Filtration Basin 6

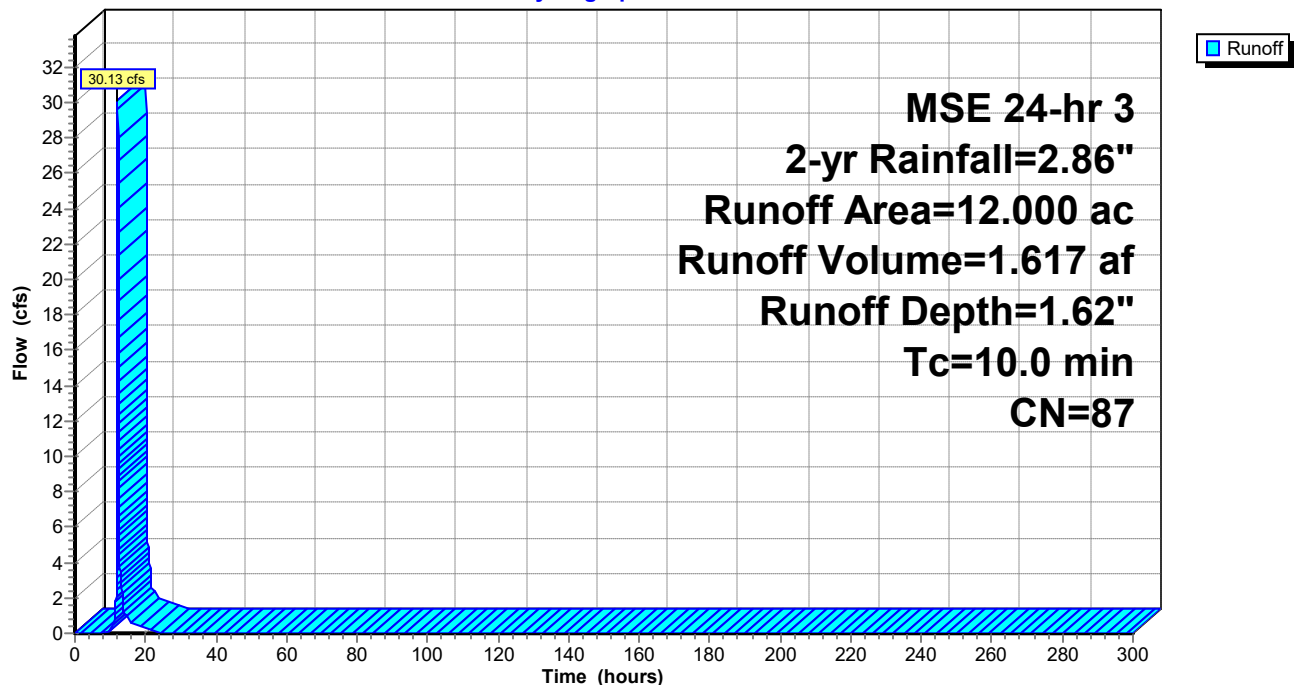
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
4.700	98	Paved parking, HSG D
7.300	80	>75% Grass cover, Good, HSG D
12.000	87	Weighted Average
7.300		60.83% Pervious Area
4.700		39.17% Impervious Area

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

Subcatchment 6P: Drainage to Filtration Basin 6

Hydrograph



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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Subcatchment 7P: Onsite Drainage to 7PP

Runoff = 22.72 cfs @ 12.23 hrs, Volume= 1.453 af, Depth= 1.54"
Routed to Pond 7PP : Pond 7

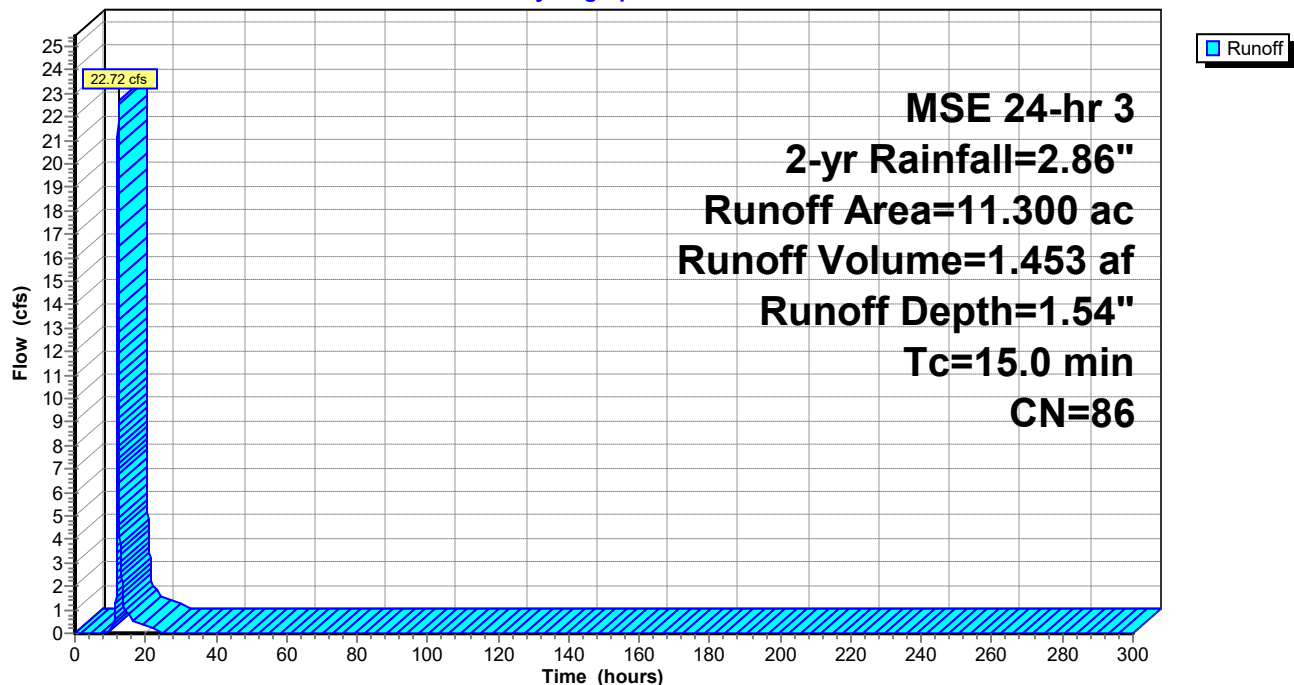
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 3.700	98	Proposed Impervious
7.600	80	>75% Grass cover, Good, HSG D
11.300	86	Weighted Average
7.600		67.26% Pervious Area
3.700		32.74% Impervious Area

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

Subcatchment 7P: Onsite Drainage to 7PP

Hydrograph



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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Subcatchment 8Ex: Territorial Ditch

Runoff = 3.08 cfs @ 12.13 hrs, Volume= 0.131 af, Depth= 1.47"
Routed to Pond 8PP : Existing Territorial Ditch

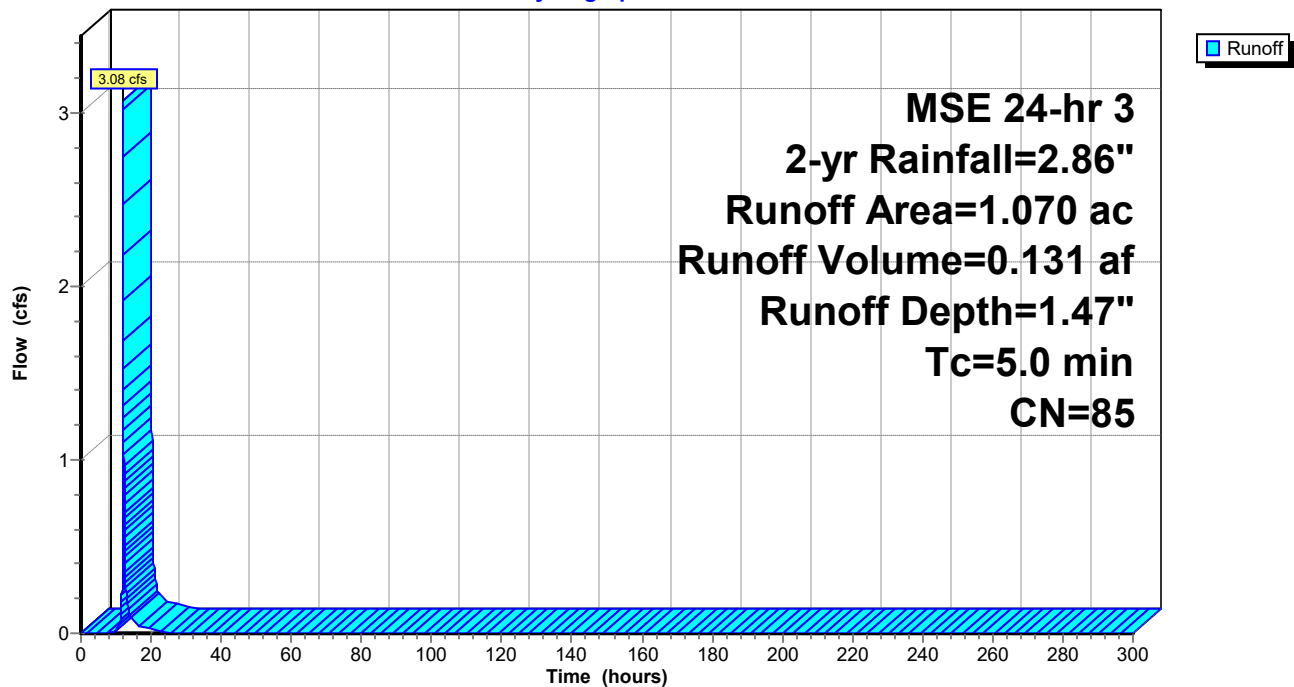
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
* 0.310	98	Existing Impervious
0.760	80	>75% Grass cover, Good, HSG D
1.070	85	Weighted Average
0.760		71.03% Pervious Area
0.310		28.97% Impervious Area

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

Subcatchment 8Ex: Territorial Ditch

Hydrograph



Summary for Subcatchment 9P: Offsite Drainage East

Runoff = 0.18 cfs @ 12.13 hrs, Volume= 0.008 af, Depth= 1.15"

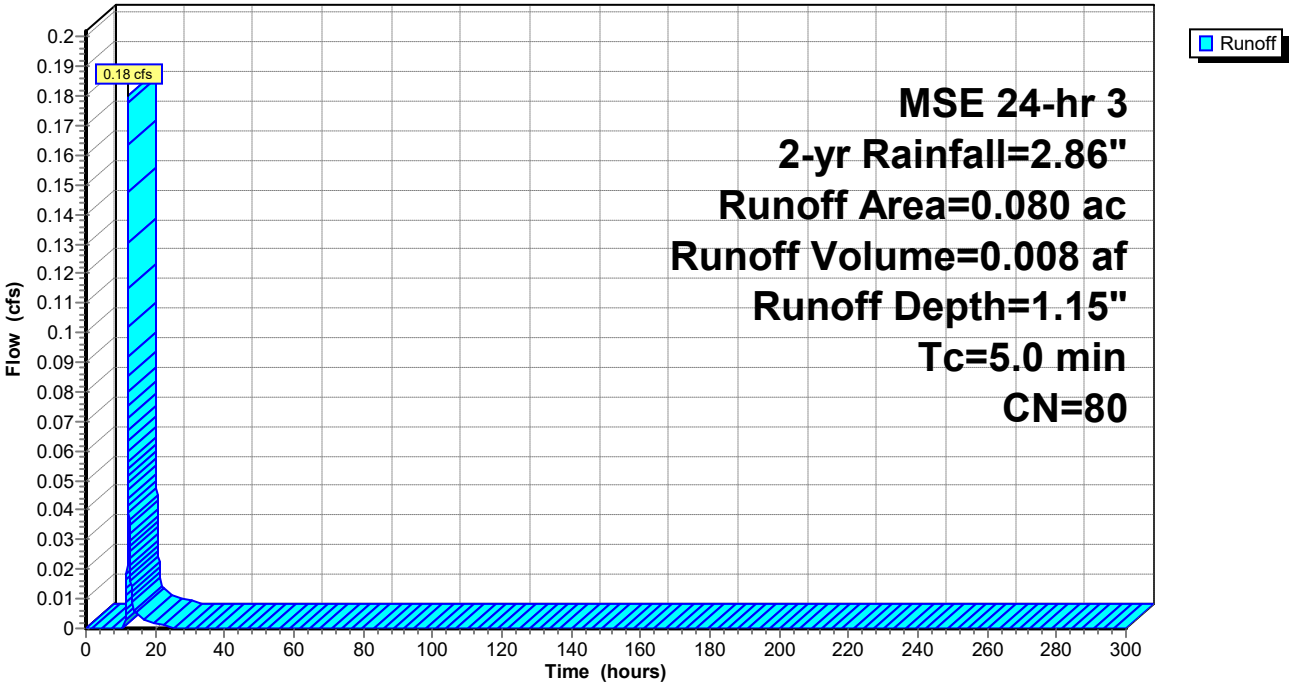
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-yr Rainfall=2.86"

Area (ac)	CN	Description
0.080	80	>75% Grass cover, Good, HSG D
0.080		100.00% Pervious Area

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

Subcatchment 9P: Offsite Drainage East

Hydrograph



Summary for Reach 1ER: To Big Woods - Southwest Wetland Complex

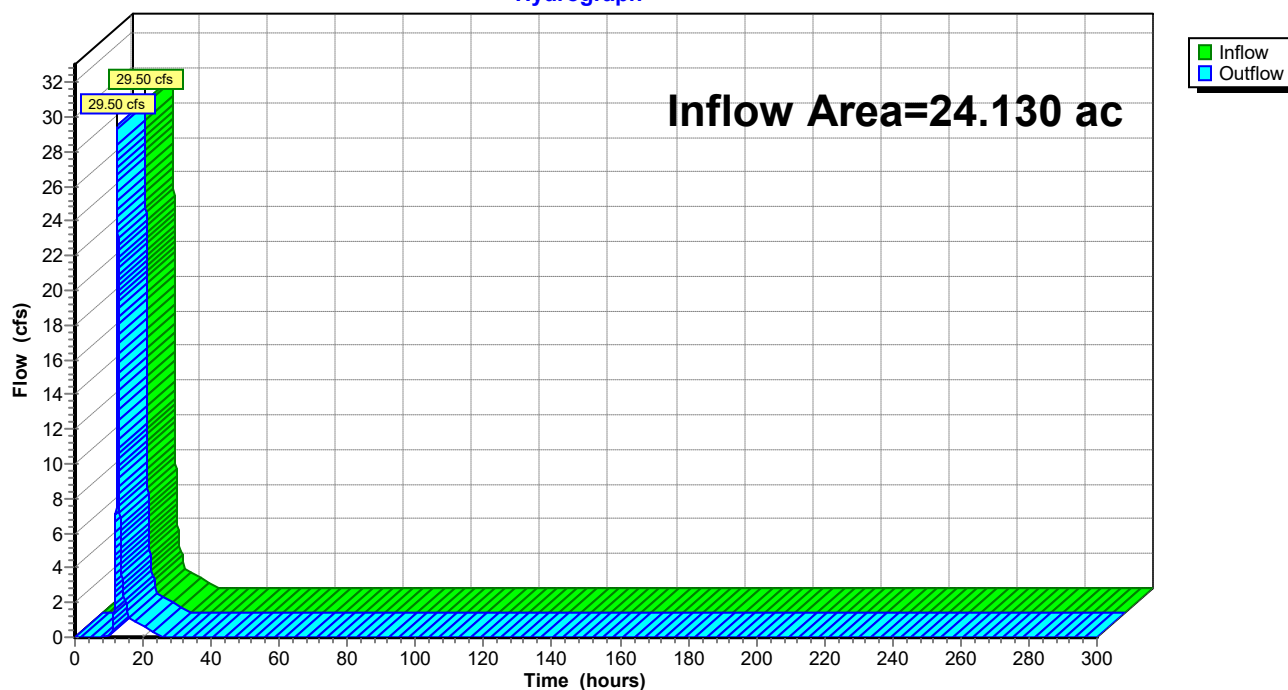
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 24.130 ac, 3.81% Impervious, Inflow Depth = 1.50" for 2-yr event
 Inflow = 29.50 cfs @ 12.43 hrs, Volume= 3.024 af
 Outflow = 29.50 cfs @ 12.44 hrs, Volume= 3.024 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1ER: To Big Woods - Southwest Wetland Complex

Hydrograph



Summary for Reach 1PR: To Big Woods - Southwest Wetland Complex

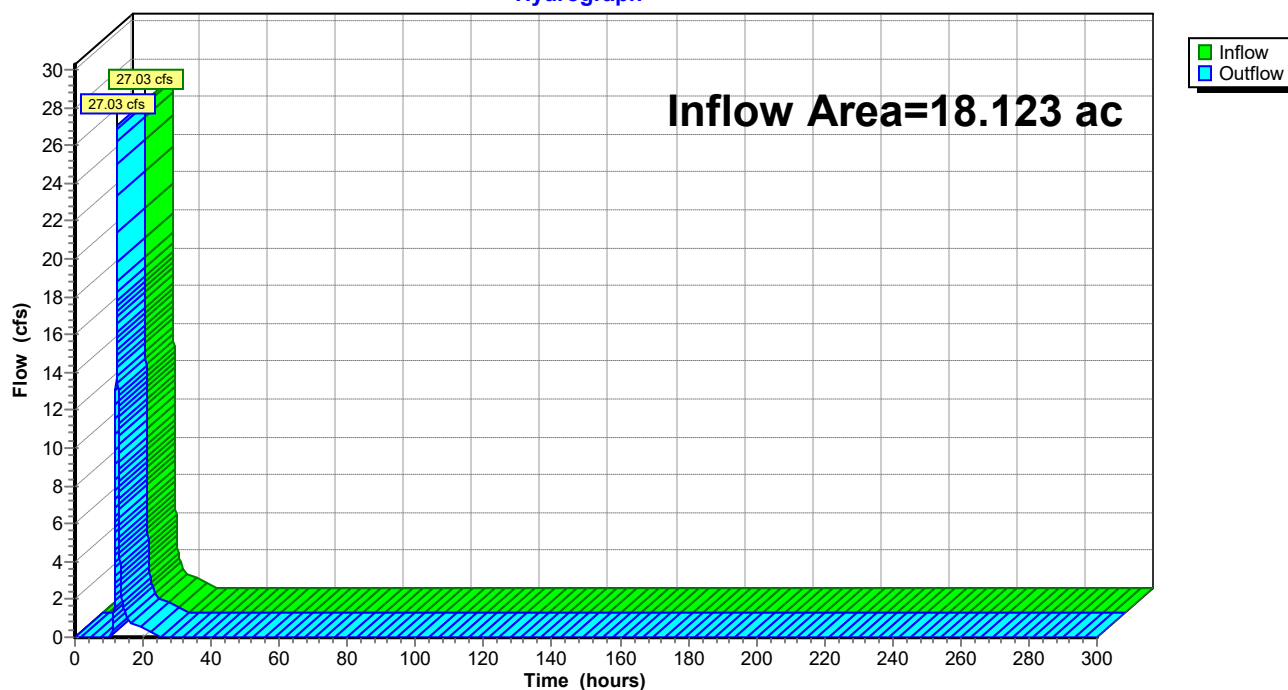
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.123 ac, 7.67% Impervious, Inflow Depth = 1.47" for 2-yr event
Inflow = 27.03 cfs @ 12.18 hrs, Volume= 2.214 af
Outflow = 27.03 cfs @ 12.19 hrs, Volume= 2.214 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1PR: To Big Woods - Southwest Wetland Complex

Hydrograph



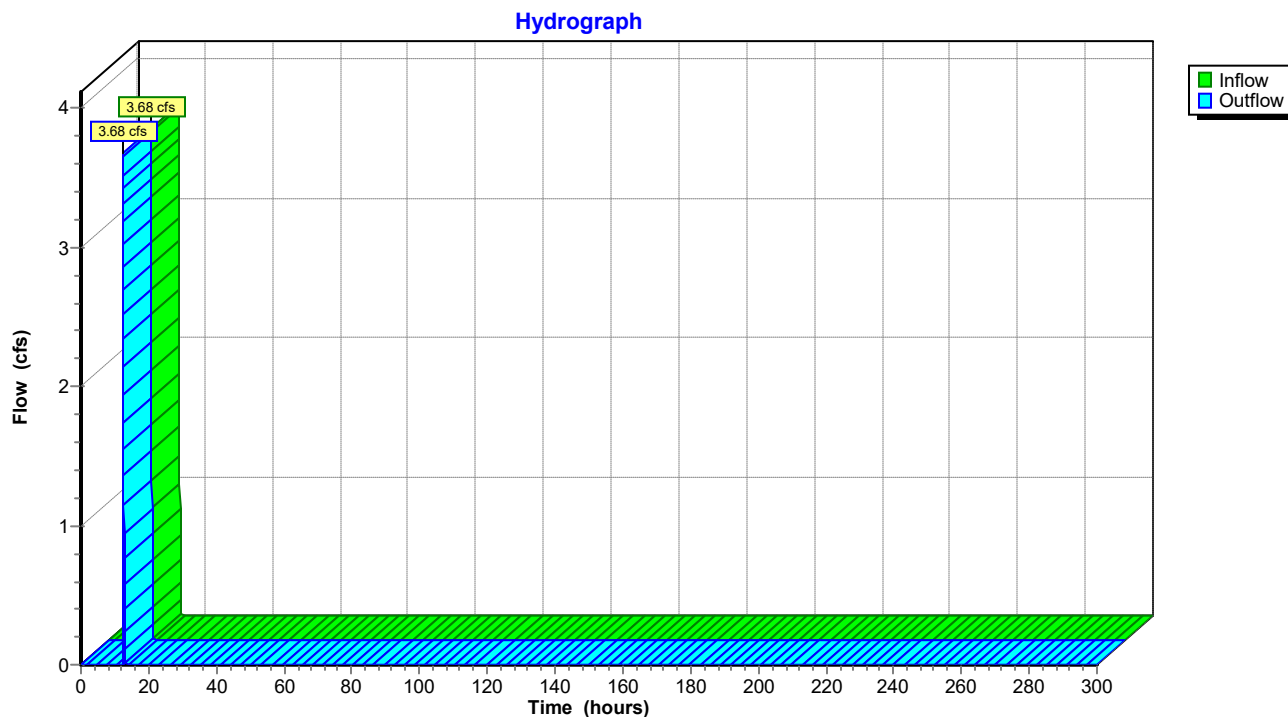
Summary for Reach 2ER: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 3.68 cfs @ 12.50 hrs, Volume= 0.073 af
 Outflow = 3.68 cfs @ 12.51 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2ER: Existing Overflow Offsite to North



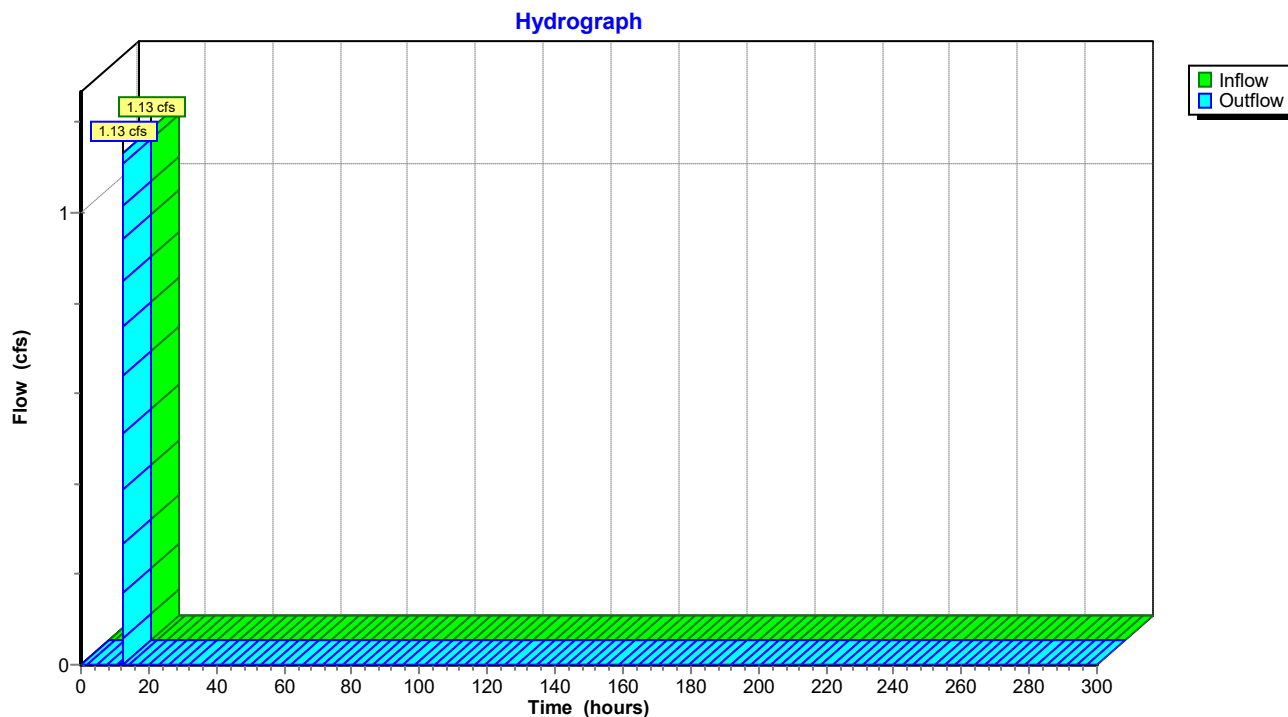
Summary for Reach 2PR: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 1.13 cfs @ 12.45 hrs, Volume= 0.013 af
 Outflow = 1.13 cfs @ 12.46 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2PR: Existing Overflow Offsite to North



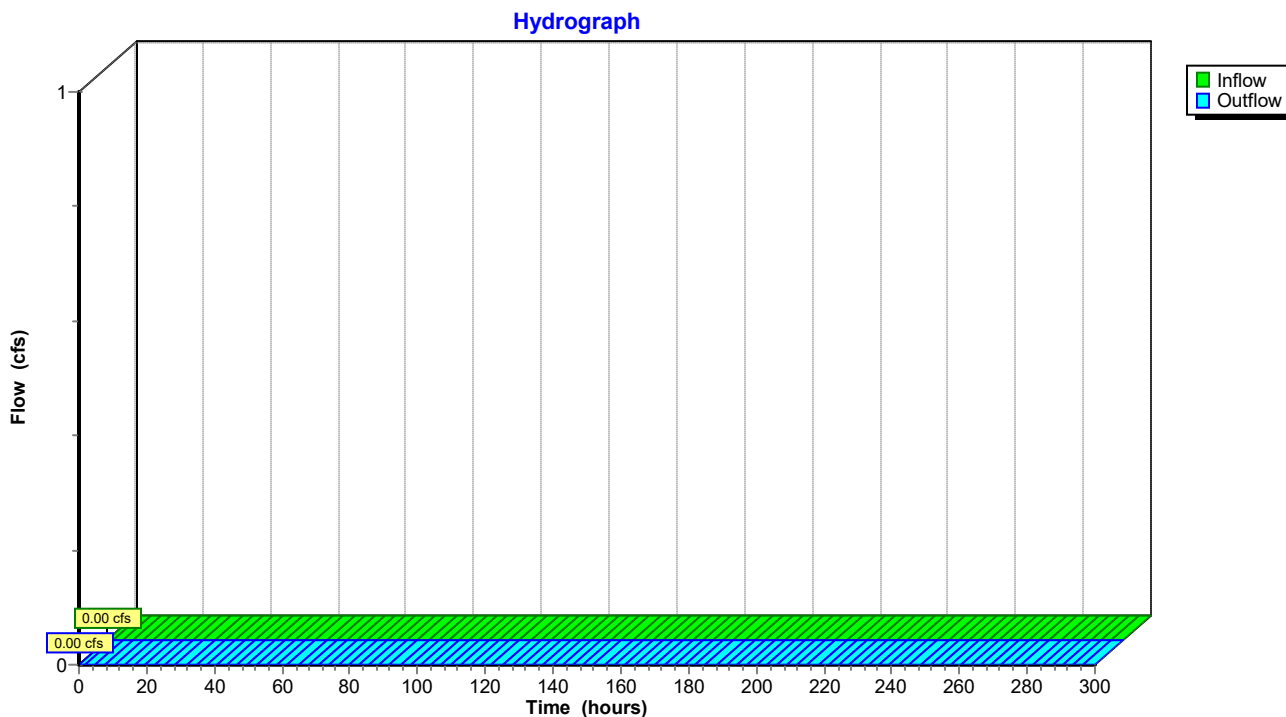
Summary for Reach 3ER: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

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

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3ER: To Big Woods - Southeast Wetland Complex



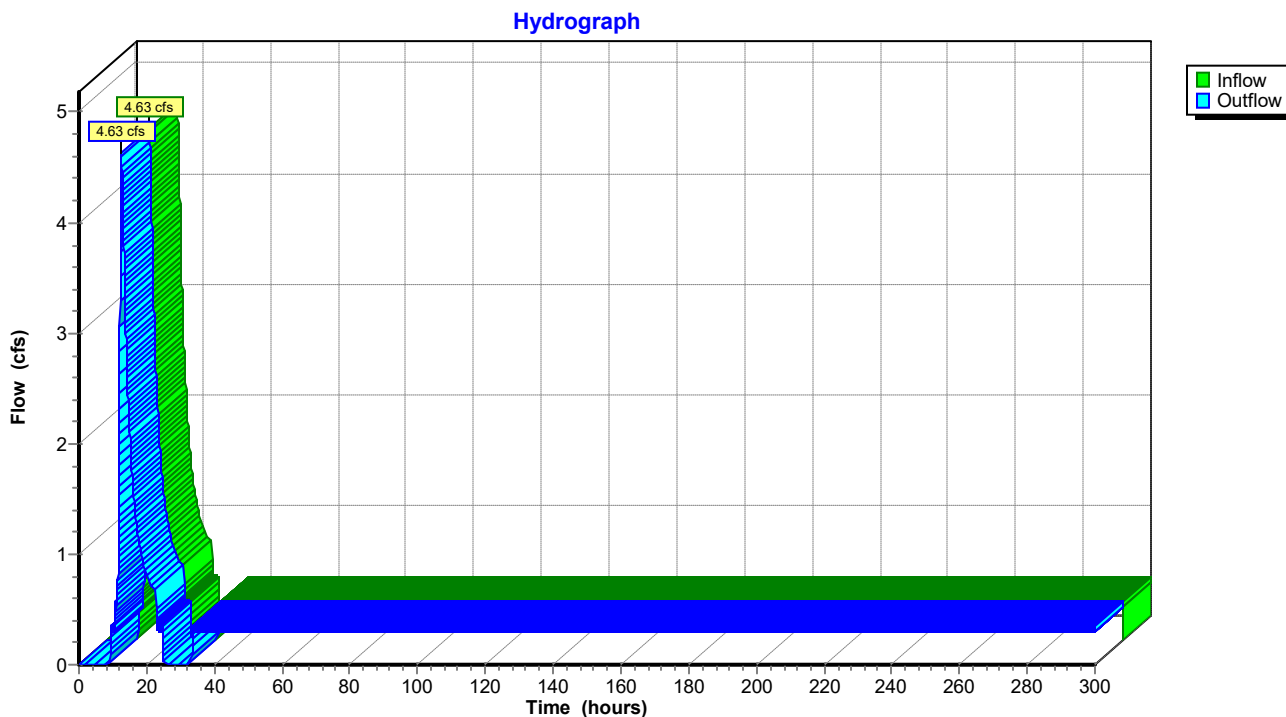
Summary for Reach 3PR: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 4.63 cfs @ 12.54 hrs, Volume= 8.866 af
 Outflow = 4.63 cfs @ 12.55 hrs, Volume= 8.866 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3PR: To Big Woods - Southeast Wetland Complex



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MSE 24-hr 3 2-yr Rainfall=2.86"

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Summary for Pond 1EP: Offsite Low Area - Northwest

Inflow Area = 11.480 ac, 5.40% Impervious, Inflow Depth = 1.62" for 2-yr event
 Inflow = 18.27 cfs @ 12.38 hrs, Volume= 1.547 af
 Outflow = 15.33 cfs @ 12.50 hrs, Volume= 1.547 af, Atten= 16%, Lag= 7.7 min
 Primary = 11.65 cfs @ 12.50 hrs, Volume= 1.473 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 3.68 cfs @ 12.50 hrs, Volume= 0.073 af
 Routed to Reach 2ER : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 947.27' @ 12.50 hrs Surf.Area= 0.242 ac Storage= 0.182 af

Plug-Flow detention time= 9.0 min calculated for 1.547 af (100% of inflow)
 Center-of-Mass det. time= 8.8 min (827.7 - 818.9)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 ' S= 0.0246 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.65 cfs @ 12.50 hrs HW=947.27' TW=0.00' (Dynamic Tailwater)

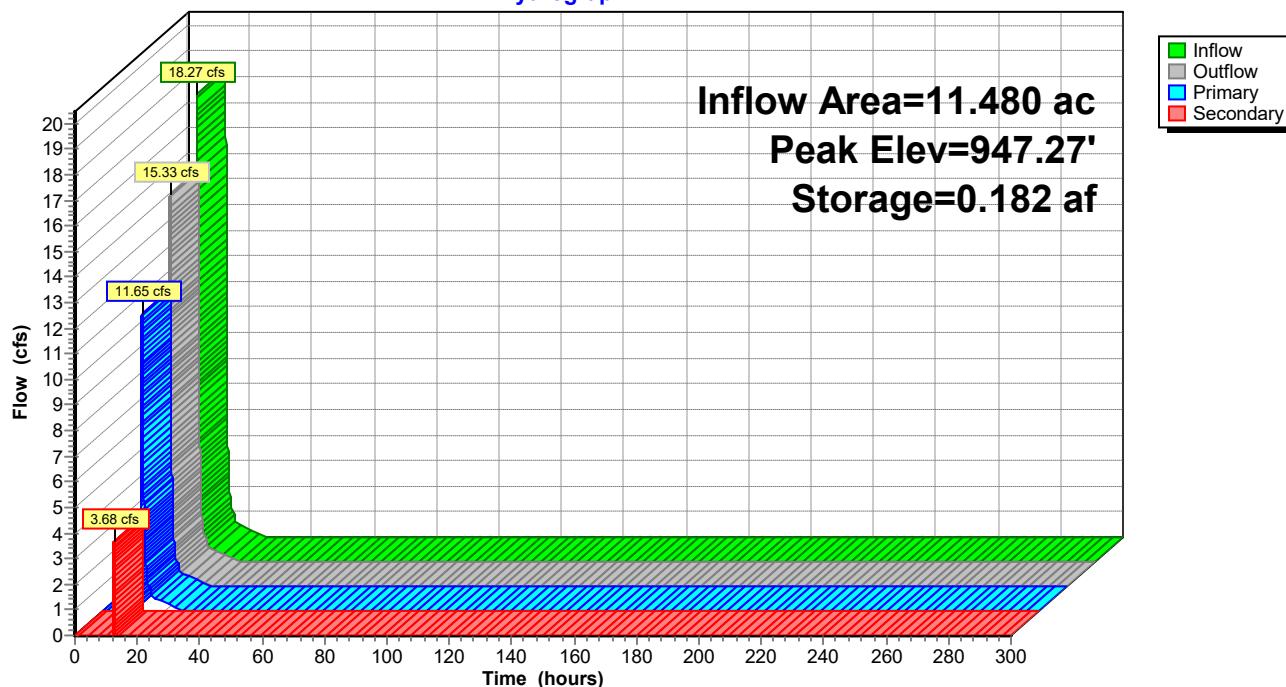
↑ **1=Culvert** (Inlet Controls 11.65 cfs @ 6.59 fps)

Secondary OutFlow Max=3.67 cfs @ 12.50 hrs HW=947.27' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 3.67 cfs @ 1.38 fps)

Pond 1EP: Offsite Low Area - Northwest

Hydrograph



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Summary for Pond 1PP: Offsite Low Area - Northwest

Inflow Area = 9.393 ac, 8.84% Impervious, Inflow Depth = 1.60" for 2-yr event
 Inflow = 15.56 cfs @ 12.31 hrs, Volume= 1.251 af
 Outflow = 12.33 cfs @ 12.45 hrs, Volume= 1.250 af, Atten= 21%, Lag= 8.3 min
 Primary = 11.20 cfs @ 12.45 hrs, Volume= 1.237 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 1.13 cfs @ 12.45 hrs, Volume= 0.013 af
 Routed to Reach 2PR : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 947.12' @ 12.45 hrs Surf.Area= 0.176 ac Storage= 0.152 af

Plug-Flow detention time= 9.3 min calculated for 1.250 af (100% of inflow)
 Center-of-Mass det. time= 9.0 min (823.5 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
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#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)
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Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
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#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 ' S= 0.0246 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

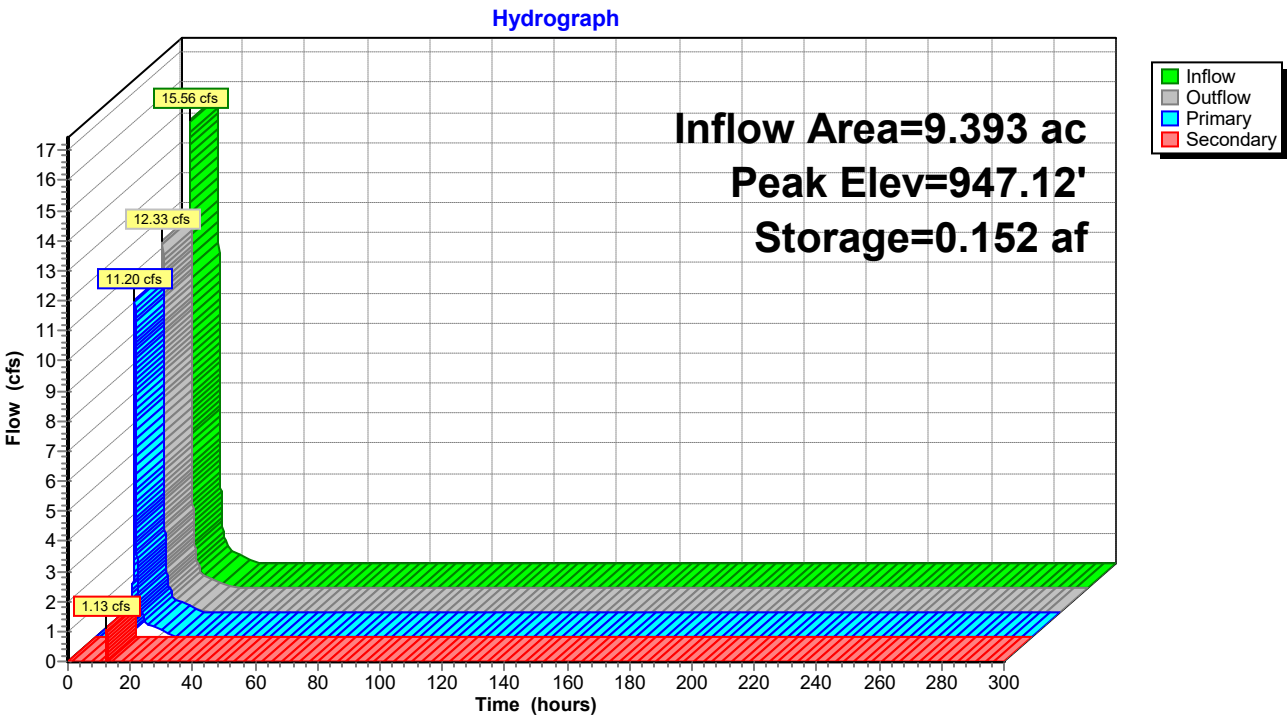
Primary OutFlow Max=11.20 cfs @ 12.45 hrs HW=947.12' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 11.20 cfs @ 6.34 fps)

Secondary OutFlow Max=1.13 cfs @ 12.45 hrs HW=947.12' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 1.13 cfs @ 0.93 fps)

Pond 1PP: Offsite Low Area - Northwest



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Summary for Pond 2EP: Offsite Low Area - North Middle

Inflow Area = 12.650 ac, 2.37% Impervious, Inflow Depth = 1.47" for 2-yr event
 Inflow = 18.48 cfs @ 12.36 hrs, Volume= 1.551 af
 Outflow = 18.00 cfs @ 12.42 hrs, Volume= 1.551 af, Atten= 3%, Lag= 3.4 min
 Primary = 18.00 cfs @ 12.42 hrs, Volume= 1.551 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 1EP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 948.17' @ 12.42 hrs Surf.Area= 0.043 ac Storage= 0.029 af

Plug-Flow detention time= 1.3 min calculated for 1.551 af (100% of inflow)
 Center-of-Mass det. time= 1.0 min (824.8 - 823.8)

Volume	Invert	Avail.Storage	Storage Description
#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)

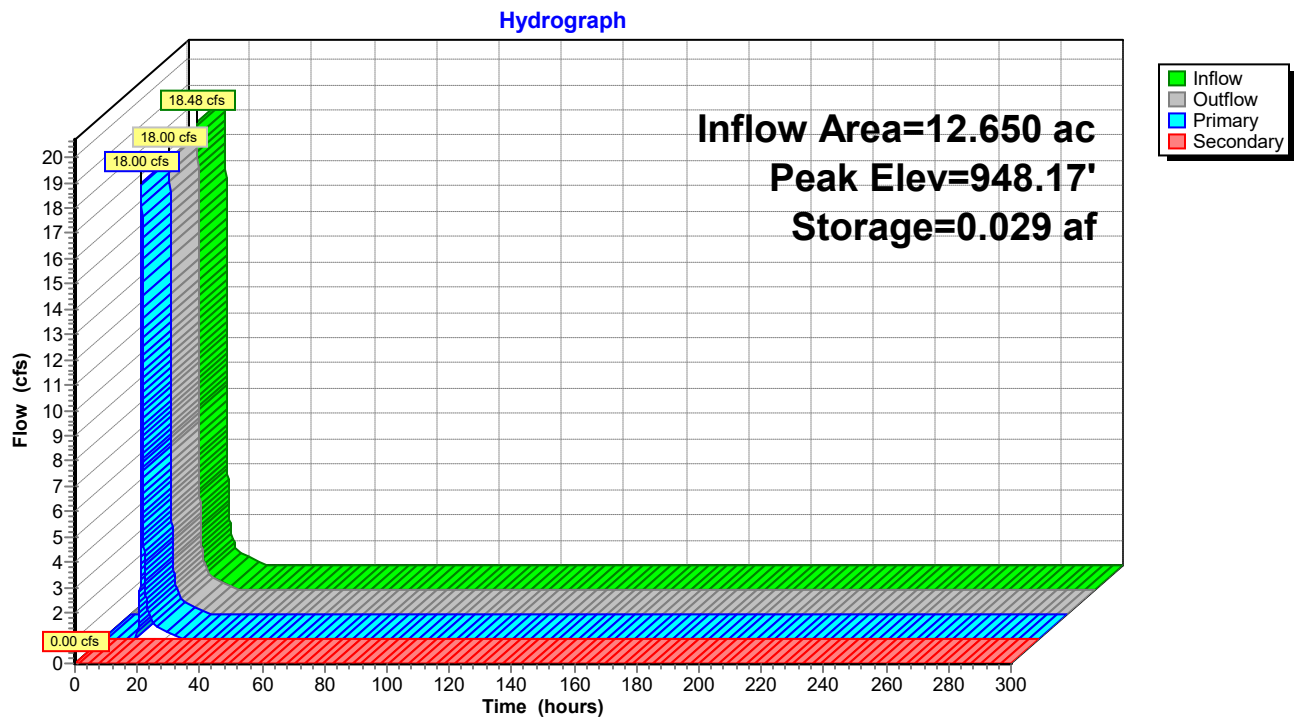
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

Device	Routing	Invert	Outlet Devices
#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=18.00 cfs @ 12.42 hrs HW=948.17' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 18.00 cfs @ 5.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=945.70' TW=944.60' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2EP: Offsite Low Area - North Middle



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Summary for Pond 2PP: Offsite Low Area - North Middle

Inflow Area = 8.730 ac, 6.41% Impervious, Inflow Depth = 1.34" for 2-yr event
 Inflow = 22.55 cfs @ 12.13 hrs, Volume= 0.977 af
 Outflow = 19.25 cfs @ 12.17 hrs, Volume= 0.977 af, Atten= 15%, Lag= 2.2 min
 Primary = 19.25 cfs @ 12.17 hrs, Volume= 0.977 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 1PP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 948.37' @ 12.17 hrs Surf.Area= 0.072 ac Storage= 0.041 af

Plug-Flow detention time= 1.4 min calculated for 0.977 af (100% of inflow)
 Center-of-Mass det. time= 1.0 min (811.3 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)

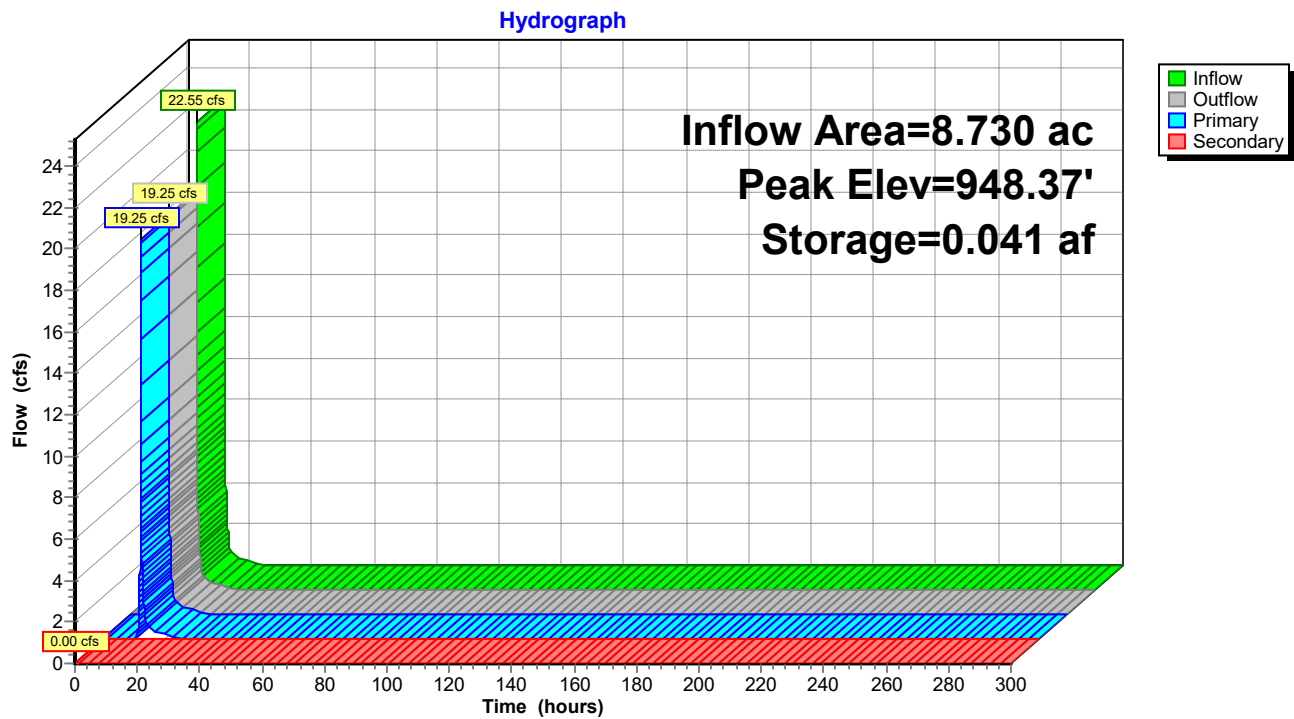
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

Device	Routing	Invert	Outlet Devices
#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 ' S= 0.0109 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=19.24 cfs @ 12.17 hrs HW=948.37' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 19.24 cfs @ 6.12 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=945.70' TW=944.60' (Dynamic Tailwater)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2PP: Offsite Low Area - North Middle



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Summary for Pond 3EP: Existing Wetland - Northeast

[92] Warning: Device #3 is above defined storage

Inflow = 12.57 cfs @ 12.32 hrs, Volume= 2.659 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 3ER : To Big Woods - Southeast Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4EP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 951.09' @ 300.00 hrs Surf.Area= 1.892 ac Storage= 2.659 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

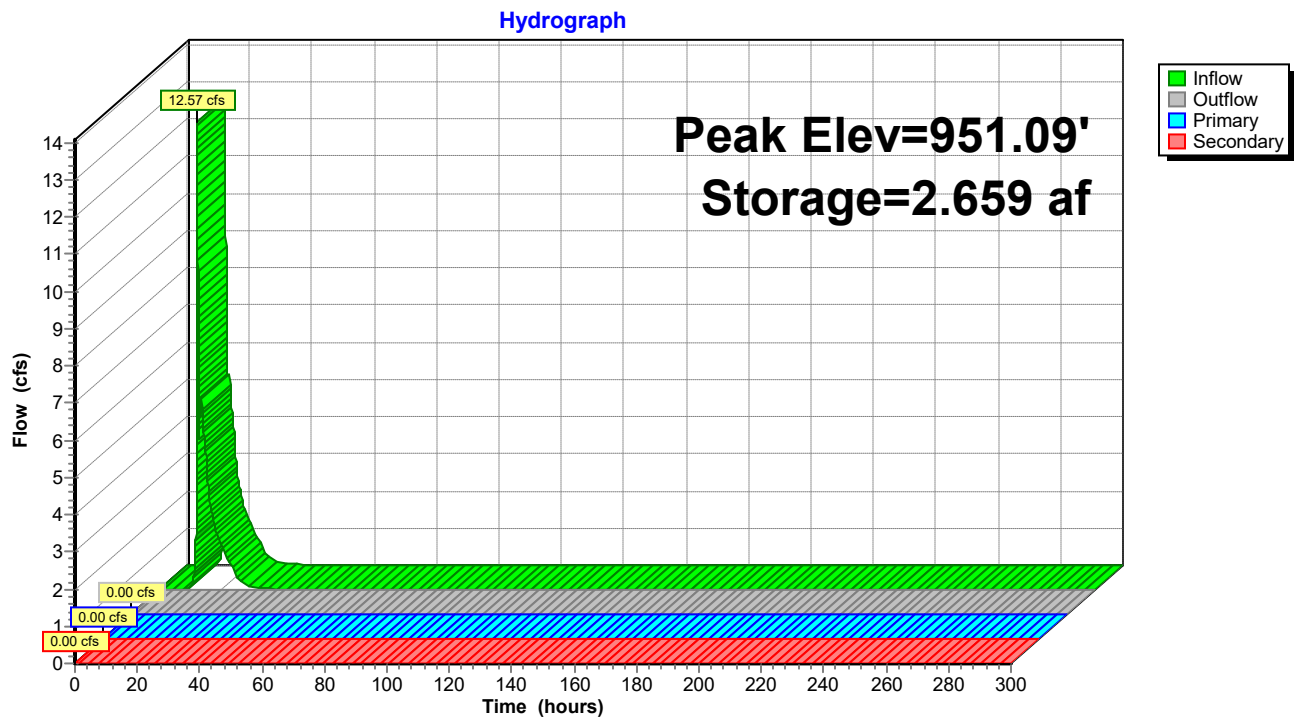
Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	11.020 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
948.00	0.050	0.000	0.000
949.00	0.400	0.225	0.225
950.00	1.150	0.775	1.000
952.00	2.510	3.660	4.660
954.00	3.850	6.360	11.020

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	951.10'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Secondary	954.30'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=948.00' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Controls 0.00 cfs)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=948.00' TW=954.00' (Dynamic Tailwater)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3EP: Existing Wetland - Northeast



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Summary for Pond 3PP: Existing Wetland - Northeast

Inflow = 5.80 cfs @ 12.33 hrs, Volume= 2.160 af
 Outflow = 0.02 cfs @ 47.88 hrs, Volume= 0.065 af, Atten= 100%, Lag= 2,133.0 min
 Primary = 0.02 cfs @ 47.88 hrs, Volume= 0.065 af
 Routed to Pond 6PP : Filtration Basin 6
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4PP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 952.05' @ 47.88 hrs Surf.Area= 39,082 sf Storage= 92,847 cf

Plug-Flow detention time= 4,515.5 min calculated for 0.065 af (3% of inflow)
 Center-of-Mass det. time= 4,124.4 min (5,235.3 - 1,111.0)

Volume	Invert	Avail.Storage	Storage Description
#1	948.80'	366,452 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.80	22,044	0	0
950.00	24,609	27,992	27,992
952.00	38,365	62,974	90,966
954.00	67,868	106,233	197,199
956.00	101,385	169,253	366,452

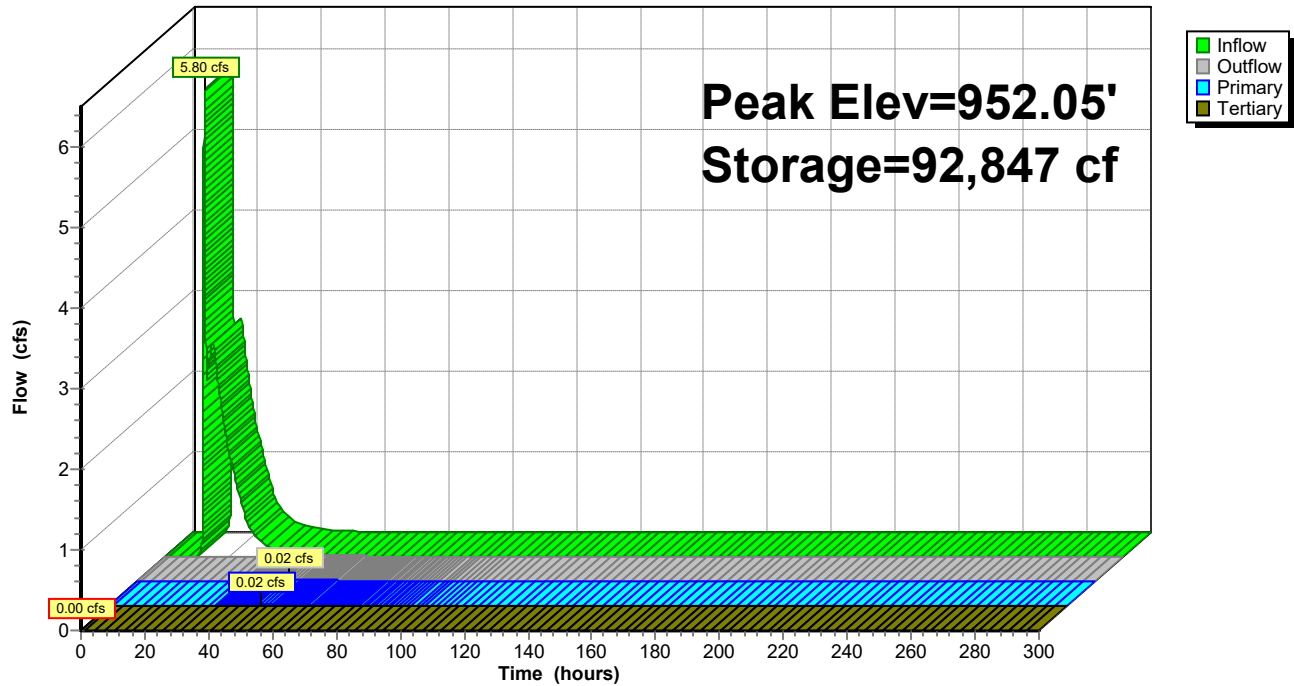
Device	Routing	Invert	Outlet Devices
#1	Primary	952.00'	24.0" Round Culvert L= 24.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 952.00' / 951.50' S= 0.0208 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Tertiary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.02 cfs @ 47.88 hrs HW=952.05' TW=951.50' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 0.02 cfs @ 0.75 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=948.80' TW=954.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3PP: Existing Wetland - Northeast

Hydrograph



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Summary for Pond 4EP: Offsite Wetland - Southeast

Inflow = 28.85 cfs @ 12.51 hrs, Volume= 2.954 af
 Outflow = 4.01 cfs @ 13.81 hrs, Volume= 1.686 af, Atten= 86%, Lag= 78.1 min
 Primary = 4.01 cfs @ 13.81 hrs, Volume= 1.686 af
 Routed to Pond 3EP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.44' @ 13.81 hrs Surf.Area= 4.486 ac Storage= 1.896 af

Plug-Flow detention time= 326.7 min calculated for 1.686 af (57% of inflow)
 Center-of-Mass det. time= 241.8 min (1,075.1 - 833.3)

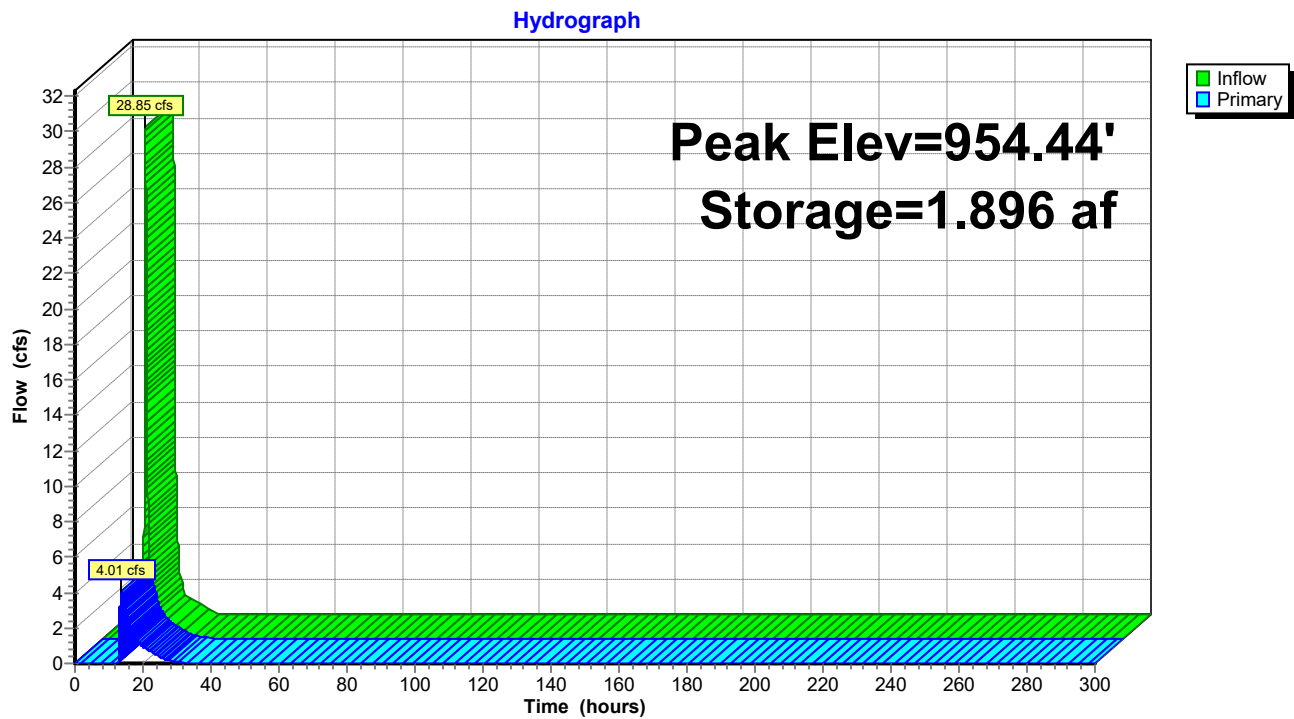
Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.01 cfs @ 13.81 hrs HW=954.44' TW=949.98' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 4.01 cfs @ 0.94 fps)

Pond 4EP: Offsite Wetland - Southeast



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Summary for Pond 4PP: Offsite Wetland - Southeast

Inflow = 24.82 cfs @ 12.33 hrs, Volume= 2.864 af
 Outflow = 2.38 cfs @ 15.22 hrs, Volume= 1.596 af, Atten= 90%, Lag= 173.0 min
 Primary = 2.38 cfs @ 15.22 hrs, Volume= 1.596 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.40' @ 15.22 hrs Surf.Area= 4.448 ac Storage= 1.710 af

Plug-Flow detention time= 461.5 min calculated for 1.596 af (56% of inflow)
 Center-of-Mass det. time= 316.7 min (1,214.5 - 897.8)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

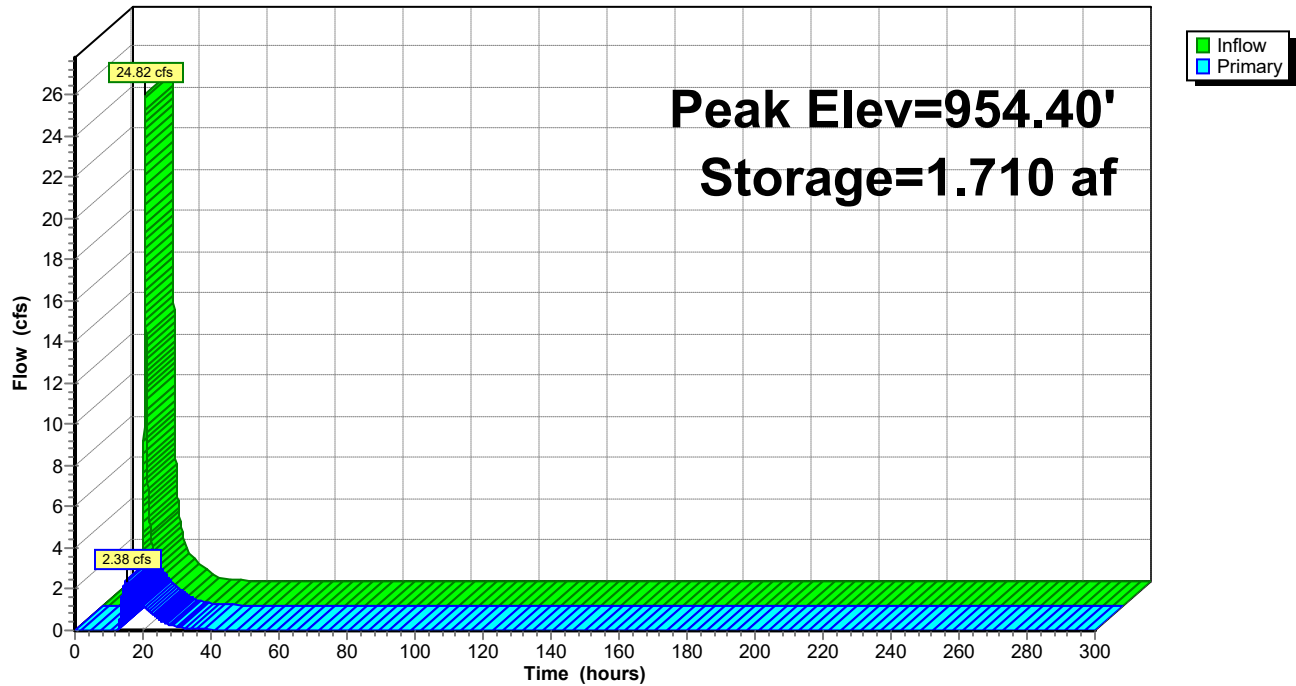
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.38 cfs @ 15.22 hrs HW=954.40' TW=950.26' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 2.38 cfs @ 0.79 fps)

Pond 4PP: Offsite Wetland - Southeast

Hydrograph



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Summary for Pond 5PP: Pond 5

Inflow = 8.29 cfs @ 12.23 hrs, Volume= 0.552 af
 Outflow = 0.99 cfs @ 13.94 hrs, Volume= 0.431 af, Atten= 88%, Lag= 102.3 min
 Primary = 0.99 cfs @ 13.94 hrs, Volume= 0.431 af
 Routed to Pond 7PP : Pond 7

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 955.06' @ 13.12 hrs Surf.Area= 19,571 sf Storage= 19,531 cf

Plug-Flow detention time= 439.6 min calculated for 0.431 af (78% of inflow)
 Center-of-Mass det. time= 357.6 min (1,180.6 - 823.0)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	144,732 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

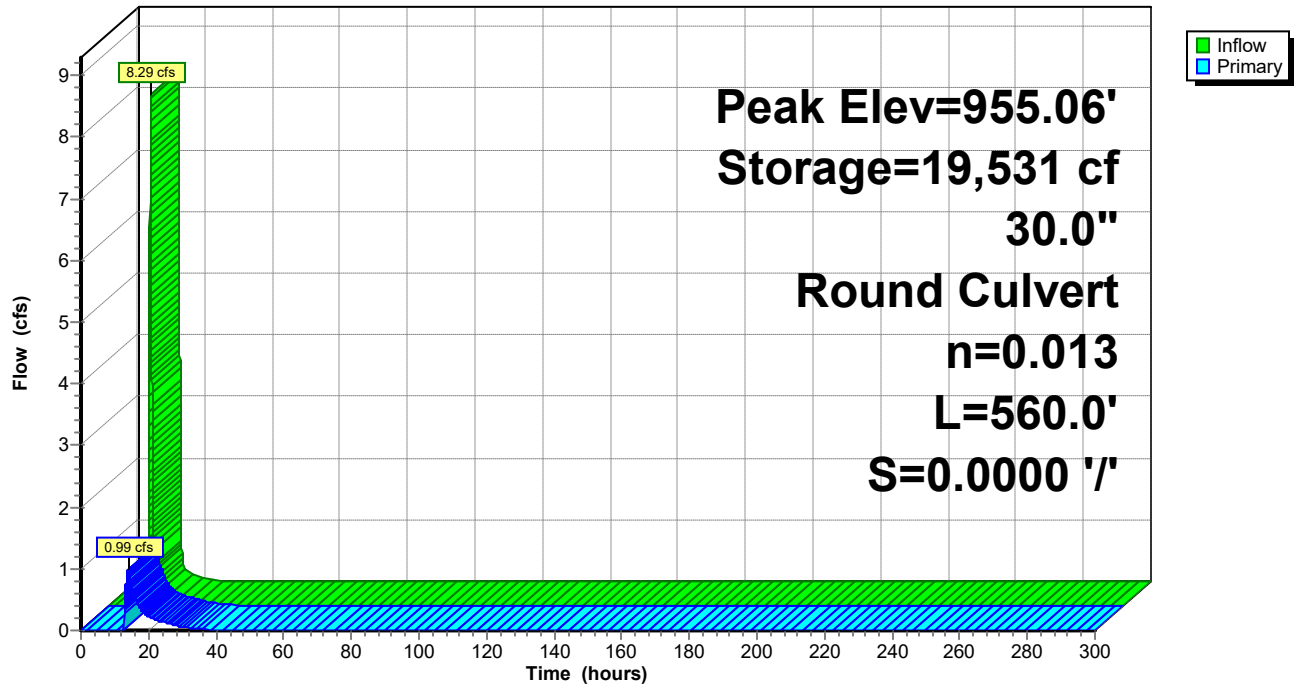
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	17,270	0	0
956.00	21,611	38,881	38,881
958.00	26,370	47,981	86,862
960.00	31,500	57,870	144,732

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=0.99 cfs @ 13.94 hrs HW=954.99' TW=954.89' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 0.99 cfs @ 0.81 fps)

Pond 5PP: Pond 5

Hydrograph



Summary for Pond 6PP: Filtration Basin 6

[86] Warning: Oscillations may require smaller dt (severity=13507)

Inflow = 30.13 cfs @ 12.18 hrs, Volume= 1.683 af
 Outflow = 5.61 cfs @ 12.58 hrs, Volume= 8.871 af, Atten= 81%, Lag= 24.5 min
 Primary = 4.21 cfs @ 12.59 hrs, Volume= 8.740 af
 Routed to Pond 8PP : Existing Territorial Ditch
 Secondary = 1.40 cfs @ 12.58 hrs, Volume= 0.131 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 952.49' @ 12.58 hrs Surf.Area= 33,829 sf Storage= 32,063 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 7,301.6 min (8,278.4 - 976.8)

Volume	Invert	Avail.Storage	Storage Description
#1	951.50'	166,675 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
951.50	31,134	0	0
952.00	32,613	15,937	15,937
954.00	37,625	70,238	86,175
956.00	42,875	80,500	166,675

Device	Routing	Invert	Outlet Devices
#1	Primary	948.17'	18.0" Round Culvert L= 38.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.17' / 948.12' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	948.25'	6.0" Round 6" Drain tile L= 265.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.25' / 948.17' S= 0.0003 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	951.50'	1.000 in/hr Exfiltration over Surface area
#4	Secondary	952.00'	24.0" Round Culvert L= 25.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 951.50' / 952.00' S= -0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#5	Device 1	951.50'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Primary	953.50'	0.5' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

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Primary OutFlow Max=4.21 cfs @ 12.59 hrs HW=952.49' TW=949.17' (Dynamic Tailwater)

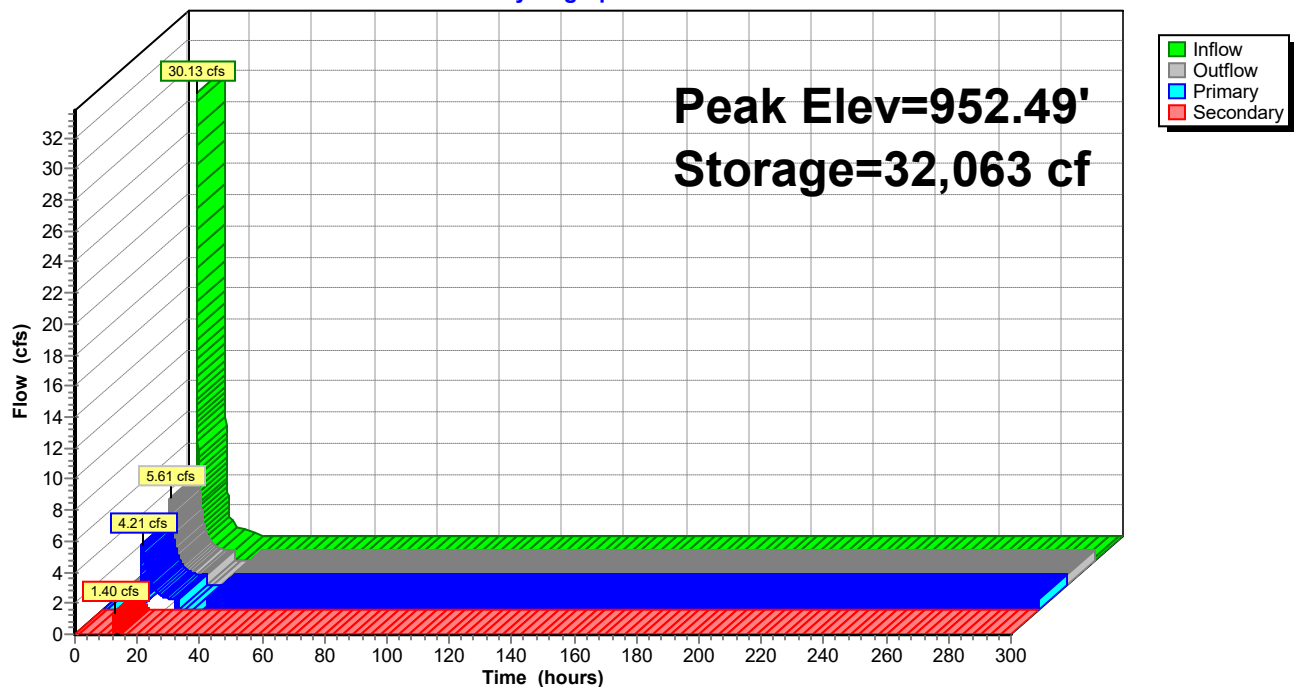
- 1=Culvert (Passes 4.21 cfs of 15.50 cfs potential flow)
- 2=6" Draintile (Outlet Controls 0.71 cfs @ 3.60 fps)
- 3=Exfiltration (Passes 0.71 cfs of 0.78 cfs potential flow)
- 5=Orifice/Grate (Orifice Controls 3.51 cfs @ 3.38 fps)
- 6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=1.40 cfs @ 12.58 hrs HW=952.49' TW=949.26' (Dynamic Tailwater)

- 4=Culvert (Inlet Controls 1.40 cfs @ 2.37 fps)

Pond 6PP: Filtration Basin 6

Hydrograph



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Summary for Pond 7PP: Pond 7

Inflow = 22.72 cfs @ 12.23 hrs, Volume= 1.884 af
 Outflow = 15.03 cfs @ 12.38 hrs, Volume= 1.827 af, Atten= 34%, Lag= 8.6 min
 Primary = 9.58 cfs @ 12.38 hrs, Volume= 1.573 af
 Routed to Pond 4PP : Offsite Wetland - Southeast
 Secondary = 5.46 cfs @ 12.38 hrs, Volume= 0.254 af
 Routed to Pond 5PP : Pond 5

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 955.75' @ 12.38 hrs Surf.Area= 10,832 sf Storage= 16,572 cf

Plug-Flow detention time= 83.7 min calculated for 1.827 af (97% of inflow)
 Center-of-Mass det. time= 43.4 min (939.6 - 896.2)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	117,172 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	8,084	0	0
956.00	11,221	19,305	19,305
958.00	14,420	25,641	44,946
960.00	17,768	32,188	77,134
962.00	22,270	40,038	117,172

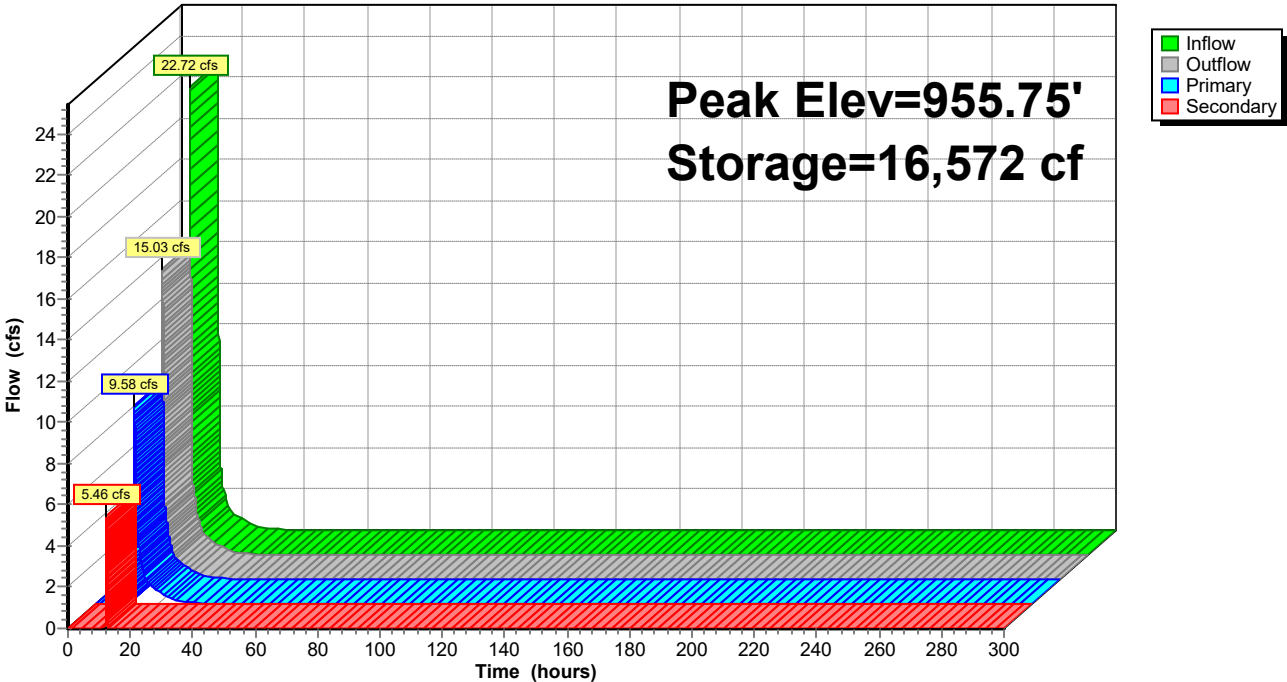
Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 230.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 953.70' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=9.57 cfs @ 12.38 hrs HW=955.75' TW=954.15' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 9.57 cfs @ 3.66 fps)

Secondary OutFlow Max=5.46 cfs @ 12.38 hrs HW=955.75' TW=954.57' (Dynamic Tailwater)
 ↑2=Culvert (Barrel Controls 5.46 cfs @ 2.09 fps)

Pond 7PP: Pond 7

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Summary for Pond 8PP: Existing Territorial Ditch

Inflow = 4.64 cfs @ 12.45 hrs, Volume= 8.871 af
 Outflow = 4.63 cfs @ 12.54 hrs, Volume= 8.867 af, Atten= 0%, Lag= 5.3 min
 Primary = 4.63 cfs @ 12.54 hrs, Volume= 8.867 af
 Routed to Reach 3PR : To Big Woods - Southeast Wetland Complex

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 949.17' @ 12.54 hrs Surf.Area= 900 sf Storage= 786 cf

Plug-Flow detention time= 8.7 min calculated for 8.867 af (100% of inflow)
 Center-of-Mass det. time= 4.1 min (8,282.9 - 8,278.8)

Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	31,368 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

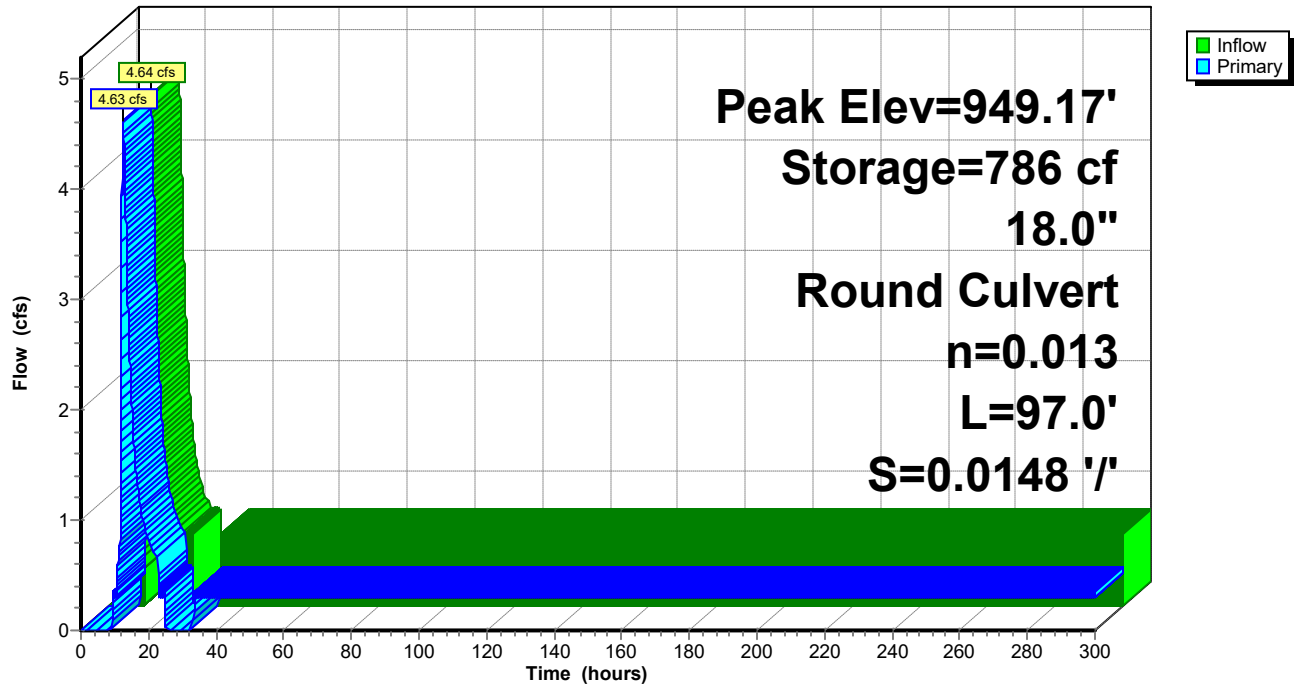
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.00	440	0	0
950.00	1,225	1,665	1,665
952.00	5,310	6,535	8,200
954.00	17,858	23,168	31,368

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=4.63 cfs @ 12.54 hrs HW=949.17' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 4.63 cfs @ 3.49 fps)

Pond 8PP: Existing Territorial Ditch

Hydrograph



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Time span=0.00-300.00 hrs, dt=0.01 hrs, 30001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1E: Direct Drainage to 1EP Runoff Area=11.480 ac 5.40% Impervious Runoff Depth=2.88"
Flow Length=1,422' Slope=0.0170 '/' Tc=25.5 min CN=87 Runoff=32.16 cfs 2.752 af

Subcatchment 1Ex: Offsite Direct Drainage Runoff Area=8.530 ac 7.27% Impervious Runoff Depth=2.88"
Flow Length=1,180' Slope=0.0180 '/' Tc=21.3 min CN=87 Runoff=26.27 cfs 2.044 af

Subcatchment 1P: Onsite Drainage to 1EP Runoff Area=0.863 ac 24.33% Impervious Runoff Depth=2.60"
Tc=5.0 min CN=84 Runoff=4.30 cfs 0.187 af

Subcatchment 2E: Direct Drainage to 2EP Runoff Area=12.650 ac 2.37% Impervious Runoff Depth=2.69"
Flow Length=1,273' Slope=0.0170 '/' Tc=25.1 min CN=85 Runoff=33.78 cfs 2.837 af

Subcatchment 2Ex: Offsite Direct Drainage Runoff Area=7.580 ac 3.96% Impervious Runoff Depth=2.51"
Flow Length=655' Slope=0.1400 '/' Tc=5.5 min CN=83 Runoff=35.95 cfs 1.588 af

Subcatchment 2P: Onsite Drainage to 2EP Runoff Area=1.150 ac 22.61% Impervious Runoff Depth=2.60"
Tc=5.0 min CN=84 Runoff=5.74 cfs 0.249 af

Subcatchment 3E: Direct Drainage to 3EP Runoff Area=7.930 ac 6.31% Impervious Runoff Depth=2.69"
Flow Length=605' Slope=0.0071 '/' Tc=21.4 min CN=85 Runoff=22.91 cfs 1.779 af

Subcatchment 3Ex: Offsite Drainage to 3EP Runoff Area=1.600 ac 6.25% Impervious Runoff Depth=2.34"
Tc=12.0 min CN=81 Runoff=5.40 cfs 0.312 af

Subcatchment 3P: Onsite Drainage to 3EP Runoff Area=2.700 ac 3.70% Impervious Runoff Depth=2.34"
Flow Length=605' Slope=0.0071 '/' Tc=24.4 min CN=81 Runoff=6.36 cfs 0.527 af

Subcatchment 4E: Direct Drainage to 4EP Runoff Area=24.090 ac 2.08% Impervious Runoff Depth=2.69"
Flow Length=1,227' Slope=0.0081 '/' Tc=35.3 min CN=85 Runoff=52.71 cfs 5.403 af

Subcatchment 4Ex: Offsite Direct Drainage Runoff Area=10.540 ac 4.74% Impervious Runoff Depth=2.43"
Flow Length=651' Slope=0.0100 '/' Tc=21.1 min CN=82 Runoff=28.00 cfs 2.132 af

Subcatchment 4P: Onsite Drainage to 4EP Runoff Area=1.577 ac 17.31% Impervious Runoff Depth=2.51"
Tc=5.0 min CN=83 Runoff=7.63 cfs 0.330 af

Subcatchment 5E: Direct Drainage to Runoff Area=5.720 ac 0.00% Impervious Runoff Depth=2.88"
Flow Length=560' Slope=0.0240 '/' Tc=10.2 min CN=87 Runoff=24.94 cfs 1.371 af

Subcatchment 5P: Onsite Drainage to 5PP Runoff Area=2.820 ac 11.35% Impervious Runoff Depth=2.43"
Tc=10.0 min CN=82 Runoff=10.62 cfs 0.570 af

Subcatchment 6P: Drainage to Filtration Runoff Area=12.000 ac 39.17% Impervious Runoff Depth=2.88"
Tc=10.0 min CN=87 Runoff=52.65 cfs 2.876 af

Subcatchment 7P: Onsite Drainage to 7PP Runoff Area=11.300 ac 32.74% Impervious Runoff Depth=2.78"
Tc=15.0 min CN=86 Runoff=40.58 cfs 2.621 af

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Subcatchment 8Ex: Territorial Ditch	Runoff Area=1.070 ac 28.97% Impervious Runoff Depth=2.69" Tc=5.0 min CN=85 Runoff=5.49 cfs 0.240 af
Subcatchment 9P: Offsite Drainage East	Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=2.26" Tc=5.0 min CN=80 Runoff=0.35 cfs 0.015 af
Reach 1ER: To Big Woods - Southwest Wetland Complex	Inflow=38.23 cfs 5.066 af Outflow=38.23 cfs 5.066 af
Reach 1PR: To Big Woods - Southwest Wetland Complex	Inflow=35.98 cfs 3.745 af Outflow=35.98 cfs 3.745 af
Reach 2ER: Existing Overflow Offsite to North	Inflow=14.83 cfs 0.522 af Outflow=14.83 cfs 0.522 af
Reach 2PR: Existing Overflow Offsite to North	Inflow=10.99 cfs 0.323 af Outflow=10.99 cfs 0.323 af
Reach 3ER: To Big Woods - Southeast Wetland Complex	Inflow=6.25 cfs 3.238 af Outflow=6.25 cfs 3.238 af
Reach 3PR: To Big Woods - Southeast Wetland Complex	Inflow=8.19 cfs 12.992 af Outflow=8.19 cfs 12.992 af
Pond 1EP: Offsite Low Area - Northwest	Peak Elev=947.67' Storage=0.320 af Inflow=32.16 cfs 2.752 af Primary=12.86 cfs 2.229 af Secondary=14.83 cfs 0.522 af Outflow=27.69 cfs 2.751 af
Pond 1PP: Offsite Low Area - Northwest	Peak Elev=947.55' Storage=0.269 af Inflow=27.39 cfs 2.232 af Primary=12.50 cfs 1.908 af Secondary=10.99 cfs 0.323 af Outflow=23.49 cfs 2.231 af
Pond 2EP: Offsite Low Area - North Middle	Peak Elev=949.57' Storage=0.228 af Inflow=33.78 cfs 2.837 af Primary=25.39 cfs 2.837 af Secondary=0.00 cfs 0.000 af Outflow=25.39 cfs 2.837 af
Pond 2PP: Offsite Low Area - North Middle	Peak Elev=949.38' Storage=0.185 af Inflow=41.68 cfs 1.837 af Primary=24.54 cfs 1.837 af Secondary=0.00 cfs 0.000 af Outflow=24.54 cfs 1.837 af
Pond 3EP: Existing Wetland - Northeast	Peak Elev=951.49' Storage=3.470 af Inflow=22.91 cfs 5.914 af Primary=6.25 cfs 3.238 af Secondary=0.00 cfs 0.000 af Outflow=6.25 cfs 3.238 af
Pond 3PP: Existing Wetland - Northeast	Peak Elev=953.03' Storage=138,445 cf Inflow=16.88 cfs 5.639 af Primary=4.56 cfs 3.544 af Tertiary=0.00 cfs 0.000 af Outflow=4.56 cfs 3.544 af
Pond 4EP: Offsite Wetland - Southeast	Peak Elev=954.65' Storage=2.871 af Inflow=52.71 cfs 5.403 af Outflow=16.14 cfs 4.136 af
Pond 4PP: Offsite Wetland - Southeast	Peak Elev=954.57' Storage=2.479 af Inflow=47.25 cfs 5.474 af Outflow=10.62 cfs 4.207 af
Pond 5PP: Pond 5	Peak Elev=955.85' Storage=35,696 cf Inflow=17.39 cfs 1.024 af 30.0" Round Culvert n=0.013 L=560.0' S=0.0000 ' Outflow=2.91 cfs 0.902 af

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Pond 6PP: Filtration Basin 6

Peak Elev=953.15' Storage=55,003 cf Inflow=52.65 cfs 6.420 af
Primary=6.70 cfs 12.757 af Secondary=6.80 cfs 0.593 af Outflow=13.50 cfs 13.349 af

Pond 7PP: Pond 7

Peak Elev=956.55' Storage=25,774 cf Inflow=40.58 cfs 3.523 af
Primary=17.69 cfs 3.012 af Secondary=11.02 cfs 0.453 af Outflow=28.71 cfs 3.466 af

Pond 8PP: Existing Territorial Ditch

Peak Elev=949.80' Storage=1,425 cf Inflow=9.15 cfs 12.996 af
18.0" Round Culvert n=0.013 L=97.0' S=0.0148 '/' Outflow=8.19 cfs 12.992 af

Total Runoff Area = 123.680 ac Runoff Volume = 27.833 af Average Runoff Depth = 2.70"

89.24% Pervious = 110.367 ac 10.76% Impervious = 13.313 ac

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Summary for Subcatchment 1E: Direct Drainage to 1EP

Runoff = 32.16 cfs @ 12.36 hrs, Volume= 2.752 af, Depth= 2.88"
Routed to Pond 1EP : Offsite Low Area - Northwest

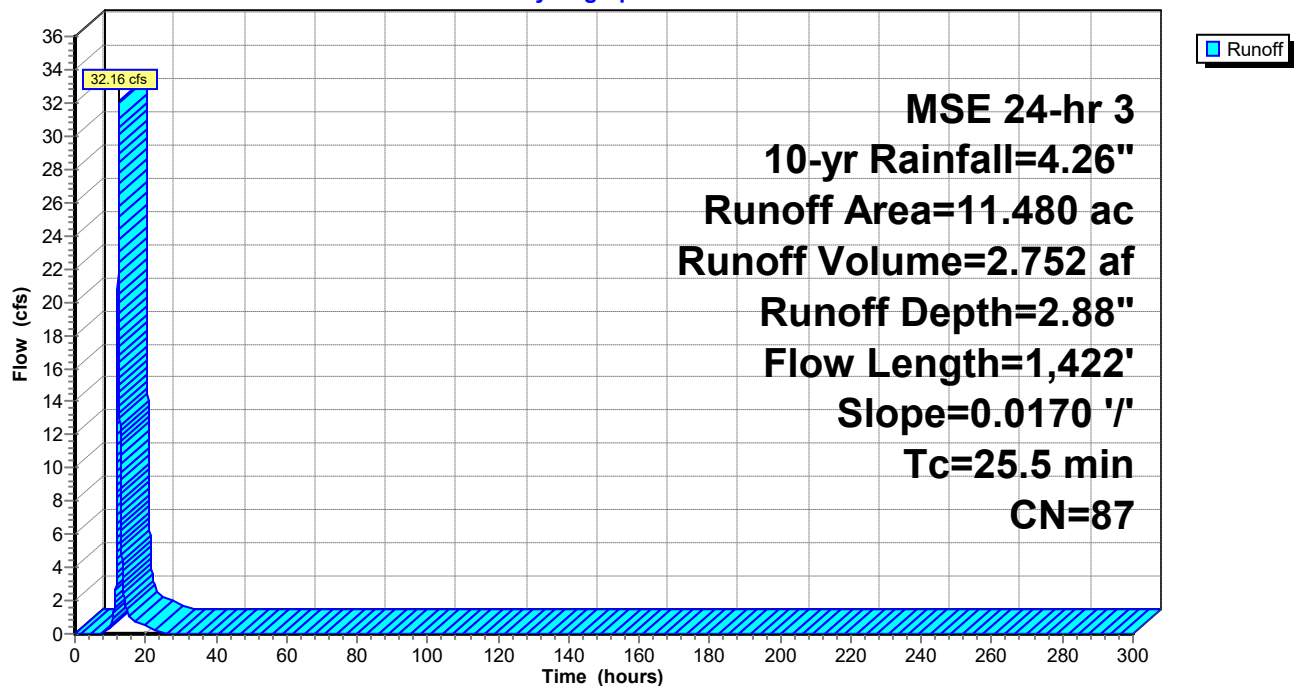
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
10.110	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
11.480	87	Weighted Average
10.860		94.60% Pervious Area
0.620		5.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.5	1,422	0.0170	0.93		Lag/CN Method,

Subcatchment 1E: Direct Drainage to 1EP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Runoff = 26.27 cfs @ 12.31 hrs, Volume= 2.044 af, Depth= 2.88"
Routed to Pond 1PP : Offsite Low Area - Northwest

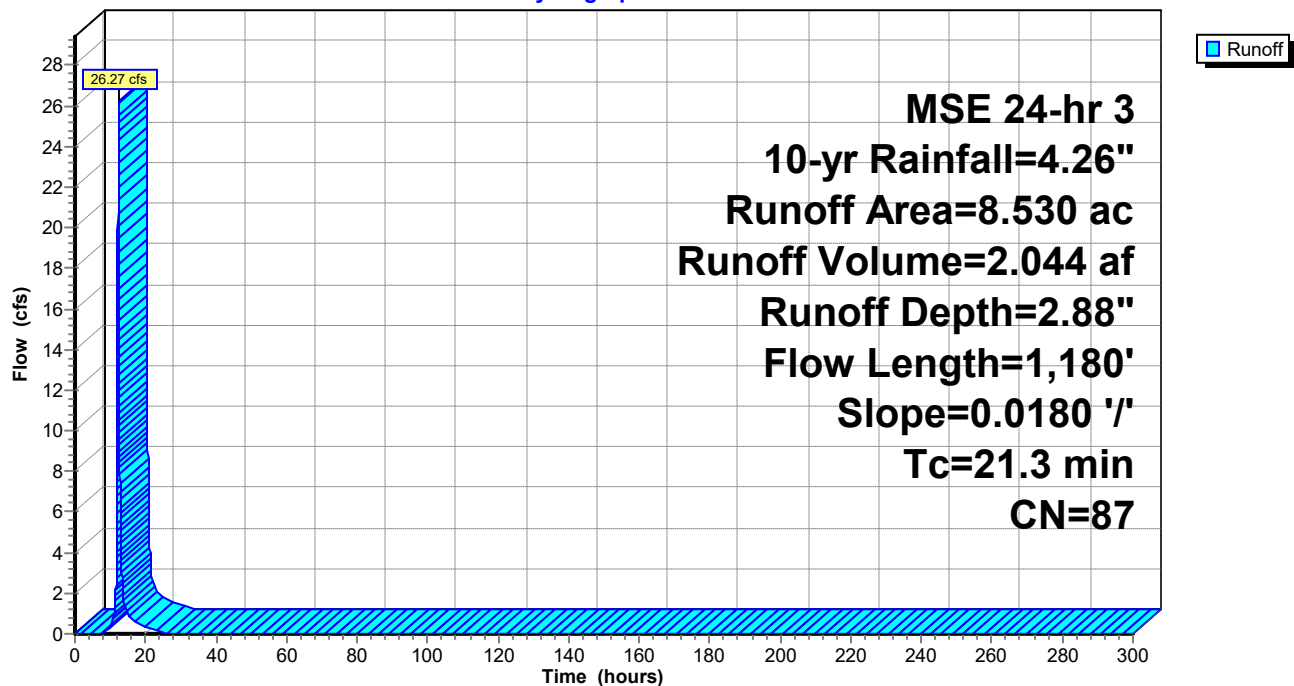
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
7.160	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
8.530	87	Weighted Average
7.910		92.73% Pervious Area
0.620		7.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	1,180	0.0180	0.92		Lag/CN Method,

Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Hydrograph



Summary for Subcatchment 1P: Onsite Drainage to 1EP

Runoff = 4.30 cfs @ 12.12 hrs, Volume= 0.187 af, Depth= 2.60"

Routed to Pond 1PP : Offsite Low Area - Northwest

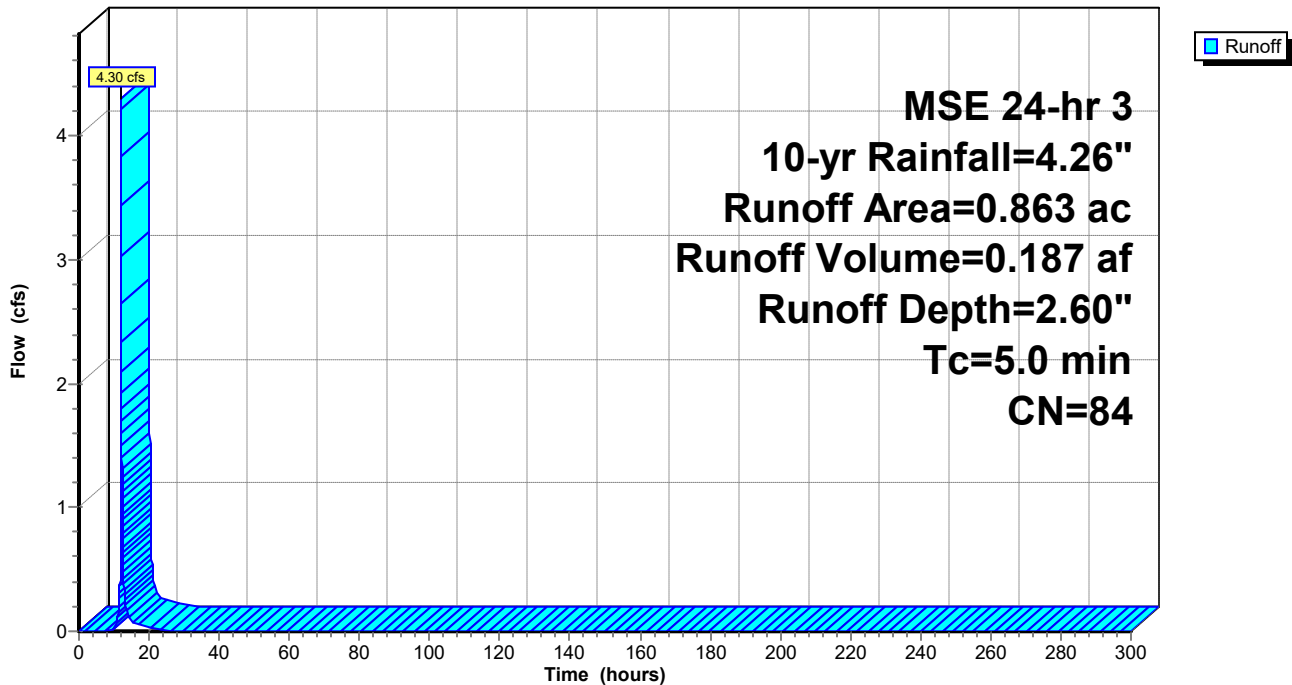
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.210	98	Proposed Impervious
0.653	80	>75% Grass cover, Good, HSG D
0.863	84	Weighted Average
0.653		75.67% Pervious Area
0.210		24.33% Impervious Area

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

Subcatchment 1P: Onsite Drainage to 1EP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 2E: Direct Drainage to 2EP

Runoff = 33.78 cfs @ 12.35 hrs, Volume= 2.837 af, Depth= 2.69"
Routed to Pond 2EP : Offsite Low Area - North Middle

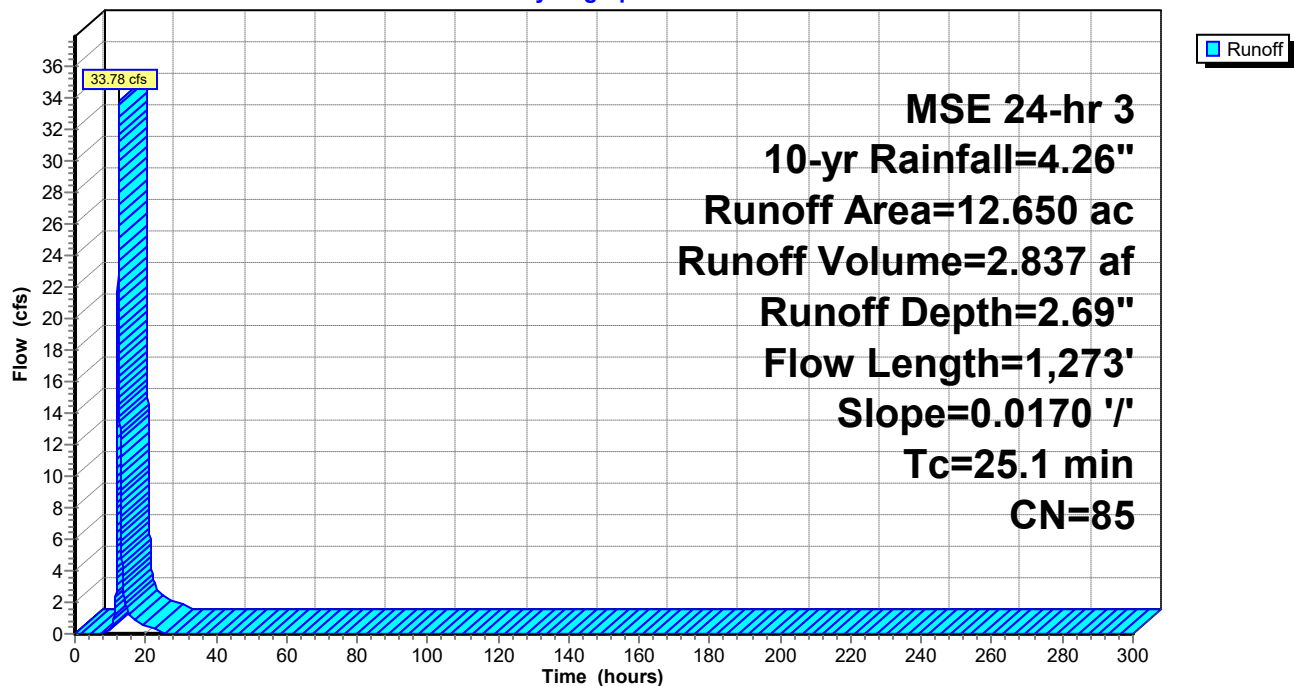
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
7.540	87	Small grain, straight row, Good, HSG D
12.650	85	Weighted Average
12.350		97.63% Pervious Area
0.300		2.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.1	1,273	0.0170	0.85		Lag/CN Method,

Subcatchment 2E: Direct Drainage to 2EP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Runoff = 35.95 cfs @ 12.13 hrs, Volume= 1.588 af, Depth= 2.51"
Routed to Pond 2PP : Offsite Low Area - North Middle

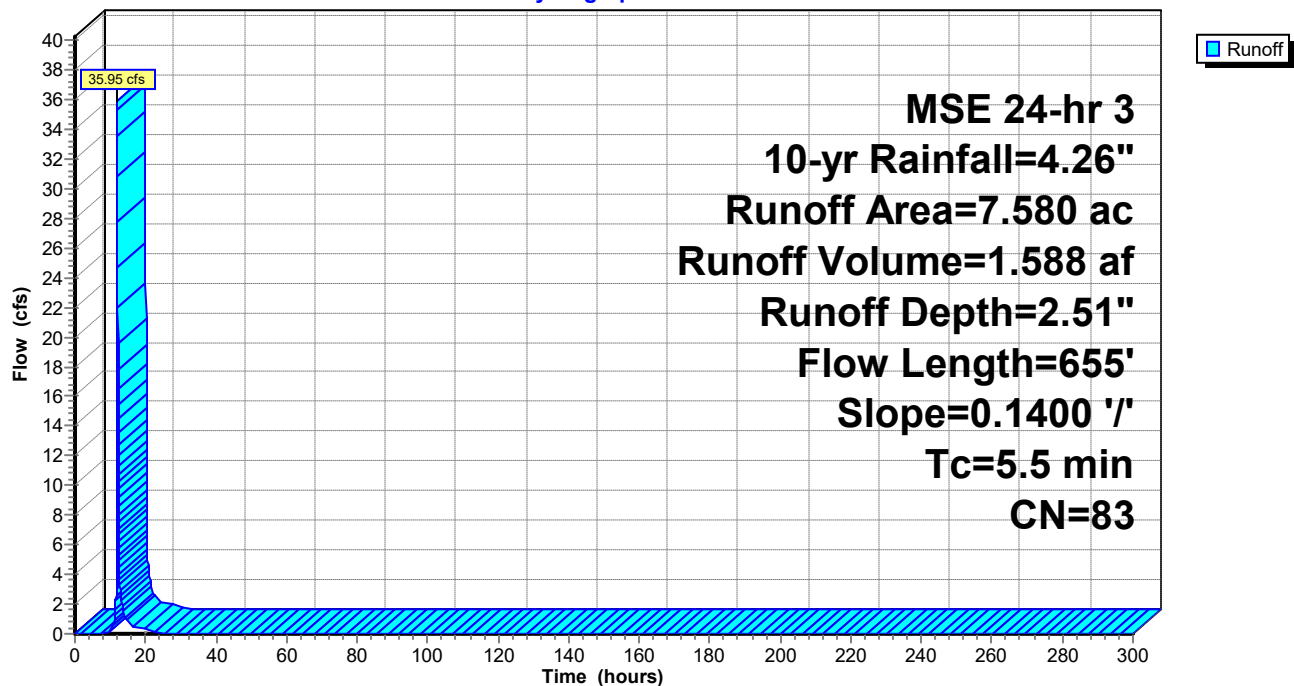
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
2.470	87	Small grain, straight row, Good, HSG D
7.580	83	Weighted Average
7.280		96.04% Pervious Area
0.300		3.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	655	0.1400	1.99		Lag/CN Method,

Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 2P: Onsite Drainage to 2EP

Runoff = 5.74 cfs @ 12.12 hrs, Volume= 0.249 af, Depth= 2.60"
Routed to Pond 2PP : Offsite Low Area - North Middle

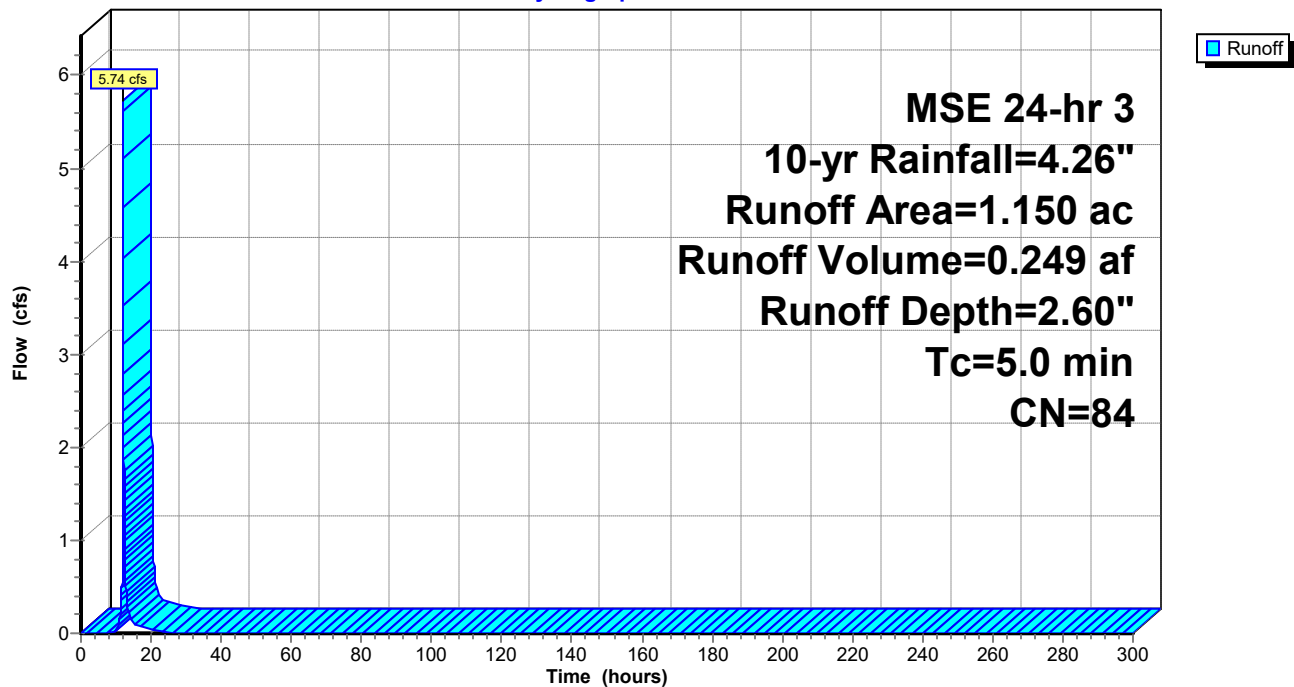
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.260	98	Proposed Impervious
0.890	80	>75% Grass cover, Good, HSG D
1.150	84	Weighted Average
0.890		77.39% Pervious Area
0.260		22.61% Impervious Area

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

Subcatchment 2P: Onsite Drainage to 2EP

Hydrograph



Summary for Subcatchment 3E: Direct Drainage to 3EP

Runoff = 22.91 cfs @ 12.31 hrs, Volume= 1.779 af, Depth= 2.69"

Routed to Pond 3EP : Existing Wetland - Northeast

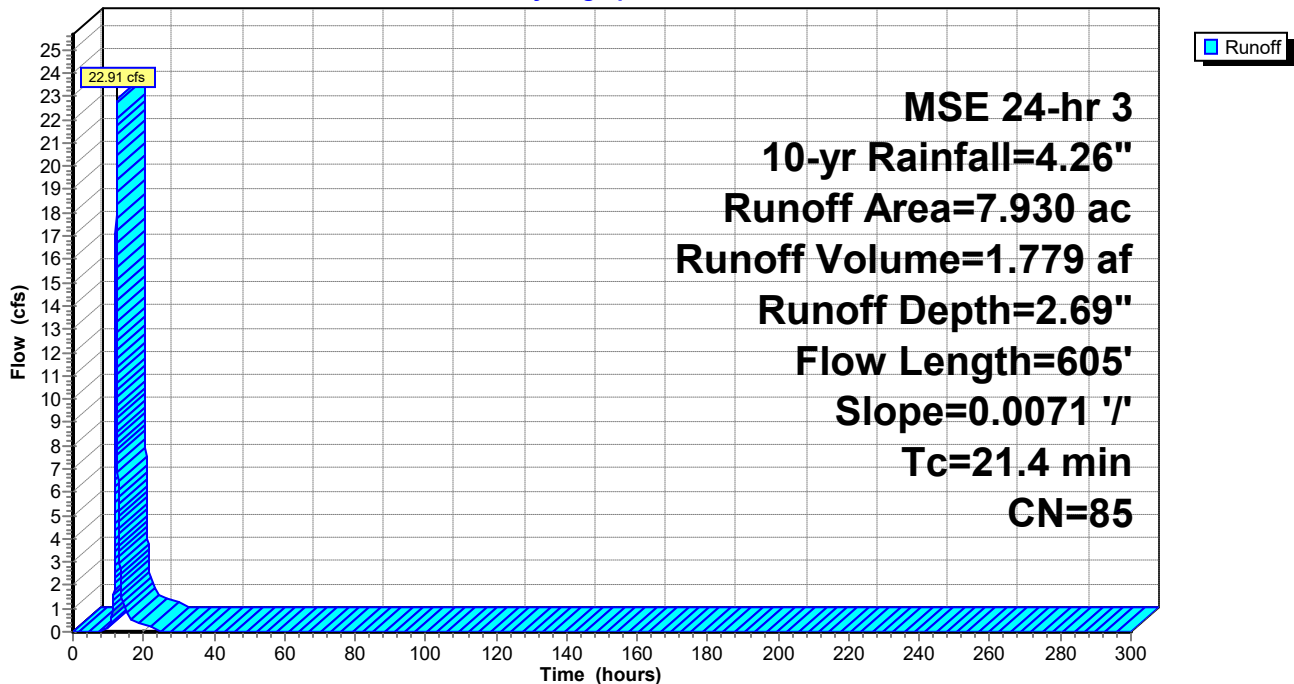
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
2.780	80	>75% Grass cover, Good, HSG D
4.650	87	Small grain, straight row, Good, HSG D
7.930	85	Weighted Average
7.430		93.69% Pervious Area
0.500		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	605	0.0071	0.47		Lag/CN Method,

Subcatchment 3E: Direct Drainage to 3EP

Hydrograph



Summary for Subcatchment 3Ex: Offsite Drainage to 3EP

Runoff = 5.40 cfs @ 12.20 hrs, Volume= 0.312 af, Depth= 2.34"

Routed to Pond 3PP : Existing Wetland - Northeast

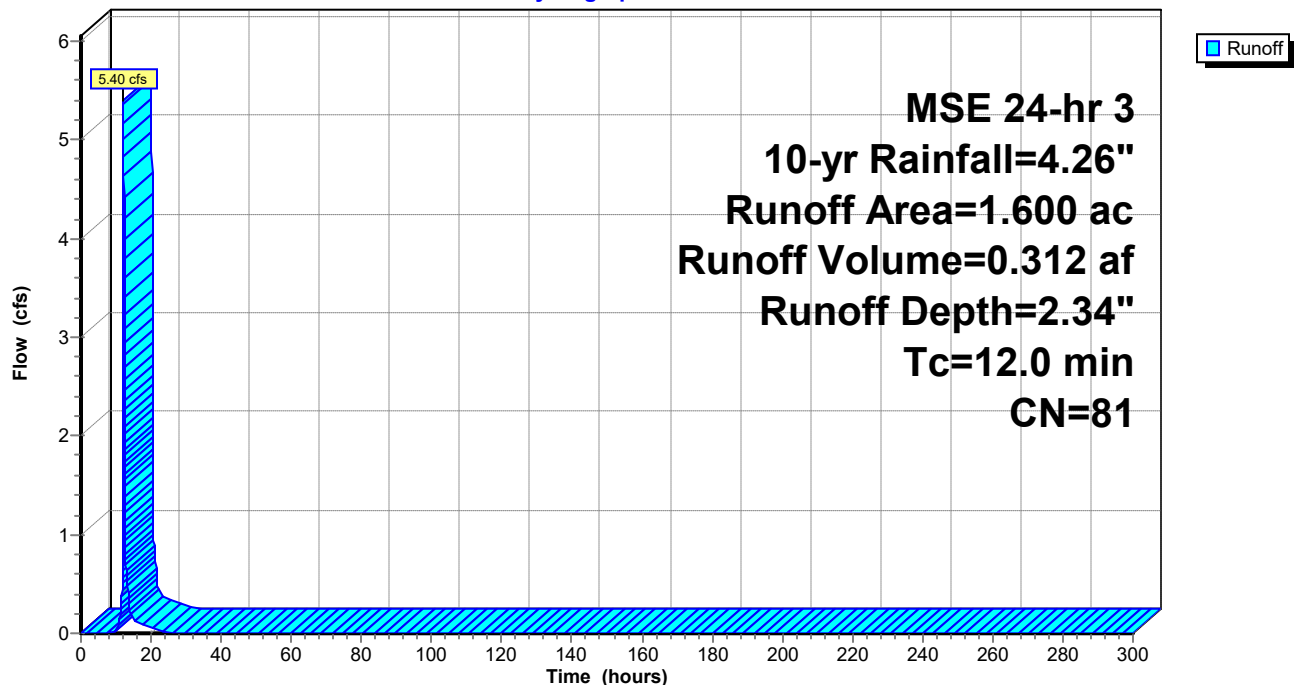
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
1.500	80	>75% Grass cover, Good, HSG D
1.600	81	Weighted Average
1.500		93.75% Pervious Area
0.100		6.25% Impervious Area

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

Subcatchment 3Ex: Offsite Drainage to 3EP

Hydrograph



Summary for Subcatchment 3P: Onsite Drainage to 3EP

Runoff = 6.36 cfs @ 12.34 hrs, Volume= 0.527 af, Depth= 2.34"
 Routed to Pond 3PP : Existing Wetland - Northeast

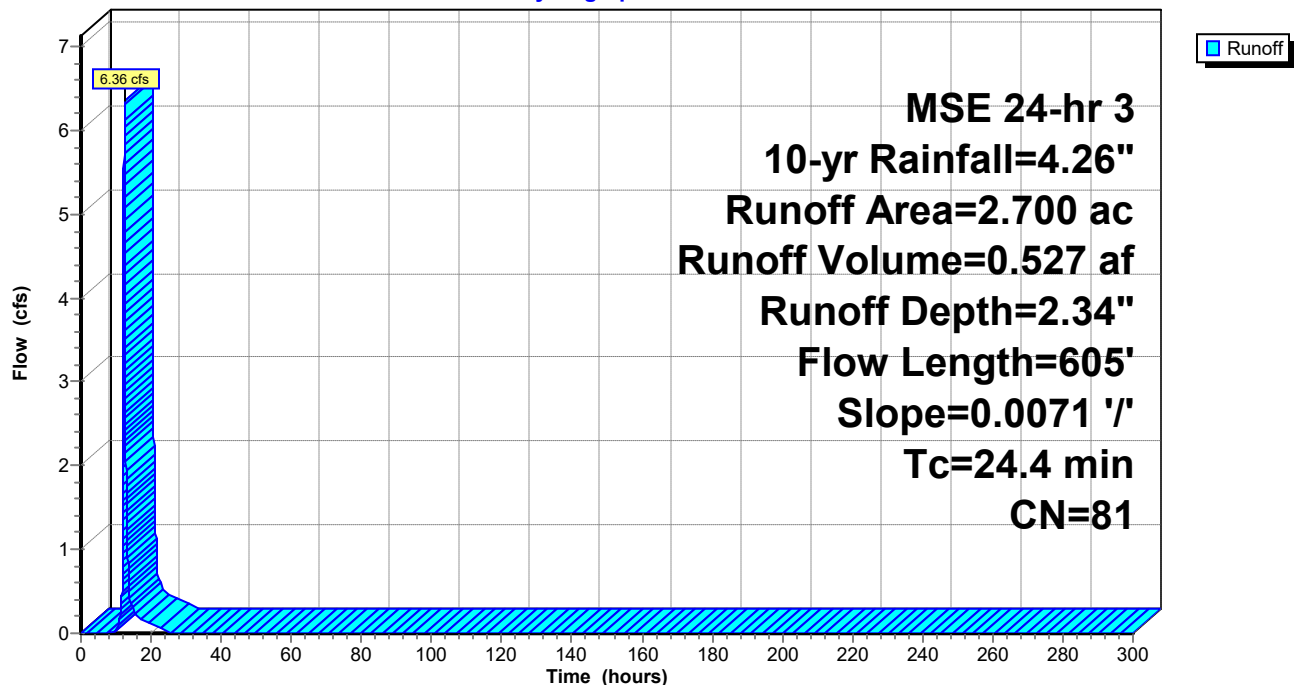
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
2.600	80	>75% Grass cover, Good, HSG D
2.700	81	Weighted Average
2.600		96.30% Pervious Area
0.100		3.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.4	605	0.0071	0.41		Lag/CN Method,

Subcatchment 3P: Onsite Drainage to 3EP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 4E: Direct Drainage to 4EP

Runoff = 52.71 cfs @ 12.51 hrs, Volume= 5.403 af, Depth= 2.69"
Routed to Pond 4EP : Offsite Wetland - Southeast

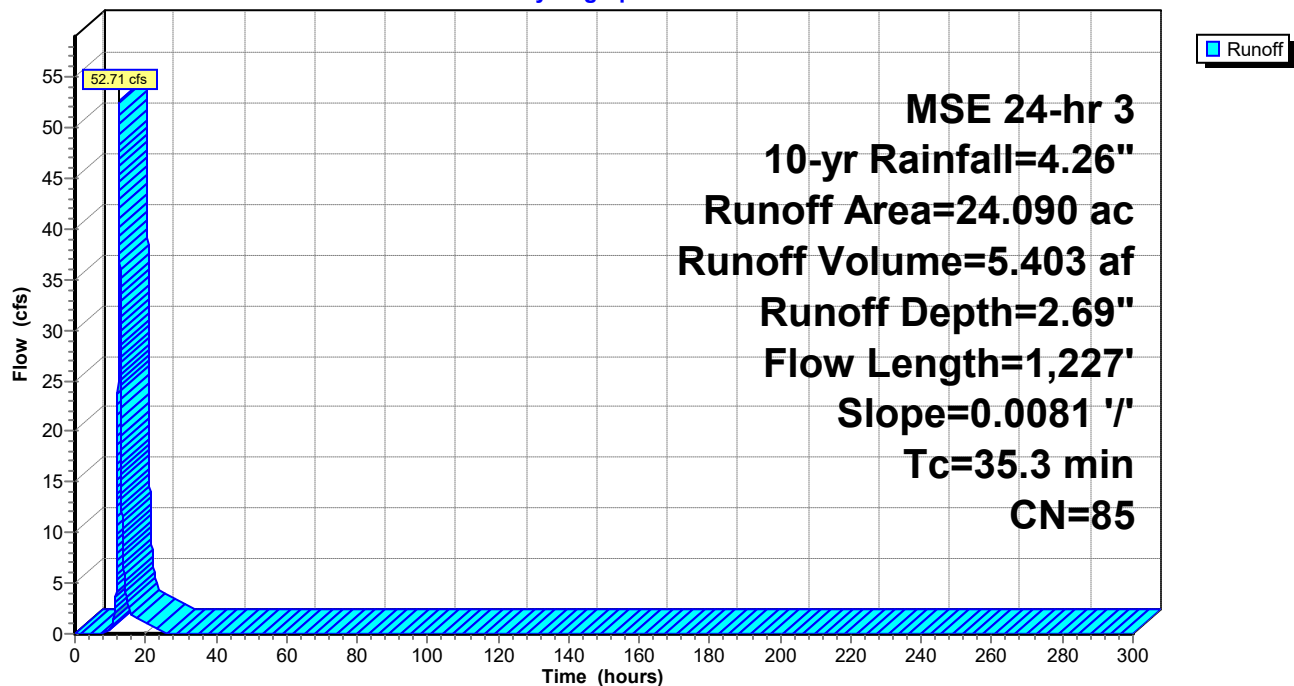
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
8.950	80	>75% Grass cover, Good, HSG D
14.640	87	Small grain, straight row, Good, HSG D
24.090	85	Weighted Average
23.590		97.92% Pervious Area
0.500		2.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	1,227	0.0081	0.58		Lag/CN Method,

Subcatchment 4E: Direct Drainage to 4EP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Runoff = 28.00 cfs @ 12.31 hrs, Volume= 2.132 af, Depth= 2.43"
Routed to Pond 4PP : Offsite Wetland - Southeast

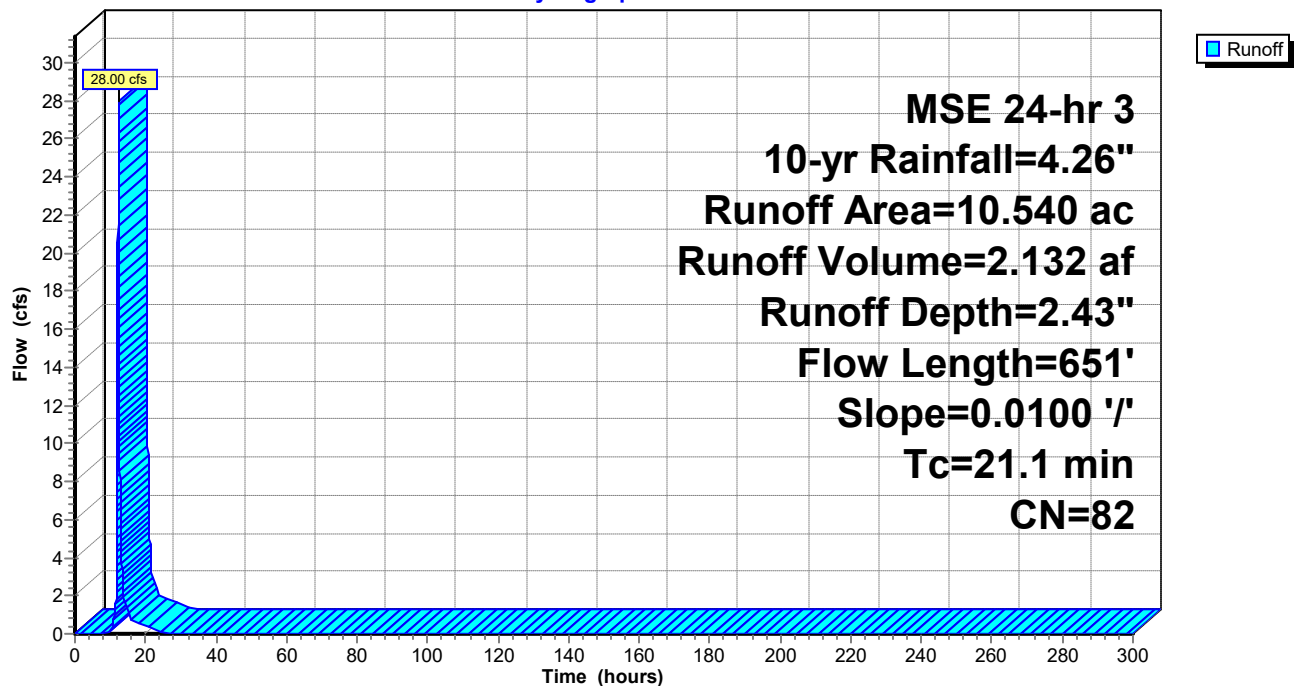
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
7.990	80	>75% Grass cover, Good, HSG D
2.050	87	Small grain, straight row, Good, HSG D
10.540	82	Weighted Average
10.040		95.26% Pervious Area
0.500		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.1	651	0.0100	0.51		Lag/CN Method,

Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 4P: Onsite Drainage to 4EP

Runoff = 7.63 cfs @ 12.12 hrs, Volume= 0.330 af, Depth= 2.51"
Routed to Pond 4PP : Offsite Wetland - Southeast

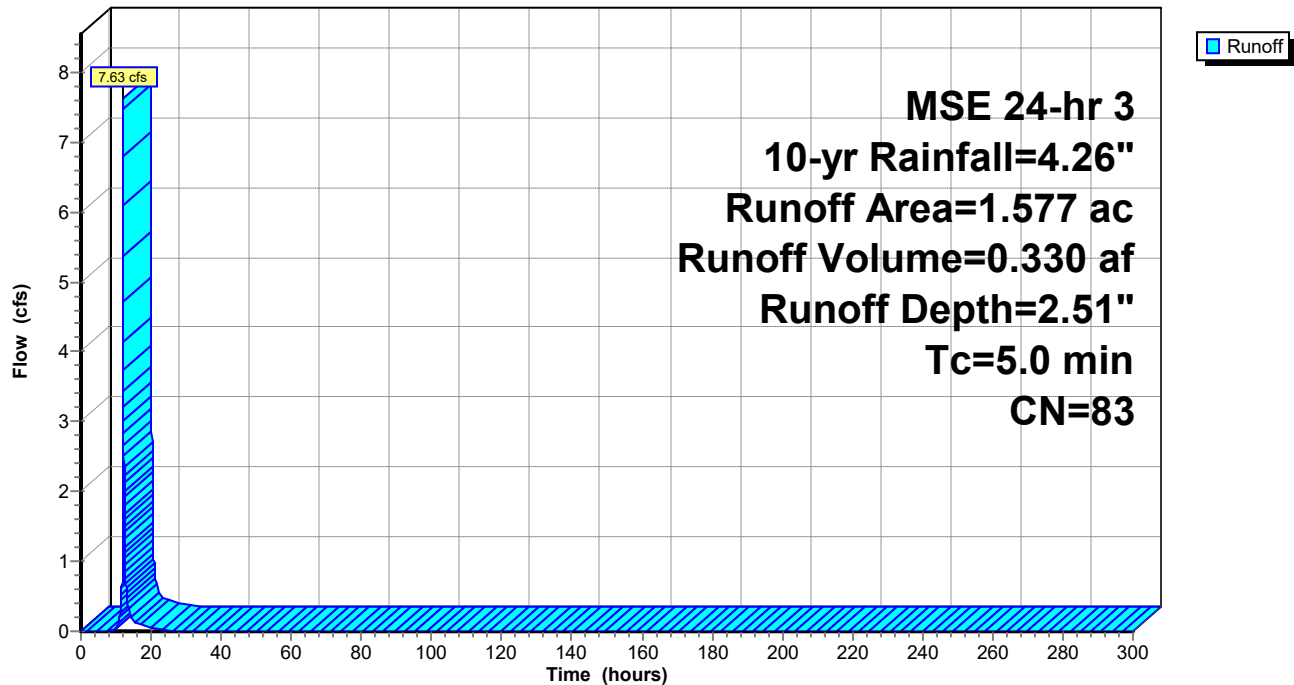
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
0.273	98	Paved parking, HSG D
1.304	80	>75% Grass cover, Good, HSG D
1.577	83	Weighted Average
1.304		82.69% Pervious Area
0.273		17.31% Impervious Area

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

Subcatchment 4P: Onsite Drainage to 4EP

Hydrograph



Summary for Subcatchment 5E: Direct Drainage to Southwest Wetland

Runoff = 24.94 cfs @ 12.18 hrs, Volume= 1.371 af, Depth= 2.88"

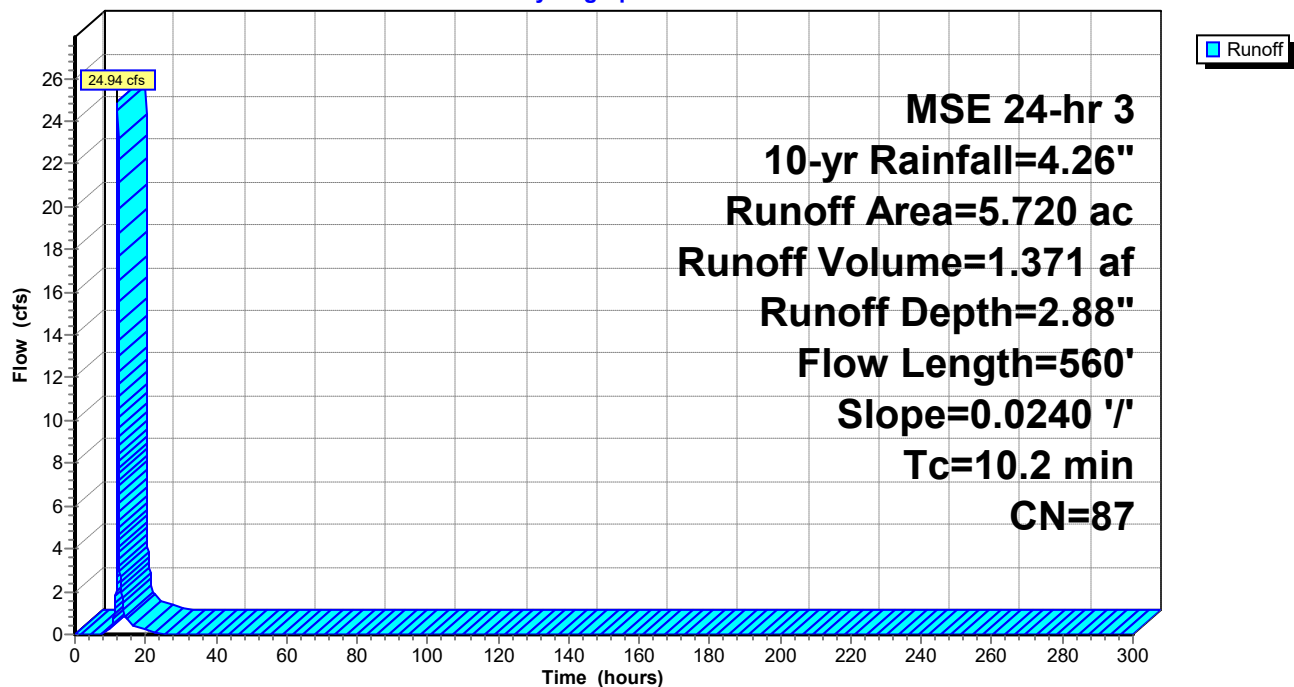
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
5.720	87	Small grain, straight row, Good, HSG D
5.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	560	0.0240	0.92		Lag/CN Method,

Subcatchment 5E: Direct Drainage to Southwest Wetland

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 5P: Onsite Drainage to 5PP

Runoff = 10.62 cfs @ 12.18 hrs, Volume= 0.570 af, Depth= 2.43"
Routed to Pond 5PP : Pond 5

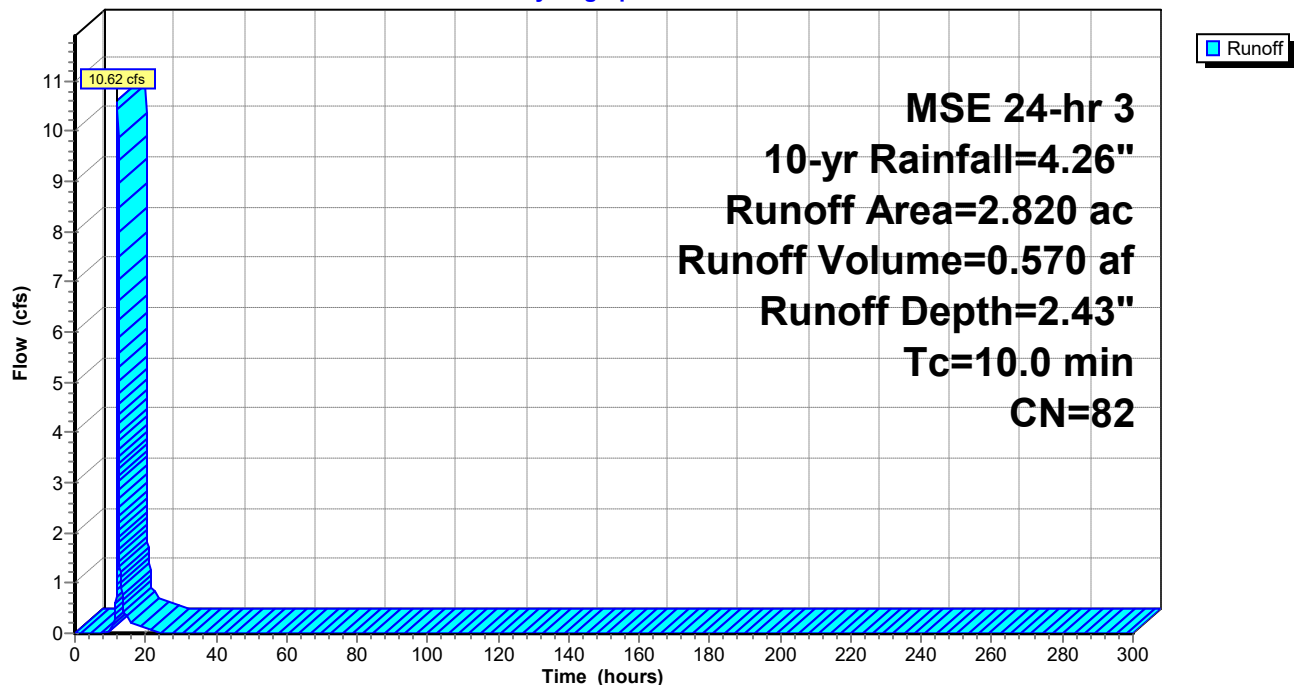
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.320	98	Proposed Impervious
2.500	80	>75% Grass cover, Good, HSG D
2.820	82	Weighted Average
2.500		88.65% Pervious Area
0.320		11.35% Impervious Area

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

Subcatchment 5P: Onsite Drainage to 5PP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 6P: Drainage to Filtration Basin 6

Runoff = 52.65 cfs @ 12.17 hrs, Volume= 2.876 af, Depth= 2.88"
Routed to Pond 6PP : Filtration Basin 6

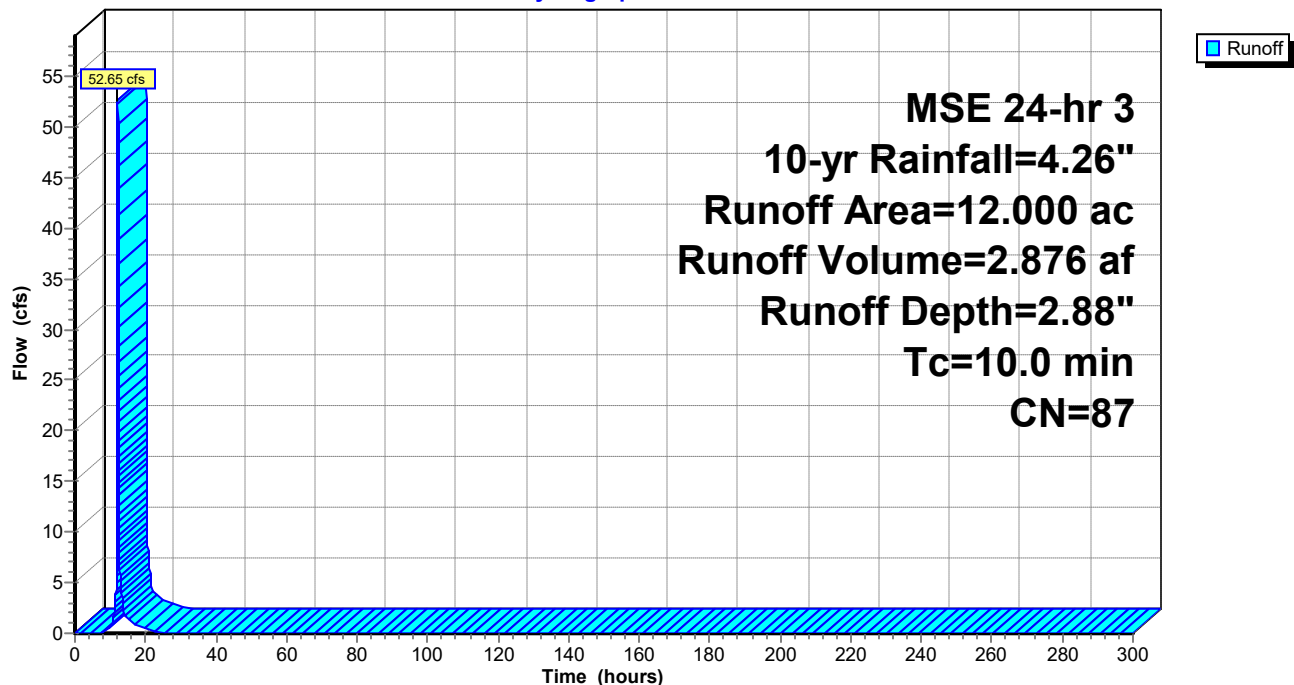
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
4.700	98	Paved parking, HSG D
7.300	80	>75% Grass cover, Good, HSG D
12.000	87	Weighted Average
7.300		60.83% Pervious Area
4.700		39.17% Impervious Area

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

Subcatchment 6P: Drainage to Filtration Basin 6

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 7P: Onsite Drainage to 7PP

Runoff = 40.58 cfs @ 12.23 hrs, Volume= 2.621 af, Depth= 2.78"
Routed to Pond 7PP : Pond 7

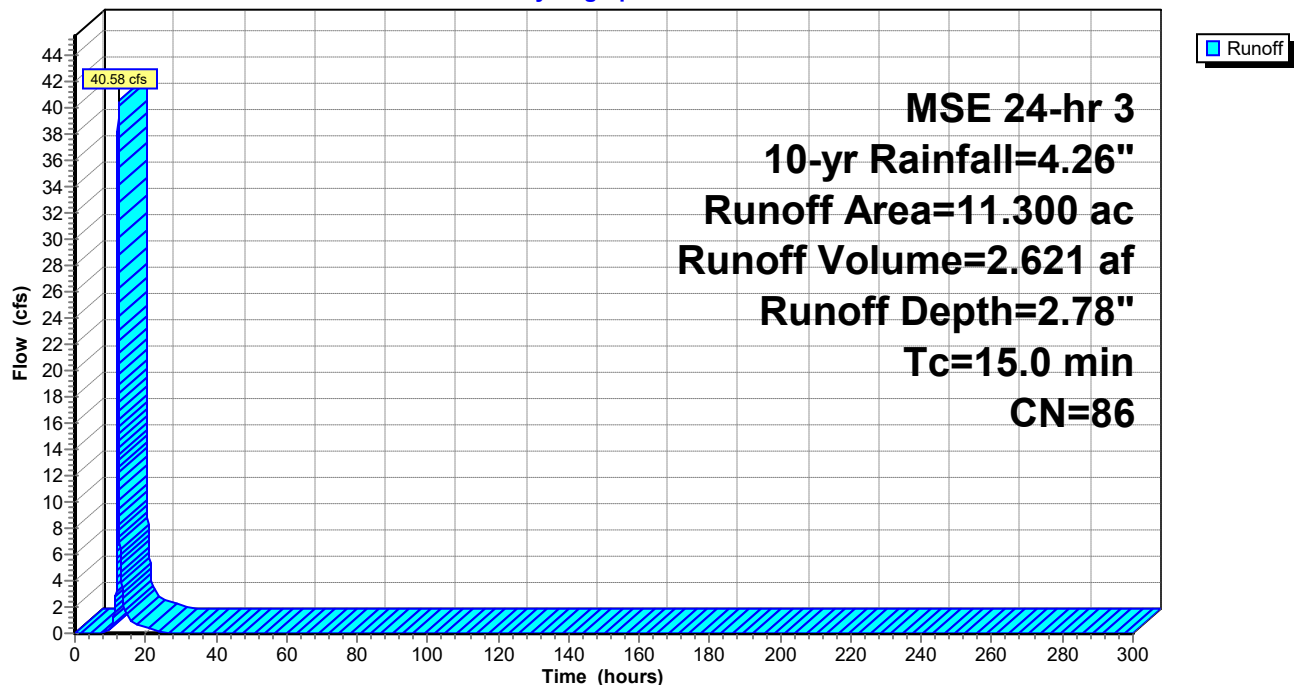
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 3.700	98	Proposed Impervious
7.600	80	>75% Grass cover, Good, HSG D
11.300	86	Weighted Average
7.600		67.26% Pervious Area
3.700		32.74% Impervious Area

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

Subcatchment 7P: Onsite Drainage to 7PP

Hydrograph



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Subcatchment 8Ex: Territorial Ditch

Runoff = 5.49 cfs @ 12.12 hrs, Volume= 0.240 af, Depth= 2.69"

Routed to Pond 8PP : Existing Territorial Ditch

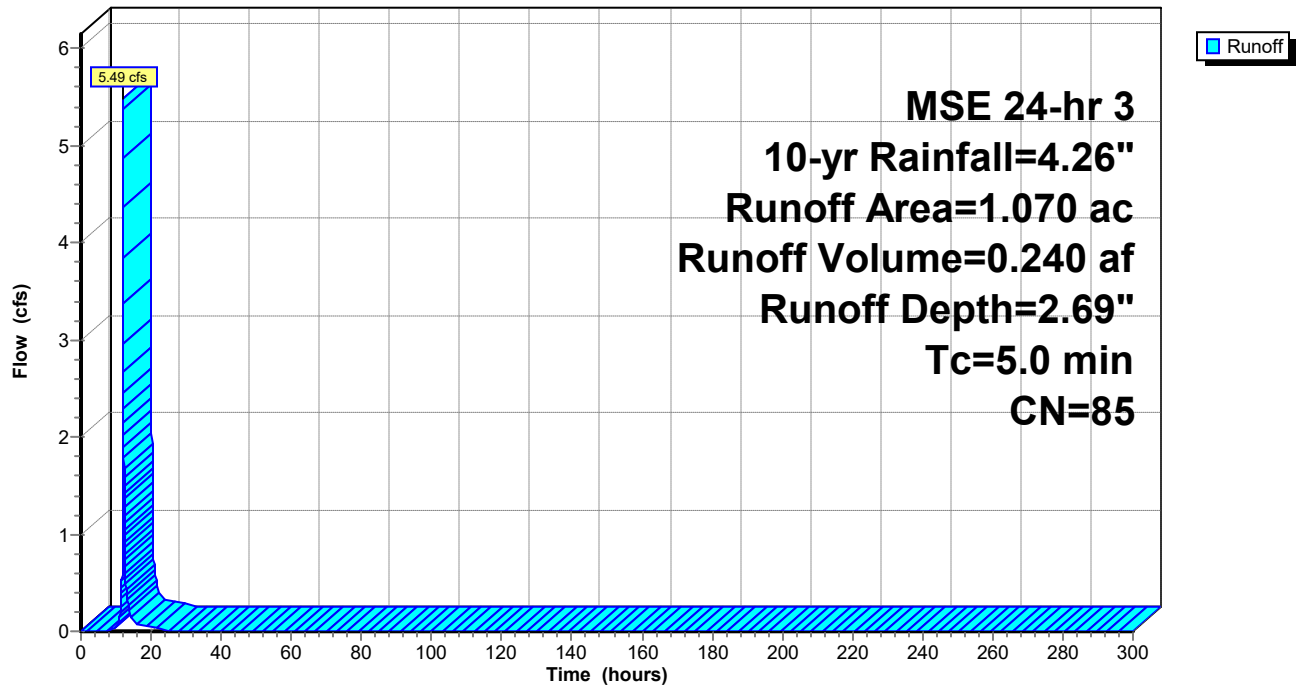
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
* 0.310	98	Existing Impervious
0.760	80	>75% Grass cover, Good, HSG D
1.070	85	Weighted Average
0.760		71.03% Pervious Area
0.310		28.97% Impervious Area

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

Subcatchment 8Ex: Territorial Ditch

Hydrograph



Summary for Subcatchment 9P: Offsite Drainage East

Runoff = 0.35 cfs @ 12.13 hrs, Volume= 0.015 af, Depth= 2.26"

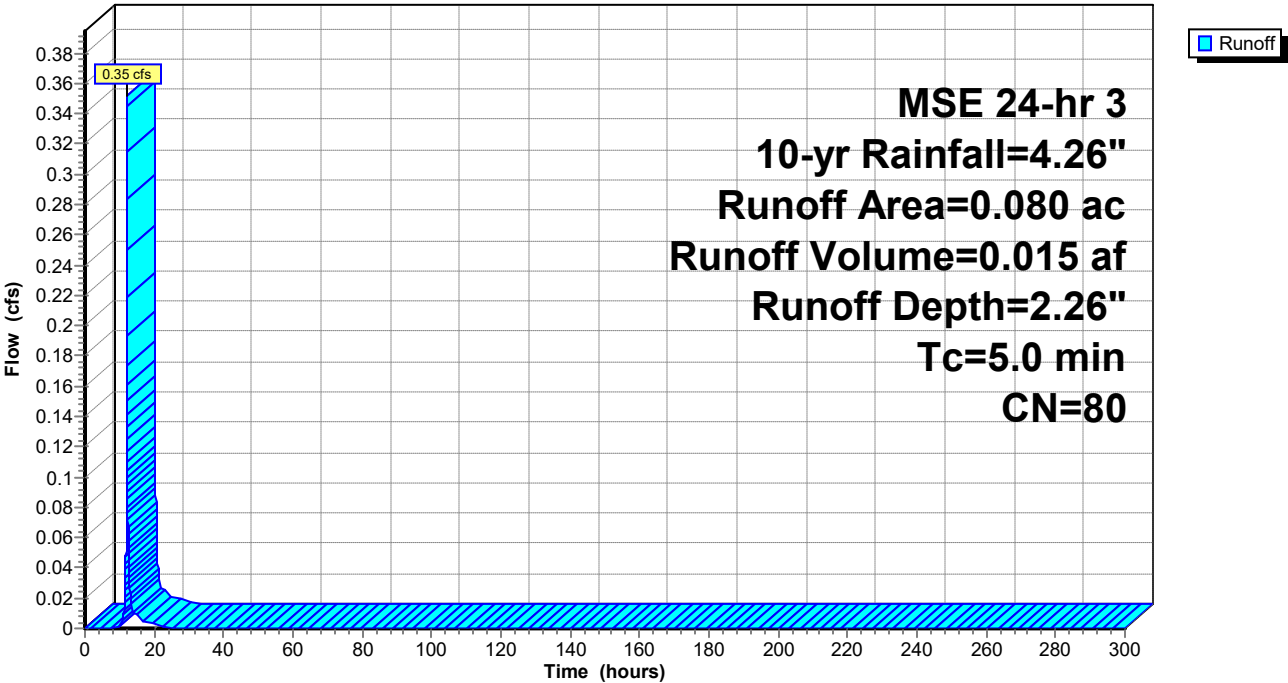
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-yr Rainfall=4.26"

Area (ac)	CN	Description
0.080	80	>75% Grass cover, Good, HSG D
0.080		100.00% Pervious Area

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

Subcatchment 9P: Offsite Drainage East

Hydrograph



Summary for Reach 1ER: To Big Woods - Southwest Wetland Complex

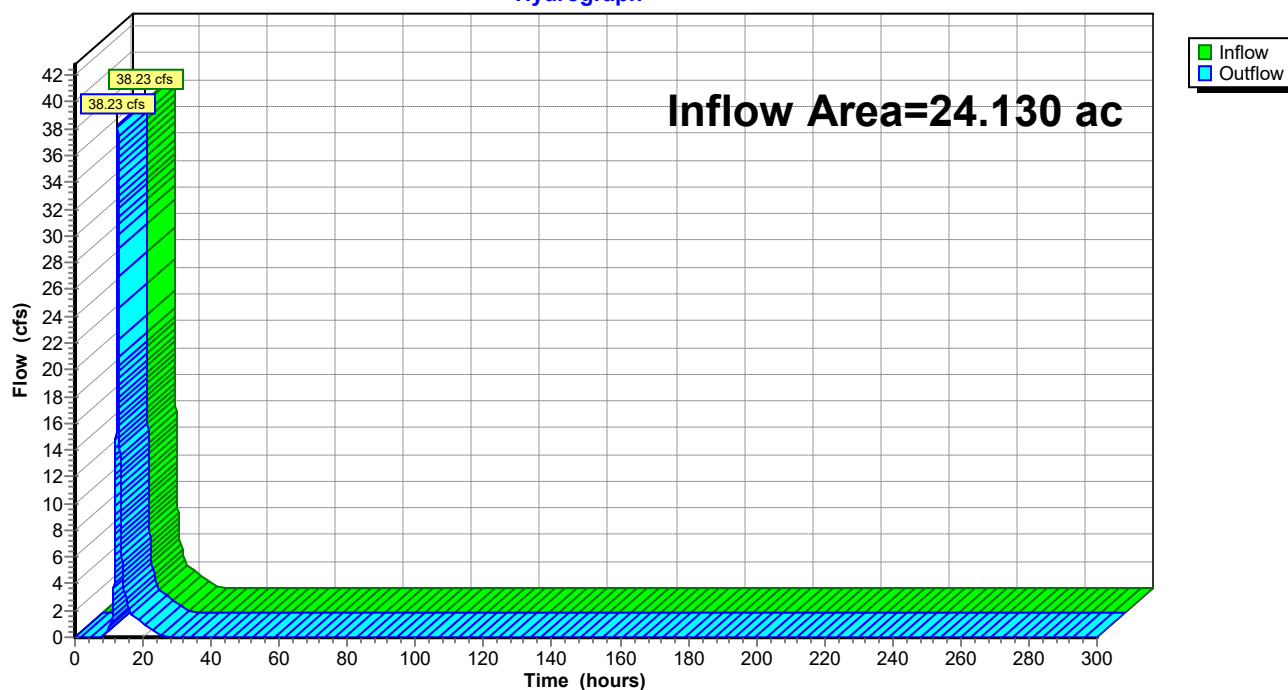
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 24.130 ac, 3.81% Impervious, Inflow Depth = 2.52" for 10-yr event
 Inflow = 38.23 cfs @ 12.52 hrs, Volume= 5.066 af
 Outflow = 38.23 cfs @ 12.53 hrs, Volume= 5.066 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1ER: To Big Woods - Southwest Wetland Complex

Hydrograph



Summary for Reach 1PR: To Big Woods - Southwest Wetland Complex

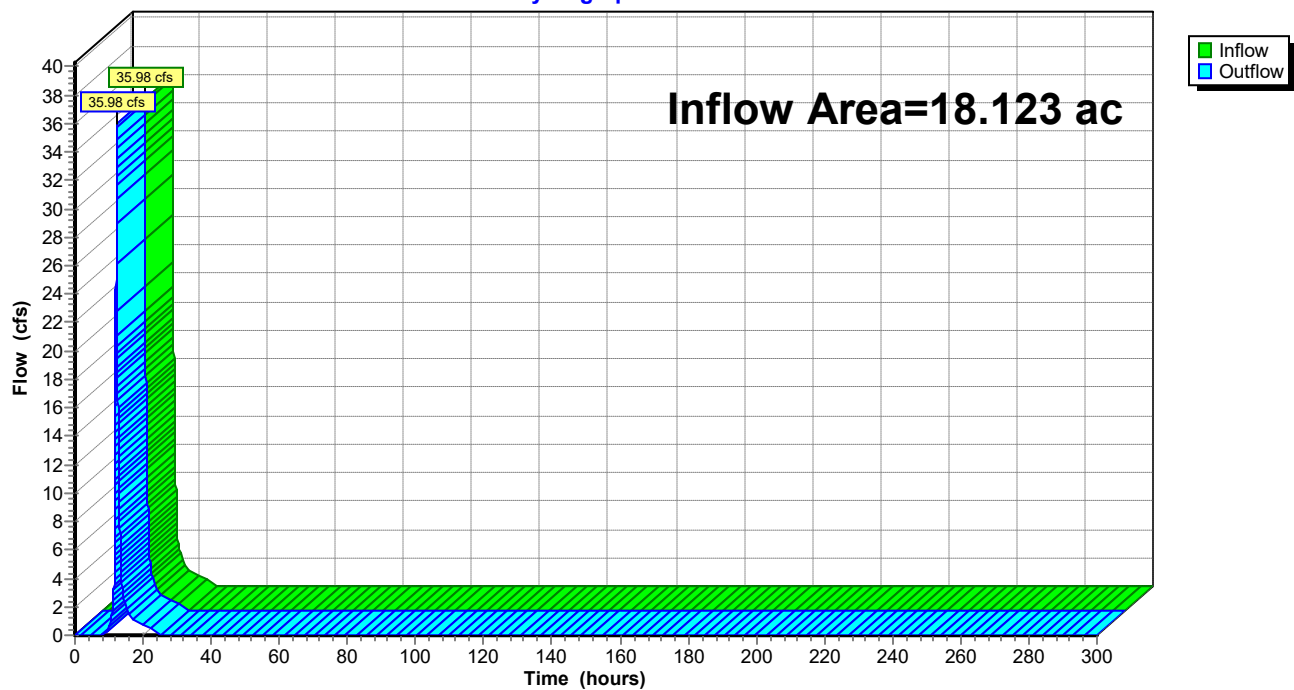
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.123 ac, 7.67% Impervious, Inflow Depth = 2.48" for 10-yr event
Inflow = 35.98 cfs @ 12.23 hrs, Volume= 3.745 af
Outflow = 35.98 cfs @ 12.24 hrs, Volume= 3.745 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1PR: To Big Woods - Southwest Wetland Complex

Hydrograph



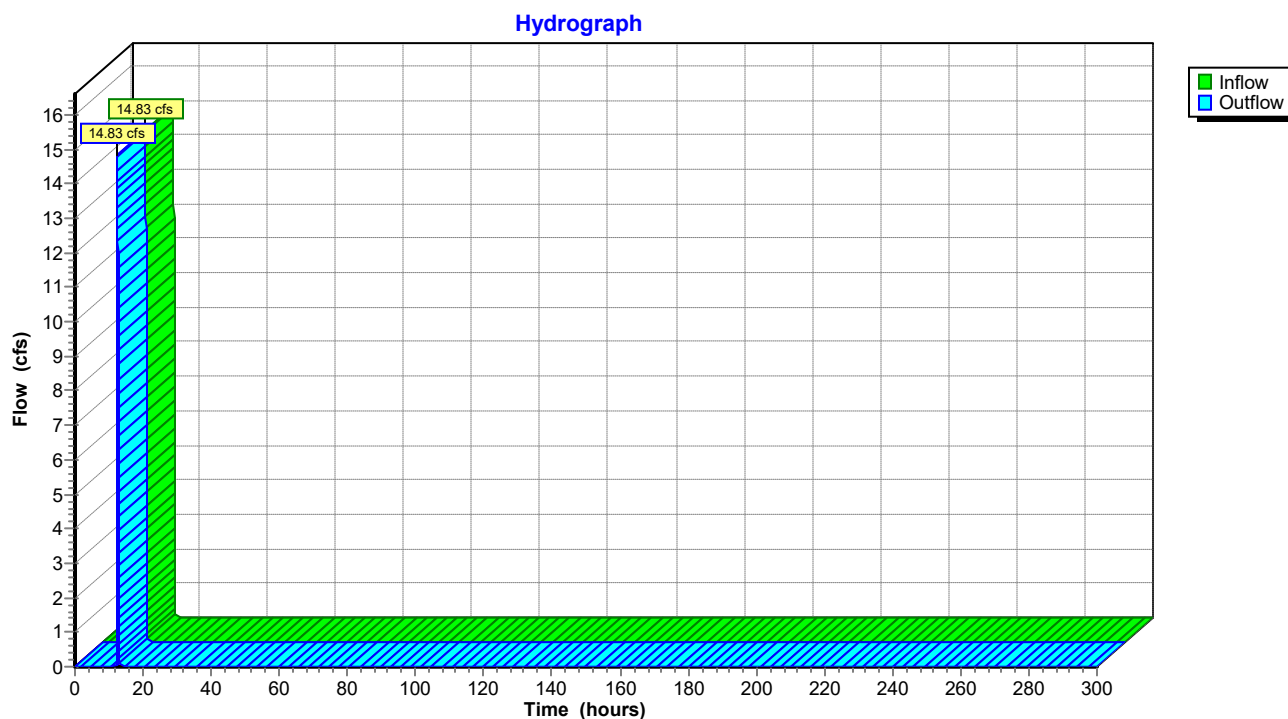
Summary for Reach 2ER: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 14.83 cfs @ 12.49 hrs, Volume= 0.522 af
 Outflow = 14.83 cfs @ 12.50 hrs, Volume= 0.522 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2ER: Existing Overflow Offsite to North



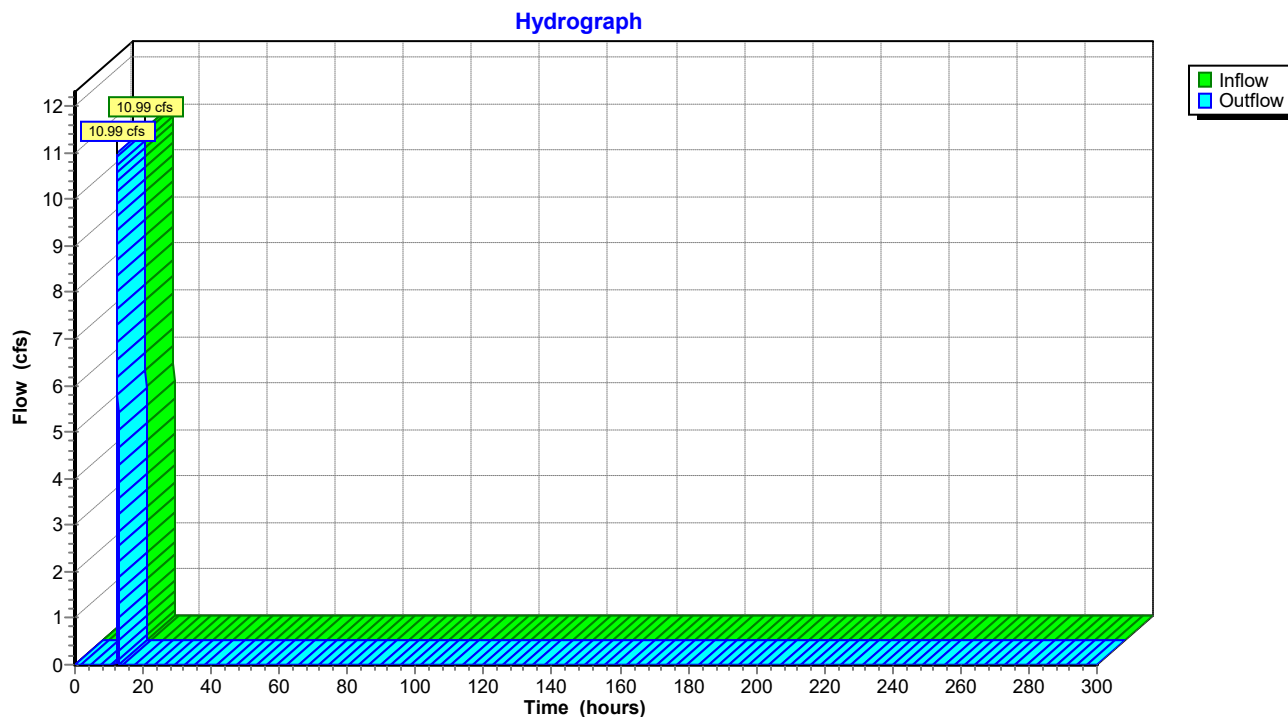
Summary for Reach 2PR: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 10.99 cfs @ 12.41 hrs, Volume= 0.323 af
 Outflow = 10.99 cfs @ 12.42 hrs, Volume= 0.323 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2PR: Existing Overflow Offsite to North



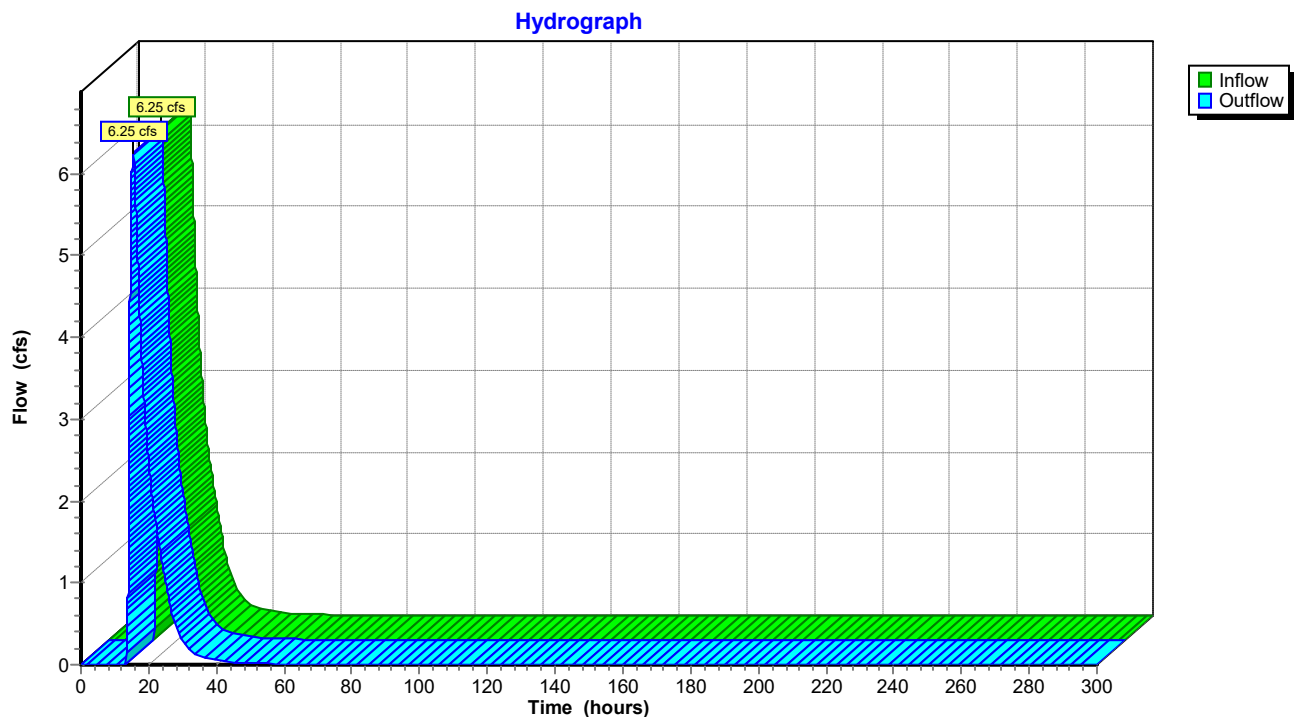
Summary for Reach 3ER: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 6.25 cfs @ 15.36 hrs, Volume= 3.238 af
 Outflow = 6.25 cfs @ 15.37 hrs, Volume= 3.238 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3ER: To Big Woods - Southeast Wetland Complex



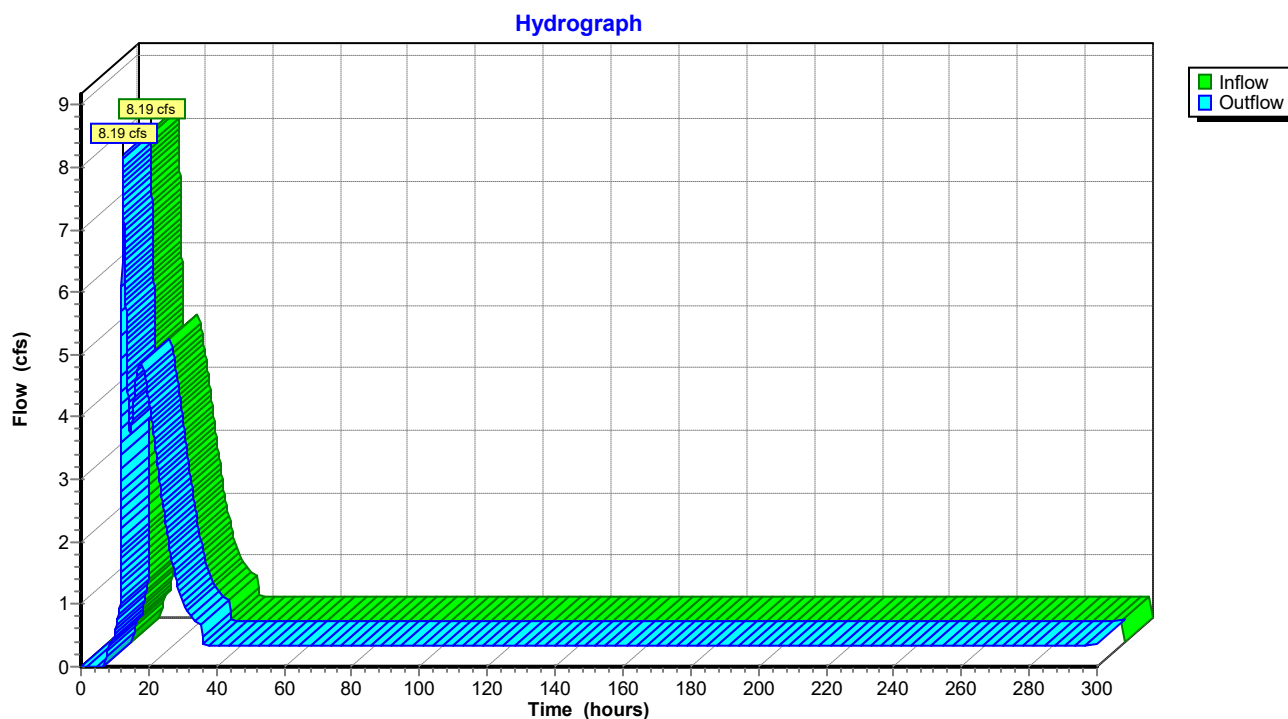
Summary for Reach 3PR: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 8.19 cfs @ 12.19 hrs, Volume= 12.992 af
 Outflow = 8.19 cfs @ 12.20 hrs, Volume= 12.992 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3PR: To Big Woods - Southeast Wetland Complex



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Pond 1EP: Offsite Low Area - Northwest

Inflow Area = 11.480 ac, 5.40% Impervious, Inflow Depth = 2.88" for 10-yr event
 Inflow = 32.16 cfs @ 12.36 hrs, Volume= 2.752 af
 Outflow = 27.69 cfs @ 12.49 hrs, Volume= 2.751 af, Atten= 14%, Lag= 7.4 min
 Primary = 12.86 cfs @ 12.49 hrs, Volume= 2.229 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 14.83 cfs @ 12.49 hrs, Volume= 0.522 af
 Routed to Reach 2ER : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 947.67' @ 12.49 hrs Surf.Area= 0.430 ac Storage= 0.320 af

Plug-Flow detention time= 8.7 min calculated for 2.751 af (100% of inflow)
 Center-of-Mass det. time= 8.3 min (815.8 - 807.4)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 ' S= 0.0246 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

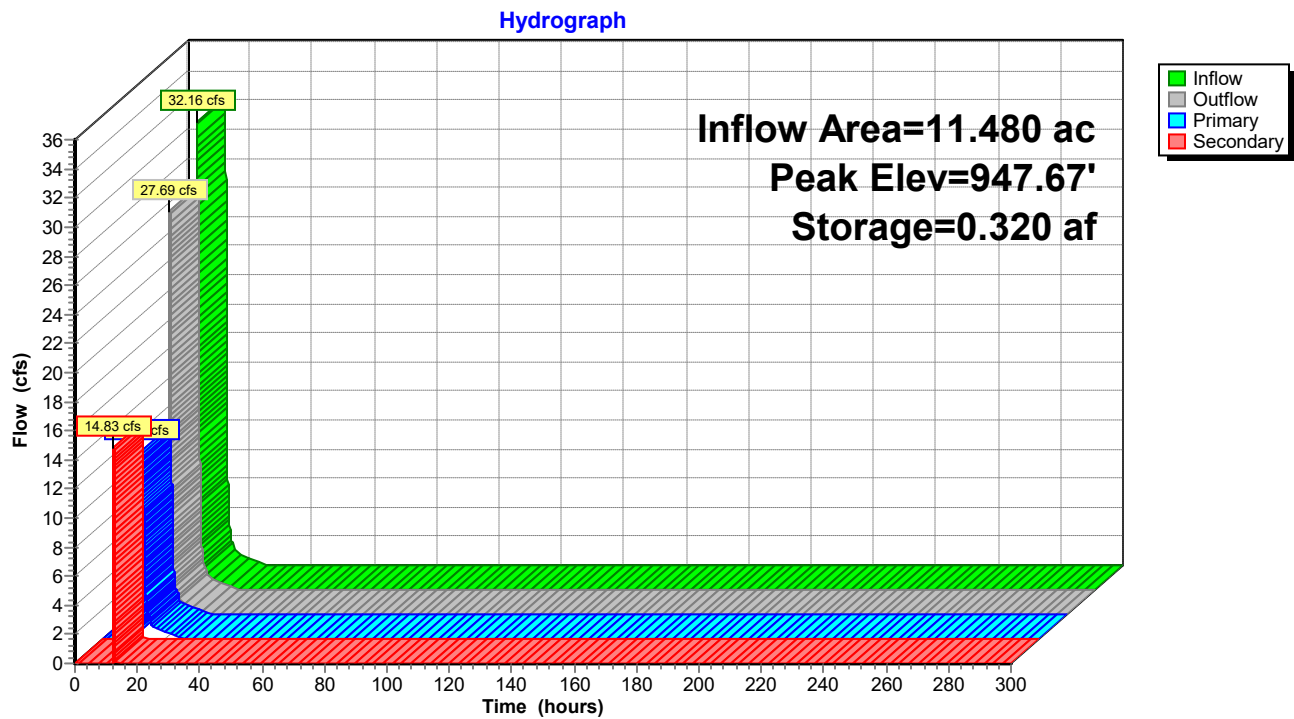
Primary OutFlow Max=12.86 cfs @ 12.49 hrs HW=947.67' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 12.86 cfs @ 7.28 fps)

Secondary OutFlow Max=14.82 cfs @ 12.49 hrs HW=947.67' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 14.82 cfs @ 2.20 fps)

Pond 1EP: Offsite Low Area - Northwest



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MSE 24-hr 3 10-yr Rainfall=4.26"

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Summary for Pond 1PP: Offsite Low Area - Northwest

Inflow Area = 9.393 ac, 8.84% Impervious, Inflow Depth = 2.85" for 10-yr event
 Inflow = 27.39 cfs @ 12.31 hrs, Volume= 2.232 af
 Outflow = 23.49 cfs @ 12.41 hrs, Volume= 2.231 af, Atten= 14%, Lag= 6.5 min
 Primary = 12.50 cfs @ 12.41 hrs, Volume= 1.908 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 10.99 cfs @ 12.41 hrs, Volume= 0.323 af
 Routed to Reach 2PR : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 947.55' @ 12.41 hrs Surf.Area= 0.373 ac Storage= 0.269 af

Plug-Flow detention time= 8.7 min calculated for 2.231 af (100% of inflow)
 Center-of-Mass det. time= 8.5 min (811.3 - 802.8)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

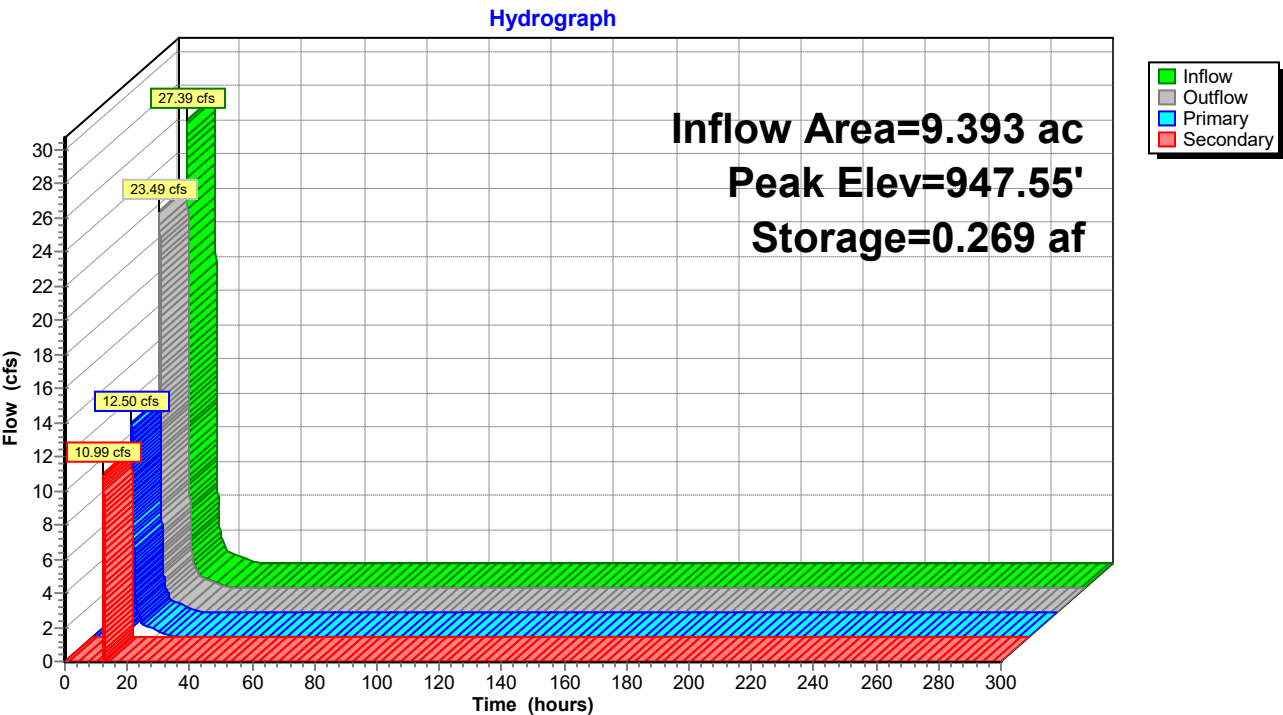
Primary OutFlow Max=12.50 cfs @ 12.41 hrs HW=947.55' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 12.50 cfs @ 7.08 fps)

Secondary OutFlow Max=10.99 cfs @ 12.41 hrs HW=947.55' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 10.99 cfs @ 2.00 fps)

Pond 1PP: Offsite Low Area - Northwest



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Summary for Pond 2EP: Offsite Low Area - North Middle

Inflow Area = 12.650 ac, 2.37% Impervious, Inflow Depth = 2.69" for 10-yr event
 Inflow = 33.78 cfs @ 12.35 hrs, Volume= 2.837 af
 Outflow = 25.39 cfs @ 12.53 hrs, Volume= 2.837 af, Atten= 25%, Lag= 10.6 min
 Primary = 25.39 cfs @ 12.53 hrs, Volume= 2.837 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 1EP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 949.57' @ 12.53 hrs Surf.Area= 0.239 ac Storage= 0.228 af

Plug-Flow detention time= 2.6 min calculated for 2.837 af (100% of inflow)
 Center-of-Mass det. time= 2.6 min (814.2 - 811.7)

Volume	Invert	Avail.Storage	Storage Description
#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)

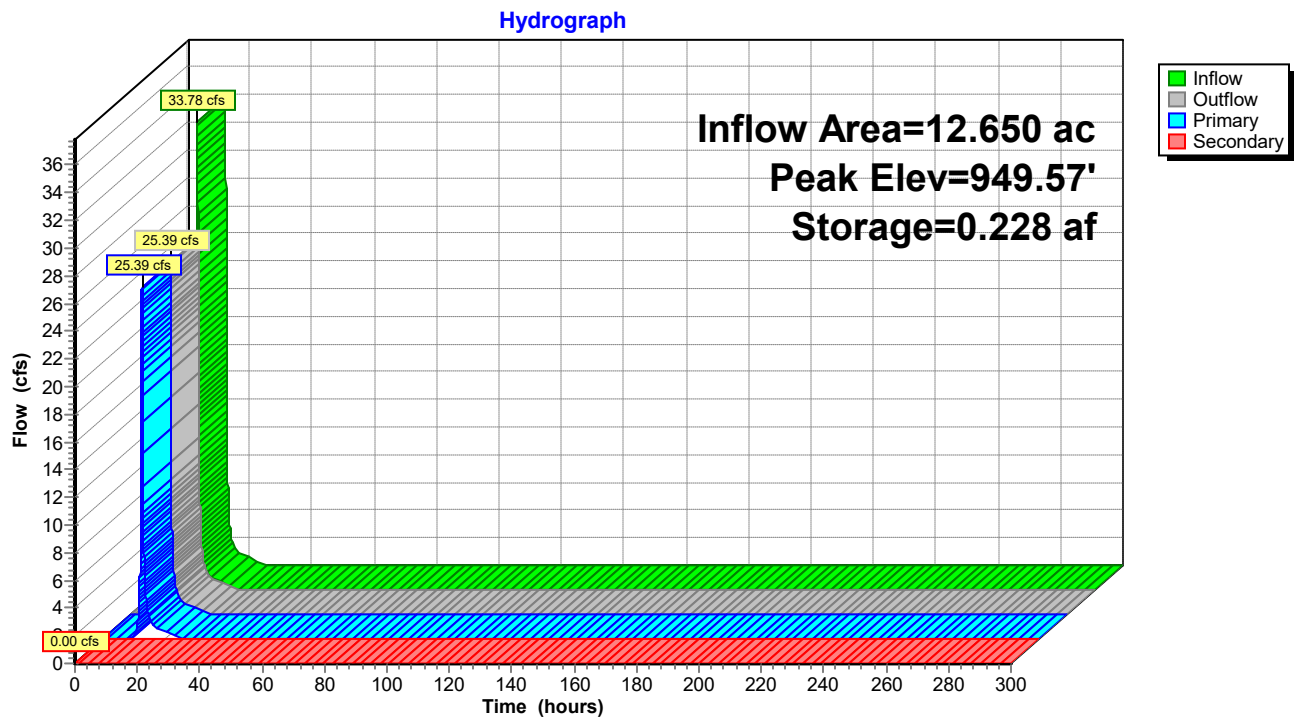
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

Device	Routing	Invert	Outlet Devices
#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=25.39 cfs @ 12.53 hrs HW=949.57' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 25.39 cfs @ 8.08 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=945.70' TW=944.60' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2EP: Offsite Low Area - North Middle



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Summary for Pond 2PP: Offsite Low Area - North Middle

Inflow Area = 8.730 ac, 6.41% Impervious, Inflow Depth = 2.52" for 10-yr event
 Inflow = 41.68 cfs @ 12.13 hrs, Volume= 1.837 af
 Outflow = 24.54 cfs @ 12.20 hrs, Volume= 1.837 af, Atten= 41%, Lag= 4.1 min
 Primary = 24.54 cfs @ 12.20 hrs, Volume= 1.837 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 1PP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 949.38' @ 12.20 hrs Surf.Area= 0.213 ac Storage= 0.185 af

Plug-Flow detention time= 2.0 min calculated for 1.837 af (100% of inflow)
 Center-of-Mass det. time= 2.0 min (799.5 - 797.5)

Volume	Invert	Avail.Storage	Storage Description
#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

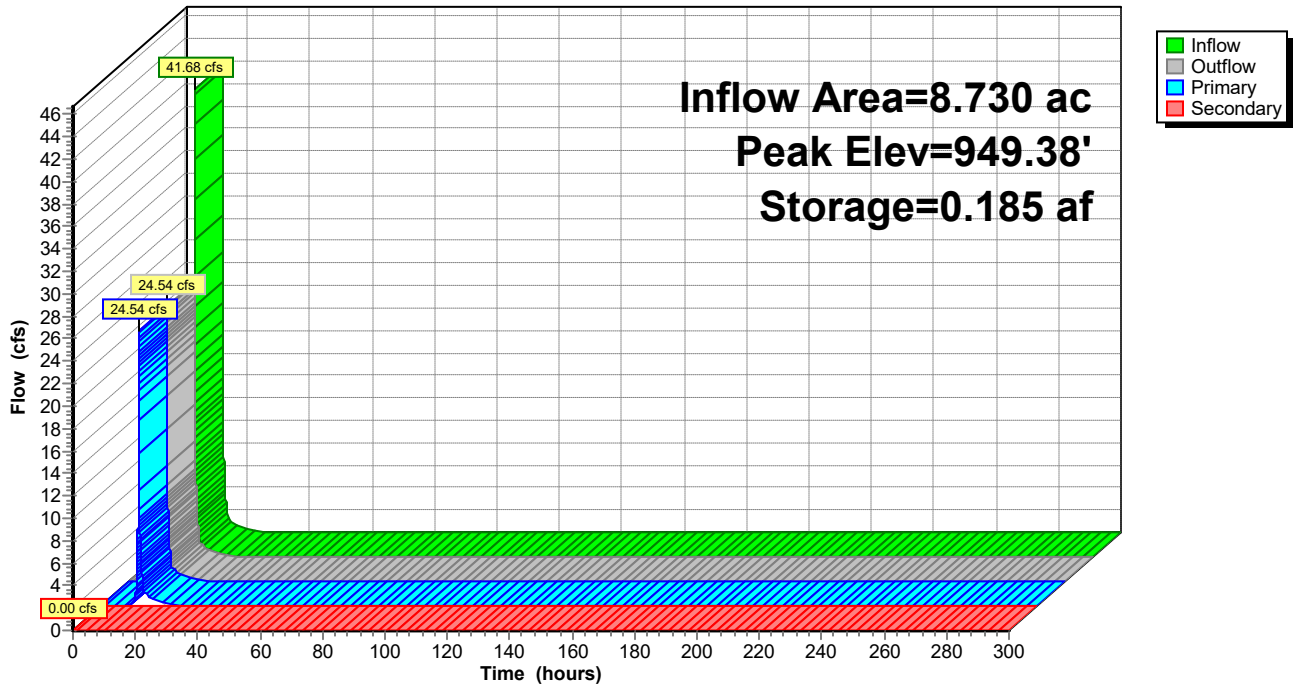
Device	Routing	Invert	Outlet Devices
#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=24.53 cfs @ 12.20 hrs HW=949.38' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 24.53 cfs @ 7.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=945.70' TW=944.60' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2PP: Offsite Low Area - North Middle

Hydrograph



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Summary for Pond 3EP: Existing Wetland - Northeast

[92] Warning: Device #3 is above defined storage

Inflow = 22.91 cfs @ 12.31 hrs, Volume= 5.914 af
 Outflow = 6.25 cfs @ 15.36 hrs, Volume= 3.238 af, Atten= 73%, Lag= 183.3 min
 Primary = 6.25 cfs @ 15.36 hrs, Volume= 3.238 af
 Routed to Reach 3ER : To Big Woods - Southeast Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4EP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 951.49' @ 15.36 hrs Surf.Area= 2.164 ac Storage= 3.470 af

Plug-Flow detention time= 405.9 min calculated for 3.238 af (55% of inflow)
 Center-of-Mass det. time= 262.9 min (1,183.8 - 921.0)

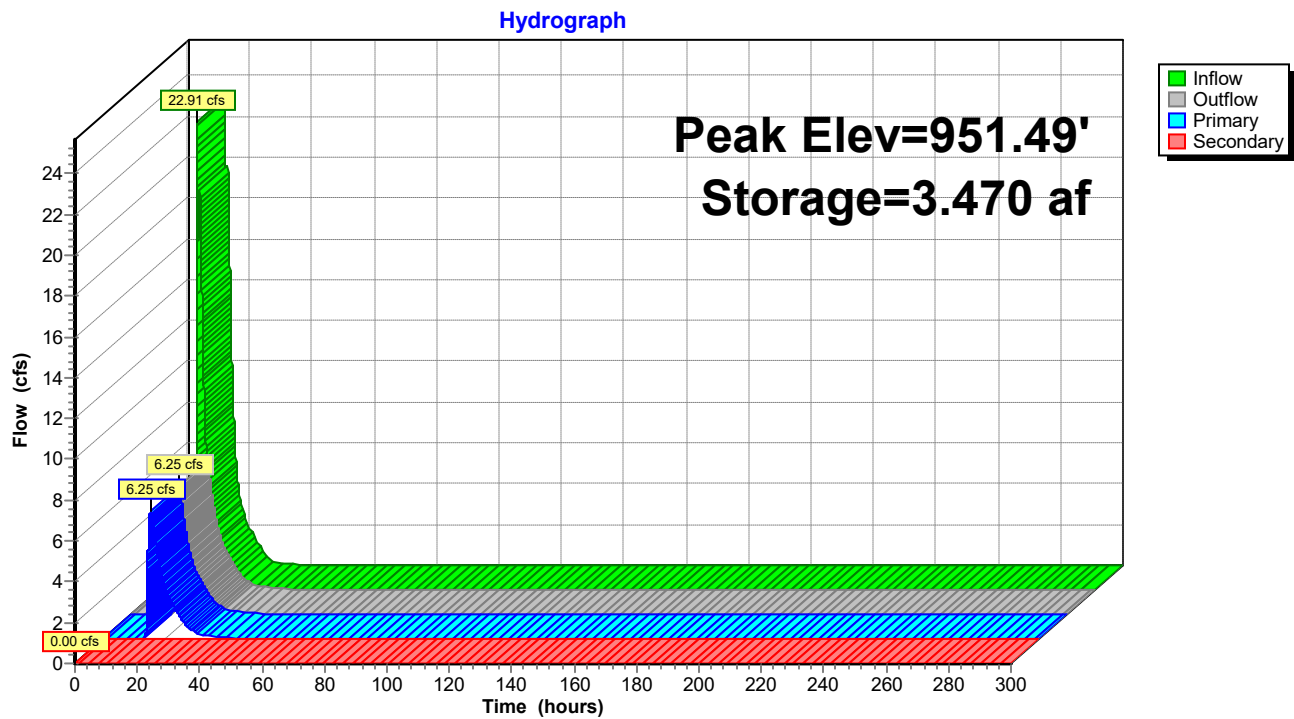
Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	11.020 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
948.00	0.050	0.000	0.000
949.00	0.400	0.225	0.225
950.00	1.150	0.775	1.000
952.00	2.510	3.660	4.660
954.00	3.850	6.360	11.020

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	951.10'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Secondary	954.30'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.25 cfs @ 15.36 hrs HW=951.49' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 6.25 cfs of 13.78 cfs potential flow)↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 6.25 cfs @ 1.60 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=948.00' TW=954.00' (Dynamic Tailwater)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3EP: Existing Wetland - Northeast



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Summary for Pond 3PP: Existing Wetland - Northeast

Inflow = 16.88 cfs @ 12.59 hrs, Volume= 5.639 af
 Outflow = 4.56 cfs @ 16.05 hrs, Volume= 3.544 af, Atten= 73%, Lag= 207.7 min
 Primary = 4.56 cfs @ 16.05 hrs, Volume= 3.544 af
 Routed to Pond 6PP : Filtration Basin 6
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4PP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 953.03' @ 16.55 hrs Surf.Area= 53,597 sf Storage= 138,445 cf

Plug-Flow detention time= 577.4 min calculated for 3.544 af (63% of inflow)
 Center-of-Mass det. time= 411.2 min (1,390.7 - 979.4)

Volume	Invert	Avail.Storage	Storage Description
#1	948.80'	366,452 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.80	22,044	0	0
950.00	24,609	27,992	27,992
952.00	38,365	62,974	90,966
954.00	67,868	106,233	197,199
956.00	101,385	169,253	366,452

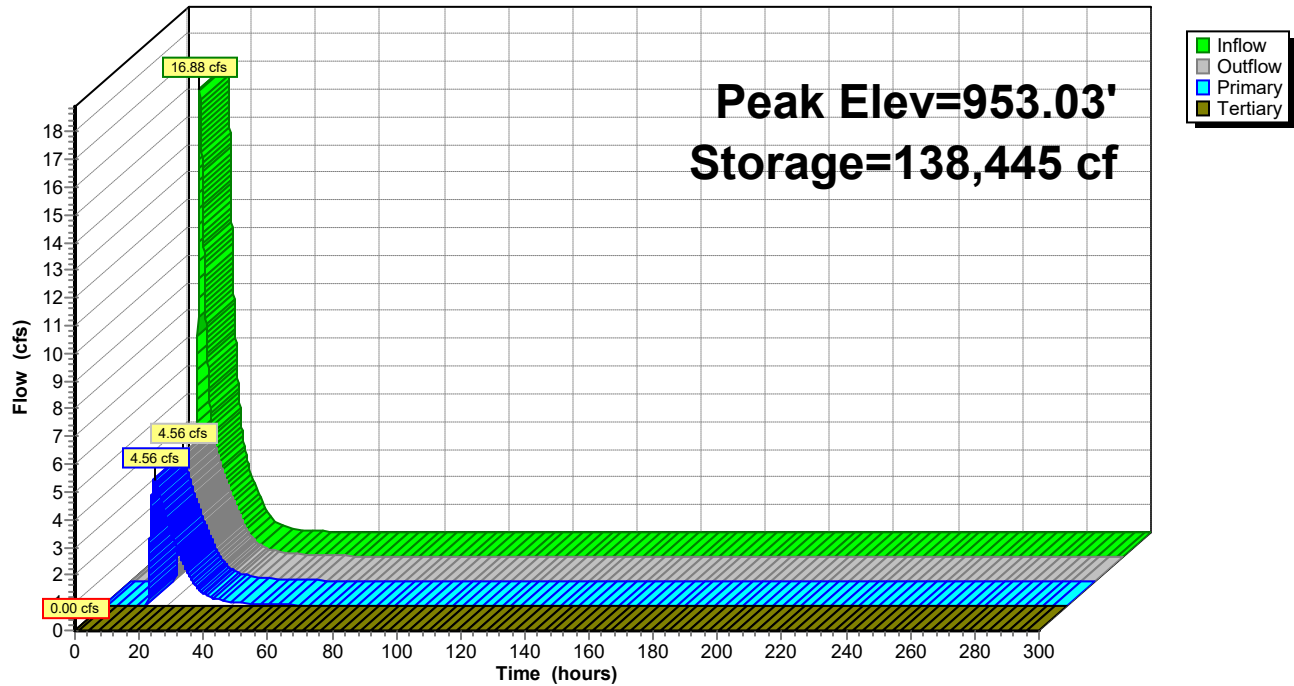
Device	Routing	Invert	Outlet Devices
#1	Primary	952.00'	24.0" Round Culvert L= 24.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 952.00' / 951.50' S= 0.0208 ' / Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Tertiary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.55 cfs @ 16.05 hrs HW=953.02' TW=952.53' (Dynamic Tailwater)
 ↑1=Culvert (Outlet Controls 4.55 cfs @ 4.11 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=948.80' TW=954.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3PP: Existing Wetland - Northeast

Hydrograph



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Summary for Pond 4EP: Offsite Wetland - Southeast

Inflow = 52.71 cfs @ 12.51 hrs, Volume= 5.403 af
 Outflow = 16.14 cfs @ 13.14 hrs, Volume= 4.136 af, Atten= 69%, Lag= 38.3 min
 Primary = 16.14 cfs @ 13.14 hrs, Volume= 4.136 af
 Routed to Pond 3EP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.65' @ 13.14 hrs Surf.Area= 4.676 ac Storage= 2.871 af

Plug-Flow detention time= 214.8 min calculated for 4.136 af (77% of inflow)
 Center-of-Mass det. time= 148.3 min (969.4 - 821.2)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

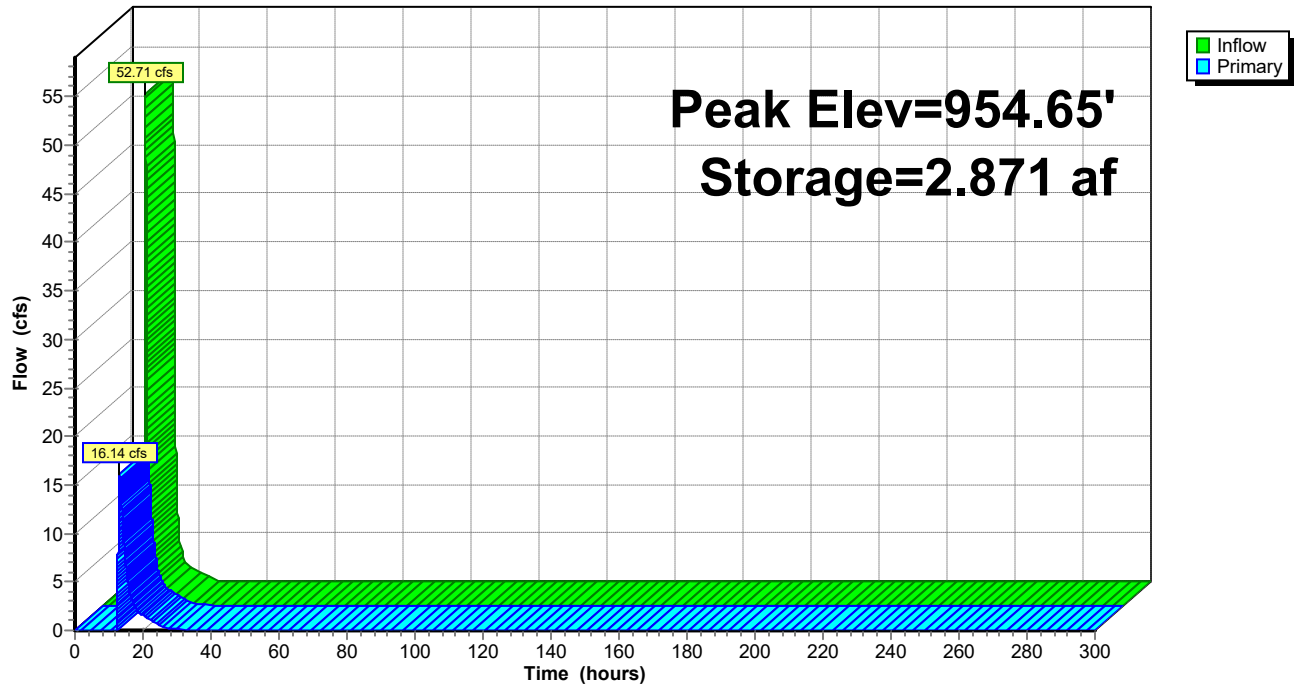
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=16.14 cfs @ 13.14 hrs HW=954.65' TW=950.64' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 16.14 cfs @ 1.52 fps)

Pond 4EP: Offsite Wetland - Southeast

Hydrograph



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Summary for Pond 4PP: Offsite Wetland - Southeast

Inflow = 47.25 cfs @ 12.31 hrs, Volume= 5.474 af
 Outflow = 10.62 cfs @ 13.46 hrs, Volume= 4.207 af, Atten= 78%, Lag= 68.6 min
 Primary = 10.62 cfs @ 13.46 hrs, Volume= 4.207 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.57' @ 13.46 hrs Surf.Area= 4.601 ac Storage= 2.479 af

Plug-Flow detention time= 267.2 min calculated for 4.207 af (77% of inflow)
 Center-of-Mass det. time= 171.9 min (1,041.5 - 869.6)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

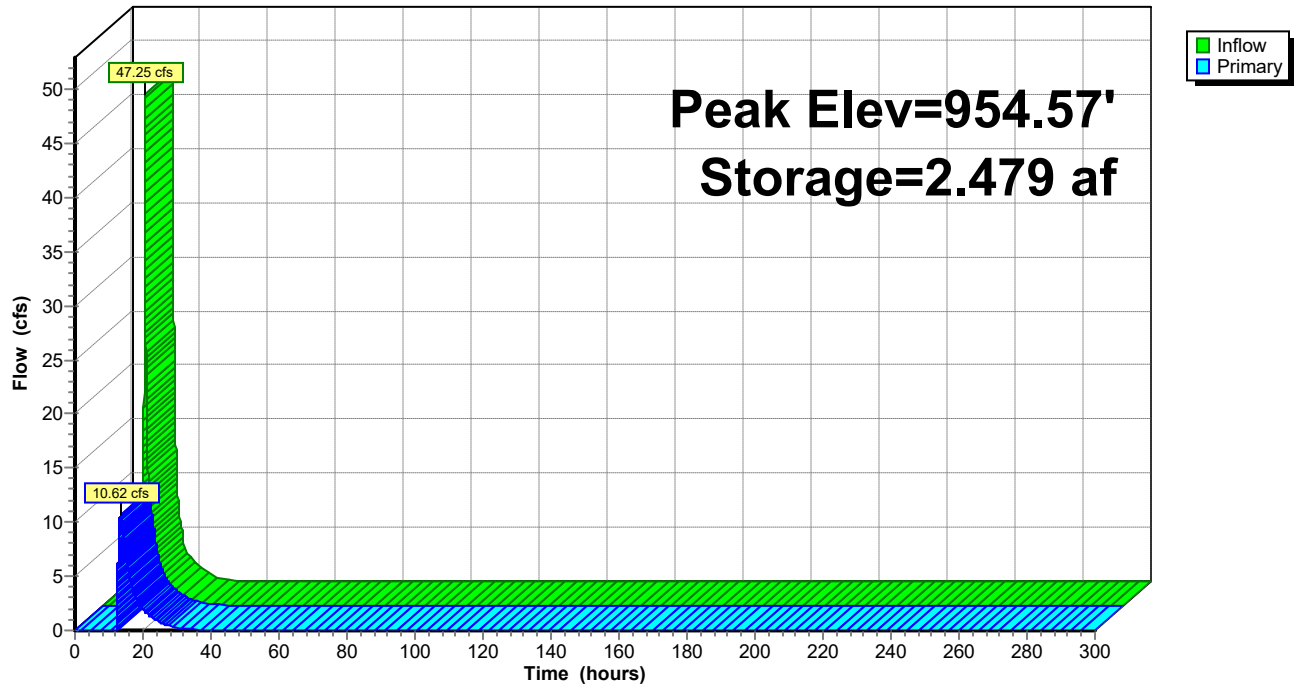
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=10.62 cfs @ 13.46 hrs HW=954.57' TW=951.69' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 10.62 cfs @ 1.31 fps)

Pond 4PP: Offsite Wetland - Southeast

Hydrograph



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Summary for Pond 5PP: Pond 5

Inflow = 17.39 cfs @ 12.22 hrs, Volume= 1.024 af
 Outflow = 2.91 cfs @ 13.14 hrs, Volume= 0.902 af, Atten= 83%, Lag= 55.7 min
 Primary = 2.91 cfs @ 13.14 hrs, Volume= 0.902 af
 Routed to Pond 7PP : Pond 7

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 955.85' @ 12.74 hrs Surf.Area= 21,289 sf Storage= 35,696 cf

Plug-Flow detention time= 314.7 min calculated for 0.902 af (88% of inflow)
 Center-of-Mass det. time= 258.1 min (1,053.1 - 795.0)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	144,732 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

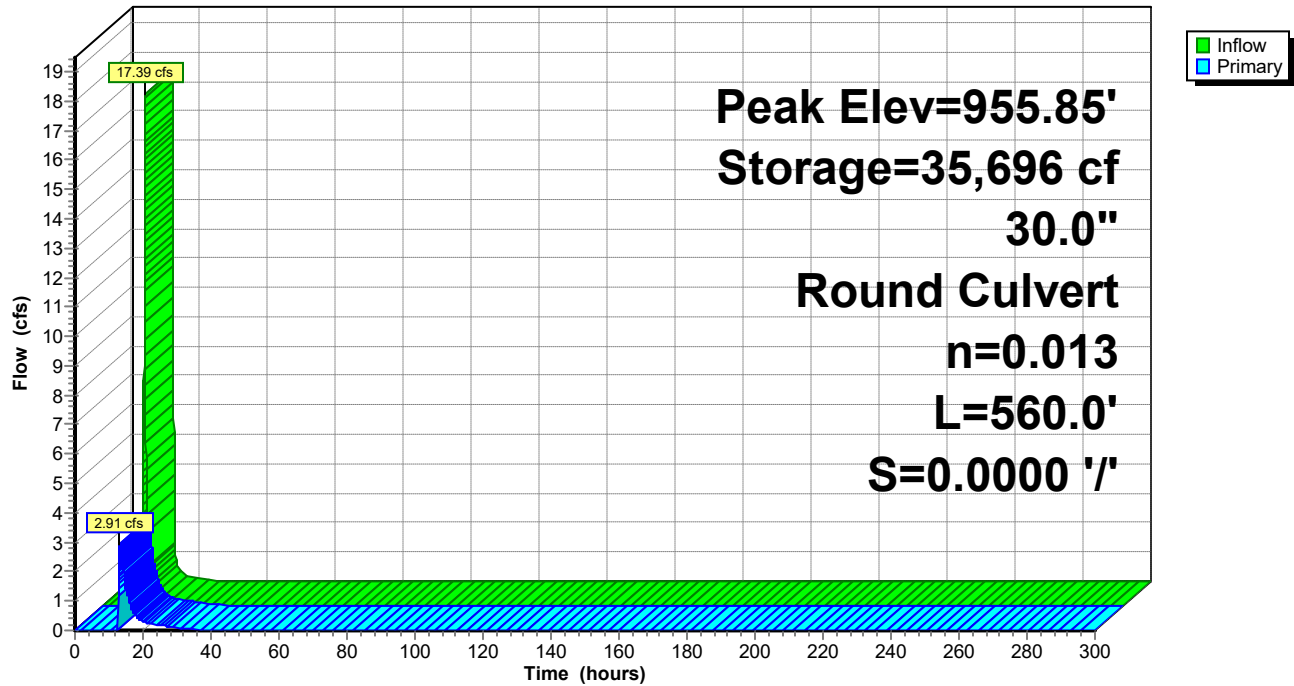
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	17,270	0	0
956.00	21,611	38,881	38,881
958.00	26,370	47,981	86,862
960.00	31,500	57,870	144,732

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=2.95 cfs @ 13.14 hrs HW=955.75' TW=955.62' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 2.95 cfs @ 1.13 fps)

Pond 5PP: Pond 5

Hydrograph



Summary for Pond 6PP: Filtration Basin 6

[86] Warning: Oscillations may require smaller dt (severity=13332)

Inflow = 52.65 cfs @ 12.17 hrs, Volume= 6.420 af
 Outflow = 13.50 cfs @ 12.47 hrs, Volume= 13.349 af, Atten= 74%, Lag= 18.0 min
 Primary = 6.70 cfs @ 12.48 hrs, Volume= 12.757 af
 Routed to Pond 8PP : Existing Territorial Ditch
 Secondary = 6.80 cfs @ 12.47 hrs, Volume= 0.593 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 953.15' @ 12.47 hrs Surf.Area= 35,488 sf Storage= 55,003 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 4,784.5 min (5,907.5 - 1,122.9)

Volume	Invert	Avail.Storage	Storage Description
#1	951.50'	166,675 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
951.50	31,134	0	0
952.00	32,613	15,937	15,937
954.00	37,625	70,238	86,175
956.00	42,875	80,500	166,675

Device	Routing	Invert	Outlet Devices
#1	Primary	948.17'	18.0" Round Culvert L= 38.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.17' / 948.12' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	948.25'	6.0" Round 6" Drain tile L= 265.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.25' / 948.17' S= 0.0003 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	951.50'	1.000 in/hr Exfiltration over Surface area
#4	Secondary	952.00'	24.0" Round Culvert L= 25.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 951.50' / 952.00' S= -0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#5	Device 1	951.50'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Primary	953.50'	0.5' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

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Primary OutFlow Max=6.70 cfs @ 12.48 hrs HW=953.15' TW=949.68' (Dynamic Tailwater)

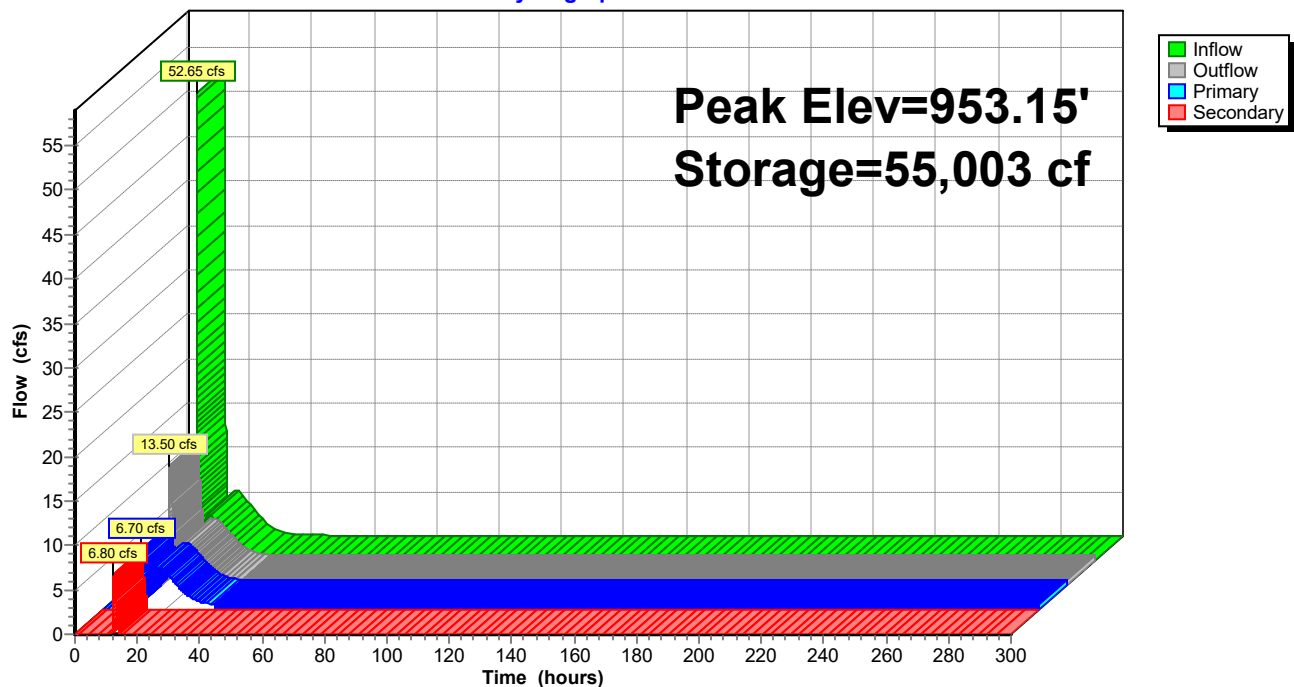
- 1=Culvert (Passes 6.70 cfs of 15.84 cfs potential flow)
- 2=6" Draintile (Outlet Controls 0.72 cfs @ 3.68 fps)
- 3=Exfiltration (Passes 0.72 cfs of 0.82 cfs potential flow)
- 5=Orifice/Grate (Orifice Controls 5.97 cfs @ 4.87 fps)
- 6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=6.80 cfs @ 12.47 hrs HW=953.15' TW=949.81' (Dynamic Tailwater)

- 4=Culvert (Inlet Controls 6.80 cfs @ 3.65 fps)

Pond 6PP: Filtration Basin 6

Hydrograph



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Summary for Pond 7PP: Pond 7

Inflow = 40.58 cfs @ 12.23 hrs, Volume= 3.523 af
 Outflow = 28.71 cfs @ 12.36 hrs, Volume= 3.466 af, Atten= 29%, Lag= 7.6 min
 Primary = 17.69 cfs @ 12.36 hrs, Volume= 3.012 af
 Routed to Pond 4PP : Offsite Wetland - Southeast
 Secondary = 11.02 cfs @ 12.36 hrs, Volume= 0.453 af
 Routed to Pond 5PP : Pond 5

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 956.55' @ 12.36 hrs Surf.Area= 12,108 sf Storage= 25,774 cf

Plug-Flow detention time= 57.7 min calculated for 3.466 af (98% of inflow)
 Center-of-Mass det. time= 34.3 min (899.2 - 864.9)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	117,172 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	8,084	0	0
956.00	11,221	19,305	19,305
958.00	14,420	25,641	44,946
960.00	17,768	32,188	77,134
962.00	22,270	40,038	117,172

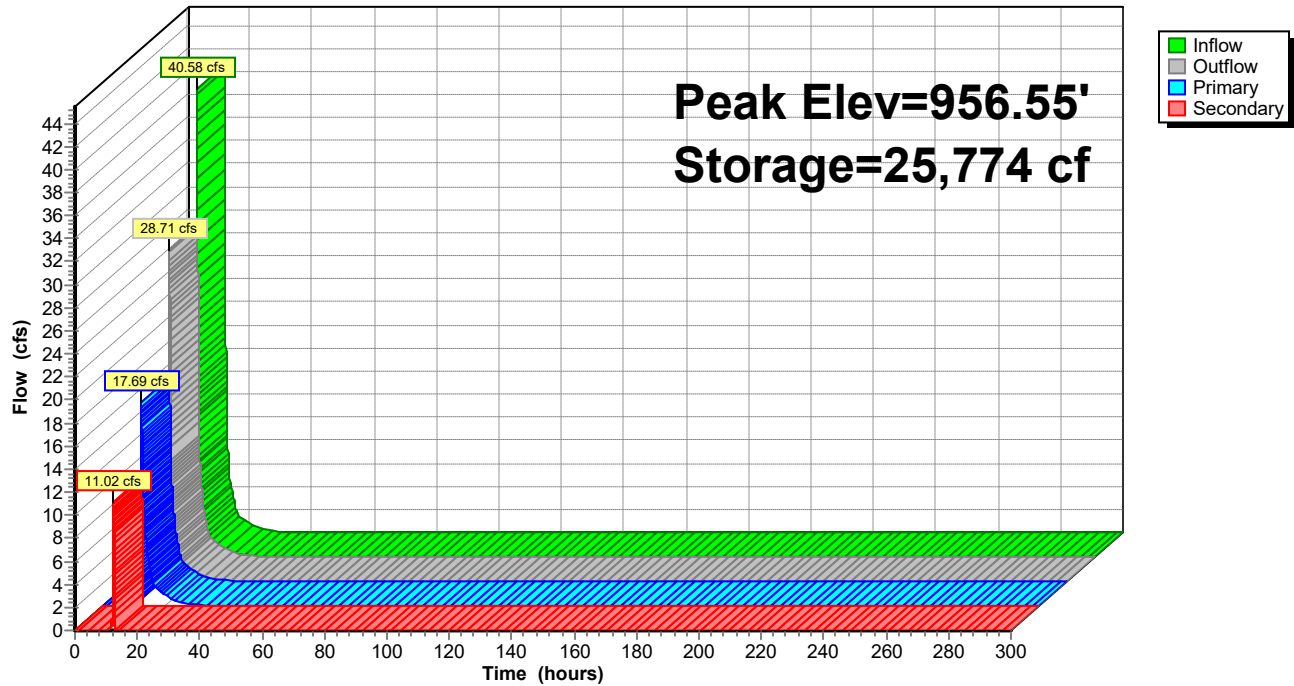
Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 230.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 953.70' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=17.68 cfs @ 12.36 hrs HW=956.55' TW=954.32' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 17.68 cfs @ 4.38 fps)

Secondary OutFlow Max=11.02 cfs @ 12.36 hrs HW=956.55' TW=955.22' (Dynamic Tailwater)
 ↑ **2=Culvert** (Barrel Controls 11.02 cfs @ 2.73 fps)

Pond 7PP: Pond 7

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Summary for Pond 8PP: Existing Territorial Ditch

Inflow = 9.15 cfs @ 12.14 hrs, Volume= 12.996 af
 Outflow = 8.19 cfs @ 12.19 hrs, Volume= 12.992 af, Atten= 10%, Lag= 3.0 min
 Primary = 8.19 cfs @ 12.19 hrs, Volume= 12.992 af
 Routed to Reach 3PR : To Big Woods - Southeast Wetland Complex

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 949.80' @ 12.19 hrs Surf.Area= 1,145 sf Storage= 1,425 cf

Plug-Flow detention time= 6.8 min calculated for 12.992 af (100% of inflow)
 Center-of-Mass det. time= 3.2 min (6,049.9 - 6,046.7)

Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	31,368 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

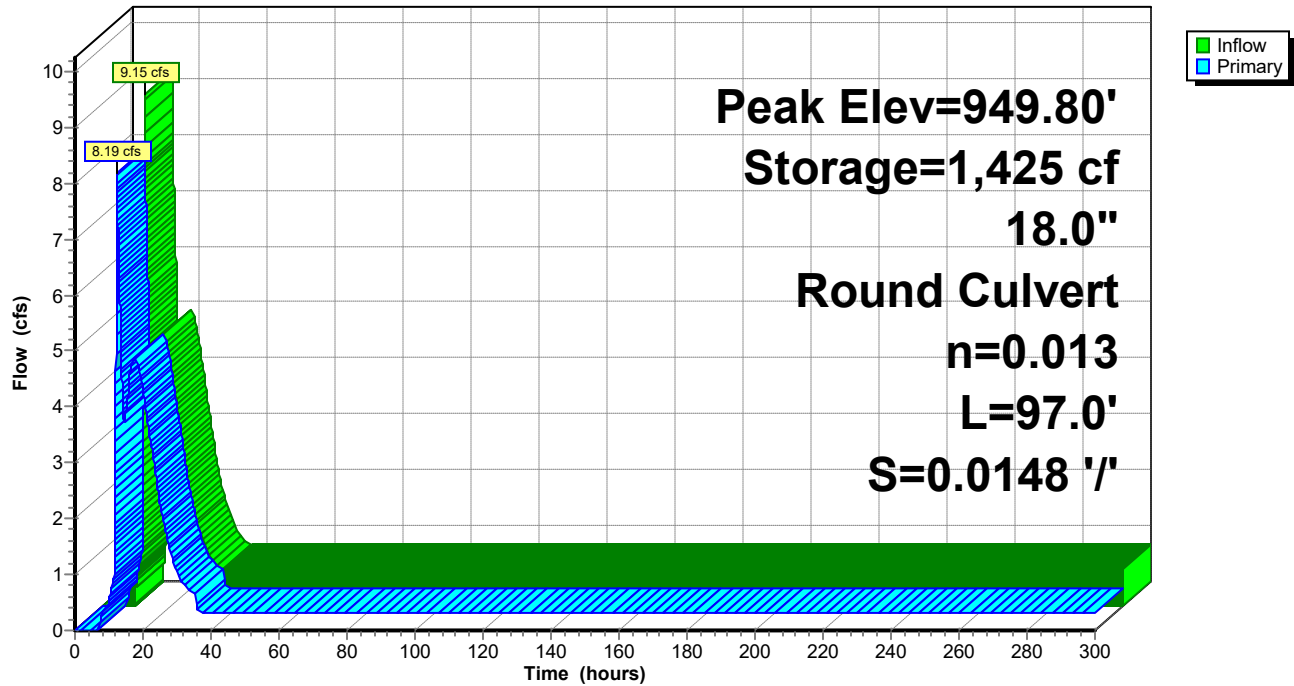
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.00	440	0	0
950.00	1,225	1,665	1,665
952.00	5,310	6,535	8,200
954.00	17,858	23,168	31,368

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=8.19 cfs @ 12.19 hrs HW=949.80' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 8.19 cfs @ 4.63 fps)

Pond 8PP: Existing Territorial Ditch

Hydrograph



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Time span=0.00-300.00 hrs, dt=0.01 hrs, 30001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1E: Direct Drainage to 1EP Runoff Area=11.480 ac 5.40% Impervious Runoff Depth=5.95"
Flow Length=1,422' Slope=0.0170 '/' Tc=25.5 min CN=87 Runoff=64.73 cfs 5.696 af

Subcatchment 1Ex: Offsite Direct Drainage Runoff Area=8.530 ac 7.27% Impervious Runoff Depth=5.95"
Flow Length=1,180' Slope=0.0180 '/' Tc=21.3 min CN=87 Runoff=52.76 cfs 4.232 af

Subcatchment 1P: Onsite Drainage to 1EP Runoff Area=0.863 ac 24.33% Impervious Runoff Depth=5.61"
Tc=5.0 min CN=84 Runoff=8.88 cfs 0.403 af

Subcatchment 2E: Direct Drainage to 2EP Runoff Area=12.650 ac 2.37% Impervious Runoff Depth=5.72"
Flow Length=1,273' Slope=0.0170 '/' Tc=25.1 min CN=85 Runoff=70.12 cfs 6.032 af

Subcatchment 2Ex: Offsite Direct Drainage Runoff Area=7.580 ac 3.96% Impervious Runoff Depth=5.49"
Flow Length=655' Slope=0.1400 '/' Tc=5.5 min CN=83 Runoff=75.42 cfs 3.469 af

Subcatchment 2P: Onsite Drainage to 2EP Runoff Area=1.150 ac 22.61% Impervious Runoff Depth=5.61"
Tc=5.0 min CN=84 Runoff=11.83 cfs 0.537 af

Subcatchment 3E: Direct Drainage to 3EP Runoff Area=7.930 ac 6.31% Impervious Runoff Depth=5.72"
Flow Length=605' Slope=0.0071 '/' Tc=21.4 min CN=85 Runoff=47.54 cfs 3.781 af

Subcatchment 3Ex: Offsite Drainage to 3EP Runoff Area=1.600 ac 6.25% Impervious Runoff Depth=5.26"
Tc=12.0 min CN=81 Runoff=11.86 cfs 0.702 af

Subcatchment 3P: Onsite Drainage to 3EP Runoff Area=2.700 ac 3.70% Impervious Runoff Depth=5.26"
Flow Length=605' Slope=0.0071 '/' Tc=24.4 min CN=81 Runoff=14.14 cfs 1.184 af

Subcatchment 4E: Direct Drainage to 4EP Runoff Area=24.090 ac 2.08% Impervious Runoff Depth=5.72"
Flow Length=1,227' Slope=0.0081 '/' Tc=35.3 min CN=85 Runoff=109.54 cfs 11.487 af

Subcatchment 4Ex: Offsite Direct Drainage Runoff Area=10.540 ac 4.74% Impervious Runoff Depth=5.38"
Flow Length=651' Slope=0.0100 '/' Tc=21.1 min CN=82 Runoff=60.92 cfs 4.723 af

Subcatchment 4P: Onsite Drainage to 4EP Runoff Area=1.577 ac 17.31% Impervious Runoff Depth=5.49"
Tc=5.0 min CN=83 Runoff=15.99 cfs 0.722 af

Subcatchment 5E: Direct Drainage to Runoff Area=5.720 ac 0.00% Impervious Runoff Depth=5.95"
Flow Length=560' Slope=0.0240 '/' Tc=10.2 min CN=87 Runoff=49.68 cfs 2.838 af

Subcatchment 5P: Onsite Drainage to 5PP Runoff Area=2.820 ac 11.35% Impervious Runoff Depth=5.38"
Tc=10.0 min CN=82 Runoff=22.87 cfs 1.264 af

Subcatchment 6P: Drainage to Filtration Runoff Area=12.000 ac 39.17% Impervious Runoff Depth=5.95"
Tc=10.0 min CN=87 Runoff=104.91 cfs 5.954 af

Subcatchment 7P: Onsite Drainage to 7PP Runoff Area=11.300 ac 32.74% Impervious Runoff Depth=5.84"
Tc=15.0 min CN=86 Runoff=82.58 cfs 5.497 af

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Subcatchment 8Ex: Territorial Ditch Runoff Area=1.070 ac 28.97% Impervious Runoff Depth=5.72"
Tc=5.0 min CN=85 Runoff=11.16 cfs 0.510 af

Subcatchment 9P: Offsite Drainage East Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=5.15"
Tc=5.0 min CN=80 Runoff=0.77 cfs 0.034 af

Reach 1ER: To Big Woods - Southwest Wetland Complex Inflow=45.29 cfs 8.877 af
Outflow=45.29 cfs 8.877 af

Reach 1PR: To Big Woods - Southwest Wetland Complex Inflow=43.43 cfs 6.829 af
Outflow=43.43 cfs 6.829 af

Reach 2ER: Existing Overflow Offsite to North Inflow=57.38 cfs 2.850 af
Outflow=57.38 cfs 2.850 af

Reach 2PR: Existing Overflow Offsite to North Inflow=43.49 cfs 1.812 af
Outflow=43.49 cfs 1.812 af

Reach 3ER: To Big Woods - Southeast Wetland Complex Inflow=17.12 cfs 11.325 af
Outflow=17.12 cfs 11.325 af

Reach 3PR: To Big Woods - Southeast Wetland Complex Inflow=13.38 cfs 23.795 af
Outflow=13.38 cfs 23.795 af

Pond 1EP: Offsite Low Area - Northwest Peak Elev=948.68' Storage=0.976 af Inflow=88.92 cfs 6.650 af
Primary=15.44 cfs 3.799 af Secondary=57.38 cfs 2.850 af Outflow=72.82 cfs 6.649 af

Pond 1PP: Offsite Low Area - Northwest Peak Elev=948.39' Storage=0.745 af Inflow=74.17 cfs 5.064 af
Primary=14.75 cfs 3.251 af Secondary=43.49 cfs 1.812 af Outflow=58.24 cfs 5.063 af

Pond 2EP: Offsite Low Area - North Middle Peak Elev=950.66' Storage=0.638 af Inflow=70.12 cfs 6.032 af
Primary=29.92 cfs 5.078 af Secondary=28.87 cfs 0.954 af Outflow=58.79 cfs 6.032 af

Pond 2PP: Offsite Low Area - North Middle Peak Elev=950.58' Storage=0.589 af Inflow=87.24 cfs 4.006 af
Primary=29.59 cfs 3.578 af Secondary=25.39 cfs 0.428 af Outflow=54.98 cfs 4.006 af

Pond 3EP: Existing Wetland - Northeast Peak Elev=952.95' Storage=7.344 af Inflow=67.94 cfs 14.001 af
Primary=17.12 cfs 11.325 af Secondary=0.00 cfs 0.000 af Outflow=17.12 cfs 11.325 af

Pond 3PP: Existing Wetland - Northeast Peak Elev=954.97' Storage=271,053 cf Inflow=67.75 cfs 13.828 af
Primary=10.27 cfs 11.733 af Tertiary=0.00 cfs 0.000 af Outflow=10.27 cfs 11.733 af

Pond 4EP: Offsite Wetland - Southeast Peak Elev=955.09' Storage=4.973 af Inflow=109.54 cfs 11.487 af
Outflow=56.31 cfs 10.220 af

Pond 4PP: Offsite Wetland - Southeast Peak Elev=954.98' Storage=4.425 af Inflow=94.75 cfs 12.027 af
Outflow=40.79 cfs 10.760 af

Pond 5PP: Pond 5 Peak Elev=957.69' Storage=78,870 cf Inflow=36.81 cfs 2.216 af
30.0" Round Culvert n=0.013 L=560.0' S=0.0000 ' Outflow=9.54 cfs 2.095 af

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Pond 6PP: Filtration Basin 6

Peak Elev=954.61' Storage=109,733 cf Inflow=104.91 cfs 17.687 af
Primary=11.59 cfs 23.290 af Secondary=19.21 cfs 1.182 af Outflow=30.80 cfs 24.472 af

Pond 7PP: Pond 7

Peak Elev=958.45' Storage=51,663 cf Inflow=82.58 cfs 7.592 af
Primary=31.04 cfs 6.582 af Secondary=19.93 cfs 0.953 af Outflow=50.41 cfs 7.535 af

Pond 8PP: Existing Territorial Ditch

Peak Elev=951.34' Storage=5,156 cf Inflow=18.48 cfs 23.800 af
18.0" Round Culvert n=0.013 L=97.0' S=0.0148 '/' Outflow=13.38 cfs 23.796 af

Total Runoff Area = 123.680 ac Runoff Volume = 59.066 af Average Runoff Depth = 5.73"

89.24% Pervious = 110.367 ac 10.76% Impervious = 13.313 ac

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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 1E: Direct Drainage to 1EP

Runoff = 64.73 cfs @ 12.35 hrs, Volume= 5.696 af, Depth= 5.95"
Routed to Pond 1EP : Offsite Low Area - Northwest

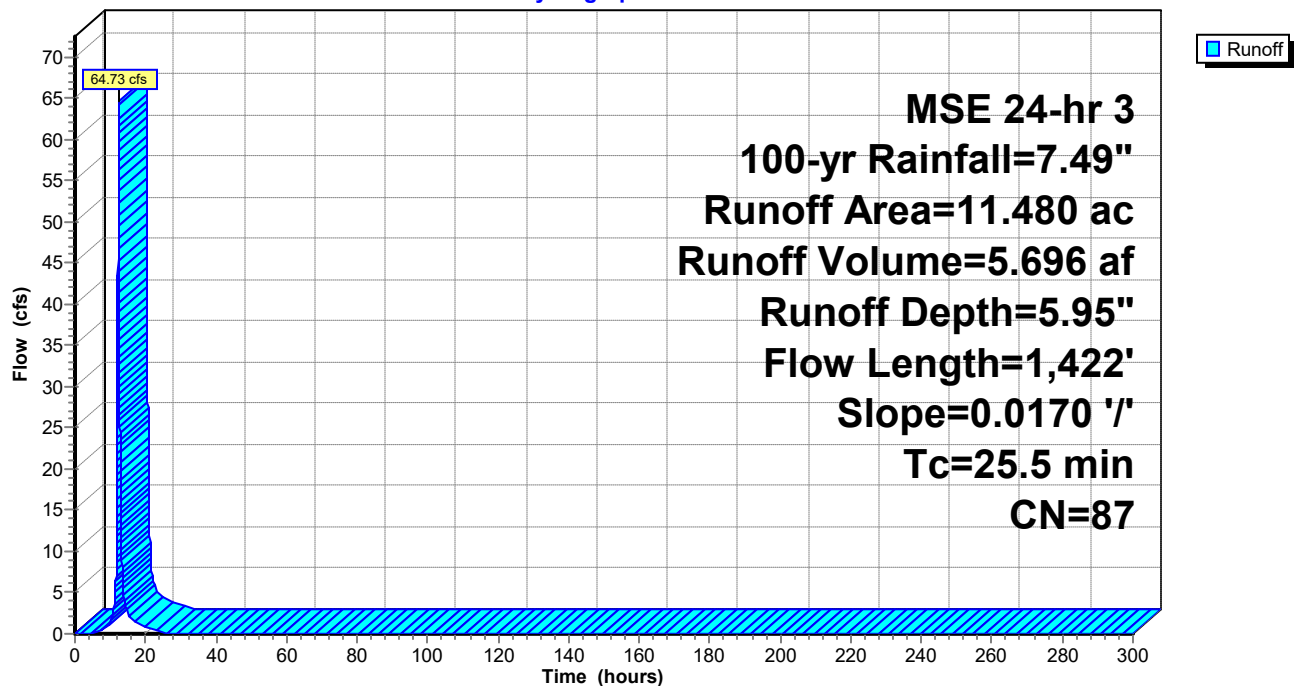
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
10.110	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
11.480	87	Weighted Average
10.860		94.60% Pervious Area
0.620		5.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.5	1,422	0.0170	0.93		Lag/CN Method,

Subcatchment 1E: Direct Drainage to 1EP

Hydrograph



Summary for Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Runoff = 52.76 cfs @ 12.30 hrs, Volume= 4.232 af, Depth= 5.95"
Routed to Pond 1PP : Offsite Low Area - Northwest

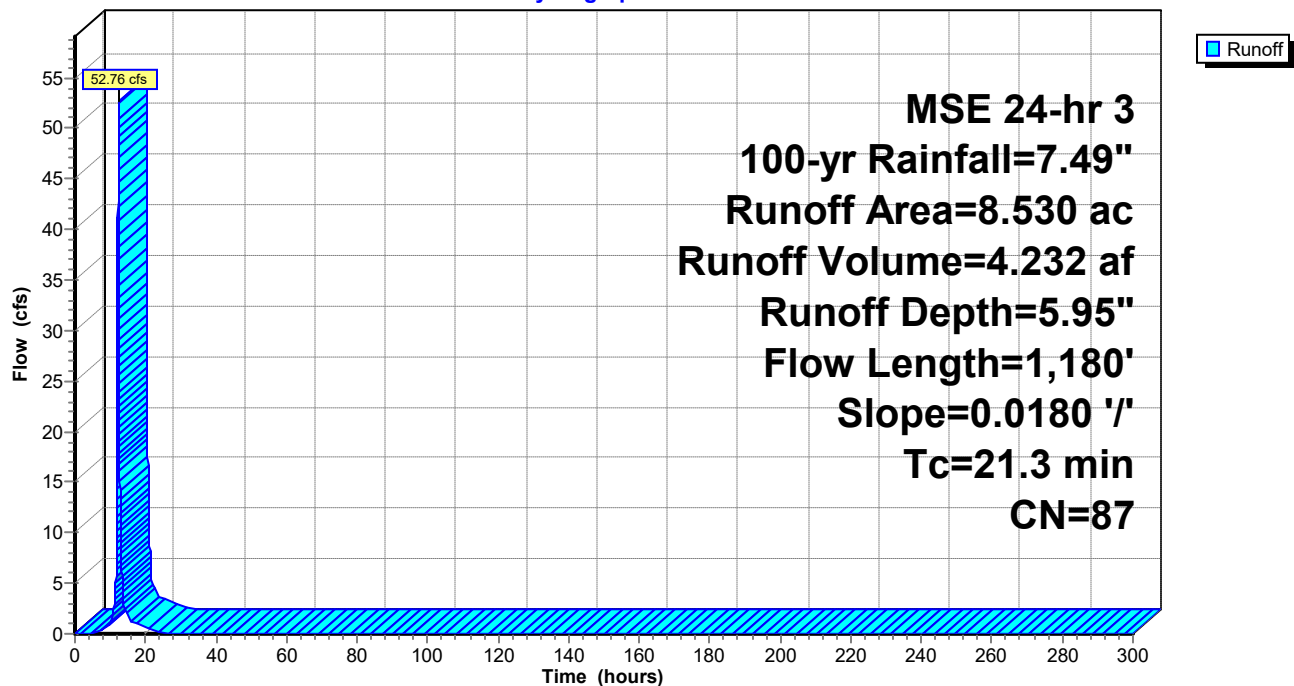
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
7.160	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
8.530	87	Weighted Average
7.910		92.73% Pervious Area
0.620		7.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	1,180	0.0180	0.92		Lag/CN Method,

Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Hydrograph



Summary for Subcatchment 1P: Onsite Drainage to 1EP

Runoff = 8.88 cfs @ 12.12 hrs, Volume= 0.403 af, Depth= 5.61"
 Routed to Pond 1PP : Offsite Low Area - Northwest

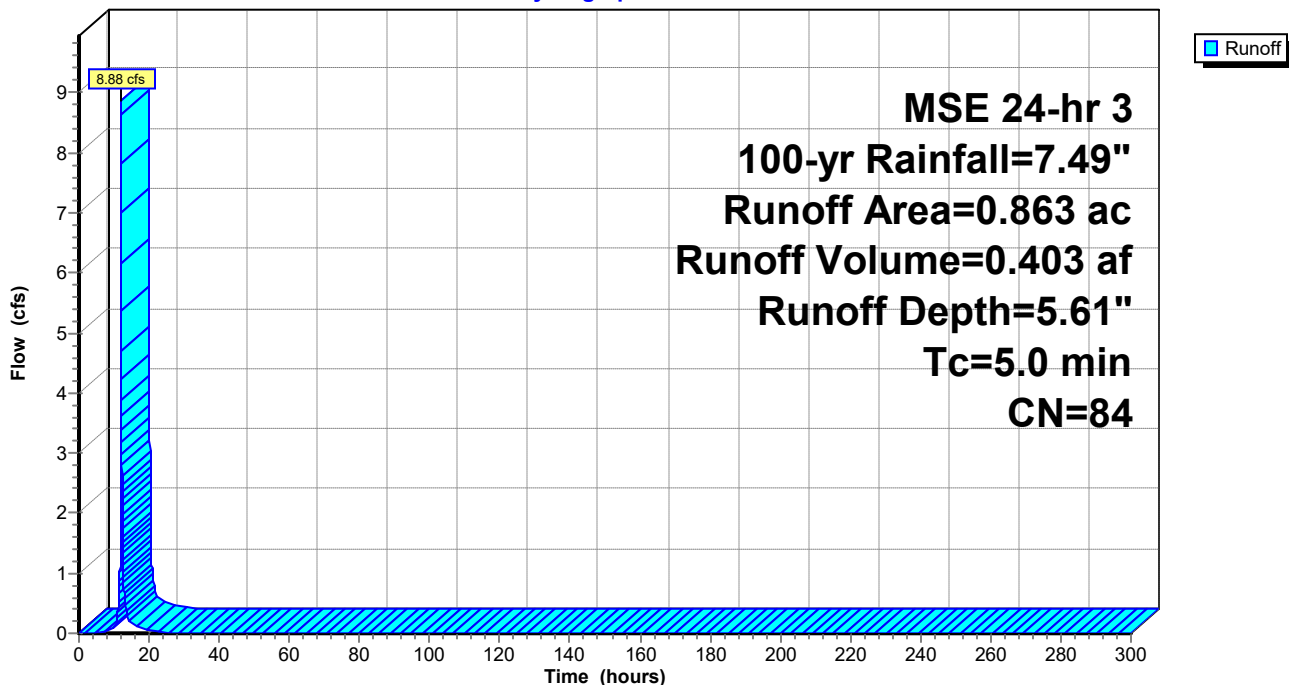
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.210	98	Proposed Impervious
0.653	80	>75% Grass cover, Good, HSG D
0.863	84	Weighted Average
0.653		75.67% Pervious Area
0.210		24.33% Impervious Area

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

Subcatchment 1P: Onsite Drainage to 1EP

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 2E: Direct Drainage to 2EP

Runoff = 70.12 cfs @ 12.35 hrs, Volume= 6.032 af, Depth= 5.72"

Routed to Pond 2EP : Offsite Low Area - North Middle

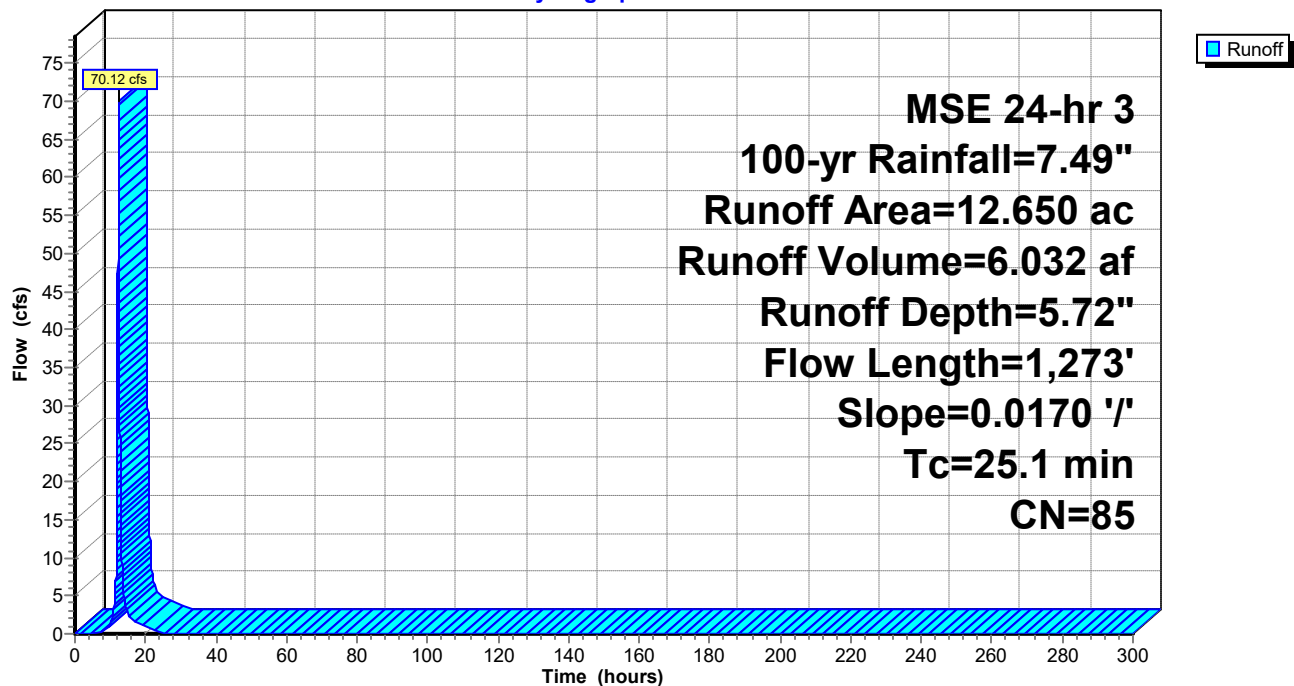
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
7.540	87	Small grain, straight row, Good, HSG D
12.650	85	Weighted Average
12.350		97.63% Pervious Area
0.300		2.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.1	1,273	0.0170	0.85		Lag/CN Method,

Subcatchment 2E: Direct Drainage to 2EP

Hydrograph



Summary for Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Runoff = 75.42 cfs @ 12.13 hrs, Volume= 3.469 af, Depth= 5.49"
 Routed to Pond 2PP : Offsite Low Area - North Middle

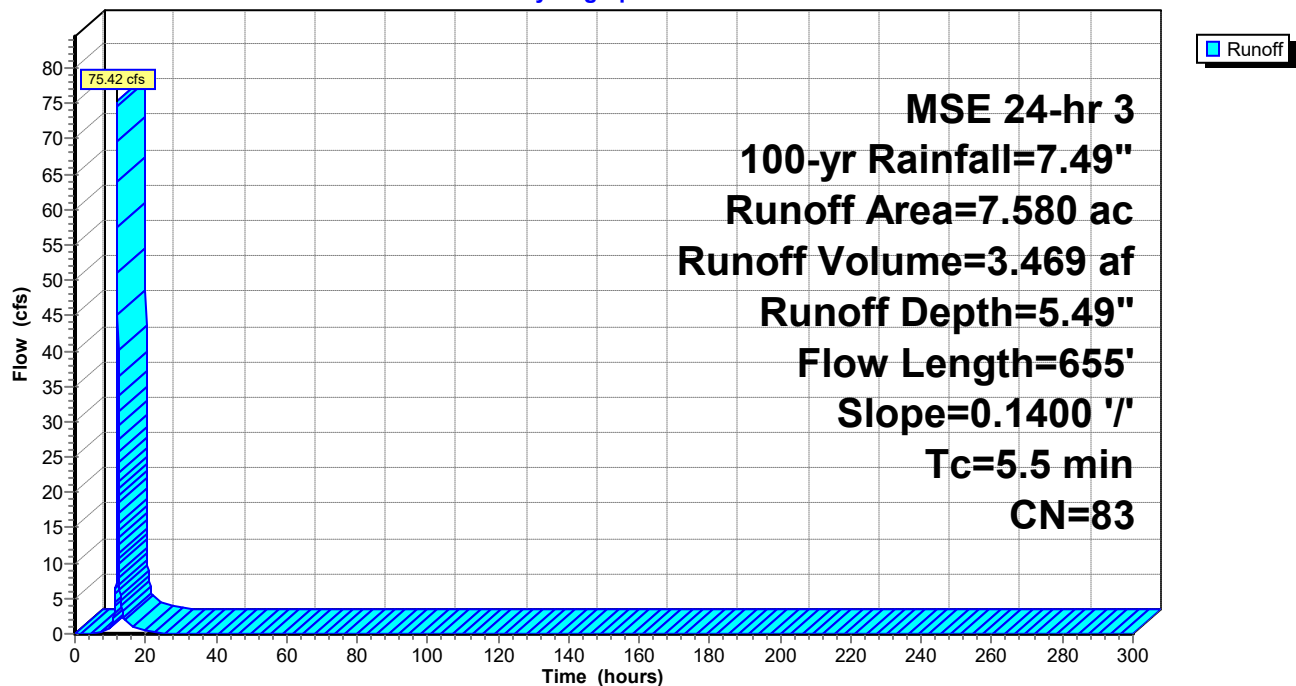
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
2.470	87	Small grain, straight row, Good, HSG D
7.580	83	Weighted Average
7.280		96.04% Pervious Area
0.300		3.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	655	0.1400	1.99		Lag/CN Method,

Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 2P: Onsite Drainage to 2EP

Runoff = 11.83 cfs @ 12.12 hrs, Volume= 0.537 af, Depth= 5.61"
Routed to Pond 2PP : Offsite Low Area - North Middle

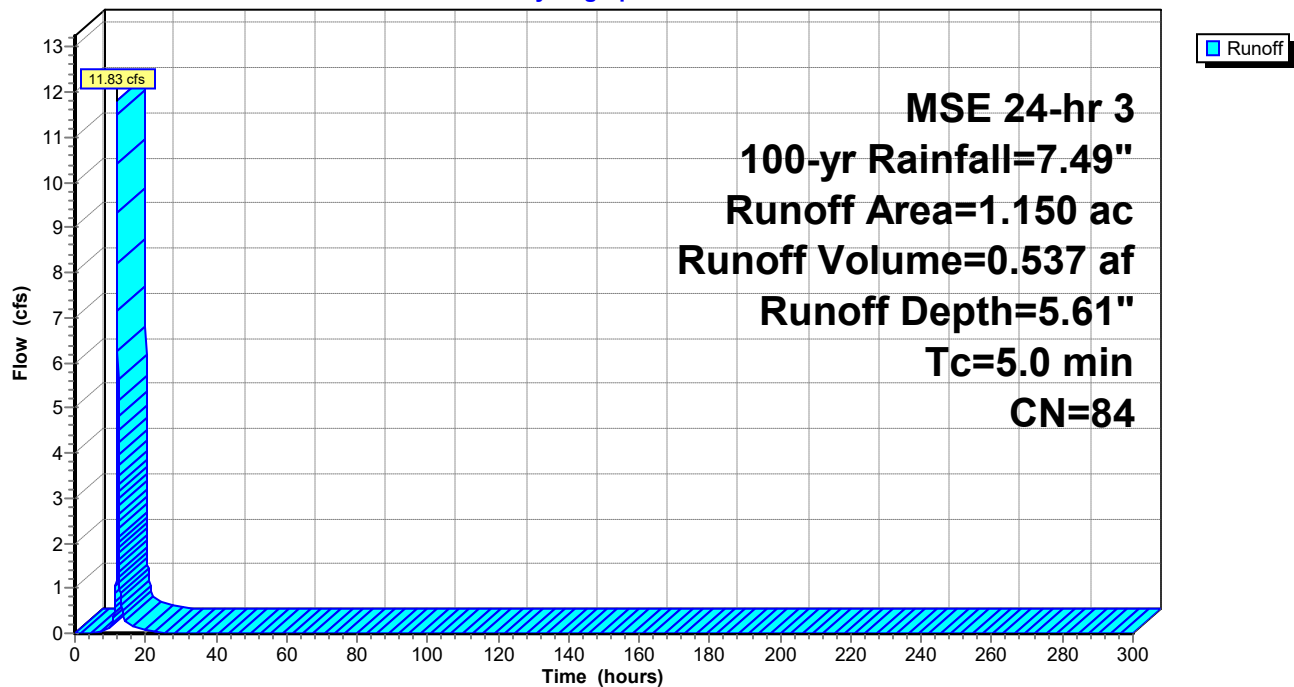
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.260	98	Proposed Impervious
0.890	80	>75% Grass cover, Good, HSG D
1.150	84	Weighted Average
0.890		77.39% Pervious Area
0.260		22.61% Impervious Area

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

Subcatchment 2P: Onsite Drainage to 2EP

Hydrograph



Summary for Subcatchment 3E: Direct Drainage to 3EP

Runoff = 47.54 cfs @ 12.30 hrs, Volume= 3.781 af, Depth= 5.72"

Routed to Pond 3EP : Existing Wetland - Northeast

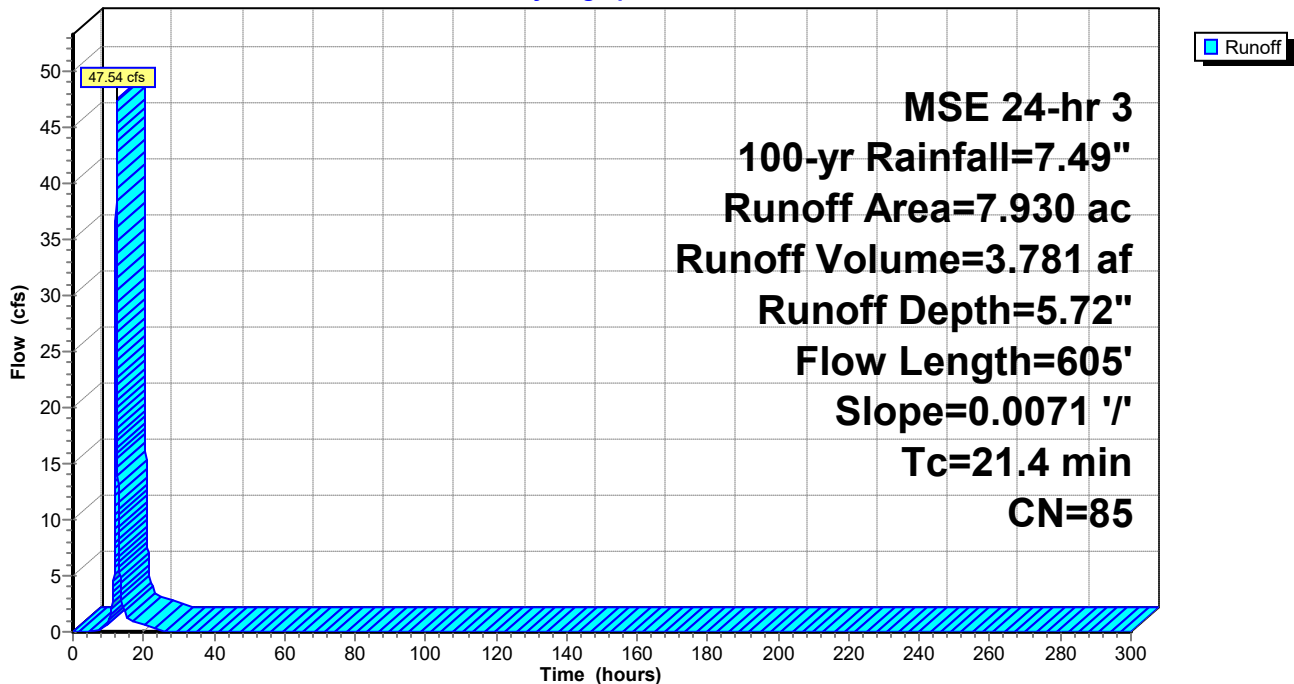
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
2.780	80	>75% Grass cover, Good, HSG D
4.650	87	Small grain, straight row, Good, HSG D
7.930	85	Weighted Average
7.430		93.69% Pervious Area
0.500		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	605	0.0071	0.47		Lag/CN Method,

Subcatchment 3E: Direct Drainage to 3EP

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 3Ex: Offsite Drainage to 3EP

Runoff = 11.86 cfs @ 12.20 hrs, Volume= 0.702 af, Depth= 5.26"

Routed to Pond 3PP : Existing Wetland - Northeast

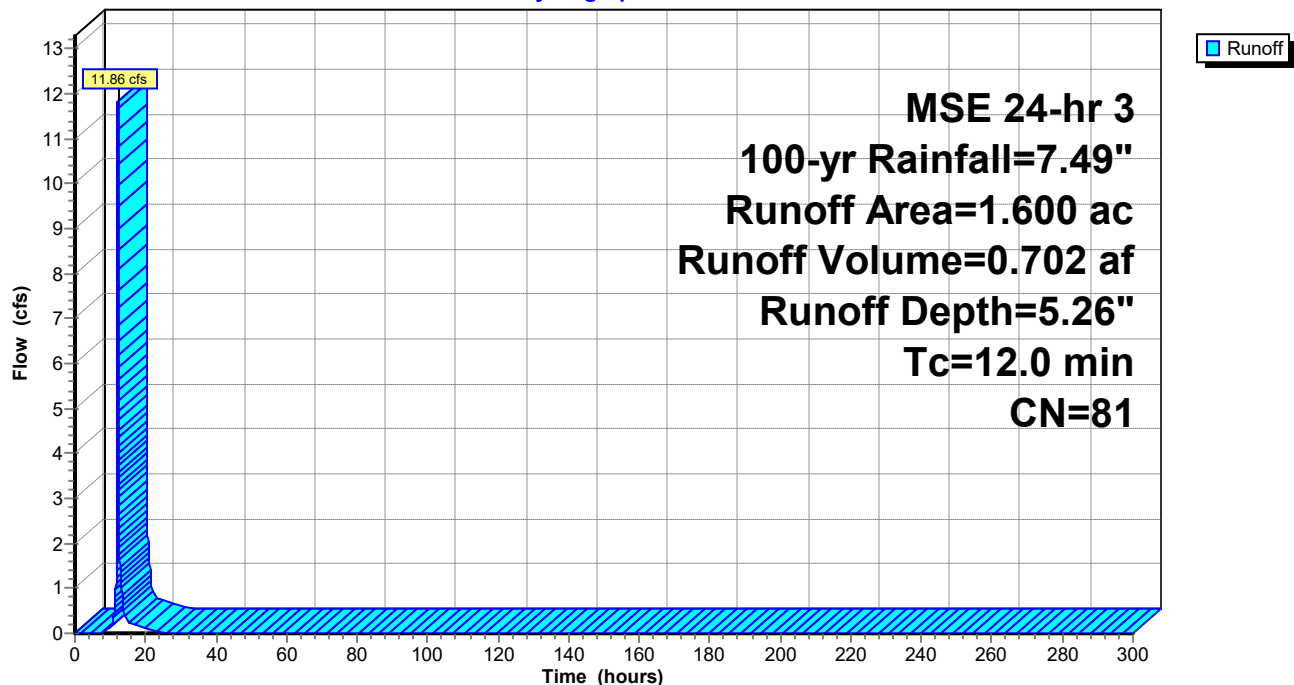
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
1.500	80	>75% Grass cover, Good, HSG D
1.600	81	Weighted Average
1.500		93.75% Pervious Area
0.100		6.25% Impervious Area

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

Subcatchment 3Ex: Offsite Drainage to 3EP

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 3P: Onsite Drainage to 3EP

Runoff = 14.14 cfs @ 12.34 hrs, Volume= 1.184 af, Depth= 5.26"

Routed to Pond 3PP : Existing Wetland - Northeast

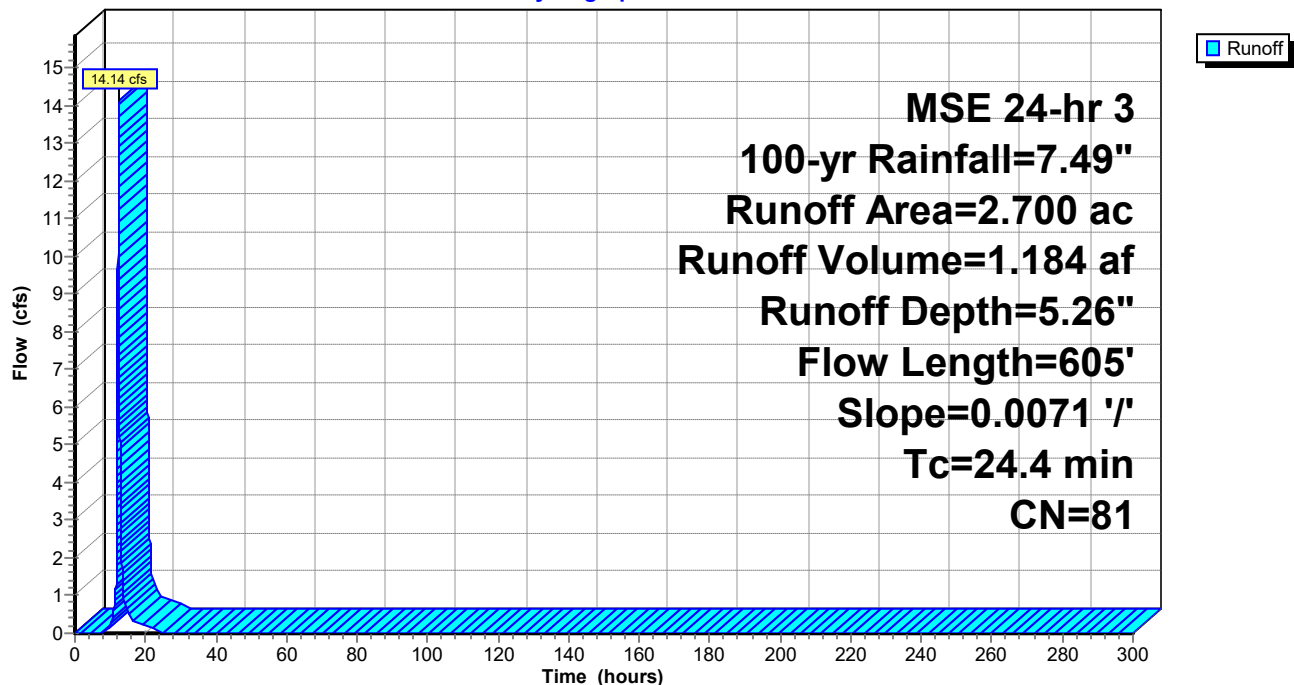
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
2.600	80	>75% Grass cover, Good, HSG D
2.700	81	Weighted Average
2.600		96.30% Pervious Area
0.100		3.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.4	605	0.0071	0.41		Lag/CN Method,

Subcatchment 3P: Onsite Drainage to 3EP

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 4E: Direct Drainage to 4EP

Runoff = 109.54 cfs @ 12.48 hrs, Volume= 11.487 af, Depth= 5.72"
Routed to Pond 4EP : Offsite Wetland - Southeast

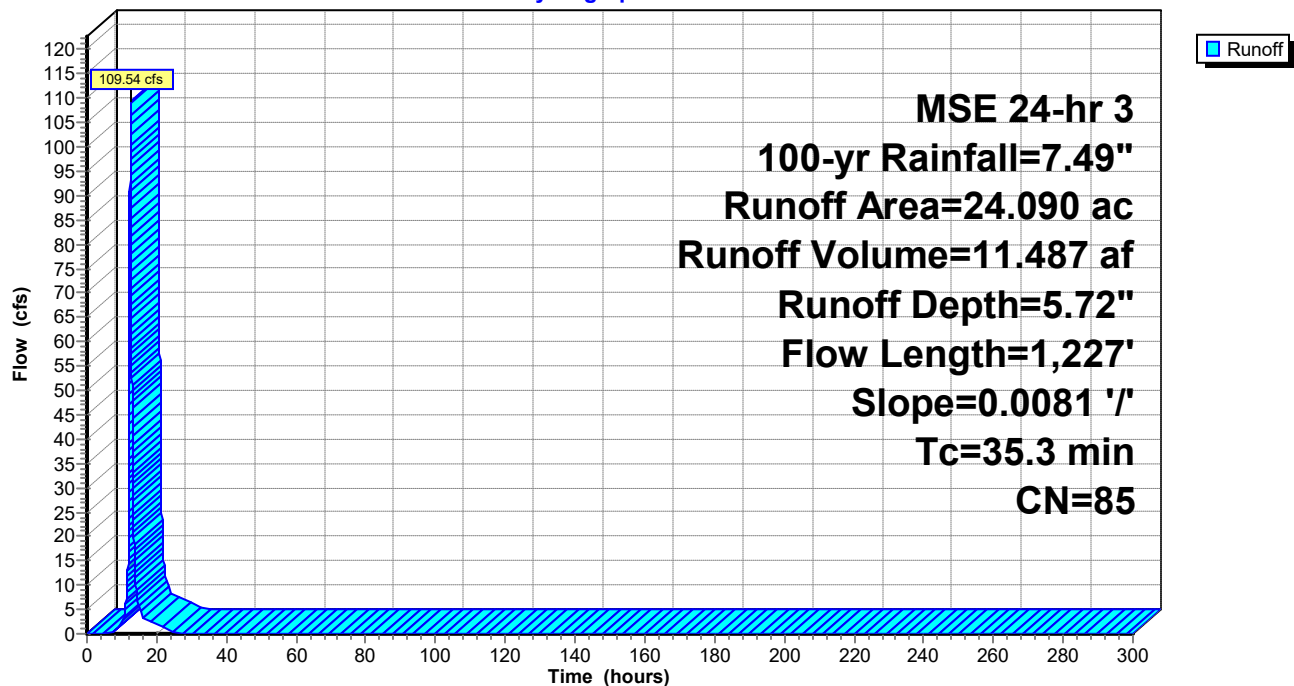
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
8.950	80	>75% Grass cover, Good, HSG D
14.640	87	Small grain, straight row, Good, HSG D
24.090	85	Weighted Average
23.590		97.92% Pervious Area
0.500		2.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	1,227	0.0081	0.58		Lag/CN Method,

Subcatchment 4E: Direct Drainage to 4EP

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Runoff = 60.92 cfs @ 12.31 hrs, Volume= 4.723 af, Depth= 5.38"
Routed to Pond 4PP : Offsite Wetland - Southeast

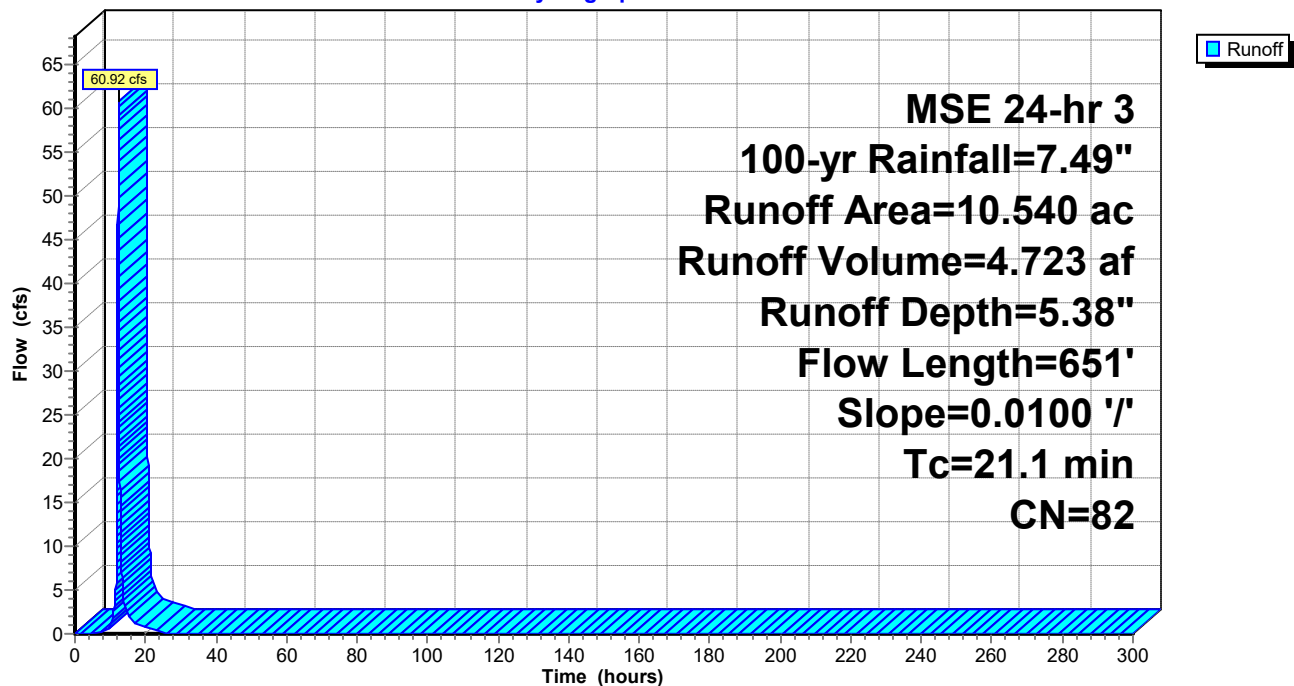
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
7.990	80	>75% Grass cover, Good, HSG D
2.050	87	Small grain, straight row, Good, HSG D
10.540	82	Weighted Average
10.040		95.26% Pervious Area
0.500		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.1	651	0.0100	0.51		Lag/CN Method,

Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 4P: Onsite Drainage to 4EP

Runoff = 15.99 cfs @ 12.12 hrs, Volume= 0.722 af, Depth= 5.49"
Routed to Pond 4PP : Offsite Wetland - Southeast

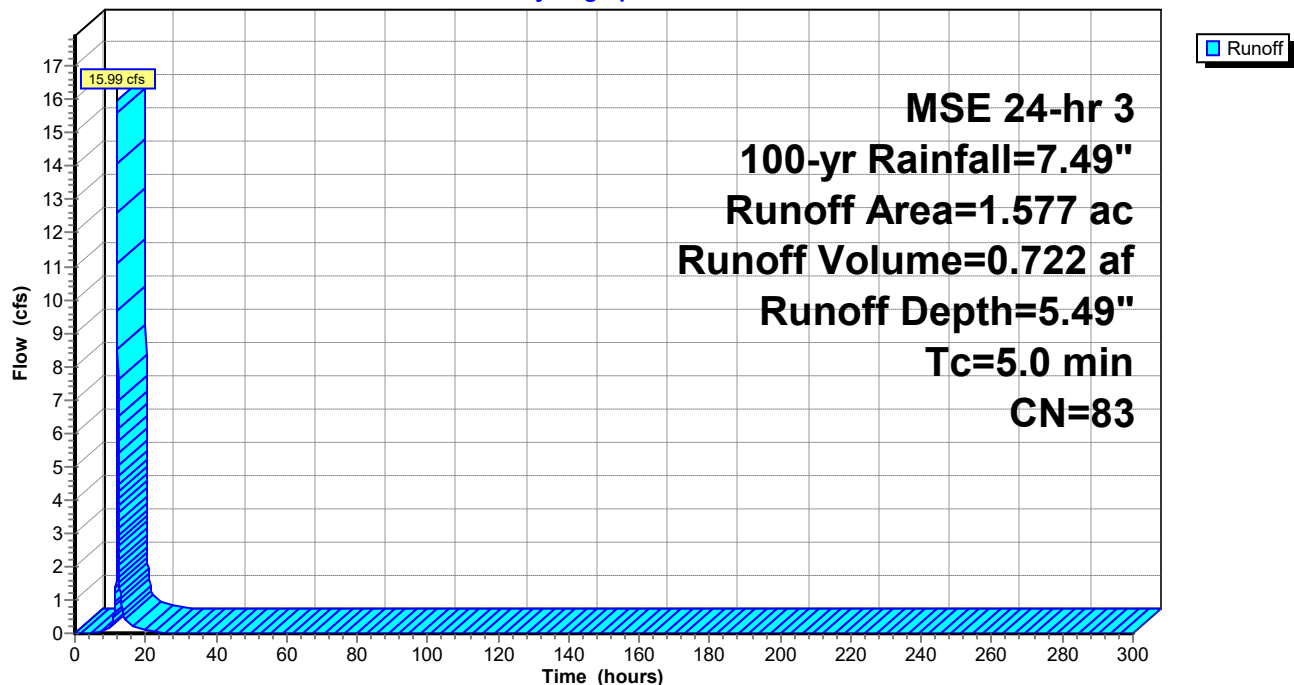
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
0.273	98	Paved parking, HSG D
1.304	80	>75% Grass cover, Good, HSG D
1.577	83	Weighted Average
1.304		82.69% Pervious Area
0.273		17.31% Impervious Area

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

Subcatchment 4P: Onsite Drainage to 4EP

Hydrograph



Summary for Subcatchment 5E: Direct Drainage to Southwest Wetland

Runoff = 49.68 cfs @ 12.18 hrs, Volume= 2.838 af, Depth= 5.95"

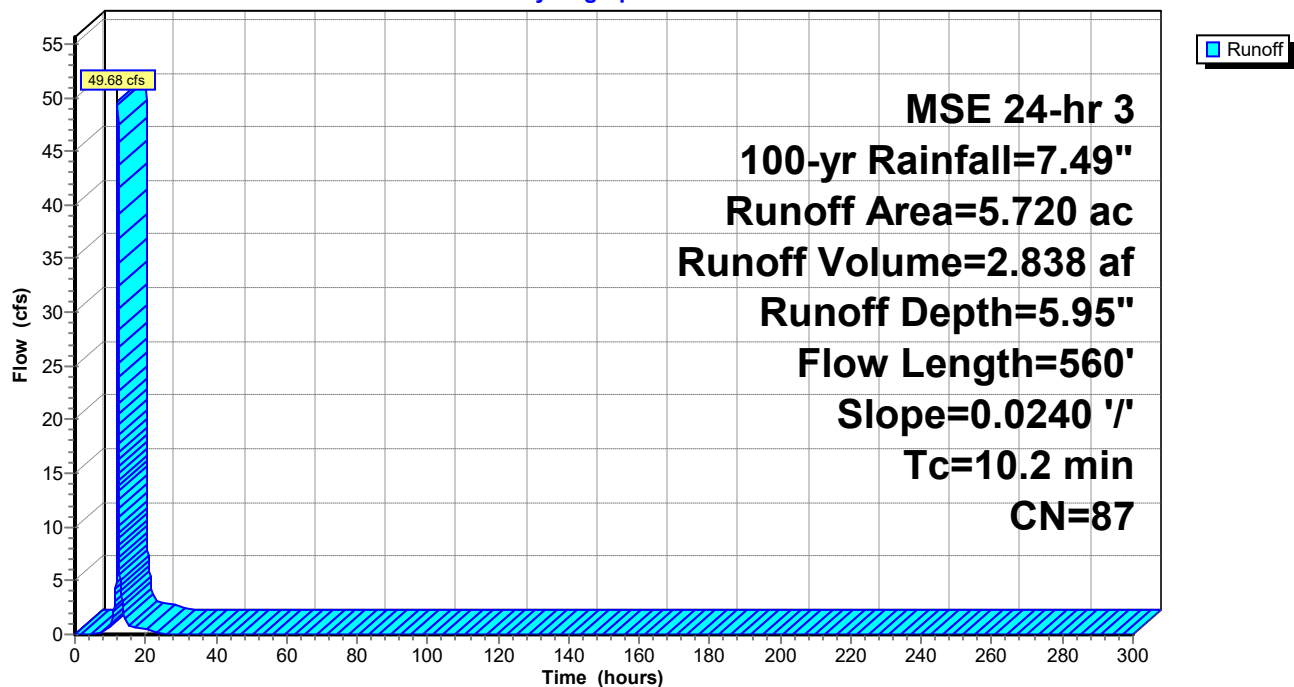
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
5.720	87	Small grain, straight row, Good, HSG D
5.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	560	0.0240	0.92		Lag/CN Method,

Subcatchment 5E: Direct Drainage to Southwest Wetland

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 5P: Onsite Drainage to 5PP

Runoff = 22.87 cfs @ 12.17 hrs, Volume= 1.264 af, Depth= 5.38"
Routed to Pond 5PP : Pond 5

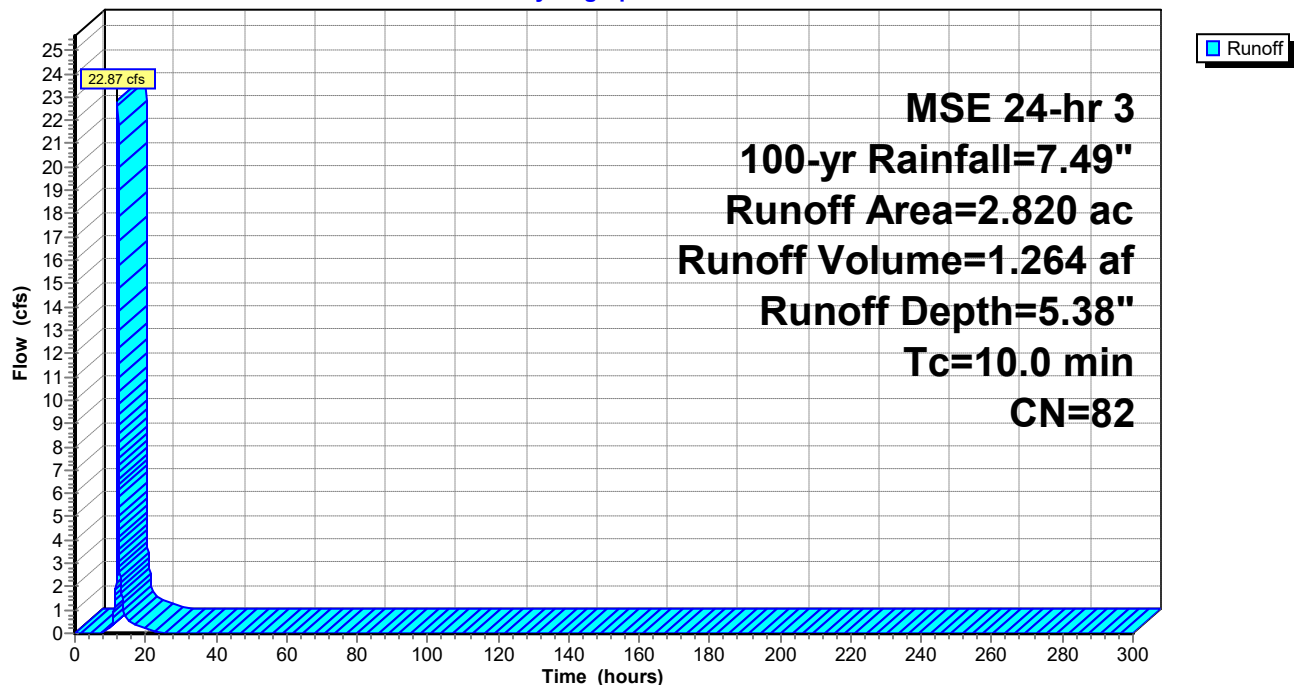
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.320	98	Proposed Impervious
2.500	80	>75% Grass cover, Good, HSG D
2.820	82	Weighted Average
2.500		88.65% Pervious Area
0.320		11.35% Impervious Area

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

Subcatchment 5P: Onsite Drainage to 5PP

Hydrograph



Summary for Subcatchment 6P: Drainage to Filtration Basin 6

Runoff = 104.91 cfs @ 12.17 hrs, Volume= 5.954 af, Depth= 5.95"
Routed to Pond 6PP : Filtration Basin 6

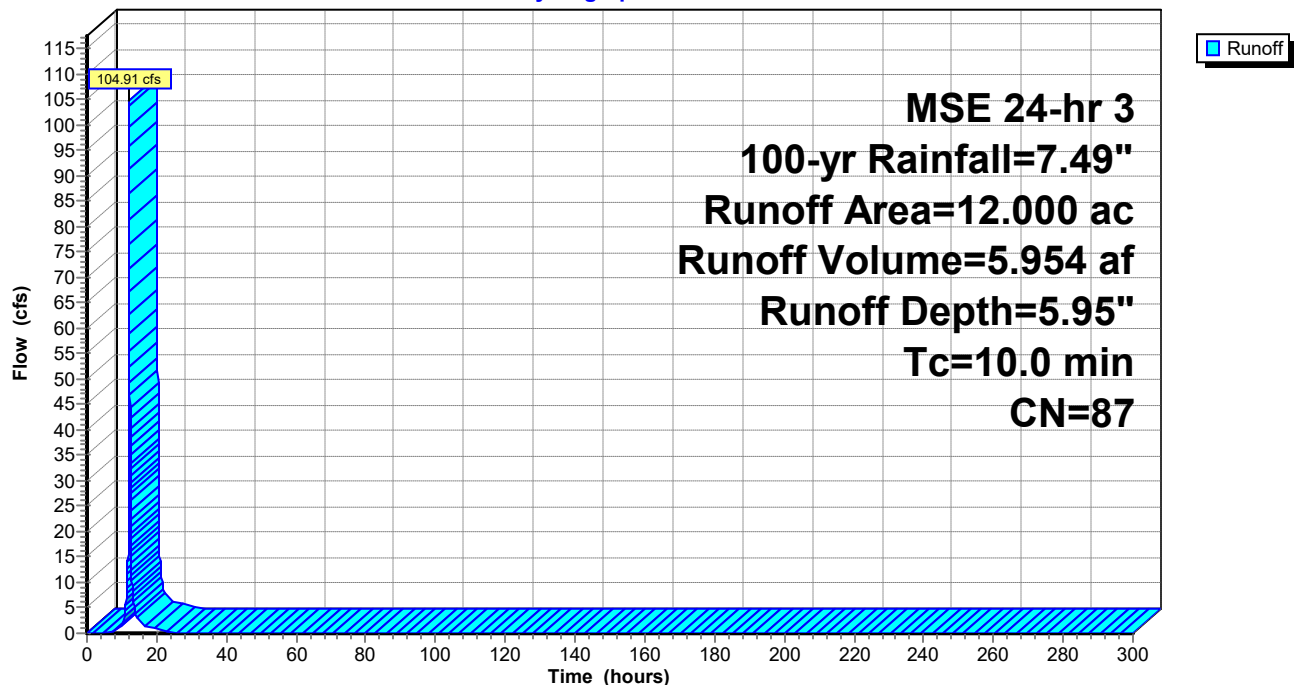
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
4.700	98	Paved parking, HSG D
7.300	80	>75% Grass cover, Good, HSG D
12.000	87	Weighted Average
7.300		60.83% Pervious Area
4.700		39.17% Impervious Area

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

Subcatchment 6P: Drainage to Filtration Basin 6

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 7P: Onsite Drainage to 7PP

Runoff = 82.58 cfs @ 12.22 hrs, Volume= 5.497 af, Depth= 5.84"
Routed to Pond 7PP : Pond 7

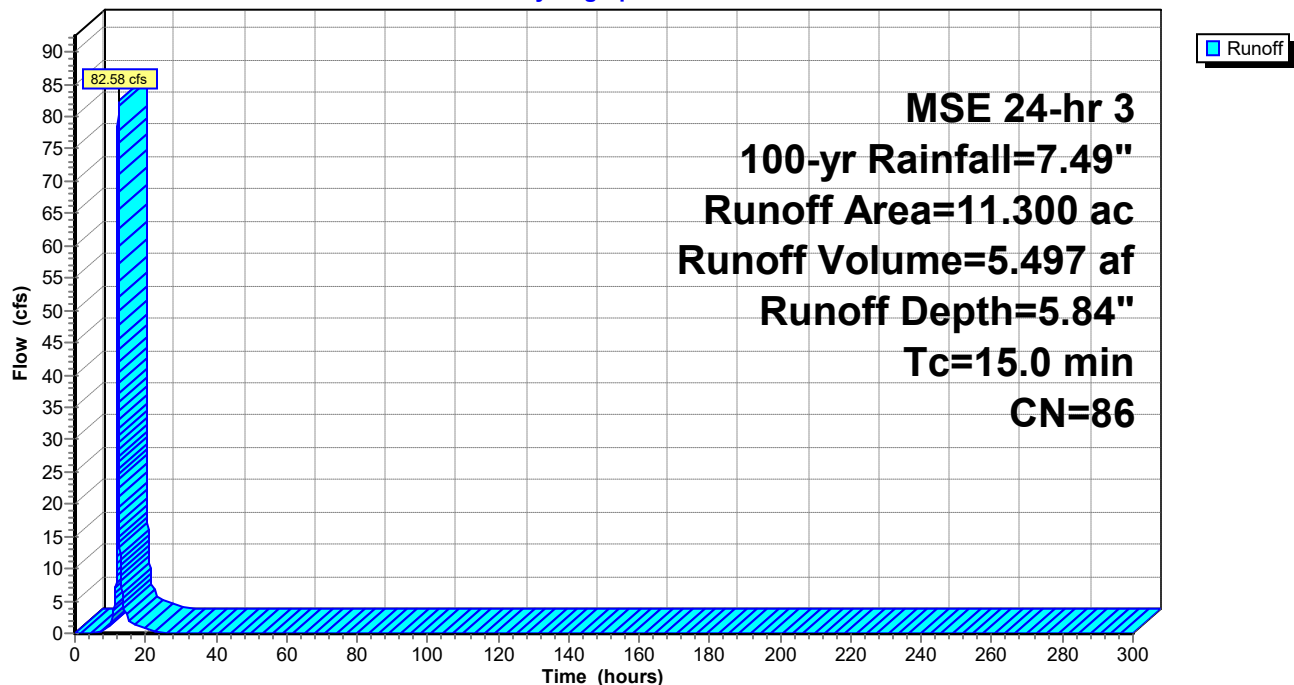
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 3.700	98	Proposed Impervious
7.600	80	>75% Grass cover, Good, HSG D
11.300	86	Weighted Average
7.600		67.26% Pervious Area
3.700		32.74% Impervious Area

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

Subcatchment 7P: Onsite Drainage to 7PP

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Subcatchment 8Ex: Territorial Ditch

Runoff = 11.16 cfs @ 12.12 hrs, Volume= 0.510 af, Depth= 5.72"
Routed to Pond 8PP : Existing Territorial Ditch

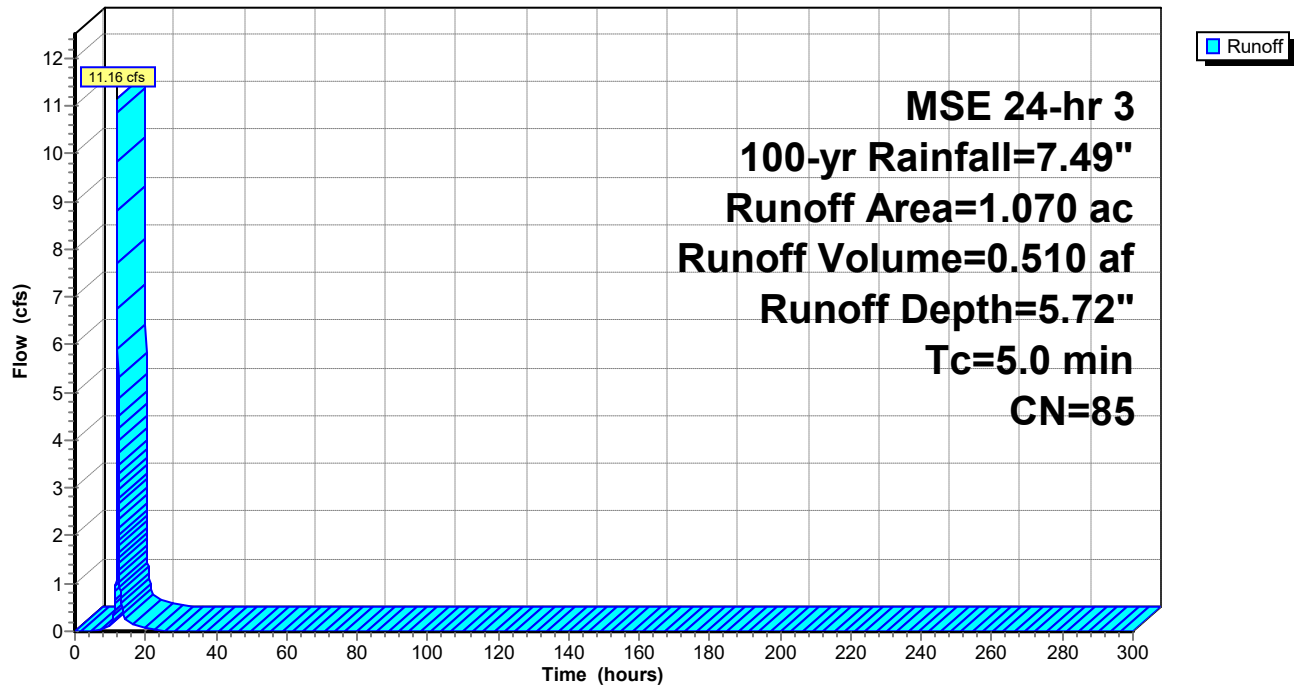
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
* 0.310	98	Existing Impervious
0.760	80	>75% Grass cover, Good, HSG D
1.070	85	Weighted Average
0.760		71.03% Pervious Area
0.310		28.97% Impervious Area

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

Subcatchment 8Ex: Territorial Ditch

Hydrograph



Summary for Subcatchment 9P: Offsite Drainage East

Runoff = 0.77 cfs @ 12.12 hrs, Volume= 0.034 af, Depth= 5.15"

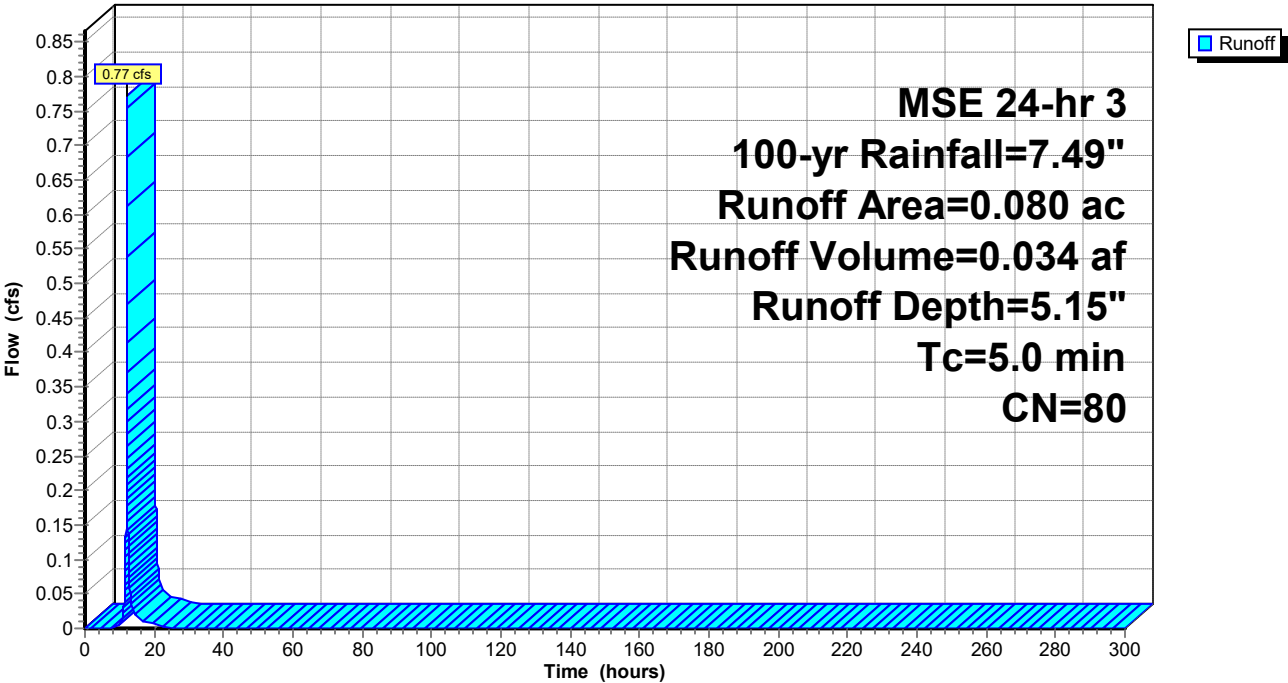
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rainfall=7.49"

Area (ac)	CN	Description
0.080	80	>75% Grass cover, Good, HSG D
0.080		100.00% Pervious Area

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

Subcatchment 9P: Offsite Drainage East

Hydrograph



Summary for Reach 1ER: To Big Woods - Southwest Wetland Complex

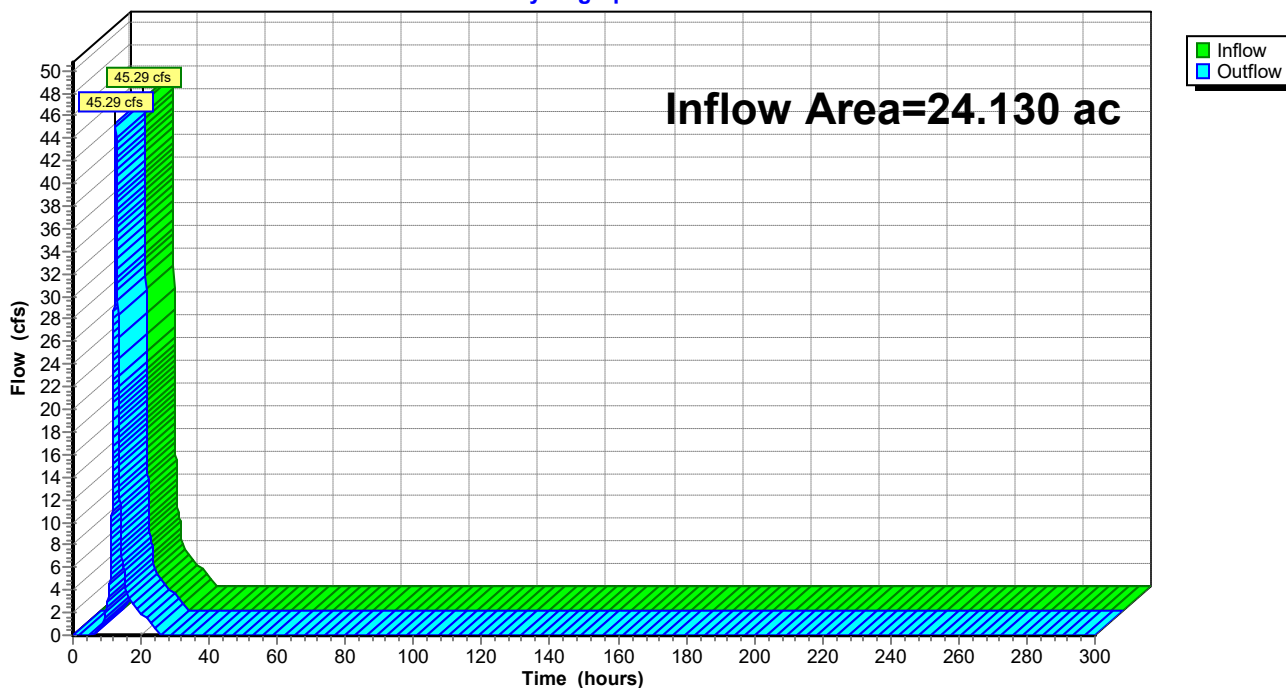
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 24.130 ac, 3.81% Impervious, Inflow Depth = 4.41" for 100-yr event
 Inflow = 45.29 cfs @ 12.51 hrs, Volume= 8.877 af
 Outflow = 45.29 cfs @ 12.52 hrs, Volume= 8.877 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1ER: To Big Woods - Southwest Wetland Complex

Hydrograph



Summary for Reach 1PR: To Big Woods - Southwest Wetland Complex

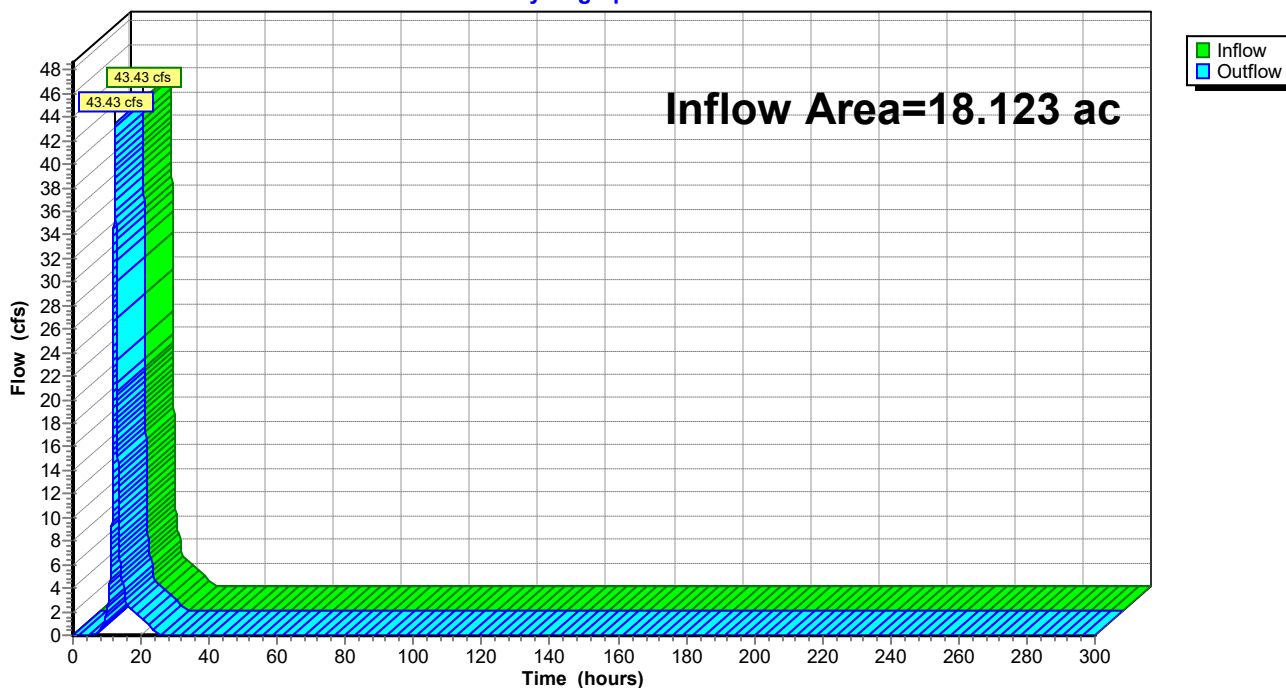
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.123 ac, 7.67% Impervious, Inflow Depth = 4.52" for 100-yr event
 Inflow = 43.43 cfs @ 12.23 hrs, Volume= 6.829 af
 Outflow = 43.43 cfs @ 12.24 hrs, Volume= 6.829 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1PR: To Big Woods - Southwest Wetland Complex

Hydrograph



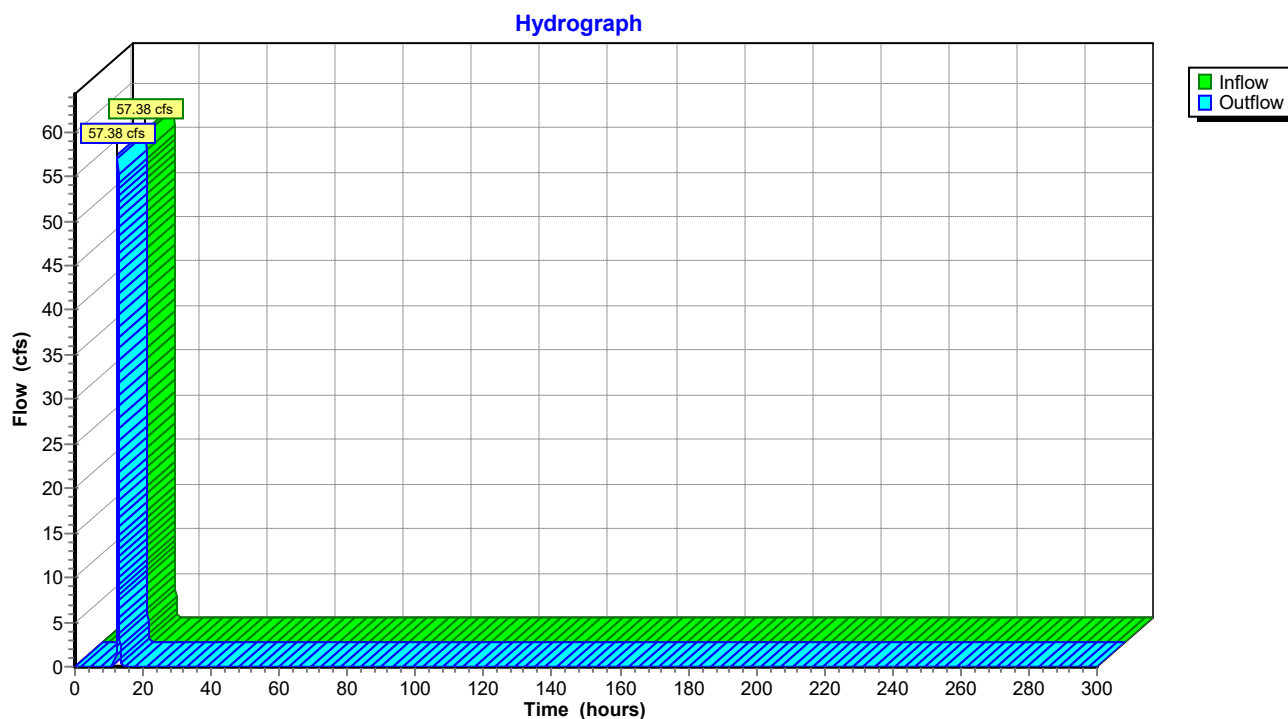
Summary for Reach 2ER: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 57.38 cfs @ 12.55 hrs, Volume= 2.850 af
 Outflow = 57.38 cfs @ 12.56 hrs, Volume= 2.850 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2ER: Existing Overflow Offsite to North



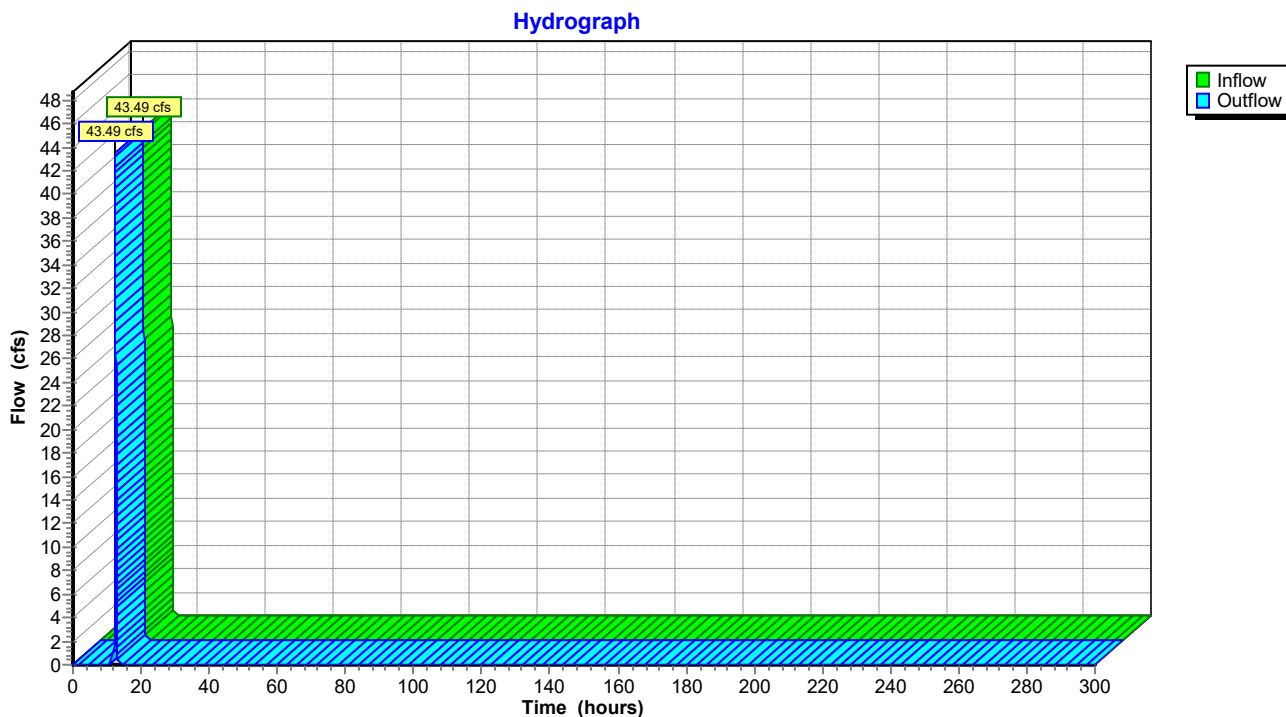
Summary for Reach 2PR: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 43.49 cfs @ 12.37 hrs, Volume= 1.812 af
 Outflow = 43.49 cfs @ 12.38 hrs, Volume= 1.812 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2PR: Existing Overflow Offsite to North



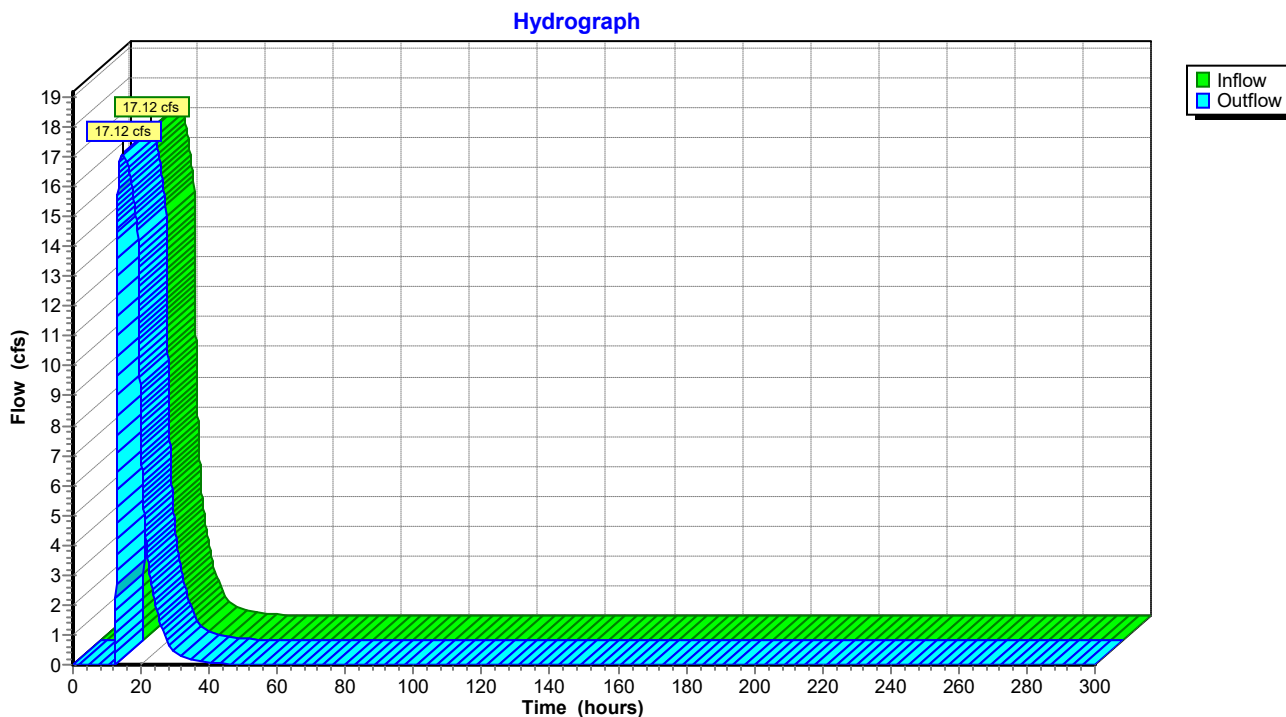
Summary for Reach 3ER: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 17.12 cfs @ 14.61 hrs, Volume= 11.325 af
 Outflow = 17.12 cfs @ 14.62 hrs, Volume= 11.325 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3ER: To Big Woods - Southeast Wetland Complex



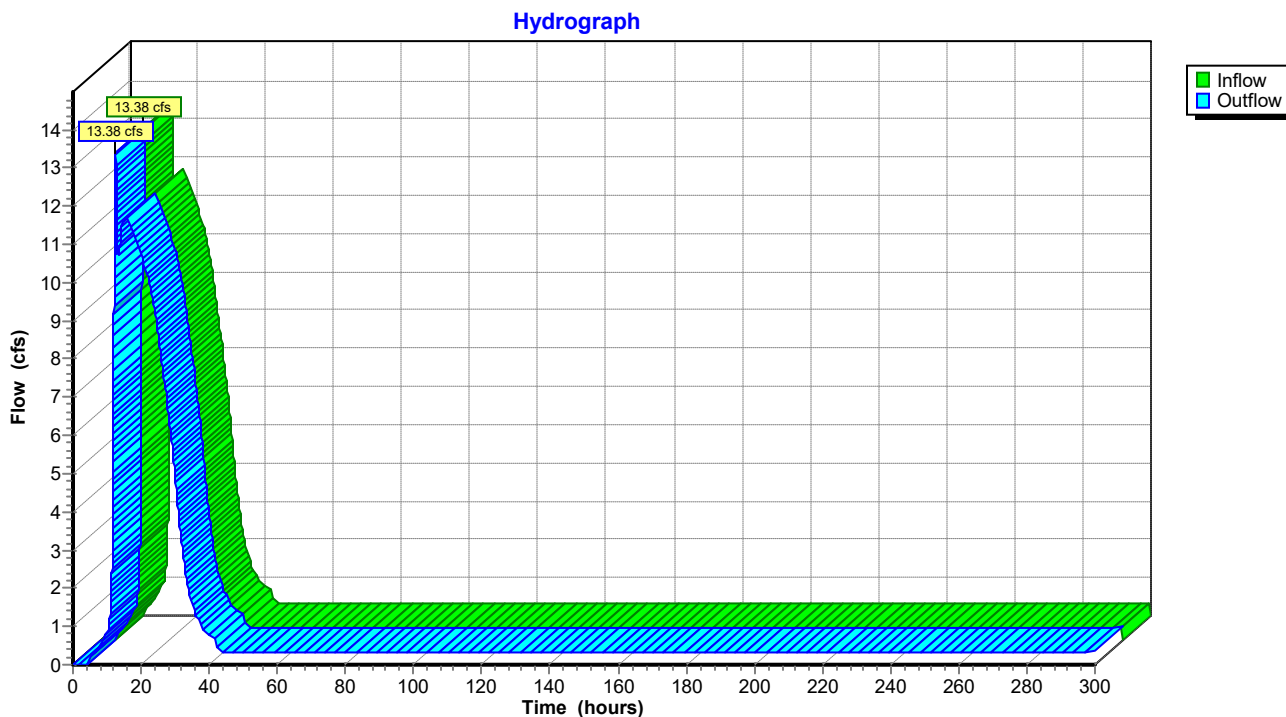
Summary for Reach 3PR: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 13.38 cfs @ 12.45 hrs, Volume= 23.795 af
 Outflow = 13.38 cfs @ 12.46 hrs, Volume= 23.795 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3PR: To Big Woods - Southeast Wetland Complex



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Pond 1EP: Offsite Low Area - Northwest

Inflow Area = 11.480 ac, 5.40% Impervious, Inflow Depth = 6.95" for 100-yr event
 Inflow = 88.92 cfs @ 12.41 hrs, Volume= 6.650 af
 Outflow = 72.82 cfs @ 12.55 hrs, Volume= 6.649 af, Atten= 18%, Lag= 8.8 min
 Primary = 15.44 cfs @ 12.55 hrs, Volume= 3.799 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 57.38 cfs @ 12.55 hrs, Volume= 2.850 af
 Routed to Reach 2ER : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 948.68' @ 12.55 hrs Surf.Area= 0.863 ac Storage= 0.976 af

Plug-Flow detention time= 8.6 min calculated for 6.649 af (100% of inflow)
 Center-of-Mass det. time= 8.5 min (795.6 - 787.1)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.44 cfs @ 12.55 hrs HW=948.68' TW=0.00' (Dynamic Tailwater)

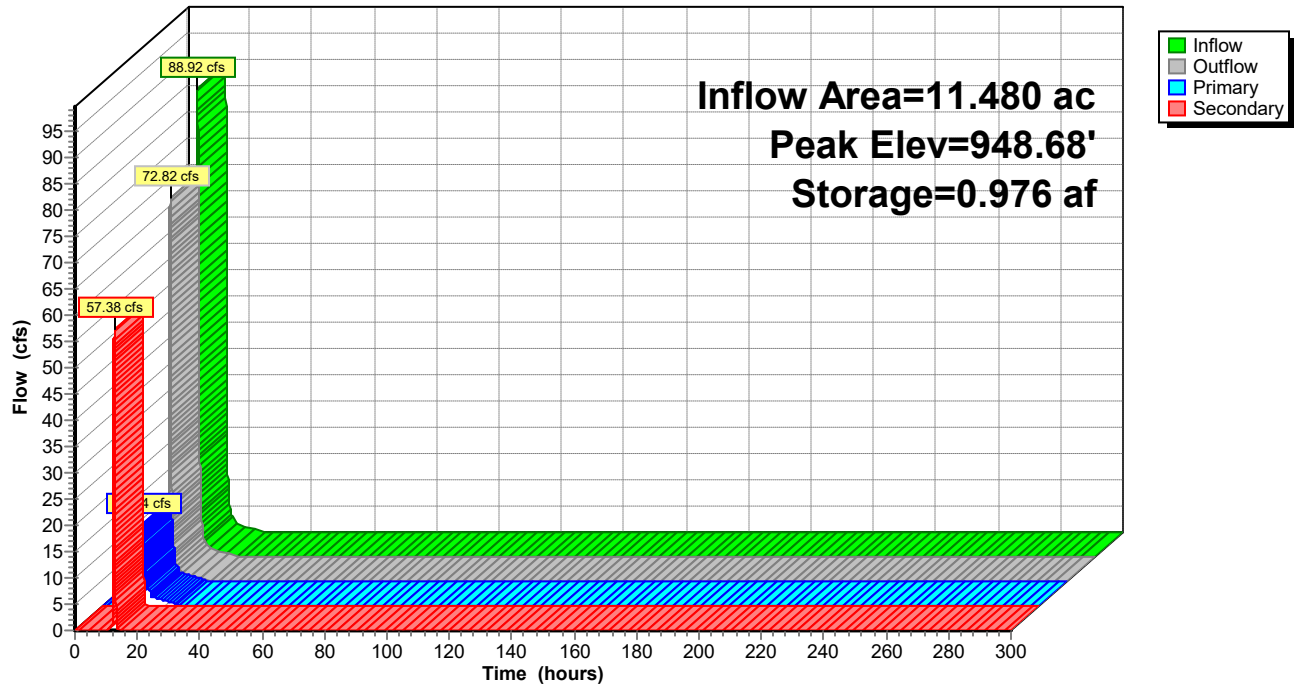
↑ **1=Culvert** (Inlet Controls 15.44 cfs @ 8.74 fps)

Secondary OutFlow Max=57.37 cfs @ 12.55 hrs HW=948.68' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 57.37 cfs @ 3.41 fps)

Pond 1EP: Offsite Low Area - Northwest

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Pond 1PP: Offsite Low Area - Northwest

Inflow Area = 9.393 ac, 8.84% Impervious, Inflow Depth = 6.47" for 100-yr event
 Inflow = 74.17 cfs @ 12.24 hrs, Volume= 5.064 af
 Outflow = 58.24 cfs @ 12.37 hrs, Volume= 5.063 af, Atten= 21%, Lag= 8.0 min
 Primary = 14.75 cfs @ 12.37 hrs, Volume= 3.251 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 43.49 cfs @ 12.37 hrs, Volume= 1.812 af
 Routed to Reach 2PR : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 948.39' @ 12.37 hrs Surf.Area= 0.744 ac Storage= 0.745 af

Plug-Flow detention time= 8.4 min calculated for 5.063 af (100% of inflow)
 Center-of-Mass det. time= 8.4 min (792.1 - 783.7)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=14.75 cfs @ 12.37 hrs HW=948.39' TW=0.00' (Dynamic Tailwater)

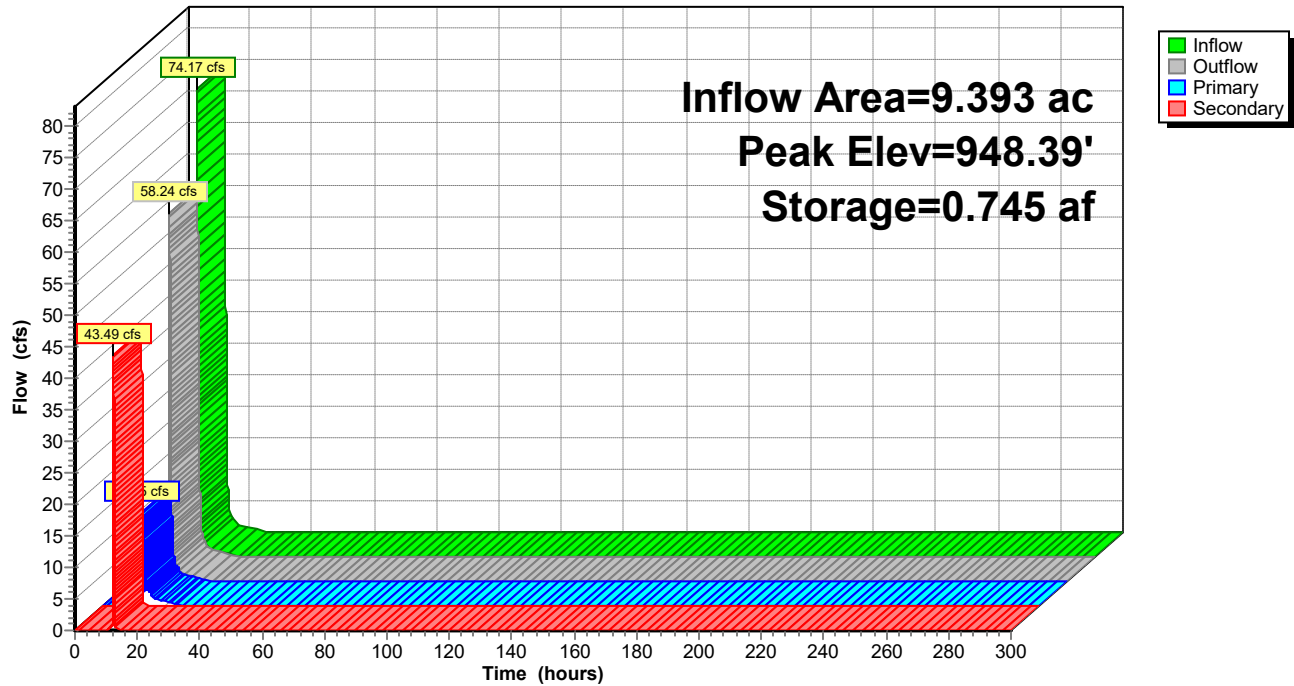
↑ **1=Culvert** (Inlet Controls 14.75 cfs @ 8.35 fps)

Secondary OutFlow Max=43.48 cfs @ 12.37 hrs HW=948.39' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 43.48 cfs @ 3.12 fps)

Pond 1PP: Offsite Low Area - Northwest

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Pond 2EP: Offsite Low Area - North Middle

Inflow Area = 12.650 ac, 2.37% Impervious, Inflow Depth = 5.72" for 100-yr event
 Inflow = 70.12 cfs @ 12.35 hrs, Volume= 6.032 af
 Outflow = 58.79 cfs @ 12.48 hrs, Volume= 6.032 af, Atten= 16%, Lag= 7.8 min
 Primary = 29.92 cfs @ 12.48 hrs, Volume= 5.078 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 28.87 cfs @ 12.48 hrs, Volume= 0.954 af
 Routed to Pond 1EP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 950.66' @ 12.48 hrs Surf.Area= 0.585 ac Storage= 0.638 af

Plug-Flow detention time= 4.2 min calculated for 6.032 af (100% of inflow)
 Center-of-Mass det. time= 4.2 min (800.9 - 796.7)

Volume	Invert	Avail.Storage	Storage Description
--------	--------	---------------	---------------------

#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)
----	---------	----------	--

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

Device	Routing	Invert	Outlet Devices
--------	---------	--------	----------------

#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=29.92 cfs @ 12.48 hrs HW=950.66' TW=0.00' (Dynamic Tailwater)

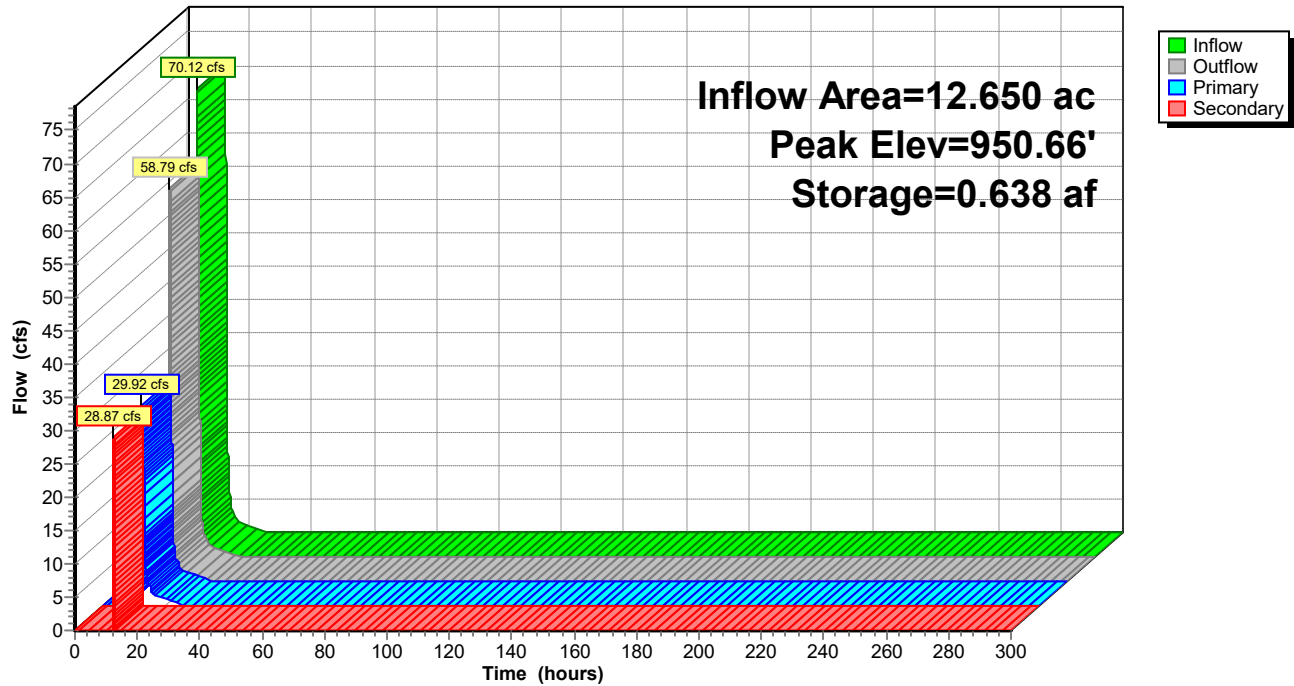
↑ **1=Culvert** (Inlet Controls 29.92 cfs @ 9.52 fps)

Secondary OutFlow Max=28.86 cfs @ 12.48 hrs HW=950.66' TW=948.63' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 28.86 cfs @ 2.71 fps)

Pond 2EP: Offsite Low Area - North Middle

Hydrograph



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Summary for Pond 2PP: Offsite Low Area - North Middle

Inflow Area = 8.730 ac, 6.41% Impervious, Inflow Depth = 5.51" for 100-yr event
 Inflow = 87.24 cfs @ 12.13 hrs, Volume= 4.006 af
 Outflow = 54.98 cfs @ 12.19 hrs, Volume= 4.006 af, Atten= 37%, Lag= 3.8 min
 Primary = 29.59 cfs @ 12.19 hrs, Volume= 3.578 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 25.39 cfs @ 12.19 hrs, Volume= 0.428 af
 Routed to Pond 1PP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 950.58' @ 12.19 hrs Surf.Area= 0.548 ac Storage= 0.589 af

Plug-Flow detention time= 3.9 min calculated for 4.006 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (785.6 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
--------	--------	---------------	---------------------

#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)
----	---------	----------	--

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

Device	Routing	Invert	Outlet Devices
--------	---------	--------	----------------

#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=29.59 cfs @ 12.19 hrs HW=950.58' TW=0.00' (Dynamic Tailwater)

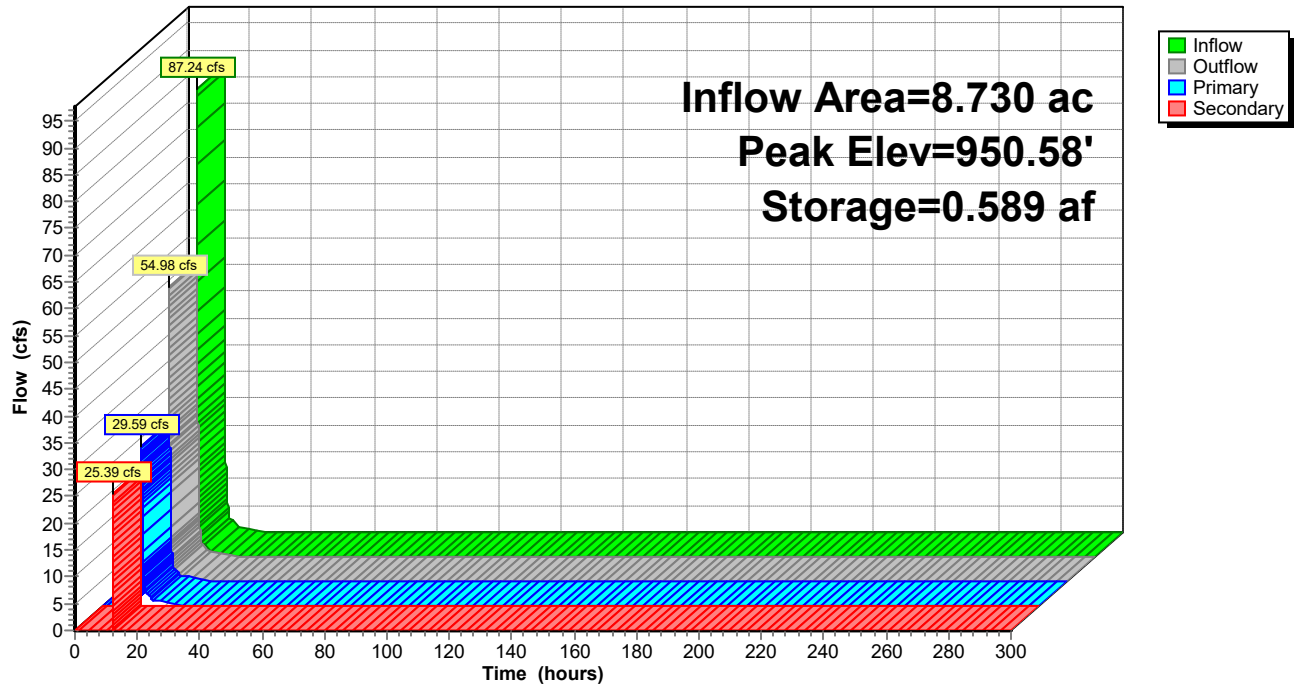
↑ **1=Culvert** (Inlet Controls 29.59 cfs @ 9.42 fps)

Secondary OutFlow Max=25.38 cfs @ 12.19 hrs HW=950.58' TW=947.95' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 25.38 cfs @ 2.60 fps)

Pond 2PP: Offsite Low Area - North Middle

Hydrograph



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MSE 24-hr 3 100-yr Rainfall=7.49"

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Summary for Pond 3EP: Existing Wetland - Northeast

[92] Warning: Device #3 is above defined storage

Inflow = 67.94 cfs @ 12.72 hrs, Volume= 14.001 af
 Outflow = 17.12 cfs @ 14.61 hrs, Volume= 11.325 af, Atten= 75%, Lag= 112.9 min
 Primary = 17.12 cfs @ 14.61 hrs, Volume= 11.325 af
 Routed to Reach 3ER : To Big Woods - Southeast Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4EP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 952.95' @ 14.61 hrs Surf.Area= 3.146 ac Storage= 7.344 af

Plug-Flow detention time= 262.3 min calculated for 11.324 af (81% of inflow)
 Center-of-Mass det. time= 182.9 min (1,057.7 - 874.8)

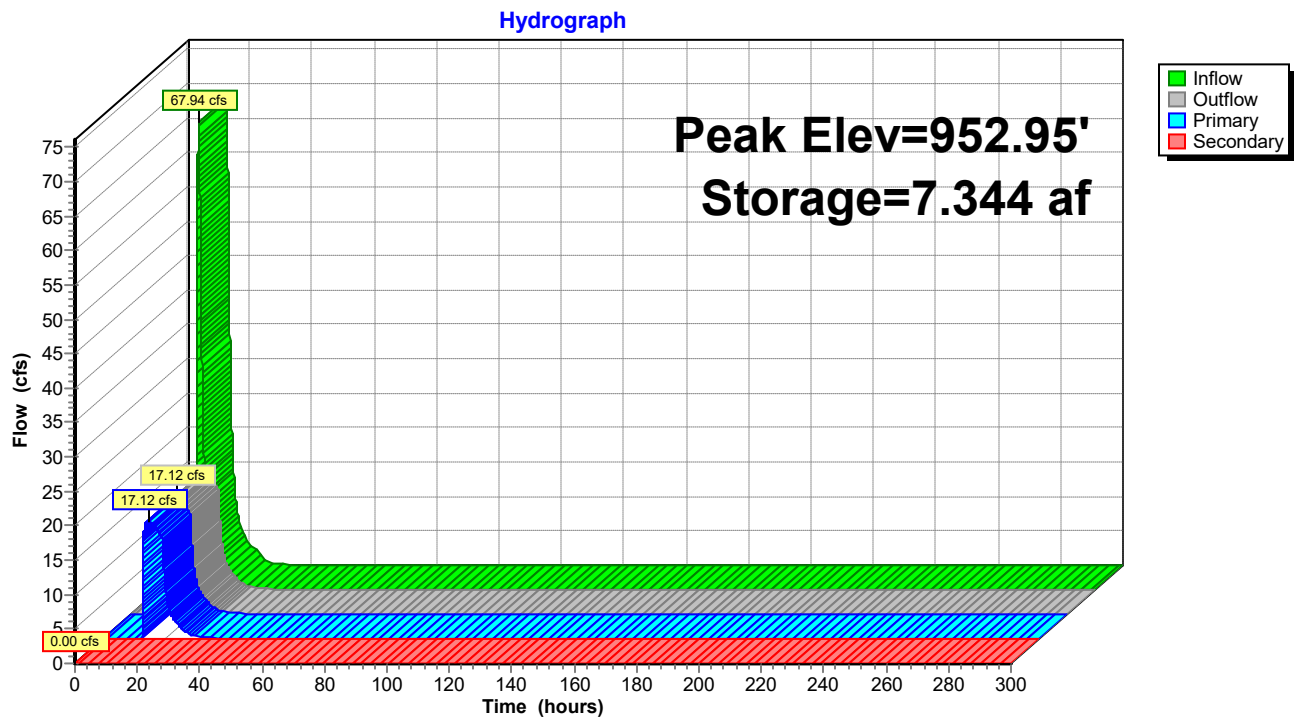
Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	11.020 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
948.00	0.050	0.000	0.000
949.00	0.400	0.225	0.225
950.00	1.150	0.775	1.000
952.00	2.510	3.660	4.660
954.00	3.850	6.360	11.020

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 ' S= 0.0148 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	951.10'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Secondary	954.30'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=17.12 cfs @ 14.61 hrs HW=952.95' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 17.12 cfs @ 9.69 fps)↑ **2=Broad-Crested Rectangular Weir** (Passes 17.12 cfs of 66.38 cfs potential flow)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=948.00' TW=954.00' (Dynamic Tailwater)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3EP: Existing Wetland - Northeast



Knapp - Rogers Stormwater

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Summary for Pond 3PP: Existing Wetland - Northeast

Inflow = 67.75 cfs @ 12.57 hrs, Volume= 13.828 af
 Outflow = 10.27 cfs @ 13.69 hrs, Volume= 11.733 af, Atten= 85%, Lag= 67.6 min
 Primary = 10.27 cfs @ 13.69 hrs, Volume= 11.733 af
 Routed to Pond 6PP : Filtration Basin 6
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4PP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.97' @ 15.22 hrs Surf.Area= 84,151 sf Storage= 271,053 cf

Plug-Flow detention time= 446.5 min calculated for 11.733 af (85% of inflow)
 Center-of-Mass det. time= 351.9 min (1,324.8 - 972.9)

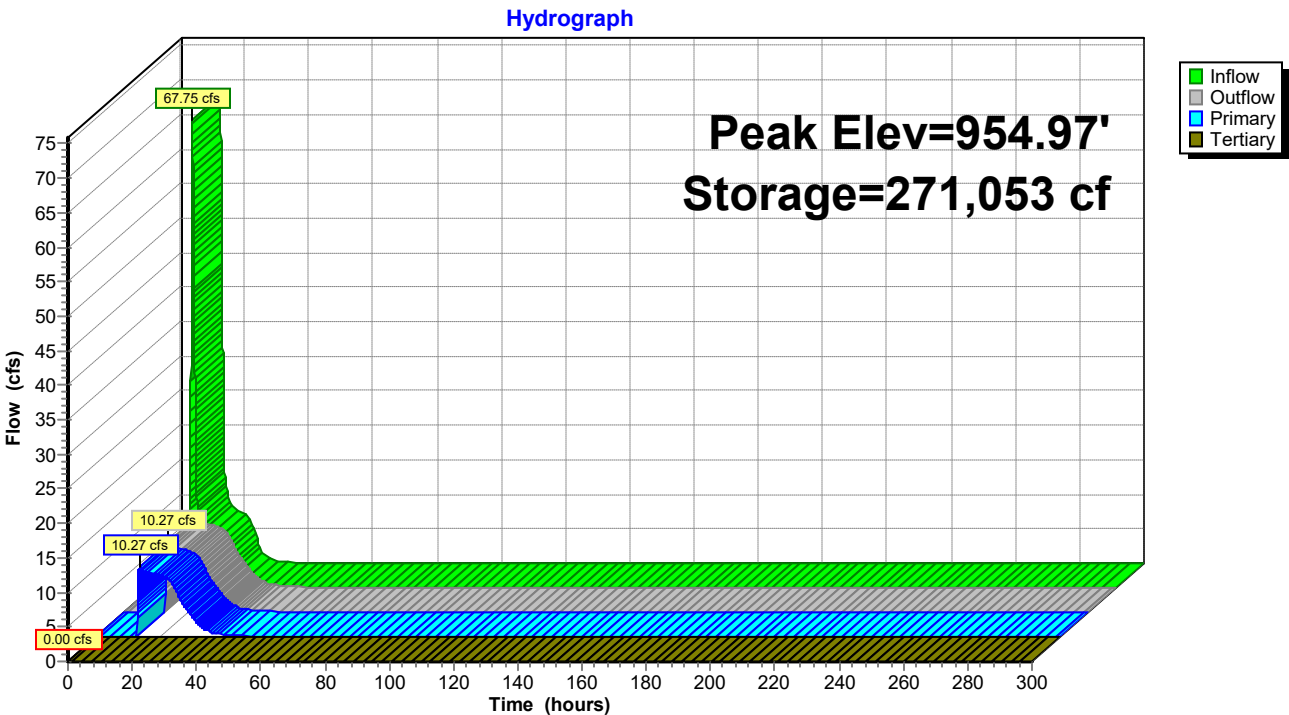
Volume	Invert	Avail.Storage	Storage Description
#1	948.80'	366,452 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.80	22,044	0	0
950.00	24,609	27,992	27,992
952.00	38,365	62,974	90,966
954.00	67,868	106,233	197,199
956.00	101,385	169,253	366,452

Device	Routing	Invert	Outlet Devices
#1	Primary	952.00'	24.0" Round Culvert L= 24.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 952.00' / 951.50' S= 0.0208 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Tertiary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=10.23 cfs @ 13.69 hrs HW=954.86' TW=954.40' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 10.23 cfs @ 3.26 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=948.80' TW=954.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3PP: Existing Wetland - Northeast



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Summary for Pond 4EP: Offsite Wetland - Southeast

Inflow = 109.54 cfs @ 12.48 hrs, Volume= 11.487 af
 Outflow = 56.31 cfs @ 12.87 hrs, Volume= 10.220 af, Atten= 49%, Lag= 23.6 min
 Primary = 56.31 cfs @ 12.87 hrs, Volume= 10.220 af
 Routed to Pond 3EP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 955.09' @ 12.87 hrs Surf.Area= 5.063 ac Storage= 4.973 af

Plug-Flow detention time= 142.8 min calculated for 10.220 af (89% of inflow)
 Center-of-Mass det. time= 98.8 min (905.0 - 806.2)

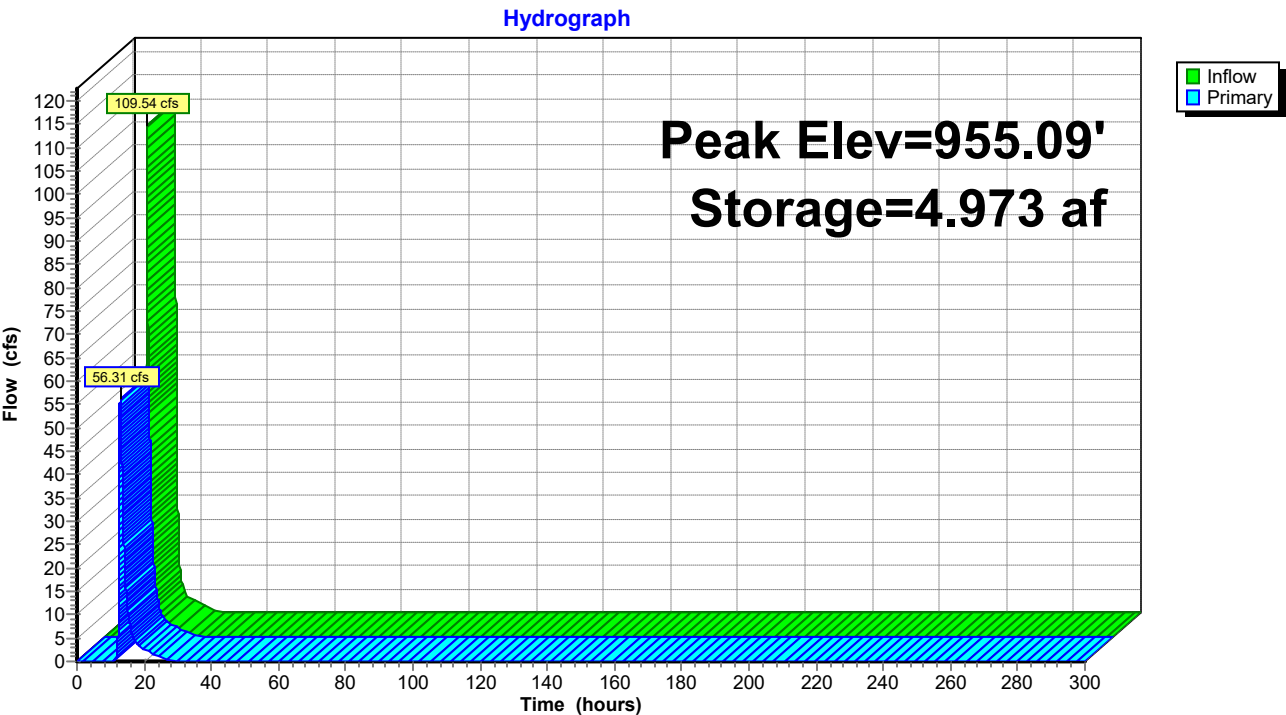
Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=56.31 cfs @ 12.87 hrs HW=955.09' TW=951.87' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 56.31 cfs @ 2.39 fps)

Pond 4EP: Offsite Wetland - Southeast



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Summary for Pond 4PP: Offsite Wetland - Southeast

Inflow = 94.75 cfs @ 12.31 hrs, Volume= 12.027 af
 Outflow = 40.79 cfs @ 12.78 hrs, Volume= 10.760 af, Atten= 57%, Lag= 28.3 min
 Primary = 40.79 cfs @ 12.78 hrs, Volume= 10.760 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.98' @ 15.21 hrs Surf.Area= 4.965 ac Storage= 4.425 af

Plug-Flow detention time= 238.3 min calculated for 10.760 af (89% of inflow)
 Center-of-Mass det. time= 181.2 min (1,028.0 - 846.8)

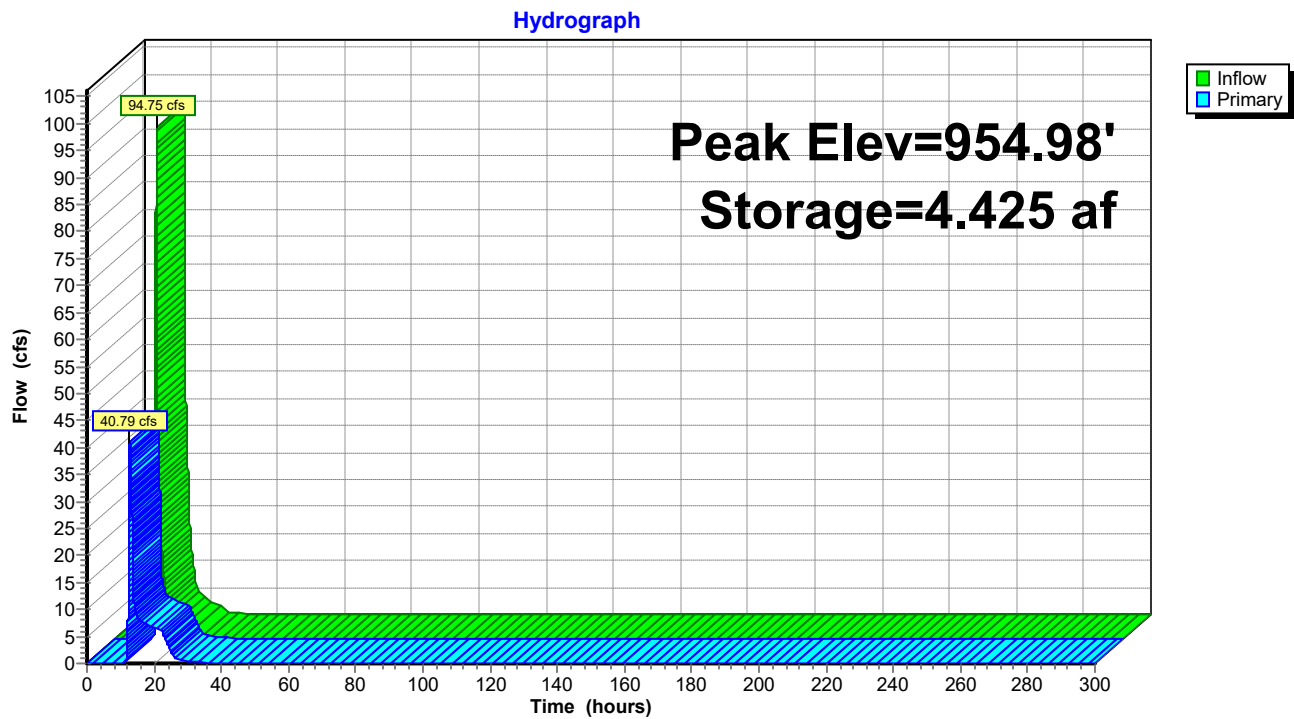
Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=40.79 cfs @ 12.78 hrs HW=954.93' TW=953.44' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 40.79 cfs @ 2.15 fps)

Pond 4PP: Offsite Wetland - Southeast



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Summary for Pond 5PP: Pond 5

Inflow = 36.81 cfs @ 12.18 hrs, Volume= 2.216 af
 Outflow = 9.54 cfs @ 13.27 hrs, Volume= 2.095 af, Atten= 74%, Lag= 65.0 min
 Primary = 9.54 cfs @ 13.27 hrs, Volume= 2.095 af
 Routed to Pond 7PP : Pond 7

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 957.69' @ 12.69 hrs Surf.Area= 25,639 sf Storage= 78,870 cf

Plug-Flow detention time= 245.6 min calculated for 2.095 af (95% of inflow)
 Center-of-Mass det. time= 212.7 min (983.2 - 770.5)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	144,732 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

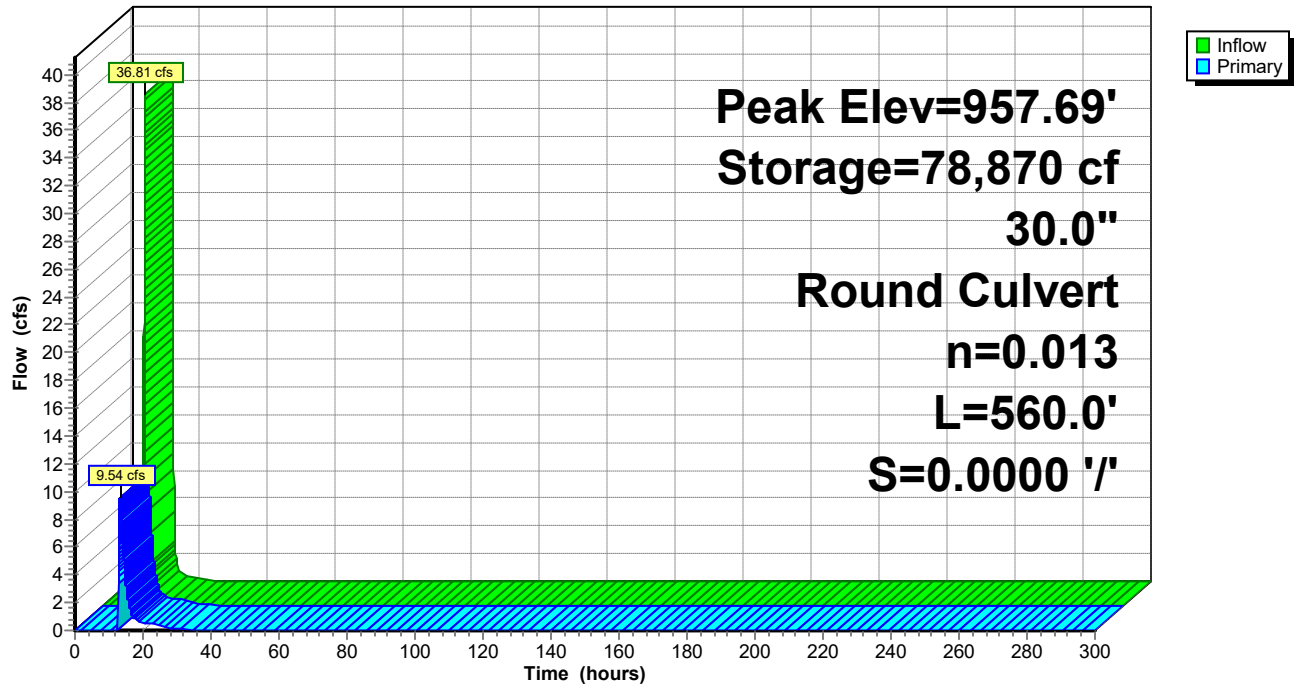
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	17,270	0	0
956.00	21,611	38,881	38,881
958.00	26,370	47,981	86,862
960.00	31,500	57,870	144,732

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=9.68 cfs @ 13.27 hrs HW=957.23' TW=956.86' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 9.68 cfs @ 1.99 fps)

Pond 5PP: Pond 5

Hydrograph



Summary for Pond 6PP: Filtration Basin 6

[86] Warning: Oscillations may require smaller dt (severity=13008)

Inflow = 104.91 cfs @ 12.17 hrs, Volume= 17.687 af
 Outflow = 30.80 cfs @ 12.43 hrs, Volume= 24.472 af, Atten= 71%, Lag= 15.2 min
 Primary = 11.59 cfs @ 15.14 hrs, Volume= 23.290 af
 Routed to Pond 8PP : Existing Territorial Ditch
 Secondary = 19.21 cfs @ 12.43 hrs, Volume= 1.182 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Peak Elev= 954.61' @ 12.43 hrs Surf.Area= 39,234 sf Storage= 109,733 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 2,666.4 min (3,807.3 - 1,141.0)

Volume	Invert	Avail.Storage	Storage Description
#1	951.50'	166,675 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
951.50	31,134	0	0
952.00	32,613	15,937	15,937
954.00	37,625	70,238	86,175
956.00	42,875	80,500	166,675

Device	Routing	Invert	Outlet Devices
#1	Primary	948.17'	18.0" Round Culvert L= 38.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.17' / 948.12' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	948.25'	6.0" Round 6" Drain tile L= 265.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.25' / 948.17' S= 0.0003 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	951.50'	1.000 in/hr Exfiltration over Surface area
#4	Secondary	952.00'	24.0" Round Culvert L= 25.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 951.50' / 952.00' S= -0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#5	Device 1	951.50'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Primary	953.50'	0.5' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=11.59 cfs @ 15.14 hrs HW=954.60' TW=950.78' (Dynamic Tailwater)

1=Culvert (Passes 10.05 cfs of 16.62 cfs potential flow)

2=6" Draintile (Outlet Controls 0.76 cfs @ 3.86 fps)

3=Exfiltration (Passes 0.76 cfs of 0.91 cfs potential flow)

5=Orifice/Grate (Orifice Controls 9.29 cfs @ 7.57 fps)

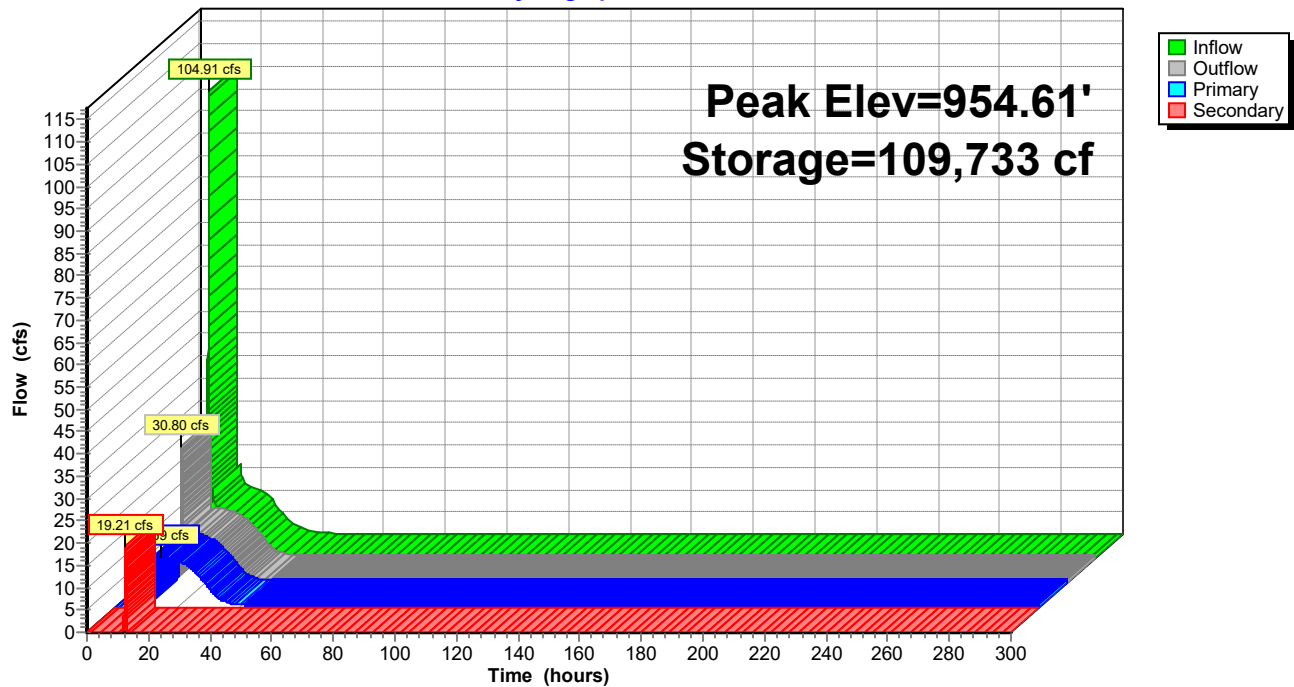
6=Broad-Crested Rectangular Weir (Weir Controls 1.54 cfs @ 2.80 fps)

Secondary OutFlow Max=19.21 cfs @ 12.43 hrs HW=954.61' TW=951.62' (Dynamic Tailwater)

4=Culvert (Inlet Controls 19.21 cfs @ 6.11 fps)

Pond 6PP: Filtration Basin 6

Hydrograph



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Summary for Pond 7PP: Pond 7

Inflow = 82.58 cfs @ 12.22 hrs, Volume= 7.592 af
 Outflow = 50.41 cfs @ 12.35 hrs, Volume= 7.535 af, Atten= 39%, Lag= 7.4 min
 Primary = 31.04 cfs @ 12.38 hrs, Volume= 6.582 af
 Routed to Pond 4PP : Offsite Wetland - Southeast
 Secondary = 19.93 cfs @ 12.31 hrs, Volume= 0.953 af
 Routed to Pond 5PP : Pond 5

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 958.45' @ 12.38 hrs Surf.Area= 15,180 sf Storage= 51,663 cf

Plug-Flow detention time= 42.7 min calculated for 7.535 af (99% of inflow)
 Center-of-Mass det. time= 30.8 min (870.7 - 840.0)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	117,172 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	8,084	0	0
956.00	11,221	19,305	19,305
958.00	14,420	25,641	44,946
960.00	17,768	32,188	77,134
962.00	22,270	40,038	117,172

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 230.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 953.70' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=31.04 cfs @ 12.38 hrs HW=958.45' TW=954.76' (Dynamic Tailwater)

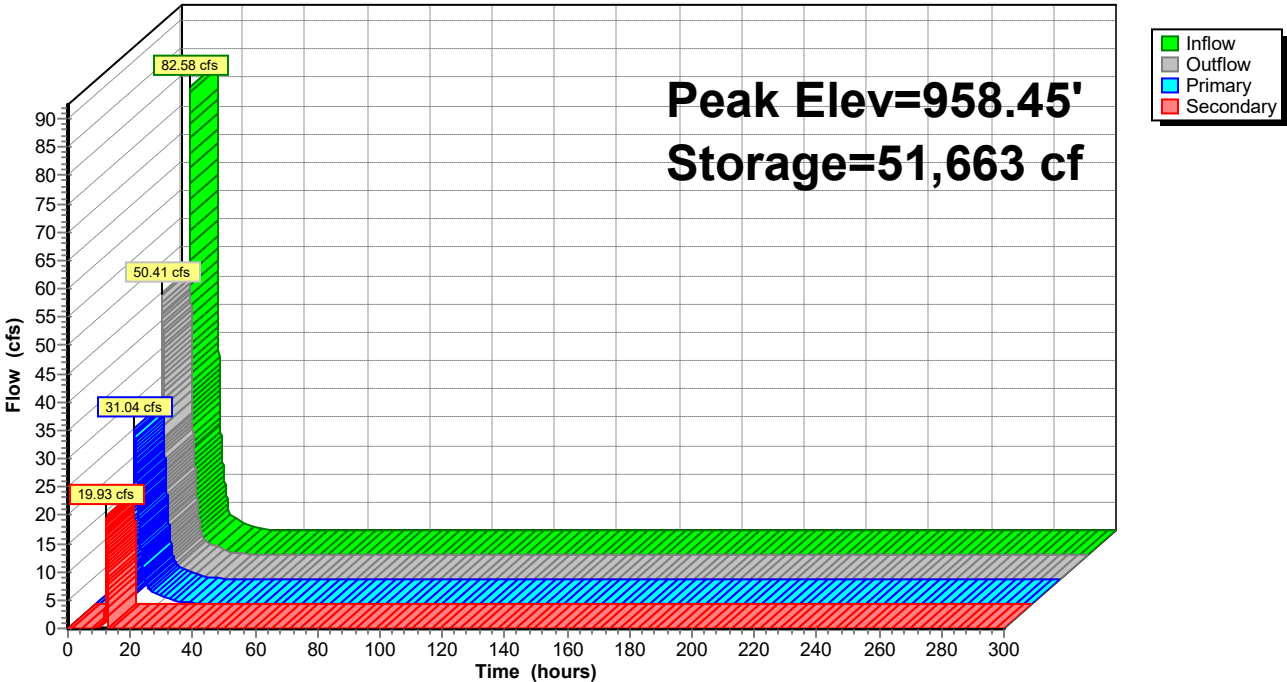
↑ **1=Culvert** (Barrel Controls 31.04 cfs @ 6.32 fps)

Secondary OutFlow Max=19.63 cfs @ 12.31 hrs HW=958.27' TW=956.61' (Dynamic Tailwater)

↑ **2=Culvert** (Outlet Controls 19.63 cfs @ 4.00 fps)

Pond 7PP: Pond 7

Hydrograph



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Summary for Pond 8PP: Existing Territorial Ditch

Inflow = 18.48 cfs @ 12.13 hrs, Volume= 23.800 af
 Outflow = 13.38 cfs @ 12.45 hrs, Volume= 23.796 af, Atten= 28%, Lag= 19.3 min
 Primary = 13.38 cfs @ 12.45 hrs, Volume= 23.796 af
 Routed to Reach 3PR : To Big Woods - Southeast Wetland Complex

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 951.34' @ 12.45 hrs Surf.Area= 3,970 sf Storage= 5,156 cf

Plug-Flow detention time= 5.5 min calculated for 23.796 af (100% of inflow)
 Center-of-Mass det. time= 3.2 min (3,897.2 - 3,894.0)

Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	31,368 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

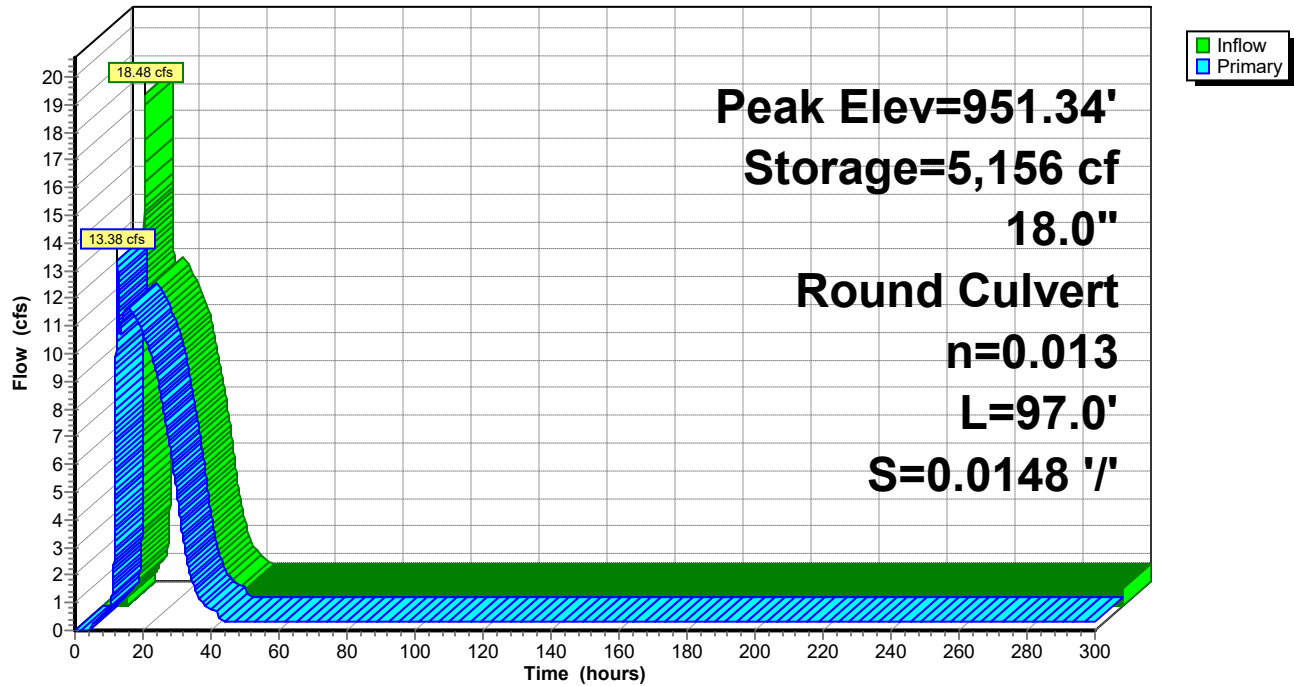
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.00	440	0	0
950.00	1,225	1,665	1,665
952.00	5,310	6,535	8,200
954.00	17,858	23,168	31,368

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=13.38 cfs @ 12.45 hrs HW=951.34' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 13.38 cfs @ 7.57 fps)

Pond 8PP: Existing Territorial Ditch

Hydrograph



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Time span=0.00-300.00 hrs, dt=0.01 hrs, 30001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1E: Direct Drainage to 1EP Runoff Area=11.480 ac 5.40% Impervious Runoff Depth=5.35"
Flow Length=1,422' Slope=0.0170 '/' Tc=25.5 min CN=87 Runoff=58.49 cfs 5.122 af

Subcatchment 1Ex: Offsite Direct Drainage Runoff Area=8.530 ac 7.27% Impervious Runoff Depth=5.35"
Flow Length=1,180' Slope=0.0180 '/' Tc=21.3 min CN=87 Runoff=47.69 cfs 3.806 af

Subcatchment 1P: Onsite Drainage to 1EP Runoff Area=0.863 ac 24.33% Impervious Runoff Depth=5.02"
Tc=5.0 min CN=84 Runoff=8.00 cfs 0.361 af

Subcatchment 2E: Direct Drainage to 2EP Runoff Area=12.650 ac 2.37% Impervious Runoff Depth=5.13"
Flow Length=1,273' Slope=0.0170 '/' Tc=25.1 min CN=85 Runoff=63.14 cfs 5.406 af

Subcatchment 2Ex: Offsite Direct Drainage Runoff Area=7.580 ac 3.96% Impervious Runoff Depth=4.91"
Flow Length=655' Slope=0.1400 '/' Tc=5.5 min CN=83 Runoff=67.83 cfs 3.098 af

Subcatchment 2P: Onsite Drainage to 2EP Runoff Area=1.150 ac 22.61% Impervious Runoff Depth=5.02"
Tc=5.0 min CN=84 Runoff=10.66 cfs 0.481 af

Subcatchment 3E: Direct Drainage to 3EP Runoff Area=7.930 ac 6.31% Impervious Runoff Depth=5.13"
Flow Length=605' Slope=0.0071 '/' Tc=21.4 min CN=85 Runoff=42.81 cfs 3.389 af

Subcatchment 3Ex: Offsite Drainage to 3EP Runoff Area=1.600 ac 6.25% Impervious Runoff Depth=4.68"
Tc=12.0 min CN=81 Runoff=10.61 cfs 0.625 af

Subcatchment 3P: Onsite Drainage to 3EP Runoff Area=2.700 ac 3.70% Impervious Runoff Depth=4.68"
Flow Length=605' Slope=0.0071 '/' Tc=24.4 min CN=81 Runoff=12.63 cfs 1.054 af

Subcatchment 4E: Direct Drainage to 4EP Runoff Area=24.090 ac 2.08% Impervious Runoff Depth=5.13"
Flow Length=1,227' Slope=0.0081 '/' Tc=35.3 min CN=85 Runoff=98.59 cfs 10.295 af

Subcatchment 4Ex: Offsite Direct Drainage Runoff Area=10.540 ac 4.74% Impervious Runoff Depth=4.79"
Flow Length=651' Slope=0.0100 '/' Tc=21.1 min CN=82 Runoff=54.55 cfs 4.211 af

Subcatchment 4P: Onsite Drainage to 4EP Runoff Area=1.577 ac 17.31% Impervious Runoff Depth=4.91"
Tc=5.0 min CN=83 Runoff=14.38 cfs 0.645 af

Subcatchment 5E: Direct Drainage to Runoff Area=5.720 ac 0.00% Impervious Runoff Depth=5.35"
Flow Length=560' Slope=0.0240 '/' Tc=10.2 min CN=87 Runoff=44.95 cfs 2.552 af

Subcatchment 5P: Onsite Drainage to 5PP Runoff Area=2.820 ac 11.35% Impervious Runoff Depth=4.79"
Tc=10.0 min CN=82 Runoff=20.51 cfs 1.127 af

Subcatchment 6P: Drainage to Filtration Runoff Area=12.000 ac 39.17% Impervious Runoff Depth=5.35"
Tc=10.0 min CN=87 Runoff=94.92 cfs 5.354 af

Subcatchment 7P: Onsite Drainage to 7PP Runoff Area=11.300 ac 32.74% Impervious Runoff Depth=5.24"
Tc=15.0 min CN=86 Runoff=74.54 cfs 4.935 af

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Subcatchment 8Ex: Territorial Ditch Runoff Area=1.070 ac 28.97% Impervious Runoff Depth=5.13"
Tc=5.0 min CN=85 Runoff=10.08 cfs 0.457 af

Subcatchment 9P: Offsite Drainage East Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=4.57"
Tc=5.0 min CN=80 Runoff=0.69 cfs 0.030 af

Reach 1ER: To Big Woods - Southwest Wetland Complex Inflow=44.37 cfs 8.205 af
Outflow=44.37 cfs 8.205 af

Reach 1PR: To Big Woods - Southwest Wetland Complex Inflow=42.51 cfs 6.284 af
Outflow=42.51 cfs 6.284 af

Reach 2ER: Existing Overflow Offsite to North Inflow=48.96 cfs 2.322 af
Outflow=48.96 cfs 2.322 af

Reach 2PR: Existing Overflow Offsite to North Inflow=36.19 cfs 1.461 af
Outflow=36.19 cfs 1.461 af

Reach 3ER: To Big Woods - Southeast Wetland Complex Inflow=16.45 cfs 9.740 af
Outflow=16.45 cfs 9.740 af

Reach 3PR: To Big Woods - Southeast Wetland Complex Inflow=12.52 cfs 21.686 af
Outflow=12.52 cfs 21.686 af

Pond 1EP: Offsite Low Area - Northwest Peak Elev=948.51' Storage=0.835 af Inflow=77.68 cfs 5.837 af
Primary=15.03 cfs 3.514 af Secondary=48.96 cfs 2.322 af Outflow=63.99 cfs 5.836 af

Pond 1PP: Offsite Low Area - Northwest Peak Elev=948.23' Storage=0.631 af Inflow=64.15 cfs 4.467 af
Primary=14.35 cfs 3.005 af Secondary=36.19 cfs 1.461 af Outflow=50.53 cfs 4.467 af

Pond 2EP: Offsite Low Area - North Middle Peak Elev=950.53' Storage=0.562 af Inflow=63.14 cfs 5.406 af
Primary=29.40 cfs 4.691 af Secondary=23.49 cfs 0.715 af Outflow=52.89 cfs 5.406 af

Pond 2PP: Offsite Low Area - North Middle Peak Elev=950.43' Storage=0.514 af Inflow=78.48 cfs 3.579 af
Primary=29.03 cfs 3.278 af Secondary=20.03 cfs 0.301 af Outflow=49.05 cfs 3.579 af

Pond 3EP: Existing Wetland - Northeast Peak Elev=952.61' Storage=6.304 af Inflow=58.27 cfs 12.417 af
Primary=16.45 cfs 9.740 af Secondary=0.00 cfs 0.000 af Outflow=16.45 cfs 9.740 af

Pond 3PP: Existing Wetland - Northeast Peak Elev=954.77' Storage=254,710 cf Inflow=57.00 cfs 12.256 af
Primary=10.81 cfs 10.161 af Tertiary=0.00 cfs 0.000 af Outflow=10.81 cfs 10.161 af

Pond 4EP: Offsite Wetland - Southeast Peak Elev=955.01' Storage=4.588 af Inflow=98.59 cfs 10.295 af
Outflow=48.36 cfs 9.028 af

Pond 4PP: Offsite Wetland - Southeast Peak Elev=954.87' Storage=3.896 af Inflow=85.59 cfs 10.739 af
Outflow=34.57 cfs 9.472 af

Pond 5PP: Pond 5 Peak Elev=957.36' Storage=70,482 cf Inflow=33.60 cfs 1.988 af
30.0" Round Culvert n=0.013 L=560.0' S=0.0000 ' /' Outflow=8.46 cfs 1.867 af

Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Pond 6PP: Filtration Basin 6

Peak Elev=954.41' Storage=101,973 cf Inflow=94.92 cfs 15.515 af
Primary=10.87 cfs 21.234 af Secondary=17.21 cfs 1.106 af Outflow=27.76 cfs 22.340 af

Pond 7PP: Pond 7

Peak Elev=958.09' Storage=46,296 cf Inflow=74.54 cfs 6.802 af
Primary=28.45 cfs 5.883 af Secondary=19.14 cfs 0.861 af Outflow=47.53 cfs 6.744 af

Pond 8PP: Existing Territorial Ditch

Peak Elev=951.03' Storage=4,023 cf Inflow=16.90 cfs 21.691 af
18.0" Round Culvert n=0.013 L=97.0' S=0.0148 '/' Outflow=12.52 cfs 21.687 af

Total Runoff Area = 123.680 ac Runoff Volume = 52.947 af Average Runoff Depth = 5.14"
89.24% Pervious = 110.367 ac 10.76% Impervious = 13.313 ac

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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 1E: Direct Drainage to 1EP

Runoff = 58.49 cfs @ 12.36 hrs, Volume= 5.122 af, Depth= 5.35"
Routed to Pond 1EP : Offsite Low Area - Northwest

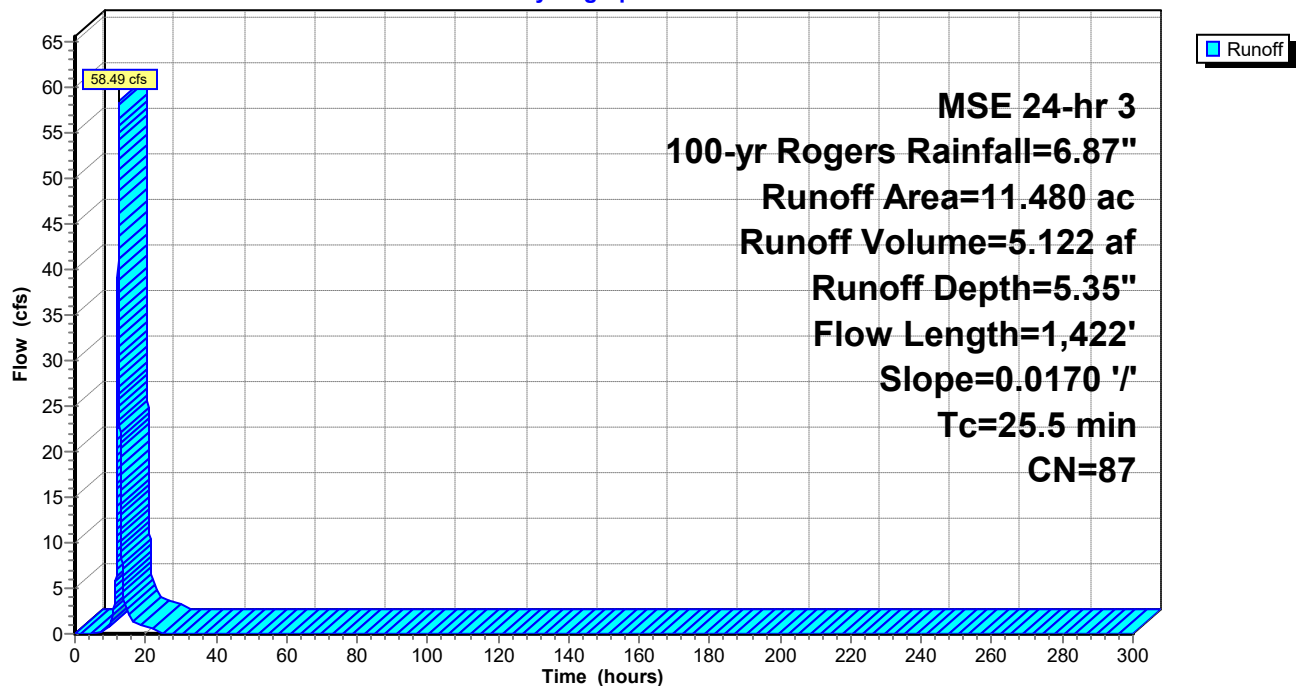
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
10.110	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
11.480	87	Weighted Average
10.860		94.60% Pervious Area
0.620		5.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.5	1,422	0.0170	0.93		Lag/CN Method,

Subcatchment 1E: Direct Drainage to 1EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Runoff = 47.69 cfs @ 12.30 hrs, Volume= 3.806 af, Depth= 5.35"

Routed to Pond 1PP : Offsite Low Area - Northwest

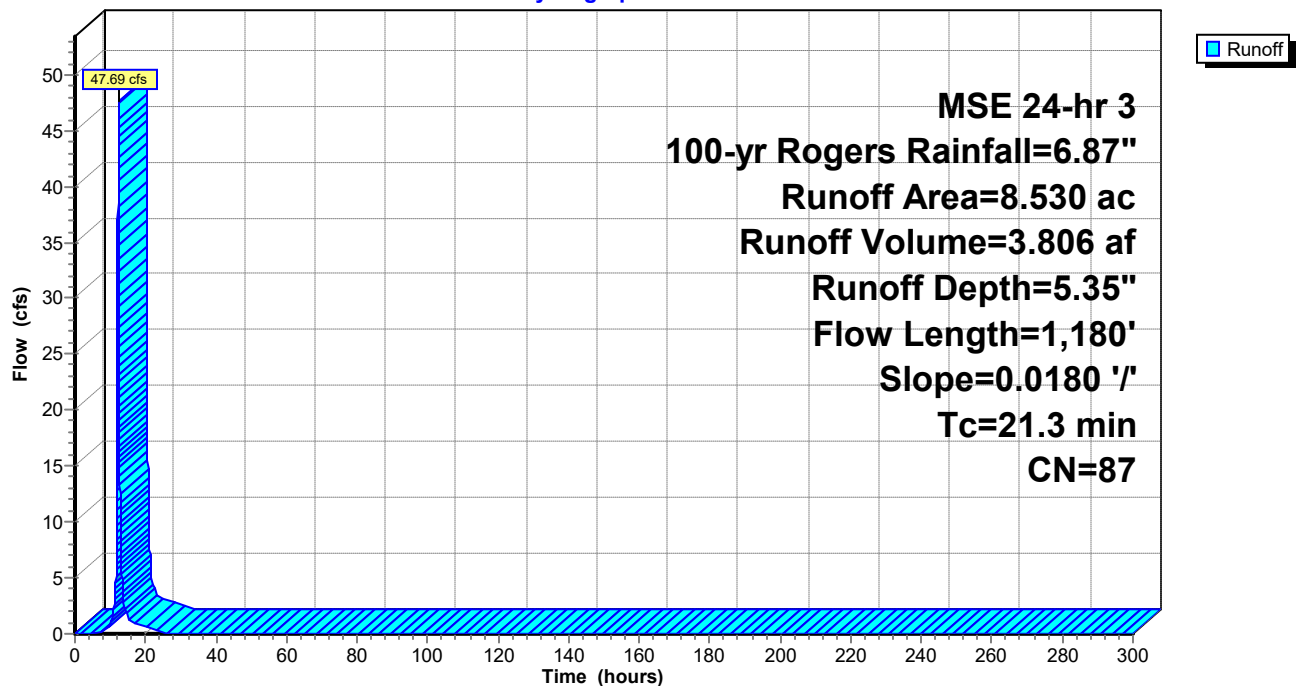
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
7.160	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
8.530	87	Weighted Average
7.910		92.73% Pervious Area
0.620		7.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	1,180	0.0180	0.92		Lag/CN Method,

Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 1P: Onsite Drainage to 1EP

Runoff = 8.00 cfs @ 12.12 hrs, Volume= 0.361 af, Depth= 5.02"

Routed to Pond 1PP : Offsite Low Area - Northwest

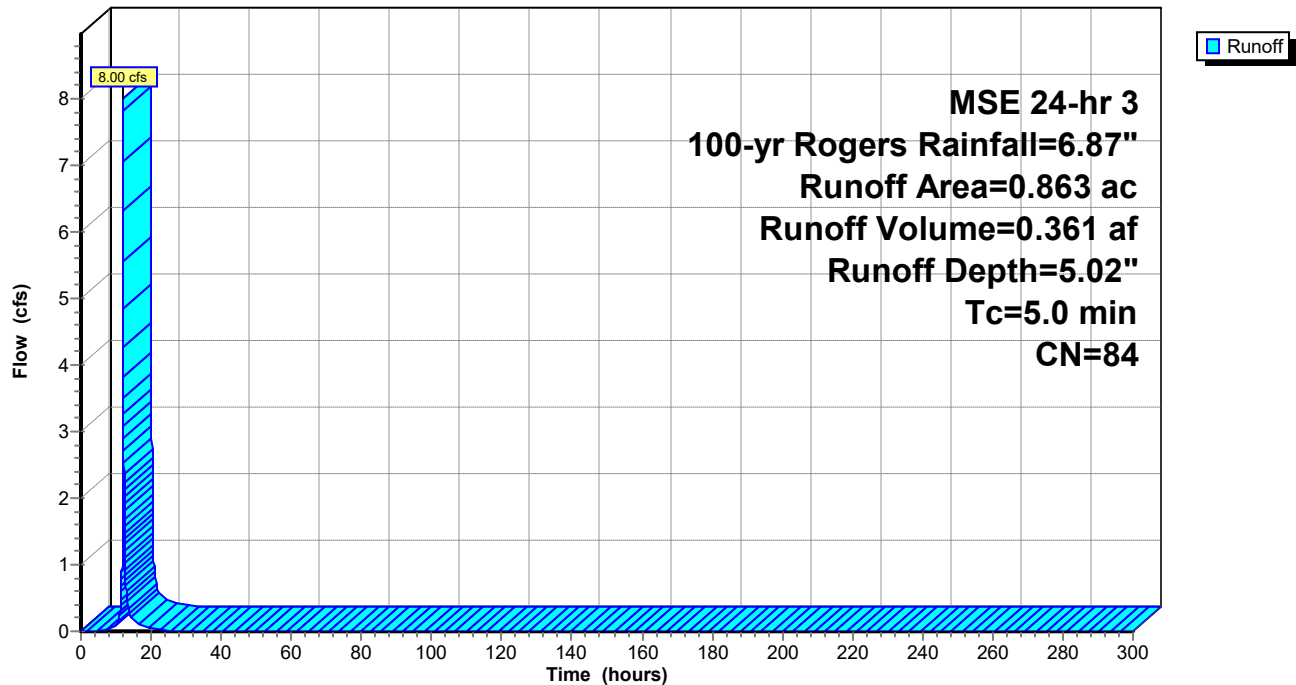
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.210	98	Proposed Impervious
0.653	80	>75% Grass cover, Good, HSG D
0.863	84	Weighted Average
0.653		75.67% Pervious Area
0.210		24.33% Impervious Area

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

Subcatchment 1P: Onsite Drainage to 1EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 2E: Direct Drainage to 2EP

Runoff = 63.14 cfs @ 12.35 hrs, Volume= 5.406 af, Depth= 5.13"
Routed to Pond 2EP : Offsite Low Area - North Middle

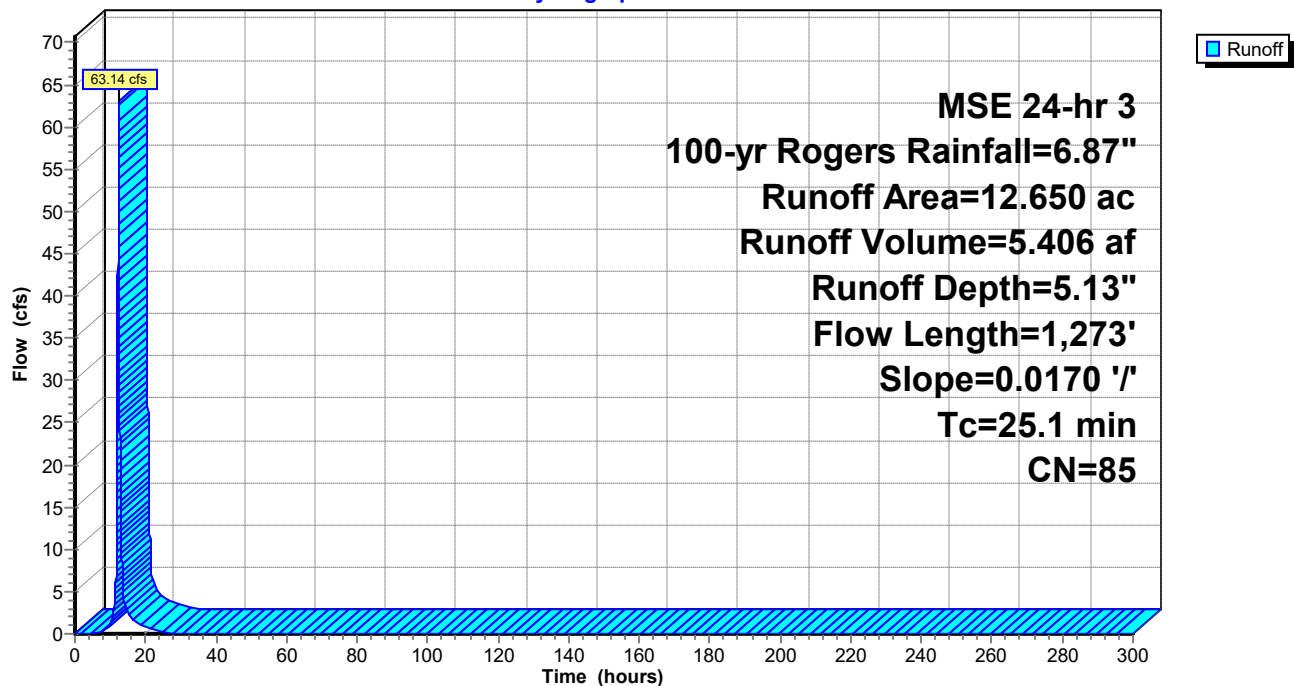
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
7.540	87	Small grain, straight row, Good, HSG D
12.650	85	Weighted Average
12.350		97.63% Pervious Area
0.300		2.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.1	1,273	0.0170	0.85		Lag/CN Method,

Subcatchment 2E: Direct Drainage to 2EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Runoff = 67.83 cfs @ 12.13 hrs, Volume= 3.098 af, Depth= 4.91"

Routed to Pond 2PP : Offsite Low Area - North Middle

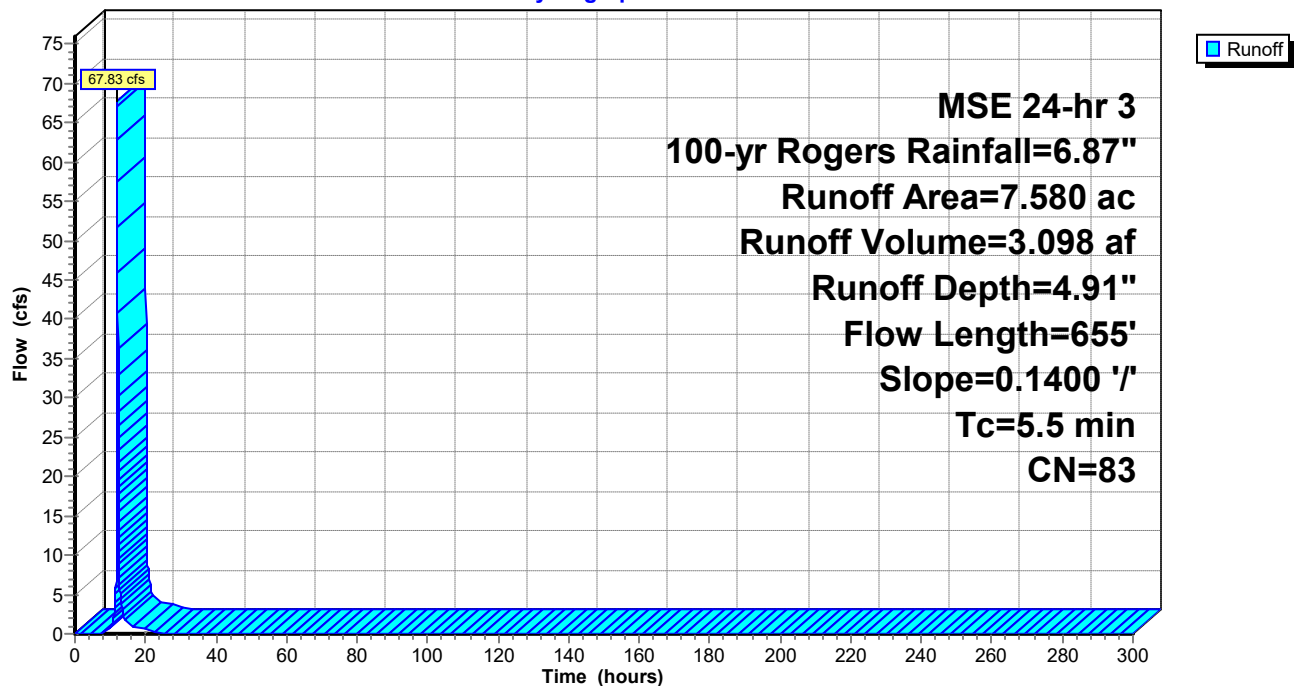
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
2.470	87	Small grain, straight row, Good, HSG D
7.580	83	Weighted Average
7.280		96.04% Pervious Area
0.300		3.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	655	0.1400	1.99		Lag/CN Method,

Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 2P: Onsite Drainage to 2EP

Runoff = 10.66 cfs @ 12.12 hrs, Volume= 0.481 af, Depth= 5.02"

Routed to Pond 2PP : Offsite Low Area - North Middle

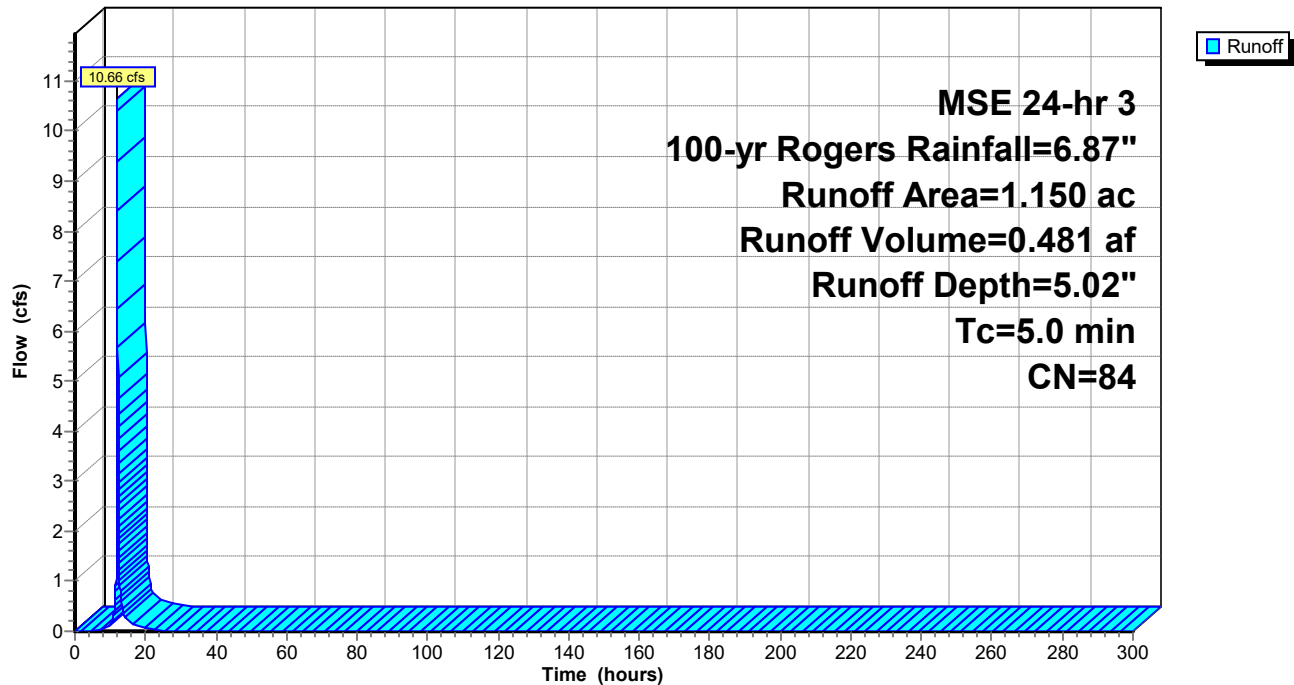
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.260	98	Proposed Impervious
0.890	80	>75% Grass cover, Good, HSG D
1.150	84	Weighted Average
0.890		77.39% Pervious Area
0.260		22.61% Impervious Area

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

Subcatchment 2P: Onsite Drainage to 2EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 3E: Direct Drainage to 3EP

Runoff = 42.81 cfs @ 12.30 hrs, Volume= 3.389 af, Depth= 5.13"

Routed to Pond 3EP : Existing Wetland - Northeast

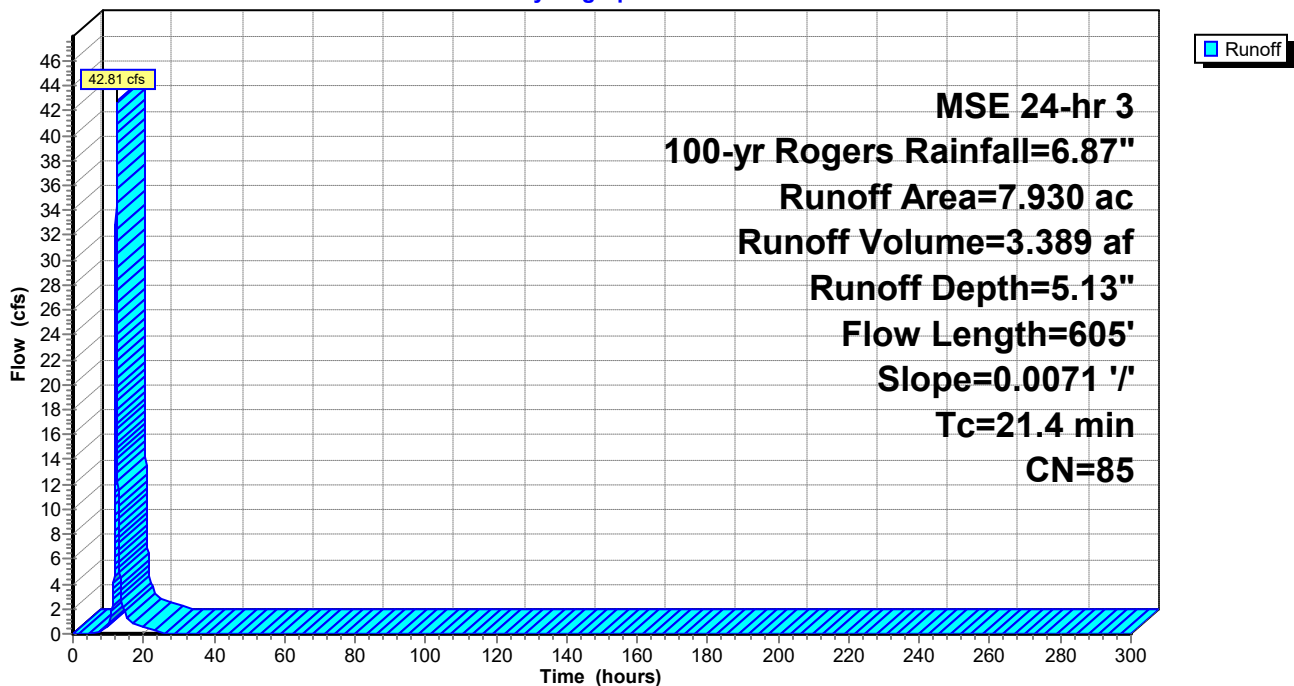
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
2.780	80	>75% Grass cover, Good, HSG D
4.650	87	Small grain, straight row, Good, HSG D
7.930	85	Weighted Average
7.430		93.69% Pervious Area
0.500		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	605	0.0071	0.47		Lag/CN Method,

Subcatchment 3E: Direct Drainage to 3EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 3Ex: Offsite Drainage to 3EP

Runoff = 10.61 cfs @ 12.20 hrs, Volume= 0.625 af, Depth= 4.68"
Routed to Pond 3PP : Existing Wetland - Northeast

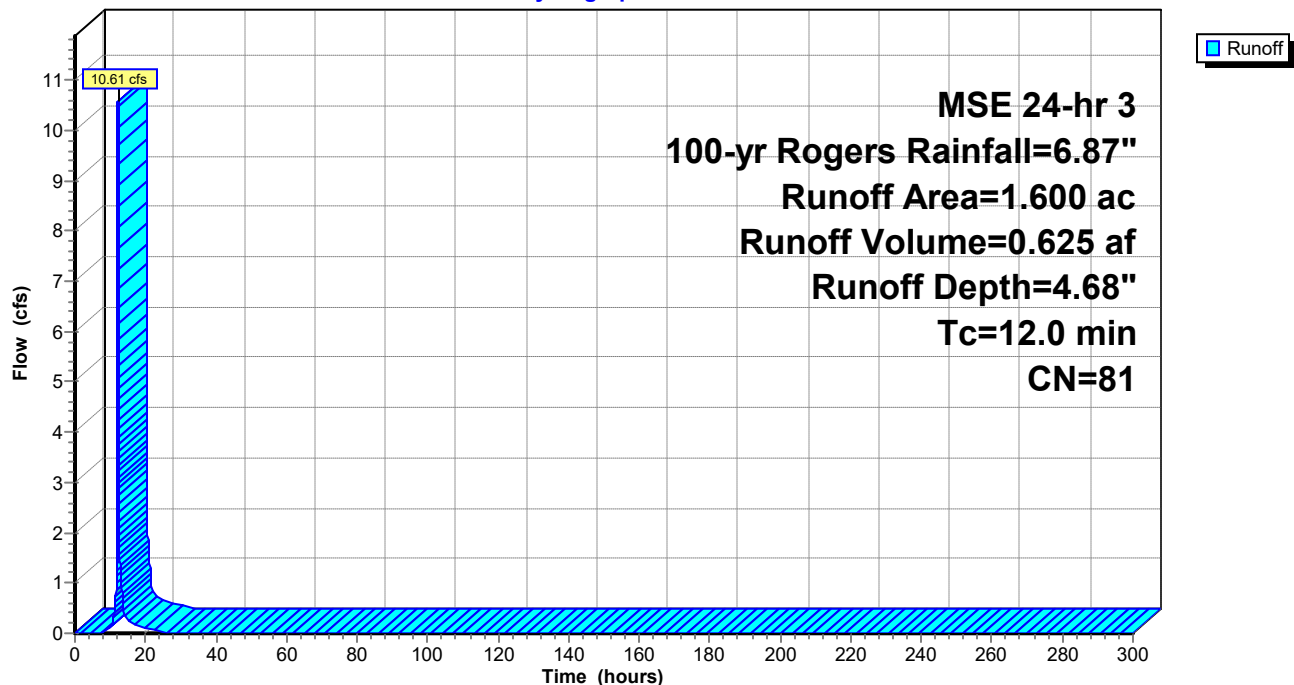
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
1.500	80	>75% Grass cover, Good, HSG D
1.600	81	Weighted Average
1.500		93.75% Pervious Area
0.100		6.25% Impervious Area

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

Subcatchment 3Ex: Offsite Drainage to 3EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 3P: Onsite Drainage to 3EP

Runoff = 12.63 cfs @ 12.34 hrs, Volume= 1.054 af, Depth= 4.68"
Routed to Pond 3PP : Existing Wetland - Northeast

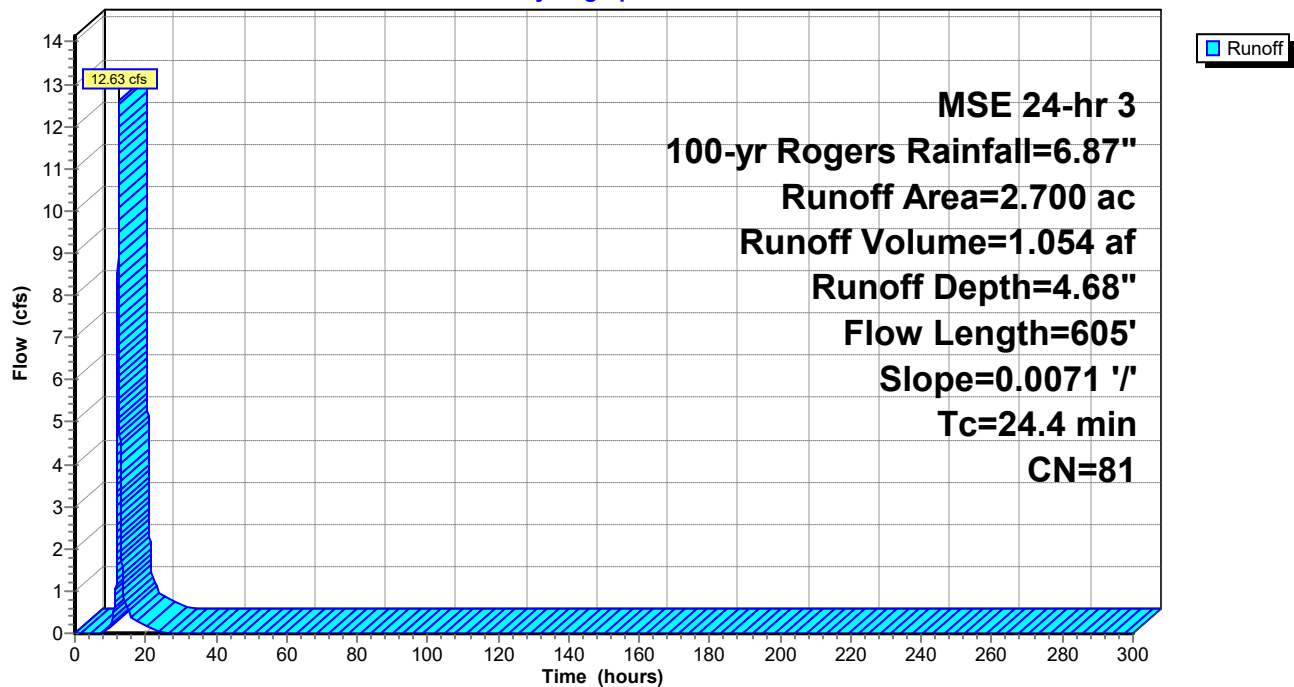
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
2.600	80	>75% Grass cover, Good, HSG D
2.700	81	Weighted Average
2.600		96.30% Pervious Area
0.100		3.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.4	605	0.0071	0.41		Lag/CN Method,

Subcatchment 3P: Onsite Drainage to 3EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 4E: Direct Drainage to 4EP

Runoff = 98.59 cfs @ 12.48 hrs, Volume= 10.295 af, Depth= 5.13"
Routed to Pond 4EP : Offsite Wetland - Southeast

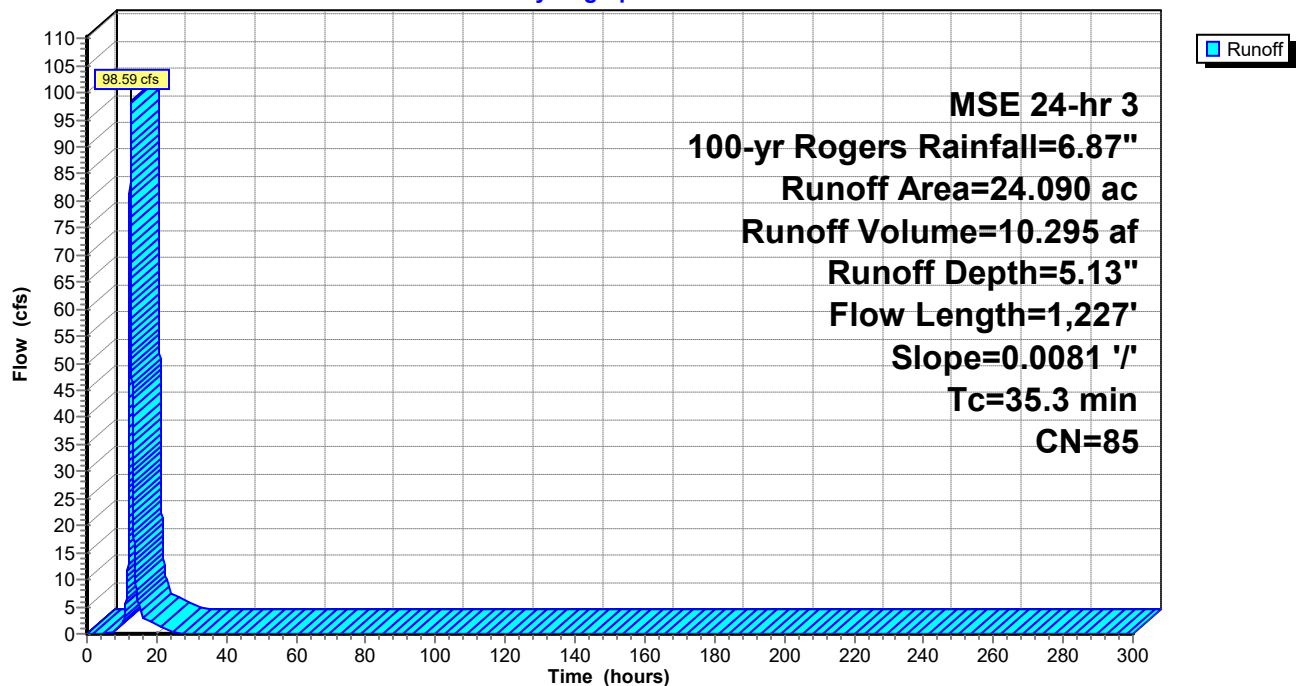
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
8.950	80	>75% Grass cover, Good, HSG D
14.640	87	Small grain, straight row, Good, HSG D
24.090	85	Weighted Average
23.590		97.92% Pervious Area
0.500		2.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	1,227	0.0081	0.58		Lag/CN Method,

Subcatchment 4E: Direct Drainage to 4EP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Runoff = 54.55 cfs @ 12.31 hrs, Volume= 4.211 af, Depth= 4.79"
Routed to Pond 4PP : Offsite Wetland - Southeast

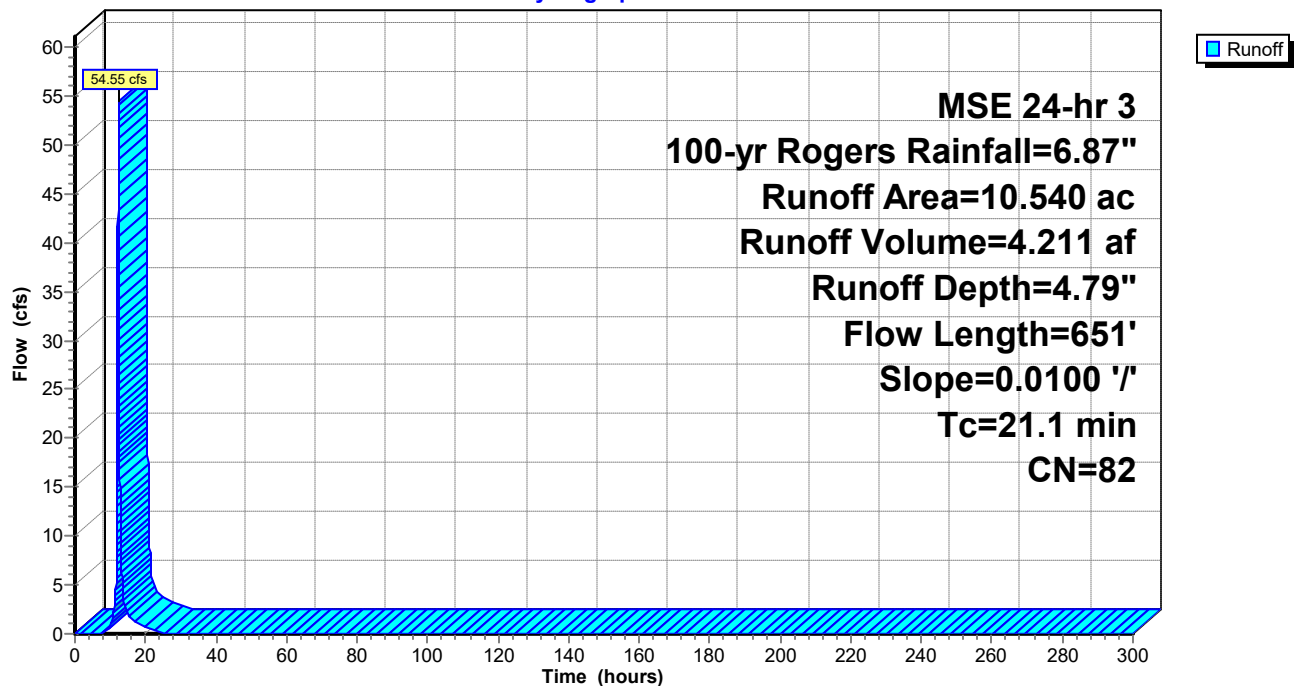
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
7.990	80	>75% Grass cover, Good, HSG D
2.050	87	Small grain, straight row, Good, HSG D
10.540	82	Weighted Average
10.040		95.26% Pervious Area
0.500		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.1	651	0.0100	0.51		Lag/CN Method,

Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Hydrograph



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Summary for Subcatchment 4P: Onsite Drainage to 4EP

Runoff = 14.38 cfs @ 12.12 hrs, Volume= 0.645 af, Depth= 4.91"
Routed to Pond 4PP : Offsite Wetland - Southeast

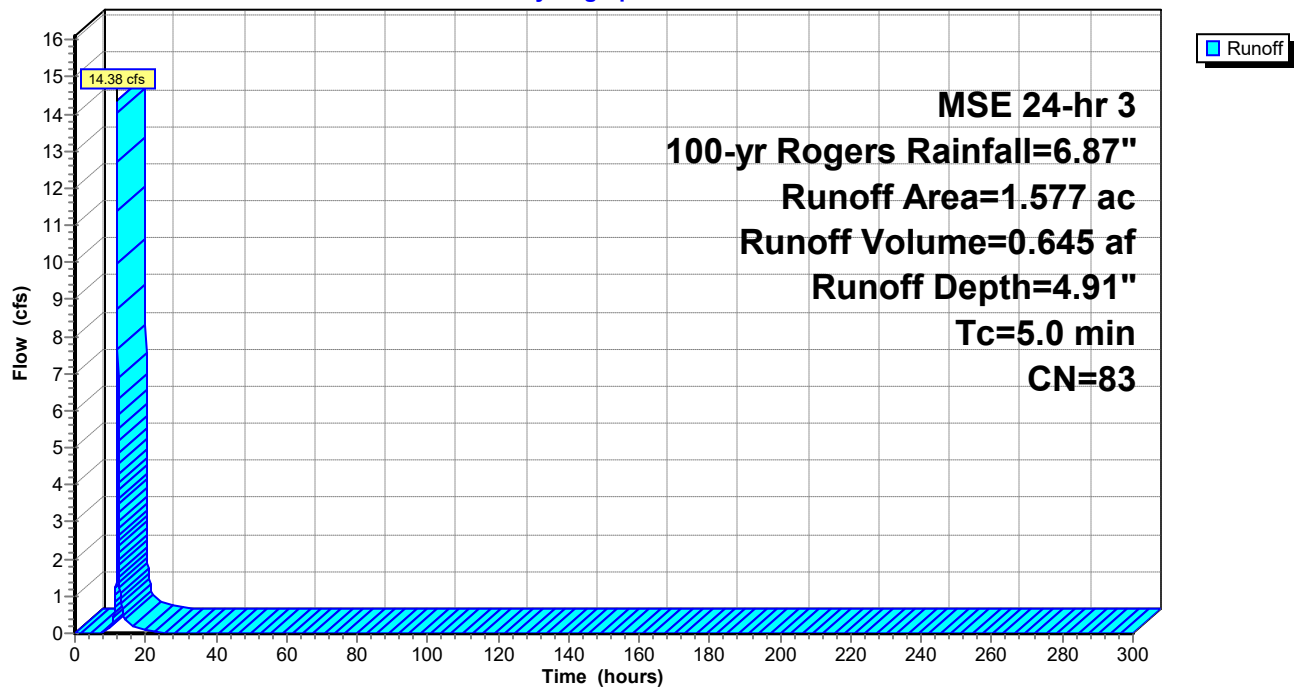
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
0.273	98	Paved parking, HSG D
1.304	80	>75% Grass cover, Good, HSG D
1.577	83	Weighted Average
1.304		82.69% Pervious Area
0.273		17.31% Impervious Area

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

Subcatchment 4P: Onsite Drainage to 4EP

Hydrograph



Summary for Subcatchment 5E: Direct Drainage to Southwest Wetland

Runoff = 44.95 cfs @ 12.18 hrs, Volume= 2.552 af, Depth= 5.35"

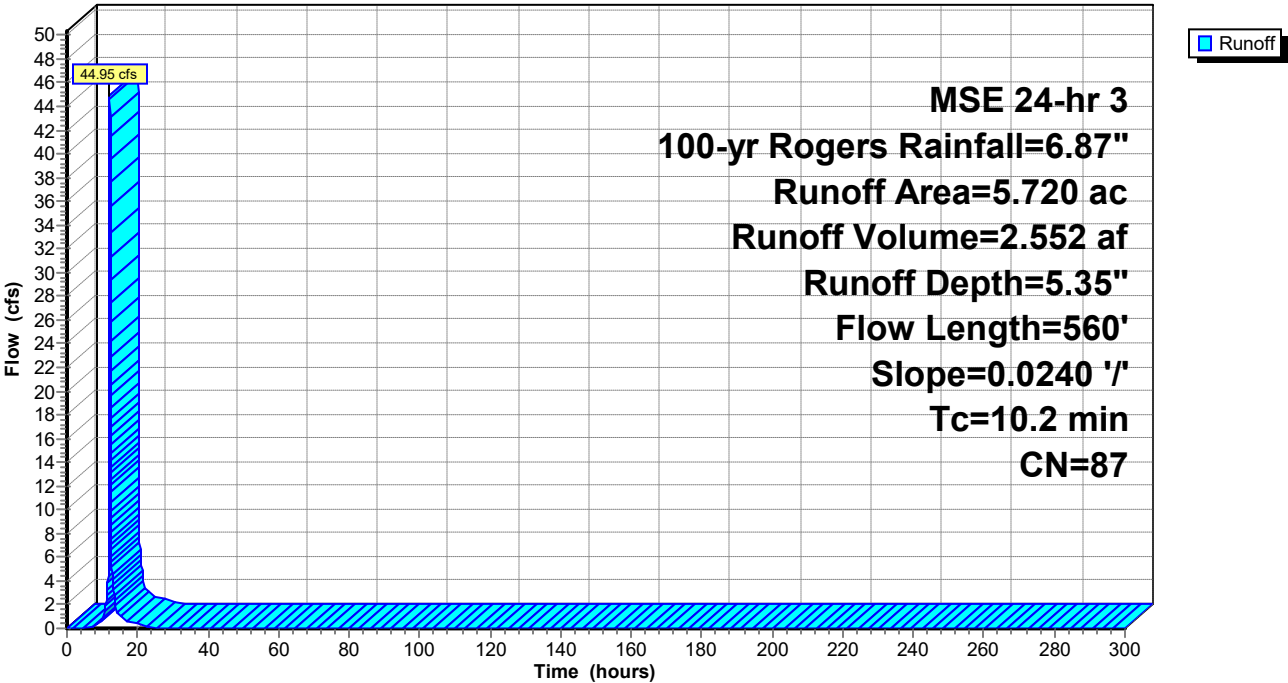
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
5.720	87	Small grain, straight row, Good, HSG D
5.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	560	0.0240	0.92		Lag/CN Method,

Subcatchment 5E: Direct Drainage to Southwest Wetland

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 5P: Onsite Drainage to 5PP

Runoff = 20.51 cfs @ 12.17 hrs, Volume= 1.127 af, Depth= 4.79"
Routed to Pond 5PP : Pond 5

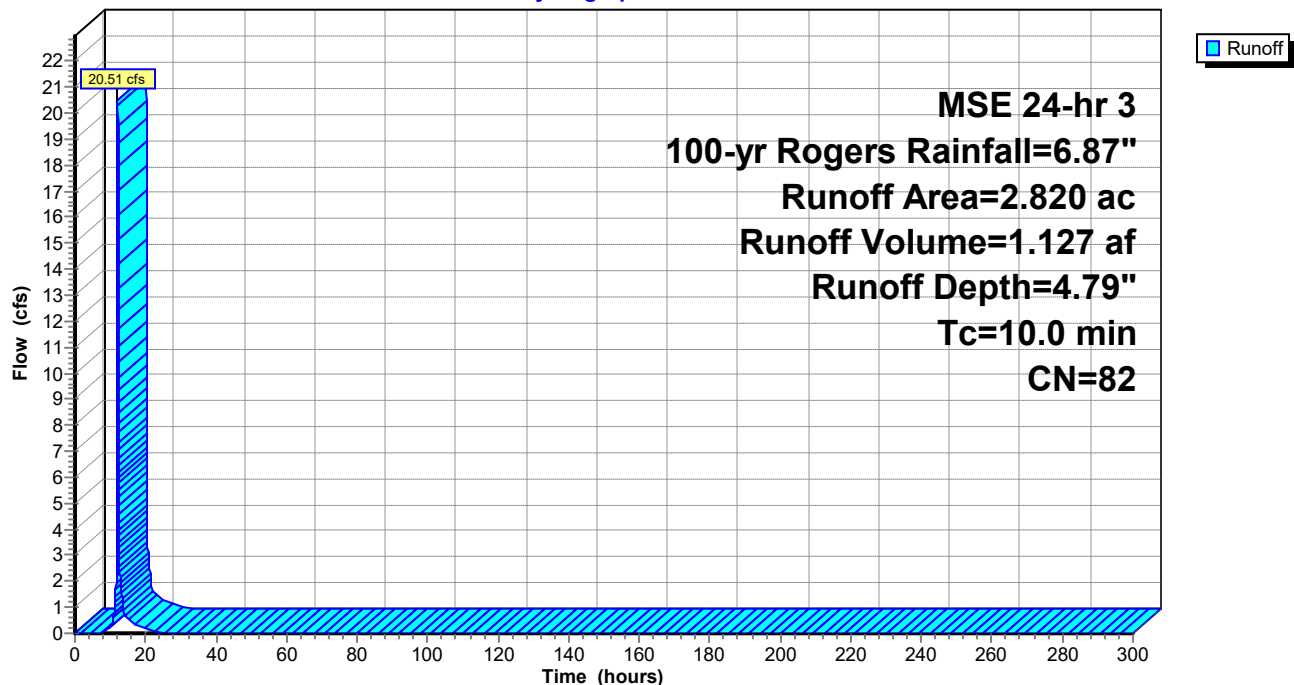
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.320	98	Proposed Impervious
2.500	80	>75% Grass cover, Good, HSG D
2.820	82	Weighted Average
2.500		88.65% Pervious Area
0.320		11.35% Impervious Area

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

Subcatchment 5P: Onsite Drainage to 5PP

Hydrograph



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Summary for Subcatchment 6P: Drainage to Filtration Basin 6

Runoff = 94.92 cfs @ 12.17 hrs, Volume= 5.354 af, Depth= 5.35"
Routed to Pond 6PP : Filtration Basin 6

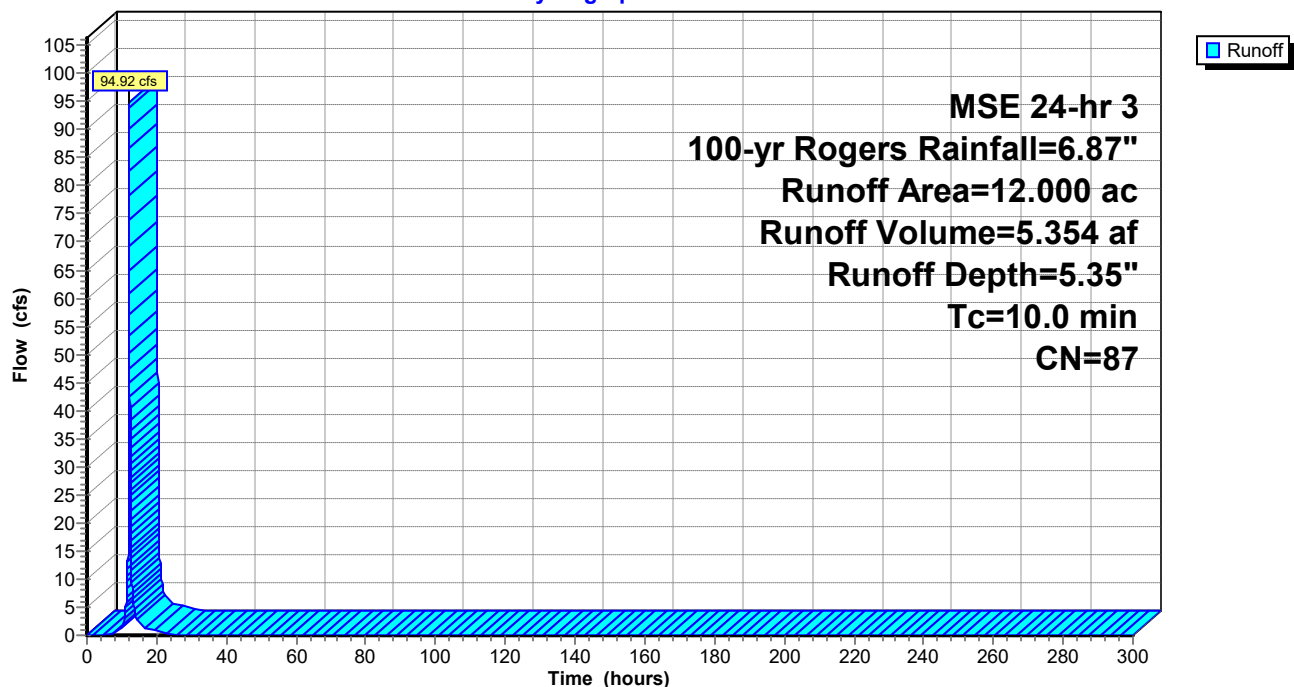
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
4.700	98	Paved parking, HSG D
7.300	80	>75% Grass cover, Good, HSG D
12.000	87	Weighted Average
7.300		60.83% Pervious Area
4.700		39.17% Impervious Area

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

Subcatchment 6P: Drainage to Filtration Basin 6

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 7P: Onsite Drainage to 7PP

Runoff = 74.54 cfs @ 12.22 hrs, Volume= 4.935 af, Depth= 5.24"
Routed to Pond 7PP : Pond 7

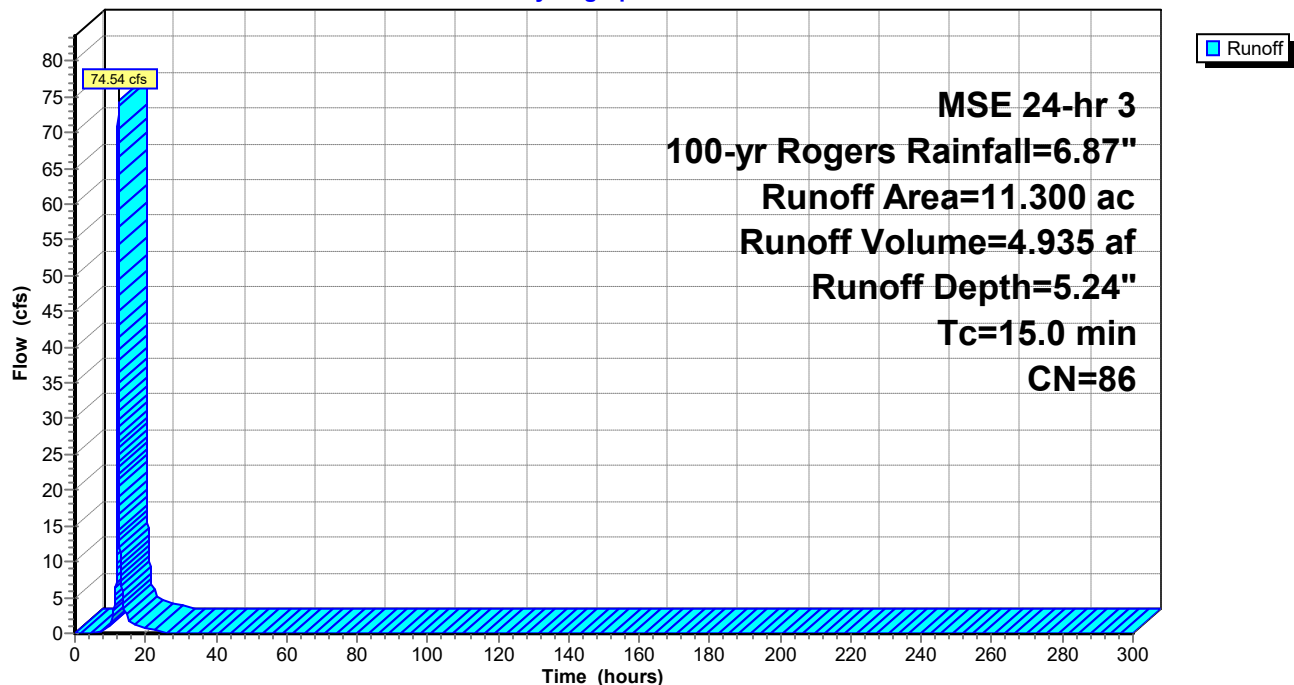
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 3.700	98	Proposed Impervious
7.600	80	>75% Grass cover, Good, HSG D
11.300	86	Weighted Average
7.600		67.26% Pervious Area
3.700		32.74% Impervious Area

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

Subcatchment 7P: Onsite Drainage to 7PP

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Subcatchment 8Ex: Territorial Ditch

Runoff = 10.08 cfs @ 12.12 hrs, Volume= 0.457 af, Depth= 5.13"
Routed to Pond 8PP : Existing Territorial Ditch

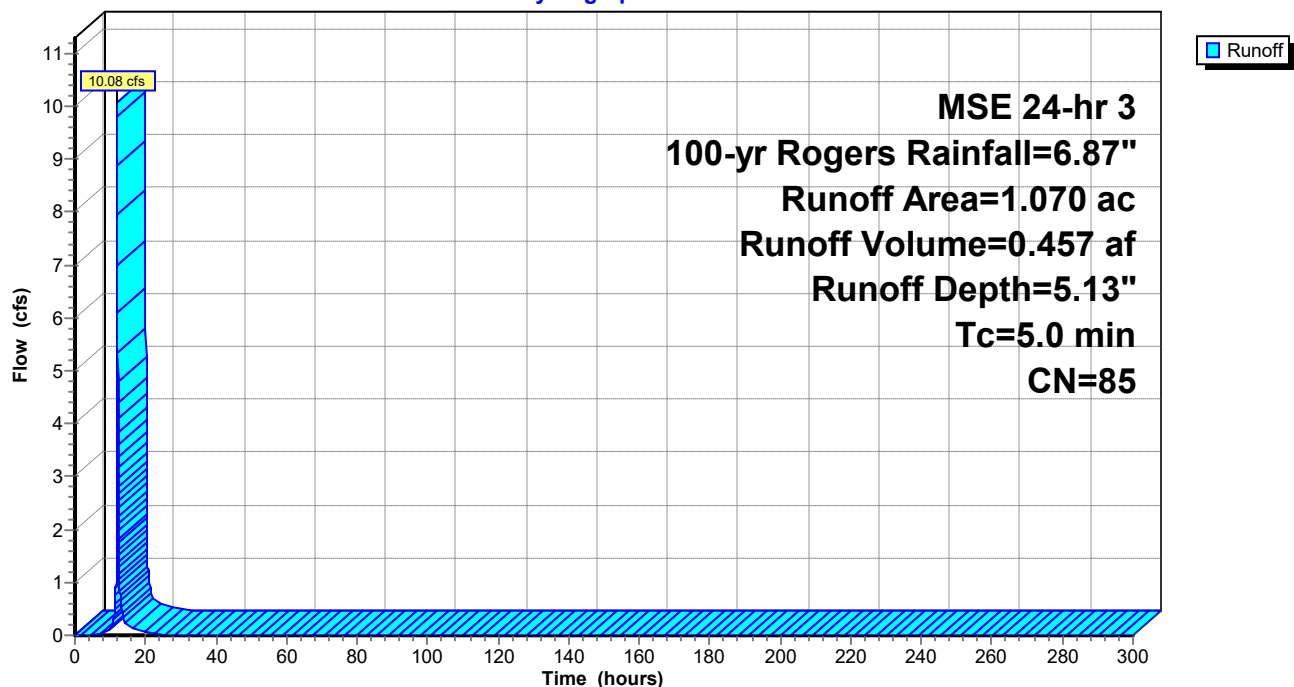
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
* 0.310	98	Existing Impervious
0.760	80	>75% Grass cover, Good, HSG D
1.070	85	Weighted Average
0.760		71.03% Pervious Area
0.310		28.97% Impervious Area

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

Subcatchment 8Ex: Territorial Ditch

Hydrograph



Summary for Subcatchment 9P: Offsite Drainage East

Runoff = 0.69 cfs @ 12.12 hrs, Volume= 0.030 af, Depth= 4.57"

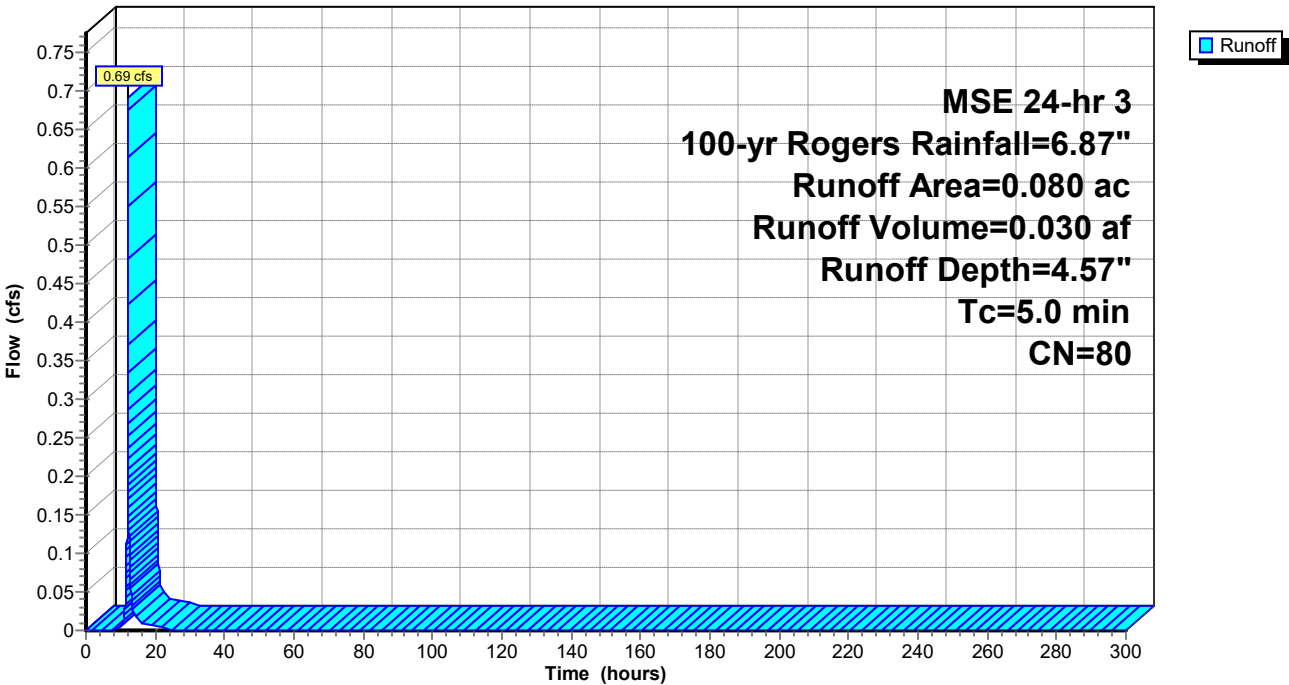
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

Area (ac)	CN	Description
0.080	80	>75% Grass cover, Good, HSG D
0.080		100.00% Pervious Area

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

Subcatchment 9P: Offsite Drainage East

Hydrograph



Summary for Reach 1ER: To Big Woods - Southwest Wetland Complex

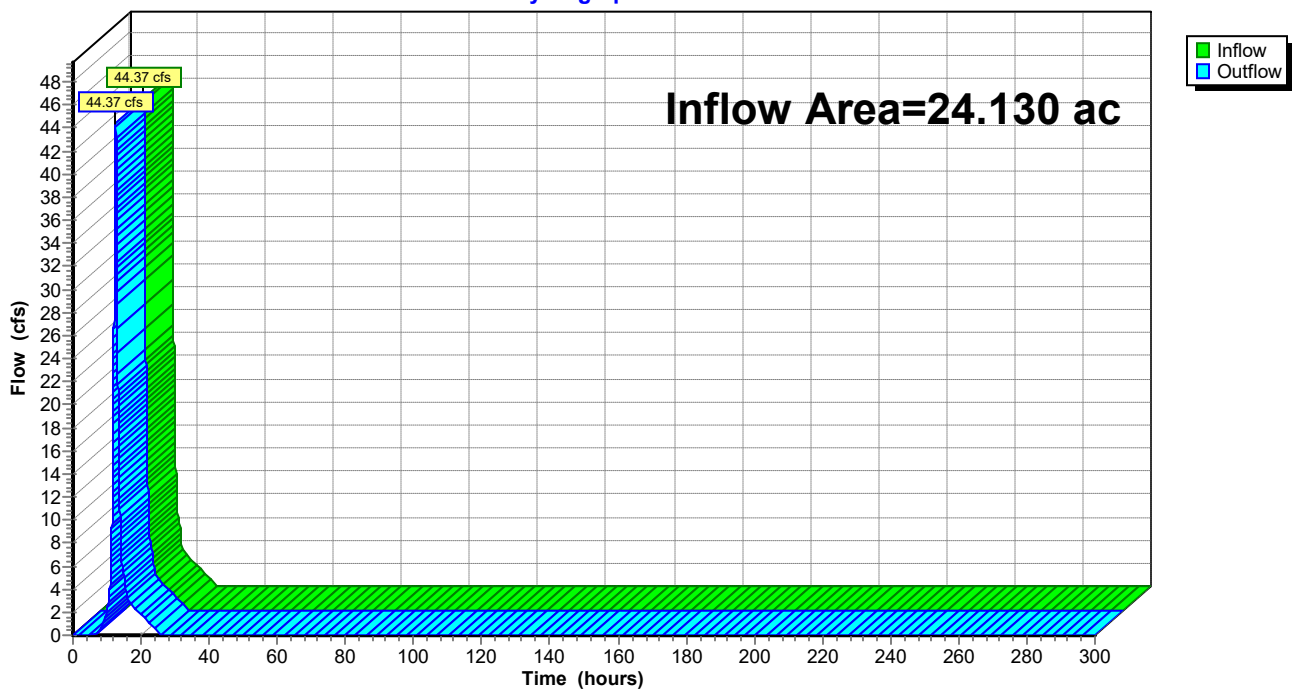
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 24.130 ac, 3.81% Impervious, Inflow Depth = 4.08" for 100-yr Rogers event
 Inflow = 44.37 cfs @ 12.51 hrs, Volume= 8.205 af
 Outflow = 44.37 cfs @ 12.52 hrs, Volume= 8.205 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1ER: To Big Woods - Southwest Wetland Complex

Hydrograph

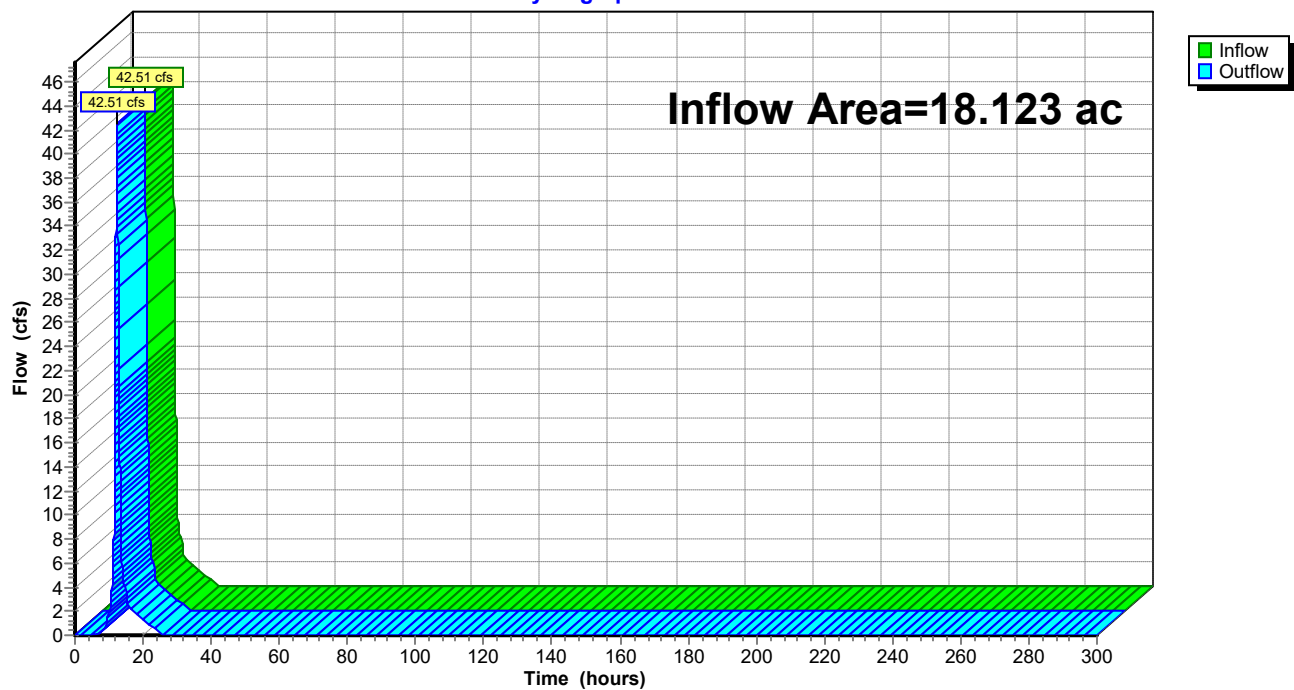


Summary for Reach 1PR: To Big Woods - Southwest Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.123 ac, 7.67% Impervious, Inflow Depth = 4.16" for 100-yr Rogers event
Inflow = 42.51 cfs @ 12.23 hrs, Volume= 6.284 af
Outflow = 42.51 cfs @ 12.24 hrs, Volume= 6.284 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1PR: To Big Woods - Southwest Wetland Complex**Hydrograph**

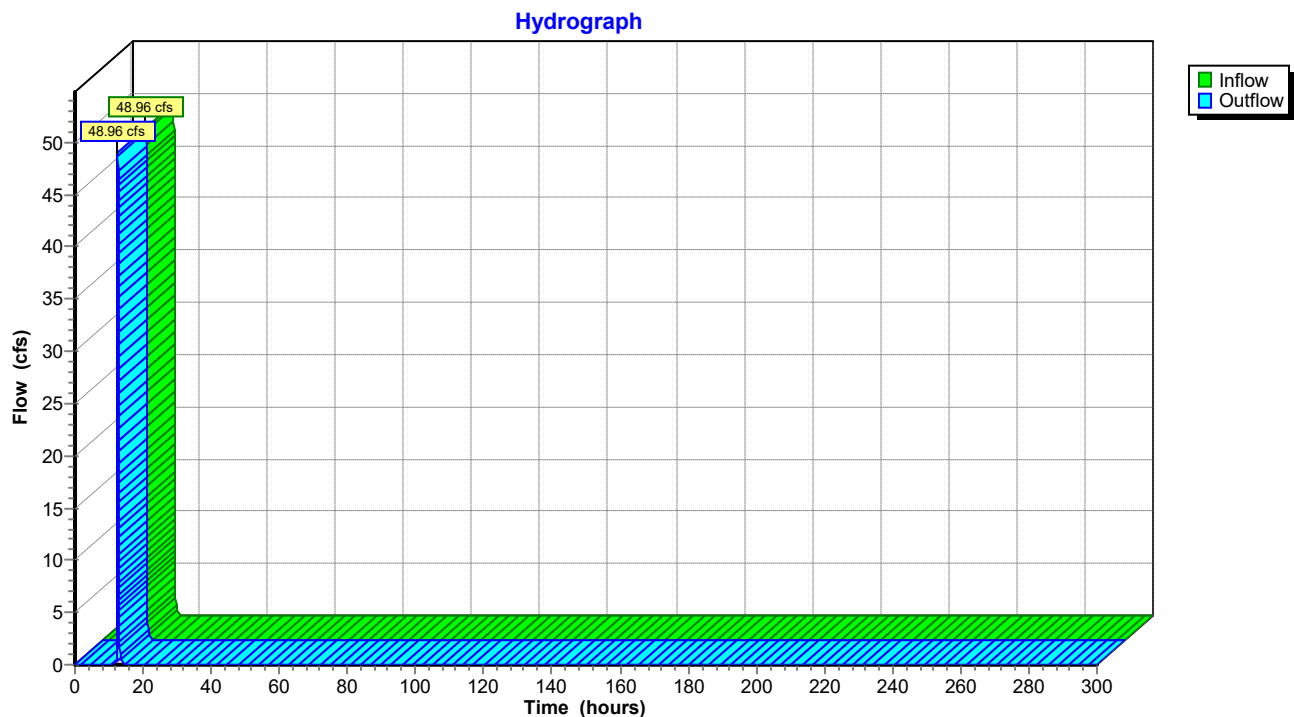
Summary for Reach 2ER: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 48.96 cfs @ 12.55 hrs, Volume= 2.322 af
 Outflow = 48.96 cfs @ 12.56 hrs, Volume= 2.322 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2ER: Existing Overflow Offsite to North



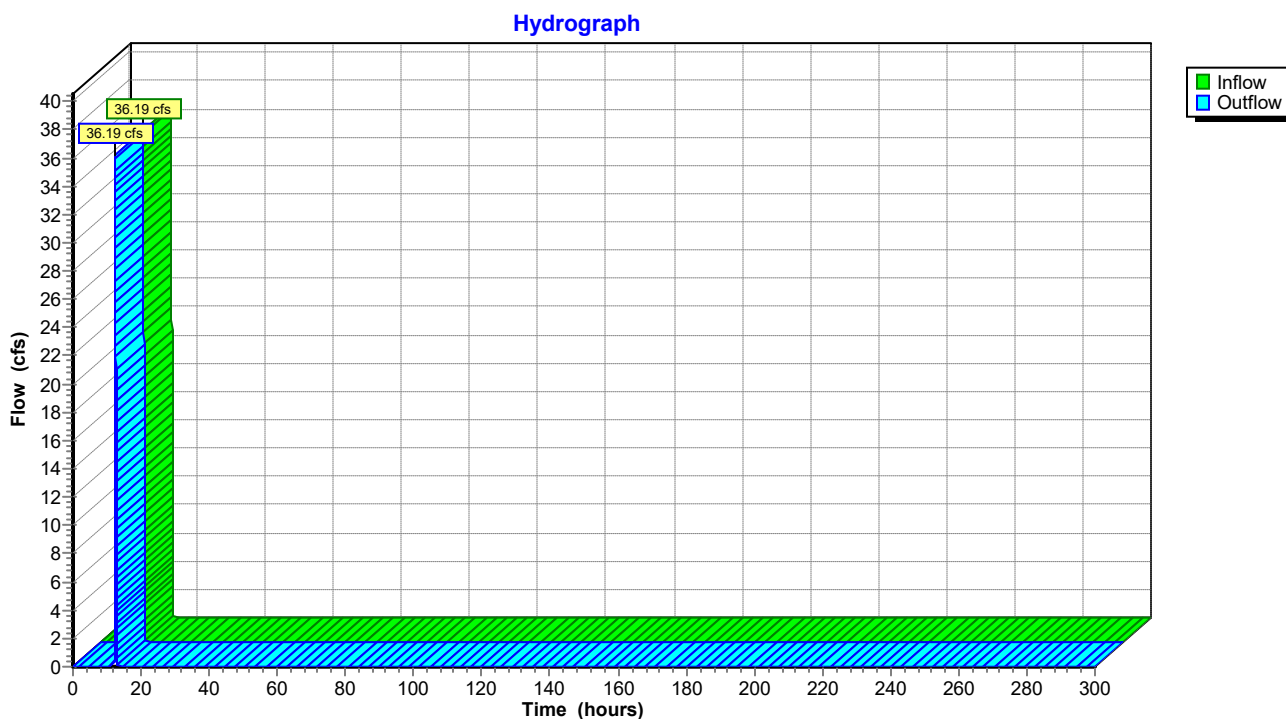
Summary for Reach 2PR: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 36.19 cfs @ 12.37 hrs, Volume= 1.461 af
 Outflow = 36.19 cfs @ 12.38 hrs, Volume= 1.461 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2PR: Existing Overflow Offsite to North



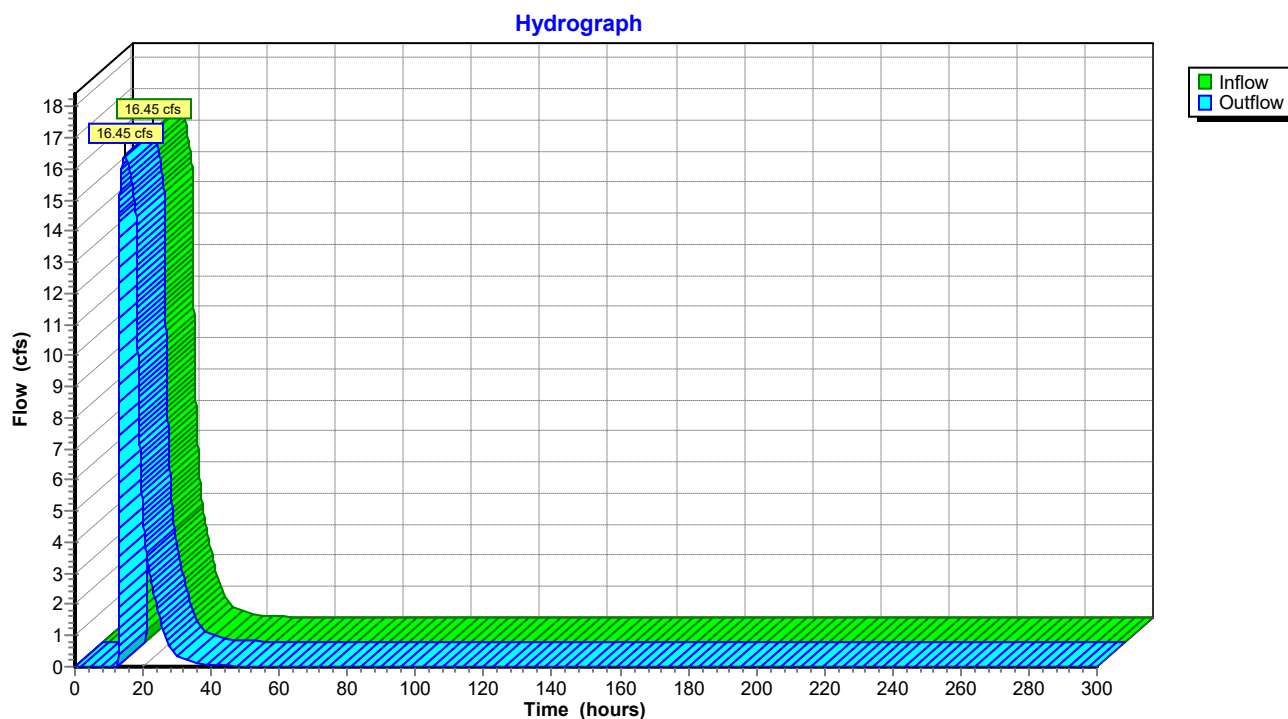
Summary for Reach 3ER: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 16.45 cfs @ 14.53 hrs, Volume= 9.740 af
 Outflow = 16.45 cfs @ 14.54 hrs, Volume= 9.740 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3ER: To Big Woods - Southeast Wetland Complex



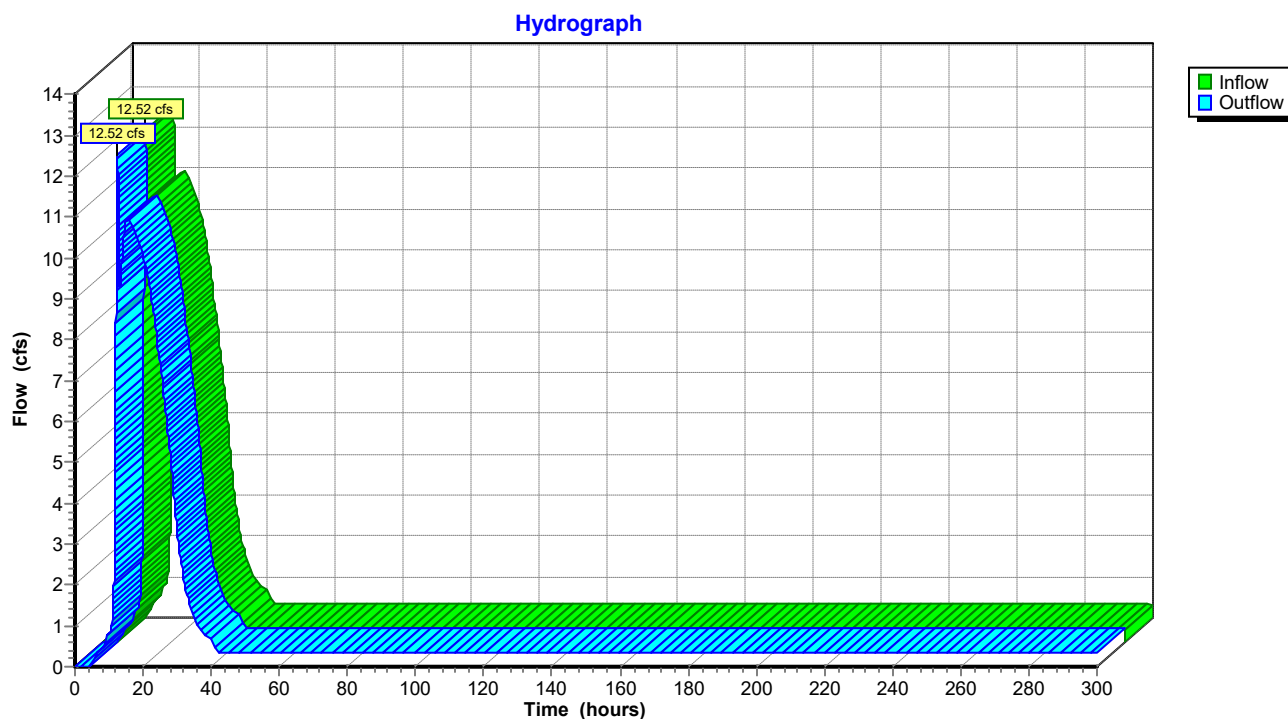
Summary for Reach 3PR: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 12.52 cfs @ 12.37 hrs, Volume= 21.686 af
 Outflow = 12.52 cfs @ 12.38 hrs, Volume= 21.686 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3PR: To Big Woods - Southeast Wetland Complex



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 1EP: Offsite Low Area - Northwest

Inflow Area = 11.480 ac, 5.40% Impervious, Inflow Depth = 6.10" for 100-yr Rogers event
 Inflow = 77.68 cfs @ 12.41 hrs, Volume= 5.837 af
 Outflow = 63.99 cfs @ 12.55 hrs, Volume= 5.836 af, Atten= 18%, Lag= 8.5 min
 Primary = 15.03 cfs @ 12.55 hrs, Volume= 3.514 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 48.96 cfs @ 12.55 hrs, Volume= 2.322 af
 Routed to Reach 2ER : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 948.51' @ 12.55 hrs Surf.Area= 0.792 ac Storage= 0.835 af

Plug-Flow detention time= 8.8 min calculated for 5.836 af (100% of inflow)
 Center-of-Mass det. time= 8.4 min (798.2 - 789.8)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.03 cfs @ 12.55 hrs HW=948.51' TW=0.00' (Dynamic Tailwater)

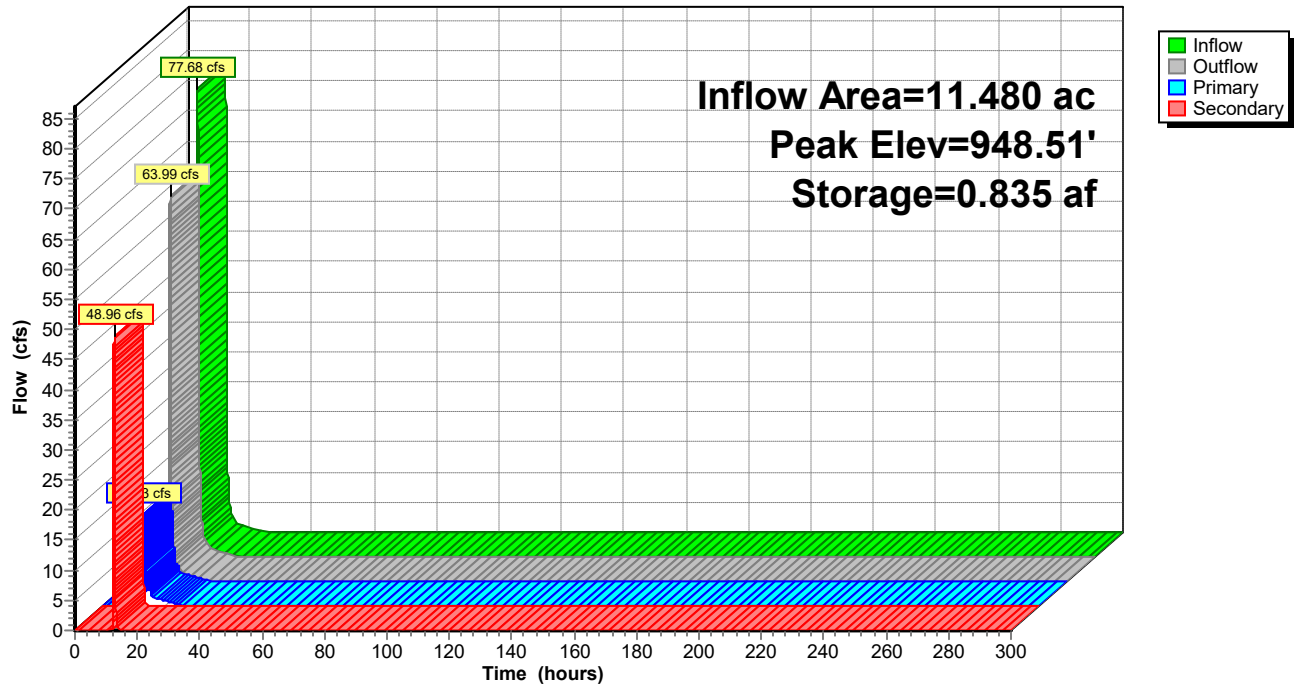
↑ **1=Culvert** (Inlet Controls 15.03 cfs @ 8.51 fps)

Secondary OutFlow Max=48.96 cfs @ 12.55 hrs HW=948.51' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 48.96 cfs @ 3.24 fps)

Pond 1EP: Offsite Low Area - Northwest

Hydrograph



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 1PP: Offsite Low Area - Northwest

Inflow Area = 9.393 ac, 8.84% Impervious, Inflow Depth = 5.71" for 100-yr Rogers event
 Inflow = 64.15 cfs @ 12.24 hrs, Volume= 4.467 af
 Outflow = 50.53 cfs @ 12.37 hrs, Volume= 4.467 af, Atten= 21%, Lag= 7.7 min
 Primary = 14.35 cfs @ 12.37 hrs, Volume= 3.005 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 36.19 cfs @ 12.37 hrs, Volume= 1.461 af
 Routed to Reach 2PR : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 948.23' @ 12.37 hrs Surf.Area= 0.677 ac Storage= 0.631 af

Plug-Flow detention time= 8.4 min calculated for 4.466 af (100% of inflow)
 Center-of-Mass det. time= 8.3 min (794.9 - 786.6)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=14.35 cfs @ 12.37 hrs HW=948.23' TW=0.00' (Dynamic Tailwater)

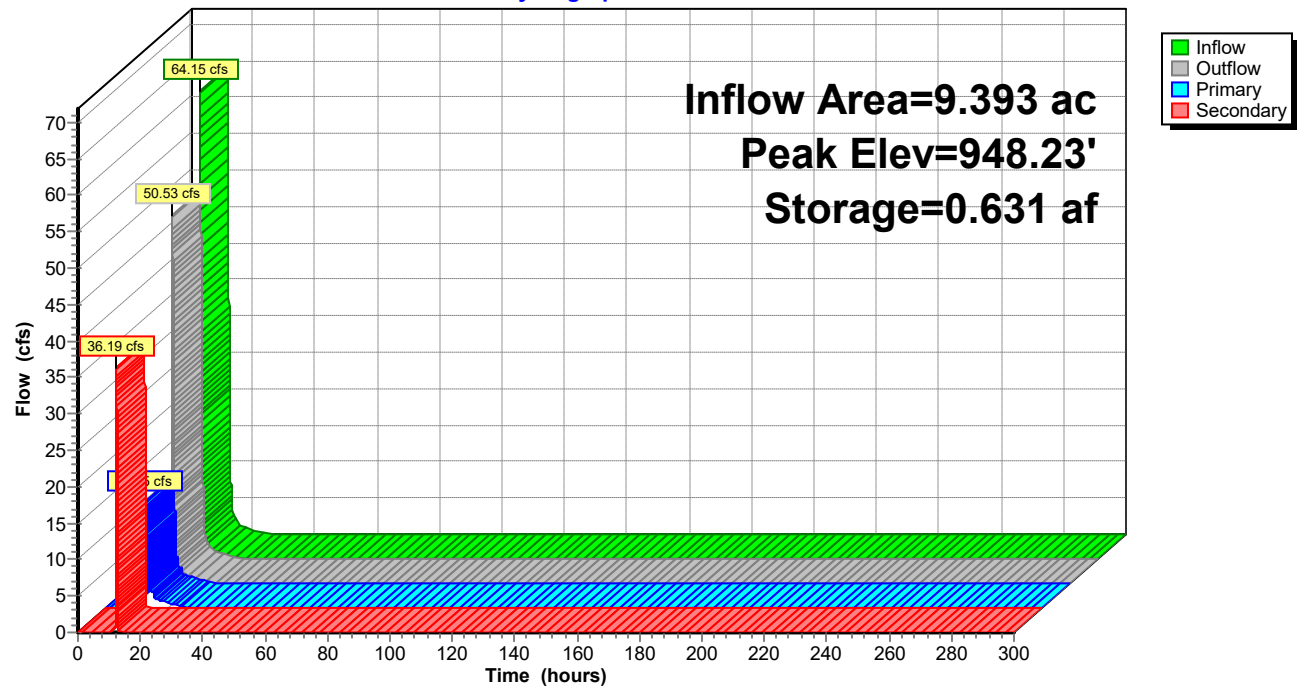
↑ **1=Culvert** (Inlet Controls 14.35 cfs @ 8.12 fps)

Secondary OutFlow Max=36.18 cfs @ 12.37 hrs HW=948.23' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 36.18 cfs @ 2.93 fps)

Pond 1PP: Offsite Low Area - Northwest

Hydrograph



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 2EP: Offsite Low Area - North Middle

Inflow Area = 12.650 ac, 2.37% Impervious, Inflow Depth = 5.13" for 100-yr Rogers event
 Inflow = 63.14 cfs @ 12.35 hrs, Volume= 5.406 af
 Outflow = 52.89 cfs @ 12.48 hrs, Volume= 5.406 af, Atten= 16%, Lag= 7.9 min
 Primary = 29.40 cfs @ 12.48 hrs, Volume= 4.691 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 23.49 cfs @ 12.48 hrs, Volume= 0.715 af
 Routed to Pond 1EP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 950.53' @ 12.48 hrs Surf.Area= 0.526 ac Storage= 0.562 af

Plug-Flow detention time= 4.3 min calculated for 5.406 af (100% of inflow)
 Center-of-Mass det. time= 4.0 min (802.9 - 798.8)

Volume	Invert	Avail.Storage	Storage Description
--------	--------	---------------	---------------------

#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)
----	---------	----------	--

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

Device	Routing	Invert	Outlet Devices
--------	---------	--------	----------------

#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=29.40 cfs @ 12.48 hrs HW=950.53' TW=0.00' (Dynamic Tailwater)

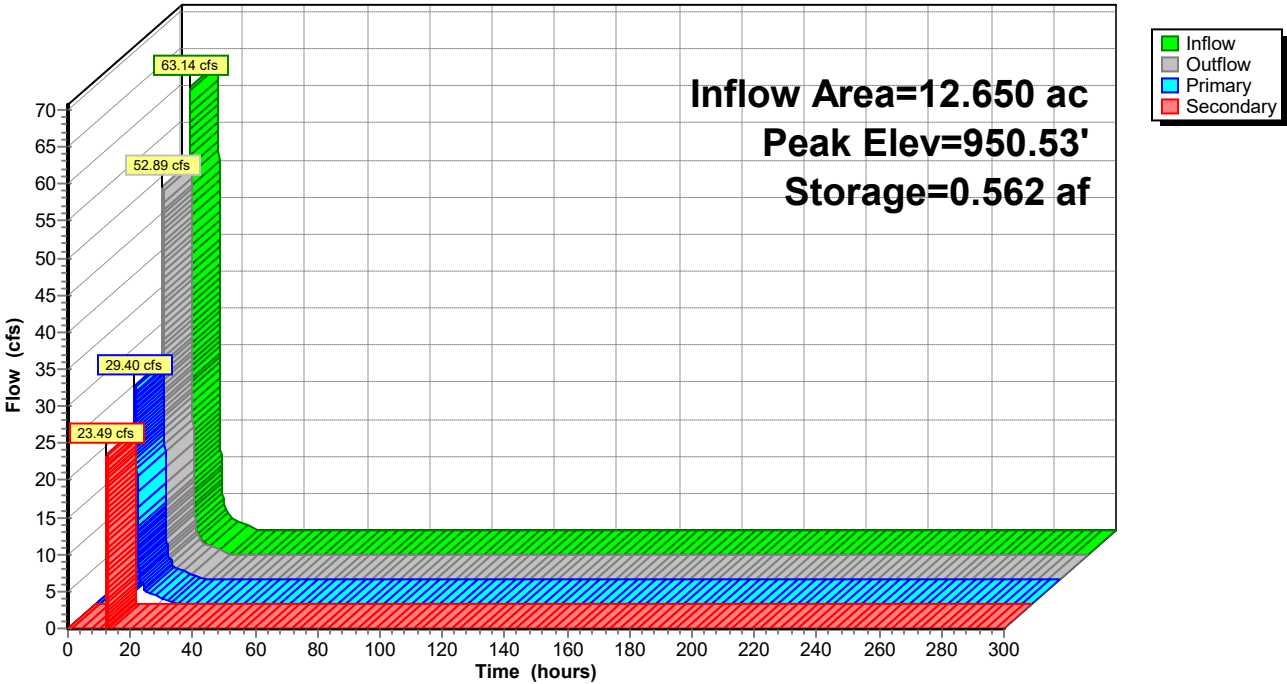
↑ **1=Culvert** (Inlet Controls 29.40 cfs @ 9.36 fps)

Secondary OutFlow Max=23.48 cfs @ 12.48 hrs HW=950.53' TW=948.47' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 23.48 cfs @ 2.53 fps)

Pond 2EP: Offsite Low Area - North Middle

Hydrograph



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 2PP: Offsite Low Area - North Middle

Inflow Area = 8.730 ac, 6.41% Impervious, Inflow Depth = 4.92" for 100-yr Rogers event
 Inflow = 78.48 cfs @ 12.13 hrs, Volume= 3.579 af
 Outflow = 49.05 cfs @ 12.19 hrs, Volume= 3.579 af, Atten= 38%, Lag= 3.8 min
 Primary = 29.03 cfs @ 12.19 hrs, Volume= 3.278 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 20.03 cfs @ 12.19 hrs, Volume= 0.301 af
 Routed to Pond 1PP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 950.43' @ 12.19 hrs Surf.Area= 0.486 ac Storage= 0.514 af

Plug-Flow detention time= 3.7 min calculated for 3.579 af (100% of inflow)
 Center-of-Mass det. time= 3.4 min (787.6 - 784.2)

Volume	Invert	Avail.Storage	Storage Description
--------	--------	---------------	---------------------

#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)
----	---------	----------	--

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

Device	Routing	Invert	Outlet Devices
--------	---------	--------	----------------

#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 ' / Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=29.02 cfs @ 12.19 hrs HW=950.43' TW=0.00' (Dynamic Tailwater)

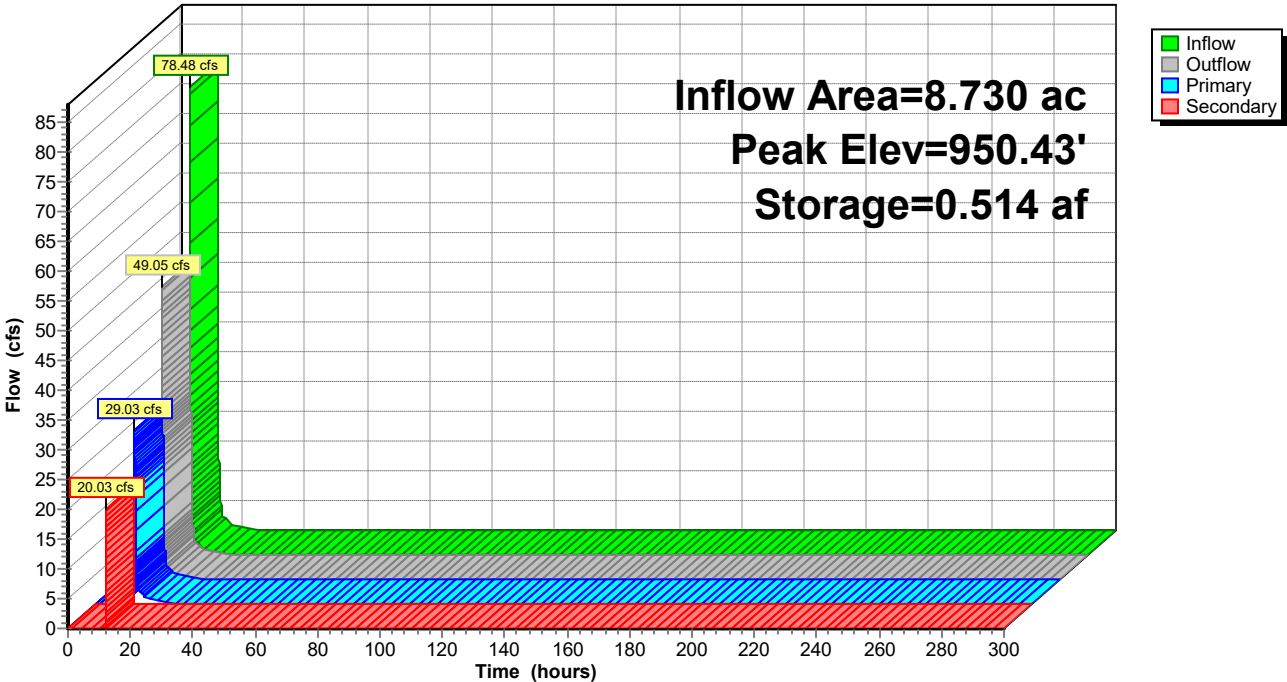
↑ **1=Culvert** (Inlet Controls 29.02 cfs @ 9.24 fps)

Secondary OutFlow Max=20.01 cfs @ 12.19 hrs HW=950.43' TW=947.83' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 20.01 cfs @ 2.41 fps)

Pond 2PP: Offsite Low Area - North Middle

Hydrograph



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 3EP: Existing Wetland - Northeast

[92] Warning: Device #3 is above defined storage

Inflow = 58.27 cfs @ 12.76 hrs, Volume= 12.417 af
 Outflow = 16.45 cfs @ 14.53 hrs, Volume= 9.740 af, Atten= 72%, Lag= 106.4 min
 Primary = 16.45 cfs @ 14.53 hrs, Volume= 9.740 af
 Routed to Reach 3ER : To Big Woods - Southeast Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4EP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 952.61' @ 14.53 hrs Surf.Area= 2.916 ac Storage= 6.304 af

Plug-Flow detention time= 256.7 min calculated for 9.740 af (78% of inflow)
 Center-of-Mass det. time= 170.1 min (1,050.3 - 880.2)

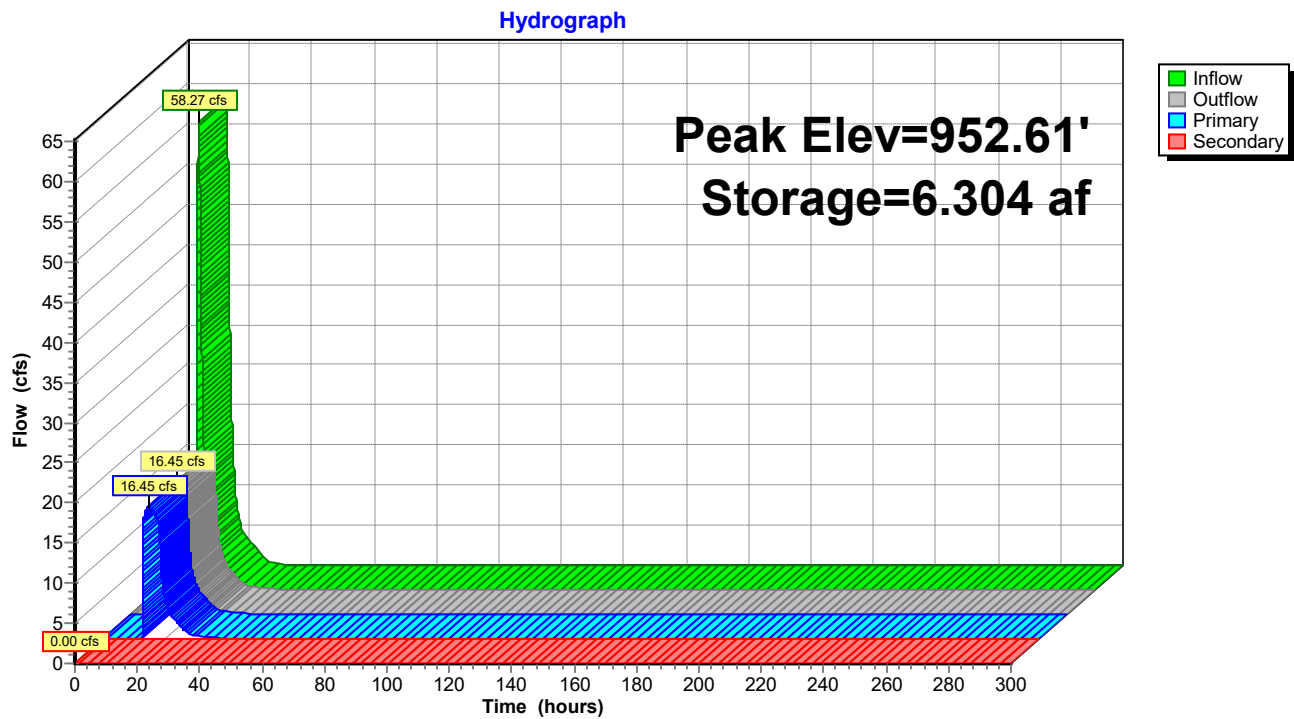
Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	11.020 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
948.00	0.050	0.000	0.000
949.00	0.400	0.225	0.225
950.00	1.150	0.775	1.000
952.00	2.510	3.660	4.660
954.00	3.850	6.360	11.020

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	951.10'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Secondary	954.30'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=16.45 cfs @ 14.53 hrs HW=952.61' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 16.45 cfs @ 9.31 fps)↑ **2=Broad-Crested Rectangular Weir** (Passes 16.45 cfs of 49.06 cfs potential flow)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=948.00' TW=954.00' (Dynamic Tailwater)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3EP: Existing Wetland - Northeast



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 3PP: Existing Wetland - Northeast

Inflow = 57.00 cfs @ 12.56 hrs, Volume= 12.256 af
 Outflow = 10.81 cfs @ 13.90 hrs, Volume= 10.161 af, Atten= 81%, Lag= 80.4 min
 Primary = 10.81 cfs @ 13.90 hrs, Volume= 10.161 af
 Routed to Pond 6PP : Filtration Basin 6
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4PP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.77' @ 15.18 hrs Surf.Area= 80,831 sf Storage= 254,710 cf

Plug-Flow detention time= 441.5 min calculated for 10.161 af (83% of inflow)
 Center-of-Mass det. time= 344.0 min (1,291.3 - 947.3)

Volume	Invert	Avail.Storage	Storage Description
#1	948.80'	366,452 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.80	22,044	0	0
950.00	24,609	27,992	27,992
952.00	38,365	62,974	90,966
954.00	67,868	106,233	197,199
956.00	101,385	169,253	366,452

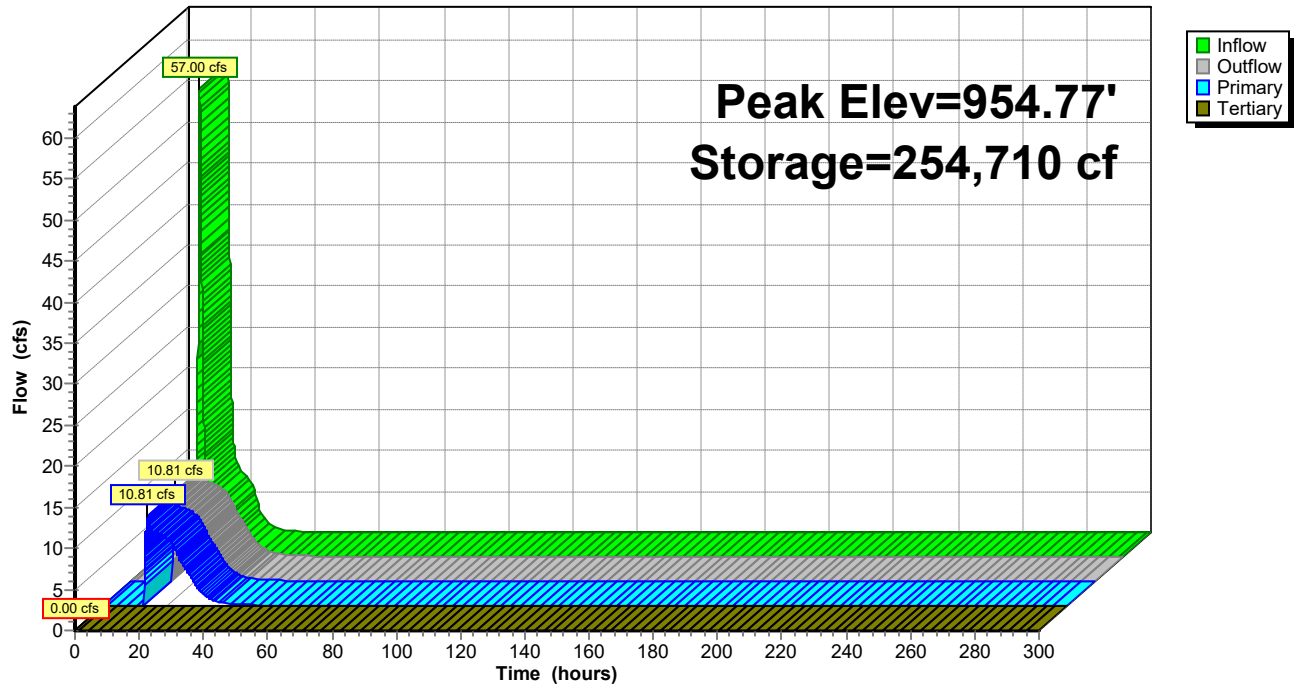
Device	Routing	Invert	Outlet Devices
#1	Primary	952.00'	24.0" Round Culvert L= 24.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 952.00' / 951.50' S= 0.0208 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Tertiary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=10.77 cfs @ 13.90 hrs HW=954.66' TW=954.16' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 10.77 cfs @ 3.43 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=948.80' TW=954.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3PP: Existing Wetland - Northeast

Hydrograph



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 4EP: Offsite Wetland - Southeast

Inflow = 98.59 cfs @ 12.48 hrs, Volume= 10.295 af
 Outflow = 48.36 cfs @ 12.90 hrs, Volume= 9.028 af, Atten= 51%, Lag= 24.9 min
 Primary = 48.36 cfs @ 12.90 hrs, Volume= 9.028 af
 Routed to Pond 3EP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 955.01' @ 12.90 hrs Surf.Area= 4.994 ac Storage= 4.588 af

Plug-Flow detention time= 150.7 min calculated for 9.028 af (88% of inflow)
 Center-of-Mass det. time= 103.6 min (912.0 - 808.3)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

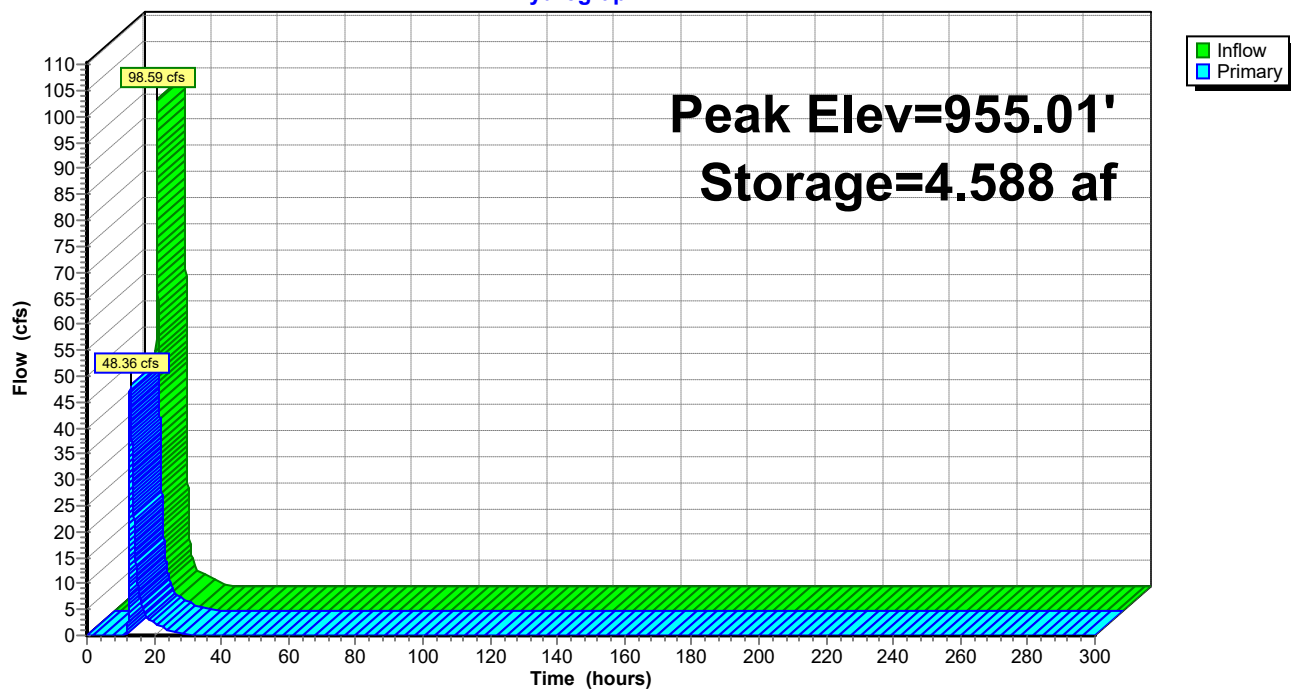
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=48.36 cfs @ 12.90 hrs HW=955.01' TW=951.67' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 48.36 cfs @ 2.27 fps)

Pond 4EP: Offsite Wetland - Southeast

Hydrograph



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 4PP: Offsite Wetland - Southeast

Inflow = 85.59 cfs @ 12.31 hrs, Volume= 10.739 af
 Outflow = 34.57 cfs @ 12.86 hrs, Volume= 9.472 af, Atten= 60%, Lag= 33.0 min
 Primary = 34.57 cfs @ 12.86 hrs, Volume= 9.472 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.87' @ 12.86 hrs Surf.Area= 4.868 ac Storage= 3.896 af

Plug-Flow detention time= 208.9 min calculated for 9.472 af (88% of inflow)
 Center-of-Mass det. time= 148.5 min (996.1 - 847.5)

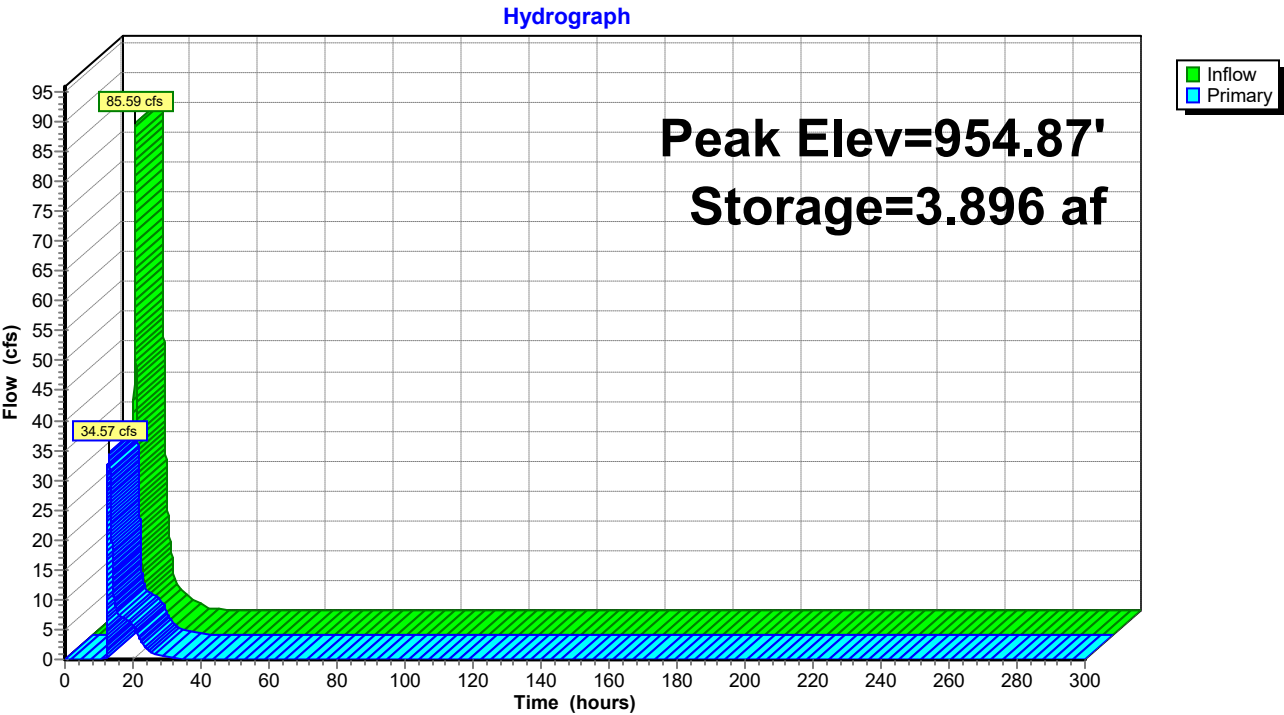
Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=34.57 cfs @ 12.86 hrs HW=954.87' TW=953.26' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 34.57 cfs @ 2.02 fps)

Pond 4PP: Offsite Wetland - Southeast



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 5PP: Pond 5

Inflow = 33.60 cfs @ 12.19 hrs, Volume= 1.988 af
 Outflow = 8.46 cfs @ 13.10 hrs, Volume= 1.867 af, Atten= 75%, Lag= 54.6 min
 Primary = 8.46 cfs @ 13.10 hrs, Volume= 1.867 af
 Routed to Pond 7PP : Pond 7

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 957.36' @ 12.68 hrs Surf.Area= 24,848 sf Storage= 70,482 cf

Plug-Flow detention time= 242.7 min calculated for 1.867 af (94% of inflow)
 Center-of-Mass det. time= 207.7 min (981.3 - 773.6)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	144,732 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

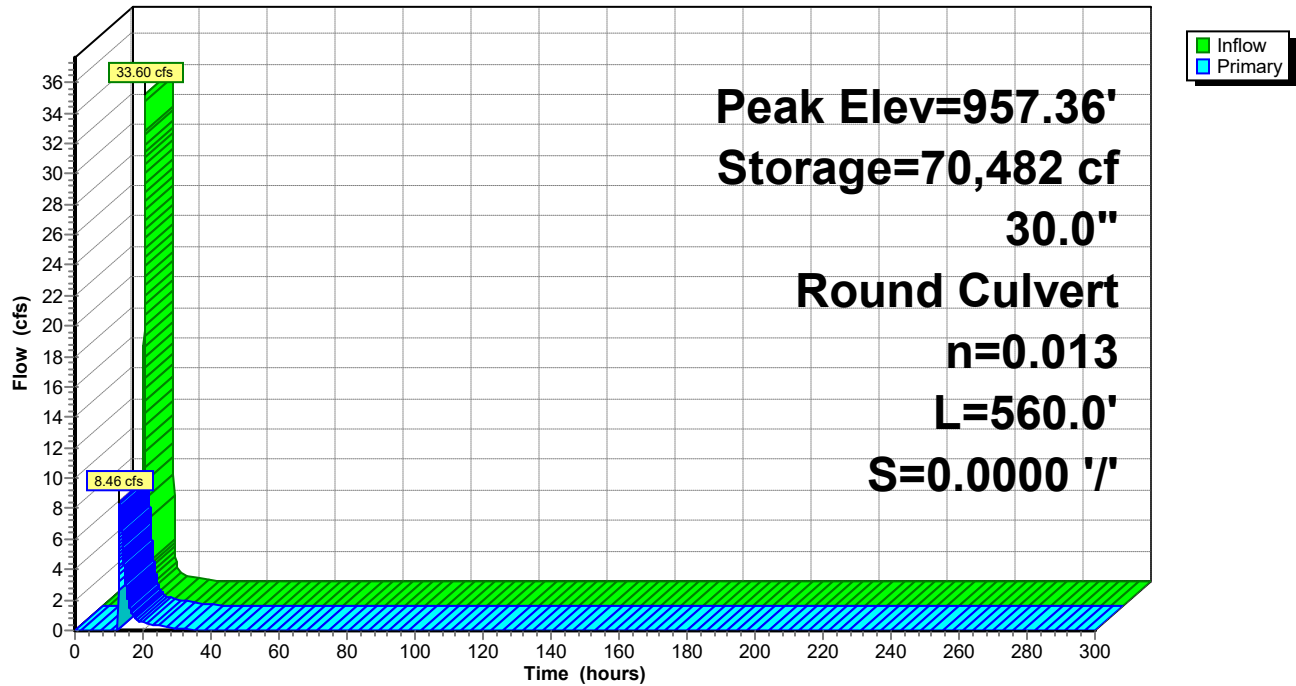
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	17,270	0	0
956.00	21,611	38,881	38,881
958.00	26,370	47,981	86,862
960.00	31,500	57,870	144,732

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=8.61 cfs @ 13.10 hrs HW=957.06' TW=956.77' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 8.61 cfs @ 1.83 fps)

Pond 5PP: Pond 5

Hydrograph



Summary for Pond 6PP: Filtration Basin 6

[86] Warning: Oscillations may require smaller dt (severity=13096)

Inflow = 94.92 cfs @ 12.17 hrs, Volume= 15.515 af
 Outflow = 27.76 cfs @ 12.43 hrs, Volume= 22.340 af, Atten= 71%, Lag= 15.4 min
 Primary = 10.87 cfs @ 15.21 hrs, Volume= 21.234 af
 Routed to Pond 8PP : Existing Territorial Ditch
 Secondary = 17.21 cfs @ 12.43 hrs, Volume= 1.106 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.41' @ 15.21 hrs Surf.Area= 38,712 sf Storage= 101,973 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 2,916.6 min (4,031.7 - 1,115.1)

Volume	Invert	Avail.Storage	Storage Description
#1	951.50'	166,675 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
951.50	31,134	0	0
952.00	32,613	15,937	15,937
954.00	37,625	70,238	86,175
956.00	42,875	80,500	166,675

Device	Routing	Invert	Outlet Devices
#1	Primary	948.17'	18.0" Round Culvert L= 38.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.17' / 948.12' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	948.25'	6.0" Round 6" Drain tile L= 265.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.25' / 948.17' S= 0.0003 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	951.50'	1.000 in/hr Exfiltration over Surface area
#4	Secondary	952.00'	24.0" Round Culvert L= 25.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 951.50' / 952.00' S= -0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#5	Device 1	951.50'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Primary	953.50'	0.5' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=10.87 cfs @ 15.21 hrs HW=954.41' TW=950.54' (Dynamic Tailwater)

1=Culvert (Passes 9.70 cfs of 16.74 cfs potential flow)

2=6" Draintile (Outlet Controls 0.76 cfs @ 3.89 fps)

3=Exfiltration (Passes 0.76 cfs of 0.90 cfs potential flow)

5=Orifice/Grate (Orifice Controls 8.94 cfs @ 7.28 fps)

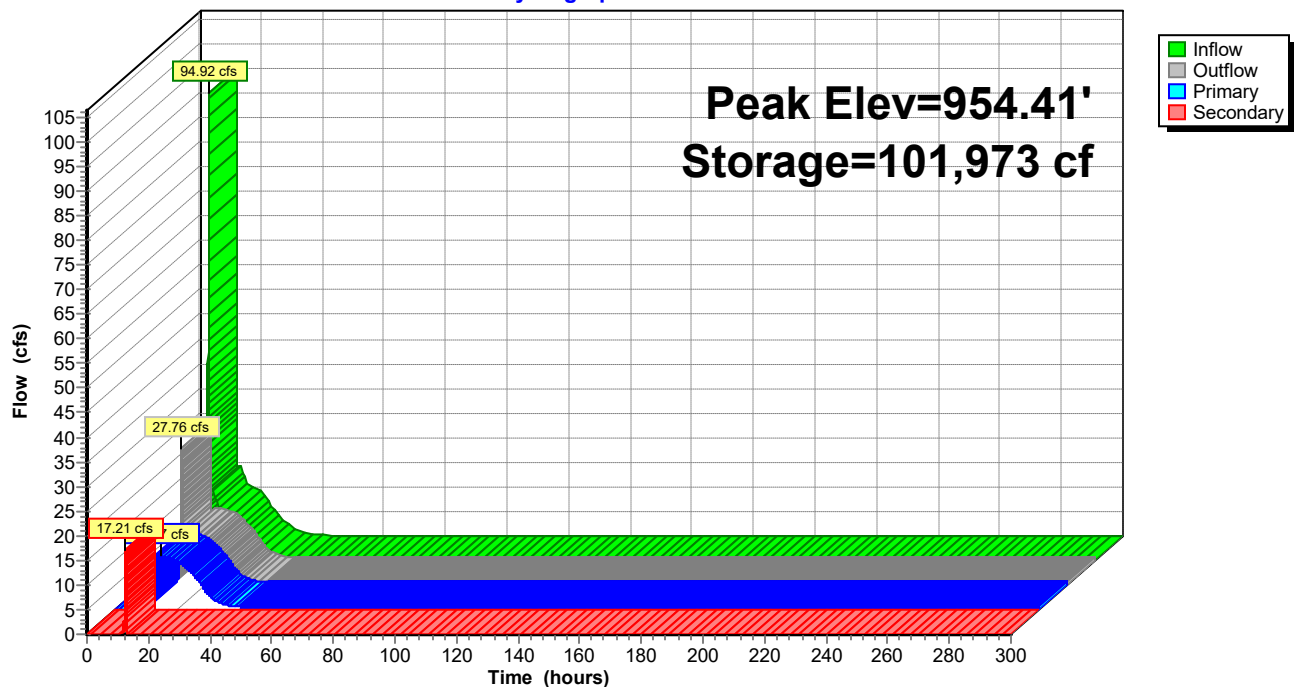
6=Broad-Crested Rectangular Weir (Weir Controls 1.17 cfs @ 2.56 fps)

Secondary OutFlow Max=17.21 cfs @ 12.43 hrs HW=954.34' TW=951.25' (Dynamic Tailwater)

4=Culvert (Barrel Controls 17.21 cfs @ 5.48 fps)

Pond 6PP: Filtration Basin 6

Hydrograph



Knapp - Rogers Stormwater

MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 7PP: Pond 7

Inflow = 74.54 cfs @ 12.22 hrs, Volume= 6.802 af
 Outflow = 47.53 cfs @ 12.36 hrs, Volume= 6.744 af, Atten= 36%, Lag= 8.0 min
 Primary = 28.45 cfs @ 12.37 hrs, Volume= 5.883 af
 Routed to Pond 4PP : Offsite Wetland - Southeast
 Secondary = 19.14 cfs @ 12.35 hrs, Volume= 0.861 af
 Routed to Pond 5PP : Pond 5

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 958.09' @ 12.37 hrs Surf.Area= 14,576 sf Storage= 46,296 cf

Plug-Flow detention time= 42.3 min calculated for 6.744 af (99% of inflow)
 Center-of-Mass det. time= 29.9 min (870.5 - 840.7)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	117,172 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	8,084	0	0
956.00	11,221	19,305	19,305
958.00	14,420	25,641	44,946
960.00	17,768	32,188	77,134
962.00	22,270	40,038	117,172

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 230.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 953.70' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=28.45 cfs @ 12.37 hrs HW=958.09' TW=954.68' (Dynamic Tailwater)

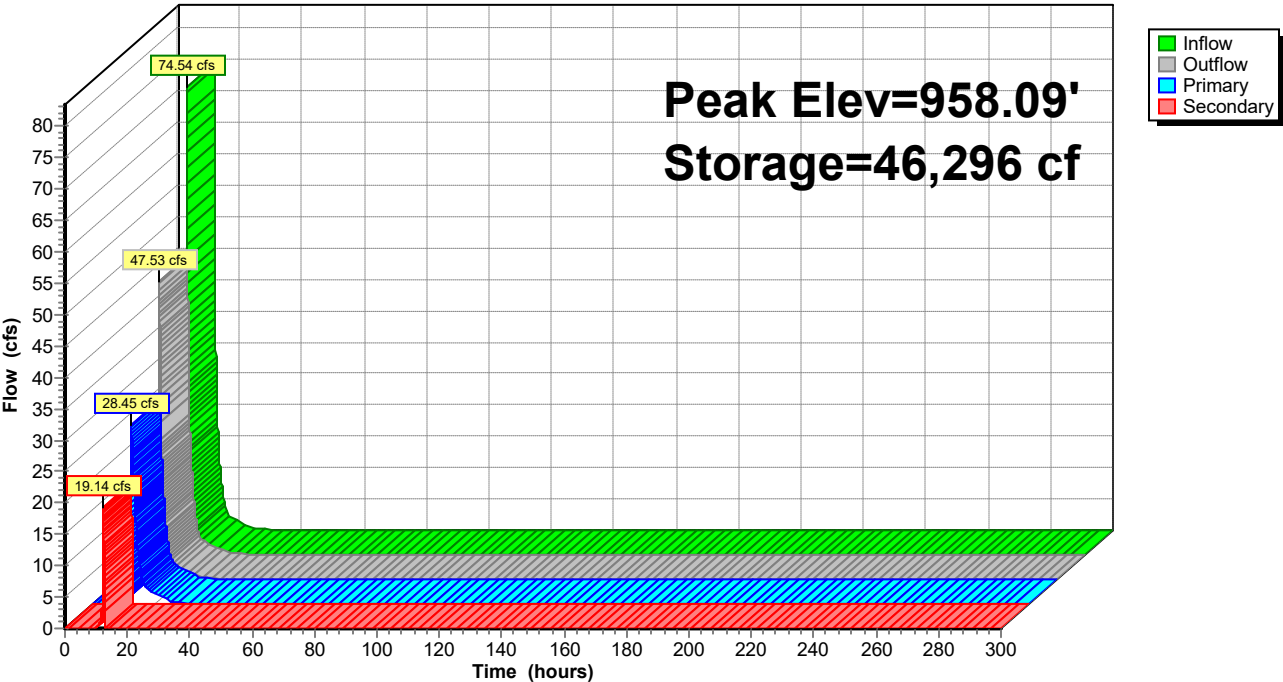
↑ **1=Culvert** (Barrel Controls 28.45 cfs @ 5.80 fps)

Secondary OutFlow Max=18.98 cfs @ 12.35 hrs HW=958.08' TW=956.53' (Dynamic Tailwater)

↑ **2=Culvert** (Outlet Controls 18.98 cfs @ 3.87 fps)

Pond 7PP: Pond 7

Hydrograph



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MSE 24-hr 3 100-yr Rogers Rainfall=6.87"

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Summary for Pond 8PP: Existing Territorial Ditch

Inflow = 16.90 cfs @ 12.13 hrs, Volume= 21.691 af
 Outflow = 12.52 cfs @ 12.37 hrs, Volume= 21.687 af, Atten= 26%, Lag= 14.5 min
 Primary = 12.52 cfs @ 12.37 hrs, Volume= 21.687 af
 Routed to Reach 3PR : To Big Woods - Southeast Wetland Complex

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 951.03' @ 12.37 hrs Surf.Area= 3,336 sf Storage= 4,023 cf

Plug-Flow detention time= 5.5 min calculated for 21.686 af (100% of inflow)
 Center-of-Mass det. time= 3.0 min (4,133.0 - 4,130.0)

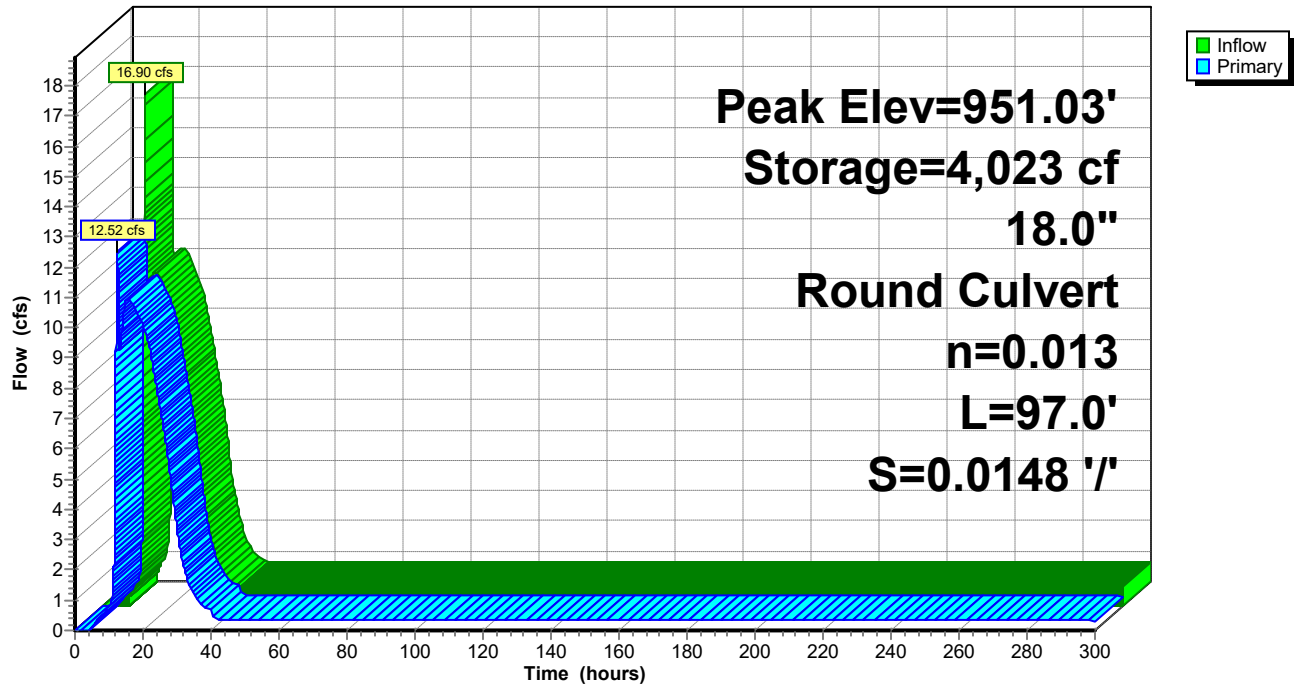
Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	31,368 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.00	440	0	0
950.00	1,225	1,665	1,665
952.00	5,310	6,535	8,200
954.00	17,858	23,168	31,368

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=12.52 cfs @ 12.37 hrs HW=951.03' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 12.52 cfs @ 7.08 fps)

Pond 8PP: Existing Territorial Ditch

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Time span=0.00-300.00 hrs, dt=0.01 hrs, 30001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1E: Direct Drainage to 1EP Runoff Area=11.480 ac 5.40% Impervious Runoff Depth=1.31"
Flow Length=1,422' Slope=0.0170 '/' Tc=25.5 min CN=87 Runoff=14.80 cfs 1.254 af

Subcatchment 1Ex: Offsite Direct Drainage Runoff Area=8.530 ac 7.27% Impervious Runoff Depth=1.31"
Flow Length=1,180' Slope=0.0180 '/' Tc=21.3 min CN=87 Runoff=12.09 cfs 0.932 af

Subcatchment 1P: Onsite Drainage to 1EP Runoff Area=0.863 ac 24.33% Impervious Runoff Depth=1.12"
Tc=5.0 min CN=84 Runoff=1.89 cfs 0.080 af

Subcatchment 2E: Direct Drainage to 2EP Runoff Area=12.650 ac 2.37% Impervious Runoff Depth=1.18"
Flow Length=1,273' Slope=0.0170 '/' Tc=25.1 min CN=85 Runoff=14.73 cfs 1.242 af

Subcatchment 2Ex: Offsite Direct Drainage Runoff Area=7.580 ac 3.96% Impervious Runoff Depth=1.06"
Flow Length=655' Slope=0.1400 '/' Tc=5.5 min CN=83 Runoff=15.36 cfs 0.667 af

Subcatchment 2P: Onsite Drainage to 2EP Runoff Area=1.150 ac 22.61% Impervious Runoff Depth=1.12"
Tc=5.0 min CN=84 Runoff=2.52 cfs 0.107 af

Subcatchment 3E: Direct Drainage to 3EP Runoff Area=7.930 ac 6.31% Impervious Runoff Depth=1.18"
Flow Length=605' Slope=0.0071 '/' Tc=21.4 min CN=85 Runoff=10.03 cfs 0.779 af

Subcatchment 3Ex: Offsite Drainage to 3EP Runoff Area=1.600 ac 6.25% Impervious Runoff Depth=0.94"
Tc=12.0 min CN=81 Runoff=2.14 cfs 0.126 af

Subcatchment 3P: Onsite Drainage to 3EP Runoff Area=2.700 ac 3.70% Impervious Runoff Depth=0.94"
Flow Length=605' Slope=0.0071 '/' Tc=24.4 min CN=81 Runoff=2.49 cfs 0.212 af

Subcatchment 4E: Direct Drainage to 4EP Runoff Area=24.090 ac 2.08% Impervious Runoff Depth=1.18"
Flow Length=1,227' Slope=0.0081 '/' Tc=35.3 min CN=85 Runoff=23.00 cfs 2.366 af

Subcatchment 4Ex: Offsite Direct Drainage Runoff Area=10.540 ac 4.74% Impervious Runoff Depth=1.00"
Flow Length=651' Slope=0.0100 '/' Tc=21.1 min CN=82 Runoff=11.28 cfs 0.877 af

Subcatchment 4P: Onsite Drainage to 4EP Runoff Area=1.577 ac 17.31% Impervious Runoff Depth=1.06"
Tc=5.0 min CN=83 Runoff=3.28 cfs 0.139 af

Subcatchment 5E: Direct Drainage to Runoff Area=5.720 ac 0.00% Impervious Runoff Depth=1.31"
Flow Length=560' Slope=0.0240 '/' Tc=10.2 min CN=87 Runoff=11.61 cfs 0.625 af

Subcatchment 5P: Onsite Drainage to 5PP Runoff Area=2.820 ac 11.35% Impervious Runoff Depth=1.00"
Tc=10.0 min CN=82 Runoff=4.35 cfs 0.235 af

Subcatchment 6P: Drainage to Filtration Runoff Area=12.000 ac 39.17% Impervious Runoff Depth=1.31"
Tc=10.0 min CN=87 Runoff=24.50 cfs 1.311 af

Subcatchment 7P: Onsite Drainage to 7PP Runoff Area=11.300 ac 32.74% Impervious Runoff Depth=1.24"
Tc=15.0 min CN=86 Runoff=18.29 cfs 1.171 af

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Subcatchment 8Ex: Territorial Ditch	Runoff Area=1.070 ac 28.97% Impervious Runoff Depth=1.18" Tc=5.0 min CN=85 Runoff=2.48 cfs 0.105 af
Subcatchment 9P: Offsite Drainage East	Runoff Area=0.080 ac 0.00% Impervious Runoff Depth=0.89" Tc=5.0 min CN=80 Runoff=0.14 cfs 0.006 af
Reach 1ER: To Big Woods - Southwest Wetland Complex	Inflow=25.11 cfs 2.490 af Outflow=25.11 cfs 2.490 af
Reach 1PR: To Big Woods - Southwest Wetland Complex	Inflow=23.18 cfs 1.785 af Outflow=23.18 cfs 1.785 af
Reach 2ER: Existing Overflow Offsite to North	Inflow=0.63 cfs 0.006 af Outflow=0.63 cfs 0.006 af
Reach 2PR: Existing Overflow Offsite to North	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 3ER: To Big Woods - Southeast Wetland Complex	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach 3PR: To Big Woods - Southeast Wetland Complex	Inflow=3.59 cfs 1.435 af Outflow=3.59 cfs 1.435 af
Pond 1EP: Offsite Low Area - Northwest	Peak Elev=947.08' Storage=0.145 af Inflow=14.80 cfs 1.254 af Primary=11.07 cfs 1.247 af Secondary=0.63 cfs 0.006 af Outflow=11.70 cfs 1.253 af
Pond 1PP: Offsite Low Area - Northwest	Peak Elev=946.78' Storage=0.109 af Inflow=12.61 cfs 1.012 af Primary=10.03 cfs 1.011 af Secondary=0.00 cfs 0.000 af Outflow=10.03 cfs 1.011 af
Pond 2EP: Offsite Low Area - North Middle	Peak Elev=947.67' Storage=0.018 af Inflow=14.73 cfs 1.242 af Primary=14.64 cfs 1.242 af Secondary=0.00 cfs 0.000 af Outflow=14.64 cfs 1.242 af
Pond 2PP: Offsite Low Area - North Middle	Peak Elev=948.00' Storage=0.024 af Inflow=17.88 cfs 0.774 af Primary=16.94 cfs 0.774 af Secondary=0.00 cfs 0.000 af Outflow=16.94 cfs 0.774 af
Pond 3EP: Existing Wetland - Northeast	Peak Elev=950.64' Storage=1.877 af Inflow=10.03 cfs 1.877 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond 3PP: Existing Wetland - Northeast	Peak Elev=951.11' Storage=59,541 cf Inflow=4.07 cfs 1.367 af Primary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond 4EP: Offsite Wetland - Southeast	Peak Elev=954.39' Storage=1.648 af Inflow=23.00 cfs 2.366 af Outflow=1.90 cfs 1.098 af
Pond 4PP: Offsite Wetland - Southeast	Peak Elev=954.36' Storage=1.539 af Inflow=19.18 cfs 2.242 af Outflow=1.15 cfs 0.975 af
Pond 5PP: Pond 5	Peak Elev=954.87' Storage=15,790 cf Inflow=6.10 cfs 0.440 af 30.0" Round Culvert n=0.013 L=560.0' S=0.0000 ' Outflow=0.62 cfs 0.319 af

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Pond 6PP: Filtration Basin 6

Peak Elev=952.31' Storage=26,255 cf Inflow=24.50 cfs 1.311 af

Primary=3.30 cfs 1.332 af Secondary=0.60 cfs 0.054 af Outflow=3.89 cfs 1.386 af

Pond 7PP: Pond 7

Peak Elev=955.52' Storage=14,101 cf Inflow=18.29 cfs 1.490 af

Primary=7.39 cfs 1.227 af Secondary=4.04 cfs 0.206 af Outflow=11.43 cfs 1.432 af

Pond 8PP: Existing Territorial Ditch

Peak Elev=949.02' Storage=655 cf Inflow=3.60 cfs 1.437 af

18.0" Round Culvert n=0.013 L=97.0' S=0.0148 '/' Outflow=3.59 cfs 1.435 af

Total Runoff Area = 123.680 ac Runoff Volume = 12.233 af Average Runoff Depth = 1.19"

89.24% Pervious = 110.367 ac 10.76% Impervious = 13.313 ac

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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 1E: Direct Drainage to 1EP

Runoff = 14.80 cfs @ 12.38 hrs, Volume= 1.254 af, Depth= 1.31"
Routed to Pond 1EP : Offsite Low Area - Northwest

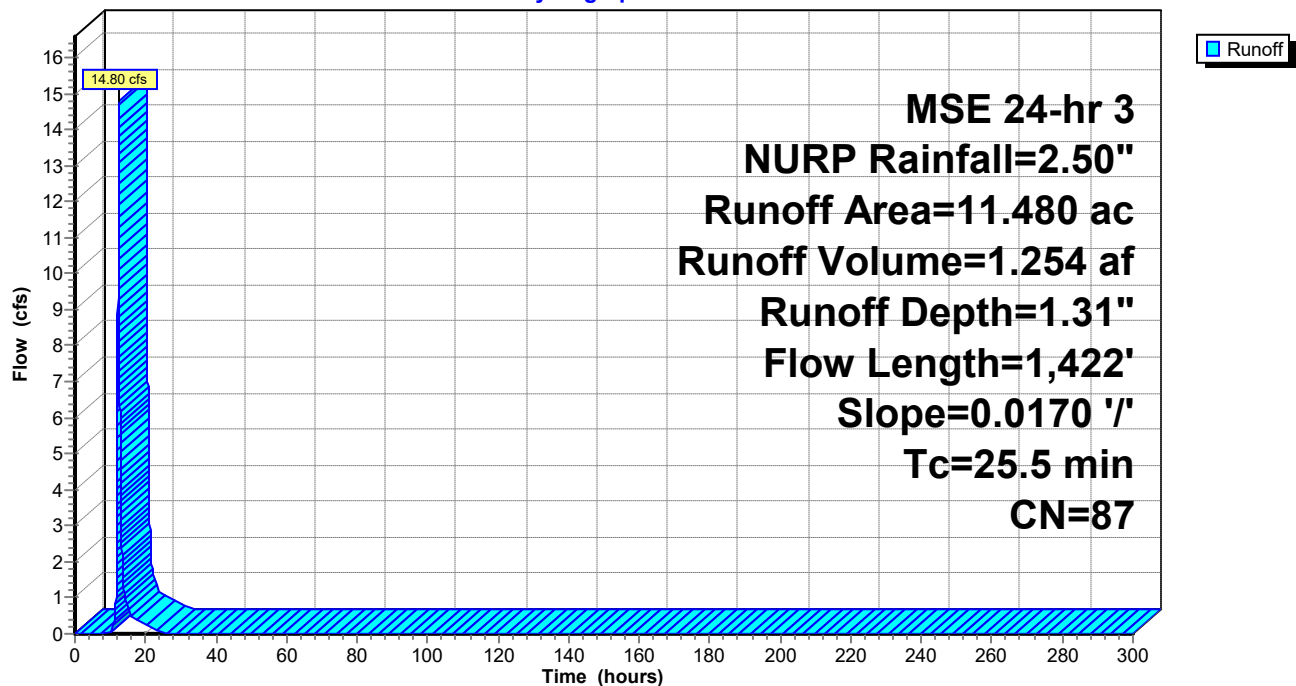
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
10.110	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
11.480	87	Weighted Average
10.860		94.60% Pervious Area
0.620		5.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.5	1,422	0.0170	0.93		Lag/CN Method,

Subcatchment 1E: Direct Drainage to 1EP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Runoff = 12.09 cfs @ 12.32 hrs, Volume= 0.932 af, Depth= 1.31"
Routed to Pond 1PP : Offsite Low Area - Northwest

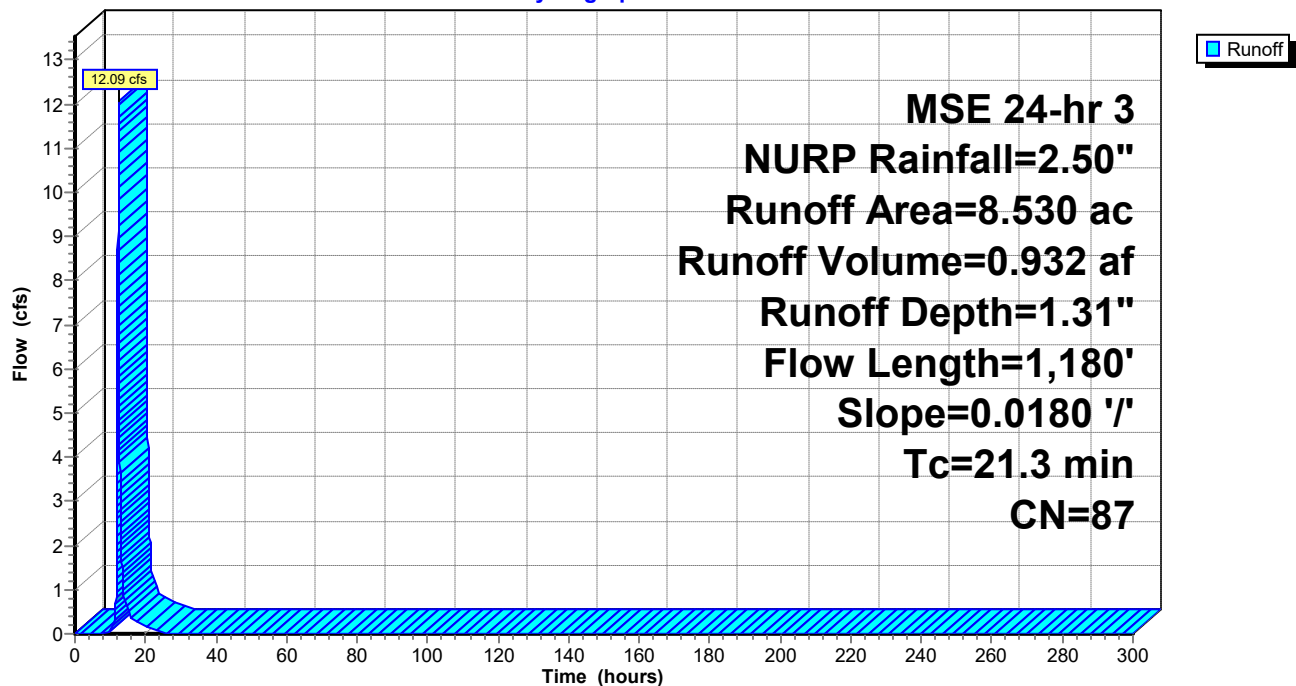
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.620	98	Existing Impervious
7.160	87	Small grain, straight row, Good, HSG D
0.750	80	>75% Grass cover, Good, HSG D
8.530	87	Weighted Average
7.910		92.73% Pervious Area
0.620		7.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.3	1,180	0.0180	0.92		Lag/CN Method,

Subcatchment 1Ex: Offsite Direct Drainage to 1EP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 1P: Onsite Drainage to 1EP

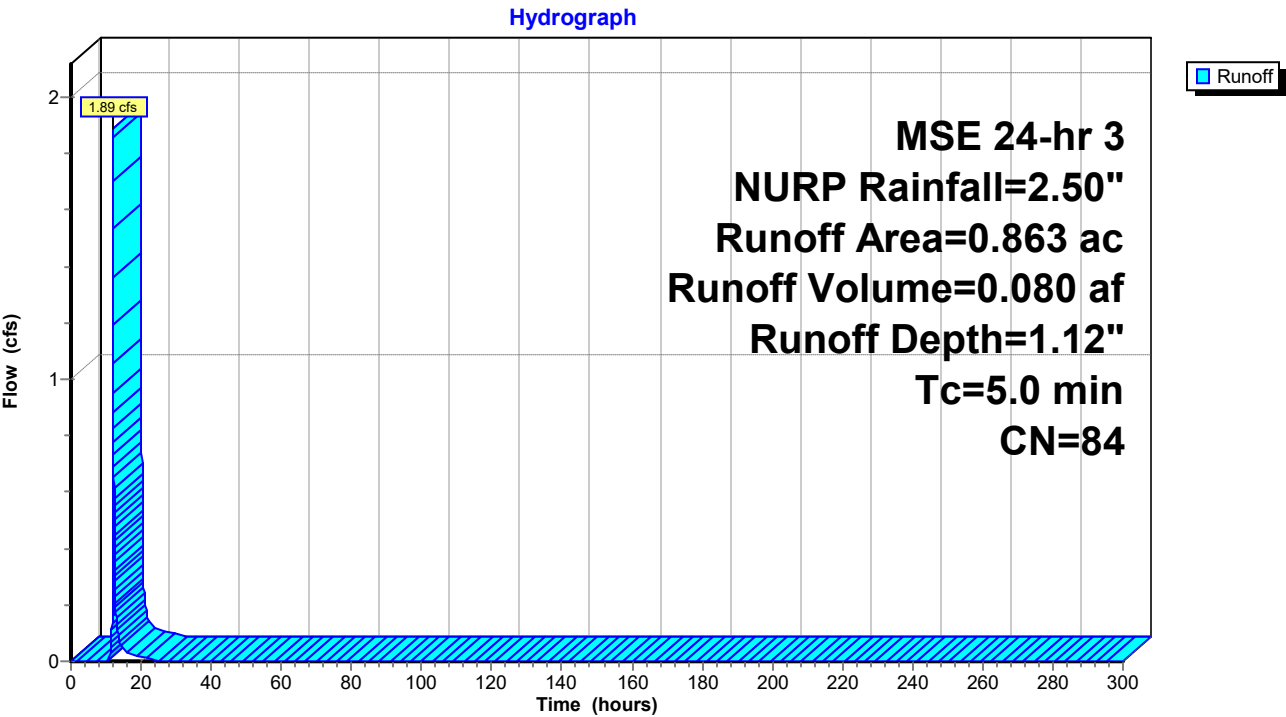
Runoff = 1.89 cfs @ 12.13 hrs, Volume= 0.080 af, Depth= 1.12"
Routed to Pond 1PP : Offsite Low Area - Northwest

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.210	98	Proposed Impervious
0.653	80	>75% Grass cover, Good, HSG D
0.863	84	Weighted Average
0.653		75.67% Pervious Area
0.210		24.33% Impervious Area

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

Subcatchment 1P: Onsite Drainage to 1EP



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 2E: Direct Drainage to 2EP

Runoff = 14.73 cfs @ 12.36 hrs, Volume= 1.242 af, Depth= 1.18"
Routed to Pond 2EP : Offsite Low Area - North Middle

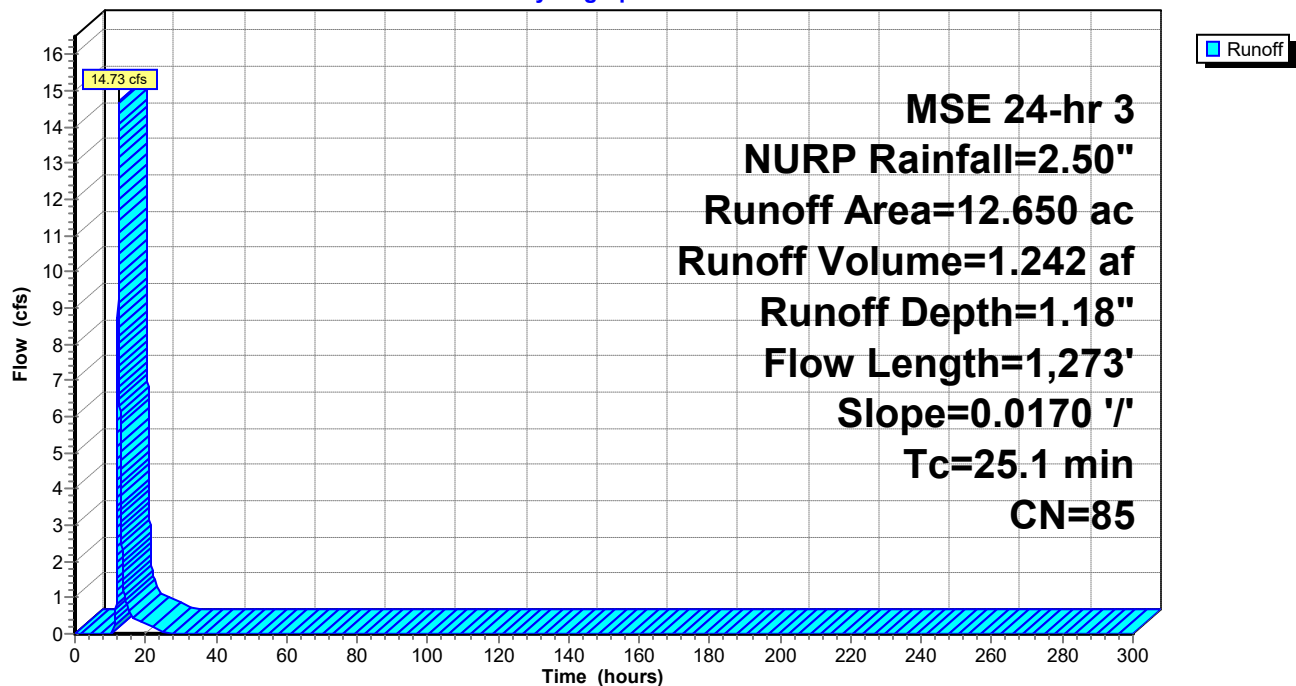
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
7.540	87	Small grain, straight row, Good, HSG D
12.650	85	Weighted Average
12.350		97.63% Pervious Area
0.300		2.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.1	1,273	0.0170	0.85		Lag/CN Method,

Subcatchment 2E: Direct Drainage to 2EP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Runoff = 15.36 cfs @ 12.13 hrs, Volume= 0.667 af, Depth= 1.06"

Routed to Pond 2PP : Offsite Low Area - North Middle

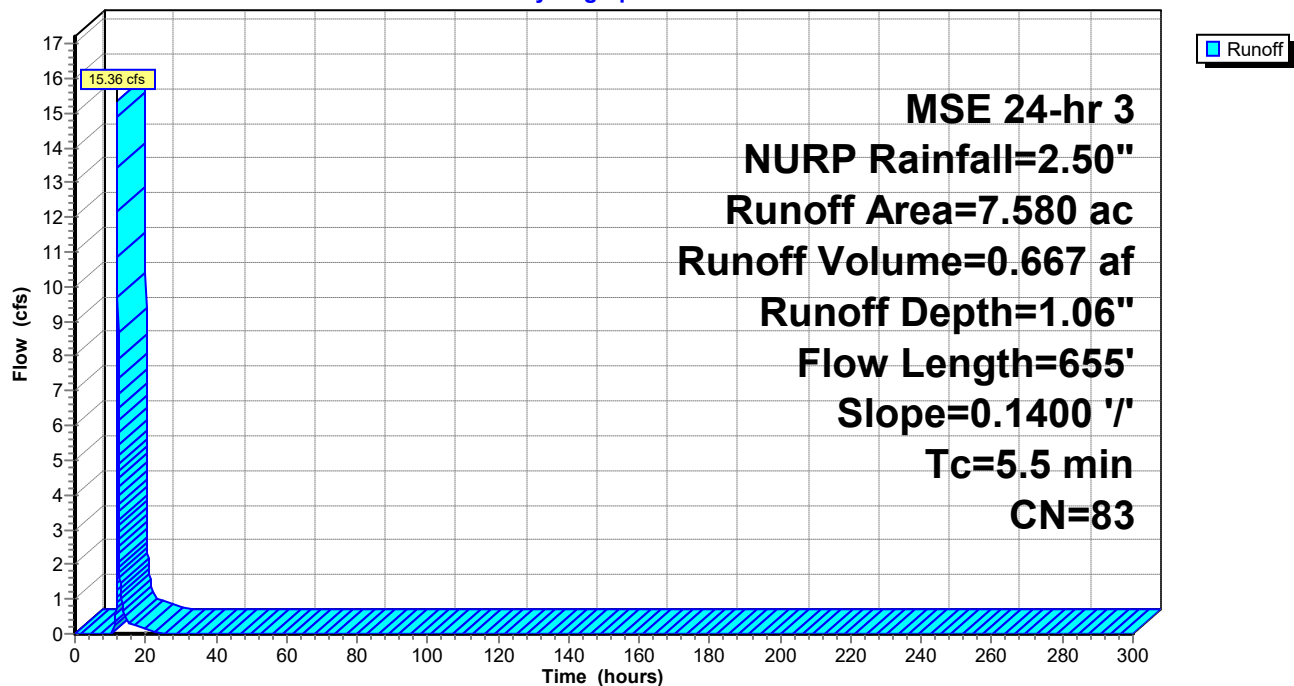
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.300	98	Existing Impervious
4.810	80	>75% Grass cover, Good, HSG D
2.470	87	Small grain, straight row, Good, HSG D
7.580	83	Weighted Average
7.280		96.04% Pervious Area
0.300		3.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	655	0.1400	1.99		Lag/CN Method,

Subcatchment 2Ex: Offsite Direct Drainage to 2EP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 2P: Onsite Drainage to 2EP

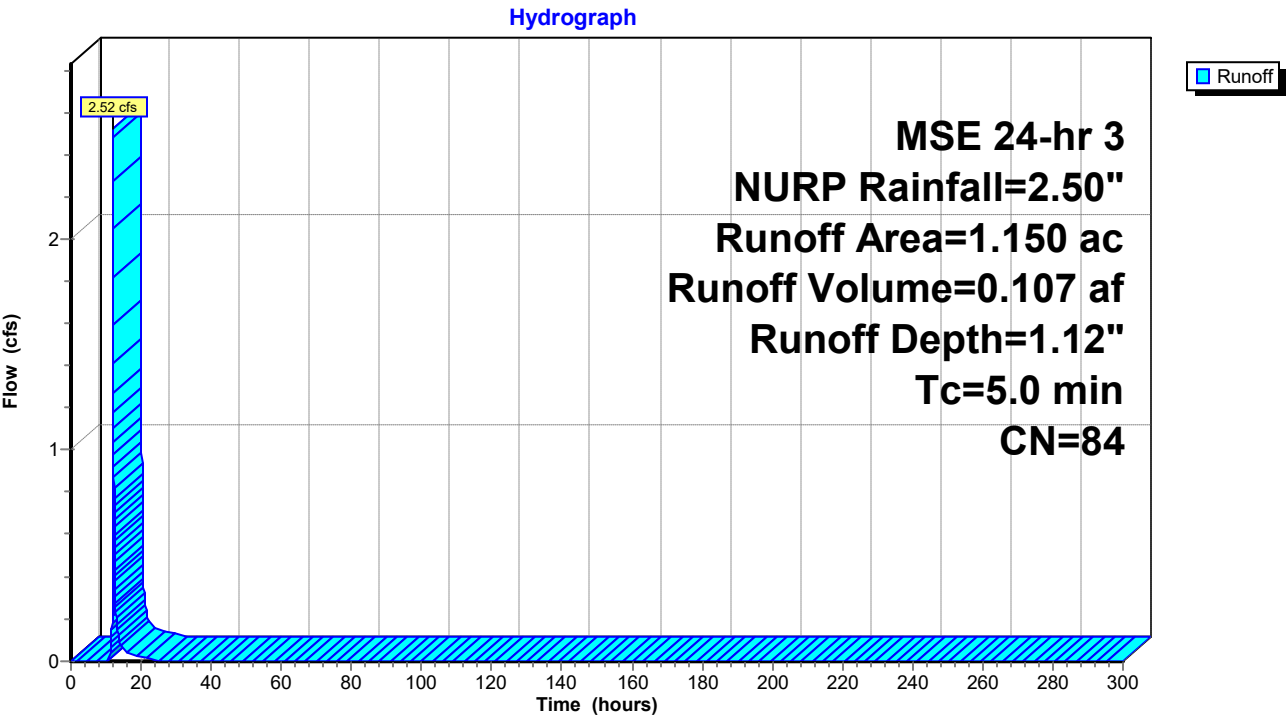
Runoff = 2.52 cfs @ 12.13 hrs, Volume= 0.107 af, Depth= 1.12"
Routed to Pond 2PP : Offsite Low Area - North Middle

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.260	98	Proposed Impervious
0.890	80	>75% Grass cover, Good, HSG D
1.150	84	Weighted Average
0.890		77.39% Pervious Area
0.260		22.61% Impervious Area

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

Subcatchment 2P: Onsite Drainage to 2EP



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 3E: Direct Drainage to 3EP

Runoff = 10.03 cfs @ 12.32 hrs, Volume= 0.779 af, Depth= 1.18"
Routed to Pond 3EP : Existing Wetland - Northeast

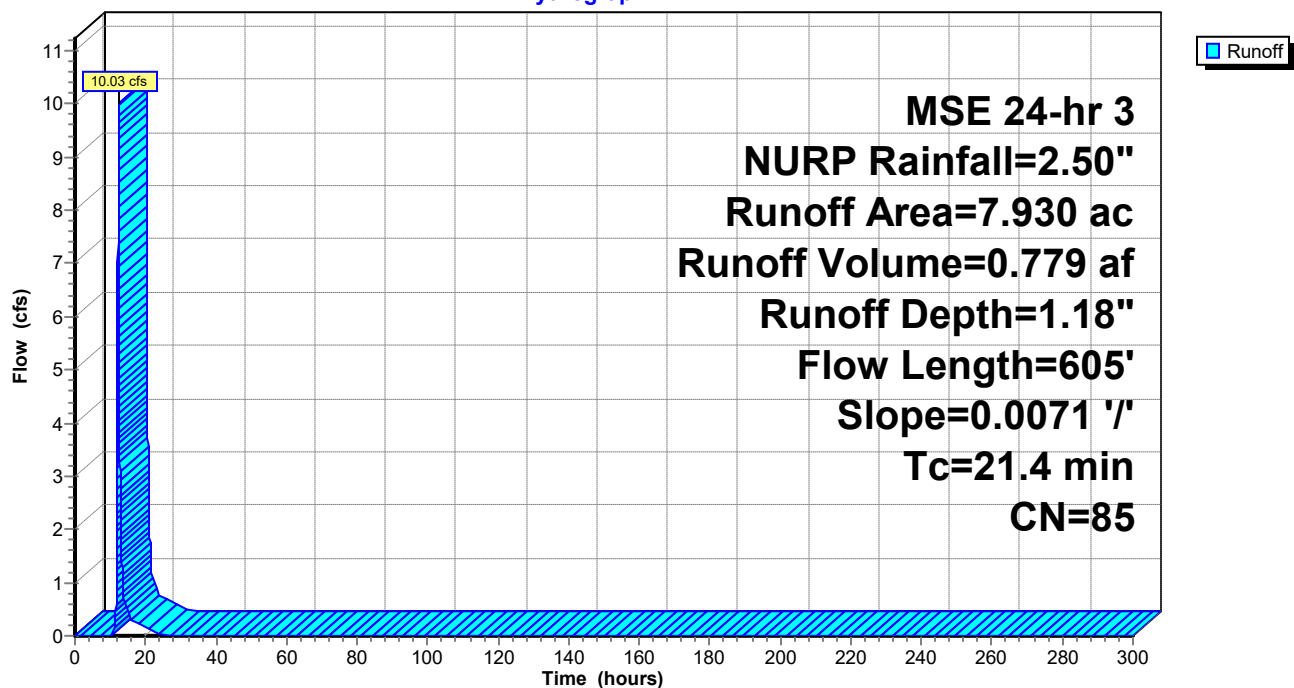
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
2.780	80	>75% Grass cover, Good, HSG D
4.650	87	Small grain, straight row, Good, HSG D
7.930	85	Weighted Average
7.430		93.69% Pervious Area
0.500		6.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.4	605	0.0071	0.47		Lag/CN Method,

Subcatchment 3E: Direct Drainage to 3EP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 3Ex: Offsite Drainage to 3EP

Runoff = 2.14 cfs @ 12.20 hrs, Volume= 0.126 af, Depth= 0.94"

Routed to Pond 3PP : Existing Wetland - Northeast

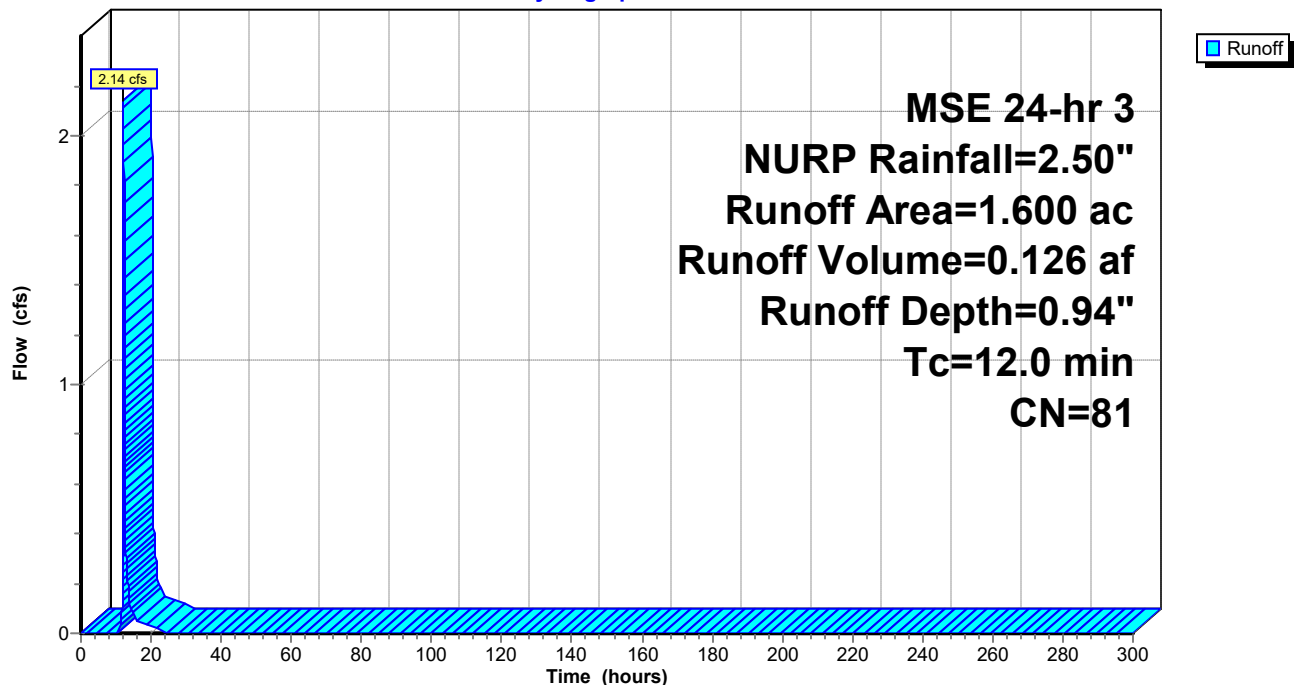
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
1.500	80	>75% Grass cover, Good, HSG D
1.600	81	Weighted Average
1.500		93.75% Pervious Area
0.100		6.25% Impervious Area

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

Subcatchment 3Ex: Offsite Drainage to 3EP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 3P: Onsite Drainage to 3EP

Runoff = 2.49 cfs @ 12.37 hrs, Volume= 0.212 af, Depth= 0.94"

Routed to Pond 3PP : Existing Wetland - Northeast

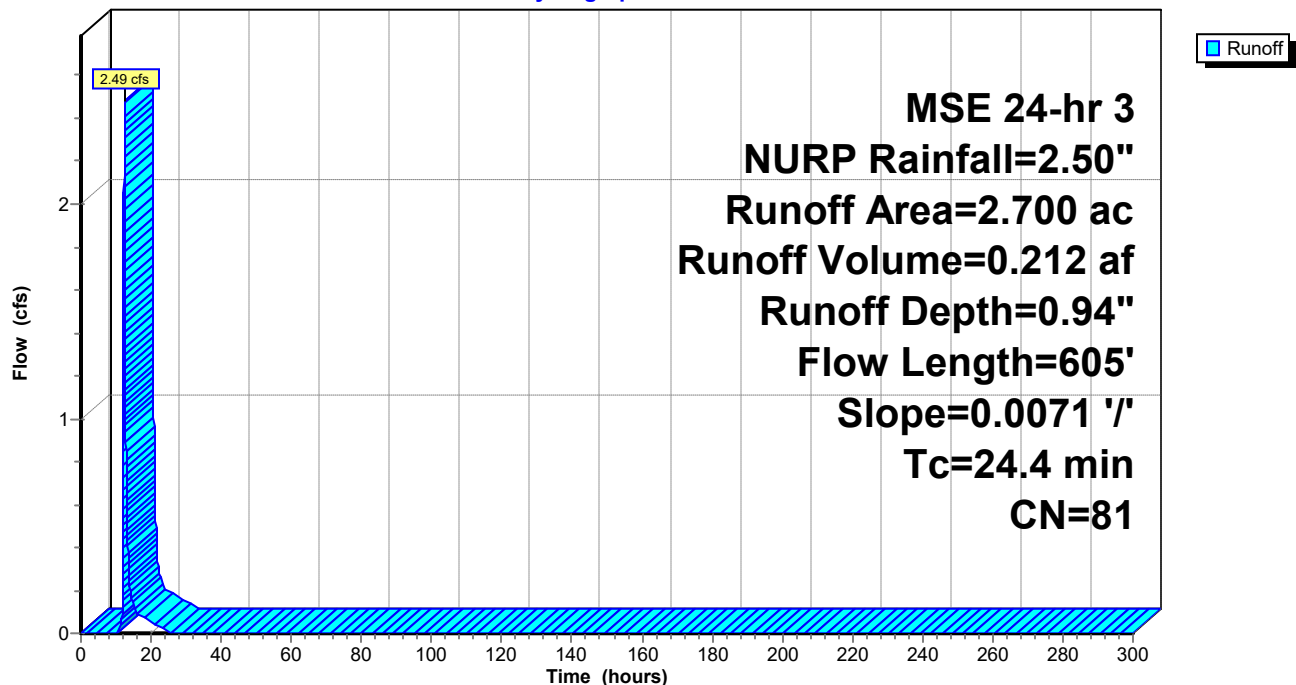
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.100	98	Proposed Impervious
2.600	80	>75% Grass cover, Good, HSG D
2.700	81	Weighted Average
2.600		96.30% Pervious Area
0.100		3.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.4	605	0.0071	0.41		Lag/CN Method,

Subcatchment 3P: Onsite Drainage to 3EP

Hydrograph



Summary for Subcatchment 4E: Direct Drainage to 4EP

Runoff = 23.00 cfs @ 12.51 hrs, Volume= 2.366 af, Depth= 1.18"
 Routed to Pond 4EP : Offsite Wetland - Southeast

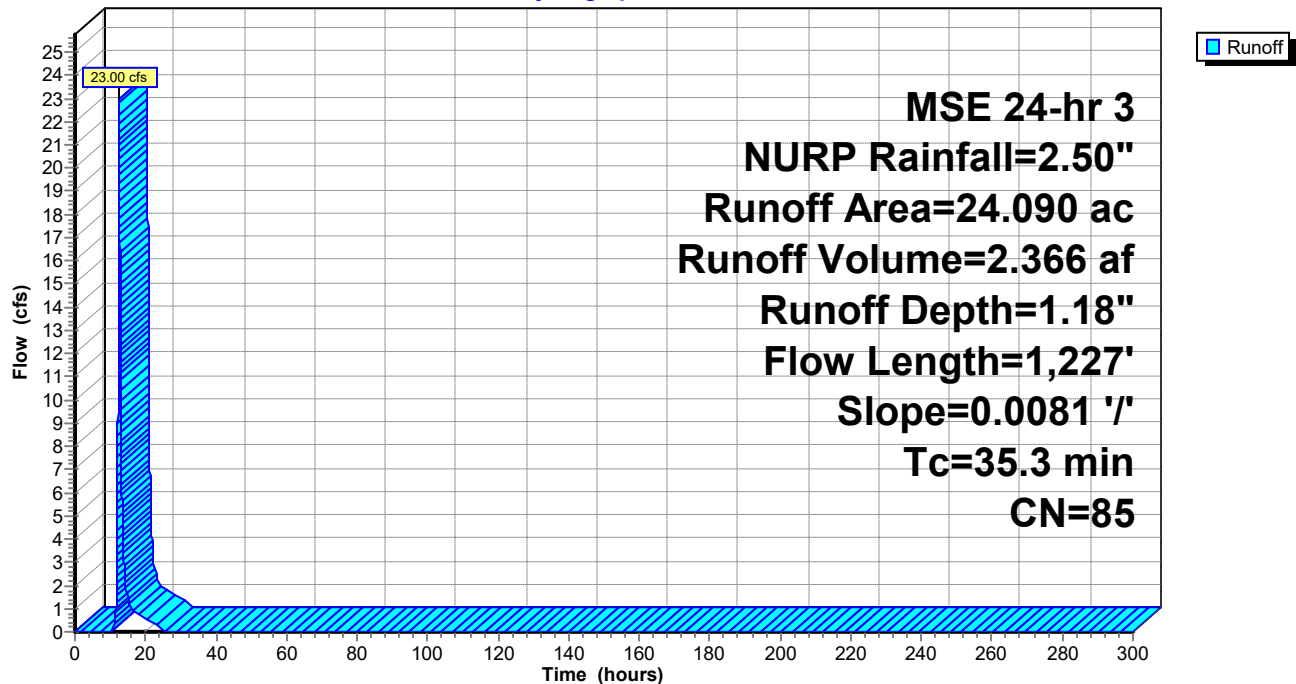
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
8.950	80	>75% Grass cover, Good, HSG D
14.640	87	Small grain, straight row, Good, HSG D
24.090	85	Weighted Average
23.590		97.92% Pervious Area
0.500		2.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	1,227	0.0081	0.58		Lag/CN Method,

Subcatchment 4E: Direct Drainage to 4EP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Runoff = 11.28 cfs @ 12.31 hrs, Volume= 0.877 af, Depth= 1.00"
Routed to Pond 4PP : Offsite Wetland - Southeast

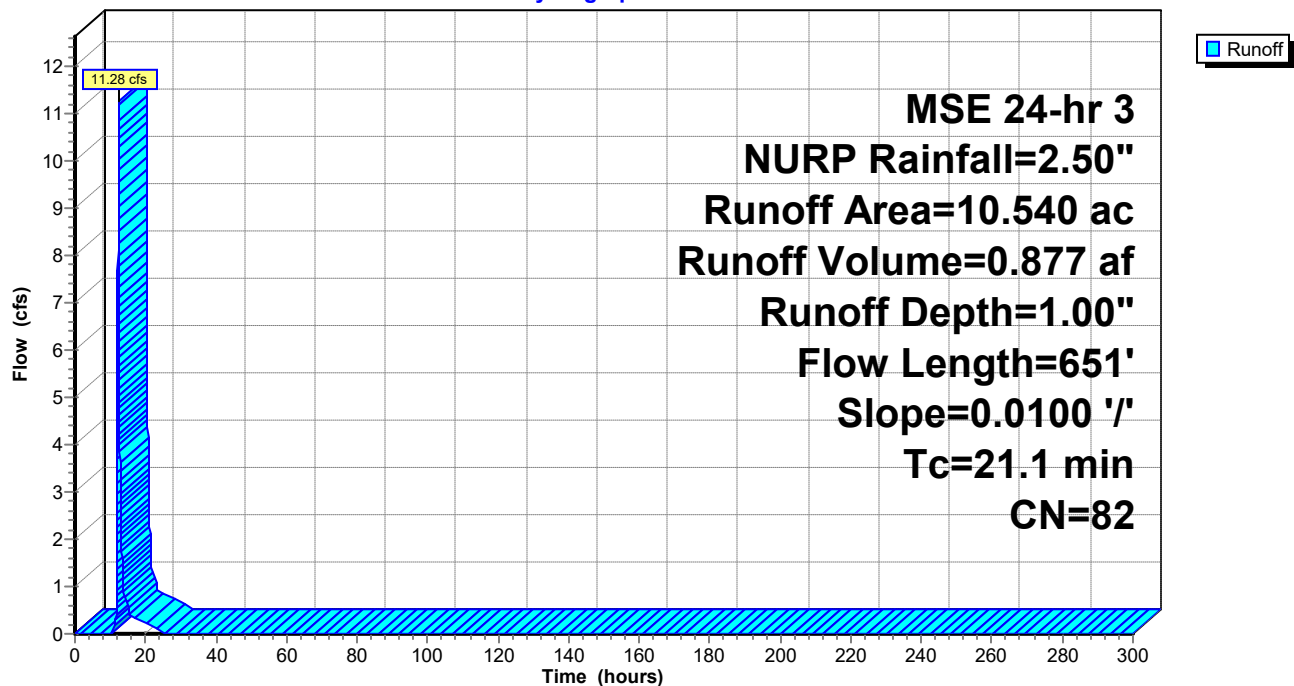
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.500	98	Existing Impervious
7.990	80	>75% Grass cover, Good, HSG D
2.050	87	Small grain, straight row, Good, HSG D
10.540	82	Weighted Average
10.040		95.26% Pervious Area
0.500		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.1	651	0.0100	0.51		Lag/CN Method,

Subcatchment 4Ex: Offsite Direct Drainage to 4EP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 4P: Onsite Drainage to 4EP

Runoff = 3.28 cfs @ 12.13 hrs, Volume= 0.139 af, Depth= 1.06"
Routed to Pond 4PP : Offsite Wetland - Southeast

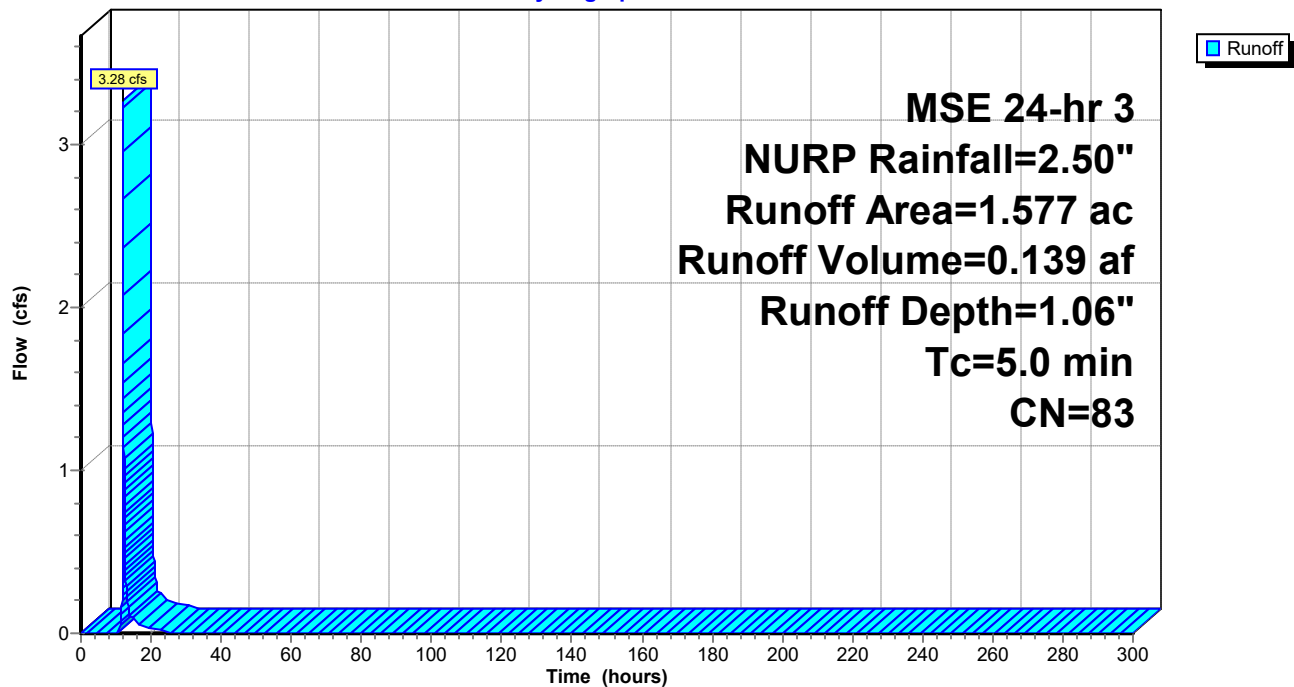
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.273	98	Paved parking, HSG D
1.304	80	>75% Grass cover, Good, HSG D
1.577	83	Weighted Average
1.304		82.69% Pervious Area
0.273		17.31% Impervious Area

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

Subcatchment 4P: Onsite Drainage to 4EP

Hydrograph



Summary for Subcatchment 5E: Direct Drainage to Southwest Wetland

Runoff = 11.61 cfs @ 12.18 hrs, Volume= 0.625 af, Depth= 1.31"

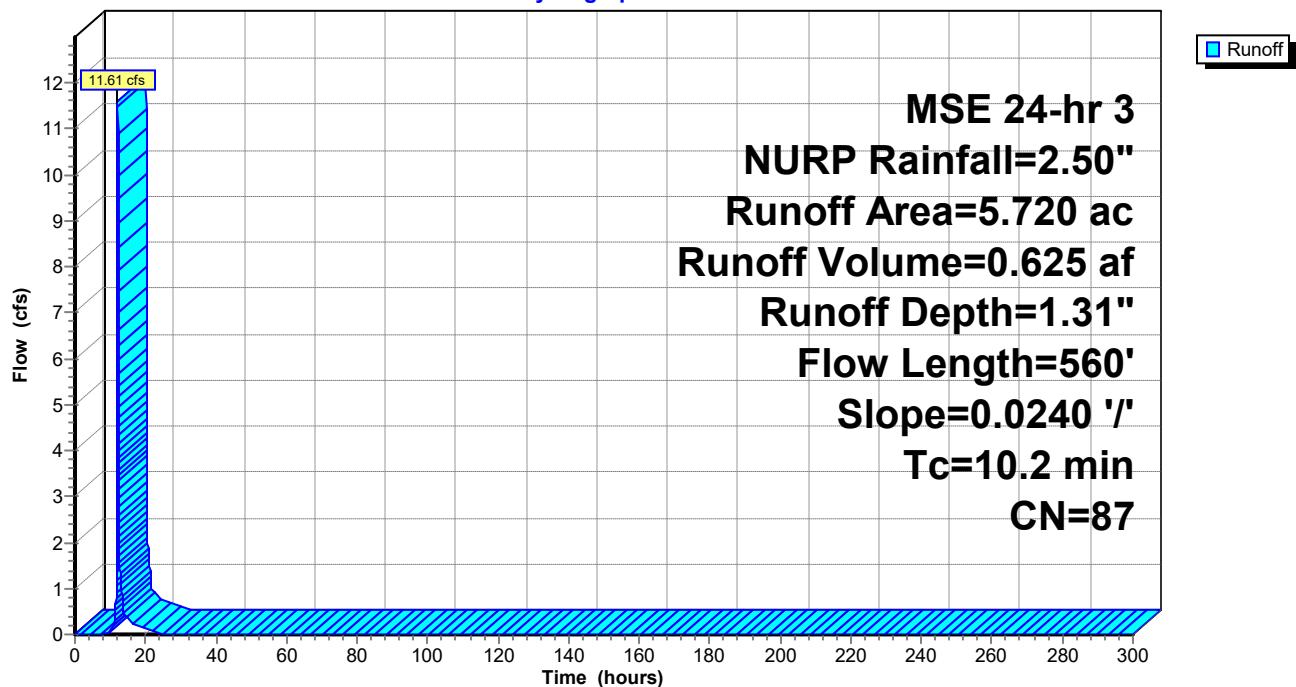
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
5.720	87	Small grain, straight row, Good, HSG D
5.720		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	560	0.0240	0.92		Lag/CN Method,

Subcatchment 5E: Direct Drainage to Southwest Wetland

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 5P: Onsite Drainage to 5PP

Runoff = 4.35 cfs @ 12.18 hrs, Volume= 0.235 af, Depth= 1.00"
Routed to Pond 5PP : Pond 5

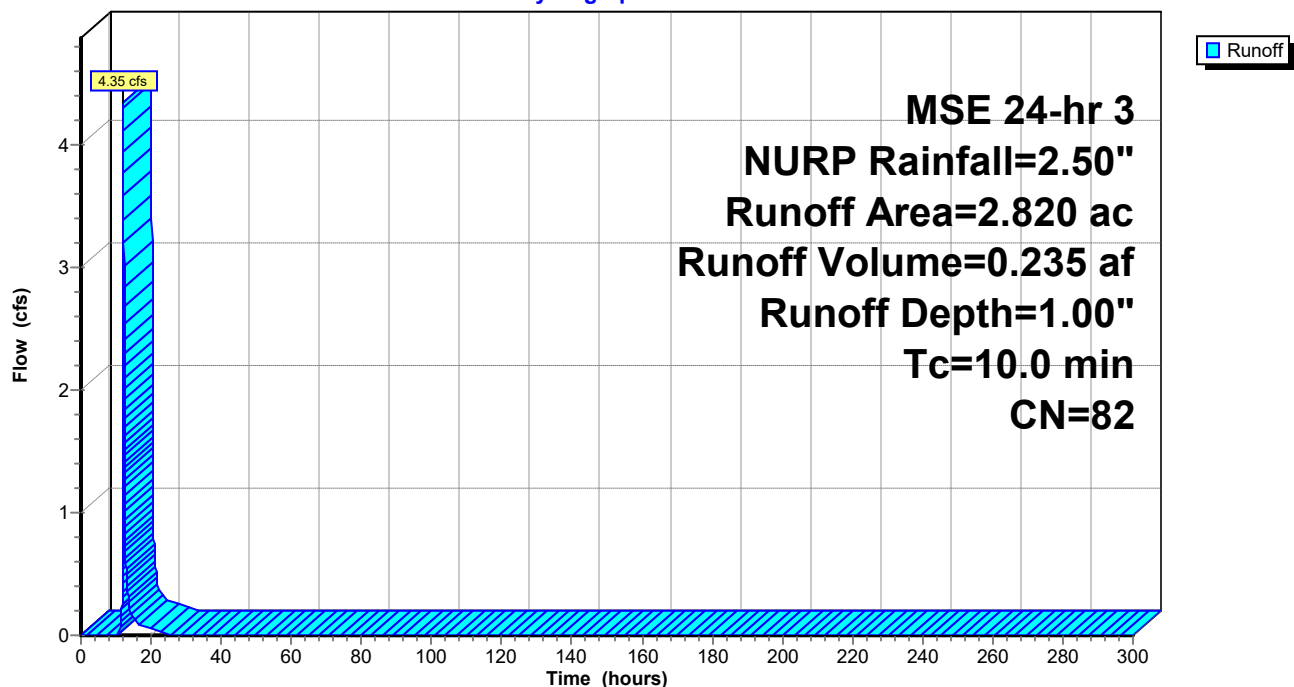
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.320	98	Proposed Impervious
2.500	80	>75% Grass cover, Good, HSG D
2.820	82	Weighted Average
2.500		88.65% Pervious Area
0.320		11.35% Impervious Area

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

Subcatchment 5P: Onsite Drainage to 5PP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 6P: Drainage to Filtration Basin 6

Runoff = 24.50 cfs @ 12.18 hrs, Volume= 1.311 af, Depth= 1.31"
Routed to Pond 6PP : Filtration Basin 6

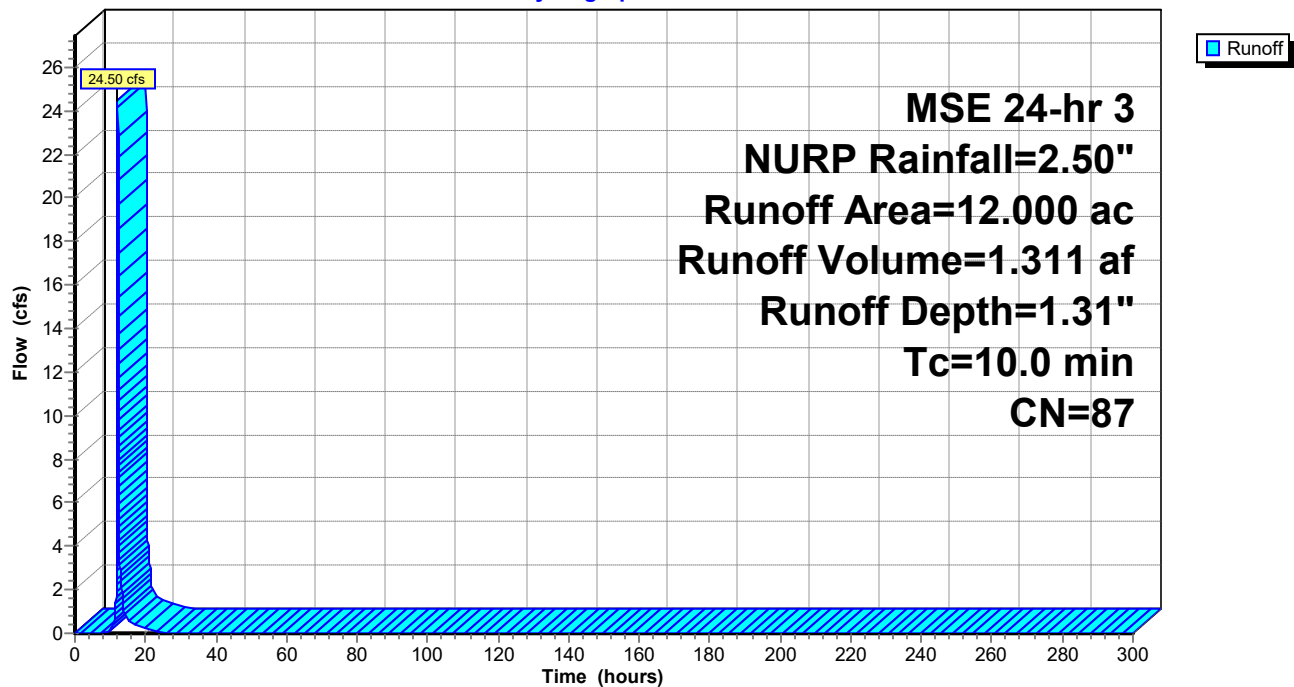
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
4.700	98	Paved parking, HSG D
7.300	80	>75% Grass cover, Good, HSG D
12.000	87	Weighted Average
7.300		60.83% Pervious Area
4.700		39.17% Impervious Area

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

Subcatchment 6P: Drainage to Filtration Basin 6

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 7P: Onsite Drainage to 7PP

Runoff = 18.29 cfs @ 12.24 hrs, Volume= 1.171 af, Depth= 1.24"
Routed to Pond 7PP : Pond 7

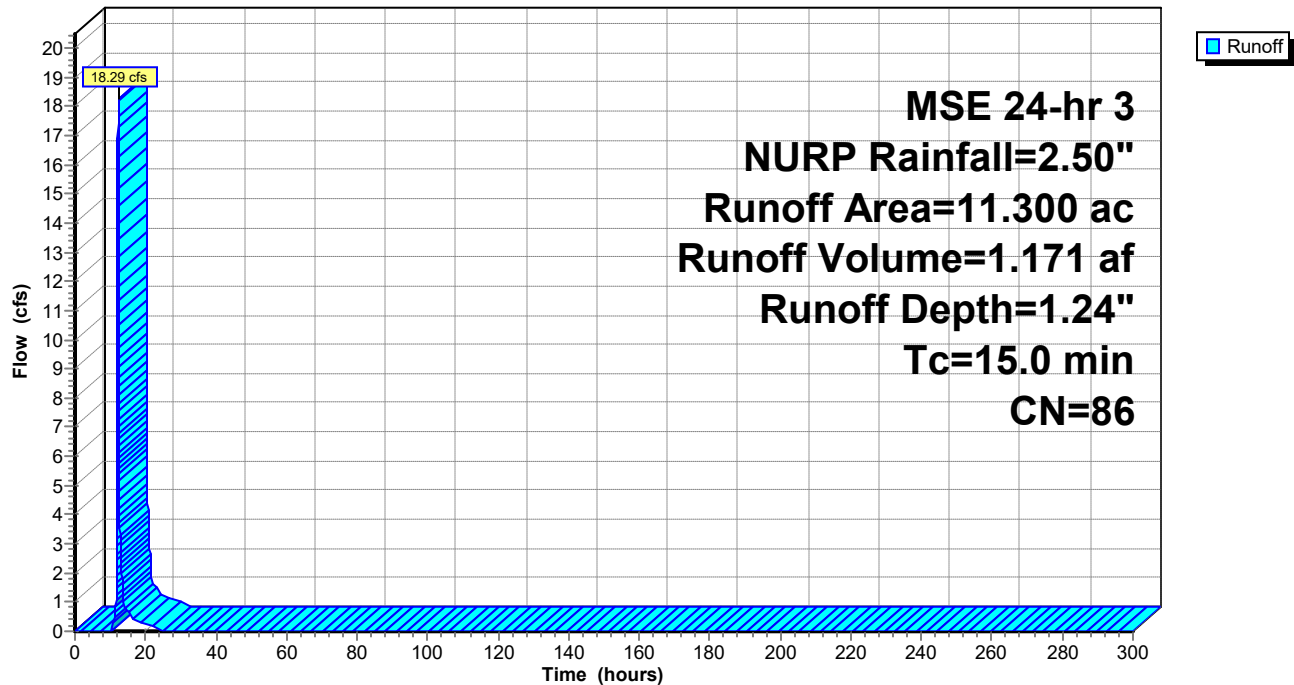
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 3.700	98	Proposed Impervious
7.600	80	>75% Grass cover, Good, HSG D
11.300	86	Weighted Average
7.600		67.26% Pervious Area
3.700		32.74% Impervious Area

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

Subcatchment 7P: Onsite Drainage to 7PP

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 8Ex: Territorial Ditch

Runoff = 2.48 cfs @ 12.13 hrs, Volume= 0.105 af, Depth= 1.18"
Routed to Pond 8PP : Existing Territorial Ditch

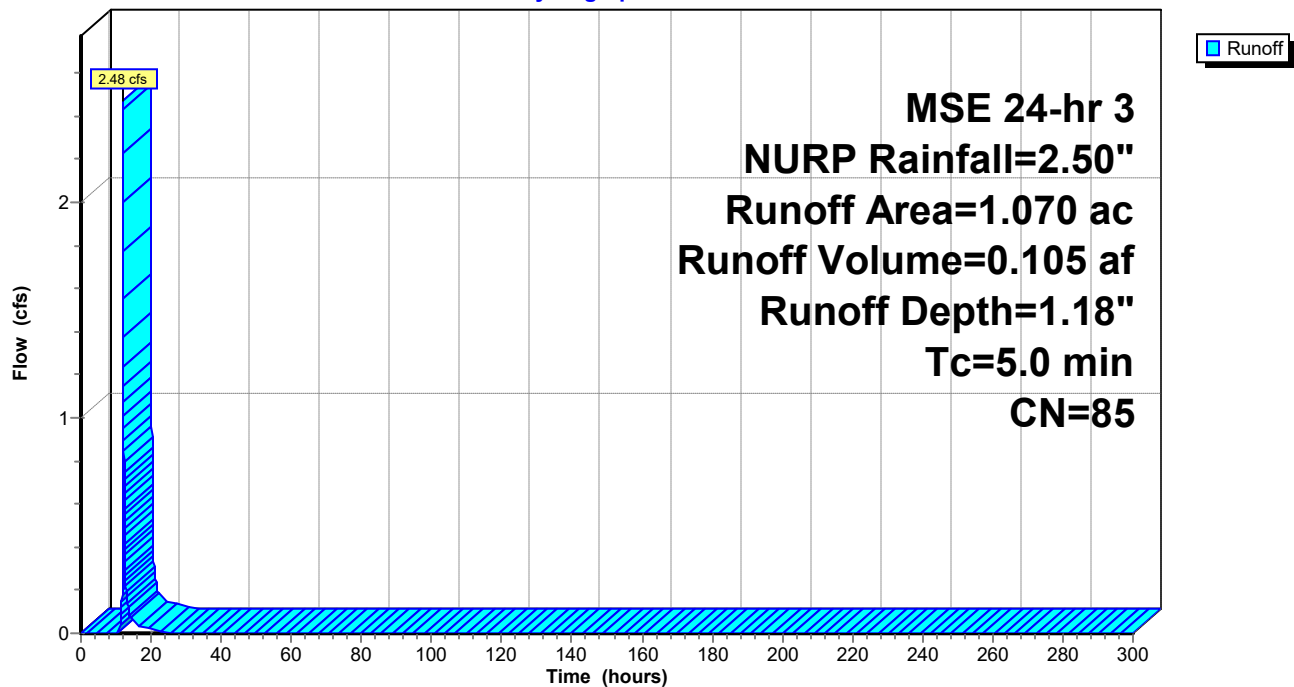
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
* 0.310	98	Existing Impervious
0.760	80	>75% Grass cover, Good, HSG D
1.070	85	Weighted Average
0.760		71.03% Pervious Area
0.310		28.97% Impervious Area

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

Subcatchment 8Ex: Territorial Ditch

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 9P: Offsite Drainage East

Runoff = 0.14 cfs @ 12.13 hrs, Volume= 0.006 af, Depth= 0.89"

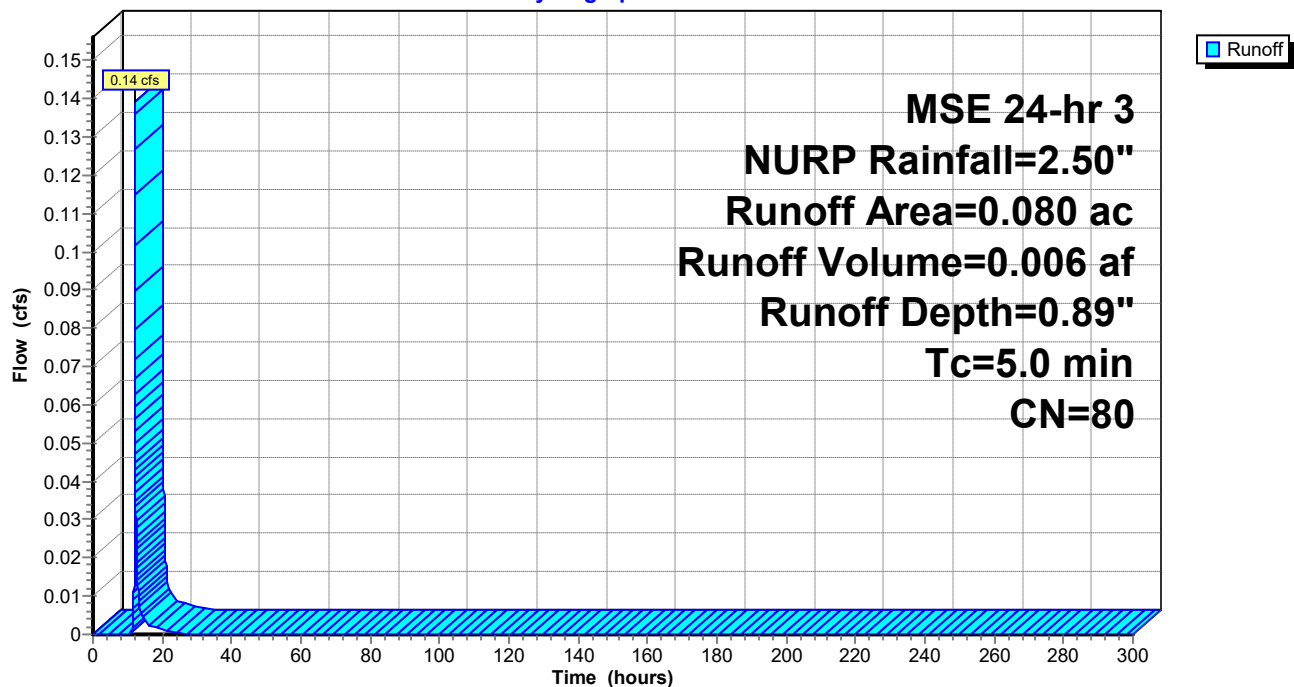
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.080	80	>75% Grass cover, Good, HSG D
0.080		100.00% Pervious Area

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

Subcatchment 9P: Offsite Drainage East

Hydrograph



Summary for Reach 1ER: To Big Woods - Southwest Wetland Complex

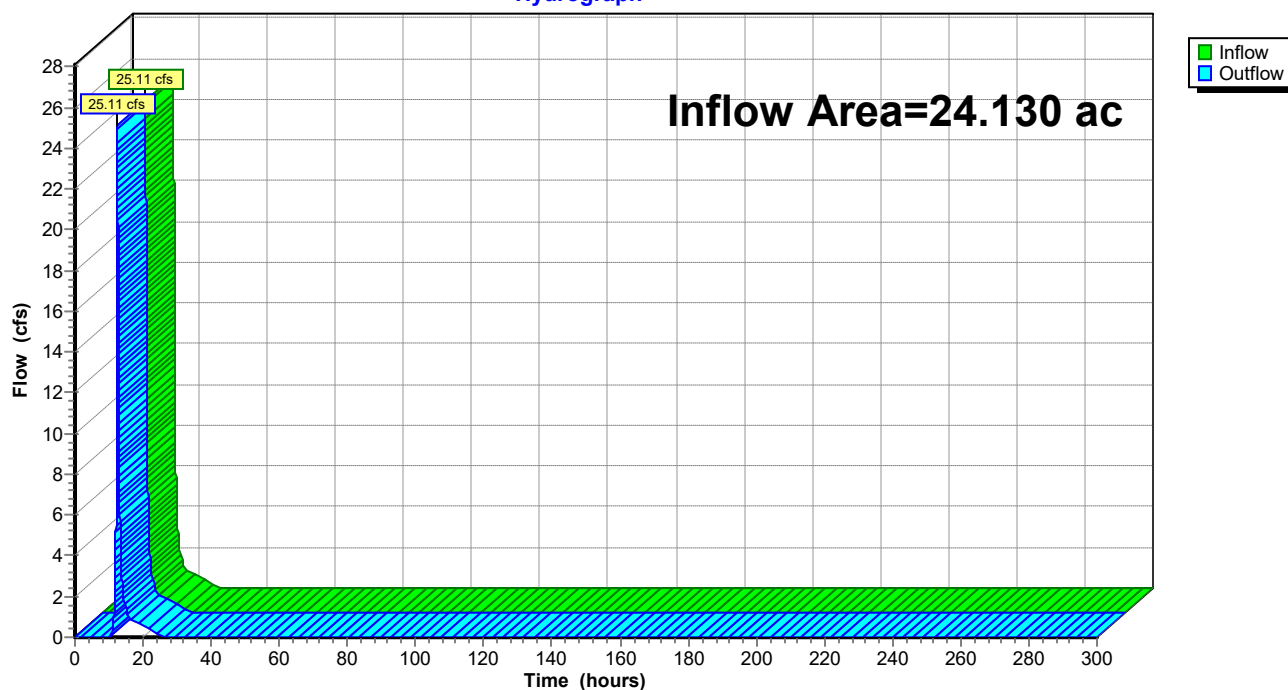
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 24.130 ac, 3.81% Impervious, Inflow Depth = 1.24" for NURP event
Inflow = 25.11 cfs @ 12.42 hrs, Volume= 2.490 af
Outflow = 25.11 cfs @ 12.43 hrs, Volume= 2.490 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1ER: To Big Woods - Southwest Wetland Complex

Hydrograph



Summary for Reach 1PR: To Big Woods - Southwest Wetland Complex

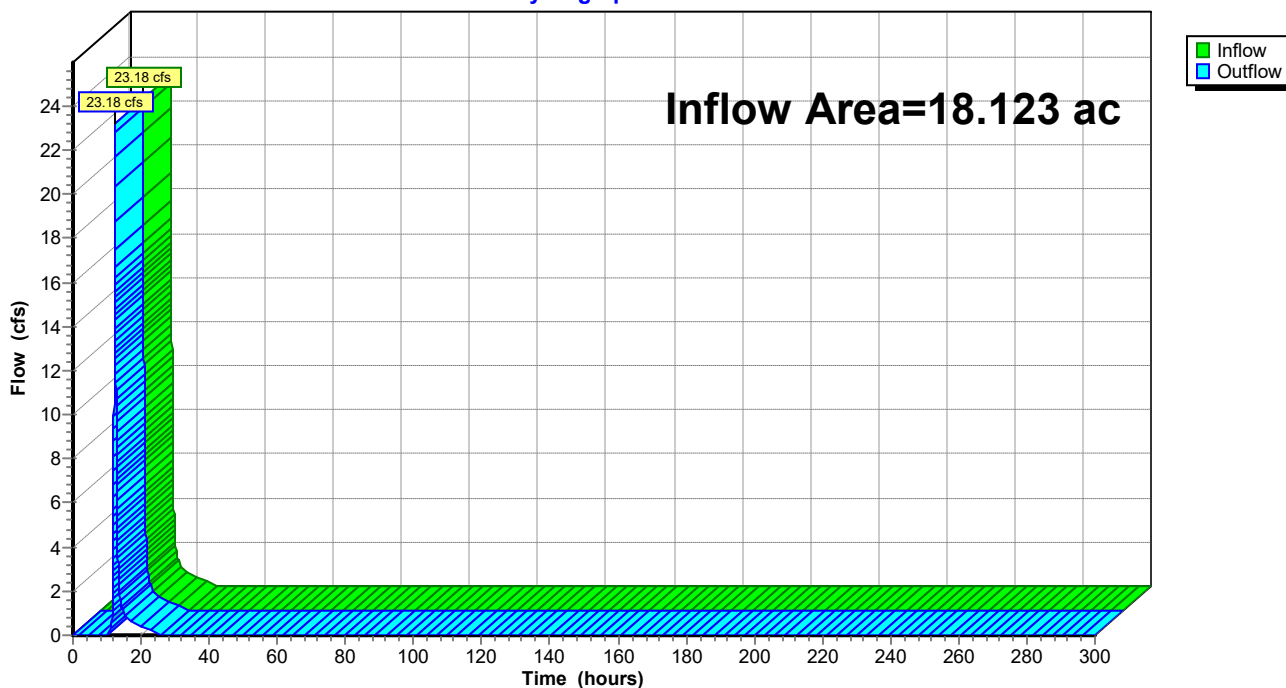
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.123 ac, 7.67% Impervious, Inflow Depth = 1.18" for NURP event
Inflow = 23.18 cfs @ 12.16 hrs, Volume= 1.785 af
Outflow = 23.18 cfs @ 12.17 hrs, Volume= 1.785 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 1PR: To Big Woods - Southwest Wetland Complex

Hydrograph



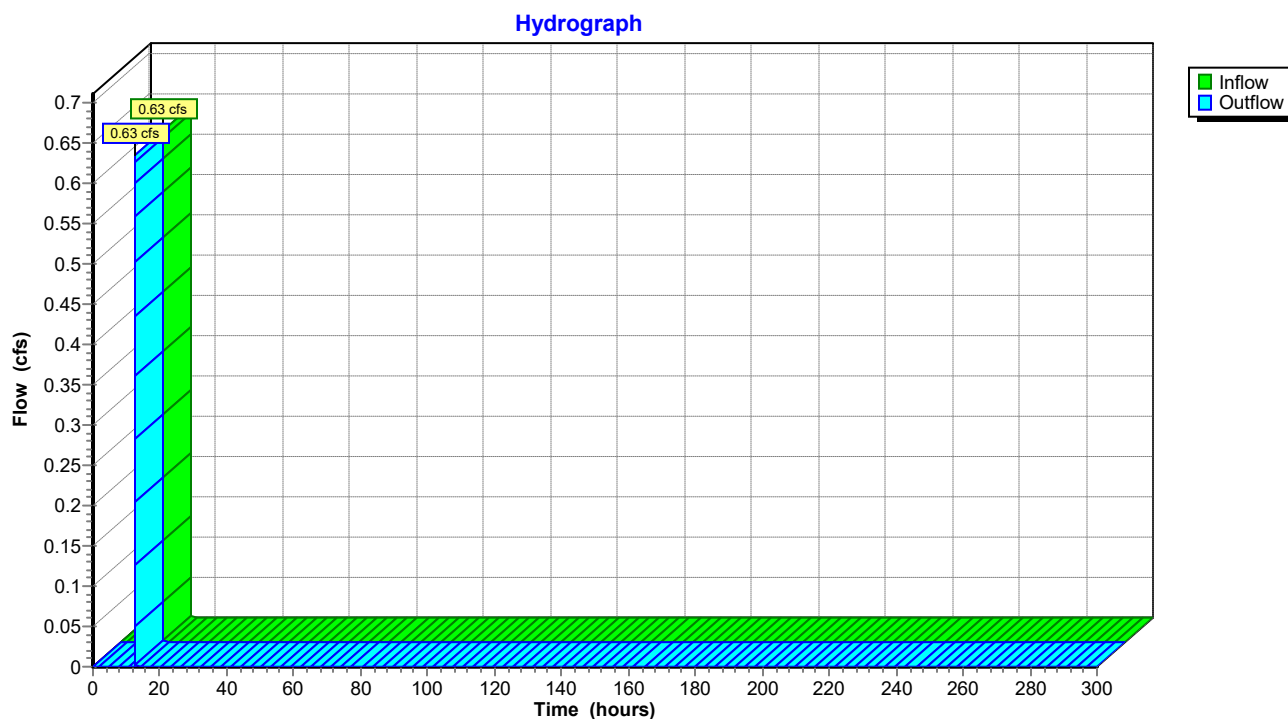
Summary for Reach 2ER: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 0.63 cfs @ 12.53 hrs, Volume= 0.006 af
 Outflow = 0.63 cfs @ 12.54 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2ER: Existing Overflow Offsite to North



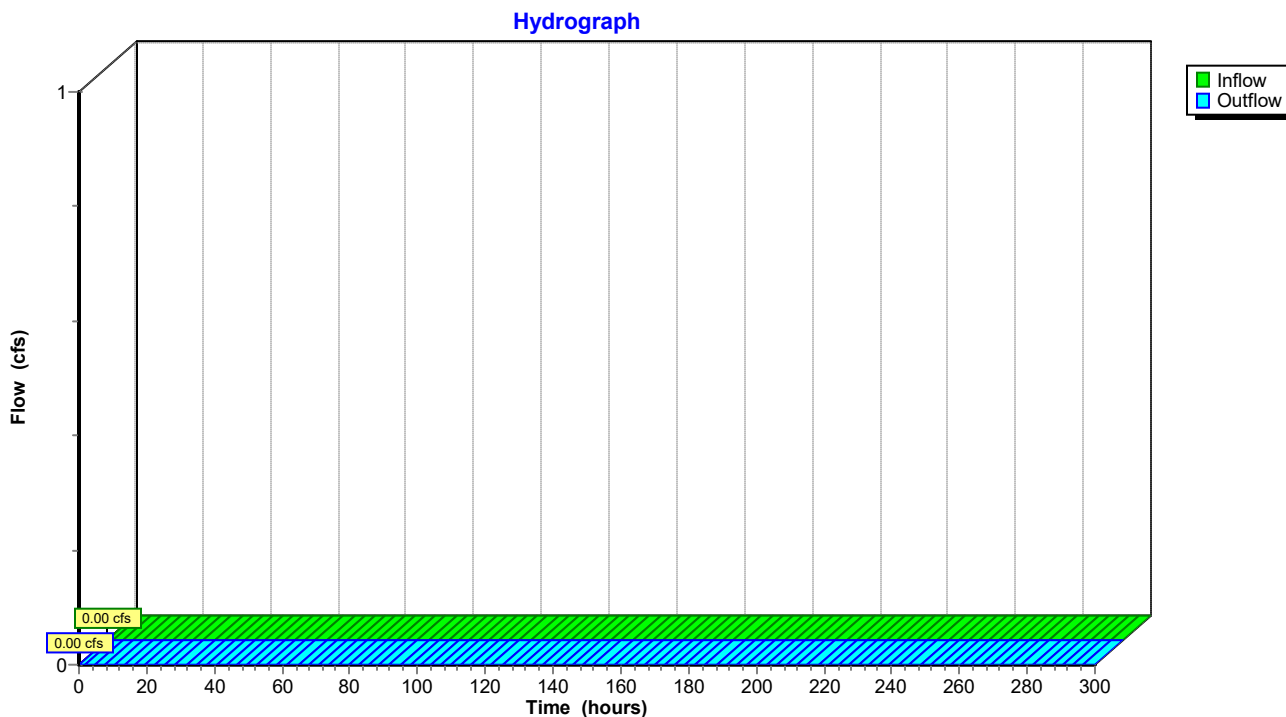
Summary for Reach 2PR: Existing Overflow Offsite to North

[40] Hint: Not Described (Outflow=Inflow)

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

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 2PR: Existing Overflow Offsite to North



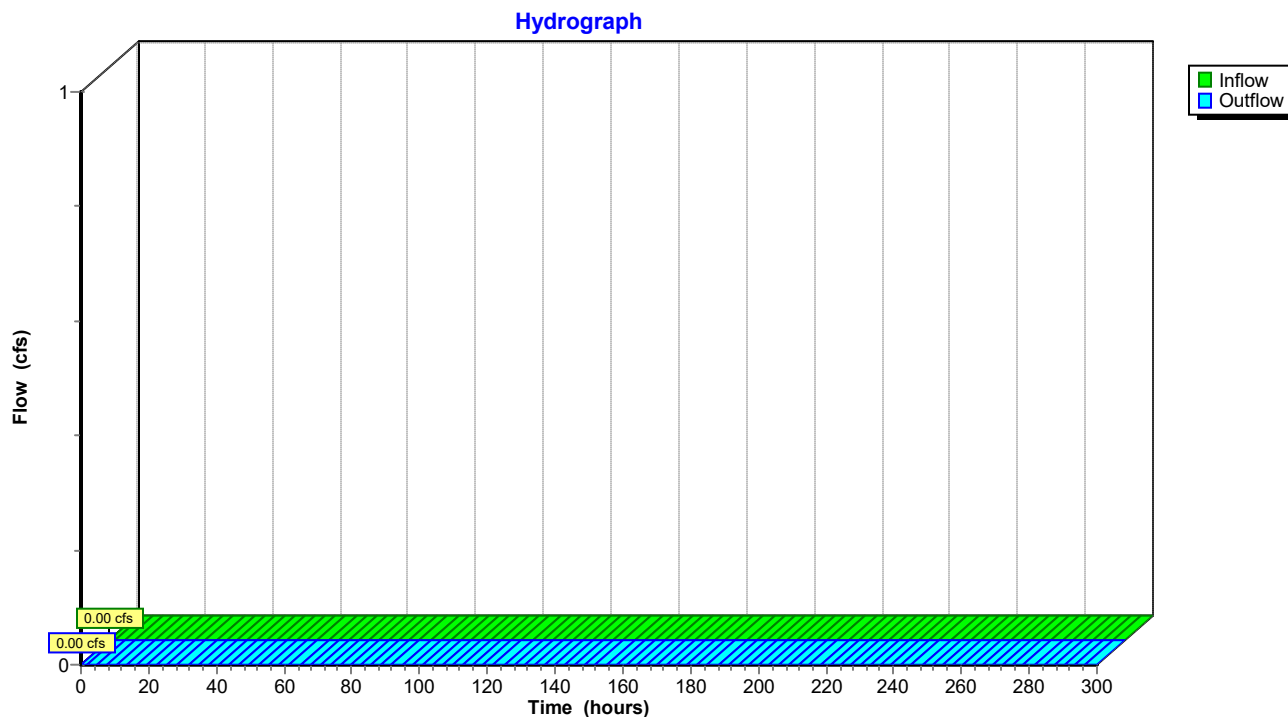
Summary for Reach 3ER: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

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

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3ER: To Big Woods - Southeast Wetland Complex



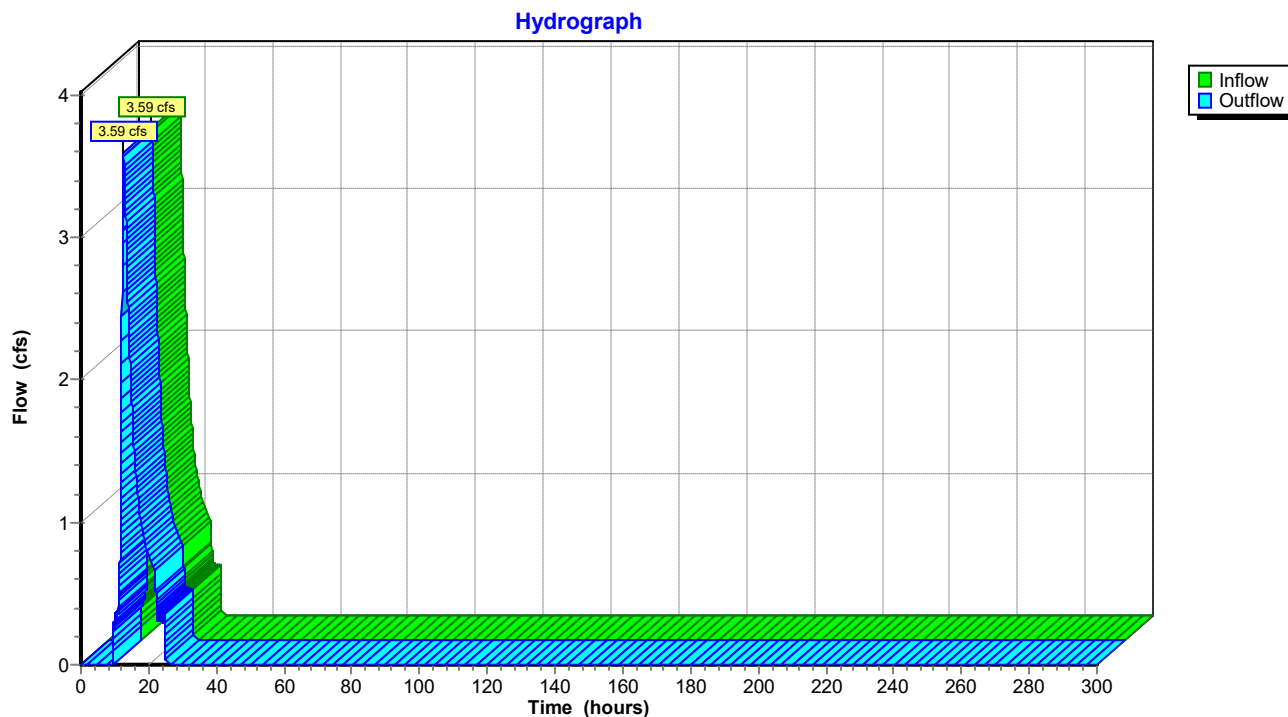
Summary for Reach 3PR: To Big Woods - Southeast Wetland Complex

[40] Hint: Not Described (Outflow=Inflow)

Inflow = 3.59 cfs @ 12.56 hrs, Volume= 1.435 af
 Outflow = 3.59 cfs @ 12.57 hrs, Volume= 1.435 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Reach 3PR: To Big Woods - Southeast Wetland Complex



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Pond 1EP: Offsite Low Area - Northwest

Inflow Area = 11.480 ac, 5.40% Impervious, Inflow Depth = 1.31" for NURP event
 Inflow = 14.80 cfs @ 12.38 hrs, Volume= 1.254 af
 Outflow = 11.70 cfs @ 12.53 hrs, Volume= 1.253 af, Atten= 21%, Lag= 9.2 min
 Primary = 11.07 cfs @ 12.53 hrs, Volume= 1.247 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 0.63 cfs @ 12.53 hrs, Volume= 0.006 af
 Routed to Reach 2ER : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 947.08' @ 12.53 hrs Surf.Area= 0.158 ac Storage= 0.145 af

Plug-Flow detention time= 9.2 min calculated for 1.253 af (100% of inflow)
 Center-of-Mass det. time= 8.9 min (832.1 - 823.2)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

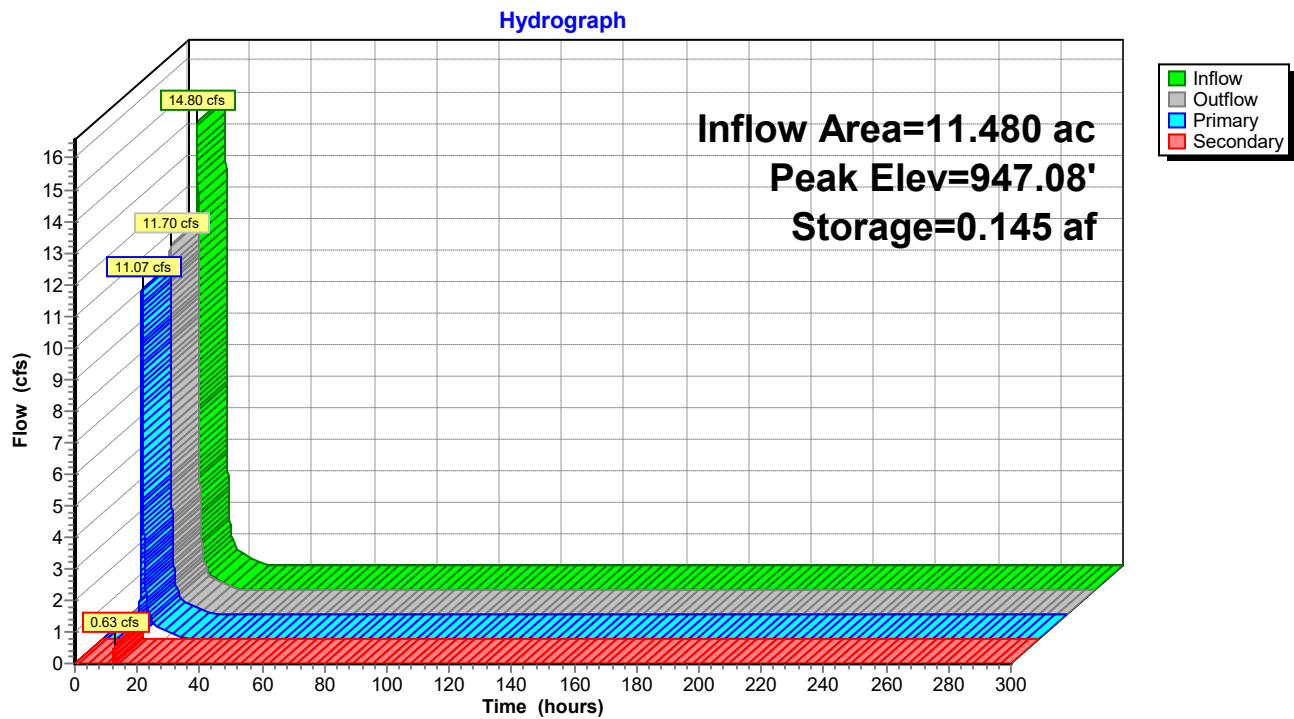
Primary OutFlow Max=11.07 cfs @ 12.53 hrs HW=947.08' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 11.07 cfs @ 6.26 fps)

Secondary OutFlow Max=0.63 cfs @ 12.53 hrs HW=947.08' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.63 cfs @ 0.77 fps)

Pond 1EP: Offsite Low Area - Northwest



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Summary for Pond 1PP: Offsite Low Area - Northwest

Inflow Area = 9.393 ac, 8.84% Impervious, Inflow Depth = 1.29" for NURP event
 Inflow = 12.61 cfs @ 12.31 hrs, Volume= 1.012 af
 Outflow = 10.03 cfs @ 12.45 hrs, Volume= 1.011 af, Atten= 20%, Lag= 8.2 min
 Primary = 10.03 cfs @ 12.45 hrs, Volume= 1.011 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 2PR : Existing Overflow Offsite to North

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 946.78' @ 12.45 hrs Surf.Area= 0.105 ac Storage= 0.109 af

Plug-Flow detention time= 9.5 min calculated for 1.011 af (100% of inflow)
 Center-of-Mass det. time= 8.9 min (827.6 - 818.7)

Volume	Invert	Avail.Storage	Storage Description
#1	944.60'	2.474 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
944.60	0.020	0.000	0.000
946.00	0.050	0.049	0.049
947.00	0.120	0.085	0.134
948.00	0.580	0.350	0.484
950.00	1.410	1.990	2.474

Device	Routing	Invert	Outlet Devices
#1	Primary	944.64'	18.0" Round Culvert L= 55.7' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 944.64' / 943.27' S= 0.0246 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	947.00'	10.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

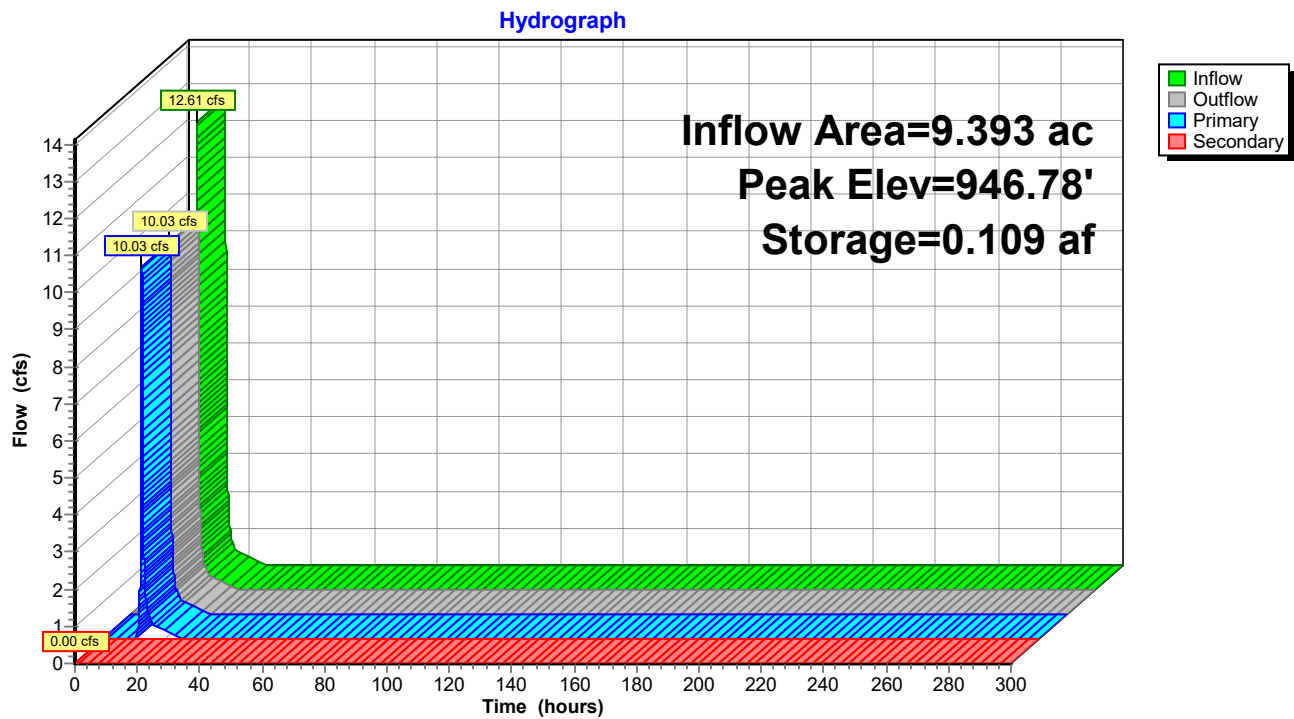
Primary OutFlow Max=10.03 cfs @ 12.45 hrs HW=946.78' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 10.03 cfs @ 5.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=944.60' TW=0.00' (Dynamic Tailwater)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1PP: Offsite Low Area - Northwest



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Summary for Pond 2EP: Offsite Low Area - North Middle

Inflow Area = 12.650 ac, 2.37% Impervious, Inflow Depth = 1.18" for NURP event
 Inflow = 14.73 cfs @ 12.36 hrs, Volume= 1.242 af
 Outflow = 14.64 cfs @ 12.39 hrs, Volume= 1.242 af, Atten= 1%, Lag= 1.8 min
 Primary = 14.64 cfs @ 12.39 hrs, Volume= 1.242 af
 Routed to Reach 1ER : To Big Woods - Southwest Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 1EP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 947.67' @ 12.39 hrs Surf.Area= 0.017 ac Storage= 0.018 af

Plug-Flow detention time= 1.2 min calculated for 1.242 af (100% of inflow)
 Center-of-Mass det. time= 0.9 min (829.3 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

Device	Routing	Invert	Outlet Devices
#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=14.64 cfs @ 12.39 hrs HW=947.67' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 14.64 cfs @ 4.72 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=945.70' TW=944.60' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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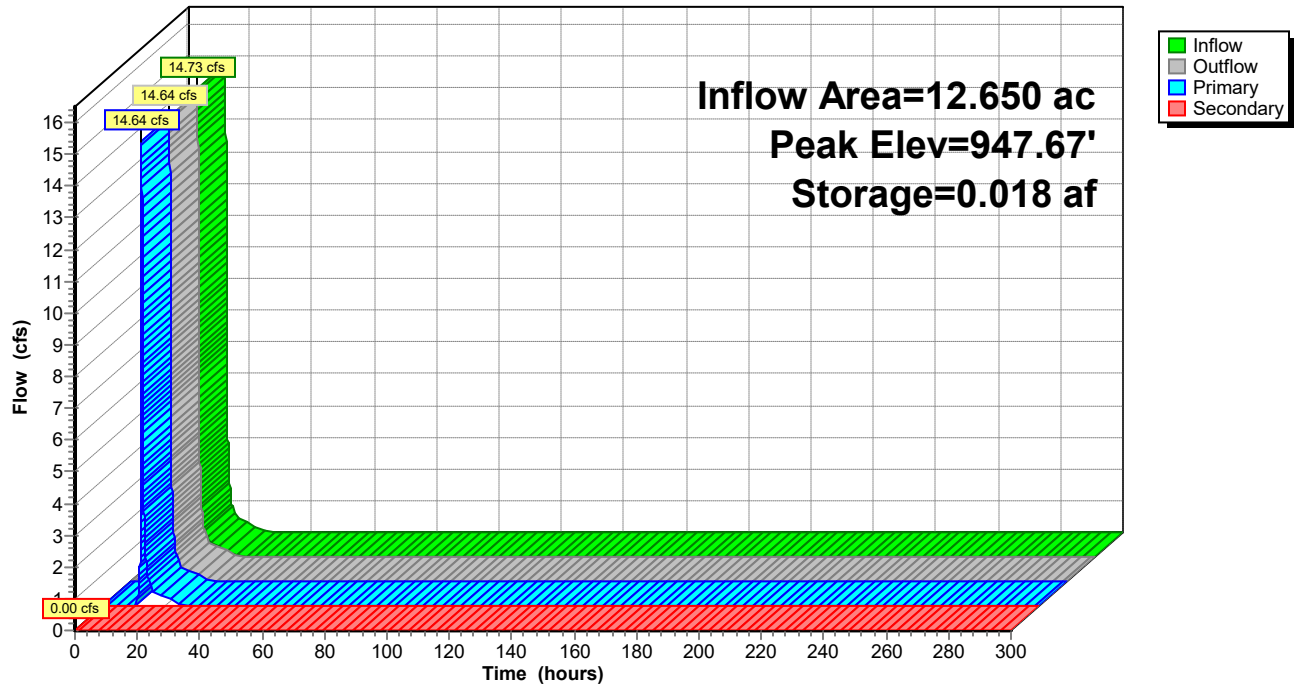
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Pond 2EP: Offsite Low Area - North Middle

Hydrograph



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Summary for Pond 2PP: Offsite Low Area - North Middle

Inflow Area = 8.730 ac, 6.41% Impervious, Inflow Depth = 1.06" for NURP event
 Inflow = 17.88 cfs @ 12.13 hrs, Volume= 0.774 af
 Outflow = 16.94 cfs @ 12.15 hrs, Volume= 0.774 af, Atten= 5%, Lag= 1.4 min
 Primary = 16.94 cfs @ 12.15 hrs, Volume= 0.774 af
 Routed to Reach 1PR : To Big Woods - Southwest Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 1PP : Offsite Low Area - Northwest

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 948.00' @ 12.15 hrs Surf.Area= 0.021 ac Storage= 0.024 af

Plug-Flow detention time= 1.3 min calculated for 0.774 af (100% of inflow)
 Center-of-Mass det. time= 1.0 min (816.2 - 815.2)

Volume	Invert	Avail.Storage	Storage Description
#1	945.70'	1.804 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
945.70	0.001	0.000	0.000
948.00	0.020	0.024	0.024
950.00	0.300	0.320	0.344
952.00	1.160	1.460	1.804

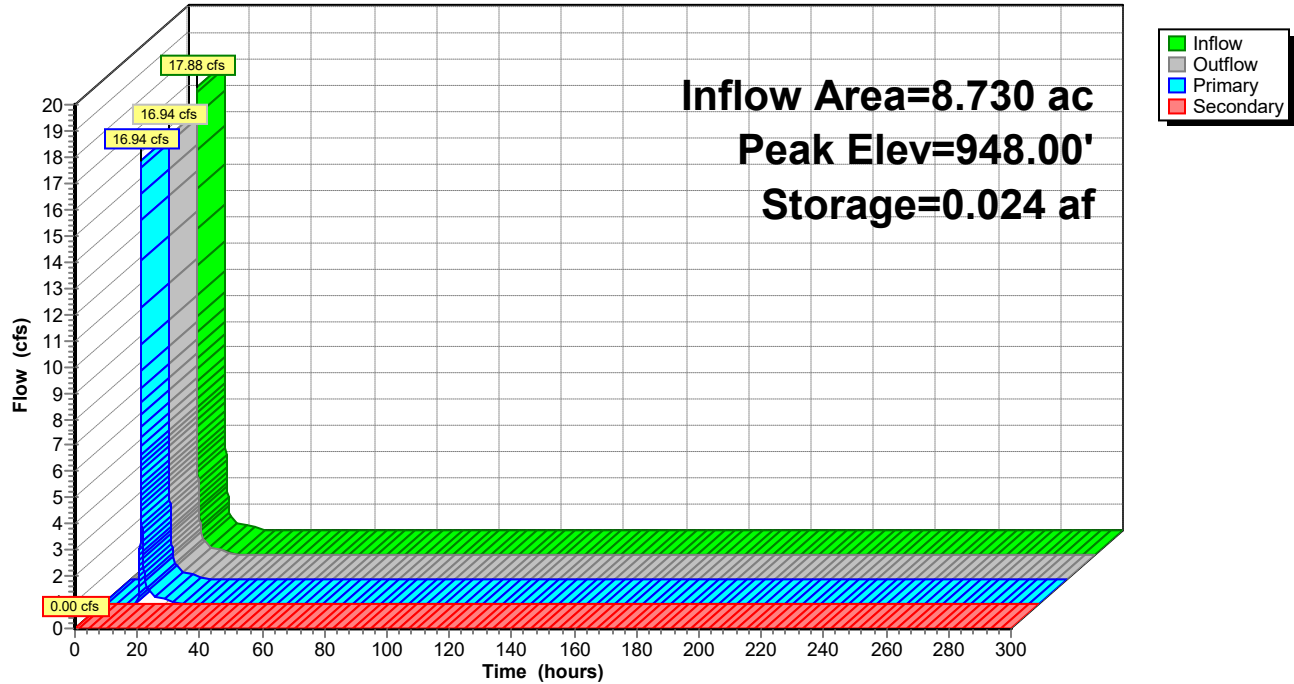
Device	Routing	Invert	Outlet Devices
#1	Primary	945.75'	24.0" Round Culvert L= 73.4' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 945.75' / 944.95' S= 0.0109 '/ Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Secondary	949.60'	10.0' long x 16.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=16.90 cfs @ 12.15 hrs HW=948.00' TW=0.00' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 16.90 cfs @ 5.38 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=945.70' TW=944.60' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2PP: Offsite Low Area - North Middle

Hydrograph



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Summary for Pond 3EP: Existing Wetland - Northeast

[92] Warning: Device #3 is above defined storage

Inflow = 10.03 cfs @ 12.32 hrs, Volume= 1.877 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 3ER : To Big Woods - Southeast Wetland Complex
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4EP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 950.64' @ 300.00 hrs Surf.Area= 1.586 ac Storage= 1.877 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	11.020 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
948.00	0.050	0.000	0.000
949.00	0.400	0.225	0.225
950.00	1.150	0.775	1.000
952.00	2.510	3.660	4.660
954.00	3.850	6.360	11.020

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	951.10'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#3	Secondary	954.30'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=948.00' TW=0.00' (Dynamic Tailwater)

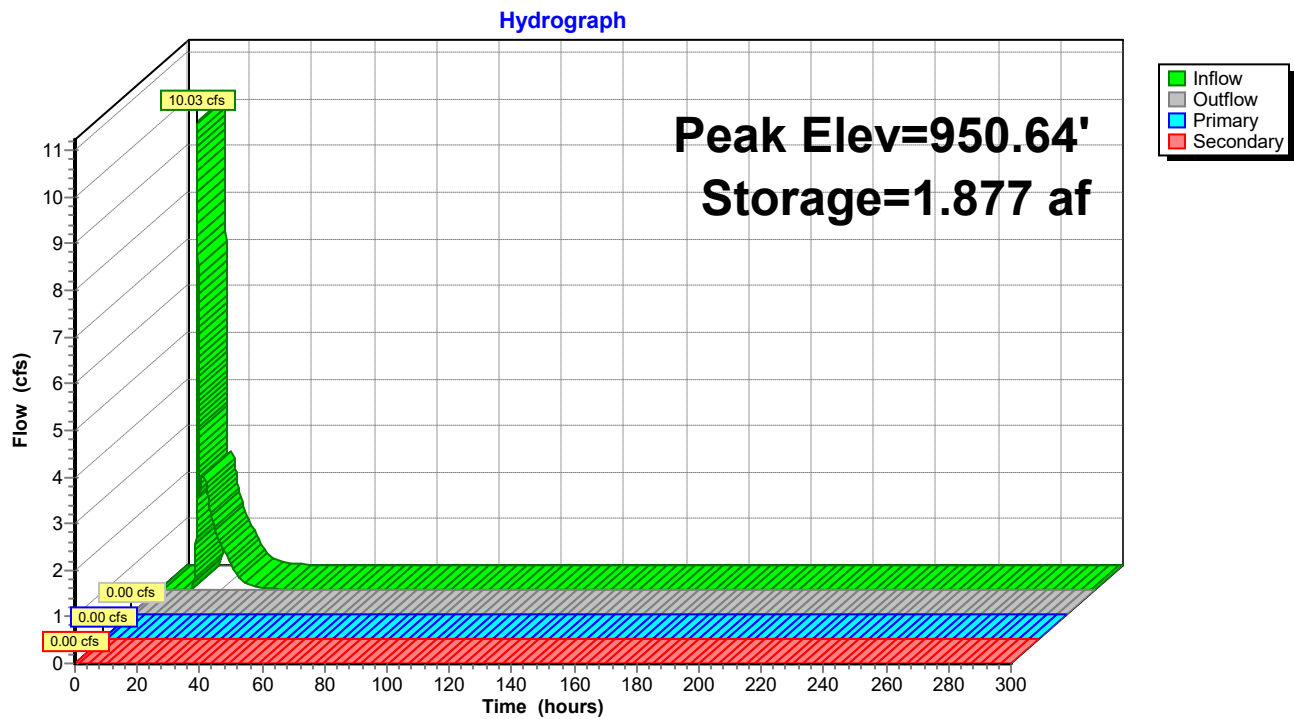
↑ **1=Culvert** (Controls 0.00 cfs)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=948.00' TW=954.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3EP: Existing Wetland - Northeast



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Summary for Pond 3PP: Existing Wetland - Northeast

Inflow = 4.07 cfs @ 12.30 hrs, Volume= 1.367 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 6PP : Filtration Basin 6
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 4PP : Offsite Wetland - Southeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Peak Elev= 951.11' @ 300.00 hrs Surf.Area= 32,243 sf Storage= 59,541 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

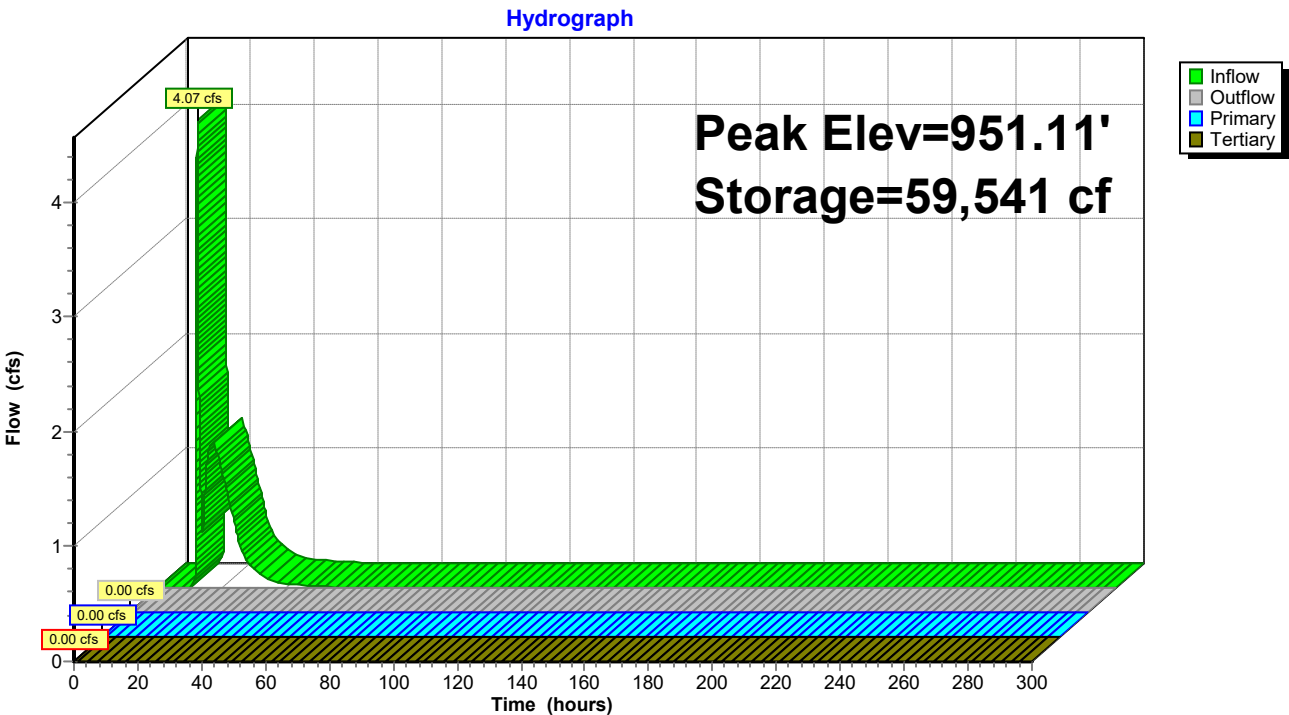
Volume	Invert	Avail.Storage	Storage Description
#1	948.80'	366,452 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.80	22,044	0	0
950.00	24,609	27,992	27,992
952.00	38,365	62,974	90,966
954.00	67,868	106,233	197,199
956.00	101,385	169,253	366,452

Device	Routing	Invert	Outlet Devices
#1	Primary	952.00'	24.0" Round Culvert L= 24.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 952.00' / 951.50' S= 0.0208 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Tertiary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=948.80' TW=951.50' (Dynamic Tailwater)↑**1=Culvert** (Controls 0.00 cfs)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=948.80' TW=954.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3PP: Existing Wetland - Northeast



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Summary for Pond 4EP: Offsite Wetland - Southeast

Inflow = 23.00 cfs @ 12.51 hrs, Volume= 2.366 af
 Outflow = 1.90 cfs @ 14.33 hrs, Volume= 1.098 af, Atten= 92%, Lag= 109.3 min
 Primary = 1.90 cfs @ 14.33 hrs, Volume= 1.098 af
 Routed to Pond 3EP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.39' @ 14.33 hrs Surf.Area= 4.436 ac Storage= 1.648 af

Plug-Flow detention time= 404.0 min calculated for 1.098 af (46% of inflow)
 Center-of-Mass det. time= 311.0 min (1,148.9 - 837.9)

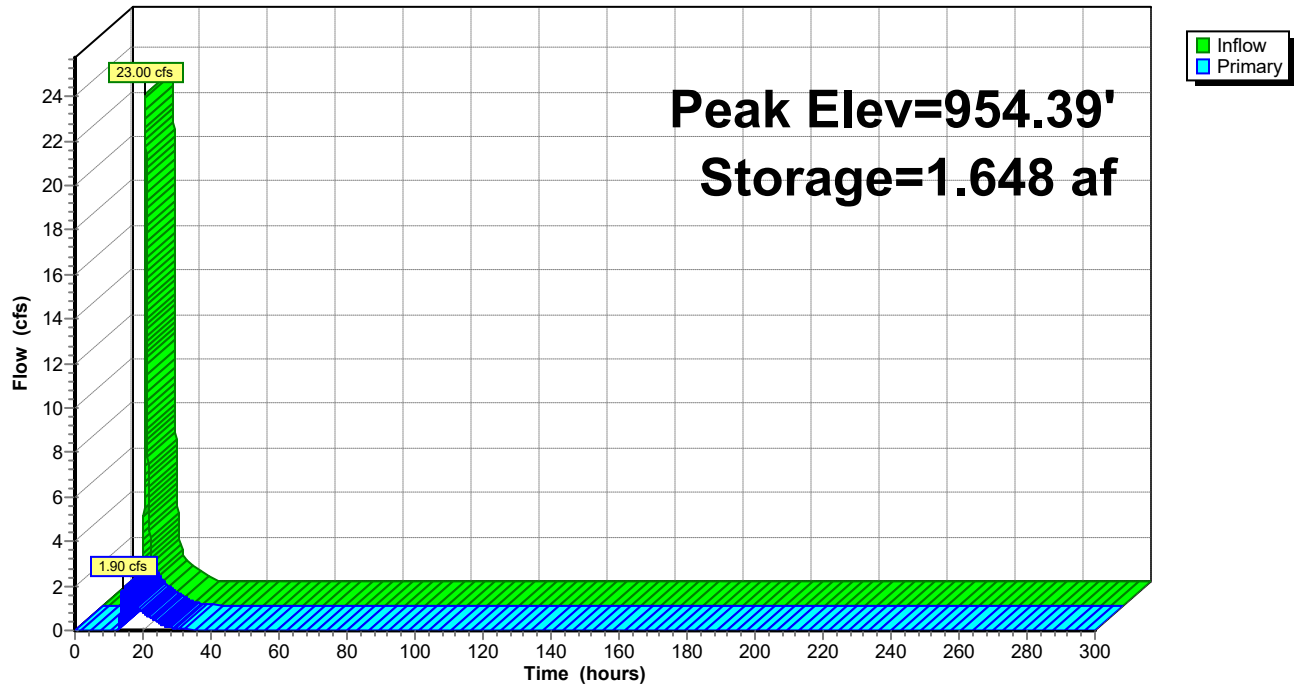
Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.90 cfs @ 14.33 hrs HW=954.39' TW=949.76' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 1.90 cfs @ 0.73 fps)

Pond 4EP: Offsite Wetland - Southeast

Hydrograph



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Summary for Pond 4PP: Offsite Wetland - Southeast

Inflow = 19.18 cfs @ 12.34 hrs, Volume= 2.242 af
 Outflow = 1.15 cfs @ 17.01 hrs, Volume= 0.975 af, Atten= 94%, Lag= 280.1 min
 Primary = 1.15 cfs @ 17.01 hrs, Volume= 0.975 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.36' @ 17.01 hrs Surf.Area= 4.414 ac Storage= 1.539 af

Plug-Flow detention time= 597.6 min calculated for 0.975 af (43% of inflow)
 Center-of-Mass det. time= 433.7 min (1,341.8 - 908.1)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	23.650 af	Custom Stage Data (Prismatic) Listed below (Recalc)

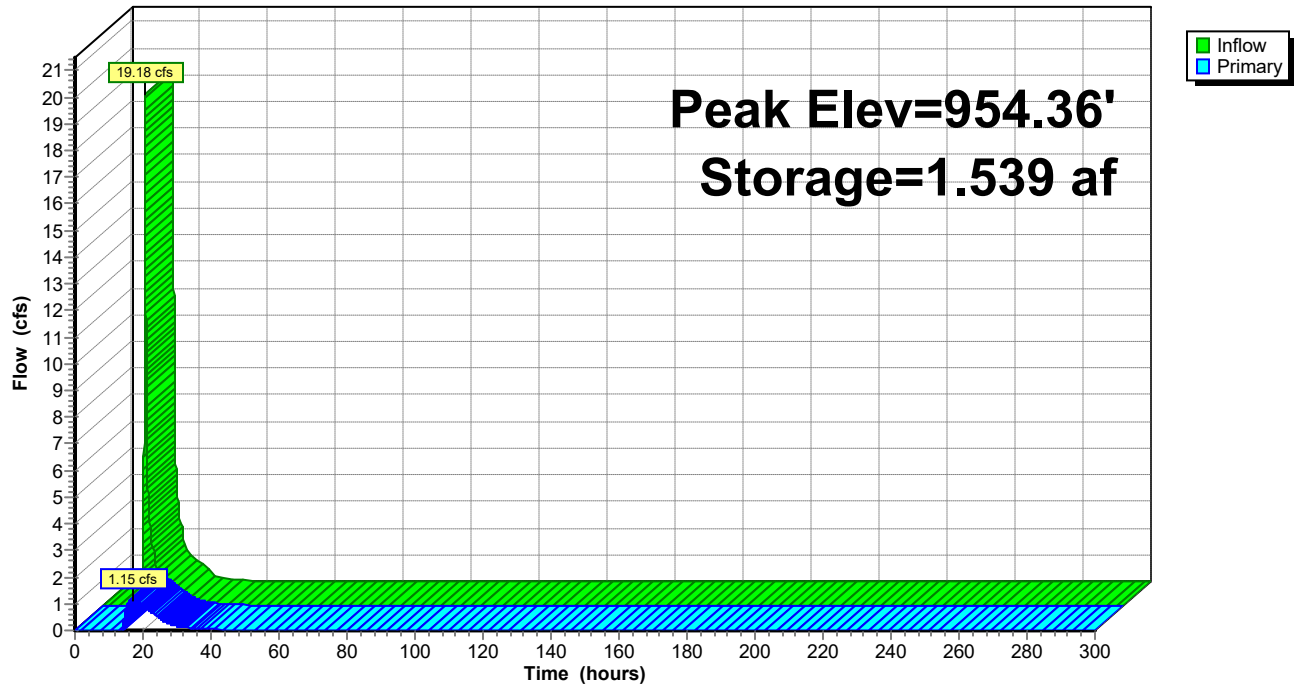
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.00	4.090	0.000	0.000
956.00	5.880	9.970	9.970
958.00	7.800	13.680	23.650

Device	Routing	Invert	Outlet Devices
#1	Primary	954.30'	30.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.15 cfs @ 17.01 hrs HW=954.36' TW=949.85' (Dynamic Tailwater)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 1.15 cfs @ 0.62 fps)

Pond 4PP: Offsite Wetland - Southeast

Hydrograph



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Summary for Pond 5PP: Pond 5

Inflow = 6.10 cfs @ 12.23 hrs, Volume= 0.440 af
 Outflow = 0.62 cfs @ 14.04 hrs, Volume= 0.319 af, Atten= 90%, Lag= 108.4 min
 Primary = 0.62 cfs @ 14.04 hrs, Volume= 0.319 af
 Routed to Pond 7PP : Pond 7

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 954.87' @ 13.39 hrs Surf.Area= 19,152 sf Storage= 15,790 cf

Plug-Flow detention time= 501.3 min calculated for 0.319 af (72% of inflow)
 Center-of-Mass det. time= 407.4 min (1,243.4 - 836.0)

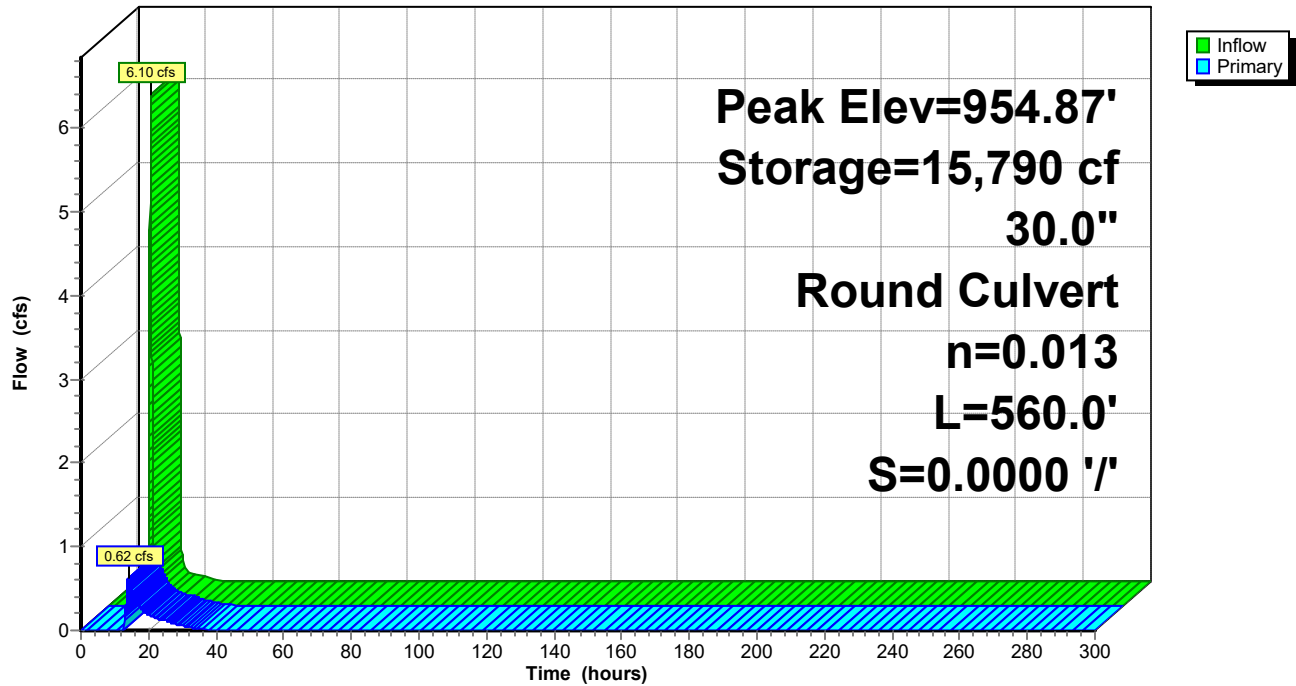
Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	144,732 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	17,270	0	0
956.00	21,611	38,881	38,881
958.00	26,370	47,981	86,862
960.00	31,500	57,870	144,732

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=0.63 cfs @ 14.04 hrs HW=954.83' TW=954.75' (Dynamic Tailwater)
 ↑ **1=Culvert** (Outlet Controls 0.63 cfs @ 0.65 fps)

Pond 5PP: Pond 5

Hydrograph



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Summary for Pond 6PP: Filtration Basin 6

[86] Warning: Oscillations may require smaller dt (severity=198)

Inflow = 24.50 cfs @ 12.18 hrs, Volume= 1.311 af
 Outflow = 3.89 cfs @ 12.64 hrs, Volume= 1.386 af, Atten= 84%, Lag= 27.7 min
 Primary = 3.30 cfs @ 12.64 hrs, Volume= 1.332 af
 Routed to Pond 8PP : Existing Territorial Ditch
 Secondary = 0.60 cfs @ 12.64 hrs, Volume= 0.054 af
 Routed to Pond 3PP : Existing Wetland - Northeast

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs

Peak Elev= 952.31' @ 12.64 hrs Surf.Area= 33,396 sf Storage= 26,255 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 124.2 min (933.0 - 808.8)

Volume	Invert	Avail.Storage	Storage Description
#1	951.50'	166,675 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
951.50	31,134	0	0
952.00	32,613	15,937	15,937
954.00	37,625	70,238	86,175
956.00	42,875	80,500	166,675

Device	Routing	Invert	Outlet Devices
#1	Primary	948.17'	18.0" Round Culvert L= 38.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.17' / 948.12' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Device 1	948.25'	6.0" Round 6" Drain tile L= 265.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.25' / 948.17' S= 0.0003 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf
#3	Device 2	951.50'	1.000 in/hr Exfiltration over Surface area
#4	Secondary	952.00'	24.0" Round Culvert L= 25.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 951.50' / 952.00' S= -0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#5	Device 1	951.50'	15.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Primary	953.50'	0.5' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Knapp - Rogers Stormwater

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MSE 24-hr 3 NURP Rainfall=2.50"

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Primary OutFlow Max=3.30 cfs @ 12.64 hrs HW=952.31' TW=949.02' (Dynamic Tailwater)

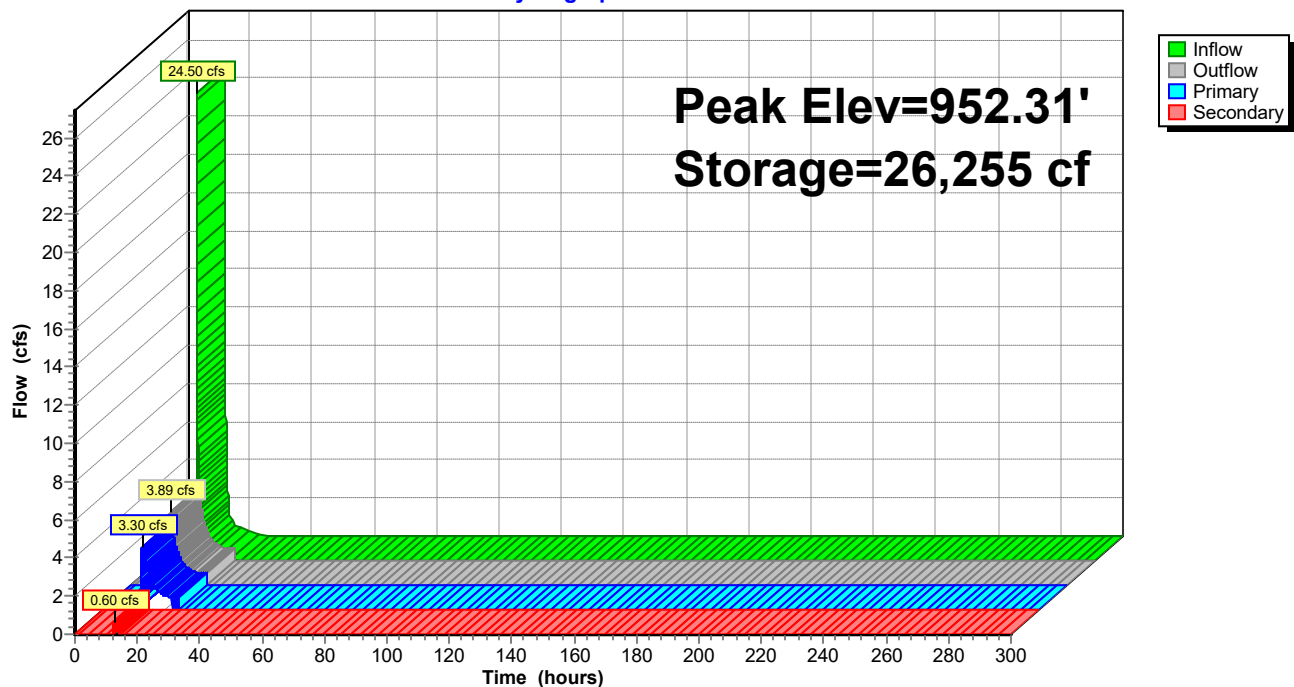
- 1=Culvert (Passes 3.30 cfs of 15.45 cfs potential flow)
- 2=6" Draintile (Outlet Controls 0.70 cfs @ 3.59 fps)
- 3=Exfiltration (Passes 0.70 cfs of 0.77 cfs potential flow)
- 5=Orifice/Grate (Orifice Controls 2.59 cfs @ 3.07 fps)
- 6=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.60 cfs @ 12.64 hrs HW=952.31' TW=949.14' (Dynamic Tailwater)

- 4=Culvert (Inlet Controls 0.60 cfs @ 1.90 fps)

Pond 6PP: Filtration Basin 6

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Pond 7PP: Pond 7

Inflow = 18.29 cfs @ 12.24 hrs, Volume= 1.490 af
 Outflow = 11.43 cfs @ 12.39 hrs, Volume= 1.432 af, Atten= 38%, Lag= 9.5 min
 Primary = 7.39 cfs @ 12.39 hrs, Volume= 1.227 af
 Routed to Pond 4PP : Offsite Wetland - Southeast
 Secondary = 4.04 cfs @ 12.39 hrs, Volume= 0.206 af
 Routed to Pond 5PP : Pond 5

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 955.52' @ 12.39 hrs Surf.Area= 10,468 sf Storage= 14,101 cf

Plug-Flow detention time= 96.8 min calculated for 1.432 af (96% of inflow)
 Center-of-Mass det. time= 47.4 min (955.1 - 907.7)

Volume	Invert	Avail.Storage	Storage Description
#1	954.00'	117,172 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
954.00	8,084	0	0
956.00	11,221	19,305	19,305
958.00	14,420	25,641	44,946
960.00	17,768	32,188	77,134
962.00	22,270	40,038	117,172

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	30.0" Round Culvert L= 230.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 953.70' S= 0.0013 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	954.00'	30.0" Round Culvert L= 560.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 954.00' / 954.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 4.91 sf

Primary OutFlow Max=7.39 cfs @ 12.39 hrs HW=955.52' TW=954.11' (Dynamic Tailwater)
 ↑ **1=Culvert** (Barrel Controls 7.39 cfs @ 3.39 fps)

Secondary OutFlow Max=4.04 cfs @ 12.39 hrs HW=955.52' TW=954.43' (Dynamic Tailwater)
 ↑ **2=Culvert** (Barrel Controls 4.04 cfs @ 1.85 fps)

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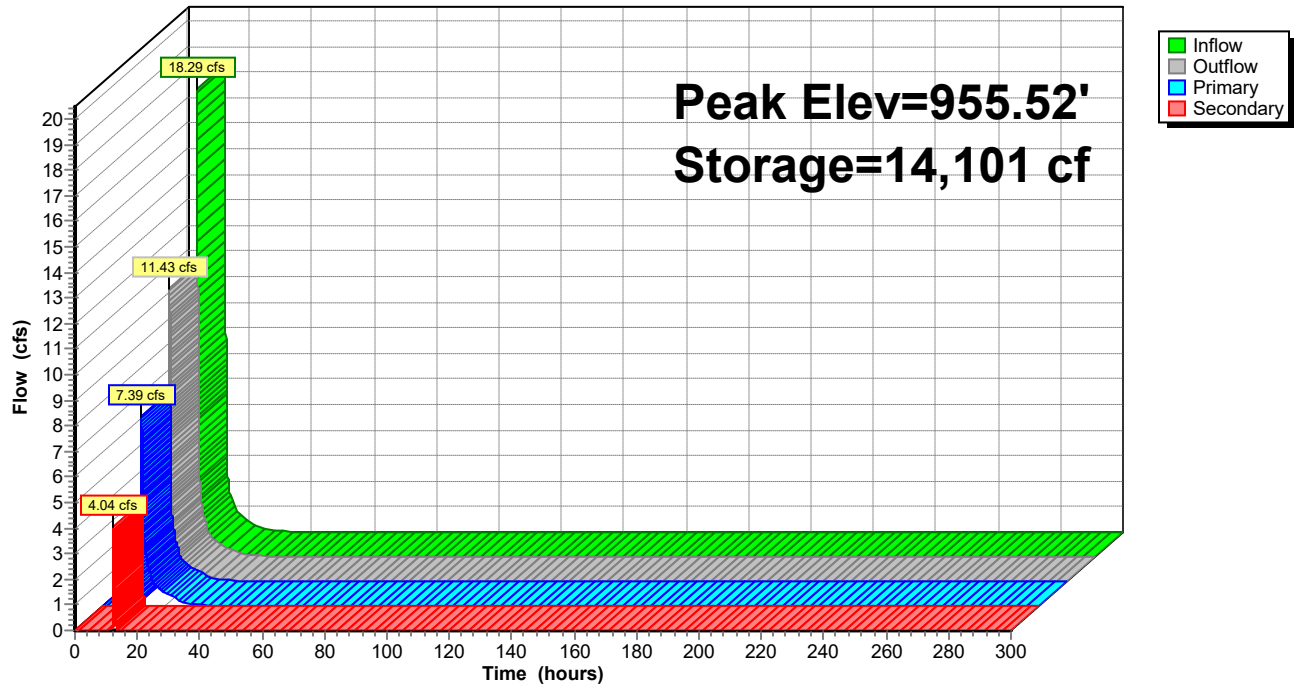
MSE 24-hr 3 NURP Rainfall=2.50"

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Pond 7PP: Pond 7

Hydrograph



Knapp - Rogers Stormwater

MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Pond 8PP: Existing Territorial Ditch

Inflow = 3.60 cfs @ 12.53 hrs, Volume= 1.437 af
 Outflow = 3.59 cfs @ 12.56 hrs, Volume= 1.435 af, Atten= 0%, Lag= 1.5 min
 Primary = 3.59 cfs @ 12.56 hrs, Volume= 1.435 af
 Routed to Reach 3PR : To Big Woods - Southeast Wetland Complex

Routing by Sim-Route method, Time Span= 0.00-300.00 hrs, dt= 0.01 hrs
 Peak Elev= 949.02' @ 12.56 hrs Surf.Area= 841 sf Storage= 655 cf

Plug-Flow detention time= 4.7 min calculated for 1.435 af (100% of inflow)
 Center-of-Mass det. time= 4.3 min (934.0 - 929.8)

Volume	Invert	Avail.Storage	Storage Description
#1	948.00'	31,368 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
948.00	440	0	0
950.00	1,225	1,665	1,665
952.00	5,310	6,535	8,200
954.00	17,858	23,168	31,368

Device	Routing	Invert	Outlet Devices
#1	Primary	948.12'	18.0" Round Culvert L= 97.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 948.12' / 946.68' S= 0.0148 '/' Cc= 0.900 n= 0.013 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=3.59 cfs @ 12.56 hrs HW=949.02' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Culvert** (Inlet Controls 3.59 cfs @ 3.23 fps)

Pond 8PP: Existing Territorial Ditch

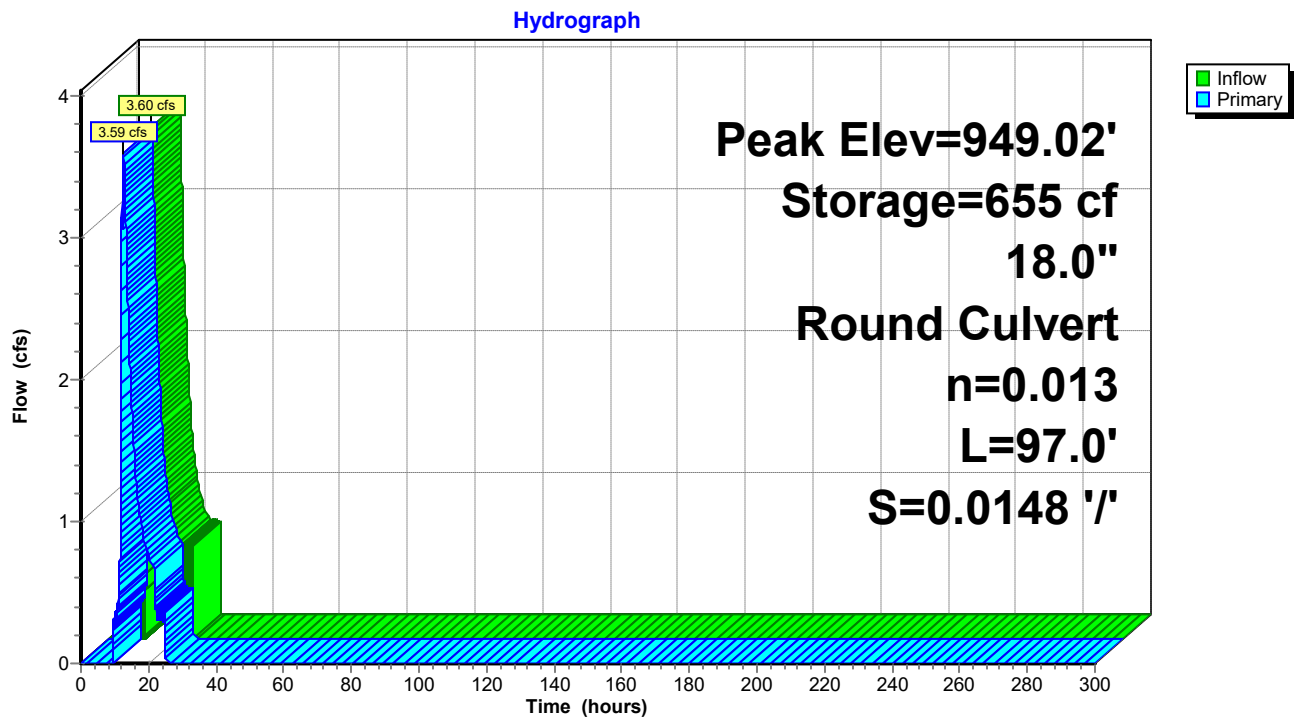


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10-yr Event

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100-yr Rogers Event

162	Node Listing
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169	Subcat 2Ex: Offsite Direct Drainage to 2EP
170	Subcat 2P: Onsite Drainage to 2EP
171	Subcat 3E: Direct Drainage to 3EP
172	Subcat 3Ex: Offsite Drainage to 3EP
173	Subcat 3P: Onsite Drainage to 3EP
174	Subcat 4E: Direct Drainage to 4EP
175	Subcat 4Ex: Offsite Direct Drainage to 4EP
176	Subcat 4P: Onsite Drainage to 4EP
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NURP Event

213	Node Listing
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217	Subcat 1Ex: Offsite Direct Drainage to 1EP
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220	Subcat 2Ex: Offsite Direct Drainage to 2EP
221	Subcat 2P: Onsite Drainage to 2EP
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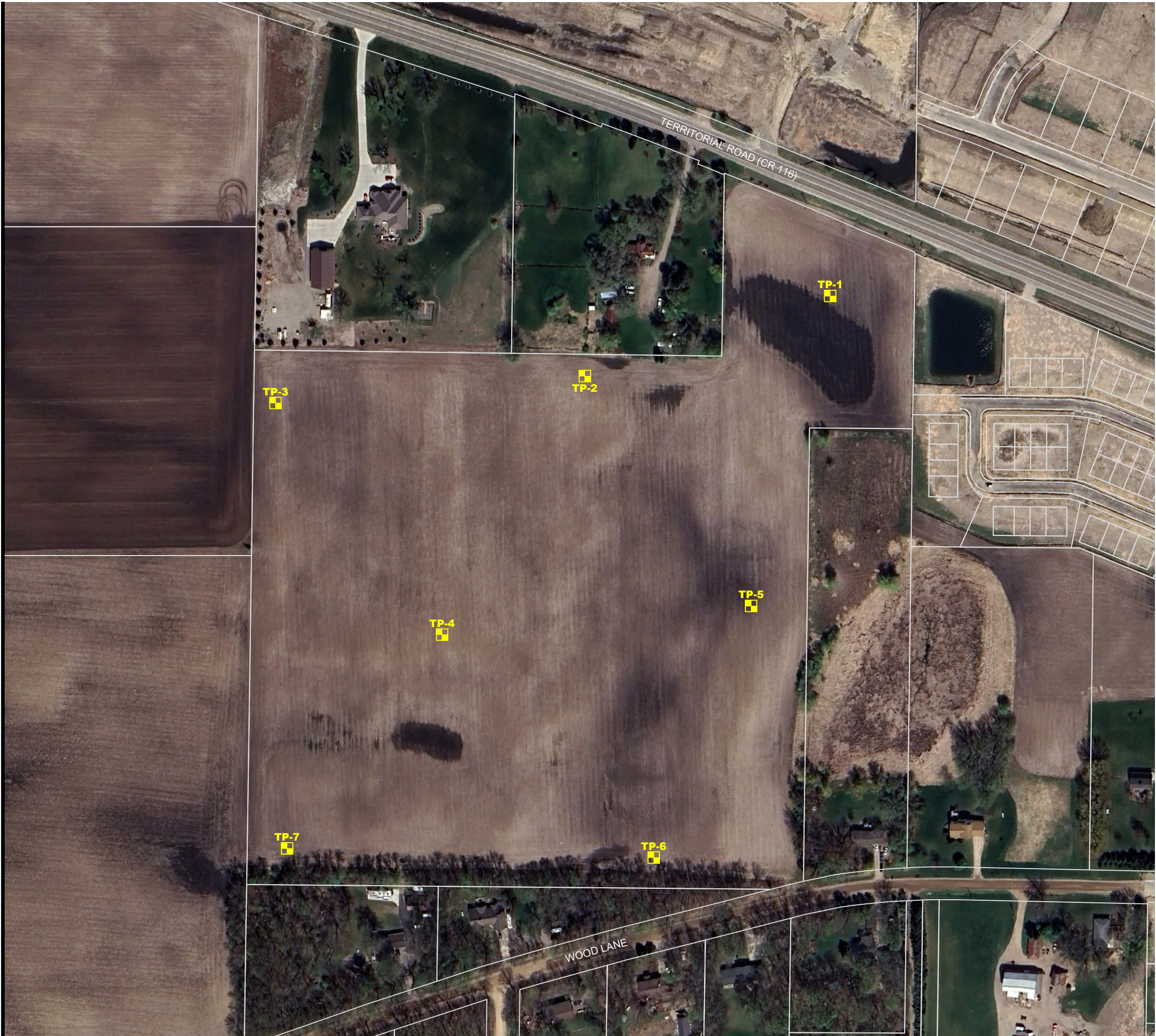
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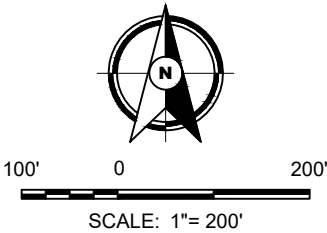
239	Reach 3PR: To Big Woods - Southeast Wetland Complex
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244	Pond 2EP: Offsite Low Area - North Middle
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EXHIBIT 4

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 **DENOTES APPROXIMATE LOCATION OF TEST PIT**



Drawing Information

Project No:
B2406868

Drawing No:
B2406868

Drawn By: JAG
Date Drawn: 7/25/24
Checked By: JTC
Last Modified: 9/12/24

Project Information

Knapp Parcel

Southeast of
Territorial Road
and Tucker Road

Rogers, Minnesota

**Test Pit Location
Sketch**

Project Number B2406868 Geotechnical Evaluation Knapp Parcel Territorial Road and Tucker Road Rogers, Minnesota					TEST PIT: TP-1		
					LOCATION:		
					DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)		
					NORTHING: 242372	EASTING: 449558	
EXCAVATOR: Scherber Excavating		LOGGED BY: I. Becket		START DATE: 09/09/24	END DATE: 09/09/24		
SURFACE ELEVATION: 949.9 ft		RIG: Excavator		SURFACING: Field		WEATHER: Clear, 60°	
Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487)	Sample	Sample Blows Recovery	q _p tsf	MC %	Tests or Remarks
948.4		LEAN CLAY (CL), with Sand, trace roots, brown, moist (TOPSOIL)					
1.5		LEAN CLAY (CL), with Sand, light gray, moist, soft (ALLUVIUM)					
943.9		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)					
6.0							
939.9		END OF TEST PIT					
10.0		Test pit then backfilled with spoils					Water not observed while excavating.

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2406868 Geotechnical Evaluation Knapp Parcel Territorial Road and Tucker Road Rogers, Minnesota					TEST PIT: TP-2				
					LOCATION:				
					DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)				
					NORTHING: 242211	EASTING: 449064			
EXCAVATOR: Scherber Excavating		LOGGED BY: I. Becket		START DATE: 09/09/24	END DATE: 09/09/24				
SURFACE ELEVATION: 957.8 ft		RIG: Excavator		SURFACING: Field	WEATHER: Clear, 60°				
Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487)			Sample	Sample Blows Recovery	q _p tsf	MC %	Tests or Remarks
956.6	1.2	SANDY LEAN CLAY (CL), trace roots, black, moist (TOPSOIL)							
954.3	3.5	LEAN CLAY (CL), with Sand, brown, moist, medium (ALLUVIUM)							
		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)							
947.8	10.0	END OF TEST PIT							
Test pit then backfilled with spoils									Water not observed while excavating.

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2406868 Geotechnical Evaluation Knapp Parcel Territorial Road and Tucker Road Rogers, Minnesota					TEST PIT: TP-3		
					LOCATION:		
					DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)		
					NORTHING: 242157	EASTING: 448443	
EXCAVATOR: Scherber Excavating		LOGGED BY: I. Becket		START DATE: 09/09/24	END DATE: 09/09/24		
SURFACE ELEVATION: 958.4 ft		RIG: Excavator		SURFACING: Field		WEATHER: Clear, 60°	
Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487)	Sample	Sample Blows Recovery	q _p tsf	MC %	Tests or Remarks
957.3		SANDY LEAN CLAY (CL), trace roots, brown, moist (TOPSOIL)					
1.1		LEAN CLAY (CL), with Sand, brown, moist, medium (ALLUVIUM)					
954.9		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)					
3.5							
5							
948.4		END OF TEST PIT					
10.0		Test pit then backfilled with spoils					Water not observed while excavating.

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Project Number B2406868 Geotechnical Evaluation Knapp Parcel Territorial Road and Tucker Road Rogers, Minnesota					TEST PIT: TP-5		
					LOCATION:		
					DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)		
					NORTHING: 241749	EASTING: 449399	
EXCAVATOR: Scherber Excavating	LOGGED BY: I. Becket		START DATE: 09/09/24	END DATE: 09/09/24			
SURFACE ELEVATION: 958.8 ft	RIG: Excavator	SURFACING: Field		WEATHER: Clear, 60°			

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487)	Sample	Sample Blows Recovery	q _p tsf	MC %	Tests or Remarks
957.4		LEAN CLAY (CL), with Sand, trace Gravel, brown, moist (TOPSOIL)					
1.4		LEAN CLAY (CL), light gray, moist, soft (ALLUVIUM)					
955.8		SANDY LEAN CLAY (CL), trace Gravel, light brown, moist, medium to stiff (GLACIAL TILL)					
3.0							
950.8		SILTY SAND (SM), fine-grained, brown, wet (GLACIAL TILL)					
8.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, stiff (GLACIAL TILL)					
950.3							
8.5							
948.8		END OF TEST PIT					
10.0		Test pit then backfilled with spoils					

Water observed at 3.0 feet while excavating.

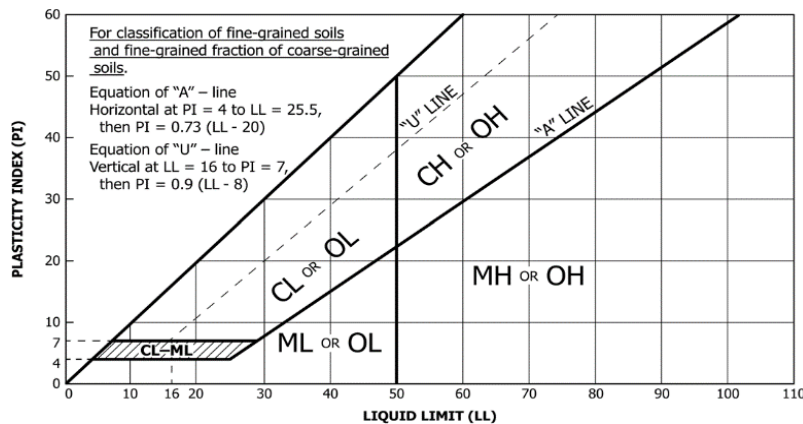
Water observed at 8.5 feet immediately after withdrawal of excavator.

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Project Number B2406868 Geotechnical Evaluation Knapp Parcel Territorial Road and Tucker Road Rogers, Minnesota					TEST PIT: TP-7		
					LOCATION:		
					DATUM: NAD 1983 HARN Adj MN Hennepin (US Feet)		
					NORTHING: 241262	EASTING: 448466	
EXCAVATOR: Scherber Excavating		LOGGED BY: I. Becket		START DATE: 09/09/24	END DATE: 09/09/24		
SURFACE ELEVATION: 956.7 ft		RIG: Excavator		SURFACING: Field		WEATHER: Clear, 60°	
Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487)	Sample	Sample Blows Recovery	q _p tsf	MC %	Tests or Remarks
954.4		LEAN CLAY (CL), with Sand, with roots, black, moist (TOPSOIL)					
2.3		LEAN CLAY (CL), light gray, moist, medium (ALLUVIUM)					
952.7		SANDY LEAN CLAY (CL), grayish brown, moist, medium to stiff (GLACIAL TILL)					
4.0			5				Cobbles at 5 1/2 feet
		Sand seams at 9 feet					
946.7		END OF TEST PIT	10				Water not observed while excavating.
10.0		Test pit then backfilled with spoils					

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A				Group Symbol	Soil Classification
					Group Name ^B
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines ^C)	$C_u \geq 4$ and $1 \leq C_c \leq 3^D$	GW	Well-graded gravel ^E
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$) ^D	GP	Poorly graded gravel ^E
		Gravels with Fines (More than 12% fines ^C)	Fines classify as ML or MH	GM	Silty gravel ^{EFG}
			Fines Classify as CL or CH	GC	Clayey gravel ^{EFG}
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines ^H)	$C_u \geq 6$ and $1 \leq C_c \leq 3^D$	SW	Well-graded sand ^I
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$) ^D	SP	Poorly graded sand ^I
		Sands with Fines (More than 12% fines ^H)	Fines classify as ML or MH	SM	Silty sand ^{FGI}
			Fines classify as CL or CH	SC	Clayey sand ^{FGI}
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line ^J	CL	Lean clay ^{KLM}
			PI < 4 or plots below "A" line ^J	ML	Silt ^{KLM}
		Organic	Liquid Limit – oven dried Liquid Limit – not dried <0.75	OL	Organic clay ^{KLMN} Organic silt ^{KLMQ}
			PI plots on or above "A" line	CH	Fat clay ^{KLM}
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots below "A" line	MH	Elastic silt ^{KLM}
			Liquid Limit – oven dried Liquid Limit – not dried <0.75	OH	Organic clay ^{KLMP} Organic silt ^{KLMQ}
		Organic	Liquid Limit – oven dried Liquid Limit – not dried <0.75	OH	Organic clay ^{KLMP} Organic silt ^{KLMQ}
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

- A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains $\geq 15\%$ sand, add "with sand" to group name.
F. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
G. If fines are organic, add "with organic fines" to group name.
H. Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
I. If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
L. If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains $\geq 30\%$ plus No. 200 predominantly gravel, add "gravelly" to group name.
N. PI ≥ 4 and plots on or above "A" line.
O. PI < 4 or plots below "A" line.
P. PI plots on or above "A" line.
Q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	q _p	Pocket penetrometer strength, tsf
WD	Wet density, pcf	q _u	Unconfined compression test, tsf
P200	% Passing #200 sieve	LL	Liquid limit
MC	Moisture content, %	PL	Plastic limit
OC	Organic content, %	PI	Plasticity index

Particle Size Identification

Boulders.....	over 12"
Cobbles.....	3" to 12"
Gravel	
Coarse.....	3/4" to 3" (19.00 mm to 75.00 mm)
Fine.....	No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand	
Coarse.....	No. 10 to No. 4 (2.00 mm to 4.75 mm)
Medium.....	No. 40 to No. 10 (0.425 mm to 2.00 mm)
Fine.....	No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt.....	No. 200 (0.075 mm) to .005 mm
Clay.....	< .005 mm

Relative Proportions^{L M}

trace.....	0 to 5%
little.....	6 to 14%
with.....	$\geq 15\%$

Inclusion Thicknesses

lens.....	0 to 1/8"
seam.....	1/8" to 1"
layer.....	over 1"

Apparent Relative Density of Cohesionless Soils

Very loose	0 to 4 BPF
Loose	5 to 10 BPF
Medium dense.....	11 to 30 BPF
Dense.....	31 to 50 BPF
Very dense.....	over 50 BPF

Consistency of Cohesive Soils

Blows Per Foot	Approximate Unconfined Compressive Strength
Very soft.....	0 to 1 BPF..... < 0.25 tsf
Soft.....	2 to 4 BPF..... 0.25 to 0.5 tsf
Medium.....	5 to 8 BPF..... 0.5 to 1 tsf
Stiff.....	9 to 15 BPF..... 1 to 2 tsf
Very Stiff.....	16 to 30 BPF..... 2 to 4 tsf
Hard.....	over 30 BPF..... > 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:

Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WOR: Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

Water Level: Indicates the water level measured by the drillers either while drilling (, at the end of drilling (, or at some time after drilling ().

Sample Symbols

	Standard Penetration Test		Rock Core
	Modified California (MC)		Thinwall (TW)/Shelby Tube (SH)
	Auger		Texas Cone Penetrometer
	Grab Sample		Dynamic Cone Penetrometer

EXHIBIT 5

POND VOLUME CALCULATIONS

PROJECT: Northview Preserve **NUMBER:** 0033874
DATE: 9/10/2024 **BY:** TDD

POND	6PP			NWL =	951.5	
CONTOUR ELEVATION	SURFACE AREA		INCREMENTAL VOLUME (FT³)	CUMULATIVE VOLUME		
	(FT²)	(ACRES)		(FT³)	(AC*FT)	
950	27,635	0.63				
			44,077	44,077		1.01
951.5	31,134	0.71				
POND	7PP			NWL =	954	
CONTOUR ELEVATION	SURFACE AREA		INCREMENTAL VOLUME (FT³)	CUMULATIVE VOLUME		
	(FT²)	(ACRES)		(FT³)	(AC*FT)	
949	832	0.02				
			1,280	1,280		0.03
950	1,727	0.04				
			5,557	6,837		0.16
952	3,830	0.09				
			13,462	20,299		0.47
954	9,632	0.22				
POND	5PP			NWL =	954	
CONTOUR ELEVATION	SURFACE AREA		INCREMENTAL VOLUME (FT³)	CUMULATIVE VOLUME		
	(FT²)	(ACRES)		(FT³)	(AC*FT)	
946	2,600	0.06				
			7,016	7,016		0.16
948	4,416	0.10				
			11,141	18,157		0.42
950	6,725	0.15				
			16,250	34,407		0.79
952	9,525	0.22				
			26,795	61,202		1.41
954	17,270	0.40				

EXHIBIT 6

Existing Output:

"P8 Urban Catchment Model, Version 3.5

Run Date 09/04/24

Case	Knapp Existing 240816.p8c	FirstDate	01/01/15
Precip(in)	76.2		
Title	Knapp Existing	LastDate	12/31/16
Rain(in)	71.94		
PrecFile	MSP Precip File 10-19-17.pcp	Events	114
Snow(in)	4.21		
PartFile	nurp50.p8p	TotalHrs	17016
TotalYrs	1.94		

Mass Balances by Device and Variable

Device: Big Woods-Southwest ComType: PIPE Variable: P0%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	85.3	43.9	1.00
06 normal outlet	31.42	0.02	85.3	43.9	1.00
09 total inflow	31.42	0.02	85.3	43.9	1.00
10 surface outflow	31.42	0.02	85.3	43.9	1.00
12 total outflow	31.42	0.02	85.3	43.9	1.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE Variable: P10%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	923.7	475.8	10.81
06 normal outlet	31.42	0.02	923.7	475.8	10.81
09 total inflow	31.42	0.02	923.7	475.8	10.81
10 surface outflow	31.42	0.02	923.7	475.8	10.81
12 total outflow	31.42	0.02	923.7	475.8	10.81
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE Variable: P30%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	741.8	382.1	8.68
06 normal outlet	31.42	0.02	741.8	382.1	8.68
09 total inflow	31.42	0.02	741.8	382.1	8.68
10 surface outflow	31.42	0.02	741.8	382.1	8.68
12 total outflow	31.42	0.02	741.8	382.1	8.68
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE Variable: P50%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	440.6	227.0	5.16
06 normal outlet	31.42	0.02	440.6	227.0	5.16
09 total inflow	31.42	0.02	440.6	227.0	5.16
10 surface outflow	31.42	0.02	440.6	227.0	5.16
12 total outflow	31.42	0.02	440.6	227.0	5.16

Reduction (%)	0.00	0.00	0.0	0.0
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Device: Big Woods-Southwest ComType: PIPE

Variable: P80%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	169.4	87.3	1.98
06 normal outlet	31.42	0.02	169.4	87.3	1.98
09 total inflow	31.42	0.02	169.4	87.3	1.98
10 surface outflow	31.42	0.02	169.4	87.3	1.98
12 total outflow	31.42	0.02	169.4	87.3	1.98
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE

Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	2275.5	1172.3	26.64
06 normal outlet	31.42	0.02	2275.5	1172.3	26.64
09 total inflow	31.42	0.02	2275.5	1172.3	26.64
10 surface outflow	31.42	0.02	2275.5	1172.3	26.64
12 total outflow	31.42	0.02	2275.5	1172.3	26.64
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE

Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	16.6	8.5	0.19
06 normal outlet	31.42	0.02	16.6	8.5	0.19
09 total inflow	31.42	0.02	16.6	8.5	0.19
10 surface outflow	31.42	0.02	16.6	8.5	0.19
12 total outflow	31.42	0.02	16.6	8.5	0.19
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE

Variable: TKN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	82.8	42.6	0.97
06 normal outlet	31.42	0.02	82.8	42.6	0.97
09 total inflow	31.42	0.02	82.8	42.6	0.97
10 surface outflow	31.42	0.02	82.8	42.6	0.97
12 total outflow	31.42	0.02	82.8	42.6	0.97
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE

Variable: CU

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	1.9	1.0	0.02
06 normal outlet	31.42	0.02	1.9	1.0	0.02
09 total inflow	31.42	0.02	1.9	1.0	0.02
10 surface outflow	31.42	0.02	1.9	1.0	0.02
12 total outflow	31.42	0.02	1.9	1.0	0.02
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE

Variable: PB

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	0.6	0.3	0.01
06 normal outlet	31.42	0.02	0.6	0.3	0.01
09 total inflow	31.42	0.02	0.6	0.3	0.01
10 surface outflow	31.42	0.02	0.6	0.3	0.01
12 total outflow	31.42	0.02	0.6	0.3	0.01
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE

Variable: ZN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	8.8	4.5	0.10
06 normal outlet	31.42	0.02	8.8	4.5	0.10
09 total inflow	31.42	0.02	8.8	4.5	0.10
10 surface outflow	31.42	0.02	8.8	4.5	0.10
12 total outflow	31.42	0.02	8.8	4.5	0.10
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Woods-Southwest ComType: PIPE

Variable: HC

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	31.42	0.02	72.5	37.4	0.85
06 normal outlet	31.42	0.02	72.5	37.4	0.85
09 total inflow	31.42	0.02	72.5	37.4	0.85
10 surface outflow	31.42	0.02	72.5	37.4	0.85
12 total outflow	31.42	0.02	72.5	37.4	0.85
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE

Variable: P0%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	95.4	49.2	1.00
06 normal outlet	35.10	0.02	95.4	49.2	1.00
09 total inflow	35.10	0.02	95.4	49.2	1.00
10 surface outflow	35.10	0.02	95.4	49.2	1.00
12 total outflow	35.10	0.02	95.4	49.2	1.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE

Variable: P10%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	594.4	306.2	6.23
06 normal outlet	35.10	0.02	594.4	306.2	6.23
09 total inflow	35.10	0.02	594.4	306.2	6.23
10 surface outflow	35.10	0.02	594.4	306.2	6.23
12 total outflow	35.10	0.02	594.4	306.2	6.23
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE

Variable: P30%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	219.4	113.0	2.30
06 normal outlet	35.10	0.02	219.4	113.0	2.30
09 total inflow	35.10	0.02	219.4	113.0	2.30
10 surface outflow	35.10	0.02	219.4	113.0	2.30
12 total outflow	35.10	0.02	219.4	113.0	2.30
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE

Variable: P50%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	67.2	34.6	0.70
06 normal outlet	35.10	0.02	67.2	34.6	0.70
09 total inflow	35.10	0.02	67.2	34.6	0.70
10 surface outflow	35.10	0.02	67.2	34.6	0.70
12 total outflow	35.10	0.02	67.2	34.6	0.70
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE

Variable: P80%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	15.7	8.1	0.16
06 normal outlet	35.10	0.02	15.7	8.1	0.16
09 total inflow	35.10	0.02	15.7	8.1	0.16
10 surface outflow	35.10	0.02	15.7	8.1	0.16
12 total outflow	35.10	0.02	15.7	8.1	0.16
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE

Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	896.7	461.9	9.40
06 normal outlet	35.10	0.02	896.7	461.9	9.40
09 total inflow	35.10	0.02	896.7	461.9	9.40
10 surface outflow	35.10	0.02	896.7	461.9	9.40
12 total outflow	35.10	0.02	896.7	461.9	9.40
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE

Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	12.8	6.6	0.13
06 normal outlet	35.10	0.02	12.8	6.6	0.13
09 total inflow	35.10	0.02	12.8	6.6	0.13
10 surface outflow	35.10	0.02	12.8	6.6	0.13
12 total outflow	35.10	0.02	12.8	6.6	0.13
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE

Variable: TKN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	70.5	36.3	0.74

06 normal outlet	35.10	0.02	70.5	36.3	0.74
09 total inflow	35.10	0.02	70.5	36.3	0.74
10 surface outflow	35.10	0.02	70.5	36.3	0.74
12 total outflow	35.10	0.02	70.5	36.3	0.74
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE Variable: CU

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	1.6	0.8	0.02
06 normal outlet	35.10	0.02	1.6	0.8	0.02
09 total inflow	35.10	0.02	1.6	0.8	0.02
10 surface outflow	35.10	0.02	1.6	0.8	0.02
12 total outflow	35.10	0.02	1.6	0.8	0.02
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE Variable: PB

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	0.4	0.2	0.00
06 normal outlet	35.10	0.02	0.4	0.2	0.00
09 total inflow	35.10	0.02	0.4	0.2	0.00
10 surface outflow	35.10	0.02	0.4	0.2	0.00
12 total outflow	35.10	0.02	0.4	0.2	0.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE Variable: ZN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	7.5	3.9	0.08
06 normal outlet	35.10	0.02	7.5	3.9	0.08
09 total inflow	35.10	0.02	7.5	3.9	0.08
10 surface outflow	35.10	0.02	7.5	3.9	0.08
12 total outflow	35.10	0.02	7.5	3.9	0.08
Reduction (%)	0.00	0.00	0.0	0.0	

Device: Big Wood -Southeast ComType: PIPE Variable: HC

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	35.10	0.02	44.0	22.7	0.46
06 normal outlet	35.10	0.02	44.0	22.7	0.46
09 total inflow	35.10	0.02	44.0	22.7	0.46
10 surface outflow	35.10	0.02	44.0	22.7	0.46
12 total outflow	35.10	0.02	44.0	22.7	0.46
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest Type: PIPE Variable: P0%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	17.2	8.9	1.00
06 normal outlet	6.33	0.00	17.2	8.9	1.00
09 total inflow	6.33	0.00	17.2	8.9	1.00

10 surface outflow	6.33	0.00	17.2	8.9	1.00
12 total outflow	6.33	0.00	17.2	8.9	1.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest Type: PIPE Variable: P10%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	159.2	82.0	9.25
06 normal outlet	6.33	0.00	159.2	82.0	9.25
09 total inflow	6.33	0.00	159.2	82.0	9.25
10 surface outflow	6.33	0.00	159.2	82.0	9.25
12 total outflow	6.33	0.00	159.2	82.0	9.25
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest Type: PIPE Variable: P30%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	159.2	82.0	9.25
06 normal outlet	6.33	0.00	159.2	82.0	9.25
09 total inflow	6.33	0.00	159.2	82.0	9.25
10 surface outflow	6.33	0.00	159.2	82.0	9.25
12 total outflow	6.33	0.00	159.2	82.0	9.25
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest Type: PIPE Variable: P50%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	159.2	82.0	9.25
06 normal outlet	6.33	0.00	159.2	82.0	9.25
09 total inflow	6.33	0.00	159.2	82.0	9.25
10 surface outflow	6.33	0.00	159.2	82.0	9.25
12 total outflow	6.33	0.00	159.2	82.0	9.25
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest Type: PIPE Variable: P80%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	318.4	164.0	18.50
06 normal outlet	6.33	0.00	318.4	164.0	18.50
09 total inflow	6.33	0.00	318.4	164.0	18.50
10 surface outflow	6.33	0.00	318.4	164.0	18.50
12 total outflow	6.33	0.00	318.4	164.0	18.50
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest Type: PIPE Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	796.1	410.1	46.25
06 normal outlet	6.33	0.00	796.1	410.1	46.25
09 total inflow	6.33	0.00	796.1	410.1	46.25
10 surface outflow	6.33	0.00	796.1	410.1	46.25
12 total outflow	6.33	0.00	796.1	410.1	46.25

Reduction (%)	0.00	0.00	0.0	0.0
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Device: To Southwest	Type: PIPE	Variable: TP
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	3.5	1.8	0.21
06 normal outlet	6.33	0.00	3.5	1.8	0.21
09 total inflow	6.33	0.00	3.5	1.8	0.21
10 surface outflow	6.33	0.00	3.5	1.8	0.21
12 total outflow	6.33	0.00	3.5	1.8	0.21
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest	Type: PIPE	Variable: TKN
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	17.5	9.0	1.02
06 normal outlet	6.33	0.00	17.5	9.0	1.02
09 total inflow	6.33	0.00	17.5	9.0	1.02
10 surface outflow	6.33	0.00	17.5	9.0	1.02
12 total outflow	6.33	0.00	17.5	9.0	1.02
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest	Type: PIPE	Variable: CU
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	0.5	0.3	0.03
06 normal outlet	6.33	0.00	0.5	0.3	0.03
09 total inflow	6.33	0.00	0.5	0.3	0.03
10 surface outflow	6.33	0.00	0.5	0.3	0.03
12 total outflow	6.33	0.00	0.5	0.3	0.03
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest	Type: PIPE	Variable: PB
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	0.2	0.1	0.01
06 normal outlet	6.33	0.00	0.2	0.1	0.01
09 total inflow	6.33	0.00	0.2	0.1	0.01
10 surface outflow	6.33	0.00	0.2	0.1	0.01
12 total outflow	6.33	0.00	0.2	0.1	0.01
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest	Type: PIPE	Variable: ZN
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	1.9	1.0	0.11
06 normal outlet	6.33	0.00	1.9	1.0	0.11
09 total inflow	6.33	0.00	1.9	1.0	0.11
10 surface outflow	6.33	0.00	1.9	1.0	0.11
12 total outflow	6.33	0.00	1.9	1.0	0.11
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Southwest

Type: PIPE

Variable: HC

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	6.33	0.00	22.2	11.4	1.29
06 normal outlet	6.33	0.00	22.2	11.4	1.29
09 total inflow	6.33	0.00	22.2	11.4	1.29
10 surface outflow	6.33	0.00	22.2	11.4	1.29
12 total outflow	6.33	0.00	22.2	11.4	1.29
Reduction (%)	0.00	0.00	0.0	0.0	
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Existing Output:

TSS = 2,044.3 lbs/yr

TP = 16.9 lbs/yr

Proposed Output:

"P8 Urban Catchment Model, Version 3.5

Run Date 09/10/24

Case	Knapp Proposed 240816.p8c	FirstDate	01/01/15
Precip(in)	76.2		
Title	Knapp Proposed	LastDate	12/31/16
Rain(in)	71.94		
PrecFile	MSP Precip File 10-19-17.pcp	Events	114
Snow(in)	4.21		
PartFile	nurp50.p8p	TotalHrs	17016
TotalYrs	1.94		

Mass Balances by Device and Variable

Device: To Big Woods Southwest Type: PIPE

Variable: P0%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	63.2	32.6	1.00
06 normal outlet	23.29	0.02	63.2	32.6	1.00
09 total inflow	23.29	0.02	63.2	32.6	1.00
10 surface outflow	23.29	0.02	63.2	32.6	1.00
12 total outflow	23.29	0.02	63.2	32.6	1.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE

Variable: P10%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	708.8	365.2	11.20
06 normal outlet	23.29	0.02	708.8	365.2	11.20
09 total inflow	23.29	0.02	708.8	365.2	11.20
10 surface outflow	23.29	0.02	708.8	365.2	11.20
12 total outflow	23.29	0.02	708.8	365.2	11.20
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE

Variable: P30%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	533.2	274.7	8.42
06 normal outlet	23.29	0.02	533.2	274.7	8.42
09 total inflow	23.29	0.02	533.2	274.7	8.42
10 surface outflow	23.29	0.02	533.2	274.7	8.42
12 total outflow	23.29	0.02	533.2	274.7	8.42
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE

Variable: P50%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	286.5	147.6	4.53
06 normal outlet	23.29	0.02	286.5	147.6	4.53
09 total inflow	23.29	0.02	286.5	147.6	4.53
10 surface outflow	23.29	0.02	286.5	147.6	4.53

12 total outflow	23.29	0.02	286.5	147.6	4.53
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE

Variable: P80%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	102.5	52.8	1.62
06 normal outlet	23.29	0.02	102.5	52.8	1.62
09 total inflow	23.29	0.02	102.5	52.8	1.62
10 surface outflow	23.29	0.02	102.5	52.8	1.62
12 total outflow	23.29	0.02	102.5	52.8	1.62
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE

Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	1631.0	840.3	25.77
06 normal outlet	23.29	0.02	1631.0	840.3	25.77
09 total inflow	23.29	0.02	1631.0	840.3	25.77
10 surface outflow	23.29	0.02	1631.0	840.3	25.77
12 total outflow	23.29	0.02	1631.0	840.3	25.77
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE

Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	12.1	6.3	0.19
06 normal outlet	23.29	0.02	12.1	6.3	0.19
09 total inflow	23.29	0.02	12.1	6.3	0.19
10 surface outflow	23.29	0.02	12.1	6.3	0.19
12 total outflow	23.29	0.02	12.1	6.3	0.19
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE

Variable: TKN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	60.9	31.4	0.96
06 normal outlet	23.29	0.02	60.9	31.4	0.96
09 total inflow	23.29	0.02	60.9	31.4	0.96
10 surface outflow	23.29	0.02	60.9	31.4	0.96
12 total outflow	23.29	0.02	60.9	31.4	0.96
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE

Variable: CU

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	1.4	0.7	0.02
06 normal outlet	23.29	0.02	1.4	0.7	0.02
09 total inflow	23.29	0.02	1.4	0.7	0.02
10 surface outflow	23.29	0.02	1.4	0.7	0.02
12 total outflow	23.29	0.02	1.4	0.7	0.02

Reduction (%)	0.00	0.00	0.0	0.0
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Device: To Big Woods Southwest Type: PIPE Variable: PB

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	0.4	0.2	0.01
06 normal outlet	23.29	0.02	0.4	0.2	0.01
09 total inflow	23.29	0.02	0.4	0.2	0.01
10 surface outflow	23.29	0.02	0.4	0.2	0.01
12 total outflow	23.29	0.02	0.4	0.2	0.01
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE Variable: ZN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	6.5	3.3	0.10
06 normal outlet	23.29	0.02	6.5	3.3	0.10
09 total inflow	23.29	0.02	6.5	3.3	0.10
10 surface outflow	23.29	0.02	6.5	3.3	0.10
12 total outflow	23.29	0.02	6.5	3.3	0.10
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southwest Type: PIPE Variable: HC

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	23.29	0.02	52.5	27.1	0.83
06 normal outlet	23.29	0.02	52.5	27.1	0.83
09 total inflow	23.29	0.02	52.5	27.1	0.83
10 surface outflow	23.29	0.02	52.5	27.1	0.83
12 total outflow	23.29	0.02	52.5	27.1	0.83
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East Type: PIPE Variable: P0%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	0.2	0.1	1.00
06 normal outlet	0.06	0.00	0.2	0.1	1.00
09 total inflow	0.06	0.00	0.2	0.1	1.00
10 surface outflow	0.06	0.00	0.2	0.1	1.00
12 total outflow	0.06	0.00	0.2	0.1	1.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East Type: PIPE Variable: P10%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	1.2	0.6	7.15
06 normal outlet	0.06	0.00	1.2	0.6	7.15
09 total inflow	0.06	0.00	1.2	0.6	7.15
10 surface outflow	0.06	0.00	1.2	0.6	7.15
12 total outflow	0.06	0.00	1.2	0.6	7.15
15 mass balance chec	0.00	0.00	0.0	0.0	

Reduction (%)	0.00	0.00	0.0	0.0
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Device: To East	Type: PIPE	Variable: P30%
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	1.2	0.6	7.15
06 normal outlet	0.06	0.00	1.2	0.6	7.15
09 total inflow	0.06	0.00	1.2	0.6	7.15
10 surface outflow	0.06	0.00	1.2	0.6	7.15
12 total outflow	0.06	0.00	1.2	0.6	7.15
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East	Type: PIPE	Variable: P50%
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	1.2	0.6	7.15
06 normal outlet	0.06	0.00	1.2	0.6	7.15
09 total inflow	0.06	0.00	1.2	0.6	7.15
10 surface outflow	0.06	0.00	1.2	0.6	7.15
12 total outflow	0.06	0.00	1.2	0.6	7.15
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East	Type: PIPE	Variable: P80%
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	2.3	1.2	14.29
06 normal outlet	0.06	0.00	2.3	1.2	14.29
09 total inflow	0.06	0.00	2.3	1.2	14.29
10 surface outflow	0.06	0.00	2.3	1.2	14.29
12 total outflow	0.06	0.00	2.3	1.2	14.29
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East	Type: PIPE	Variable: TSS
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	5.8	3.0	35.73
06 normal outlet	0.06	0.00	5.8	3.0	35.73
09 total inflow	0.06	0.00	5.8	3.0	35.73
10 surface outflow	0.06	0.00	5.8	3.0	35.73
12 total outflow	0.06	0.00	5.8	3.0	35.73
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East	Type: PIPE	Variable: TP
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Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	0.0	0.0	0.18
06 normal outlet	0.06	0.00	0.0	0.0	0.18

09 total inflow	0.06	0.00	0.0	0.0	0.18
10 surface outflow	0.06	0.00	0.0	0.0	0.18
12 total outflow	0.06	0.00	0.0	0.0	0.18
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East Type: PIPE Variable: TKN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	0.1	0.1	0.92
06 normal outlet	0.06	0.00	0.1	0.1	0.92
09 total inflow	0.06	0.00	0.1	0.1	0.92
10 surface outflow	0.06	0.00	0.1	0.1	0.92
12 total outflow	0.06	0.00	0.1	0.1	0.92
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East Type: PIPE Variable: CU

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	0.0	0.0	0.03
06 normal outlet	0.06	0.00	0.0	0.0	0.03
09 total inflow	0.06	0.00	0.0	0.0	0.03
10 surface outflow	0.06	0.00	0.0	0.0	0.03
12 total outflow	0.06	0.00	0.0	0.0	0.03
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East Type: PIPE Variable: PB

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	0.0	0.0	0.01
06 normal outlet	0.06	0.00	0.0	0.0	0.01
09 total inflow	0.06	0.00	0.0	0.0	0.01
10 surface outflow	0.06	0.00	0.0	0.0	0.01
12 total outflow	0.06	0.00	0.0	0.0	0.01
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East Type: PIPE Variable: ZN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	0.0	0.0	0.10
06 normal outlet	0.06	0.00	0.0	0.0	0.10
09 total inflow	0.06	0.00	0.0	0.0	0.10
10 surface outflow	0.06	0.00	0.0	0.0	0.10
12 total outflow	0.06	0.00	0.0	0.0	0.10
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To East Type: PIPE Variable: HC

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
01 watershed inflows	0.06	0.00	0.2	0.1	1.05
06 normal outlet	0.06	0.00	0.2	0.1	1.05
09 total inflow	0.06	0.00	0.2	0.1	1.05
10 surface outflow	0.06	0.00	0.2	0.1	1.05
12 total outflow	0.06	0.00	0.2	0.1	1.05
15 mass balance chec	0.00	0.00	0.0	0.0	
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: P0%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	170.3	87.7	1.00
06 normal outlet	62.55	0.04	170.3	87.7	1.00
09 total inflow	62.55	0.04	170.3	87.7	1.00
10 surface outflow	62.55	0.04	170.3	87.7	1.00
12 total outflow	62.55	0.04	170.3	87.7	1.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: P10%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	757.2	390.1	4.45
06 normal outlet	62.55	0.04	757.2	390.1	4.45
09 total inflow	62.55	0.04	757.2	390.1	4.45
10 surface outflow	62.55	0.04	757.2	390.1	4.45
12 total outflow	62.55	0.04	757.2	390.1	4.45
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: P30%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	107.2	55.2	0.63
06 normal outlet	62.55	0.04	107.2	55.2	0.63
09 total inflow	62.55	0.04	107.2	55.2	0.63
10 surface outflow	62.55	0.04	107.2	55.2	0.63
12 total outflow	62.55	0.04	107.2	55.2	0.63
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: P50%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	65.2	33.6	0.38
06 normal outlet	62.55	0.04	65.2	33.6	0.38
09 total inflow	62.55	0.04	65.2	33.6	0.38
10 surface outflow	62.55	0.04	65.2	33.6	0.38
12 total outflow	62.55	0.04	65.2	33.6	0.38
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: P80%

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	31.1	16.0	0.18
06 normal outlet	62.55	0.04	31.1	16.0	0.18
09 total inflow	62.55	0.04	31.1	16.0	0.18
10 surface outflow	62.55	0.04	31.1	16.0	0.18
12 total outflow	62.55	0.04	31.1	16.0	0.18
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: TSS

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	960.6	494.9	5.65
06 normal outlet	62.55	0.04	960.6	494.9	5.65
09 total inflow	62.55	0.04	960.6	494.9	5.65
10 surface outflow	62.55	0.04	960.6	494.9	5.65
12 total outflow	62.55	0.04	960.6	494.9	5.65
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: TP

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	20.4	10.5	0.12
06 normal outlet	62.55	0.04	20.4	10.5	0.12
09 total inflow	62.55	0.04	20.4	10.5	0.12
10 surface outflow	62.55	0.04	20.4	10.5	0.12
12 total outflow	62.55	0.04	20.4	10.5	0.12
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: TKN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	116.1	59.8	0.68
06 normal outlet	62.55	0.04	116.1	59.8	0.68
09 total inflow	62.55	0.04	116.1	59.8	0.68
10 surface outflow	62.55	0.04	116.1	59.8	0.68
12 total outflow	62.55	0.04	116.1	59.8	0.68
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: CU

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	2.6	1.4	0.02
06 normal outlet	62.55	0.04	2.6	1.4	0.02
09 total inflow	62.55	0.04	2.6	1.4	0.02
10 surface outflow	62.55	0.04	2.6	1.4	0.02
12 total outflow	62.55	0.04	2.6	1.4	0.02
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: PB

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	0.5	0.3	0.00
06 normal outlet	62.55	0.04	0.5	0.3	0.00
09 total inflow	62.55	0.04	0.5	0.3	0.00
10 surface outflow	62.55	0.04	0.5	0.3	0.00
12 total outflow	62.55	0.04	0.5	0.3	0.00
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: ZN

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	12.4	6.4	0.07
06 normal outlet	62.55	0.04	12.4	6.4	0.07
09 total inflow	62.55	0.04	12.4	6.4	0.07
10 surface outflow	62.55	0.04	12.4	6.4	0.07
12 total outflow	62.55	0.04	12.4	6.4	0.07
Reduction (%)	0.00	0.00	0.0	0.0	

Device: To Big Woods Southeast Type: PIPE

Variable: HC

Mass Balance Term	Flow_acft	Flow_cfs	Load_lbs	Load_lbs/yr	Conc_ppm
02 upstream device	62.55	0.04	64.2	33.1	0.38
06 normal outlet	62.55	0.04	64.2	33.1	0.38
09 total inflow	62.55	0.04	64.2	33.1	0.38
10 surface outflow	62.55	0.04	64.2	33.1	0.38
12 total outflow	62.55	0.04	64.2	33.1	0.38
Reduction (%)	0.00	0.00	0.0	0.0	

"

Proposed Output:

TSS = 1,338.2 lbs/yr

TP = 16.8 lbs/yr

RESOLUTION NO. 2025 - XX

**A RESOLUTION GRANTING APPROVAL OF THE
PRELIMINARY PLAT FOR
NORTHVIEW PRESERVE**

WHEREAS, the Summergate Development/Summergate Companies LLC (“Developer”) submitted an application requesting approval of a Preliminary Plat for NORTHVIEW PRESERVE (“Plat”) for the approximate 31 acre parcel at with the PID 27-120-23-22-0004 and legally described on Exhibit A (the “Subject Property/Property”); and,

WHEREAS, the Developer is proposing to plat the property into 75 single-family lots and three outlots to accommodate a single-family residential development of the area as shown in Exhibit B; and,

WHEREAS, the Subject Property contains approximately 31.27 gross acres is guided as Low Density Residential in the 2040 Comprehensive Plan and within the Single-Family Residential (R2) zoning district; and

WHEREAS, the proposed Preliminary Plat are consistent with 2040 Comprehensive Plan and current zoning regulations for the City; and

WHEREAS, pursuant to Minnesota Statute §462.357 the Planning Commission (“Commission”) conducted a public hearing to receive public comment on the proposed Plat on January 6th, 2025; and

WHEREAS, notice of the Hearing was posted, published in the City’s official newspaper, and mailed to nearby properties, as required by State Statute; and,

WHEREAS, written and verbal comment were received and considered by the Commission; and,

WHEREAS, following the Hearing, the Commission recommended approval of the NORTHVIEW PRESERVE preliminary plat.

NOW THEREFORE, BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF ROGERS, MINNESOTA, that the Preliminary Plat, NORTHVIEW PRESERVE, is hereby approved subject to the following conditions:

1. The Developer shall comply with the plat opinion and complete revisions to the Plat as may be required by the City Attorney prior to the recording of the future final plat.
2. The subdivision will be subject to the review, comments, and intersection permitting by Hennepin County. The developers shall coordinate with the county regarding safe pedestrian crossing across Territorial Road.
3. The Developer shall adequately address comments from the City Engineer and make plans changes as deemed necessary by the City Engineer and Public Works department.
4. The Developer shall satisfy comments from the Fire Chief and/or Fire Marshal.

5. The Stormwater and Grading Plans shall be subject to review and approval by the Elm Creek Watershed Commission and City Engineer.
6. The Developer and City of Rogers shall execute a Subdivision Agreement for the development, identifying the terms and conditions of the development and fees, escrows, and financial security obligations required of the Developer at time of Final Plat.
7. A stormwater maintenance agreement may be required by the Public Works Department and/or Elm Creek Watershed Commission to determine the disposition and maintenance of the stormwater ponds.

[Remainder of page left intentionally blank]

Moved by Councilmember _____, seconded by Councilmember _____

The following voted in favor of said resolution:

The following voted against the same:

The following abstained:

Whereupon said resolution was declared duly passed and adopted, and was signed by the Mayor, and attested by the Clerk dated this 28th day of January, 2025.

Shannon Klick, Mayor

ATTEST:

Stacie Brown, City Clerk

EXHIBIT A

LEGAL DESCRIPTION

Existing Legal Description

The East 385.80 feet of the Southwest Quarter of the Southwest Quarter of Section 22, Township 120, Range 23, Hennepin County, Minnesota lying southerly of the centerline of County State Aid Highway No. 116 and the Northwest Quarter of the Northwest Quarter of Section 27, Township 120, Range 23, Hennepin County, Minnesota except the South 928.10 feet of the East 207.50 feet of said Northwest Quarter of the Northwest Quarter and except the North 247.50 feet of said Northwest Quarter of the Northwest Quarter lying West of the East 385.80 feet of said Northwest Quarter of the Northwest Quarter.

Abstract Property

PRELIMINARY PLAT

