

**AGENDA**  
**PLAN COMMISSION MEETING**  
**Thursday, July 30, 2020 at 7:00 p.m.**  
**Jackson Village Hall**  
**N168 W20733 Main Street**  
**Jackson, WI 53037**

1. Call to Order and Roll Call
2. Approval of Minutes for the Plan Commission Meeting of June 25, 2020
3. Planned Unit Development - Amendment – Home Path Financial LP - Morning Meadows Subdivision – Phase I – Site Plan and Developers Agreement
4. Discussion of Possible Chicken Ordinance
5. Citizens to Address the Plan Commission
6. Adjourn

Persons with disabilities requiring special accommodations for attendance at the meeting should contact the Village Hall at least one (1) business day prior to the meeting.

It is possible that members of the Village Board may attend the above meeting. No action will be taken by any governmental body at this meeting other than the governmental body specifically referred to in this meeting notice. This notice is given so that members of the Village Board may attend the meeting without violating the open meeting law.

**DRAFT MINUTES**  
**PLAN COMMISSION MEETING**  
**Thursday, June 25, 2020 at 7:00 p.m.**  
**Jackson Village Hall**  
**N168 W20733 Main Street**  
**Jackson, WI 53037**

**1. Call to Order and Roll Call**

Pres. Schwab called the meeting to order at 7:00 p.m.

Members Present: Keith Berben, Tr. Kruepke, Jon Molkentin, Dan Reik and Jon Weil

Members Excused: Tr. Emmrich

Staff Present: Collin Johnson, John Walther and Jilline Dobratz

**2. Approval of Minutes for the Plan Commission Meeting of May 28, 2020**

Motion by Jon Weil, second by Keith Berben to approve the Plan Commission minutes of May 28, 2020 as presented.

Vote: 7 ayes, 0 nays. Motion carried.

**3. Planned Unit Development Amendment – Premier Rosewood Jackson PR3 – Sign**

Collin Johnson commented there were updated plans submitted showing the relocated sign outside of the setback area as well as the landscaping plan. The actual colors of the sign will match the color scheme of the development.

Motion by Jon Molkentin, second by Tr. Kruepke to recommend Village Board approve the Planned Unit Development Amendment – Premier Rosewood Jackson PR3 – Sign as amended.

Vote: 6 ayes, 0 nays. Motion carried.

**4. Conditional Use Permit – Jackson Golf Club LLC/Mark McCune – JD Laser Building Addition**

Doug Forton, Design 2 Construct, was present and provided background information. The 28,000 square foot addition will max out the site. The finished floor elevation will be 8 feet lower than the rest of the building. The difference in height is made up by a mezzanine and ADA accessibility. The new portion of the building will be used to finish the product which is now being outsourced. Truck traffic will be less as trucks won't be sent out for the finishing process. The addition is precast and metal panels which will be painted similar to match the existing building.

Motion by Tr. Kruepke, second by Jon Weil to recommend Village Board approve the Conditional Use Permit – Jackson Golf Club LLC/Mark McCune – JD Laser Building Addition per staff comments.

Vote: 6 ayes, 0 nays. Motion carried

**5. Citizens to Address the Plan Commission**

None.

**6. Adjourn**

Motion by Pres. Schwab, second by Tr. Kruepke to adjourn.

Vote: 6 ayes, 0 nays. Meeting adjourned at 7:06 p.m.

Respectfully submitted,

Jilline Dobratz, *CMC/WCMC*  
Village Clerk

DRAFT

Village of Jackson  
PLAN COMMISSION APPLICATION

Application/Permit #: \_\_\_\_\_ - \_\_\_\_\_

**PROPERTY INFORMATION**

COMMERCIAL       INDUSTRIAL       RESIDENTIAL       OTHER \_\_\_\_\_

CONDITIONAL USE       PLANNED UNIT DEVELOPMENT       CERTIFIED SURVEY MAP  
 New       New       CONCEPT PLAN  
 Special Use       Special Use       OTHER \_\_\_\_\_  
(For existing CU ONLY)      (For existing PUD ONLY)

Property Address: 3381 County Highway P Jackson, WI Unit: \_\_\_\_\_ Jackson, WI

Parcel #: 0521007001 Lot Size: 04.92 sq. ft. Building Area: — sq. ft.

Current Zoning:  B-1    B-2    M-1    M-2    I-1    PUD    Other \_\_\_\_\_    Floodplain

**APPLICANT INFORMATION**

Name(s): Home Path Financial LP

Mailing Address: 14435 West Capitol Drive Suite 102 State WI Zip 53045

Office: ( 262 ) 282-1721 Cell: ( 262 ) 282-1721 Fax: ( \_\_\_\_\_ ) —

Email: sjagodzinski@myhomepath.com

**BUSINESS INFORMATION** (If New Business)

Legal Business Name: Home Path Financial LP

D/B/A: Home Path Financial FEIN #: \_\_\_\_\_

Mailing Address: 14435 West Capitol Drive Suite 102 State WI Zip 53045

Office: ( 262 ) 282-1721 Cell: ( 262 ) 282-1721 Fax: ( \_\_\_\_\_ ) —

Email: sjagodzinski@myhomepath.com

Website: myhomepath.com

**PROPERTY OWNER INFORMATION**

Name(s): Home Path Financial LP

Address: 14435 West Capitol Drive State WI Zip 53045

Office: ( 262 ) 282-1721 Cell: ( 262 ) 282-1721 Fax: ( \_\_\_\_\_ ) \_\_\_\_\_

Email: sjagodzinski@myhomepath.com

**ARCHITECT / ENGINEER / CONTRACTOR INFORMATION** (Circle One)

Firm Name: raSmith

Primary Contact: Chris Hitch

Address: 16745 West Bluemound Road, Brookfield State WI Zip 53005

Office: ( 262 ) 317-3267 Cell: ( 262 ) 317-3267 Fax: ( \_\_\_\_\_ ) \_\_\_\_\_

Email: Chris.Hitch@raSmith.com

Please provide as much detailed information as possible. (Add additional pages if needed.)

Briefly explain what you are requesting to be reviewed and/or approved: We are requesting approval of 84 single-family lots for the subdivision named "Morning Meadows" along County Highway P. The subdivision will be fully sewered and watered and we are requesting a 'natural' subdivision.

Provide a brief overview of proposed use(s) of entire property and/or lease space: Residential use for all 84 homes. There are three outlots as well.

Hours of Operation: Residents leave for work in morning and return in the evening

Provide a brief overview of proposed daily on-site operations: Residential development. Residents will mostly leave in the morning for work and return in the evening

Describe any potential environmental impacts from the proposed use including but not limited to exterior storage, noise, smoke, dust, odors, hazardous materials, vibration, horns, speakers, vehicles and equipment operation and exterior generators, HVAC, or other stationary mechanical equipment, etc.: None

Describe all businesses, properties and other entities located adjacent to the proposed use: minimal adjacent properties

Proposed, development, on-site improvements or other construction/remodeling activities: Construction proposed to start in late summer 2020 to start grading and utilities for the site

Proposed grading and/or stormwater management plan: Three good sized detention ponds to manage stormwater

Proposed landscape plan/improvements including driveways, sidewalks, vegetative plantings, etc.: Attractive vegetative plantings. No proposed sidewalks

Proposed on-site security measures including site lighting: N/A

Life Safety Systems – Existing or Proposed (Includes fire hydrants, fire suppression & fire alarm systems): Proposed fire hydrants as required

Projected traffic circulation and impacts: 590 trips per day anticipated

Setbacks from rights-of-way and property lines and height limitations: 25' front/rear setback from the right of way. Height limitations would be greater than 2 stories.

Status of State/Federal License(s) or Certificate(s) required for operation: N/A

Does this project require other Jurisdictional Approvals from other Governmental or Regulatory entities?  
 No  Yes If yes, explain: \_\_\_\_\_

Describe any proposed signage including type and location: Permanent subdivision entry signs and temporary marketing signage

Exterior Building Materials (type, color, etc.): Attractive exteriors with tasteful colors and partial masonry

Site Specific Features/Constraints: N/A

Parking (Total No. of spaces plus number of dedicated handicapped parking and type): Ample private parking

Proposed screening/buffering from adjacent properties: 33 foot buffer from the lots closest to highway & serves as a screening mechanism. 64 foot buffer from the lots on the nearest to Sherman Road

Proposed provisions for refuse and recycling collection/storage: N/A

Projected Sewer/Wastewater Usage: 9,745,000 gal/year

Projected Water Usage: 9,745,000 gal/year

**ACKNOWLEDGEMENT & SIGNATURES**

*I/We hereby certify that I/We have reviewed the above Village of Jackson Plan Commission application and requirements, and hereby certify that the above information, attachments, and exhibits are complete, true and correct. I/We further understand that any missing or incomplete information may result in a delay of the review of this application. The Village reserves the right to request additional information as deemed necessary.*

Applicant Name (Print): Sam Jugodzinski, Authorized Agent

Applicant Signature: 

Co-Applicant Name (Print): \_\_\_\_\_

CO-Applicant Signature: \_\_\_\_\_

Date of Application: 07-03-2020

**You MUST sign and date this Application!**

**SUBMIT TO:** Village of Jackson – Village Hall (*Checks shall be made payable to Village of Jackson*)  
N168 W20733 Main Street  
PO BOX 637  
Jackson, WI 53037

**QUESTIONS?**

Village Clerk: For all **general questions** related to completing form or questions related to Village meetings.  
Phone: (262) 677-9001 x11  
Email: [jilline.dobratz@villageofjackson.com](mailto:jilline.dobratz@villageofjackson.com)

Building Inspector: For questions concerning **building codes, zoning, or technical questions.**  
Phone: (262) 677-9696  
Email: [collin.johnson@villageofjackson.com](mailto:collin.johnson@villageofjackson.com)

**TERMS OF THIS PERMIT**

1. This permit shall become effective upon Village approval and where required, the execution and recording by the owners of the premises of an acceptance hereof in such form as to constitute an effective covenant running with the land.
2. The permit shall be void unless: (a) pursuant to the Building and Zoning Codes of the Village, the approved use is commenced or (b) the building permit is obtained within 12 months of the date of Village Board approval.
3. This approval is subject to amendment and termination in accordance with the provisions of the Zoning Code of the Village of Jackson.
4. Construction and operation of this permit shall be in strict conformity to the approved building, site, and operational plans which were filed in connection with the application for this approval (as attached and/or referenced).
5. Any of the conditions of this permit which would normally be the responsibility of the tenants of the premises, shall be made a part of their lease by the owner.

**VILLAGE APPROVAL:**

TEMPORARY      Expiration Date: \_\_\_\_\_, 20\_\_\_\_

Plan Commission Approval:      Meeting Date: \_\_\_\_\_, 20\_\_\_\_

Village Board Approval:      Meeting Date: \_\_\_\_\_, 20\_\_\_\_

In-House Approval (O-T-C):      Date: \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_  
*Approved by: John Walther, Village Administrator*

**Conditions and Duration of Approval:**

Depending on the request, approvals shall generally be continual or temporary in nature. ALL approvals are subject to the Conditions of Approval outlined below. All conditional or special uses/approvals shall, upon complaint, be subject to review, amendment, or revocation by the Village. Where temporary approvals are issued, such approvals shall be subject to the time limitations specified.

Conditions of Approval: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

APPLICATION DENIED: Date: \_\_\_\_\_, 20\_\_\_\_

Staff Initials: \_\_\_\_\_

Reason for Denial: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

<b>FOR OFFICE USE ONLY</b>	
Acct. #: 100-00-45730-000-00	
Date Received:	<u>7-10-2020</u>
Amount:	<u>\$150.00</u>
Payment Type:	<u>CH/CC/CA</u>
Check/Receipt #:	<u>232243</u>
Received By:	<u>Jal</u>

**VILLAGE OF JACKSON**

N168W20733 MAIN ST.  
P O BOX 637  
JACKSON, WI 53037-0147

Receipt Nbr: 232243  
Date: 7/10/2020  
Check

RECEIVED FROM HOME PATH FINANCIAL LP \$150.00

<u>Type of Payment</u>	<u>Description</u>	<u>Amount</u>
Accounting	Account Nbr: 100-00-45730-000-000 PLANNING / ZONING FEES PLANNED UNIT DEVELOPMENT / CK #12541	150.00

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TOTAL RECEIVED 150.00

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Receipt Memo: PLANNED UNIT DEVELOPMENT / CK #12541

**VILLAGE OF JACKSON PLAN COMMISSION APPLICATION - SUBMITTAL GUIDE**

**(Meetings are held the fourth Thursday of the month. Applications are DUE the 1<sup>st</sup> Friday of the month for that month's meeting.)**

<b>ACTION REQUESTED</b>	<b>FEE</b>	<b>SUBMITTAL REQUIREMENTS</b> <i>Refer to number items in shaded column →</i>	<b>TYPE OF INFORMATION DESCRIBED</b> <i>(See reverse side for further instructions)</i>	<b>Paper or Digital Copy Required</b>
CONCEPT PLAN	\$50	1,2,6,13	1) Complete Application (all pages) ✓ 2) Describe the intended use and operation ✓ 3) Address labels of adjacent owners to be notified (200' /500') ✓ 4) Property owner acknowledgement of the request ✓ 5) Impact Statement ✓ 6) Location Map ✓	Both Both Both Both Both Both
CONDITIONAL USE	\$150	1,2,3,4,5,6,7,14,15,16,18,19,20	7) Development Plan / Site Plan ✓ 8) Preliminary Plat	Both
- Full Review	\$50	1,2,4,5,6,7,13	9) Final Plat	Both
- *Special Use (to existing CU)	\$150	1,2,3,4,5,6,7,8,9,10,14,15,16,17,18,20	10) Certified Survey Map	Both
PLANNED UNIT DEVELOPMENT	\$50	1,2,3,4,5,6,7,13 (14-22 upon request)	11) Annexation Petition	Both
- *Special Use (to existing PUD)	\$200	1,2,3,4,6,9 or 10 (500' for rezoning)	12) Annexation Map	Both
REZONING	\$150	200' for Cond. Use or PUD Site Plan	13) Sketch Plan	Both
CERTIFIED SURVEY MAP (CSM)	\$150	1,2,6,10,20	14) Landscape and Buffer Plan ✓	Both
MINOR SUBDIVISION	\$150	1,2,3,5,6,10,15,16,17,18,20		Both
EXTRA TERRITORIAL PLAT/CSM	\$150	1,2,6,9 / 10		
EXTRA TERRITORIAL PLAT OUTSIDE SANITARY SRVC. AREA	\$50	1,2,6,9 / 10	<b>Engineering Review - Infrastructure</b>	
PRELIMINARY PLAT	\$300	1,2,3,5,6,9,15,16,17,18	15) Grading / Drainage Plan ✓ 16) Water / Sanitary Sewer / Storm Sewer Plans ✓ 17) Street / Right of Way cross sections	Both (24x36) Both (24x36) Both (24x36)
FINAL PLAT / Final Plat Reappl.	\$100	1,2,3,5,6,9,15,16,17,18,20	18) Erosion Control Plan ✓ 19) Proposed colors / materials ✓ 20) Developers Agreement ✓ 21) Annexation Agreement (includes pre-annex agreements)	Both (24x36) Both Both Both
ANNEXATION / ATTACHMENT	\$200	1,2,3,4,5,6,11,12,21	22) Other -	Both
STREET EASEMENT/ VACATION	\$150	1,2,3,4,6,9		Both
VARIANCE / APPEAL	\$150	1,2,3,4,6,7		Both
MAILING LABELS	\$25	For all property addresses within 200 feet For all properties within 500' if rezoning ONLY	Must submit additional fee if not providing labels	Both

**\*SPECIAL USE PERMITS** are applicable to EXISTING Conditional Use Permits and Planned Unit Developments. The granting of a Special Use Permit shall not change the character of the principal use or conflict with the purpose and intent of the original Conditional Use or Planned Use Development approval. Special Use Permits shall be reviewed for impact on neighboring uses in addition to the neighborhood. Compatibility is a primary consideration.

**Examples of special uses include:** New or expanded tenant uses including occupancies, minor changes to building facades, minor lighting changes, paint schemes, certain accessory structures, sign replacements of equal or lesser size or other uses or modifications as determined by the Village.

**Applications shall be submitted NO LATER than 4:00 PM on the 1<sup>st</sup> Friday of the month to be considered at that month's meeting.** In some cases, additional copies of a submittal may be required. Only COMPLETE applications shall be presented to the Planning Commission and the Village Board for action. Applications submitted without a pre-submittal conference risk delay.

The Planning Commission meets on the last Thursday of each month unless there is a conflict with a holiday. The Village Board meets on the second Tuesday of each month at which a public hearing may be held. A decision on the request could be made at that time.

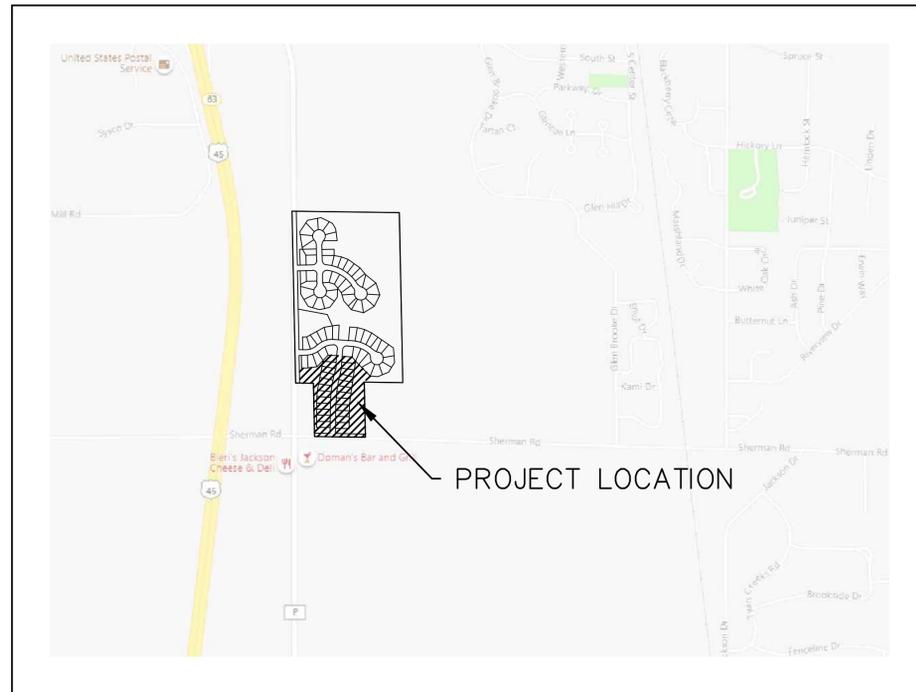
**EXPLANATION OF TYPES OF INFORMATION REQUIRED (From front page of application form)**

1. **Application Form:** You MUST SUBMIT both HARD (paper) and DIGITAL (USB Drive) copies of your application.
2. **Letter of Intent:** What you are requesting in your own words? (Be brief)
3. **Mailing/Address Labels:** It is your responsibility to provide the Village with addresses labels of ALL adjacent property owners within a 200-foot radius of the subject property. If mailed notification is required for your application, an incorrect address may cause a delay. (Additional \$25 is required if Village provides address labels.)
4. **Proof of Property Ownership:** A copy of a deed, tax notice, title insurance policy (first page), recorded plat, etc.
5. **Impact Statement:** In general, the following points represent most of the topics to be addressed in the impact statement. Specific points will be designated at the pre-submittal conference by staff.
  - A. General hours of operation.
  - B. Unusual conditions which warrant special attention (hazardous materials storage, fire hazards, odors, noise generation, etc).
  - C. Vehicle trip generation (trips per day per unit x number of units).
  - D. Estimated numbers of vehicles and/or equipment, materials, to be parked and/or stored on site.
  - E. Proposed sign(s) advertising business, directional signage, dwelling unit rental, etc.
  - F. Proposed dates of construction and completion.
  - G. Anticipated user profiles (for residential developments).
  - H. Annual water consumption estimate (100% occupancy and build-out).
  - I. Annual sewage generation estimate (100% occupancy and build-out).
6. **Location Map:** An aerial map indicating where the site is located within the Village.
7. **Development Plan:** Show entire proposal on the site. Include edge of pavement and/or back of the curb line, sidewalks (existing and proposed), structure footprint(s), driveways, parking areas, fencing, refuse enclosures, locations of accessory uses, and overall dimensions of structures and setbacks, etc. Landscape plans and water/sewer/storm plans may be shown combined on the plan if the composition is easily read and understood.
- 8/9. **Plat Map:** Prints of the preliminary and final (recordable plat), with proper signature blocks.
10. **Certified Survey Map:** A recordable document showing the legal and mapped description of the land division.
11. **Annexation Petition/Attachment Request:** Shows owner is supporting the annexation.
12. **Annexation Map:** A recordable map having the legal and mapped description of the parcel to be annexed.
13. **Sketch Plan:** An informal drawing depicting the proposal for discussion purposes.
14. **Landscape Plan:** Show location, size, type, botanical name & common name of proposed trees & shrubs. Also details surface treatments. Show walls, fence location and style, buffers/screening and similar details.
15. **Grading/Drainage Plan:** Show original & proposed grades & runoff calculations based on a 10-year storm. It is usually combined with a Storm Sewer Plan. (Storm sewer system, ditches, culverts, etc.)
16. **Water/Sewer/Storm Sewer Plans:** Show size and location of proposed water mains & fire hydrants; size and location of the proposed sanitary sewer system with gradient profiles and invert elevations; shows the proposed storm drainage system as in #15 above.
17. **Street Crossing Sections:** Section shows curb, gutter, paving, and sidewalk relative to the right-of-way width.
18. **Erosion Control Plan:** A map of existing site conditions on a scale of at least 1-inch equals 100 feet showing the site, boundaries and immediately adjacent areas which accurately identify site locations.
19. **Proposed Building Colors and Materials:** Submit samples of exterior colors and materials.
20. **Improvement Agreement:** An agreement between the developer and the Village determining park dedications and the responsibilities for street, water, sewer, and the storm sewer improvements and extensions.
21. **Annexation Agreement.**

**MEETINGS AT WHICH THE REQUEST IS BEING HEARD SHOULD BE ATTENDED BY THE APPLICANT OR A REPRESENTATIVE IN ORDER TO RESPOND TO QUESTIONS AND AVOID DELAYS IN THE APPROVAL PROCESS**

# CONSTRUCTION PLANS FOR MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WISCONSIN

## VICINITY MAP



### LEGEND (PROPOSED FEATURES)

- TREE REMOVAL
- EXISTING CONCRETE PAVEMENT TO BE REMOVED
- EXISTING ASPHALT PAVEMENT TO BE REMOVED
- EXISTING GRAVEL TO BE REMOVED
- EXISTING BUILDING/STRUCTURE TO BE REMOVED
- SAWCUT LINE
- PROPOSED PROPERTY LINE
- PROPOSED SITE LIGHTING (DESIGNED BY OTHERS, FOR REFERENCE ONLY)
- MONUMENT SIGNS (CONSTRUCTION DETAILS BY OTHERS)
- SIGN
- HEAVY-DUTY CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- HEAVY-DUTY ASPHALT PAVEMENT
- STANDARD-DUTY ASPHALT PAVEMENT
- COLORED AND STAMPED CONCRETE
- PROPOSED 30" REJECT CURB & GUTTER (AS SHOWN ON SITE PLAN)
- PROPOSED 30" STANDARD CURB & GUTTER (AS SHOWN ON SITE PLAN)
- PROPOSED ACCESSIBLE PAVEMENT MARKING
- VAN ACCESSIBLE STALL
- PROPOSED TYPE 3 CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 3A CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 4 CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 4A CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 7 CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- DOOR
- STRUCTURAL RETAINING WALL - (DESIGNED BY OTHERS)
- PROPOSED 0.5-FOOT GRADE CONTOUR (ONLY USED WHEN CRITICAL)
- PROPOSED 1-FOOT GRADE CONTOUR
- PROPOSED 5-FOOT GRADE CONTOUR
- PROPOSED SPOT GRADE
- PROPOSED TOP OF CURB
- DENOTES PROPOSED GARAGE FLOOR GRADE @ THRESHOLD
- IF A SECOND ELEVATION IS GIVEN, DENOTES GROUND LEVEL FOR LOOK OUT OR BASEMENT SLAB GRADE FOR WALK OUT.
- PROPOSED EROSION CONTROL BALE
- TEMPORARY DITCH CHECK
- CULVERT PIPE DITCH CHECK
- PROPOSED INLET PROTECTION
- PROPOSED SILT FENCE
- PROPOSED STRAW WATTLE
- PROPOSED TEMPORARY DIVERSION
- PROPOSED LEVEL SPREADER
- PROPOSED STONE TRACKING MAT
- PROPOSED PERMANENT TURF REINFORCEMENT MAT
- EROSION CONTROL BLANKET
- PROPOSED RIPRAP
- PROPOSED GAS LINE
- PROPOSED ELECTRIC LINE
- PROPOSED TELEPHONE LINE
- PROPOSED WATER MAIN
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE
- PROPOSED AREA DRAIN
- PROPOSED SANITARY MANHOLE

### LEGEND

- ( ) INDICATES RECORDED DIMENSION WHERE DIFFERENT FROM ACTUAL MEASUREMENT
- OR 1/4 SECTION OR 1/4 SECTION CORNER AS DESCRIBED
- 1" DIA. IRON PIPE FOUND (UNLESS OTHERWISE NOTED)
- 1" DIA. IRON PIPE, 18" LONG-SET (UNLESS OTHERWISE NOTED)
- BOLLARD
- SOIL BORING/MONITORING WELL
- FLAGPOLE
- MAILBOX
- SIGN
- BILLBOARD
- AIR CONDITIONER
- CONTROL BOX
- TRAFFIC SIGNAL
- RAILROAD CROSSING SIGNAL
- CABLE PEDESTAL
- POWER POLE
- GUY POLE
- GUY WIRE
- LIGHT POLE
- SPOT/YARD/PEDESTAL LIGHT
- HANDICAPPED PARKING
- ELECTRIC MANHOLE
- ELECTRIC PEDESTAL
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- MARKED FIBER OPTIC
- GAS VALVE
- GAS METER
- GAS WARNING SIGN
- STORM MANHOLE
- ROUND INLET
- SQUARE INLET
- STORM SEWER END SECTION
- SANITARY MANHOLE
- SANITARY CLEANOUT OR SEPTIC VENT
- SANITARY INTERCEPTOR MANHOLE
- MISCELLANEOUS MANHOLE
- WATER VALVE
- HYDRANT
- WATER SERVICE CURB STOP
- WATER MANHOLE
- WELL
- WATER SURFACE
- WETLANDS FLAG
- MARSH
- CONIFEROUS TREE
- DECIDUOUS TREE
- SHRUB
- EDGE OF TREES
- SANITARY SEWER
- STORM SEWER
- WATERMAIN
- MARKED GAS MAIN
- MARKED ELECTRIC
- OVERHEAD WIRES
- BUREAU ELEC. SERV.
- MARKED TELEPHONE
- MARKED CABLE TV LINE
- MARKED FIBER OPTIC
- INDICATES EXISTING CONTOUR ELEVATION
- INDICATES EXISTING SPOT ELEVATION
- EXISTING PROPERTY LINE
- EXISTING EASEMENT LINE

ENGINEER:



RAS PROJECT: 3050195.01  
CONTACT: CHRIS D. HITCH, P.E.

16745 W. Bluemound Road  
Brookfield, WI 53005-5938  
(262) 781-1000  
rasmith.com

OWNER/DEVELOPER:

HOME PATH FINANCIAL, LP  
CONTACT: ED WOODLAND  
19435 W. CAPITAL DRIVE, #102  
BROOKFIELD, WI 53045  
PH.: 262-336-3862

COMMUNITY:

VILLAGE OF JACKSON  
CONTACT: BRIAN KOBER  
DIRECTOR OF PUBLIC WORKS  
N168 W20733 MAIN ST.  
JACKSON, WI 53037  
PH.: 262-677-0707 x11

BENCHMARKS:

SET BM. RR SPIKE PP#85-02721  
APPROX. 406' EAST OF CTH P  
ON SHERMAN RD  
ELEV = 861.11  
SET BM. RR SPIKE PP#03-04062  
APPROX. 1,605' NORTH OF  
SHERMAN ON CTH P  
ELEV = 865.99

### PLAN INDEX

SHEET NO.	DESCRIPTION
C000	TITLE SHEET
C100	OVERALL EROSION CONTROL & GRADING PLAN
C101-C103	DETAILED EROSION CONTROL & GRADING PLANS
C200	SANITARY SEWER & WATER MAIN PLAN & PROFILE
C300-C301	STORM SEWER & PAVING PLAN & PROFILE
C400-C402	DETAILS

PLAN DATE: 07/02/2020

REVISIONS	ISSUE DATE	SHEET NO.'S	ISSUED FOR:
-	--	--	--

16745 W. Bluemound Road  
Brookfield, WI 53005-5938  
(262) 781-1000  
rasmith.com



Brookfield, WI | Milwaukee, WI | Appleton, WI | Madison, WI | Cedarburg, WI  
Mount Pleasant, WI | Waukesha, WI | Wauwatosa, WI | Irving, CA

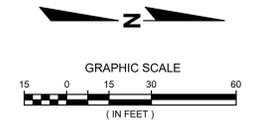
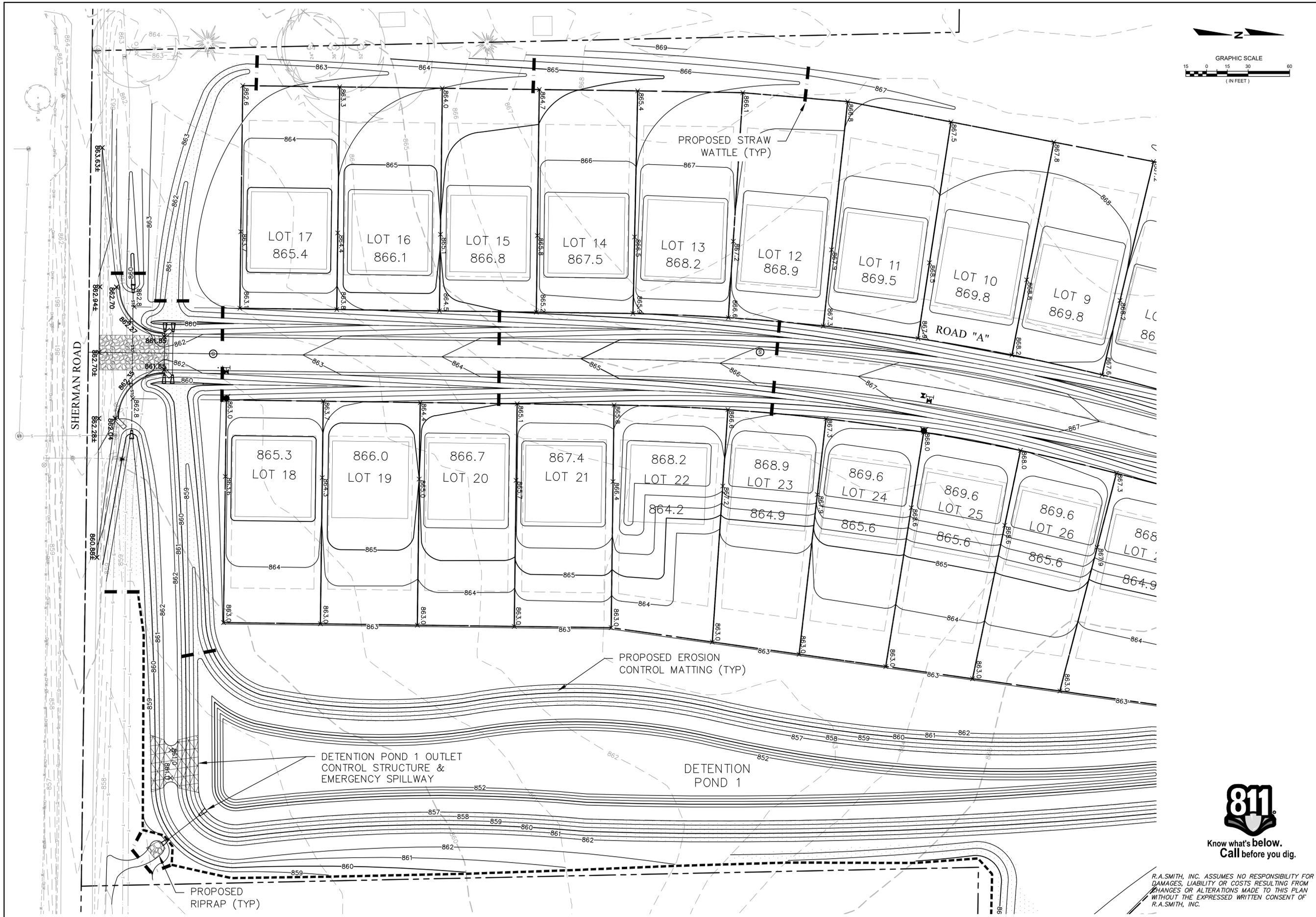
MORNING MEADOWS SUBDIVISION - PHASE 1  
VILLAGE OF JACKSON, WI

TITLE SHEET

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DATE: 07/02/2020  
SCALE: N.T.S.  
JOB NO. 3050195.01  
PROJECT MANAGER:  
CHRIS D. HITCH, P.E.  
DESIGNED BY: DJM  
CHECKED BY: CDH

SHEET NUMBER  
C000





DATE	DESCRIPTION

  
 CREATIVITY BEYOND ENGINEERING  
 16745 W. Bluemound Road  
 Brookfield, WI 53005-5938  
 (262) 781-1000  
[rasmith.com](http://rasmith.com)  
 Brookfield, WI | Milwaukee, WI | Appleton, WI | Madison, WI | Cedarburg, WI  
 Mount Pleasant, WI | Naperville, IL | Irvine, CA

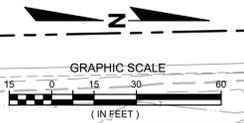
**MORNING MEADOWS SUBDIVISION - PHASE 1**  
**VILLAGE OF JACKSON, WI**  
**DETAILED EROSION CONTROL & GRADING PLAN**

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DATE: 07/02/2020
SCALE: 1" = 30'
JOB NO. 3050195.01
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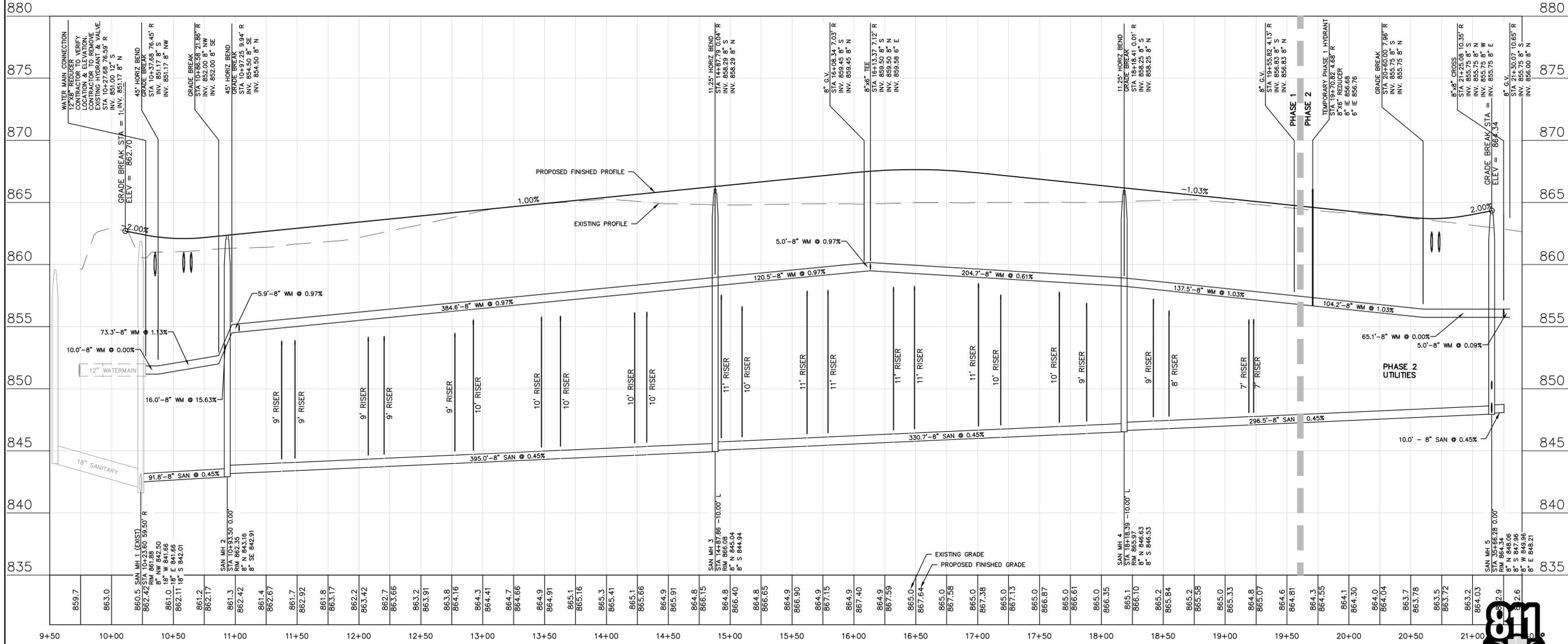
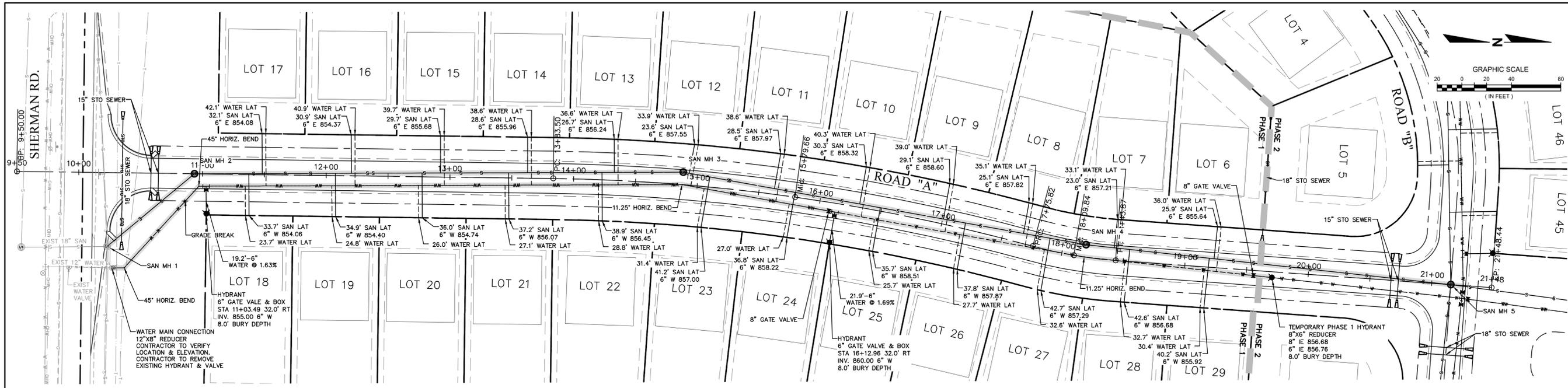
CREATIVITY BEYOND ENGINEERING  
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Mount Pleasant, WI | Naperville, IL | Irvine, CA

**MORNING MEADOWS SUBDIVISION - PHASE 1  
VILLAGE OF JACKSON, WI**

**DETAILED EROSION CONTROL &  
GRADING PLAN**

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PROJECT MANAGER: CHRIS D. HITCH, P.E.
DESIGNED BY: DJM
CHECKED BY: CDH
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C102





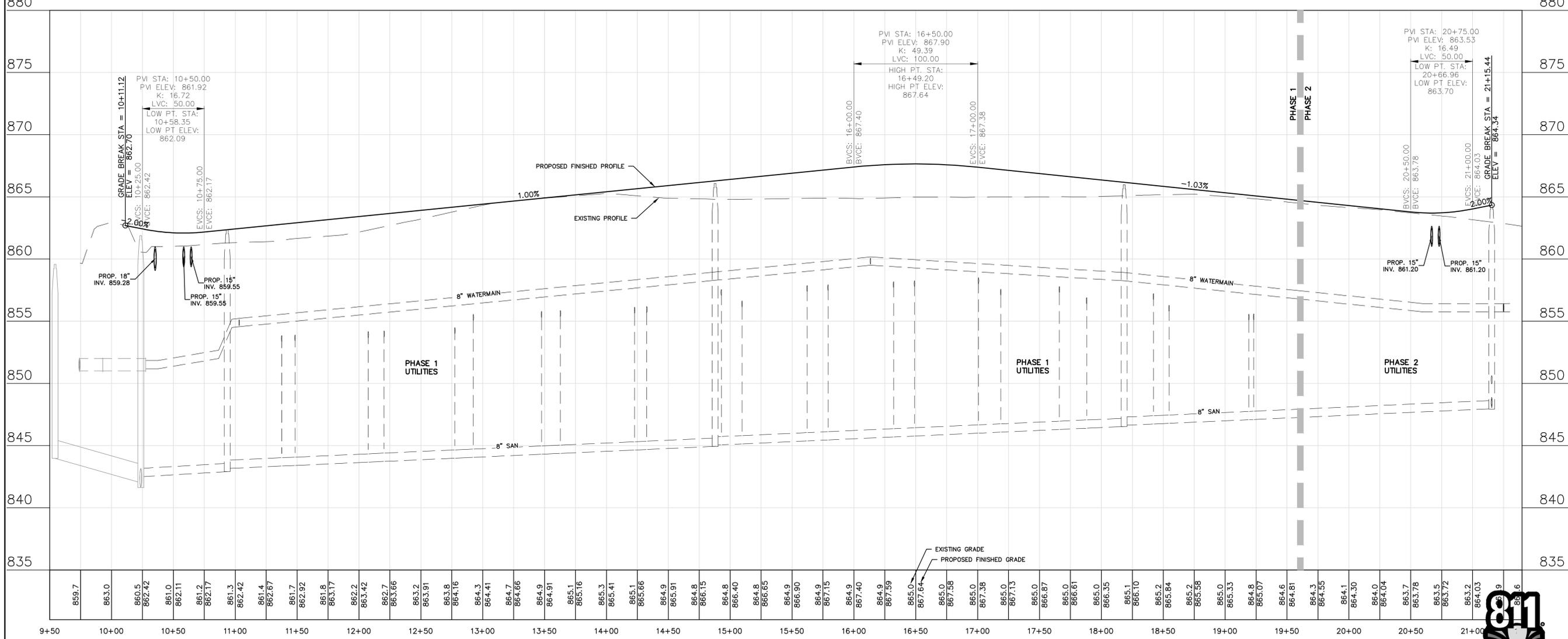
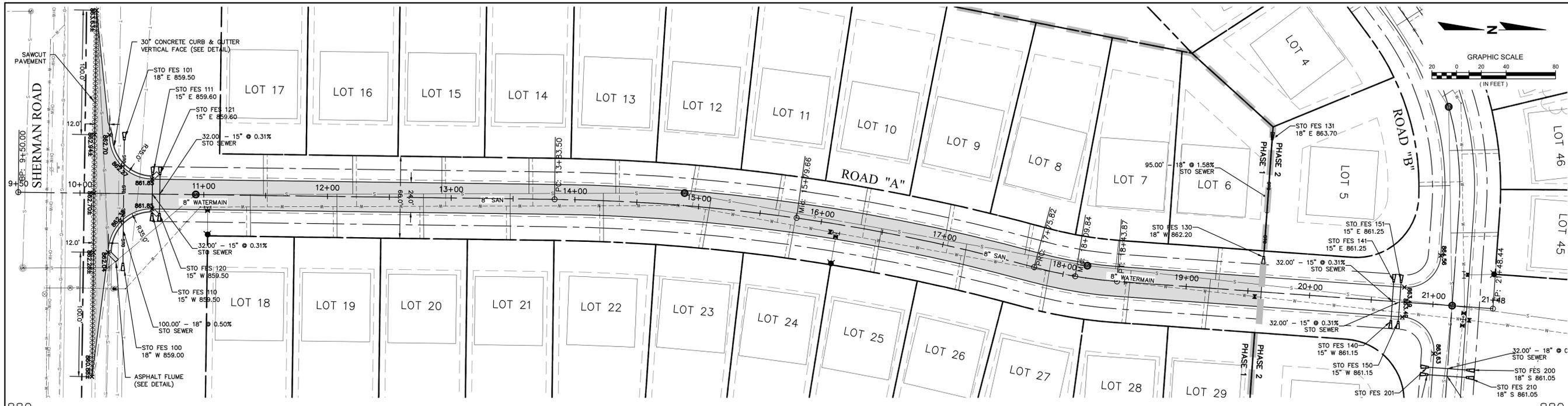
DESCRIPTION	
DATE	
<p>16745 W. Bluemound Road          Brookfield, WI 53005-5938          (262) 781-1000  <a href="http://rasmith.com">rasmith.com</a></p> <p><b>raSmith</b>          CREATIVITY BEYOND ENGINEERING</p> <p>Brookfield, WI   Milwaukee, WI   Appleton, WI   Madison, WI   Cedarburg, WI          Mount Pleasant, WI   Napperville, IL   Irvine, CA</p>	
<p><b>MORNING MEADOWS SUBDIVISION - PHASE 1</b>  <b>VILLAGE OF JACKSON, WI</b>  <b>SANITARY SEWER &amp; WATER MAIN</b>  <b>PLAN &amp; PROFILE</b></p>	
<p>© COPYRIGHT 2020          R.A. Smith, Inc.          DATE: 07/02/2020          SCALE: 1" = 40'          JOB NO. 3050195.01          PROJECT MANAGER:          CHRIS D. HITCH, P.E.          DESIGNED BY: DJM          CHECKED BY: CDH</p>	
<p><b>SHEET NUMBER</b>  <span style="font-size: 2em;">C200</span></p>	

THE LOCATIONS OF EXISTING UTILITY INSTALLATIONS AS SHOWN ON THIS PLAN ARE APPROXIMATE. THERE MAY BE OTHER UNDERGROUND UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.

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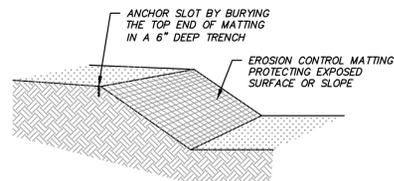
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**NOTES:**  
 1. ALL SPOT GRADES AND DIMENSIONS ARE TO THE FLANGE LINE OF CURB & GUTTER OR EDGE OF PAVEMENT.  
 THE LOCATIONS OF EXISTING UTILITY INSTALLATIONS AS SHOWN ON THIS PLAN ARE APPROXIMATE. THERE MAY BE OTHER UNDERGROUND UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.  
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CREATIVITY BEYOND ENGINEERING Brookfield, WI   Milwaukee, WI   Appleton, WI   Madison, WI   Cedarburg, WI Mount Pleasant, WI   Naperville, IL   Irvine, CA	
<b>MORNING MEADOWS SUBDIVISION - PHASE 1</b> <b>VILLAGE OF JACKSON, WI</b> <b>STORM SEWER &amp; PAVING</b> <b>PLAN &amp; PROFILE</b>	
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<b>SHEET NUMBER</b> <b>C300</b>	

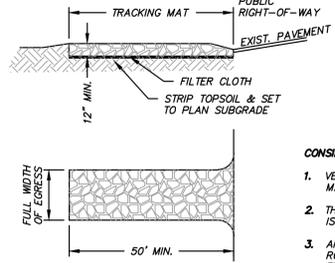




**NOTES:**

1. PRIOR TO THE INSTALLATION OF ANY EROSION CONTROL MATTING, ALL ROCKS, DIRT CLODS, STUMPS, ROOTS, TRASH AND ANY OTHER OBSTRUCTIONS WHICH WOULD PREVENT THE MAT FROM LAYING IN DIRECT CONTACT WITH THE SOIL SHALL BE REMOVED.
2. EROSION CONTROL MATTING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 628 OF THE WISCONSIN DOT STANDARD SPECIFICATIONS, DNR TECHNICAL STANDARD 1053 (CHANNEL APPLICATIONS), AND LATEST MANUFACTURER SPECIFICATIONS, ESPECIALLY NOTING REQUIRED STAPLE PATTERNS AND ANCHOR TRENCH REQUIREMENTS.
3. INSTALLATION PROCEDURES MUST INSURE THAT THE MAT WILL REMAIN IN CONTACT WITH THE SOIL.
4. THE MATTING SHALL BE ANCHORED PER MANUFACTURER REQUIREMENTS.
5. THE MATTING SHALL BE ANCHORED TO THE GROUND PER MANUFACTURER REQUIREMENTS.
6. TEMPORARY EROSION CONTROL MATTING SHALL BE WSDOT PAL CLASS I, TYPE B AND PERMANENT EROSION CONTROL MATTING SHALL BE WSDOT PAL CLASS III, TYPE A.
7. MATTED AREAS MUST BE INSPECTED ON A WEEKLY BASIS, AND AFTER EACH SIGNIFICANT RAINFALL, BARE SPOTS, MISSING OR LOOSESED MATTING MUST BE IMMEDIATELY REPLACED AND/OR RE-ANCHORED.
8. FOR CHANNEL APPLICATIONS, EXTEND MAT UPSLOPE ONE-FOOT MINIMUM VERTICALLY FROM DITCH BOTTOM OR SIX-INCHES HIGHER THAN DESIGN FLOW, WHICHEVER IS GREATER.

**EROSION CONTROL MATTING DETAIL**  
NOTE: INSTALL ON ALL SLOPES OF 4:1 OR GREATER



**CONSIDERATIONS:**

1. VEHICLES TRAVELING ACROSS THE TRACKING PAD SHOULD MAINTAIN A SLOW CONSTANT SPEED.
2. THE BEST APPROACH TO PREVENTING OFF-SITE TRACKING IS TO RESTRICT VEHICLES TO STABILIZED AREAS.
3. ANY SEDIMENT TRACKED ONTO A PUBLIC OR PRIVATE ROAD SHOULD BE REMOVED BY STREET CLEANING, NOT FLUSHING, BEFORE THE END OF EACH WORKING DAY.

**NOTES:**

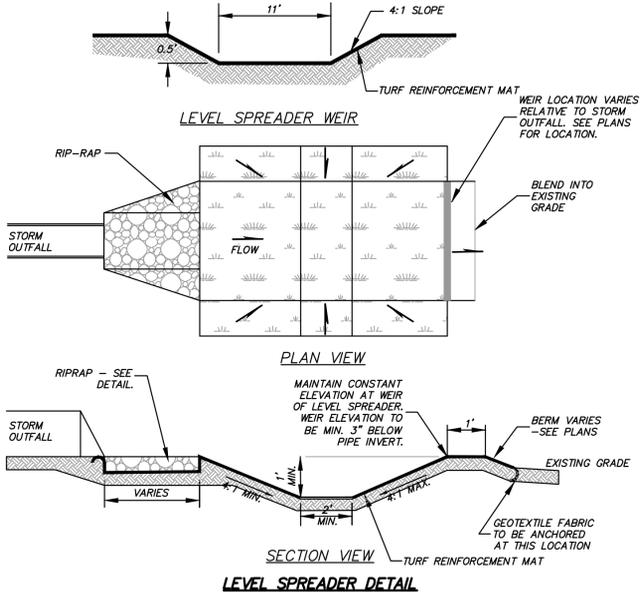
**A. TRACKING PAD:**

1. TRACKING PAD TO CONFORM TO WDNR CONSERVATION PRACTICE STANDARD 1057.
2. THE TRACKING PAD SHALL BE INSTALLED PRIOR TO ANY TRAFFIC LEAVING THE SITE.
3. THE AGGREGATE FOR TRACKING PADS SHALL BE 3"- 6" CLEAR OR WASHED STONE. ALL MATERIAL SHALL BE RETAINED ON A 3-INCH SIEVE.
4. THE AGGREGATE SHALL BE PLACED IN A LAYER AT LEAST 12 INCHES THICK. ON SITES WITH A HIGH WATER TABLE, OR WHERE SATURATED CONDITIONS ARE EXPECTED DURING THE LIFE OF THE PRACTICE, STONE TRACKING PADS SHALL BE UNDERLAIN WITH A WSDOT TYPE R GEOTEXTILE FABRIC TO PREVENT MIGRATION OF UNDERLYING SOIL INTO THE STONE.
5. THE TRACKING PAD SHALL BE THE FULL WIDTH OF THE EGRESS POINT. THE TRACKING PAD SHALL BE A MINIMUM OF 50 FEET LONG.
6. SURFACE WATER MUST BE PREVENTED FROM PASSING THROUGH THE TRACKING PAD. FLOWS SHALL BE DIVERTED AWAY FROM TRACKING PADS OR CONVEYED UNDER AND AROUND THEM BY USING A VARIETY OF PRACTICES, SUCH AS CULVERTS, WATER BARS, OR OTHER SIMILAR PRACTICES.

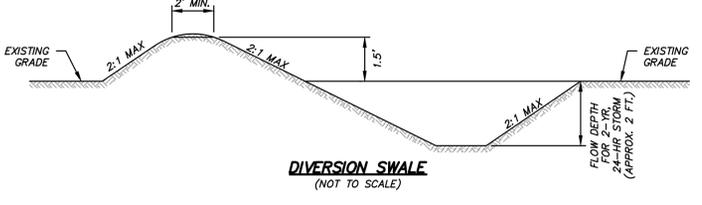
**B. MAINTENANCE**

1. ROCKS LODGED BETWEEN THE TIRES OF DUAL WHEEL VEHICLES SHALL BE REMOVED PRIOR TO LEAVING THE CONSTRUCTION SITE.
2. TRACKING PADS AND TIRE WASHING STATIONS SHALL, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
3. THE TRACKING PAD PERFORMANCE SHALL BE MAINTAINED BY SCRAPING OR TOP-DRESSING WITH ADDITIONAL AGGREGATE.
4. A MINIMUM 12-INCH THICK PAD SHALL BE MAINTAINED.

**STONE TRACKING PAD DETAIL**  
(NOT TO SCALE)



**LEVEL SPREADER DETAIL**



**NOTES:**

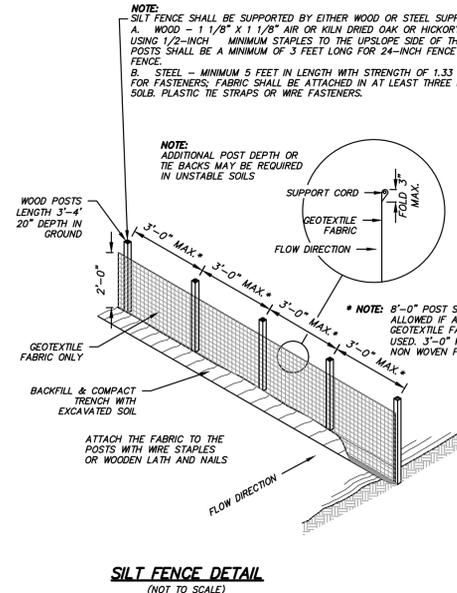
1. DIVERSION TO CONFORM TO WDNR CONSERVATION PRACTICE STANDARD 1066.
2. DIVERSION TO BE STABILIZED WITH VEGETATION OR EROSION MAT PRIOR TO USE.
3. DIVERSIONS SHALL, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
4. MAINTENANCE SHALL BE COMPLETED AS SOON AS POSSIBLE WITH CONSIDERATION TO SITE CONDITIONS.
5. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES ONE-HALF THE HEIGHT OF THE DIVERSION BERM. PROPERLY DISPOSE OF ANY SEDIMENT REMOVED FROM THE DIVERSION.
6. DIVERSIONS SHALL BE REMOVED AND THE AREA STABILIZED ACCORDING TO CONSTRUCTION PLANS.

**NOTES:**

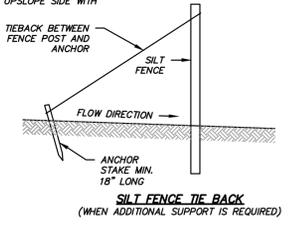
1. SILT FENCE INSTALLATION AND MATERIALS SHALL CONFORM TO WDNR CONSERVATION STANDARD 1056
2. SILT FENCE SHALL BE PLACED ON THE CONTOUR AND NOT PERPENDICULAR TO THE CONTOUR. THE ENDS SHALL BE EXTENDED UPSLOPE TO PREVENT WATER FROM FLOWING AROUND THE ENDS OF THE FENCE.
3. WHEN SILT FENCE IS INSTALLED ON A SLOPE, THE PARALLEL SPACING SHALL NOT EXCEED THE REQUIREMENTS IN THE TABLE BELOW:

SLOPE	FENCE SPACING
< 2%	100 FEET
2 TO 5%	75 FEET
5 TO 10%	50 FEET
10 TO 33%	25 FEET
> 33%	20 FEET

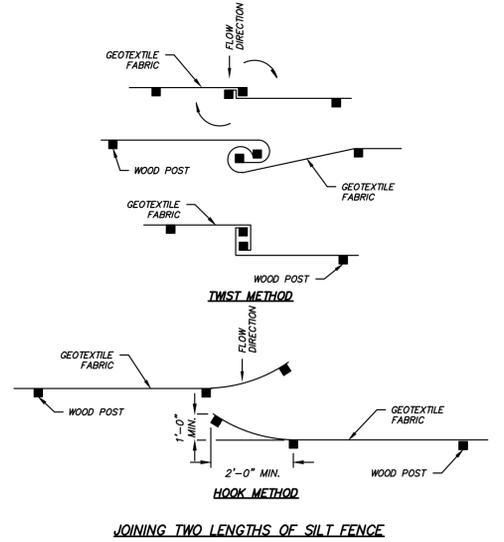
4. INSTALLED SILT FENCES SHALL BE MINIMUM 14 INCHES HIGH AND A MAXIMUM OF 28 INCHES IN HEIGHT MEASURED FROM THE INSTALLED GROUND ELEVATION.
5. A MINIMUM OF 20 INCHES OF THE POST SHALL EXTEND INTO THE GROUND AFTER INSTALLATION.
6. SILT FENCE SHALL BE ANCHORED BY SPREADING AT LEAST 8 INCHES OF THE FABRIC IN A 4-INCH TRENCH WIDE BY 6-INCH DEEP TRENCH, OR 6-INCH V-TRENCH ON THE UPSLOPE SIDE OF THE FENCE. TRENCH SHALL BE BACKFILLED AND COMPACTED. TRENCHES SHALL NOT BE EXCAVATED WIDER THAN NECESSARY FOR PROPER INSTALLATION.
7. CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS:
  - A) TWIST METHOD—OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 90 DEGREES.
  - B) HOOK METHOD—HOOK THE END OF EACH SILT FENCE LENGTH.
8. SILT FENCE SHALL AT A MINIMUM BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EACH PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
9. DAMAGED OR DECOMPOSED FENCES, UNDERCUTTING, OR FLOW CHANNELS AROUND THE END OF BARRIERS SHALL BE REPAIRED OR CORRECTED.
10. SEDIMENT BE PROPERLY DISPOSED OF ONCE THE DEPOSITS REACH ONE HALF THE HEIGHT OF THE FENCE.
11. SILT FENCES SHALL BE REMOVED ONCE THE DISTURBED AREA IS PERMANENTLY STABILIZED AND IS NO LONGER SUSCEPTIBLE TO EROSION.



**SILT FENCE DETAIL**  
(NOT TO SCALE)



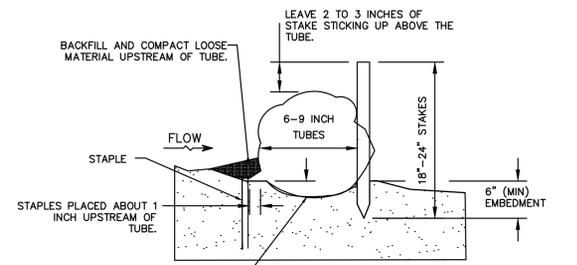
**SILT FENCE TIE BACK**  
(WHEN ADDITIONAL SUPPORT IS REQUIRED)



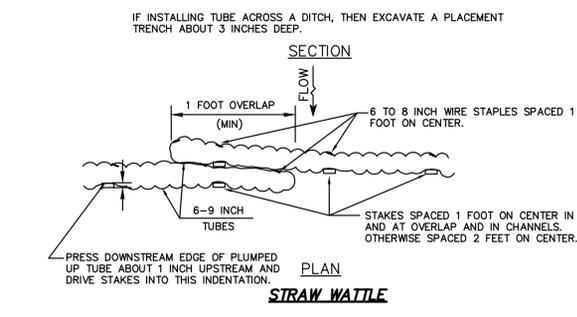
**JOINING TWO LENGTHS OF SILT FENCE**

**NOTES:**

1. TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.



**SECTION**



**STRAW WATTLE**

DESCRIPTION

DATE

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Brookfield, WI 53005-5938  
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**MORNING MEADOWS SUBDIVISION - PHASE 1**  
**VILLAGE OF JACKSON, WI**

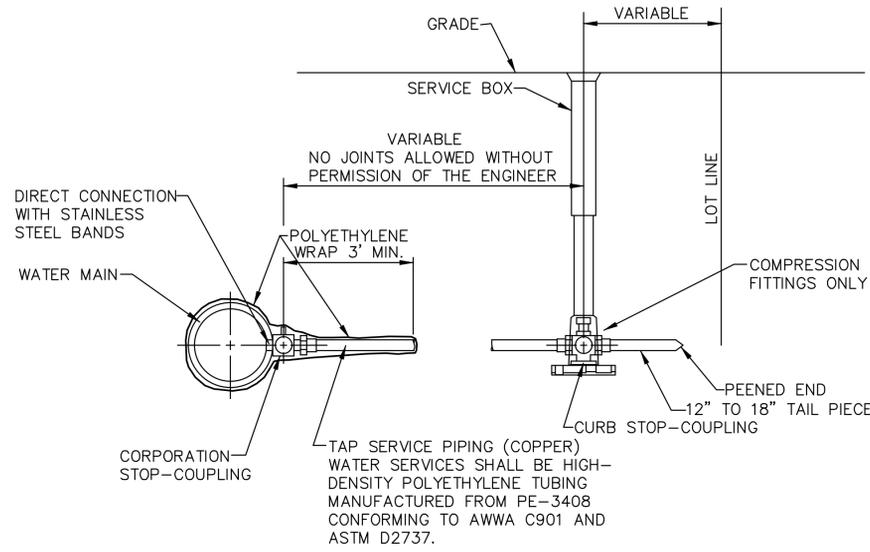
**EROSION CONTROL DETAILS**

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SCALE: #####  
JOB NO. 3050195.01  
PROJECT MANAGER:  
CHRIS D. HITCH, P.E.  
DESIGNED BY: DJM  
CHECKED BY: CDH  
**SHEET NUMBER**  
C400

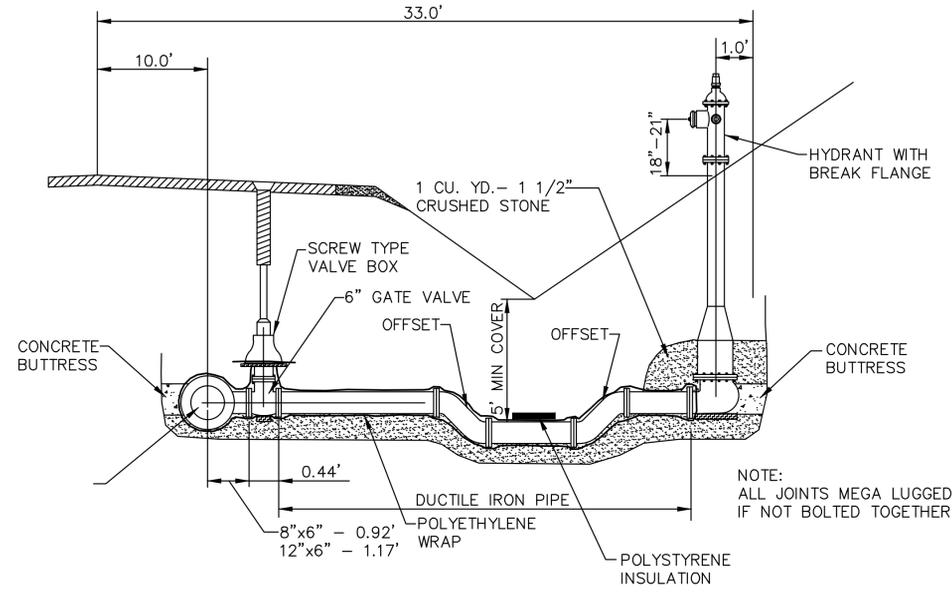


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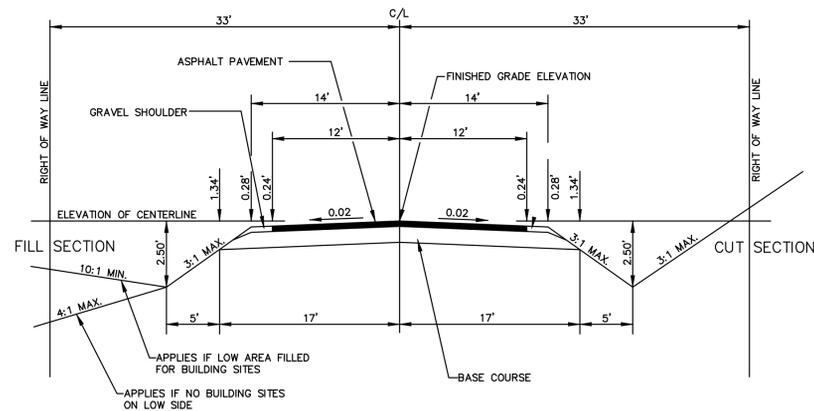
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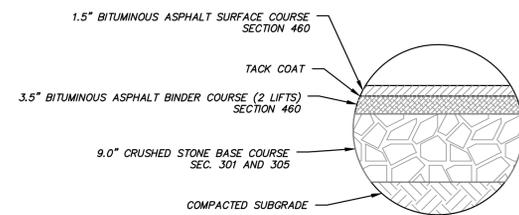
**TAP SERVICE PIPING (COPPER)**  
N.T.S.



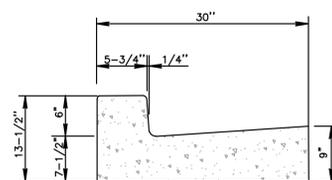
**TYPICAL HYDRANT SETTING**  
N.T.S.



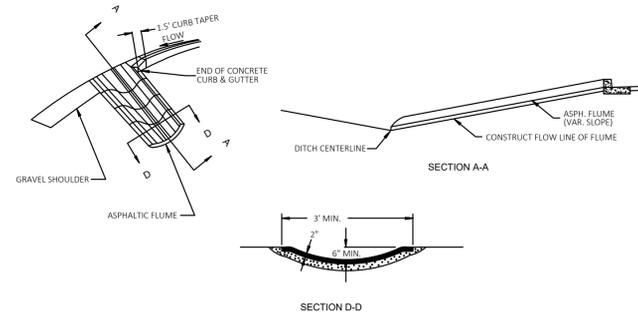
**PROPOSED RURAL STREET SECTION**  
N.T.S.



**ASPHALT PAVEMENT SECTION**



**CONCRETE CURB & GUTTER - VERTICAL FACE**  
N.T.S.



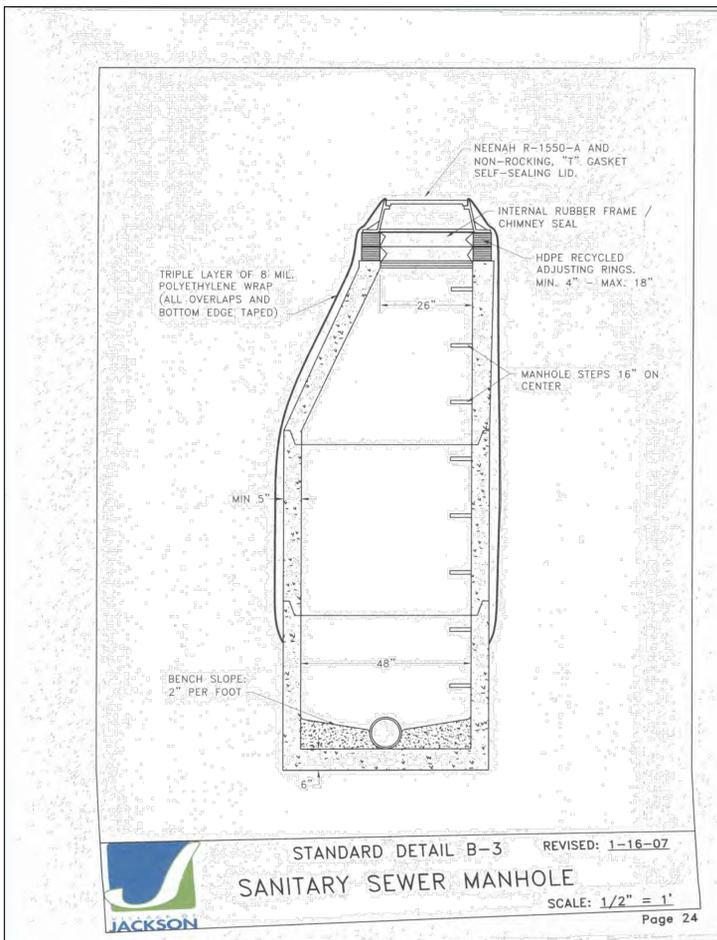
**ASPHALTIC FLUME DETAIL**  
N.T.S. AT RURAL INTERSECTIONS

- WATER MAIN NOTES:**
1. ALL WATER MAIN SHALL BE 8" DIAMETER PVC SDR-18, CLASS 150, CONFORMING TO AWWA C-900, WITH "PUSH-ON" TYPE RUBBER GASKET JOINTS.
  2. ALL WATER LATERALS SHALL BE 1-1/4" DIAMETER HIGH-DENSITY POLYETHYLENE.
  3. ALL HYDRANTS SHALL BE TRAFFIC MODELS WITH BREAK-AWAY FLANGE, PAINTED RED AND OPEN LEFT. A 6" RESILIENT WEDGE GATE VALVE SHALL BE PROVIDED ON EACH HYDRANT LEAD AND CONNECTED TO THE MAIN BY AN ANCHORING TEE AND "MEGALUG" GLAND TO THE LEAD FROM BOTH THE GATE VALVE AND HYDRANT.
  4. ALL GATE VALVES SHALL CONFORM TO AWWA-C509, RESILIENT SEATED GATE VALVES.
  5. A LOCATION WIRE SHALL BE 10 GAUGE, TYPE UF, SOLID CORE WIRE, AND SHALL BE TAPED EVERY 4 FT TO THE WATER MAIN. A LOOP OF LOCATION WIRE SHALL BE RUN TO THE SURFACE AT ALL HYDRANTS, WITH A "VALCO" TRACER WIRE TERMINAL BOX.
  6. ALL EXISTING HYDRANTS THAT ARE BEING REMOVED FOR THE CONNECTION TO EXISTING WATER MAIN SHALL BE INSPECTED AND VERIFIED FOR REUSE IN THE PROJECT.

- SANITARY SEWER NOTES:**
1. ALL SANITARY MANHOLES SHALL BE 48" IN DIAMETER WITH A LOCKING, NON-ROCKING, SOLID GASKET SELF-SEALING LID, AND 2 CONCEALED PICK HOLES, NEENAH R-1550-A.
  2. ALL SANITARY SEWER MAINS SHALL BE 8" DIAMETER PVC.
  3. ALL SANITARY LATERALS AND RISERS SHALL BE 6" DIAMETER PVC AND LATERAL SLOPE @ 0.0208 FT/FT.
  4. ALL SANITARY SEWER PIPES TO MANHOLE CONNECTIONS FOR PVC SHALL BE WITH AN APPROVED FLEXIBLE, WATERTIGHT PIPE TO MANHOLE SEAL. "A-LOCK" AND "CORE SEAL" OR APPROVED EQUAL SHALL BE USED.

- STORM SEWER NOTES:**
1. STORM SEWER PIPES SHALL BE AT A MINIMUM CLASS III (CLASS IV IN PAVEMENTS AREAS) ASTM C-76 REINFORCED CONCRETE PIPE. STORM SEWER PIPE SHALL HAVE RUBBER GASKETS AT ALL JOINTS.
- BACKFILL NOTE:**  
ALL TRENCHES SHALL BE BACKFILLED WITH GRANULAR BACKFILL AS SPECIFIED IN CHAPTER 8.43.4 OF STANDARD SPECIFICATIONS. WHERE SPOIL BACKFILL IS ALLOWED, MATERIAL USED SHALL BE SELECT EXCAVATED MATERIALS SUBJECT TO THE REQUIREMENTS OF CHAPTER 8.43.5 OF STANDARD SPECIFICATIONS.

**NOTE:**  
ALL WORK PERFORMED AND MATERIAL SUPPLIED SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, SIXTH EDITION, DATED DECEMBER 22, 2003, WITH LATEST ADDENDA, THE WISCONSIN STATE ADMINISTRATIVE CODE, AND VILLAGE OF JACKSON ENGINEERING DEPARTMENT.



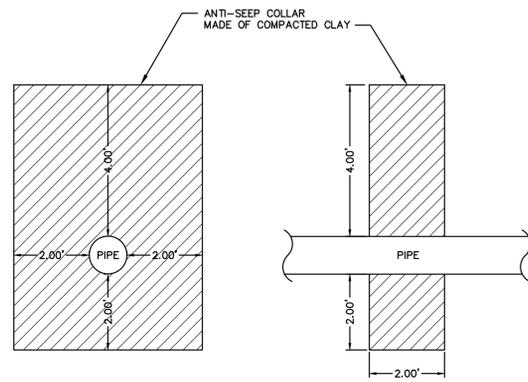
STANDARD DETAIL B-3 REVISED: 1-16-07  
**SANITARY SEWER MANHOLE**  
SCALE: 1/2" = 1'  
Page 24



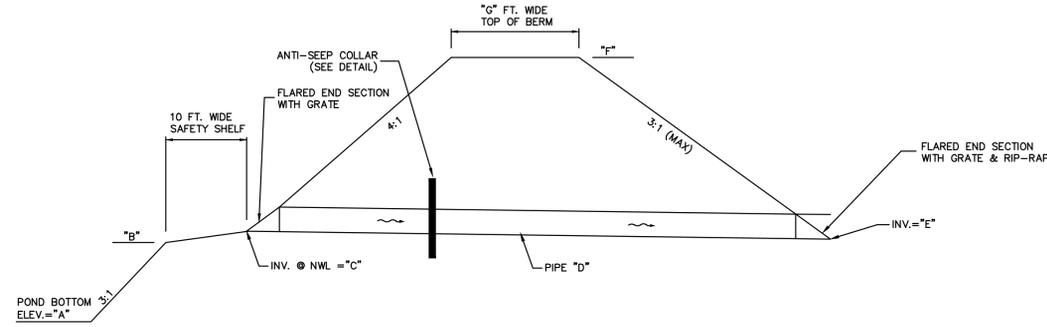
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<b>MORNING MEADOWS SUBDIVISION - PHASE 1</b>	
<b>VILLAGE OF JACKSON, WI</b>	
<b>SITE DETAILS</b>	
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DATE: 07/02/2020	
SCALE: #####	
JOB NO. 3050195.01	
PROJECT MANAGER: CHRIS D. HITCH, P.E.	
DESIGNED BY: DJM	
CHECKED BY: CDH	
<b>SHEET NUMBER</b>	
C401	

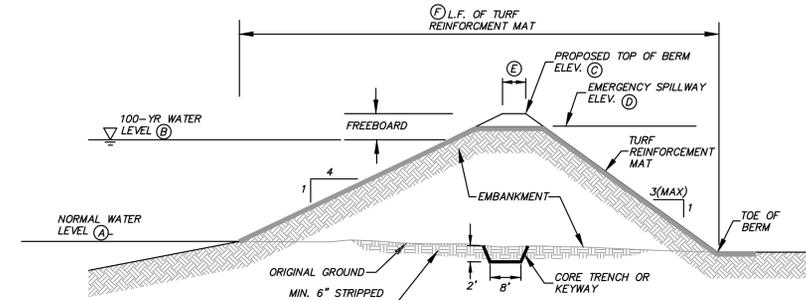


**SECTION VIEW**  
**ANTI-SEEP COLLAR DETAIL**



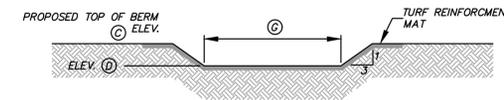
	A	B	C	D	E	F	G
DETENTION POND 1	852.00	856.00	857.00	30.0' - 12" @ 1.00%	857.00	856.70	10'
DETENTION POND 2	851.00	855.00	856.00	2@ 23.0' - 24" @ 1.00%	856.00	855.77	10'

**WET DETENTION POND CROSS SECTION**  
**N.T.S.**

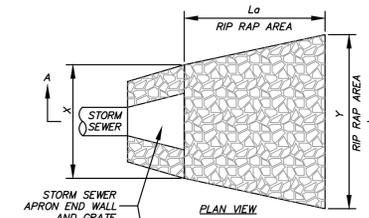


PROPOSED EMERGENCY SPILLWAY DIMENSIONS

	A	B	C	D	E	F	G
DETENTION POND 1	887.00	859.36	862.00	861.00	10'	34'	20'
DETENTION POND 2	856.00	858.64	860.00	859.00	10'	34'	20'

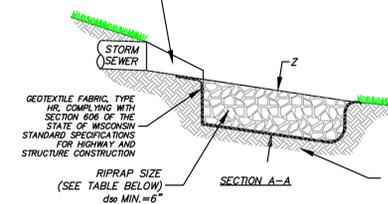


**PROPOSED EMERGENCY SPILLWAY**  
**N.T.S.**



DIMENSIONS

OUTLET	La	X	Y	GRADE	Z
POND 1	10'	3'	13'	MED.	1.5'
POND 2	10'	3'	13'	LRG.	2.0'



RIPRAP SHALL COMPLY WITH THE SECTION 606 OF THE STATE OF WISCONSIN STANDARD FOR HIGHWAY AND STRUCTURE CONSTRUCTION.  
PLAN VIEW CONTOURS AND GRADES REPRESENT PROPOSED TOP OF FIELD STONE ELEVATIONS.  
ALL STORM SEWER APRON END WALLS SHALL HAVE A GRATE TO SECURE THE OPEN END OF THE PIPE.  
NOTE: IF RIPRAP PLACED OVER POND CLAY LINER, CONSTRUCT FULL DEPTH LINER BELOW RIPRAP

**RIPRAP**  
**N.T.S.**

**MORNING MEADOWS SUBDIVISION - PHASE 1**  
**VILLAGE OF JACKSON, WI**

**DETENTION POND DETAILS**

DESCRIPTION  
DATE

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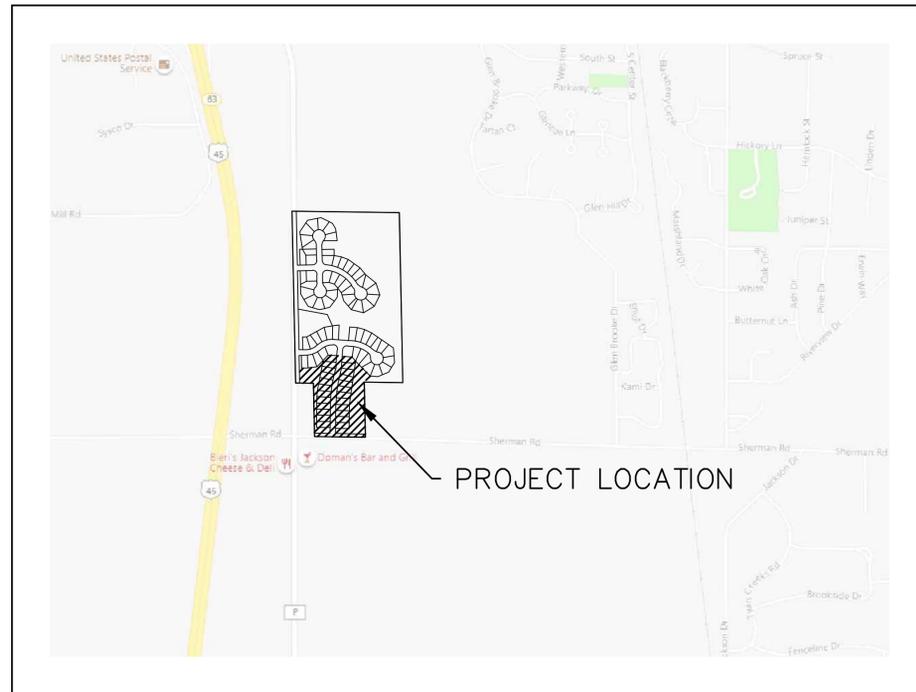
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DESIGNED BY: DJM  
CHECKED BY: CDH

**SHEET NUMBER**  
**C402**

# CONSTRUCTION PLANS FOR MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WISCONSIN

## VICINITY MAP



### LEGEND (PROPOSED FEATURES)

- TREE REMOVAL
- EXISTING CONCRETE PAVEMENT TO BE REMOVED
- EXISTING ASPHALT PAVEMENT TO BE REMOVED
- EXISTING GRAVEL TO BE REMOVED
- EXISTING BUILDING/STRUCTURE TO BE REMOVED
- SAWCUT LINE
- PROPOSED PROPERTY LINE
- PROPOSED SITE LIGHTING (DESIGNED BY OTHERS, FOR REFERENCE ONLY)
- MONUMENT SIGNS (CONSTRUCTION DETAILS BY OTHERS)
- SIGN
- HEAVY-DUTY CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- HEAVY-DUTY ASPHALT PAVEMENT
- STANDARD-DUTY ASPHALT PAVEMENT
- COLORED AND STAMPED CONCRETE
- PROPOSED 30" REJECT CURB & GUTTER (AS SHOWN ON SITE PLAN)
- PROPOSED 30" STANDARD CURB & GUTTER (AS SHOWN ON SITE PLAN)
- PROPOSED ACCESSIBLE PAVEMENT MARKING
- VAN ACCESSIBLE STALL
- PROPOSED TYPE 3 CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 3A CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 4 CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 4A CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- PROPOSED TYPE 7 CURB RAMP (SEE DETAIL SHEET, NOTE LINEWORK ON PLAN IS SYMBOLIC ONLY.)
- DOOR
- STRUCTURAL RETAINING WALL - (DESIGNED BY OTHERS)
- PROPOSED 0.5-FOOT GRADE CONTOUR (ONLY USED WHEN CRITICAL)
- PROPOSED 1-FOOT GRADE CONTOUR
- PROPOSED 5-FOOT GRADE CONTOUR
- PROPOSED SPOT GRADE
- PROPOSED TOP OF CURB
- DENOTES PROPOSED GARAGE FLOOR GRADE @ THRESHOLD
- IF A SECOND ELEVATION IS GIVEN, DENOTES GROUND LEVEL FOR LOOK OUT OR BASEMENT SLAB GRADE FOR WALK OUT.
- PROPOSED EROSION CONTROL BALE
- TEMPORARY DITCH CHECK
- CULVERT PIPE DITCH CHECK
- PROPOSED INLET PROTECTION
- PROPOSED SILT FENCE
- PROPOSED STRAW WATTLE
- PROPOSED TEMPORARY DIVERSION
- PROPOSED LEVEL SPREADER
- PROPOSED STONE TRACKING MAT
- PROPOSED PERMANENT TURF REINFORCEMENT MAT
- EROSION CONTROL BLANKET
- PROPOSED RIPRAP
- PROPOSED GAS LINE
- PROPOSED ELECTRIC LINE
- PROPOSED TELEPHONE LINE
- PROPOSED WATER MAIN
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED INLET/ CB
- PROPOSED STORM MANHOLE
- PROPOSED AREA DRAIN
- PROPOSED SANITARY MANHOLE

### LEGEND

- ( ) INDICATES RECORDED DIMENSION WHERE DIFFERENT FROM ACTUAL MEASUREMENT
- OR 1/4 SECTION OR 1/4 SECTION CORNER AS DESCRIBED
- 1" DIA. IRON PIPE FOUND (UNLESS OTHERWISE NOTED)
- 1" DIA. IRON PIPE, 18" LONG-SET (UNLESS OTHERWISE NOTED)
- BOLLARD
- SOIL BORING/MONITORING WELL
- FLAGPOLE
- MAILBOX
- SIGN
- BILLBOARD
- AIR CONDITIONER
- CONTROL BOX
- TRAFFIC SIGNAL
- RAILROAD CROSSING SIGNAL
- CABLE PEDESTAL
- POWER POLE
- GUY POLE
- GUY WIRE
- LIGHT POLE
- SPOT/YARD/PEDESTAL LIGHT
- HANDICAPPED PARKING
- ELECTRIC MANHOLE
- ELECTRIC PEDESTAL
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- MARKED FIBER OPTIC
- GAS VALVE
- GAS METER
- GAS WARNING SIGN
- STORM MANHOLE
- ROUND INLET
- SQUARE INLET
- STORM SEWER END SECTION
- SANITARY MANHOLE
- SANITARY CLEANOUT OR SEPTIC VENT
- SANITARY INTERCEPTOR MANHOLE
- MISCELLANEOUS MANHOLE
- WATER VALVE
- HYDRANT
- WATER SERVICE CURB STOP
- WATER MANHOLE
- WELL
- WATER SURFACE
- WETLANDS FLAG
- MARSH
- CONIFEROUS TREE
- DECIDUOUS TREE
- SHRUB
- EDGE OF TREES
- SANITARY SEWER
- STORM SEWER
- WATERMAIN
- MARKED GAS MAIN
- MARKED ELECTRIC
- OVERHEAD WIRES
- BUREAU ELEC. SERV.
- MARKED TELEPHONE
- MARKED CABLE TV LINE
- MARKED FIBER OPTIC
- INDICATES EXISTING CONTOUR ELEVATION
- INDICATES EXISTING SPOT ELEVATION
- EXISTING PROPERTY LINE
- EXISTING EASEMENT LINE

ENGINEER:

**raSmith**  
CREATIVITY BEYOND ENGINEERING

RAS PROJECT: 3050195.01  
CONTACT: CHRIS D. HITCH, P.E.

16745 W. Bluemound Road  
Brookfield, WI 53005-5938  
(262) 781-1000  
rasmith.com

OWNER/DEVELOPER:

HOME PATH FINANCIAL, LP  
CONTACT: ED WOODLAND  
19435 W. CAPITAL DRIVE, #102  
BROOKFIELD, WI 53045  
PH.: 262-336-3862

COMMUNITY:

VILLAGE OF JACKSON  
CONTACT: BRIAN KOBER  
DIRECTOR OF PUBLIC WORKS  
N168 W20733 MAIN ST.  
JACKSON, WI 53037  
PH.: 262-677-0707 x11

BENCHMARKS:

SET BM. RR SPIKE PP#85-02721  
APPROX. 406' EAST OF CTH P  
ON SHERMAN RD  
ELEV = 861.11  
SET BM. RR SPIKE PP#03-04062  
APPROX. 1,605' NORTH OF  
SHERMAN ON CTH P  
ELEV = 865.99

### PLAN INDEX

SHEET NO.	DESCRIPTION
C000	TITLE SHEET
C100	OVERALL EROSION CONTROL & GRADING PLAN
C101-C103	DETAILED EROSION CONTROL & GRADING PLANS
C200	SANITARY SEWER & WATER MAIN PLAN & PROFILE
C300-C301	STORM SEWER & PAVING PLAN & PROFILE
C400-C402	DETAILS

PLAN DATE: 07/02/2020

REVISIONS	ISSUE DATE	SHEET NO.'S	ISSUED FOR:
-	--	--	--

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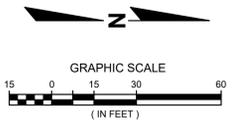
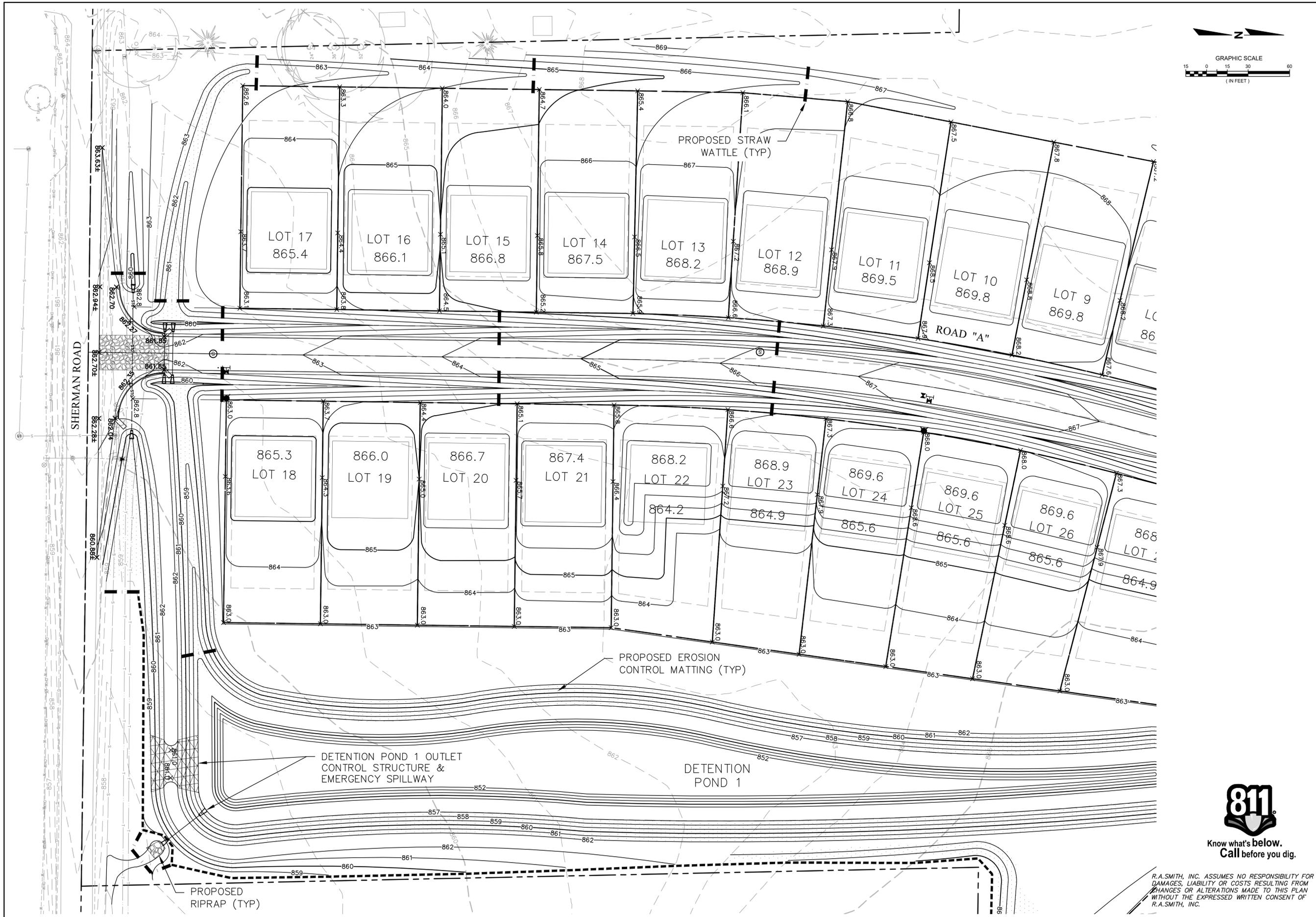
MORNING MEADOWS SUBDIVISION - PHASE 1  
VILLAGE OF JACKSON, WI

TITLE SHEET

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JOB NO. 3050195.01  
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DESIGNED BY: DJM  
CHECKED BY: CDH

SHEET NUMBER  
C000





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**MORNING MEADOWS SUBDIVISION - PHASE 1**  
**VILLAGE OF JACKSON, WI**  
**DETAILED EROSION CONTROL & GRADING PLAN**

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SCALE: 1" = 30'
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PROJECT MANAGER: CHRIS D. HITCH, P.E.
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C101



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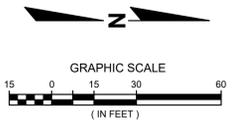
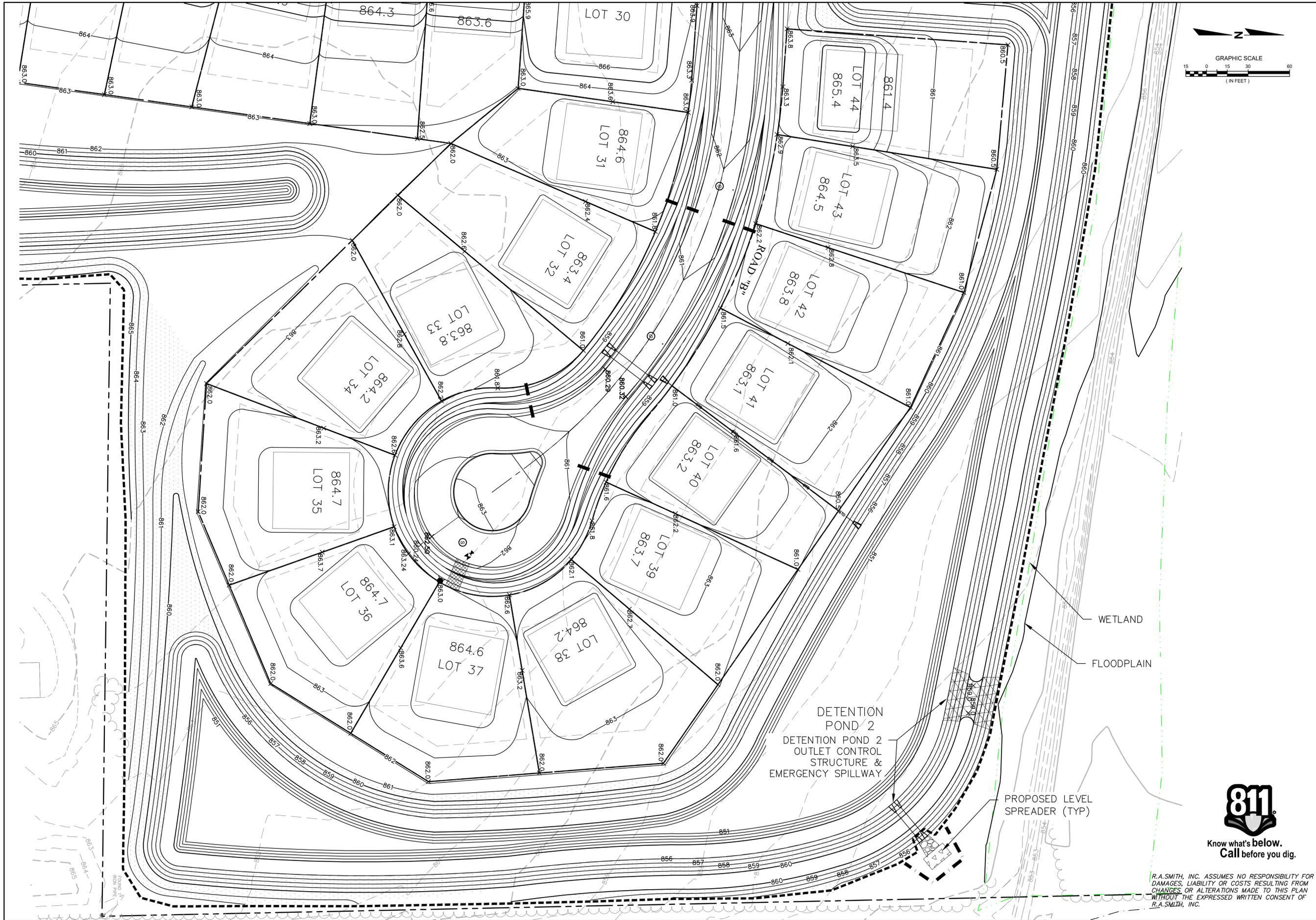
**MORNING MEADOWS SUBDIVISION - PHASE 1**  
**VILLAGE OF JACKSON, WI**  
**DETAILED EROSION CONTROL & GRADING PLAN**

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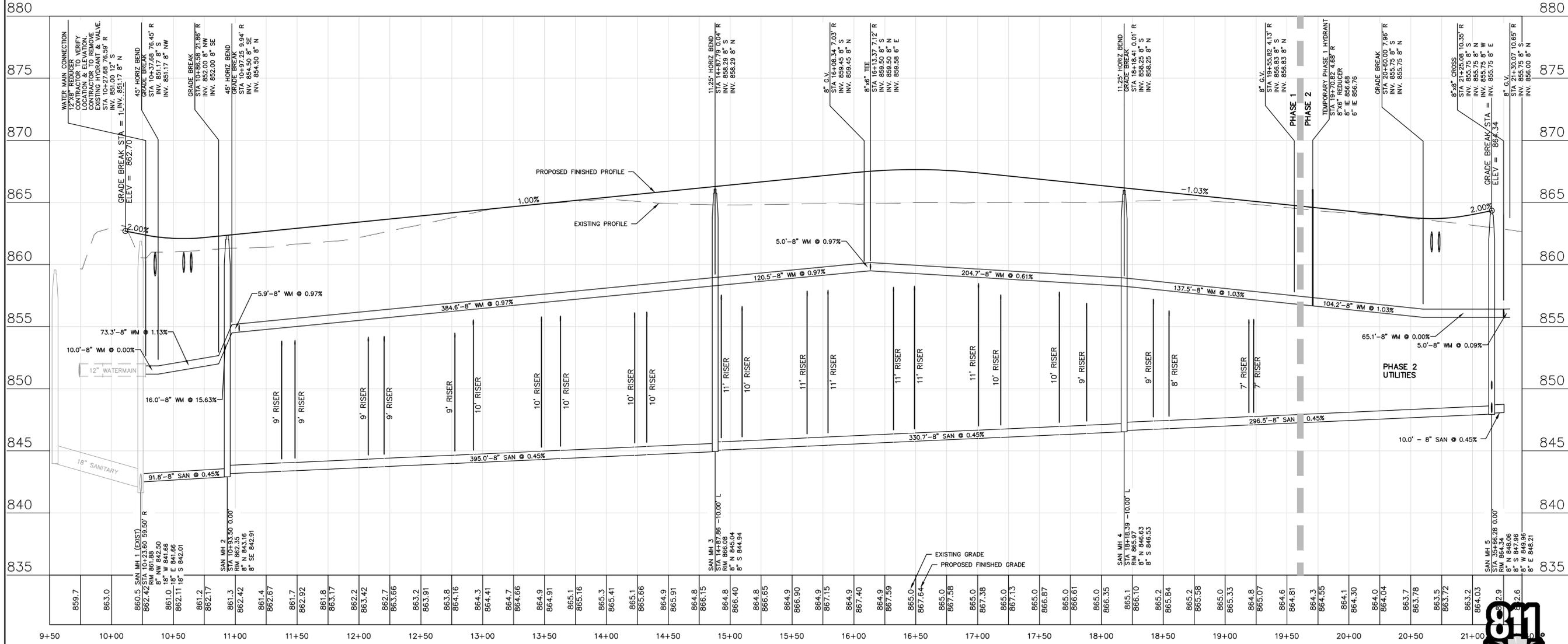
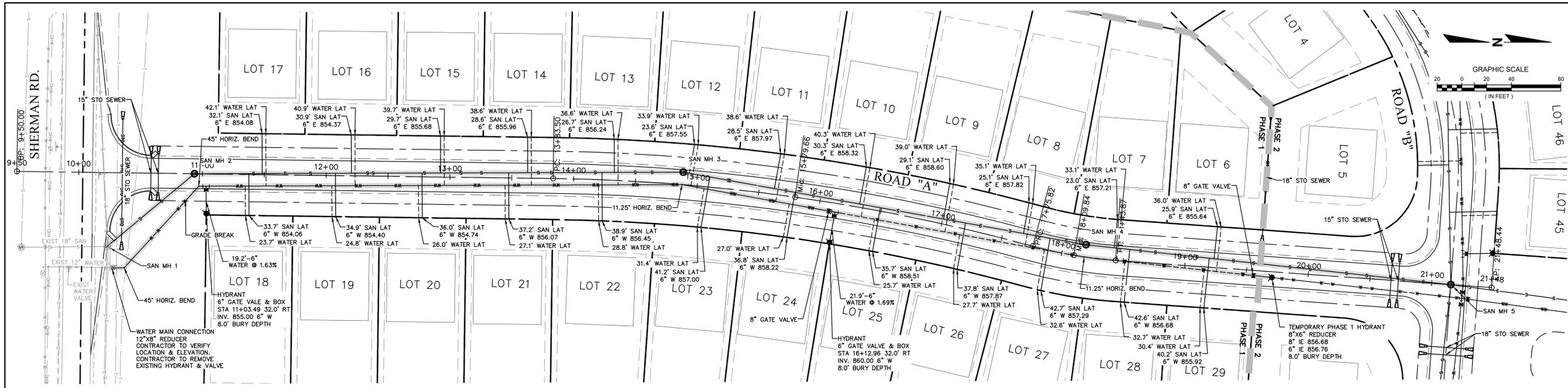
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**DETAILED EROSION CONTROL & GRADING PLAN**

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CHECKED BY: CDH
<b>SHEET NUMBER</b>
C103

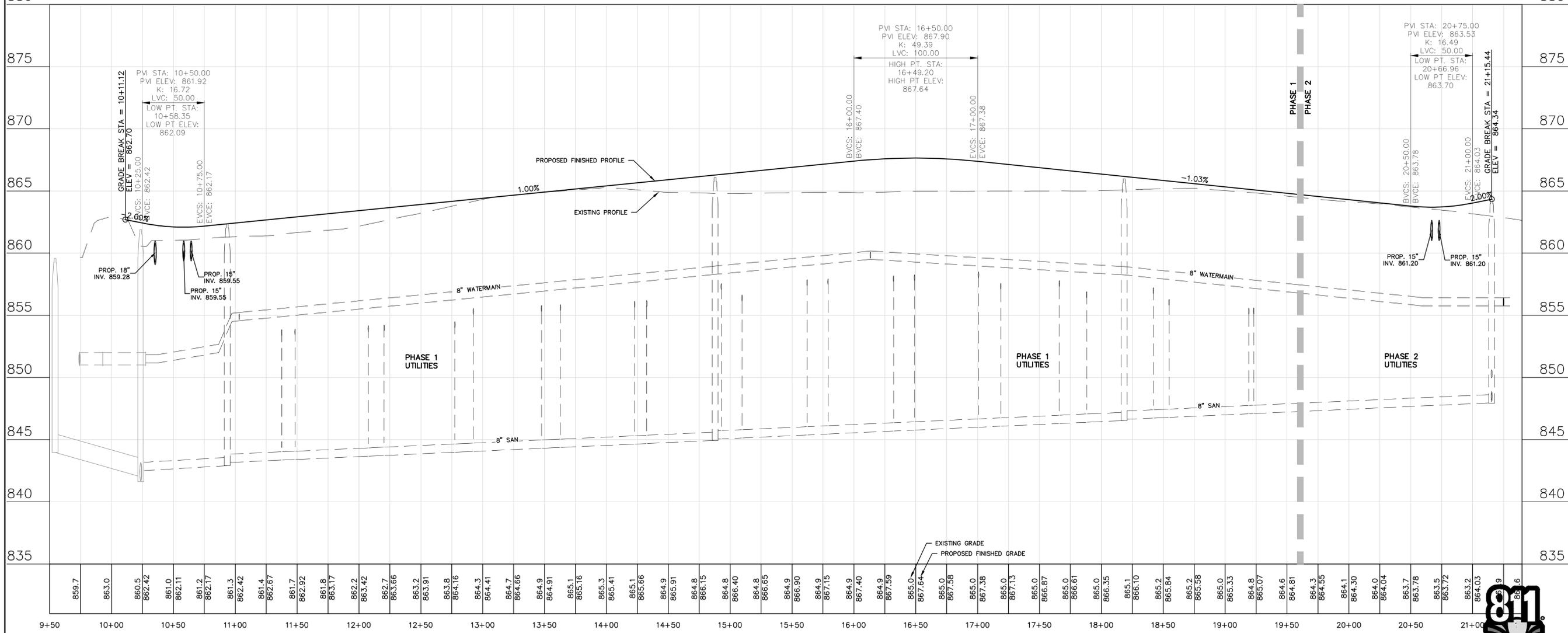
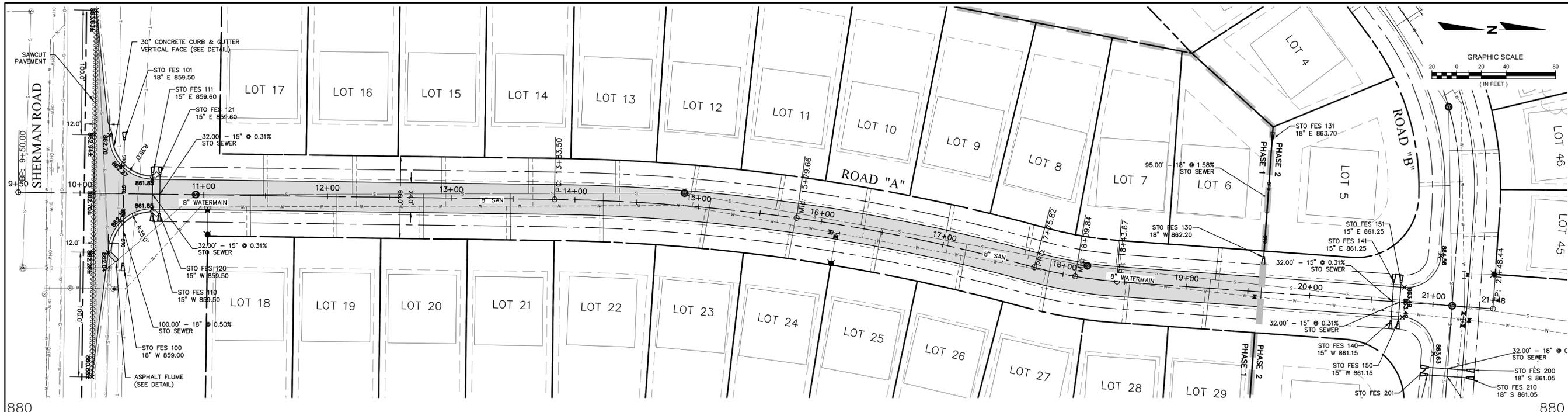


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<p><b>MORNING MEADOWS SUBDIVISION - PHASE 1</b> <b>VILLAGE OF JACKSON, WI</b> <b>SANITARY SEWER &amp; WATER MAIN</b> <b>PLAN &amp; PROFILE</b></p>	
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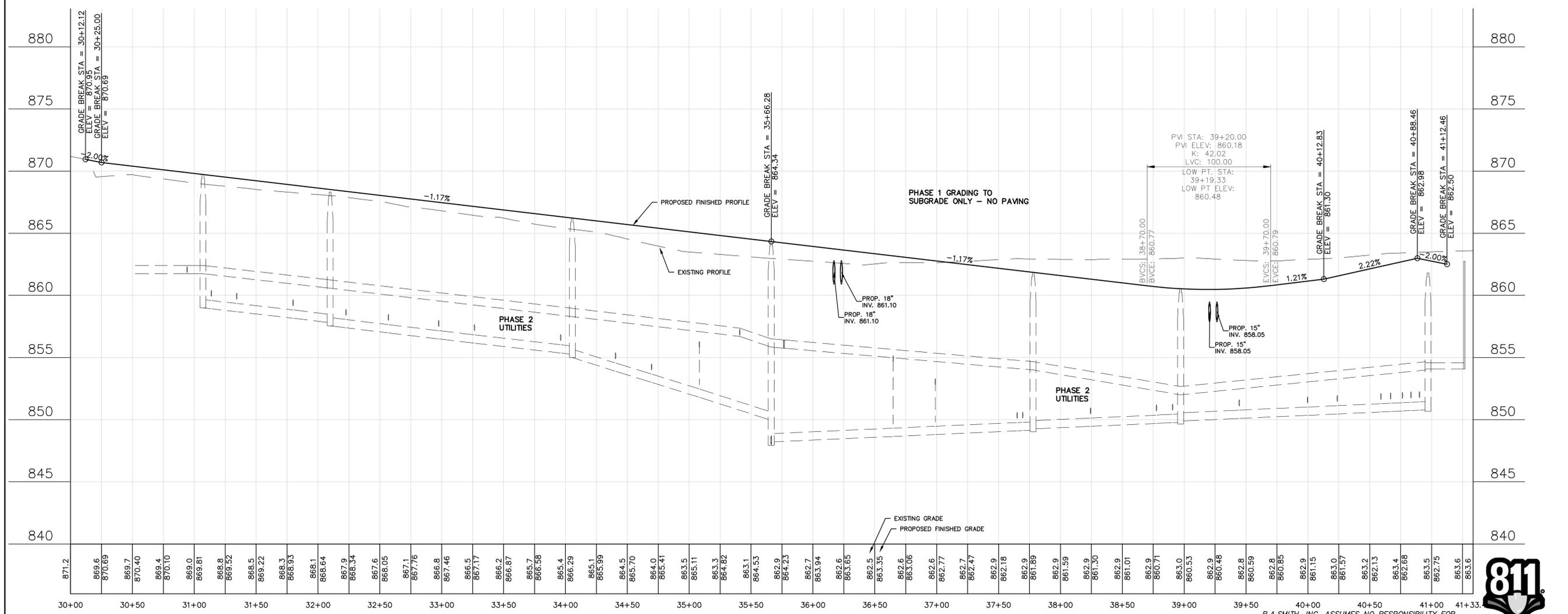
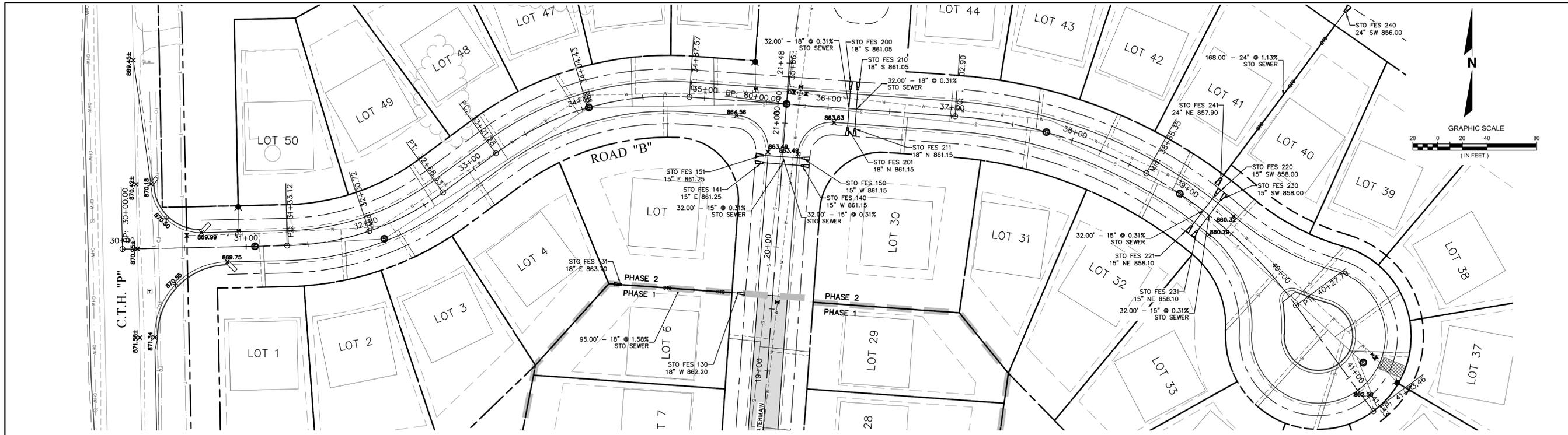
859.7	853.0	860.5	862.42	861.0	862.11	861.2	862.17	861.3	862.42	861.4	862.67	861.7	862.92	861.8	863.17	862.2	863.42	862.7	863.66	863.2	863.91	863.8	864.16	864.3	864.41	864.7	864.66	864.9	864.91	865.1	865.16	865.3	865.41	865.1	865.66	864.9	865.91	864.8	866.15	864.8	866.40	864.8	866.65	866.90	864.9	867.15	864.9	867.40	867.59	865.0	867.64	865.0	867.58	865.0	867.38	865.0	867.13	865.0	866.87	865.0	866.61	865.0	866.35	865.1	866.10	865.2	865.84	865.2	865.58	865.3	865.33	864.8	865.07	864.6	864.81	864.3	864.35	864.30	864.0	864.04	863.7	863.78	863.5	863.72	863.2	864.03	863.9	863.16
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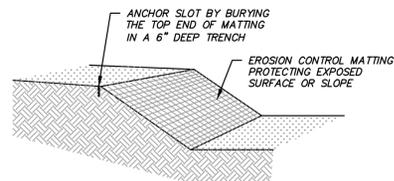
**NOTES:**  
 1. ALL SPOT GRADES AND DIMENSIONS ARE TO THE FLANGE LINE OF CURB & GUTTER OR EDGE OF PAVEMENT.  
 THE LOCATIONS OF EXISTING UTILITY INSTALLATIONS AS SHOWN ON THIS PLAN ARE APPROXIMATE. THERE MAY BE OTHER UNDERGROUND UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.  
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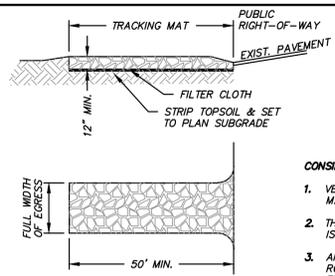
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<b>MORNING MEADOWS SUBDIVISION - PHASE 1</b> <b>VILLAGE OF JACKSON, WI</b> <b>STORM SEWER &amp; PAVING</b> <b>PLAN &amp; PROFILE</b>	
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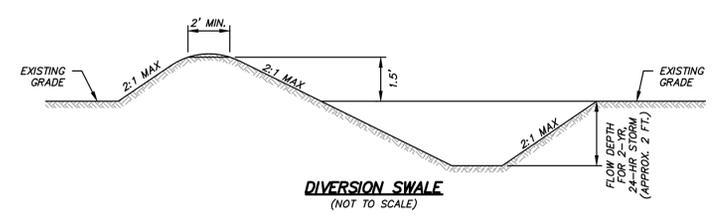
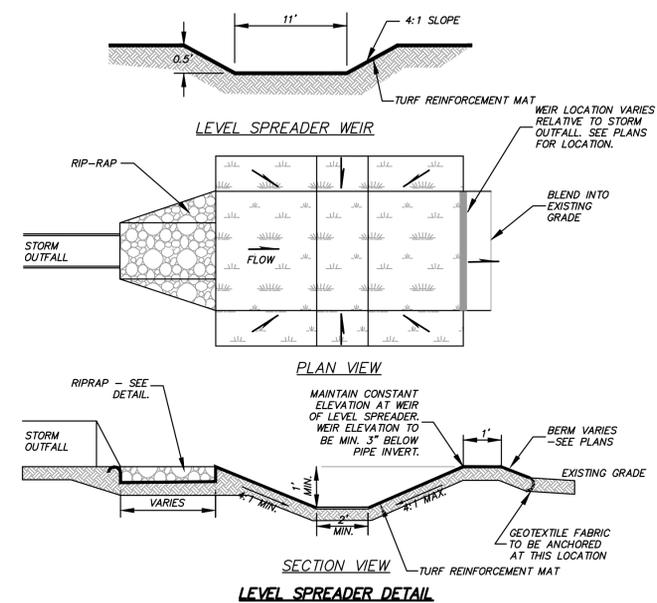
- NOTES:**
1. PRIOR TO THE INSTALLATION OF ANY EROSION CONTROL MATTING, ALL ROCKS, DIRT CLODS, STUMPS, ROOTS, TRASH AND ANY OTHER OBSTRUCTIONS WHICH WOULD PREVENT THE MAT FROM LAYING IN DIRECT CONTACT WITH THE SOIL SHALL BE REMOVED.
  2. EROSION CONTROL MATTING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 628 OF THE WISCONSIN DOT STANDARD SPECIFICATIONS, DNR TECHNICAL STANDARD 1053 (CHANNEL APPLICATIONS), AND LATEST MANUFACTURER SPECIFICATIONS, ESPECIALLY NOTING REQUIRED STAPLE PATTERNS AND ANCHOR TRENCH REQUIREMENTS.
  3. INSTALLATION PROCEDURES MUST INSURE THAT THE MAT WILL REMAIN IN CONTACT WITH THE SOIL.
  4. THE MATTING SHALL BE ANCHORED PER MANUFACTURER REQUIREMENTS.
  5. THE MATTING SHALL BE ANCHORED TO THE GROUND PER MANUFACTURER REQUIREMENTS.
  6. TEMPORARY EROSION CONTROL MATTING SHALL BE WSDOT PAL CLASS I, TYPE B AND PERMANENT EROSION CONTROL MATTING SHALL BE WSDOT PAL CLASS III, TYPE A.
  7. MATTED AREAS MUST BE INSPECTED ON A WEEKLY BASIS, AND AFTER EACH SIGNIFICANT RAINFALL, BARE SPOTS, MISSING OR LOOSESED MATTING MUST BE IMMEDIATELY REPLACED AND/OR RE-ANCHORED.
  8. FOR CHANNEL APPLICATIONS, EXTEND MAT UPSLOPE ONE-FOOT MINIMUM VERTICALLY FROM DITCH BOTTOM OR SIX-INCHES HIGHER THAN DESIGN FLOW, WHICHEVER IS GREATER.

**EROSION CONTROL MATTING DETAIL**  
NOTE: INSTALL ON ALL SLOPES OF 4:1 OR GREATER



- CONSIDERATIONS:**
1. VEHICLES TRAVELING ACROSS THE TRACKING PAD SHOULD MAINTAIN A SLOW CONSTANT SPEED.
  2. THE BEST APPROACH TO PREVENTING OFF-SITE TRACKING IS TO RESTRICT VEHICLES TO STABILIZED AREAS.
  3. ANY SEDIMENT TRACKED ONTO A PUBLIC OR PRIVATE ROAD SHOULD BE REMOVED BY STREET CLEANING, NOT FLUSHING, BEFORE THE END OF EACH WORKING DAY.
- NOTES:**
- A. TRACKING PAD:**
1. TRACKING PAD TO CONFORM TO WDMR CONSERVATION PRACTICE STANDARD 1057.
  2. THE TRACKING PAD SHALL BE INSTALLED PRIOR TO ANY TRAFFIC LEAVING THE SITE.
  3. THE AGGREGATE FOR TRACKING PADS SHALL BE 3"- 6" CLEAR OR WASHED STONE. ALL MATERIAL SHALL BE RETAINED ON A 3-INCH SIEVE.
  4. THE AGGREGATE SHALL BE PLACED IN A LAYER AT LEAST 12 INCHES THICK. ON SITES WITH A HIGH WATER TABLE, OR WHERE SATURATED CONDITIONS ARE EXPECTED DURING THE LIFE OF THE PRACTICE, STONE TRACKING PADS SHALL BE UNDERLAIN WITH A WSDOT TYPE R GEOTEXTILE FABRIC TO PREVENT MIGRATION OF UNDERLYING SOIL INTO THE STONE.
  5. THE TRACKING PAD SHALL BE THE FULL WIDTH OF THE EGRESS POINT. THE TRACKING PAD SHALL BE A MINIMUM OF 50 FEET LONG.
  6. SURFACE WATER MUST BE PREVENTED FROM PASSING THROUGH THE TRACKING PAD. FLOWS SHALL BE DIVERTED AWAY FROM TRACKING PADS OR CONVEYED UNDER AND AROUND THEM BY USING A VARIETY OF PRACTICES, SUCH AS CULVERTS, WATER BARS, OR OTHER SIMILAR PRACTICES.
- B. MAINTENANCE**
1. ROCKS LODGED BETWEEN THE TIRES OF DUAL WHEEL VEHICLES SHALL BE REMOVED PRIOR TO LEAVING THE CONSTRUCTION SITE.
  2. TRACKING PADS AND TIRE WASHING STATIONS SHALL, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
  3. THE TRACKING PAD PERFORMANCE SHALL BE MAINTAINED BY SCRAPING OR TOP-DRESSING WITH ADDITIONAL AGGREGATE.
  4. A MINIMUM 12-INCH THICK PAD SHALL BE MAINTAINED.

**STONE TRACKING PAD DETAIL**  
(NOT TO SCALE)

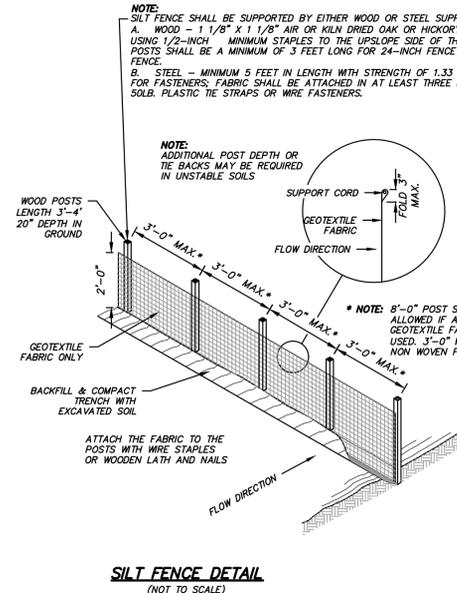


- NOTES:**
1. DIVERSION TO CONFORM TO WDMR CONSERVATION PRACTICE STANDARD 1066.
  2. DIVERSION TO BE STABILIZED WITH VEGETATION OR EROSION MAT PRIOR TO USE.
  3. DIVERSIONS SHALL, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
  4. MAINTENANCE SHALL BE COMPLETED AS SOON AS POSSIBLE WITH CONSIDERATION TO SITE CONDITIONS.
  5. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES ONE-HALF THE HEIGHT OF THE DIVERSION BERM. PROPERLY DISPOSE OF ANY SEDIMENT REMOVED FROM THE DIVERSION.
  6. DIVERSIONS SHALL BE REMOVED AND THE AREA STABILIZED ACCORDING TO CONSTRUCTION PLANS.

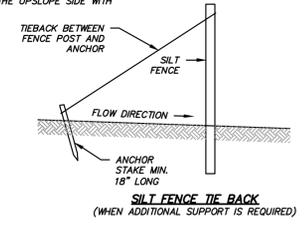
- NOTES:**
1. SILT FENCE INSTALLATION AND MATERIALS SHALL CONFORM TO WDMR CONSERVATION STANDARD 1056
  2. SILT FENCE SHALL BE PLACED ON THE CONTOUR AND NOT PERPENDICULAR TO THE CONTOUR. THE ENDS SHALL BE EXTENDED UPSLOPE TO PREVENT WATER FROM FLOWING AROUND THE ENDS OF THE FENCE.
  3. WHEN SILT FENCE IS INSTALLED ON A SLOPE, THE PARALLEL SPACING SHALL NOT EXCEED THE REQUIREMENTS IN THE TABLE BELOW:

SLOPE	FENCE SPACING
< 2%	100 FEET
2 TO 5%	75 FEET
5 TO 10%	50 FEET
10 TO 33%	25 FEET
> 33%	20 FEET

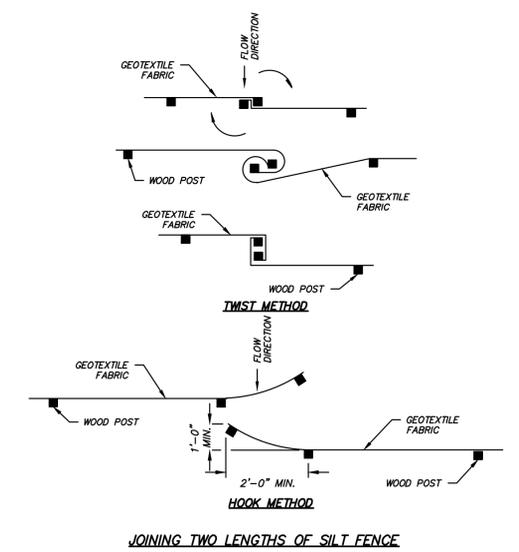
4. INSTALLED SILT FENCES SHALL BE MINIMUM 14 INCHES HIGH AND A MAXIMUM OF 28 INCHES IN HEIGHT MEASURED FROM THE INSTALLED GROUND ELEVATION.
5. A MINIMUM OF 20 INCHES OF THE POST SHALL EXTEND INTO THE GROUND AFTER INSTALLATION.
6. SILT FENCE SHALL BE ANCHORED BY SPREADING AT LEAST 8 INCHES OF THE FABRIC IN A 4-INCH TRENCH WIDE BY 6-INCH DEEP TRENCH, OR 6-INCH V-TRENCH ON THE UPSLOPE SIDE OF THE FENCE. TRENCH SHALL BE BACKFILLED AND COMPACTED. TRENCHES SHALL NOT BE EXCAVATED WIDER THAN NECESSARY FOR PROPER INSTALLATION.
7. CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS:  
A) TWIST METHOD—OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 90 DEGREES.  
B) HOOK METHOD—HOOK THE END OF EACH SILT FENCE LENGTH.
8. SILT FENCE SHALL AT A MINIMUM BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EACH PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
9. DAMAGED OR DECOMPOSED FENCES, UNDERCUTTING, OR FLOW CHANNELS AROUND THE END OF BARRIERS SHALL BE REPAIRED OR CORRECTED.
10. SEDIMENT BE PROPERLY DISPOSED OF ONCE THE DEPOSITS REACH ONE HALF THE HEIGHT OF THE FENCE.
11. SILT FENCES SHALL BE REMOVED ONCE THE DISTURBED AREA IS PERMANENTLY STABILIZED AND IS NO LONGER SUSCEPTIBLE TO EROSION.



**SILT FENCE DETAIL**  
(NOT TO SCALE)

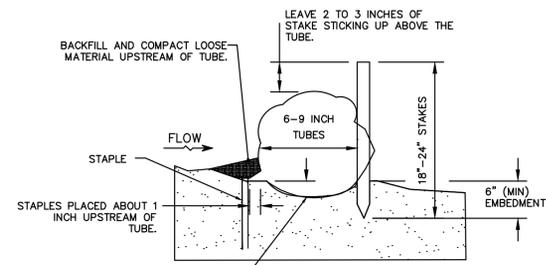


**SILT FENCE TIE BACK**  
(WHEN ADDITIONAL SUPPORT IS REQUIRED)



**JOINING TWO LENGTHS OF SILT FENCE**

- NOTES:**
1. TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.



**SECTION**

**PLAN**

**STRAW WATTLE**

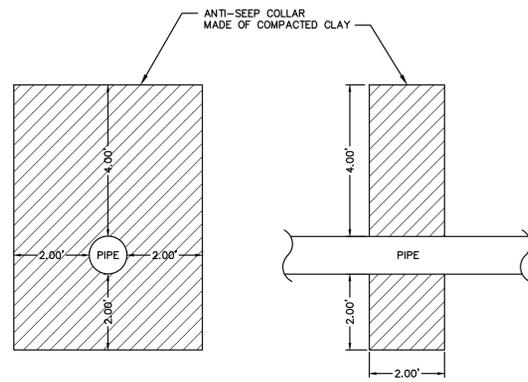
DESCRIPTION	
DATE	
<p>16745 W. Bluemound Road Brookfield, WI 53005-5938 (262) 781-1000 rasmith.com</p> <p><b>raSmith</b> CREATIVITY BEYOND ENGINEERING</p> <p>Brookfield, WI   Milwaukee, WI   Appleton, WI   Madison, WI   Cedarburg, WI Mount Pleasant, WI   Naperville, IL   Irvine, CA</p>	
<p><b>MORNING MEADOWS SUBDIVISION - PHASE 1</b> <b>VILLAGE OF JACKSON, WI</b></p> <p><b>EROSION CONTROL DETAILS</b></p>	
<p>© COPYRIGHT 2020 R.A. Smith, Inc. DATE: 07/02/2020 SCALE: ##### JOB NO. 3050195.01 PROJECT MANAGER: CHRIS D. HITCH, P.E. DESIGNED BY: DJM CHECKED BY: CDH</p>	
<p><b>SHEET NUMBER</b> <b>C400</b></p>	



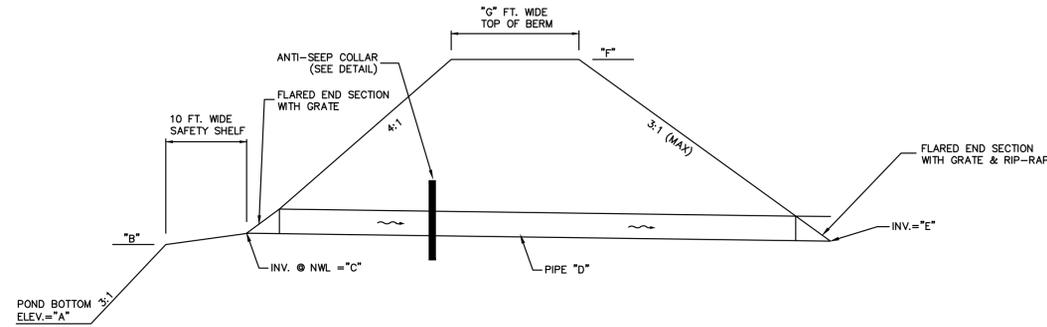
Know what's below.  
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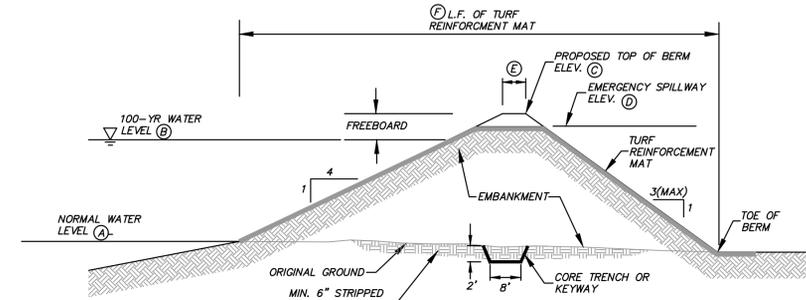


**SECTION VIEW**  
**ANTI-SEEP COLLAR DETAIL**



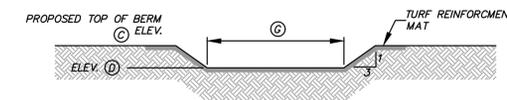
	A	B	C	D	E	F	G
DETENTION POND 1	852.00	856.00	857.00	30.0' - 12" @ 1.00%	857.00	856.70	10'
DETENTION POND 2	851.00	855.00	856.00	2 @ 23.0' - 24" @ 1.00%	856.00	855.77	10'

**WET DETENTION POND CROSS SECTION**  
**N.T.S.**

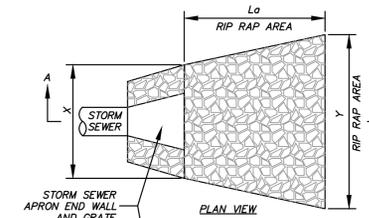


PROPOSED EMERGENCY SPILLWAY DIMENSIONS

	A	B	C	D	E	F	G
DETENTION POND 1	887.00	859.36	862.00	861.00	10'	34'	20'
DETENTION POND 2	856.00	858.64	860.00	859.00	10'	34'	20'

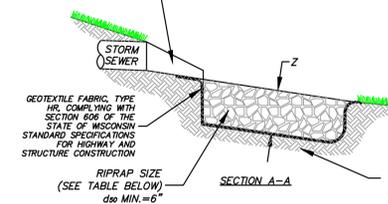


**PROPOSED EMERGENCY SPILLWAY**  
**N.T.S.**



DIMENSIONS

OUTLET	La	X	Y	GRADE	Z
POND 1	10'	3'	13'	MED.	1.5'
POND 2	10'	3'	13'	LRG.	2.0'



RIPRAP SHALL COMPLY WITH THE SECTION 606 OF THE STATE OF WISCONSIN STANDARD FOR HIGHWAY AND STRUCTURE CONSTRUCTION.

PLAN VIEW CONTOURS AND GRADES REPRESENT PROPOSED TOP OF FIELD STONE ELEVATIONS.

ALL STORM SEWER APRON END WALLS SHALL HAVE A GRATE TO SECURE THE OPEN END OF THE PIPE.

NOTE: IF RIPRAP PLACED OVER POND CLAY LINER, CONSTRUCT FULL DEPTH LINER BELOW RIPRAP

**RIPRAP**  
**N.T.S.**

**MORNING MEADOWS SUBDIVISION - PHASE 1**  
**VILLAGE OF JACKSON, WI**

**DETENTION POND DETAILS**

DESCRIPTION

DATE

16745 W. Bluemound Road  
Brookfield, WI 53005-5938  
(262) 781-1000  
rasmith.com



Brookfield, WI | Milwaukee, WI | Appleton, WI | Madison, WI | Cedarburg, WI  
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R.A. Smith, Inc.  
DATE: 07/02/2020  
SCALE: #####  
JOB NO. 3050195.01  
PROJECT MANAGER:  
CHRIS D. HITCH, P.E.  
DESIGNED BY: DJM  
CHECKED BY: CDH

**SHEET NUMBER**  
**C402**



CREATIVITY BEYOND ENGINEERING

# **Stormwater Management Plan for MORNING MEADOWS SUBDIVISION Village of Jackson, Wisconsin**

**Project No. 3050195.02**

**July 1, 2020**

Stormwater Management Plan for  
Morning Meadows Subdivision  
Village of Jackson, Wisconsin

Prepared by

raSmith  
16745 W. Bluemound Road  
Brookfield, WI 53005

Prepared for

Home Path Financial, LP  
Contact: Ed Woodland  
19435 W. Capital Drive  
Brookfield, Wisconsin 53045

July 1, 2020

## INTRODUCTION

This analysis was completed for Morning Meadows, a proposed single-family residential subdivision, located at the northeast corner of C.T.H. "P" and Sherman Road. It is further described as being a part of the southwest quarter and northwest quarter of the southwest quarter of Section 19, Township 10 North, Range 20 East in the Village of Jackson, Washington County, Wisconsin.

Stormwater management facilities for the proposed residential development site were designed according to the Village of Jackson Municipal Code – Chapter 35, the Wisconsin Administrative Code – Chapter NR 151 and latest Wisconsin Department of Natural Resources Technical Standards. The following is a summary of key performance standards:

- Reduce the post-development peak runoff rate to the pre-development peak runoff rate for the 1-year, 24-hour storm event.
- Reduce the post-development peak runoff rate for the 5-year, 24-hour storm event to the pre-development peak runoff rate for the 2-year, 24-hour storm event.
- Reduce the post-development peak runoff rate for the 100-year, 24-hour storm event to the pre-development peak runoff rate for the 5-year, 24-hour storm event.
- Reduce the post-development average annual suspended solids load by a minimum of 80% when compared to the same developed condition with no runoff management controls.
- Reduce the post-development average annual phosphorus load by a minimum of 60% when compared to the same developed condition with no runoff management controls.
- Infiltrate at least 75% of the average annual pre-development volume.

## METHOD OF ANALYSIS

Water quantity analysis included in this report was performed using HydroCAD Stormwater Modeling. Modeling parameters include drainage area, SCS runoff curve number, time of concentration, NOAA Atlas 14 precipitation and NRCS MSE3 distribution.

**Table 1 – Design Storm Events**

Frequency (years)	Duration (hours)	Rainfall Depth (inches)
1	24	2.35
2	24	2.66
5	24	3.26
100	24	6.41

Water quality analysis included in this report was performed using the Source Loading and Management Model (SLAMM).

## WATER QUANTITY DESIGN

The study area is 49.28 acres and the pre-development cover is cropland. The site is approximately 28% C soils and 72% D soils. A copy of the NRCS soil survey is included with this report.

Table 2 summarizes the peak discharge rates generated by the 1-year, 2-year, 5-year and 100-year storm events. See appendix for further design information.

**Table 2 – Pre-Development Peak Discharge Rates**

Watershed	Peak Discharge (cfs)			
	1-year	2-year	5-year	100-year
E1	8.27	10.62	15.48	43.59
E2	12.32	15.84	23.02	64.57
E3	19.06	24.01	34.07	90.85
E OFF 1	0.89	1.17	1.75	5.20
COMBINED	<b>39.30</b>	<b>50.06</b>	<b>72.10</b>	198.98

The post-development site will be a 89-lot, single-family subdivision which will increase peak runoff discharge rates due to the increased impervious area. For the purposes of assigning TR-55 curve numbers to the watershed, the lots were considered 1/4 acre.

The stormwater runoff for the post-development conditions was analyzed as six watersheds. P1 is tributary to wet detention Pond 1. P OFF 1 is tributary to wet detention Pond 1. P2 is tributary to wet detention Pond 2. P3 is tributary to wet detention Pond 3. UD1 is undetained and generally drains to the southeast. UD2 is undetained and generally drains to the east. UD3 is undetained and generally drains to the east.

Table 3 summarizes the peak discharge rates generated by the 1-year, 2-year, 5-year and 100-year storm events after detention. See appendix for further design information.

**Table 3 – Post-Development Peak Discharge Rate**

Watershed	Peak Discharge (cfs)			
	1-year	2-year	5-year	100-year
P1 (Pond 1)	1.04	1.44	2.30	5.15
P2 (Pond 2)	7.47	9.97	14.99	38.70
P3 (Pond 3)	1.29	1.74	2.58	4.91
UD1	0.98	1.27	1.86	5.33
UD2	0.62	0.79	1.15	3.20
UD3	4.82	6.03	8.45	22.04
COMBINED	<b>9.94</b>	13.31	<b>20.25</b>	<b>53.76</b>

Table 4 summarizes the maximum water surface elevations for the 1-year, 2-year, 10-year and 100-year storm events for the wet detention ponds. See appendix for further design information.

**Table 4 – Pond Maximum Water Surface Elevations**

	Maximum Water Surface Elevation			
	1-year	2-year	5-year	100-year
Pond 1	857.54	857.66	857.90	859.36
Pond 2	856.82	856.96	857.23	858.64
Pond 3	858.60	858.72	858.96	860.35

## WATER QUALITY DESIGN

Stormwater quality was evaluated using SLAMM. The results are shown in Table 5 and Table 6, with the applicable computer generated information located in the appendix.

**Table 5 – Post-Development Particulate Solids Load**

Area (ac)	Before (lbs)	After (lbs)	Removal (%)
49.285	8700	1472	83.08

**Table 6 – Post-Development Particulate Phosphorous Load**

Area (ac)	Before (lbs)	After (lbs)	Removal (%)
49.285	28.36	5.618	80.19

## INFILTRATION DESIGN

Infiltration was evaluated using SLAMM. The results are shown in Table 7 and Table 8, with the applicable computer generated information located in the appendix.

**Table 7 – Pre-Development Infiltration Volume**

Area (ac)	Total Rain (in)	Total Volume (ac-ft)	Runoff Volume (ac-ft)	Infiltration Volume (ac-ft)
47.51	29.96	118.6	8.3	110.3

\*Required = 75% Pre-Development Volume = 82.7 ac-ft

**Table 8 – Post-Development Infiltration Volume**

Area (ac)	Total Rain (in)	Total Volume (ac-ft)	Total Losses (in)	Infiltration Volume (ac-ft)
47.51	29.96	118.6	23.15	91.7

## **SUMMARY**

Stormwater management facilities for the proposed residential development site were designed according to the Village of Jackson Municipal Code – Chapter 35, the Wisconsin Administrative Code – Chapter NR 151 and latest Wisconsin Department of Natural Resources Technical Standards.

Peak discharge rates for the post-development site will not exceed maximum allowable. Total suspended solids load from the post-development site will not exceed maximum allowable. Total phosphorous load from the post-development site will not exceed maximum allowable. Infiltration volume from the post-development site will exceed 75% of the pre-development infiltration volume.

## **TABLE OF CONTENTS – APPENDICES**

### **Appendix A: Subsurface Information**

Geotechnical Exploration  
NRCS Soils Map

### **Appendix B: Water Quantity Calculations**

HydroCAD Modeling Data  
Pre-Development Exhibit  
Post-Development Exhibit

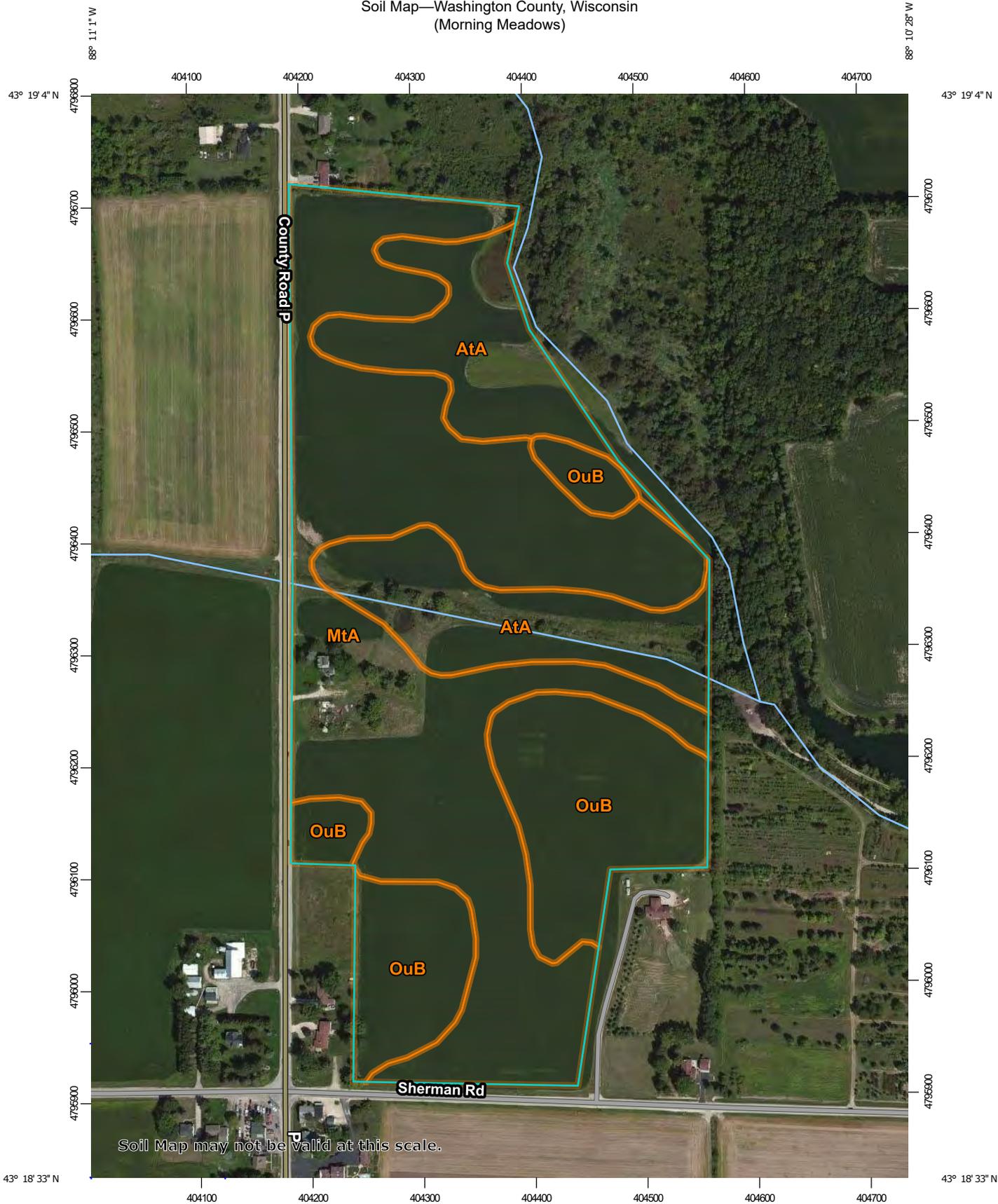
### **Appendix C: Water Quality Calculations**

SLAMM Modeling Data

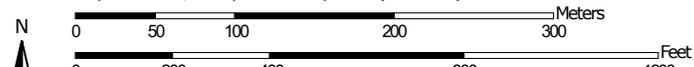
# **Appendix A**

**(Subsurface Information)**

Soil Map—Washington County, Wisconsin  
(Morning Meadows)



Map Scale: 1:4,720 if printed on A portrait (8.5" x 11") sheet.



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



Natural Resources  
Conservation Service

Web Soil Survey  
National Cooperative Soil Survey

6/28/2020  
Page 1 of 3

## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Washington County, Wisconsin

Survey Area Data: Version 19, Sep 14, 2019

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

Date(s) aerial images were photographed: Apr 29, 2011—Sep 6, 2011

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

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AtA	Ashkum silty clay loam, 0 to 2 percent slopes	12.6	22.3%
MtA	Mequon silt loam, 1 to 3 percent slopes	30.5	54.0%
OuB	Ozaukee silt loam, high carbonate substratum, 2 to 6 percent slopes	13.4	23.7%
<b>Totals for Area of Interest</b>		<b>56.5</b>	<b>100.0%</b>



Construction • Geotechnical  
Consulting Engineering/Testing

June 27, 2005  
CM05044

Mr. Bill Carity  
Morning Meadows LLC  
12720 W. North Avenue  
Brookfield, WI 53005

Re: Subsurface Exploration  
Morning Meadows  
CTH P and Sherman Road  
Jackson, Wisconsin

Dear Mr. Carity:

Construction • Geotechnical Consultants, Inc. (CGC) has completed an initial site evaluation for the proposed residential development at the above-noted site. The purpose of this exploration was to determine the nature of the subsurface conditions for various soil mappings on the site and, more specifically, to provide an indication as to the infiltration properties of the soils. One copy of this report is provided for your use. Two additional copies have been forwarded directly to Mr. Dan Mazurkiewicz of National Survey & Engineering.

### **PROJECT DESCRIPTION**

We understand that development plans are proceeding forward for an approximate 65 acre parcel in the Town of Jackson for a 48 lot residential subdivision. Specifically, the site is located in the Southwest  $\frac{1}{4}$  of Section 19, Township 10 North, Range 20 East in Washington County, Wisconsin. Included with the development will be the construction of five stormwater wet detention basins, along with the incorporation of infiltration devices (i.e., swales, etc.) should the site's subsoil conditions be suitable for such purposes. The northeastern corner of the project site is traversed by Cedar Creek.

### **EXPLORATION PROGRAM**

The subsurface conditions for the project were explored by excavating a series of seven exploratory test pits to depths of 10 to 13 ft below the existing ground surface. The test pits were excavated with a backhoe by C.W. Purpero (under subcontract to CGC) on June 10, 2005. The test pit locations and depths were selected by the design team after consultation with the developer. The approximate test pit locations are shown in plan on the Test Pit Location Map presented in Appendix A. The test pit locations were located in the field, utilizing various site/topographic features. Ground surface elevations were established by interpolating between the site contours presented on the Preliminary

Mr. Bill Carity  
Morning Meadows LLC  
June 27, 2005  
Page 2

Grading Plan prepared by National Survey & Engineering (dated April 13, 2005); and should be considered approximate.

Representative samples of the subsoils were collected during the field exploration for classification and laboratory testing. The soils were classified by a geotechnical engineer using the Unified Soil Classification System (UCSC) and in accordance with the descriptive procedures, terminology and interpretations presented by the USDA - NRCS Field Book for Describing and Sampling Soils (version 2.0, dated September 2002). The final logs and soil evaluation forms prepared by the engineer for the USCS and USDA procedures are presented in Appendices A and B, respectively. Laboratory test results are presented on the test pit logs attached in Appendix A.

## **SITE CONDITIONS**

### **A. Regional Geology**

The site being considered for development is generally described as consisting of level to slightly rolling agricultural land located northeast of the intersection of CTH P and Sherman Road in the Town of Jackson. The surface soils within the project limits are predominantly mapped in the *Soil Survey for Washington County* as Ashkum (AtA), Mequon (MtA) and Ozaukee (OuB), with inclusions of Brookston (BsA) and Mussey (MzKA) along the eastern fringes of the parcel, along Cedar Creek. Surficial soil deposits in the project area are generally described as silt loam and/or silty clay and clay loam soils. The one exception to the prevailing clayey subsoils is the occurrence of sand and gravel outwash and/or gravelly loam deposits associated with the Brookston and Mussey series. These granular soils reportedly occur below a depth of 17 to 28 in., respectively, per the *Soil Survey*. The Brookston and Mussey soil series generally lie outside the currently planned development limits of the site, however. Pertinent aspects of the prevailing site soil series are defined in the *Soil Survey* as follows:

- The Ashkum and Mequon series are described as being somewhat poorly drained soils formed in lowlands and/or nearby level areas, underlain by calcareous silty clay loam glacial till. The Ozaukee series are described as well drained upland soils formed in calcareous silty clay loam till.
- The depth to the seasonal high water table is typically 1 to 3 ft or less in the Ashkum and Mequon mappings, while greater than 5 ft in the Ozaukee series.
- All of the soil mappings exhibit severe to very severe limitations to on-site sewage disposal type of systems (i.e., seepage ponds, mound systems, etc.) due to a seasonally high water table and the characteristic slow permeability of the clayey subsoils.

Mr. Bill Carity  
Morning Meadows LLC  
June 27, 2005  
Page 3

The Brookston and Mussey inclusions found at the extreme northeast and east limits of the project site predominantly lie within the wetland preservation area of the site occurring along Cedar Creek.

### **B. Subsurface Conditions**

With few exceptions, the exploratory test pits reveal that subsoil conditions are in general agreement with the mappings provided in the *Soil Survey*. The site is mantled by 11 to 24 in. of black silty/clayey topsoil; 6 to 8 ft of brown, gray to gray brown lean clay and/or sandy clayey silt; followed typically by gray lean clay to the maximum depth explored. The clays are typically stiff to hard based on pocket penetrometer readings performed on intact specimens. Exceptions to the generalized soil profile presented were noted and include the following:

- Clayey soil layers encountered at depths of 2.5 ft and 3 ft in Test Pits 3 and 5, respectively, were classified as soft to medium stiff.
- Portions of the upper clayey stratum were interspersed with thin seams/layers of silt and clayey sandy silt. These interspersed soils were typically very moist to wet.
- At a depth of 7 ft in Test Pit 7, a 1.5 ft thick layer of brown fine to coarse sand was noted within the predominantly clayey soil profile. The granular soils were water-bearing and produced sloughing/cave-in of the excavation sidewalls.
- The upper clayey strata were typically mottled, indicating the occurrence of a fluctuating groundwater condition and/or seasonal saturation of the near surface soils.

### **C. Groundwater Conditions**

Groundwater seepage/inflows were encountered in five of the seven test pits during and/or upon completion of excavation. In Test Pits 4 through 6, groundwater seepage was recorded at depths of 8 to 9.8 ft, upon penetrating the underlying gray/gray brown colored clayey soils. Inflows were fairly slow due to the relatively low permeability of the clays. In Test Pits 1 and 7, higher groundwater inflows were noted at depths of 4 ft and 7 ft, respectively, upon advancing the excavation through the clayey profile which contained water-bearing granular seams/layers. Water levels can be expected to fluctuate across the site based on seasonal variations in precipitation, infiltration, etc., as evidenced by the mottled condition of the clayey soils within the soil profile at all test pit locations.

Mr. Bill Carity  
Morning Meadows LLC  
June 27, 2005  
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More detailed information regarding the subsurface and groundwater conditions is presented on the test pit logs contained in Appendix A. The completed soil evaluation report, with detailed soil profile descriptions prepared following USDA classification procedures, is presented in Appendix B.

### **SUMMARY OF FINDINGS**

We offer the following comments related to the potential of the on-site soils for the infiltration of stormwater based on the subsoil information provided by Test Pit Nos. 1 through 7 and our review of the *Soil Survey*:

- Seasonal high/fluctuating groundwater conditions and heavy-textured soils which appear to prevail throughout the project site limit the suitability of the site's soils for consideration for stormwater infiltration. Based on the silty clay loam and clay textures, we believe the on-site soils typically exhibit an infiltration rate of less than 0.6 in./hr.
- Granular soils, which are generally deemed more favorable for infiltration, were encountered as interspersed seams/layers "sandwiched" within the heavy-textured and frequently mottled clays. Furthermore, these granular seams were typically observed as being water-bearing.

In summary, based on the available subsoil information, it is our opinion, from a geotechnical engineering viewpoint, that the site's subsoils are not favorable for the incorporation of infiltration devices such as basins, swales, etc. Furthermore, it is our opinion that the site should be eligible for *exemption* under Chapter N151 Wis. Adm. code guidelines.

\* \* \* \* \*

It has been a pleasure to serve you on this phase of the project. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C. If you have any questions or need additional consultation, please contact us.

Sincerely,

**CGC, Inc.**



Jeff P. Simkowski, P.E.  
Senior Consulting Professional

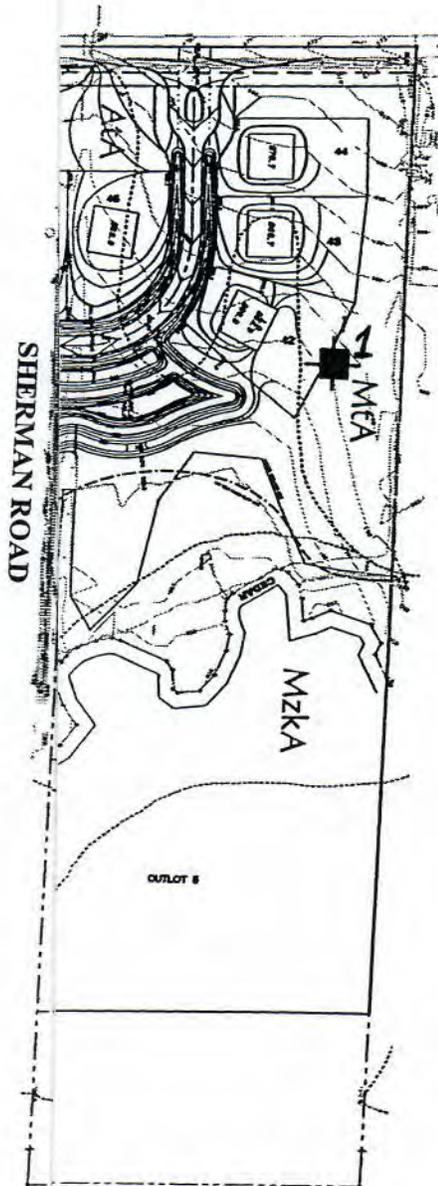
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Morning Meadows LLC  
June 27, 2005  
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Encl: Appendix A - Test Pit Location Map  
          Logs of Test Pits (7)  
          Log of Test Boring - General Notes  
          Unified Soil Classification System  
Appendix B - Soil Evaluation Report  
Appendix C - Document Qualifications

cc: Mr. Dan Mazurkiewicz, P.E. / National Survey & Engineering

**APPENDIX A**

**TEST PIT LOCATION MAP  
LOGS OF TEST PITS (7)  
LOG OF TEST BORING - GENERAL NOTES  
UNIFIED SOIL CLASSIFICATION SYSTEM**



Legend


 Denotes Approximate Test Pit Location and Number

USDA, SCS Soil Survey of Washington County.  
 contract to CGC, Inc.) on June 10, 2005.

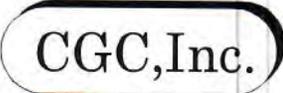
Scale: 1" = 250' (approximate)

**PIT LOCATION MAP**  
 Morning Meadows  
 Jackson, Wisconsin

Drawn: --

Approved: JPS

## LOG OF TEST PIT



Project **Morning Meadows**

Pit No. **1**

**CTH P and Sherman Road**

Surface Elevation **861.5'**

Location **Jackson, Wisconsin**

Job No. **CM05044**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE			VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Moist	Depth		qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M	13"	13" Black Silty TOPSOIL					
		4-5'	Stiff, Gray Brown Mottled Lean CLAY (CL)	(1.25-1.5)				4-5
2	M/W	5'	Stiff, Brown Sandy Lean CLAY; Some Fine to Coarse Gravel, Few Cobbles and Fine to Coarse Sand Seams (CL)	(1.5-1.75)				4-10
		10'	Very Stiff to Hard, Gray Lean CLAY; Little Fine to Coarse Sand and Gravel, Few Cobbles (CL)	(3.0-4.5)				
		15'	End of Excavation at 10 ft					

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

### WATER LEVEL OBSERVATIONS

While Excavating: 4' (steady seepage) Upon Completion of Excavating: \_\_\_\_\_

Time After Excavating: 5 min. 1.75 hrs \_\_\_\_\_

Depth to Water: \_\_\_\_\_ 6' \_\_\_\_\_

Depth to Cave In: 3'

### GENERAL NOTES

Date Excavated: 6/10/05

Logger JPS Editor JPS

Equipment Used: CAT 320C Tracked Backhoe

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

# LOG OF TEST PIT



Project **Morning Meadows**

Pit No. **2**

**CTH P and Sherman Road**

Surface Elevation **860.0'**

Location **Jackson, Wisconsin**

Job No. **CM05044**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE			VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Moist	Depth		qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M	11"	11" Black Silty TOPSOIL	(1.25-1.5)				4-7
		Stiff, Gray to Brown Highly Mottled Lean CLAY (CL)						
2	M	5	Very Stiff, Brown Sandy Lean CLAY; Little Fine to Coarse Gravel (CL)	(2.5-3.0)				5-6
3	M		Brown Clayey Sandy SILT; Little Fine Gravel, Scattered Cobbles and Boulders (ML)					
4	M		Very Stiff to Hard, Gray lean CLAY; Little to Some Fine Sand and Fine Gravel (CL)	(3.5-4.0)				
		10	End of Excavation at 10 ft					
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS	
While Excavating: <u>  NW  </u>	Upon Completion of Excavating: <u>  NW  </u>
Time After Excavating: <u>  1.5 hr  </u>	
Depth to Water: <u>  NW  </u>	
Depth to Cave In: <u>  --  </u>	

GENERAL NOTES	
Date Excavated: <u>  6/10/05  </u>	
Logger <u>  JPS  </u>	Editor <u>  JPS  </u>
Equipment Used: <u>  CAT 320C Tracked Backhoe  </u>	

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



# LOG OF TEST PIT

Project **Morning Meadows**  
**CTH P and Sherman Road**  
 Location **Jackson, Wisconsin**

Pit No. **3**  
 Surface Elevation **861.5'**  
 Job No. **CM05044**  
 Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE			VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Moist	Depth		qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M	15"	15" Black Silty TOPSOIL					
		14"	14" Very Stiff, Gray Mottled Lean CLAY (CL)	(2.5)				1-2
2	M/W	5'	Soft to Medium Stiff, Brown Sandy CLAY; Little Fine to Coarse Sand, Few Cobbles, Few Fine to Coarse Sand Pockets (CL)	(0.5-0.75)				6-8
		5'	Medium Stiff to Stiff, Brown Mottled Lean CLAY; Little Fine to Coarse Sand (CL)	(0.75-1.5)				4-5
3	M		Stiff, Brown Lean CLAY (CL)	(1.5)				
4	M	9'	Hard, Gray Brown Lean CLAY (CL)	(4.0-4.5)				
		9'	Boulder at 9 ft					
		10'	End of Excavation at 10 ft					
		15'						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS
While Excavating: <u>  NW  </u> Upon Completion of Excavating: <u>  NW  </u>
Time After Excavating: <u>  2 hrs  </u>
Depth to Water: <u>  NW  </u>
Depth to Cave In: <u>  5.5' Sidewall Cave In  </u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES
Date Excavated: <u>  6/10/05  </u>
Logger <u>  JPS  </u> Editor <u>  JPS  </u>
Equipment Used: <u>  CAT 320C Tracked Backhoe  </u>

# LOG OF TEST PIT



Project **Morning Meadows**  
**CTH P and Sherman Road**  
 Location **Jackson, Wisconsin**

Pit No. **4**  
 Surface Elevation **860.0'**  
 Job No. **CM05044**  
 Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE			VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Moist	Depth		qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		15" Dark Brown Clayey TOPSOIL	(4.5)				1-2
			6" Light Brown Mottled Silty CLAY; Some Fine Sand (CL-ML)					
2	M		Hard, Brown Mottled Lean CLAY (CL) (Some Carbonate Staining)					
			Yellow Brown to Gray Mottled Sandy SILT; Some Clay, Few Cobbles and Boulders (ML)					
3	MW	5	Very Stiff, Brown Lean CLAY; Little Fine Sand (CL)	(2.75)				5-7
			Color change to gray at 9 ft					
4	M		End of Excavation at 10 ft	(2.5)				

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

### WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW  
 Time After Excavating: 1 hr  
 Depth to Water: 9.7'  
 Depth to Cave In: 9.5'

### GENERAL NOTES

Date Excavated: 6/10/05  
 Logger JPS Editor JPS  
 Equipment Used: CAT 320C Tracked Backhoe

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



# LOG OF TEST PIT

Project **Morning Meadows**  
**CTH P and Sherman Road**  
 Location **Jackson, Wisconsin**

Pit No. **5**  
 Surface Elevation **858.5'**  
 Job No. **CM05044**  
 Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE			VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Moist	Depth		qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M	0 - 10"	24" Dark Brown Clayey TOPSOIL					
2	W M	10" - 15"	10" Mixture of Brown to Gray Brown Fine to Coarse Clayey SAND/Mottled Silty CLAY (CL) (Blocky Structure) Soft to Medium Stiff, Brown to Gray Mottled Lean CLAY (CL)	(0.5-0.75) (1.5-1.75)				7-8
3	M	15" - 20"	Stiff to Very Stiff, Brown Slightly Mottled Lean CLAY; Little Fine to Coarse Sand and Fine Gravel, Scattered Cobbles and Boulders (CL)	(2.0-2.25)				3-4
4	M	20" - 10'	Very Stiff to Hard, Gray Lean CLAY (CL)	(3.5-3.75) (4.0-4.5)				
			End of Excavation at 10 ft					

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

### WATER LEVEL OBSERVATIONS

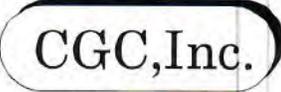
While Excavating: 8.5' (seepage) Upon Completion of Excavating: 10'  
 Time After Excavating: 1 hr  
 Depth to Water: 9'  
 Depth to Cave In: --

### GENERAL NOTES

Date Excavated: 6/10/05  
 Logger JPS Editor JPS  
 Equipment Used: CAT 320C Tracked Backhoe

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

# LOG OF TEST PIT



Project **Morning Meadows**

Pit No. **6**

**CTH P and Sherman Road**

Surface Elevation **865.0'**

Location **Jackson, Wisconsin**

Job No. **CM05044**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE			VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Moist	Depth		qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M	0	11" Dark Brown Clayey TOPSOIL					
		1	Stiff to Very Stiff, Brown Mottled Lean CLAY (CL)	(2.0-2.75)				4-5
2	M	2						
	M/W	5	Very Stiff, Yellow Brown Mottled Sandy Clayey SILT; Little to Some Fine to Coarse Gravel, Few Cobbles (CL-ML)	(2.5-3.0)				6
3		6						
		7	Stiff to Very Stiff, Brown to Gray Mottled Lean CLAY; Some Fine to Medium Sand, Little Fine to Coarse Gravel, Few Cobbles (CL)	(1.75-2.25)				
	M	10	Stiff to Very Stiff, Gray Brown Lean CLAY; Little Fine to Coarse Gravel, Few Cobbles (CL)	(2.0-2.5)				
		15	End of Excavation at 10 ft					

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Excavating: 8' (slight sidewall seepage) Upon Completion of Excavating: NW

Date Excavated: 6/10/05

Time After Excavating: 45 min.

Logger JPS Editor JPS

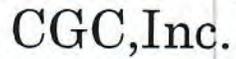
Depth to Water: 9.8'

Equipment Used: CAT 320C Tracked Backhoe

Depth to Cave In: \_\_\_\_\_

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

# LOG OF TEST PIT



Project **Morning Meadows**

Pit No. **7**

Surface Elevation **861.5'**

**CTH P and Sherman Road**

Job No. **CM05044**

Location **Jackson, Wisconsin**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE			VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Moist	Depth		qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M	13"	13" Dark Brown Clayey TOPSOIL					
		5	Stiff to Very Stiff, Gray to Brown Mottled Lean CLAY (CL)	(2.25)				2-3
2	M/W	5	Gray and Brown Mottled SILT; Some Fine Sand (ML)	(1.25-1.5)				6-8
		7	Brown Fine to Coarse SAND; Little Fine to Coarse Gravel and Silt, Few Cobbles (SP-SM/GP-GM) Sidewall cave in at 7 ft / seepage at 7 ft					
4	M	10	Very Stiff to Hard, Gray Lean CLAY; Few Cobbles (CL)	(3.0)				6-8
		15	End of Excavation at 13 ft	(3.5-4.0)				

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

### WATER LEVEL OBSERVATIONS

While Excavating: 7'      Upon Completion of Excavating: 7'

Time After Excavating: \_\_\_\_\_

Depth to Water: \_\_\_\_\_

Depth to Cave In: \_\_\_\_\_

### GENERAL NOTES

Date Excavated: 6/10/05

Logger JPS      Editor JPS

Equipment Used: CAT 320C Tracked Backhoe

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

**LOG OF TEST BORING**  
*General Notes*

**Descriptive Soil Classification**

GRAIN SIZE TERMINOLOGY

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse	3/4" to 3"	3/4" to 3"
Fine	4.76 mm to 3/4"	#4 to 3/4"
Sand: Coarse	2.00 mm to 4.76 mm	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm	#200 to #40
Silt	0.005 mm to 0.074 mm	Smaller than #200
Clay	Smaller than 0.005 mm	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

GENERAL TERMINOLOGY

Physical Characteristics  
Color, moisture, grain shape, fineness, etc.,  
Major Constituents  
Clay, silt, sand, gravel  
Structure  
Laminated, varved, fibrous, stratified,  
cemented, fissured, etc.  
Geologic Origin  
Glacial, alluvial, eolian, residual, etc.

RELATIVE DENSITY

Term	"N" Value
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

RELATIVE PROPORTIONS OF  
OF COHESIONLESS SOILS

Proportional Term	Defining Range by Percentage of Weight
Trace	0%-5%
Little	5%-12%
Some	12%-35%
And	35%-50%

ORGANIC CONTENT BY  
COMBUSTION METHOD

Soil Description	Loss on Ignition
Non Organic	Less than 4%
Organic Silt/Clay	4-12%
Sedimentary Peat	12-50%
Fibrous and Woody Peat	More than 50%

CONSISTENCY

Term	q <sub>v</sub> -tons/sq. ft.
Very Soft	0.0 to 0.25
Soft	.025 to 0.50
Medium	0.50 to 1.0
Stiff	1.0 to 2.0
Very Stiff	2.0 to 4.0
Hard	Over 4.0

PLASTICITY

Term	Plastic Index
None to Slight	0-4
Slight	5-7
Medium	8-22
High to Very High	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

**SYMBOLS**

DRILLING AND SAMPLING

- CS--Continuous Sampling
- RC--Rock Coring: Size AW, BW, NW, 2"W
- RQD--Rock Quality Designator
- RB--Rock Bit
- FT--Fish Tail
- DC--Drove Casing
- C--Casing: Size 2 1/2", NW, 4", HW
- CW--Clear Water
- DM--Drilling Mud
- HSA--Hollow Stem Auger
- FA--Flight Auger
- HA--Hand Auger
- COA--Clean-Out Auger
- SS--2" Diameter Split-Barrel Sample
- 2ST--2" Diameter Thin-Walled Tube Sample
- 3ST--3" Diameter Thin-Walled Tube Sample
- PT--3" Diameter Piston Tube Sample
- AS--Auger Sample
- WS--Wash Sample
- PTS--Peat Sample
- PS--Pitcher Sample
- NR--No Recovery
- S--Sounding
- PMT--Borehole Pressuremeter Test
- VS--Vane Shear Test
- WPT--Water Pressure Test

LABORATORY TESTS

- q<sub>a</sub>--Penetrometer Reading, tons/sq. ft.
- q<sub>u</sub>--Unconfined Strength, tons/sq. ft.
- W--Moisture Content, %
- LL--Liquid Limit, %
- PL--Plastic Limit, %
- SL--Shrinkage Limit, %
- LI--Loss on Ignition, %
- D--Dry Unit Weight, lbs/cu. ft.
- pH--Measure of Soil Alkalinity or Acidity
- FS--Free Swell, %

WATER LEVEL MEASUREMENT

- ∇ --Water Level at time shown
- NW--No Water Encountered
- WD--While Drilling
- BCR--Before Casing Removal
- ACR--After Casing Removal
- CW--Caved and Wet
- CM--Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

# UNIFIED SOIL CLASSIFICATION SYSTEM

## COARSE-GRAINED SOILS

(More than half of material is larger than No. 200 sieve size.)

**GRAVELS**  
More than half of coarse fraction larger than No. 4 sieve size

Clean Gravels (Little or no fines)

**GW** Well-graded gravels, gravel-sand mixtures, little or no fines

**GP** Poorly graded gravels, gravel-sand mixtures, little or no fines

Gravels with Fines (Appreciable amount of fines)

**GM<sub>u</sub><sup>d</sup>** Silty gravels, gravel-sand-silt mixtures

**GC** Clayey gravels, gravel-sand-clay mixtures

**SANDS**  
More than half of coarse fraction smaller than No. 4 sieve size

Clean Sands (Little or no fines)

**SW** Well-graded sands, gravelly sands, little or no fines

**SP** Poorly graded sands, gravelly sands, little or no fines

Sands with Fines (Appreciable amount of fines)

**SM<sub>u</sub><sup>d</sup>** Silty sands, sand-silt mixtures

**SC** Clayey sands, sand-clay mixtures

## FINE-GRAINED SOILS

(More than half of material is smaller than No. 200 sieve.)

**SILTS AND CLAYS**  
Liquid limit less than 50%

**ML** Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity

**CL** Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays

**OL** Organic silts and organic silty clays of low plasticity

**SILTS AND CLAYS**  
Liquid limit greater than 50%

**MH** Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts

**CH** Inorganic clays of high plasticity, fat clays

**OH** Organic clays of medium to high plasticity, organic silts

**HIGHLY ORGANIC SOILS**

**PT** Peat and other highly organic soils

## LABORATORY CLASSIFICATION CRITERIA

**GW**  $C_u = \frac{D_{60}}{D_{10}}$  greater than 4;  $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$  between 1 and 3

**GP** Not meeting all gradation requirements for GW

**GM** Atterberg limits below "A" line or P.I. less than 4

Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols

**GC** Atterberg limits above "A" line with P.I. greater than 7

**SW**  $C_u = \frac{D_{60}}{D_{10}}$  greater than 6;  $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$  between 1 and 3

**SP** Not meeting all gradation requirements for SW

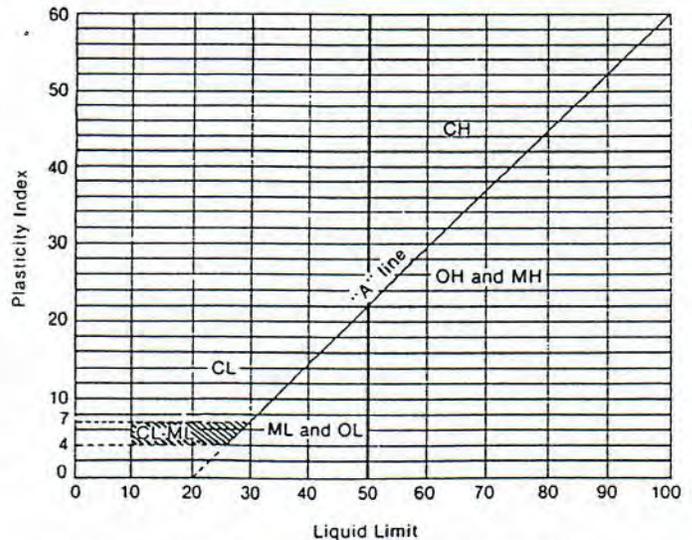
**SM** Atterberg limits below "A" line or P.I. less than 4

Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.

**SC** Atterberg limits above "A" line with P.I. greater than 7

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:  
 Less than 5 per cent ..... GW, GP, SW, SP  
 More than 12 per cent ..... GM, GC, SM, SC  
 5 to 12 per cent ..... Borderline cases requiring dual symbols

## PLASTICITY CHART



For classification of fine-grained soils and fine fraction of coarse-grained soils.

Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols.

Equation of A-line:  $PI = 0.73 (LL - 20)$

**APPENDIX B**

**SOIL EVALUATION REPORT**

# SOIL EVALUATION REPORT

in accordance with Comm 85, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and location and distance to nearest road.

**Please print all information.**

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

County	WASHINGTON
Parcel I.D.	
Reviewed by	Date

Property Owner MORNING MEADOWS LLC	Property Location Govt. Lot 1/4 SW 1/4 S 19 T 10 N R 20 E (or) W <input checked="" type="checkbox"/> <input type="checkbox"/>
Property Owner's Mailing Address 12720 W. NORTH AVENUE	Lot # Block # Subd. Name or CSM# MORNING MEADOWS
City State Zip Code Phone Number BROOKFIELD WI 53005 (262) 785-1969	<input type="checkbox"/> City <input type="checkbox"/> Village <input checked="" type="checkbox"/> Town Nearest Road JACKSON CTH P & SHAWAN RD.

New Construction Use:  Residential / Number of Lots 48 Code derived design flow rate \_\_\_\_\_ GPD  
 Replacement  Public or commercial - Describe: \_\_\_\_\_  
 Parent material GLACIAL TILL Flood Plain elevation if applicable \_\_\_\_\_ ft.  
 General comments and recommendations:

1 Boring #  Boring  Pit Ground surface elev. 861.5 ft. Depth to limiting factor 13 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ft <sup>2</sup>	
									*Eff#1	*Eff#2
A	0-13	10YR 2/1	NONE	SICL	2, F, CDY	m(vfr)	CS	NONE		
B	13-42	10YR 4/3	C, 1, P, 10YR 5/1	CL	2, VF, MA	m(fi)	AS	NONE		
C	42-96	10YR 5/3	NONE	SCL	2, M, SBK	m(fi)	AS	NONE		
D	96-120	10YR 5/2	NONE	CL	2, VF, MA	m(vfi)	-	NONE		

2 Boring #  Boring  Pit Ground surface elev. 860.0 ft. Depth to limiting factor 11 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ft <sup>2</sup>	
									*Eff#1	*Eff#2
A	0-11	10YR 2/1	NONE	SICL	2, F, CDY	m(vfr)	CS	NONE		
B	11-42	10YR 5/3	C, 1, P, 10YR 5/1	CL	2, VF, SBK	m(fi)	AS	NONE		
C	42-72	10YR 5/3	NONE	SCL	2, F, SBK	m(vfi)	AS	NONE		
D	72-96	2.5Y 5/3	NONE	SIL	1, F, SGR	m(vfr)	AS	NONE		
E	96-120	10YR 5/2	NONE	CL	2, VF, MA	m(vfi-efi)	-	NONE		

\* Effluent #1 = BOD<sub>5</sub> > 30 ≤ 220 mg/L and TSS > 30 ≤ 150 mg/L

\* Effluent #2 = BOD<sub>5</sub> ≤ 30 mg/L and TSS ≤ 30 mg/L

CST Name (Please Print) JEFF P. SIMKOWSKI	Signature <i>Jeff P. Simkowski</i>	CST Number
Address CFC, INC. 336 S. CURTIS ROAD, WEST ALLIS, WI 53214	Date Evaluation Conducted 6/10/05	Telephone Number (414) 443-2000

**3** Boring #  Boring  Pit Ground surface elev. 841.5 ft. Depth to limiting factor 15 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ff	
									*Eff#1	*Eff#2
A	0-15	10YR 2/1	NONE	SI CL	2, F, COY	m(vfr)	GS	NONE		
B	15-29	2.5Y 5/1	C, 1 D, 10YR 6/3	CL	2, F, SBK	m(vfi)	DI	"		
C	29-48	10YR 5/3	NONE	SC	2, F, SBK	m(fr)	CS	"		
D	48-72	10YR 5/4	C, 1, P, 10YR 5/6	CL	2, VF, MA	m(fr-fi)	CS	"		
E	72-96	10YR 5/3	NONE	CL	2, VF, MA	m(fi)	GS	"		
F	96-120	10YR 4/3	NONE	CL	2, VF, MA	m(e fi)	-	"		

**4** Boring #  Boring  Pit Ground surface elev. 860.0 ft. Depth to limiting factor 15 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ff	
									*Eff#1	*Eff#2
A	0-15	7.5YR 2.5/1	NONE	SI CL	2, F, COY	m(vfr)	GS	NONE		
B	15-21	10YR 5/6	M, 2, P, 10YR 4/1	SIC	2, F, SBK	m(fr)	DI	"		
C	21-48	7.5YR 5/4	M, 2, P, 10YR 7/1	CL	2, F, PL	m(e fi)	CS	"		
D	48-78	10YR 6/6	M, 2, P, 10YR 5/4	SIL	1, F, SGR	m(fr)	CS	"		
E	78-120	10YR 5/4	NONE	CL	2, VA, MA	m(vfi)	-	"		

**5** Boring #  Boring  Pit Ground surface elev. 858.5 ft. Depth to limiting factor 24 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ff	
									*Eff#1	*Eff#2
A	0-24	7.5YR 2.5/1	NONE	SI CL	2, F, COY	m(vfr)	CS	NONE		
B	24-34	10YR 6/4	C, 1, P, 10YR 6/1	SCL/SCL	1, F-M, SBK	m(vfr)	DI	"		
C	34-48	10YR 6/4	C, 1, P, 10YR 6/2	CL	2, F, SBK	m(vfr)	CS	"		
D	48-96	10YR 5/4	C, 1, P, 10YR 5/6	CL	2, VF, SBK	m(fi-vfi)	CS	"		
E	96-120	10YR 5/2	NONE	CL	2, VF, MA	m(e fi)	-	"		

\* Effluent #1 = BOD<sub>5</sub> > 30 ≤ 220 mg/L and TSS > 30 ≤ 150 mg/L

\* Effluent #2 = BOD<sub>5</sub> ≤ 30 mg/L and TSS ≤ 30 mg/L

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**6** Boring #  Boring  Pit  
 Ground surface elev. 865.0 ft. Depth to limiting factor 11 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ff	
									*Eff#1	*Eff#2
A	0-11	7.5YR 2.5/1	NONE	SI CL	2, F, CDY	m(vfr)	CS	NONE		
B	11-48	10YR 6/3	C, 1, P, 10YR 5/6	CL	2, VF, MA	m(vfi)	CS	"		
C	48-66	10YR 6/4	C, 2, P, 10YR 6/L	SI L	2, H, SBK	m(vfi)	GI	"		
D	66-102	10YR 5/3	C, 1, P, 10YR 6/1	CL	2, F, SBK	m(fi-vfi)	CS	"		
E	102-120	10YR 5/2	NONE	CL	2, VF, MA	m(vfi)	-	"		

**7** Boring #  Boring  Pit  
 Ground surface elev. 861.5 ft. Depth to limiting factor 13 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ff	
									*Eff#1	*Eff#2
A	0-13	7.5YR 2.5/1	NONE	SI CL	2, F, CDY	m(vfr)	CS	NONE		
B	13-62	2.5Y 6/2	F, 3, D, 10YR 5/L	CL	2, VF, MA	m(fi-vfi)	CS	"		
C	66-84	10YR 5/6	C, 1, F, 10YR 6/3	SI	1, F, SGR	m(vfr)	GW	"		
D	84-102	10YR 5/L	NONE	LC OS	0, F-co, GR	m(lo)	CS	"		
E	102-156	10YR 5/3	NONE	CL	2, VF, MA	m(vfi-efi)	-	"		

Boring #  Boring  Pit  
 Ground surface elev. \_\_\_\_\_ ft. Depth to limiting factor \_\_\_\_\_ in.

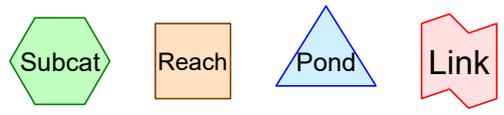
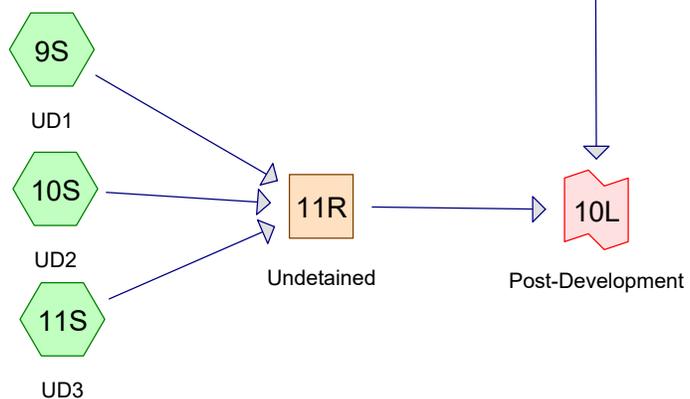
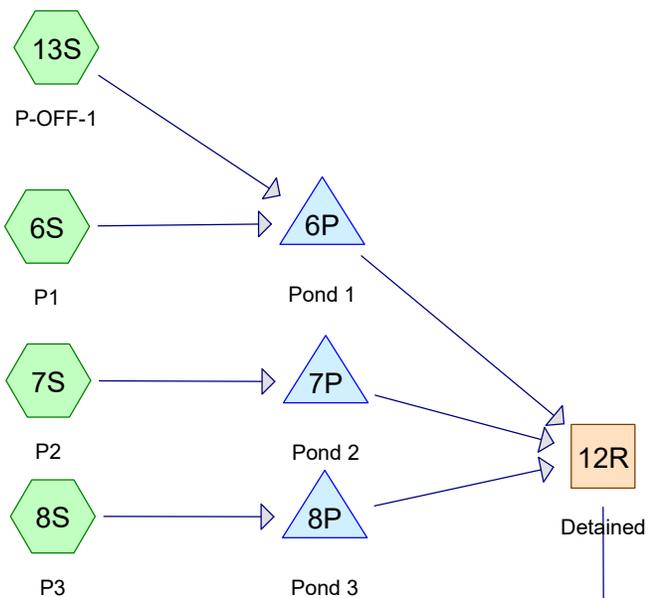
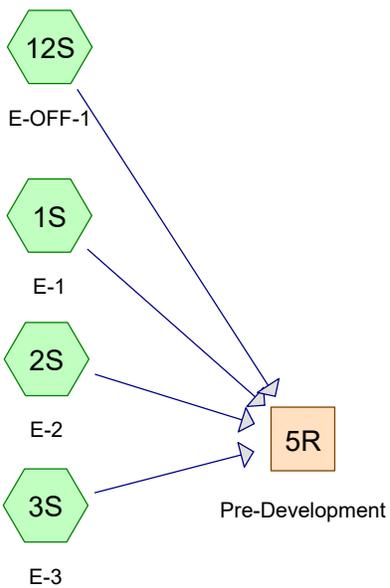
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ff	
									*Eff#1	*Eff#2

\* Effluent #1 = BOD<sub>5</sub> > 30 ≤ 220 mg/L and TSS >30 ≤ 150 mg/L      \* Effluent #2 = BOD<sub>5</sub> ≤ 30 mg/L and TSS ≤ 30 mg/L

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# **Appendix B**

**(Water Quantity Calculations)**



**Routing Diagram for Morning Meadows 2020-05-30**  
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# Morning Meadows 2020-05-30

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## Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.540	79	1 acre lots, 20% imp, HSG C (12S, 13S)
4.060	83	C, 1/4 Ac Lots (6S)
4.770	83	C, 1/4-Ac Lots (7S, 8S)
13.260	78	C, Cropland (1S, 2S, 3S)
1.520	74	C, Open Space (6S, 8S, 9S)
1.900	61	C, Open Space (7S)
2.190	87	D, 1/4 Ac Lots (6S)
20.530	87	D, 1/4-Ac Lots (7S, 8S, 11S)
34.250	83	D, Cropland (1S, 2S, 3S)
8.140	80	D, Open Space (6S, 7S, 8S, 9S, 10S, 11S)
4.380	98	Pond (6S, 7S, 8S)
0.030	74	c, Open Space (10S)
<b>98.570</b>	<b>83</b>	<b>TOTAL AREA</b>

# Morning Meadows 2020-05-30

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## Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
3.540	HSG C	12S, 13S
0.000	HSG D	
95.030	Other	1S, 2S, 3S, 6S, 7S, 8S, 9S, 10S, 11S
<b>98.570</b>		<b>TOTAL AREA</b>

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## Ground Covers (selected 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	3.540	0.000	0.000	3.540	1 acre lots, 20% imp	12S, 13S
0.000	0.000	0.000	0.000	4.060	4.060	C, 1/4 Ac Lots	6S
0.000	0.000	0.000	0.000	4.770	4.770	C, 1/4-Ac Lots	7S, 8S
0.000	0.000	0.000	0.000	13.260	13.260	C, Cropland	1S, 2S, 3S
0.000	0.000	0.000	0.000	3.420	3.420	C, Open Space	6S, 7S, 8S, 9S
0.000	0.000	0.000	0.000	2.190	2.190	D, 1/4 Ac Lots	6S
0.000	0.000	0.000	0.000	20.530	20.530	D, 1/4-Ac Lots	7S, 8S, 11S
0.000	0.000	0.000	0.000	34.250	34.250	D, Cropland	1S, 2S, 3S
0.000	0.000	0.000	0.000	8.140	8.140	D, Open Space	6S, 7S, 8S, 9S, 10S, 11S
0.000	0.000	0.000	0.000	4.380	4.380	Pond	6S, 7S, 8S
0.000	0.000	0.000	0.000	0.030	0.030	c, Open Space	10S
<b>0.000</b>	<b>0.000</b>	<b>3.540</b>	<b>0.000</b>	<b>95.030</b>	<b>98.570</b>	<b>TOTAL AREA</b>	

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## Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	6S	0.00	0.00	44.0	0.0100	0.011	18.0	0.0	0.0
2	7S	0.00	0.00	111.0	0.0140	0.011	18.0	0.0	0.0
3	7S	0.00	0.00	44.0	0.0100	0.011	18.0	0.0	0.0
4	7S	0.00	0.00	43.0	0.0100	0.011	18.0	0.0	0.0
5	13S	0.00	0.00	44.0	0.0100	0.011	18.0	0.0	0.0
6	6P	857.00	856.70	30.0	0.0100	0.011	12.0	0.0	0.0
7	7P	856.00	855.40	60.0	0.0100	0.011	24.0	0.0	0.0
8	7P	856.00	855.40	60.0	0.0100	0.011	24.0	0.0	0.0
9	8P	858.00	856.80	120.0	0.0100	0.011	12.0	0.0	0.0

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

<b>Subcatchment1S: E-1</b>	Runoff Area=12.040 ac 0.00% Impervious Runoff Depth>0.79" Flow Length=1,174' Tc=32.5 min CN=81 Runoff=8.27 cfs 0.789 af
<b>Subcatchment2S: E-2</b>	Runoff Area=15.300 ac 0.00% Impervious Runoff Depth>0.79" Flow Length=937' Tc=24.6 min CN=81 Runoff=12.32 cfs 1.006 af
<b>Subcatchment3S: E-3</b>	Runoff Area=20.170 ac 0.00% Impervious Runoff Depth>0.89" Flow Length=799' Tc=23.8 min CN=83 Runoff=19.06 cfs 1.500 af
<b>Subcatchment6S: P1</b>	Runoff Area=10.080 ac 10.22% Impervious Runoff Depth>0.94" Flow Length=992' Tc=53.8 min CN=84 Runoff=6.16 cfs 0.788 af
<b>Subcatchment7S: P2</b>	Runoff Area=16.080 ac 10.57% Impervious Runoff Depth>0.94" Flow Length=834' Tc=39.2 min CN=84 Runoff=12.06 cfs 1.264 af
<b>Subcatchment8S: P3</b>	Runoff Area=15.540 ac 10.62% Impervious Runoff Depth>1.12" Flow Length=719' Tc=40.9 min CN=87 Runoff=13.68 cfs 1.455 af
<b>Subcatchment9S: UD1</b>	Runoff Area=0.750 ac 0.00% Impervious Runoff Depth>0.70" Tc=6.0 min CN=79 Runoff=0.98 cfs 0.044 af
<b>Subcatchment10S: UD2</b>	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth>0.74" Tc=6.0 min CN=80 Runoff=0.62 cfs 0.027 af
<b>Subcatchment11S: UD3</b>	Runoff Area=4.630 ac 0.00% Impervious Runoff Depth>0.95" Flow Length=413' Tc=22.2 min CN=84 Runoff=4.82 cfs 0.366 af
<b>Subcatchment12S: E-OFF-1</b>	Runoff Area=1.770 ac 20.00% Impervious Runoff Depth>0.69" Flow Length=1,171' Tc=42.3 min CN=79 Runoff=0.89 cfs 0.102 af
<b>Subcatchment13S: P-OFF-1</b>	Runoff Area=1.770 ac 20.00% Impervious Runoff Depth>0.69" Flow Length=916' Tc=42.5 min CN=79 Runoff=0.89 cfs 0.102 af
<b>Reach 5R: Pre-Development</b>	Inflow=39.30 cfs 3.397 af Outflow=39.30 cfs 3.397 af
<b>Reach 11R: Undetained</b>	Inflow=5.36 cfs 0.437 af Outflow=5.36 cfs 0.437 af
<b>Reach 12R: Detained</b>	Inflow=8.67 cfs 2.331 af Outflow=8.67 cfs 2.331 af
<b>Pond 6P: Pond 1</b>	Peak Elev=857.54' Storage=0.574 af Inflow=7.00 cfs 0.890 af 12.0" Round Culvert n=0.011 L=30.0' S=0.0100 1/1' Outflow=1.04 cfs 0.489 af
<b>Pond 7P: Pond 2</b>	Peak Elev=856.82' Storage=0.395 af Inflow=12.06 cfs 1.264 af Outflow=7.47 cfs 1.180 af

**Morning Meadows 2020-05-30**

*MSE 24-hr 3 1-Year Rainfall=2.35"*

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**Pond 8P: Pond 3**

Peak Elev=858.60' Storage=1.018 af Inflow=13.68 cfs 1.455 af  
12.0" Round Culvert n=0.011 L=120.0' S=0.0100 '/' Outflow=1.29 cfs 0.661 af

**Link 10L: Post-Development**

Inflow=9.94 cfs 2.768 af  
Primary=9.94 cfs 2.768 af

**Total Runoff Area = 98.570 ac Runoff Volume = 7.442 af Average Runoff Depth = 0.91"**  
**94.84% Pervious = 93.482 ac 5.16% Impervious = 5.088 ac**

**Summary for Subcatchment 1S: E-1**

Runoff = 8.27 cfs @ 12.49 hrs, Volume= 0.789 af, Depth> 0.79"

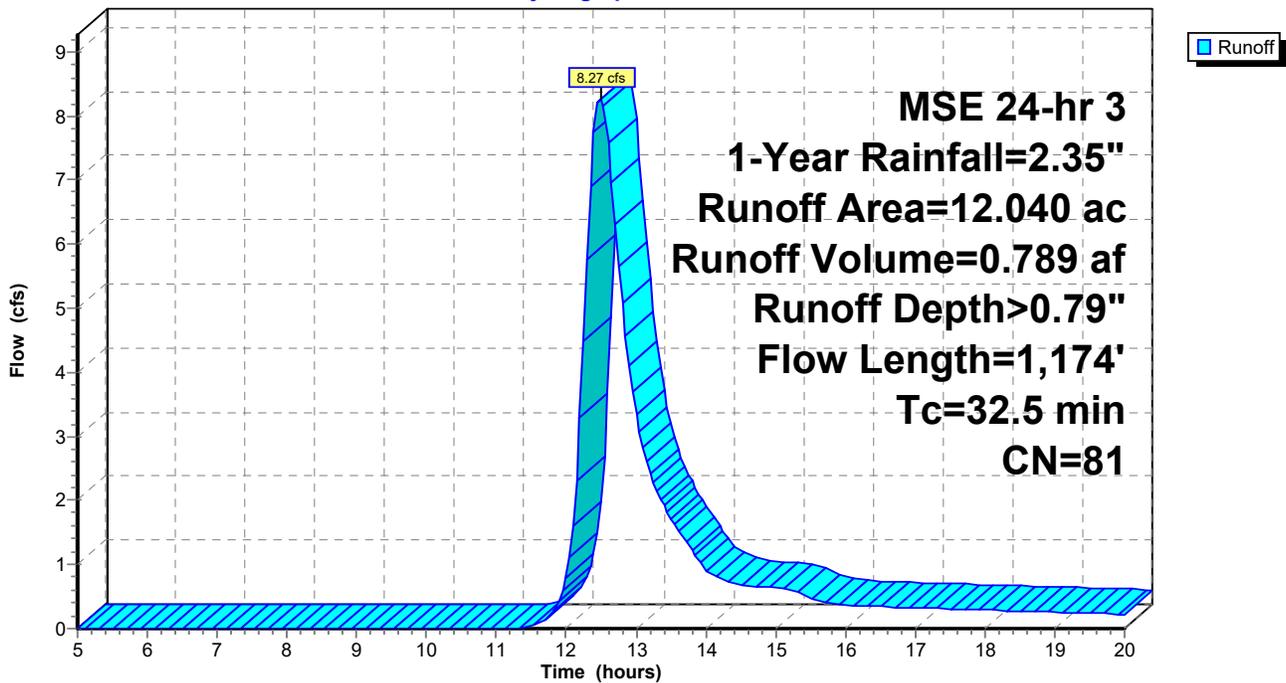
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 5.650	78	C, Cropland
* 6.390	83	D, Cropland
12.040	81	Weighted Average
12.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	275	0.0176	0.38		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.3	266	0.0131	1.03		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		<b>Shallow Concentrated Flow, C-D</b> Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		<b>Shallow Concentrated Flow, D-E</b> Cultivated Straight Rows Kv= 9.0 fps
32.5	1,174	Total			

**Subcatchment 1S: E-1**

Hydrograph



**Summary for Subcatchment 2S: E-2**

Runoff = 12.32 cfs @ 12.38 hrs, Volume= 1.006 af, Depth> 0.79"

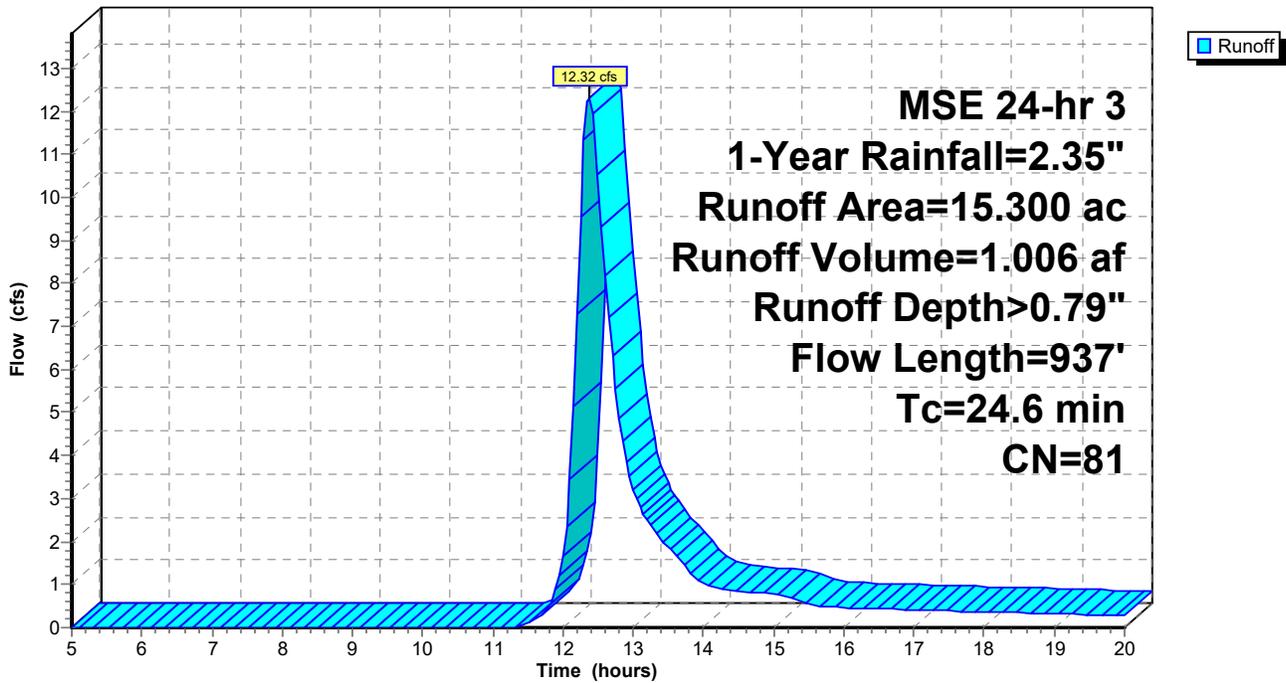
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 6.650	78	C, Cropland
* 8.650	83	D, Cropland
15.300	81	Weighted Average
15.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	275	0.0119	0.32		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
10.3	662	0.0142	1.07		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
24.6	937	Total			

**Subcatchment 2S: E-2**

Hydrograph



**Summary for Subcatchment 3S: E-3**

Runoff = 19.06 cfs @ 12.36 hrs, Volume= 1.500 af, Depth> 0.89"

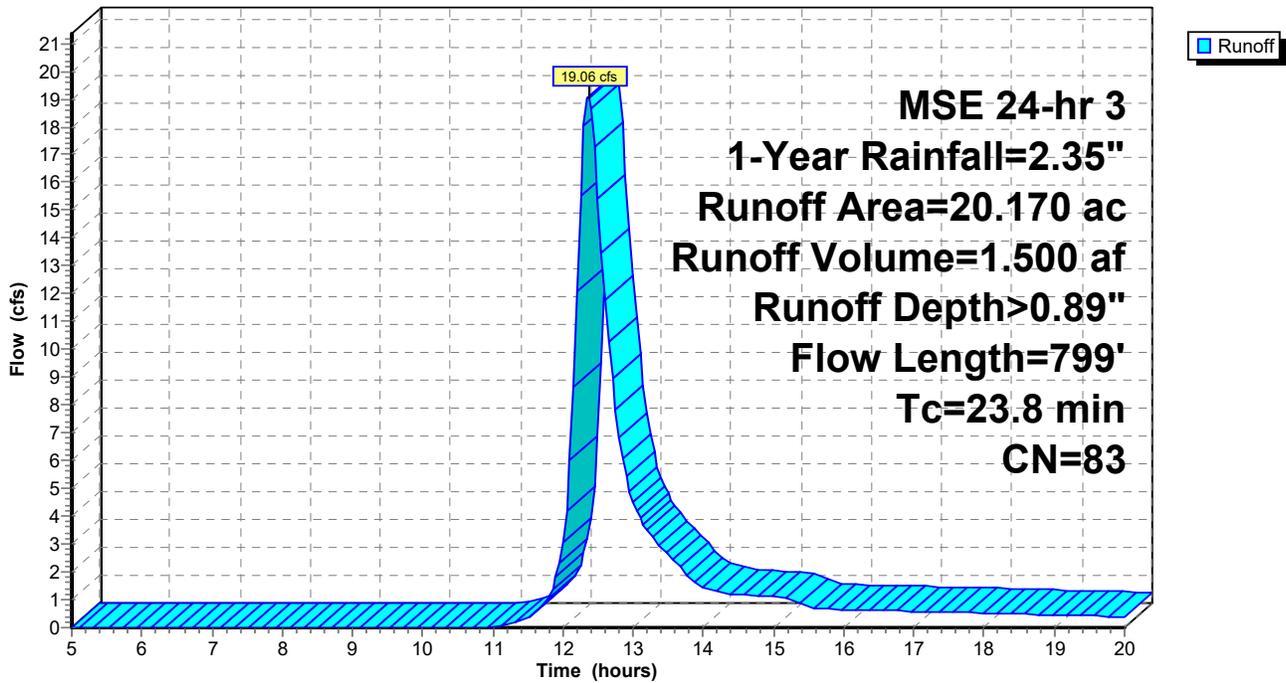
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 0.960	78	C, Cropland
* 19.210	83	D, Cropland
20.170	83	Weighted Average
20.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	275	0.0160	0.36		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
11.1	524	0.0077	0.79		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
23.8	799	Total			

**Subcatchment 3S: E-3**

Hydrograph



**Summary for Subcatchment 6S: P1**

Runoff = 6.16 cfs @ 12.76 hrs, Volume= 0.788 af, Depth> 0.94"

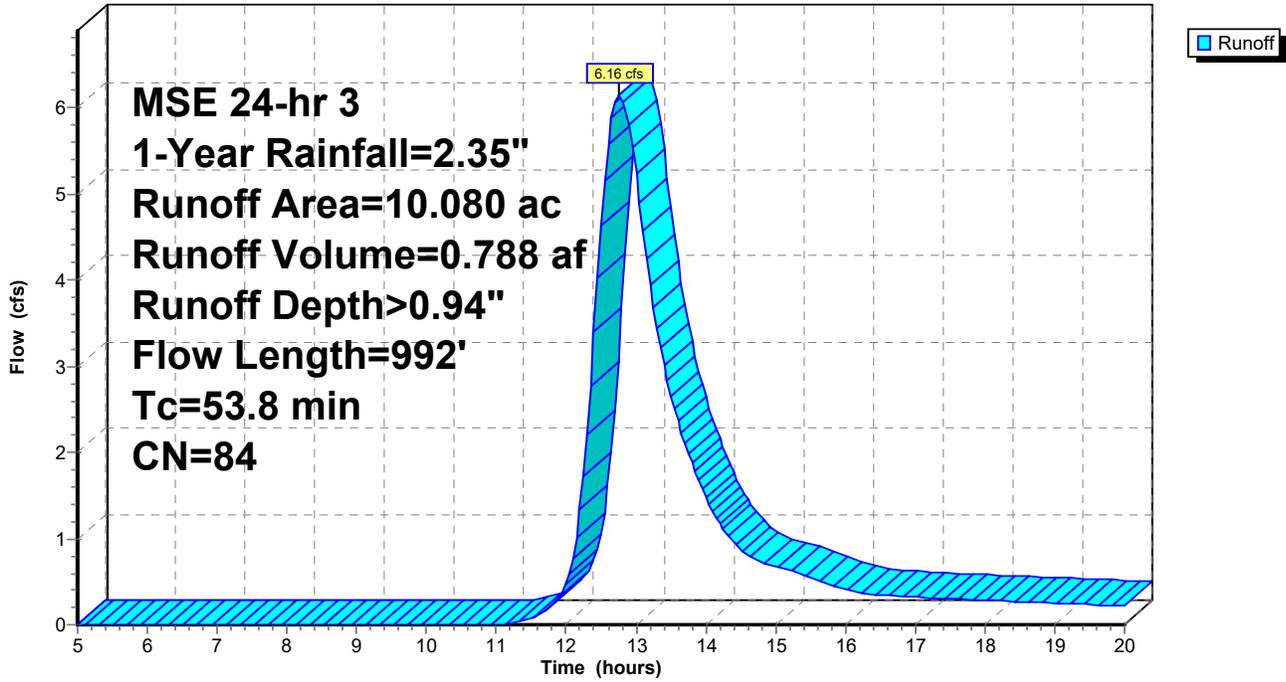
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 4.060	83	C, 1/4 Ac Lots
* 2.190	87	D, 1/4 Ac Lots
* 1.350	74	C, Open Space
* 1.450	80	D, Open Space
* 1.030	98	Pond
10.080	84	Weighted Average
9.050		89.78% Pervious Area
1.030		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	218	0.0180	0.12		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
23.2	730	0.0110	0.52	4.72	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, C-D</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
53.8	992	Total			

### Subcatchment 6S: P1

Hydrograph



**Summary for Subcatchment 7S: P2**

Runoff = 12.06 cfs @ 12.57 hrs, Volume= 1.264 af, Depth> 0.94"

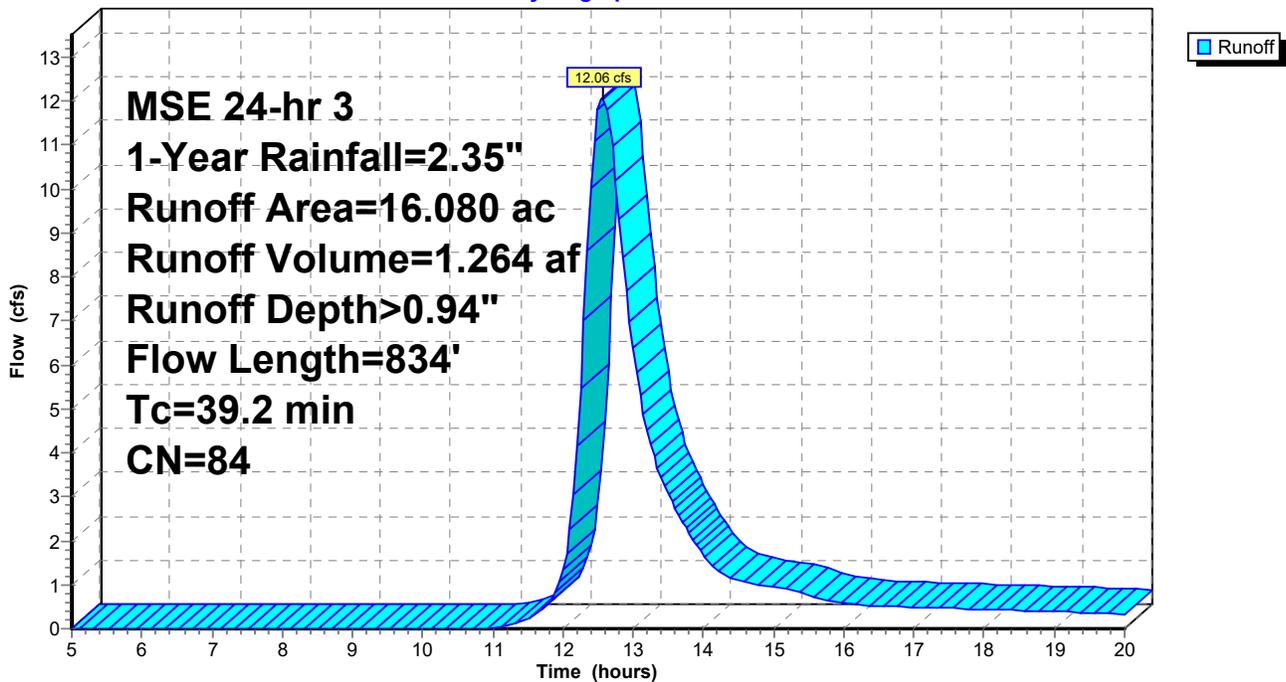
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 4.150	83	C, 1/4-Ac Lots
* 7.070	87	D, 1/4-Ac Lots
* 1.900	61	C, Open Space
* 1.260	80	D, Open Space
* 1.700	98	Pond
16.080	84	Weighted Average
14.380		89.43% Pervious Area
1.700		10.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	239	0.0160	0.17		<b>Sheet Flow, A-B</b> Grass: Short n= 0.150 P2= 2.66"
4.5	154	0.0130	0.57	5.13	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
2.0	89	0.0210	0.72	6.52	<b>Channel Flow, C-D</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.2	111	0.0140	8.31	14.69	<b>Pipe Channel, D-E</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
3.6	106	0.0094	0.48	4.36	<b>Channel Flow, E-F</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, F-G</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
5.1	48	0.0010	0.16	1.42	<b>Channel Flow, G-H</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	43	0.0100	7.03	12.41	<b>Pipe Channel, H-I</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
39.2	834	Total			

### Subcatchment 7S: P2

Hydrograph



**Summary for Subcatchment 8S: P3**

Runoff = 13.68 cfs @ 12.58 hrs, Volume= 1.455 af, Depth> 1.12"

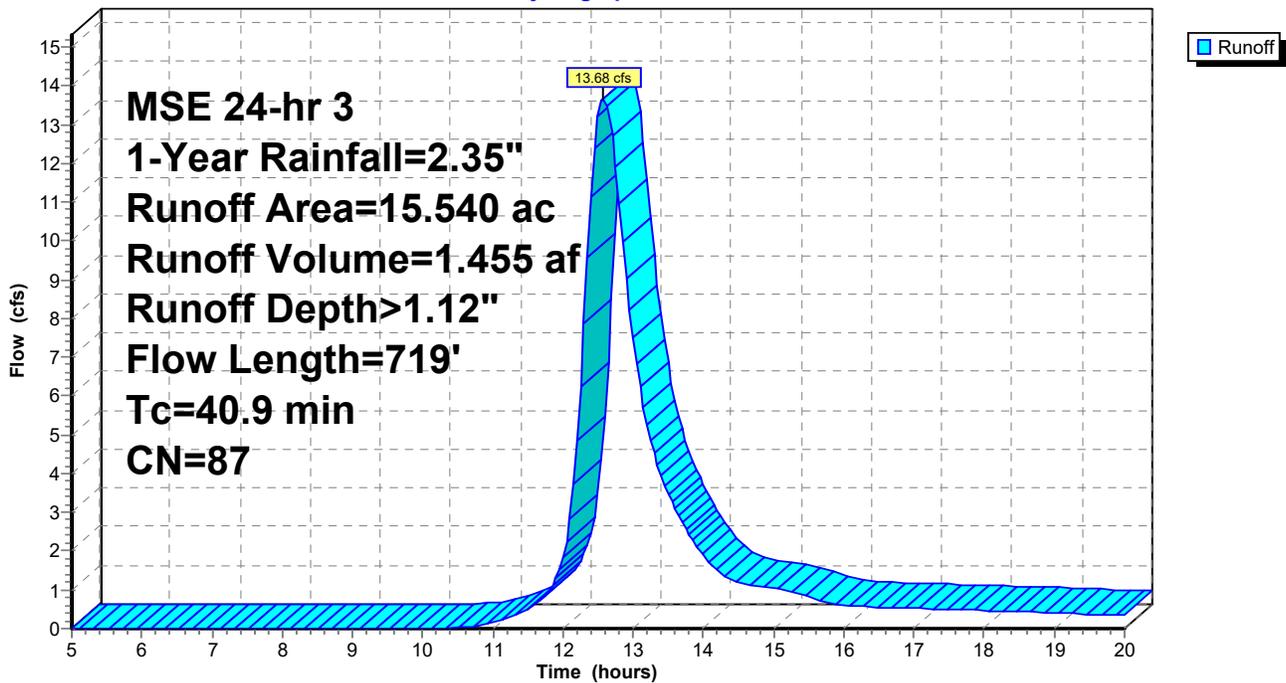
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 0.620	83	C, 1/4-Ac Lots
* 10.760	87	D, 1/4-Ac Lots
* 0.100	74	C, Open Space
* 2.410	80	D, Open Space
* 1.650	98	Pond
15.540	87	Weighted Average
13.890		89.38% Pervious Area
1.650		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.7	143	0.0180	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
19.2	576	0.0100	0.50	4.50	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
40.9	719	Total			

**Subcatchment 8S: P3**

Hydrograph



**Summary for Subcatchment 9S: UD1**

Runoff = 0.98 cfs @ 12.14 hrs, Volume= 0.044 af, Depth> 0.70"

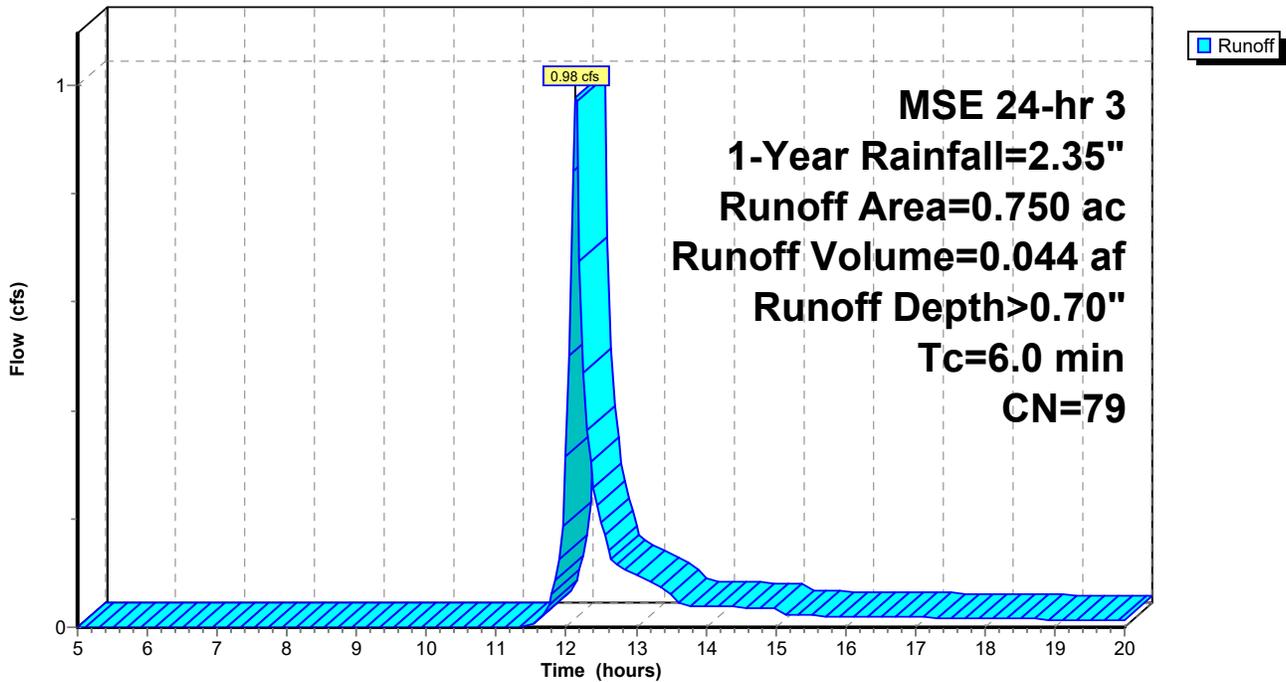
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 0.070	74	C, Open Space
* 0.680	80	D, Open Space
0.750	79	Weighted Average
0.750		100.00% Pervious Area

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

**Subcatchment 9S: UD1**

Hydrograph



**Summary for Subcatchment 10S: UD2**

Runoff = 0.62 cfs @ 12.14 hrs, Volume= 0.027 af, Depth> 0.74"

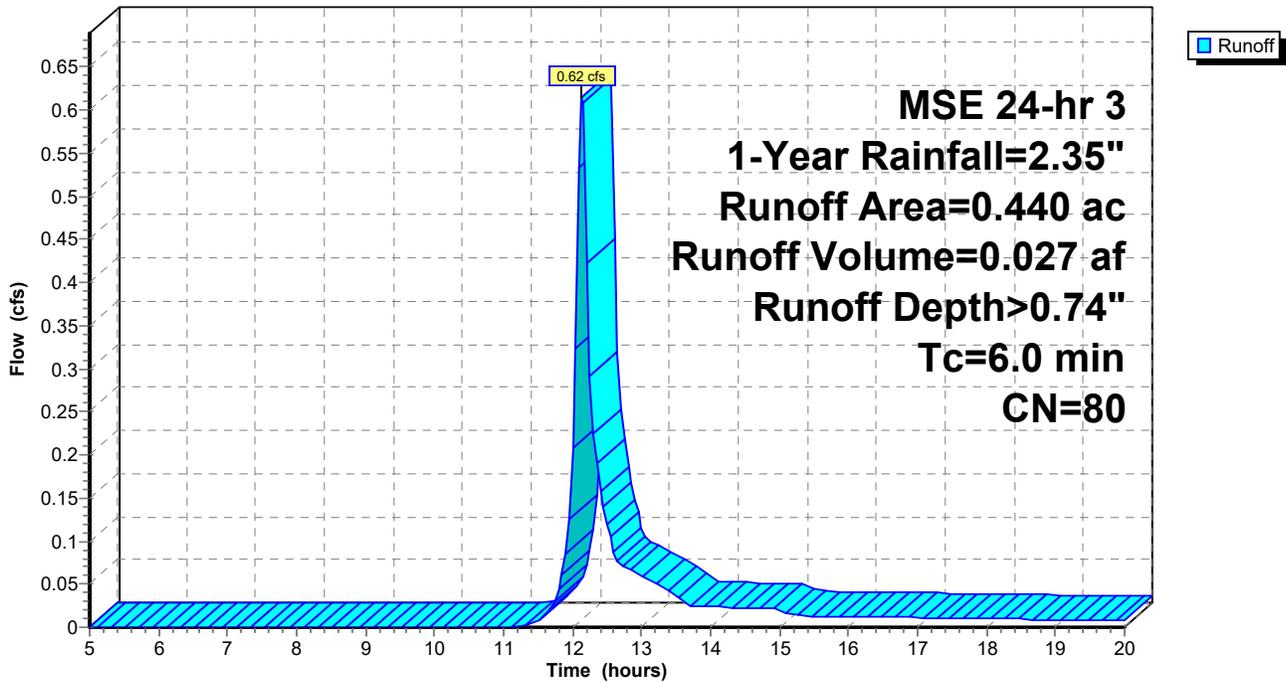
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 0.030	74	c, Open Space
* 0.410	80	D, Open Space
0.440	80	Weighted Average
0.440		100.00% Pervious Area

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

**Subcatchment 10S: UD2**

Hydrograph



**Summary for Subcatchment 11S: UD3**

Runoff = 4.82 cfs @ 12.34 hrs, Volume= 0.366 af, Depth> 0.95"

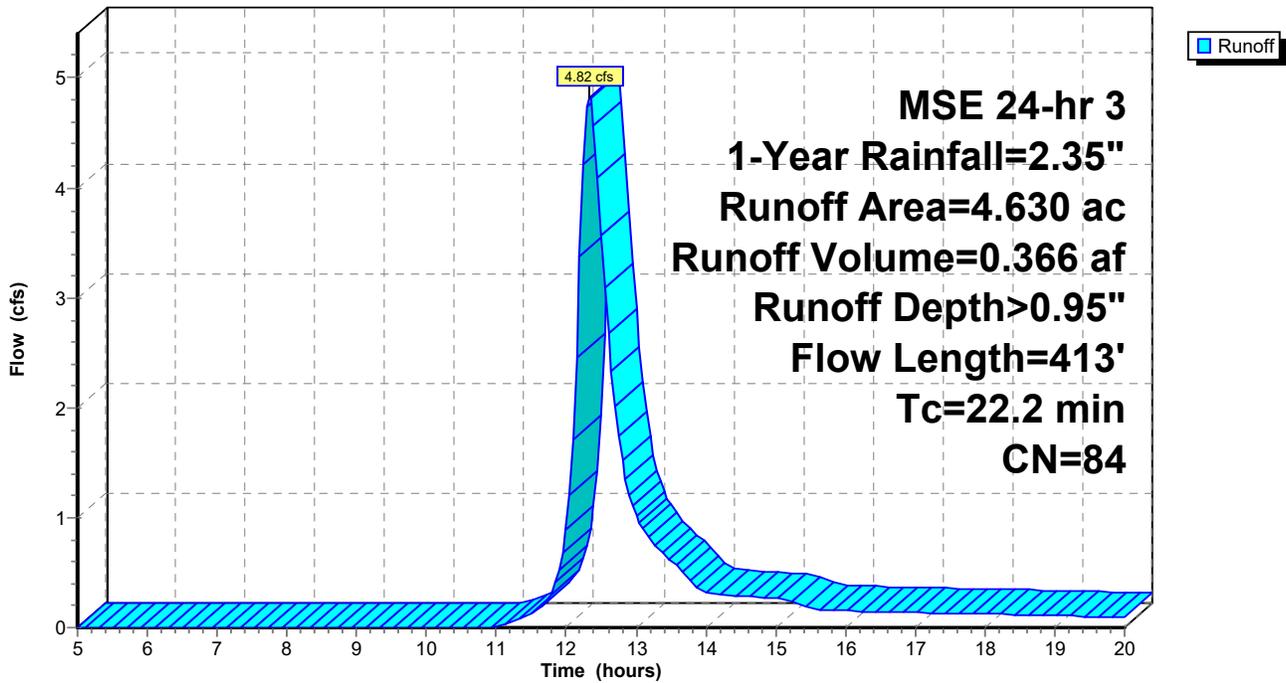
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 1-Year Rainfall=2.35"

Area (ac)	CN	Description
* 2.700	87	D, 1/4-Ac Lots
* 1.930	80	D, Open Space
4.630	84	Weighted Average
4.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	50	0.0150	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
12.1	363	0.0100	0.50	4.50	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
22.2	413	Total			

**Subcatchment 11S: UD3**

Hydrograph



**Summary for Subcatchment 12S: E-OFF-1**

Runoff = 0.89 cfs @ 12.64 hrs, Volume= 0.102 af, Depth> 0.69"

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

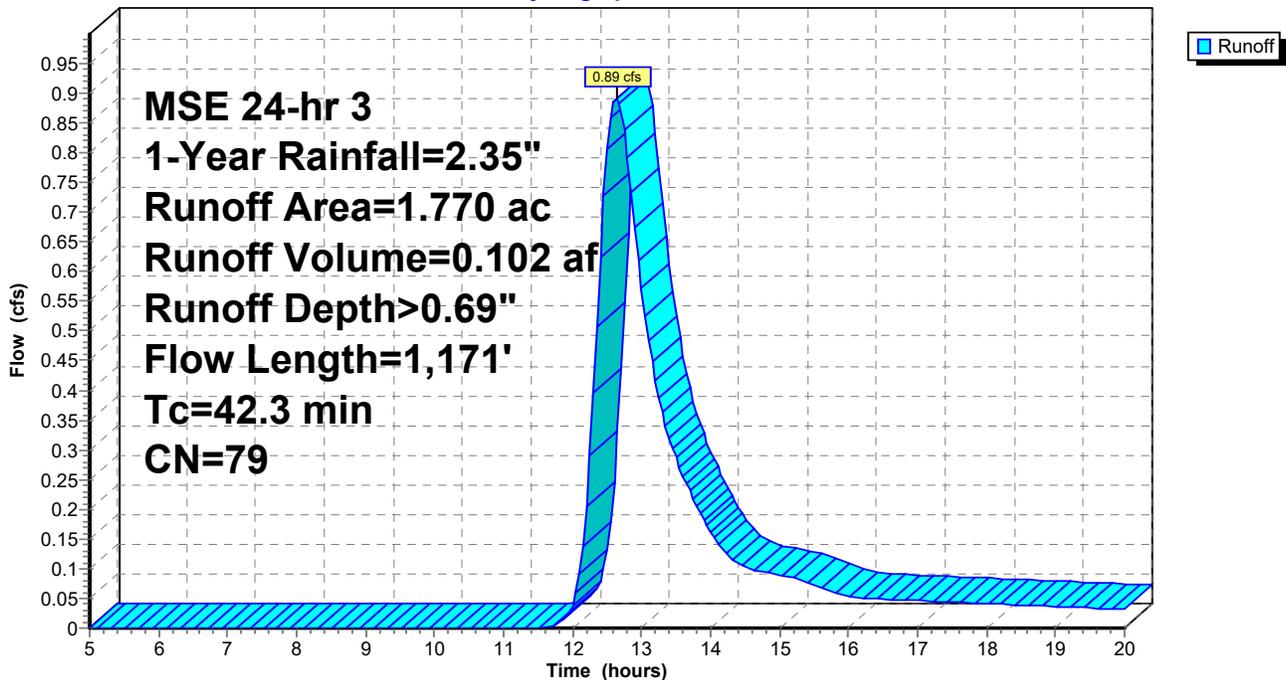
Area (ac)	CN	Description
1.770	79	1 acre lots, 20% imp, HSG C
1.416		80.00% Pervious Area
0.354		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	162	0.0210	0.17		<b>Sheet Flow, A-AA</b> Grass: Short n= 0.150 P2= 2.66"
6.4	113	0.0150	0.29		<b>Sheet Flow, AA-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.4	263	0.0120	0.99		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		<b>Shallow Concentrated Flow, C-D</b> Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		<b>Shallow Concentrated Flow, D-E</b> Cultivated Straight Rows Kv= 9.0 fps
42.3	1,171	Total			

**Subcatchment 12S: E-OFF-1**

Hydrograph



**Summary for Subcatchment 13S: P-OFF-1**

Runoff = 0.89 cfs @ 12.63 hrs, Volume= 0.102 af, Depth> 0.69"

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

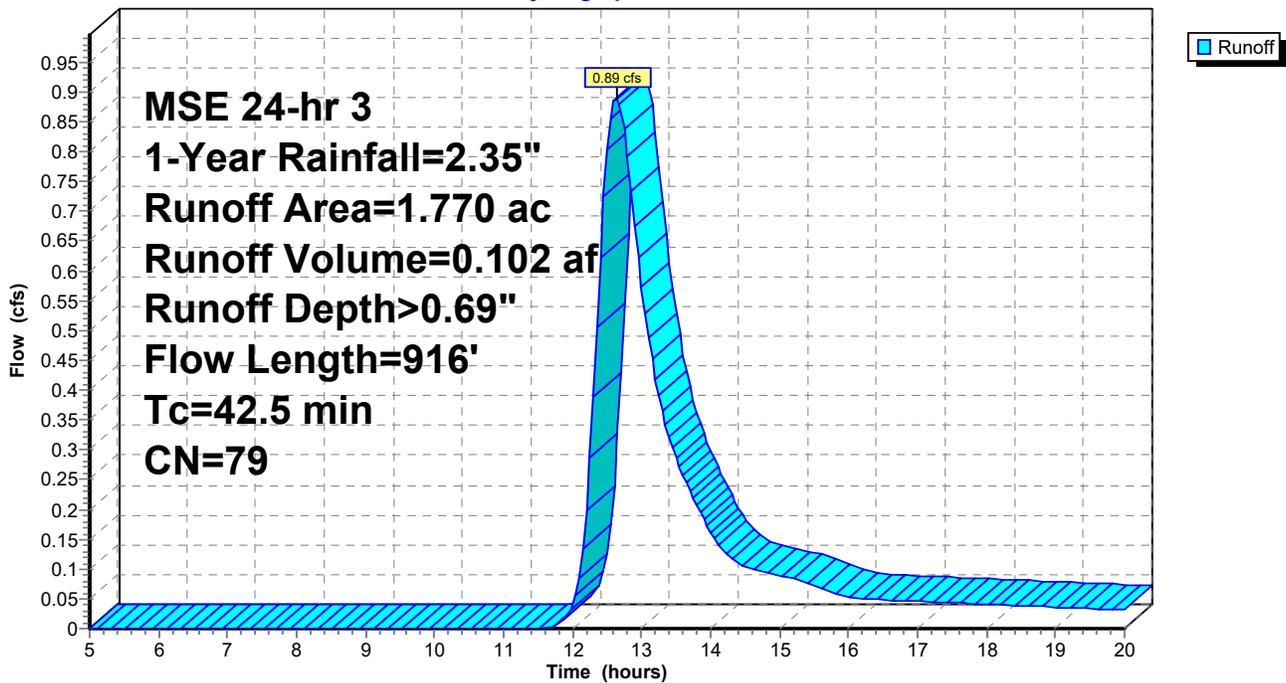
Area (ac)	CN	Description
1.770	79	1 acre lots, 20% imp, HSG C
1.416		80.00% Pervious Area
0.354		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	162	0.0210	0.17		<b>Sheet Flow, A-AA</b> Grass: Short n= 0.150 P2= 2.66"
6.7	45	0.0130	0.11		<b>Sheet Flow, AA-B</b> Grass: Short n= 0.150 P2= 2.66"
20.2	665	0.0120	0.55	4.93	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, C-D</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
42.5	916	Total			

**Subcatchment 13S: P-OFF-1**

Hydrograph



### Summary for Reach 5R: Pre-Development

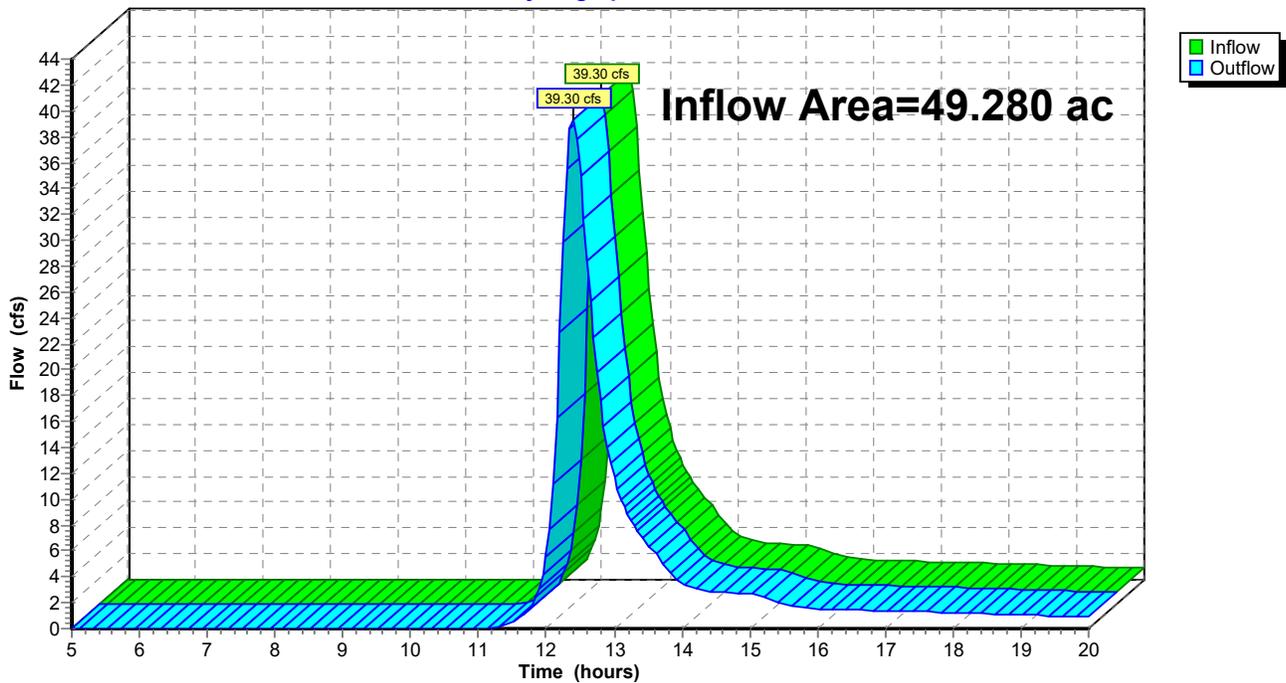
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 49.280 ac, 0.72% Impervious, Inflow Depth > 0.83" for 1-Year event  
Inflow = 39.30 cfs @ 12.39 hrs, Volume= 3.397 af  
Outflow = 39.30 cfs @ 12.39 hrs, Volume= 3.397 af, Atten= 0%, Lag= 0.0 min

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

### Reach 5R: Pre-Development

Hydrograph



### Summary for Reach 11R: Undetained

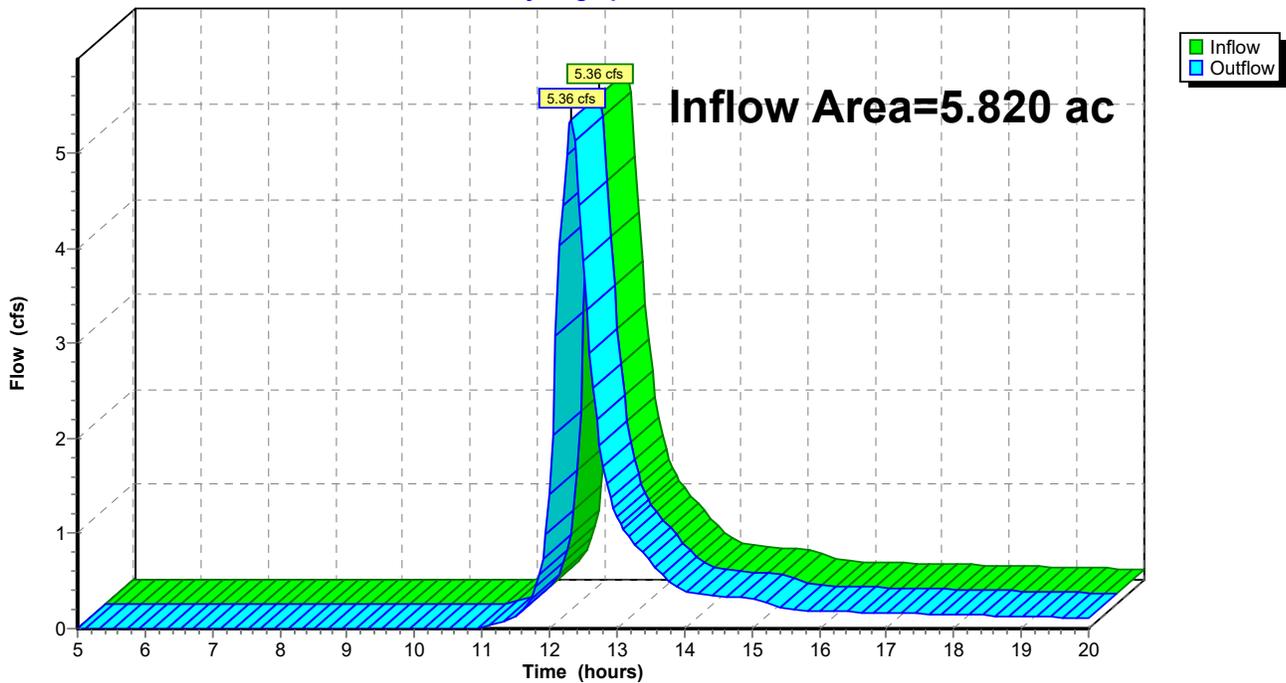
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.820 ac, 0.00% Impervious, Inflow Depth > 0.90" for 1-Year event  
Inflow = 5.36 cfs @ 12.32 hrs, Volume= 0.437 af  
Outflow = 5.36 cfs @ 12.32 hrs, Volume= 0.437 af, Atten= 0%, Lag= 0.0 min

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

### Reach 11R: Undetained

Hydrograph



### Summary for Reach 12R: Detained

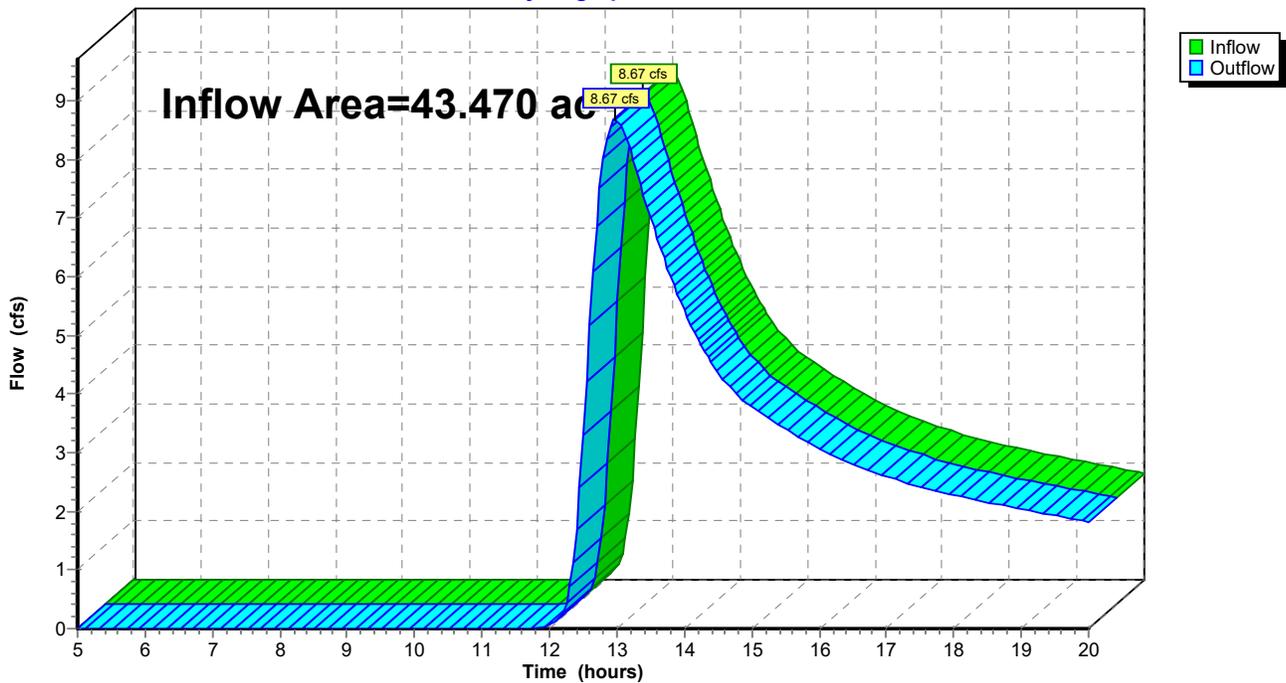
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 43.470 ac, 10.89% Impervious, Inflow Depth > 0.64" for 1-Year event  
Inflow = 8.67 cfs @ 12.98 hrs, Volume= 2.331 af  
Outflow = 8.67 cfs @ 12.98 hrs, Volume= 2.331 af, Atten= 0%, Lag= 0.0 min

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

### Reach 12R: Detained

Hydrograph



**Summary for Pond 6P: Pond 1**

Inflow Area = 11.850 ac, 11.68% Impervious, Inflow Depth > 0.90" for 1-Year event  
 Inflow = 7.00 cfs @ 12.74 hrs, Volume= 0.890 af  
 Outflow = 1.04 cfs @ 14.42 hrs, Volume= 0.489 af, Atten= 85%, Lag= 100.7 min  
 Primary = 1.04 cfs @ 14.42 hrs, Volume= 0.489 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 857.54' @ 14.42 hrs Surf.Area= 1.090 ac Storage= 0.574 af

Plug-Flow detention time= 205.2 min calculated for 0.488 af (55% of inflow)  
 Center-of-Mass det. time= 140.3 min ( 970.0 - 829.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	857.00'	6.825 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

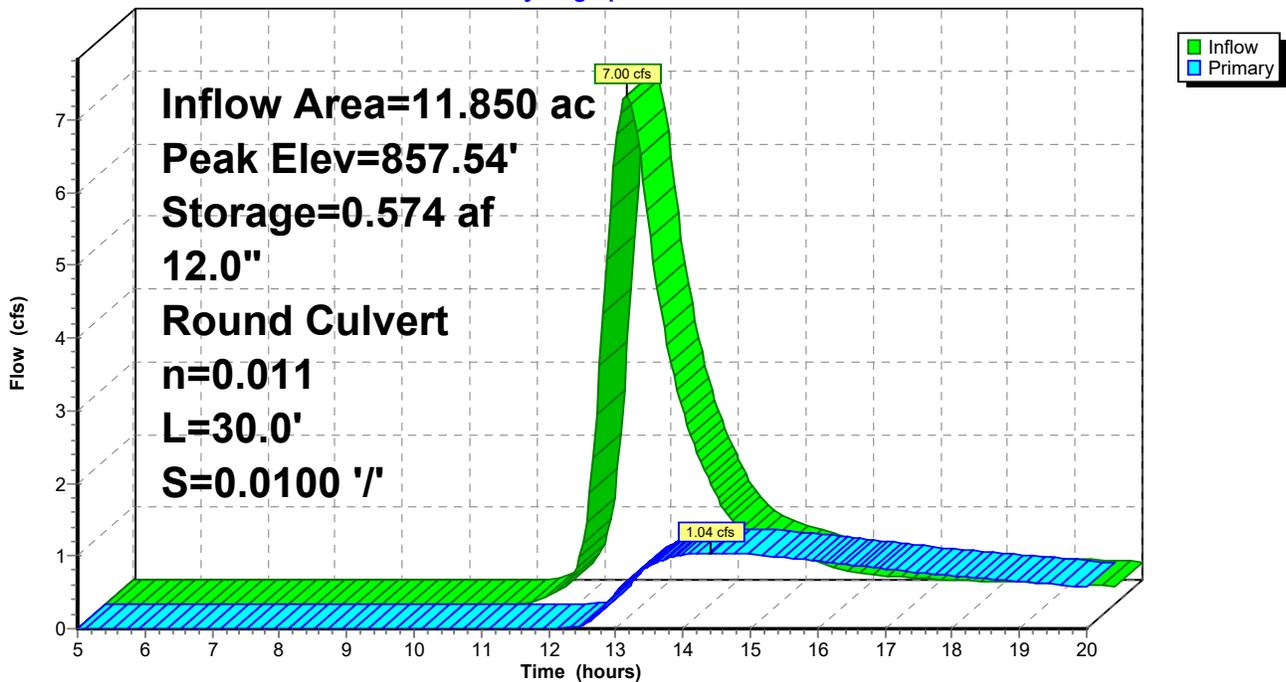
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
857.00	1.030	0.000	0.000
858.00	1.140	1.085	1.085
859.00	1.270	1.205	2.290
860.00	1.420	1.345	3.635
861.00	1.570	1.495	5.130
862.00	1.820	1.695	6.825

Device	Routing	Invert	Outlet Devices
#1	Primary	857.00'	<b>12.0" Round RCP_Round 12"</b> L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 857.00' / 856.70' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.04 cfs @ 14.42 hrs HW=857.54' (Free Discharge)  
 ↑1=RCP\_Round 12" (Barrel Controls 1.04 cfs @ 3.48 fps)

### Pond 6P: Pond 1

Hydrograph



**Summary for Pond 7P: Pond 2**

Inflow Area = 16.080 ac, 10.57% Impervious, Inflow Depth > 0.94" for 1-Year event  
 Inflow = 12.06 cfs @ 12.57 hrs, Volume= 1.264 af  
 Outflow = 7.47 cfs @ 12.92 hrs, Volume= 1.180 af, Atten= 38%, Lag= 21.1 min  
 Primary = 7.47 cfs @ 12.92 hrs, Volume= 1.180 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 856.82' @ 12.92 hrs Surf.Area= 0.504 ac Storage= 0.395 af

Plug-Flow detention time= 60.0 min calculated for 1.177 af (93% of inflow)  
 Center-of-Mass det. time= 38.9 min ( 856.9 - 818.0 )

Volume	Invert	Avail.Storage	Storage Description
#1	856.00'	2.280 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
856.00	0.461	0.000	0.000
857.00	0.514	0.487	0.487
858.00	0.568	0.541	1.028
859.00	0.625	0.596	1.625
860.00	0.684	0.654	2.280

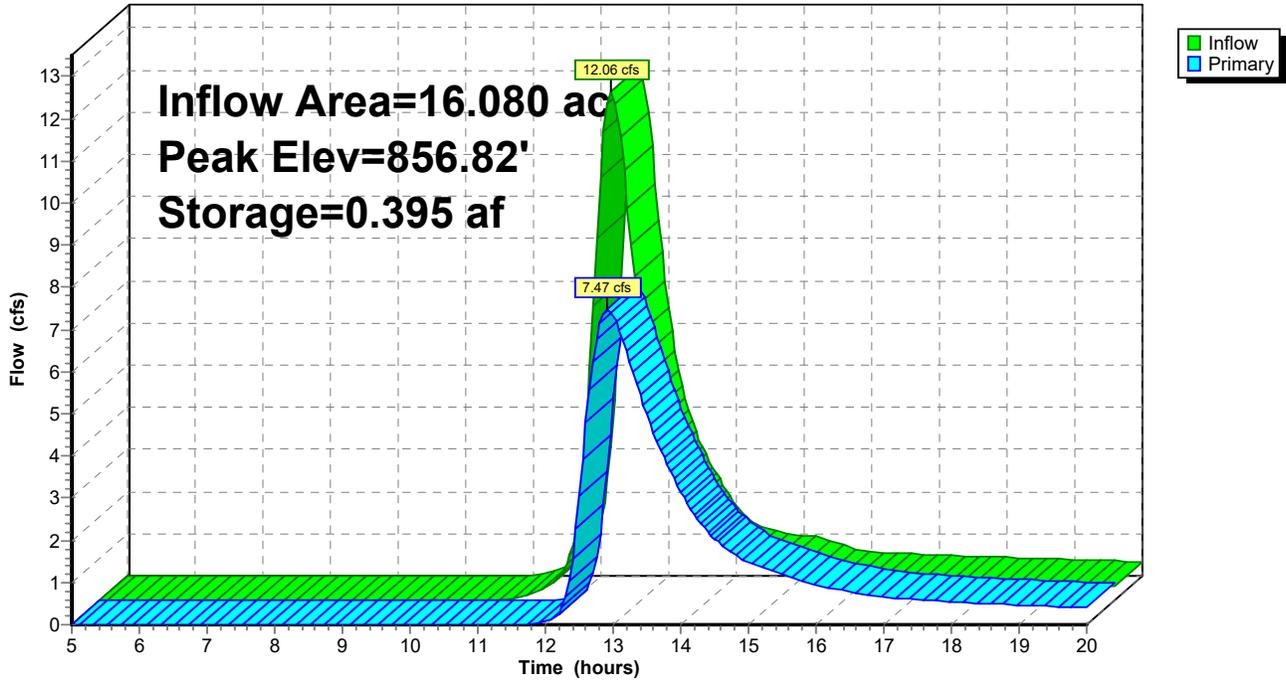
Device	Routing	Invert	Outlet Devices
#1	Primary	856.00'	<b>24.0" Round Culvert</b> L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 856.00' / 855.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	856.00'	<b>24.0" Round Culvert</b> L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 856.00' / 855.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

**Primary OutFlow** Max=7.45 cfs @ 12.92 hrs HW=856.82' (Free Discharge)

1=Culvert (Inlet Controls 3.73 cfs @ 3.08 fps)  
 2=Culvert (Inlet Controls 3.73 cfs @ 3.08 fps)

### Pond 7P: Pond 2

Hydrograph



**Summary for Pond 8P: Pond 3**

Inflow Area = 15.540 ac, 10.62% Impervious, Inflow Depth > 1.12" for 1-Year event  
 Inflow = 13.68 cfs @ 12.58 hrs, Volume= 1.455 af  
 Outflow = 1.29 cfs @ 14.36 hrs, Volume= 0.661 af, Atten= 91%, Lag= 106.6 min  
 Primary = 1.29 cfs @ 14.36 hrs, Volume= 0.661 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 858.60' @ 14.36 hrs Surf.Area= 1.758 ac Storage= 1.018 af

Plug-Flow detention time= 224.9 min calculated for 0.659 af (45% of inflow)  
 Center-of-Mass det. time= 158.3 min ( 971.2 - 812.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	8.080 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
858.00	1.650	0.000	0.000
859.00	1.830	1.740	1.740
860.00	2.020	1.925	3.665
861.00	2.210	2.115	5.780
862.00	2.390	2.300	8.080

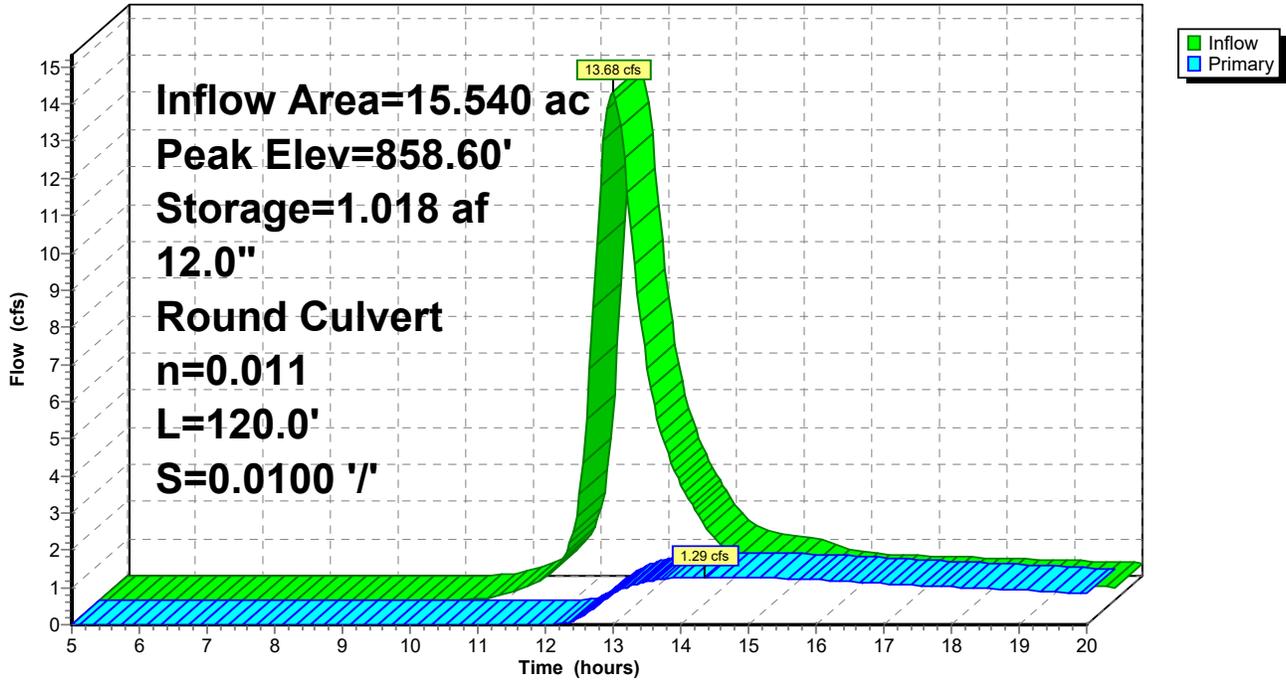
Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	<b>12.0" Round RCP_Round 12"</b> L= 120.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 856.80' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.29 cfs @ 14.36 hrs HW=858.60' (Free Discharge)

↑1=RCP\_Round 12" (Inlet Controls 1.29 cfs @ 2.63 fps)

### Pond 8P: Pond 3

Hydrograph



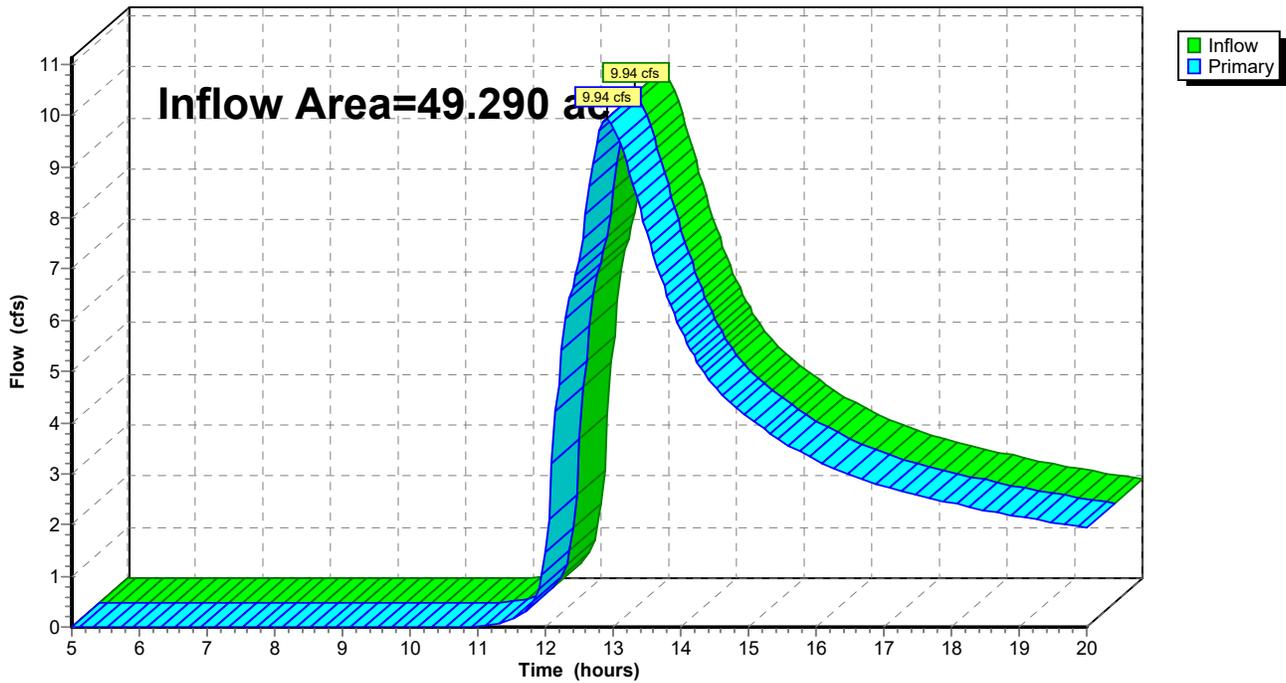
### Summary for Link 10L: Post-Development

Inflow Area = 49.290 ac, 9.60% Impervious, Inflow Depth > 0.67" for 1-Year event  
Inflow = 9.94 cfs @ 12.92 hrs, Volume= 2.768 af  
Primary = 9.94 cfs @ 12.92 hrs, Volume= 2.768 af, Atten= 0%, Lag= 0.0 min

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

### Link 10L: Post-Development

Hydrograph



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

<b>Subcatchment1S: E-1</b>	Runoff Area=12.040 ac 0.00% Impervious Runoff Depth>1.00" Flow Length=1,174' Tc=32.5 min CN=81 Runoff=10.62 cfs 1.001 af
<b>Subcatchment2S: E-2</b>	Runoff Area=15.300 ac 0.00% Impervious Runoff Depth>1.00" Flow Length=937' Tc=24.6 min CN=81 Runoff=15.84 cfs 1.275 af
<b>Subcatchment3S: E-3</b>	Runoff Area=20.170 ac 0.00% Impervious Runoff Depth>1.12" Flow Length=799' Tc=23.8 min CN=83 Runoff=24.01 cfs 1.878 af
<b>Subcatchment6S: P1</b>	Runoff Area=10.080 ac 10.22% Impervious Runoff Depth>1.17" Flow Length=992' Tc=53.8 min CN=84 Runoff=7.71 cfs 0.981 af
<b>Subcatchment7S: P2</b>	Runoff Area=16.080 ac 10.57% Impervious Runoff Depth>1.17" Flow Length=834' Tc=39.2 min CN=84 Runoff=15.09 cfs 1.572 af
<b>Subcatchment8S: P3</b>	Runoff Area=15.540 ac 10.62% Impervious Runoff Depth>1.37" Flow Length=719' Tc=40.9 min CN=87 Runoff=16.71 cfs 1.777 af
<b>Subcatchment9S: UD1</b>	Runoff Area=0.750 ac 0.00% Impervious Runoff Depth>0.90" Tc=6.0 min CN=79 Runoff=1.27 cfs 0.056 af
<b>Subcatchment10S: UD2</b>	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth>0.95" Tc=6.0 min CN=80 Runoff=0.79 cfs 0.035 af
<b>Subcatchment11S: UD3</b>	Runoff Area=4.630 ac 0.00% Impervious Runoff Depth>1.18" Flow Length=413' Tc=22.2 min CN=84 Runoff=6.03 cfs 0.455 af
<b>Subcatchment12S: E-OFF-1</b>	Runoff Area=1.770 ac 20.00% Impervious Runoff Depth>0.89" Flow Length=1,171' Tc=42.3 min CN=79 Runoff=1.17 cfs 0.131 af
<b>Subcatchment13S: P-OFF-1</b>	Runoff Area=1.770 ac 20.00% Impervious Runoff Depth>0.89" Flow Length=916' Tc=42.5 min CN=79 Runoff=1.17 cfs 0.131 af
<b>Reach 5R: Pre-Development</b>	Inflow=50.06 cfs 4.284 af Outflow=50.06 cfs 4.284 af
<b>Reach 11R: Undetained</b>	Inflow=6.70 cfs 0.546 af Outflow=6.70 cfs 0.546 af
<b>Reach 12R: Detained</b>	Inflow=11.64 cfs 3.011 af Outflow=11.64 cfs 3.011 af
<b>Pond 6P: Pond 1</b>	Peak Elev=857.66' Storage=0.705 af Inflow=8.81 cfs 1.111 af 12.0" Round Culvert n=0.011 L=30.0' S=0.0100 1/1' Outflow=1.44 cfs 0.656 af
<b>Pond 7P: Pond 2</b>	Peak Elev=856.96' Storage=0.468 af Inflow=15.09 cfs 1.572 af Outflow=9.97 cfs 1.482 af

**Morning Meadows 2020-05-30**

*MSE 24-hr 3 2-Year Rainfall=2.66"*

Prepared by {enter your company name here}

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**Pond 8P: Pond 3**

Peak Elev=858.72' Storage=1.229 af Inflow=16.71 cfs 1.777 af  
12.0" Round Culvert n=0.011 L=120.0' S=0.0100 '/' Outflow=1.74 cfs 0.874 af

**Link 10L: Post-Development**

Inflow=13.31 cfs 3.557 af  
Primary=13.31 cfs 3.557 af

**Total Runoff Area = 98.570 ac Runoff Volume = 9.290 af Average Runoff Depth = 1.13"**  
**94.84% Pervious = 93.482 ac 5.16% Impervious = 5.088 ac**

**Summary for Subcatchment 1S: E-1**

Runoff = 10.62 cfs @ 12.48 hrs, Volume= 1.001 af, Depth> 1.00"

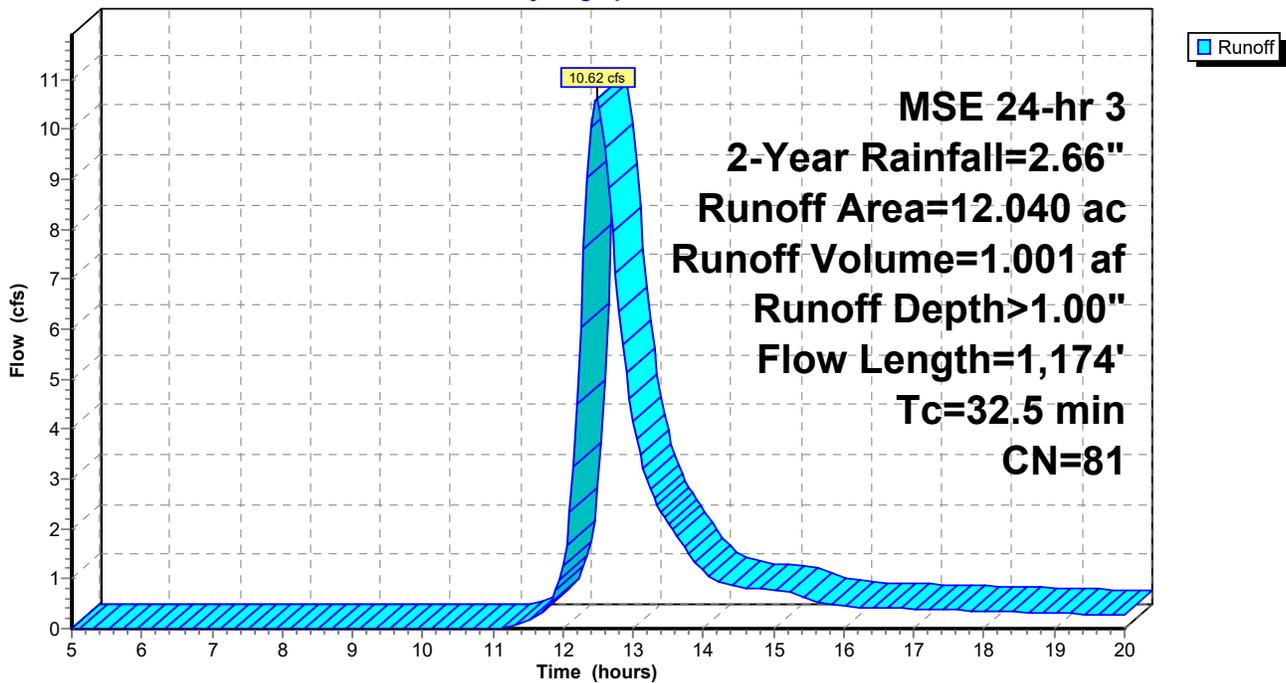
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 5.650	78	C, Cropland
* 6.390	83	D, Cropland
12.040	81	Weighted Average
12.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	275	0.0176	0.38		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.3	266	0.0131	1.03		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		<b>Shallow Concentrated Flow, C-D</b> Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		<b>Shallow Concentrated Flow, D-E</b> Cultivated Straight Rows Kv= 9.0 fps
32.5	1,174	Total			

**Subcatchment 1S: E-1**

Hydrograph



**Summary for Subcatchment 2S: E-2**

Runoff = 15.84 cfs @ 12.37 hrs, Volume= 1.275 af, Depth> 1.00"

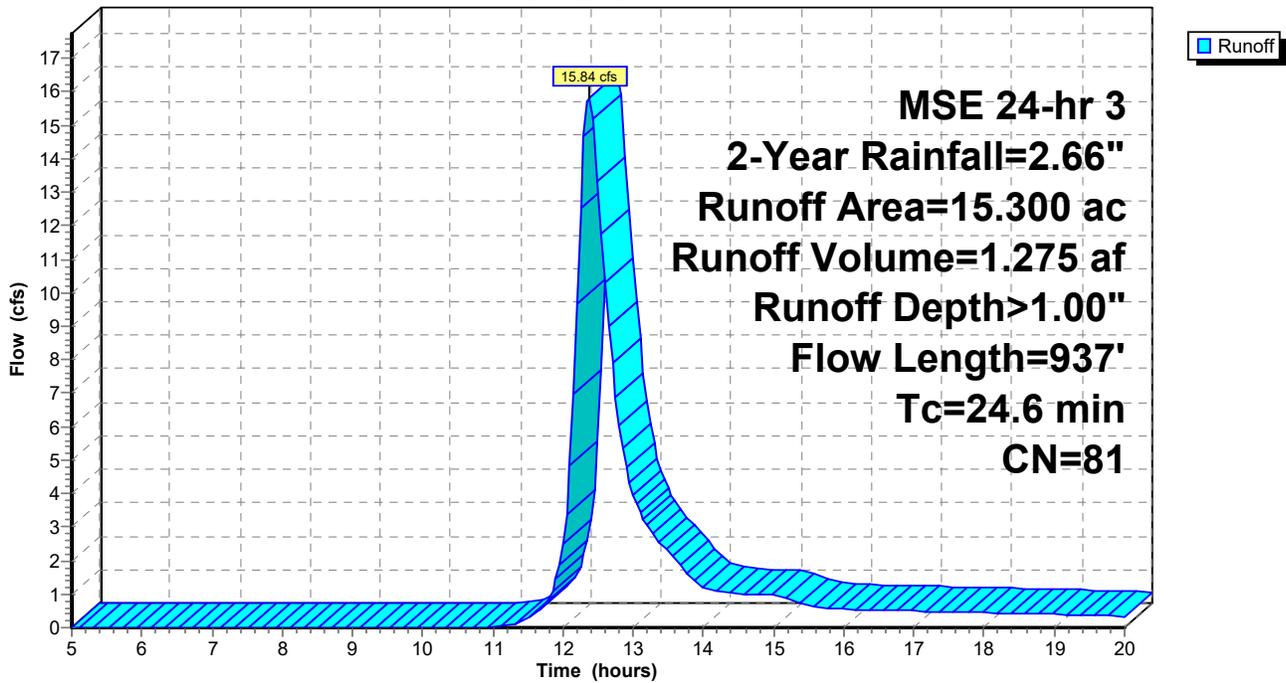
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 6.650	78	C, Cropland
* 8.650	83	D, Cropland
15.300	81	Weighted Average
15.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	275	0.0119	0.32		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
10.3	662	0.0142	1.07		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
24.6	937	Total			

**Subcatchment 2S: E-2**

Hydrograph



**Summary for Subcatchment 3S: E-3**

Runoff = 24.01 cfs @ 12.36 hrs, Volume= 1.878 af, Depth> 1.12"

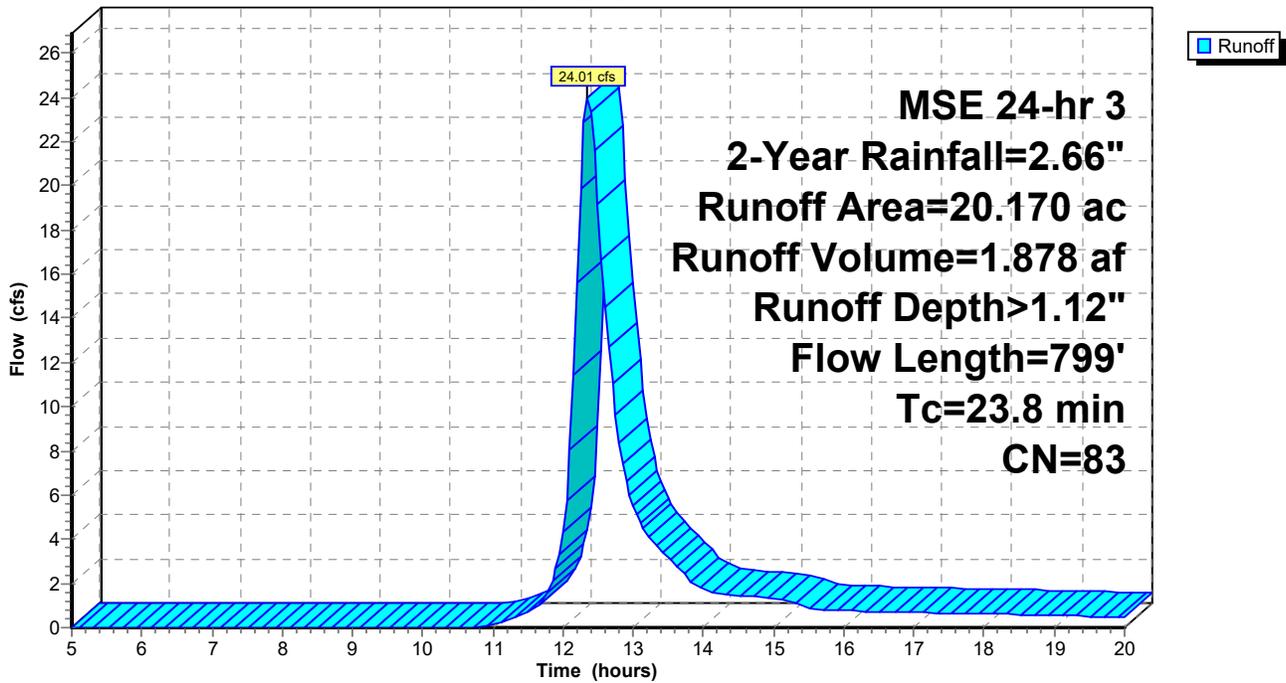
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 0.960	78	C, Cropland
* 19.210	83	D, Cropland
20.170	83	Weighted Average
20.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	275	0.0160	0.36		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
11.1	524	0.0077	0.79		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
23.8	799	Total			

**Subcatchment 3S: E-3**

Hydrograph



**Summary for Subcatchment 6S: P1**

Runoff = 7.71 cfs @ 12.75 hrs, Volume= 0.981 af, Depth> 1.17"

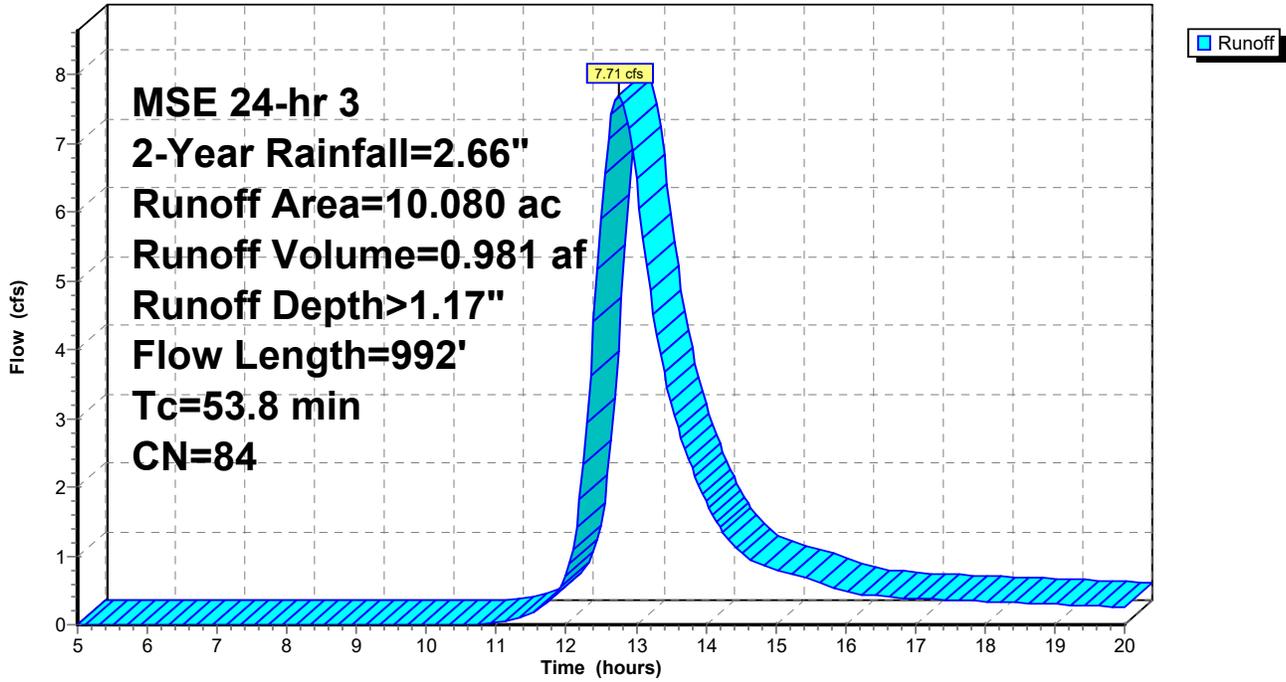
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 4.060	83	C, 1/4 Ac Lots
* 2.190	87	D, 1/4 Ac Lots
* 1.350	74	C, Open Space
* 1.450	80	D, Open Space
* 1.030	98	Pond
10.080	84	Weighted Average
9.050		89.78% Pervious Area
1.030		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	218	0.0180	0.12		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
23.2	730	0.0110	0.52	4.72	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, C-D</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
53.8	992	Total			

### Subcatchment 6S: P1

Hydrograph



**Summary for Subcatchment 7S: P2**

Runoff = 15.09 cfs @ 12.56 hrs, Volume= 1.572 af, Depth> 1.17"

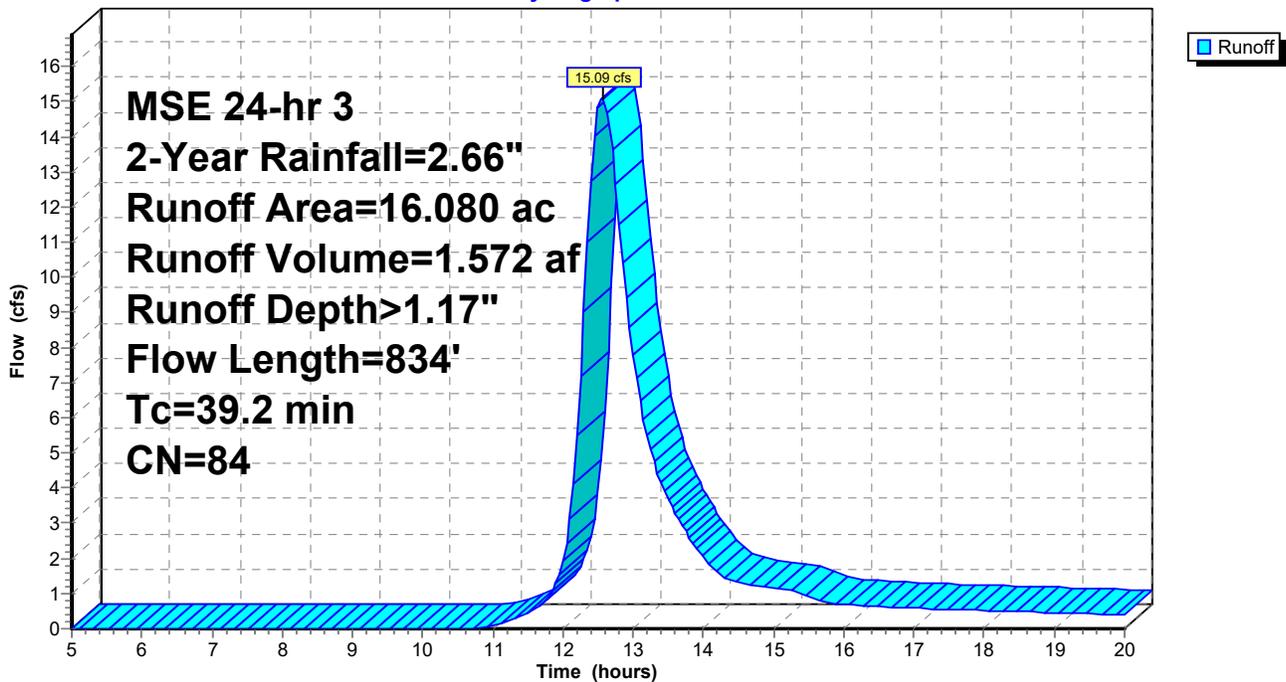
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 4.150	83	C, 1/4-Ac Lots
* 7.070	87	D, 1/4-Ac Lots
* 1.900	61	C, Open Space
* 1.260	80	D, Open Space
* 1.700	98	Pond
16.080	84	Weighted Average
14.380		89.43% Pervious Area
1.700		10.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	239	0.0160	0.17		<b>Sheet Flow, A-B</b> Grass: Short n= 0.150 P2= 2.66"
4.5	154	0.0130	0.57	5.13	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
2.0	89	0.0210	0.72	6.52	<b>Channel Flow, C-D</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.2	111	0.0140	8.31	14.69	<b>Pipe Channel, D-E</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
3.6	106	0.0094	0.48	4.36	<b>Channel Flow, E-F</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, F-G</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
5.1	48	0.0010	0.16	1.42	<b>Channel Flow, G-H</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	43	0.0100	7.03	12.41	<b>Pipe Channel, H-I</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
39.2	834	Total			

### Subcatchment 7S: P2

Hydrograph



**Summary for Subcatchment 8S: P3**

Runoff = 16.71 cfs @ 12.58 hrs, Volume= 1.777 af, Depth> 1.37"

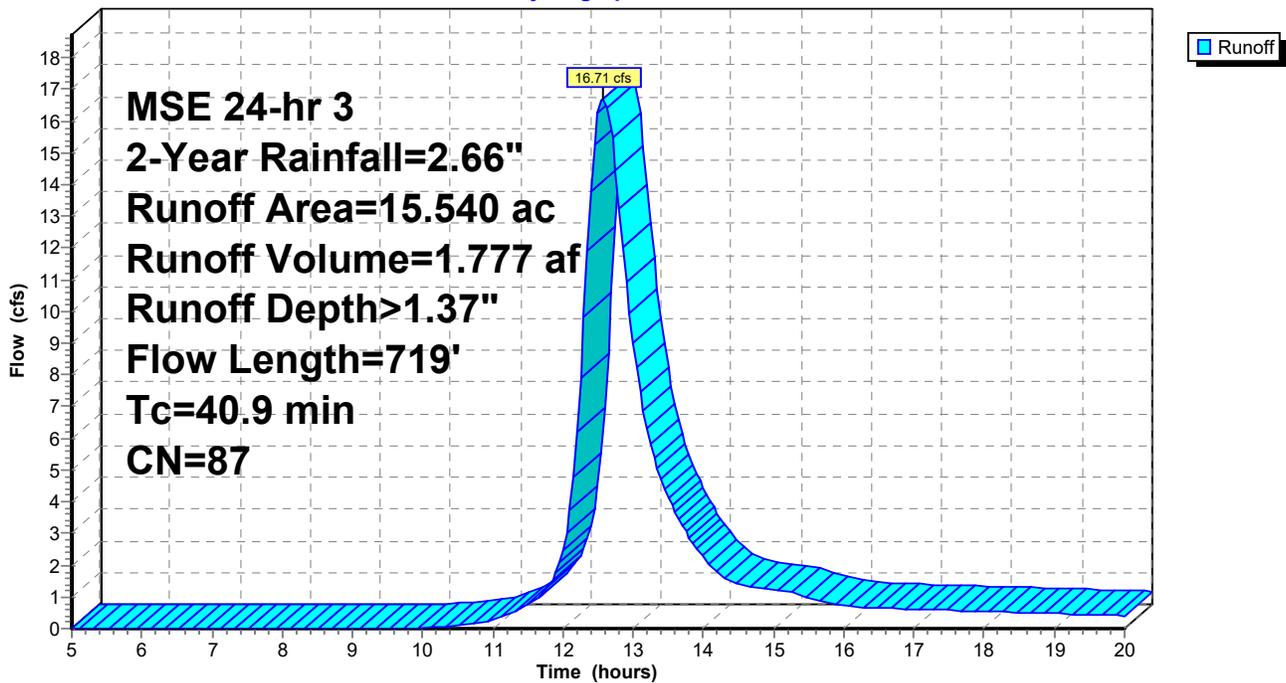
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 0.620	83	C, 1/4-Ac Lots
* 10.760	87	D, 1/4-Ac Lots
* 0.100	74	C, Open Space
* 2.410	80	D, Open Space
* 1.650	98	Pond
15.540	87	Weighted Average
13.890		89.38% Pervious Area
1.650		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.7	143	0.0180	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
19.2	576	0.0100	0.50	4.50	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
40.9	719	Total			

**Subcatchment 8S: P3**

Hydrograph



**Summary for Subcatchment 9S: UD1**

Runoff = 1.27 cfs @ 12.14 hrs, Volume= 0.056 af, Depth> 0.90"

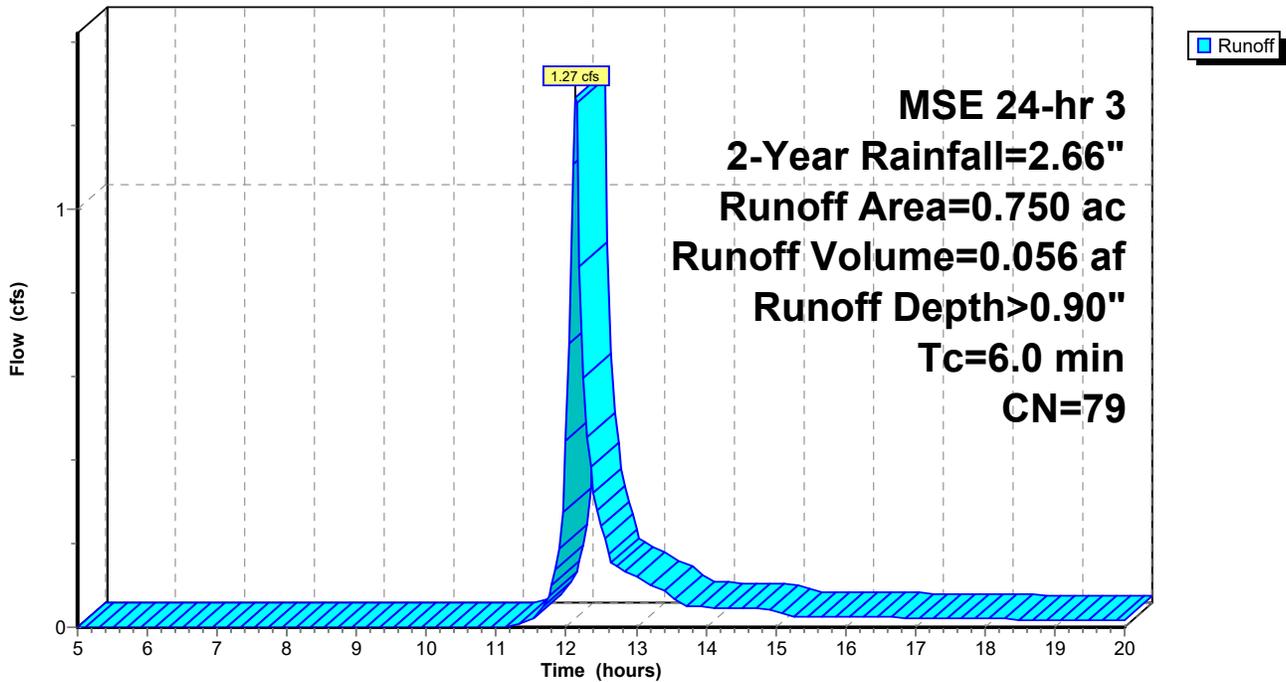
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 0.070	74	C, Open Space
* 0.680	80	D, Open Space
0.750	79	Weighted Average
0.750		100.00% Pervious Area

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

**Subcatchment 9S: UD1**

Hydrograph



**Summary for Subcatchment 10S: UD2**

Runoff = 0.79 cfs @ 12.14 hrs, Volume= 0.035 af, Depth> 0.95"

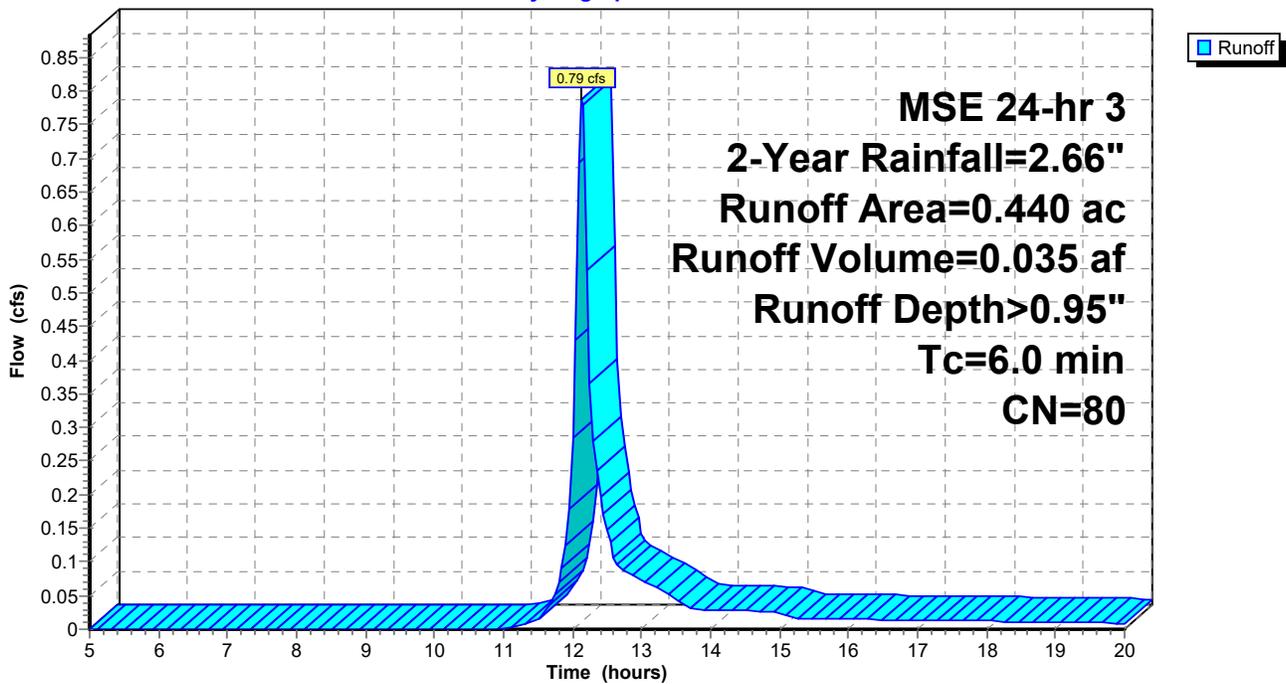
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 0.030	74	c, Open Space
* 0.410	80	D, Open Space
0.440	80	Weighted Average
0.440		100.00% Pervious Area

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

**Subcatchment 10S: UD2**

Hydrograph



**Summary for Subcatchment 11S: UD3**

Runoff = 6.03 cfs @ 12.33 hrs, Volume= 0.455 af, Depth> 1.18"

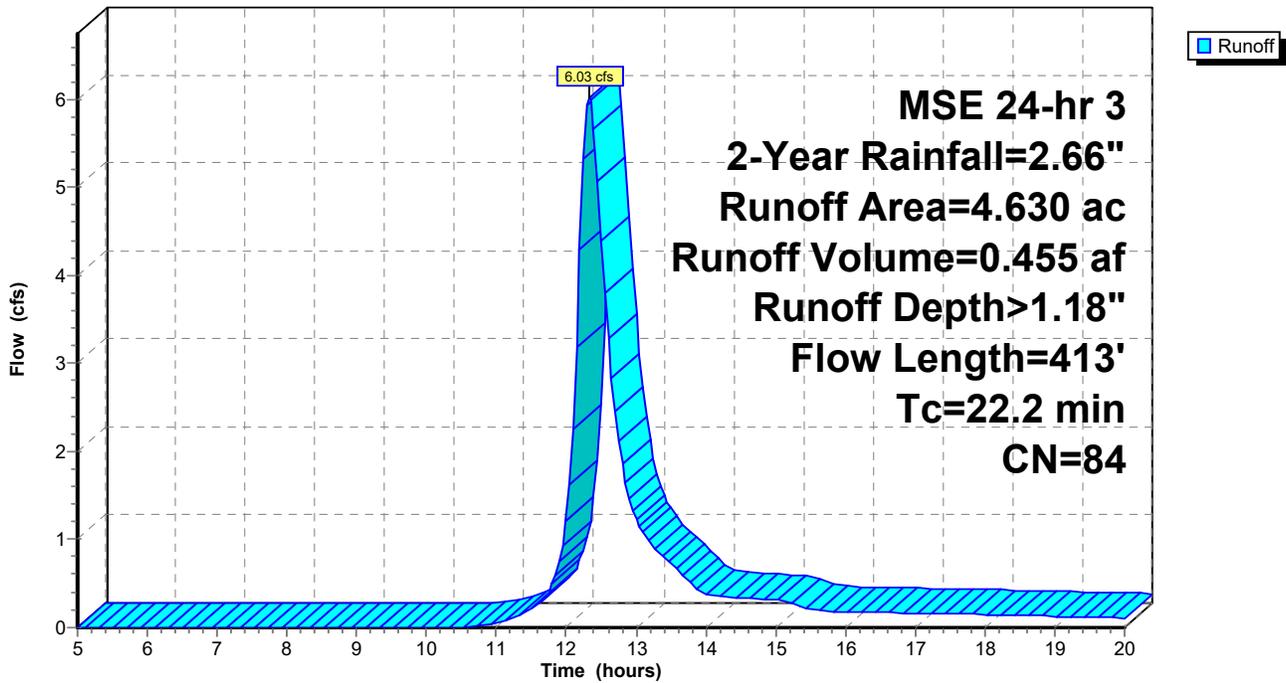
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 2-Year Rainfall=2.66"

Area (ac)	CN	Description
* 2.700	87	D, 1/4-Ac Lots
* 1.930	80	D, Open Space
4.630	84	Weighted Average
4.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	50	0.0150	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
12.1	363	0.0100	0.50	4.50	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
22.2	413	Total			

**Subcatchment 11S: UD3**

Hydrograph



**Summary for Subcatchment 12S: E-OFF-1**

Runoff = 1.17 cfs @ 12.63 hrs, Volume= 0.131 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 2-Year Rainfall=2.66"

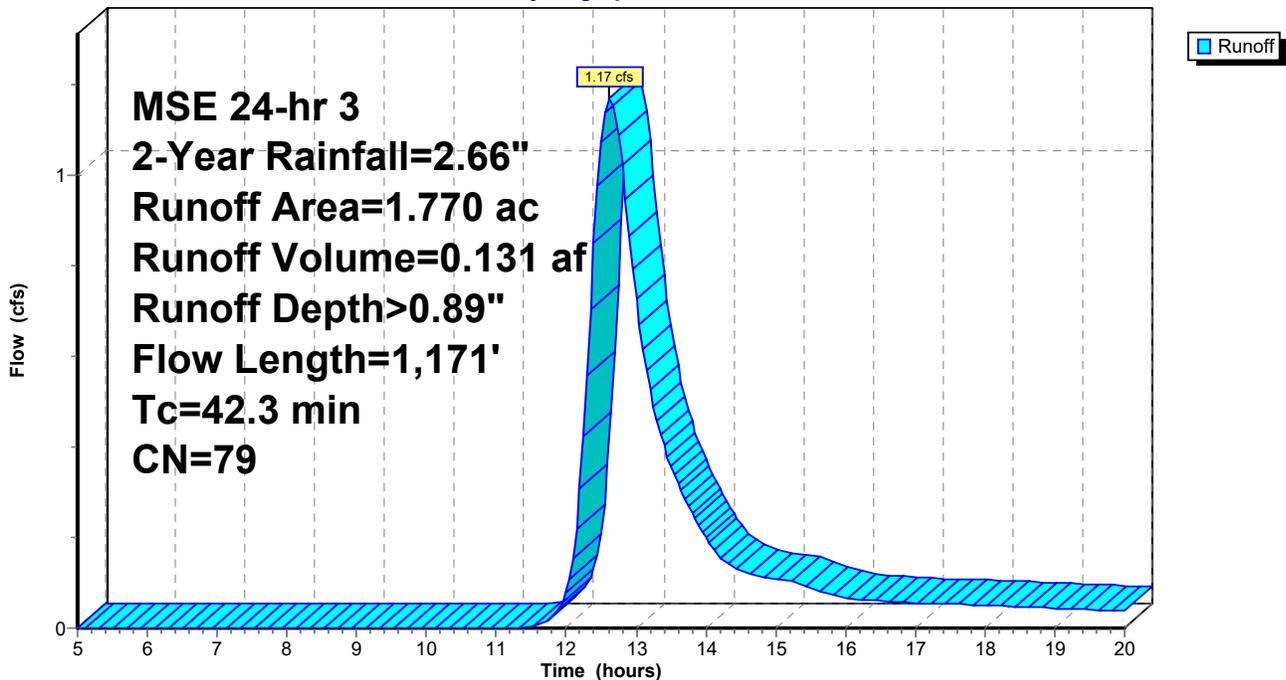
Area (ac)	CN	Description
1.770	79	1 acre lots, 20% imp, HSG C
1.416		80.00% Pervious Area
0.354		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	162	0.0210	0.17		<b>Sheet Flow, A-AA</b> Grass: Short n= 0.150 P2= 2.66"
6.4	113	0.0150	0.29		<b>Sheet Flow, AA-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.4	263	0.0120	0.99		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		<b>Shallow Concentrated Flow, C-D</b> Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		<b>Shallow Concentrated Flow, D-E</b> Cultivated Straight Rows Kv= 9.0 fps
42.3	1,171	Total			

**Subcatchment 12S: E-OFF-1**

Hydrograph



**Summary for Subcatchment 13S: P-OFF-1**

Runoff = 1.17 cfs @ 12.62 hrs, Volume= 0.131 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 2-Year Rainfall=2.66"

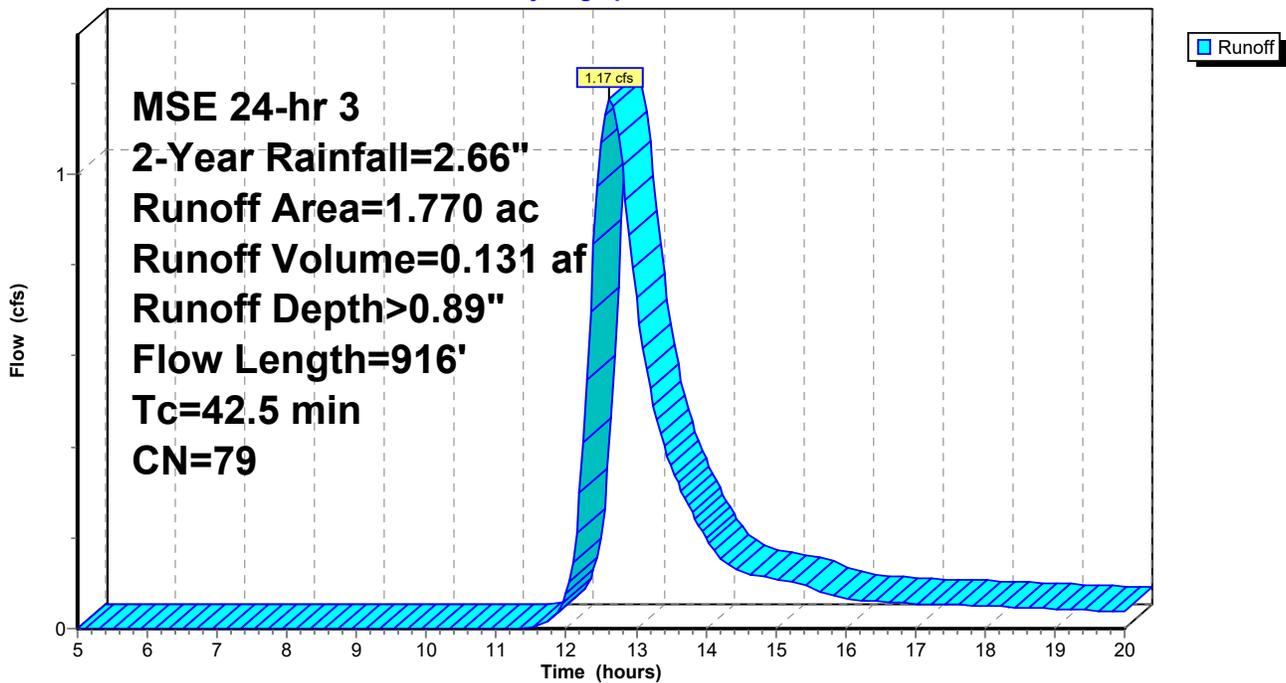
Area (ac)	CN	Description
1.770	79	1 acre lots, 20% imp, HSG C
1.416		80.00% Pervious Area
0.354		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	162	0.0210	0.17		<b>Sheet Flow, A-AA</b> Grass: Short n= 0.150 P2= 2.66"
6.7	45	0.0130	0.11		<b>Sheet Flow, AA-B</b> Grass: Short n= 0.150 P2= 2.66"
20.2	665	0.0120	0.55	4.93	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, C-D</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
42.5	916	Total			

**Subcatchment 13S: P-OFF-1**

Hydrograph



### Summary for Reach 5R: Pre-Development

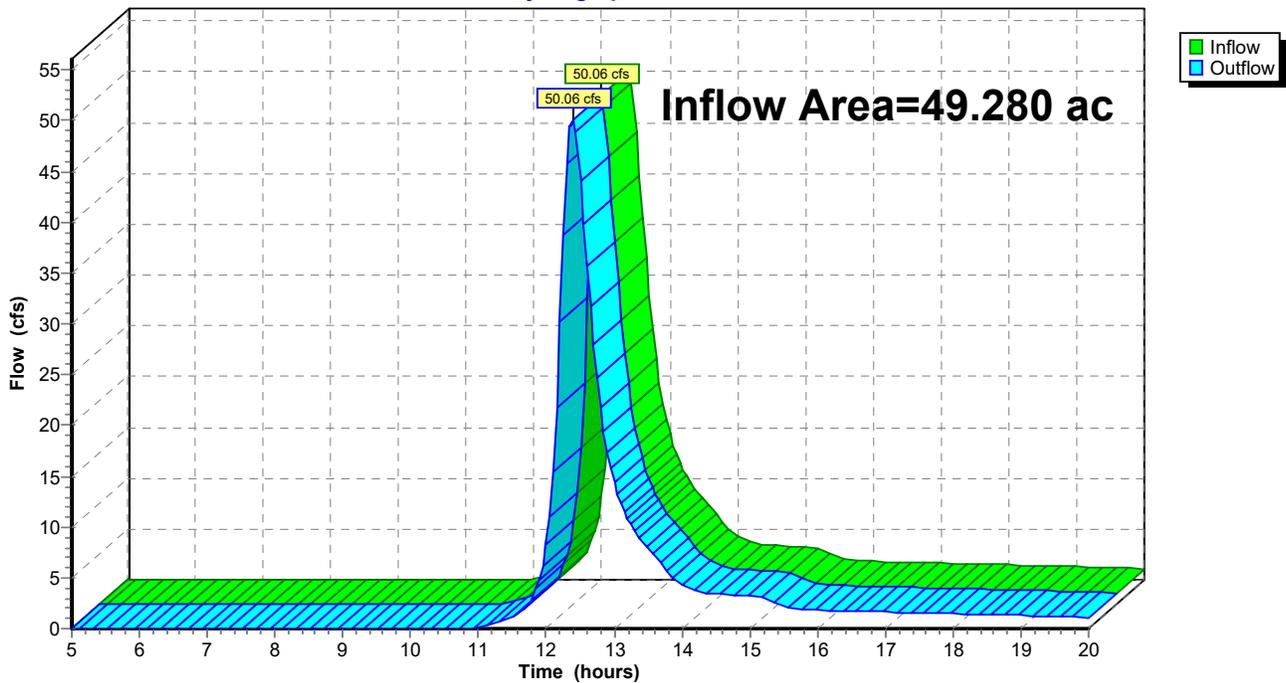
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 49.280 ac, 0.72% Impervious, Inflow Depth > 1.04" for 2-Year event  
Inflow = 50.06 cfs @ 12.38 hrs, Volume= 4.284 af  
Outflow = 50.06 cfs @ 12.38 hrs, Volume= 4.284 af, Atten= 0%, Lag= 0.0 min

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

### Reach 5R: Pre-Development

Hydrograph



### Summary for Reach 11R: Undetained

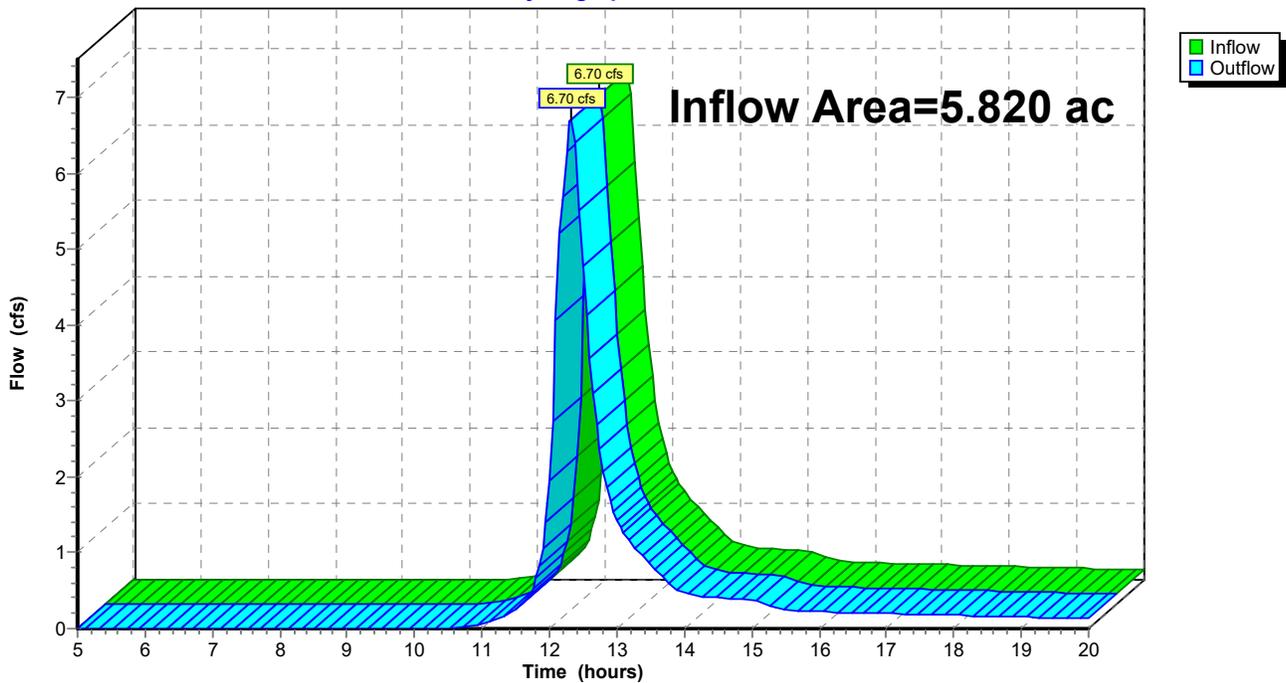
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.820 ac, 0.00% Impervious, Inflow Depth > 1.13" for 2-Year event  
Inflow = 6.70 cfs @ 12.32 hrs, Volume= 0.546 af  
Outflow = 6.70 cfs @ 12.32 hrs, Volume= 0.546 af, Atten= 0%, Lag= 0.0 min

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

### Reach 11R: Undetained

Hydrograph



### Summary for Reach 12R: Detained

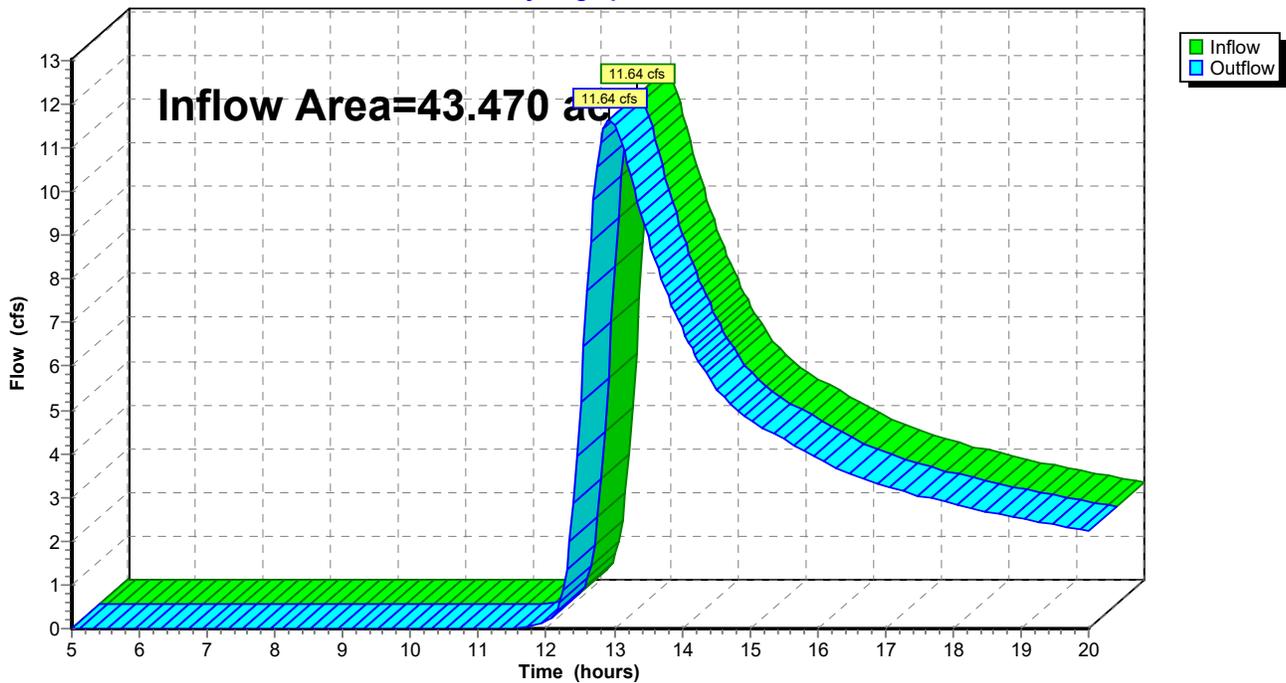
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 43.470 ac, 10.89% Impervious, Inflow Depth > 0.83" for 2-Year event  
Inflow = 11.64 cfs @ 12.94 hrs, Volume= 3.011 af  
Outflow = 11.64 cfs @ 12.94 hrs, Volume= 3.011 af, Atten= 0%, Lag= 0.0 min

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

### Reach 12R: Detained

Hydrograph



**Summary for Pond 6P: Pond 1**

Inflow Area = 11.850 ac, 11.68% Impervious, Inflow Depth > 1.13" for 2-Year event  
 Inflow = 8.81 cfs @ 12.74 hrs, Volume= 1.111 af  
 Outflow = 1.44 cfs @ 14.28 hrs, Volume= 0.656 af, Atten= 84%, Lag= 92.5 min  
 Primary = 1.44 cfs @ 14.28 hrs, Volume= 0.656 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 857.66' @ 14.28 hrs Surf.Area= 1.103 ac Storage= 0.705 af

Plug-Flow detention time= 199.4 min calculated for 0.656 af (59% of inflow)  
 Center-of-Mass det. time= 137.5 min ( 963.9 - 826.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	857.00'	6.825 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

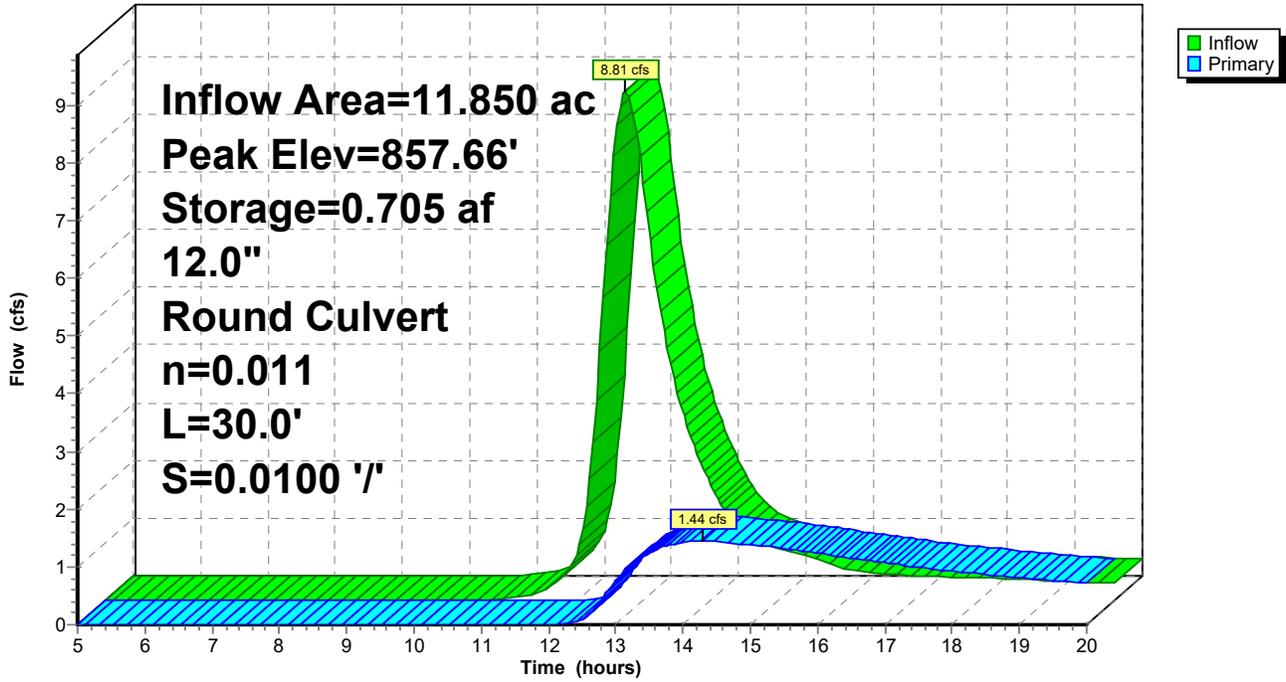
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
857.00	1.030	0.000	0.000
858.00	1.140	1.085	1.085
859.00	1.270	1.205	2.290
860.00	1.420	1.345	3.635
861.00	1.570	1.495	5.130
862.00	1.820	1.695	6.825

Device	Routing	Invert	Outlet Devices
#1	Primary	857.00'	<b>12.0" Round RCP_Round 12"</b> L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 857.00' / 856.70' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.44 cfs @ 14.28 hrs HW=857.66' (Free Discharge)  
 ↑1=RCP\_Round 12" (Barrel Controls 1.44 cfs @ 3.71 fps)

### Pond 6P: Pond 1

Hydrograph



**Summary for Pond 7P: Pond 2**

Inflow Area = 16.080 ac, 10.57% Impervious, Inflow Depth > 1.17" for 2-Year event  
 Inflow = 15.09 cfs @ 12.56 hrs, Volume= 1.572 af  
 Outflow = 9.97 cfs @ 12.87 hrs, Volume= 1.482 af, Atten= 34%, Lag= 18.9 min  
 Primary = 9.97 cfs @ 12.87 hrs, Volume= 1.482 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 856.96' @ 12.87 hrs Surf.Area= 0.512 ac Storage= 0.468 af

Plug-Flow detention time= 54.4 min calculated for 1.477 af (94% of inflow)  
 Center-of-Mass det. time= 35.6 min ( 850.3 - 814.6 )

Volume	Invert	Avail.Storage	Storage Description
#1	856.00'	2.280 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
856.00	0.461	0.000	0.000
857.00	0.514	0.487	0.487
858.00	0.568	0.541	1.028
859.00	0.625	0.596	1.625
860.00	0.684	0.654	2.280

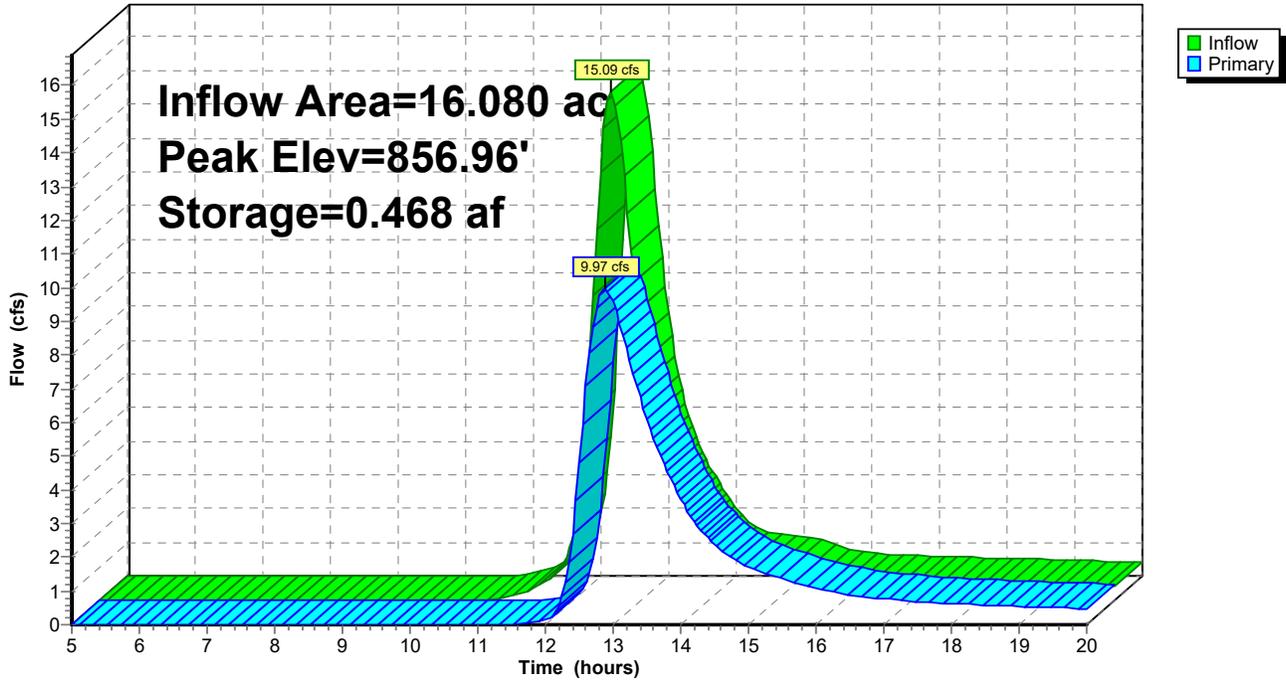
Device	Routing	Invert	Outlet Devices
#1	Primary	856.00'	<b>24.0" Round Culvert</b> L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 856.00' / 855.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	856.00'	<b>24.0" Round Culvert</b> L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 856.00' / 855.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

**Primary OutFlow** Max=9.95 cfs @ 12.87 hrs HW=856.96' (Free Discharge)

1=Culvert (Inlet Controls 4.97 cfs @ 3.34 fps)  
 2=Culvert (Inlet Controls 4.97 cfs @ 3.34 fps)

### Pond 7P: Pond 2

Hydrograph



**Summary for Pond 8P: Pond 3**

Inflow Area = 15.540 ac, 10.62% Impervious, Inflow Depth > 1.37" for 2-Year event  
 Inflow = 16.71 cfs @ 12.58 hrs, Volume= 1.777 af  
 Outflow = 1.74 cfs @ 14.20 hrs, Volume= 0.874 af, Atten= 90%, Lag= 97.7 min  
 Primary = 1.74 cfs @ 14.20 hrs, Volume= 0.874 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 858.72' @ 14.20 hrs Surf.Area= 1.779 ac Storage= 1.229 af

Plug-Flow detention time= 220.6 min calculated for 0.871 af (49% of inflow)  
 Center-of-Mass det. time= 156.6 min ( 966.5 - 809.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	8.080 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
858.00	1.650	0.000	0.000
859.00	1.830	1.740	1.740
860.00	2.020	1.925	3.665
861.00	2.210	2.115	5.780
862.00	2.390	2.300	8.080

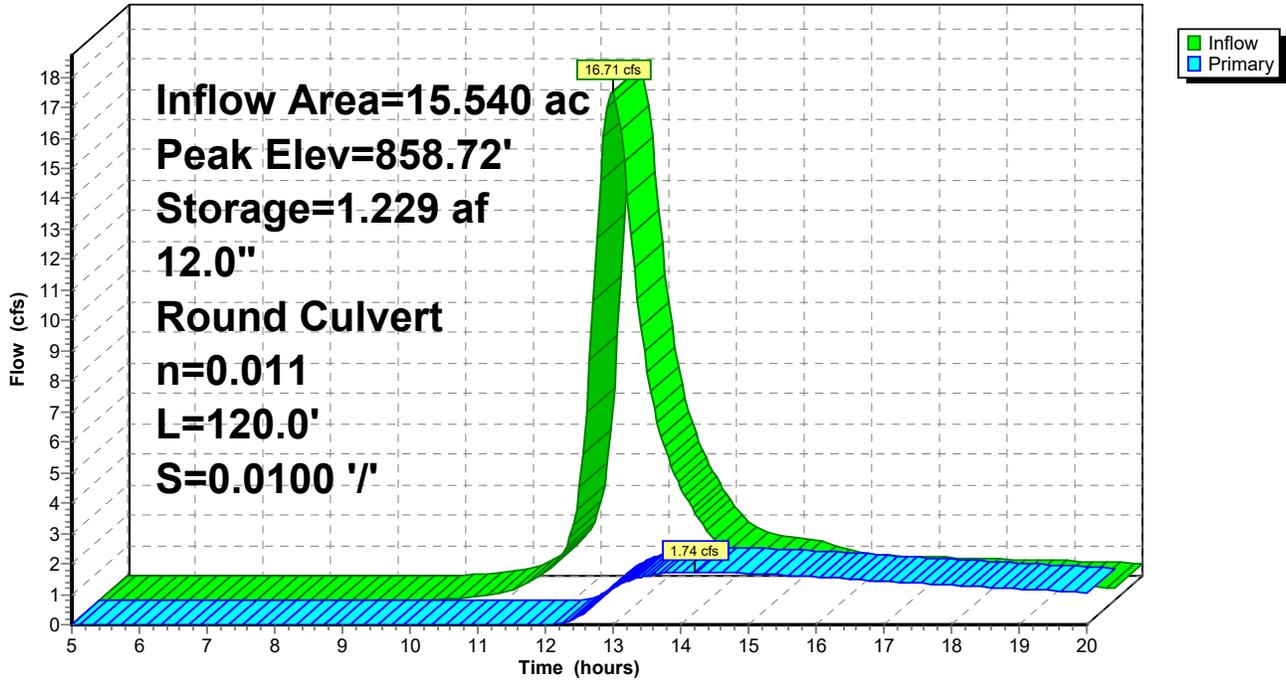
Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	<b>12.0" Round RCP_Round 12"</b> L= 120.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 856.80' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

**Primary OutFlow** Max=1.74 cfs @ 14.20 hrs HW=858.72' (Free Discharge)

↑1=RCP\_Round 12" (Inlet Controls 1.74 cfs @ 2.88 fps)

### Pond 8P: Pond 3

Hydrograph



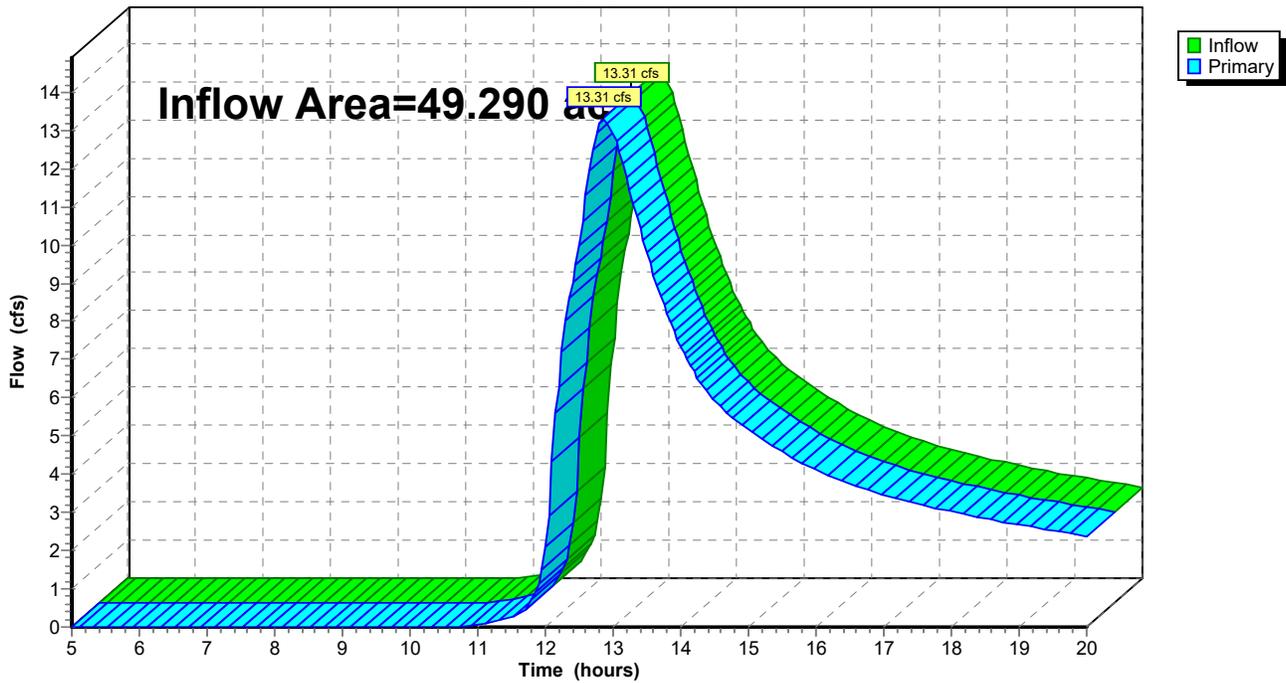
### Summary for Link 10L: Post-Development

Inflow Area = 49.290 ac, 9.60% Impervious, Inflow Depth > 0.87" for 2-Year event  
Inflow = 13.31 cfs @ 12.87 hrs, Volume= 3.557 af  
Primary = 13.31 cfs @ 12.87 hrs, Volume= 3.557 af, Atten= 0%, Lag= 0.0 min

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

### Link 10L: Post-Development

Hydrograph



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

<b>Subcatchment1S: E-1</b>	Runoff Area=12.040 ac 0.00% Impervious Runoff Depth>1.44" Flow Length=1,174' Tc=32.5 min CN=81 Runoff=15.48 cfs 1.441 af
<b>Subcatchment2S: E-2</b>	Runoff Area=15.300 ac 0.00% Impervious Runoff Depth>1.44" Flow Length=937' Tc=24.6 min CN=81 Runoff=23.02 cfs 1.835 af
<b>Subcatchment3S: E-3</b>	Runoff Area=20.170 ac 0.00% Impervious Runoff Depth>1.58" Flow Length=799' Tc=23.8 min CN=83 Runoff=34.07 cfs 2.654 af
<b>Subcatchment6S: P1</b>	Runoff Area=10.080 ac 10.22% Impervious Runoff Depth>1.64" Flow Length=992' Tc=53.8 min CN=84 Runoff=10.86 cfs 1.374 af
<b>Subcatchment7S: P2</b>	Runoff Area=16.080 ac 10.57% Impervious Runoff Depth>1.64" Flow Length=834' Tc=39.2 min CN=84 Runoff=21.22 cfs 2.203 af
<b>Subcatchment8S: P3</b>	Runoff Area=15.540 ac 10.62% Impervious Runoff Depth>1.87" Flow Length=719' Tc=40.9 min CN=87 Runoff=22.76 cfs 2.426 af
<b>Subcatchment9S: UD1</b>	Runoff Area=0.750 ac 0.00% Impervious Runoff Depth>1.32" Tc=6.0 min CN=79 Runoff=1.86 cfs 0.082 af
<b>Subcatchment10S: UD2</b>	Runoff Area=0.440 ac 0.00% Impervious Runoff Depth>1.38" Tc=6.0 min CN=80 Runoff=1.15 cfs 0.051 af
<b>Subcatchment11S: UD3</b>	Runoff Area=4.630 ac 0.00% Impervious Runoff Depth>1.65" Flow Length=413' Tc=22.2 min CN=84 Runoff=8.45 cfs 0.637 af
<b>Subcatchment12S: E-OFF-1</b>	Runoff Area=1.770 ac 20.00% Impervious Runoff Depth>1.30" Flow Length=1,171' Tc=42.3 min CN=79 Runoff=1.75 cfs 0.192 af
<b>Subcatchment13S: P-OFF-1</b>	Runoff Area=1.770 ac 20.00% Impervious Runoff Depth>1.30" Flow Length=916' Tc=42.5 min CN=79 Runoff=1.75 cfs 0.192 af
<b>Reach 5R: Pre-Development</b>	Inflow=72.10 cfs 6.121 af Outflow=72.10 cfs 6.121 af
<b>Reach 11R: Undetained</b>	Inflow=9.42 cfs 0.770 af Outflow=9.42 cfs 0.770 af
<b>Reach 12R: Detained</b>	Inflow=17.78 cfs 4.418 af Outflow=17.78 cfs 4.418 af
<b>Pond 6P: Pond 1</b>	Peak Elev=857.90' Storage=0.974 af Inflow=12.49 cfs 1.566 af 12.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/ Outflow=2.30 cfs 1.011 af
<b>Pond 7P: Pond 2</b>	Peak Elev=857.23' Storage=0.606 af Inflow=21.22 cfs 2.203 af Outflow=14.99 cfs 2.100 af

**Morning Meadows 2020-05-30**

*MSE 24-hr 3 5-Year Rainfall=3.26"*

Prepared by {enter your company name here}

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**Pond 8P: Pond 3**

Peak Elev=858.96' Storage=1.662 af Inflow=22.76 cfs 2.426 af  
12.0" Round Culvert n=0.011 L=120.0' S=0.0100 '/' Outflow=2.58 cfs 1.307 af

**Link 10L: Post-Development**

Inflow=20.25 cfs 5.188 af  
Primary=20.25 cfs 5.188 af

**Total Runoff Area = 98.570 ac Runoff Volume = 13.086 af Average Runoff Depth = 1.59"**  
**94.84% Pervious = 93.482 ac 5.16% Impervious = 5.088 ac**

**Summary for Subcatchment 1S: E-1**

Runoff = 15.48 cfs @ 12.47 hrs, Volume= 1.441 af, Depth> 1.44"

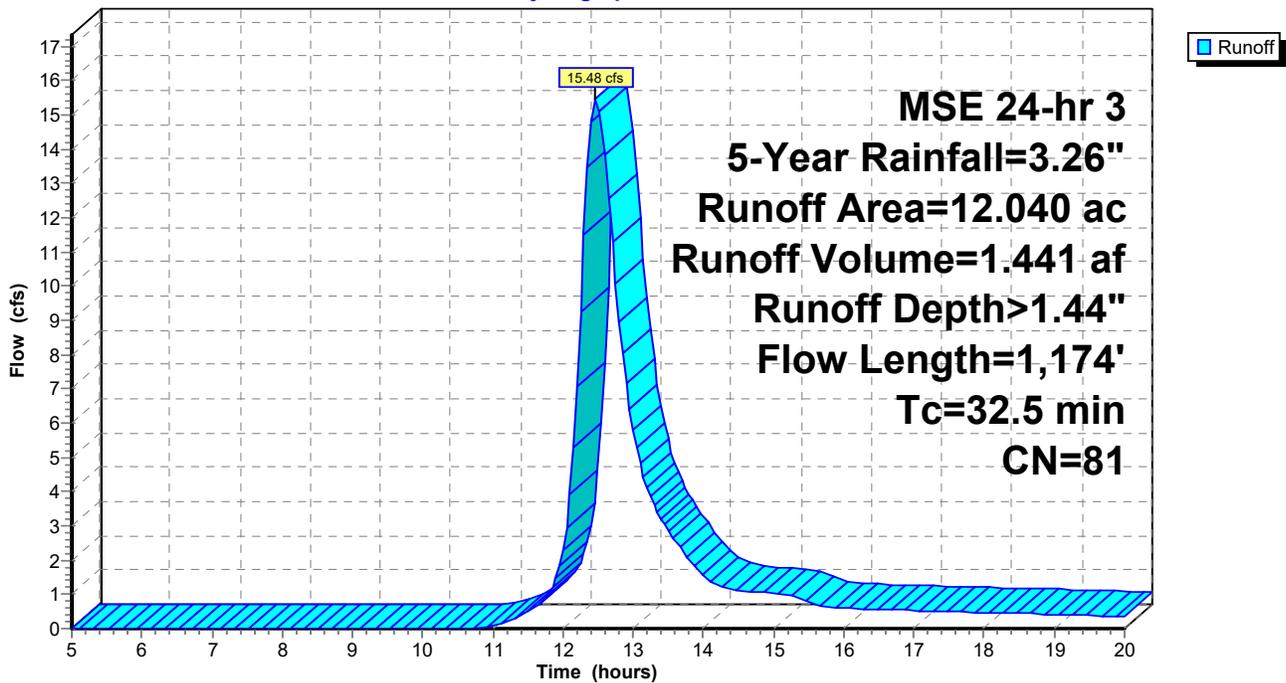
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 5.650	78	C, Cropland
* 6.390	83	D, Cropland
12.040	81	Weighted Average
12.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	275	0.0176	0.38		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.3	266	0.0131	1.03		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		<b>Shallow Concentrated Flow, C-D</b> Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		<b>Shallow Concentrated Flow, D-E</b> Cultivated Straight Rows Kv= 9.0 fps
32.5	1,174	Total			

**Subcatchment 1S: E-1**

Hydrograph



**Summary for Subcatchment 2S: E-2**

Runoff = 23.02 cfs @ 12.37 hrs, Volume= 1.835 af, Depth> 1.44"

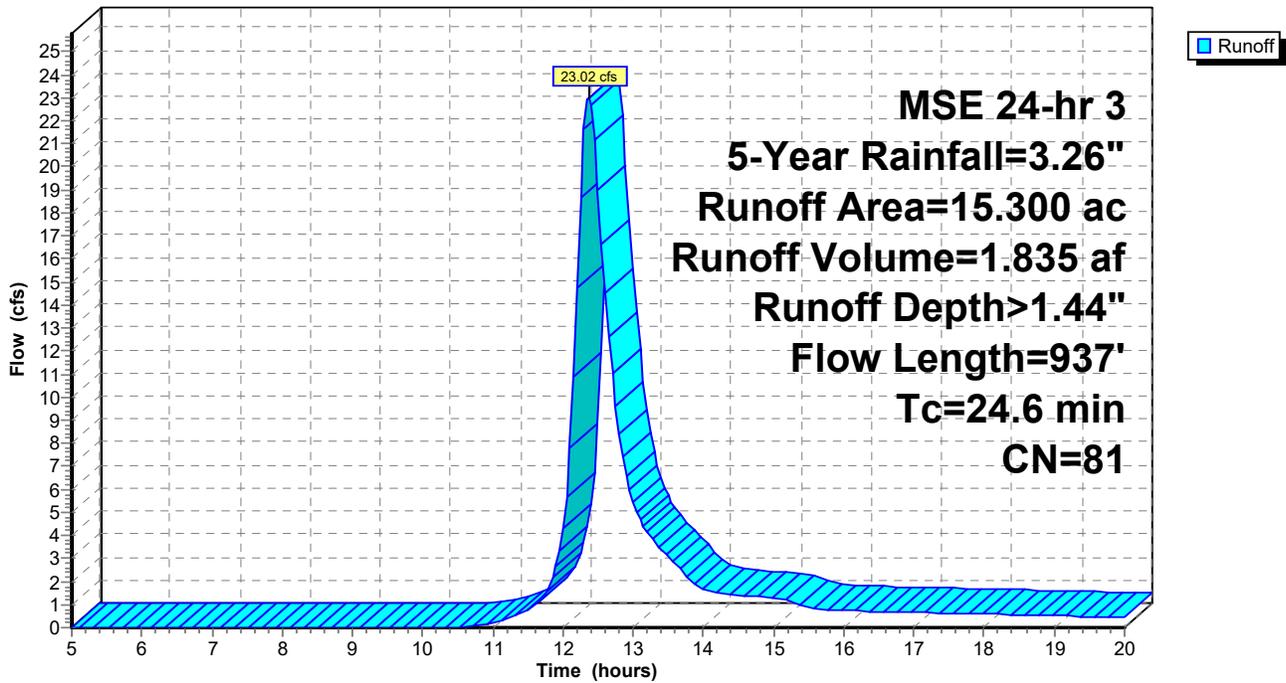
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 6.650	78	C, Cropland
* 8.650	83	D, Cropland
15.300	81	Weighted Average
15.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	275	0.0119	0.32		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
10.3	662	0.0142	1.07		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
24.6	937	Total			

**Subcatchment 2S: E-2**

Hydrograph



**Summary for Subcatchment 3S: E-3**

Runoff = 34.07 cfs @ 12.35 hrs, Volume= 2.654 af, Depth> 1.58"

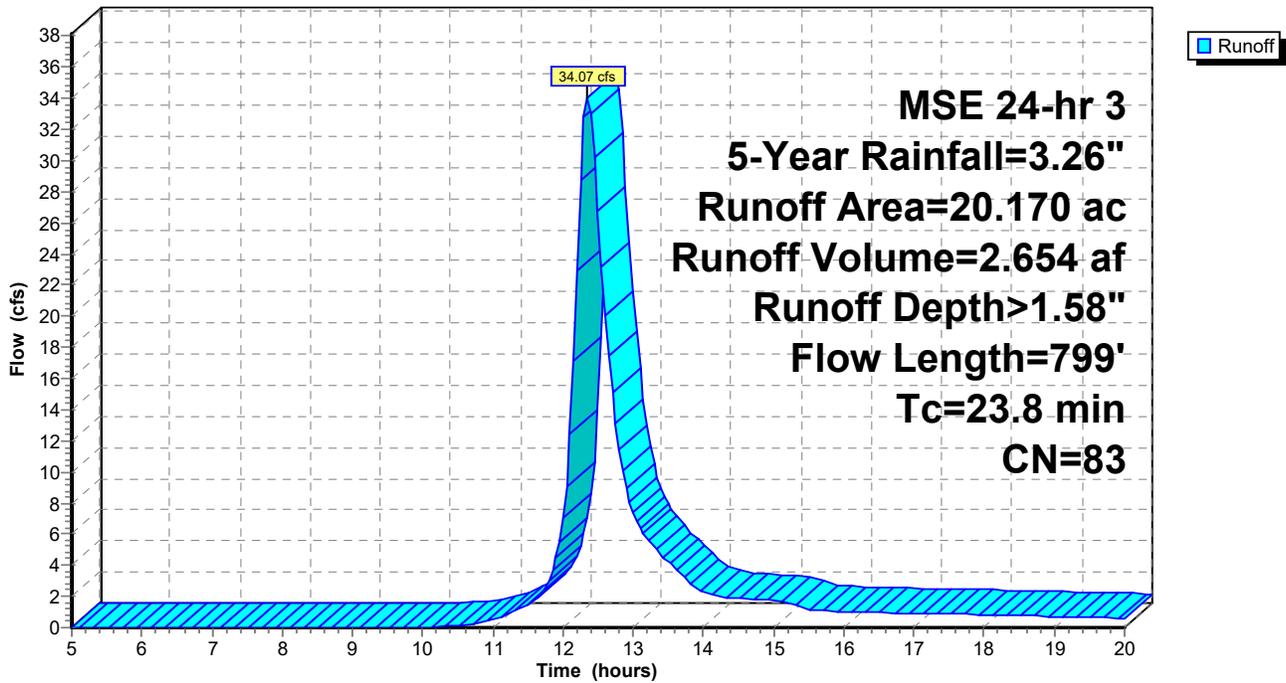
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 0.960	78	C, Cropland
* 19.210	83	D, Cropland
20.170	83	Weighted Average
20.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	275	0.0160	0.36		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
11.1	524	0.0077	0.79		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
23.8	799	Total			

**Subcatchment 3S: E-3**

Hydrograph



**Summary for Subcatchment 6S: P1**

Runoff = 10.86 cfs @ 12.74 hrs, Volume= 1.374 af, Depth> 1.64"

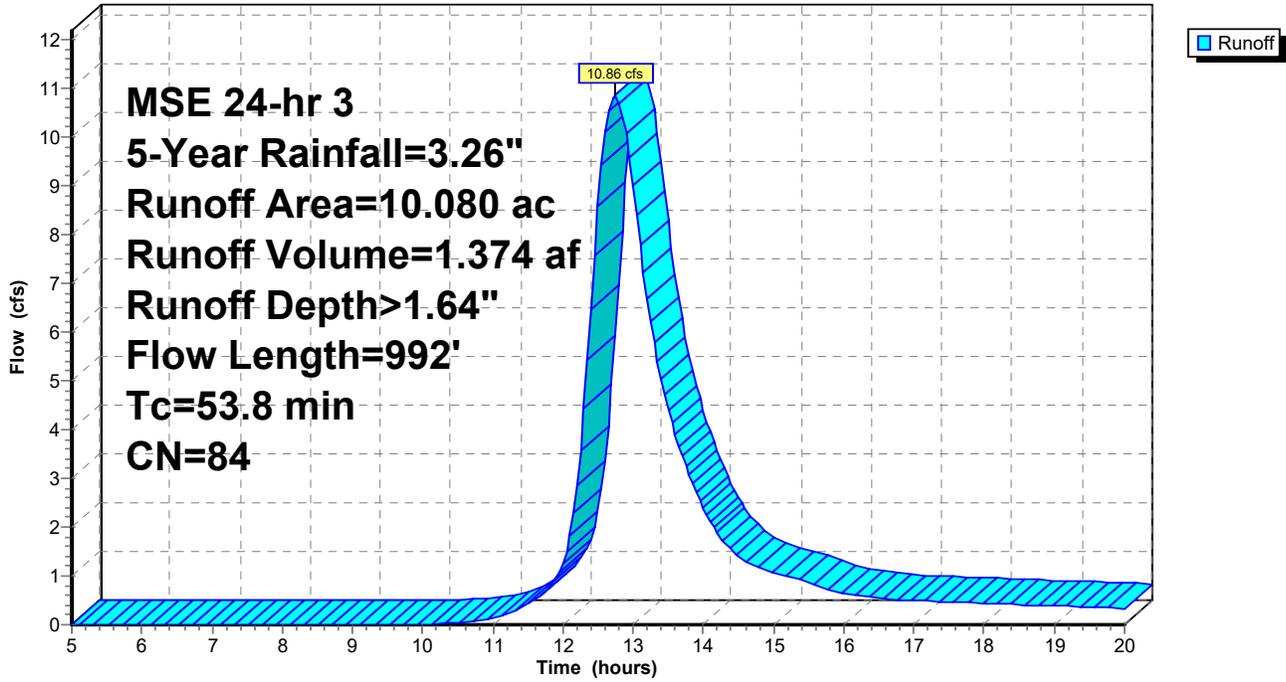
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 4.060	83	C, 1/4 Ac Lots
* 2.190	87	D, 1/4 Ac Lots
* 1.350	74	C, Open Space
* 1.450	80	D, Open Space
* 1.030	98	Pond
10.080	84	Weighted Average
9.050		89.78% Pervious Area
1.030		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	218	0.0180	0.12		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
23.2	730	0.0110	0.52	4.72	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, C-D</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
53.8	992	Total			

### Subcatchment 6S: P1

Hydrograph



**Summary for Subcatchment 7S: P2**

Runoff = 21.22 cfs @ 12.55 hrs, Volume= 2.203 af, Depth> 1.64"

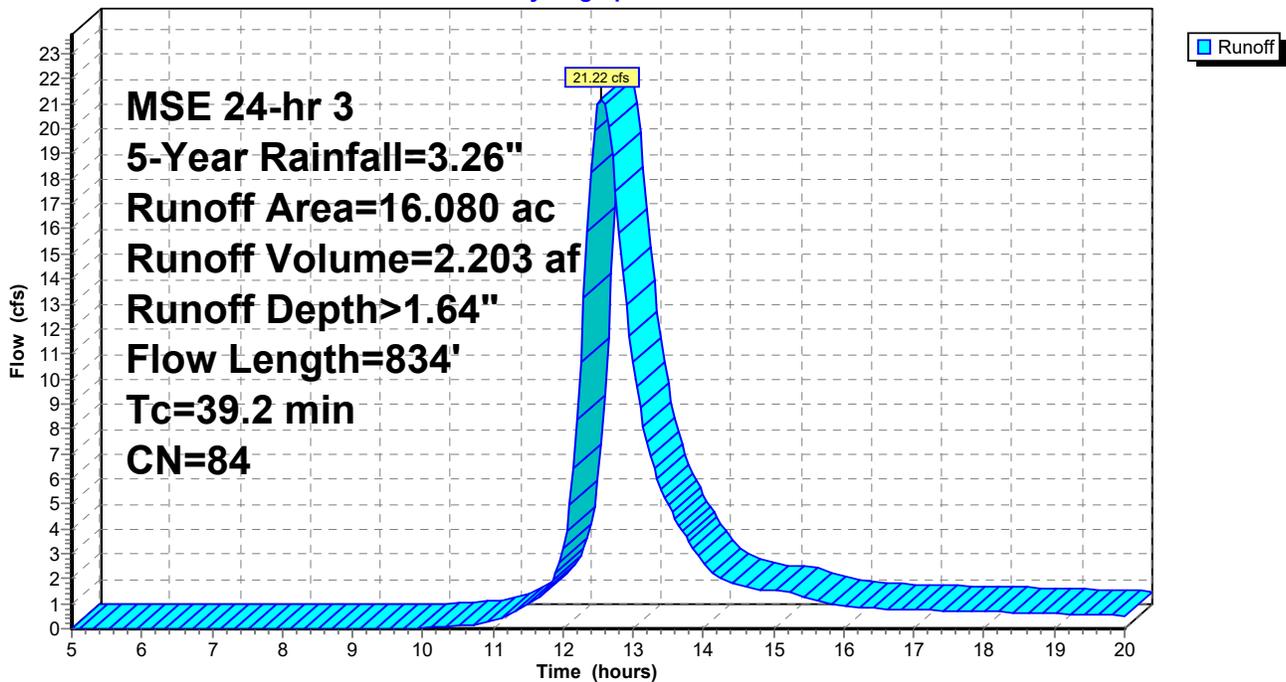
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 4.150	83	C, 1/4-Ac Lots
* 7.070	87	D, 1/4-Ac Lots
* 1.900	61	C, Open Space
* 1.260	80	D, Open Space
* 1.700	98	Pond
16.080	84	Weighted Average
14.380		89.43% Pervious Area
1.700		10.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	239	0.0160	0.17		<b>Sheet Flow, A-B</b> Grass: Short n= 0.150 P2= 2.66"
4.5	154	0.0130	0.57	5.13	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
2.0	89	0.0210	0.72	6.52	<b>Channel Flow, C-D</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.2	111	0.0140	8.31	14.69	<b>Pipe Channel, D-E</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
3.6	106	0.0094	0.48	4.36	<b>Channel Flow, E-F</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, F-G</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
5.1	48	0.0010	0.16	1.42	<b>Channel Flow, G-H</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	43	0.0100	7.03	12.41	<b>Pipe Channel, H-I</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
39.2	834	Total			

### Subcatchment 7S: P2

Hydrograph



**Summary for Subcatchment 8S: P3**

Runoff = 22.76 cfs @ 12.57 hrs, Volume= 2.426 af, Depth> 1.87"

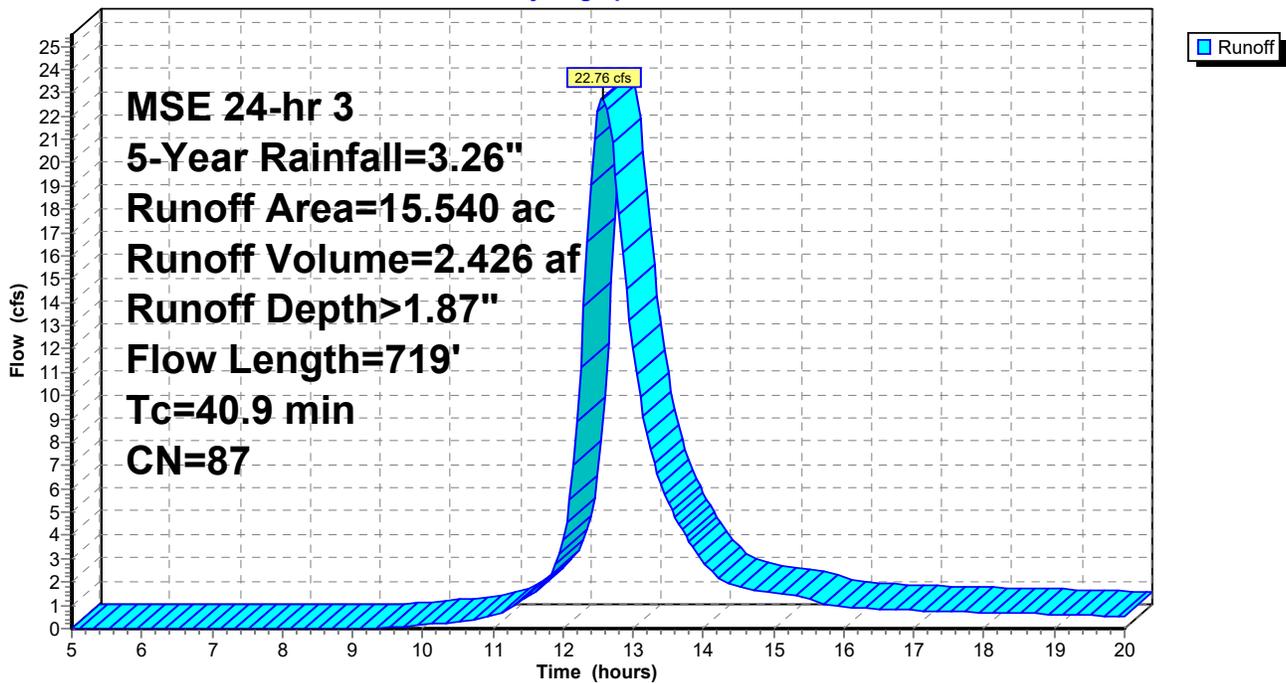
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 0.620	83	C, 1/4-Ac Lots
* 10.760	87	D, 1/4-Ac Lots
* 0.100	74	C, Open Space
* 2.410	80	D, Open Space
* 1.650	98	Pond
15.540	87	Weighted Average
13.890		89.38% Pervious Area
1.650		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.7	143	0.0180	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
19.2	576	0.0100	0.50	4.50	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
40.9	719	Total			

**Subcatchment 8S: P3**

Hydrograph



**Summary for Subcatchment 9S: UD1**

Runoff = 1.86 cfs @ 12.14 hrs, Volume= 0.082 af, Depth> 1.32"

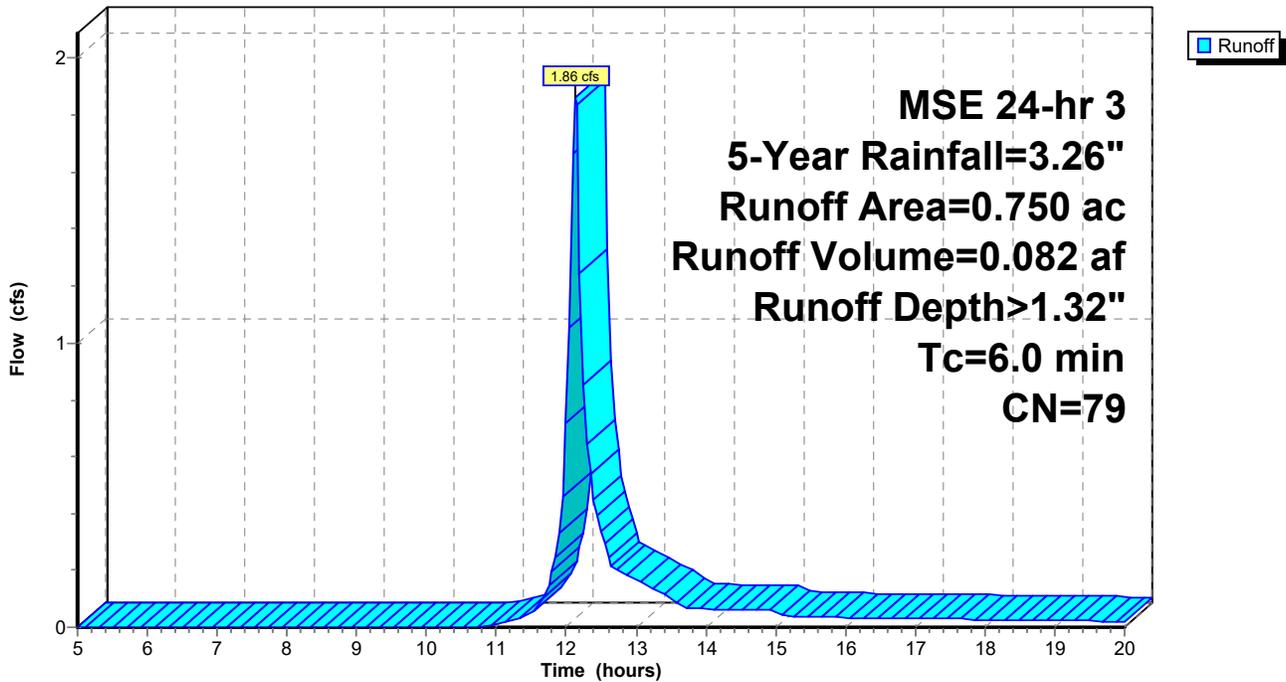
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 0.070	74	C, Open Space
* 0.680	80	D, Open Space
0.750	79	Weighted Average
0.750		100.00% Pervious Area

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

**Subcatchment 9S: UD1**

Hydrograph



**Summary for Subcatchment 10S: UD2**

Runoff = 1.15 cfs @ 12.14 hrs, Volume= 0.051 af, Depth> 1.38"

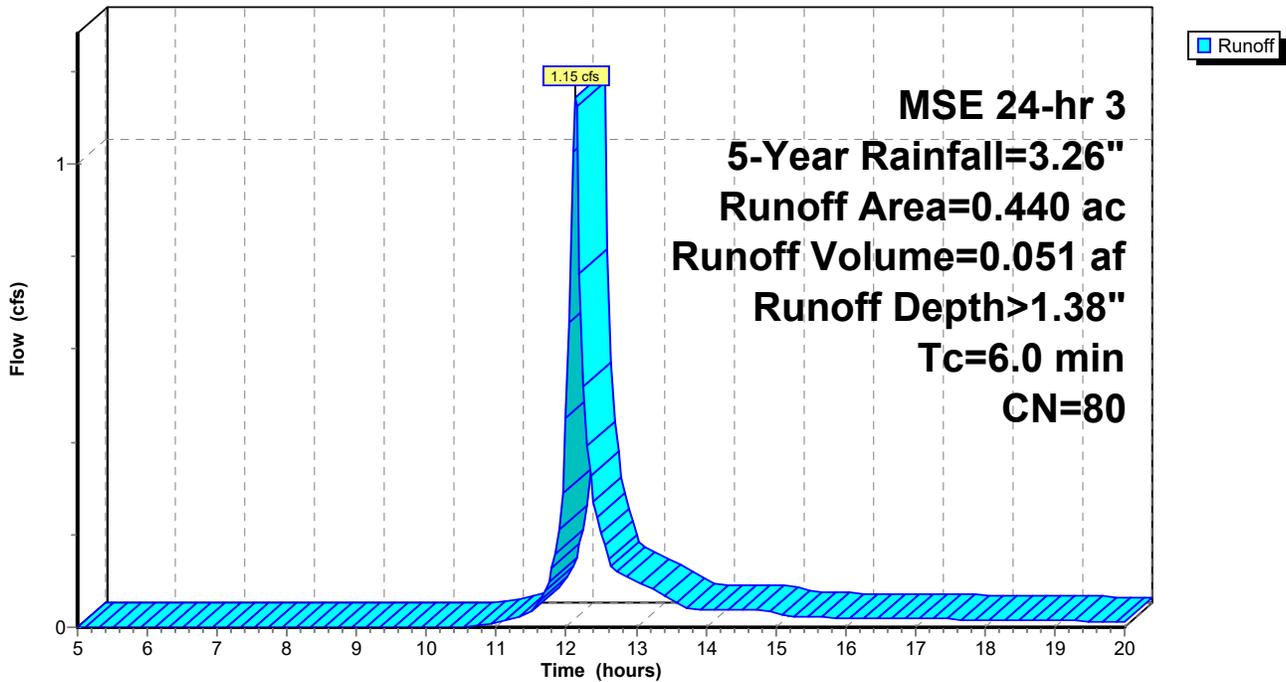
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 0.030	74	c, Open Space
* 0.410	80	D, Open Space
0.440	80	Weighted Average
0.440		100.00% Pervious Area

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

**Subcatchment 10S: UD2**

Hydrograph



**Summary for Subcatchment 11S: UD3**

Runoff = 8.45 cfs @ 12.33 hrs, Volume= 0.637 af, Depth> 1.65"

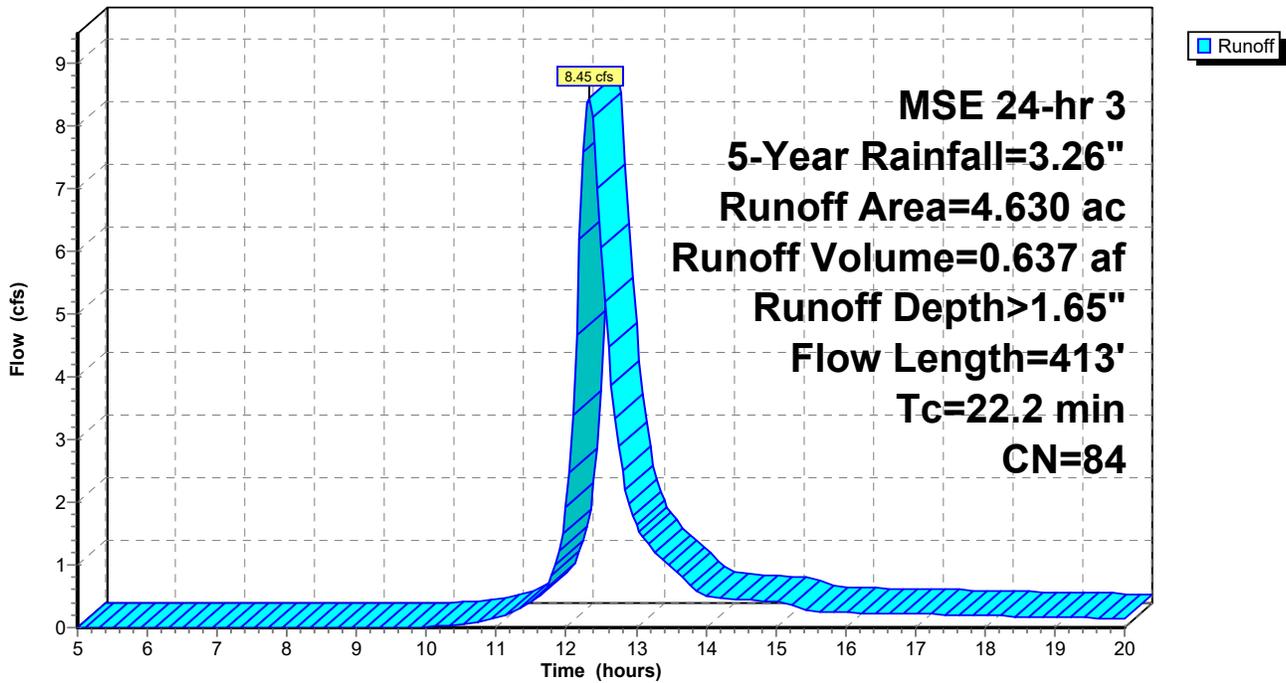
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 5-Year Rainfall=3.26"

Area (ac)	CN	Description
* 2.700	87	D, 1/4-Ac Lots
* 1.930	80	D, Open Space
4.630	84	Weighted Average
4.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	50	0.0150	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
12.1	363	0.0100	0.50	4.50	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
22.2	413	Total			

**Subcatchment 11S: UD3**

Hydrograph



**Summary for Subcatchment 12S: E-OFF-1**

Runoff = 1.75 cfs @ 12.61 hrs, Volume= 0.192 af, Depth> 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 5-Year Rainfall=3.26"

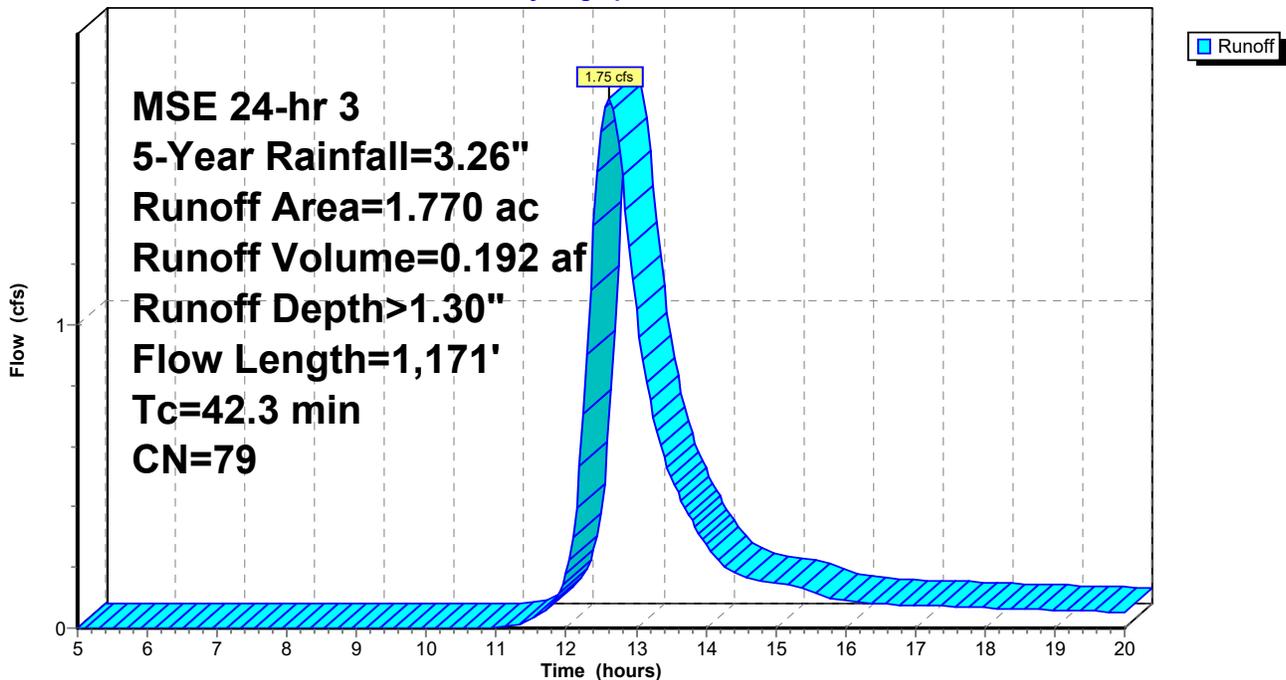
Area (ac)	CN	Description
1.770	79	1 acre lots, 20% imp, HSG C
1.416		80.00% Pervious Area
0.354		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	162	0.0210	0.17		<b>Sheet Flow, A-AA</b> Grass: Short n= 0.150 P2= 2.66"
6.4	113	0.0150	0.29		<b>Sheet Flow, AA-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.4	263	0.0120	0.99		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		<b>Shallow Concentrated Flow, C-D</b> Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		<b>Shallow Concentrated Flow, D-E</b> Cultivated Straight Rows Kv= 9.0 fps
42.3	1,171	Total			

**Subcatchment 12S: E-OFF-1**

Hydrograph



**Summary for Subcatchment 13S: P-OFF-1**

Runoff = 1.75 cfs @ 12.61 hrs, Volume= 0.192 af, Depth> 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 5-Year Rainfall=3.26"

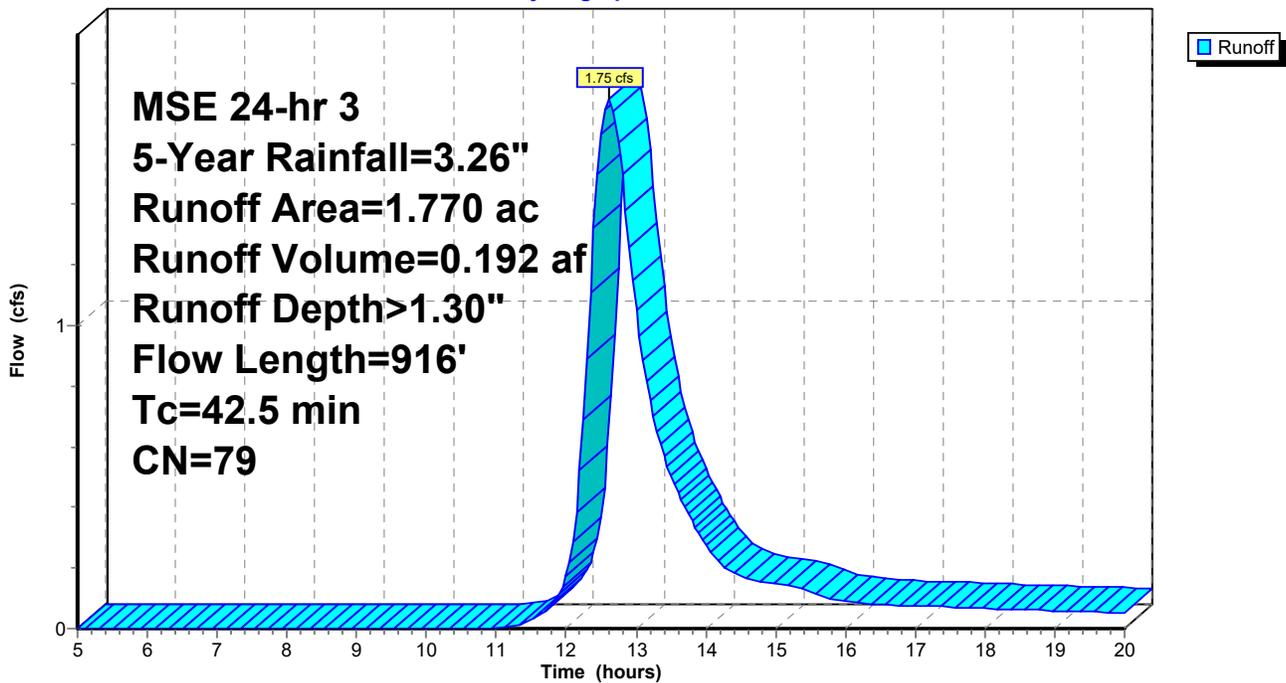
Area (ac)	CN	Description
1.770	79	1 acre lots, 20% imp, HSG C
1.416		80.00% Pervious Area
0.354		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	162	0.0210	0.17		<b>Sheet Flow, A-AA</b> Grass: Short n= 0.150 P2= 2.66"
6.7	45	0.0130	0.11		<b>Sheet Flow, AA-B</b> Grass: Short n= 0.150 P2= 2.66"
20.2	665	0.0120	0.55	4.93	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, C-D</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
42.5	916	Total			

**Subcatchment 13S: P-OFF-1**

Hydrograph



### Summary for Reach 5R: Pre-Development

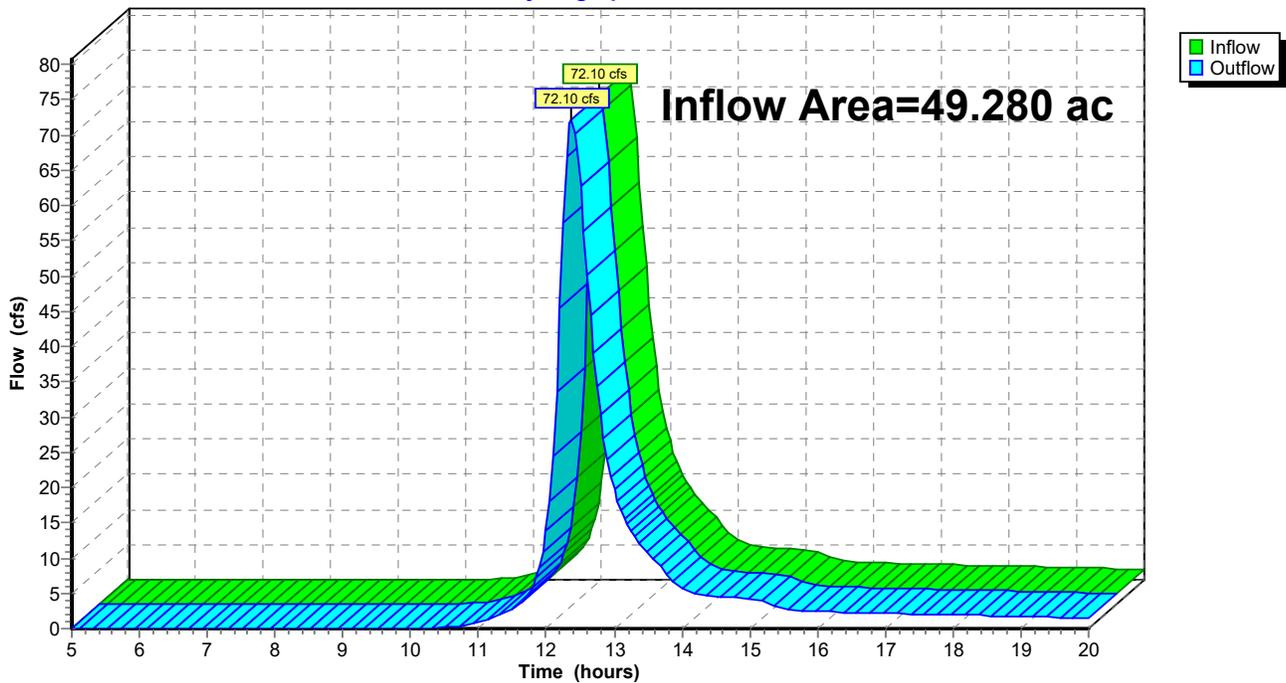
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 49.280 ac, 0.72% Impervious, Inflow Depth > 1.49" for 5-Year event  
Inflow = 72.10 cfs @ 12.38 hrs, Volume= 6.121 af  
Outflow = 72.10 cfs @ 12.38 hrs, Volume= 6.121 af, Atten= 0%, Lag= 0.0 min

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

### Reach 5R: Pre-Development

Hydrograph



### Summary for Reach 11R: Undetained

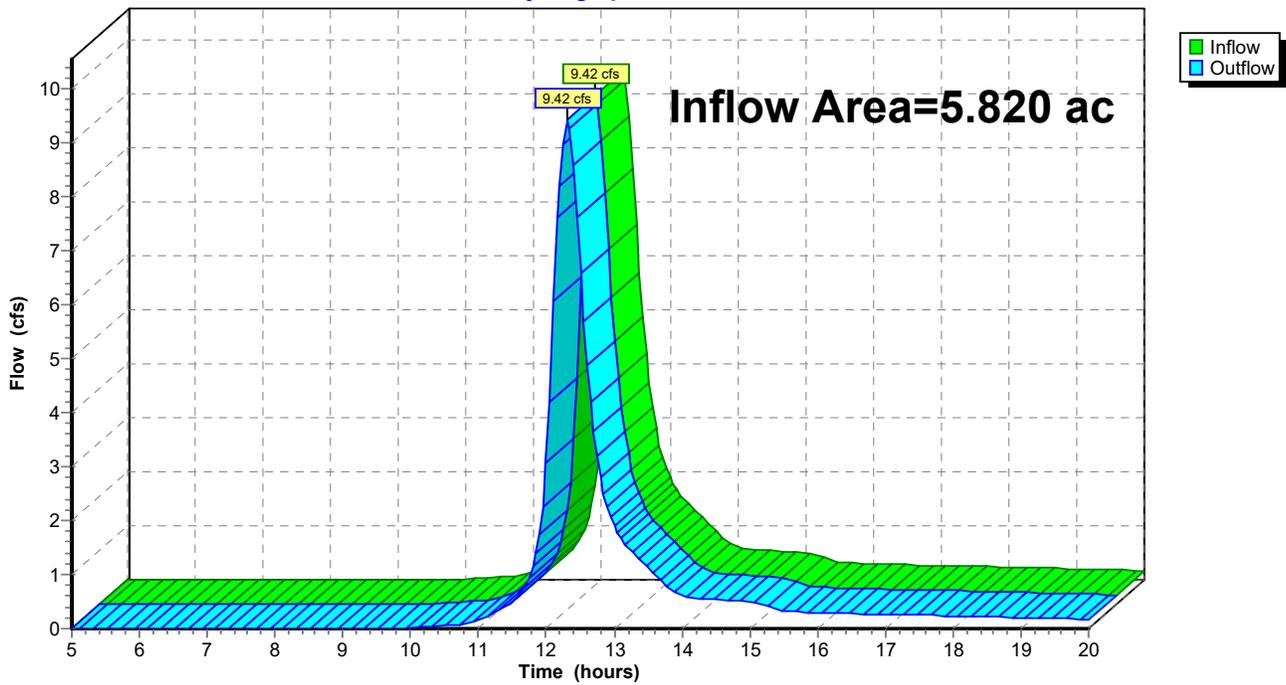
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.820 ac, 0.00% Impervious, Inflow Depth > 1.59" for 5-Year event  
Inflow = 9.42 cfs @ 12.31 hrs, Volume= 0.770 af  
Outflow = 9.42 cfs @ 12.31 hrs, Volume= 0.770 af, Atten= 0%, Lag= 0.0 min

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

### Reach 11R: Undetained

Hydrograph



### Summary for Reach 12R: Detained

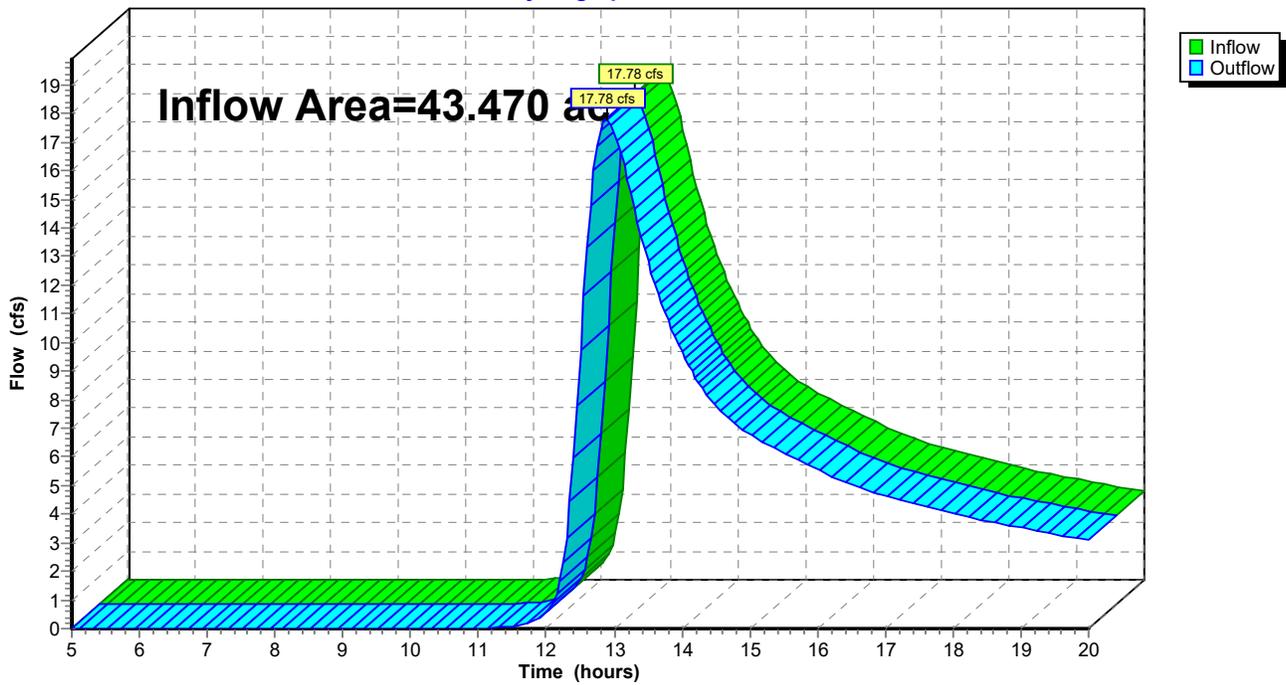
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 43.470 ac, 10.89% Impervious, Inflow Depth > 1.22" for 5-Year event  
Inflow = 17.78 cfs @ 12.89 hrs, Volume= 4.418 af  
Outflow = 17.78 cfs @ 12.89 hrs, Volume= 4.418 af, Atten= 0%, Lag= 0.0 min

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

### Reach 12R: Detained

Hydrograph



**Summary for Pond 6P: Pond 1**

Inflow Area = 11.850 ac, 11.68% Impervious, Inflow Depth > 1.59" for 5-Year event  
 Inflow = 12.49 cfs @ 12.72 hrs, Volume= 1.566 af  
 Outflow = 2.30 cfs @ 14.12 hrs, Volume= 1.011 af, Atten= 82%, Lag= 83.9 min  
 Primary = 2.30 cfs @ 14.12 hrs, Volume= 1.011 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 857.90' @ 14.12 hrs Surf.Area= 1.129 ac Storage= 0.974 af

Plug-Flow detention time= 190.6 min calculated for 1.008 af (64% of inflow)  
 Center-of-Mass det. time= 134.6 min ( 955.6 - 821.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	857.00'	6.825 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

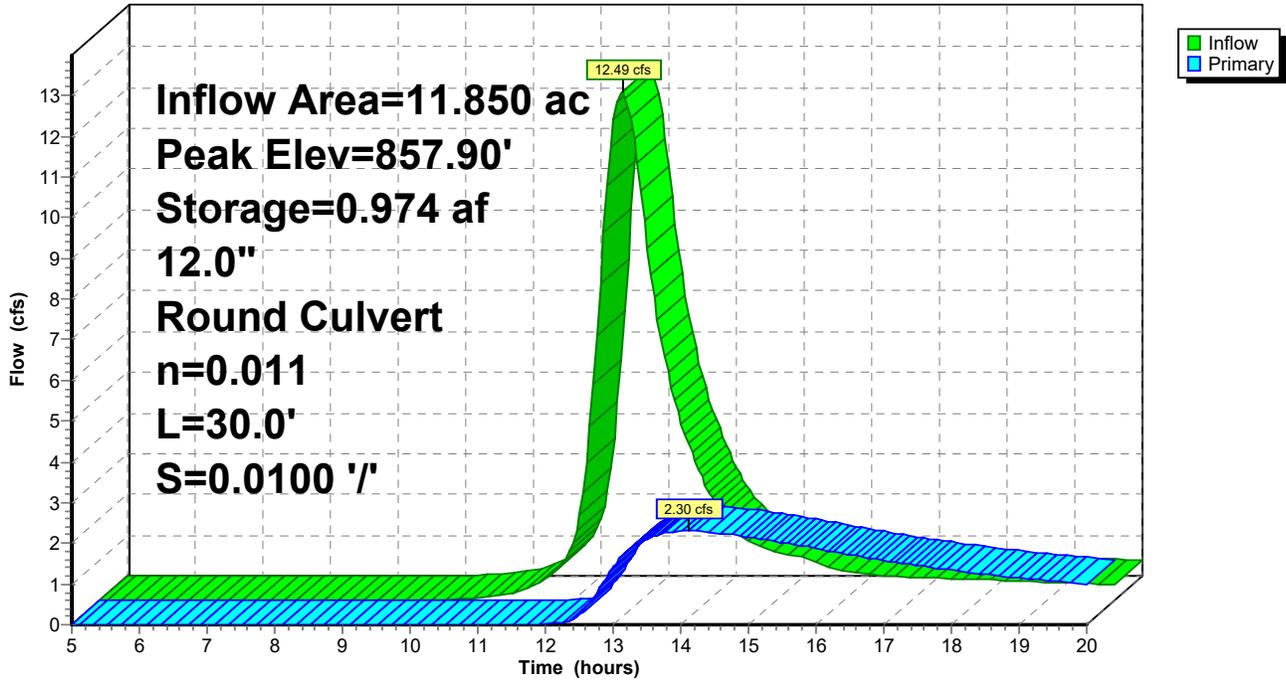
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
857.00	1.030	0.000	0.000
858.00	1.140	1.085	1.085
859.00	1.270	1.205	2.290
860.00	1.420	1.345	3.635
861.00	1.570	1.495	5.130
862.00	1.820	1.695	6.825

Device	Routing	Invert	Outlet Devices
#1	Primary	857.00'	<b>12.0" Round RCP_Round 12"</b> L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 857.00' / 856.70' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

**Primary OutFlow** Max=2.30 cfs @ 14.12 hrs HW=857.90' (Free Discharge)  
 ↑1=RCP\_Round 12" (Barrel Controls 2.30 cfs @ 4.07 fps)

### Pond 6P: Pond 1

Hydrograph



**Summary for Pond 7P: Pond 2**

Inflow Area = 16.080 ac, 10.57% Impervious, Inflow Depth > 1.64" for 5-Year event  
 Inflow = 21.22 cfs @ 12.55 hrs, Volume= 2.203 af  
 Outflow = 14.99 cfs @ 12.83 hrs, Volume= 2.100 af, Atten= 29%, Lag= 16.8 min  
 Primary = 14.99 cfs @ 12.83 hrs, Volume= 2.100 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 857.23' @ 12.83 hrs Surf.Area= 0.526 ac Storage= 0.606 af

Plug-Flow detention time= 47.5 min calculated for 2.100 af (95% of inflow)  
 Center-of-Mass det. time= 31.6 min ( 841.0 - 809.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	856.00'	2.280 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
856.00	0.461	0.000	0.000
857.00	0.514	0.487	0.487
858.00	0.568	0.541	1.028
859.00	0.625	0.596	1.625
860.00	0.684	0.654	2.280

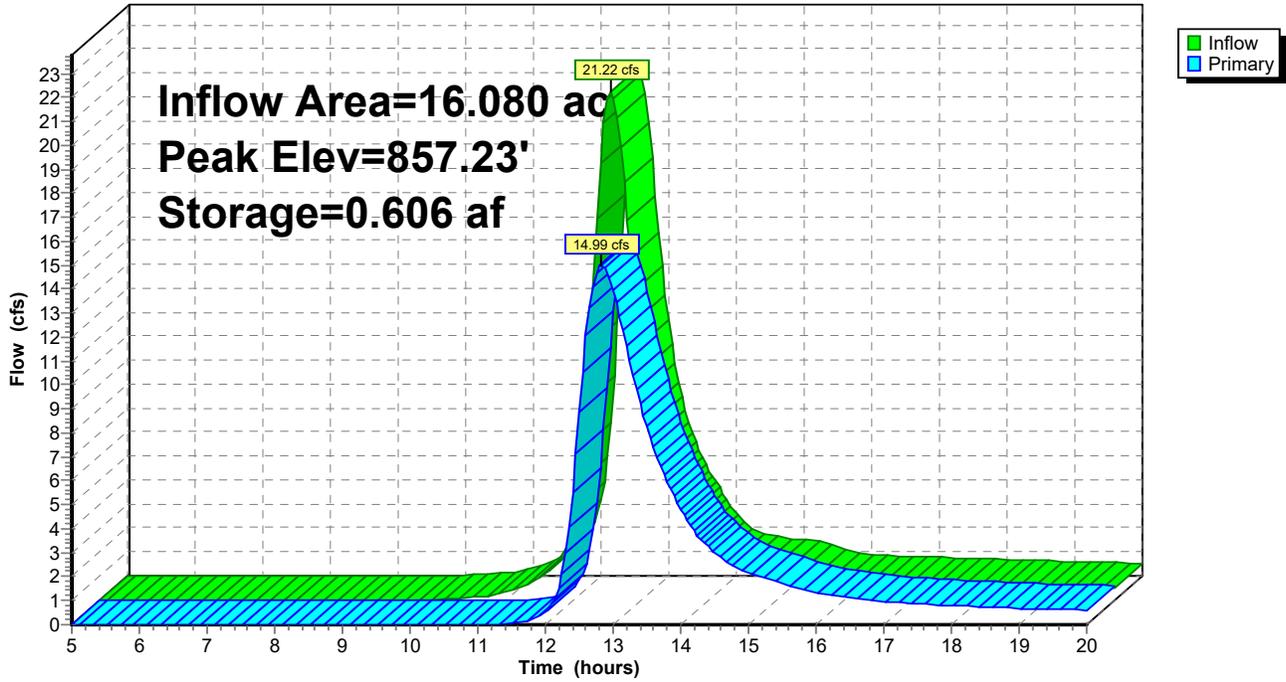
Device	Routing	Invert	Outlet Devices
#1	Primary	856.00'	<b>24.0" Round Culvert</b> L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 856.00' / 855.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	856.00'	<b>24.0" Round Culvert</b> L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 856.00' / 855.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

**Primary OutFlow** Max=14.96 cfs @ 12.83 hrs HW=857.23' (Free Discharge)

1=Culvert (Barrel Controls 7.48 cfs @ 5.30 fps)  
 2=Culvert (Barrel Controls 7.48 cfs @ 5.30 fps)

### Pond 7P: Pond 2

Hydrograph



**Summary for Pond 8P: Pond 3**

Inflow Area = 15.540 ac, 10.62% Impervious, Inflow Depth > 1.87" for 5-Year event  
 Inflow = 22.76 cfs @ 12.57 hrs, Volume= 2.426 af  
 Outflow = 2.58 cfs @ 14.09 hrs, Volume= 1.307 af, Atten= 89%, Lag= 91.1 min  
 Primary = 2.58 cfs @ 14.09 hrs, Volume= 1.307 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 858.96' @ 14.09 hrs Surf.Area= 1.822 ac Storage= 1.662 af

Plug-Flow detention time= 217.8 min calculated for 1.302 af (54% of inflow)  
 Center-of-Mass det. time= 157.1 min ( 962.0 - 804.9 )

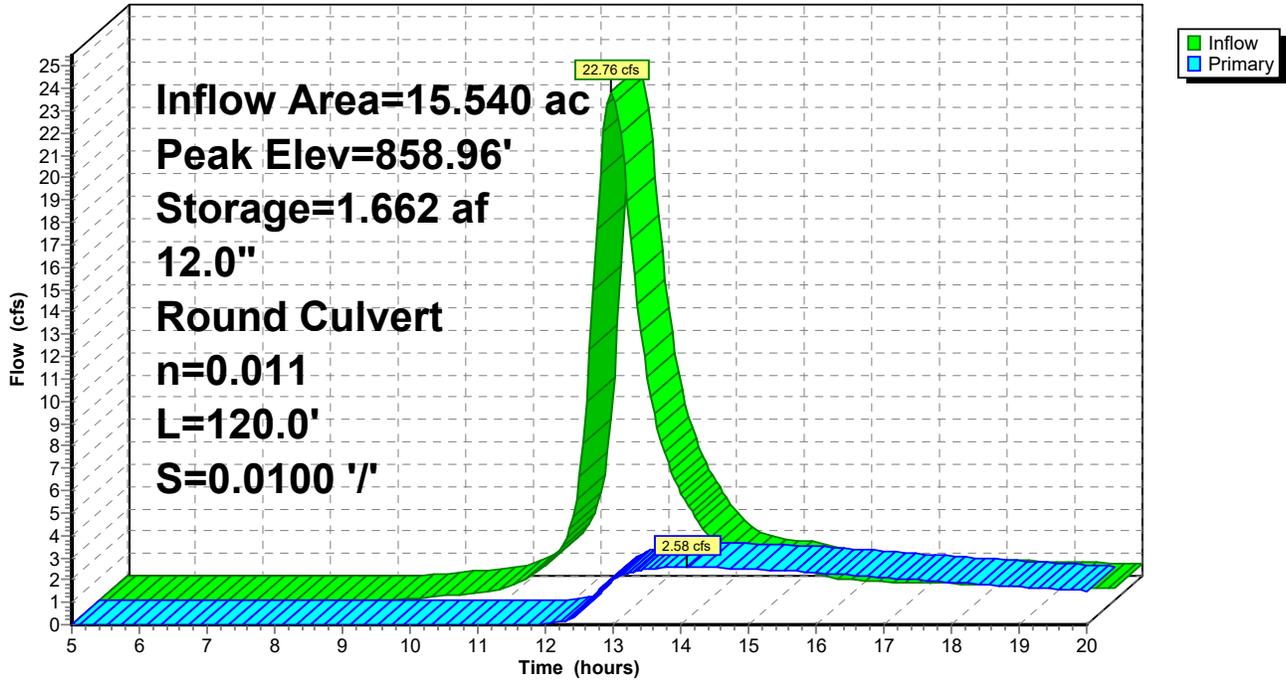
Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	8.080 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
858.00	1.650	0.000	0.000
859.00	1.830	1.740	1.740
860.00	2.020	1.925	3.665
861.00	2.210	2.115	5.780
862.00	2.390	2.300	8.080

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	<b>12.0" Round RCP_Round 12"</b> L= 120.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 856.80' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

**Primary OutFlow** Max=2.58 cfs @ 14.09 hrs HW=858.96' (Free Discharge)  
 ↑1=RCP\_Round 12" (Inlet Controls 2.58 cfs @ 3.33 fps)

### Pond 8P: Pond 3

Hydrograph



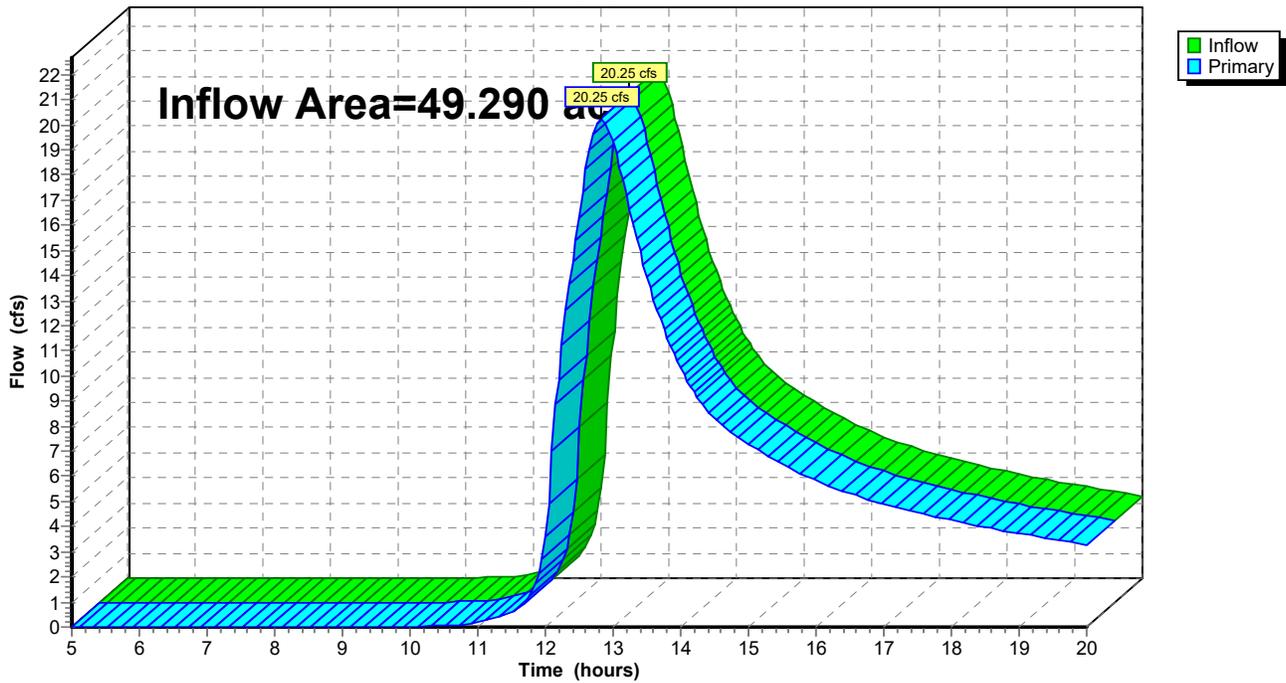
### Summary for Link 10L: Post-Development

Inflow Area = 49.290 ac, 9.60% Impervious, Inflow Depth > 1.26" for 5-Year event  
Inflow = 20.25 cfs @ 12.82 hrs, Volume= 5.188 af  
Primary = 20.25 cfs @ 12.82 hrs, Volume= 5.188 af, Atten= 0%, Lag= 0.0 min

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

### Link 10L: Post-Development

Hydrograph



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

**Subcatchment1S: E-1** Runoff Area=12.040 ac 0.00% Impervious Runoff Depth>4.07"  
Flow Length=1,174' Tc=32.5 min CN=81 Runoff=43.59 cfs 4.088 af

**Subcatchment2S: E-2** Runoff Area=15.300 ac 0.00% Impervious Runoff Depth>4.08"  
Flow Length=937' Tc=24.6 min CN=81 Runoff=64.57 cfs 5.206 af

**Subcatchment3S: E-3** Runoff Area=20.170 ac 0.00% Impervious Runoff Depth>4.29"  
Flow Length=799' Tc=23.8 min CN=83 Runoff=90.85 cfs 7.219 af

**Subcatchment6S: P1** Runoff Area=10.080 ac 10.22% Impervious Runoff Depth>4.37"  
Flow Length=992' Tc=53.8 min CN=84 Runoff=28.57 cfs 3.670 af

**Subcatchment7S: P2** Runoff Area=16.080 ac 10.57% Impervious Runoff Depth>4.39"  
Flow Length=834' Tc=39.2 min CN=84 Runoff=55.62 cfs 5.876 af

**Subcatchment8S: P3** Runoff Area=15.540 ac 10.62% Impervious Runoff Depth>4.71"  
Flow Length=719' Tc=40.9 min CN=87 Runoff=55.58 cfs 6.097 af

**Subcatchment9S: UD1** Runoff Area=0.750 ac 0.00% Impervious Runoff Depth>3.89"  
Tc=6.0 min CN=79 Runoff=5.33 cfs 0.243 af

**Subcatchment10S: UD2** Runoff Area=0.440 ac 0.00% Impervious Runoff Depth>4.00"  
Tc=6.0 min CN=80 Runoff=3.20 cfs 0.147 af

**Subcatchment11S: UD3** Runoff Area=4.630 ac 0.00% Impervious Runoff Depth>4.40"  
Flow Length=413' Tc=22.2 min CN=84 Runoff=22.04 cfs 1.699 af

**Subcatchment12S: E-OFF-1** Runoff Area=1.770 ac 20.00% Impervious Runoff Depth>3.86"  
Flow Length=1,171' Tc=42.3 min CN=79 Runoff=5.20 cfs 0.569 af

**Subcatchment13S: P-OFF-1** Runoff Area=1.770 ac 20.00% Impervious Runoff Depth>3.86"  
Flow Length=916' Tc=42.5 min CN=79 Runoff=5.21 cfs 0.569 af

**Reach 5R: Pre-Development** Inflow=198.98 cfs 17.082 af  
Outflow=198.98 cfs 17.082 af

**Reach 11R: Undetained** Inflow=24.64 cfs 2.089 af  
Outflow=24.64 cfs 2.089 af

**Reach 12R: Detained** Inflow=46.84 cfs 11.493 af  
Outflow=46.84 cfs 11.493 af

**Pond 6P: Pond 1** Peak Elev=859.36' Storage=2.752 af Inflow=33.42 cfs 4.238 af  
12.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/ Outflow=5.15 cfs 2.799 af

**Pond 7P: Pond 2** Peak Elev=858.64' Storage=1.402 af Inflow=55.62 cfs 5.876 af  
Outflow=38.70 cfs 5.725 af

**Morning Meadows 2020-05-30**

*MSE 24-hr 3 100-Year Rainfall=6.41"*

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**Pond 8P: Pond 3**

Peak Elev=860.35' Storage=4.375 af Inflow=55.58 cfs 6.097 af  
12.0" Round Culvert n=0.011 L=120.0' S=0.0100 '/' Outflow=4.91 cfs 2.970 af

**Link 10L: Post-Development**

Inflow=53.76 cfs 13.582 af  
Primary=53.76 cfs 13.582 af

**Total Runoff Area = 98.570 ac Runoff Volume = 35.382 af Average Runoff Depth = 4.31"**  
**94.84% Pervious = 93.482 ac 5.16% Impervious = 5.088 ac**

**Summary for Subcatchment 1S: E-1**

Runoff = 43.59 cfs @ 12.45 hrs, Volume= 4.088 af, Depth> 4.07"

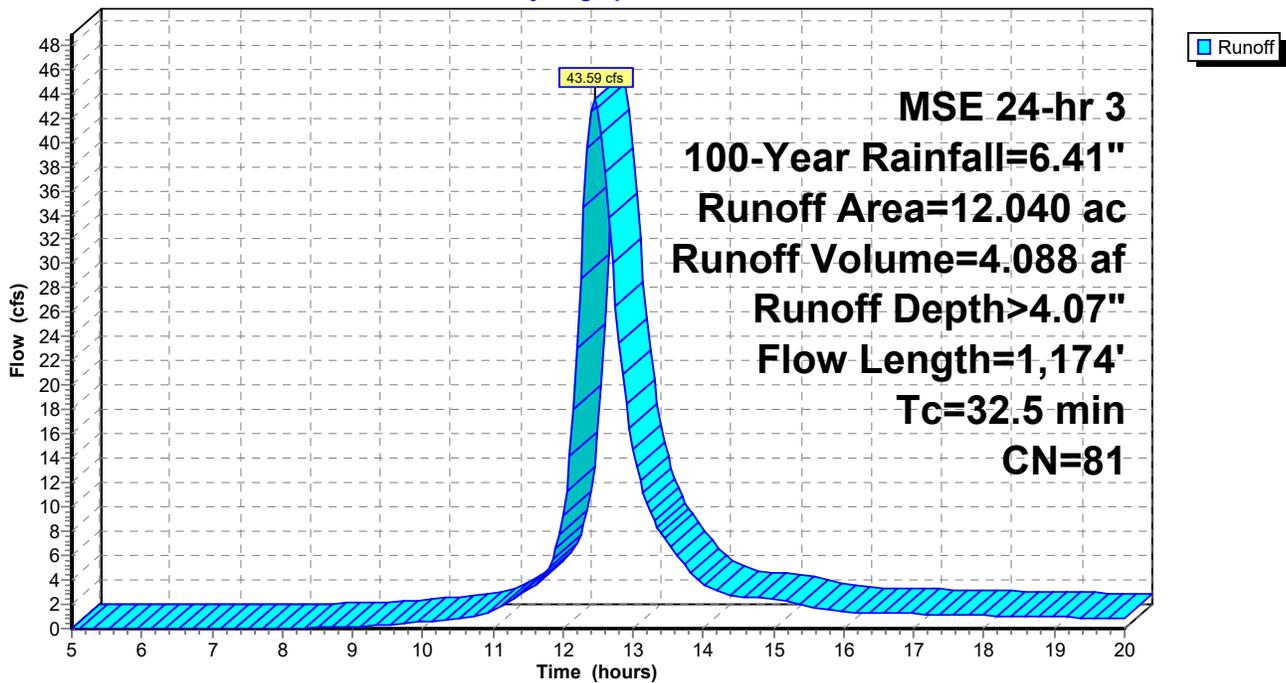
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 5.650	78	C, Cropland
* 6.390	83	D, Cropland
12.040	81	Weighted Average
12.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	275	0.0176	0.38		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.3	266	0.0131	1.03		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		<b>Shallow Concentrated Flow, C-D</b> Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		<b>Shallow Concentrated Flow, D-E</b> Cultivated Straight Rows Kv= 9.0 fps
32.5	1,174	Total			

**Subcatchment 1S: E-1**

Hydrograph



**Summary for Subcatchment 2S: E-2**

Runoff = 64.57 cfs @ 12.35 hrs, Volume= 5.206 af, Depth> 4.08"

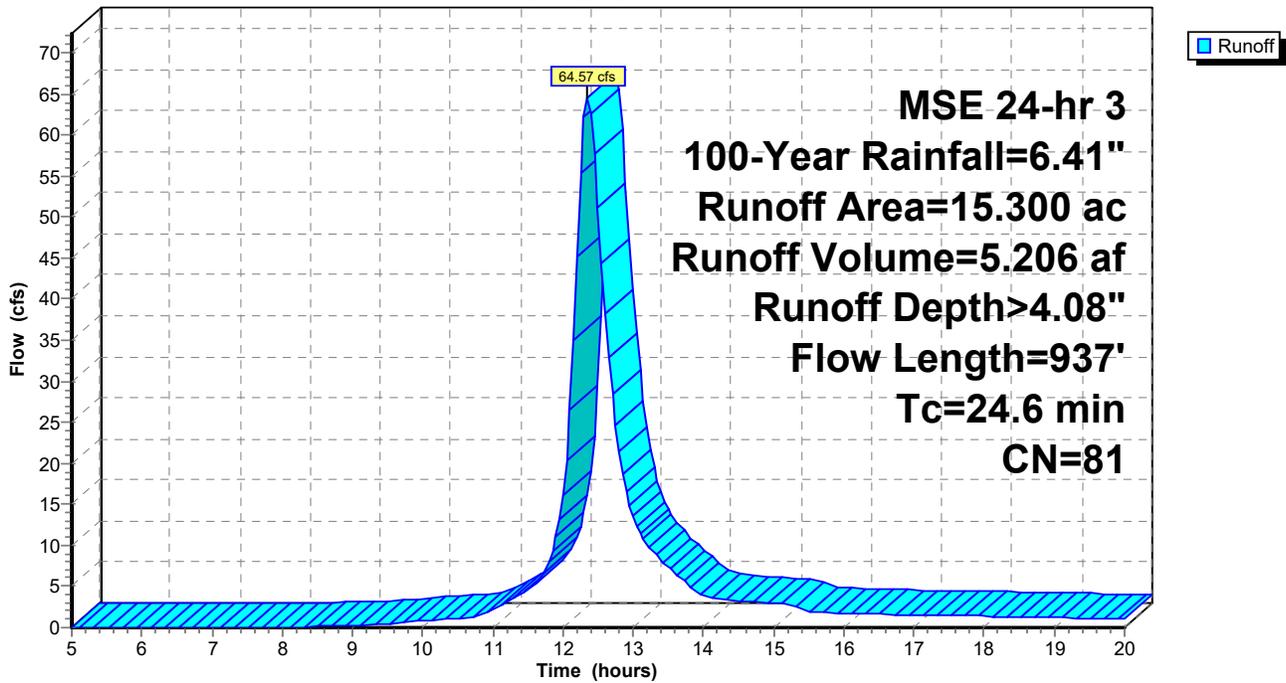
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 6.650	78	C, Cropland
* 8.650	83	D, Cropland
15.300	81	Weighted Average
15.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	275	0.0119	0.32		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
10.3	662	0.0142	1.07		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
24.6	937	Total			

**Subcatchment 2S: E-2**

Hydrograph



**Summary for Subcatchment 3S: E-3**

Runoff = 90.85 cfs @ 12.34 hrs, Volume= 7.219 af, Depth> 4.29"

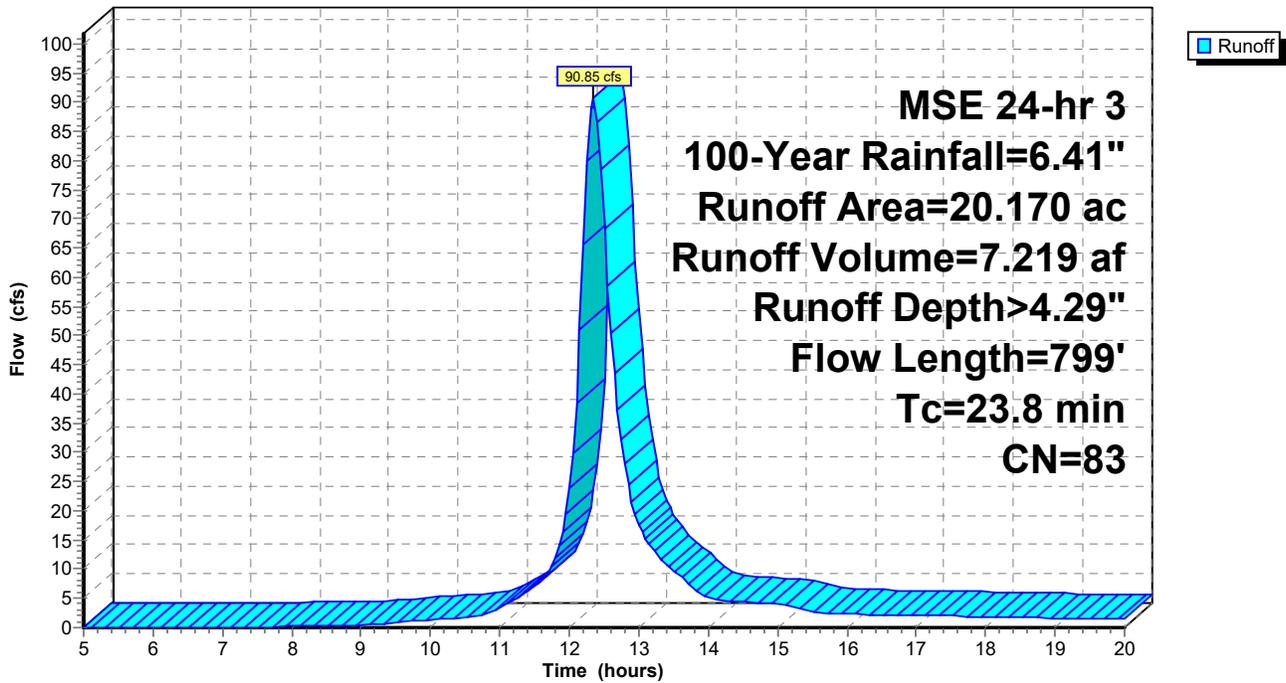
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 0.960	78	C, Cropland
* 19.210	83	D, Cropland
20.170	83	Weighted Average
20.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	275	0.0160	0.36		<b>Sheet Flow, A-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
11.1	524	0.0077	0.79		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
23.8	799	Total			

**Subcatchment 3S: E-3**

Hydrograph



**Summary for Subcatchment 6S: P1**

Runoff = 28.57 cfs @ 12.72 hrs, Volume= 3.670 af, Depth> 4.37"

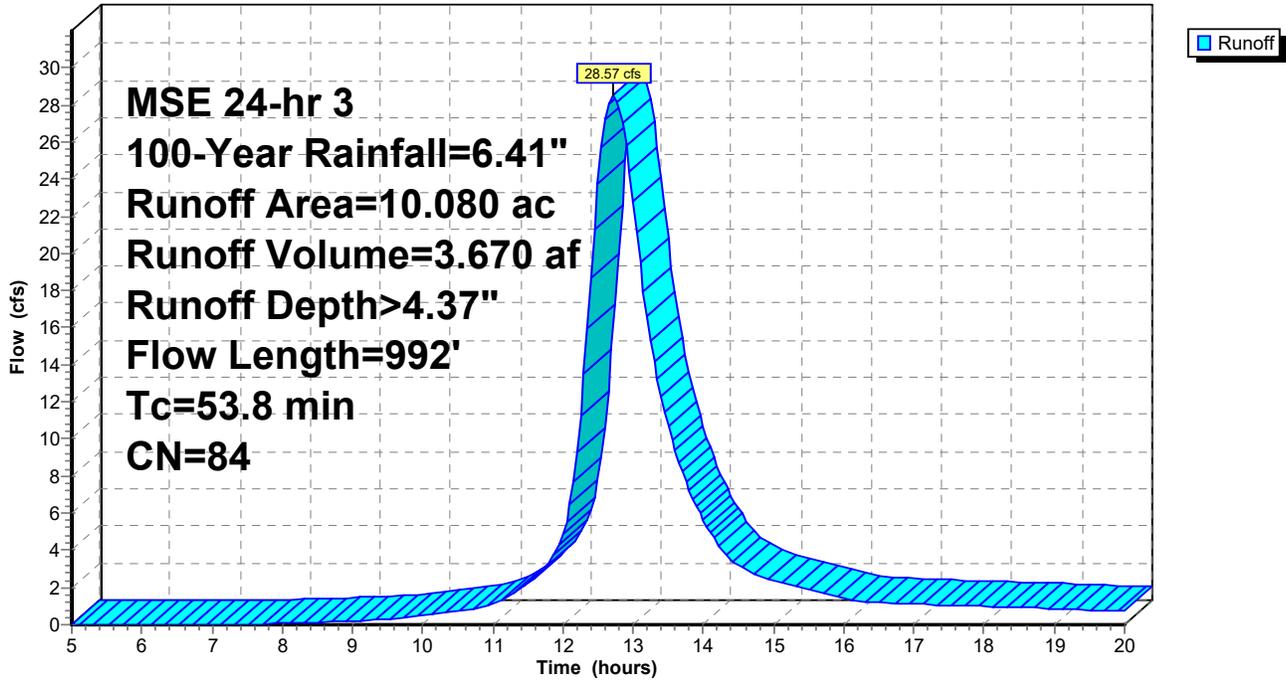
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 4.060	83	C, 1/4 Ac Lots
* 2.190	87	D, 1/4 Ac Lots
* 1.350	74	C, Open Space
* 1.450	80	D, Open Space
* 1.030	98	Pond
10.080	84	Weighted Average
9.050		89.78% Pervious Area
1.030		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.5	218	0.0180	0.12		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
23.2	730	0.0110	0.52	4.72	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, C-D</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
53.8	992	Total			

### Subcatchment 6S: P1

Hydrograph



**Summary for Subcatchment 7S: P2**

Runoff = 55.62 cfs @ 12.53 hrs, Volume= 5.876 af, Depth> 4.39"

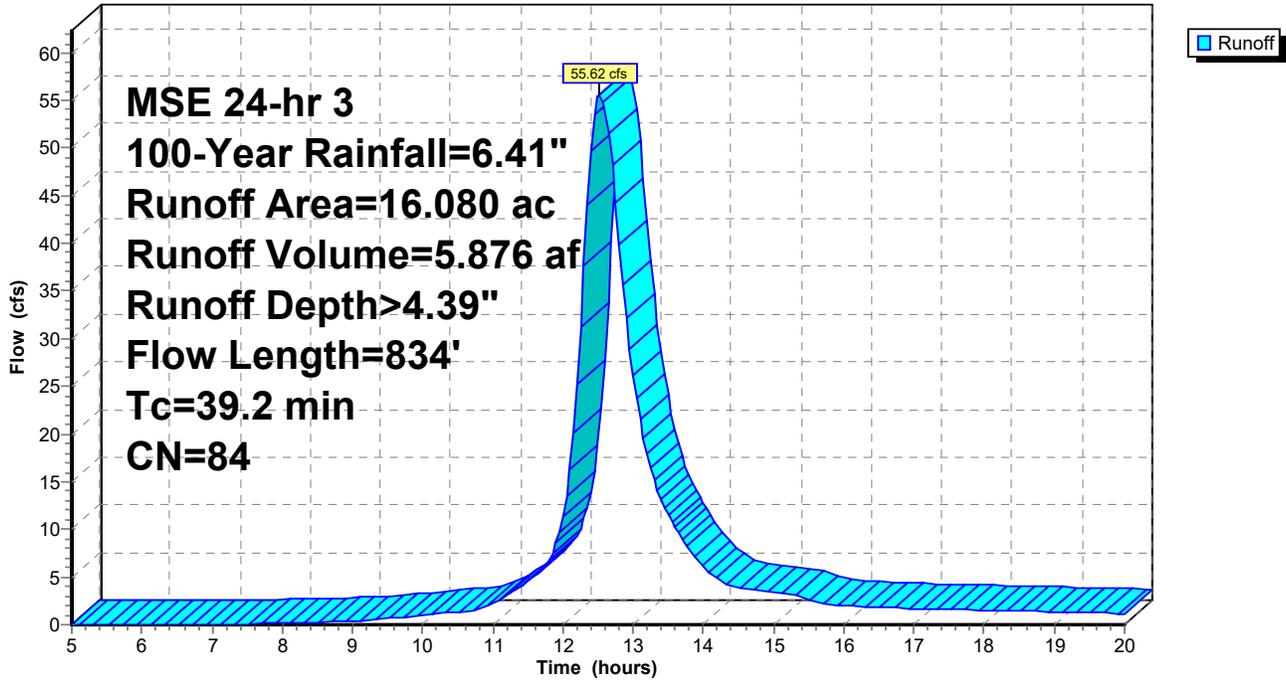
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 4.150	83	C, 1/4-Ac Lots
* 7.070	87	D, 1/4-Ac Lots
* 1.900	61	C, Open Space
* 1.260	80	D, Open Space
* 1.700	98	Pond
16.080	84	Weighted Average
14.380		89.43% Pervious Area
1.700		10.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	239	0.0160	0.17		<b>Sheet Flow, A-B</b> Grass: Short n= 0.150 P2= 2.66"
4.5	154	0.0130	0.57	5.13	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
2.0	89	0.0210	0.72	6.52	<b>Channel Flow, C-D</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.2	111	0.0140	8.31	14.69	<b>Pipe Channel, D-E</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
3.6	106	0.0094	0.48	4.36	<b>Channel Flow, E-F</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, F-G</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
5.1	48	0.0010	0.16	1.42	<b>Channel Flow, G-H</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	43	0.0100	7.03	12.41	<b>Pipe Channel, H-I</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
39.2	834	Total			

### Subcatchment 7S: P2

Hydrograph



**Summary for Subcatchment 8S: P3**

Runoff = 55.58 cfs @ 12.55 hrs, Volume= 6.097 af, Depth> 4.71"

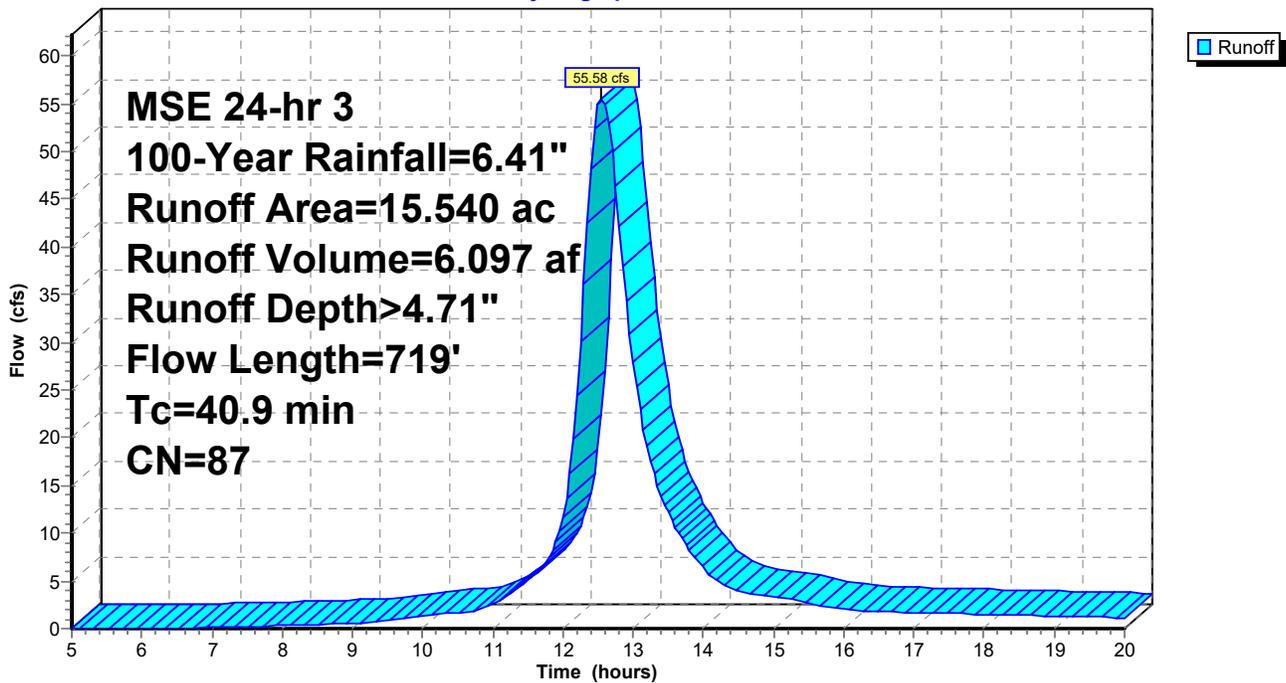
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 0.620	83	C, 1/4-Ac Lots
* 10.760	87	D, 1/4-Ac Lots
* 0.100	74	C, Open Space
* 2.410	80	D, Open Space
* 1.650	98	Pond
15.540	87	Weighted Average
13.890		89.38% Pervious Area
1.650		10.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.7	143	0.0180	0.11		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
19.2	576	0.0100	0.50	4.50	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
40.9	719	Total			

**Subcatchment 8S: P3**

Hydrograph



**Summary for Subcatchment 9S: UD1**

Runoff = 5.33 cfs @ 12.13 hrs, Volume= 0.243 af, Depth> 3.89"

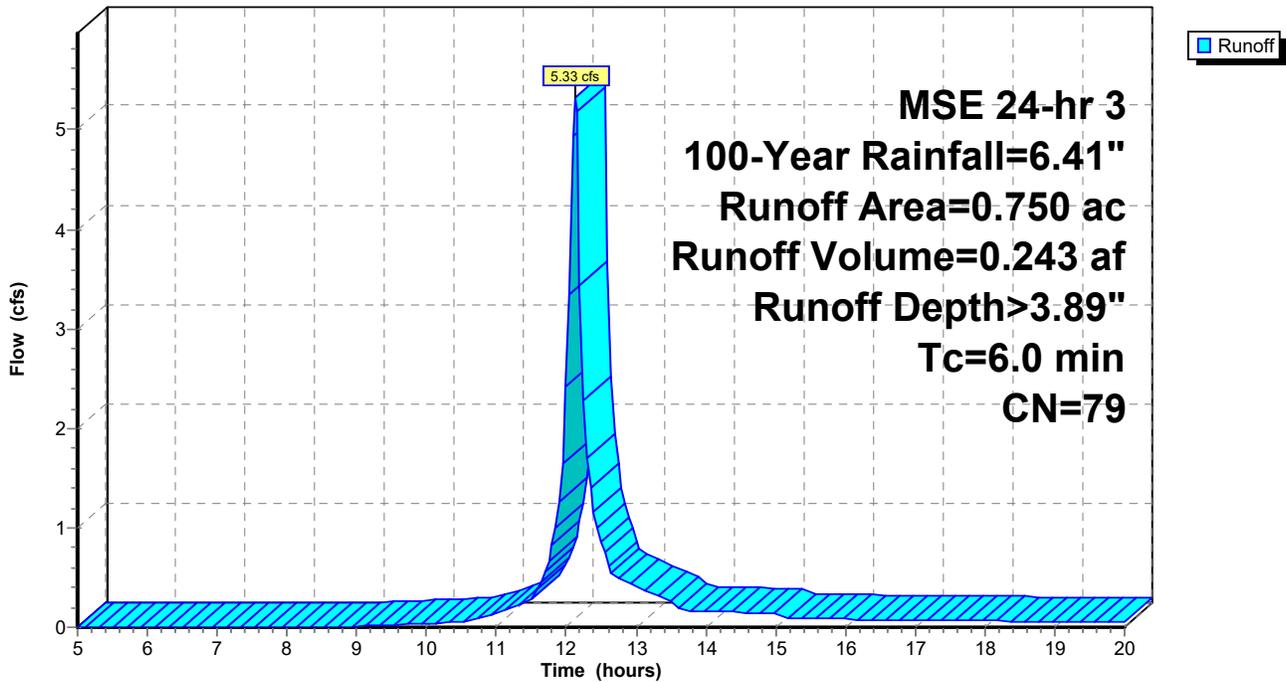
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 0.070	74	C, Open Space
* 0.680	80	D, Open Space
0.750	79	Weighted Average
0.750		100.00% Pervious Area

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

**Subcatchment 9S: UD1**

Hydrograph



**Summary for Subcatchment 10S: UD2**

Runoff = 3.20 cfs @ 12.13 hrs, Volume= 0.147 af, Depth> 4.00"

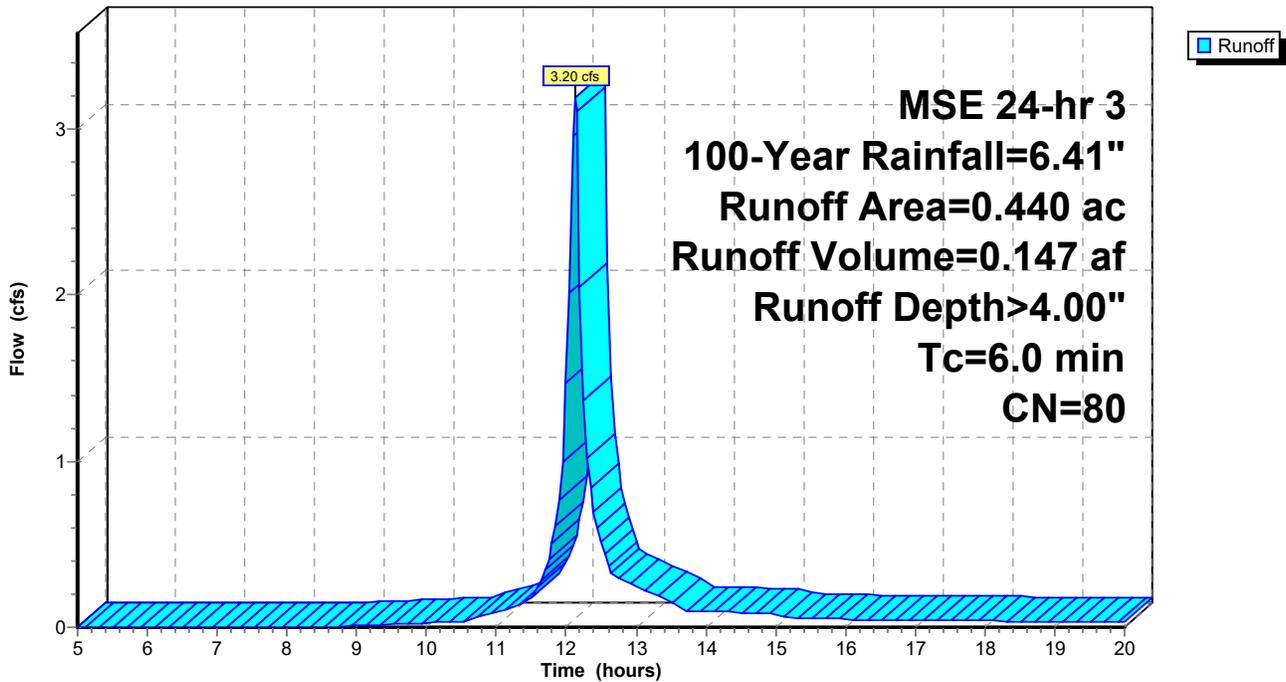
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 0.030	74	c, Open Space
* 0.410	80	D, Open Space
0.440	80	Weighted Average
0.440		100.00% Pervious Area

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

**Subcatchment 10S: UD2**

Hydrograph



**Summary for Subcatchment 11S: UD3**

Runoff = 22.04 cfs @ 12.32 hrs, Volume= 1.699 af, Depth> 4.40"

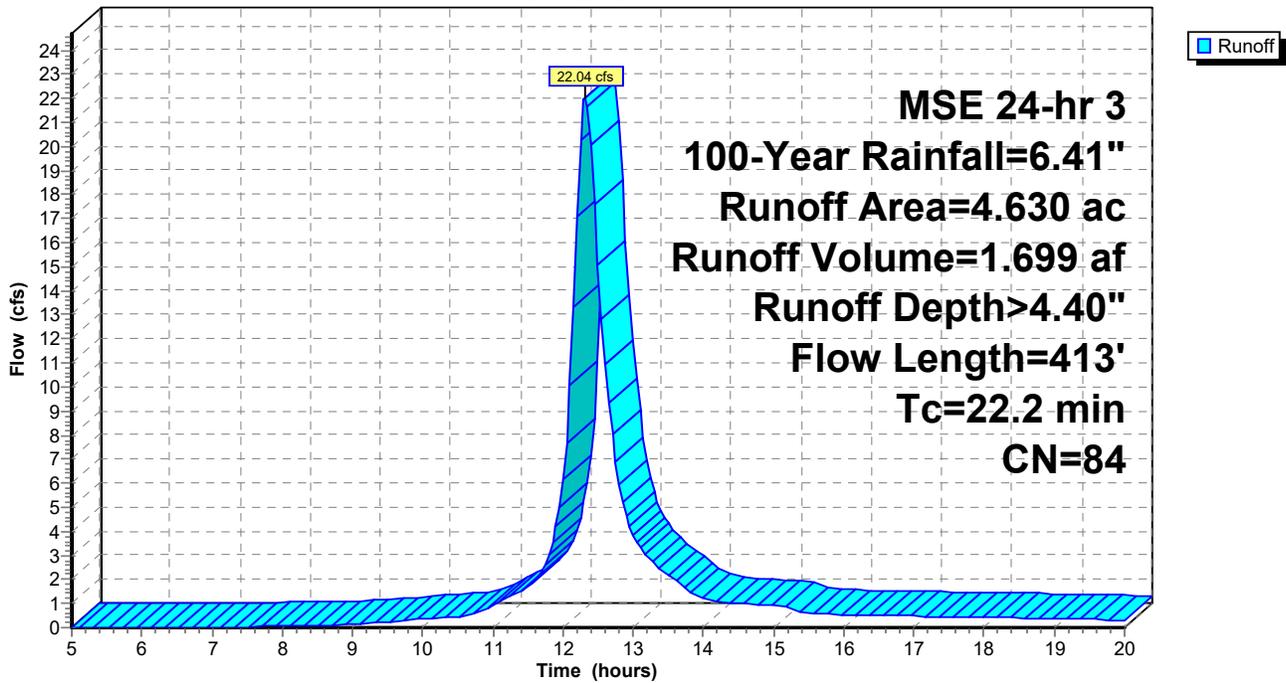
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

Area (ac)	CN	Description
* 2.700	87	D, 1/4-Ac Lots
* 1.930	80	D, Open Space
4.630	84	Weighted Average
4.630		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	50	0.0150	0.08		<b>Sheet Flow, A-B</b> Grass: Dense n= 0.240 P2= 2.66"
12.1	363	0.0100	0.50	4.50	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
22.2	413	Total			

**Subcatchment 11S: UD3**

Hydrograph



**Summary for Subcatchment 12S: E-OFF-1**

Runoff = 5.20 cfs @ 12.58 hrs, Volume= 0.569 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 MSE 24-hr 3 100-Year Rainfall=6.41"

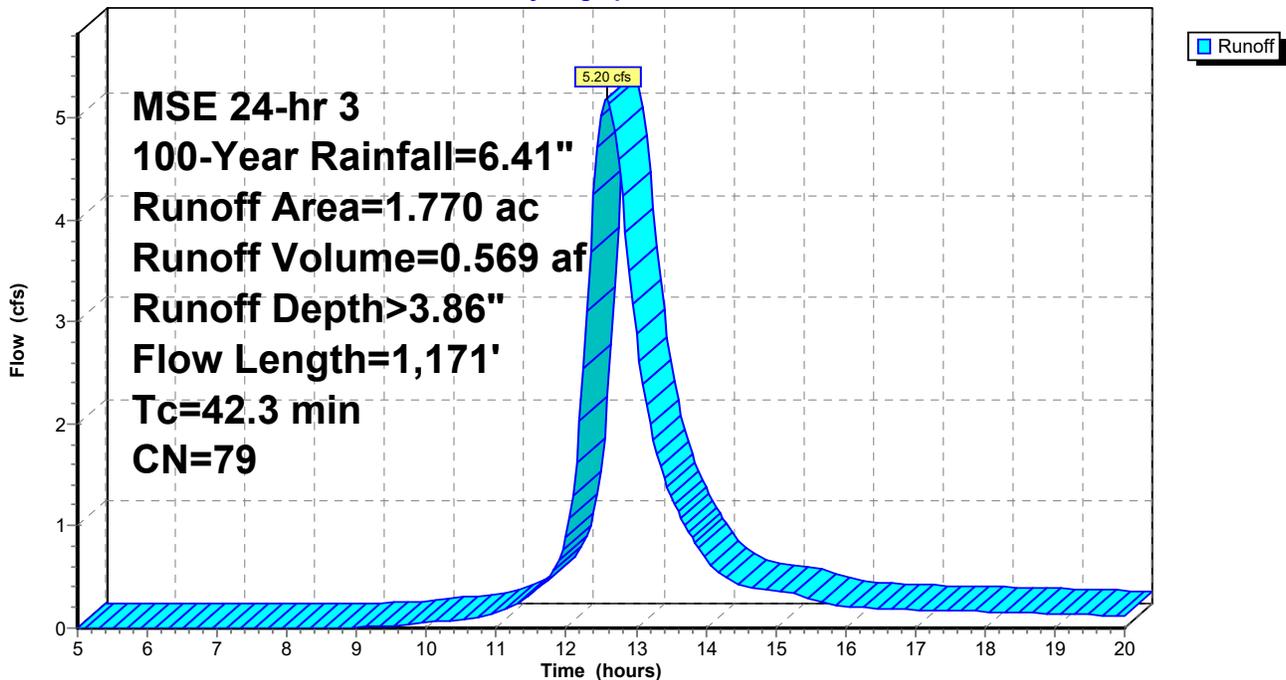
Area (ac)	CN	Description
1.770	79	1 acre lots, 20% imp, HSG C
1.416		80.00% Pervious Area
0.354		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	162	0.0210	0.17		<b>Sheet Flow, A-AA</b> Grass: Short n= 0.150 P2= 2.66"
6.4	113	0.0150	0.29		<b>Sheet Flow, AA-B</b> Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.4	263	0.0120	0.99		<b>Shallow Concentrated Flow, B-C</b> Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		<b>Shallow Concentrated Flow, C-D</b> Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		<b>Shallow Concentrated Flow, D-E</b> Cultivated Straight Rows Kv= 9.0 fps
42.3	1,171	Total			

**Subcatchment 12S: E-OFF-1**

Hydrograph



**Summary for Subcatchment 13S: P-OFF-1**

Runoff = 5.21 cfs @ 12.59 hrs, Volume= 0.569 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
MSE 24-hr 3 100-Year Rainfall=6.41"

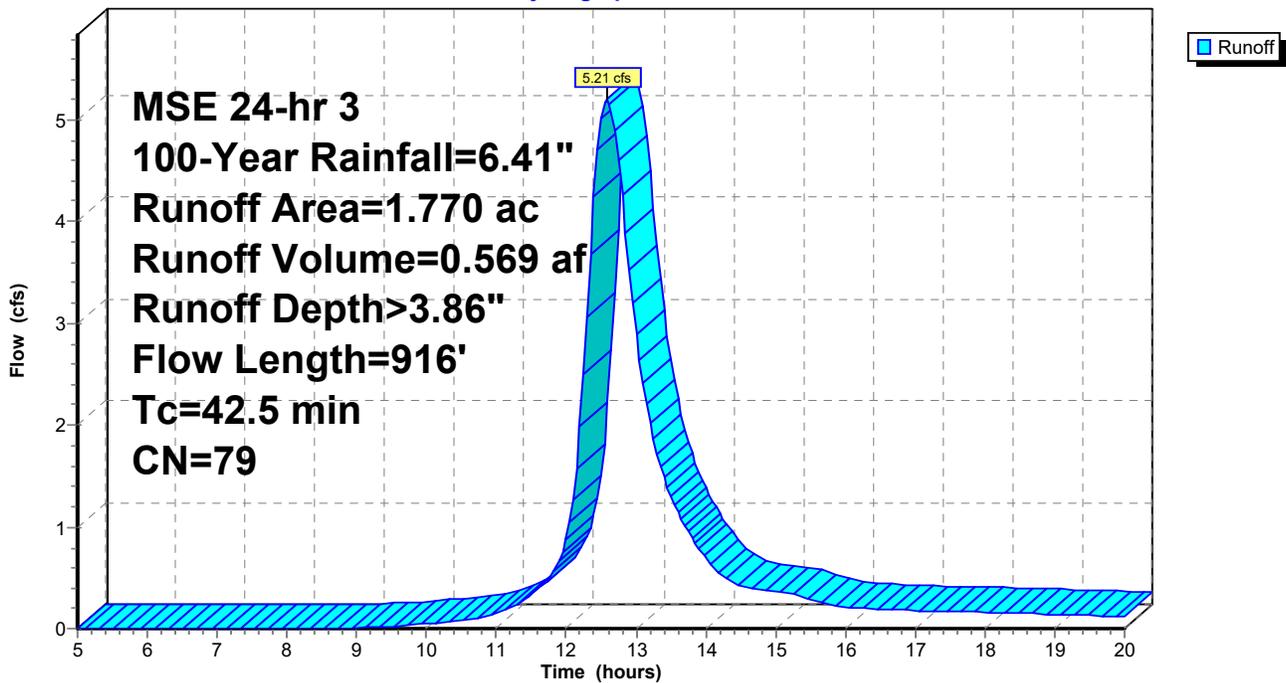
Area (ac)	CN	Description
1.770	79	1 acre lots, 20% imp, HSG C
1.416		80.00% Pervious Area
0.354		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	162	0.0210	0.17		<b>Sheet Flow, A-AA</b> Grass: Short n= 0.150 P2= 2.66"
6.7	45	0.0130	0.11		<b>Sheet Flow, AA-B</b> Grass: Short n= 0.150 P2= 2.66"
20.2	665	0.0120	0.55	4.93	<b>Channel Flow, B-C</b> Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	<b>Pipe Channel, C-D</b> 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
42.5	916	Total			

**Subcatchment 13S: P-OFF-1**

Hydrograph



### Summary for Reach 5R: Pre-Development

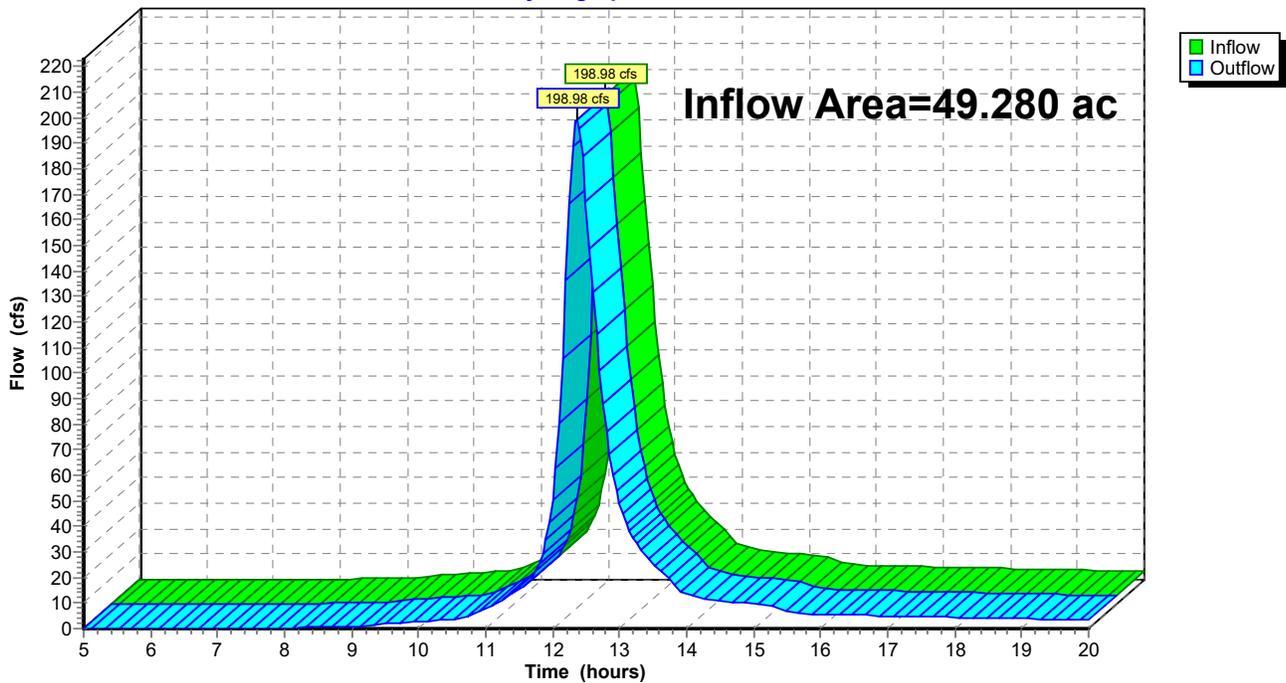
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 49.280 ac, 0.72% Impervious, Inflow Depth > 4.16" for 100-Year event  
Inflow = 198.98 cfs @ 12.36 hrs, Volume= 17.082 af  
Outflow = 198.98 cfs @ 12.36 hrs, Volume= 17.082 af, Atten= 0%, Lag= 0.0 min

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

### Reach 5R: Pre-Development

Hydrograph



### Summary for Reach 11R: Undetained

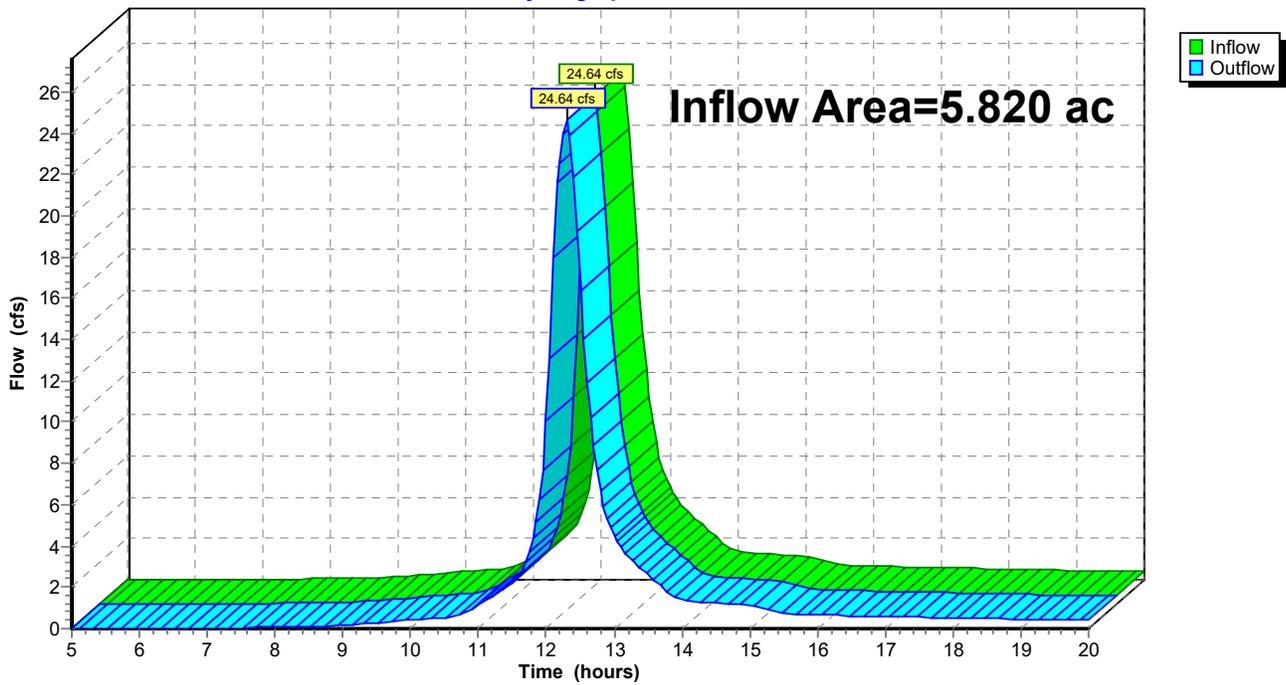
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.820 ac, 0.00% Impervious, Inflow Depth > 4.31" for 100-Year event  
Inflow = 24.64 cfs @ 12.30 hrs, Volume= 2.089 af  
Outflow = 24.64 cfs @ 12.30 hrs, Volume= 2.089 af, Atten= 0%, Lag= 0.0 min

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

### Reach 11R: Undetained

Hydrograph



### Summary for Reach 12R: Detained

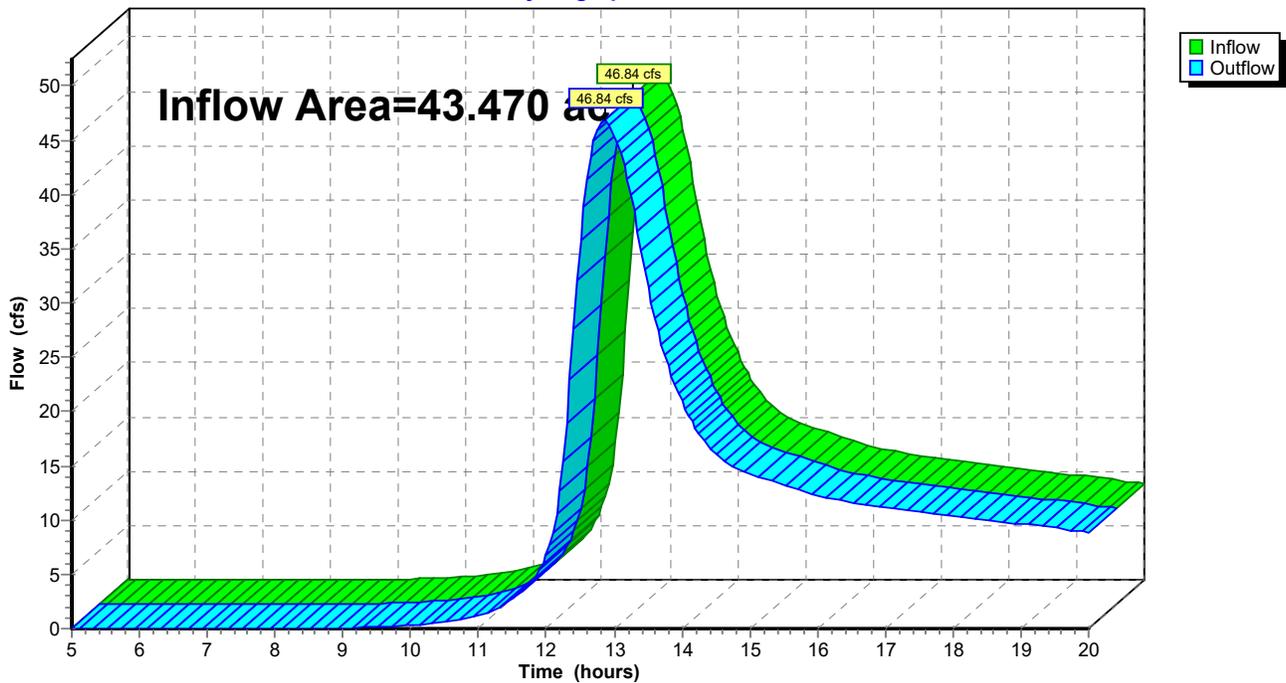
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 43.470 ac, 10.89% Impervious, Inflow Depth > 3.17" for 100-Year event  
Inflow = 46.84 cfs @ 12.86 hrs, Volume= 11.493 af  
Outflow = 46.84 cfs @ 12.86 hrs, Volume= 11.493 af, Atten= 0%, Lag= 0.0 min

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

### Reach 12R: Detained

Hydrograph



**Summary for Pond 6P: Pond 1**

Inflow Area = 11.850 ac, 11.68% Impervious, Inflow Depth > 4.29" for 100-Year event  
 Inflow = 33.42 cfs @ 12.70 hrs, Volume= 4.238 af  
 Outflow = 5.15 cfs @ 14.16 hrs, Volume= 2.799 af, Atten= 85%, Lag= 88.0 min  
 Primary = 5.15 cfs @ 14.16 hrs, Volume= 2.799 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 859.36' @ 14.16 hrs Surf.Area= 1.323 ac Storage= 2.752 af

Plug-Flow detention time= 209.5 min calculated for 2.799 af (66% of inflow)  
 Center-of-Mass det. time= 156.2 min ( 961.4 - 805.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	857.00'	6.825 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

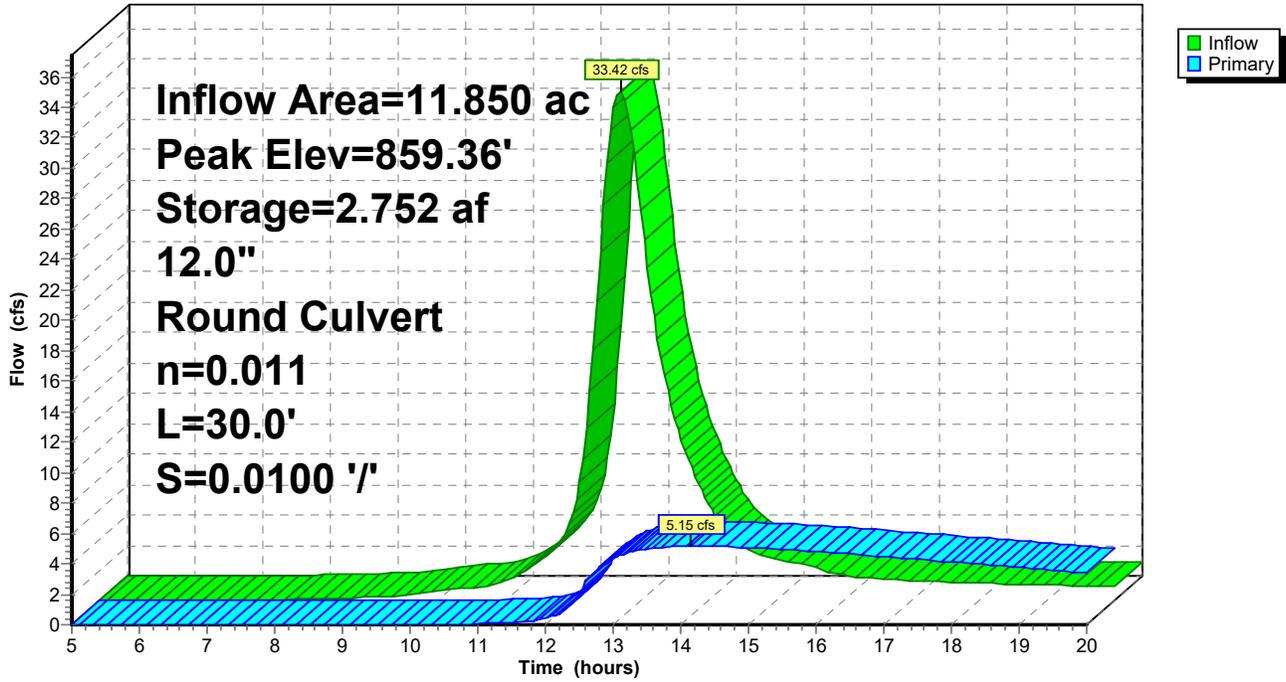
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
857.00	1.030	0.000	0.000
858.00	1.140	1.085	1.085
859.00	1.270	1.205	2.290
860.00	1.420	1.345	3.635
861.00	1.570	1.495	5.130
862.00	1.820	1.695	6.825

Device	Routing	Invert	Outlet Devices
#1	Primary	857.00'	<b>12.0" Round RCP_Round 12"</b> L= 30.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 857.00' / 856.70' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

**Primary OutFlow** Max=5.15 cfs @ 14.16 hrs HW=859.36' (Free Discharge)  
 ↑1=RCP\_Round 12" (Inlet Controls 5.15 cfs @ 6.56 fps)

### Pond 6P: Pond 1

Hydrograph



**Summary for Pond 7P: Pond 2**

Inflow Area = 16.080 ac, 10.57% Impervious, Inflow Depth > 4.39" for 100-Year event  
 Inflow = 55.62 cfs @ 12.53 hrs, Volume= 5.876 af  
 Outflow = 38.70 cfs @ 12.81 hrs, Volume= 5.725 af, Atten= 30%, Lag= 17.2 min  
 Primary = 38.70 cfs @ 12.81 hrs, Volume= 5.725 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 858.64' @ 12.81 hrs Surf.Area= 0.604 ac Storage= 1.402 af

Plug-Flow detention time= 35.4 min calculated for 5.725 af (97% of inflow)  
 Center-of-Mass det. time= 26.0 min ( 819.5 - 793.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	856.00'	2.280 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
856.00	0.461	0.000	0.000
857.00	0.514	0.487	0.487
858.00	0.568	0.541	1.028
859.00	0.625	0.596	1.625
860.00	0.684	0.654	2.280

Device	Routing	Invert	Outlet Devices
#1	Primary	856.00'	<b>24.0" Round Culvert</b> L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 856.00' / 855.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Primary	856.00'	<b>24.0" Round Culvert</b> L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 856.00' / 855.40' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf

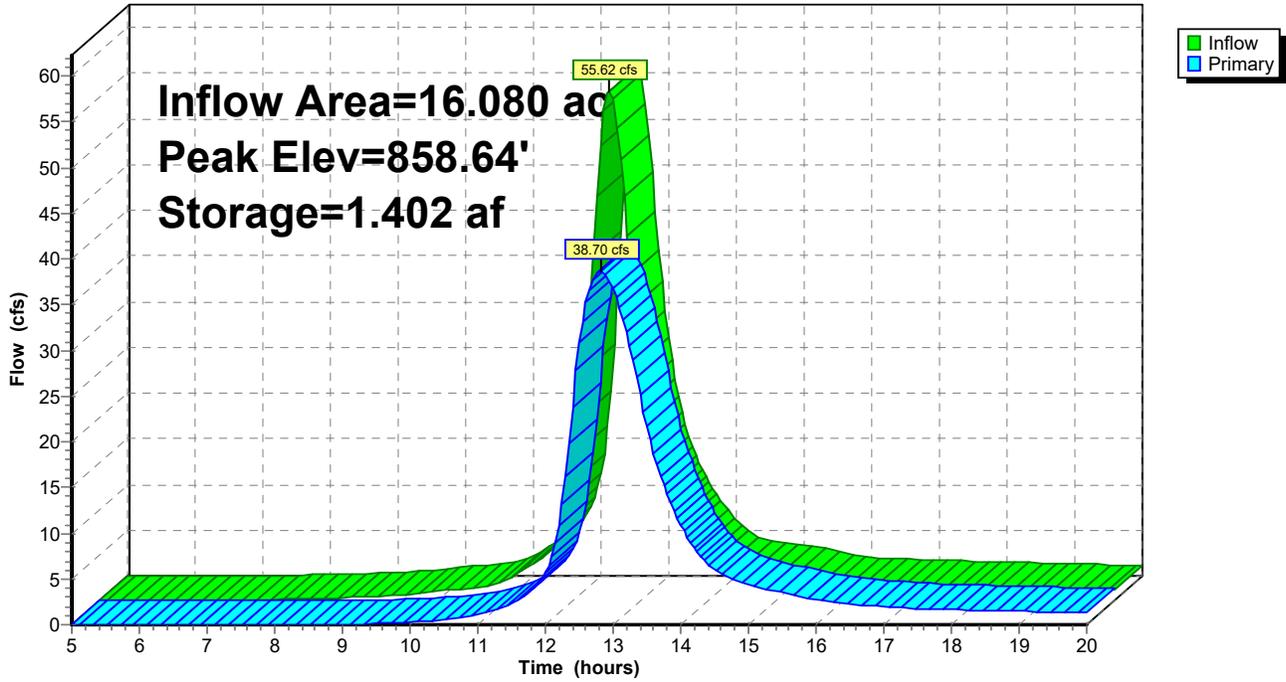
**Primary OutFlow** Max=38.66 cfs @ 12.81 hrs HW=858.63' (Free Discharge)

1=Culvert (Inlet Controls 19.33 cfs @ 6.15 fps)

2=Culvert (Inlet Controls 19.33 cfs @ 6.15 fps)

### Pond 7P: Pond 2

Hydrograph



**Summary for Pond 8P: Pond 3**

Inflow Area = 15.540 ac, 10.62% Impervious, Inflow Depth > 4.71" for 100-Year event  
 Inflow = 55.58 cfs @ 12.55 hrs, Volume= 6.097 af  
 Outflow = 4.91 cfs @ 14.21 hrs, Volume= 2.970 af, Atten= 91%, Lag= 99.4 min  
 Primary = 4.91 cfs @ 14.21 hrs, Volume= 2.970 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 860.35' @ 14.21 hrs Surf.Area= 2.086 ac Storage= 4.375 af

Plug-Flow detention time= 240.7 min calculated for 2.960 af (49% of inflow)  
 Center-of-Mass det. time= 175.6 min ( 965.2 - 789.6 )

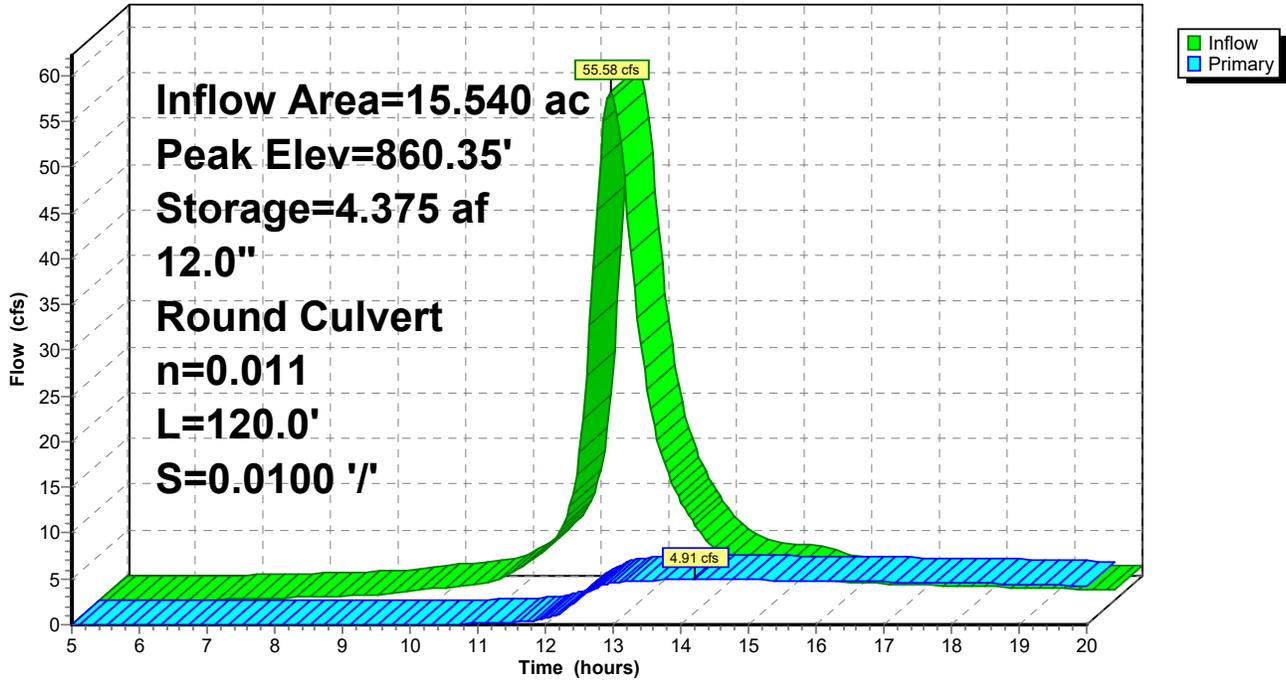
Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	8.080 af	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
858.00	1.650	0.000	0.000
859.00	1.830	1.740	1.740
860.00	2.020	1.925	3.665
861.00	2.210	2.115	5.780
862.00	2.390	2.300	8.080

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	<b>12.0" Round RCP_Round 12"</b> L= 120.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 856.80' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

**Primary OutFlow** Max=4.91 cfs @ 14.21 hrs HW=860.35' (Free Discharge)  
 ↑1=RCP\_Round 12" (Barrel Controls 4.91 cfs @ 6.25 fps)

### Pond 8P: Pond 3

Hydrograph



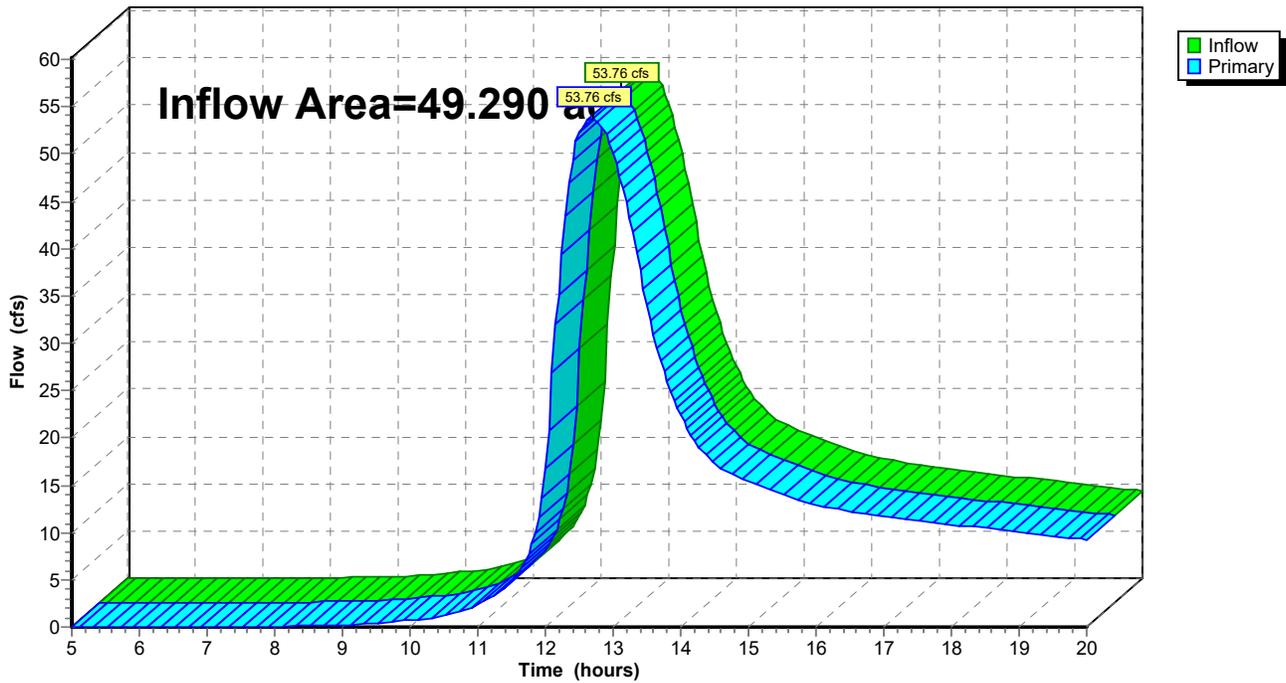
### Summary for Link 10L: Post-Development

Inflow Area = 49.290 ac, 9.60% Impervious, Inflow Depth > 3.31" for 100-Year event  
Inflow = 53.76 cfs @ 12.70 hrs, Volume= 13.582 af  
Primary = 53.76 cfs @ 12.70 hrs, Volume= 13.582 af, Atten= 0%, Lag= 0.0 min

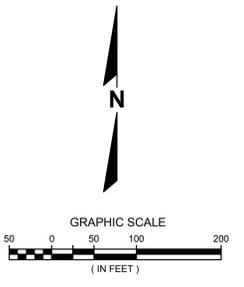
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Link 10L: Post-Development

Hydrograph







DATE	DESCRIPTION

16745 W. Bluemound Road  
 Brookfield, WI 53005-5938  
 (262) 781-1000  
 rasmith.com



Brookfield, WI | Milwaukee, WI | Appleton, WI | Madison, WI | Cedarburg, WI  
 Mount Pleasant, WI | Naperville, IL | Irvine, CA

**MORNING MEADOWS SUBDIVISION  
 VILLAGE OF JACKSON, WISCONSIN  
 STORMWATER MANAGEMENT PLAN  
 PROPOSED CONDITIONS**

© COPYRIGHT 2020 R.A. Smith, Inc.
DATE: 02/27/2020
SCALE: 1" = 100'
JOB NO. 3050195.01
PROJECT MANAGER: CHRIS D. HITCH, P.E.
DESIGNED BY: DJM
CHECKED BY: CDH
<b>SHEET NUMBER</b>
HX-PRO



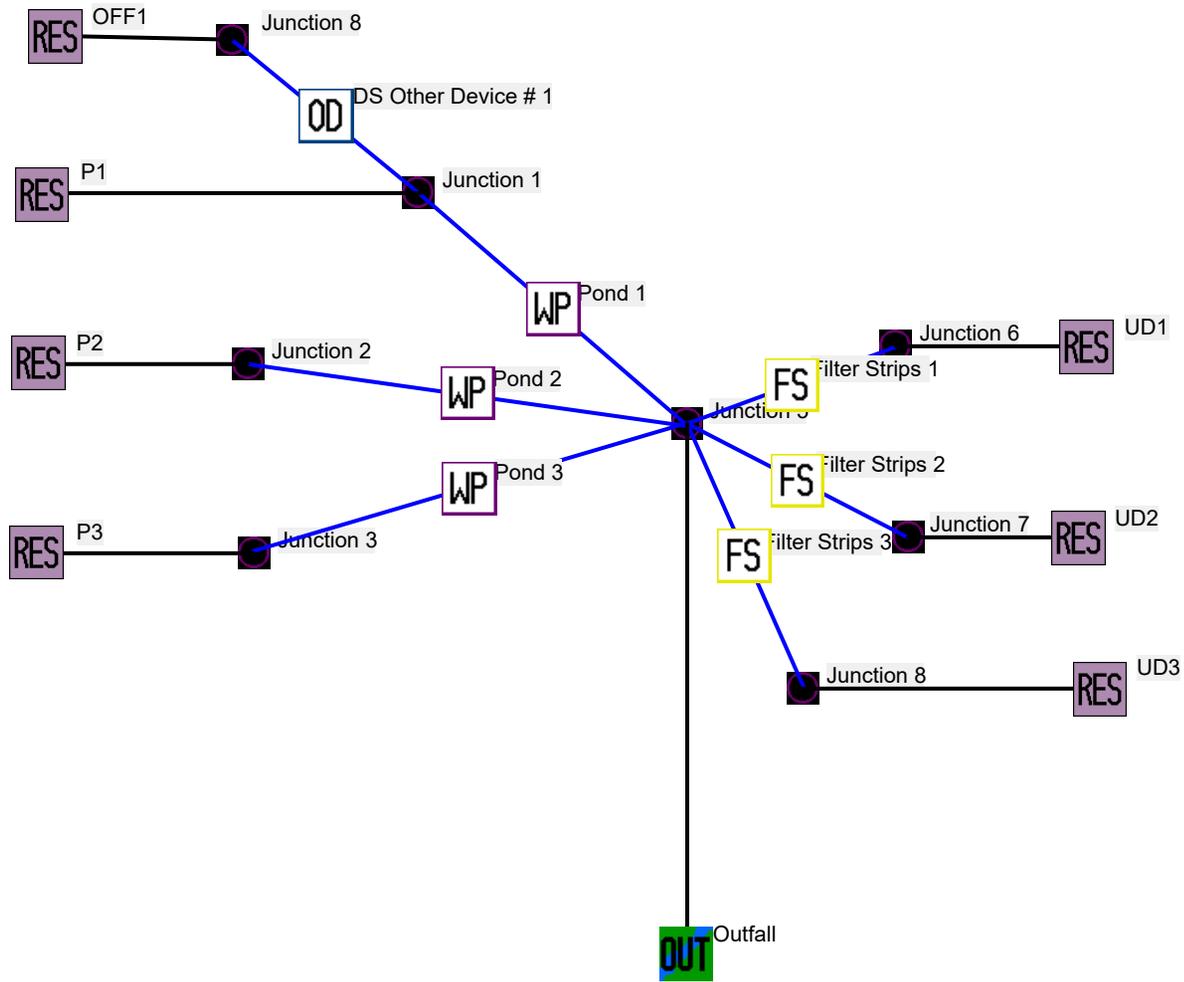
Know what's below.  
 Call before you dig.

R.A. SMITH, INC. ASSUMES NO RESPONSIBILITY FOR DAMAGES, LIABILITY OR COSTS RESULTING FROM CHANGES OR ALTERATIONS MADE TO THIS PLAN WITHOUT THE EXPRESSED WRITTEN CONSENT OF R.A. SMITH, INC.

P:\3050195\3050195.01\dwg\EXHIBITS\3050195.01-HW.dwg, STORMWATER PROPOSED, 7/1/2020 4:25:16 PM, jhm

# **Appendix C**

**(Water Quality Calculations)**



Data file name: P:\3050195\3050195.01\Eng Data\Hydrology\Morning Meadows 2020-06-30 POST.mdb

WinSLAMM Version 10.4.1

Rain file name: C:\WinSLAMM Files\Rain Files\WI Milwaukee 69.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\10.1 WI\_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI\_SL06 Dec06.rsvx

Residential Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI\_GEO03.ppdx

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations

Seed for random number generator: -42

Study period starting date: 01/05/69 Study period ending date: 12/31/69

Start of Winter Season: 12/02 End of Winter Season: 03/12

Date: 07-01-2020 Time: 16:52:40

Site information: Morning Meadows Subdivision

Village of Jackson, WI

LU# 1 - Residential: P1 Total area (ac): 10.077

1 - Roofs 1: 0.742 ac. Pitched Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.359 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.155 ac. Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 0.444 ac. Intermediate Street Length = 0.262 curb-mi Street Width (assuming two curb-mi per street mile) = 27.96183 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 7.350 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 1.027 ac. PSD File:

LU# 2 - Residential: P2 Total area (ac): 16.080

1 - Roofs 1: 1.210 ac. Pitched Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.792 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.189 ac. Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 1.158 ac. Intermediate Street Length = 0.682 curb-mi Street Width (assuming two curb-mi per street mile) = 28.01613 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 11.029 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 1.702 ac. PSD File:

LU# 3 - Residential: P3 Total area (ac): 15.541

1 - Roofs 1: 1.200 ac. Pitched Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.872 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.162 ac. Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

37 - Streets 1: 1.586 ac. Intermediate Street Length = 0.887 curb-mi Street Width (assuming two curb-mi per street mile) = 29.50282 ft

Default St. Dirt Accum. Annual Winter Load = 2500 lbs PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 10.071 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 1.650 ac. PSD File:

LU# 4 - Residential: UD1 Total area (ac): 0.751

45 - Large Landscaped Areas 1: 0.751 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 5 - Residential: UD2 Total area (ac): 0.436

45 - Large Landscaped Areas 1: 0.436 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 6 - Residential: OFF1 Total area (ac): 1.770

1 - Roofs 1: 0.300 ac. Pitched Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.250 ac. Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 1.220 ac. Normal Clayey PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 7 - Residential: UD3 Total area (ac): 4.630

1 - Roofs 1: 0.283 ac. Pitched Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.100 ac. Disconnected Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 4.247 ac. Normal Clayey Low Density PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - Pond 1

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 1
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 30
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 9

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.4120	0.00	0.00
2	1.00	0.4780	0.00	0.00
3	2.00	0.5430	0.00	0.00
4	3.00	0.6100	0.00	0.00
5	4.00	0.6770	0.00	0.00
6	5.00	1.0270	0.00	0.00
7	6.00	1.1410	0.00	0.00
8	7.00	1.2680	0.00	0.00
9	8.00	1.4170	0.00	0.00
10	9.00	1.5710	0.00	0.00
11	10.00	1.8240	0.00	0.00

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

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 2
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Orifice 2

1. Orifice diameter (ft): 2
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 30
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 8

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.6430	0.00	0.00
2	1.00	0.7240	0.00	0.00
3	2.00	0.8090	0.00	0.00
4	3.00	0.8980	0.00	0.00
5	4.00	1.0940	0.00	0.00
6	5.00	1.7020	0.00	0.00
7	6.00	1.8870	0.00	0.00
8	7.00	2.0730	0.00	0.00
9	8.00	2.2610	0.00	0.00
10	9.00	2.5070	0.00	0.00

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

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 1

2. Number of orifices: 1

3. Invert elevation above datum (ft): 5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 30

2. Weir crest width (ft): 10

3. Height from datum to bottom of weir opening: 8

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.8610	0.00	0.00
2	1.00	0.9330	0.00	0.00
3	2.00	1.0080	0.00	0.00
4	3.00	1.0850	0.00	0.00
5	4.00	1.1650	0.00	0.00
6	5.00	1.6500	0.00	0.00
7	6.00	1.8340	0.00	0.00
8	7.00	2.0190	0.00	0.00
9	8.00	2.2050	0.00	0.00
10	9.00	2.3930	0.00	0.00

Control Practice 4: Filter Strip CP# 1 (DS) - Filter Strips 1

Total drainage area (acres)= 0.751

Fraction of drainage area served by filter strips (ac) = 1.00

Total filter strip width (ft) = 1000.0

Effective flow length (ft) = 10

Infiltration rate (in/hr)= 0.100

Typical longitudinal slope (ft.H/ft.V) = 0.200

Typical grass height (in) = 4.0

Swale retardance factor = C

Use stochastic analysis to determine infiltration rate: False

Infiltration rate coefficient of variation (COV) = 0.00

Particle size distribution file name: Not needed - calculated by program

Surface Clogging Load (lbs/sf) = 3.50

Control Practice 5: Filter Strip CP# 2 (DS) - Filter Strips 2

Total drainage area (acres)= 0.436

Fraction of drainage area served by filter strips (ac) = 1.00

Total filter strip width (ft) = 1100.0

Effective flow length (ft) = 10

Infiltration rate (in/hr)= 0.100

Typical longitudinal slope (ft.H/ft.V) = 0.250

Typical grass height (in) = 4.0

Swale retardance factor = C

Use stochastic analysis to determine infiltration rate: False

Infiltration rate coefficient of variation (COV) = 0.00

Particle size distribution file name: Not needed - calculated by program

Surface Clogging Load (lbs/sf) = 3.50

Control Practice 6: Filter Strip CP# 3 (DS) - Filter Strips 3

Total drainage area (acres)= 4.630

Fraction of drainage area served by filter strips (ac) = 1.00

Total filter strip width (ft) = 2300.0

Effective flow length (ft) = 10

Infiltration rate (in/hr)= 0.100

Typical longitudinal slope (ft.H/ft.V) = 0.200

Typical grass height (in) = 4.0

Swale retardance factor = C

Use stochastic analysis to determine infiltration rate: False

Infiltration rate coefficient of variation (COV) = 0.00

Particle size distribution file name: Not needed - calculated by program

Surface Clogging Load (lbs/sf) = 3.50

Control Practice 7: Other Device CP# 1 (DS) - DS Other Device # 1

Fraction of drainage area served by device (ac) = 1.00

Particulate Concentration reduction fraction = 1.00

Filterable Concentration reduction fraction = 1.00

Runoff volume reduction fraction = 0

Data file name: P:\3050195\3050195.01\Eng Data\Hydrology\Morning Meadows 2020-06-30 POST.mdb  
WinSLAMM Version 10.4.1

Rain file name: C:\WinSLAMM Files\Rain Files\WI Milwaukee 69.RAN  
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI\_AVG01.pscx  
Runoff Coefficient file name: C:\WinSLAMM Files\WI\_SL06 Dec06.rsvx  
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI\_GEO03.ppd  
Residential Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Institutional Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
Commercial Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
Industrial Street Delivery file name: C:\WinSLAMM Files\WI\_Com Inst Indust Dec06.std  
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI\_Res and Other Urban Dec06.std  
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std  
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False  
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv  
Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations

Seed for random number generator: -42

Study period starting date: 01/05/69 Study period ending date: 12/31/69

Start of Winter Season: 12/02 End of Winter Season: 03/12

Model Run Start Date: 01/05/69 Model Run End Date: 12/31/69

Date of run: 07-01-2020 Time of run: 16:54:19

Total Area Modeled (acres): 49.285

Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	1.226E+06	-	113.6	8700	-
Outfall Total with Controls:	1.228E+06	-0.16%	19.20	1472	83.08%
Annualized Total After Outfall Controls:	1.245E+06			1492	

Pollutant	Conc. No Controls	Conc. With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units	Percent Reduction
Particulate Solids	113.6	19.20	mg/L	8700	1472	lbs	83.08 %
Particulate Phosphorus	0.3790	0.07324	mg/L	28.36	5.618	lbs	80.19 %

**Notice:** In accordance with s. NR. 108.04(2)(a), Wis. Adm. Code, this form is authorized to accompany final plans and specifications for any reviewable sanitary sewer project that is submitted to the Department of Natural Resources (Department) pursuant to s. 281.41, Wis. Stats and s. NR 108.03, Wis. Adm. Code. Completion of this form is required by the Department for any sanitary sewer plan submittal to evaluate conformance with requirements in chs. NR 108 and 110, Wis. Adm. Code.

**All necessary information must be provided on this form. Failure to complete this form correctly may result in rejection of this form by the Department.** Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law (ss. 19.31 - 19.39, Wis. Stats.).

**Please type or clearly print your answers to all questions.**

**1. General Information**

A. Municipality Name  City  Town  Village  Sanitary District  Utility District

Jackson

B. Project Name (as indicated on the plans):

MORNING MEADOWS SUBDIVISION - PHASE 1

C. Wastewater Treatment Facility Name:

Village of Jackson

D. Sewer System Owner Name (after installation):

Village of Jackson

E. Responsible Project Inspector (List name and/or title, if known):

TBD

**2. Submittal Requirements:**

- A. Is a CD containing PDF files of the final plans and/or specifications included with this plan submittal?  Yes  No
- B. Are the submitted paper and electronic plans and/or specifications signed and sealed by a registered Wisconsin professional engineer?  Yes  No
- C. Is the submitted paper set of plans in half size format (11" x 17")?  Yes  No
- D. Are the construction plans and/or specifications submitted in conformance with ch. NR 108 and ss. NR 110.06, 110.07, and 110.10(3), Wis. Adm. Code?  Yes  No
- E. Is an abbreviated engineering report included with this submittal (Only required for sewer projects that are financed by the Clean Water Fund) ?  Yes  No  N/A

**3. Sewer Service Area**

- A. Is a map of the sewer service area that shows the location of the proposed sewer attached to this plan submittal?  Yes  No
- B. Does the project only involve replacement/rehabilitation construction of existing sanitary sewer?  Yes  No
  - i. If no, please provide the area and population to be served by the proposed sewer extension(s):  
Ultimate: 64.55 Acres                      Immediate: 14.01 Acres  
Density/acre: 3.45                                      Population: 223

**4. Erosion Control**

- A. Does the municipality have an erosion control ordinance?  Yes  No
    - i. If yes, will compliance with the ordinance be required for this project?  Yes  No
  - B. Do the plan sheets show the erosion control provisions?  Yes  No
  - C. Do the specifications require that the erosion control measures be in place before construction begins and maintained during construction?  Yes  No
  - D. Is the sewer extension part of a construction site that will disturb one or more acres of land?  Yes  No
    - i. If yes, has a Notice of Intent (Form 3500-053 and 3500-053c) for the construction site for coverage under a general construction site storm water discharge permit been submitted to the Dept. in accordance with Chapter NR 216, Wis. Adm. Code?  Yes  No
- Construction Site ID#, if known: \_\_\_\_\_

**5. Water Diversion**

- A. Will this sewer project result in a diversion of water from a water supply system that uses surface water from the Great Lakes to the Mississippi River Basin?  Yes  No

**6. Overflows or Bypasses**

- A. Are there overflows or bypasses in the sewerage system that function during periods of normal dry weather?  Yes  No

i. If yes, please identify and describe them:

- B. Are there overflows or bypasses in the sewerage system that function during periods of wet weather?  Yes  No

i. If yes, please identify and describe them:

**7. Wetlands**

Applicants for sanitary sewer projects must review the DNR surface water data viewer website (<http://dnrmaps.wi.gov/SL/Viewer.html?Viewer=SWDV&runWorkflow=Wetland>) and conduct an on-site field inspection to determine whether the proposed sanitary sewer construction will impact any wetland areas prior to completing and submitting this form.

(Note: "Impact" means any construction-related disturbance resulting in any temporary or permanent change in the characteristics of the wetland including direct excavation within the wetland area, temporary or permanent soil placement / removal within the wetland area, drainage modifications within or adjacent to the wetland area that may cause hydrological changes to the wetland, etc.)

- A. Have you reviewed the DNR surface water data viewer ([SWDV](#)) web site (see link above) and conducted an on-site field inspection to verify whether the proposed sanitary sewer construction will impact any wetland areas (attach map from the SWDV)?  Yes  No
- B. Based on the review in part A, will the proposed sanitary sewer construction impact any wetland areas?  Yes  No
- i. If yes, please visit the DNR Waterways and Wetland Permit website (<http://dnr.wi.gov/topic/Waterways/>) to determine what wetland permits may be needed for your project and if a wetland permit is required, is a copy of the approved permit(s) attached with this plan submittal?  Yes  No  N/A
- (Note: The DNR wastewater program cannot issue a sanitary sewer plan approval until the DNR and/or USACE wetland permit(s) have been issued.)
- C. Do the plans show the location / boundaries of any impacted wetlands and other nearby wetlands?  Yes  No  N/A

**8. Floodplain and Waterways**

- A. Will the proposed sanitary sewer(s) be constructed near, in, on, over or below a stream, river, lake, pond, flowage or reservoir?  Yes  No
- i. If yes, please visit the DNR Waterways and Wetland Permit website (<http://dnr.wi.gov/topic/Waterways/>) to determine what Chapter 30 permits may be needed for your project and if a Chapter 30 permit is required, is a copy of the approved permit(s) attached with this plan submittal?  Yes  No  N/A
- (Note: The DNR wastewater program cannot issue a sanitary sewer plan approval until the DNR Chapter 30 permit(s) has been issued.)
- B. Does the proposed sewer(s) pass through any floodplains?  Yes  No
- i. If yes, are the regional (100-year) flood elevation and floodplain contours indicated on the plans?  Yes  No  N/A
- ii. Will solid watertight manhole covers be installed to prevent flooding?  Yes  No  N/A

**9. Groundwater**

- A. Will any proposed sewers be installed below the high groundwater level?  Yes  No
- i. If yes, are the proposed sewers that are below the high groundwater level indicated on the plans?  Yes  No  N/A
- ii. Where groundwater conditions are unfavorable, will manholes be waterproofed on the exterior with plastic coatings supplemented by a bituminous waterproof coating or other approved coatings?  Yes  No  N/A

**10. Pumping and Dewatering**

- A. Is dewatering or pumping expected from construction trenches or pits for this project?  Yes  No
- B. If dewatering/pumping is expected, will the water be discharged to a sanitary sewer system?  Yes  No  N/A
- i. If no, will the dewatering water be discharged to the waters of the state?  Yes  No  N/A
- (Note: "Waters of the state" means those portions of Lake Michigan and Lake Superior within the boundaries of Wisconsin, all lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, water courses, drainage systems and other surface or groundwater, natural or artificial, public or private within the state or under its jurisdiction, except those waters which are entirely confined and retained completely upon the property of a person.)
- ii. If dewatering water is expected to be discharged to the waters of the state, has coverage been granted by the Department under the WPDES Construction Site Storm Water Runoff General Permit and/or the WPDES Pit/Trench Dewatering General Permit for the discharge?  Yes  No  N/A
- C. If dewatering is expected and the capacity to withdraw is greater than 70 gallons per minute, is the proposed dewatering system registered with the Department's Water Use Section: (<http://dnr.wi.gov/topic/wateruse/>) and has the contractor filled out a high capacity well application: (<http://dnr.wi.gov/topic/wells/highcapacity.html>)?  Yes  No  N/A
- If yes, is the Department's Private Water Supply Section's address for well permits listed as:  
 Wisconsin Department of Natural Resources  
 Private Water Supply Section  
 Box 7921  
 Madison, WI 53707  Yes  No  N/A
- D. If dewatering is expected, has the Bureau of Remediation and Redevelopment Tracking System (BRRTS on the Web) online database (<http://dnr.wi.gov/topic/brownfields/botw.html>) been reviewed and local government been contacted to determine if there are any adjacent operating or abandoned sanitary landfills, leaking underground storage tanks or hazardous substance spills?  Yes  No  N/A
- E. Based on the above contacts, is it expected that dewatering will occur near an operating or abandoned landfill, leaking underground storage tank or a hazardous substance spill?  Yes  No  N/A
- i. If yes, is it anticipated that the dewatering/pumping operations will intercept contaminated groundwater?  Yes  No  N/A
- ii. If it is anticipated that contaminated groundwater will be discharged to waters of the state, has coverage been granted under the Contaminated Groundwater from Remedial Action Operation WPDES General Permit?  Yes  No  N/A

**11. List below all sewers to be constructed as part of this project:**

Diameter (in.)	Length (feet)	Street Name or Easement Description	Material
8	1124	ROAD "A"	PVC SDR-35

**12. Sewer Depth**

- A. Will the all sewers be designed deep enough to prevent freezing?  Yes  No
- B. If the minimum depth of cover will not prevent freezing, will the pipe be insulated?  Yes  No  N/A
- i. If yes, are all the proposed insulated pipe(s) along with a standard detail drawing indicated on the plans?  Yes  No  N/A
- C. Will all sewers be installed deep enough to provide gravity basement drainage for sanitary wastes?  Yes  No  N/A
- i. If no, has the owner(s) of the existing buildings been advised, in writing, prior to construction of the sewers?  Yes  No  N/A

**13. Sewer Slope and Sizing**

- A. Do all proposed sewers meet the minimum slope requirements of s. NR 110.13(2)(c), Wis. Adm. Code?  Yes  No  N/A

## Sanitary Sewer Submittal

Form 3400-059 (R 05/17) Page 4 of 5

- i. If no, has a variance been requested on Form 3400-205?  Yes  No  N/A
- ii. Has the sewer system owner demonstrated that physical circumstances warrant the lesser slopes?  Yes  No  N/A
- iii. Has written assurance been submitted from the sewer system owner that the sewer system owner will provide the additional maintenance which may result from sedimentation due to the decreased velocities?  Yes  No  N/A
- B. Do any sewers have slopes greater than 20%?  Yes  No  N/A
- i. If yes, is the sewer anchored?  Yes  No  N/A
- C. Design calculations for all sewers with diameters greater than 8 inches are:  Shown below  Attached  N/A

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### 14. Sewer Separation Between Water Supplies

- A. Are all sewers at least 200 feet from public water supply wells? (s. NR 811.12(5)(d)3, Wis. Adm. Code)  Yes  No
- B. Is the minimum horizontal separation distance of 8 feet between the sewer and existing or future water mains being met? (s. NR 811.74(2), Wis. Adm. Code)?  Yes  No  N/A
- C. Where water mains cross over sewers, is the minimum vertical separation distance of 6 inches being met? (s. NR 811.74(3), Wis. Adm. Code)?  Yes  No  N/A
- D. Where water mains cross under sewers, is the minimum vertical separation distance of 18 inches being met? (s. NR 811.74(3), Wis. Adm. Code)  Yes  No  N/A

**If you answered no to any of the above questions (A-D), please answer the following question E:**

- E. If a public well or water main installation is a part of the project, has a plan submittal with a variance request been sent to the DNR Public Drinking Water Engineering Section for approval?  Yes  No  N/A
- i. If no, has the municipal water utility given written approval or no-objection to the sanitary sewer plans?  Yes  No  N/A
- ii. Has the DNR Public Drinking Water Engineering Section Chief (<http://dnr.wi.gov/topic/drinkingwater/planreview.html>) been contacted and given written no-objection to the sanitary sewer plans?  Yes  No  N/A
- iii. Is a copy of the written no-objection/approval from the municipal water utility and/or DNR Public Drinking Water Engineering Section attached to this plan submittal?  Yes  No  N/A
- F. Are all sewers at least 50 feet from private water supply wells? (s. NR 812.08(4)(c)10, Wis. Adm. Code)
- i. If no, please contact the DNR Private Drinking Water Supply Field Section Chief, for the determination of a private well variance. Information can be found at the website: <http://dnr.wi.gov/topic/Wells/homeowners.html>. If a private well variance is required, is a copy of the variance attached to this application?  Yes  No  N/A

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### 15. Manhole Installation

- A. Is a manhole being constructed at the end of each sewer line?  Yes  No  N/A

# Sanitary Sewer Submittal

Form 3400-059 (R 05/17) Page 5 of 5

- i. If no, has a variance been requested on Form 3400-205?  Yes  No  N/A
- ii. Will all stubbed sewers be capped or plugged and will no service be provided until a manhole is installed under an Department approved project?  Yes  No  N/A
- B. Will all manholes be spaced less than or equal to the required maximum intervals specified in s. NR 110.13(3)(b), Wis. Adm. Code?
  - i. If no, has a variance been requested on Form 3400-205?  Yes  No  N/A
  - ii. Does the sewer system owner have access to cleaning equipment with the capability to reach these sewer lengths?  Yes  No  N/A
- C. Is there a manhole present at changes in sewer grade and size and at all pipe intersections?  Yes  No
- D. Are there locations where the invert elevation of the entering sewer to a manhole is 2 feet or more above the spring line of the outgoing sewer?
  - i. If yes, list the location of all outside drops: Yes  No
- E. Are the tops of all manholes at or above finished grade?  Yes  No

## 16. Clearwater

- A. To the best of your knowledge, will all storm and other clearwater including that from sump pumps, roof drains, cistern overflows, and building foundation drains be excluded for these proposed sanitary sewers?  Yes  No
- B. To the best of your knowledge, will these street and tributary building sewers be laid in such a manner as to minimize entrance of groundwater and will building sewers and drains be installed to conform with state plumbing regulations (s. SPS 382.36(4)(6), Wis. Adm. Code)?  Yes  No

## Certification

I certify that this document, to the best of my knowledge and belief, is true, accurate, and complete.

\_\_\_\_\_  
Signature of Consulting or Municipal Engineer Responsible for Preparing this Form

\_\_\_\_\_  
Date Signed

Wisconsin P.E. Number \_\_\_\_\_ E-37146

Phone Number (include area code) \_\_\_\_\_ (262) 781-1000

**Notice:** In accordance with s. NR. 108.04(2)(a), Wis. Adm. Code, this form is authorized to accompany final specifications for any reviewable sanitary sewer project that is submitted to the Department of Natural Resources (Department) pursuant to s. 281.41, Wis. Stats and s. NR 108.03, Wis. Adm. Code. Completion of this form is required by the Department for any sanitary sewer plan submittal to evaluate conformance with requirements in chs. NR 108 and 110, Wis. Adm. Code

**All necessary information must be provided on this form. Failure to complete this form correctly may result in rejection of this form by the Department.** Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law (ss. 19.31 - 19.39, Wis. Stats.).

**Please type or clearly print your answers to all questions.**

Sanitary sewers will be constructed in accordance with (select one of the following):

- 1. Standard specifications for Sewer and Water Construction in Wisconsin (6th edition).  
 Note: Standard specifications do not amply cover erosion control measures. Special provisions must be submitted.

- 2. Standard specifications for municipality on file with the Department:

Municipality Name: \_\_\_\_\_

Approval Number: \_\_\_\_\_ Date of Approval \_\_\_\_\_

Are the specifications on the file with the Department less than 4 years old?  Yes  No

- 3. Specifications submitted with plans (please fill out Sections A through G below):

Note: Specifications must be signed and sealed by a professional engineer.

A. Pipe Material	Application Standard	Joint Type and Standard
Asbestos Cement	_____	_____
Cast Iron	_____	_____
Concrete	_____	_____
Vitrified Clay	_____	_____
Steel	_____	_____
Ductile Iron	_____	_____
PVC	_____	_____
ABS Composite	_____	_____

Is any pressure sewer pipe being used?  Yes  No

If yes, indicate type, standard and joints: \_\_\_\_\_

B. Is trench width adequate for pipe laying, jointing and placement of proper backfill?  Yes  No

C. Bedding type for pipe meets requirements of ASTM C12-81 or MOP 9?  Yes  No

Class A  Class B  Class C

Bedding material for PVC and ABS composite pipe meets requirements of ASTM D2321-80?  Yes  No

Class I  Class II  Class III

D. Suitable backfill material within 2 feet of pipe ( no frozen or organic material or large stones)?  Yes  No

E. Infiltration - less than 200 gal/in/mi/day?  Yes  No

Test Procedure: \_\_\_\_\_

F. PVC pipe deflection testing?  Yes  No  N/A

Method: \_\_\_\_\_

G. Manholes:

Diameter \_\_\_\_\_

Material \_\_\_\_\_

Outside Drops \_\_\_\_\_

Water Tight Inlets and Outlets \_\_\_\_\_

Sketch Included \_\_\_\_\_

I certify that this document, to the best of my knowledge and belief, is true, accurate, and complete.

\_\_\_\_\_  
 Signature of Consulting or Municipal Engineer Responsible for Preparing this Form

E-37146  
 \_\_\_\_\_  
 Wisconsin P.E. Number

## Sanitary Sewer or Lift Station Project Approval Request

Form 3400-160 (R 11/17)

Date: 07/01/2020

**Notice:** In accordance with s. NR. 108.04(2)(a), Wis. Adm. Code, this form is authorized to accompany final plans and/or specifications for any reviewable sanitary sewer and/or lift station project that is submitted to the Department of Natural Resources (Department) pursuant to s. 281.41, Wis. Stats and s. NR 108.03, Wis. Adm. Code. Completion of this form is required by the Department for any sanitary sewer or lift station plan submittal to evaluate conformance with requirements in chs. NR 108 and 110, Wis. Adm. Code.

**All necessary information must be provided on this form. Failure to complete this form correctly may result in rejection of this form by the Department.** Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law (ss. 19.31 - 19.39, Wis. Stats.).

**Please type or clearly print your answers to all questions.**

**General Information**

I am submitting one paper copy and one CD containing PDF files of plans and/or specifications for (select all that apply).

- Sanitary Sewer Extension     Sewer Replacement/Rehabilitation     Lift Station     Force Main

Project Title:

Morning Meadows Subdivision - Phase 1

Project construction will occur at the following locations:

Street	Pipe Size (in.)	Pipe Length (ft.)
Road "A"	8	1,124

The sewer and/or lift station plan submittal conforms with the following:

True False NA

- Attached are completed Department Forms 3400-205, 3400-059, 3400-095 and 3400-168 (Form 3400-168 is only required for lift station projects).
- Attached is a general map of the proposed sanitary sewer extension showing the proposed sewer service area.
- Attached is the sewerage system owner approval letter in accordance with s. NR 110.12, Wis. Adm. Code (Only required if the engineer is not an employee of or has not been retained by the municipality).
- Attached is a copy of the wastewater treatment facility (WWTF) approval letter (Only required if sewer system is connected to a regional WWTF).
- Attached is a copy of the Sewer Service Area /Water Quality Management (208) conformance letter (See communities which require this letter available at the WDNR website: <http://dnr.wi.gov/topic/wastewater/RPClist.html>)
- Sewers do not come within 50 feet of a private water supply well OR 200 feet of a public water supply well in conformance with ss. NR 811.12 (5)(d) and 812.08(4)(c), Wis. Adm. Code.
- Lift Stations do not come within 8 feet of water main, 100 feet of a private water supply well OR 200 feet of a public water supply well in conformance with ss. NR 811.12 (5)(d), 811.75(1)(a) and 812.08(4)(d), Wis. Adm. Code.
- Sewers meet the minimum required horizontal and vertical separation distances from water mains in conformance with s. NR 811.74, Wis. Adm. Code.
- Erosion and sediment control practices are consistent with the WDNR construction site erosion and sediment control technical standards and are on the plan sheets. (The WDNR construction site erosion and sediment control technical standards are available on the WDNR website at: [http://dnr.wi.gov/topic/stormwater/standards/const\\_standards.html](http://dnr.wi.gov/topic/stormwater/standards/const_standards.html)). If the project is part of a construction site that will disturb one or more acres of land, a Notice of Intent and associated attachments (Forms 3500-053 and 3500-053C) for coverage under the Construction Site Stormwater Runoff General Permit has been submitted to the Department in accordance with ch. NR 216, Wis. Adm. Code.
- Sewer and/or lift station construction does not impact any wetlands.
- Sewer and/or lift station construction does not impact any navigable waterways.
- Sewer and /or lift station plans and specifications are in conformance with chs. NR 108 and 110, Wis. Adm. Code.

I certify that this document, to the best of my knowledge and belief, is true, accurate, and complete.

Preparer's Last Name	First Name	Email	P.E. Number
Mazurkiewicz	Dan	dan.mazurkiewicz@rasmith.com	E-37146
Signature		Name of Firm	
		R.A. Smith, Inc.	

If you have any questions on sewer and/or lift station approval requests or the plan review process, please visit the WDNR website at: <http://dnr.wi.gov/topic/wastewater/AdequateSubmittal.html>

**Notice:** In accordance with s. NR. 108.04(2)(a), Wis. Adm. Code, this form is authorized to accompany final plans and/or specifications for any reviewable project that is submitted to the Department of Natural Resources (Department) pursuant to s. 281.41, Wis. Stats and s. NR 108.03, Wis. Adm. Code.

**All necessary information must be provided on this form. Failure to complete this form correctly may result in rejection of this form by the Department.** Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law (ss. 19.31 - 19.39, Wis. Stats.).

Please type or clearly print your answers to all questions.

Owner Information			
Owner Name (Municipality, Company or other)		WPDES Permit No.*	County (of project location)
Jilline Dobratz - Village of Jackson Clerk		WI-S066796-1	Washington
Owner Representative Last Name	First Name	MI	Title
Kober	Brian		Director of Public Works
Address		City	State   ZIP Code
N168 W20733 Main Street		Village of Jackson	WI   53007
Phone Number (include area code)		Email Address	
(262) 677-9001		dirpubwks@villageofjackson.com	

Design Engineer Information			
Last Name		First Name	MI
Mazurkiewicz		Dan	J
Title		Company Name	
Senior Project Engineer		R.A. Smith, Inc.	
Address		City	State   ZIP Code
16745 W. Bluemound Road		Brookfield	WI   53005
Phone Number (include area code)		Email Address	
(262) 781-1000		dan.mazurkiewicz@rasmith.com	

Project Information	
Project Title	
Morning Meadows Subdivision Phase 1	
Project Description	
Construction of sanitary sewer to service new residential development (24 lots). 8" main will be constructed.	

Certification	
I certify that this document and the plans and specifications, to the best of my knowledge and belief, are true, accurate, and complete; and conform to all applicable design requirements contained in the Wisconsin Administrative Code with the exception of any requested variances or alternative requirements as detailed below:	
Requested Design Variances or Alternative Requirements	

Design Engineer Name (print)	Wisconsin P.E. Number*
Dan Mazurkiewicz, P.E.	E-37146
Signature of Design Engineer	Date Signed

Type of Project		
Select all that apply:		
<input checked="" type="checkbox"/> Sanitary Sewer Extension	<input type="checkbox"/> Municipal Treatment Plant	<input type="checkbox"/> Non-Domestic POWTS
<input type="checkbox"/> Sewer Replacement/Rehabilitation	<input type="checkbox"/> Industrial Treatment Plant	<input type="checkbox"/> Septage Storage Facility
<input type="checkbox"/> Lift Station	<input type="checkbox"/> Industrial Pretreatment Facility	<input type="checkbox"/> Large POWTS
<input type="checkbox"/> Force Main	<input type="checkbox"/> Other: _____	
<input type="checkbox"/> Clean Water Fund? Provide CWF Project Number if known: _____		
<input type="checkbox"/> Requesting Expedited Review (ONLY AVAILABLE FOR CERTAIN TYPES OF PROJECTS. See Instructions at our webpage here: <a href="#">Expedited Review</a> )		

PROJECTS FINANCED BY THE CLEAN WATER FUND REQUIRE A FACILITIES PLAN

Website for plan submittal guidance: <http://dnr.wi.gov/topic/wastewater/AdequateSubmittal.html>

\*May not be required for industrial pretreatment facilities.

**Notice:** This form is authorized by ss. 280.11, 281.11, 281.19 (1) and (2), and 281.41, Wis. Stats., and ss. NR 108.04 (2)(a) and 811.08 (1), Wis. Adm. Code. Completion of this form or a similar form approved by the Department of Natural Resources (DNR) is mandatory. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.]. Unless otherwise noted all citations refer to Wis. Adm. Code.

**WATER MAIN SUBMITTAL INSTRUCTIONS:**

The following is a listing of information that must be submitted when requesting an approval of a water main project:

- 1. A completed Water System Approval Request (DNR Form No. 3300-260) has been included?  Yes  No
- 2. One set of plans sealed by a Professional Engineer has been included in conjunction with a water main only submittal?  Yes  No  N/A
- 3. Three sets of plans sealed by a Professional Engineer have been included in conjunction with a facilities submittal?  Yes  No  N/A
- 4. One set of specifications sealed by a Professional Engineer has been included in conjunction with a water main only submittal?  Yes  No  N/A

The Specifications Section of the checklist must be completed if specifications are submitted. The submittal of specifications is not necessary if the community already has specifications on file with the Department of Natural Resources (that are not older than five years) or is using the latest edition of the Standard Specifications for Sewer and Water Construction in Wisconsin.

- 5. Three sets of specifications sealed by a Professional Engineer have been included in conjunction with a facilities submittal?  Yes  No  N/A
- 6. A plan or plans has been included that shows the location of the proposed project in relation to the rest of the distribution system?  Yes  No  N/A
- 7. An approval letter from the owner of the distribution system has been included, unless the applicant is employed or retained by the waterworks owner?  Yes  No  N/A

All sections of this checklist must be completed for every submittal; excepting, that if specifications are on file for the municipality or standard specifications are to be used, the section under specifications may be omitted. If it is felt that a question on the checklist does not apply to a particular project, indicate this with N/A and explain the reason.

**A. General Information**

Name of Municipality/Sanitary District/Other	Name/Number of Project
Village of Jackson	Morning Meadows Subdivision PH 1

**B. Specifications**

**Water mains will be constructed in accordance with:** (select one of the following three options)

- 1. Standard Specifications for Sewer and Water Construction in Wisconsin ( 6th Edition)
- 2. Standard specifications for municipality already on file with DNR: Approval number for specifications \_\_\_\_\_  
 Date of Approval \_\_\_\_\_ Are specifications on file with DNR less than 5 years old?  Yes  No
- 3. Specifications submitted with the plans (fill out the following section)

**C. Design Specifics**

- 1. Minimum horizontal (center to center) separation distance between water main and existing or future sanitary sewer 10 ft., storm sewer 10 ft. [NR811.74(2)] Minimum horizontal separation distance between fire hydrant drains and sanitary sewers, storm sewers, or storm sewer inlets 10 ft. [NR811.71(4)]
- 2. Where water mains cross over sewers, the minimum vertical separation distance (edge to edge) is 6 inches. Where water mains cross under sewers, the minimum vertical separation distance (edge to edge) is 18 inches. [NR811.74(3)]
- 3. Will a common trench be used in any portion of the project? [NR811.74(2)(b)]  Yes  No
- 4. Will the following minimum horizontal separation distances be maintained between the water main and the contamination sources listed?[NR811.75]
  - (A) Eight feet to a POWTS holding, treatment or dispersal component, lift station, or grave site?  Yes  No  N/A
  - (B) Twenty-five feet to a buried fuel tank or main?  Yes  No  N/A
  - (C) Fifty feet to a sanitary landfill?  Yes  No  N/A

**C. Design Specifics (cont'd)**

- 5. Does the municipality have an erosion control ordinance? [NR811.09(2)]  Yes  No
  - (A) If yes, will compliance with the ordinance be required for this project?  Yes  No  N/A
  - (B) Do the plan sheets show the erosion control provisions?  Yes  No
  - (C) Do the specifications require that the erosion control measures be in place before construction begins and be maintained during construction?  Yes  No
  - (D) Do the required erosion control provisions comply with the technical standards of ch. NR151?  Yes  No
- 6. Are valves provided at each intersection and at intermediate points so spacing does not exceed 800 feet? [NR811.70(9)]  Yes  No
- 7. Are hydrants provided at each intersection and at intermediate points so spacing does not exceed 600 feet? [NR811.71(1)]  Yes  No
- 8. Are hydrants or other flushing devices capable of flow velocities of at least 2.5 feet per second in the water main installed downstream of the last service at all dead-ends? [NR811.71(7)]  Yes  No
- 9. Will any watermain stubs 20 feet or greater in length be installed? [NR811.70(8)]  Yes  No
- 10. If groundwater may rise above hydrant drain ports, will the drain ports be plugged and operational procedures established for pumping the hydrant barrels dry during freezing weather? [NR811.71(4)]  
If no, explain:  Yes  No  N/A
- 11. Is there a history of external corrosion problems with buried pipe in the project area? [NR811.69(4)]  Yes  No
- 12. Do the proposed water mains pass through or adjacent to a landfill or chemical spill area that may adversely impact the piping material or gaskets? [NR811.69(5)]  Yes  No
- 13. Do the proposed water mains pass through a wetland area? [NR811.70(3)]  Yes  No
- 14. Do the proposed water mains pass through a floodway or floodplain? [NR811.70(2)]?  Yes  No
- 15. Does installation of the proposed water mains involve construction within 500 feet of the ordinary high water mark or over or under or in waters of the state?  Yes  No
- 16. If plans are submitted by someone other than the waterworks owner or authorized representative, is written acceptance of the waterworks owner included? [NR811.10]  Yes  No  N/A
- 17. Do the proposed water mains involve construction of manholes, vaults, or other below grade structures containing shutoff valves, air relief valves, pressure reducing valves, or water meters? [NR 811.72]  Yes  No
- 18. Do the proposed water mains involve any surface water crossings over 15 feet? [NR811.76]  Yes  No
- 19. Do the proposed water mains involve any common casing crossings? [NR811.77]  Yes  No
- 20. Will private mains or services be connected at more than one location, creating a loop back into the public system [NR811.68(3)]?  Yes  No
- 21. Water main pipe material(s) to be used: PVC AWWA C-900  
 Type of joint(s): Push-on rubber gasket  
 Class and/or DR: Class 150-DR 18 [NR811.69]
- 22. If ductile iron pipe will be used, will it be enclosed in polyethylene wrap?  Yes  No  N/A
- 23. Will proposed water mains serve existing structures having private wells? [NR810.15, NR810.16]  Yes  No
- 24. Will installation of the water main(s) include dewatering well construction having a total capacity exceeding 70 gallons per minute? [NR812.09(4)(a)]  Yes  No
- 25. On-site inspection of the proposed water main construction will be provided by (check all that apply): [NR811.11]  
 Engineering firm  Owner  Other (specify) \_\_\_\_\_
- 26. Normal static pressures throughout the area to be served will range from  
89.7 to 93.6 PSI [NR 811.66(1)(b) & NR 811.70(4)]
- 27. The area to be served is (check all that apply):  Residential  Commercial  Industrial [NR 811.70(9) & NR 811.71(5)]

**C. Design Specifics (cont'd)**

28. Calculate the minimum fire flow at any proposed hydrant. [NR811.70(5)&(6), NR811.71(3)]

**Fire Flow Test**

Location of residual hydrant: Sherman Road, 500' east of C.T.H. "P"

Location of flowing hydrant(s): Sherman Road, 900' east of C.T.H. "P"

Distance between residual and flowing hydrant(s): 400 ft.

Static pressure at residual hydrant: 91 PSI Elevation of residual hydrant: 857.0 ft.

Flow test results: 1188 GPM at a residual pressure of 83 PSI

Conversion of flow test to 500 GPM equivalent yields 500 GPM @ 89.4 PSI

**Calculations**

Location of critical hydrant: Road "A", 600' north of Sherman Road

Distance between critical and residual hydrants: 637 ft.

Roughness coefficient ("C" factor): 120 Elevation of critical hydrant: 868.0 ft.

Head loss due to friction: 1.8 PSI Head loss/gain due to elevation: 4.7 PSI Total head loss: 6.5 PSI

Calculated available fire flow at critical hydrant is 500 GPM at 82.9 PSI

(Attach additional sheets if necessary.)

For computer generated models, output must include all losses, assumed flows, roughness coefficient, pipe lengths, pipe diameters, and a node map.

29. Water mains proposed:

Diameter <sup>1</sup> (inches)	Length <sup>1</sup> (feet)	Street name and/or easement description [NR811.67]
8"	973	Road "A"
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

<sup>1</sup>Note: Rule requirements of other state agencies pertinent to water mains, such as Wis. Adm. Code ch. PSC 184, should be reviewed to obtain all necessary approvals.

**D. Additional Comments**

Further comments on any previous items (use additional sheets if necessary):

**E. Certification**

I certify that I have examined the above information and found it to be correct, true and complete.

Signature of Professional Engineer		Date Signed	
Printed Name of Professional Engineer Dan Mazurkiewicz		Wis. P.E. Number E-37146	
Email address dan.mazurkiewicz@rasmith.com	Phone Number (incl. area) (262) 781-1000	Fax Number (inc. area code)	

**Notice:** This form is authorized by ss. 280.11, 281.11, 281.19 (1) and (2), and 281.41, Wis. Stats., and ss. NR 108.04 (2)(a) and 811.08 (1), Wis. Adm. Code. Completion of this form or a similar form approved by the Department of Natural Resources is mandatory. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.]. Unless otherwise noted all citations refer to Wis. Adm. Code.

**A. System Information**

Water System Name <b>Jackson Water Utility</b>	
Water System Infrastructure Owned By: (select one) <input checked="" type="radio"/> Government Entity (City, Village) <input type="radio"/> Sanitary or Utility District <input type="radio"/> Utility Commission <input type="radio"/> Privately Owned (Company or Individual)	Name of Water System Owner (if different than Water System Name)

**B. Water System Owner**  
 (examples: municipal clerk, sanitary district president, utility commission clerk, OTM owner)

Water System Representative or Contact (if not Owner) (examples: water superintendent, director of public works, operator)		
Name <b>Diane Lemke, Water Utility Clerk</b>	Name <b>Dan Rathke, Water Utility Supervisor</b>	
Street Address <b>N168 W20733 Main Street</b>		
City <b>Jackson</b>	State <b>WI</b>	ZIP Code <b>53037</b>
City <b>Jackson</b>	State <b>WI</b>	ZIP Code <b>53037</b>
Phone Number <b>(262) 677-0707</b>	Fax Number	Cell Number (optional)
Phone Number <b>(262) 677-0707</b>	Fax Number	Cell Number (optional)
Email Address <b>utilityclerk@villageofjackson.com</b>		
Email Address <b>watersuper@villageofjackson.com</b>		

**C. Designer/Constructor Information**

Name <b>Dan Mazurkiewicz</b>			Firm Name <b>R.A. Smith, Inc.</b>		
Street Address <b>16745 W. Bluemound Road</b>			Phone Number <b>(262) 781-1000</b>	Fax Number	Cell Number (optional)
City <b>Brookfield</b>	State <b>WI</b>	ZIP Code <b>53005</b>	Email Address <b>dan.mazurkiewicz@rasmith.com</b>		

**D. Project Location (As applicable)**

<input type="radio"/> City <input type="radio"/> Town <input checked="" type="radio"/> Village	County
of Jackson	Washington

Will Safe Drinking Water Loan Program (SDWLP) funds be requested for this project?  Yes  No

**Brief Project Description (DO NOT LEAVE BLANK)**  
 8" water main to service new single-family residential development (24 lots).

**Applicability:** This form applies to projects being submitted for municipal and other-than-municipal community, public water systems.

**Number of Copies:** Submit three copies of all the plans, specifications, forms and attachments.  
 Only one copy needs to be submitted for water main only projects.

## Fire Flow Calculations

**Project:** Morning Meadows - Phase 1  
**Project Number:** 3050195.02  
**Client:** Home Path Financial  
**Date:** 7/2/2020  
**by:** CDH

**Test Hydrant (static):**

Location:	Sherman Road, 500' east of C.T.H. "P"	
Residual Pressure (Pr):	83	PSI
Static Pressure (Ps):	91	PSI

hydrant outlet coeff	
outlet diameter	use this coefficient
2.5"	0.9
for outlet dia = 4+"	
pitot reading	use this coefficient
>7	0.83
7	0.83
6	0.84
4	0.89
2	0.97

**Test Hydrant (flowing):**

Location:	Sherman Road, 900' east of C.T.H. "P"	
pitot pressure:		PSI
diameter of hydrant outlet (d):	2.5	inches
hydrant outlet coefficient (C):	0.9	inches
Elevation:	857.0	FEET

flow at test hydrant (Q):  $Q=29.8C(d)^2(\text{pitot})^{0.5}$   
 Q= (note 1) **1188** GPM  
 Note 1: if Q is know from test, simply type it in over the formula

**Critical Hydrant:**

Location:	Road "A", 600' north of Sherman Road	
Elevation:	868.0	FEET

**Calculate residual pressure of the test hydrant at a lower flow rate**  
 (if the test flow rate is unreasonably high, and friction losses are high)

Qf =desired reduced flow rate usually set Qf=Qt  
 Qt = flow during test  
 Ps = static pressure Qf can be lower but not higher than Qt  
 Pt = residual pressure during test  
 Pf = residual pressure at desired flow

Qf =	500	GPM
Qt =	1188	GPM
Ps =	91	PSI
Pt =	83	PSI

Residual pressure at the desired flow =	$-((Qf/Qt)^{1.85})x(Ps-Pt) + Ps$	
Residual pressure =	<b>89.39</b>	<b>PSI @ 500 GPM</b>

## Fire Flow Calculations

project #: 3050195.02

### Static Losses:

Elevation difference =	elevation at test hydrant	-	elevation at critical hydrant
Elevation difference =	857	-	868
Elevation difference =	-11	feet	

Static Pressure Loss =	elevation difference (in feet)	X	1 psi/2.31 feet
Static Pressure Loss =	-11	X	1 psi/2.31 feet
Static Pressure Loss =	4.76	PSI	(NOTE: negative number means pressure gain)

### Friction Losses

using the Hazen-Williams equation

L = pipe length in feet

Q = flow in GPM

C = coefficient of friction

D = diameter of pipe in inches

$$H_f = \frac{10.44 (L) \cdot Q^{1.85}}{C^{1.85} \times D^{4.8655}}$$

#### first length of watermain

description:	12" PVC, Sherman Road
L=	10 feet
Q=	500.00 gpm
C=	120
D=	12 inches

Hf, 1 = 0.01 FEET

#### second length of watermain

description:	8" PVC, Road "A"
L=	605 feet
Q=	500.00 gpm
C=	120
D=	8 inches

Hf, 2 = 3.57 FEET

#### third length of watermain

description:	6" PVC, Road "A"
L=	22 feet
Q=	500.00 gpm
C=	120
D=	6 inches

Hf, 3 = 0.53 FEET

Total Hf =	4.11 FEET
Hf=	pressure in feet x 1 psi/2.31 feet
Hf=	1.78 PSI

**Fire Flow Calculations**

project #: 3050195.02

**Residual Pressure at Critical Hydrant**

residual pressure =	residual pressure at test hydrant	-	static loss	-	friction loss
residual pressure =	89.39	-	4.76	-	1.78

residual pressure =	82.85	PSI	@ Q =	500	GPM
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**Static Pressure at Critical Hydrant**

static pressure =	static pressure at test hydrant	-	static loss
static pressure =	91	-	4.76
static pressure =	86.24	PSI	

convert flow to 20 PSI residual

- Qf = flow during test (or, optionally, reduced flow rate chosen to calculate losses)
- Ps = static pressure at critical hydrant
- Pf = residual pressure during fire condition
- Pr = residual pressure at critical hydrant

Qf =	500 GPM
Ps =	86.24 PSI
Pf =	20 PSI
Pr =	82.85 PSI

Q @20psi =	$Q_f \times ((P_s - P_f) / (P_s - P_r))^{0.54}$
Q @20psi =	2,488 GPM

**Calculate normal static pressures in system**

highest watermain elevation, in feet = 860.0  
 lowest watermain elevation, in feet = 851.0

static pressure, test hyd	91 psi @	857 feet
---------------------------	----------	----------

highest pressure =	$(\text{elev test hydrant} - \text{lowest elev}) / (2.31 \text{ feet/psi}) + \text{static pressure}$
highest pressure =	93.60 psi

lowest pressure =	$(\text{elev test hydrant} - \text{highest elev}) / (2.31 \text{ feet/psi}) + \text{static pressure}$
lowest pressure =	89.70 psi

## DEVELOPMENT AGREEMENT

THIS AGREEMENT is made this \_\_\_\_\_ day of \_\_\_\_\_, 2020, by and between Home Path Financial LP (“Developer”), and the Village of Jackson, a municipal corporation of the State of Wisconsin, located in Washington County, (“Village”).

**WHEREAS**, the Developer is the owner of 92.17 acres which has been zoned and approved for single-family development in the Village of Jackson, Washington County, Wisconsin, as follows:

**MORNING MEADOWS – PHASE I  
(CONSISTING OF TWENTY-FOUR LOTS)  
See EXHIBIT “A” Attached Hereto  
for legal description**

**WHEREAS**, the Village Board has approved the plan for the development of the property (“Plan”) on the condition that Developer enter into an Agreement with the Village relative to the manner and method by which the Plan will be developed in accordance with the Village of Jackson Municipal Code; and

**WHEREAS**, the parties agree that Developer shall be responsible for installing the public improvements on the site, as outlined below, but that all remaining improvements, including structures, private roadways, and private landscaping shall become the responsibility of the builder(s) who is developing the real property that is the subject of this Agreement;

**NOW, THEREFORE**, in consideration of the approval by the Village of the Plan prior to the completion and installation of all required improvements, it is agreed as follows:

### SECTION I. IMPROVEMENTS

**A. Phasing** The public improvements within the project shall be completed in three phases in accordance with the plan attached hereto as **EXHIBIT “B”**.

**B. Streets**

1. Developer shall complete the construction of **Road “A”** except the final course of asphalt, including underground utilities prior to issuance of building permits within the site, **other than the building permits for the model homes referred to in Section IV. D.3.**

2. The second course of asphalt shall be installed no earlier than 12 months and no later than 24 months following the installation of the first course of asphalt, or as directed by the Village Engineer.

**C. Sanitary Sewer**

1. Developer shall furnish, construct, and install sanitary sewer system in accordance with the design plans prepared by R.A. Smith, Inc. and as approved by the Village Engineer.
2. All sanitary sewer main and lateral construction shall be done in accordance with standard specifications of the Village and shall be completed prior to the application of the first lift of asphalt street paving.
3. Developer or subsequent builders are responsible for connecting sanitary sewer laterals to the sanitary sewer system.
4. Sanitary sewer connections shall be determined to occur at the time each building permit is issued and shall be paid according to the connection fee in effect at the time each building permit is issued, by the builder requesting each permit.

**D. Water Distribution**

1. Developer shall furnish, construct and install water mains in accordance with the design plans prepared by R.A. Smith, Inc. and as approved by the Village. If a water main in excess of 12 inches is required, the Village is responsible for the cost of oversizing. Costs shall be paid within 45 days of receiving a detailed billing from Developer.
2. All water main and service lateral construction by Developer shall be done in accordance with standard specifications of the Village and shall be completed prior to the application of the first lift of asphalt street paving.
3. Water connection charges shall be determined at the time each building permit is issued and shall be paid by the builder requesting the connection according to the connection/impact fee in effect at the time each building permit issued.

**E. Storm Sewer**

1. Developer shall furnish, construct, and install surface/storm water system in accordance with the design plans prepared by R.A. Smith, Inc. and as approved by the Village Engineer.
2. All storm water system construction shall be done in accordance with Village standards and shall be completed prior to the application of the first lift of asphalt street paving.

**F. Erosion Control Plan**

Developer shall comply with the erosion control plan prepared by R.A. Smith, Inc., which conforms to the provisions of the Village of Jackson Municipal Code.

**G. Grading Plan**

The site shall be graded in conformity with Developer's grading plan as approved by the Village Engineer. Following completion of all public improvements, Developer shall provide the Village with an as-built grading plan.

**H. Landscaping**

Developer shall comply with the landscaping plan, which is to be submitted to and approved by the Village.

**I. Completion Date**

All public improvements on the site for which a completion date is not otherwise specified, other than the final lift of asphalt paving, shall be completed prior to the issuance of building permits, other than for the model homes referred to in Section IV.D.3., per Village of Jackson Municipal Code.

**J. Installation of Improvements**

Following the completion date set forth in the preceding paragraph, the Village may replace, repair, or construct, or arrange for the replacement, repair, or construction, of any public improvements not installed by Developer, in accordance with this Agreement and the Village's standard specifications. Prior to proceeding with such replacement, repair, or construction, the Village shall give Developer notice of any deficiency in Developer's performance and allow not less than 30 days for Developer to correct such deficiency. Developer shall reimburse the Village for its costs in connection with such replacement, repair, or construction.

**K. Signs**

Developer may apply for and place its temporary promotional signs on Developer's property, if approved by the Village, until the model homes are sold.

**L. Street Lamps**

Developer agrees to pay the cost of the installation of the street lamps and the restoration required due to the installation of underground wiring per the Village developed plan. The Village of Jackson will select and design the type and location of the street lamps used for the Subdivision. The Village of Jackson will hire a contractor for the installation. The Street Lamps will be owned and maintained by the Village of Jackson.

**OR:**

In lieu of street lamps; coach lamp light posts and fixtures are to be installed, owned, and maintained in the front yard of each house by each individual property owner, with lamp construction requirements to be recorded through deed and restrictive covenants.

**SECTION II. APPROVAL AND TRANSFER OF IMPROVEMENTS**

**A. Inspection**

All utility construction shall be inspected and tested by the Village Engineer or a consultant retained by him to assure that it complies with all construction and improvement requirements of the Village. Before any sureties are released to Developer, the Village Engineer shall report the satisfactory completion and recommend acceptance of all improvements to the Board of Public Works and Village Board. The Village Engineer shall review any written requests from Developer and respond in writing within 30 days of receiving said letter indicating acceptance or reasons for denial of acceptance of said improvements. Developer shall pay the actual cost of such inspections as required by Section 38.14(f) of the Village of Jackson Municipal Code attached as **EXHIBIT "C"**.

**B. As-Builts**

After completion of all public improvements within the site, and prior to final acceptance of said improvements by the Village, Developer shall prepare and present as-built documents in accordance with Section 38-209 of the Village of Jackson Municipal Code. As-builts shall be submitted on electronic media compatible with the Village's CAD system software, in addition to providing a reproducible medium to the Village Engineer.

**C. Dedication**

Subject to all of the other provisions of this Agreement and the exhibits hereto attached, Developer shall, upon completion of all of the above described public improvements, unconditionally, and without charge to the Village, grant, convey, and fully dedicate the same to the Village, its successors and assigns forever, free and clear of all encumbrances whatsoever; together with (without limitation because of enumeration) all land, structures, mains, conduits, pipes, lines, plant machinery, equipment, and appurtenances which may in any way be a part of or pertain to such improvements, together with any and all necessary easements for access thereto.

**D. Acceptance**

Following completion and dedication of the improvements and upon written request by Developer, the Village shall report inspection and completion of the improvements to the next scheduled meetings of the Board of Public Works and Village Board. The Village shall thereupon accept such improvements in accordance with Section 15.05 of the Village of Jackson Municipal Code. The Village shall thereafter have the right to connect or integrate other utility facilities with the facilities provided hereunder without payment or award to, or consent required of, Developer. The Village Clerk shall provide Developer with a certified copy of the Village Board Resolutions accepting improvements hereunder which Developer may record to evidence compliance with this Agreement.

**E. Street Grades**

Prior to construction, the Village shall establish the grade of all streets in accordance with Section 36-26 of the Village of Jackson Municipal Code, and as approved by the Village Engineer.

**F. Improvement Guarantee**

Developer agrees to guarantee all improvements installed by it against defects in materials or workmanship which appear within a period of one year from the date of acceptance by the Village as herein provided and shall pay for any damages resulting therefrom to Village property.

**G. Title Evidence**

Prior to recording of the Final Plat, Developer shall provide the Village with title evidence acceptable to the Village showing that upon recording, the Village shall have good, indefeasible title to all interests in land dedicated or conveyed to the Village by the Plat, this Agreement, or other instruments required by this Agreement.

**H. As-Built Alterations or Repairs**

If the public improvements as installed by Developer, even if in accordance with the approved plans, do not function or perform properly in the field as determined by the Village Engineer within the 1-year guarantee period, Developer shall, at its expense, make such repairs or alterations as required by Village Engineer. If Developer fails to make such alterations or repairs as reported during the 1-year guarantee period, the Village will make the same and charge Developer and/or draw on Developer's letter of credit.

**SECTION III. FINANCIAL GUARANTEE**

**A. Letter of Credit**

Prior to the commencement of any public improvements, Developer shall provide to the Village a formal letter of credit issued pursuant to Wisconsin Statutes which shall assure the faithful performance of Developer's obligations under this Agreement as itemized in attached **EXHIBIT "D"**, attached hereto and incorporated herein by reference. The amount of the letter of credit shall be 115% of the amount of the estimated total of the contracts for the installation of public improvements as approved by the Village Engineer. The amount of the letter of credit may be reduced from time to time by the Village Administrator in amounts equal to the value of improvements, which have been installed, completed, and accepted by the Village. The letter of credit shall be payable to the Village and shall be conditioned upon guarantee to the Village the performance by Developer of its obligations under this Agreement. The letter of credit shall be approved as to form by the Village Attorney.

**B. Preservation of Assessment Rights**

In the event of a default by Developer under this agreement, and in addition to other remedies provided to the Village by this Agreement, the Village shall have the right without notice or hearing, to impose special assessments for any amount to which the Village is entitled by virtue of this Agreement. This provision constitutes Developer's consent to the installation by the Village of all public improvements required by this Agreement and constitutes Developer's waiver of notice and consent to all special assessment proceedings as described in Sec. 66.0701, Wis. Stats. In addition, if any of the common areas within the site are not maintained by the homeowner's association created by Developer in a manner acceptable to the Village, the Village shall have the authority to provide the maintenance and charge the proportionate costs thereof against each unit within the Development as a special assessment or special charge pursuant to Section 66.0701 Wis. Stats.

**C. Remedies Not Exclusive**

The remedies provided in this section are not exclusive. The Village may use any other remedies available to it under the Agreement or in law or equity in addition to, or in lieu of, the remedies provided above.

**SECTION IV. PERMITS AND FEES**

**A. Park Fees**

Developer agrees the park impact fees shall be paid according to the connection/impact fee in effect at the time each building permit is issued and shall be paid at the time of building permit issuance, by the builder making the permit application.

**B. Police and Fire Impact Fees**

Developer agrees the Police and Fire impact fees shall be paid according to the impact fee in effect at the time each building permit is issued and shall be paid at the time of building permit issuance, by the builder making the permit application.

**C. Washington County Special Assessment**

Developer agrees that the Washington County Special for sewer and water shall be paid according to the assessment in effect at the time each building permit is issued and shall be paid at the time of building permit issuance, by the builder making the permit application.

**D. Building Permits**

1. Morning Meadows is zoned PUD-Residential with the minimum requirements of the R-5 zoning. Homes will have the minimum setback requirements:

- Road Setback = 25' on local streets
- Rear Yard = 25'
- Side Yard = 8'

2. Building permits within the site, other than building permits for model homes pursuant to subsection 2 below, will not be issued by the Village for residential construction until Developer has installed, and the Village has accepted, all improvements within the phase, except the final course of asphalt.

3. Notwithstanding anything contained herein to the contrary, Developer is authorized to receive up to **two** early issue building permits to facilitate model home construction. All such homes shall be initially planned for model home use. The model homes may not be occupied for residential living purposes until Developer has installed, and the Village has accepted, all public improvements within the phase, except the final course of asphalt. The model homes may continue as model homes until sold.

**E. Developer’s Responsibility for Work**

The Work within the site shall be under the charge and care of Developer until the public improvements serving the site have been accepted by the Village.

**F. Insurance Requirements**

**General** Developer shall obtain insurance acceptable to the Village as required under this section. Developer shall maintain all required insurance under this section until improvements have been accepted and during any subsequent period in which Developer does work under this Agreement pursuant to the improvement guarantee or otherwise.

**Certificates of Insurance** Where the Village does not specify other limits for liability insurance, the minimum limits of liability shall be as follows:

Employer’s Liability (if applicable)	\$100,000.00 per occurrence
Comprehensive Motor Vehicle Liability, Bodily Injury and Property Damage combined (if applicable)	\$1,500,000.00 per accident
Comprehensive General Liability	
Bodily Injury	\$1,500,000.00 per accident
Property Damage Combine	\$1,000,000.00 aggregate

Developer may furnish coverage for bodily injury and property damage for Comprehensive Motor Vehicle Liability and Comprehensive General Liability through the use of primary liability policies or in a combination with an umbrella excess third party liability.

**SECTION V. LEGAL REQUIREMENTS AND PUBLIC RESPONSIBILITY**

**A. Laws to be Observed**

Developer shall at all times observe and comply with all federal, state, and local laws, regulations, and ordinances which are in effect or which may be placed in effect, which may affect the conduct of the work to be accomplished under this Agreement (“Work”). Developer shall indemnify and save harmless, the Village and all its agents, officers, and employees, against any claims or liability arising from or based on the violation of any such law, ordinance, regulation, or order, whether by himself or his agents, employees, or contractors. Developer shall procure all permits and licenses and pay all charges and fees and give all notices necessary and incident to the lawful prosecution of the work to be completed under this Agreement.

**B. Public Protection and Safety**

Developer shall be responsible for all damage, bodily injury, or death arising out of the Work, whether from maintaining an “attractive nuisance” or otherwise. Where apparent or potential hazards occur, incident to his conduct of the Work, Developer shall provide other reasonable safeguards.

Owner’s Protective Liability (Independent Contractor Insurance):

The liability limits shall be the same as those of the Comprehensive General Liability Policy.

Insurance required under this Agreement shall be carried with an insurer authorized to do business in Wisconsin by the Wisconsin State Insurance Department. The Village reserves the right to disapprove any insurance company.

**C. Indemnification**

Developer shall indemnify and hold harmless the Village, its officers, agents, and employees from and against all claims, damages, losses, and expenses, including attorney’s fees arising out of or resulting from the performance of the work, provided that any such claim, damage, loss, or expense (a) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom, and (b) is caused in whole or in part, by any negligent act or omission of Developer, his Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder; provided, however, that such indemnification shall not extend to directions by the Village of its employees to perform acts if the acts are performed in accordance with such direction. A claim for indemnification under this section shall be conditioned upon the Village giving to Developer, within five business days of receiving the same, written notice of any claim made against the Village which indemnification is sought, and if requested to do so by Developer’s insurance carrier, the Village shall tender the defense of such claim to Developer’s insurance carrier. In any and all claims against the Village, its officers, agents, and employees, by any employee of Developer, his Contractor, and Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this section shall not be limited

in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Developer, the Contractor, or any Subcontractor under Workers' Compensation Acts, disability benefit acts, or other employee benefits acts.

**D. Personal Liability of Public Officials**

In carrying out any of the provisions of this Agreement or in exercising any power or authority granted to them thereby, there shall be no personal liability of the Village officers, agents, or employees, it being understood and agreed that in such matters they act as agents and representatives of the Village.

**SECTION VI. MISCELLANEOUS PROVISIONS**

**A. Survey Monuments**

Developer has certified that all survey or other monuments required by statute or ordinance will be properly placed and installed. Any monuments disturbed during construction of improvements shall be restored by Developer.

**B. Zoning**

The Village does not guarantee or warrant that the lands subject to this Agreement will not at some later date be rezoned, nor does the Village agree to rezone the lands into a different zoning district. It is further understood that any rezoning that may take place shall not void this Agreement.

**C. Indemnification for Environmental Contamination**

Developer shall indemnify, defend, and hold the Village and its officers, employees, and agents harmless from any claims, judgments, damages, penalties, fines, costs, or loss (including reasonable fees for attorneys, consultants, and experts) that arise as a result of the presence or suspected presence in or on the real property dedicated or conveyed to the Village by, under, pursuant to, or in connection with the Plat or this agreement (including, but not limited to, street right of way and park land) of any toxic or hazardous substances arising from any activity occurring prior to the acceptance of all improvements. Without limiting the generality of the foregoing, the indemnification by Developer shall include costs incurred in connection with any site investigation or any remedial, removal, or restoration work required by any local, state, or federal agencies because of the presence or suspected presence of toxic or hazardous substances on or under the real property, whether in the soil, groundwater, air, or any other receptor.

The Village agrees that it will immediately notify Developer of the discovery of any contamination or of any facts or circumstances that reasonably indicate that such contamination may exist in or on the real property. The Village also agrees that following notification to Developer that contamination may exist, the Village shall make all reasonable accommodations

to allow Developer to examine the real property and conduct such clean-up operations as may be required by appropriate local, state, or federal agencies to comply with applicable laws.

**D. Easements**

All water, sanitary sewer, storm water drainage, and utility easements dedicated to the Village on the Plat grant the Village the right to construct, install, maintain, inspect, repair, and replace the designated improvements in, on, over or under the easement or permit others to do so. No use of the property shall be made which interferes with the Village rights. The Village's only obligation to restore the property after any use by the Village shall be to grade the soil, replace topsoil, and plant grass seed.

**E. Trash Container**

A standard Village trash container and recycling bin will be provided by the Village at the time the Certificate of Occupancy is issued for each residential unit contracted for trash and recycling pickup.

**F. Pond and Common Areas**

Detention ponds as approved by the Village for this development shall be transferred to a homeowner's association created by Developer. Developer shall maintain the detention pond and the common areas until they are transferred to the homeowner's association. Upon transfer to the homeowner's association, the homeowner's association shall be responsible for maintaining the pond and the common areas. The Village shall be a party entitled to enforce the obligations of all members of the homeowner's association.

**G. Exhibits**

- "A" Legal Description of Property
- "B" Site Plan / Phasing Plan
- "C" Section 38-14 of Municipal Code
- "D" Itemization of Letter of Credit

**SECTION VII. APPROVAL**

The Village shall, contemporaneously, with the approval of this Agreement, approve the Plat and cause the same to be signed and endorsed by the appropriate officers. Developer shall thereupon provide the Village with a conformed mylar copy of the Plat in accordance with Section 38-85 of the Village of Jackson Municipal Code.

**SECTION VIII. AMENDMENTS**

The Village and Developer may, by mutual consent, amend this Developer's Agreement.

**SECTION IX. BINDING EFFECT**

Developer warrants that it is the owner of all property described in **EXHIBIT “A”** and has full right and authority to make this Agreement. This Agreement and the grants, consents, and waivers contained herein shall run with the land and be binding upon Developer and its successors and assigns including all individual lot owners within the plat.

**HOME PATH FINANCIAL, INC.**

Dated: \_\_\_\_\_

By: \_\_\_\_\_  
Name – President

Subscribed and sworn to before me

on: \_\_\_\_\_, 2020

\_\_\_\_\_  
Notary Public – State of Wisconsin (print name)

\_\_\_\_\_  
Notary signature

My commission expires: \_\_\_\_\_

**VILLAGE OF JACKSON**

Dated: \_\_\_\_\_

By: \_\_\_\_\_  
Michael E. Schwab, Village President

Subscribed and sworn to before me

on: \_\_\_\_\_, 2020

\_\_\_\_\_  
Notary Public – State of Wisconsin (print name)

\_\_\_\_\_  
Notary signature

My commission expires: \_\_\_\_\_

DRAFT

**STAFF REVIEW COMMENTS**  
**Plan Commission Meeting – July 30, 2020**

**1. Developers Agreement - Morning Meadows - Home Path Financial LP**

**Building Inspection**

- Concept plan reviewed and approved by PC on 5/23/2019 and by Village Board on 6/11/19.
- Temporary zoning and annexation granted by PC on 8/29/2019 and by Village Board 9/10/2019 (Ref: Ord. #19-02)
- Preliminary Plat submitted and due to the pandemic and cancelled meetings, went directly to the Village Board for consideration. Village Board approved the preliminary plat on 5/12/2020.
- Developers Agreement is currently being drafted.
- Developer is proposing a phased construction approach with the first of three phases consisting of 24 lots and associated infrastructure.

**Public Works/Engineering**

- Staff is working on the review of the utility plans and stormwater management plan. The review comments will be by a separate letter. The Board of Public Works will review the extension of sewer and water to serve the development at the July 29, 2020 meeting.
- The Developer has been notified on the special assessment and additional connection fees associated with the property allowing connection to the sewer and water located in Sherman Road. The Sherman Road Assessment Fee will be required to be paid prior to the start of construction.
- The concept plan for the development was approved without requiring public sidewalks to be installed. Village owned streetlights are being proposed for the development. The plan set will need to include a driveway access detail (retaining walls and culverts) so there is consistency in driveway design.

**Police Department**

- No Comments.

**Fire Department**

- No comments on change of ownership. Revert to original Plan Commission and Village Board approvals.

**STAFF REVIEW COMMENTS**  
**Plan Commission Meeting – July 30, 2020**

**Administrative/Planning**

- No additional comments.