

AGENDA
BOARD OF PUBLIC WORKS MEETING
Tuesday, July 28, 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 the Board of Public Works Minutes of June 30, 2020
3. Change Order #1 – Spruce Street & Ridgeway Drive Extension Project
4. Pay Request #1 - Spruce Street & Ridgeway Drive Extension Project
5. Morning Meadows Phase 1 – Sanitary Sewer and Water Extension
6. Discussion of Village Informational Signs
7. Director of Public Works Report
8. Citizens/Village Staff to address the Board
9. 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
Board of Public Works Meeting
Tuesday, June 30, 2020 at 7:00 p.m.
Jackson Village Hall
N168 W20733 Main Street

1. Call to Order and Roll Call

Chair Olson called the meeting to order at 7:00 p.m.

Members Present: Tr. Heckendorf, Tr. Lippold and Gloria Teifke

Member Absent: Dan Leonard and Sarah Malchow

Staff Present: Brian Kober, John Walther and Jilline Dobratz

2. Approval of the Board of Public Works Minutes of February 25, 2020

Motion by Chair Olson, second by Tr. Lippold to approve the Board of Public Works minutes of February 25, 2020.

Vote: 4 ayes, 0 nays. Motion carried.

3. Pay Request #3 – Jackson Park Alley Project

Brian Kober explained this is for three separate projects. Sherman Road Drainage, \$4,757.87, the grass is coming in and the contractor is to remove the matting material. We are retaining \$3,558.30. Jackson Park West Parking Lot, \$51,957.25, was paved in the spring and funds being retained are \$3,852.79. The Jackson Park Cul-de sac, \$28,322.20, and retaining funds of \$8,023.49 for broken curb replacement. Tr. Heckendorf inquired on a water drainage issue at Jackson Park West Parking Lot after it rains. Brian Kober answered it does drain out slowly and will be reviewed if a change is necessary.

Motion by Chair Olson, seconded by Tr. Lippold to recommend Budget & Finance and Village Board approve Pay Request #3 – Jackson Park Alley Project to Payne & Dolan in an amount not to exceed \$85,037.32.

Vote: 4 ayes, 0 nays. Motion carried.

4. Resolution #20-09 Final Special Assessment Jackson Park Alley Project

Brian Kober reported the project total is \$160,469.73 and will be special assessing \$28,527.50 which hasn't changed since the preliminary.

Motion by Chair Olson, second by Tr. Heckendorf to recommend Budget & Finance and Village Board approve Resolution #20-09 Final Special Assessment Jackson Park Alley Project.

Vote: 4 ayes, 0 nays. Motion carried.

5. Resolution #20-10 Final Special Assessment Chateau Dr & Hickory Ln Project

Brian Kober stated there was one bidder. The sidewalk on Hickory Ln. is \$8.37 a square foot and a capped storm lateral at \$3,000.00. This hasn't changed since preliminary and will be special assessing \$19,949.26. Chateau storm lateral was capped at \$3,000.00 and will be special assessing \$38,118.57. The landscaping was delayed due to snow in November.

Motion by Chair Olson, second by Tr. Heckendorf to recommend Budget & Finance and Village Board approve Resolution #20-10 Final Special Assessment Chateau Dr & Hickory Lane Project.

Vote: 4 ayes, 0 nays. Motion carried.

6. Review of Bids – 2020 Road and Utility Project – Hunters Road

Brian Kober commented four bids were received. The Engineers' Estimate is \$718,556.00 and the low bid was \$458,548.12. Sidewalk is \$5.00 per square foot and storm lateral is \$2,200.00. There was an informational meeting tonight with the residents. This is a Local Road Improvement Project in which \$41,530.94 in funding will be received from WisDOT that will pay a portion of the engineering and inspection services.

Motion by Chair Olson, second by Tr. Lippold to recommend Budget & Finance and Village Board approve Review of Bids – 2020 Road and Utility Project – Hunters Road to Wondra Construction in an amount not to exceed \$458,548.12.

Vote: 4 ayes, 0 nays. Motion carried.

7. Resolution #20-11 Preliminary Special Assessment 2020 Road and Utility Project – Hunters Road

Brian Kober explained the project area. A preconstruction meeting will be held after July 14, 2020. The project will start the end of July and will be completed by September. A preliminary assessment letter will be mailed to the residents after Village Board approval.

Motion by Tr. Heckendorf, second by Tr. Lippold to recommend Budget & Finance and Village Board approve Resolution #20-11 Preliminary Special Assessment 2020 Road and Utility Project – Hunters Road.

Vote: 4 ayes, 0 nays. Motion carried.

8. Engineering Services for Phosphorus Compliance – Town & Country

Brian Kober explained the DNR is proposing a permit modification. We have to follow the same schedule of testing and meet .075 milligrams per liter (mg/L) by 2026. Town & Country would complete an evaluation to determine which compliance options may be selected. Chemicals would be used to get the phosphorus down to .075 by September. The study needs to be completed and the reports need to be done in five years. Right now, we are achieving 0.85 mg/L of phosphorus discharge. An upstream study will be done in year four.

Motion by Chair Olson, second by Tr. Lippold to recommend Budget & Finance and Village Board approve Engineering Services for Phosphorus Compliance – Town & Country in an amount not to exceed \$15,000.00.

Vote: 4 ayes, 0 nays. Motion carried.

9. Bielinski Homes Reimbursement Cedar Creek Water Main

Brian Kober stated a water main needs to be installed on the north side of Cedar Creek Road in order to complete the development of Laurel Springs Addition No. 1 and the paving of Cedar Creek Road. The water main will serve the future development of Laurel Springs Villas. Bielinski would pay for their portion of \$39,930.00.

Motion by Chair Olson, second by Tr. Lippold to recommend Budget & Finance and Village Board approve Bielinski Homes Reimbursement Cedar Creek Water Main in the amount of \$65,265.00.

Vote: 4 ayes, 0 nays. Motion carried.

10. Review of Quote for Final Surface of Cedar Creek Road

Brian Kober provided background information on the Town of Jackson putting the final 1.5" lift on Cedar Creek Road from the railroad tracks west to County Trunk Highway P. The proposal is for a 1.5" lift and the Village's standard is a 2" lift of asphalt.

Motion by Chair Olson, second by Tr. Lippold to recommend Budget & Finance and Village Board reject the Quote for Final Surface of Cedar Creek Road by Payne & Dolan and request a quote with a 2" lift to comply with Village standards.

Vote: 4 ayes, 0 nays. Motion carried.

11. Review of Quotes for Well #3 Sand Issue

Brian Kober reviewed the memo from Water Supervisor Dan Rathke regarding Well #3 sand issues. Quotes were requested from three contractors and one abstained due to their workload. The well is currently offline, and the sand is out of the main.

Motion by Chair Olson, second by Tr. Lippold to recommend Budget & Finance and Village Board approve the Quote for Well #3 Sand Issue to Water Well Solutions in the amount of \$14,920.00.

Vote: 4 ayes, 0 nays. Motion carried.

12. Update on STH 60 Path from Coffeerville to Eagle Drive

Brian Kober presented the plans for the path along Highway 60 on the South side of the road from Coffeerville to Eagle Drive. Also, would like to obtain a proposal for a pedestrian safe passageway with lights going across the street. In April a grant was applied for the project. The last two years grants were applied for but were not received. The results of the grant application should be known by September or October. We are under contract with Key Engineering and would like to go out for bid to have a contractor ready. Chair Olson inquired on waiting until the grant results come back before going forward with the project.

Motion by Chair Olson, second by Tr. Lippold to refer STH 60 Path from Coffeerville to Eagle Drive to the next Board of Public Works meeting.

Vote: 4 ayes, 0 nays. Motion carried.

13. Discussion of Village Informational Signs

Brian Kober reported he will apply for the signs and will ask the Department of Transportation (DOT) to start reviewing them. The design of the signs has not been finalized.

Motion by Chair Olson, second by Tr. Lippold to refer Discussion of Village Informational Signs to the next Board of Public Works meeting.

Vote: 4 ayes, 0 nays. Motion carried.

14. Director of Public Works Report

Brian Kober provided the report. He discussed the missing sidewalk along the east side of Eagle Drive between the two driveways of East Side Mart. The new Municipal

Complex site has major earth work being done, the pond is being dug, onsite water main and sewer are being installed and working to stabilize the site to start the footings. Storm sewer, pond, conduit, is all going in. Ridgeway Drive and Spruce Streets are under construction. Laurel Springs Subdivision has the first lift of asphalt, sidewalks and Village owned streetlights going in. John Walther gave a Park n Ride update. The initial appraisal by the DOT was received. Tr. Lippold inquired on a future date for the canceled Spring cleanup. Rescheduling in the fall was discussed.

Motion by Chair Olson, second by Tr. Lippold to place the Director of Public Works Report on file.

Vote: 4 ayes, 0 nays. Motion carried.

15. Citizens/Village Staff to Address the Board

Gloria Teifke asked about the status of Maplewood Farms. Brian Kober explained a ground water analysis is being completed, the results will be done in the next months. Morning Meadows Subdivision will have a Developer's Agreement at the July Plan Commission meeting. The first phase will start in the fall.

16. Adjourn.

Motion by Tr. Lippold, second by Chair Olson to adjourn.

Vote: 4 ayes, 0 nays. Meeting was adjourned 8:20 p.m.

Respectfully submitted,

Jilline Dobratz, *CMC/WCMC*
Village Clerk

SECTION 00941
CHANGE ORDER

Change Order No. 1

Date of Issuance: June 22, 2020 Effective Date: June 22, 2020
Owner: Village of Jackson Owner's Contract No.: A-20
Contractor: Wondra Construction, Inc. Contractor's Project No.:
Engineer: Cedar Corporation Engineer's Project No.: 05789-0008
Project: Spruce Street and Ridgeway Drive Extensions Contract Name:

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

1 ADD 1 EACH Remove Catch Basin @ 500.00 EACH (Bid Item #13)	=	\$500.00
2 DELETE 131 LINEAL FEET of 18" RCP Storm Sewer @ \$51.90/LF (Bid Item #18)	=	(\$6,798.90)
3 ADD 37 LINEAL FEET of 12" RCP Storm Sewer @ \$44.70/LF (Bid Item #22)	=	\$1,653.90
4 ADD 2 EACH 2'x3' Storm Sewer Catch Basins @ \$1,930.00 EA (Bid Item #25)	=	\$3,860.00
TOTAL	=	(\$785.00)

Reason for Change Order:

- a) Change Order Item Nos. 1-4: Cost changes associated with post bid storm sewer revisions related to conditions of the ANR Pipeline permit approval.

Attachments: (List documents supporting change)

- a) Change Order Item Nos. 1-4: 1) Revised Drawing Sheets 4 & 5 of 27, 2) E-mail correspondence between Engineer, Owner and Contractor dated 6/18/20.

CHANGE IN CONTRACT PRICE:	CHANGE IN CONTRACT TIMES:
Original Contract Price	Original Contract Times:
\$ <u>1,423,655.55</u>	Substantial completion (date): <u>September 15, 2020</u>
	Ready for Final Payment (date): <u>October 15, 2020</u>
[Increase] [Decrease] from previous approved Change Orders No. <u>0</u> to No. <u>0</u> :	from previous Change Orders:
\$ <u>0.00</u>	No. <u>0</u> to No. <u>0</u> :
	Substantial Completion (days): <u>0</u>
	Ready for Final Payment (days): <u>0</u>
Contract Price prior to this Change Order:	Contract Times prior to this Change Order:
\$ <u>1,423,655.55</u>	Substantial completion (date): <u>September 15, 2020</u>
	<u>October 15, 2020</u>
[Decrease] of this Change Order:	[Increase] [Decrease] this Change Order:
\$ <u>(785.00)</u>	Substantial Completion (days): <u>0</u>
	Ready for Final Payment (days): <u>0</u>
Contract Price incorporating this Change Order:	Contract Times with all approved Change Orders:
\$ <u>1,422,870.55</u>	Substantial completion (date): <u>September 15, 2020</u>
	Ready for Final Payment (date): <u>October 15, 2020</u>

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: <u>[Signature]</u>	By: <u>[Signature]</u>	By: <u>Matthew Cameron</u>
Engineer (if required)	Owner (Authorized Signature)	CONTRACTOR (Authorized Signature)
Title: <u>Sen. Engr. Manager</u>	Title:	Title: <u>Project Manager</u>
Date: <u>6-22-20</u>	Date:	Date: <u>7-7-2020</u>

Approved by Funding Agency (if applicable):

By: _____ Date: _____
Title: _____

Doug Kroes

From: Doug Kroes
Sent: Thursday, June 18, 2020 4:42 PM
To: 'Brian Kober'; Matt Cameron
Cc: joe.coe@cedarcorp.com
Subject: Jackson Spruce & Ridgeway Extensions: Plan Revisions - Storm Sewer
Attachments: Design-04_Spruce St.pdf; Design-05_Spruce St.pdf

Brian & Matt:

As discussed at the preconstruction conference this week, attached please find revised Plan Sheets 4 of 27 & 5 of 27. The revisions are related to the proposed storm sewer and were prepared post bid as a result of review comments by representatives of ANR Pipeline. These revisions affect estimated contract quantities as follows:

Bid Item #13, Remove Catch Basin: ADD 1 EACH
Bid Item #18, 18" RCP Storm Sewer: DELETE 131 Lineal Feet
Bid Item #22, 12" RCP Storm Sewer: ADD 37 Lineal Feet
Bid Item #25, 2'x3' Storm Sewer Catch Basin: ADD 2 EACH

Our office will prepare a contract change order to include the above mentioned change items.

Please let us know if you have any questions.

Thank you,

Doug Kroes

Senior Construction Manager
Cedar Corporation

W61 N497 Washington Avenue | Cedarburg | WI | 53012

Office: 262-204-2360 ext 1403 | TF: 800-472-7372

Cell: 920-246-6326

doug.kroes@cedarcorp.com

www.cedarcorp.com | [LinkedIn](#) | [Facebook](#) | [Twitter](#)

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engineering | architecture | environmental | surveying
landscape architecture | planning | economic development

W61 N497 Washington Avenue
Cedarburg, WI 53012
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FAX 262-375-2688
www.cedarcorp.com

July 24, 2020

Village of Jackson
N168 W20733 Main Street
PO Box 637
Jackson, WI 53037

Attn: Mr. Brian Kober, P.E., Director of Public Works

Re: Contractor's Application for Payment No. 1
Spruce Street and Ridgeway Drive Extensions
Project No. 05789-0008

Dear Mr. Kober:

Enclosed for your use in payment to Wondra Construction, Inc. in the amount of \$365,561.84 is Contractor's Application for Payment No. 1.

Following your review and approval, please complete the application for payment forms within the areas reserved for the Owner. Thereafter, retain one copy for your records, provide the second copy to the Contractor with payment, and provide the third copy to our office.

Should you have any questions, please feel free to contact me at our Cedarburg office.

Sincerely,

CEDAR CORPORATION

A handwritten signature in blue ink, appearing to read "Douglas T. Kroes".

Douglas T. Kroes
Senior Construction Manager

Enclosed: As Noted

Cc: Roger Thimm, Wondra Construction, Inc.

☒ Owner ☐ Engineer
☐ Contractor ☐ Funding Agency

Contractor's Application for Payment No. 1

Application Period: 6/23/20 - 7/23/20		Application Date: 7/23/2020
To (Owner): Village of Jackson	From (Contractor): Wondra Construction, Inc.	Via (Engineer): Cedar Corporation
Project: Spruce Street and Ridgeway Drive Extensions	Contract: Roger Thimm	
Owner's Contract No: A-20	Contractor's Project No:	Engineer's Project No: 05789-0008

Application For Payment Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
1		
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1. ORIGINAL CONTRACT PRICE..... \$ \$1,424,505.55
2. Net change by Change Orders..... \$ _____
3. Current Contract Price (Line 1 ± 2)..... \$ \$1,424,505.55
4. TOTAL COMPLETED AND STORED TO DATE
(Column 1 total on Progress Estimates)..... \$ \$384,801.94
5. RETAINAGE:
a. 5% X \$384,801.94 Work Completed..... \$ \$19,240.10
b. 5% X _____ Stored Material..... \$ _____
c. Total Retainage (Line 5.a + Line 5.b)..... \$ \$19,240.10
6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c)..... \$ \$365,561.84
7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)..... \$ _____
8. AMOUNT DUE THIS APPLICATION..... \$ \$365,561.84

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:
(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and
(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor Signature

By: Roger W Thimm Date: 7-24-20

Payment of: \$ \$365,561.84
(Line 8 or other - attach explanation of the other amount)

is recommended by:

[Signature] 7/24/20
(Engineer) (Date)

Payment of:

\$ \$365,561.84
(Line 8 or other - attach explanation of the other amount)

is approved by:

(Owner) (Date)

Approved by:

Funding or Financing Entity (if applicable) (Date)

Unit Price Progress Estimate

Contractor's Application

Project: Spruce Street and Ridgeway Drive Extensions							Application Number: 1					
Application Period: 6/23/20 - 7/23/20							Application Date: July 23, 2020					
A				B	C	D	E	F	G	H	I	J
Item		Estimated Bid Quantity	Unit Price	Quantity Completed						Total Completed & Stored to Date (C+E+G)		% Comp.
Bid No.	Description			Previous Applications		This Application		Materials Stored				
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	
1	CLEARING AND GRUBBING	1 L.S.	\$12,000.00			1	\$12,000.00			1	\$12,000.00	100.0%
2	COMMON EXCAVATION	1 L.S.	\$132,600.00			0.75	\$99,450.00			0.75	\$99,450.00	75.0%
3	IMPORTED FILL MATERIAL	3,200 C.Y.	\$26.00									
4	SAW CUTTING ASPHALT PAVEMENT	451 L.F.	\$3.35									
5	ASPHALT PAVEMENT REMOVAL	562 S.Y.	\$2.60									
6	8" PVC SANITARY SEWER MAIN	1,871 L.F.	\$90.00			1642	\$147,780.00			1642	\$147,780.00	87.8%
7	48" DIA. SANITARY SEWER MANHOLE (7 Units)	94 V.F.	\$310.25			65.6	\$20,352.40			65.6	\$20,352.40	69.8%
8	SANITARY MANHOLE RIM ADJUSTMENT	1 EACH	\$550.00									
9	8" PVC WATER MAIN	2,750 L.F.	\$64.10			588	\$37,690.80			588	\$37,690.80	21.4%
10	12"X 8" LIVE TAPPING TEE	2 EACH	\$3,850.00			1	\$3,850.00			1	\$3,850.00	50.0%
11	HYDRANT ASSEMBLY	6 EACH	\$5,535.00			2	\$11,070.00			2	\$11,070.00	33.3%
12	8" GATE VALVE	10 EACH	\$1,995.00			2	\$3,990.00			2	\$3,990.00	20.0%
13	REMOVE CATCH BASIN	1 EACH	\$500.00									
14	27" RCP STORM SEWER	76 L.F.	\$67.95									
15	27" RCP APRON ENDWALL (AEW) W/ TRASHGUARD	1 EACH	\$1,720.00									
16	24" RCP STORM SEWER	734 L.F.	\$60.60			61.5	\$3,726.90			61.5	\$3,726.90	8.4%
17	24" RCP APRON ENDWALL (AEW) W/ TRASHGUARD	1 EACH	\$1,455.00									
18	18" RCP STORM SEWER	495 L.F.	\$51.90									
19	18" RCP APRON ENDWALL (AEW) W/ TRASHGUARD	1 EACH	\$1,200.00									
20	15" RCP STORM SEWER	88 L.F.	\$46.90									
21	15" RCP APRON ENDWALL (AEW) W/ TRASHGUARD	1 EACH	\$1,080.00									
22	12" RCP STORM SEWER	290 L.F.	\$44.70			117.5	\$5,252.25			117.5	\$5,252.25	40.5%
23	48" DIA. STORM SEWER MANHOLE (5 Units)	16 V.F.	\$723.75			7.25	\$5,247.19			7.25	\$5,247.19	45.3%
24	60" DIA. STORM SEWER MANHOLE (1 Unit)	4 V.F.	\$736.50									
25	2' X 3' STORM SEWER CATCH BASIN	16 EACH	\$1,930.00			2	\$3,860.00			2	\$3,860.00	12.5%
26	POND OUTLET STRUCTURE	1 EACH	\$4,420.00									
27	CULVERT REMOVAL W/O REPLACEMENT	2 EACH	\$300.00									
28	53"X 34" HERCP CULVERT REMOVE AND REPLACE	204 L.F.	\$137.00									
29	53"X 34" HERCP CULVERT APRON ENDWALL (AEW)	4 EACH	\$1,725.00									
30	68"X 43" HERCP CULVERT	170 L.F.	\$180.60			104	\$18,782.40			104	\$18,782.40	61.2%
31	68"X 43" HERCP CULVERT APRON ENDWALL (AEW)	4 EACH	\$2,850.00			2	\$5,700.00			2	\$5,700.00	50.0%
32	RIP RAP, MEDIUM	120 C.Y.	\$85.70									
33	EXCAVATION BELOW SUBGRADE (EBS)	800 C.Y.	\$18.10									
34	EBS BACKFILL 1 1/4" DENSE	800 TONS	\$13.60									
35	EBS BACKFILL, BREAKER RUN	800 TONS	\$14.15									
36	CRUSHED AGGREGATE BASE COURSE 1 1/4"	6029 TONS	\$13.10									
37	REMOVE CURB AND GUTTER	272 L.F.	\$5.00									
38	30" CURB AND GUTTER TYPE D	5,225 L.F.	\$12.50									
39	7" CONCRETE DRIVEWAY APRON	1212 S.F.	\$6.70									
40	4" CONCRETE SIDEWALK	25030 S.F.	\$3.80									
41	LOWER LAYER HMA PAVEMENT, 3 LT	1790 TONS	\$65.81									
42	UPPER LAYER HMA PAVEMENT, 4 LT	1040 TONS	\$62.90									

Unit Price Progress Estimate

Contractor's Application

Project: Spruce Street and Ridgeway Drive Extensions							Application Number: 1						
Application Period: 6/23/20 - 7/23/20							Application Date: July 23, 2020						
A				B	C	D	E	F	G	H	I	J	
Item		Estimated Bid Quantity	Unit Price	Quantity Completed						Total Completed & Stored to Date (C+E+G)		% Comp.	
Bid No.	Description			Previous Applications		This Application		Materials Stored					
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount		
43	DITCH CHECKS	19 EACH	\$158.00										
44	SILT FENCE	2450 L.F.	\$1.50										
45	INLET PROTECTION	17 EACH	\$85.00										
46	TRACKING PAD	2 EACH	\$2,100.00			2	\$4,200.00			2	\$4,200.00	100.0%	
47	TRAFFIC CONTROL	1 L.S.	\$3,700.00			0.5	\$1,850.00			0.5	\$1,850.00	50.0%	
48	SITE RESTORATION	1 L.S.	\$36,800.00										
Alt 1	ASPHALT WEDGING	1 L.S.	\$850.00										
	TOTAL						\$384,801.94				\$384,801.94		

CONSTRUCTION PLANS FOR G MEADOWS SUBDIVISION - VILLAGE OF JACKSON, WISCONSIN

VICINITY MAP

PLAN INDEX

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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

[illegible]

MORNING MEADOWS SUBDIVISION - PHASE 1
VILLAGE OF JACKSON, WI

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R.A. Smith, Inc.
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

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

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 |
| | COLORLED 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 |
| | DENOTES 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 SWALE & BERM |
| | 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

- (C) INDICATES RECORDED DIMENSION WHICH DIFFER FROM ACTUAL MEASUREMENT
- ✕ OR ✕ SECTION OR 1/4 SECTION CORNER AS DESCRIBED
- 1" DIA. BOX PIPE FOUND (UNLESS OTHERWISE NOTED)
- 1" DIA. IRON PIPE, 18" LONG-SET (UNLESS OTHERWISE NOTED)
- BOLLARD
- + SOIL BORING/MONITORING WELL
- POLE
- ✕ MAILBOX
- SIGN
- BILLBOARD
- A AIR CONDITIONER
- B CONTROL BOX
- C TRAFFIC SIGNAL
- R RAILROAD CROSSING SIGNAL
- P CABLE PEDESTAL
- ⚡ POWER POLE
- ✕ GUY WIRE
- ✕ GUY WIRE
- ✕ LIGHT POLE
- SPOT YARD/PEDESTAL LIGHT
- HANDICAPPED PARKING
- E ELECTRIC MANHOLE
- E ELECTRIC PEDESTAL
- X ELECTRIC METER
- E ELECTRIC TRANSFORMER
- T TELEPHONE MANHOLE
- T TELEPHONE PEDESTAL
- F MARKED FIBER OPTIC
- ✕ GAS VALVE
- ✕ GAS METER
- ✕ GAS WARNING SIGN
- 6T STORM MARKED ROUND INLET
- ✕ SQUARE INLET
- ✕ STORM SEWER END SECTION
- S SANITARY MANHOLE
- S SANITARY CLEANOUT OR SEPTIC VENT
- ✕ SANITARY INTERCEPTOR MANHOLE
- ✕ MISCELLANEOUS MANHOLE
- ✕ WATER VALVE
- ✕ HYDRANT
- 6T WATER SERVICE CURB STOP
- W WATER MANHOLE
- W WATER SURFACE
- W WETLANDS FLAG
- ✕ MARSH
- ✕ CONIFEROUS TREE
- ✕ DECIDUOUS TREE
- ✕ SHRUB
- ~~~~~ -EDGE OF TREES
- -SANITARY SEWER
- -STORM SEWER
- -WATERMAIN
- -MARKED GAS MAIN
- -STORM SEWER
- DHW -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**

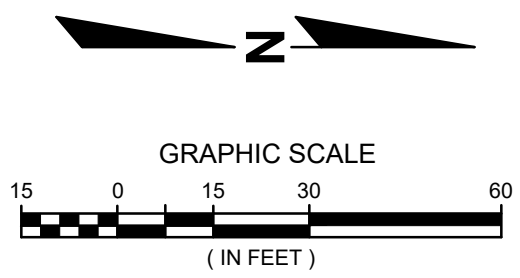
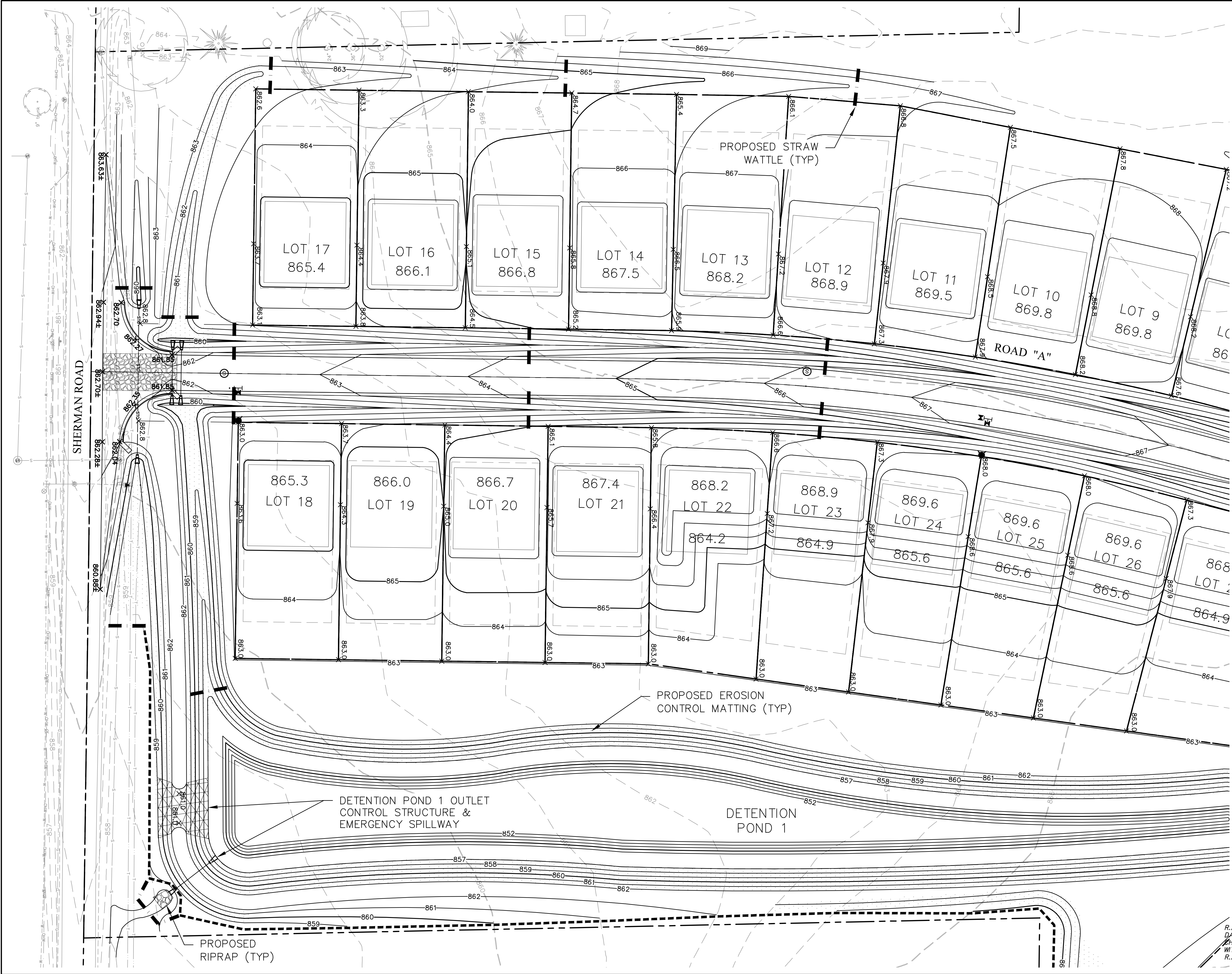
BENCHMARKS:

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



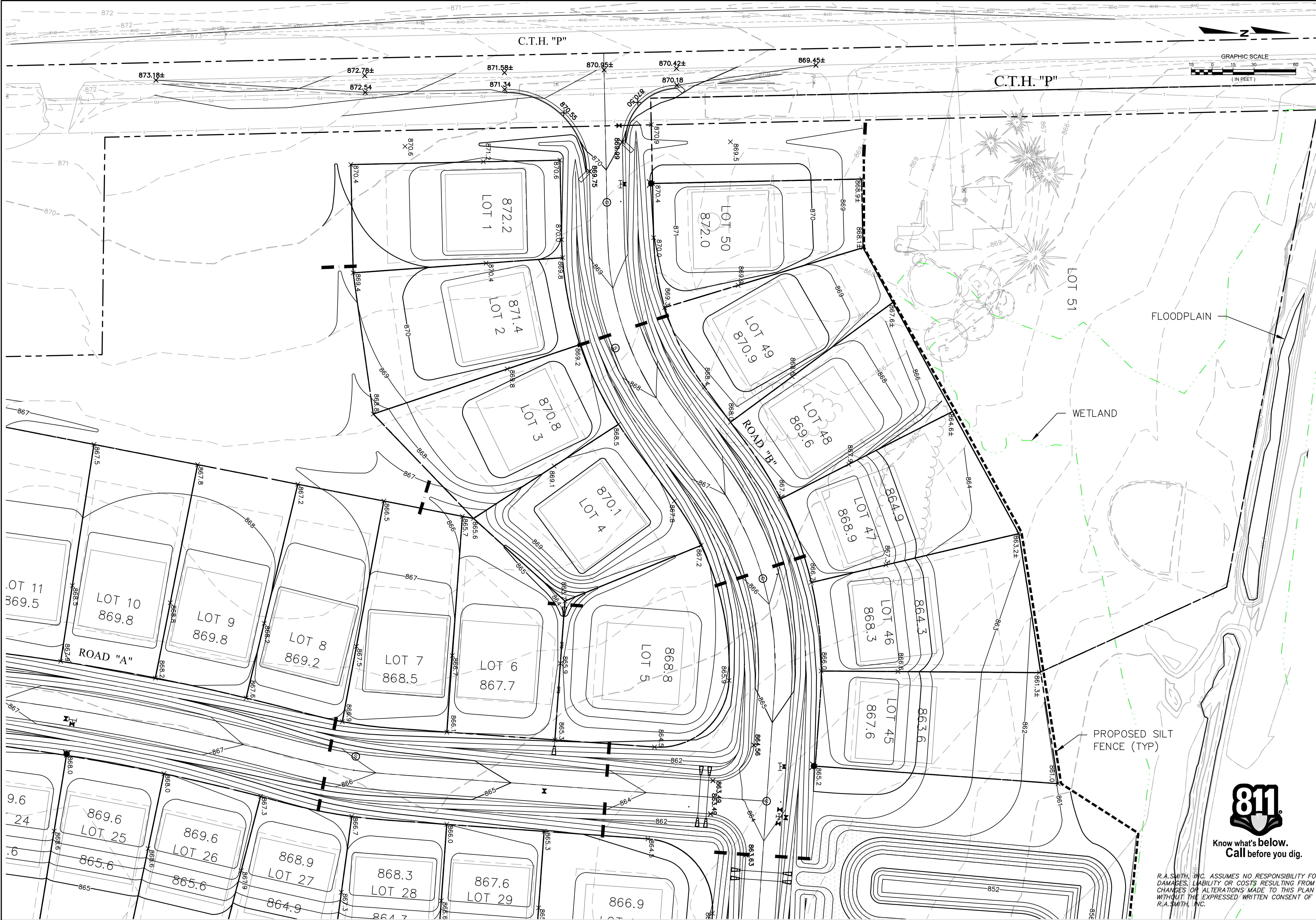
© COPYRIGHT 2020 R.A. Smith, Inc. DATE: 07/02/2020 SCALE: 1" = 60' JOB NO. 3050195.01 PROJECT MANAGER: CHRIS D. HITCH, P.E. DESIGNED BY: DJM CHECKED BY: CDH		MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WI		OVERALL EROSION CONTROL & GRADING PLAN		raSmith CREATIVITY BEYOND ENGINEERING 16745 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		DATE DESCRIPTION	
SHEET NUMBER C100											



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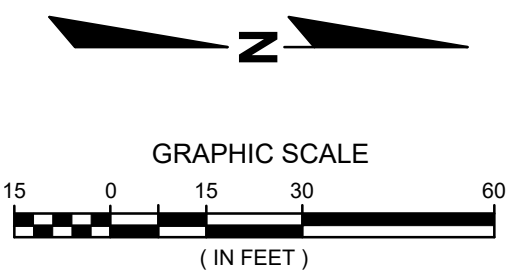
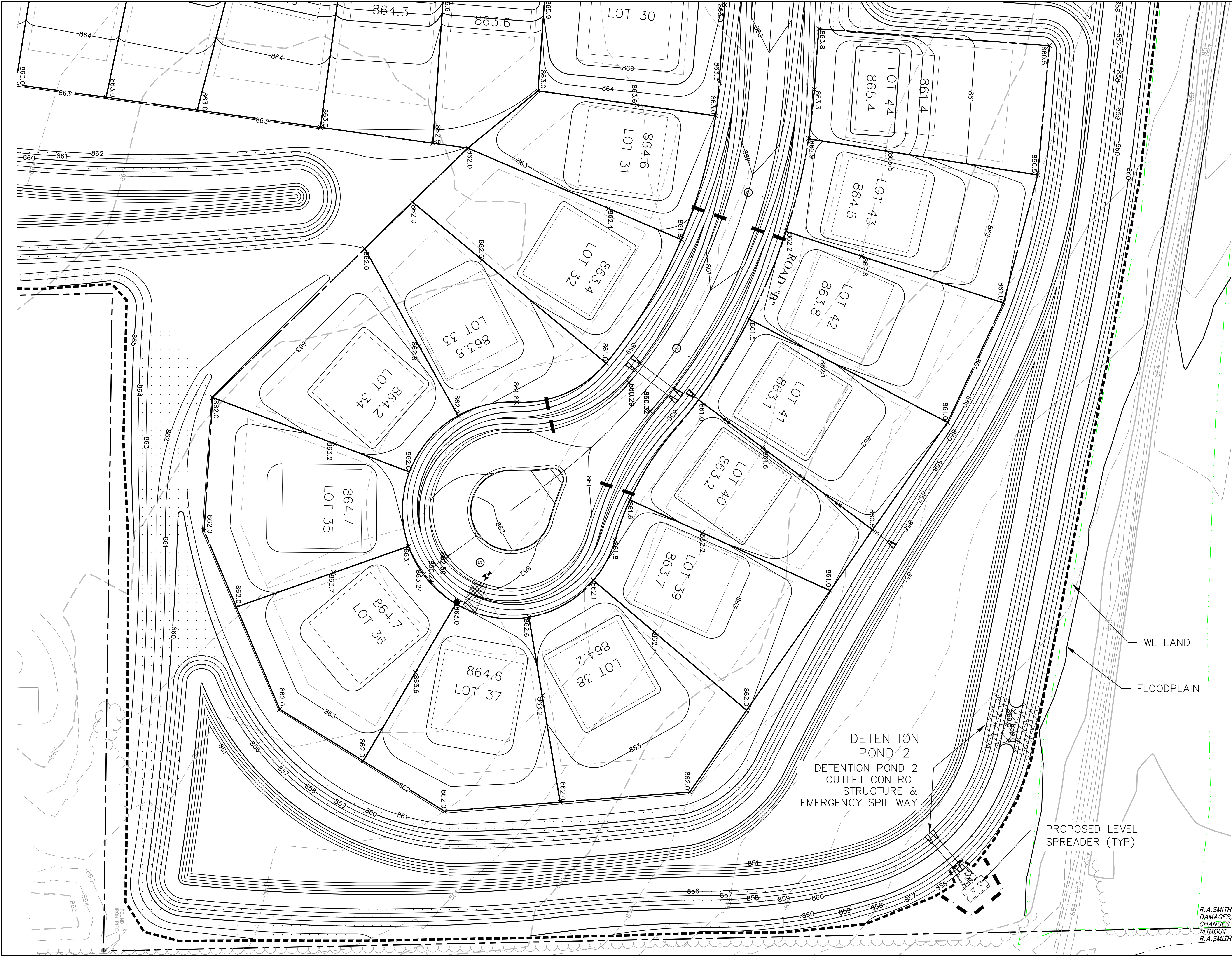
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raSmith CREATIVITY BEYOND ENGINEERING	
Brookfield, WI Milwaukee, WI Appleton, WI Madison, WI Cedarburg, WI Mount Pleasant, WI Naperville, IL Irvine, CA	
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DETAILED EROSION CONTROL & GRADING PLAN	
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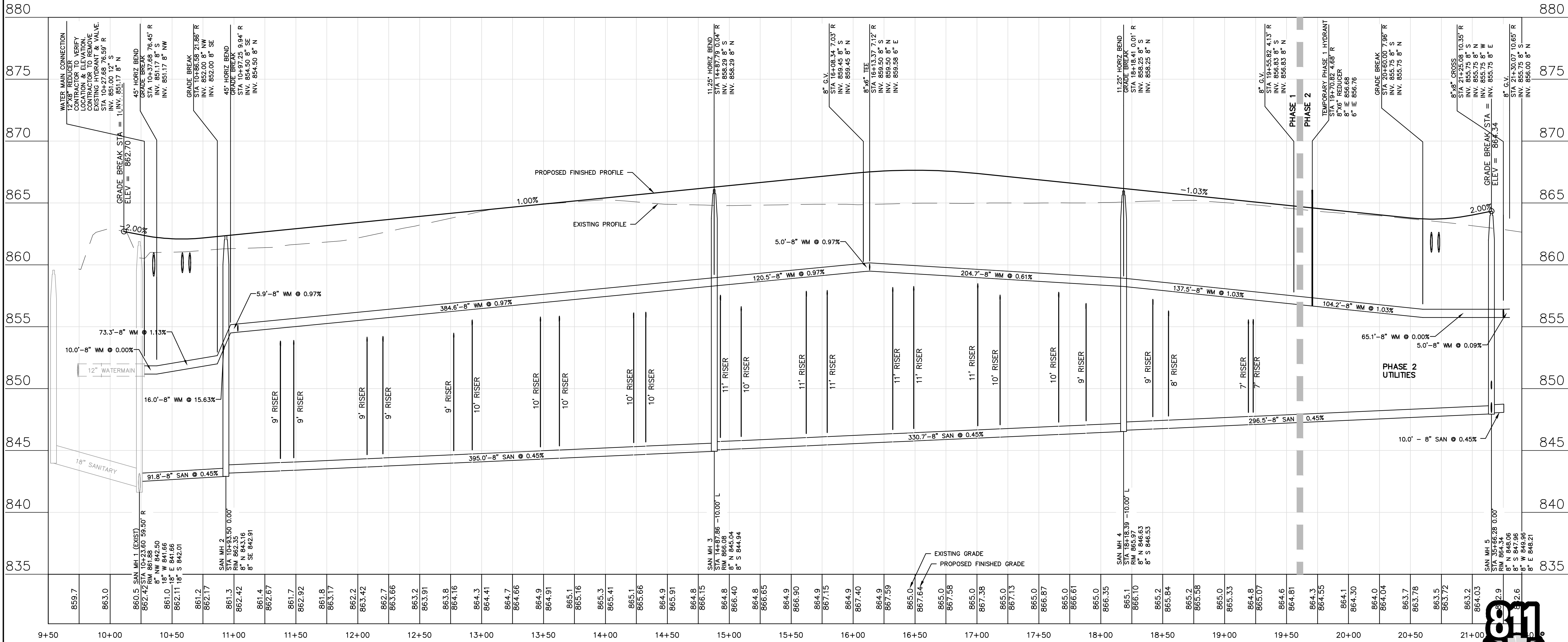
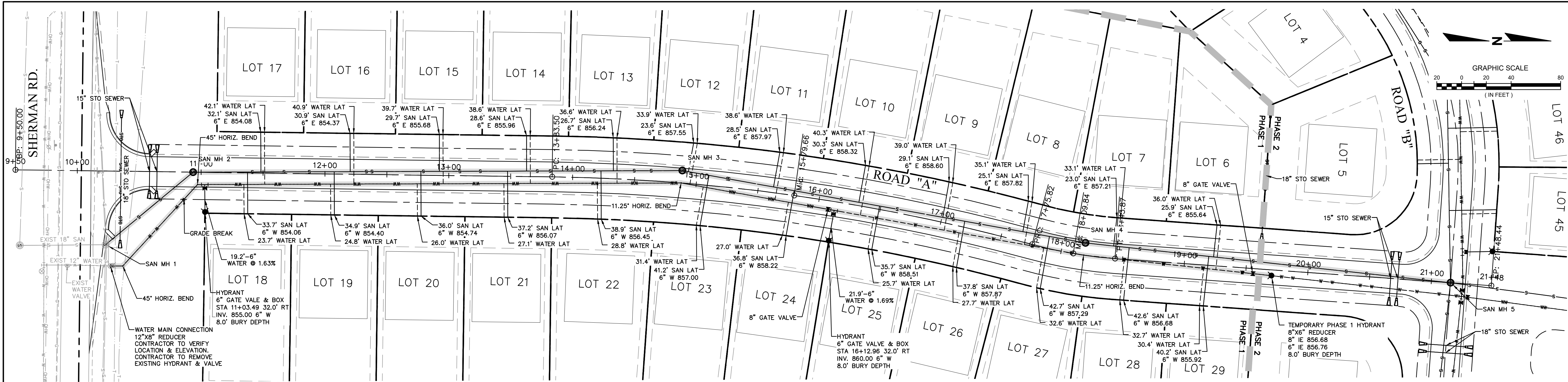
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DATE	
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raSmith CREATIVITY BEYOND ENGINEERING	
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DETAILED EROSION CONTROL & GRADING PLAN	
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DETAILED EROSION CONTROL & GRADING PLAN		DATE		DESCRIPTION	
SHEET NUMBER					
C103					



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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MORNING MEADOWS SUBDIVISION - PHASE 1
VILLAGE OF JACKSON, WI

SANITARY SEWER & WATER MAIN
PLAN & PROFILE

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DATE: 07/02/2020

SCALE: 1" = 40'

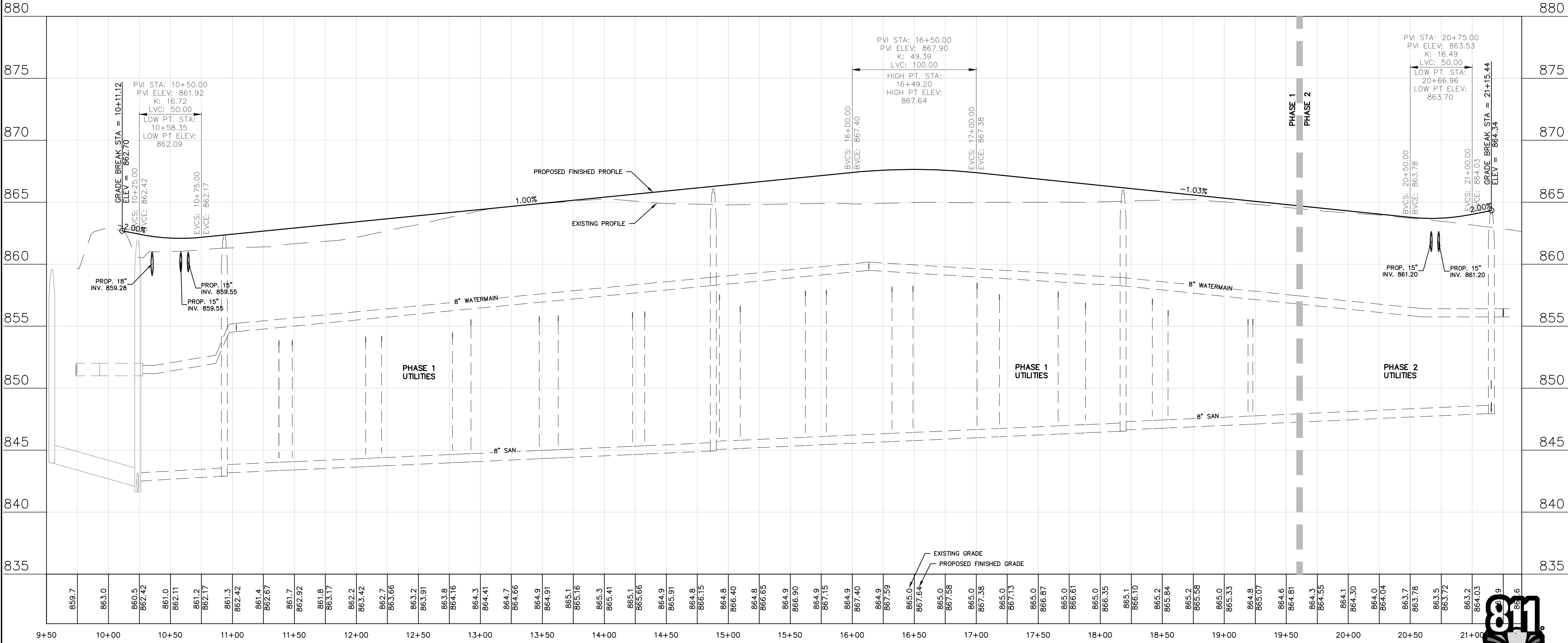
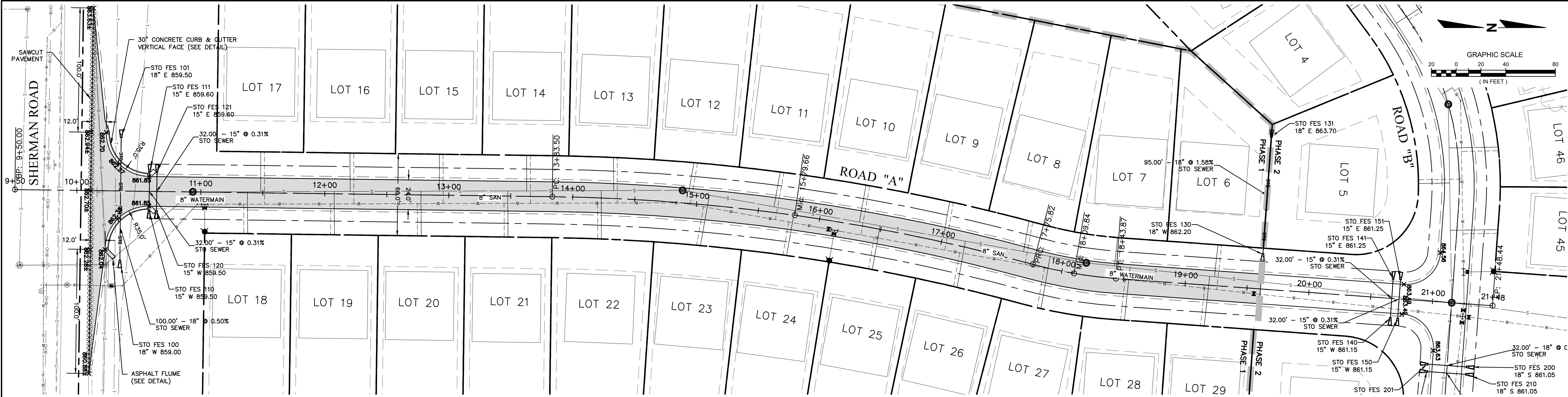
JOB NO. 3050195.01

PROJECT MANAGER:
CHRIS D. HITCH, P.E.

DESIGNED BY: DJM

CHECKED BY: CDH

SHEET NUMBER
C200



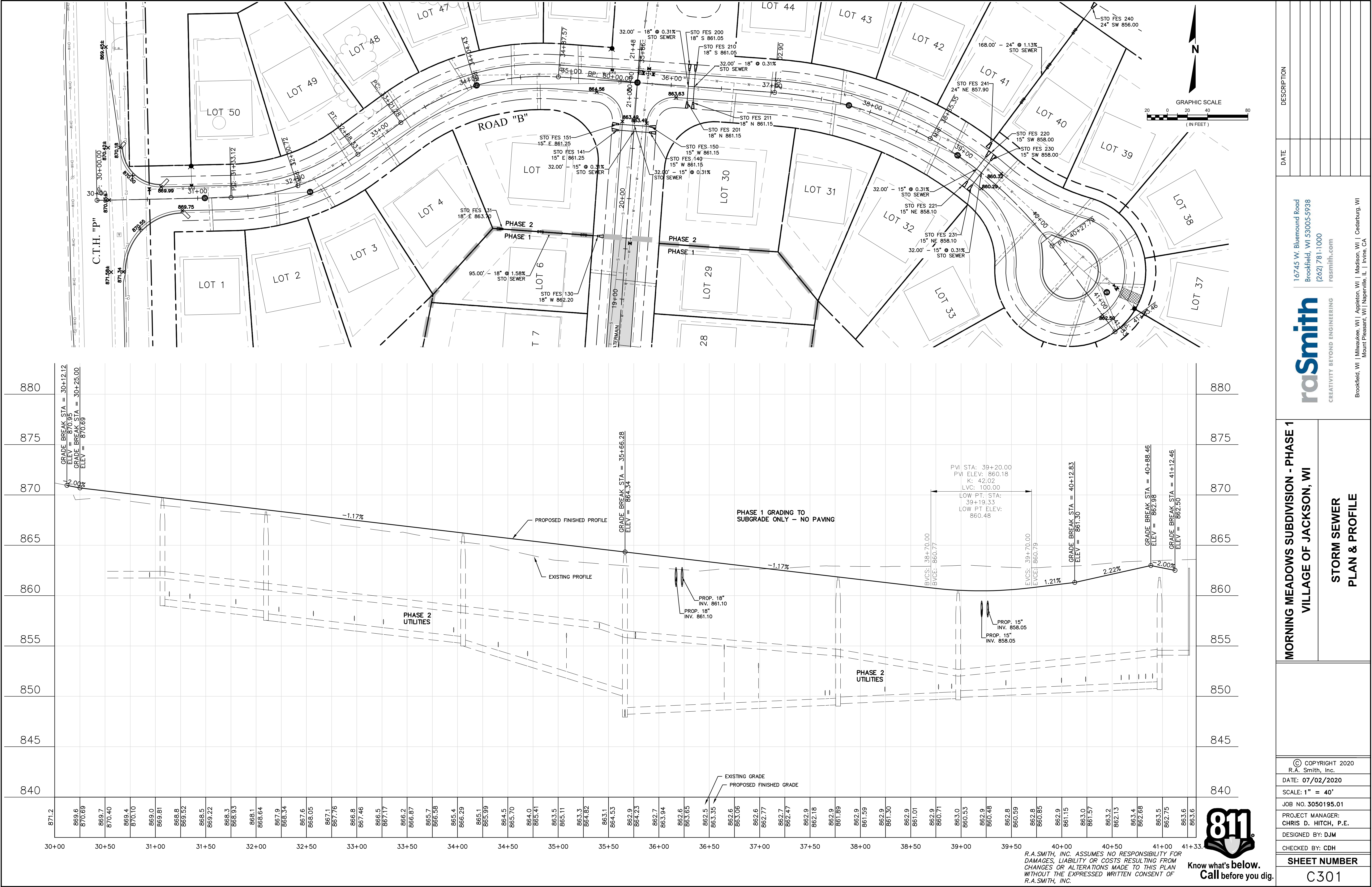
NOTES:
1. ALL SPOT GRADES AND DIMENSIONS ARE TO THE FLANGE LINE OF CURB & GUTTER OR EDGE OF PAVEMENT.

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.

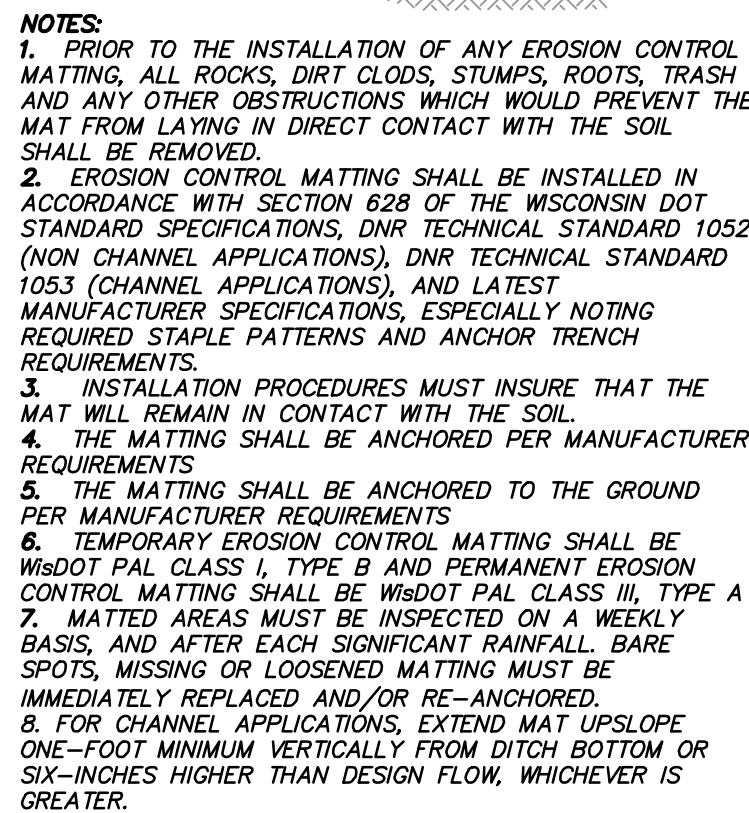
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MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WI	
STORM SEWER & PAVING PLAN & PROFILE	
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SCALE: 1" = 40'	
JOB NO. 3050195.01	
PROJECT MANAGER: CHRIS D. HITCH, P.E.	
DESIGNED BY: DJM	
CHECKED BY: CDH	
SHEET NUMBER C300	



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STORM SEWER PLAN & PROFILE	
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PROJECT MANAGER: CHRIS D. HITCH, P.E.	
DESIGNED BY: DJM	
CHECKED BY: CDH	
SHEET NUMBER	
C301	



NOTE: INSTALL ON ALL SLOPES OF 4:1 OR GREATER



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:

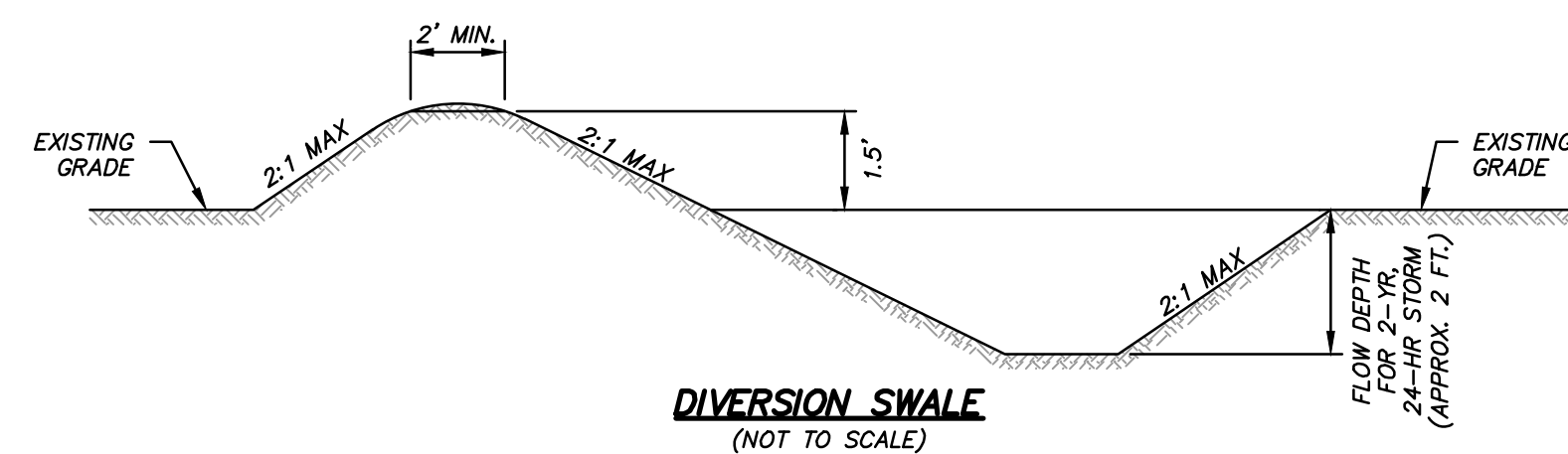
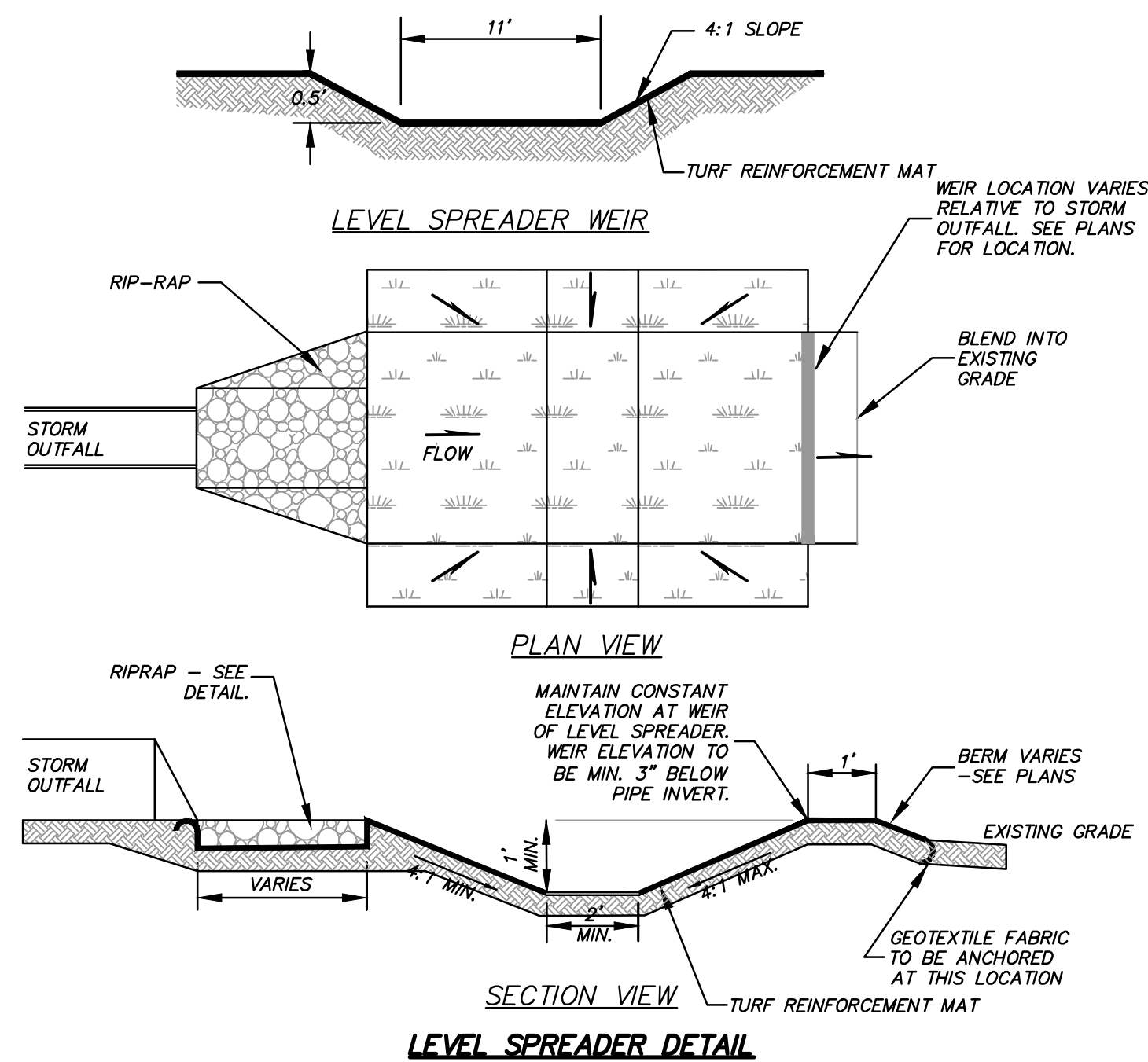
1. TRACKING PAD TO CONFORM TO WDNR CONSERVATION PRACTICE STANDARD 1057.
2. THE TRACKING PAD SHALL BE INSTALLED PRIOR TO ANY TRAFFIC LEAVING THE SITE.
3. THE AGGREGATE FOR TRACKING PADS SHALL BE 3"- 6" CLEAR OR WASHED STONE. ALL MATERIAL SHALL BE RETAINED ON A 3-INCH SIEVE.
4. THE AGGREGATE SHALL BE PLACED IN A LAYER AT LEAST 12 INCHES THICK. ON SITES WITH A HIGH WATER TABLE, WEARS AND EROSION ARE EXPECTED DURING THE LIFE OF THE PRACTICE, STONE TRACKING PADS SHALL BE UNDERLAIN WITH A WISDOT 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 PAD OR CONVEYED UNDER AND AROUND THEM BY USING A VARIETY OF PRACTICES, SUCH AS CULVERTS, WATER BARS, OR OTHER SIMILAR PRACTICES.

B. MAINTENANCE

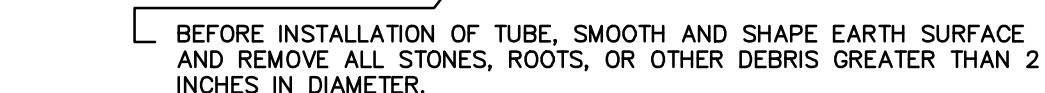
1. ROCKS LOADED BETWEEN THE TIRES IF DUAL WHEEL VEHICLES SHALL BE REMOVED PRIOR TO LEAVING THE CONSTRUCTION SITE.
2. TRACKING PADS AND TIRE WASHING STATIONS SHALL, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR 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)

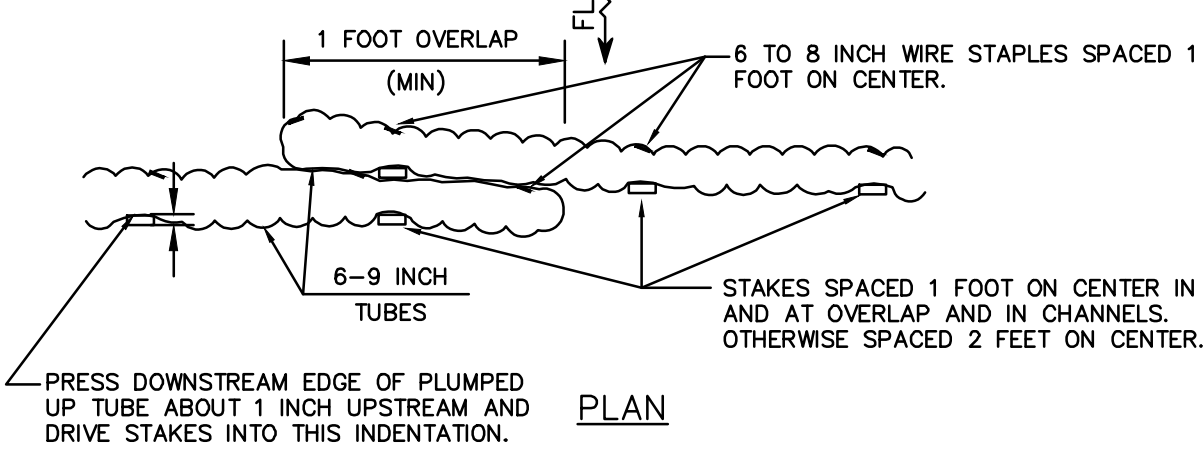


1. DIVERSION TO CONFORM TO WDMR CONSERVATION PRACTICE STANDARD 1066.
2. DIVERSION TO BE STABILIZED WITH VEGETATION OR EROSION MAT PRIOR TO USE.
3. DIVERSIONS SHALL, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 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.



IF INSTALLING TUBE ACROSS A DITCH, THEN EXCAVATE A PLACEMENT TRENCH ABOUT 3 INCHES DEEP.

SECTION



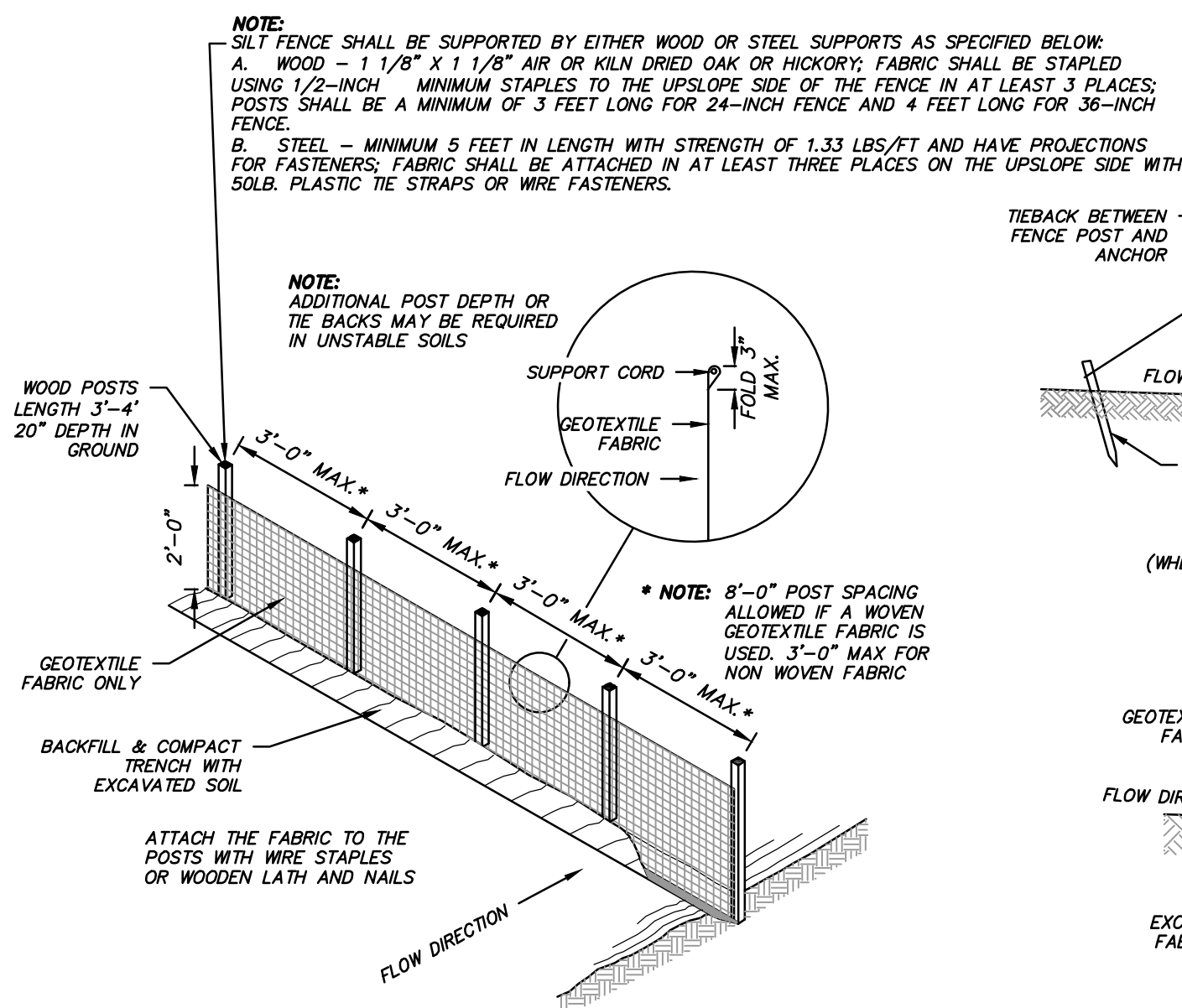
STRAW WATTLE

- NOTES:**

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:

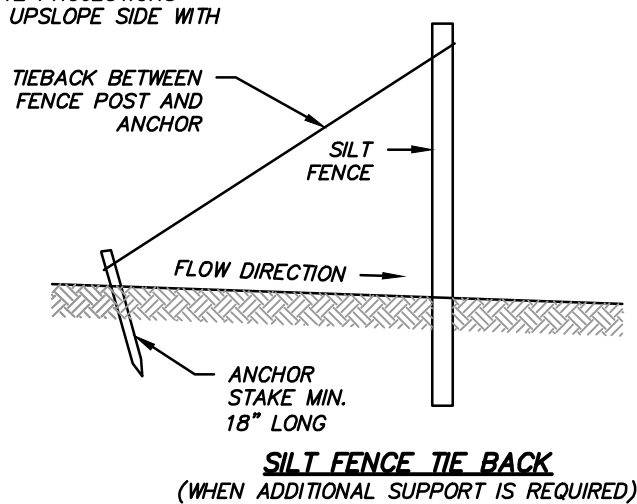
SLOPE	FENCE SPACING
< 2%	100 FEET
2 TO 5%	75 FEET
5 TO 10%	50 FEET
10 TO 33%	25 FEET
> 33%	20 FEET

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 MADE BY 4-INCH DEEP TRENCHING. TRENCHES SHALL BE LOCATED ON THE UPRIGHTS OF THE FENCE. TRENCH SHALL BE BACKFILLED AND COMPACTED. TRENCHES SHALL NOT BE EXCAVATED WHERE NOT 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 180 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 SHALL 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

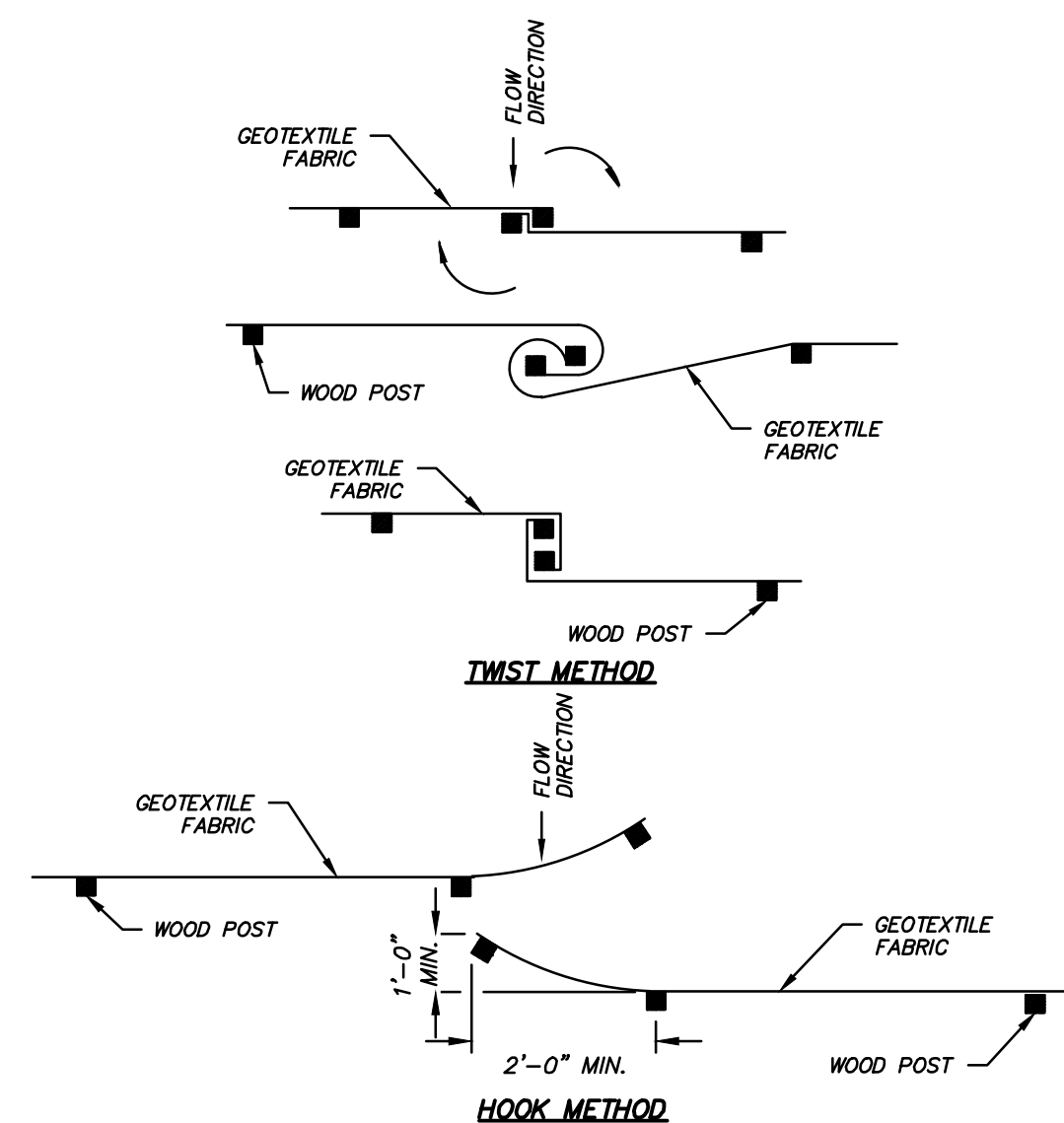
(NOT TO SCALE)



TRENCH DETAIL

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.

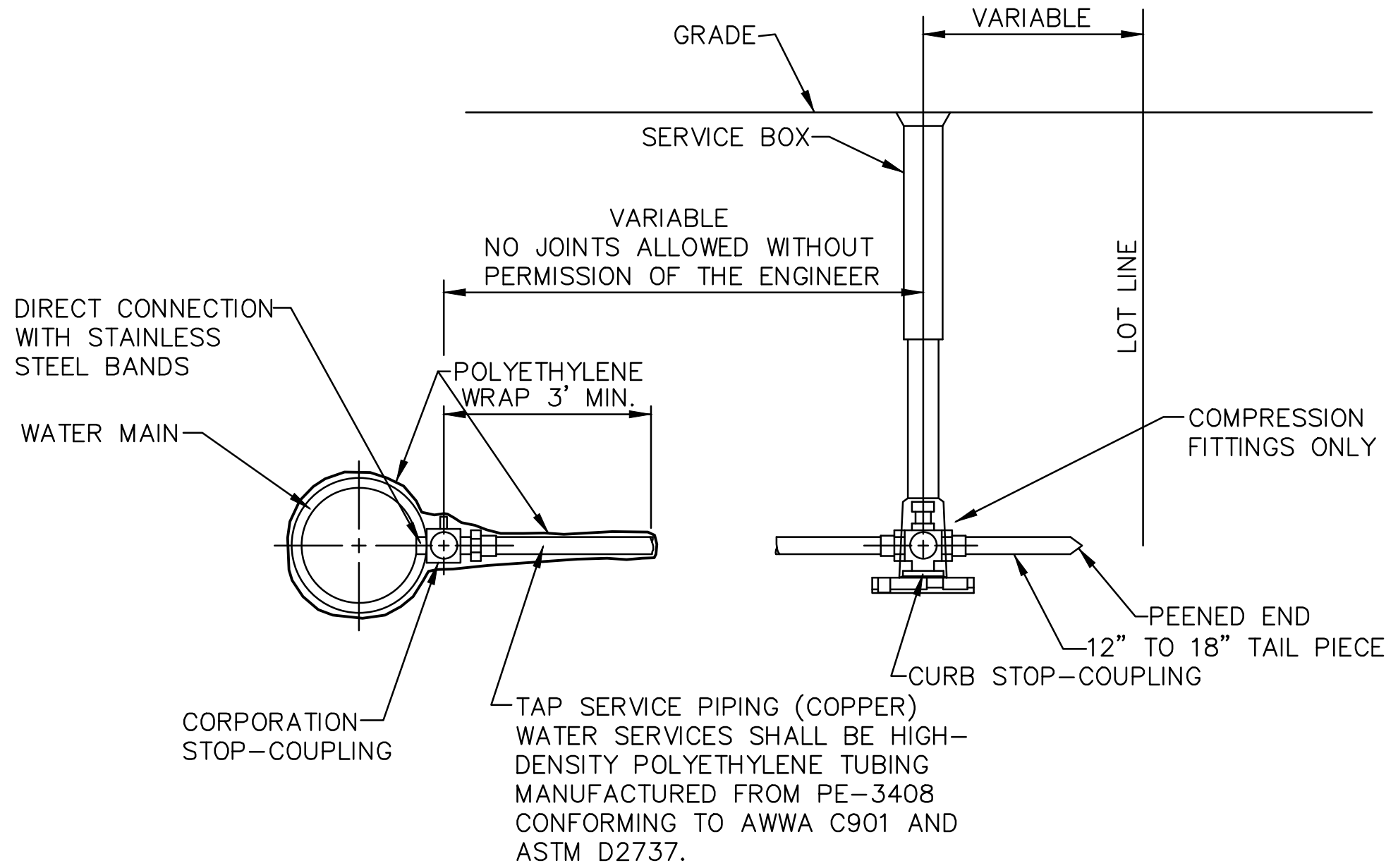


JOINING TWO LENGTHS OF SILT FENCE

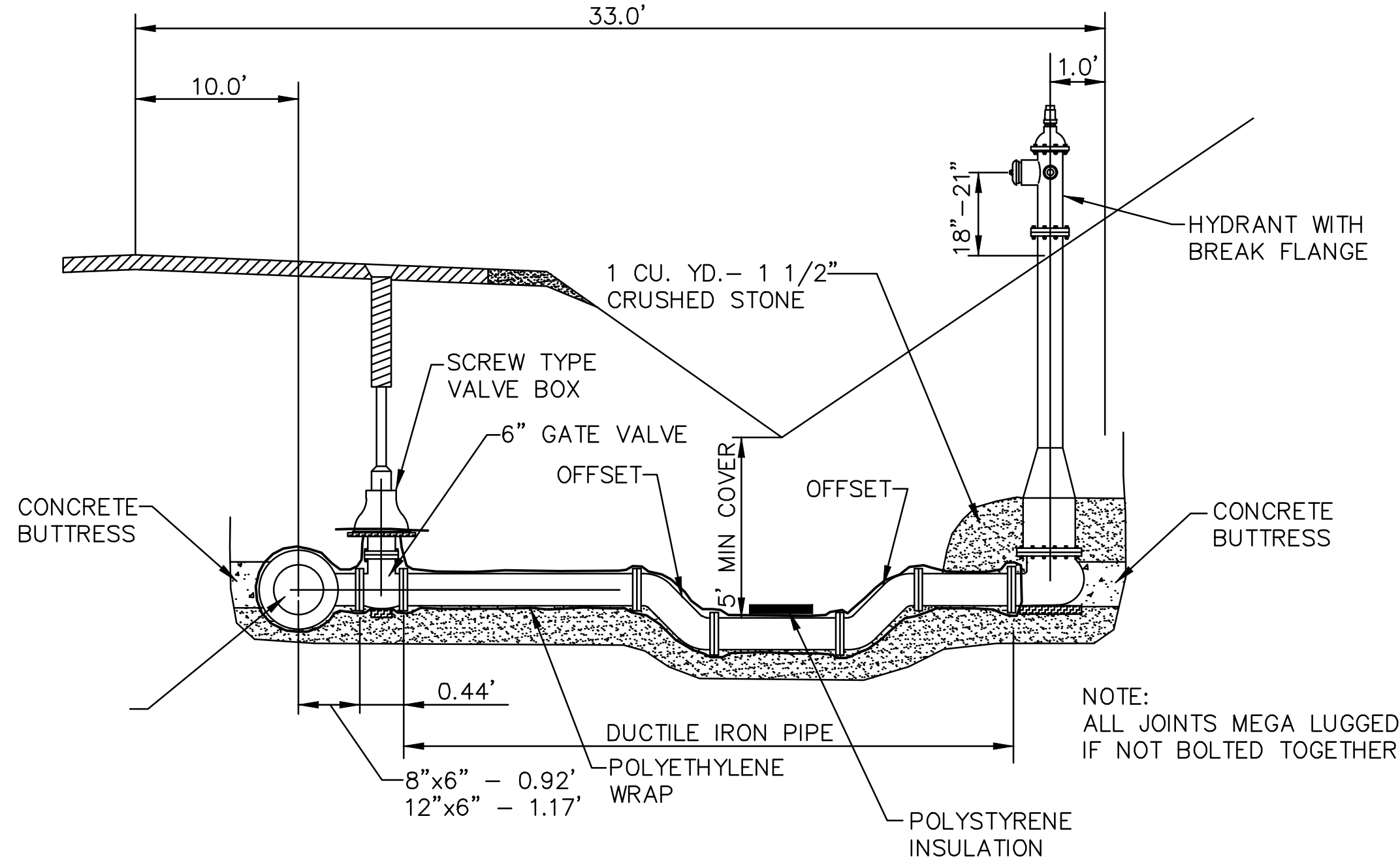


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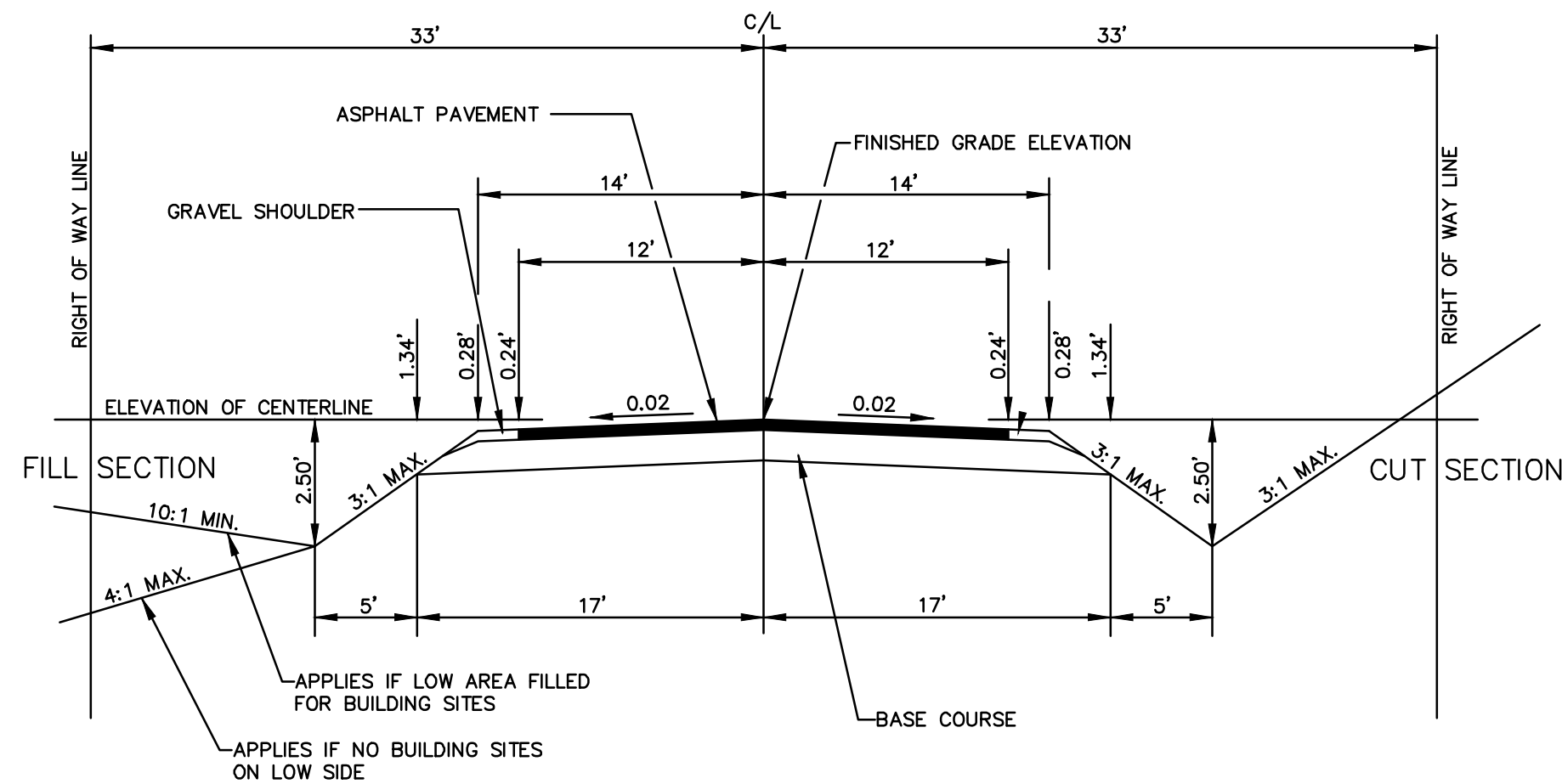
MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WI		erosion control details	
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SCALE: #####			
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PROJECT MANAGER: CHRIS D. HITCH, P.E.			
DESIGNED BY: DJM			
CHECKED BY: CDH			
SHEET NUMBER			
C400			



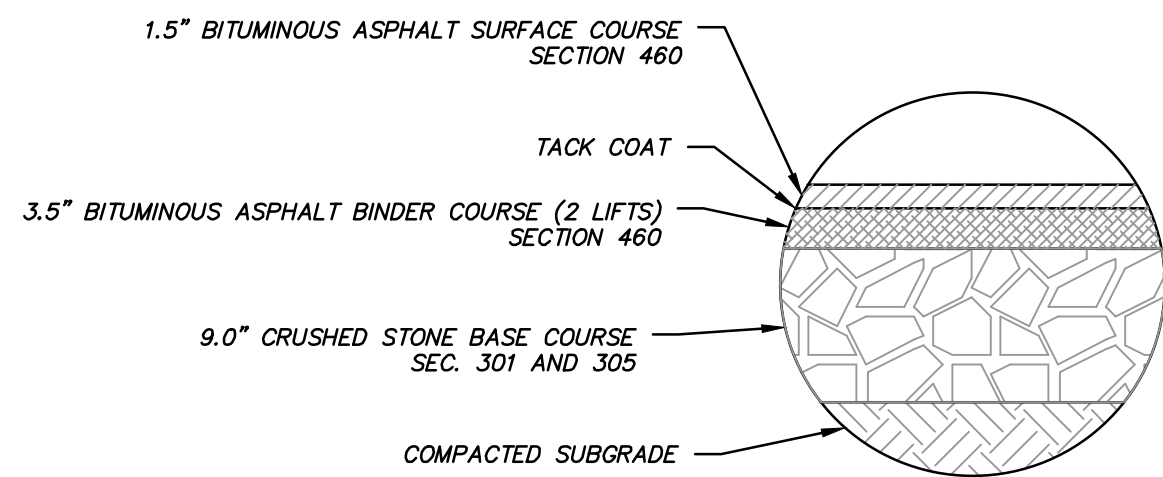
TAP SERVICE PIPING (COPPER)
N.T.S.



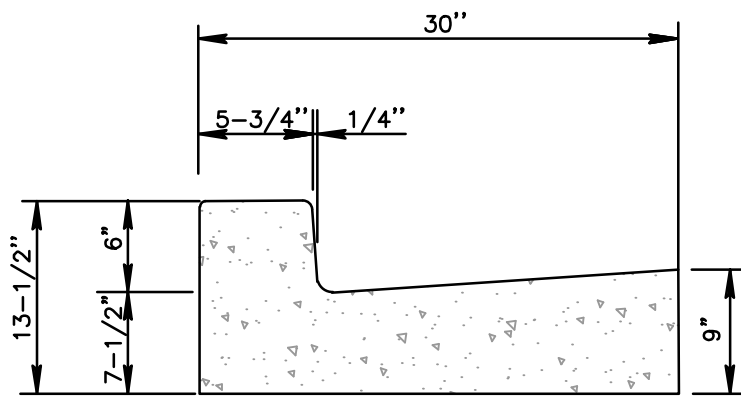
TYPICAL HYDRANT SETTING
N.T.S.



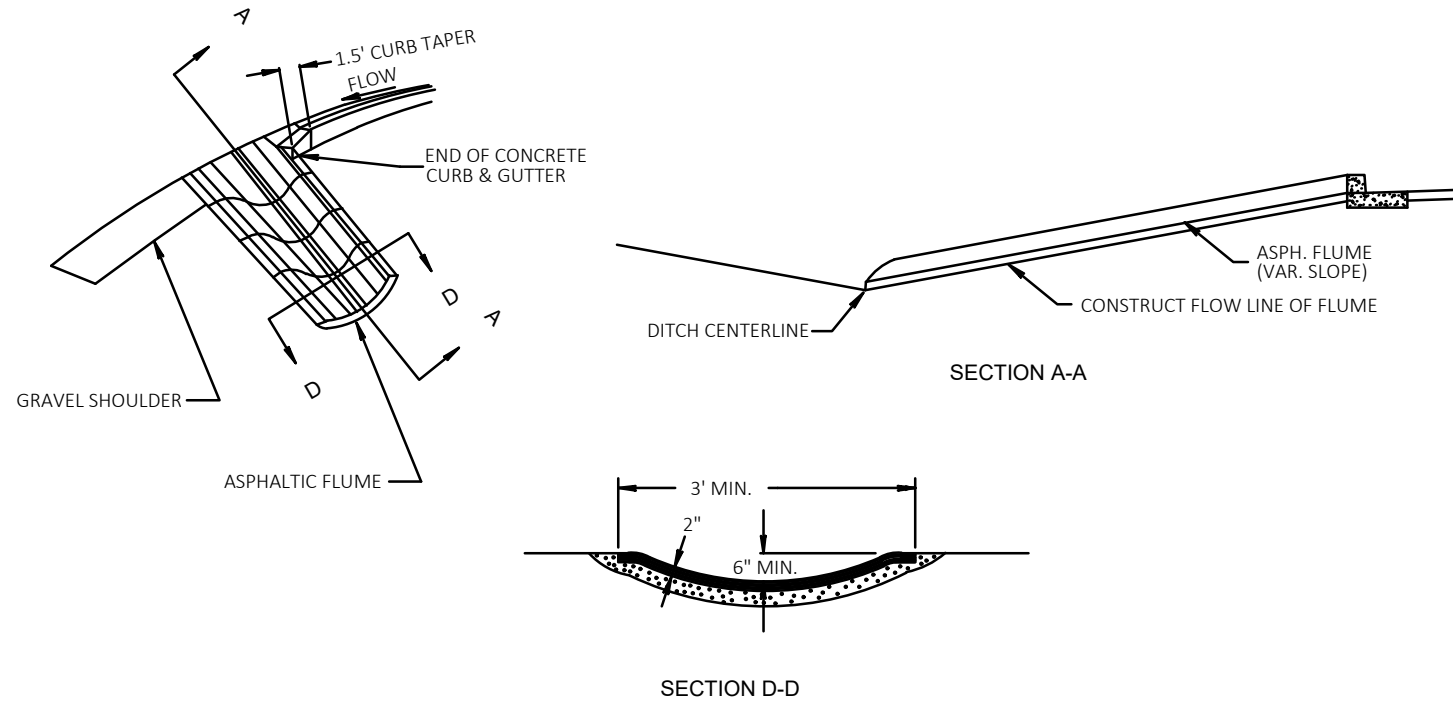
PROPOSED RURAL STREET SECTION
N.T.S.



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 WITH MANHOLE SEAL. "A-LOCK" AND "CORE SEAL" OR APPROVED EQUAL SHALL BE USED.

STORM SEWER NOTES:

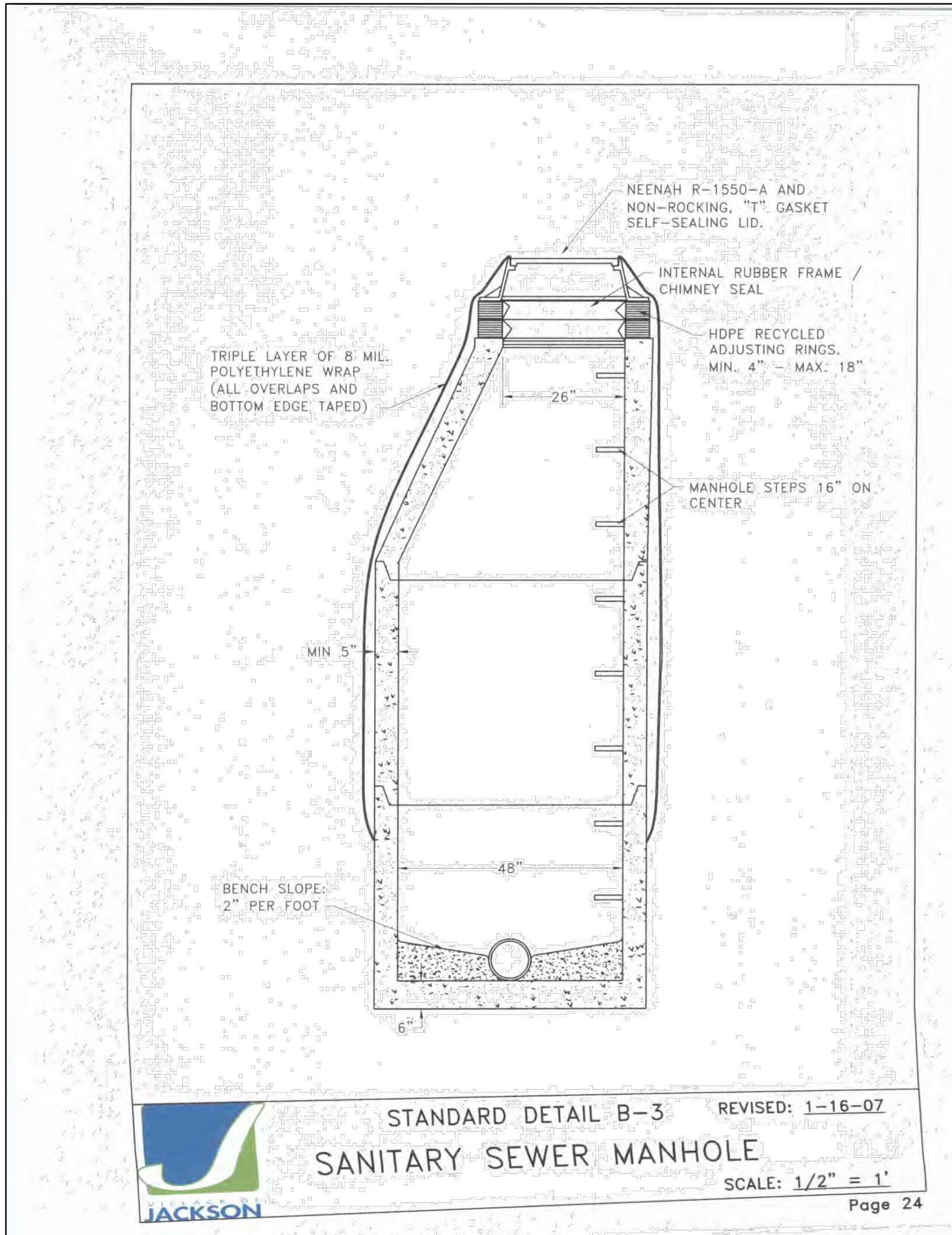
1. STORM SEWER PIPES SHALL BE AT A MINIMUM CLASS III (CLASS IV IN PAVEMENTS AREAS) ASTM C-76 REINFORCED CONCRETE PIPE. STORM SEWER PIPE SHALL HAVE RUBBER GASKETS AT ALL JOINTS.

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.



MORNING MEADOWS SUBDIVISION - PHASE 1
VILLAGE OF JACKSON, WI

SITE DETAILS

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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

SHEET NUMBER

C401

DESCRIPTION

DATE

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

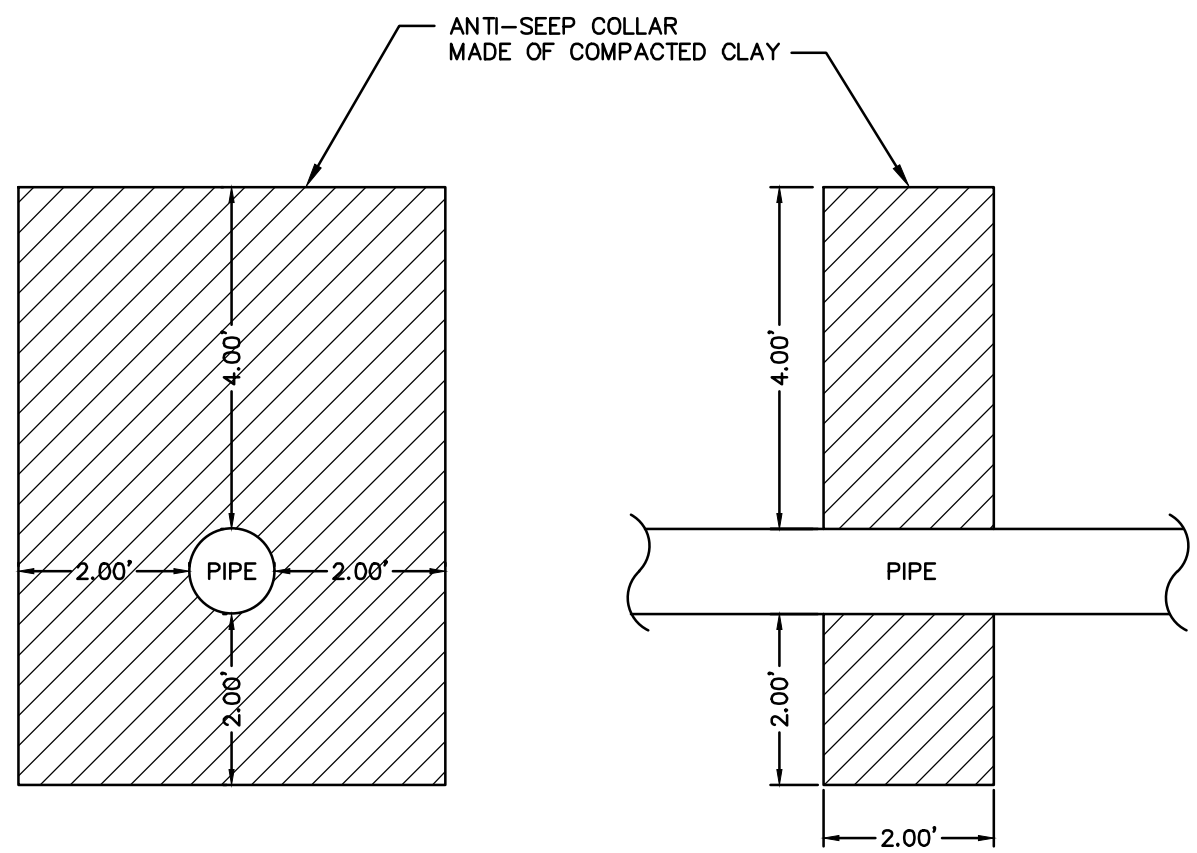
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CREATIVITY BEYOND ENGINEERING

Brookfield, WI | Milwaukee, WI | Appleton, WI | Madison, WI | Cedarburg, WI
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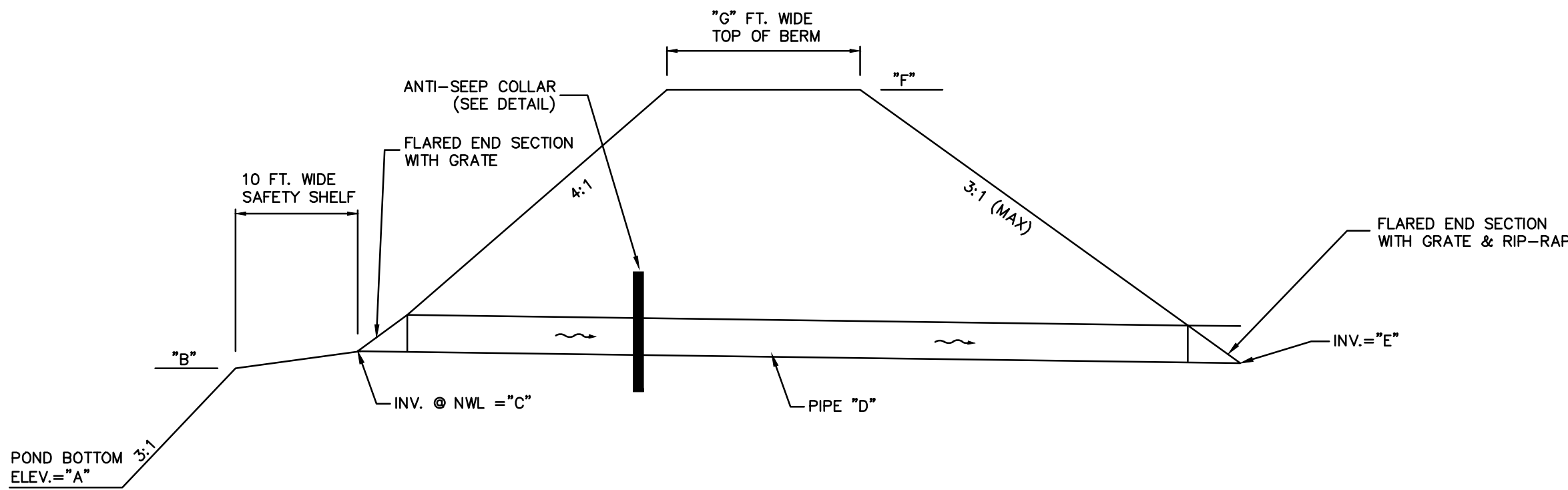
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SECTION VIEW

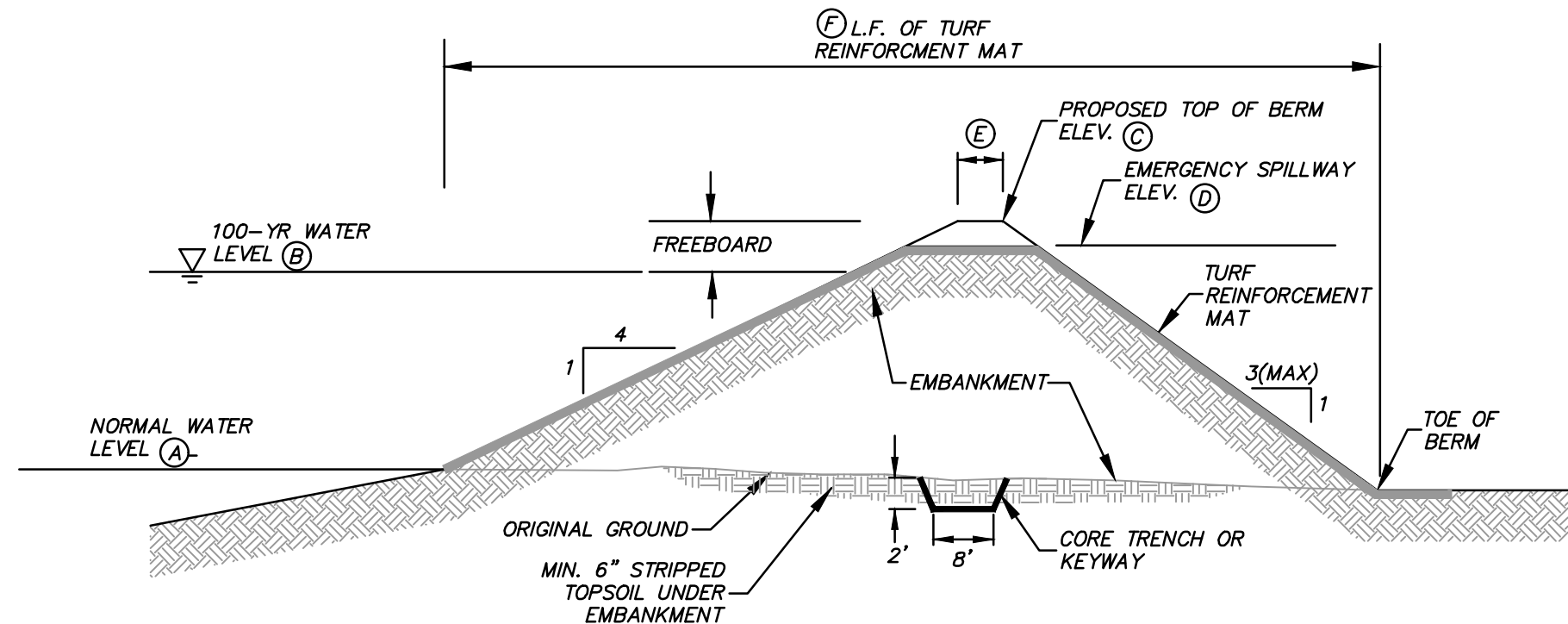
PROFILE VIEW

ANTI-SEEP COLLAR DETAIL

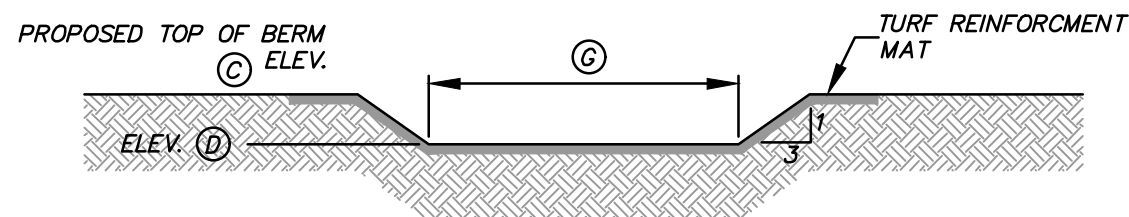


	A	B	C	D	E	F	G
DETENTION POND 1	852.00	856.00	857.00	30.0' - 12" @ 1.00%	857.00	856.70	10'
DETENTION POND 2	851.00	855.00	856.00	2@ 23.0' - 24" @ 1.00%	856.00	855.77	10'

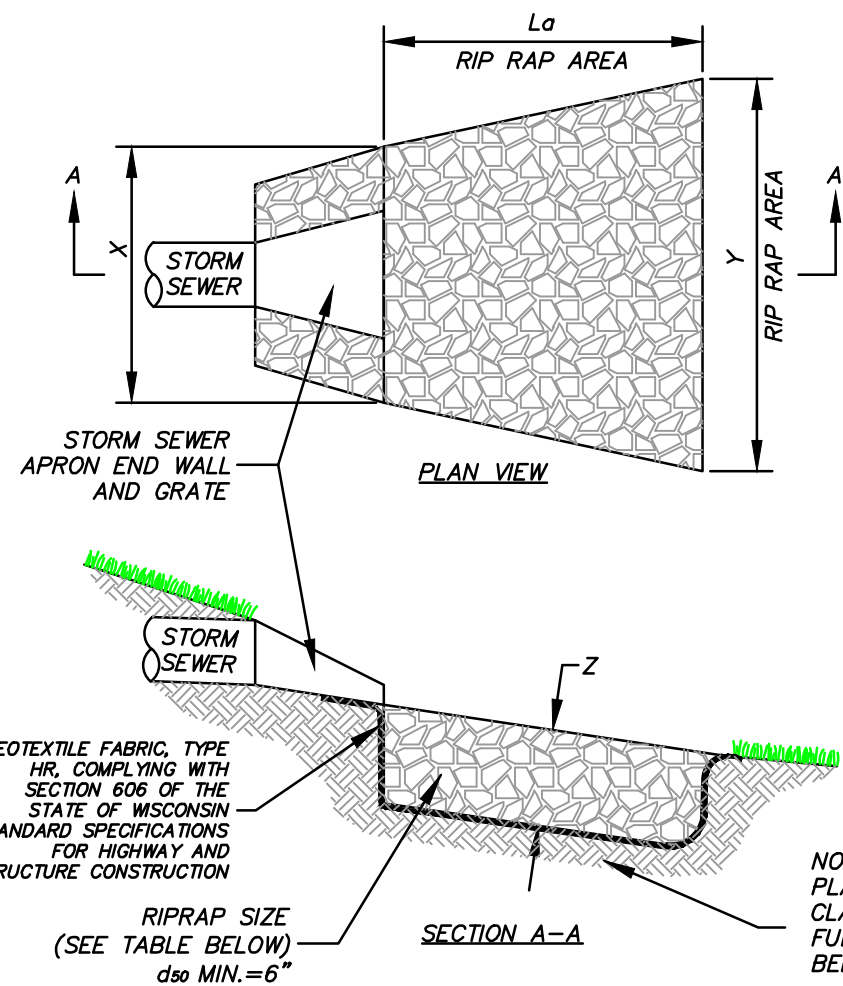
WET DETENTION POND CROSS SECTION
N.T.S.



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	Lx	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.



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Mount Pleasant, WI | Naperville, IL | Irvine, CA

MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WI	DETENTION POND DETAILS
---	------------------------

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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
SHEET NUMBER
C402

CONSTRUCTION PLANS FOR G MEADOWS SUBDIVISION VILLAGE OF JACKSON, WISCONSIN

VICINITY MAP

PLAN INDEX

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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

[illegible]

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

TITLE SHEET

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SCALE:N.T.S.

JOB NO. 3050195.01

PROJECT MANAGER:
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DESIGNED BY: DJM

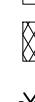
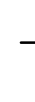
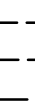
CHECKED BY: CDH

SHEET NUMBER

6000

6000

LEGEND

- | | |
|---|--|
|  | 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 |
|  | COLORLED 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 |
|  | PROPOSED GARAGE FLOOR GRADE |
|  | PROPOSED THRESHOLD |
| | IF A SECOND ELEVATION IS GIVEN, DENOTES GROUND LEVEL FOR LOOK OUT OR BASEMENT SLAB GRADE FOR WALK OUT. |
| | PROPOSED EROSION CONTROL BALE |
| | PROPOSED TEMPORARY DITCH CHECK |
| | CULVERT PIPE DITCH CHECK |
| | PROPOSED INLET PROTECTION |
| | PROPOSED SILT FENCE |
| | PROPOSED STRAW WATTLE |
| | PROPOSED TEMPORARY DIVERSION SWALE & BERM |
| | 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 ⊗ 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)
- ① BOLLARD
- + FLARE/CLIPPING/MONITORING WELL
- ✚ FLAG POLE
- ✉ MAILBOX
- SIGN
- BILLBOARD
- A AIR CONDITIONER
- B CONTROL BOX
- C TRAFFIC SIGNAL
- E RAILROAD CROSSING SIGNAL
- G GAS PEDESTAL
- F POWER POLE
- K GUY POLE
- L GUY WIRE
- LIGHT POLE
- S SPOT/YARD/PEDESTAL LIGHT
- H HANDICAPPED PARKING
- E ELECTRIC MANHOLE
- E ELECTRIC PEDESTAL
- E ELECTRIC METER
- E ELECTRIC TRANSFORMER
- T TELEPHONE MANHOLE
- T TELEPHONE PEDESTAL
- O MARKED FIBER OPTIC
- G GAS VALVE
- G GAS METER
- G GAS WARNING SIGN
- STORM MANHOLE
- R ROUND INLET
- S SQUARE INLET
- STORM SEWER END SECTION
- S SANITARY MANHOLE
- SANITARY CLEANOUT OR SEPTIC VENT
- SANITARY INTERCEPTOR MANHOLE
- M MISCELLANEOUS MANHOLE
- V WATER VALVE
- H HYDRANT
- W WATER SERVICE CURB STOP
- W WATER MANHOLE
- W WATER MAIN
- W WATER SURFACE
- W WETLANDS FLAG
- M MARCH
- * CONIFEROUS TREE
- DECIDUOUS TREE
- SHRUB
- EDGE OF TREES
- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- MARKED GAS MAIN
- MARKED ELECTRIC
- OH --- OVERHEAD WIRE
- BURIED ELEC. SERV.
- MARKED TELEPHONE
- MARKED CABLE TV LINE
- MARKED FIBER OPTIC
- INDICATES EXISTING
- CONTOUR ELEVATION
- INDICATES EXISTING
- SPOT ELEVATION
- EXISTING PROPERTY LINE
- EXISTING EASEMENT

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

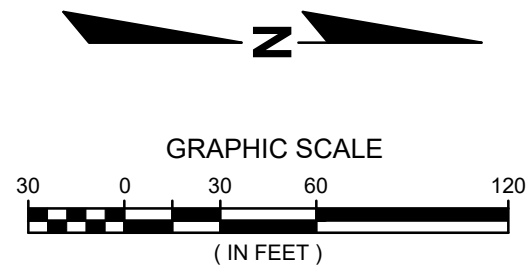
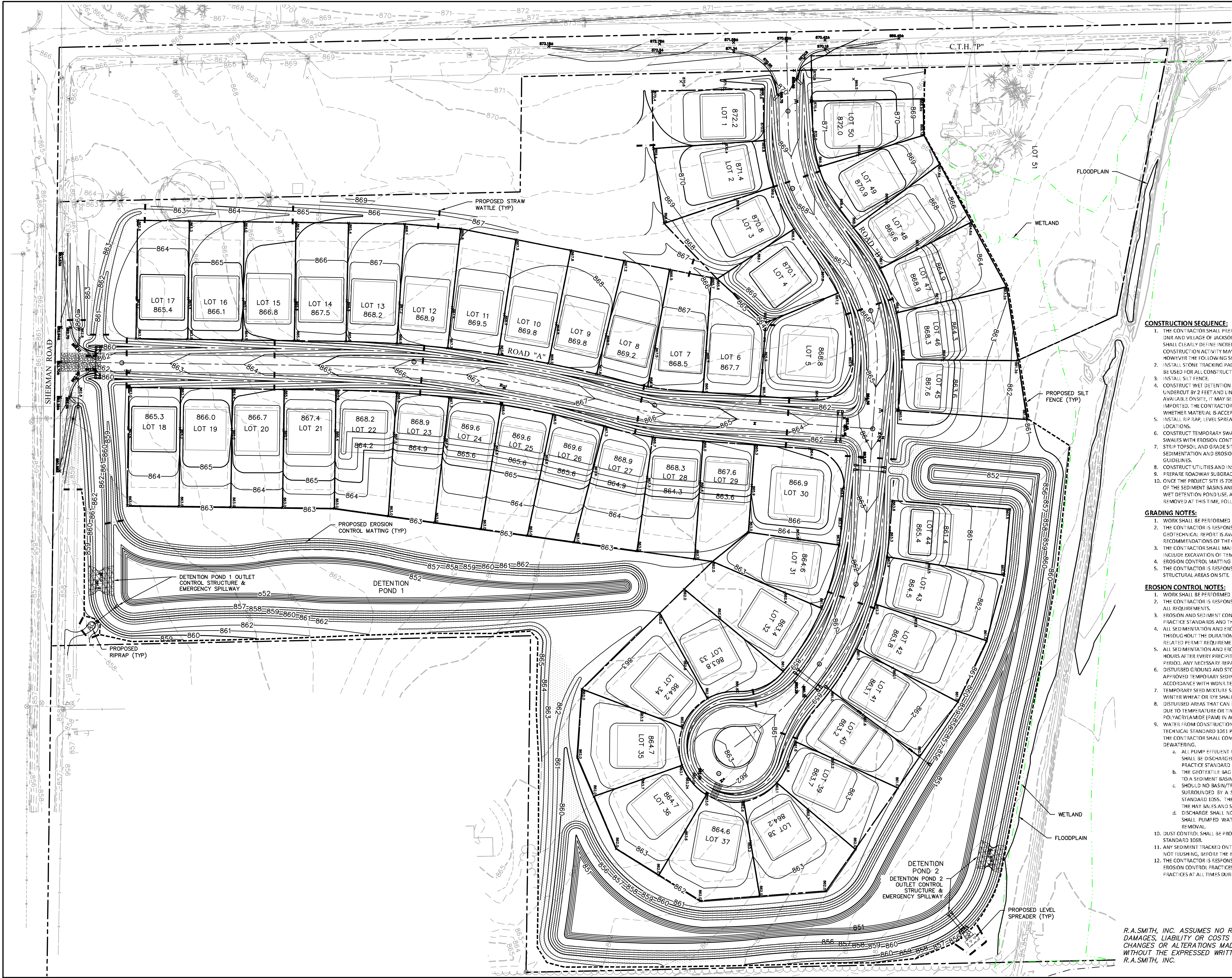
COMMUNITY:

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



CONSTRUCTION SEQUENCE:

1. THE CONTRACTOR SHALL PREPARE AN IMPLEMENTATION PLAN FOR REVIEW/APPROVAL BY WISCONSIN DNR AND VILLAGE OF JACKSON PRIOR TO THE START OF CONSTRUCTION. THE IMPLEMENTATION PLAN SHALL CLEARLY DEFINE INCREMENTS OF THE CONTRACTOR'S PROPOSED LAND DISTURBANCE. CONSTRUCTION ACTIVITY MAY OCCUR CONCURRENTLY WITHIN MORE THAN ONE INCREMENT, HOWEVER THE FOLLOWING SEQUENCE SHALL BE APPLIED TO EACH INDIVIDUAL INCREMENT.
2. INSTALL STONE TRACKING PAD AT LOCATION SHOWN ON THE PLANS. THIS IS THE ONLY ENTRANCE TO BE USED FOR ALL CONSTRUCTION ACTIVITIES.
3. INSTALL SILT FENCE.
4. CONSTRUCT WET DETENTION PONDS FOR USE AS SEDIMENT BASINS. WET DETENTION PONDS SHALL BE UNDERCUT BY 2 FEET AND LINED WITH A 2 FOOT LAYER OF CLAY. IF ACCEPTABLE MATERIAL IS AVAILABLE ON SITE, IT MAY BE USED. IF ACCEPTABLE MATERIAL IS NOT AVAILABLE ON SITE, IT SHALL BE IMPORTED. THE CONTRACTOR SHALL CONSULT WITH THE GEOTECHNICAL ENGINEER TO DETERMINE WHETHER MATERIAL IS ACCEPTABLE TO LINE THE PONDS.
5. INSTALL RIP RAP, LEVEL SPREADERS AND STRAW WATTLES AT WET DETENTION POND OUTFALL LOCATIONS.
6. CONSTRUCT TEMPORARY SWALES TO DIRECT RUNOFF TO SEDIMENT BASINS. STABILIZE TEMPORARY SWALES WITH EROSION CONTROL MATTING AND STRAW WATTLES.
7. STRIP TOPSOIL AND GRADE SITE IN INCREMENTS APPROPRIATE TO WORK WHILE MAINTAINING SEDIMENTATION AND EROSION CONTROL PRACTICES IN CONFORMANCE WITH LOCAL AND STATE GUIDELINES.
8. CONSTRUCT UTILITIES AND INSTALL STORM CULVERTS.
9. PREPARE ROADWAY SUBGRADE. INSTALL CURB & GUTTER AND BINDER SURFACE ASPHALT.
10. ONCE THE PROJECT SITE IS 70% STABILIZED, REMOVE ACCUMULATED SEDIMENT FROM THE BOTTOM OF THE SEDIMENT BASINS AND MODIFY OUTLET CONTROL STRUCTURES AS REQUIRED FOR PERMANENT WET DETENTION POND USE. ALL REMAINING TEMPORARY EROSION CONTROL SHALL ALSO BE REMOVED AT THIS TIME, FOLLOWING APPROVAL FROM THE VILLAGE OF JACKSON AND THE WDNR.

GRADING NOTES:

1. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONSTRUCTION SEQUENCE.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING SOIL CONDITIONS PRIOR TO CONSTRUCTION. A GEOTECHNICAL REPORT IS AVAILABLE FROM THE OWNER. THE CONTRACTOR SHALL ABIDE BY THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.
3. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE THROUGHOUT CONSTRUCTION. THIS MAY INCLUDE EXCAVATION OF TEMPORARY SWALES OR PUMPING TO ALLEVATE WATER PONDING.
4. EROSION CONTROL MATTING SHALL BE INSTALLED ON ALL WET DETENTION POND SIDE SLOPES.
5. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING THE SITE. TOPSOIL MAY BE USED AS FILL IN NON-STRUCTURAL AREAS ON SITE.

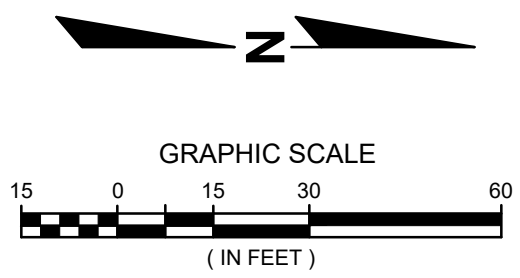
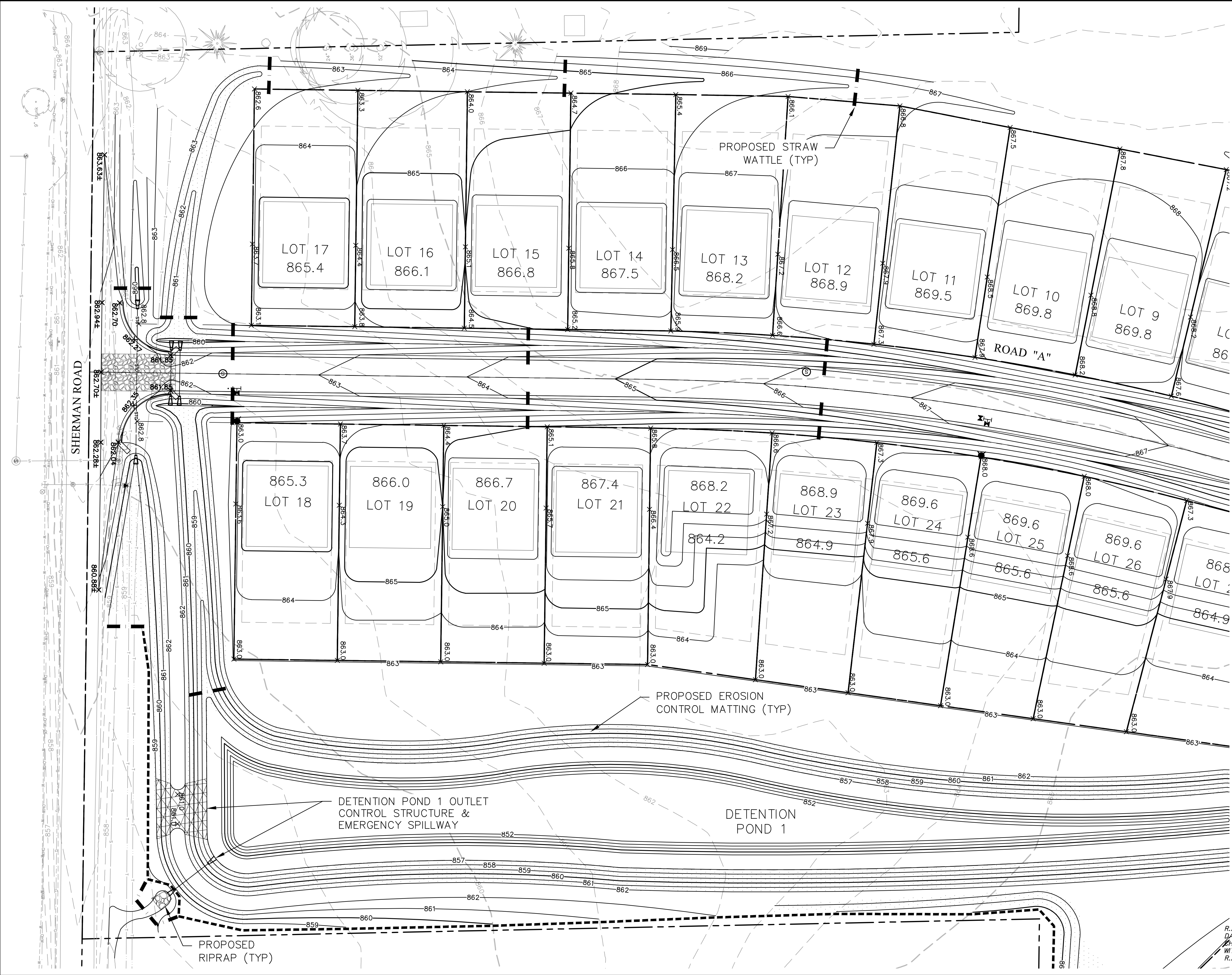
EROSION CONTROL NOTES:

1. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONSTRUCTION SEQUENCE.
2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING COPIES OF ALL RELATED PERMITS AND ABIDING BY ALL REQUIREMENTS.
3. EROSION AND SEDIMENT CONTROL PRACTICES SHALL COMPLY WITH THE WDNR CONSERVATION PRACTICE STANDARDS AND THE VILLAGE OF JACKSON.
4. ALL SEDIMENTATION AND EROSION CONTROL PRACTICES SHALL BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE DURATION OF THE PROJECT AND WARRANTY PERIOD IN CONFORMANCE WITH RELATED PERMIT REQUIREMENTS.
5. ALL SEDIMENTATION AND EROSION CONTROL PRACTICES SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OR MORE DURING A 24 HOUR PERIOD. ANY NECESSARY REPAIRS SHALL BE PERFORMED IMMEDIATELY.
6. DISTURBED GROUND AND STOCKPILES LEFT INACTIVE FOR 7 DAYS OR MORE SHALL BE STABILIZED WITH APPROVED TEMPORARY SEDIMENT CONTROL MEASURES OR TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH WDNR TECHNICAL STANDARDS 1008/1009.
7. TEMPORARY SEED MIXTURE SHALL CONFORM TO SECTION 630 OF W-8207 STANDARD SPECIFICATIONS. WINTER WHEAT OR RYE SHALL BE USED FOR SEEDING AFTER SEPTEMBER 1.
8. DISTURBED AREAS THAT CAN NOT BE STABILIZED WITH A DENSE GROWTH OF SEEDING AND MULCHING DUE TO TEMPERATURE OR TIMING OF CONSTRUCTION, SHALL BE STABILIZED BY APPLYING ANIONIC POLYACRYLAMIDE (PAM) IN ACCORDANCE WITH WDNR TECHNICAL STANDARD 1050.
9. WATER FROM CONSTRUCTION DEWATERING SHALL BE TREATED IN ACCORDANCE WITH WDNR TECHNICAL STANDARD 1061 PRIOR TO DISCHARGE TO WATERS OF THE STATE, WETLANDS OR OFFSITE. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING MINIMUM REQUIREMENTS FOR DEWATERING:
 - a. ALL PUMP EFFLUENT FROM DEWATERING OPERATIONS (TRENCH DEWATERING OR OTHERWISE) SHALL BE DISCHARGED TO A GEOTEXTILE FILTER BAG CONFORMING TO WDNR CONSERVATION PRACTICE STANDARD 1061.
 - b. THE GEOTEXTILE BAG SHALL BE PLACED ON VEGETATED/STABILIZED GROUND AND DISCHARGE TO A SEDIMENT BASIN OR TRAP.
 - c. SHOULD NO BASIN/TRAP EXIST, THE GEOTEXTILE BAG SHALL BE PLACED ON FILTER FABRIC AND SURROUNDED BY A SEDIMENT BALE BARRIER CONFORMING TO CONSERVATION PRACTICE STANDARD 1055. THE FILTER FABRIC SHALL BE BROUGHT UP THE SIDES AND OVER THE TOP OF THE BALE BARRIER AND SECURED.
 - d. DISCHARGE SHALL NOT BE ALLOWED TO FLOW OVER UNPROTECTED GROUND. IN NO CASE SHALL PUMPED WATER BE DIVERTED OUTSIDE THE PROJECT LIMITS PRIOR TO SEDIMENT REMOVAL.
10. DUST CONTROL SHALL BE PROVIDED AS NECESSARY IN ACCORDANCE WITH WDNR TECHNICAL STANDARD 1068.
11. ANY SEDIMENT TRACKED ON TO A PUBLIC OR PRIVATE ROAD SHALL BE REMOVED BY STREET CLEANING, NOT FLUSHING, BEFORE THE END OF EACH WORKING DAY.
12. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL SEDIMENTATION AND EROSION CONTROL PRACTICES NECESSARY. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED PRACTICES AT ALL TIMES DURING CONSTRUCTION UNTIL STABILIZATION IS ACHIEVED.



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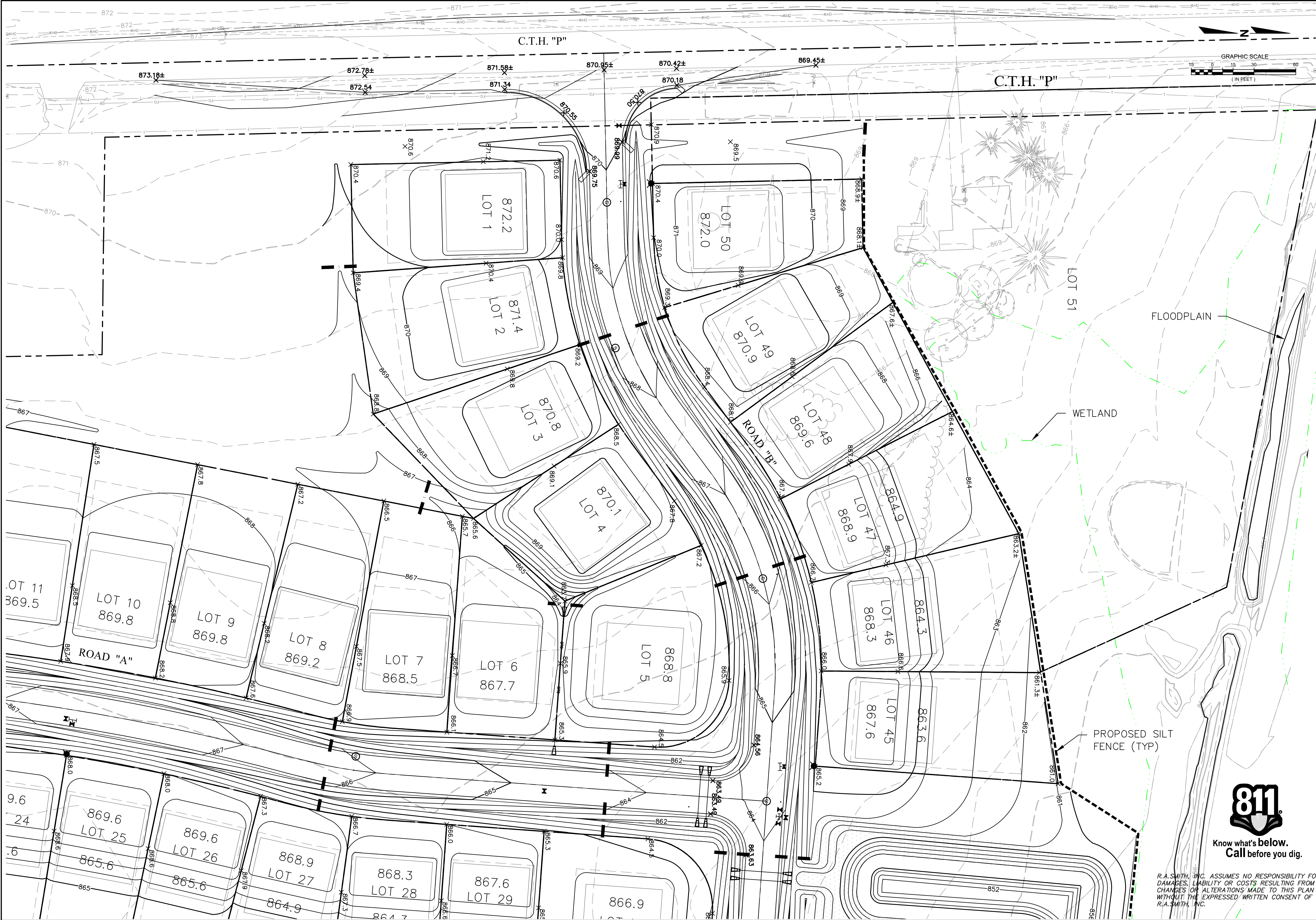
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raSmith CREATIVITY BEYOND ENGINEERING	
Brookfield, WI Milwaukee, WI Appleton, WI Madison, WI Cedarburg, WI Mount Pleasant, WI Naperville, IL Irvine, CA	
MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WI	
OVERALL EROSION CONTROL & GRADING PLAN	
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DATE: 07/02/2020	
SCALE: 1" = 60'	
JOB NO. 3050195.01	
PROJECT MANAGER: CHRIS D. HITCH, P.E.	
DESIGNED BY: DJM	
CHECKED BY: CDH	
SHEET NUMBER C100	



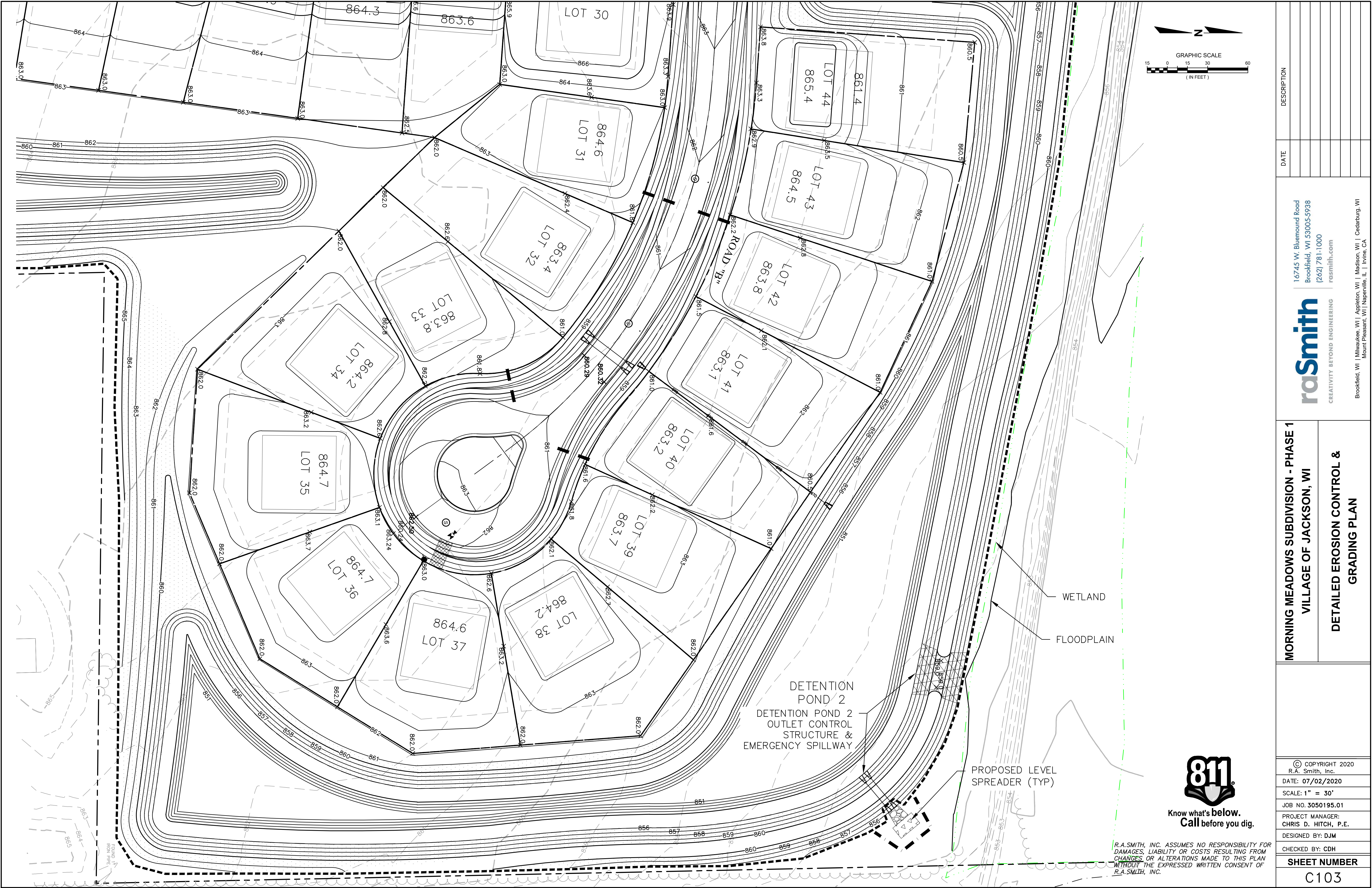
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raSmith CREATIVITY BEYOND ENGINEERING	
Brookfield, WI Milwaukee, WI Appleton, WI Madison, WI Cedarburg, WI Mount Pleasant, WI Naperville, IL Irvine, CA	
MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WI	
DETAILED EROSION CONTROL & GRADING PLAN	
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SHEET NUMBER	
C101	



DESCRIPTION	
DATE	
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MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WI	
DETAILED EROSION CONTROL & GRADING PLAN	
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SHEET NUMBER C102	



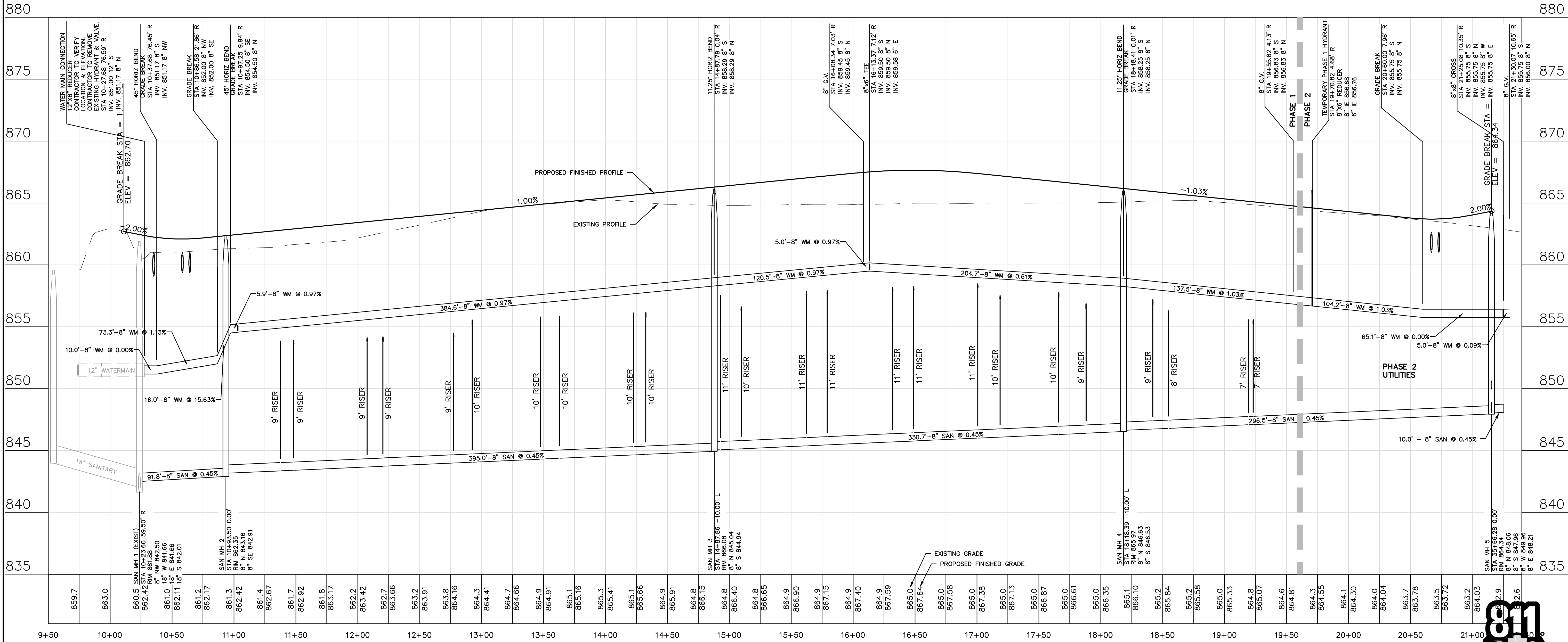
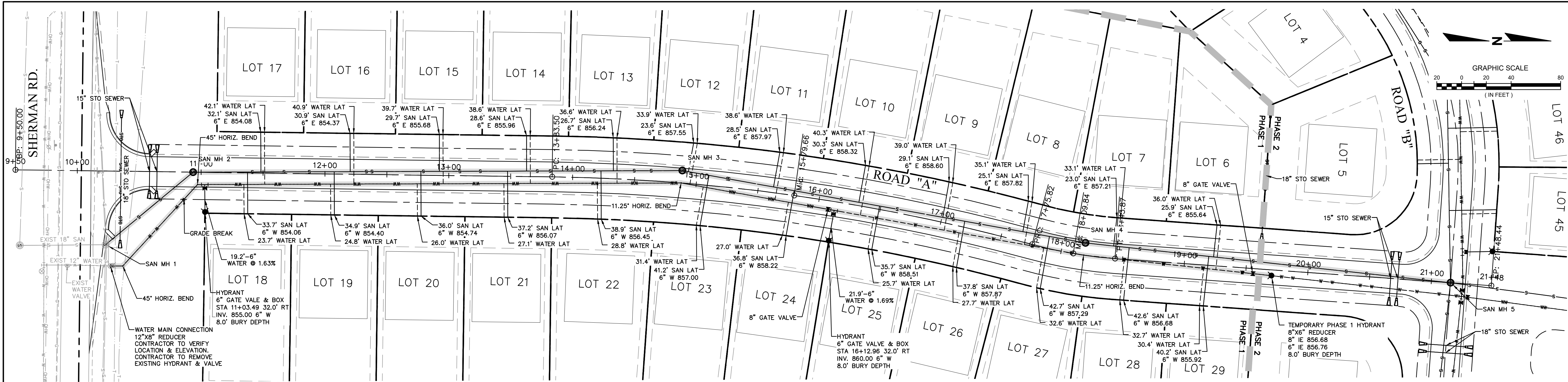
MORNING MEADOWS SUBDIVISION - PHASE 1
VILLAGE OF JACKSON, WI

DETAILED EROSION CONTROL &
GRADING PLAN

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SCALE: 1" = 30'
JOB NO. 3050195.01
PROJECT MANAGER:
CHRIS D. HITCH, P.E.
DESIGNED BY: DJM
CHECKED BY: CDH

SHEET NUMBER
C103

DATE	DESCRIPTION



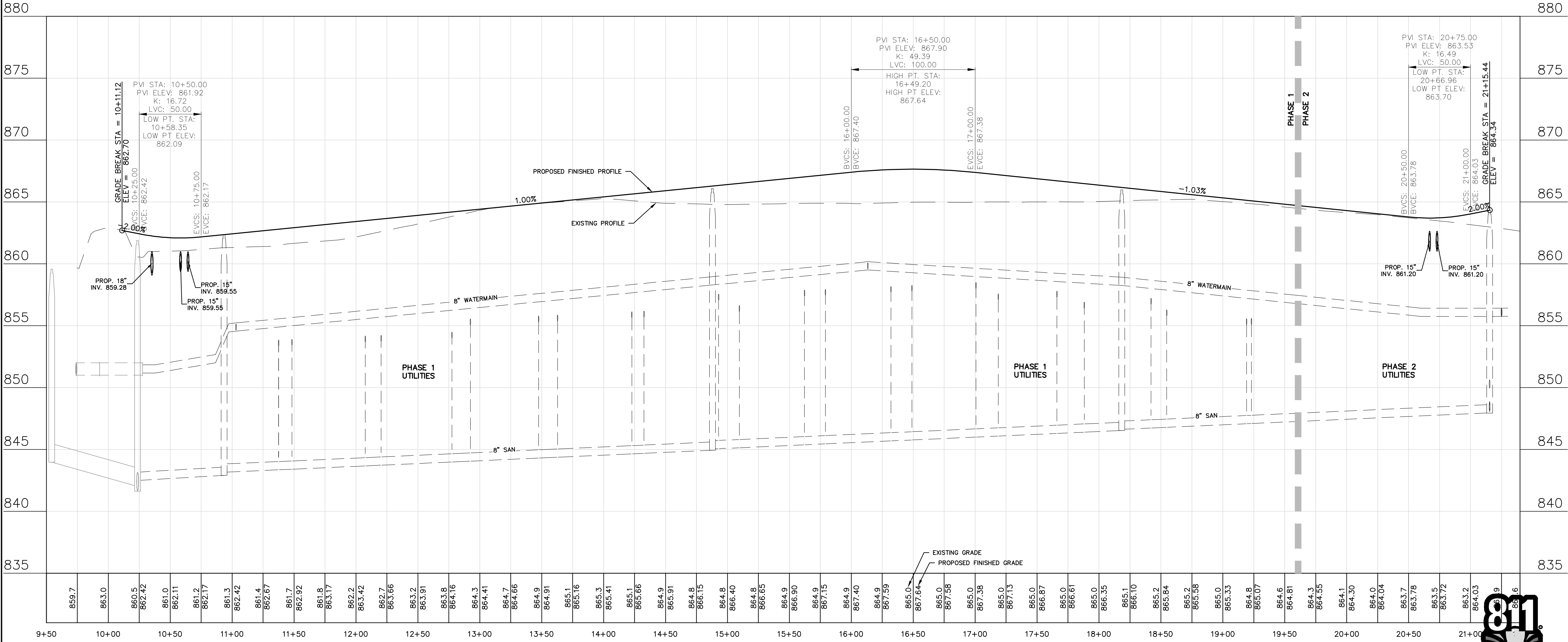
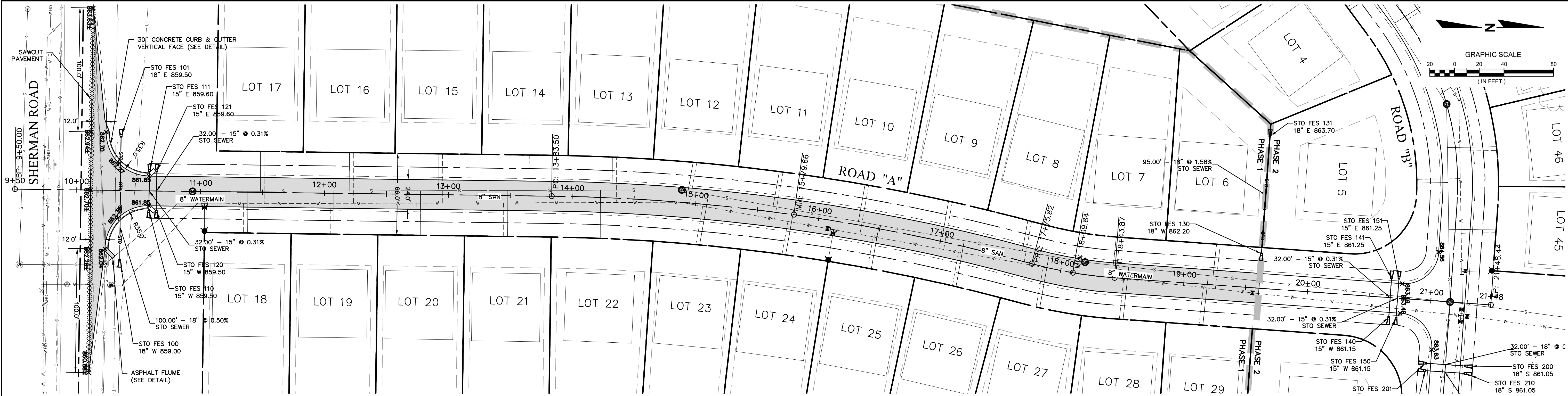
THE LOCATIONS OF EXISTING UTILITY INSTALLATIONS AS SHOWN ON THIS PLAN ARE APPROXIMATE. THERE MAY BE OTHER UNDERGROUND UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.

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MORNING MEADOWS SUBDIVISION - PHASE 1 VILLAGE OF JACKSON, WI	
SANITARY SEWER & WATER MAIN PLAN & PROFILE	
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PROJECT MANAGER: CHRIS D. HITCH, P.E.	
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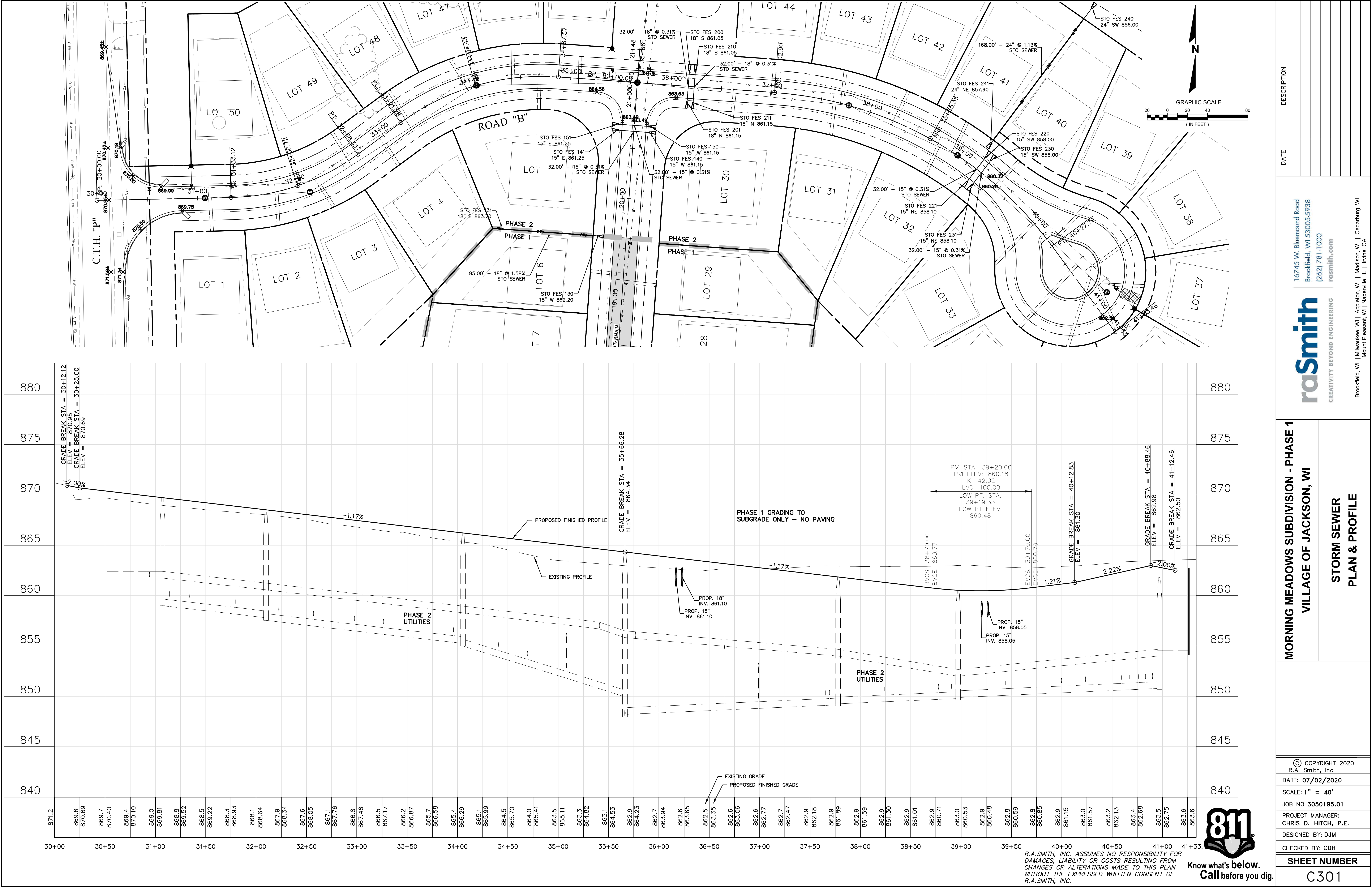
NOTES:
1. ALL SPOT GRADES AND DIMENSIONS ARE TO THE FLANGE LINE OF CURB & GUTTER OR EDGE OF PAVEMENT.

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.

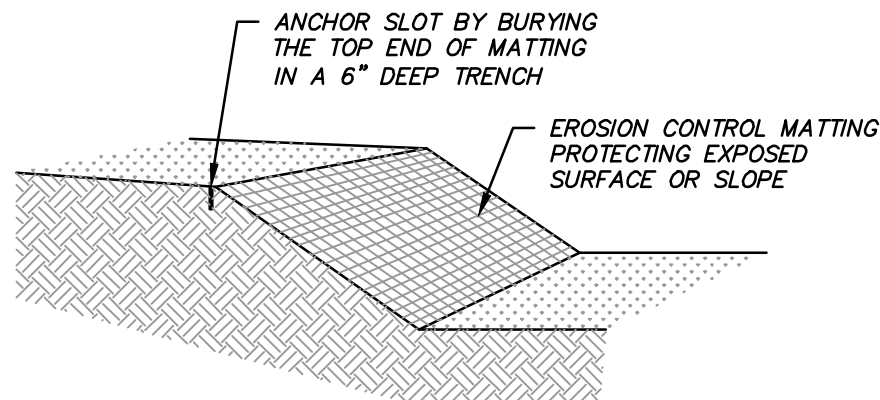
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STORM SEWER & PAVING PLAN & PROFILE	
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DATE: 07/02/2020	
SCALE: 1" = 40'	
JOB NO. 3050195.01	
PROJECT MANAGER: CHRIS D. HITCH, P.E.	
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SHEET NUMBER C300	

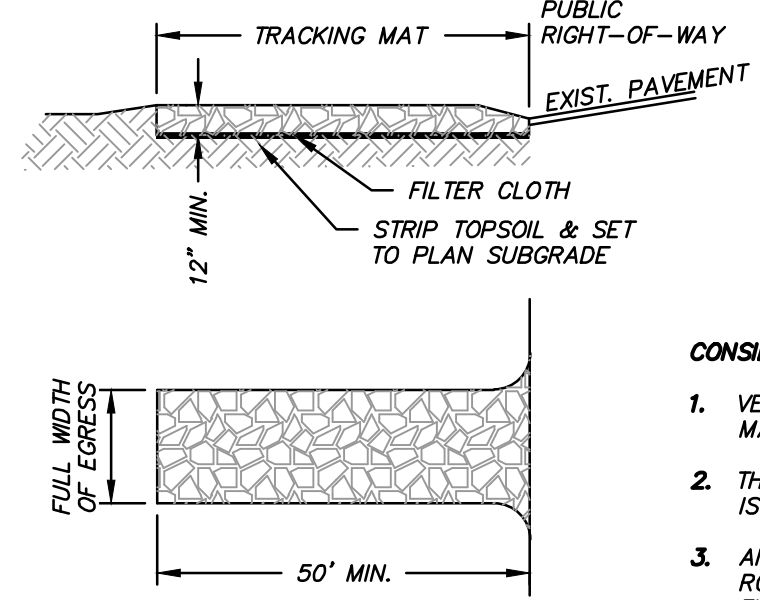


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STORM SEWER PLAN & PROFILE	
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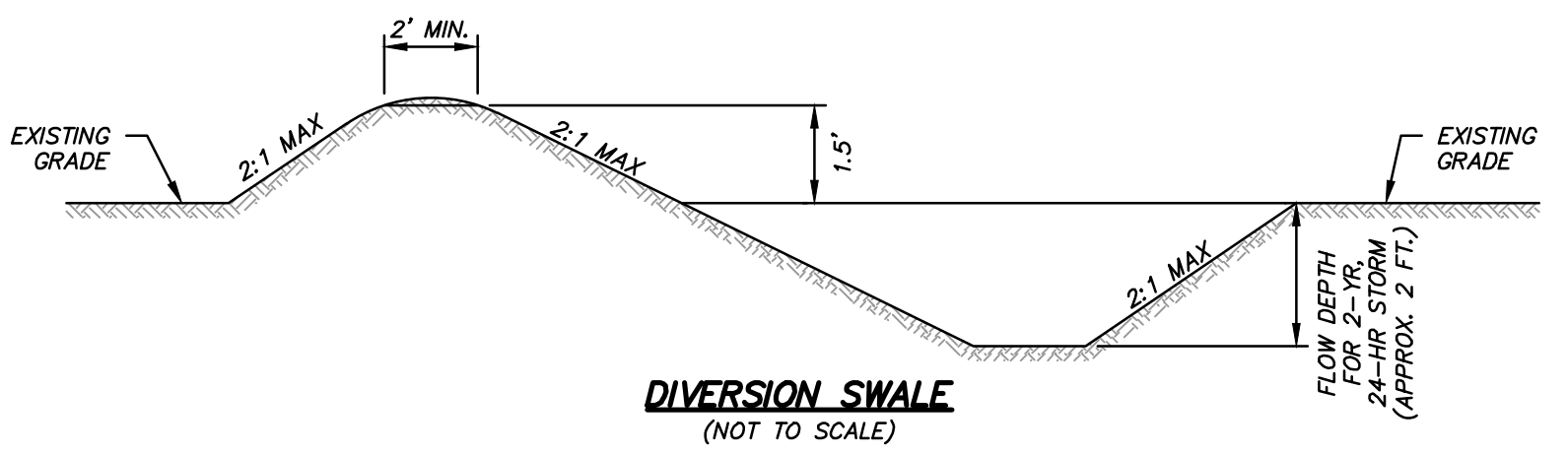
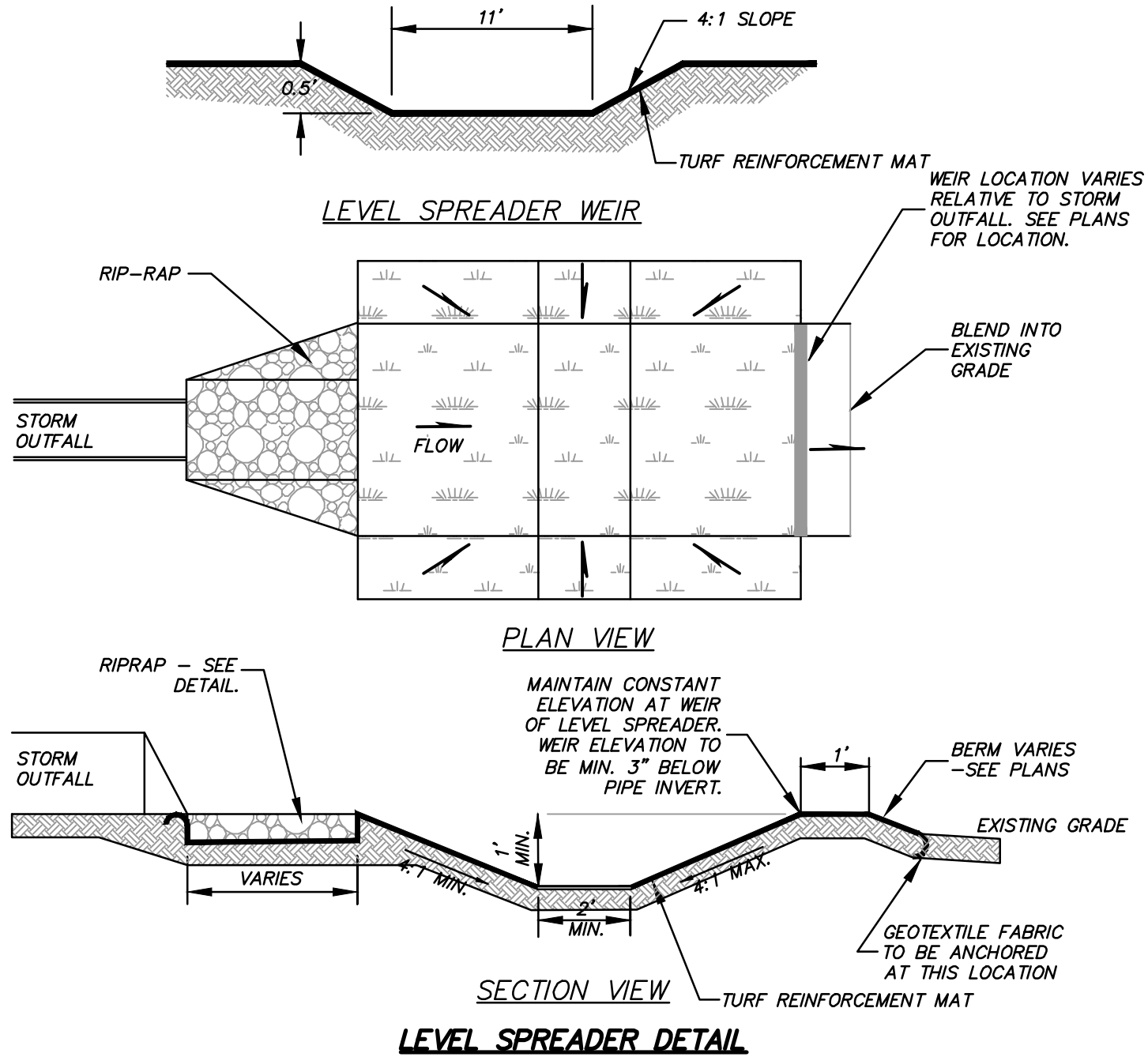
- NOTES:**
1. PRIOR TO THE INSTALLATION OF ANY EROSION CONTROL MATTING, ALL ROCKS, DIRT CLODS, STUMPS, ROOTS, TRASH AND ANY OTHER OBSTRUCTIONS WHICH WOULD PREVENT THE MAT FROM LAYING IN DIRECT CONTACT WITH THE SOIL SHALL BE REMOVED.
 2. EROSION CONTROL MATTING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 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 WISDOT PAL CLASS I, TYPE B AND PERMANENT EROSION CONTROL MATTING SHALL BE WISDOT 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



- 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 WISDOT 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 IF DUAL WHEEL VEHICLES SHALL BE REMOVED PRIOR TO LEAVING THE CONSTRUCTION SITE.
 2. TRACKING PADS AND TIRE WASHING STATIONS SHALL, AT AT 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)

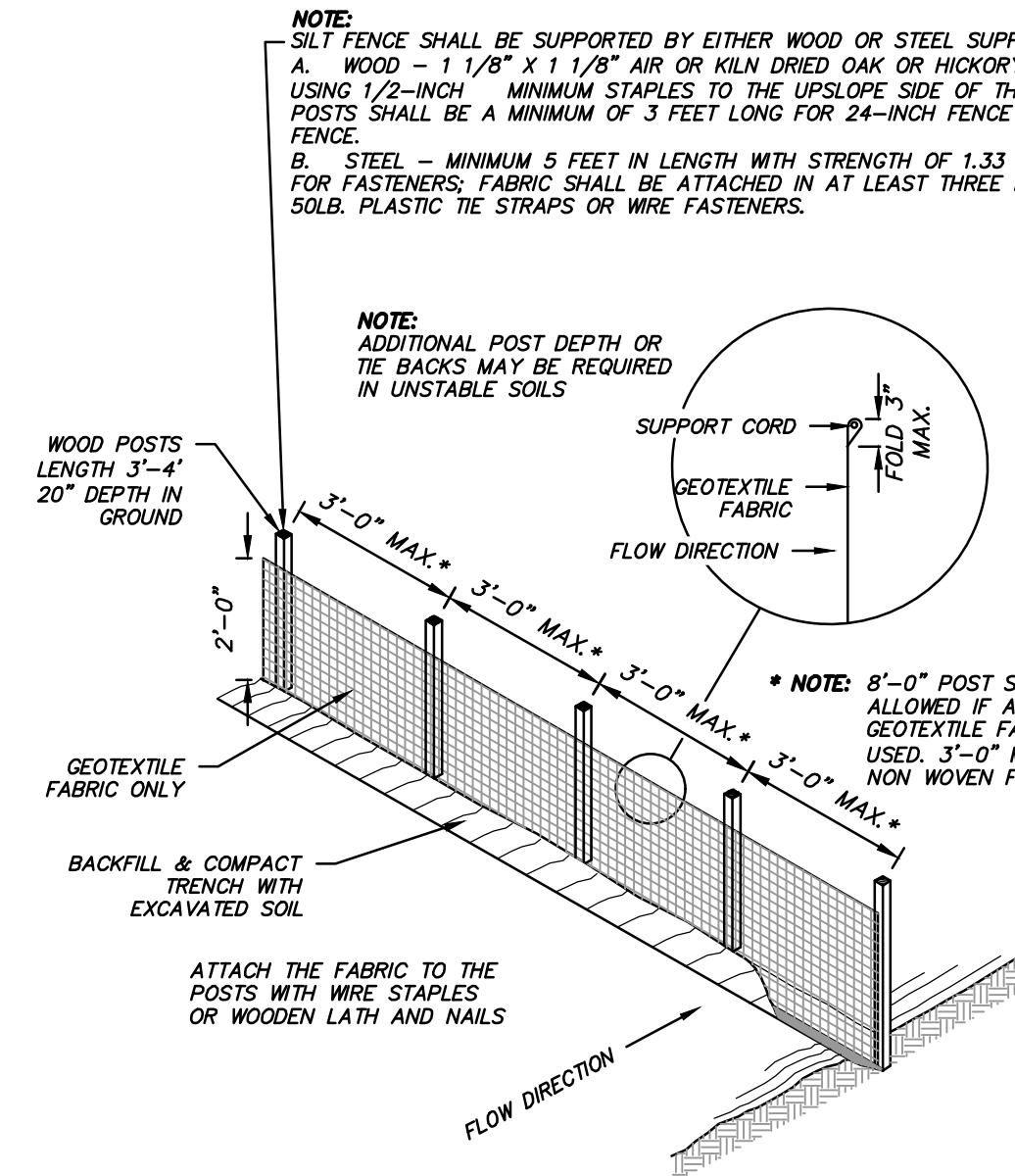


1. DIVERSION TO CONFORM TO WDNR CONSERVATION PRACTICE STANDARD 1066.
2. DIVERSION TO BE STABILIZED WITH VEGETATION OR EROSION MAT PRIOR TO USE.
3. DIVERSIONS SHALL, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 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.

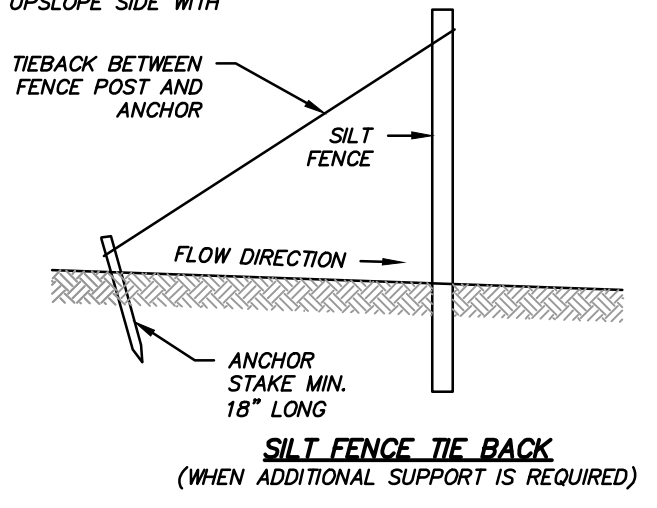
- NOTES:**
1. SILT FENCE INSTALLATION AND MATERIALS SHALL CONFORM TO WDNR CONSERVATION STANDARD 1056.
 2. SILT FENCE SHALL BE PLACED ON THE CONTOUR AND NOT PERPENDICULAR TO THE CONTOUR. THE ENDS SHALL BE EXTENDED UPSLOPE TO PREVENT WATER FROM FLOWING AROUND THE ENDS OF THE FENCE.
 3. WHEN SILT FENCE 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 180 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 SHALL 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.

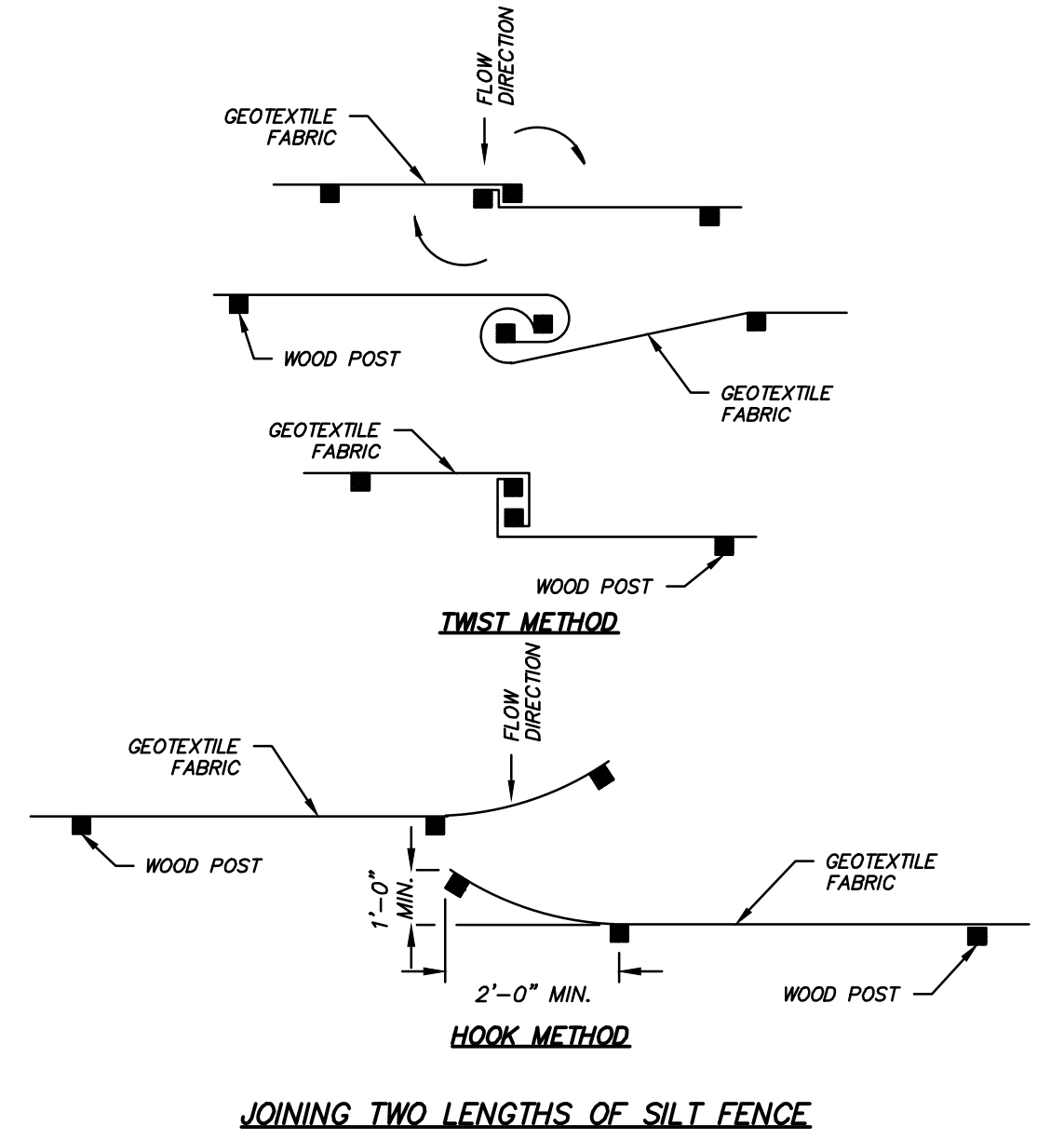


SILT FENCE DETAIL
(NOT TO SCALE)

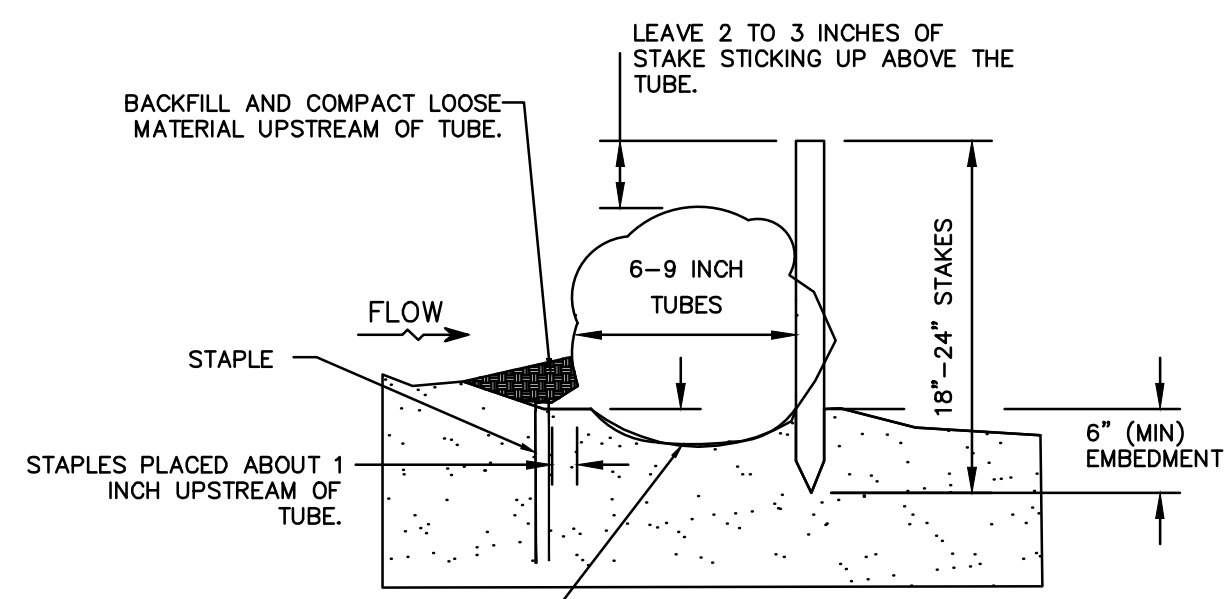


TRENCH DETAIL

- 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.

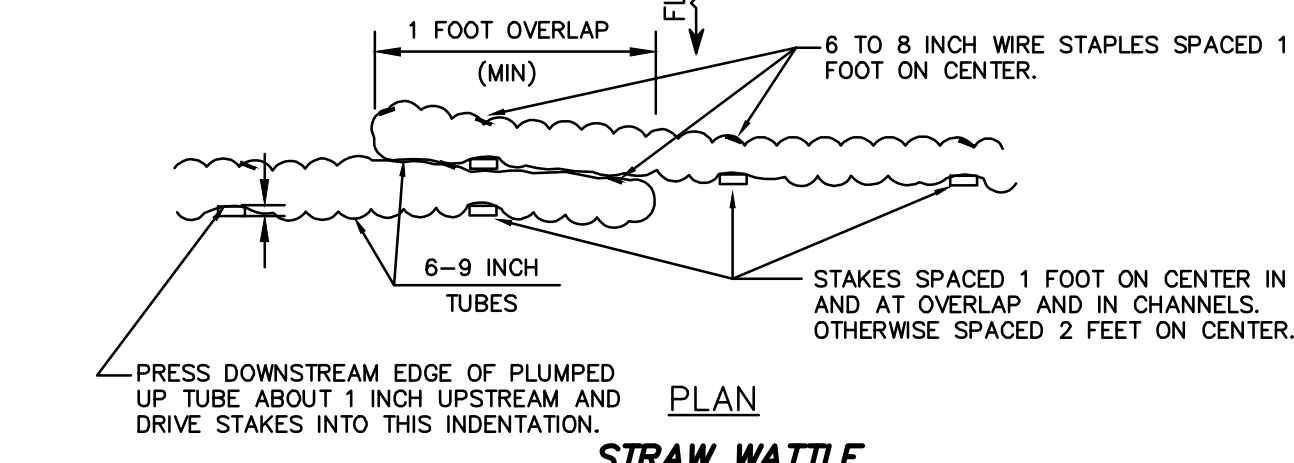


JOINING TWO LENGTHS OF SILT FENCE



- BEFORE INSTALLATION OF TUBE, SMOOTH AND SHAPE EARTH SURFACE AND REMOVE ALL STONES, ROOTS, OR OTHER DEBRIS GREATER THAN 2 INCHES IN DIAMETER.
- IF INSTALLING TUBE ACROSS A DITCH, THEN EXCAVATE A PLACEMENT TRENCH ABOUT 3 INCHES DEEP.

SECTION



STRAW WATTLE



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MORNING MEADOWS SUBDIVISION - PHASE 1
VILLAGE OF JACKSON, WI

EROSION CONTROL DETAILS

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SCALE: #####

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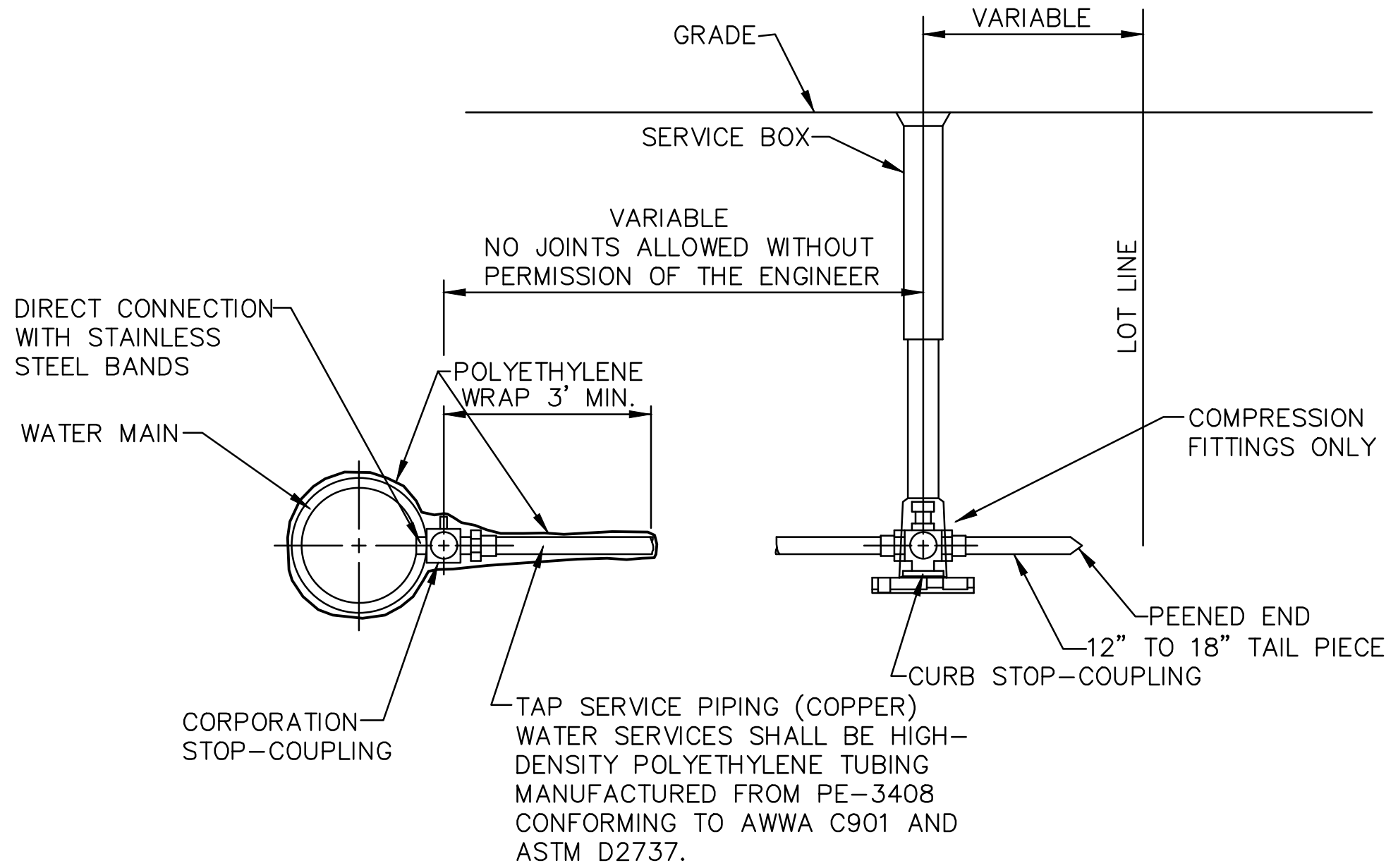
PROJECT MANAGER:
CHRIS D. HITCH, P.E.

DESIGNED BY: DJM

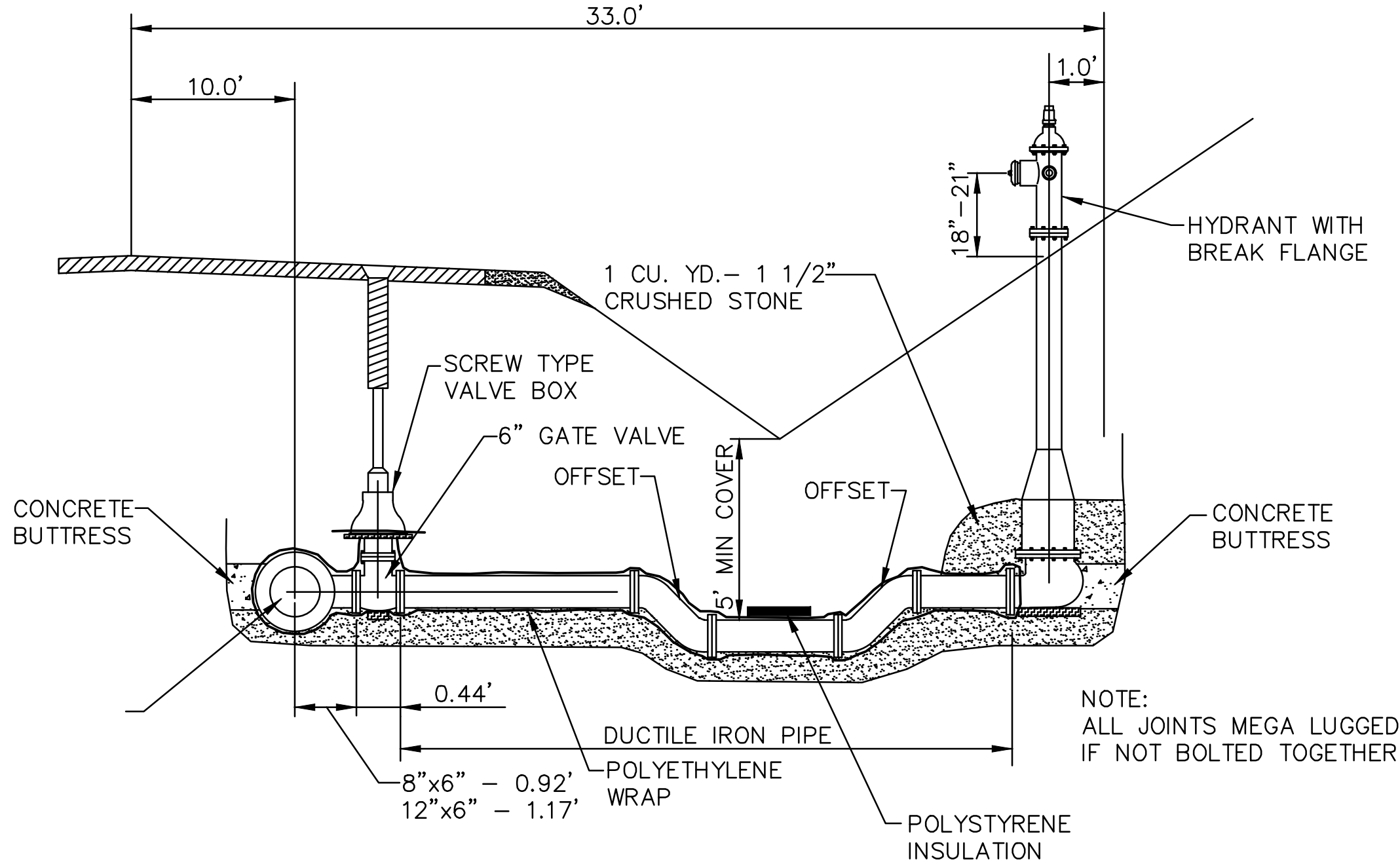
CHECKED BY: CDH

SHEET NUMBER

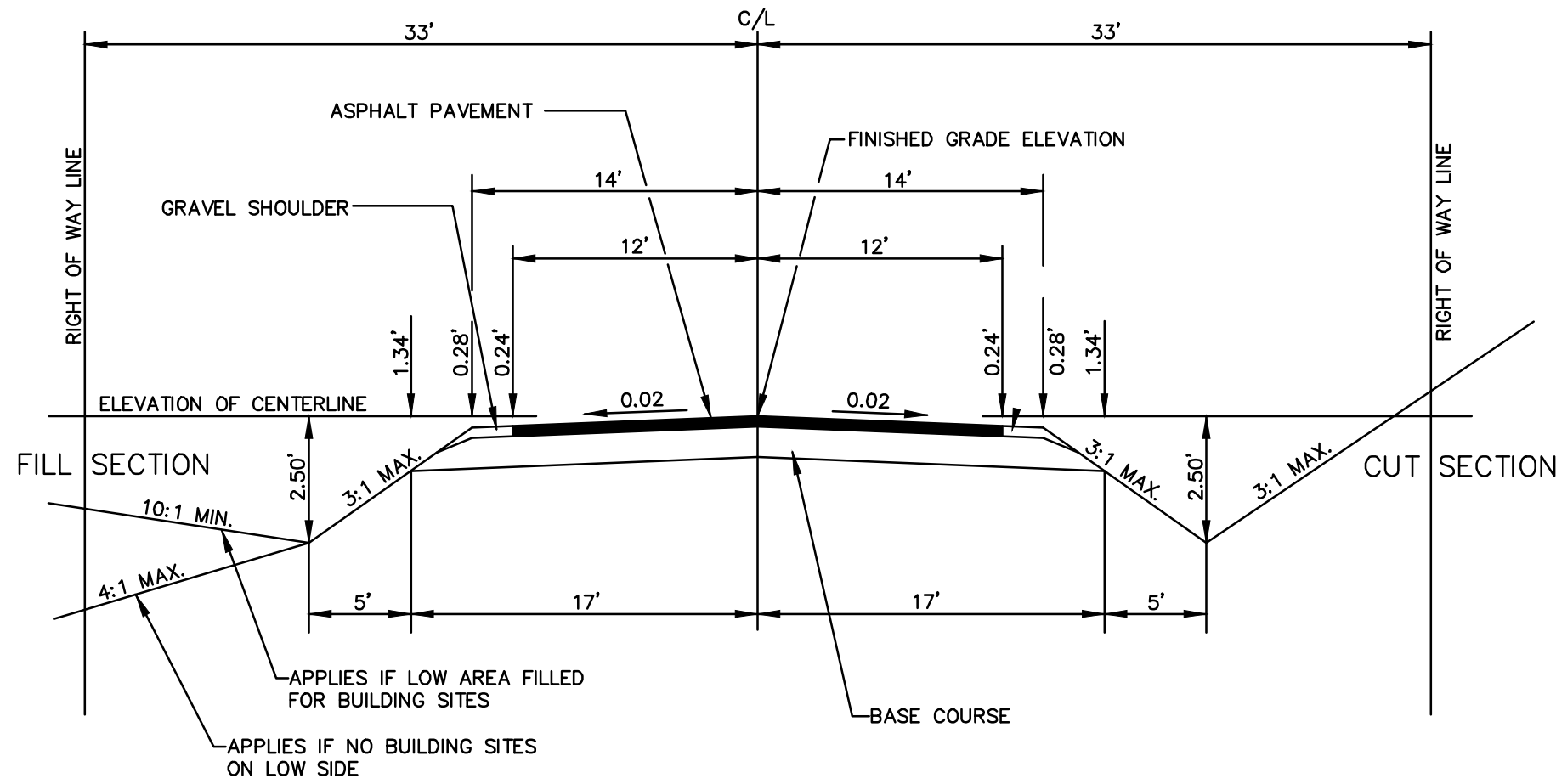
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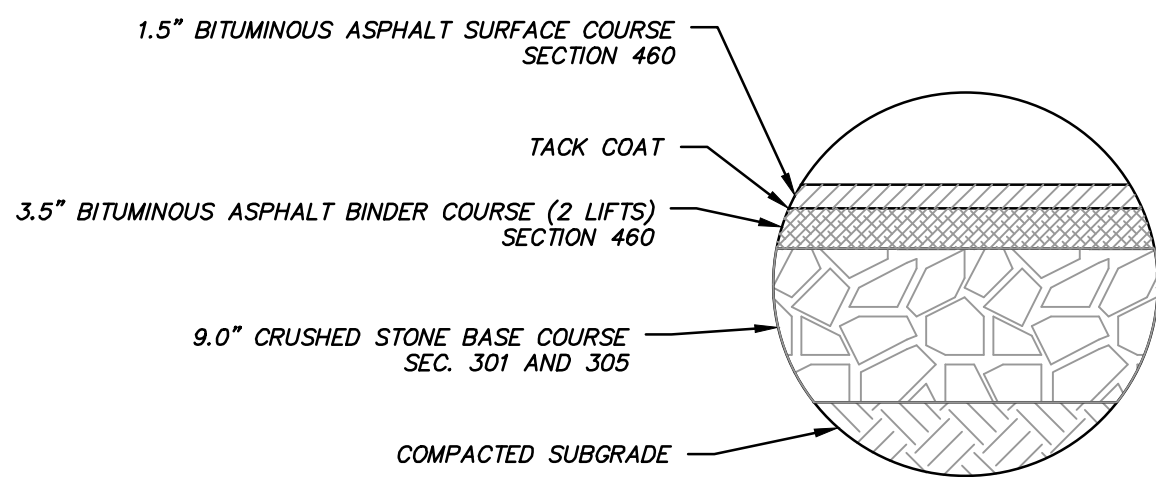
TAP SERVICE PIPING (COPPER)
N.T.S.



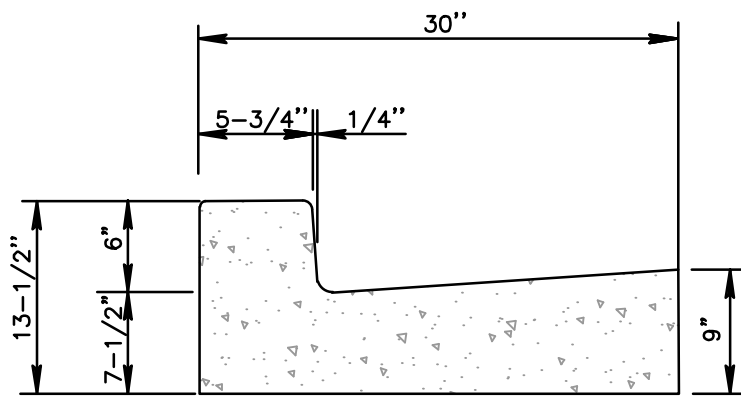
TYPICAL HYDRANT SETTING
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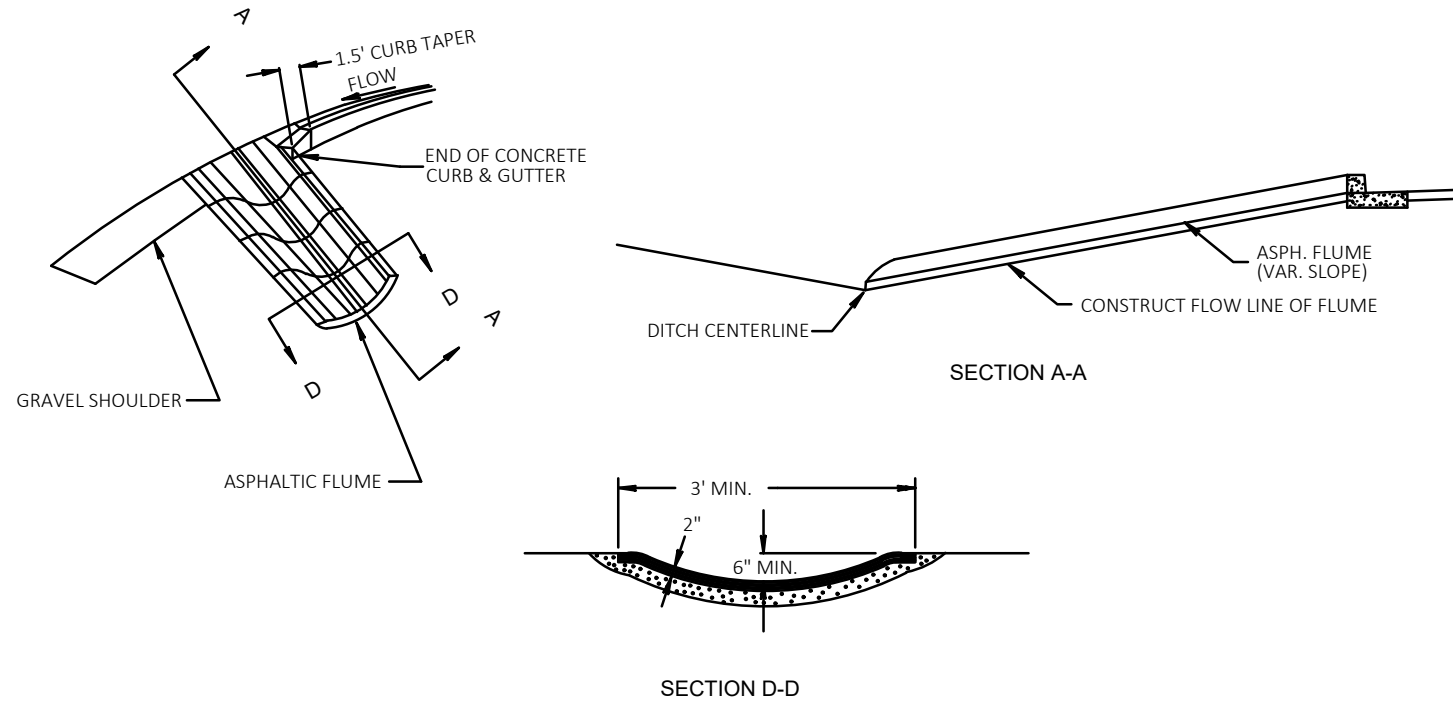
PROPOSED RURAL STREET SECTION
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ASPHALT PAVEMENT SECTION

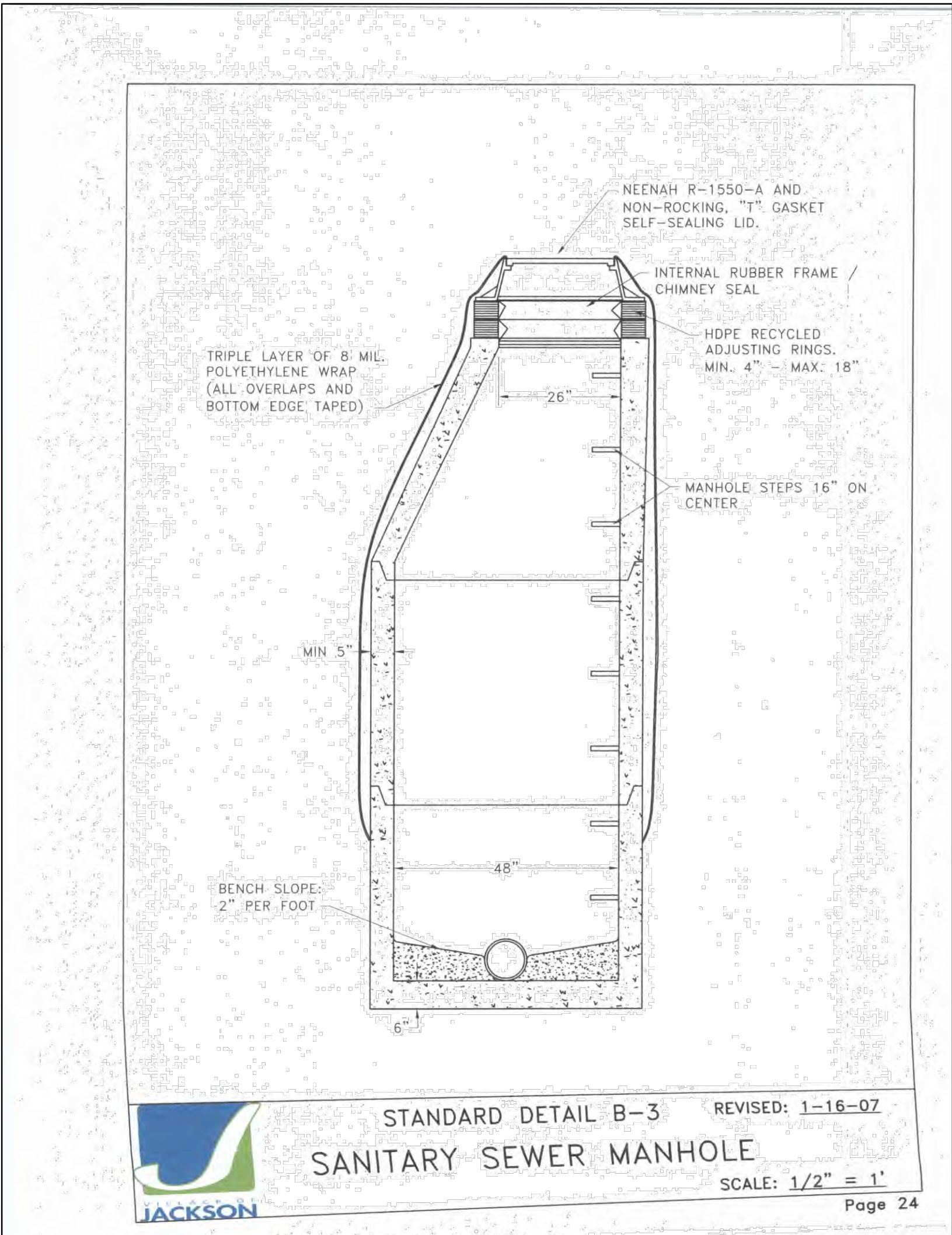


CONCRETE CURB & GUTTER - VERTICAL FACE
N.T.S.



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

MORNING MEADOWS SUBDIVISION - PHASE 1
VILLAGE OF JACKSON, WI

SITE DETAILS

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SCALE: #####
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PROJECT MANAGER:
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DESIGNED BY: DJM
CHECKED BY: CDH

SHEET NUMBER

C401

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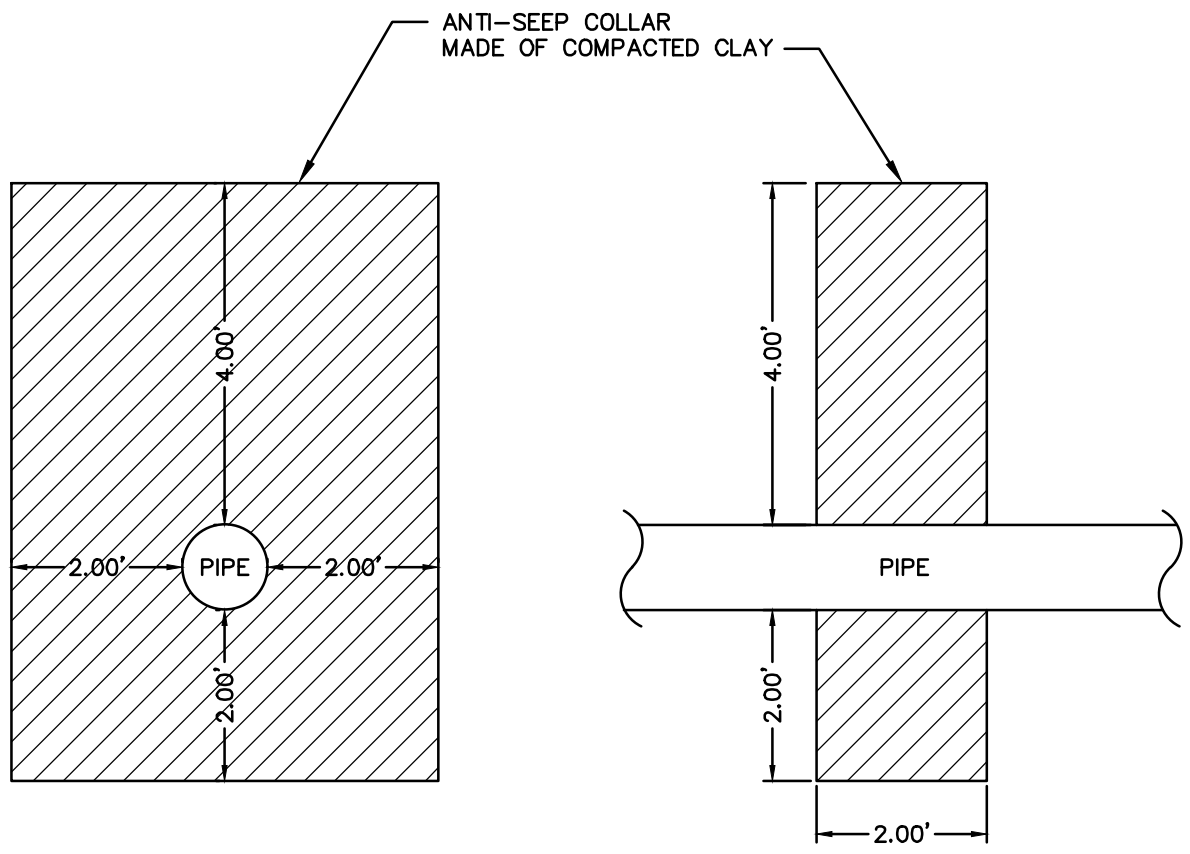
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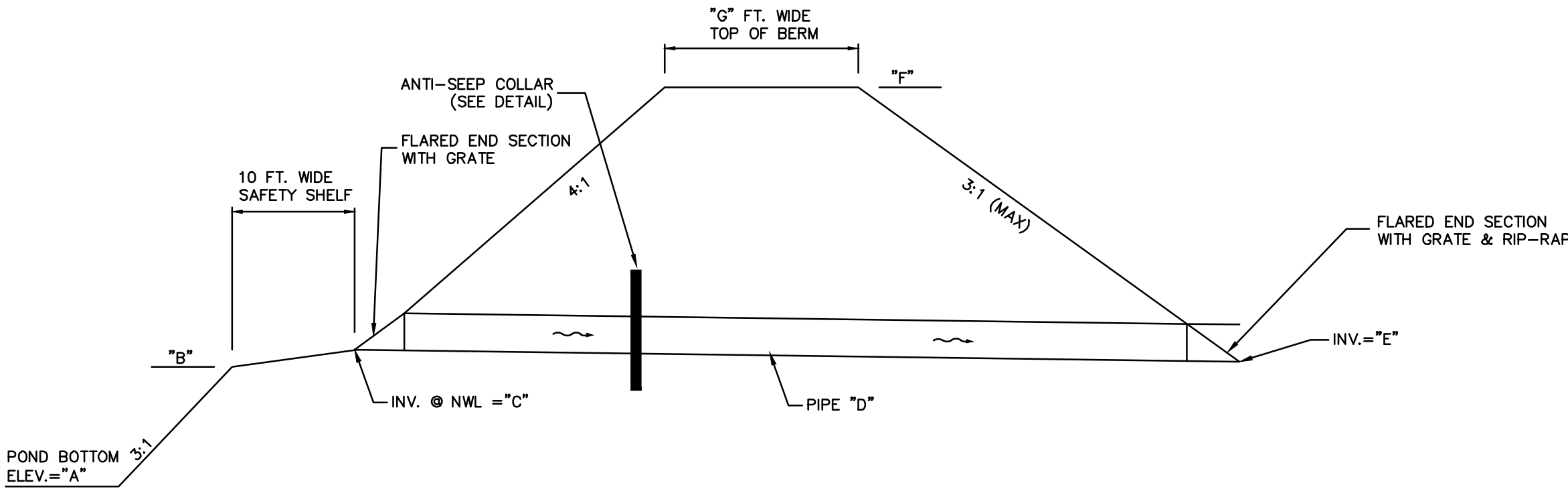
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SECTION VIEW

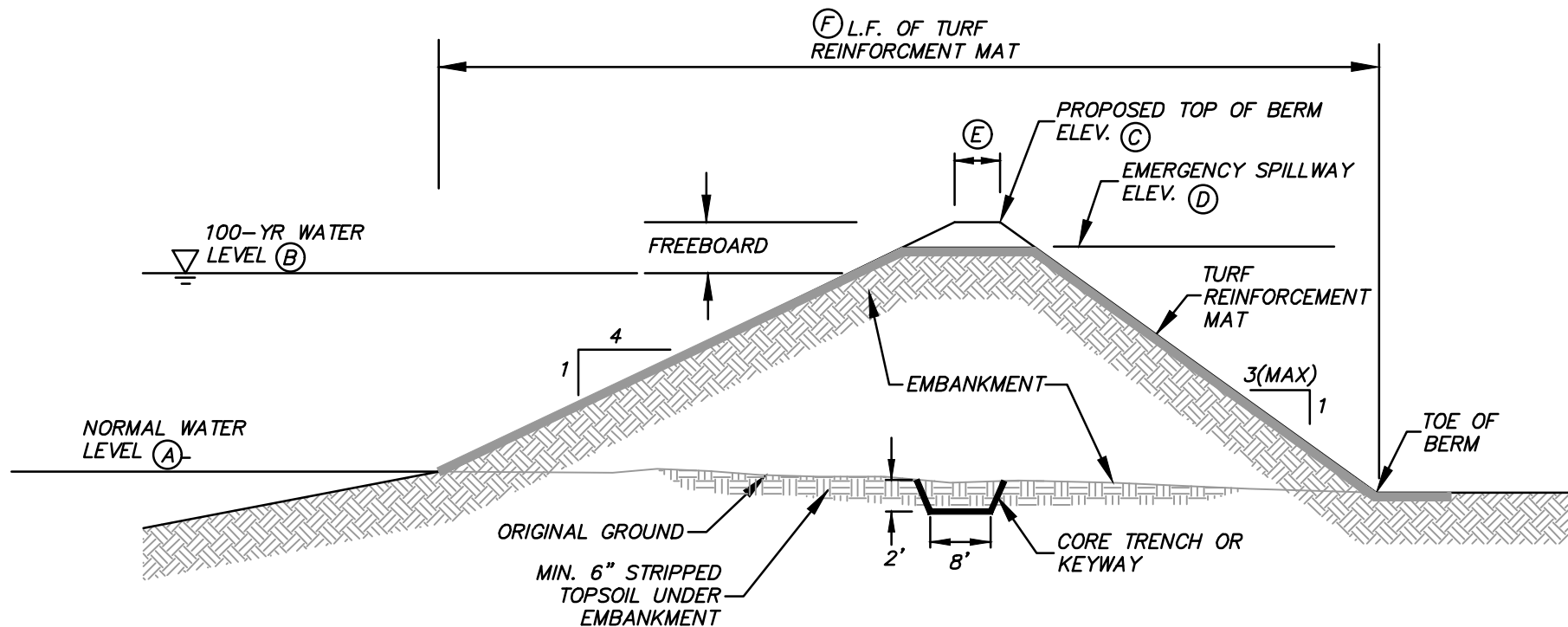
PROFILE VIEW

ANTI-SEEP COLLAR DETAIL

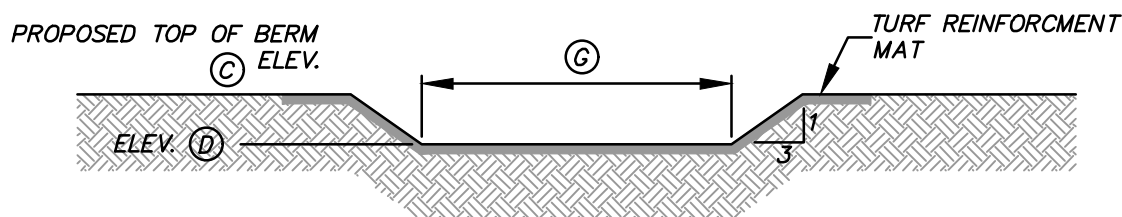


	A	B	C	D	E	F	G
DETENTION POND 1	852.00	856.00	857.00	30.0' - 12" @ 1.00%	857.00	856.70	10'
DETENTION POND 2	851.00	855.00	856.00	2@ 23.0' - 24" @ 1.00%	856.00	855.77	10'

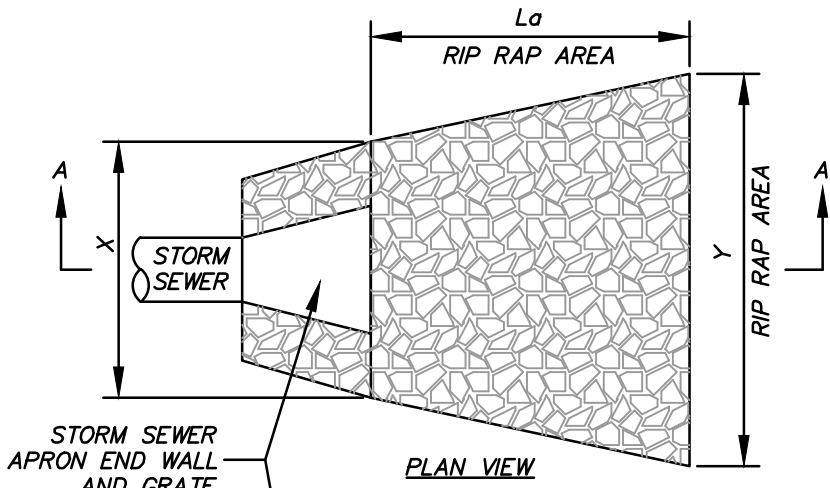
WET DETENTION POND CROSS SECTION
N.T.S.



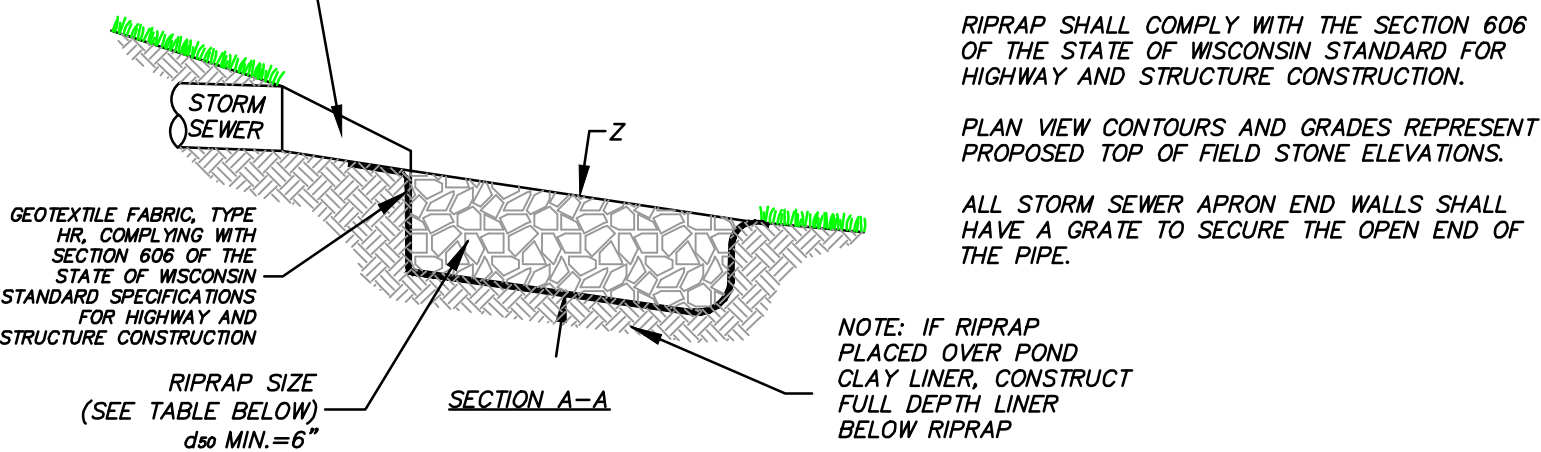
	A	B	C	D	E	F	G
DETENTION POND 1	887.00	859.36	862.00	861.00	10'	34'	20'
DETENTION POND 2	856.00	858.64	860.00	859.00	10'	34'	20'



PROPOSED EMERGENCY SPILLWAY
N.T.S.



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



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

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JOB NO. 3050195.01
PROJECT MANAGER: CHRIS D. HITCH, P.E.
DESIGNED BY: DJM
CHECKED BY: CDH
SHEET NUMBER
C402



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

	Peak Discharge (cfs)			
Watershed	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	39.30	50.06	72.10	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

	Peak Discharge (cfs)			
Watershed	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	9.94	13.31	20.25	53.76

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

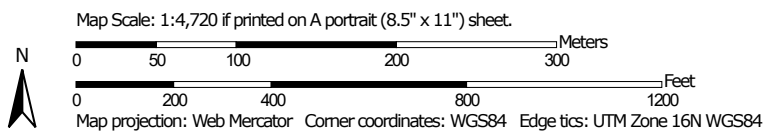
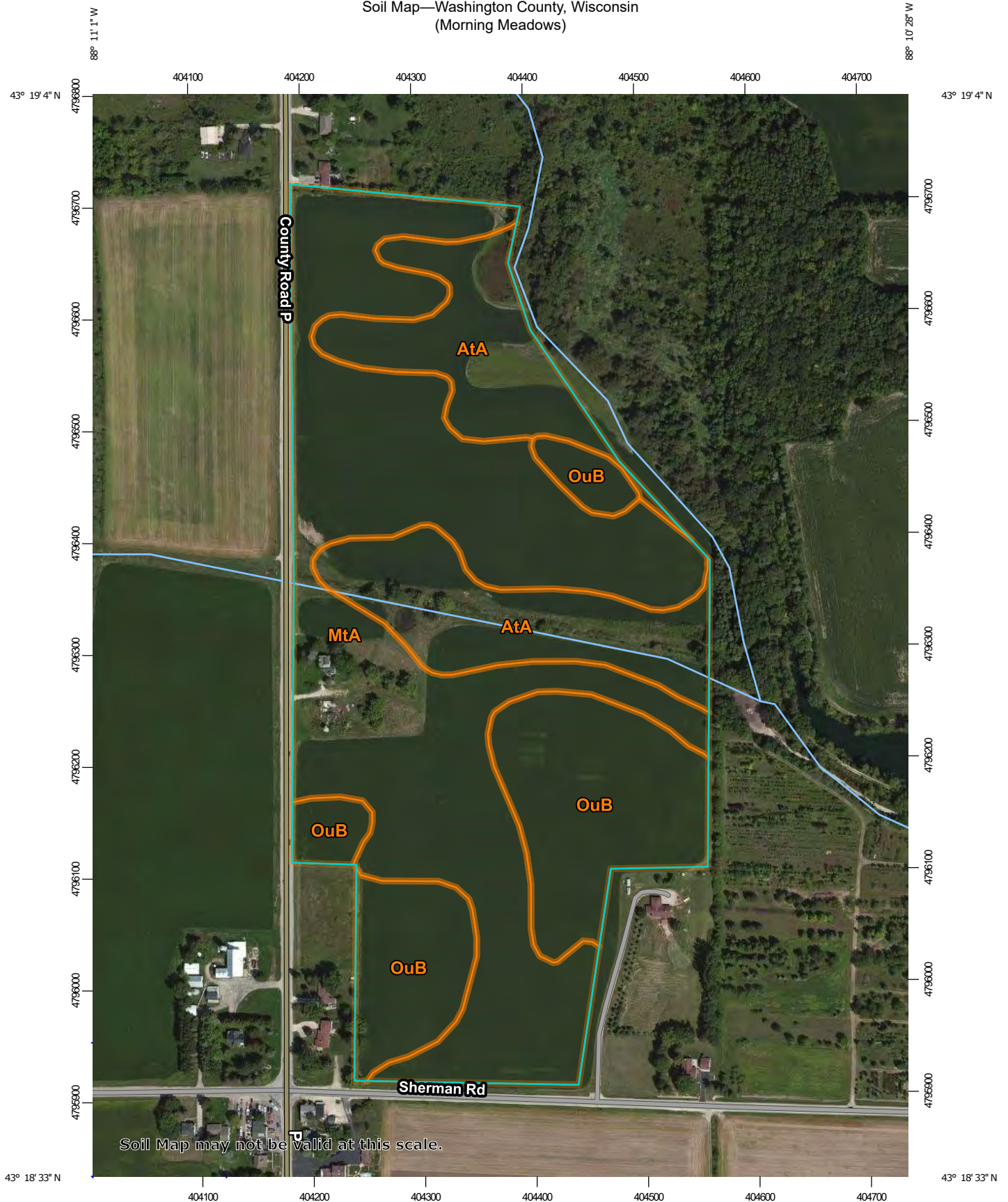
Appendix C: Water Quality Calculations

- SLAMM Modeling Data

Appendix A

(Subsurface Information)

Soil Map—Washington County, Wisconsin (Morning Meadows)



MAP 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%
Totals for Area of Interest		56.5	100.0%



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
Page 4

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

Mr. Bill Carity
Morning Meadows LLC
June 27, 2005
Page 5

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

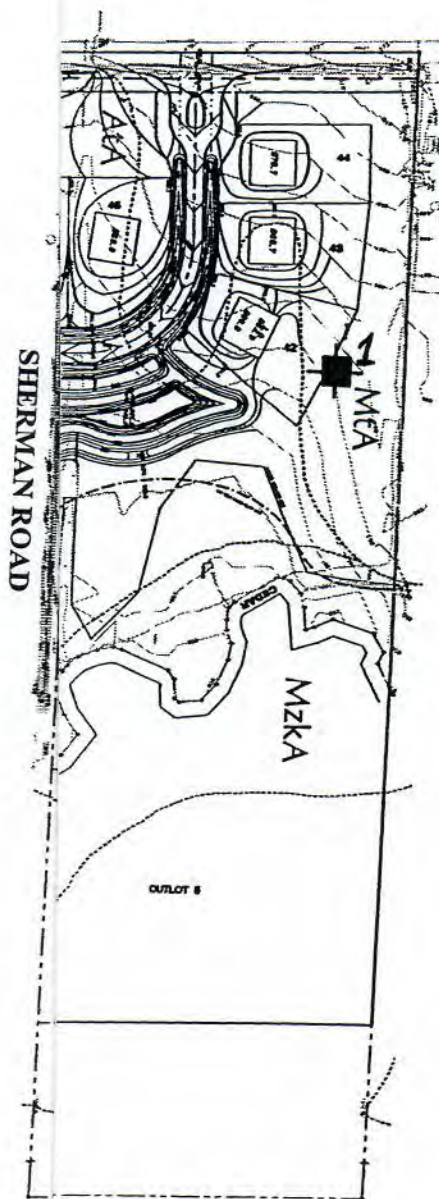
APPENDIX A

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 Country.
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**

CTH P and Sherman Road

Location **Jackson, Wisconsin**

Pit No. **1**

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		13" Black Silty TOPSOIL					
			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
			Very Stiff to Hard, Gray Lean CLAY; Little Fine to Coarse Sand and Gravel, Few Cobbles (CL)	(3.0-4.5)				
		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: 4' (steady seepage) Upon Completion of Excavating: _____
 Time After Excavating: 5 min. 1.75 hrs _____
 Depth to Water: 6' _____
 Depth to Cave In: 3' _____

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

GENERAL NOTES

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

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		GENERAL NOTES	
While Excavating: <u>NW</u>	Upon Completion of Excavating: <u>NW</u>	Date Excavated: <u>6/10/05</u>	
Time After Excavating: <u>1.5 hr</u>		Logger <u>JPS</u>	Editor <u>JPS</u>
Depth to Water: <u>NW</u>		Equipment Used: <u>CAT 320C Tracked Backhoe</u>	
Depth to Cave In: <u>--</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" Very Stiff, Gray Mottled Lean CLAY (CL)	(2.5)				1-2
			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
2	M/W	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		Hard, Gray Brown Lean CLAY (CL)	(4.0-4.5)				
			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: NW Upon Completion of Excavating: NW
 Time After Excavating: 2 hrs
 Depth to Water: NW
 Depth to Cave In: 5.5' Sidewall Cave In

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

GENERAL NOTES

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

CGC, Inc.

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					
2	M		6" Light Brown Mottled Silty CLAY; Some Fine Sand (CL-ML)					
			Hard, Brown Mottled Lean CLAY (CL) (Some Carbonate Staining)	(4.5)				1-2
3	MW	5	Yellow Brown to Gray Mottled Sandy SILT; Some Clay, Few Cobbles and Boulders (ML)					5-7
4	M		Very Stiff, Brown Lean CLAY; Little Fine Sand (CL)	(2.75)				
			Color change to gray at 9 ft	(2.5)				
		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: 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		24" Dark Brown Clayey TOPSOIL					
2	W M		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)				7-8
			Stiff to Very Stiff, Brown Slightly Mottled Lean CLAY; Little Fine to Coarse Sand and Fine Gravel, Scattered Cobbles and Boulders (CL)	(1.5-1.75)				
3	M	5		(2.0-2.25)				3-4
4	M	10	Very Stiff to Hard, Gray Lean CLAY (CL)	(3.5-3.75)				
		15	End of Excavation at 10 ft	(4.0-4.5)				

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

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

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

LOG OF TEST PIT

Pit No. 6

Project Morning Meadows

Surface Elevation 865.0'

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		11" Dark Brown Clayey TOPSOIL	(2.0-2.75)				4-5
	M		Stiff to Very Stiff, Brown Mottled Lean CLAY (CL)					
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
			Stiff to Very Stiff, Brown to Gray Mottled Lean CLAY; Some Fine to Medium Sand, Little Fine to Coarse Gravel, Few Cobbles (CL)					
3	M	10	Stiff to Very Stiff, Gray Brown Lean CLAY; Little Fine to Coarse Gravel, Few Cobbles (CL)	(2.0-2.5)				
			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

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**

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	5	13" Dark Brown Clayey TOPSOIL					
			Stiff to Very Stiff, Gray to Brown Mottled Lean CLAY (CL)	(2.25)				2-3
2	M/W	5		(1.25-1.5)				6-8
			Gray and Brown Mottled SILT; Some Fine Sand (ML)					
3	W		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)				
				(3.5-4.0)				
		15	End of Excavation at 13 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: 7' Upon Completion of Excavating: 7'

Time After Excavating: _____

Depth to Water: _____

Depth to Cave In: _____

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

GENERAL NOTES

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

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 _a -tons/sq. ft.
Very Soft	0.0 to 0.25
Soft	0.25 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_a--Penetrometer Reading, tons/sq. ft.
q_u--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_u^d 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_u^d 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

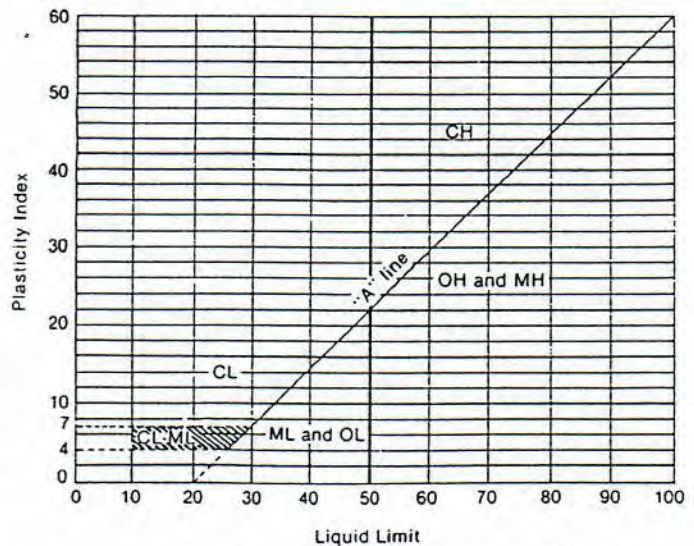
SM Atterberg limits below "A" line or P.I. less than 4

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

Page 1 of 3

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 <u>WASHINGTON</u>
Parcel I.D.
Reviewed by _____ Date _____

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

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

<u>1</u> Boring #	☐ Boring	☒ Pit	Ground surface elev. <u>861.5</u> ft.	Depth to limiting factor <u>13</u> in.	Soil Application Rate					
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	GPD/ft ²	
									*Eff#1	*Eff#2
A	0-13	10YR 2/1	NONE	SIL	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		

<u>2</u> Boring #	☐ Boring	☒ Pit	Ground surface elev. <u>860.0</u> ft.	Depth to limiting factor <u>11</u> in.	Soil Application Rate					
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	GPD/ft ²	
									*Eff#1	*Eff#2
A	0-11	10YR 2/1	NONE	SIL	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 = BOD₅ > 30 ≤ 220 mg/L and TSS > 30 ≤ 150 mg/L

* Effluent #2 = BOD₅ ≤ 30 mg/L and TSS ≤ 30 mg/L

CST Name (Please Print) <u>JEFF P. SIMKOWSKI</u>	Signature <u>[Signature]</u>	CST Number
Address <u>2901, INC.</u> <u>336 S. CURTIS ROAD, WEST ALLIS, WI 53214</u>	Date Evaluation Conducted <u>6/10/05</u>	Telephone Number <u>(414) 443-2000</u>

Property Owner MORNING MEADOWS LLC

Parcel ID # _____

Page 2 of 3

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	SI CL	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	SI CL	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 = BOD₅ > 30 ≤ 220 mg/L and TSS > 30 ≤ 150 mg/L* Effluent #2 = BOD₅ ≤ 30 mg/L and TSS ≤ 30 mg/L

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Property Owner MORNING MEADOWS LLC

Parcel ID # _____

Page 3 of 36

Boring #

☐ Boring☒ PitGround 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/ft ²	
									*Eff#1	*Eff#2
A	0-11	7.5YR 2.5/1	NONE	SICL	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 6/4	SIL	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☒ PitGround 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 ²	
									*Eff#1	*Eff#2
A	0-13	7.5YR 2.5/1	NONE	SICL	2, F, CDY	m(vfr)	CS	NONE		
B	13-66	2.5Y 6/2	F, 3, D, 10YR 5/4	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 5/4	NONE	LCOS	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.

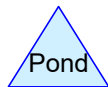
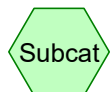
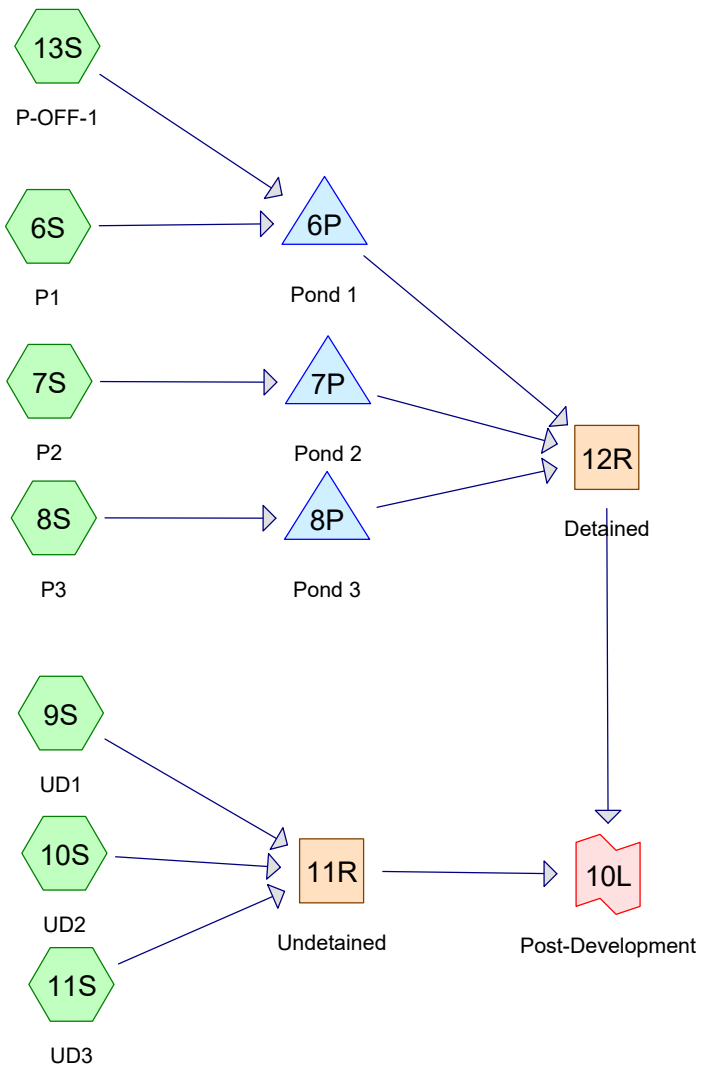
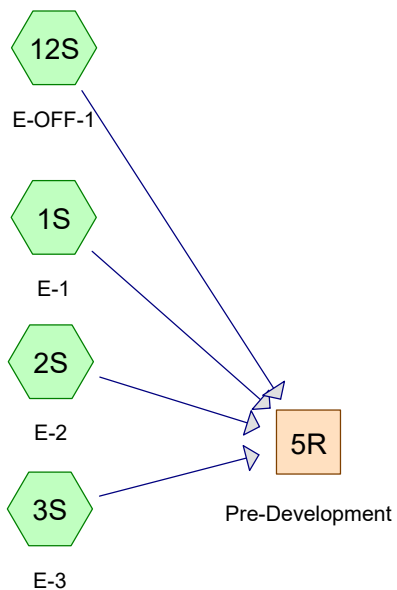
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ft ²	
									*Eff#1	*Eff#2

* Effluent #1 = BOD₅ > 30 ≤ 220 mg/L and TSS > 30 ≤ 150 mg/L* Effluent #2 = BOD₅ ≤ 30 mg/L and TSS ≤ 30 mg/L

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Appendix B

(Water Quantity Calculations)



Morning Meadows 2020-05-30

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Page 2

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)
98.570	83	TOTAL AREA

Morning Meadows 2020-05-30

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Page 3

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
98.570		TOTAL AREA

Morning Meadows 2020-05-30

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Page 4

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
0.000	0.000	3.540	0.000	95.030	98.570	TOTAL AREA	

Morning Meadows 2020-05-30

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Page 5

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

Morning Meadows 2020-05-30*MSE 24-hr 3 1-Year Rainfall=2.35"*

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Page 6

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>0.79" Flow Length=1,174' Tc=32.5 min CN=81 Runoff=8.27 cfs 0.789 af
Subcatchment2S: E-2	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
Subcatchment3S: E-3	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
Subcatchment6S: P1	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
Subcatchment7S: P2	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
Subcatchment8S: P3	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
Subcatchment9S: UD1	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
Subcatchment10S: UD2	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
Subcatchment11S: UD3	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
Subcatchment12S: E-OFF-1	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
Subcatchment13S: P-OFF-1	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
Reach 5R: Pre-Development	Inflow=39.30 cfs 3.397 af Outflow=39.30 cfs 3.397 af
Reach 11R: Undetained	Inflow=5.36 cfs 0.437 af Outflow=5.36 cfs 0.437 af
Reach 12R: Detained	Inflow=8.67 cfs 2.331 af Outflow=8.67 cfs 2.331 af
Pond 6P: Pond 1	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 '/' Outflow=1.04 cfs 0.489 af
Pond 7P: Pond 2	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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Page 7

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"

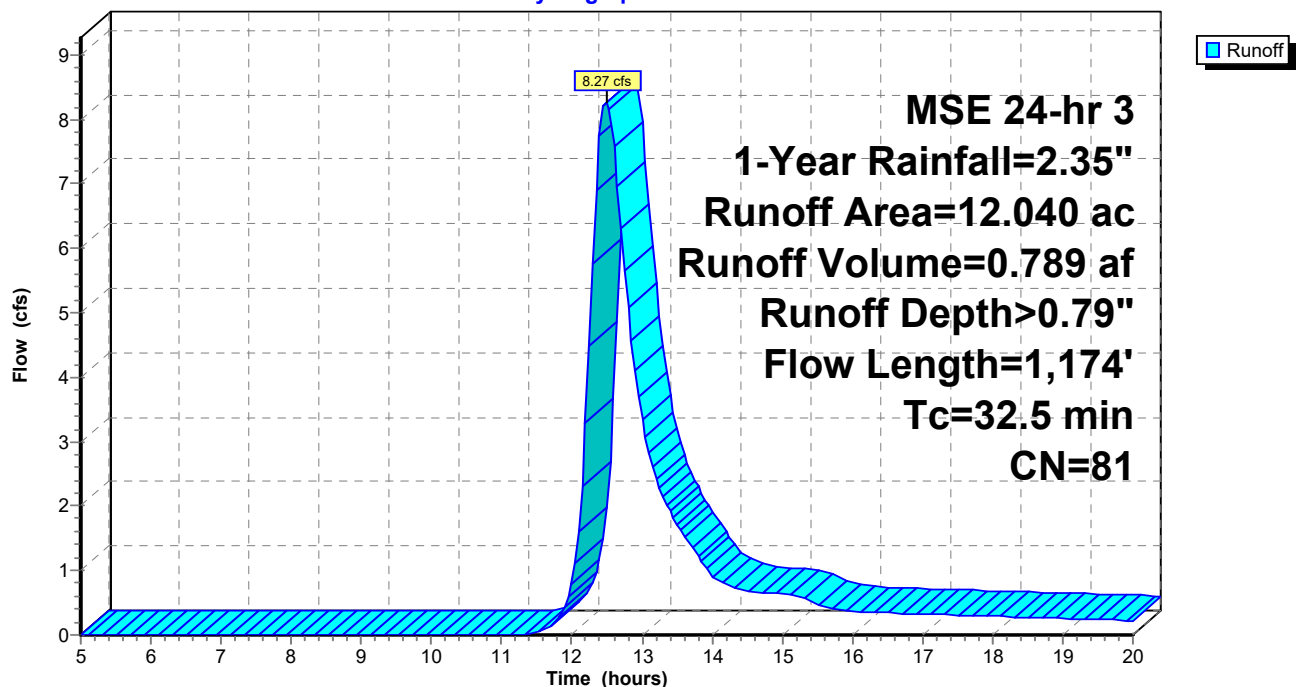
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.3	266	0.0131	1.03		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		Shallow Concentrated Flow, C-D Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		Shallow Concentrated Flow, D-E Cultivated Straight Rows Kv= 9.0 fps
32.5	1,174	Total			

Subcatchment 1S: E-1

Hydrograph



Morning Meadows 2020-05-30

Prepared by {enter your company name here}

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

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Page 9

Summary for Subcatchment 2S: E-2

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

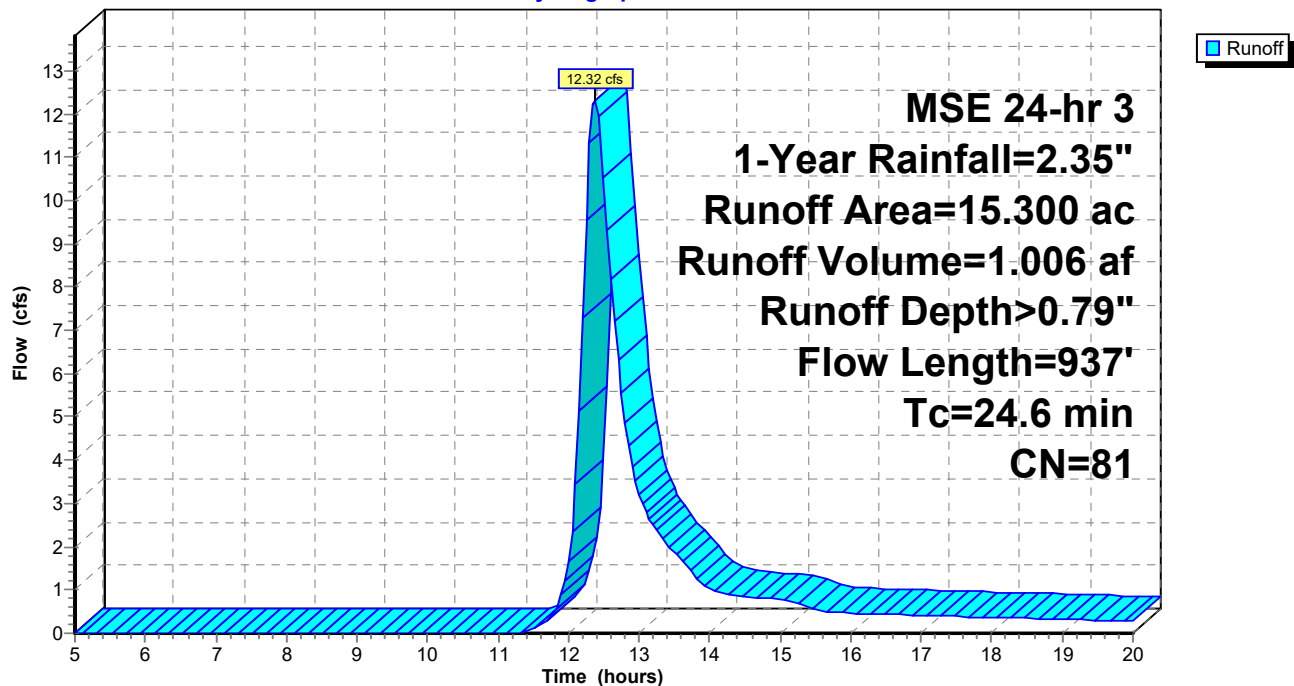
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-B
					Cultivated: Residue<=20% n= 0.060 P2= 2.66"
10.3	662	0.0142	1.07		Shallow Concentrated Flow, B-C
					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"

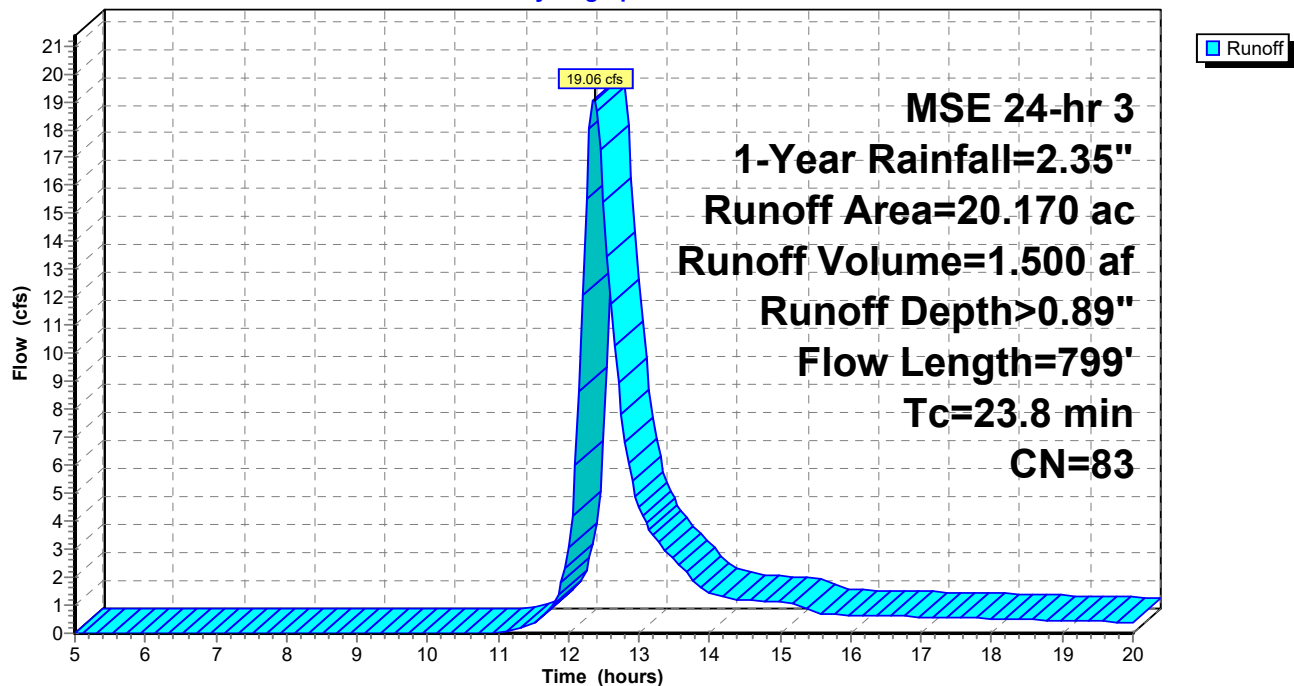
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
11.1	524	0.0077	0.79		Shallow Concentrated Flow, B-C 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"

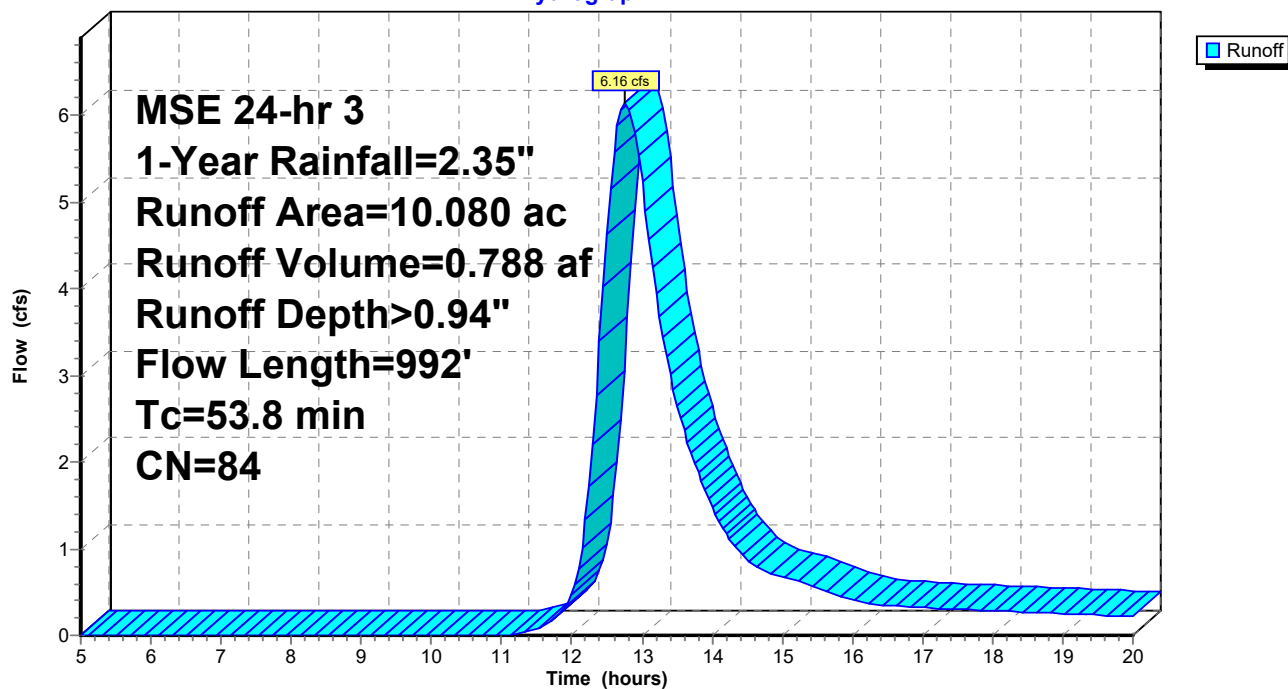
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.66"
23.2	730	0.0110	0.52	4.72	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, C-D 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"

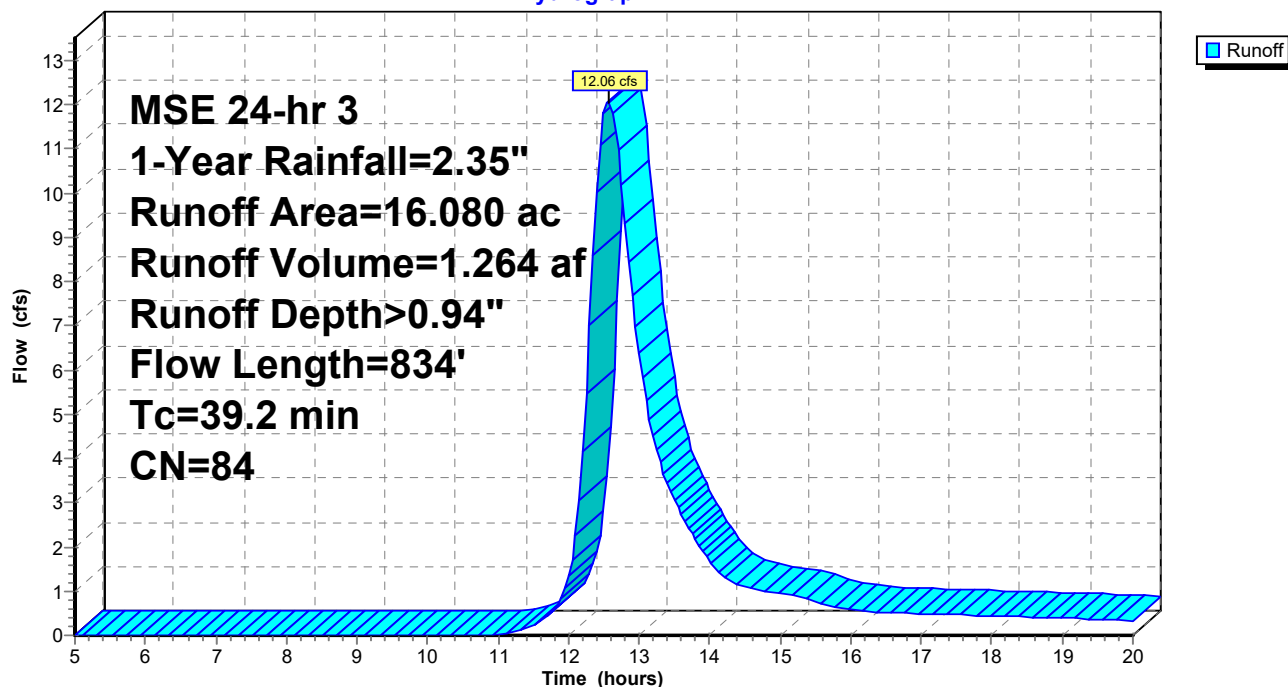
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.66"
4.5	154	0.0130	0.57	5.13	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
2.0	89	0.0210	0.72	6.52	Channel Flow, C-D Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.2	111	0.0140	8.31	14.69	Pipe Channel, D-E 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	Channel Flow, E-F Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, F-G 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	Channel Flow, G-H Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	43	0.0100	7.03	12.41	Pipe Channel, H-I 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"

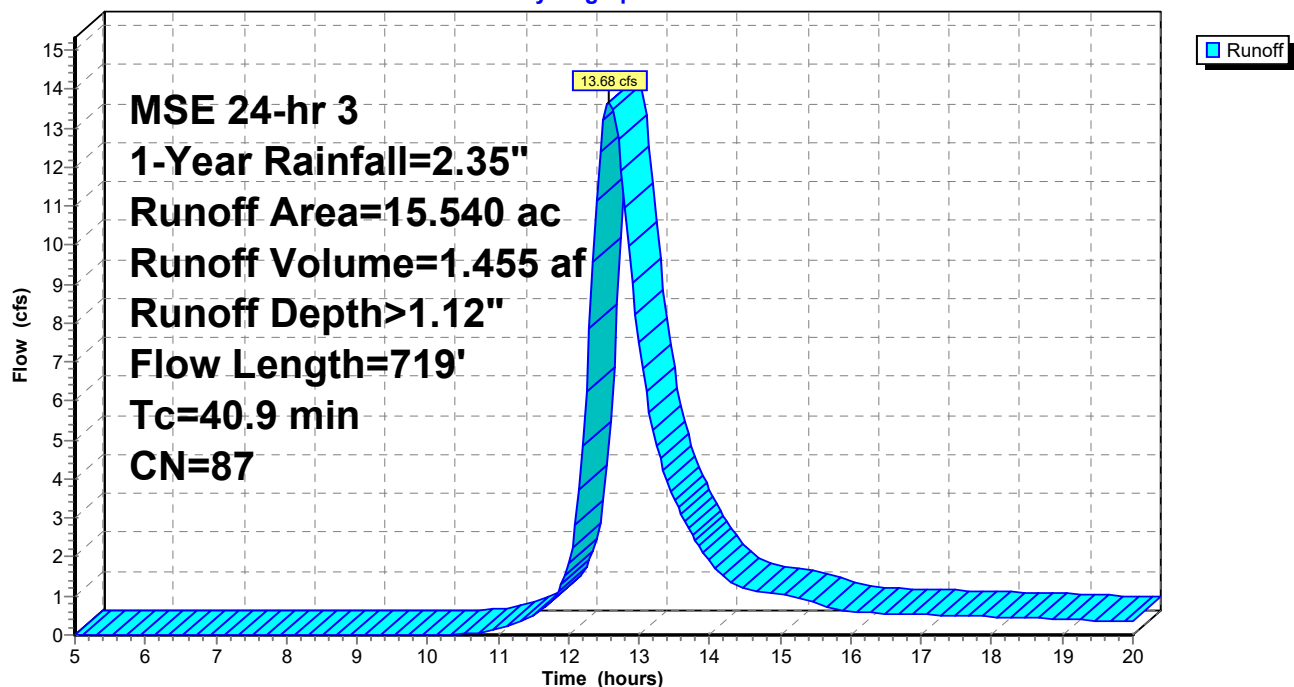
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 2.66"
19.2	576	0.0100	0.50	4.50	Channel Flow, B-C
					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"

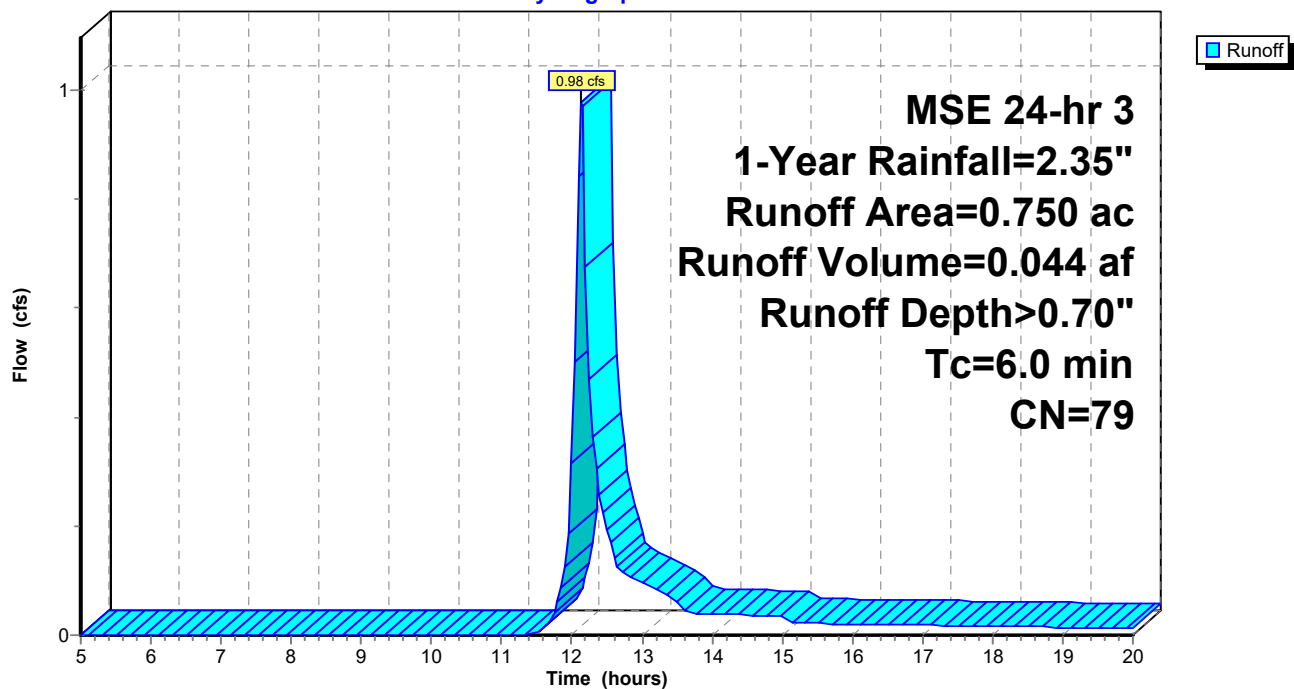
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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"

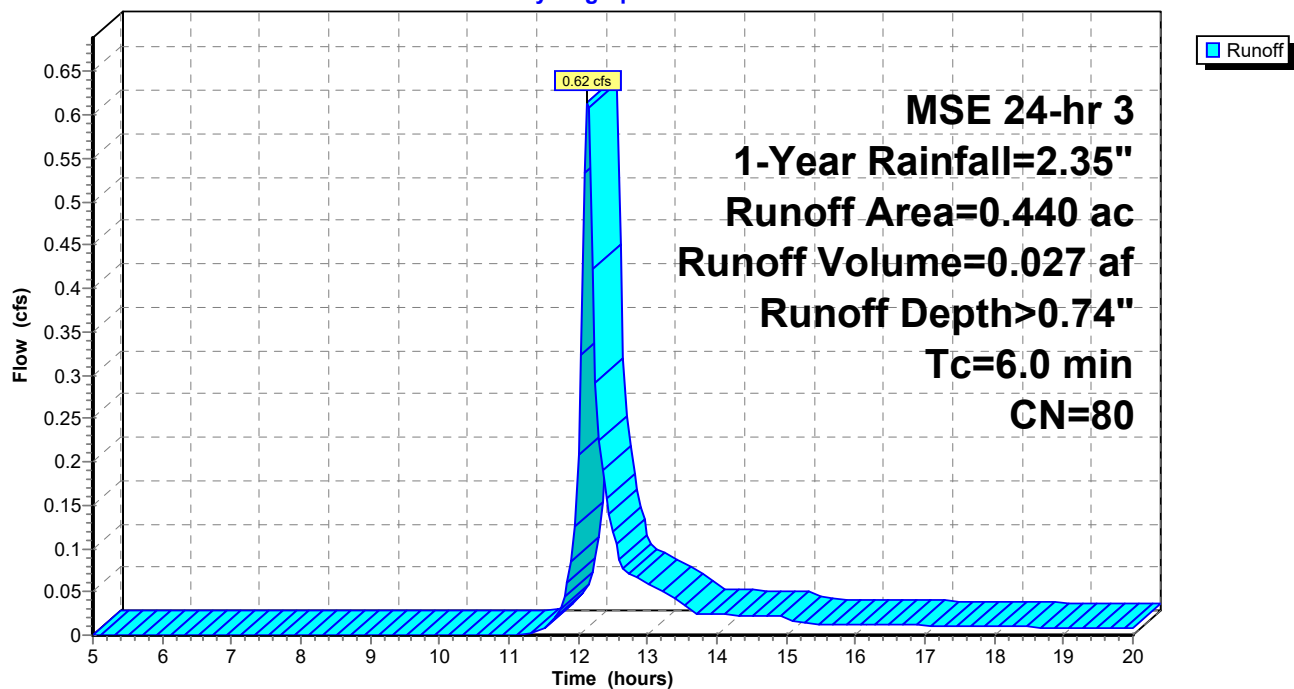
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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"

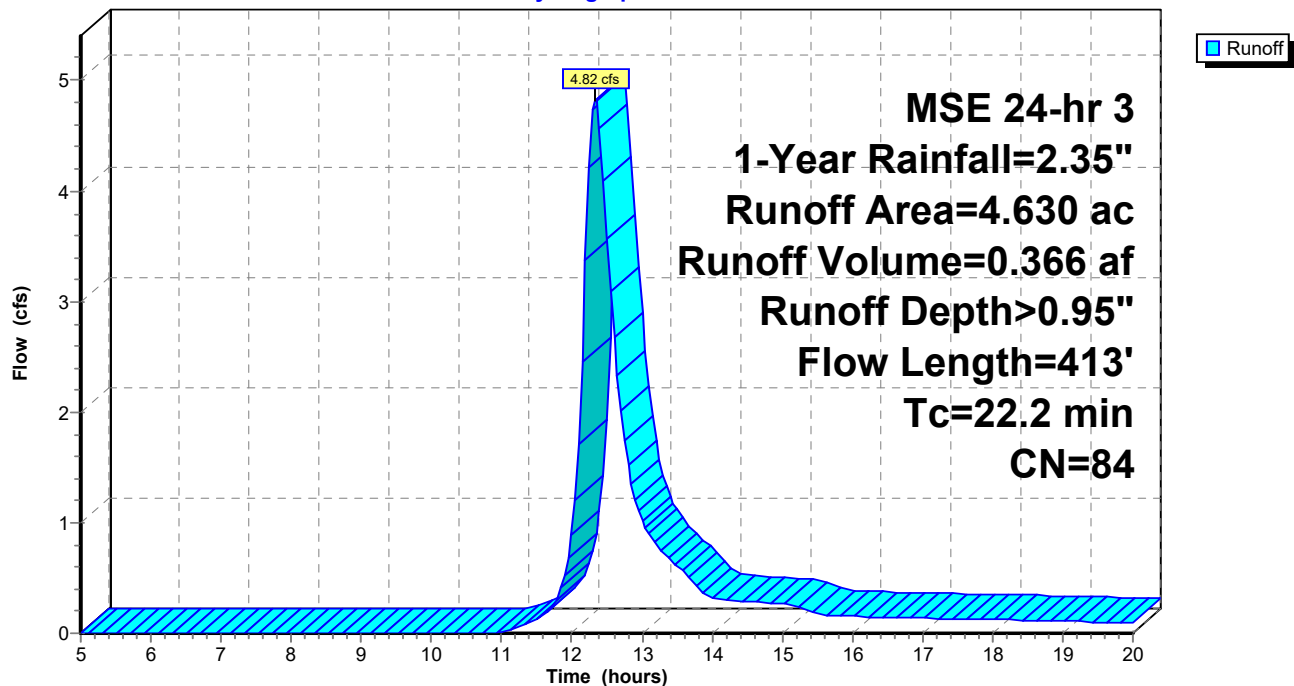
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 2.66"
12.1	363	0.0100	0.50	4.50	Channel Flow, B-C
					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"

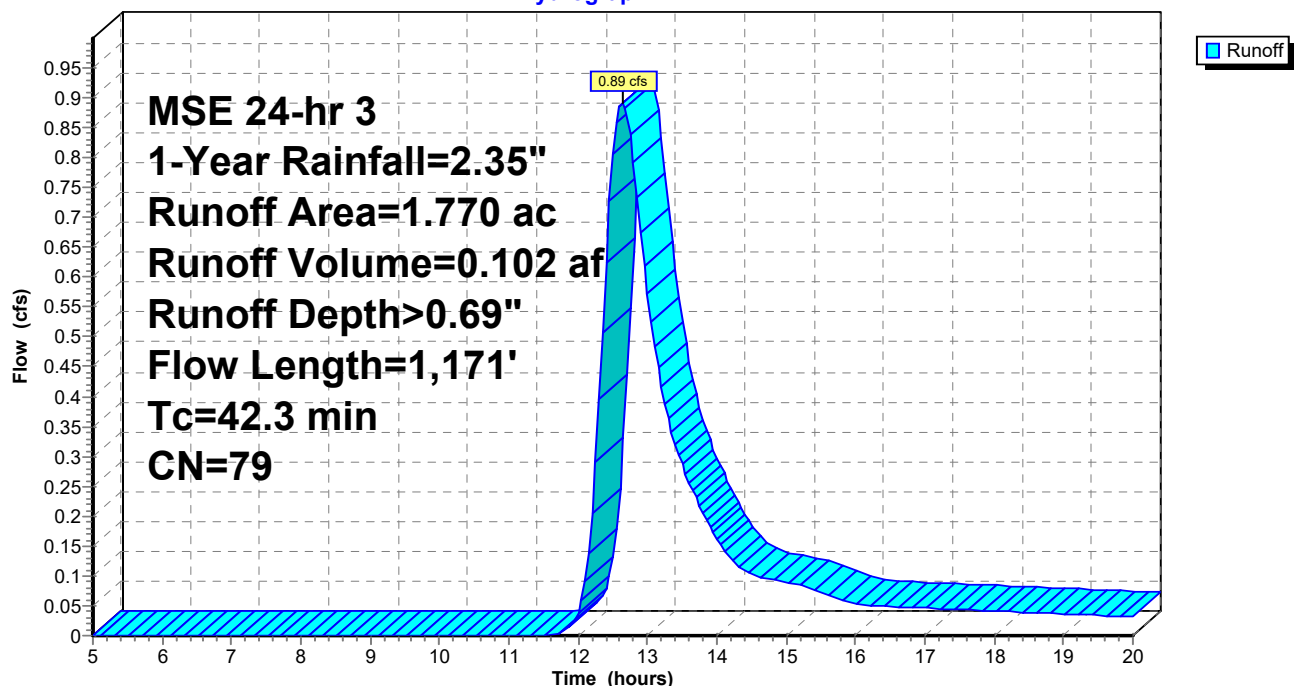
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-AA Grass: Short n= 0.150 P2= 2.66"
6.4	113	0.0150	0.29		Sheet Flow, AA-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.4	263	0.0120	0.99		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		Shallow Concentrated Flow, C-D Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		Shallow Concentrated Flow, D-E 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"

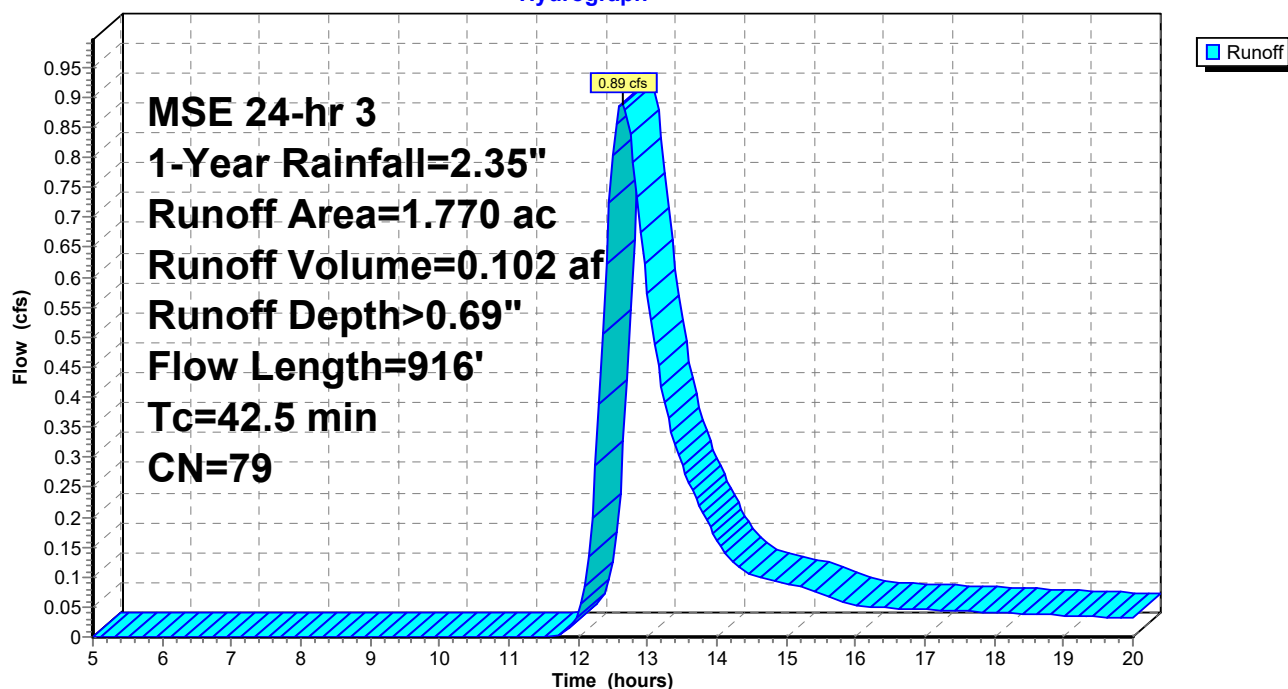
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.35"

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		Sheet Flow, A-AA Grass: Short n= 0.150 P2= 2.66"
6.7	45	0.0130	0.11		Sheet Flow, AA-B Grass: Short n= 0.150 P2= 2.66"
20.2	665	0.0120	0.55	4.93	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, C-D 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

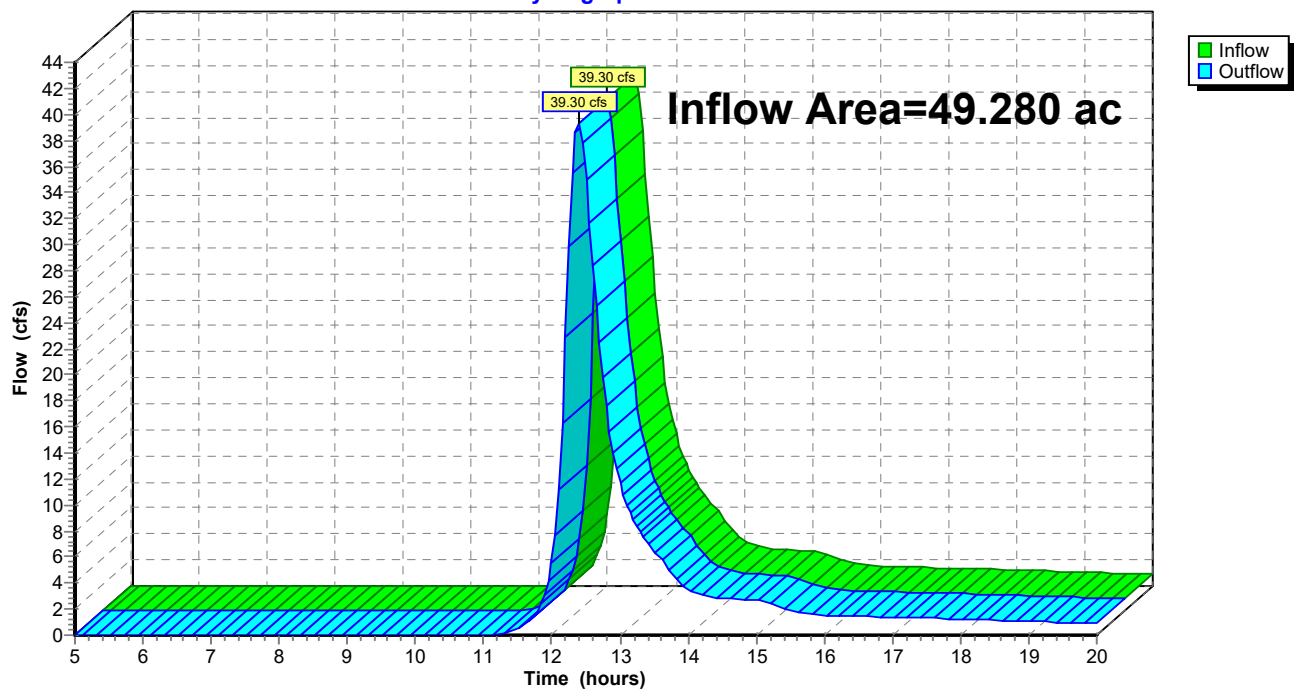


Summary for Reach 5R: Pre-Development

[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

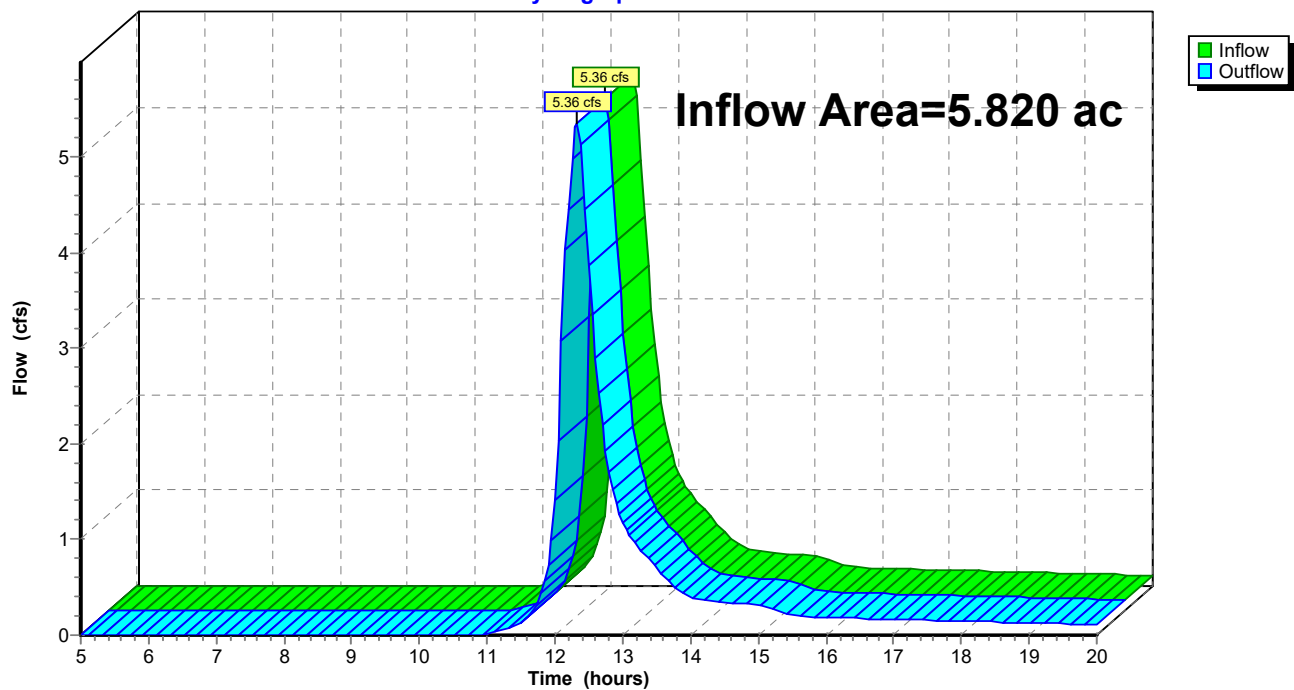
Reach 5R: Pre-Development**Hydrograph**

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

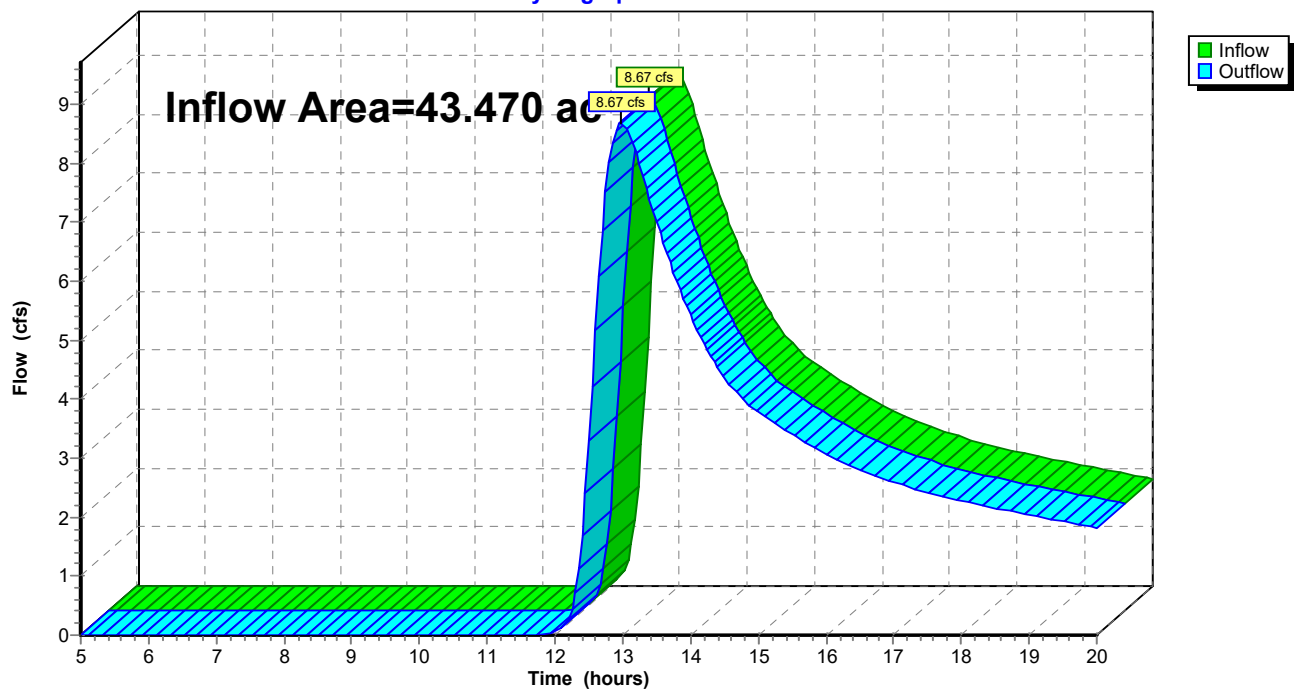
Reach 11R: Undetained**Hydrograph**

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)

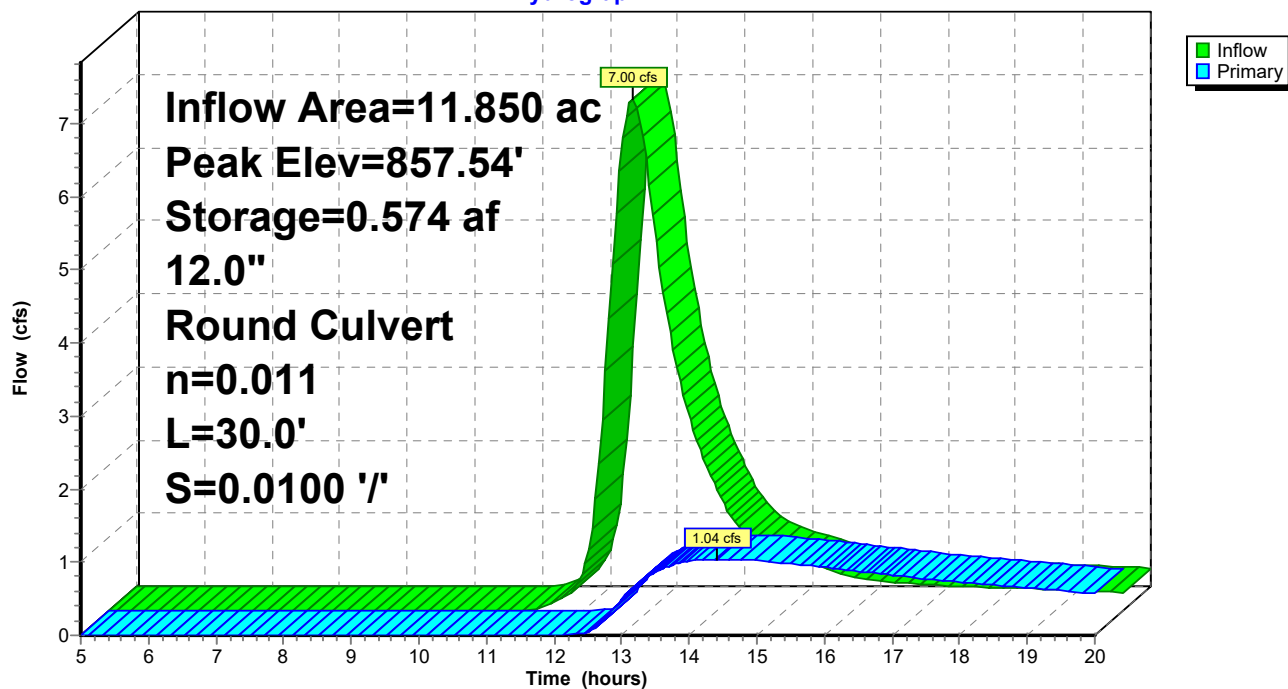
Volume	Invert	Avail.Storage	Storage Description
#1	857.00'	6.825 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
857.00	1.030	0.000	0.000
858.00	1.140	1.085	1.085
859.00	1.270	1.205	2.290
860.00	1.420	1.345	3.635
861.00	1.570	1.495	5.130
862.00	1.820	1.695	6.825

Device	Routing	Invert	Outlet Devices
#1	Primary	857.00'	12.0" Round RCP_Round 12" 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	Custom Stage Data (Prismatic) 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'	24.0" Round Culvert 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'	24.0" Round Culvert 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

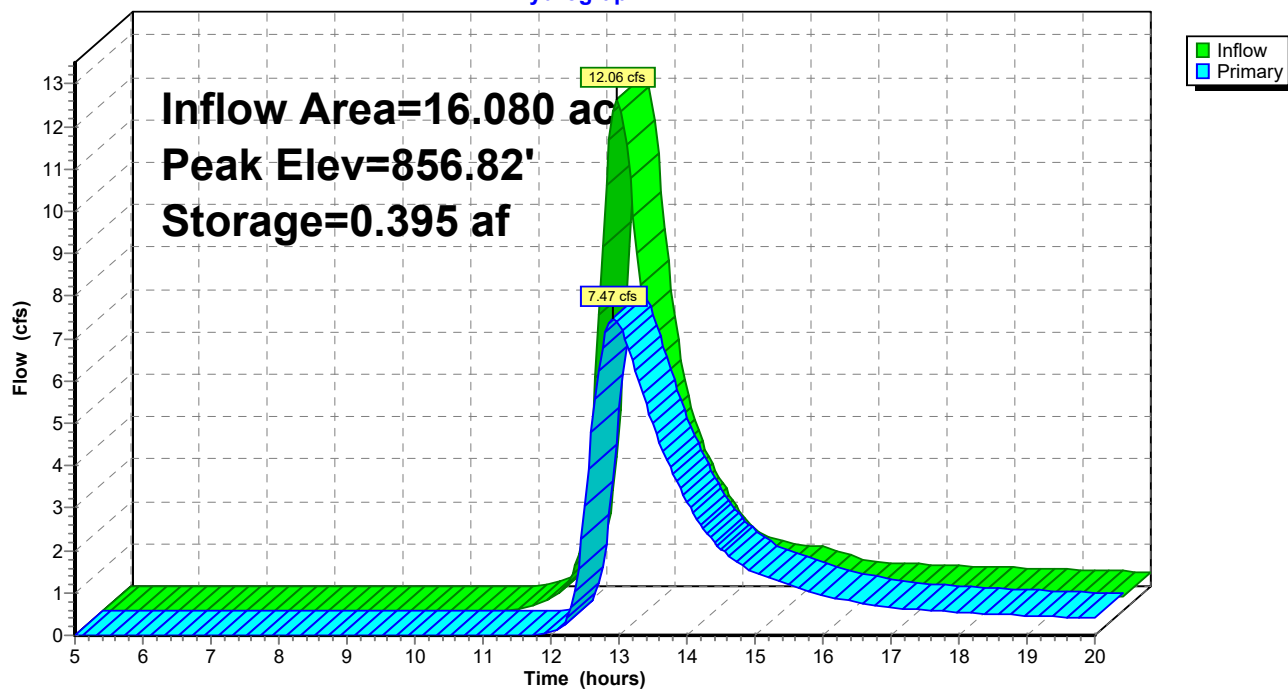
Primary OutFlow Max=7.45 cfs @ 12.92 hrs HW=856.82' (Free Discharge)

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	Custom Stage Data (Prismatic) 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

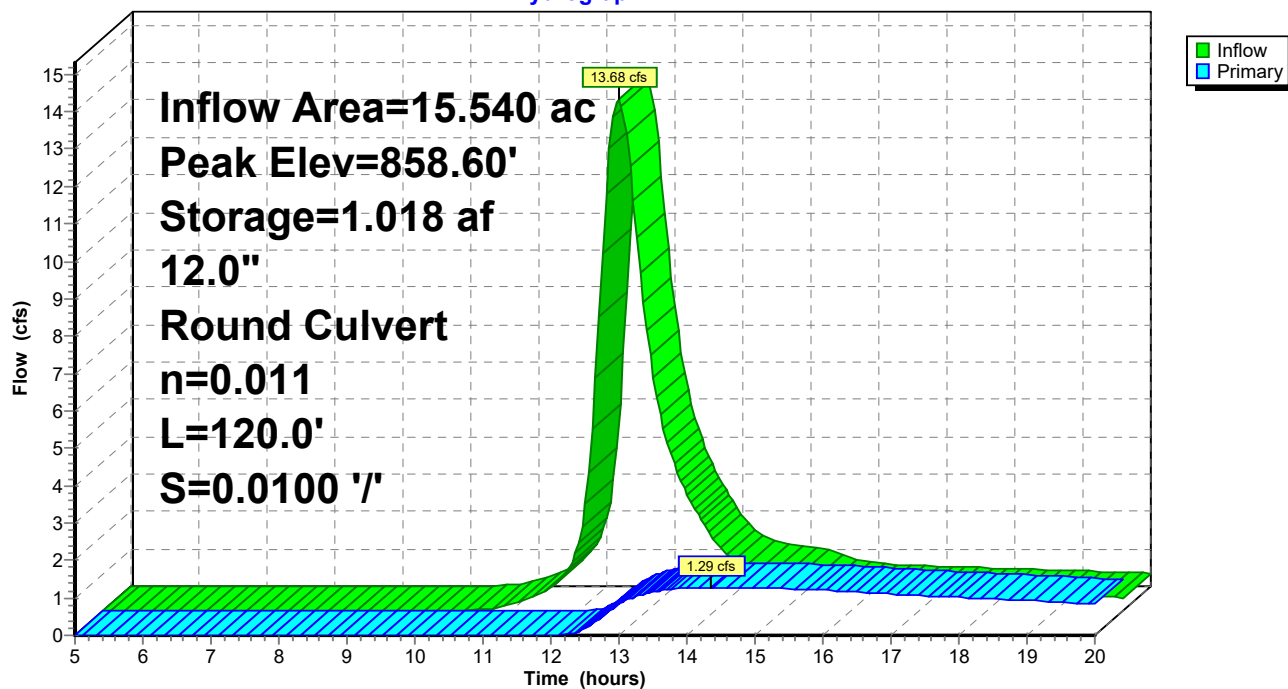
Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	12.0" Round RCP_Round 12" L= 120.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 856.80' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

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



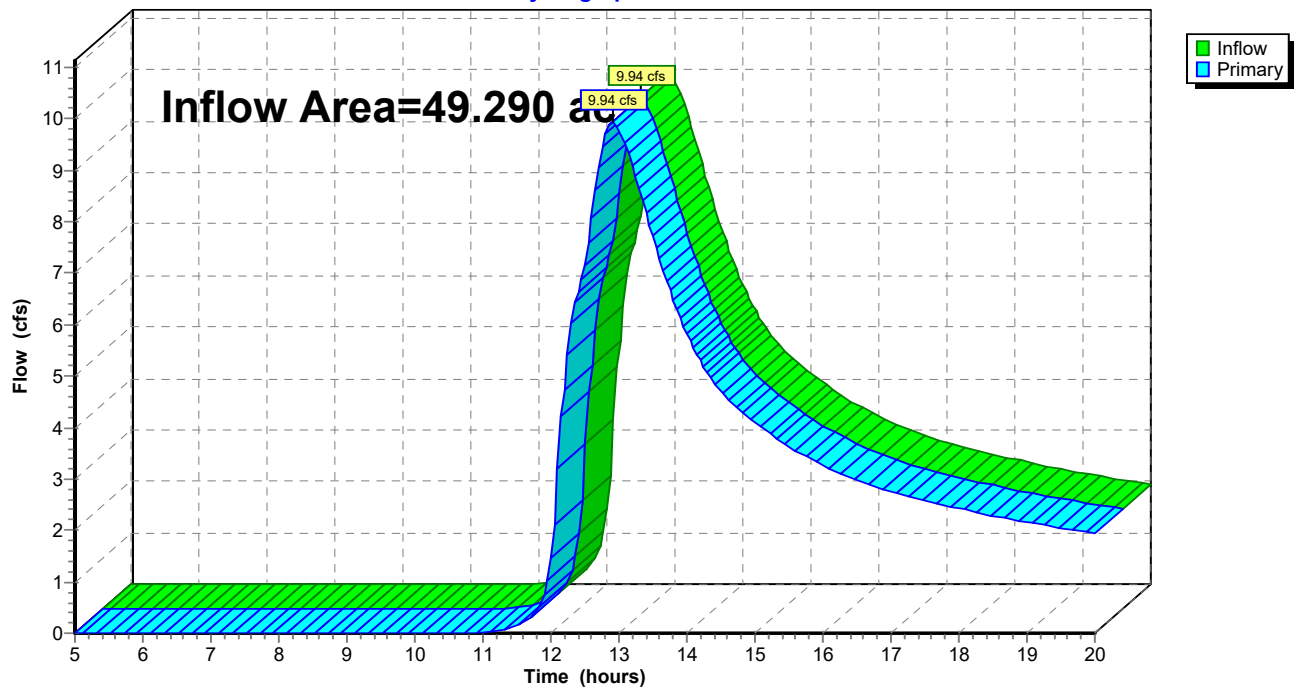
Summary for Link 10L: Post-Development

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

Subcatchment1S: E-1	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
Subcatchment2S: E-2	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
Subcatchment3S: E-3	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
Subcatchment6S: P1	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
Subcatchment7S: P2	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
Subcatchment8S: P3	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
Subcatchment9S: UD1	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
Subcatchment10S: UD2	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
Subcatchment11S: UD3	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
Subcatchment12S: E-OFF-1	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
Subcatchment13S: P-OFF-1	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
Reach 5R: Pre-Development	Inflow=50.06 cfs 4.284 af Outflow=50.06 cfs 4.284 af
Reach 11R: Undetained	Inflow=6.70 cfs 0.546 af Outflow=6.70 cfs 0.546 af
Reach 12R: Detained	Inflow=11.64 cfs 3.011 af Outflow=11.64 cfs 3.011 af
Pond 6P: Pond 1	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 '/' Outflow=1.44 cfs 0.656 af
Pond 7P: Pond 2	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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Page 32

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"

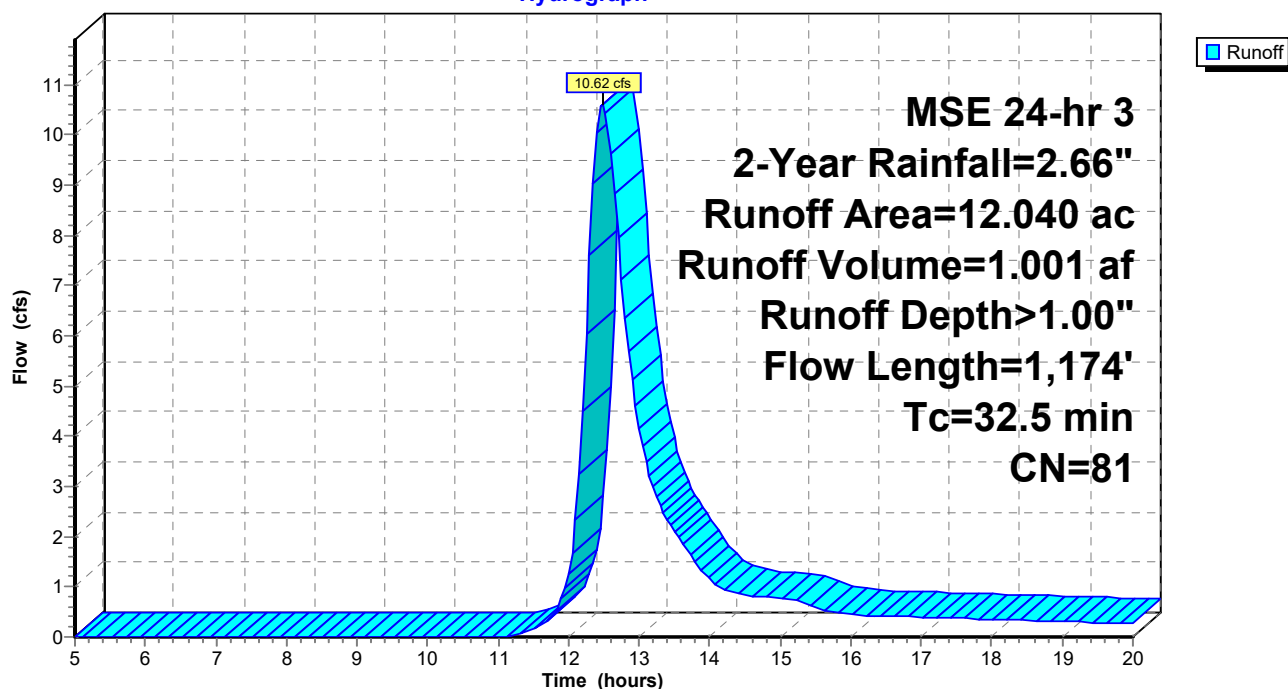
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.3	266	0.0131	1.03		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		Shallow Concentrated Flow, C-D Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		Shallow Concentrated Flow, D-E 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"

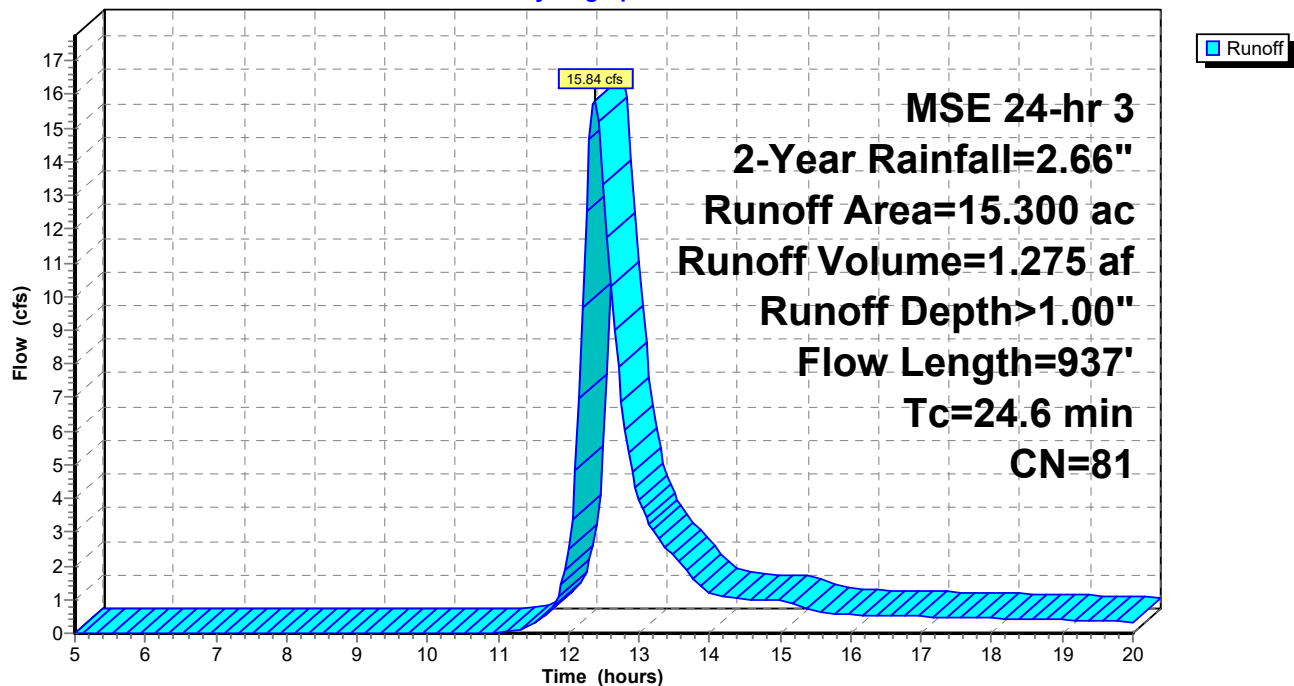
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
10.3	662	0.0142	1.07		Shallow Concentrated Flow, B-C 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"

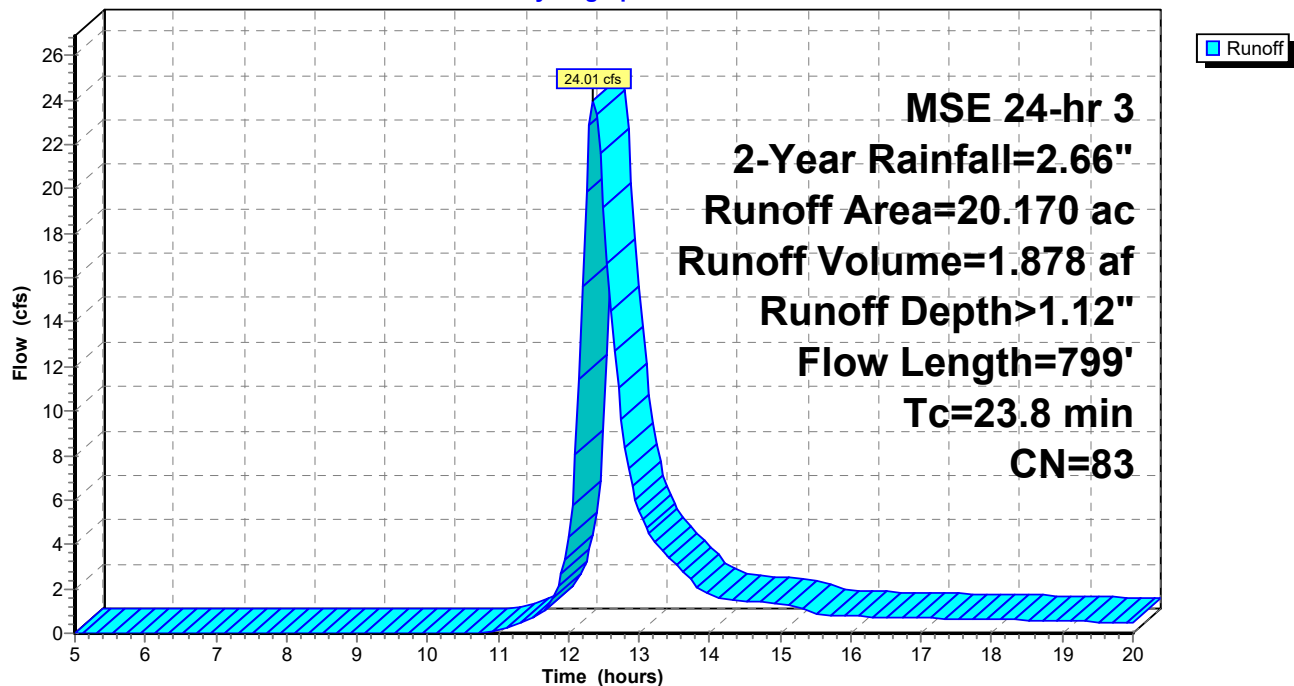
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-B
					Cultivated: Residue<=20% n= 0.060 P2= 2.66"
11.1	524	0.0077	0.79		Shallow Concentrated Flow, B-C
					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"

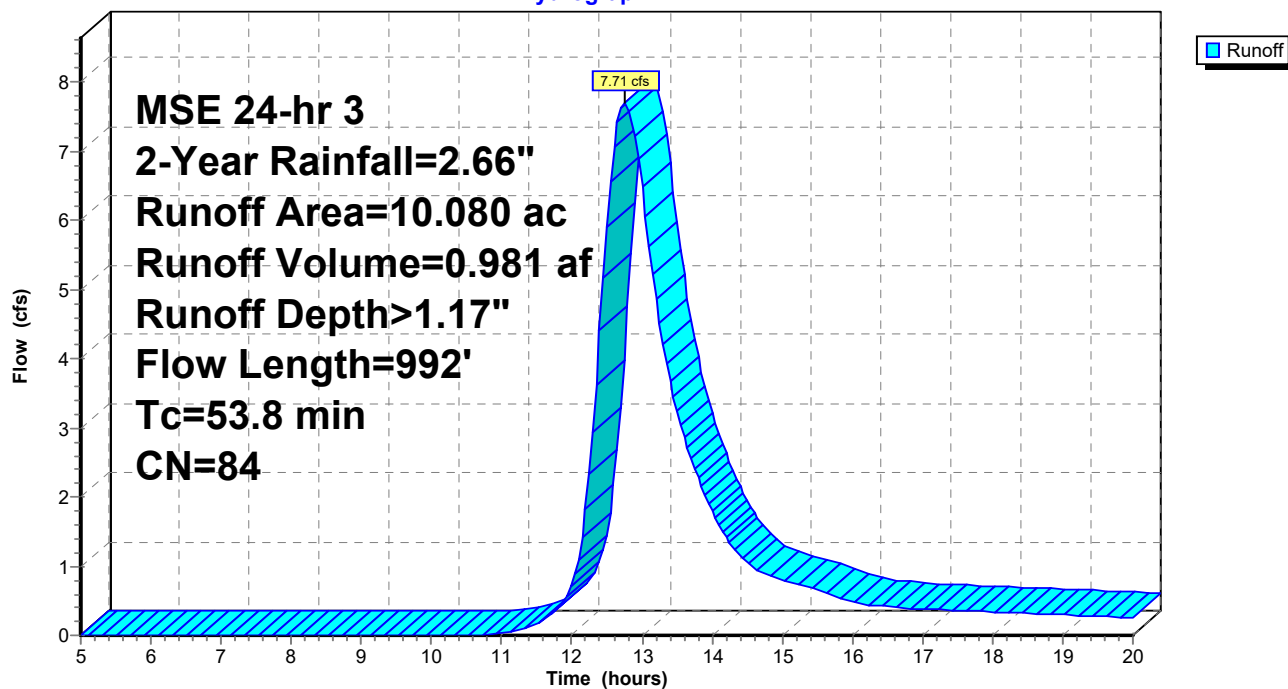
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.66"
23.2	730	0.0110	0.52	4.72	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, C-D 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"

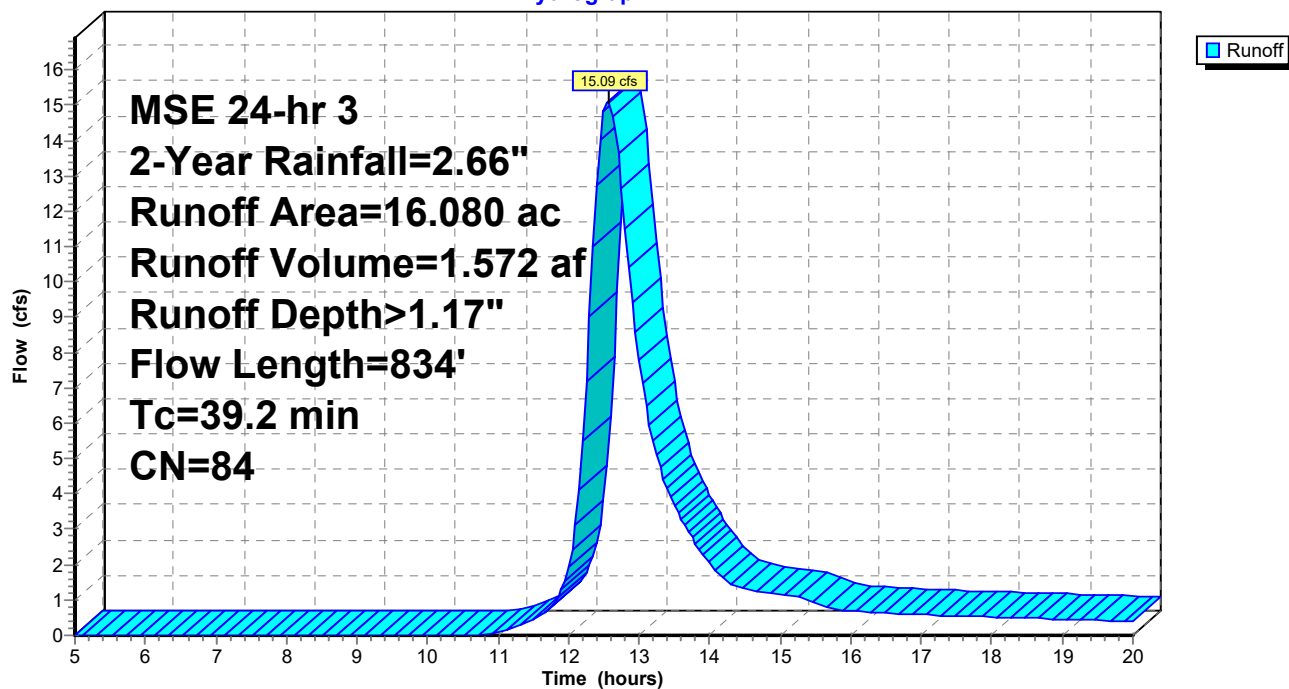
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.66"
4.5	154	0.0130	0.57	5.13	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
2.0	89	0.0210	0.72	6.52	Channel Flow, C-D Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.2	111	0.0140	8.31	14.69	Pipe Channel, D-E 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	Channel Flow, E-F Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, F-G 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	Channel Flow, G-H Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	43	0.0100	7.03	12.41	Pipe Channel, H-I 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"

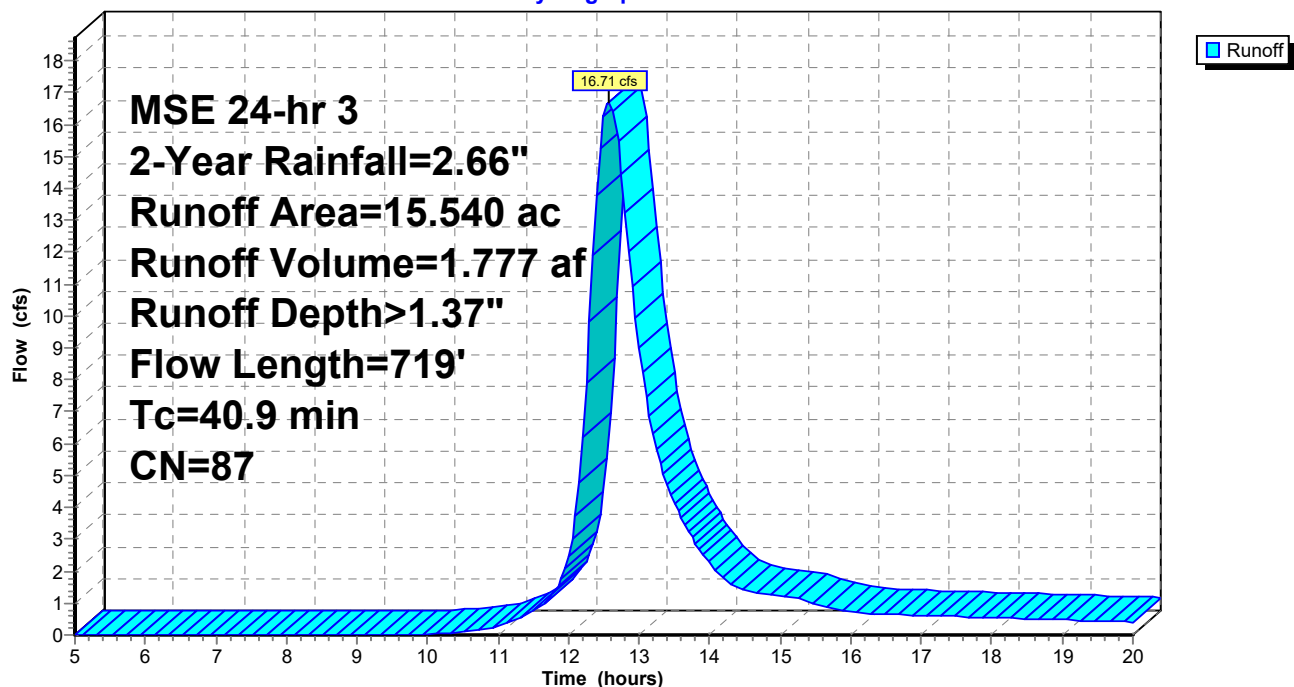
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 2.66"
19.2	576	0.0100	0.50	4.50	Channel Flow, B-C
					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"

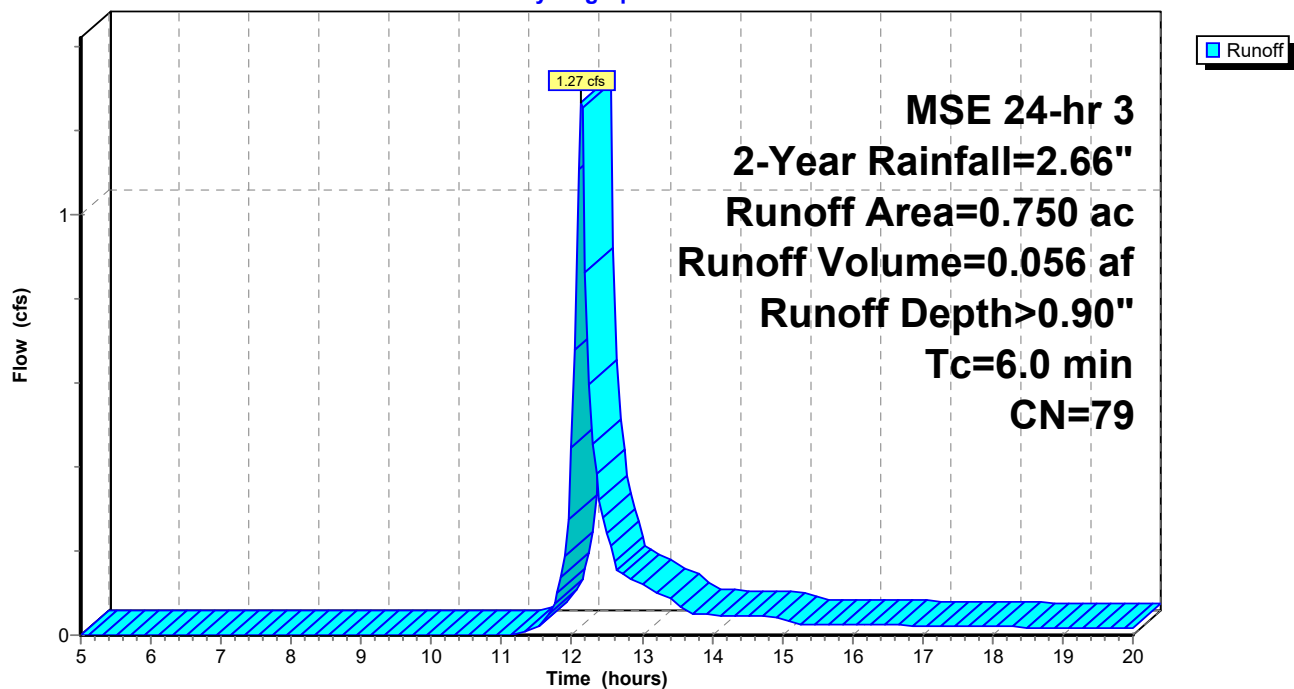
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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"

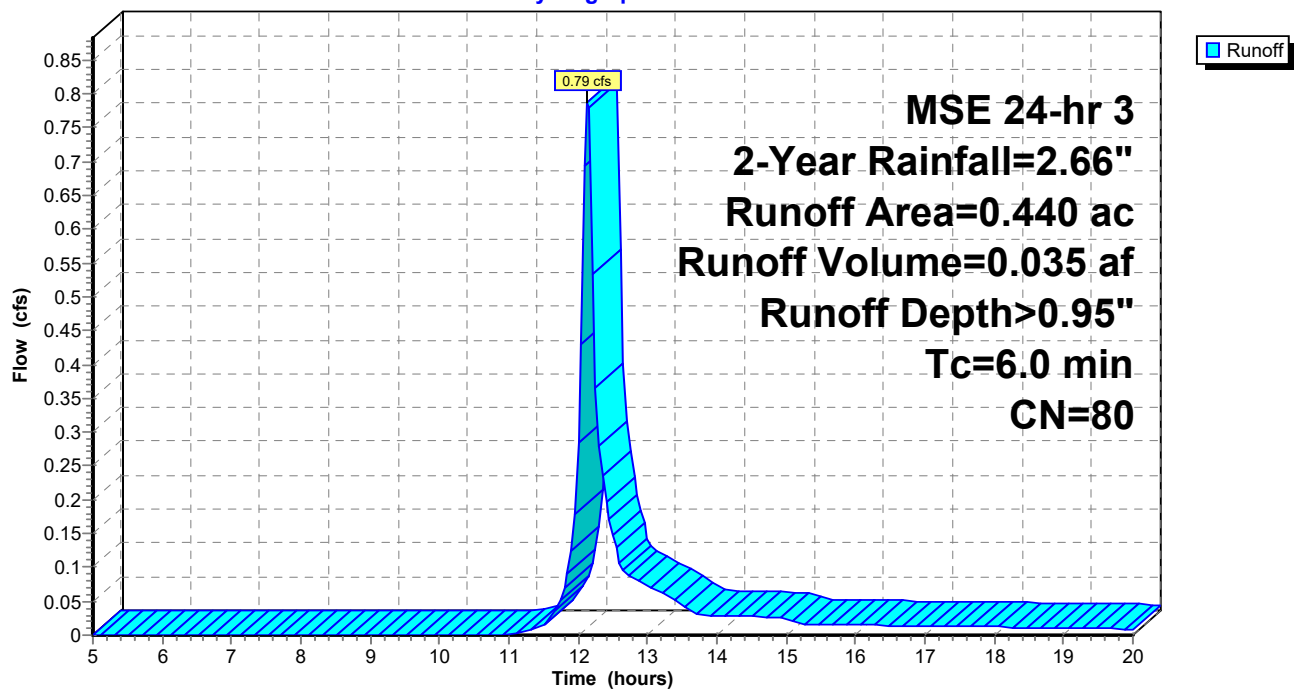
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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"

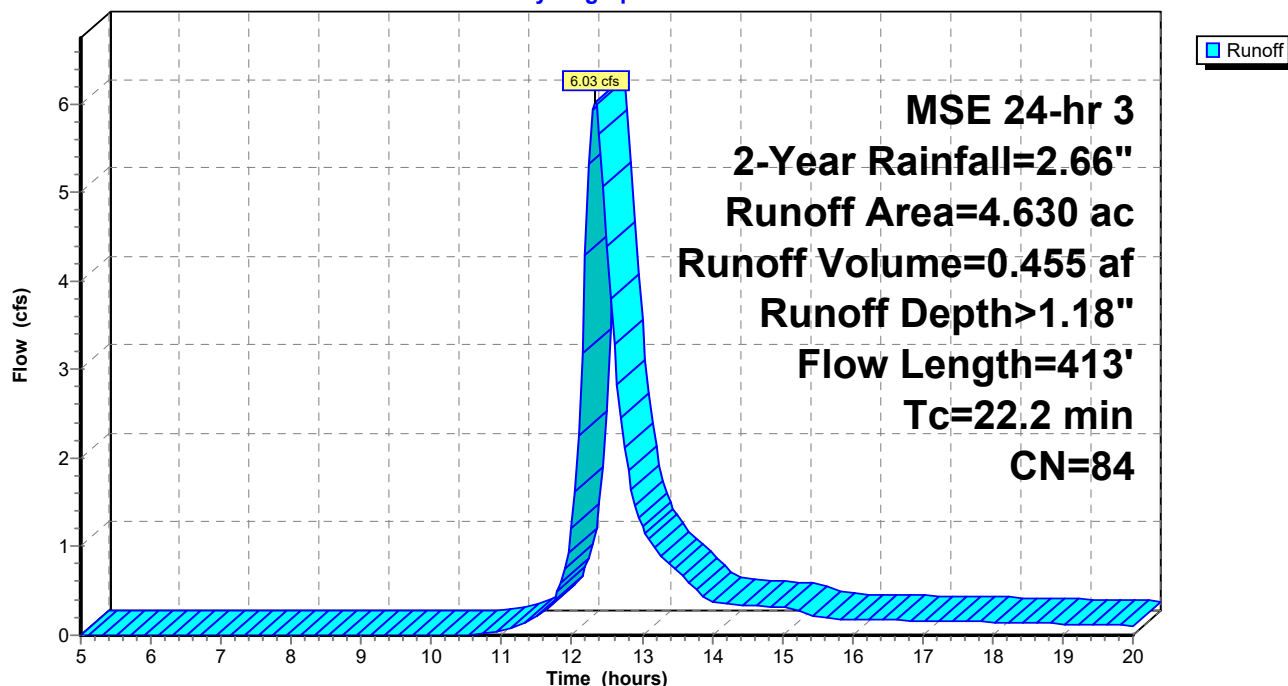
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 2.66"
12.1	363	0.0100	0.50	4.50	Channel Flow, B-C
					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"

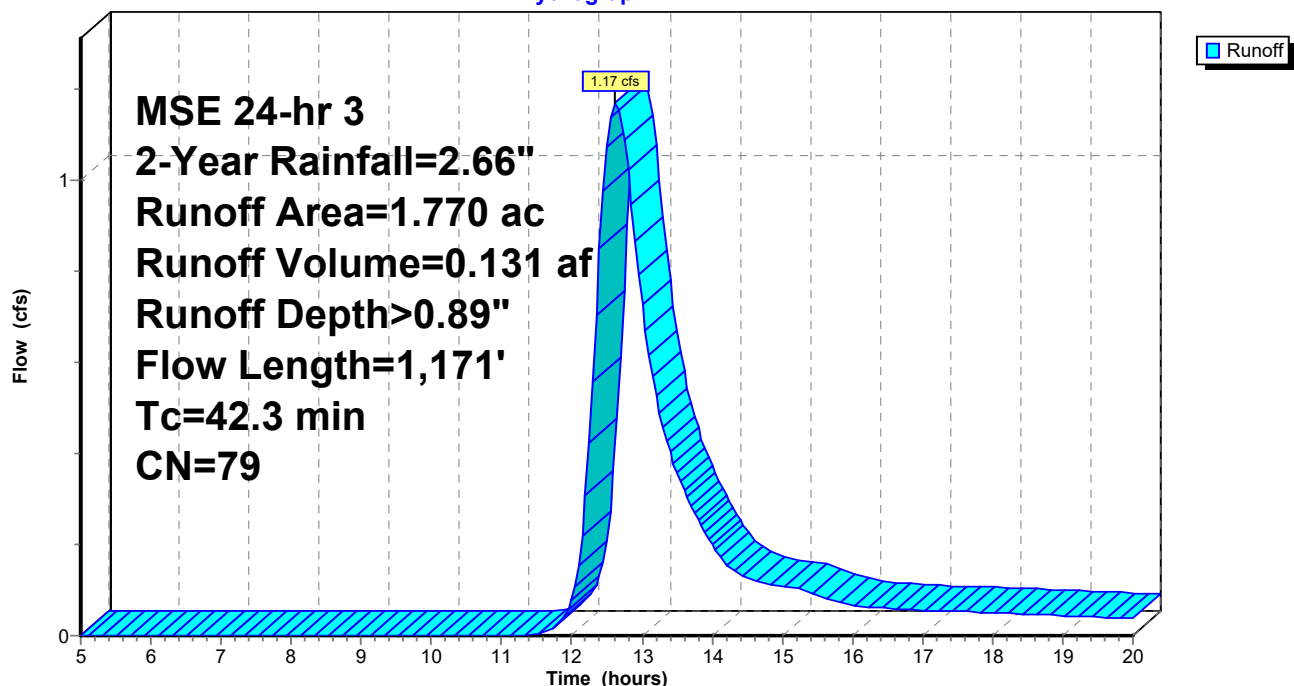
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-AA Grass: Short n= 0.150 P2= 2.66"
6.4	113	0.0150	0.29		Sheet Flow, AA-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.4	263	0.0120	0.99		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		Shallow Concentrated Flow, C-D Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		Shallow Concentrated Flow, D-E 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"

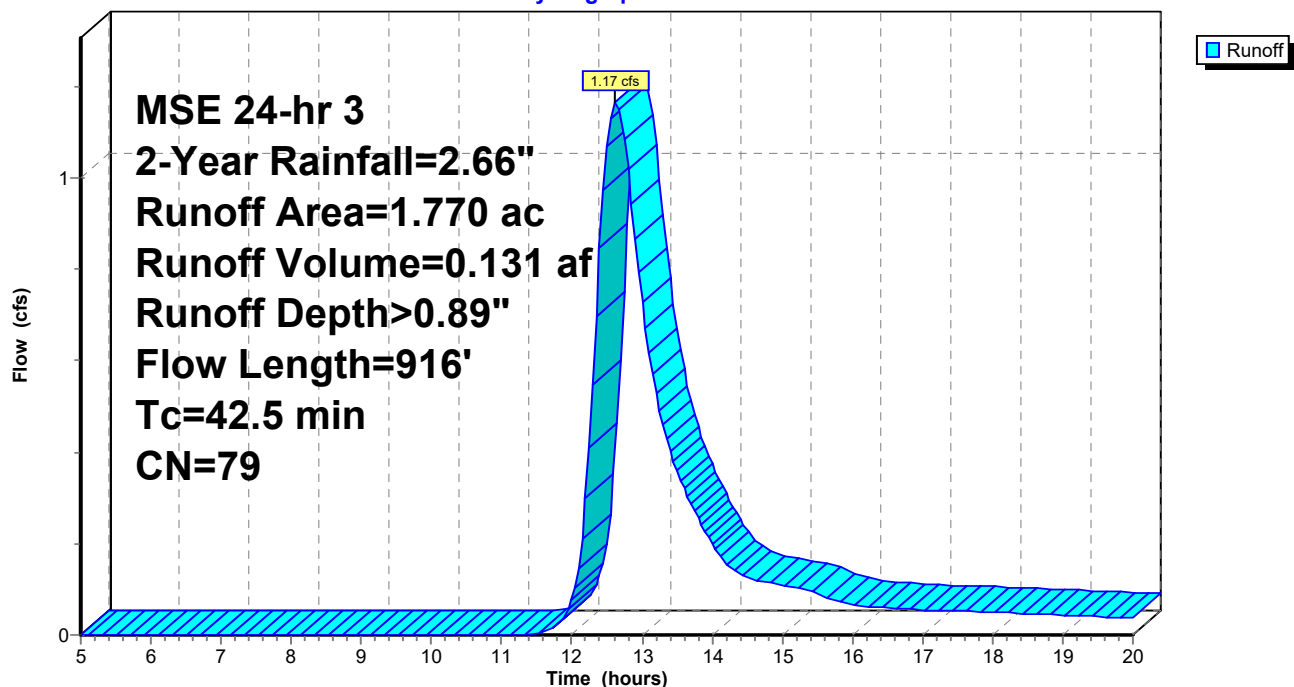
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.66"

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		Sheet Flow, A-AA Grass: Short n= 0.150 P2= 2.66"
6.7	45	0.0130	0.11		Sheet Flow, AA-B Grass: Short n= 0.150 P2= 2.66"
20.2	665	0.0120	0.55	4.93	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, C-D 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

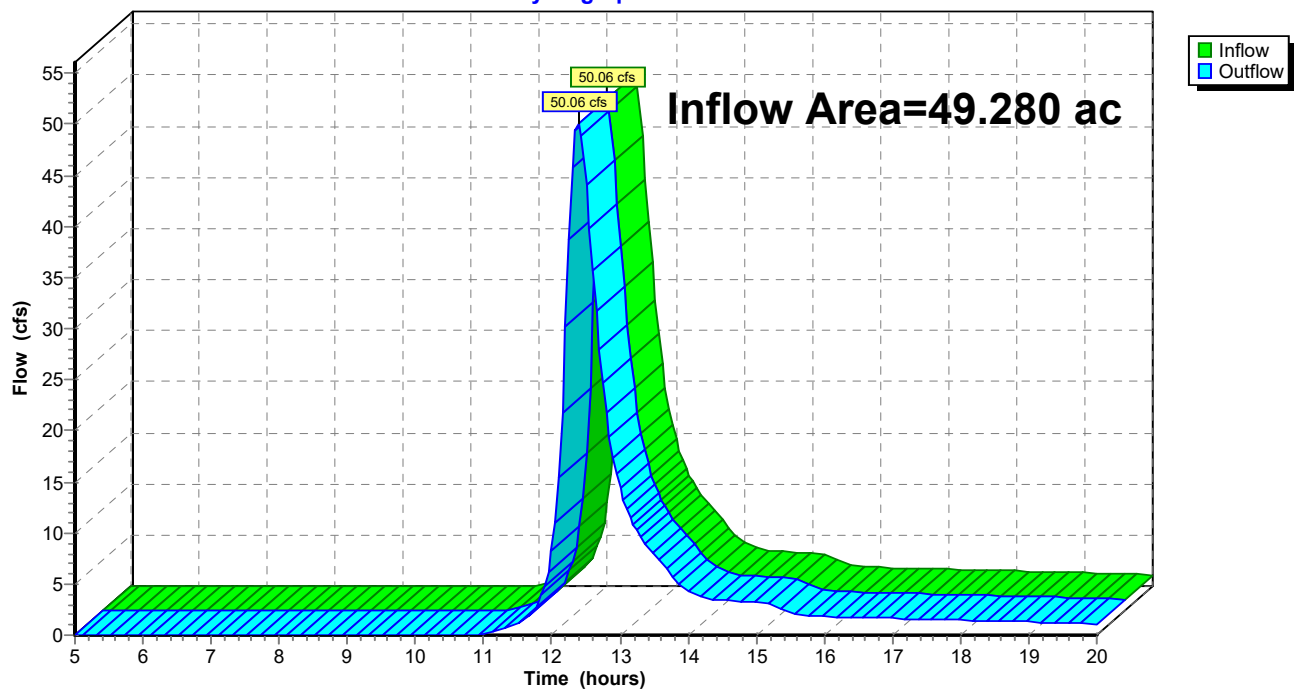


Summary for Reach 5R: Pre-Development

[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

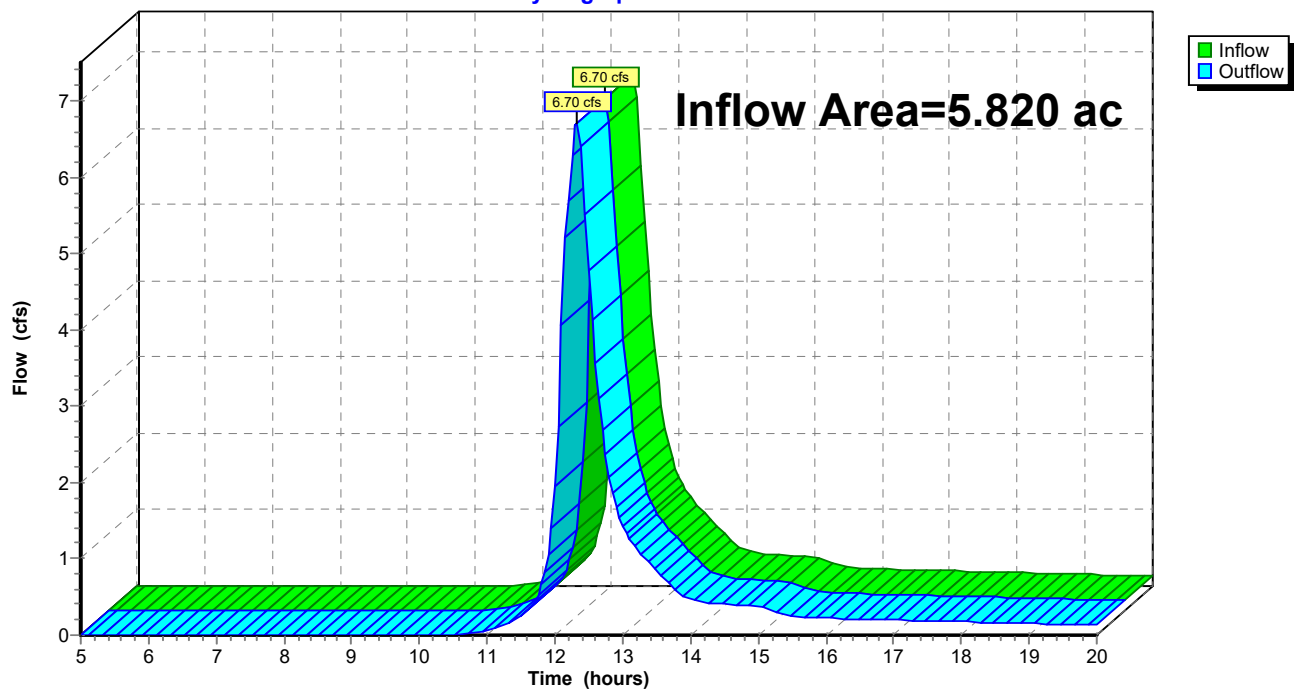
Reach 5R: Pre-Development**Hydrograph**

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

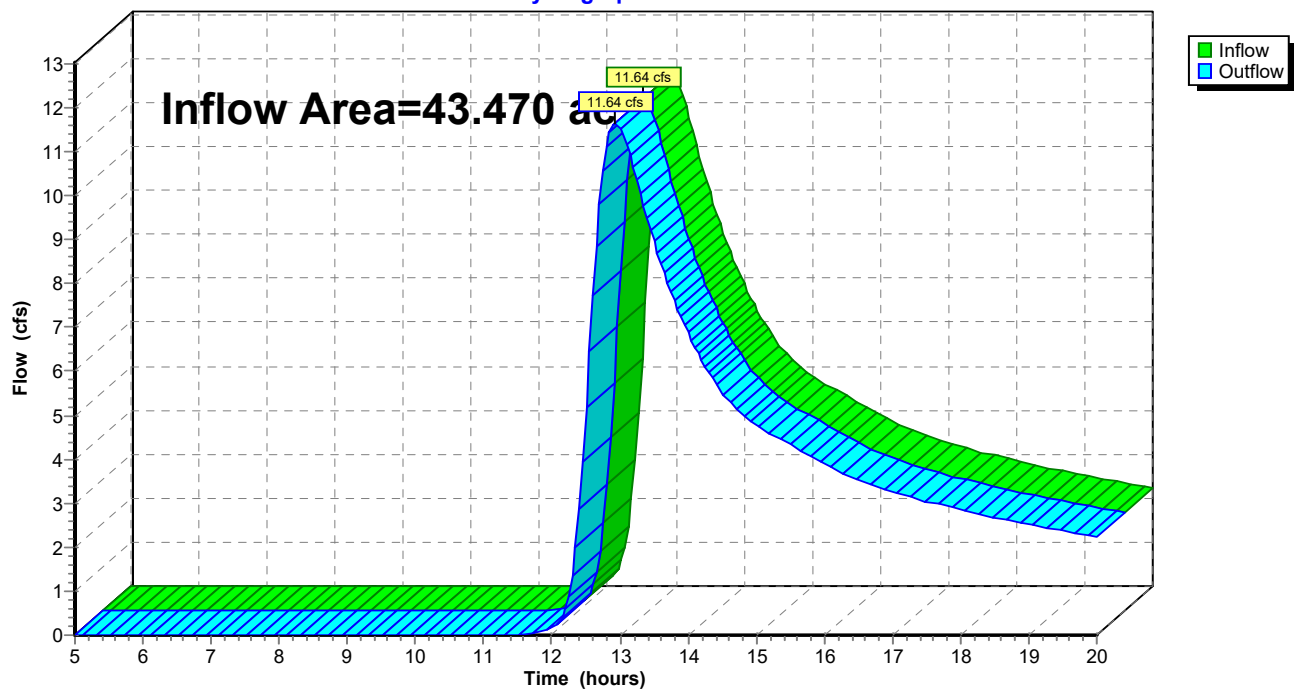
Reach 11R: Undetained**Hydrograph**

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)

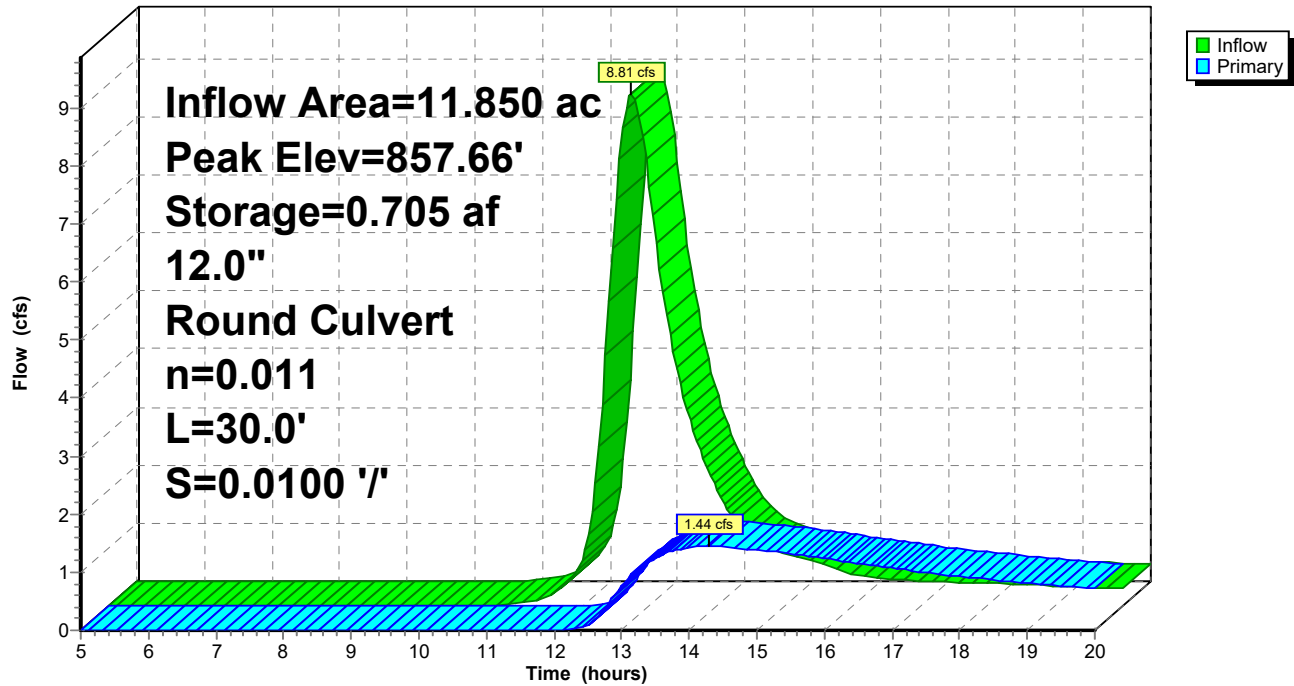
Volume	Invert	Avail.Storage	Storage Description
#1	857.00'	6.825 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
857.00	1.030	0.000	0.000
858.00	1.140	1.085	1.085
859.00	1.270	1.205	2.290
860.00	1.420	1.345	3.635
861.00	1.570	1.495	5.130
862.00	1.820	1.695	6.825

Device	Routing	Invert	Outlet Devices
#1	Primary	857.00'	12.0" Round RCP_Round 12" 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	Custom Stage Data (Prismatic) 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'	24.0" Round Culvert 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'	24.0" Round Culvert 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

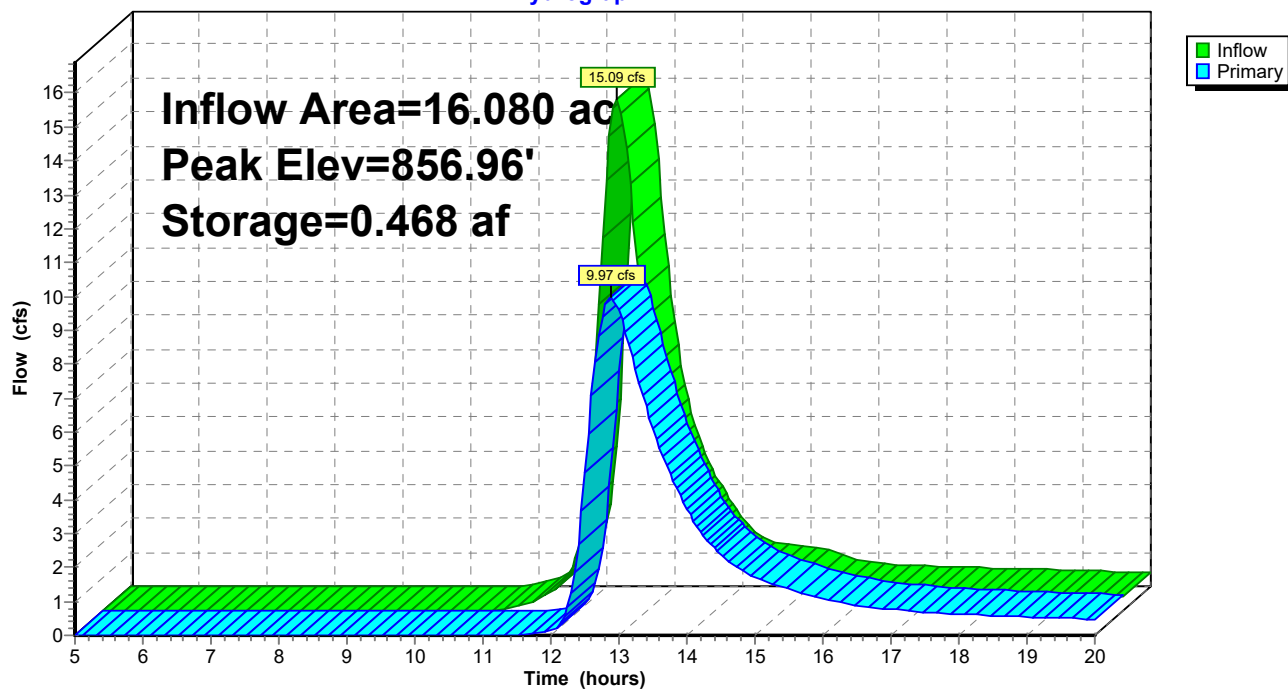
Primary OutFlow Max=9.95 cfs @ 12.87 hrs HW=856.96' (Free Discharge)

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	Custom Stage Data (Prismatic) 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

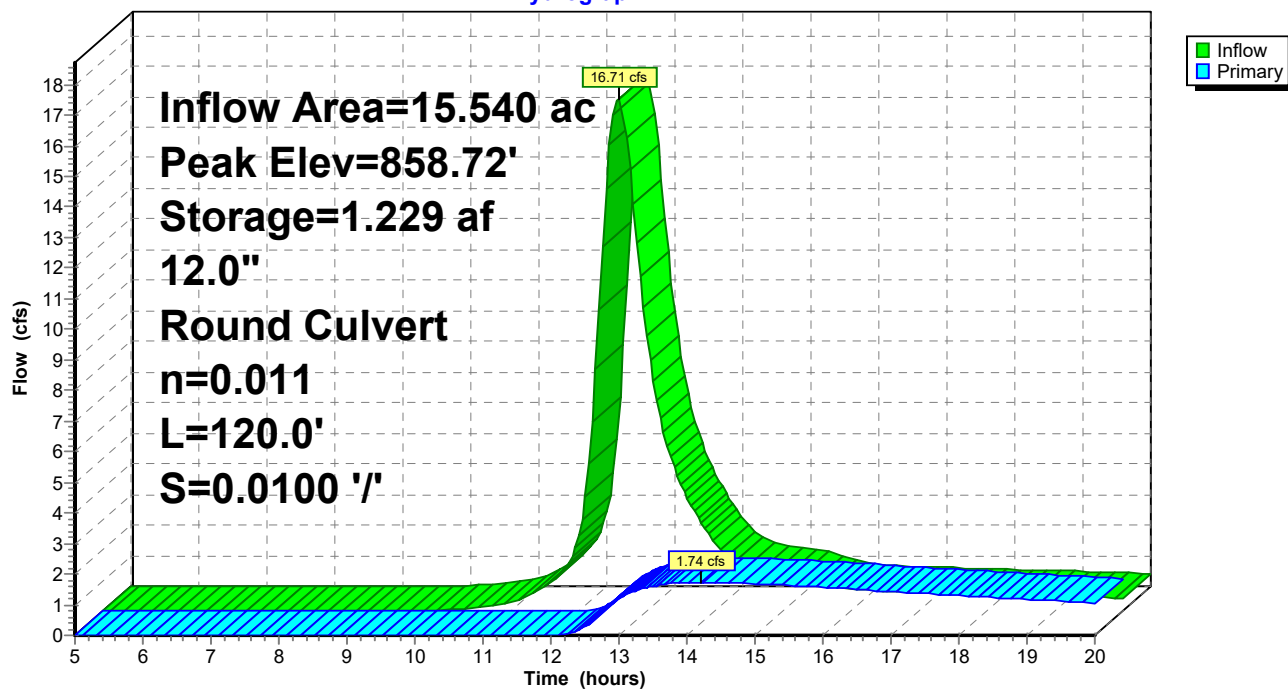
Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	12.0" Round RCP_Round 12" L= 120.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 856.80' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

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



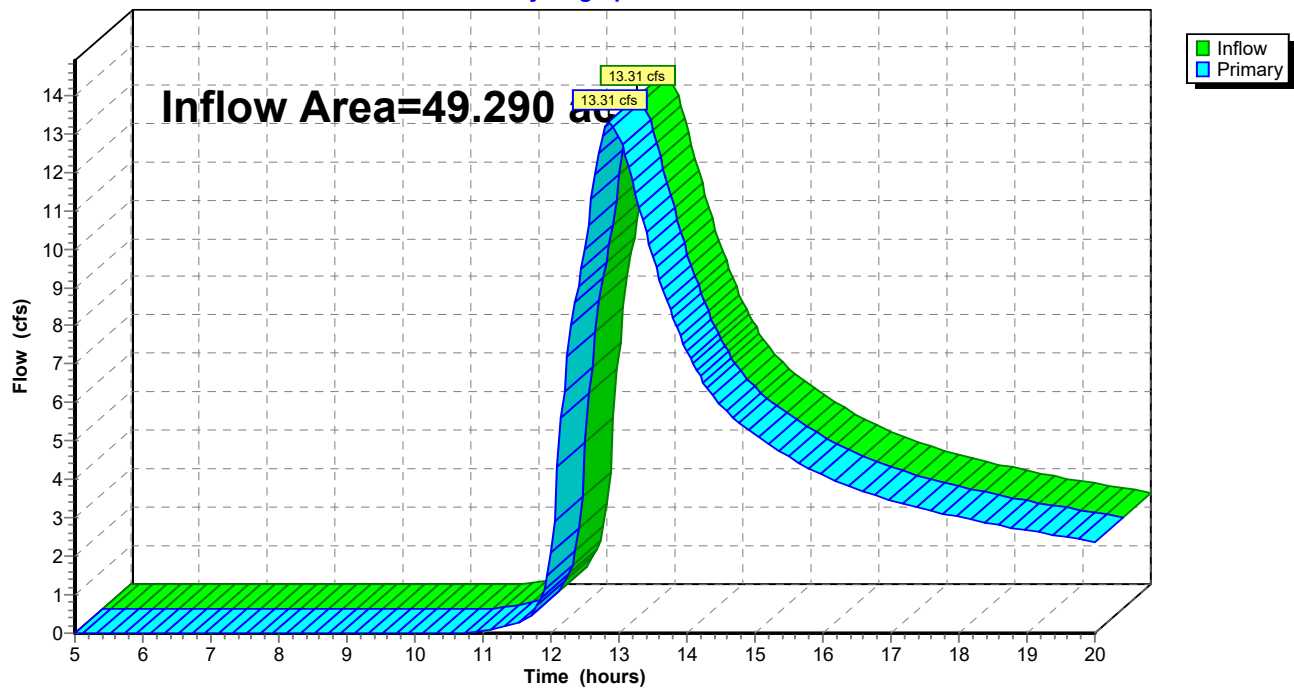
Summary for Link 10L: Post-Development

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



Morning Meadows 2020-05-30*MSE 24-hr 3 5-Year Rainfall=3.26"*

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Page 56

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>1.44" Flow Length=1,174' Tc=32.5 min CN=81 Runoff=15.48 cfs 1.441 af
Subcatchment2S: E-2	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
Subcatchment3S: E-3	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
Subcatchment6S: P1	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
Subcatchment7S: P2	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
Subcatchment8S: P3	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
Subcatchment9S: UD1	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
Subcatchment10S: UD2	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
Subcatchment11S: UD3	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
Subcatchment12S: E-OFF-1	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
Subcatchment13S: P-OFF-1	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
Reach 5R: Pre-Development	Inflow=72.10 cfs 6.121 af Outflow=72.10 cfs 6.121 af
Reach 11R: Undetained	Inflow=9.42 cfs 0.770 af Outflow=9.42 cfs 0.770 af
Reach 12R: Detained	Inflow=17.78 cfs 4.418 af Outflow=17.78 cfs 4.418 af
Pond 6P: Pond 1	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
Pond 7P: Pond 2	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"*

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Page 57

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"

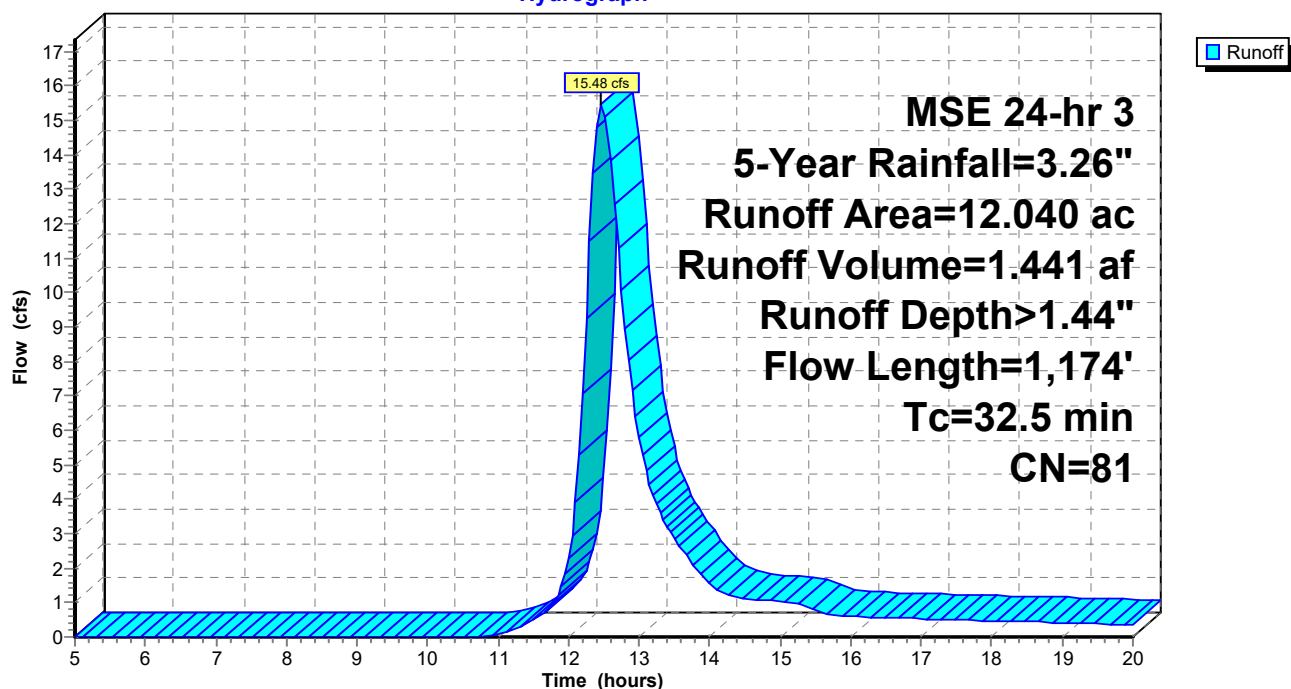
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.3	266	0.0131	1.03		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		Shallow Concentrated Flow, C-D Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		Shallow Concentrated Flow, D-E 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"

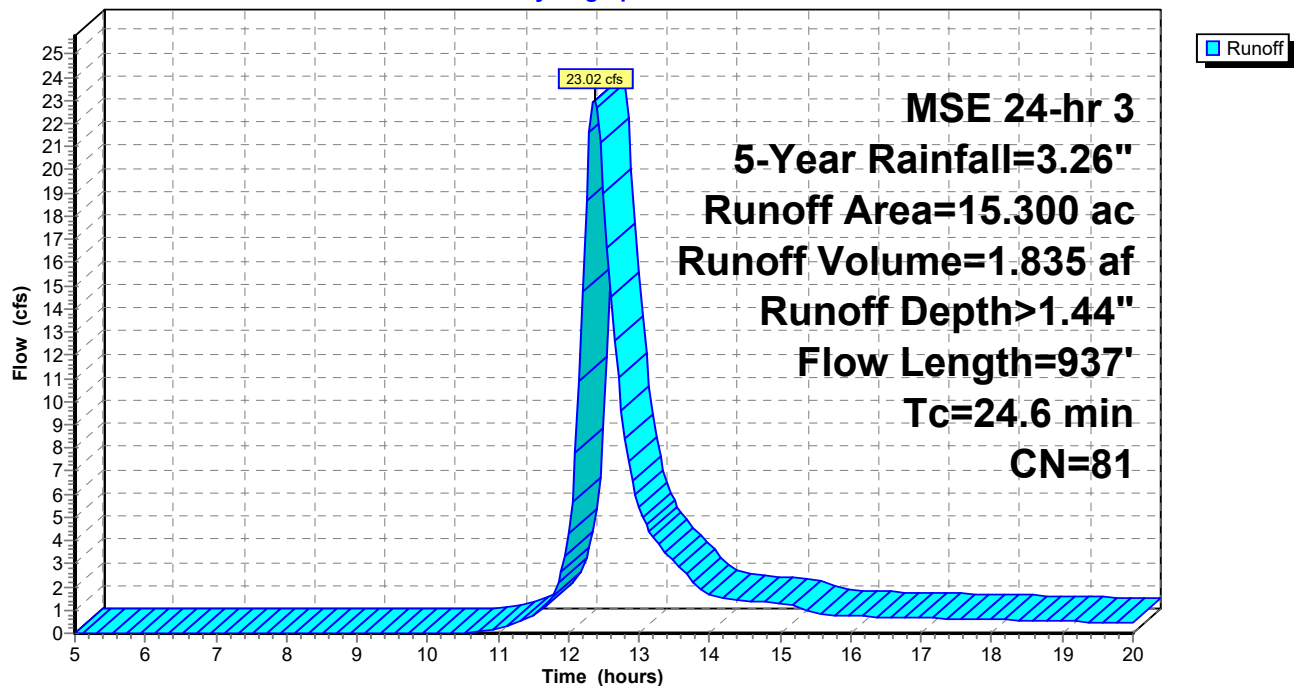
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
10.3	662	0.0142	1.07		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
24.6	937	Total			

Subcatchment 2S: E-2

Hydrograph



Morning Meadows 2020-05-30

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

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Page 60

Summary for Subcatchment 3S: E-3

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

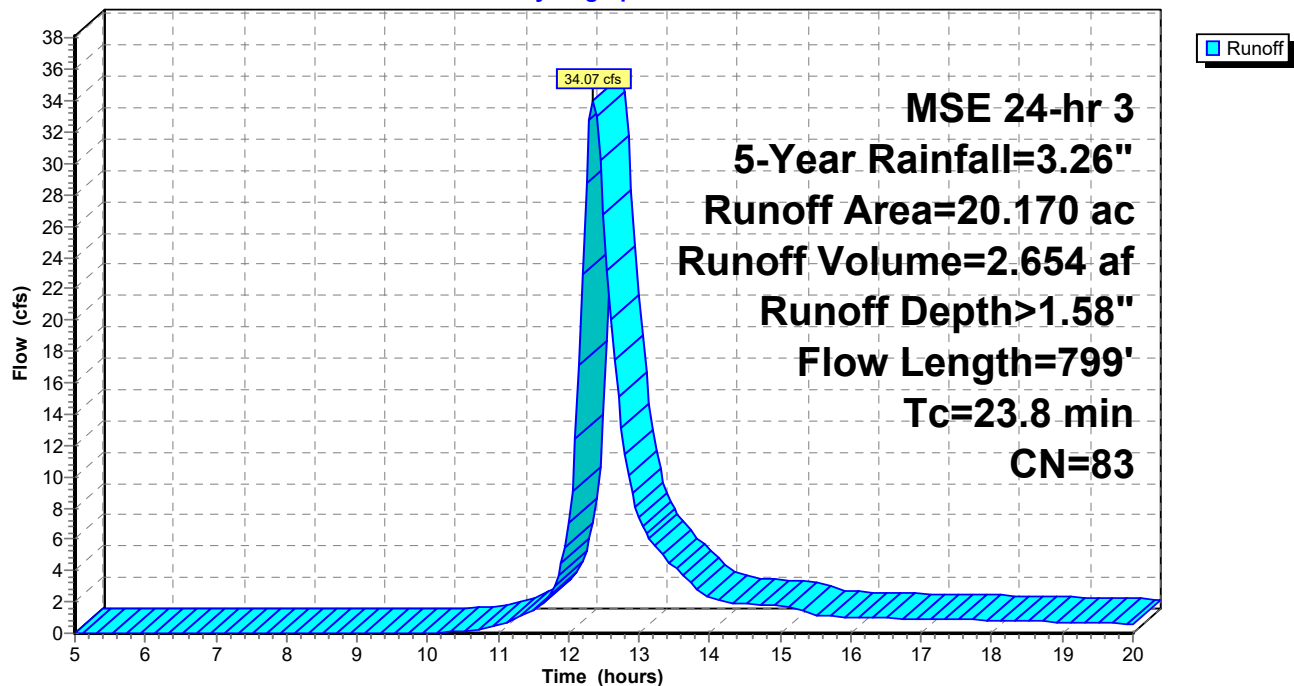
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
11.1	524	0.0077	0.79		Shallow Concentrated Flow, B-C 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"

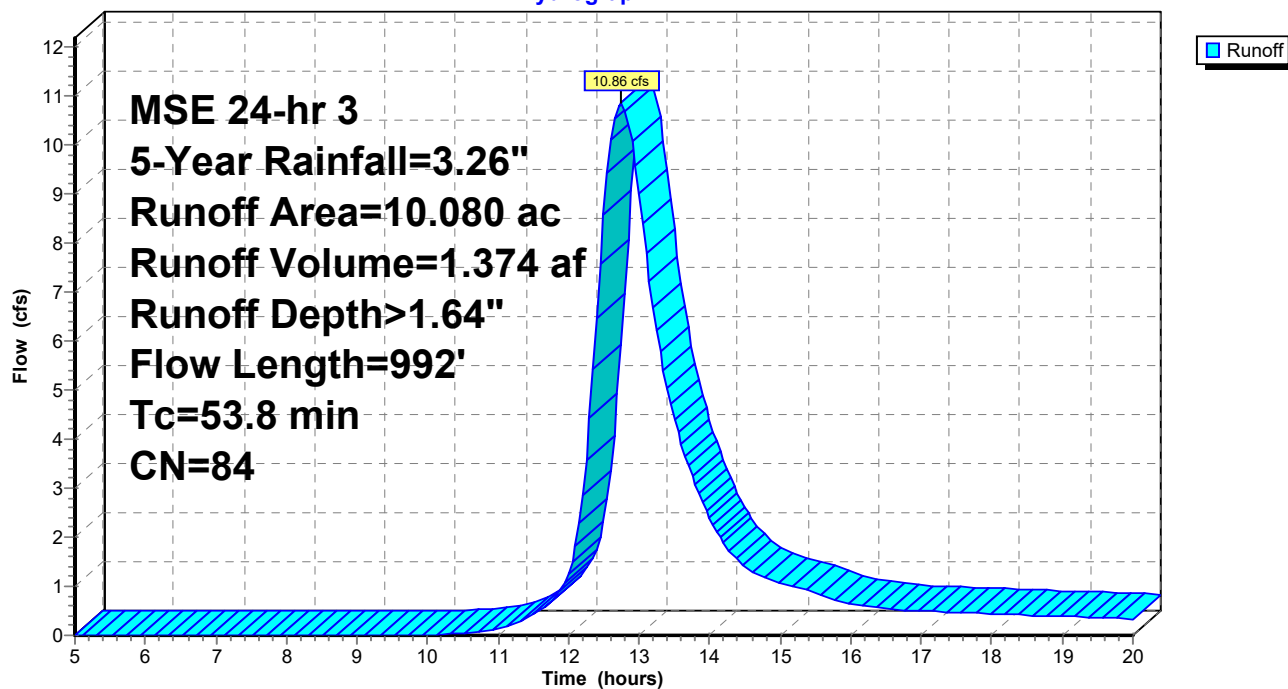
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.66"
23.2	730	0.0110	0.52	4.72	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, C-D 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"

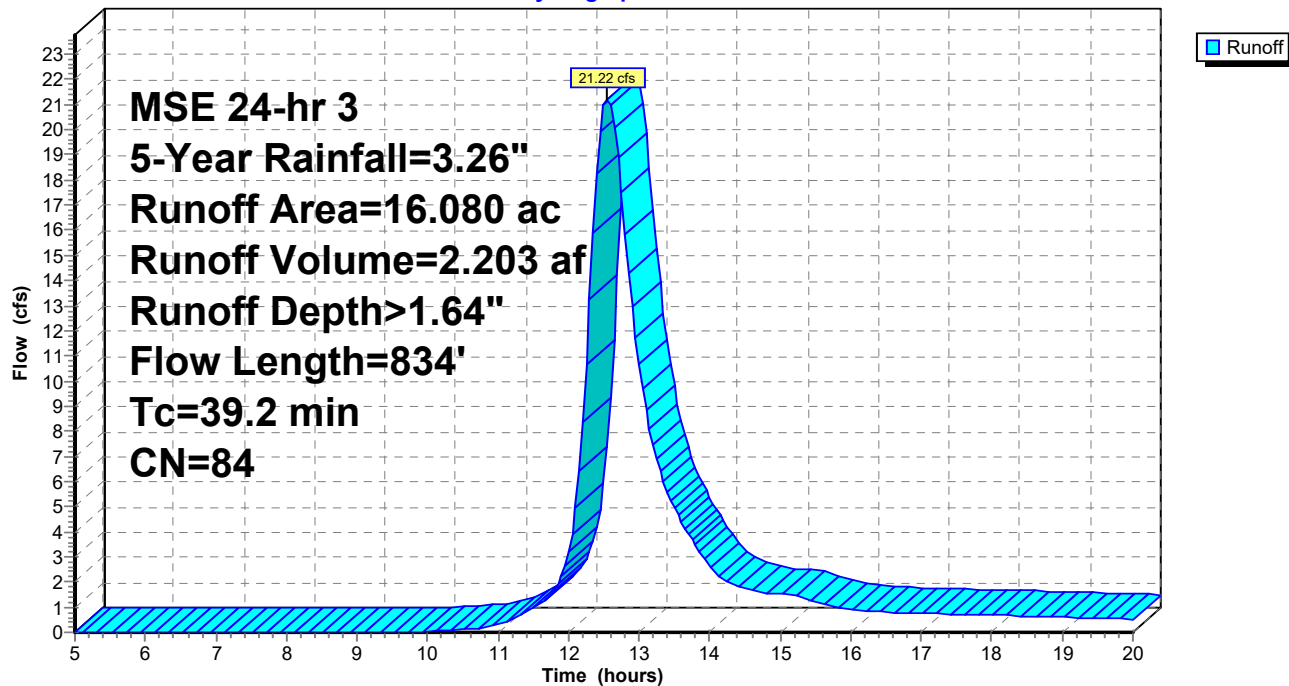
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.66"
4.5	154	0.0130	0.57	5.13	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
2.0	89	0.0210	0.72	6.52	Channel Flow, C-D Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.2	111	0.0140	8.31	14.69	Pipe Channel, D-E 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	Channel Flow, E-F Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, F-G 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	Channel Flow, G-H Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	43	0.0100	7.03	12.41	Pipe Channel, H-I 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"

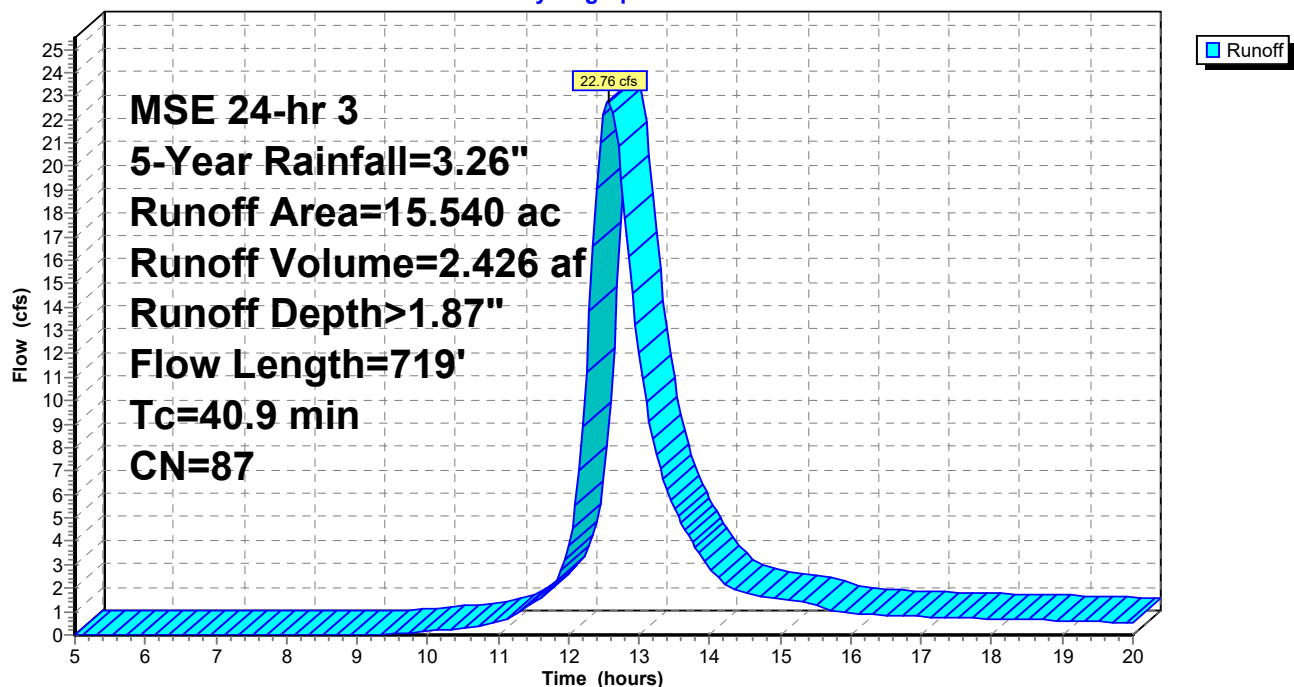
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 2.66"
19.2	576	0.0100	0.50	4.50	Channel Flow, B-C
					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"

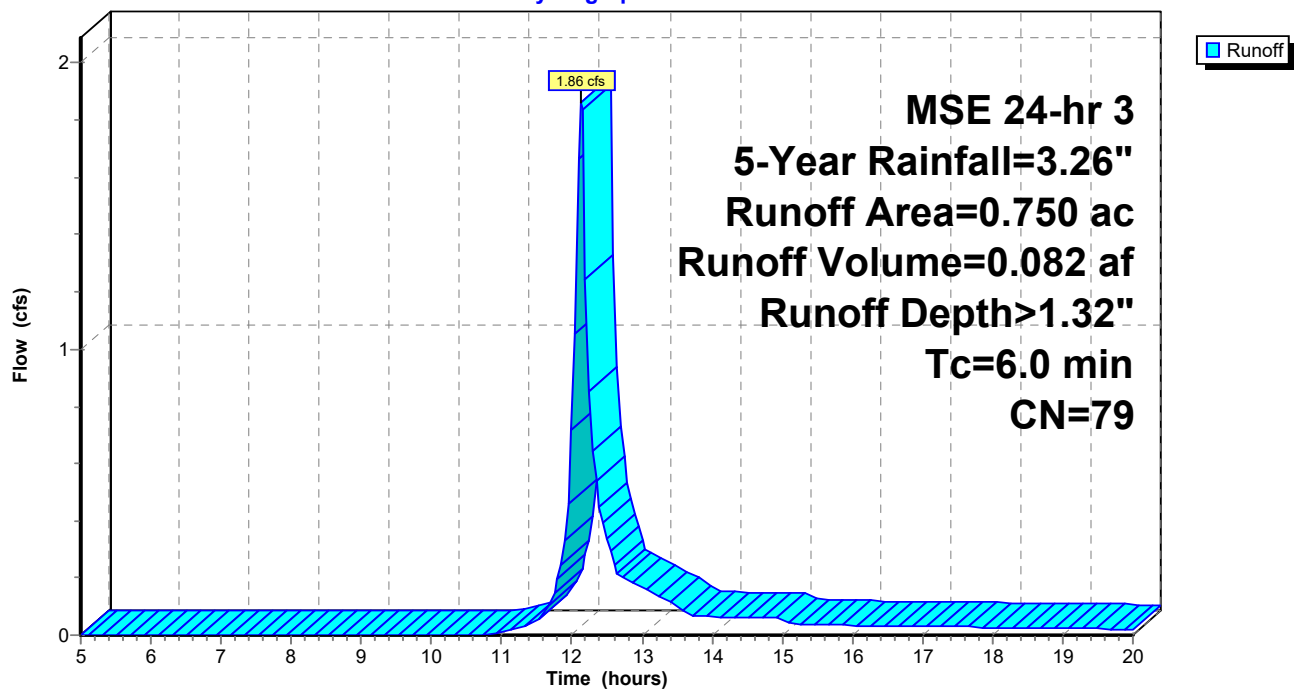
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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"

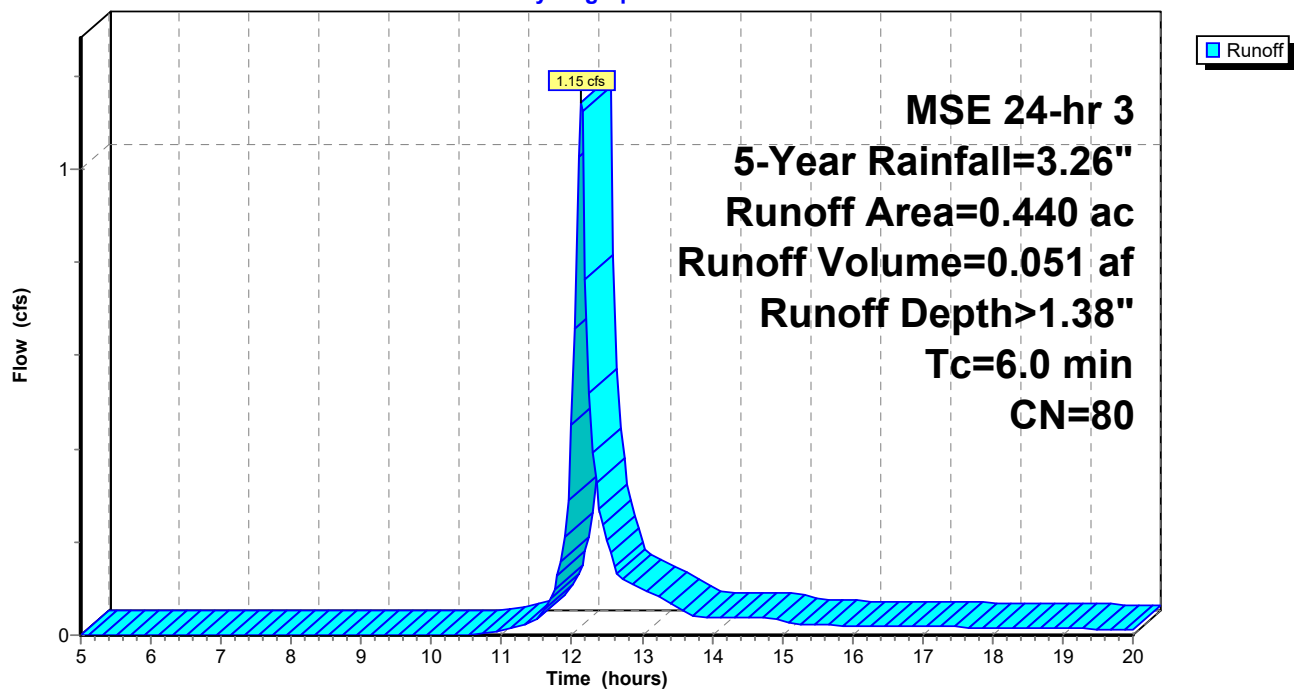
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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"

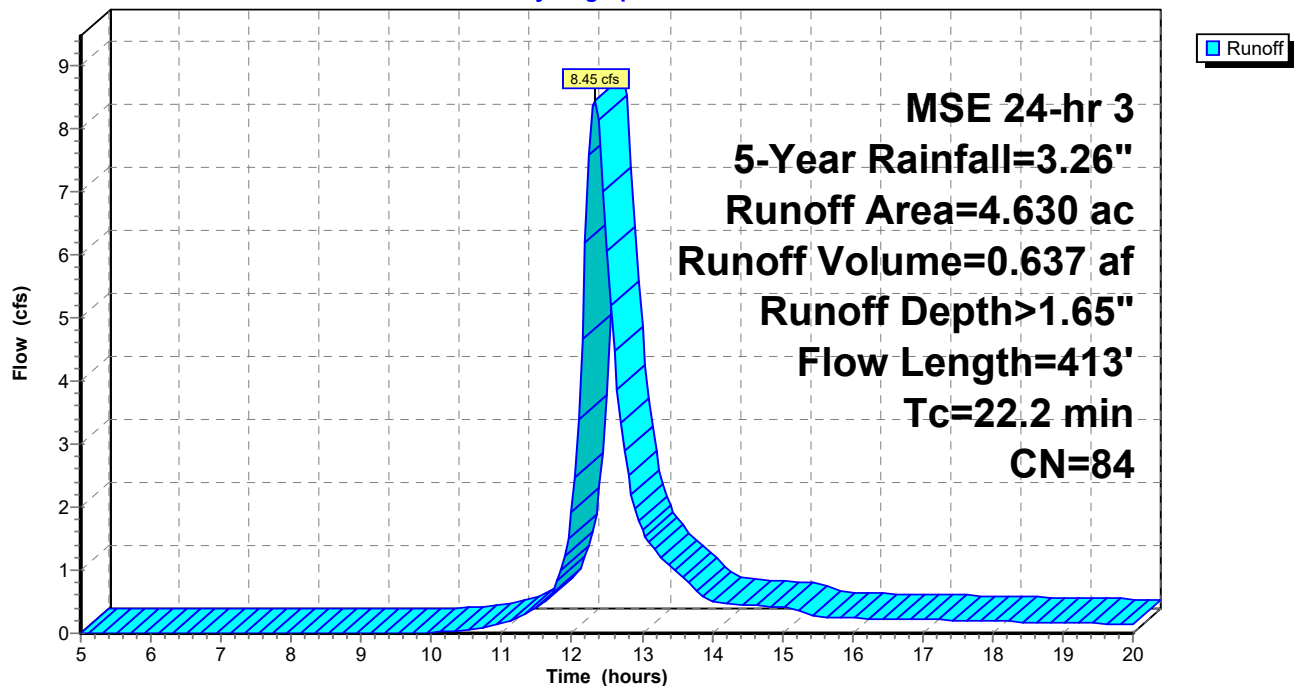
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 2.66"
12.1	363	0.0100	0.50	4.50	Channel Flow, B-C
					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"

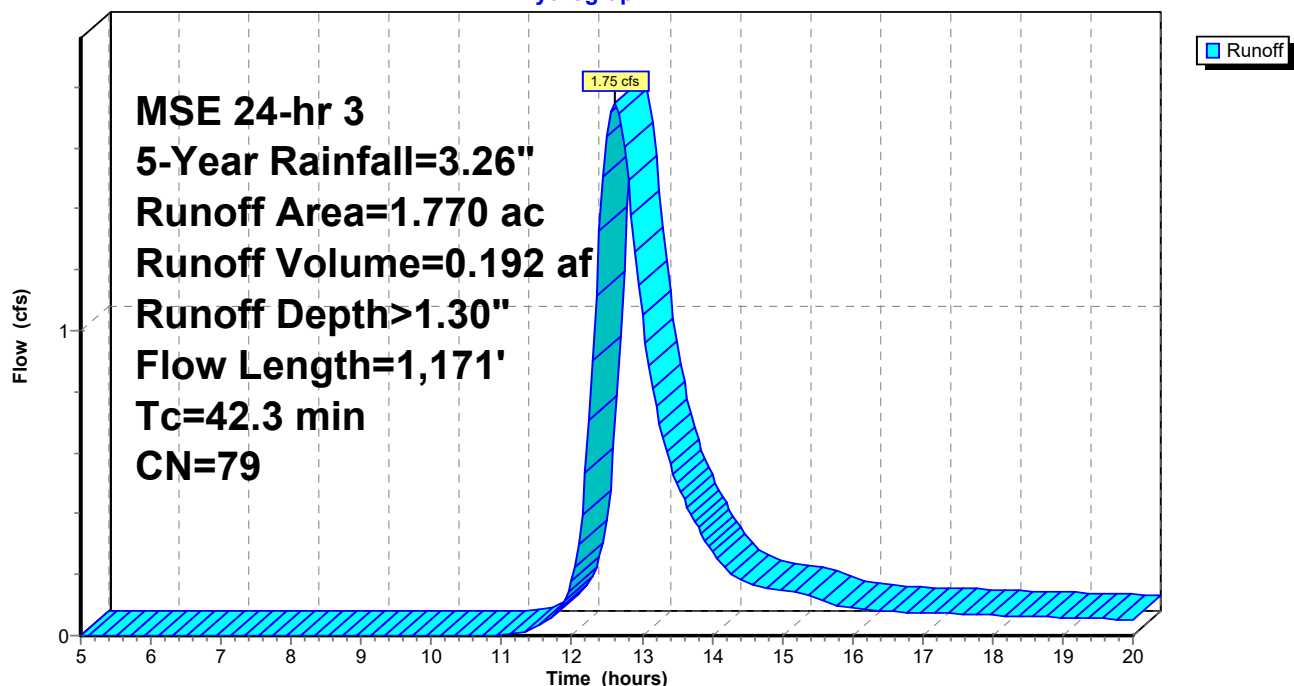
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-AA Grass: Short n= 0.150 P2= 2.66"
6.4	113	0.0150	0.29		Sheet Flow, AA-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.4	263	0.0120	0.99		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		Shallow Concentrated Flow, C-D Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		Shallow Concentrated Flow, D-E Cultivated Straight Rows Kv= 9.0 fps
42.3	1,171	Total			

Subcatchment 12S: E-OFF-1

Hydrograph



Morning Meadows 2020-05-30

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

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Page 70

Summary for Subcatchment 13S: P-OFF-1

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

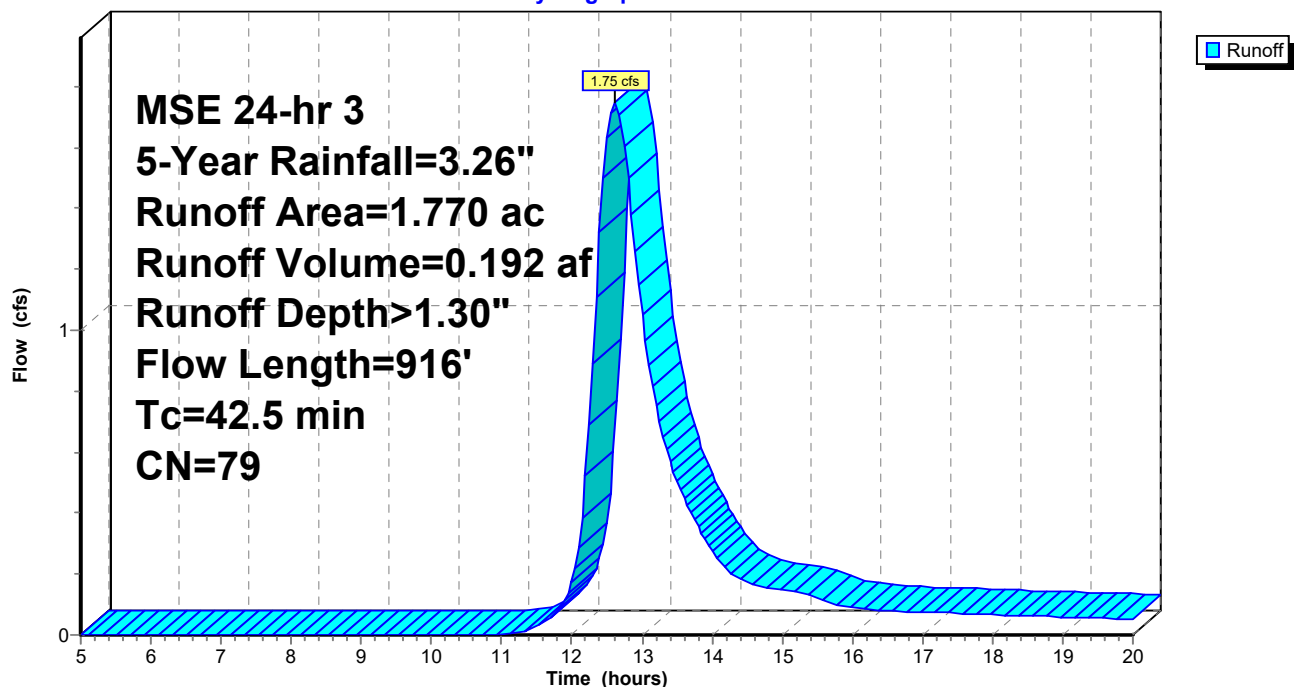
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 5-Year Rainfall=3.26"

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		Sheet Flow, A-AA Grass: Short n= 0.150 P2= 2.66"
6.7	45	0.0130	0.11		Sheet Flow, AA-B Grass: Short n= 0.150 P2= 2.66"
20.2	665	0.0120	0.55	4.93	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, C-D 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

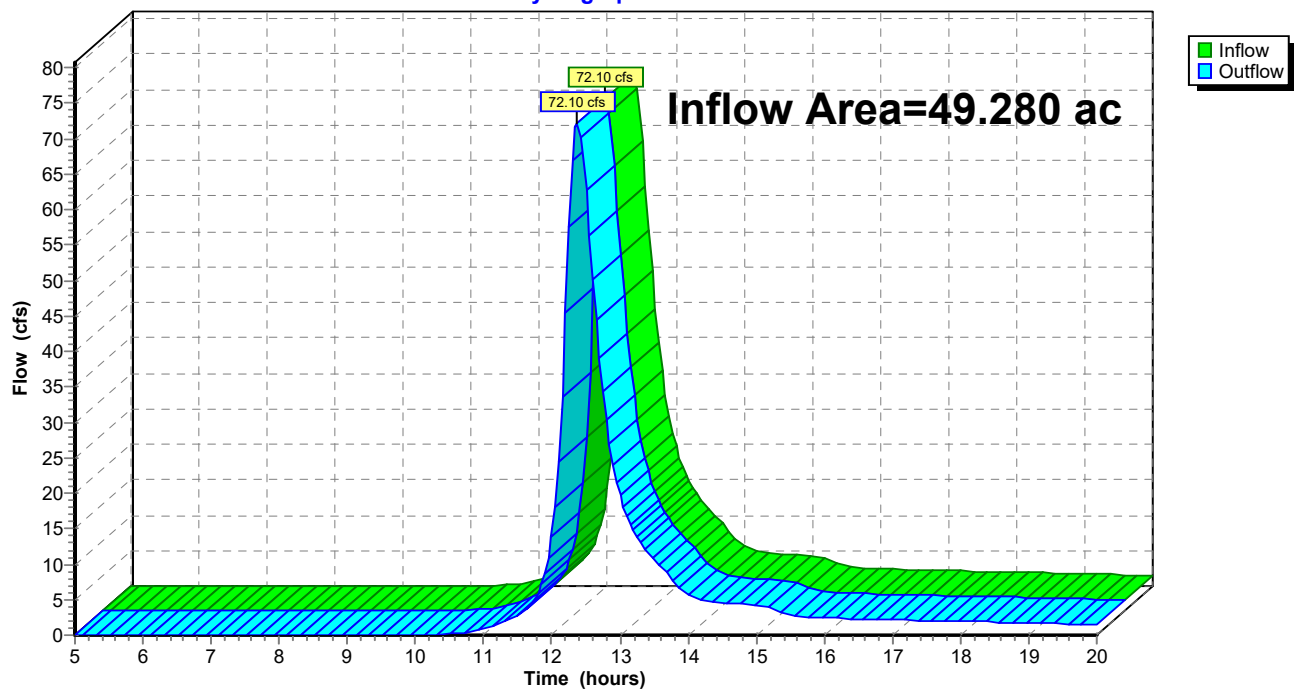


Summary for Reach 5R: Pre-Development

[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

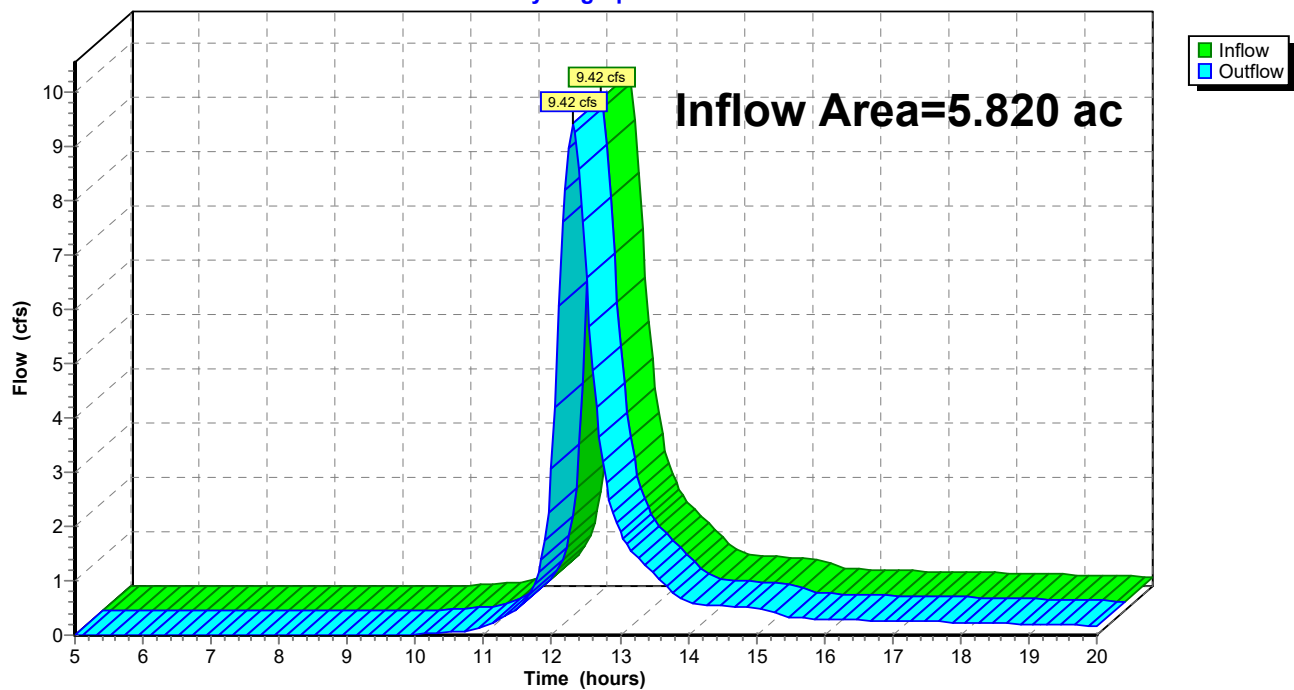
Reach 5R: Pre-Development**Hydrograph**

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

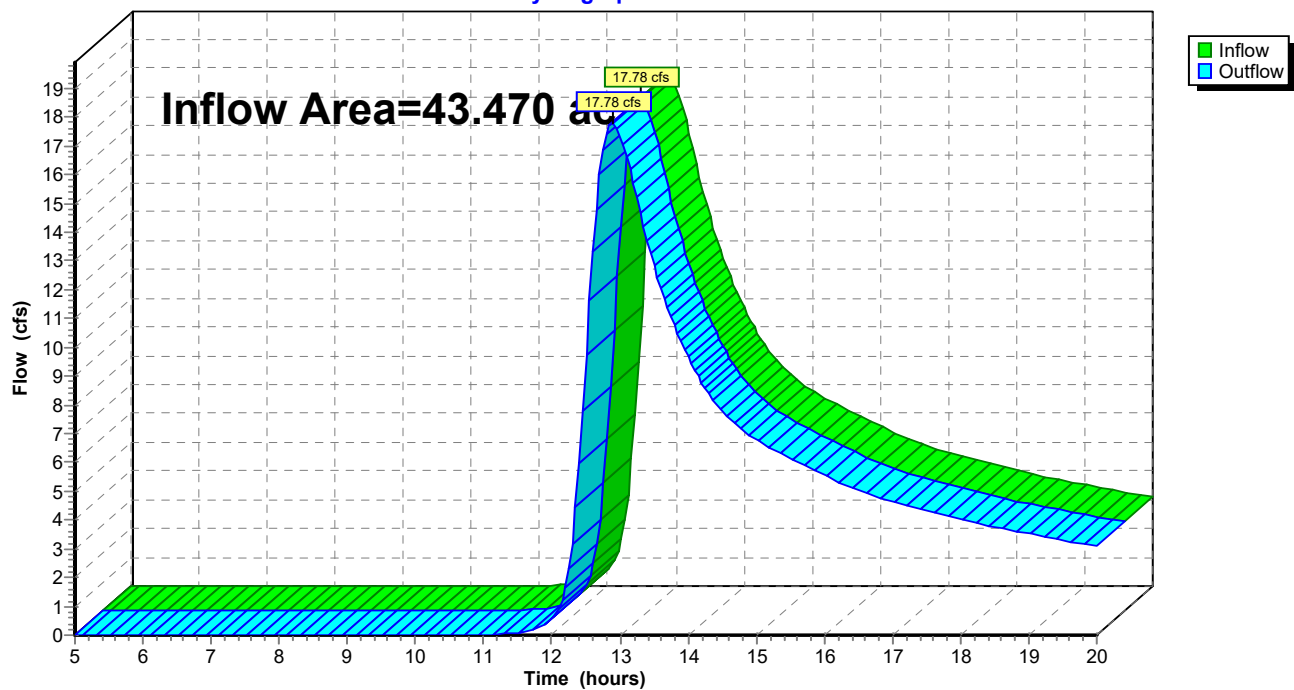
Reach 11R: Undetained**Hydrograph**

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	Custom Stage Data (Prismatic) Listed below (Recalc)

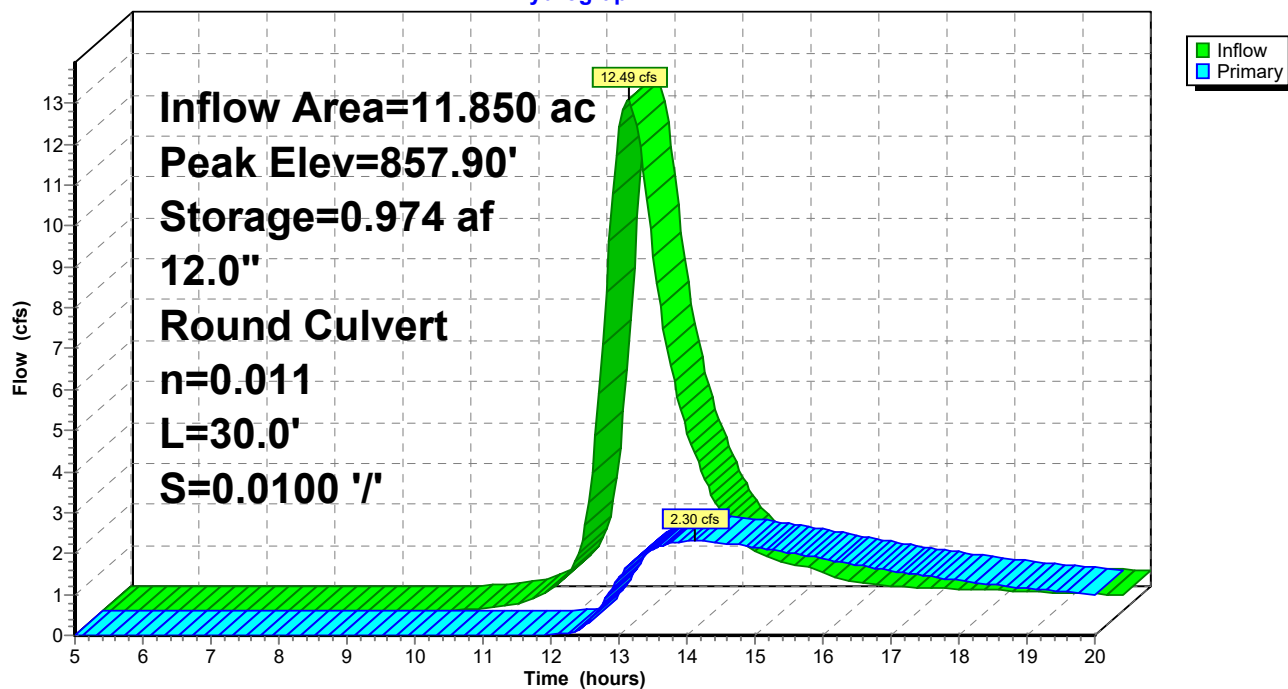
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
857.00	1.030	0.000	0.000
858.00	1.140	1.085	1.085
859.00	1.270	1.205	2.290
860.00	1.420	1.345	3.635
861.00	1.570	1.495	5.130
862.00	1.820	1.695	6.825

Device	Routing	Invert	Outlet Devices
#1	Primary	857.00'	12.0" Round RCP_Round 12" 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	Custom Stage Data (Prismatic) 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'	24.0" Round Culvert 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'	24.0" Round Culvert 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

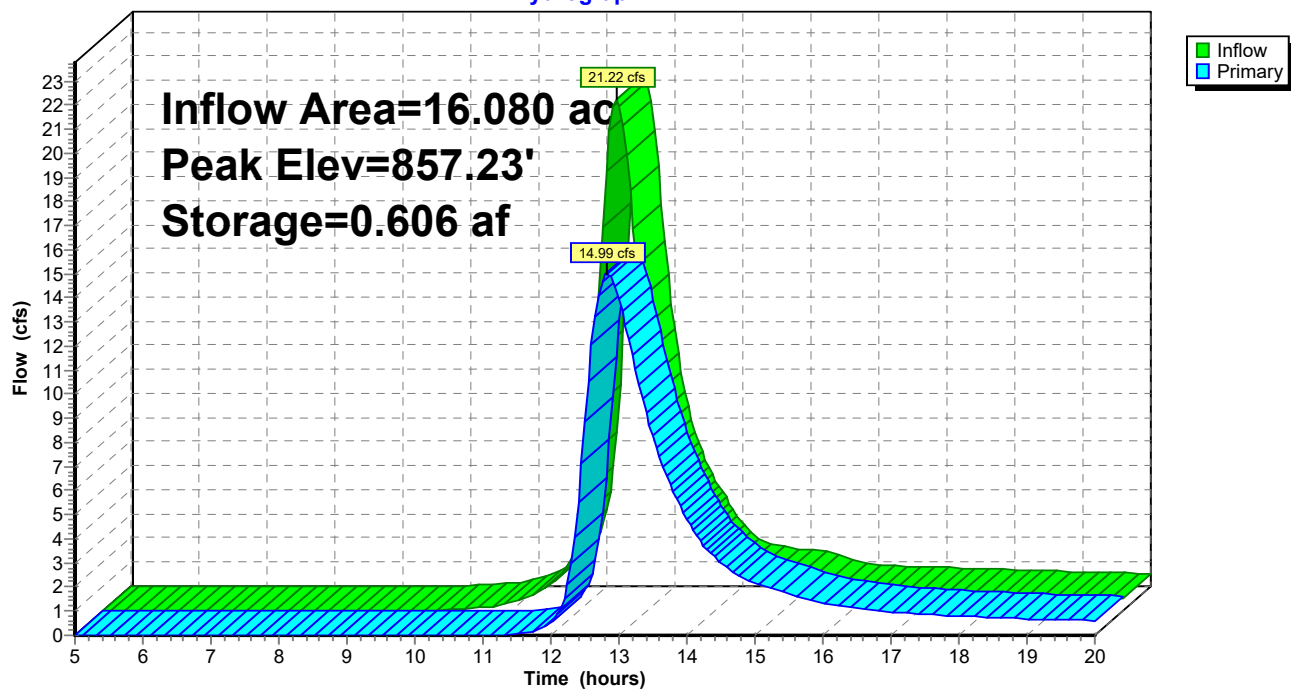
Primary OutFlow Max=14.96 cfs @ 12.83 hrs HW=857.23' (Free Discharge)

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	Custom Stage Data (Prismatic) 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

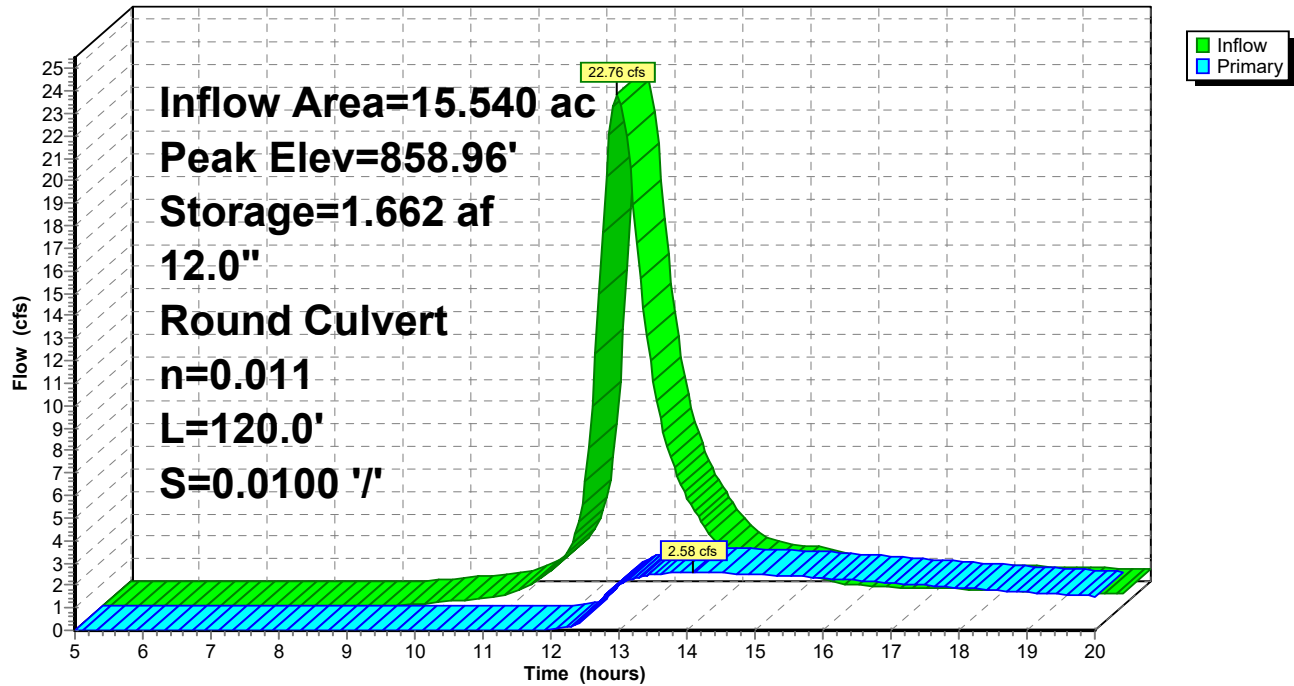
Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	12.0" Round RCP_Round 12" L= 120.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 856.80' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

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

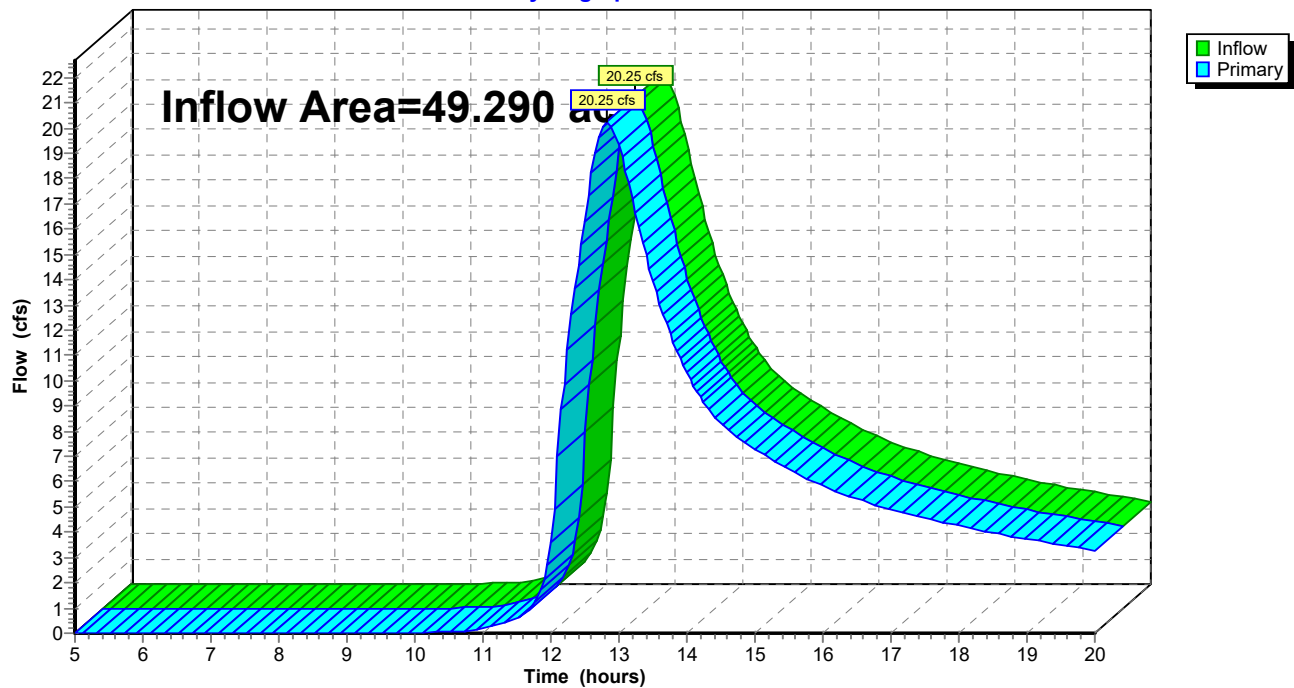
Hydrograph



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"*

Prepared by {enter your company name here}

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Page 82

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"

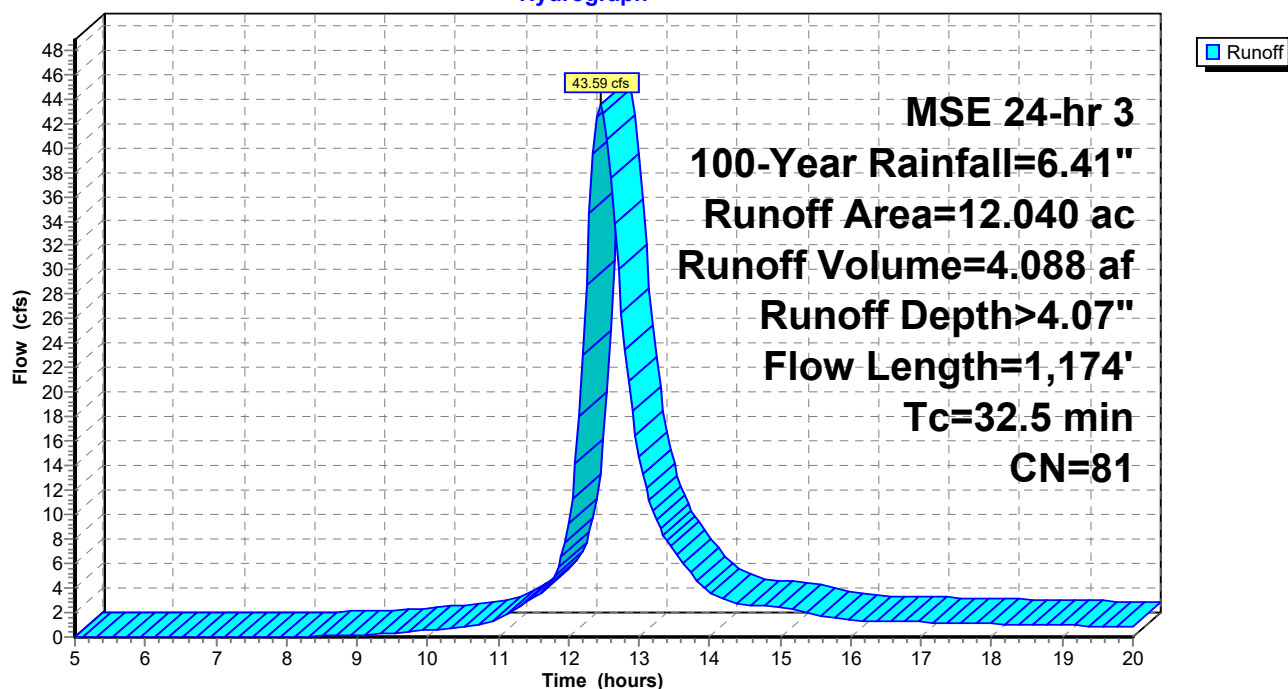
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.3	266	0.0131	1.03		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		Shallow Concentrated Flow, C-D Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		Shallow Concentrated Flow, D-E 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"

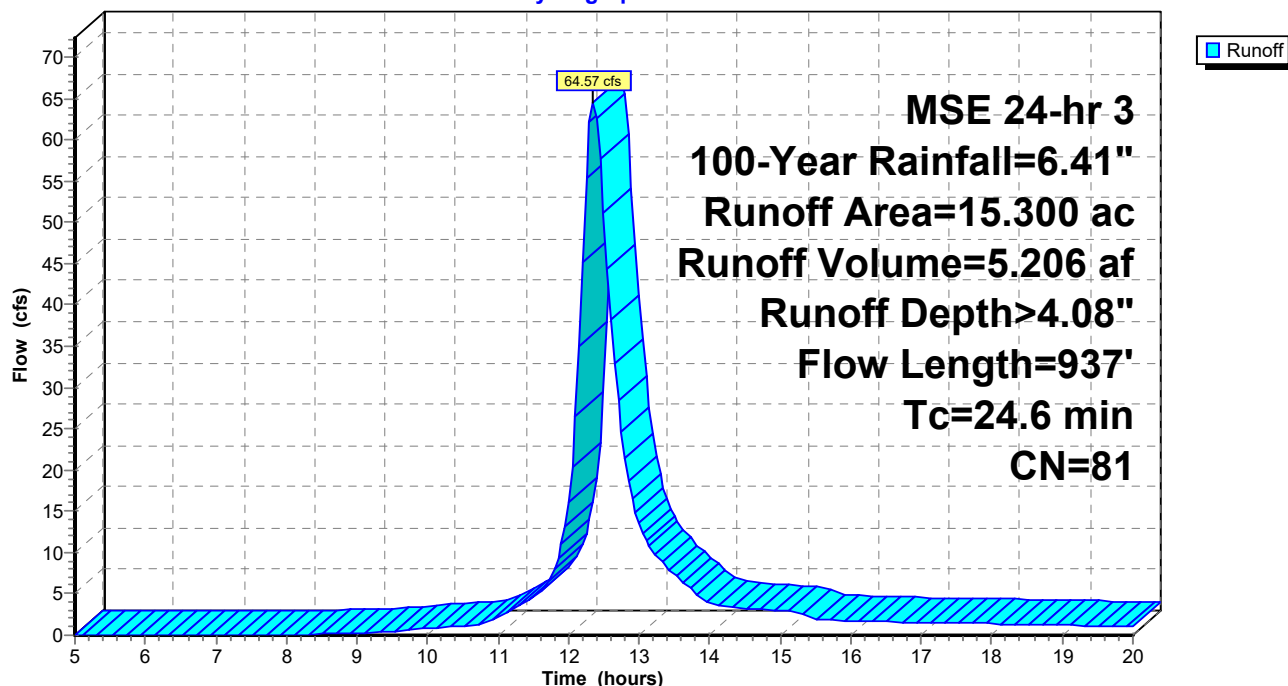
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
10.3	662	0.0142	1.07		Shallow Concentrated Flow, B-C 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"

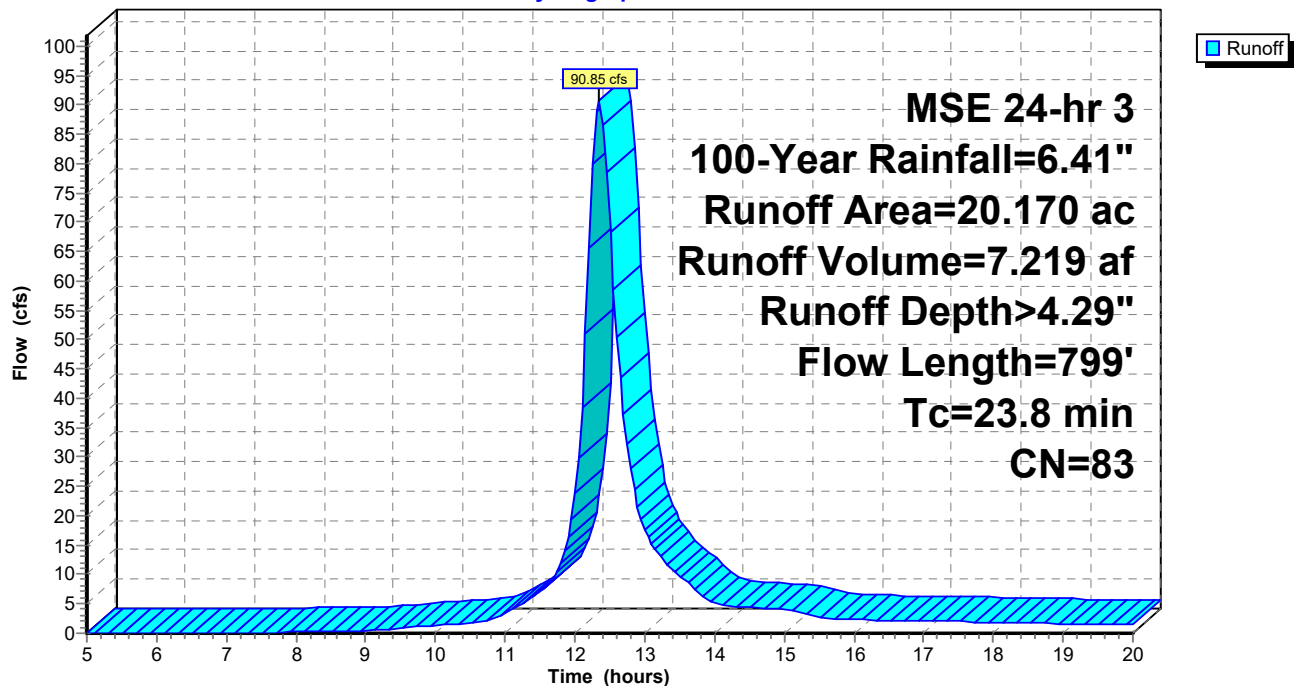
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
11.1	524	0.0077	0.79		Shallow Concentrated Flow, B-C 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"

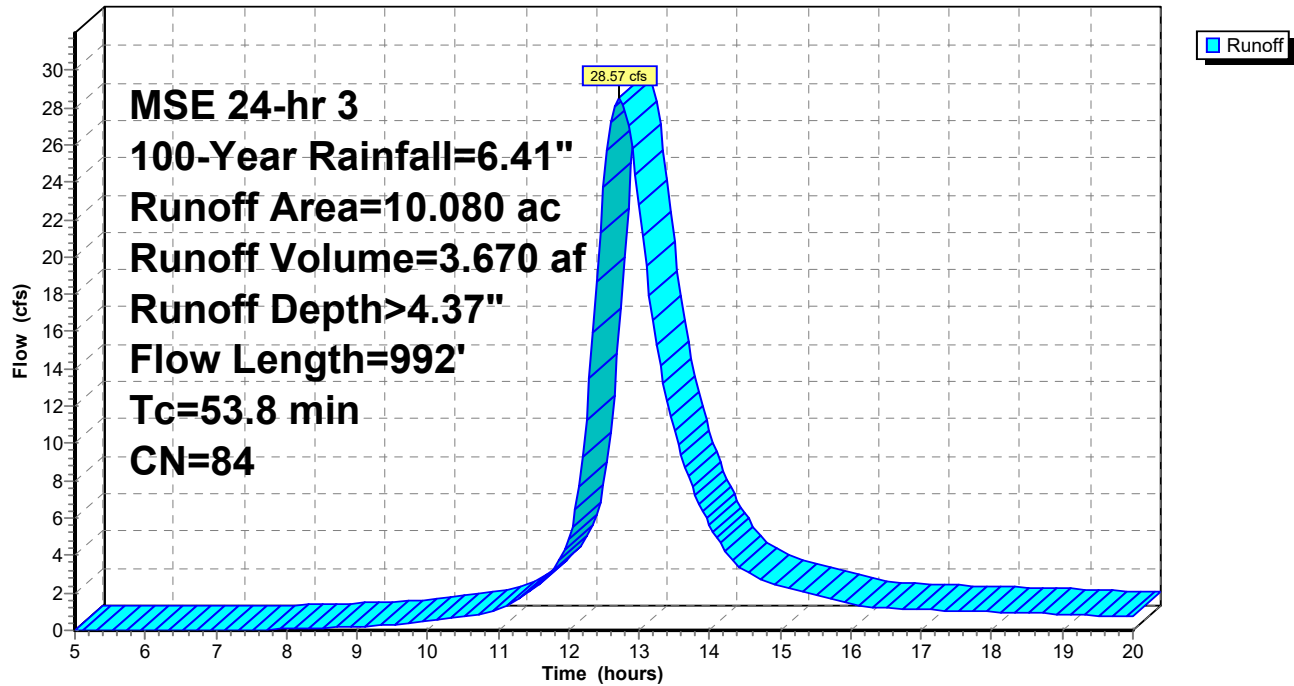
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 2.66"
23.2	730	0.0110	0.52	4.72	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, C-D 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"

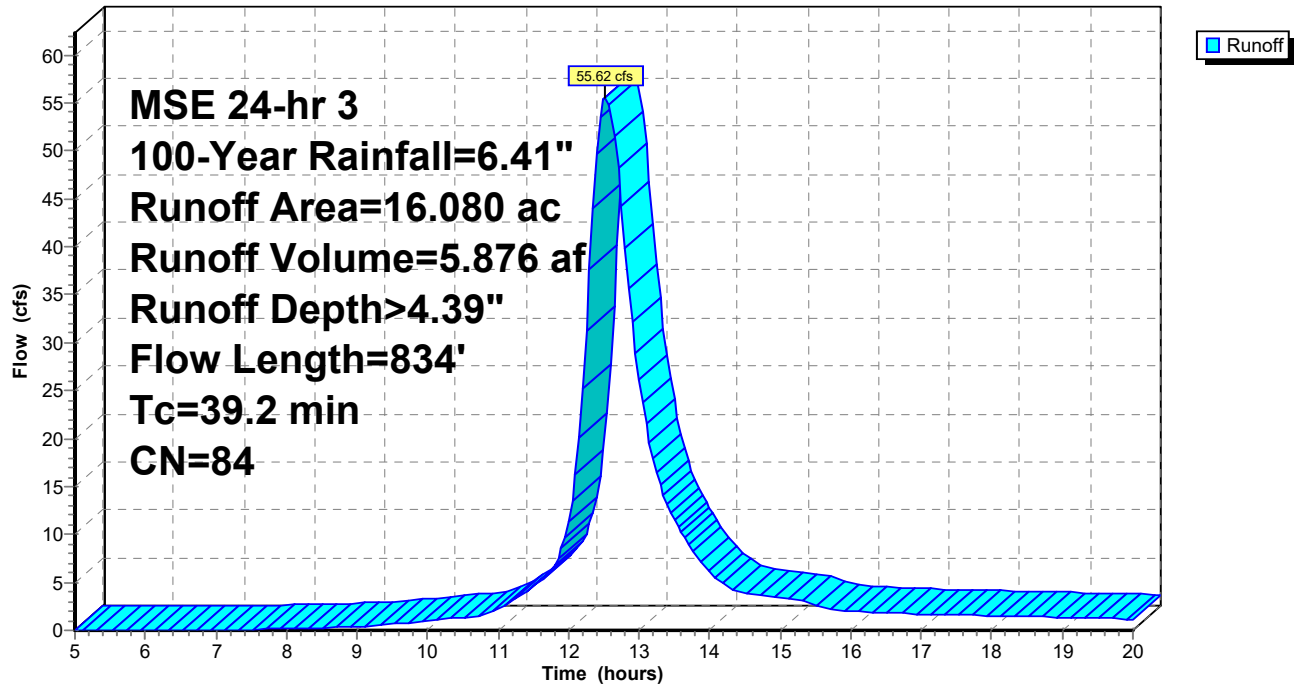
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-B Grass: Short n= 0.150 P2= 2.66"
4.5	154	0.0130	0.57	5.13	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
2.0	89	0.0210	0.72	6.52	Channel Flow, C-D Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.2	111	0.0140	8.31	14.69	Pipe Channel, D-E 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	Channel Flow, E-F Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, F-G 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	Channel Flow, G-H Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	43	0.0100	7.03	12.41	Pipe Channel, H-I 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"

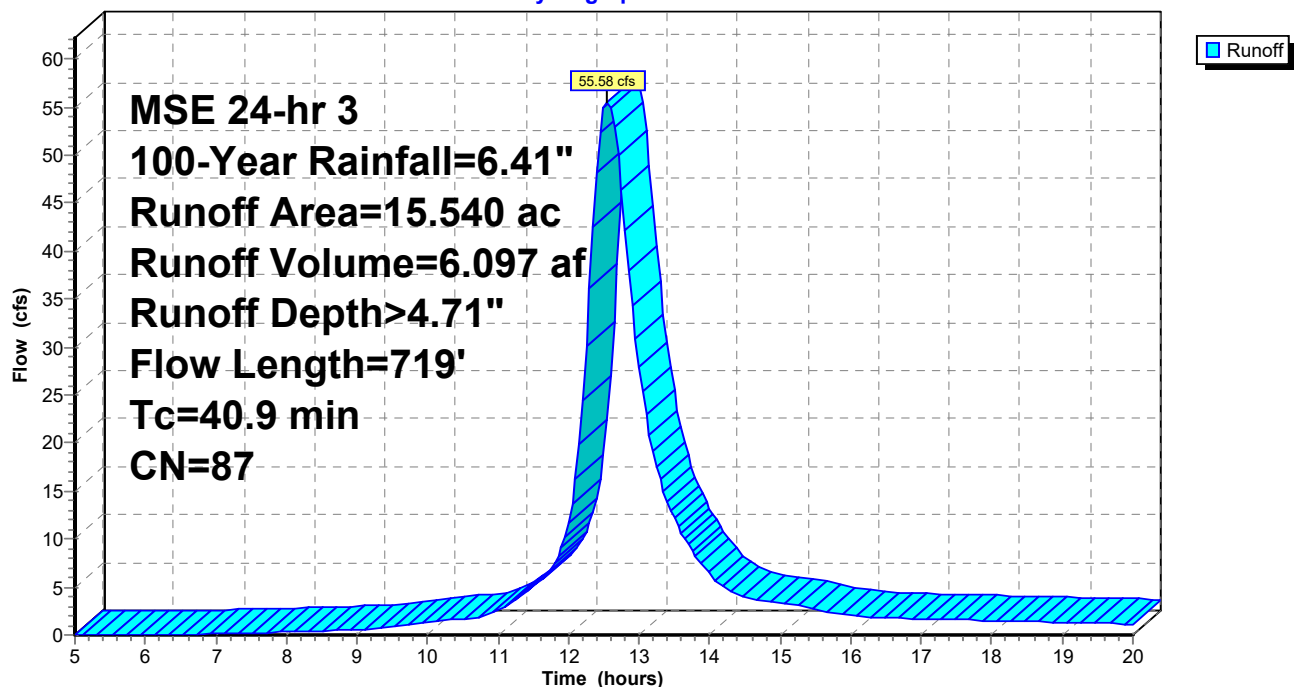
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 2.66"
19.2	576	0.0100	0.50	4.50	Channel Flow, B-C
					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"

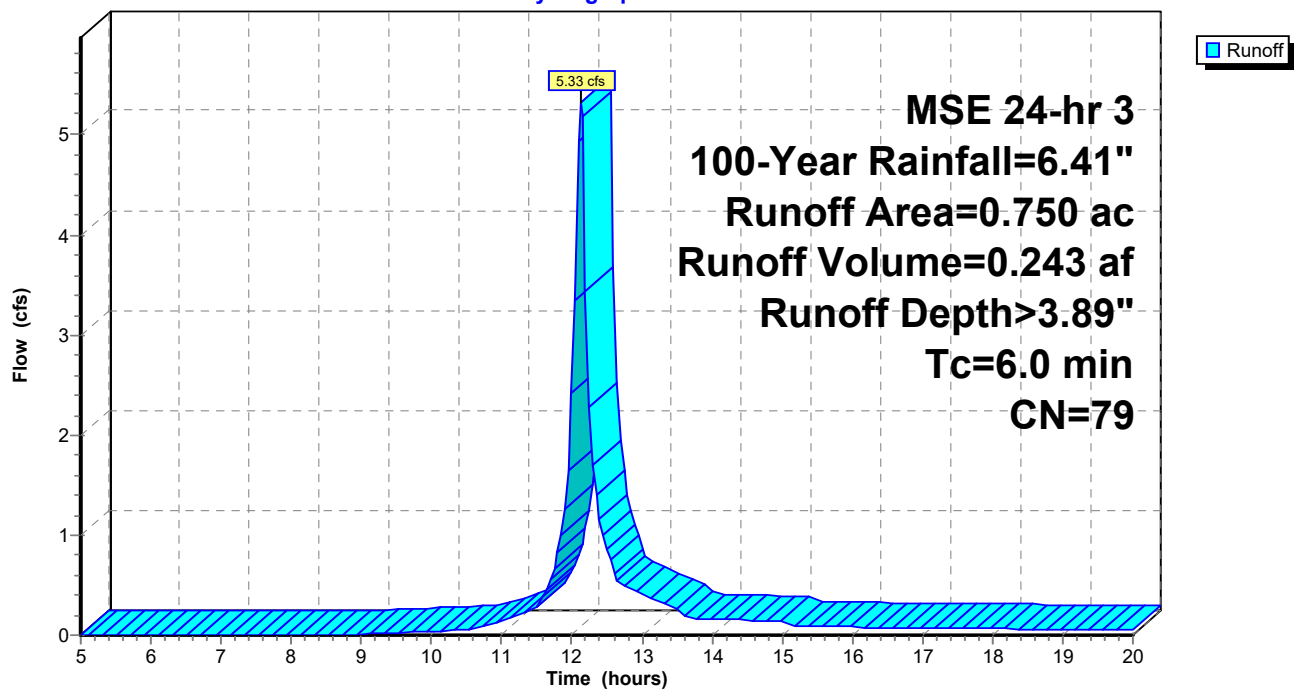
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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"

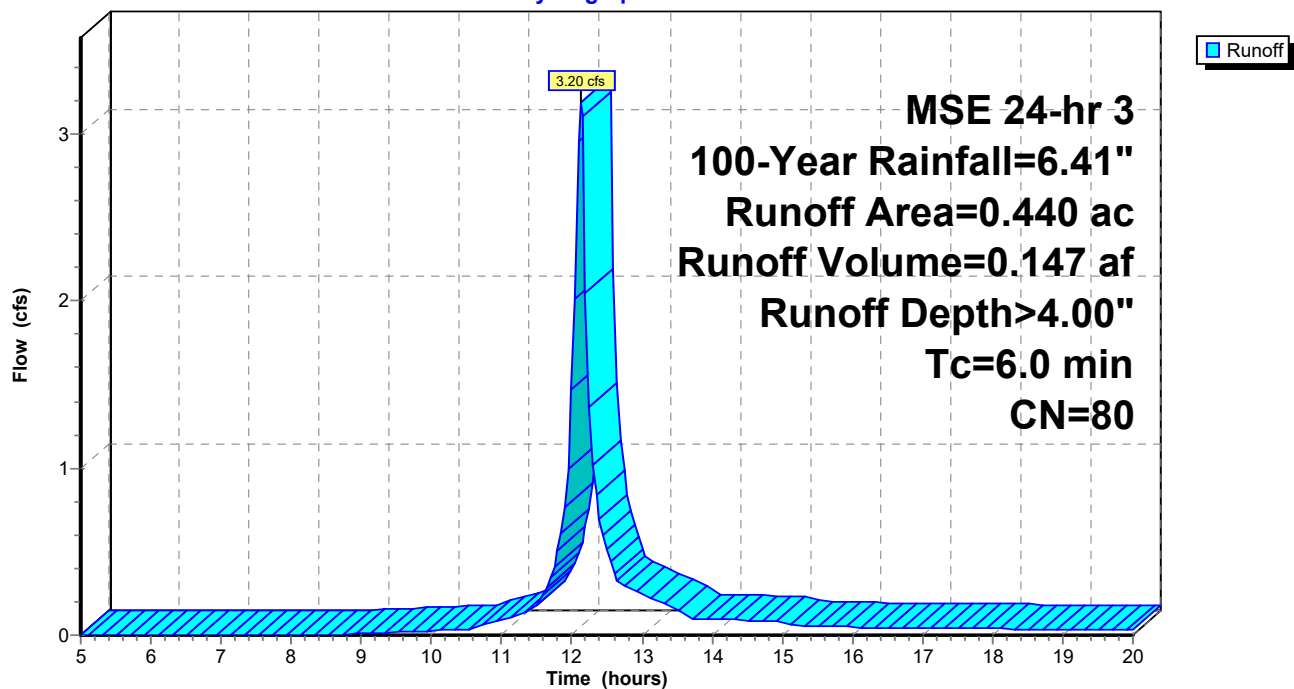
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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"

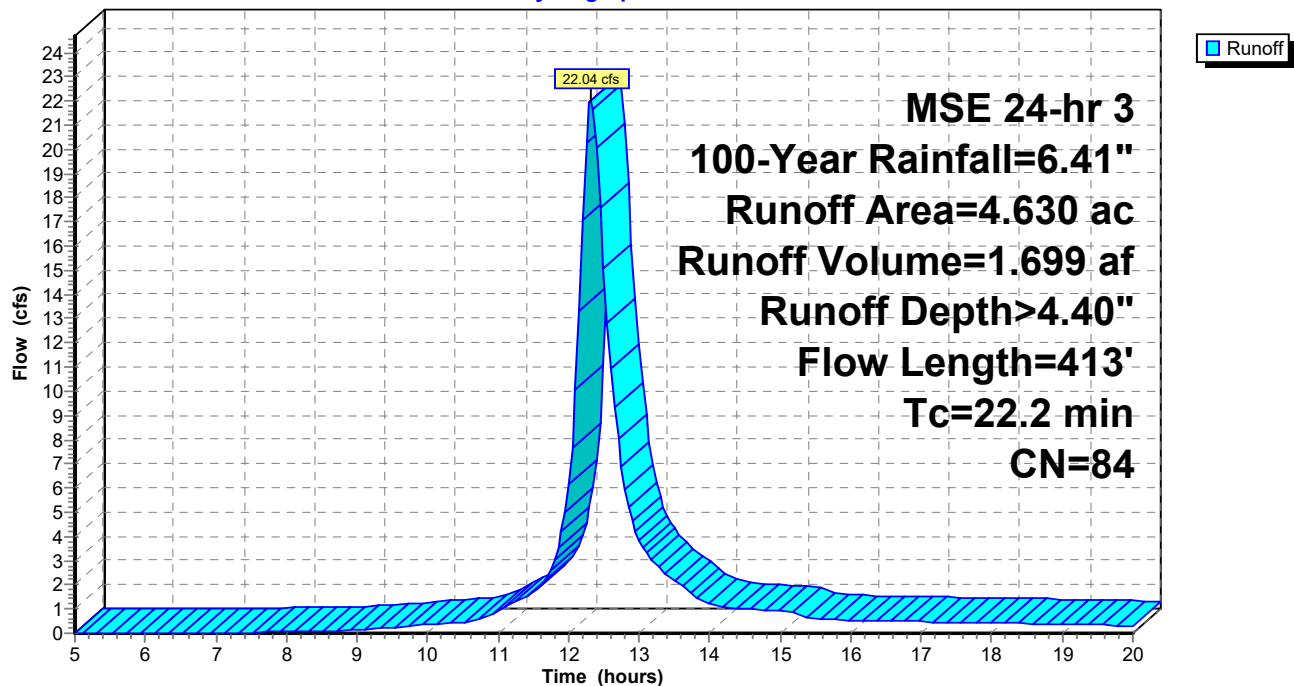
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-B
					Grass: Dense n= 0.240 P2= 2.66"
12.1	363	0.0100	0.50	4.50	Channel Flow, B-C
					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"

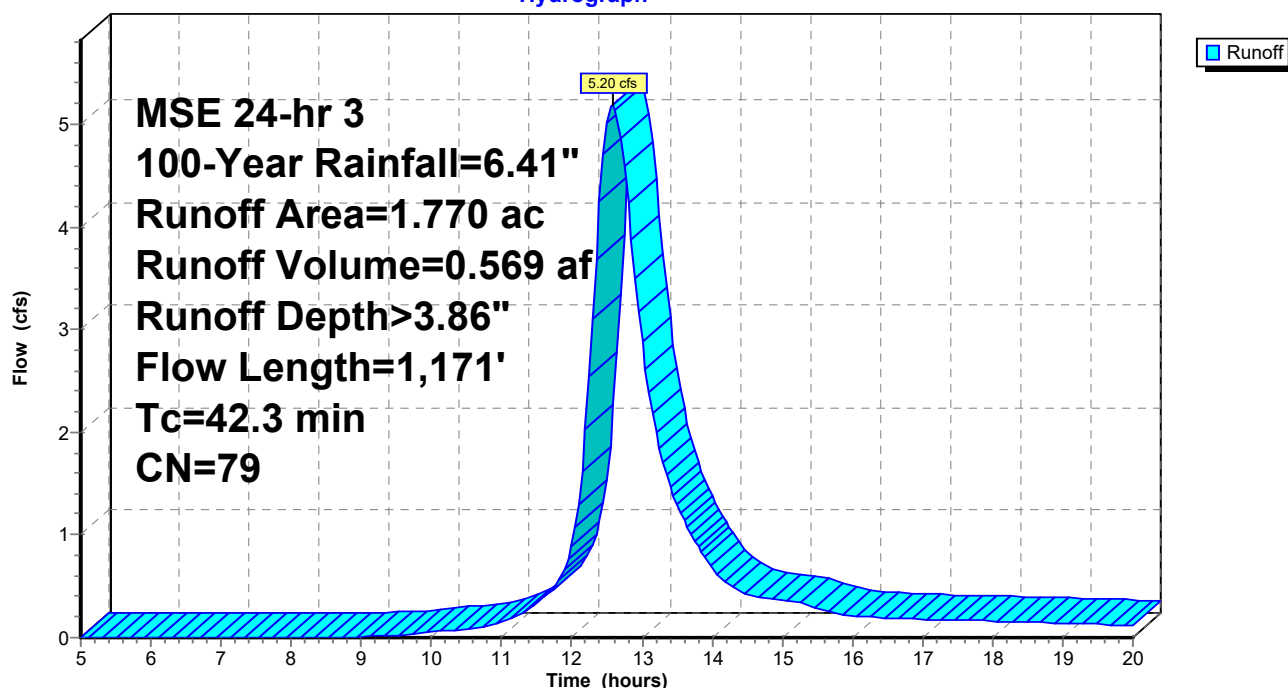
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-AA Grass: Short n= 0.150 P2= 2.66"
6.4	113	0.0150	0.29		Sheet Flow, AA-B Cultivated: Residue<=20% n= 0.060 P2= 2.66"
4.4	263	0.0120	0.99		Shallow Concentrated Flow, B-C Cultivated Straight Rows Kv= 9.0 fps
9.0	217	0.0020	0.40		Shallow Concentrated Flow, C-D Cultivated Straight Rows Kv= 9.0 fps
7.0	416	0.0120	0.99		Shallow Concentrated Flow, D-E 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"

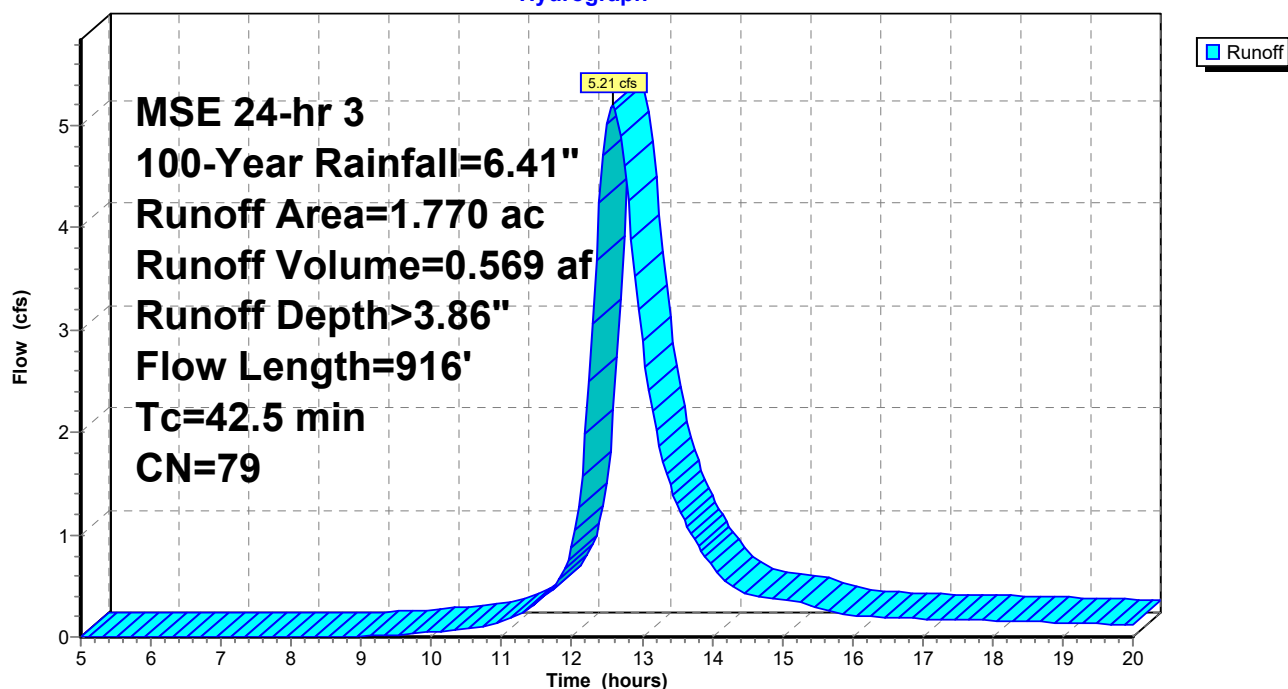
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.41"

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		Sheet Flow, A-AA Grass: Short n= 0.150 P2= 2.66"
6.7	45	0.0130	0.11		Sheet Flow, AA-B Grass: Short n= 0.150 P2= 2.66"
20.2	665	0.0120	0.55	4.93	Channel Flow, B-C Area= 9.0 sf Perim= 12.4' r= 0.73' n= 0.240
0.1	44	0.0100	7.03	12.41	Pipe Channel, C-D 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

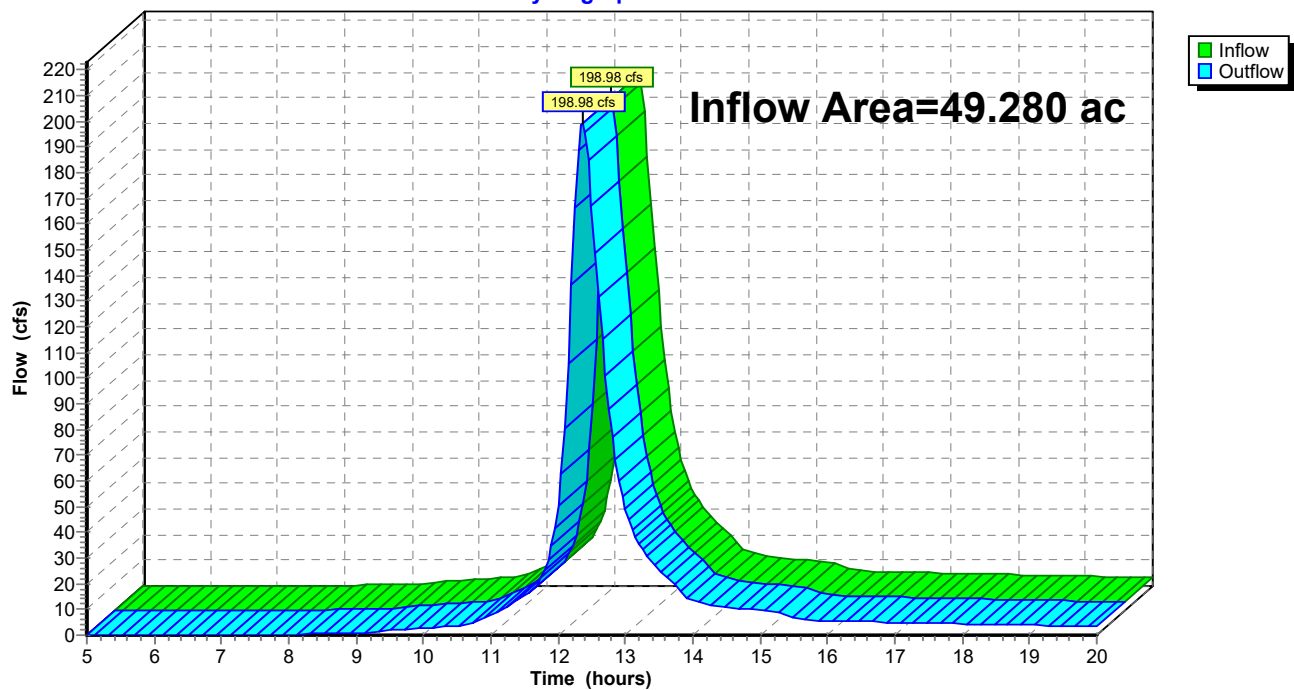
[40] Hint: Not Described (Outflow=Inflow)

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

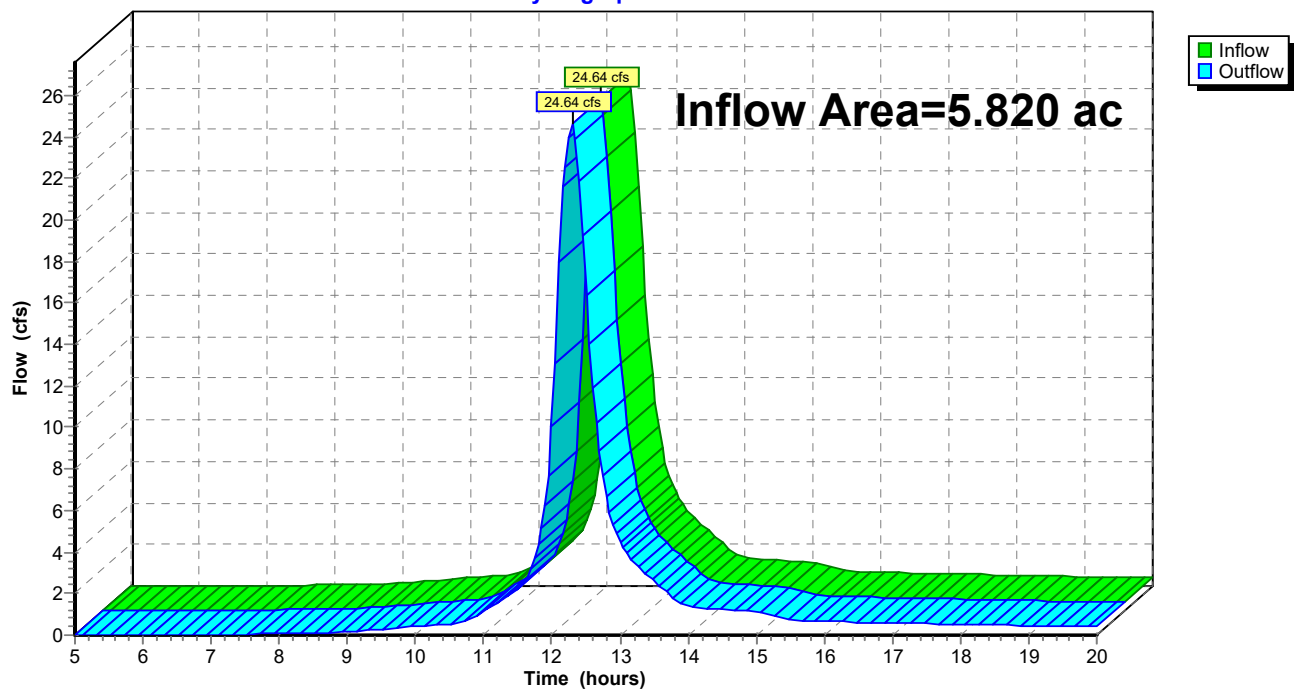
[40] Hint: Not Described (Outflow=Inflow)

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

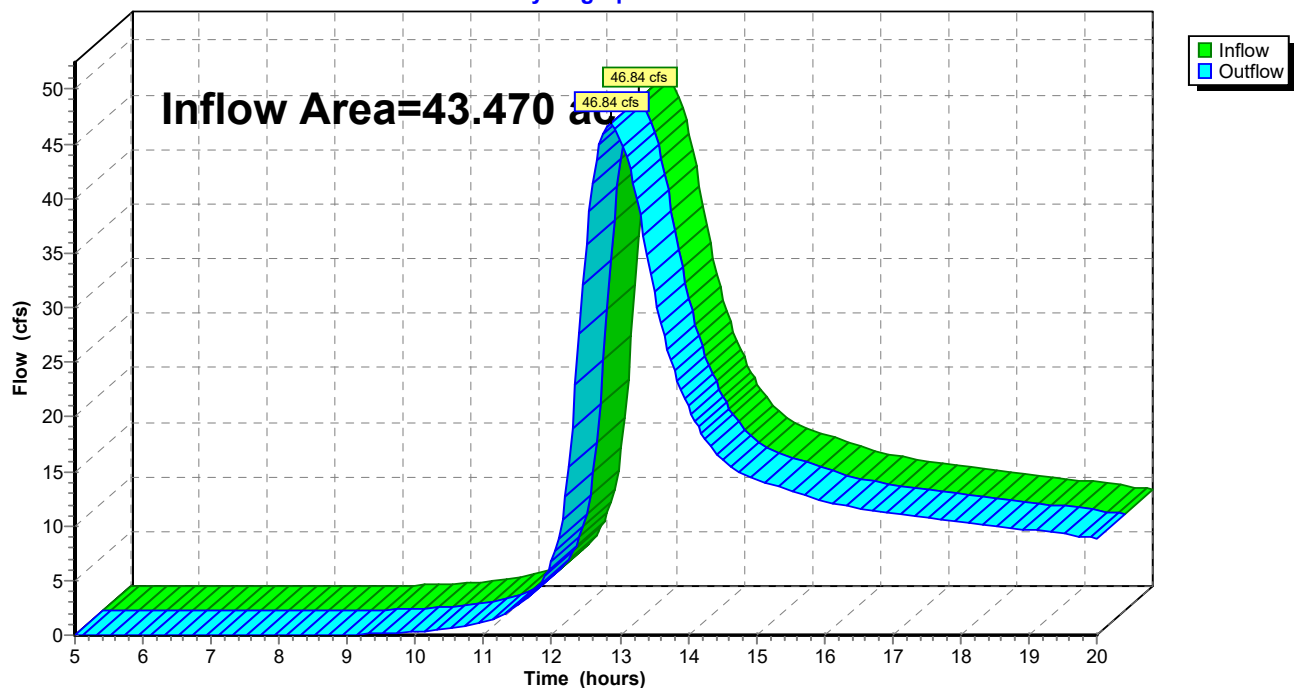
[40] Hint: Not Described (Outflow=Inflow)

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)

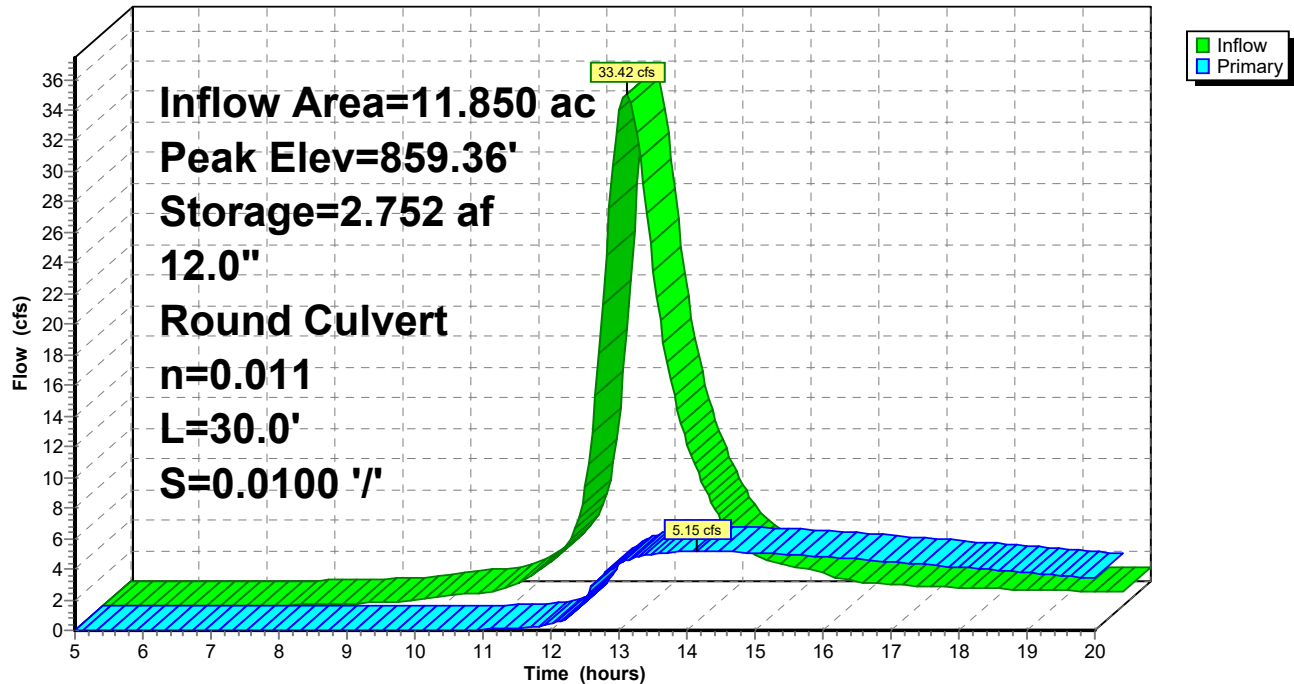
Volume	Invert	Avail.Storage	Storage Description
#1	857.00'	6.825 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
857.00	1.030	0.000	0.000
858.00	1.140	1.085	1.085
859.00	1.270	1.205	2.290
860.00	1.420	1.345	3.635
861.00	1.570	1.495	5.130
862.00	1.820	1.695	6.825

Device	Routing	Invert	Outlet Devices
#1	Primary	857.00'	12.0" Round RCP_Round 12" 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
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#1	856.00'	2.280 af	Custom Stage Data (Prismatic) 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
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#1	Primary	856.00'	24.0" Round Culvert 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'	24.0" Round Culvert 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

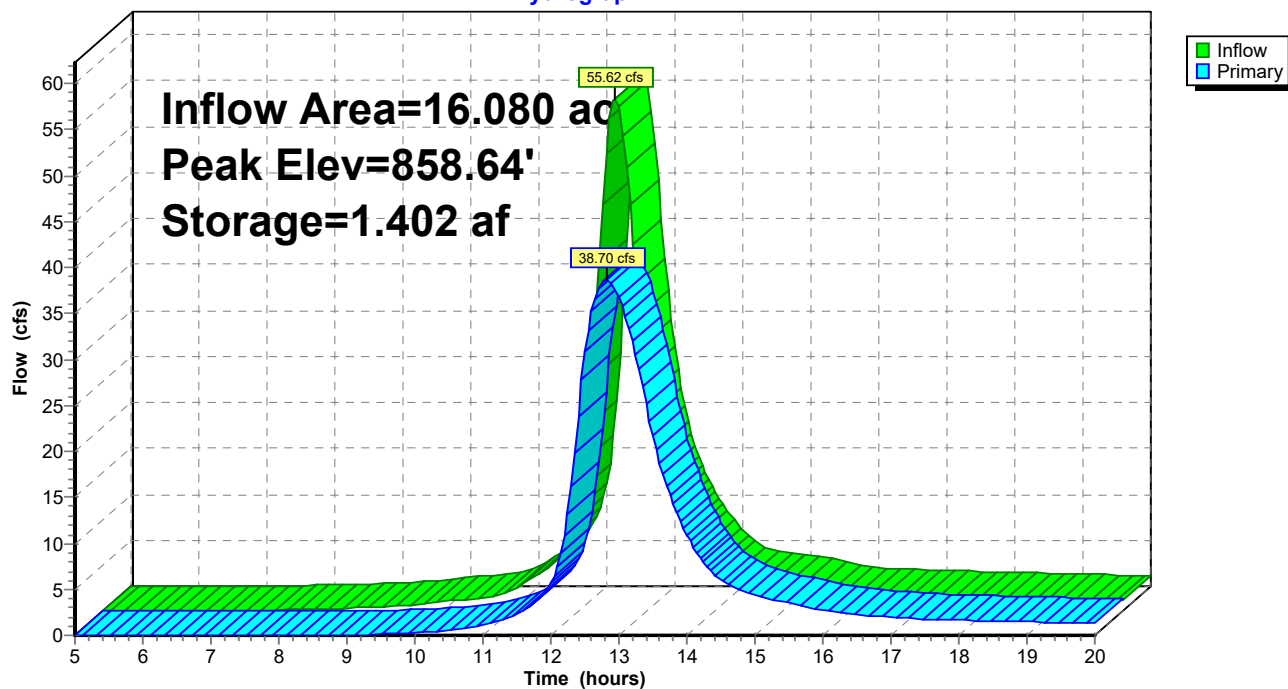
Primary OutFlow Max=38.66 cfs @ 12.81 hrs HW=858.63' (Free Discharge)

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	Custom Stage Data (Prismatic) 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
--------	---------	--------	----------------

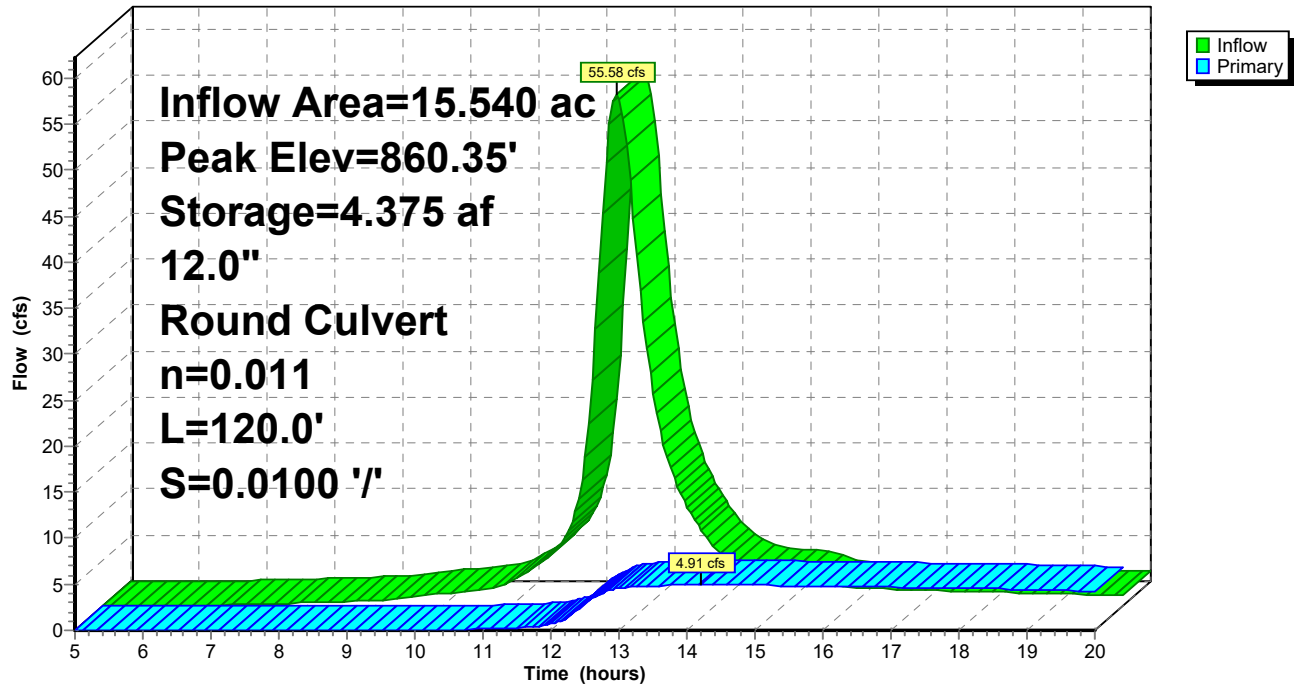
#1	Primary	858.00'	12.0" Round RCP_Round 12" L= 120.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 858.00' / 856.80' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
----	---------	---------	---

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



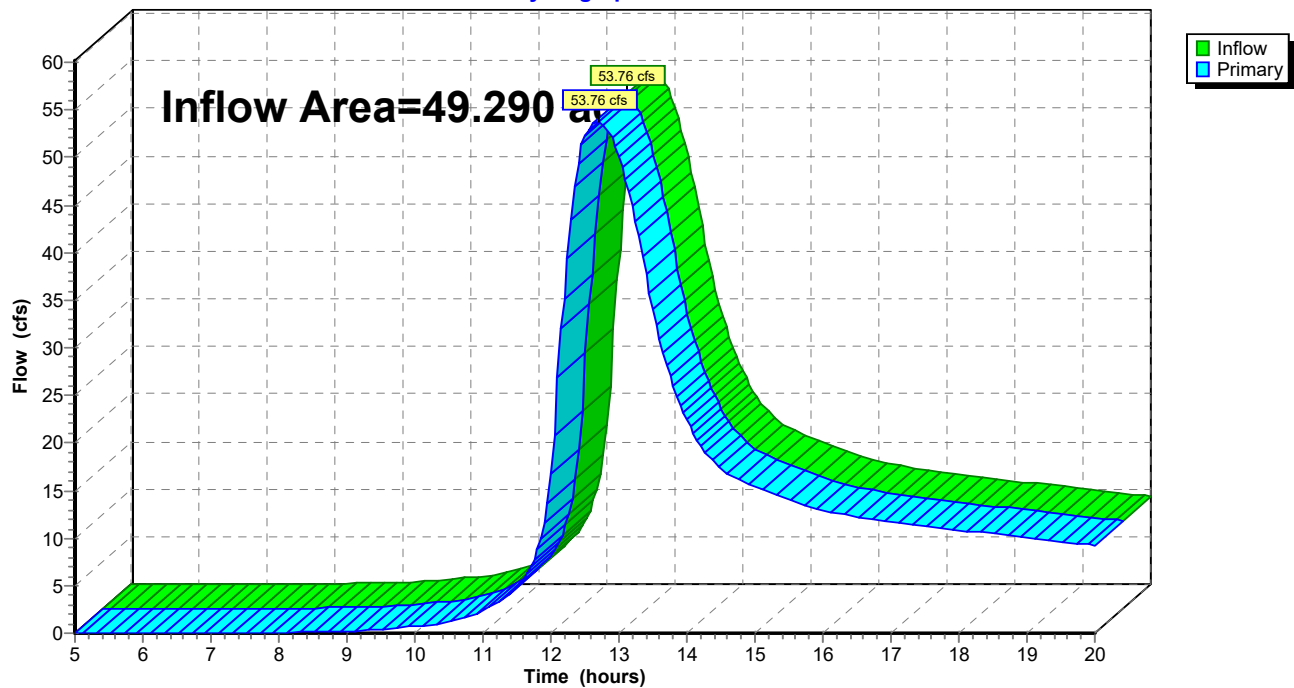
Summary for Link 10L: Post-Development

Inflow Area = 49.290 ac, 9.60% Impervious, Inflow Depth > 3.31" for 100-Year event

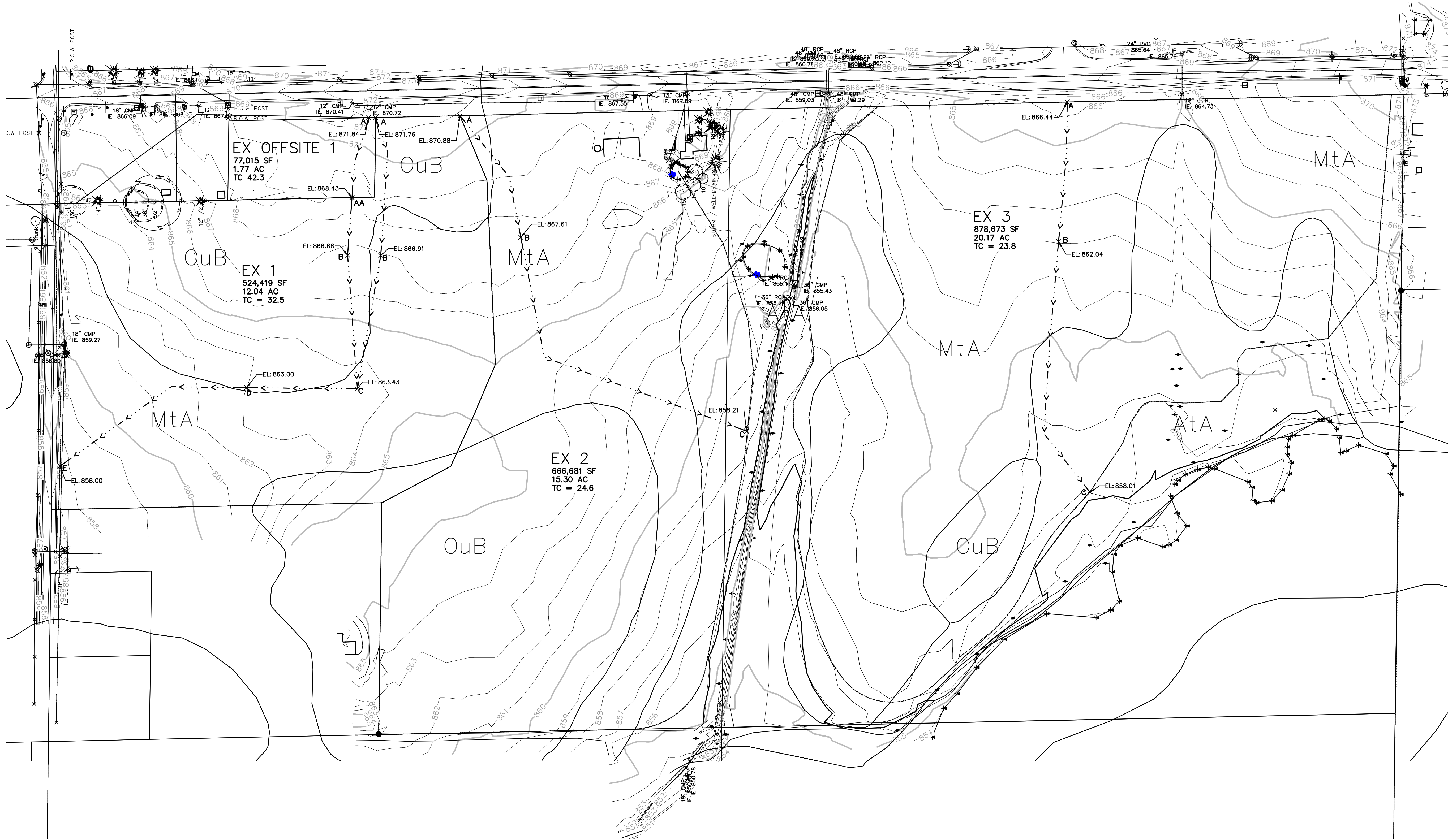
Inflow = 53.76 cfs @ 12.70 hrs, Volume= 13.582 af

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**

P:\3050195\3050195.01\dwg\EXHIBITS\3050195.01-HX.dwg, STORMWATER EXISTING, 7/1/2020 4:28:13 PM, jbm

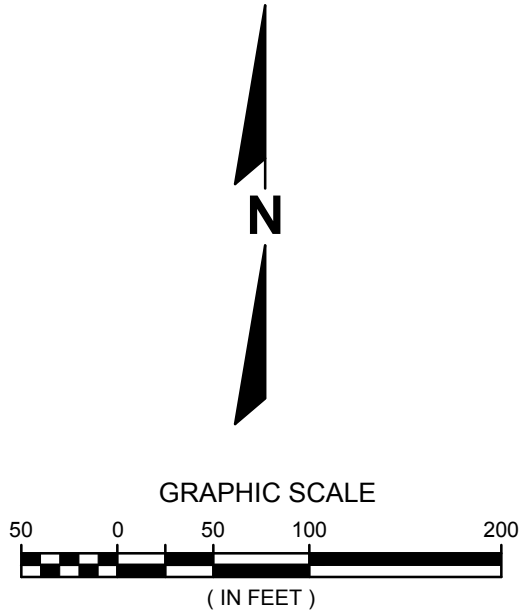


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DESCRIPTION	
DATE	
16745 W. Bluemound Road Brookfield, WI 53005-5938 (262) 781-1000 rasmith.com	
CREATIVITY BEYOND ENGINEERING	
Brookfield, WI Milwaukee, WI Appleton, WI Madison, WI Cedarburg, WI Mount Pleasant, WI Naperville, IL Irvine, CA	
MORNING MEADOWS SUBDIVISION VILLAGE OF JACKSON, WISCONSIN	
STORMWATER MANAGEMENT PLAN EXISTING 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	
SHEET NUMBER HX-EX	

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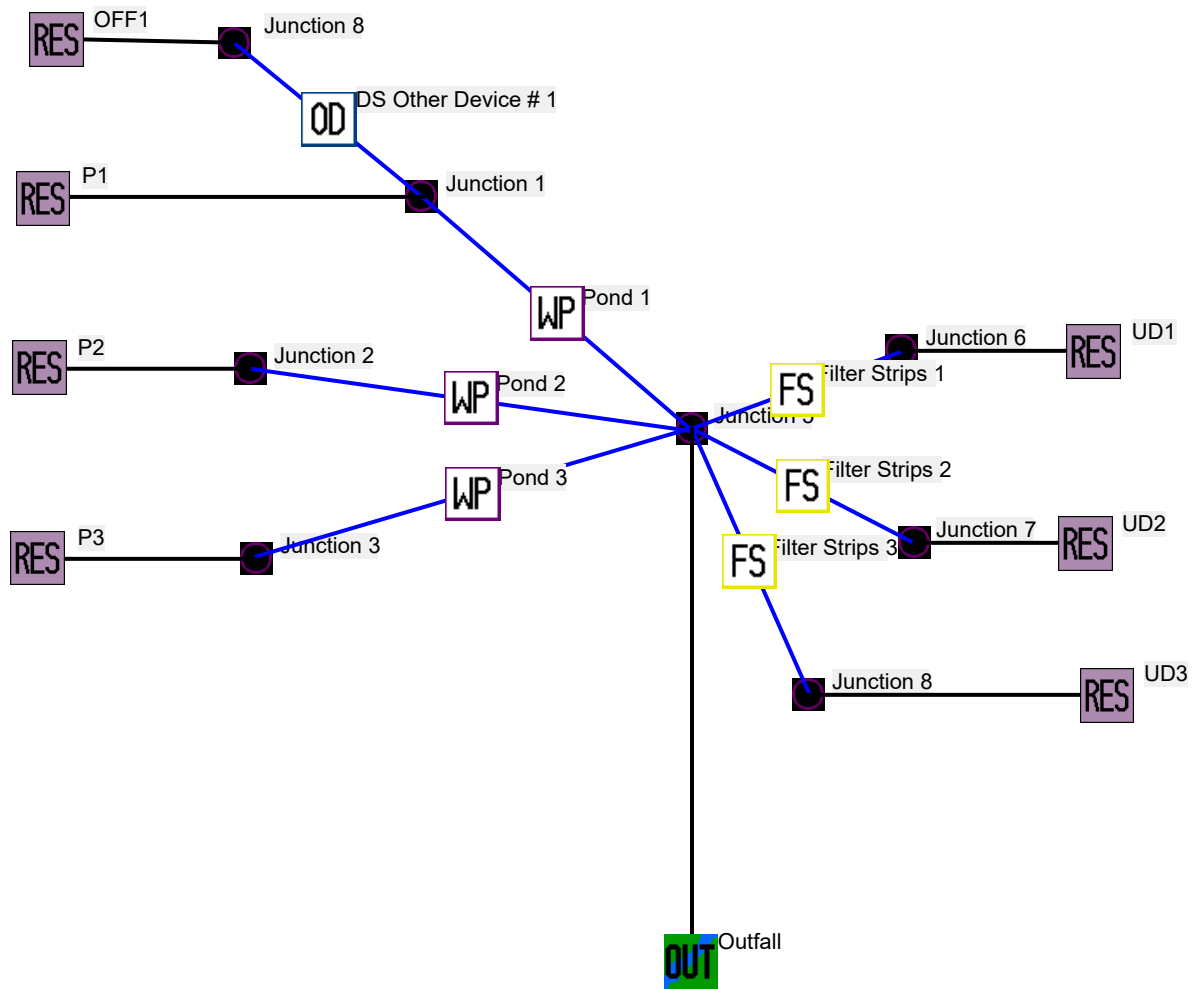
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DESCRIPTION	
DATE	
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MORNING MEADOWS SUBDIVISION VILLAGE OF JACKSON, WISCONSIN STORMWATER MANAGEMENT PLAN PROPOSED CONDITIONS	
© COPYRIGHT 2020 R.A. Smith, Inc. DATE: 02/27/2020 SCALE: 1" = 100' JOB NO. 3050195.01 PROJECT MANAGER: CHRIS D. HITCH, P.E. DESIGNED BY: DJM CHECKED BY: CDH SHEET NUMBER HX-PRO	

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\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

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

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

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations

Seed for random number generator: -42

Study period starting date: 01/05/69

Study period ending date: 12/31/69

Start of Winter Season: 12/02

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.ppdx

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

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

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations

Seed for random number generator: -42

Study period starting date: 01/05/69 Study period ending date: 12/31/69

Start of Winter Season: 12/02 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: <u>64.55</u> Acres | Immediate: <u>14.01</u> Acres |
| Density/acre: <u>3.45</u> | Population: <u>223</u> |

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://dnrmapping.wi.gov/SWViewer.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

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

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? ☒ Yes ☐ No ☐ N/A
- 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? ☐ Yes ☒ No
- i. If yes, list the location of all outside drops:
- 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

Sewer Specification Checklist

Form 3400-095 (R 4/17)

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 N/A

- ☒ ☐ 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). 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>

Wastewater System Approval Request

Form 3400-205 (R 4/17)

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
N168 W20733 Main Street		Village of Jackson	WI
Phone Number (include area code)		ZIP Code	
(262) 677-9001		53007	
Email Address			
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
16745 W. Bluemound Road		Brookfield	WI
Phone Number (include area code)		ZIP Code	
(262) 781-1000		53005	
Email Address			
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:		
☒ Sanitary Sewer Extension	☐ Municipal Treatment Plant	☐ Non-Domestic POWTS
☐ Sewer Replacement/Rehabilitation	☐ Industrial Treatment Plant	☐ Septage Storage Facility
☐ Lift Station	☐ Industrial Pretreatment Facility	☐ Large POWTS
☐ Force Main	☐ Other:	
☐ Clean Water Fund? Provide CWF Project Number if known:		
☐ Requesting Expedited Review (ONLY AVAILABLE FOR CERTAIN TYPES OF PROJECTS. See Instructions at our webpage here: Expedited Review)		

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

Village of Jackson

Name/Number of Project

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 TestLocation 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 PSIConversion of flow test to 500 GPM equivalent yields 500 GPM @ 89.4 PSI**Calculations**Location of critical hydrant: Road "A", 600' north of Sherman RoadDistance 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 PSICalculated 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 ¹ (inches)	Length ¹ (feet)	Street name and/or easement description [NR811.67]
8"	973	Road "A"

¹Note: 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)

Public Water System Approval Request

Form 3300-260 (R 12/16)

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

Jackson Water Utility

Water System Infrastructure Owned By: (select one)

- ☒ Government Entity (City, Village)
☐ Sanitary or Utility District
☐ Utility Commission
☐ 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

Diane Lemke, Water Utility Clerk

Name

Dan Rathke, Water Utility Supervisor

Street Address

N168 W20733 Main Street

Street Address

N168 W20733 Main Street

City

Jackson

State

WI

ZIP Code

53037

City

Jackson

State

WI

ZIP Code

53037

Phone Number

(262) 677-0707

Fax Number

Cell Number (optional)

Phone Number

(262) 677-0707

Fax Number

Cell Number (optional)

Email Address

utilityclerk@villageofjackson.com

Email Address

watersuper@villageofjackson.com

C. Designer/Constructor Information

Name

Dan Mazurkiewicz

Firm Name

R.A. Smith, Inc.

Street Address

16745 W. Bluemound Road

Phone Number

(262) 781-1000

Fax Number

Cell Number (optional)

City

Brookfield

State

WI

ZIP Code

53005

Email Address

dan.mazurkiewicz@rasmith.com

D. Project Location (As applicable)

☐ City ☐ Town ☒ 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

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 $Q_f = Q_t$

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 =	$-\left(\frac{Q_f}{Q_t}\right)^{1.85} \times (P_s - P_t) + P_s$
Residual pressure =	89.39 PSI @ 500 GPM

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

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

H_{f, 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

H_{f, 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

H_{f, 3} = 0.53 FEET

Total H _f =	4.11 FEET
H _f =	pressure in feet x 1 psi/2.31 feet
H _f =	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

Public Works Report

July 28, 2020

Treatment Plant - Designed Capacity – 1.67 million gallons per day
 Peak Flow Capacity – 6.0 million gallons per day

Year 2018

January	Avg. Flow 893,258 g.p.d.	Min. Flow 693,000 g.p.d.	Max. 1.541 MGD
February	Avg. Flow 1.072 MGD	Min. Flow 651,000 g.p.d.	Max. 2.476 MGD
March	Avg. Flow 1.011 MGD	Min. Flow 702,000 g.p.d.	Max. 1.365 MGD
April	Avg. Flow		
May	Avg. Flow 1.577 MGD	Min. Flow 982,000 g.p.d.	Max. 2.807 MGD
June	Avg. Flow 1.053 MGD	Min. Flow 703,000 g.p.d.	Max. 1.422 MGD
July	Avg. Flow 942,871 g.p.d.	Min. Flow 699,000 g.p.d.	Max. 1.228 MGD
August	Avg. Flow 1.342 MGD	Min. Flow 700,000 g.p.d.	Max. 3.93 MGD
September	Avg. Flow 1.608 MGD	Min. Flow 1.07 MGD	Max. 3.47 MGD
October	Avg. Flow 1.540 MGD	Min. Flow 960,000 g.p.d.	Max. 2.67 MGD
November	Avg. Flow 1.268 MGD	Min. Flow 940,000 g.p.d.	Max. 2.12 MGD
December	Avg. Flow 1.218 MGD	Min. Flow 880,000 g.p.d.	Max. 1.82 MGD

Year 2019

January	Avg. Flow 1.270 MGD	Min. Flow 900,000 g.p.d.	Max. 2.660 MGD
February	Avg. Flow 1.229 MGD	Min. Flow 850,000 g.p.d.	Max. 1.980 MGD
March	Avg. Flow 1.379 MGD	Min. Flow 910,000 g.p.d.	Max. 2.790 MGD
April	Avg. Flow 1.483 MGD	Min. Flow 1.020 MGD	Max. 2.660 MGD
May	Avg. Flow 1.542 MGD	Min. Flow 1.320 MGD	Max. 1.960 MGD
June	Avg. Flow 2.144 MGD	Min. Flow 1.300 MGD	Max. 2.700 MGD
July	Avg. Flow 1.251 MGD	Min. Flow 970,000 g.p.d.	Max. 1.850 MGD
August	Avg. Flow 1.098 MGD	Min. Flow 830,000 g.p.d.	Max. 1.470 MGD
September	Avg. Flow 1.253 MGD	Min. Flow 800,000 g.p.d.	Max. 2.050 MGD
October	Avg. Flow 1.699 MGD	Min. Flow 1.060 MGD	Max. 4.010 MGD
November	Avg. Flow 1.499 MGD	Min. Flow 1.14 MGD	Max. 2.26 MGD
December	Avg. Flow 1.372 MGD	Min. Flow 910,000 g.p.d.	Max. 2.14 MGD

Year 2020

January	Avg. Flow 1.280 MGD	Min. Flow 1.055 MGD	Max. 1.720 MGD
February	Avg. Flow 1.221 MGD	Min. Flow 1.000 MGD	Max. 1.630 MGD
March	Avg. Flow 1.581 MGD	Min. Flow 1.010 MGD	Max. 2.290 MGD
April	Avg. Flow 1.283 MGD	Min. Flow 940,000 g.p.d.	Max. 2.210 MGD
May	Avg. Flow 1.607 MGD	Min. Flow 1.010 MGD	Max. 4.090 MGD
June	Avg. Flow 1.178 MGD	Min. Flow 980,000 g.p.d.	Max. 1.510 MGD

Years Summary of Water Consumption

2006 Total Pumpage 207,719,000 gallons	2007 Total Pumpage 217,224,000 gallons
2008 Total Pumpage 229,613,000 gallons	2009 Total Pumpage 231,160,000 gallons
2010 Total Pumpage 239,326,000 gallons	2011 Total Pumpage 240,268,000 gallons
2012 Total Pumpage 253,492,000 gallons	2013 Total Pumpage 228,371,000 gallons
2014 Total Pumpage 230,973,000 gallons	2015 Total Pumpage 222,621,000 gallons
2016 Total Pumpage 254,531,000 gallons	2017 Total Pumpage 251,387,000 gallons
2018 Total Pumpage 241,322,000 gallons	2019 Total Pumpage 253,427,000 gallons

Year 2018

Jan.	Avg.	674,710 g.p.d.	Highest Day 831,000 gals.	Total	20,916,000 gallons
Feb.	Avg.	660,820 g.p.d.	Highest Day 762,000 gals.	Total	18,503,000 gallons
March	Avg.	646,810 g.p.d.	Highest Day 784,000 gals.	Total	20,051,000 gallons
April	Avg.	656,300 g.p.d.	Highest Day 1.122 MGD	Total	19,689,000 gallons
May	Avg.	682,065 g.p.d.	Highest Day 840,000 gals.	Total	21,144,000 gallons
June	Avg.	694,600 g.p.d.	Highest Day 891,000 gals.	Total	20,838,000 gallons
July	Avg.	759,160 g.p.d.	Highest Day 1.172 MGD	Total	23,534,000 gallons
August	Avg.	728,450 g.p.d.	Highest Day 963,000 gals.	Total	22,582,000 gallons
Sept	Avg.	605,200 g.p.d.	Highest Day 842,000 gals.	Total	18,156,000 gallons
Oct	Avg.	619,320 g.p.d.	Highest Day 896,000 gals.	Total	19,199,000 gallons
Nov	Avg.	596,000 g.p.d.	Highest Day 907,000 gals.	Total	17,880,000 gallons
Dec	Avg.	607,419 g.p.d.	Highest Day 785,000 gals.	Total	18,830,000 gallons

Year 2019

Jan.	Avg.	638,230 g.p.d.	Highest Day 791,000 gals.	Total	19,785,000 gallons
Feb.	Avg.	605,820 g.p.d.	Highest Day 758,000 gals.	Total	16,963,000 gallons
March	Avg.	616,230 g.p.d.	Highest Day 946,000 gals.	Total	19,103,000 gallons
April	Avg.	697,800 g.p.d.	Highest Day 1.112 MGD	Total	20,934,000 gallons
May	Avg.	707,810 g.p.d.	Highest Day 889,000 gals.	Total	21,942,000 gallons
June	Avg.	766,200 g.p.d.	Highest Day 969,000 gals.	Total	22,986,000 gallons
July	Avg.	843,710 g.p.d.	Highest Day 1.174 MGD	Total	26,155,000 gallons
August	Avg.	747,230 g.p.d.	Highest Day 1.061 MGD	Total	23,164,000 gallons
Sept	Avg.	689,300 g.p.d.	Highest Day 830,000 gals.	Total	20,679,790 gallons
Oct.	Avg.	696,520 g.p.d.	Highest Day 1.116 MGD	Total	21,592,000 gallons
Nov.	Avg.	643,970 g.p.d.	Highest Day 830,000 gals.	Total	19,319,000 gallons
Dec.	Avg.	671,100 g.p.d.	Highest Day 875,000 gals.	Total	20,805,000 gallons

Year 2020

Jan.	Avg.	662,650 g.p.d.	Highest Day 769,000 gals.	Total	20,542,000 gallons
Feb	Avg.	682,280 g.p.d.	Highest Day 886,000 gals.	Total	19,786,000 gallons
March	Avg.	702,030 g.p.d.	Highest Day 837,000 gals.	Total	21,763,000 gallons
April	Avg.	731,070 g.p.d.	Highest Day 1.153 MGD	Total	21,932,000 gallons
May	Avg.	691,030 g.p.d.	Highest Day 915,000 gals.	Total	21,422,000 gallons
June	Avg.	806,030 g.p.d.	Highest Day 1.057 MGD	Total	24,181,000 gallons

Pump Capacity - Well #1- 400 g.p.m. Well #3 -900 g.p.m. Well #4 - 1200 g.p.m. Well #5 – 1,100 g.p.m. Well #6 – 800 g.p.m.

WWTP – Holding & Septage Receiving

2005	\$ 87,562.01	2006	\$101,115.11	2007	\$152,201.07	2008	\$210,441.47
2009	\$183,815.34	2010	\$197,653.66	2011	\$220,576.28	2012	\$236,224.70
2013	\$235,336.46	2014	\$203,938.32	2015	\$210,644.47	2016	\$220,473.17
2017	\$232,358.23	2018	\$245,767.74	2019	\$219,822.80		

2018	Holdings (gals)	Grease (gals)	G Decant (gals)	Septage (gals)	S Decant (gals)	Total Billings
Jan	1,627,400			2,250	70,400	\$14,055.51
Feb	1,632,750			1,750	69,850	\$14,061.88
March	1,589,150			6,450	197,600	\$17,943.45
April	1,451,750			16,750	234,400	\$18,227.75
May	1,849,700			21,050	354,100	\$24,597.35
June	1,636,850			38,900	351,450	\$23,631.55
July	1,662,650			37,150	230,750	\$20,741.70
August	1,861,850			58,650	315,400	\$25,419.05
September	1,510,000			37,000	249,500	\$19,982.50
October	1,676,000			38,000	462,900	\$26,690.50
November	1,433,250			29,500	397,100	\$22,721.00
December	1,481,500			13,550	209,350	\$17,695.50

2019	Holdings (gals)	Grease (gals)	G Decant (gals)	Septage (gals)	S Decant (gals)	Total Billings
Jan	1,230,000			2,000	77,700	\$11,872.50
Feb	1,432,250			1,000	70,100	\$13,255.50
March	1,614,450			11,750	161,800	\$17,489.35
April	1,485,950			48,700	335,350	\$22,462.85
May	1,589,200			27,600	349,400	\$22,690.60
June	1,338,900			36,950	243,400	\$18,458.95
July	1,504,450			17,000	302,900	\$20,373.10
August	1,599,950			27,800	293,200	\$21,380.60
September	1,405,900			14,000	217,450	\$17,313.45
October	1,517,950			19,500	335,900	\$21,418.60
November	1,265,950			11,500	256,950	\$17,071.10
December	1,647,650			6,500	102,500	\$16,036.20

2020	Holdings (gals)	Grease (gals)	G Decant (gals)	Septage (gals)	S Decant (gals)	Total Billings
Jan	1,426,900				71,000	\$11,872.50
February	1,310,500			2,250	88,500	\$12,786.50
March	1,471,600	900		5,000	173,650	\$16,429.05
April	1,263,950			29,000	326,170	\$19,570.85
May	1,168,670			4,450	308,250	\$17,255.86
June	1,253,900			9,900	196,550	\$15,390.45

Rosewood Drive/TIF Expansion Project

Rosewood Apartments are being constructed. Streetlights and sidewalk on the north side of Rosewood Lane still need to be installed. A schedule is being created for the installation.

CTH P and STH 60 Intersection Project and old Park-n-Lot Property

Ownership has been determined to be WisDOT. An appraisal was completed by WisDOT, and the Village of Jackson is preparing a reply for the purchase of land.

Jackson Park Alley Project

The punch list has a few items remaining. Once completed the final pay request will be created.

Maplewood Farms

Maplewood Farms Subdivision Phase 1 has very wet sub-soil, and the grading cannot be completed until dewatering is done. The Developer is having a hydraulic study of ground water being done for the land. Results will not be done until August.

Morning Meadows Subdivision

The Developer is working to have construction started in 2020.

Laurel Springs Addition No. 1

Laurel Springs Subdivision has the first lift of asphalt installed. Streetlights and sidewalks are installed. Two early home starts have been issued. Once the final plat is approved, lots will be sold. Cedar Creek water main from Jackson Drive to Hidden Creek Court has been installed.

Trilogy Consulting - Study / Impact Fees

We are working on collection the necessary items for the study. The Park and Open Space Plan, and the bids from the new Police and Fire Building portion are items necessary for the impact fee study.

Jackson Municipal Complex

The new Jackson Municipal Complex site this week is still in major earth work happening. The pond is being dug. Onsite water main and storm sewer has been completed. Building underground plumbing is being installed. Footings are next.

Chateau Dr/Hickory Lane Reconstruction Project

The punch list has a few items remaining. Once completed the final pay request will be created.

Yard Waste Site

We have issued 52 cards so far, and one resident has lost their card with a twenty-dollar fee.

Spruce Street/Ridgeway Drive Extension Project

Water main in Ridgeway Drive has been installed. Sewer in Spruce Street is being worked on now. Working around the high-pressure gas main last slowed the installation.

Hunters Road Reconstruction Project and Highland Road Storm Sewer Project

Preconstruction meeting is being scheduled for Wednesday, August 5th. Onsite inspections for sanitary lateral televising and storm sewer lateral location has begun.

Respectfully submitted, Brian W. Kober, P.E.