

JRMFD2022-0028  
PSP2022-0031  
Review #8  
Received 9/9/2024

City of Rochester  
Hills Planning &  
Economic  
Development


**Site Plan Review**  
Reviewed for compliance with City Ordinance, Building and Fire Codes  
Conditions and mark-ups noted throughout plan set must be addressed prior to final approval

Department	Reviewer	Approved
Assessing	Assessing	Yes
Building	Jason Rhoades 248-841-2435 RhoadesJa@RochesterHills.org	Yes with conditions
Engineering - Utilities	Jason Boughton 248-841-2490 BoughtonJ@RochesterHills.org	Yes
Engineering Legal	Seth Bucholz 248-841-2491 bucholz@rochesterhills.org	YES Date: 09/23/2024
Fire	Capt. Ann Echols 248-841-2701 EcholsA@RochesterHills.org	Yes
Natural Resources	Matt Einheuser 248-841-2551 EinheuserM@RochesterHills.org	Yes
Planning	Chris McLeod 248-841-2572 mcleodc@RochesterHills.org	Yes
Traffic	Keith Depp 248-841-2503 DeppK@RochesterHills.org	Yes

Next Steps: Plans have been advertised for regular Planning Commission meeting of October 15, 2024.

Maintenance. The owner, tenant, occupant or person responsible for any property which was the subject of an approved site plan shall maintain the property and the improvements thereon in accordance with the approved site plan or an approved amendment thereof. This responsibility shall include the duty to maintain in a condition substantially similar as approved, including the duty to replace, if necessary, all improvements such as, but not by way of limitation, all greenbelts, planting, walls, fences, paving, trash receptacles, handicapped parking areas, etc.

**DESIGN ENGINEER/SURVEYOR**  
MONUMENT ENGINEERING GROUP ASSOCIATES, INC



INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS  
298 VETERANS DRIVE, FOWLERVILLE, MI 48836  
KEVIN C. MCDEVITT, PE  
PHONE: 517-223-3512

**CLIENT**  
AUBURN ANGARA OAKS, LLC  
14496 NORTH SHELDON ROAD, SUITE 230  
PLYMOUTH, MI 48170  
CONTACT: BRUCE MICHAEL  
PHONE: (248) 703-4653

**ARCHITECT**  
J. BRADLEY MOORE & ASSOCIATES, INC.  
4844 JACKSON ROAD STE 150  
ANN ARBOR, MI 48103  
PHONE: (734) 930-1500

**LANDSCAPE ARCHITECT**  
VERT VERDE LANDSCAPE ARCHITECTURE, LLC  
44960 ALBERT DRIVE  
PLYMOUTH, MI 48170  
JAMES GRAY, PLA  
PHONE: (734) 249-3568

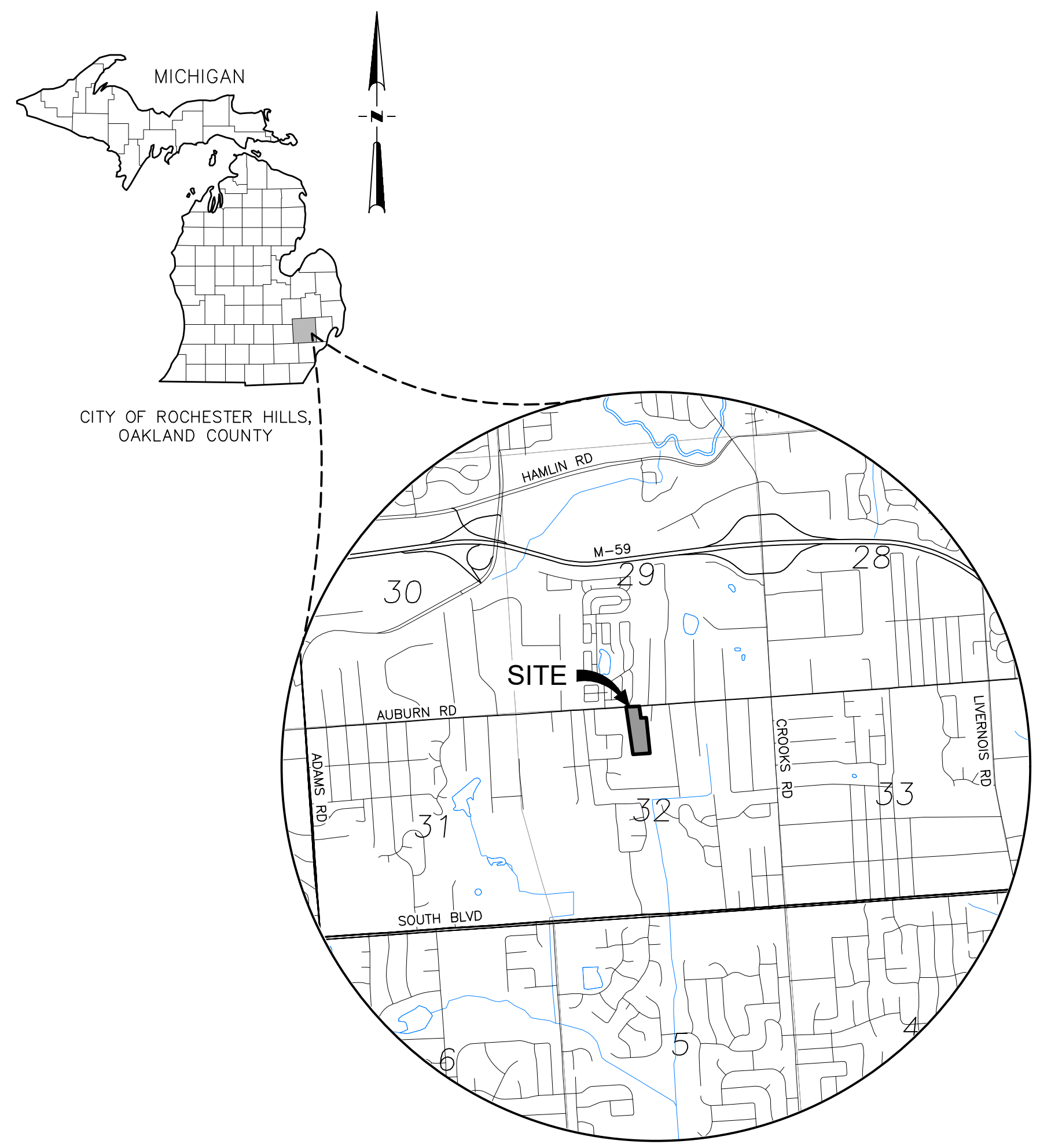
**SURVEYOR**  
REICHERT SURVEYING, INC.  
140 FLUMERFELT LANE  
ROCHESTER, MI 48306  
BRADLEY G. REICHERT, P.S.  
PHONE: (248) 651-0592

REICHERT SURVEYING, INC.  
140 FLUMERFELT LANE  
ROCHESTER, MI 48306  
BRADLEY G. REICHERT, P.S.  
PHONE: (248) 651-0592

- SP
- LIP
- TRP
- NFSM
- WP
- BP

ADM

# PRELIMINARY SITE PLAN DRAWING FOR AUBURN ANGARA OAKS



LOCATION MAP

NUMBER	PERMIT TYPE	GOVERNING AGENCY	APPROVAL DATE
--	PRELIMINARY SITE PLAN	ROCHESTER HILLS	XX/XX/XXXX
--	FIRE MARSHALL	ROCHESTER HILLS FD	XX/XX/XXXX
--	FINAL SITE PLAN	ROCHESTER HILLS	XX/XX/XXXX
--	CONSTRUCTION DOCUMENTS	ROCHESTER HILLS	XX/XX/XXXX
--	ENGINEERING/DRAINAGE REVIEW	ROCHESTER HILLS	XX/XX/XXXX
--	SOIL EROSION SEDIMENTATION CONTROL PERMIT	OAKLAND COUNTY WRC	XX/XX/XXXX
63042-086111-22	MDOT ROW PERMIT	MDOT	04/23/2024
--	JOINT PERMIT APPLICATION	EGLE	XX/XX/XXXX
--	ACT 399 PERMIT (WATER)	EGLE	XX/XX/XXXX
--	PART 41 PERMIT (SANITARY)	EGLE	XX/XX/XXXX

NOTE: BUILDING PERMITS (BUILDING, ELECTRICAL, PLUMBING, MECHANICAL, ETC.) ARE TRACKED SEPARATELY ON THE ARCHITECTURAL PLANS.

SHEET INDEX	PLAN SUBMITTALS												
	05/23/2022	11/11/2022	04/28/2023	08/23/2023	09/13/2023	1/22/2024	3/14/2024	3/28/2024	5/17/2024	7/24/2024	8/13/2024	9/4/2024	
	CONCEPT SUBMITTAL TO MDOT	PRELIMINARY SITE PLAN SUBMITTAL	REVISED SITE PLAN SUBMITTAL	REVISED SITE PLAN SUBMITTAL	RESUBMIT TO MDOT	REVISED SITE PLAN SUBMITTAL	REVISED SITE PLAN PER CITY AND MDOT	REVISED SITE PLAN PER MDOT	PRELIMINARY SITE PLAN TO CITY	REVISED SITE PLAN / WETLAND FLAGS	REVISED SITE PLAN / WETLAND FLAGS	REV PRELIMINARY SITE PLAN TO CITY	
<b>GENERAL</b>													
SHEET G-1.0 COVER													
<b>SURVEY</b>													
SHEET V-1.0 SITE SURVEY (BY REICHERT SURVEYING INC)													
SHEET V-1.1 TOPOGRAPHIC SURVEY - OFFSITE													
SHEET V-2.0 SOIL BORING LOGS													
SHEET V-2.1 SOIL BORING LOGS													
SHEET V-2.2 SOIL BORING LOGS													
<b>CIVIL DEMOLITION</b>													
SHEET CD-1.1 DEMOLITION PLAN - NORTH													
SHEET CD-1.2 DEMOLITION PLAN - SOUTH													
SHEET CD-1.3 DEMOLITION PLAN - OFFSITE													
<b>SITE PLAN</b>													
SHEET C-1.0 SITE PLAN - OVERVIEW													
SHEET C-1.1 SITE PLAN - BUILDING DATA													
SHEET C-1.2 DIMENSION AND PAVING PLAN - NORTH													
SHEET C-1.3 DIMENSION AND PAVING PLAN - SOUTH													
<b>SITUATIONAL PLANS</b>													
SHEET C-2.1 FIRE PROTECTION PLAN													
SHEET C-2.2 CODE ANALYSIS													
SHEET C-2.3 WETLAND PLAN													
SHEET C-2.4 WETLAND CROSS SECTIONS													
<b>UTILITY</b>													
SHEET C-3.1 SANITARY & WM PLAN - NORTH													
SHEET C-3.2 SANITARY & WM PLAN - SOUTH													
SHEET C-3.3 SANITARY & WM PLAN - OFFSITE													
SHEET C-3.4 SANITARY SEWER PROFILES													
SHEET C-3.5 SANITARY SEWER PROFILES													
SHEET C-3.6 SANITARY SEWER PROFILES													
SHEET C-6.1 STORM SEWER PLAN - NORTH													
SHEET C-6.2 STORM SEWER PLAN - SOUTH													
SHEET C-6.3 ANGARA DRIVE / STORM SEWER PROFILES													
SHEET C-6.4 ANGARA DRIVE / STORM SEWER PROFILES													
SHEET C-6.5 STORM SEWER PROFILES													
SHEET C-6.6 STORM SEWER PROFILES													
<b>GRADING</b>													
SHEET C-7.1 GRADING PLAN - NORTH													
SHEET C-7.2 GRADING PLAN - SOUTH													
SHEET C-7.3 GRADING PLAN - OFFSITE													
<b>SOIL EROSION &amp; SEDIMENTATION CONTROL (SESC)</b>													
SHEET C-8.1 SESC PLAN - NORTH													
SHEET C-8.2 SESC PLAN - SOUTH													
SHEET C-8.3 SESC PLAN - OFFSITE													
SHEET C-8.4 OAKLAND COUNTY SESC NOTES AND DETAILS													
<b>STORM WATER MANAGEMENT</b>													
SHEET C-9.0 DRAINAGE AREA PLAN													
SHEET C-9.1 STORM WATER CALCULATIONS													
SHEET C-9.2 DETENTION BASIN DETAILS													
<b>ROAD PLANS</b>													
SHEET C-10.0 AUBURN ROAD TYPICAL SECTIONS													
SHEET C-10.1 MOT TYPICALS AND NOTES													
SHEET C-10.2 MOT PLAN													
SHEET C-10.3 EXISTING CONDITIONS AND REMOVAL PLAN													
SHEET C-10.4 CONSTRUCTION PLAN													
SHEET C-10.5 GRADING AND SESC PLAN													
SHEET C-10.5 PAVEMENT MARKING AND SIGNAGE PLAN													
<b>DETAILS</b>													
SHEET C-11.0 DETAILS													
SHEET C-11.1 RETAINING WALL DETAILS													
SHEET C-11.2 MDOT R-28													
SHEET C-11.3 MDOT R-29													
<b>SPECIFICATIONS</b>													
SHEET C-12.0 SPECIFICATIONS													
SHEET C-12.1 SPECIFICATIONS													
<b>LANDSCAPE</b>													
SHEET L-1 TREE REMOVAL AND PRESERVATION PLAN NORTH													
SHEET L-2 TREE REMOVAL AND PRESERVATION PLAN SOUTH													
SHEET L-3 TREE LIST													
SHEET L-4 LANDSCAPE PLAN NORTH													
SHEET L-5 LANDSCAPE PLAN SOUTH													
SHEET L-6 ENLARGEMENTS AND LANDSCAPE DETAILS													


CITY OF ROCHESTER HILLS, OAKLAND COUNTY STANDARD DETAILS

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS



298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)



KEVIN C. MCDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Michigan's One-Call  
Utility Notification Organization  
1-800-482-7171  
www.missdig.org

THE LOCATIONS AND DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE INDIVIDUALLY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, DEPTHS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :  
**AUBURN ANGARA OAKS, LLC**  
14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**COVER**  
AUBURN ANGARA OAKS  
PART OF SEC. 32, T3N, R1E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	PLAN SUBMITTALS/REVISIONS
09/13/2023	RESUBMIT TO MDOT
01/27/2024	REVISED SITE PLAN SUBMITTAL
03/14/2024	REVISED SITE PLAN PER CITY AND MDOT
03/28/2024	REVISED SITE PLAN PER MDOT
05/17/2024	PRELIMINARY SITE PLAN TO CITY
07/24/2024	REVISED SITE PLAN / WETLAND FLAGS
08/13/2024	REVISED SITE PLAN / WETLAND FLAGS
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

SCALE: N/A  
0 1/2" = 1"

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**G-10**

NOT FOR CONSTRUCTION



# SITE SURVEY

**LEGAL DESCRIPTION:**  
**PARCEL "1":**  
 LOTS 10 AND 13, SUPERVISOR'S P.O.F GRANT M. JOHN'S SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN L.54A OF PLATS, PAGE(S) 61, O.C.R.

**PARCEL "2":**  
 LOT 11, SUPERVISOR'S PLAT OF GRANT M. JOHN'S SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 54A OF PLATS, PAGE(S) 61, OAKLAND COUNTY RECORDS.

**PARCEL "3":**  
 LOT 12, SUPERVISOR'S P.O.F GRANT M. JOHN'S SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN L.54A OF PLATS, PAGE(S) 61, O.C.R.

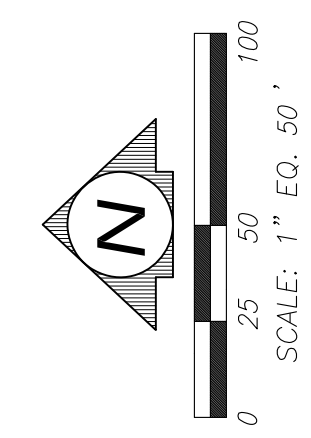
**PARCEL "4":**  
 LOT 15 AND THE SOUTH 28 FEET OF LOT 14, TOGETHER WITH AN EASEMENT FOR INGRESS AND EGRESS IN THE EAST 12 FEET OF LOT 14, SUPERVISOR'S P.O.F GRANT M. JOHN'S SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN L.54A OF PLATS, PAGE(S) 61, O.C.R.

**AS TO PARCEL "1"**  
 11. EASEMENTS OVER SUBJECT PROPERTY AS SHOWN ON 11. THE RECORDED PLAT.  
 12. TERMS AND CONDITIONS OF RIGHT OF WAY AS RECITED IN INSTRUMENT RECORDED IN L.1301, P.227, O.C.R.  
 13. TERMS AND CONDITIONS OF PEDESTRIAN BICYCLE PATH EASEMENT AND CONVEYANCE AS RECITED IN INSTRUMENT RECORDED IN L.8692, P.391, O.C.R.  
 14. TERMS AND CONDITIONS OF WATER EASEMENT AND CONVEYANCE AS RECITED IN INSTRUMENT RECORDED IN L.8237, P.691, O.C.R.  
 15. TERMS AND CONDITIONS OF ORDER OF NECESSITY AS RECITED IN INSTRUMENT RECORDED IN L.7398, P.469, O.C.R.

**AS TO PARCEL "2"**  
 11. TERMS AND CONDITIONS OF ORDER OF DEFAULT AND RIGHT OF ENTRY AS RECITED 11. IN INSTRUMENT RECORDED IN L.7187, P.685, O.C.R.  
 12. EASEMENTS OVER SUBJECT PROPERTY AS SHOWN ON THE RECORDED PLAT.  
 13. TERMS AND CONDITIONS OF PEDESTRIAN/BICYCLE PATHWAY EASEMENT AS RECITED IN INSTRUMENT RECORDED IN L.11290, P.859, O.C.R.

**AS TO PARCEL "3"**  
 12. EASEMENTS OVER SUBJECT PROPERTY AS SHOWN ON 12. THE RECORDED PLAT.  
 13. TERMS AND CONDITIONS OF RIGHT OF WAY AS RECITED IN INSTRUMENTS RECORDED IN L.1301, P.227, L.2004, P.484, L.2736, P.268, O.C.R.  
 14. TERMS AND CONDITIONS OF PEDESTRIAN BICYCLE PATH EASEMENT AND CONVEYANCE AS RECITED 14. IN INSTRUMENT RECORDED IN L.8692, P.391, O.C.R.  
 15. TERMS AND CONDITIONS OF WATER EASEMENT AND CONVEYANCE AS RECITED IN INSTRUMENT RECORDED IN L.8237, P.691, O.C.R.  
 16. TERMS AND CONDITIONS OF ORDER OF NECESSITY AS RECITED IN INSTRUMENT RECORDED IN L.7398, P.469, O.C.R.  
 17. RIGHTS OR CLAIMS OF PARTIES IN POSSESSION NOT SHOWN OF RECORD.

**AS TO PARCEL "4"**  
 11. TERMS AND CONDITIONS OF UTILITY OBLIGATION AGREEMENT AS RECITED IN INSTRUMENT 11. RECORDED IN L.8544, P.556, O.C.R.  
 12. TERMS AND CONDITIONS OF ORDER OF DEFAULT AND RIGHT OF ENTRY AS RECITED IN INSTRUMENT RECORDED IN L.7187, P.685, O.C.R.  
 13. SUBJECT PROPERTY ABUTS A PRIVATE ROAD EASEMENT WHICH IS NOT REQUIRED TO BE MAINTAINED BY THE BOARD OF COUNTY ROAD COMMISSIONERS OF THE COUNTY OF OAKLAND.  
 14. TERMS AND CONDITIONS OF PRIVATE ROAD AS RECITED IN INSTRUMENT RECORDED IN L.47627, P.794, O.C.R.  
 15. TERMS AND CONDITIONS OF ORDER OF NECESSITY AS RECITED IN INSTRUMENT RECORDED IN L.7398, P.469, O.C.R.  
 16. TERMS AND CONDITIONS OF PEDESTRIAN/BICYCLE PATHWAY EASEMENT AS RECITED IN INSTRUMENT RECORDED IN L.11497, P.219, O.C.R.  
 17. TERMS AND CONDITIONS OF TEMPORARY CONSTRUCTION EASEMENT AS RECITED IN INSTRUMENT RECORDED IN L.7160, P.481, O.C.R.



**3 FULL WORKING DAYS BEFORE YOU DIG CALL**

**811**

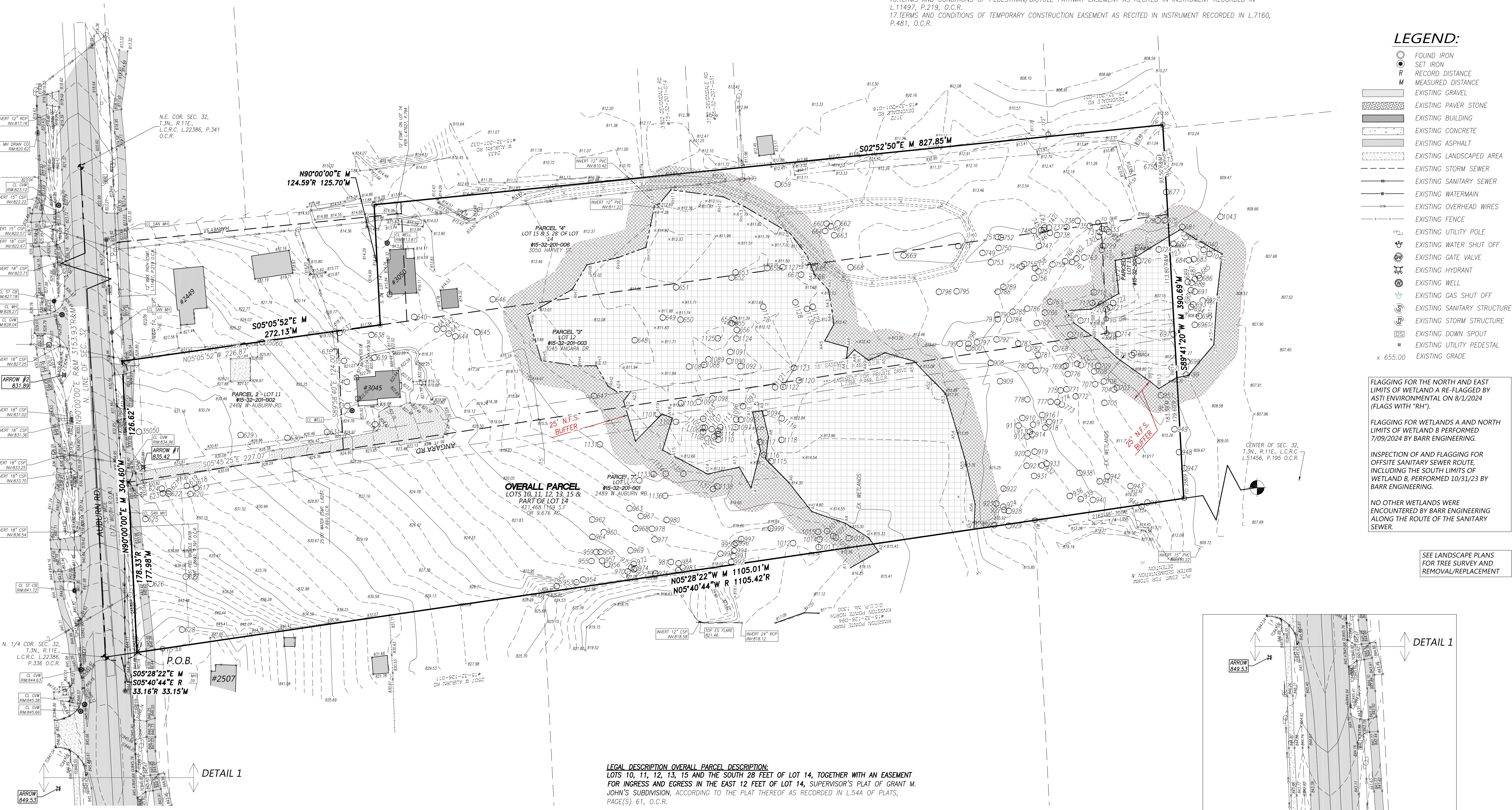
Know what's below  
 Call before you dig

MISS DIG System, Inc.  
 1-800-482-7171 www.missdig.net  
 (TOLL FREE)

**REICHERT SURVEYING INC.**

P 248.651.0592  
 F 248.656.7099

Mail@ReichertSurveying.com  
 140 Flumerfelt Lane  
 Rochester, MI 48306



- LEGEND:**
- FOUND IRON
  - SET IRON
  - R RECORD DISTANCE
  - M MEASURED DISTANCE
  - EXISTING GRAVEL
  - EXISTING PAVER STONE
  - EXISTING BUILDING
  - EXISTING CONCRETE
  - EXISTING ASPHALT
  - EXISTING LANDSCAPED AREA
  - EXISTING STORM SEWER
  - EXISTING SANITARY SEWER
  - EXISTING WATERMAIN
  - EXISTING OVERHEAD WIRES
  - EXISTING FENCE
  - EXISTING UTILITY POLE
  - EXISTING WATER SHUT OFF
  - EXISTING GATE VALVE
  - EXISTING HYDRANT
  - EXISTING WELL
  - EXISTING GAS SHUT OFF
  - EXISTING SANITARY STRUCTURE
  - EXISTING STORM STRUCTURE
  - EXISTING DOWN SPOUT
  - EXISTING UTILITY PEDESTAL
  - EXISTING GRADE

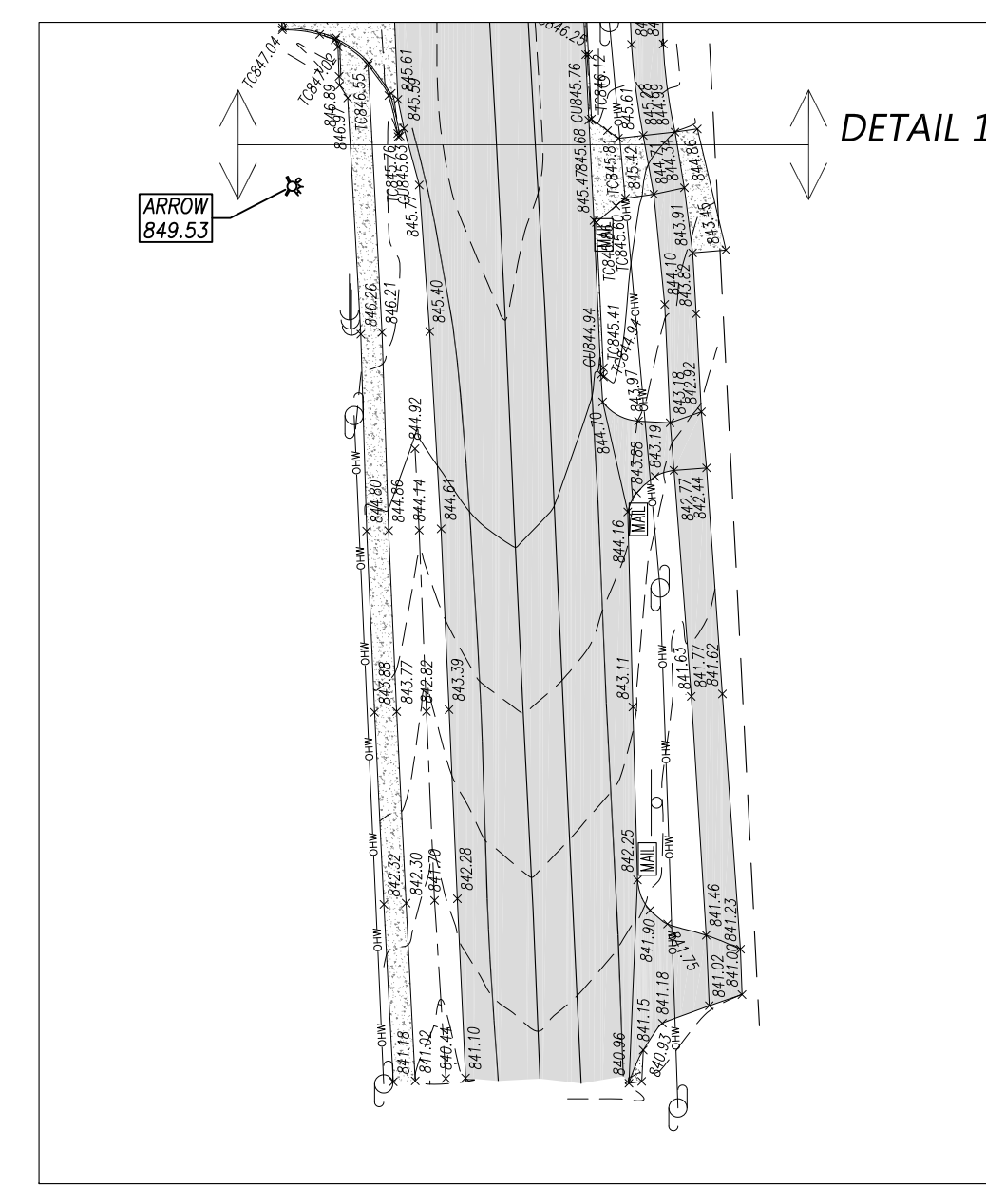
**FLAGGING FOR THE NORTH AND EAST LIMITS OF WETLAND A RE-FLAGGED BY ASTI ENVIRONMENTAL ON 8/1/2024 (FLAGS WITH "RH").**

**FLAGGING FOR WETLAND A AND NORTH LIMITS OF WETLAND B PERFORMED 7/09/2024 BY BARR ENGINEERING.**

**INSPECTION OF AND FLAGGING FOR OFFSITE SANITARY SEWER ROUTE, INCLUDING THE SOUTH LIMITS OF WETLAND B, PERFORMED 10/31/23 BY BARR ENGINEERING.**

**NO OTHER WETLANDS WERE ENCOUNTERED BY BARR ENGINEERING ALONG THE ROUTE OF THE SANITARY SEWER.**

SEE LANDSCAPE PLANS FOR TREE SURVEY AND REMOVAL/REPLACEMENT



**BENCHMARK:**

BM #1 ARROW ATOP FIRE HYDRANT AT THE N.W. CORNER OF LOT 11 ELEVATION 835.42 N.A.V.D.88 DATUM  
 BM #2 ARROW ATOP FIRE HYDRANT N. SIDE OF AUBURN ROAD OPPOSITE N.E. CORNER OF LOT 11 ELEVATION 831.89 N.A.V.D. 88 DATUM

**LEGAL DESCRIPTION OVERALL PARCEL DESCRIPTION:**  
 LOTS 10, 11, 12, 13, 15 AND THE SOUTH 28 FEET OF LOT 14, TOGETHER WITH AN EASEMENT FOR INGRESS AND EGRESS IN THE EAST 12 FEET OF LOT 14, SUPERVISOR'S PLAT OF GRANT M. JOHN'S SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN L.54A OF PLATS, PAGE(S) 61, O.C.R.

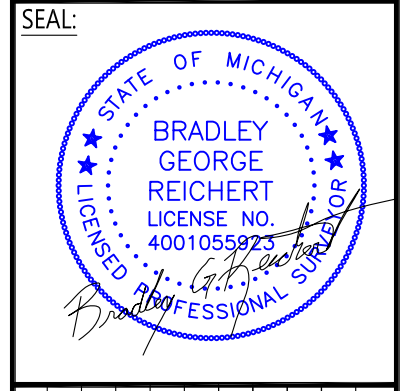
PART OF THE NORTHWEST 1/4 OF SECTION 32, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, BEING MORE PARTICULARLY DESCRIBED AS COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 32; THENCE S.05°28'22"E., 33.15 FT. TO THE SOUTH RIGHT OF WAY LINE OF AUBURN ROAD AND POINT OF BEGINNING; THENCE PROCEEDING ALONG SOUTH RIGHT OF WAY LINE N.90°00'00"E., 304.60 FT.; THENCE S.05°05'52"E., 272.13 ALONG THE EAST LINE OF LOT 11; THENCE N.90°00'00"E., 125.70 FT.; THENCE S.02°52'50"E., 827.85 FT. ALONG THE EAST LINE OF LOTS 14 & 15; THENCE S.89°41'20"W., 390.69 FT. ALONG THE SOUTH LINE OF LOTS 15, 13 AND 10; THENCE N.05°28'22"W., 1105.01 FT. ALONG THE WEST LINE OF LOT 10 TO THE POINT OF BEGINNING. CONTAINING 9.026 ACRES (NET AREA).  
 RESERVED THEREFROM ALL EASEMENTS AND RIGHT OF WAYS OF RECORD.

**SITE SURVEY**

LOTS 10-13, THE S. 28 FT. OF LOT 14 AND LOT 15 OF "SUPERVISOR'S P.O.F GRANT M. JOHN'S SUBDIVISION", ACCORDING TO THE PLAT THEREOF AS RECORDED IN L.54 OF PLATS, PAGE(S) 61, O.C.R.

PREPARED FOR:  
**THREE OAKS COMMUNITIES, LLC**

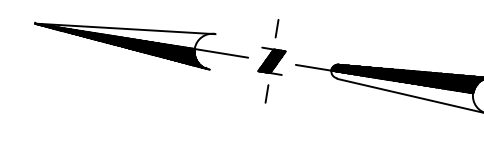
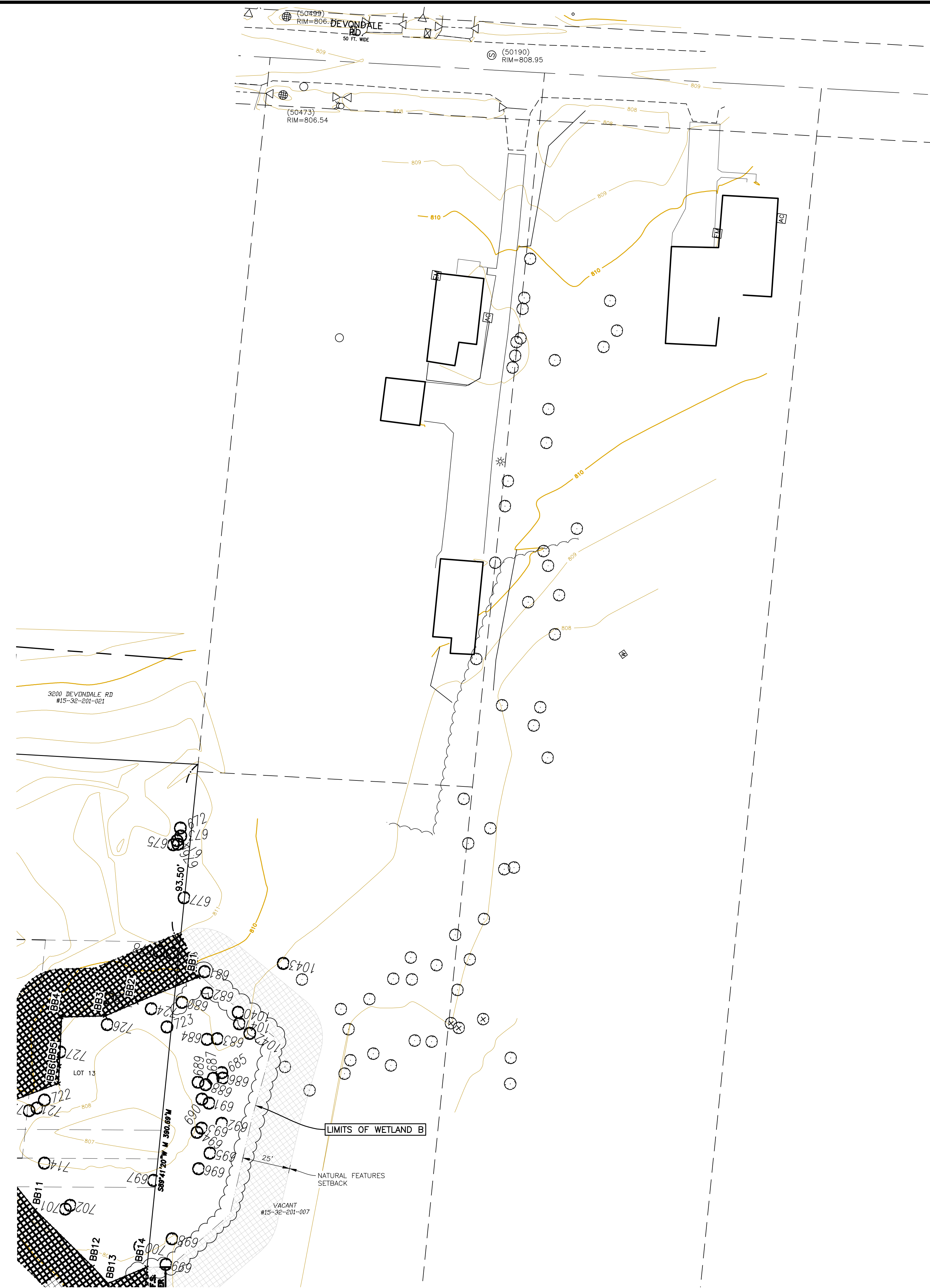
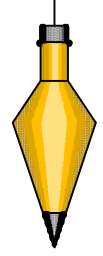
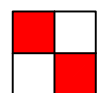
P.O. BOX 8307  
 ANN ARBOR, MI 48107  
 (248) 703-4653



NO.	DATE	DESCRIPTION	BY
1	1/15/23	REV PER CITY	GHR
2	7/25/23	REV PER OWNER	BGR
3	9/25/23	REV LEGAL DESCRIPTION	BGR
4	11/1/23	ADD NEW PARCEL	BGR
5	1/21/24	ADD PARCEL TWO LABELS	BGR
6	3/14/24	REV WETLANDS FLAGS	BGR

SCALE: 1"=50' DRAWN: B.G.R.  
 DATE: 9/20/21 CHECK: G.H.R.  
 JOB # 21-068 SHEET: V-1.0





**LEGEND:**

- FOUND IRON
- SET IRON
- R RECORD DISTANCE
- M MEASURED DISTANCE
- EXISTING GRAVEL
- EXISTING PAVER STONE
- EXISTING BUILDING
- EXISTING CONCRETE
- EXISTING ASPHALT
- EXISTING LANDSCAPED AREA
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING OVERHEAD WIRES
- EXISTING FENCE
- EXISTING UTILITY POLE
- EXISTING WATER SHUT OFF
- EXISTING GATE VALVE
- EXISTING HYDRANT
- EXISTING WELL
- EXISTING GAS SHUT OFF
- EXISTING SANITARY STRUCTURE
- EXISTING STORM STRUCTURE
- EXISTING DOWN SPOUT
- EXISTING UTILITY PEDESTAL
- EXISTING BOULDER RET. WALL
- x 655.00 EXISTING GRADE
- 100.00 PROPOSED GRADE
- PROPOSED CONCRETE
- PROPOSED BUILDING
- PROPOSED SILT FENCE
- PROP. DRAINAGE ARROW
- PROP. MAJOR CONTOURS
- PROP. MINOR CONTOURS

FLAGGING FOR THE NORTH LIMITS OF WETLAND B PERFORMED 7/09/2024 BY BARR ENGINEERING.

INSPECTION OF AND FLAGGING FOR OFFSITE SANITARY SEWER ROUTE, INCLUDING THE SOUTH LIMITS OF WETLAND B, PERFORMED 10/31/23 BY BARR ENGINEERING.

NO OTHER WETLANDS WERE ENCOUNTERED BY BARR ENGINEERING ALONG THE ROUTE OF THE SANITARY SEWER.

SEE LANDSCAPE PLANS FOR TREE SURVEY AND REMOVAL/REPLACEMENT

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**

MONUMENT ENGINEERING GROUP ASSOCIATES, INC.

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)

KEVIN C. MCDEVITT  
ENGINEER  
NO. 6201043260

*Kevin C. McDevitt*

Call MISS DIG  
3 full working days before you dig.

Michigan's Utility Notification One-Call

1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE INDIVIDUALLY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**TOPOGRAPHIC SURVEY**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

PLAN SUBMITTALS/REVISIONS	DATE
RESUBMIT TO MDOT	09/13/2023
REVISED SITE PLAN SUBMITTAL	01/23/2024
REVISED SITE PLAN PER CITY AND MDOT	03/14/2024
REVISED SITE PLAN PER MDOT	03/28/2024
PRELIMINARY SITE PLAN TO CITY	05/16/2024
REVISED SITE PLAN / WETLAND FLAGS	07/24/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/13/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/04/2024

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 30'

0 1/2" 1"

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: MN  
CHECK BY: AP

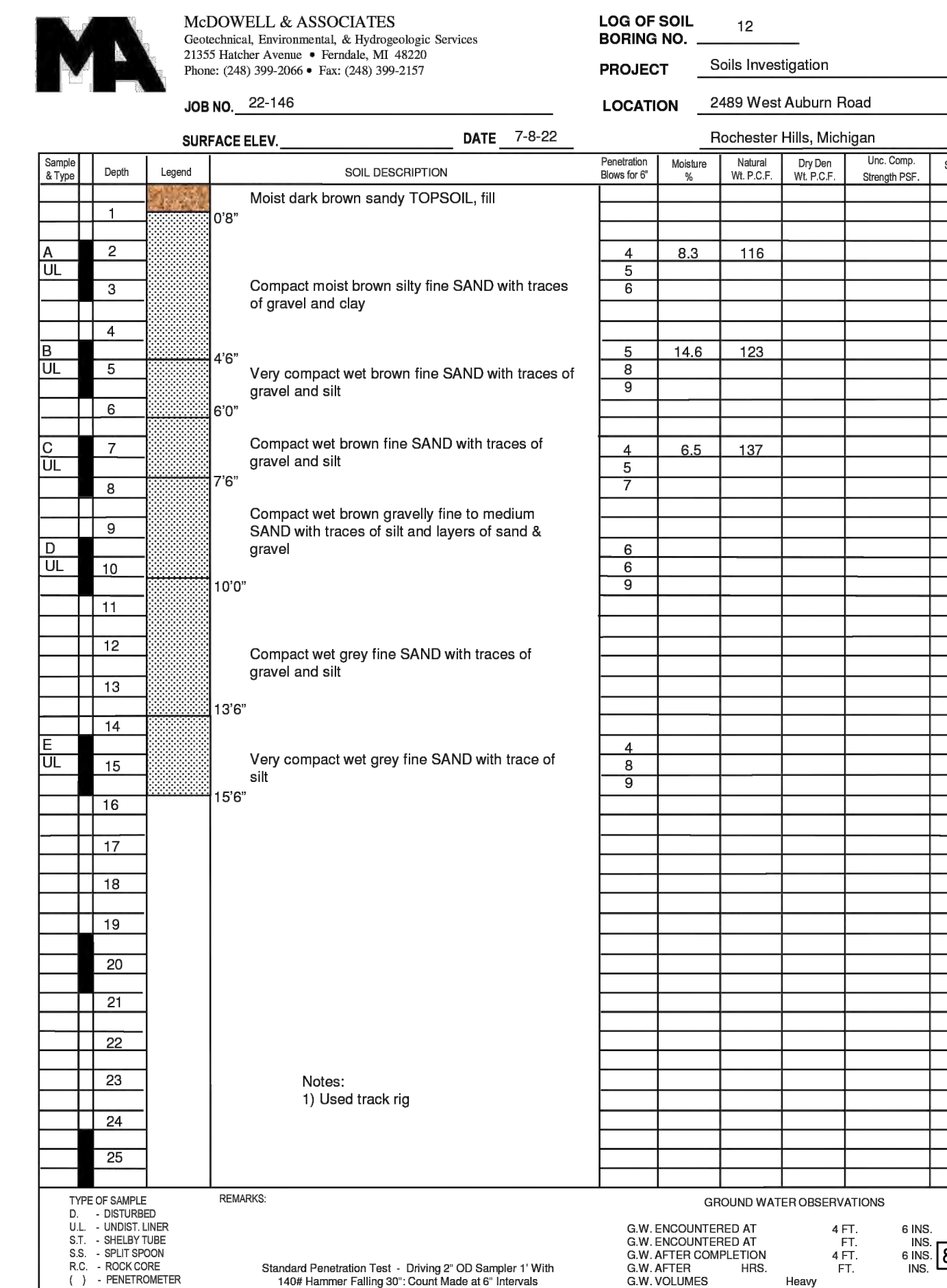
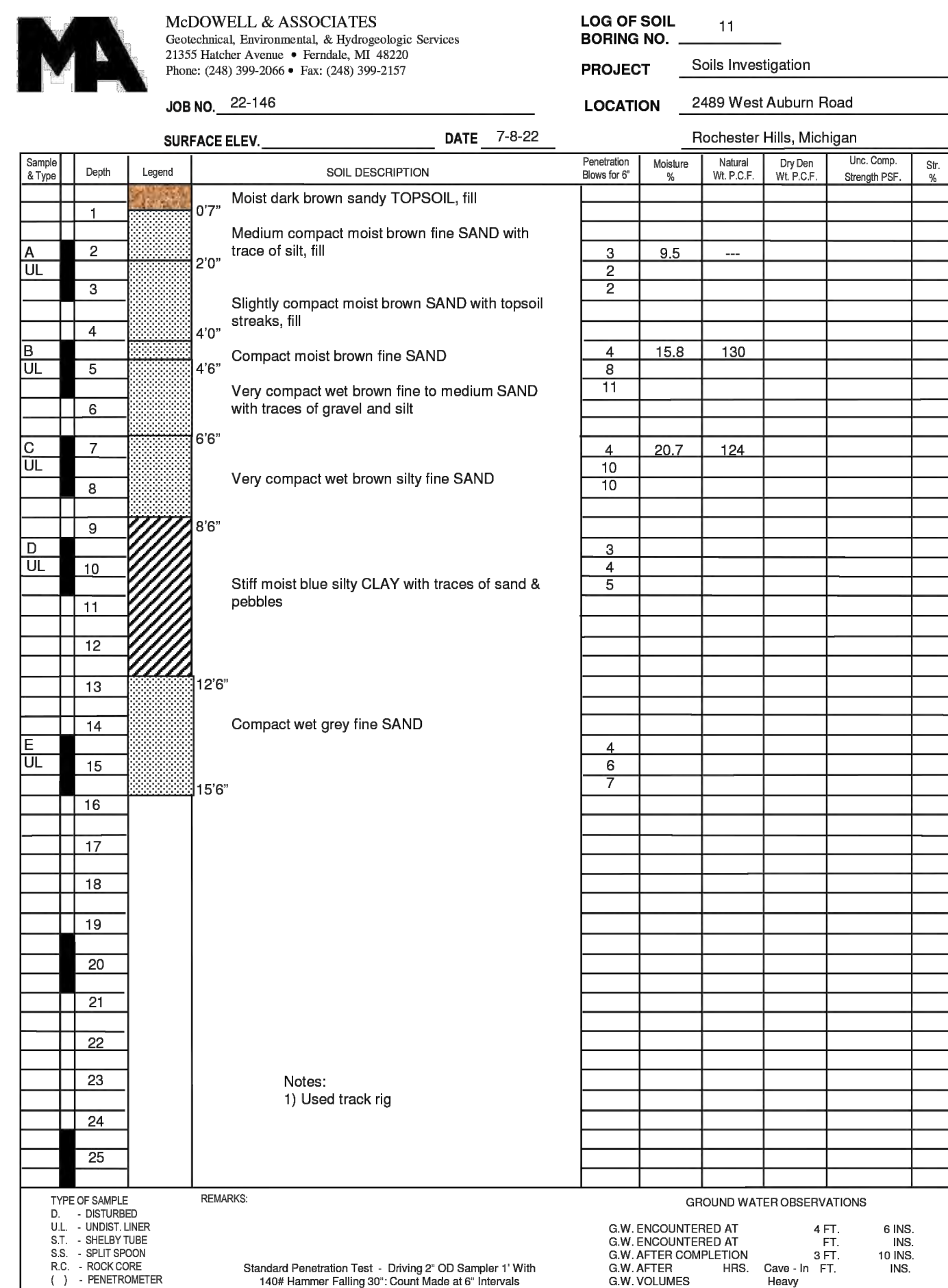
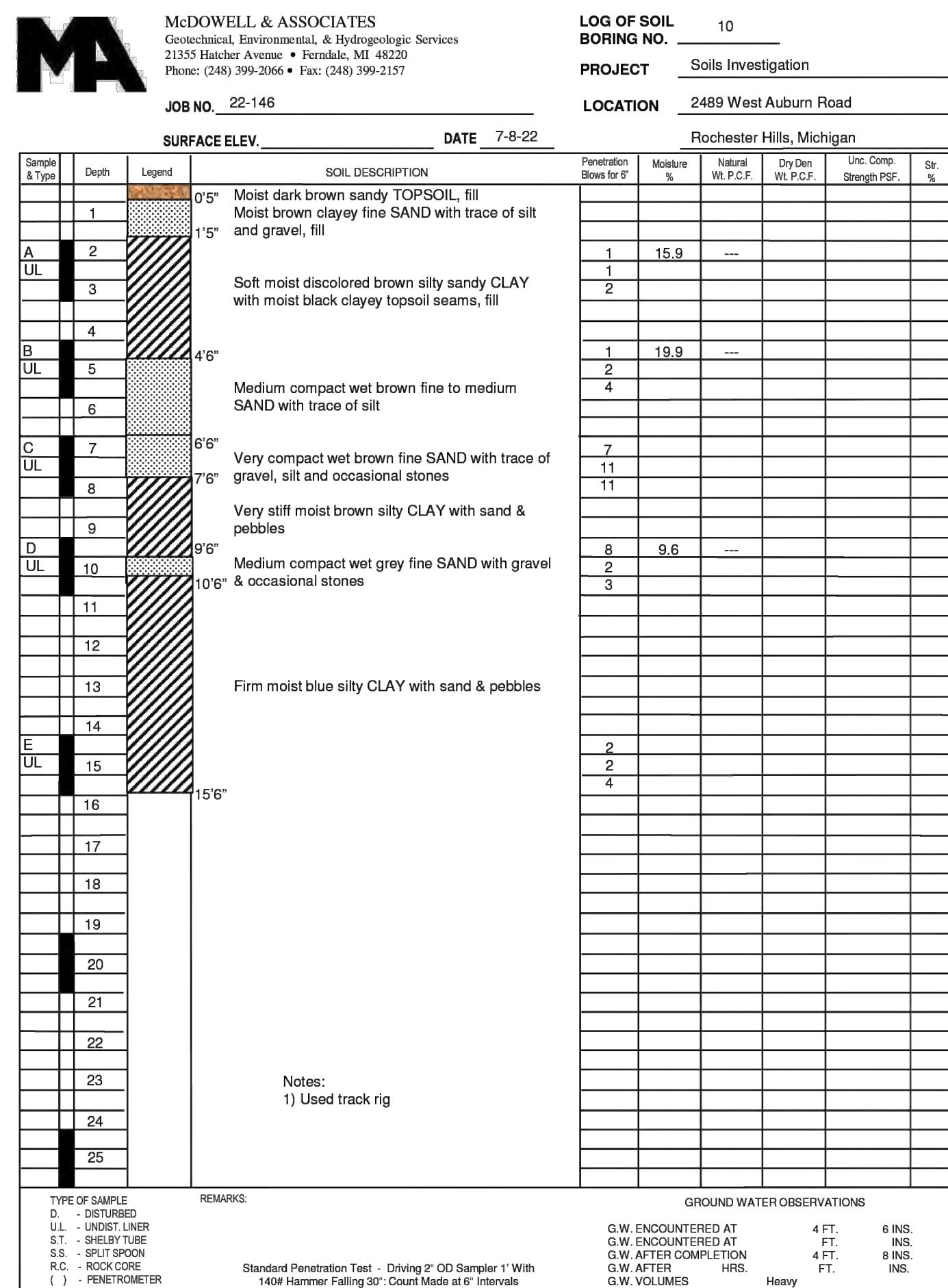
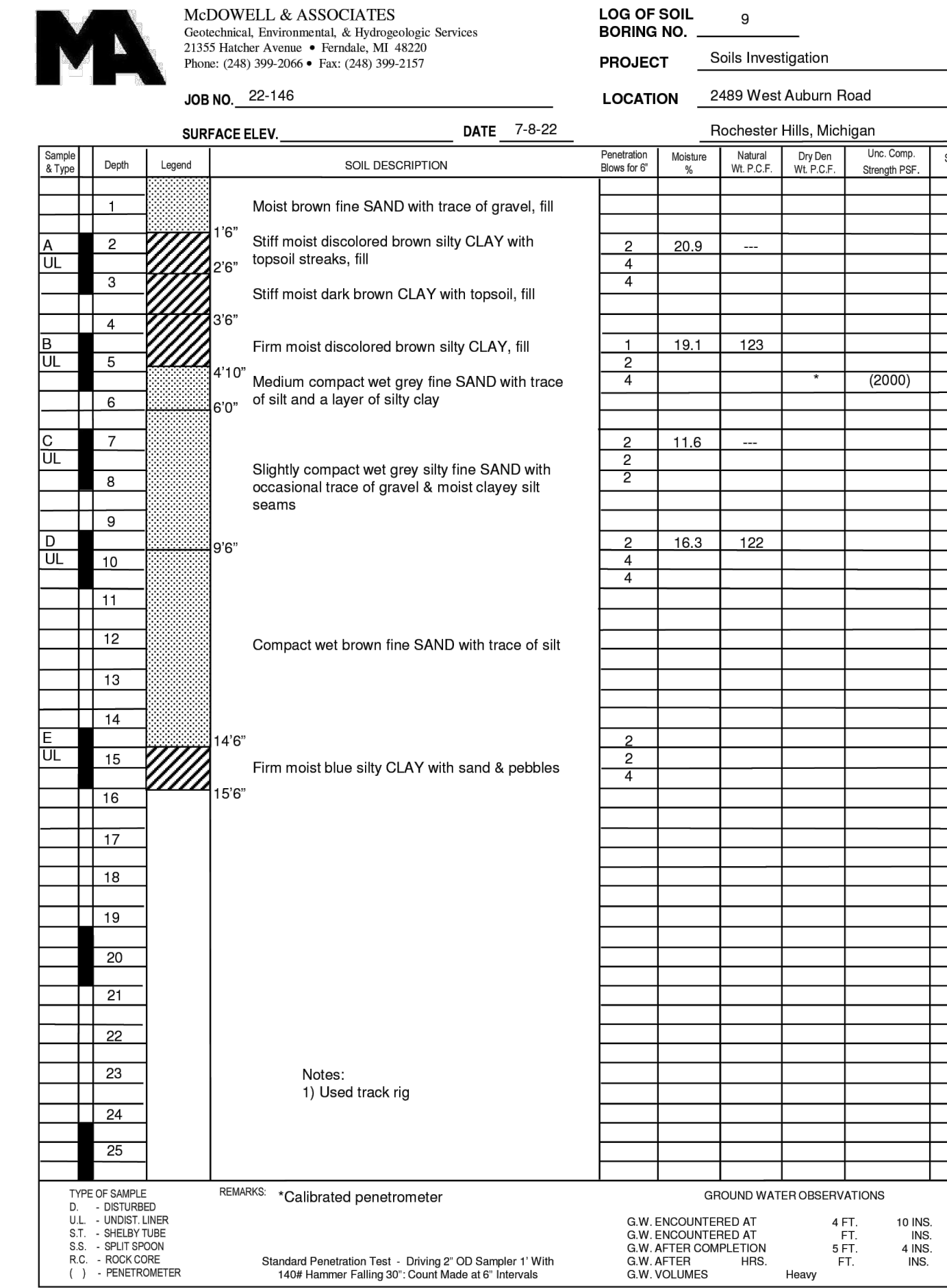
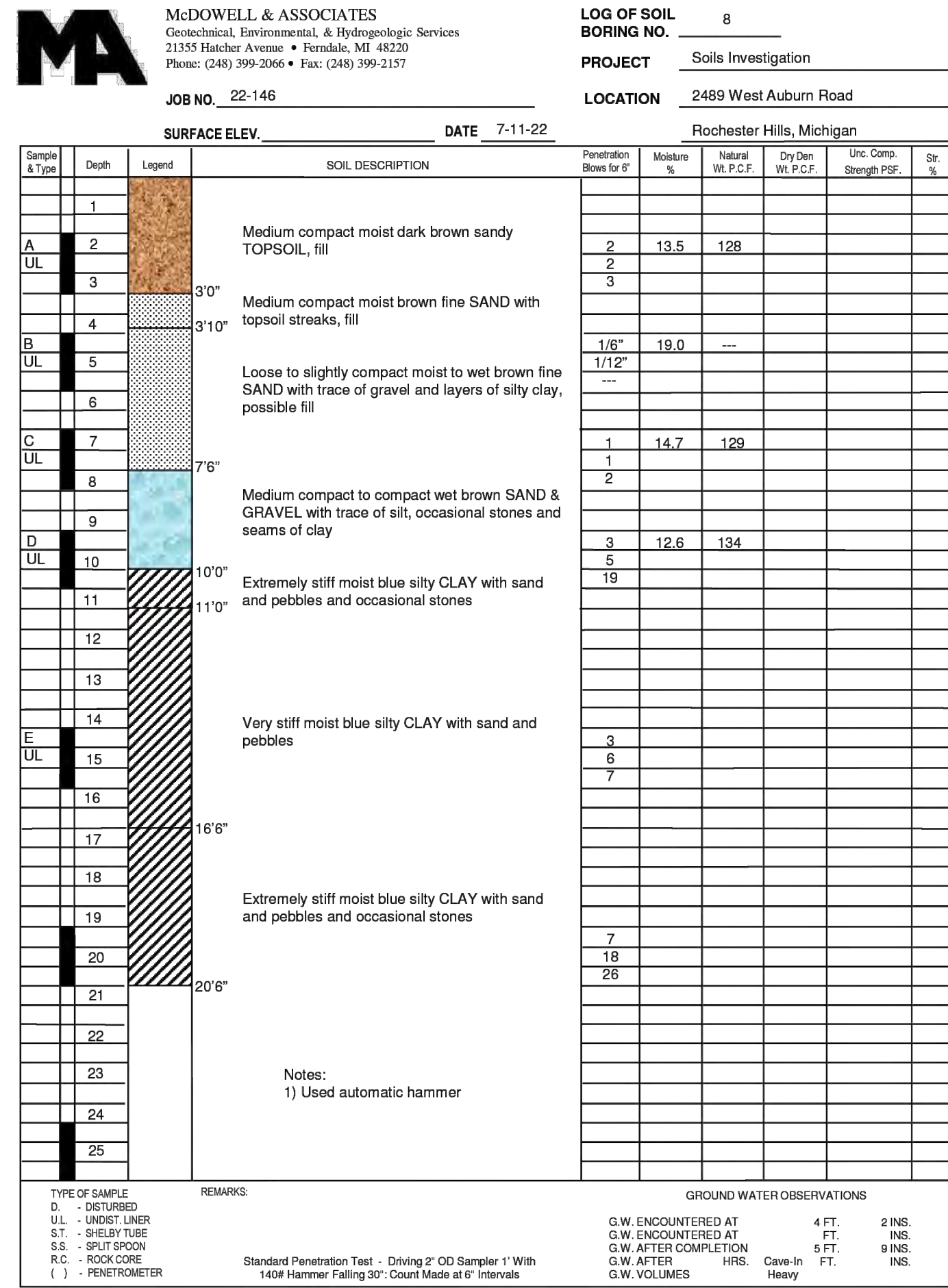
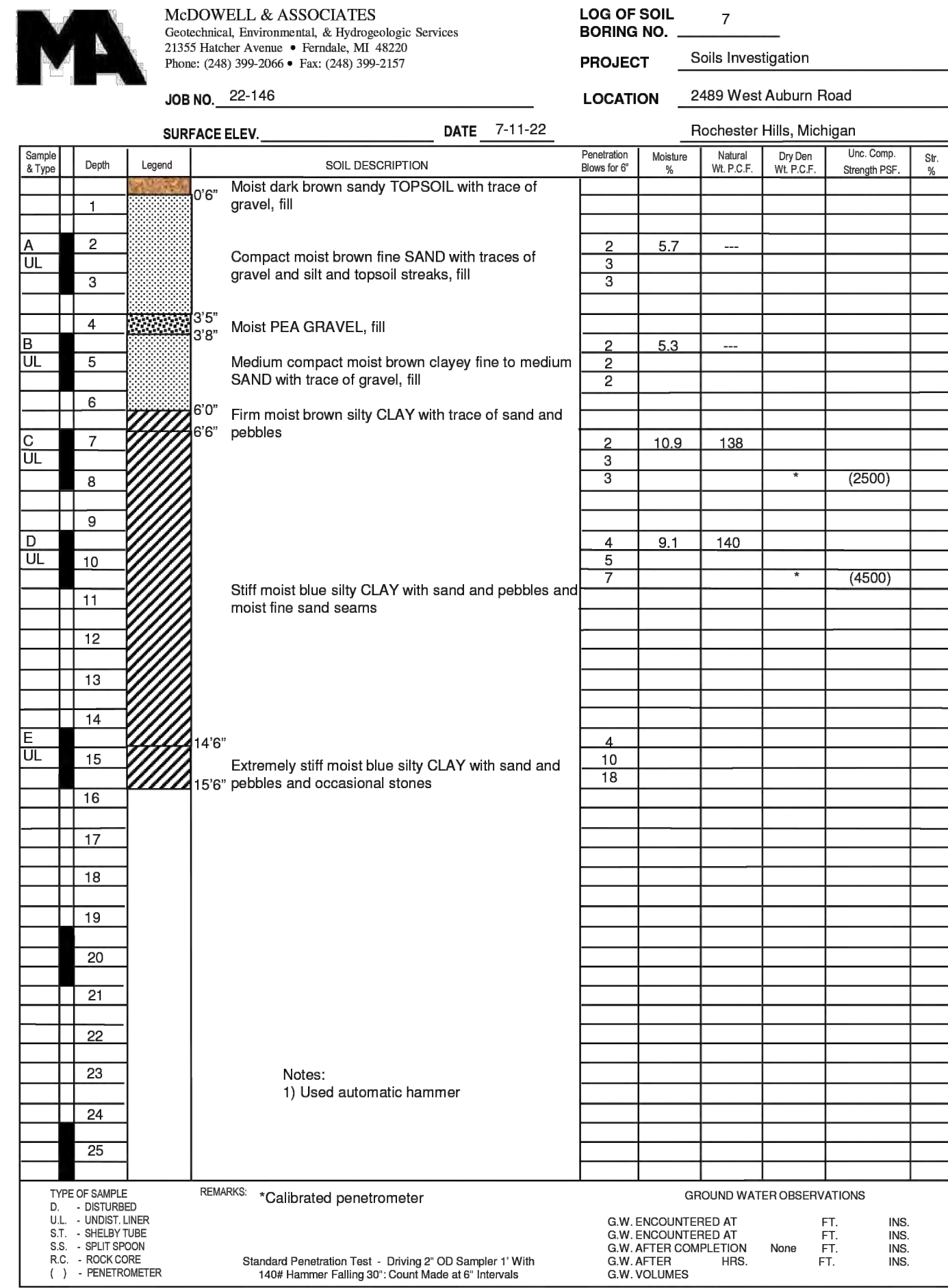
**V-11**

NOT FOR CONSTRUCTION













McDOWELL & ASSOCIATES  
Geotechnical, Environmental, & Hydrogeologic Services  
21355 Hatcher Avenue • Ferndale, MI 48220  
Phone: (248) 399-2066 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 13  
PROJECT Soils Investigation  
LOCATION 2489 West Auburn Road  
Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blow ft/ft	Moisture %	Natural Wt. P.C.P.	Dry Den Wt. P.C.P.	Unc. Comp. Strength (PSF)	Dr. %
	0'		Moist dark brown sandy TOPSOIL, fill						
A	1		Compact moist brown fine SAND with trace of silt	3	15.7	119			
UL	2		Compact moist brown silty SAND with occasional moist clayey sand seams	5					
	3			6					
B	4		Very compact wet brown silty fine SAND	6	17.8	125			
UL	5		Very compact wet grey clayey fine SAND with trace of gravel	9					
	6			5	9.7	140			
C	7		Stiff moist blue silty CLAY with sand & pebbles	9					
UL	8			11					
	9			13					
D	10		Very compact wet brown fine SAND with trace of silt						
UL	11								
	12								
	13								
E	14		Very compact wet grey fine SAND with trace of silt and wet silt lenses (Head of water 15' drive)	4					
UL	15			9					
	16			14					
	17								
	18								
	19								
	20		Very compact wet grey fine SAND with trace of silt	4					
	21			9					
	22			10					
	23								
	24		Very compact wet grey heaving fine SAND with trace of silt (Spooned out hole for sample)	6					
	25			10					
	25'			13					

TYPE OF SAMPLE REMARKS  
D - DISTURBED  
UL - UNDISTURBED  
S.T. - Shelby Tube  
S.S. - Split Spoon  
R.C. - ROCK CORE  
P.C. - PENETROMETER

1) Used track rig

Standard Penetration Test - Driving 2" OD Sample 1" With 140# Hammer Falling 30" Count Made at 6" Intervals

GROUND WATER OBSERVATIONS  
G.W. ENCOUNTERED AT 4 FT. 0 INS.  
G.W. ENCOUNTERED AT 9 FT. 3 INS.  
G.W. AFTER COMPLETION 1 FT. 3 INS.  
G.W. AFTER HRS. FT. INS.  
G.W. VOLUMES Heavy

808.3

### Cased Borehole Infiltration Test Log

McDowell & Associates

Soil Boring #: 13  
Infiltration Test #: 1  
Job Number: 22-146  
Date: 7/9/2022  
Project: Infiltration Study - 2489 West Auburn Road  
Weather: Sunny  
Location: Rochester Hills, Michigan  
Ground Elev.: N/A

Soil Stratigraphy:	Pipe Installation #1
See Boring 2 for soil and groundwater conditions.	Soil Depth: 4'0"
	Inner Pipe Dia.: 3"
	Casing Length: 5'
	Embedment: 3"
Stick-up: 1'3"	
Pipe Installation #2	
Soil Depth: N/A	
Inner Pipe Dia.: N/A	
Casing Length: N/A	
Embedment: N/A	
Stick-up: N/A	
Groundwater Depth: _____	Pipe Distance: N/A

Soak Period (Pipe #1)	Soak Period (Pipe #2)
Start Date: 7/9/2022 Start Time: _____	Start Date: N/A Start Time: N/A
Notes: Filled water to 1.97' below top of casing (TOC)	Notes: _____
Time: 30 min Water Drop: 0.26 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.12' below TOC	Notes: _____
Time: 30 min Water Drop: 0.19 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.04' below TOC	Notes: _____
Notes: Average of last 4 readings = 0.15 ft/30 min (3.6 in/hr)	Notes: N/A

Test Period (Pipe #1)	Test Period (Pipe #2)
Time: 10 min Water Drop: 0.16 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.01' below TOC	Notes: _____
Time: 30 min Water Drop: 0.15 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.0' below TOC	Notes: _____
Time: 30 min Water Drop: 0.14 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.0' below TOC	Notes: _____
Time: 30 min Water Drop: 0.14 feet	Time: _____ Water Drop: _____ inches
Notes: _____	Notes: _____
Time: _____ Water Drop: _____ feet	Time: _____ Water Drop: _____ inches
Notes: _____	Notes: _____

### Cased Borehole Infiltration Test Log

McDowell & Associates

Soil Boring #: 11  
Infiltration Test #: 2  
Job Number: 22-146  
Date: 7/9/2022  
Project: Infiltration Study - 2489 West Auburn Road  
Weather: Sunny  
Location: Rochester Hills, Michigan  
Ground Elev.: N/A

Soil Stratigraphy:	Pipe Installation #1
See Boring 11 for soil and groundwater conditions.	Soil Depth: 2'0"
	Inner Pipe Dia.: 3"
	Casing Length: 5'
	Embedment: 3"
Stick-up: 1'3"	
Pipe Installation #2	
Soil Depth: N/A	
Inner Pipe Dia.: N/A	
Casing Length: N/A	
Embedment: N/A	
Stick-up: N/A	
Groundwater Depth: _____	Pipe Distance: N/A

Soak Period (Pipe #1)	Soak Period (Pipe #2)
Start Date: 7/9/2022 Start Time: _____	Start Date: N/A Start Time: N/A
Notes: Filled water to 2.11' below top of casing (TOC)	Notes: _____
Time: 30 min Water Drop: 0.78 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.00' below TOC	Notes: _____
Time: 30 min Water Drop: 0.42 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.00' below TOC	Notes: _____
Notes: Average of last 4 readings = 0.12 ft/10 min (8.6 in/hr)	Notes: N/A

Test Period (Pipe #1)	Test Period (Pipe #2)
Time: 10 min Water Drop: 0.12 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 1.99' below TOC	Notes: _____
Time: 10 min Water Drop: 0.12 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.00' below TOC	Notes: _____
Time: 10 min Water Drop: 0.11 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.01' below TOC	Notes: _____
Time: 10 min Water Drop: 0.11 feet	Time: _____ Water Drop: _____ inches
Notes: _____	Notes: _____
Time: _____ Water Drop: _____ feet	Time: _____ Water Drop: _____ inches
Notes: _____	Notes: _____

### Cased Borehole Infiltration Test Log

McDowell & Associates

Soil Boring #: 13  
Infiltration Test #: 3  
Job Number: 22-146  
Date: 7/9/2022  
Project: Infiltration Study - 2489 West Auburn Road  
Weather: Sunny  
Location: Rochester Hills, Michigan  
Ground Elev.: N/A

Soil Stratigraphy:	Pipe Installation #1
See Boring 13 for soil and groundwater conditions.	Soil Depth: 1'6"
	Inner Pipe Dia.: 3"
	Casing Length: 5'
	Embedment: 3"
Stick-up: 1'3"	
Pipe Installation #2	
Soil Depth: N/A	
Inner Pipe Dia.: N/A	
Casing Length: N/A	
Embedment: N/A	
Stick-up: N/A	
Groundwater Depth: _____	Pipe Distance: N/A

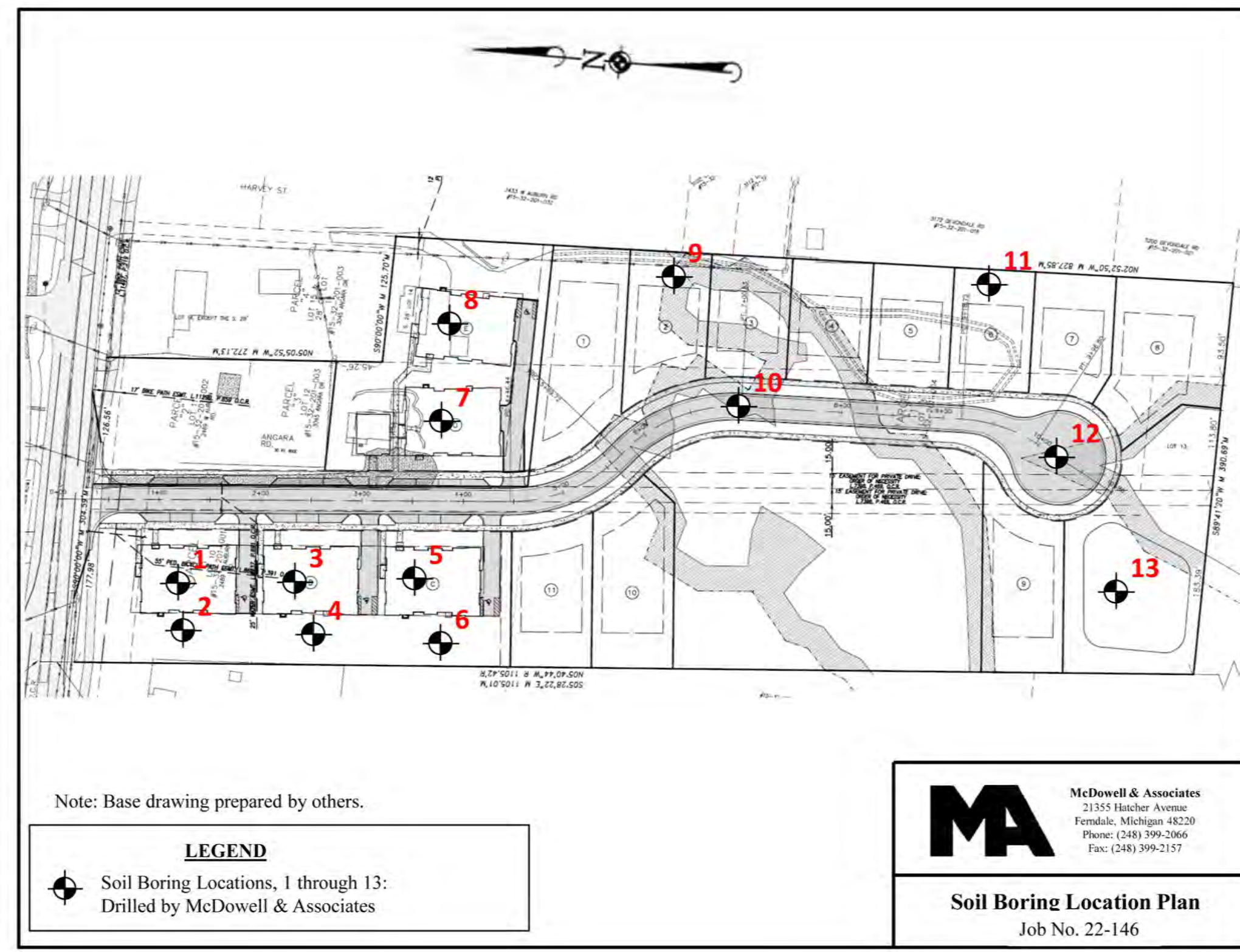
Soak Period (Pipe #1)	Soak Period (Pipe #2)
Start Date: 7/9/2022 Start Time: _____	Start Date: N/A Start Time: N/A
Notes: Filled water to 2.02' below top of casing (TOC)	Notes: _____
Time: 12 min 42 sec Water Drop: 2.00 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.01' below TOC	Notes: _____
Time: 22 min 28 sec Water Drop: 2.00 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.00' below TOC	Notes: _____
Notes: Average of last 4 readings = 0.66 ft/10 min (47.5 in/hr)	Notes: N/A

Test Period (Pipe #1)	Test Period (Pipe #2)
Time: 10 min Water Drop: 0.70 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.02' below TOC	Notes: _____
Time: 10 min Water Drop: 0.67 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.01' below TOC	Notes: _____
Time: 10 min Water Drop: 0.66 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.00' below TOC	Notes: _____
Time: 10 min Water Drop: 0.66 feet	Time: _____ Water Drop: _____ inches
Notes: Filled water to 2.00' below TOC	Notes: _____
Time: 10 min Water Drop: 0.65 feet	Time: _____ Water Drop: _____ inches
Notes: _____	Notes: _____

### SIEVE ANALYSIS

Boring	Sample	% Passing #4 Sieve	% Passing #10 Sieve	% Passing #40 Sieve	% Passing #100 Sieve	% Passing #200 Sieve
1	C	100.0	100.0	92.1	10.6	5.6
2	D	100.0	100.0	99.7	82.9	46.3
3	D	86.7	64.6	32.5	16.7	12.5
6	D	100.0	99.8	97.8	32.1	12.1
8	C	70.4	58.2	35.7	14.6	10.6
9	C	97.3	93.7	83.3	46.5	31.9
10	B	99.7	97.4	78.8	15.1	9.3
11	B	97.6	93.0	64.9	12.5	6.0
12	C	58.9	47.8	26.1	10.8	6.1
13	B	100.0	100.0	98.3	43.7	14.7

Job No. 22-146



Note: Base drawing prepared by others.

**LEGEND**  
Soil Boring Locations, 1 through 13:  
Drilled by McDowell & Associates

**McDowell & Associates**  
21355 Hatcher Avenue  
Ferndale, Michigan 48220  
Phone: (248) 399-2066  
Fax: (248) 399-2157

**Soil Boring Location Plan**  
Job No. 22-146

EXISTING GROUNDWATER WAS ENCOUNTERED IN BORINGS 12 AND 13 (VICINITY OF STORM WATER POND) AT ROUGHLY THE SAME ELEVATION. BASED ON THE INDICATIONS FROM THESE TWO BORINGS, IT IS ESTIMATED THAT THE STATIC WATER LEVEL DEPTHS ARE 4'-6" (808.1) IN BORING 12 AND 4'-0" (808.3) IN BORING 13.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**  
Engineering Group Associates

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSS)

**KEVIN C. McDEVITT**  
ENGINEER  
NO. 6201043260

Kevin C. McDevitt

Call MISS DIG  
3 full working days before you dig.

Michigan's One-Call  
Utility Notification Organization  
1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE INDIVIDUALLY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :  
**AUBURN ANGARA OAKS, LLC**  
14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**SOIL BORING LOGS**  
AUBURN ANGARA OAKS  
PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	REVISIONS
08/23/2023	PLAN SUBMITTALS
09/13/2023	REVISIT TO MOOT
01/22/2024	REVISED SITE PLAN PER CITY AND MOOT
03/28/2024	REVISED SITE PLAN PER MOOT
05/14/2024	PRELIMINARY SITE PLAN TO CITY
07/24/2024	REVISED SITE PLAN / WETLAND FLAGS
08/13/2024	REVISED SITE PLAN

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

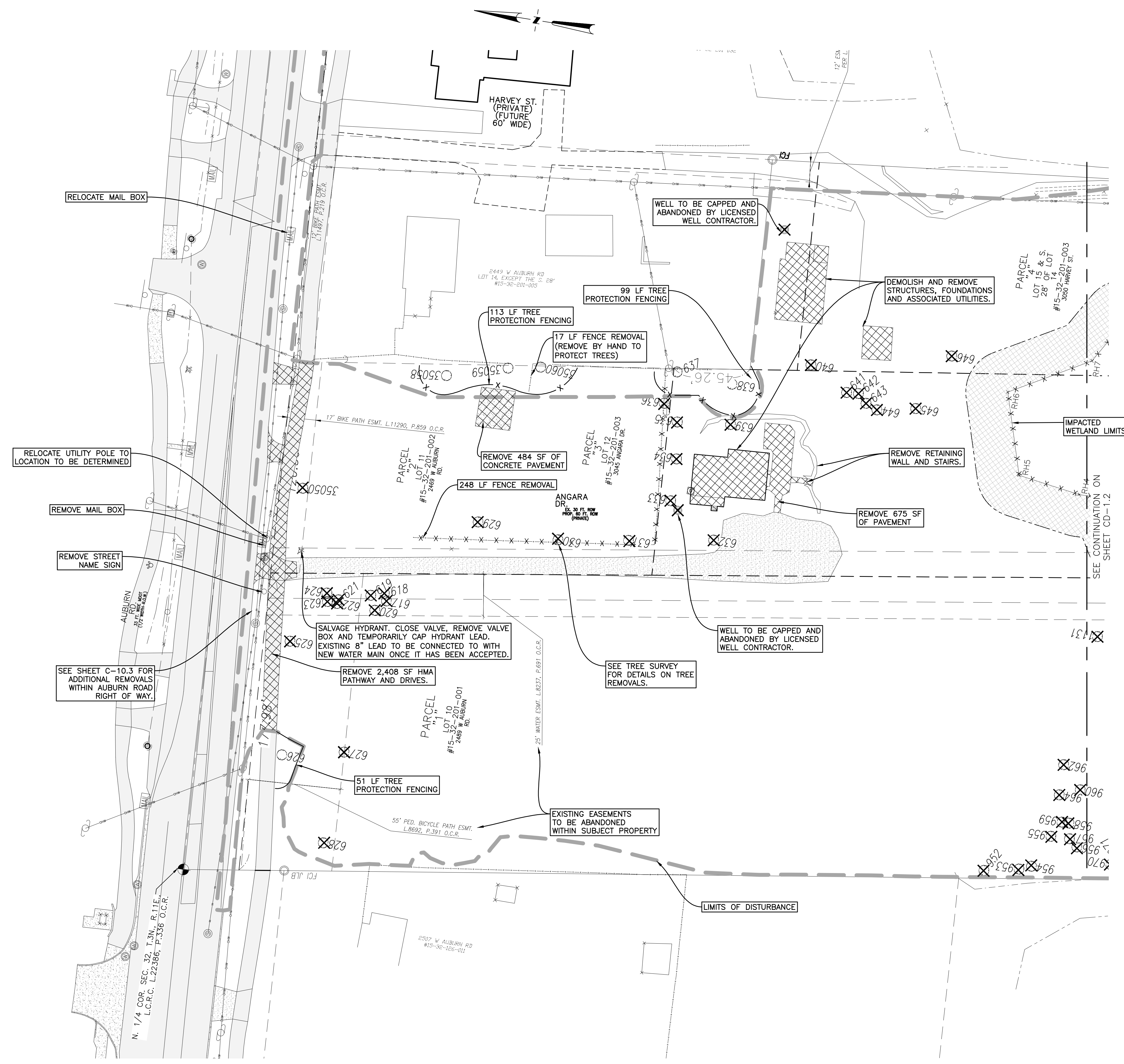
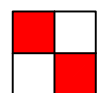
SCALE: N/A  
0 1/2" 1"

FIELD: REICHT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**V-2.2**

NOT FOR CONSTRUCTION





**LEGEND:**

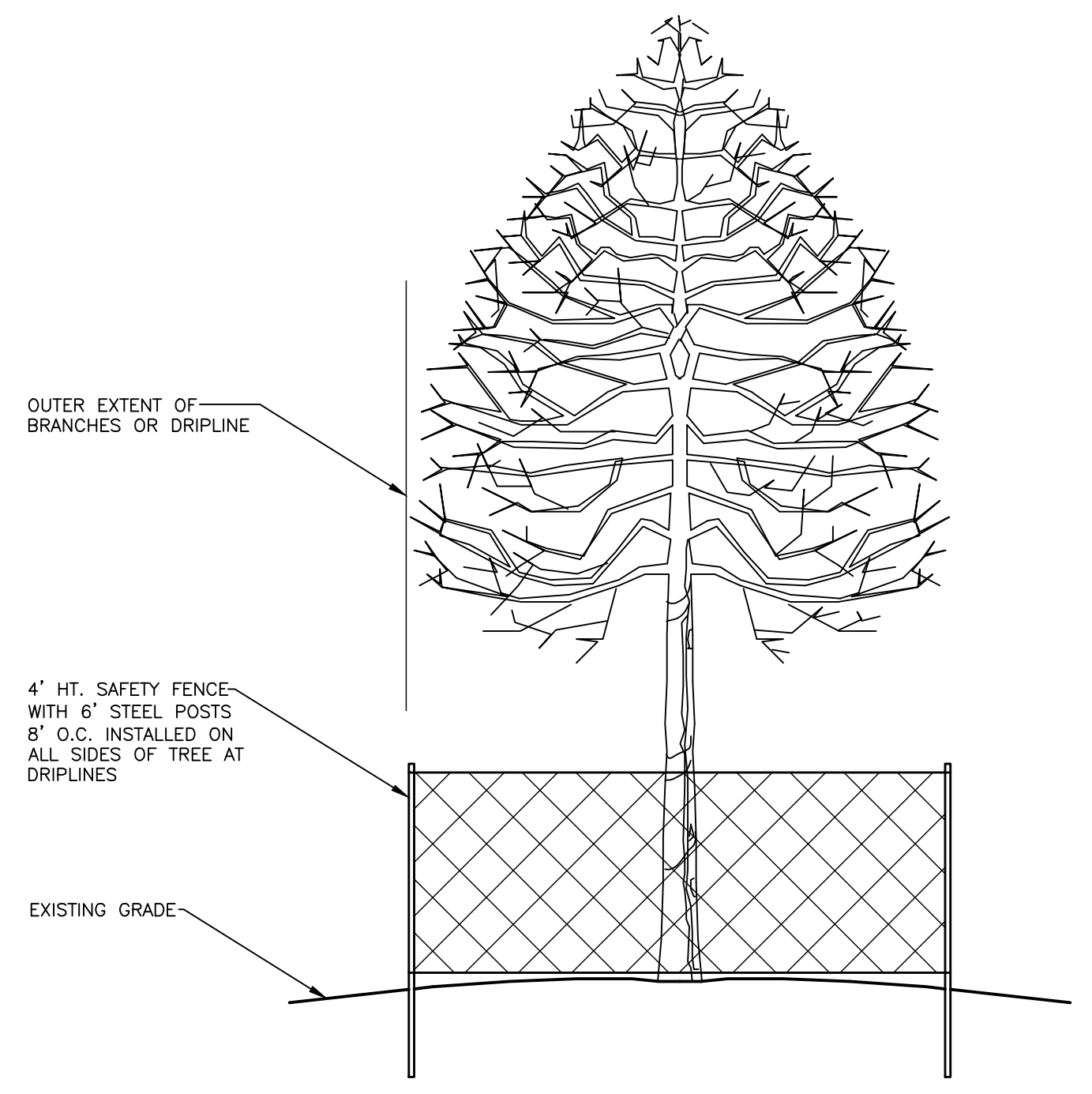
- FOUND IRON
- SET IRON
- R RECORD DISTANCE
- M MEASURED DISTANCE
- EXISTING GRAVEL
- EXISTING PAVER STONE
- EXISTING BUILDING
- EXISTING CONCRETE
- EXISTING ASPHALT
- EXISTING LANDSCAPED AREA
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING OVERHEAD WIRES
- EXISTING FENCE
- EXISTING UTILITY POLE
- EXISTING WATER SHUT OFF
- EXISTING GATE VALVE
- EXISTING HYDRANT
- EXISTING WELL
- EXISTING GAS SHUT OFF
- EXISTING SANITARY STRUCTURE
- EXISTING STORM STRUCTURE
- EXISTING DOWN SPOUT
- EXISTING UTILITY PEDESTAL
- EXISTING BOULDER RET. WALL
- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED CONCRETE
- PROPOSED BUILDING
- PROPOSED SILT FENCE
- PROP. DRAINAGE ARROW
- PROP. MAJOR CONTOURS
- PROP. MINOR CONTOURS

**DEMOLITION LEGEND**

- ..... ABANDON IN PLACE
- ////// ABANDON LINEAR FEATURE
- SAWCUT
- X X X X X X X X REMOVE LINEAR FEATURE
- LIMITS OF DISTURBANCE
- X REMOVE OBJECT
- REMOVE PAVEMENT/ STRUCTURE
- X X X TREE PROTECTION FENCE

- DEMOLITION NOTES**
- UTILITY OBJECTS SUCH AS GAS METER, TRANSFORMER, TELEPHONE PEDESTAL, UTILITY POLE & WIRES ARE TO BE REMOVED BY OTHERS IF APPLICABLE.
  - SEE LANDSCAPING PLANS FOR TREE REMOVALS. ANY TREES NOT MARKED PER PLAN ARE TO BE PROTECTED & PRESERVED DURING CONSTRUCTION.
  - WELLS SHALL BE CAPPED AND ABANDONED BY A LICENSED WELL DRILLING CONTRACTOR. CONTRACTOR TO FOLLOW ALL REGULATIONS AND FILE ALL REQUIRED PAPERWORK WITH THE COUNTY AND STATE DURING ABANDONMENT OF ANY WELLS.
  - A BUILDING PERMIT WILL BE REQUIRED FOR DEMOLITION OF STRUCTURES SEPARATELY ON EACH PROPERTY.
  - REMOVAL LIMITS SHOWN FOR UNDERGROUND CONSTRUCTION ARE APPROXIMATE ONLY. CONTRACTOR TO DETERMINE REMOVALS NEEDED FOR SAFE EXCAVATION PRACTICES AND TO COMPLY WITH APPLICABLE SAFETY STANDARDS.
  - SEPARATE BUILDING PERMITS ARE REQUIRED FOR THE DEMOLITION OF EACH EXISTING STRUCTURE.
  - SEE SHEET C-2.3 FOR WETLAND IMPACTS.

**FENCE DETAIL - TREE PROTECTION**



INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)

KEVIN C. McDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Utility Notification Organization

1-800-482-7171  
www.missdig.org

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**DEMOLITION PLAN - NORTH**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	DATE
01/23/2024	RESUBMIT TO MOOT
03/14/2024	REVISED SITE PLAN SUBMITTAL
03/28/2024	REVISED SITE PLAN PER CITY AND MOOT
05/17/2024	REVISED SITE PLAN PER MOOT
07/24/2024	PRELIMINARY SITE PLAN / WETLAND FLAGS
09/17/2024	REVISED SITE PLAN / WETLAND FLAGS
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 30'

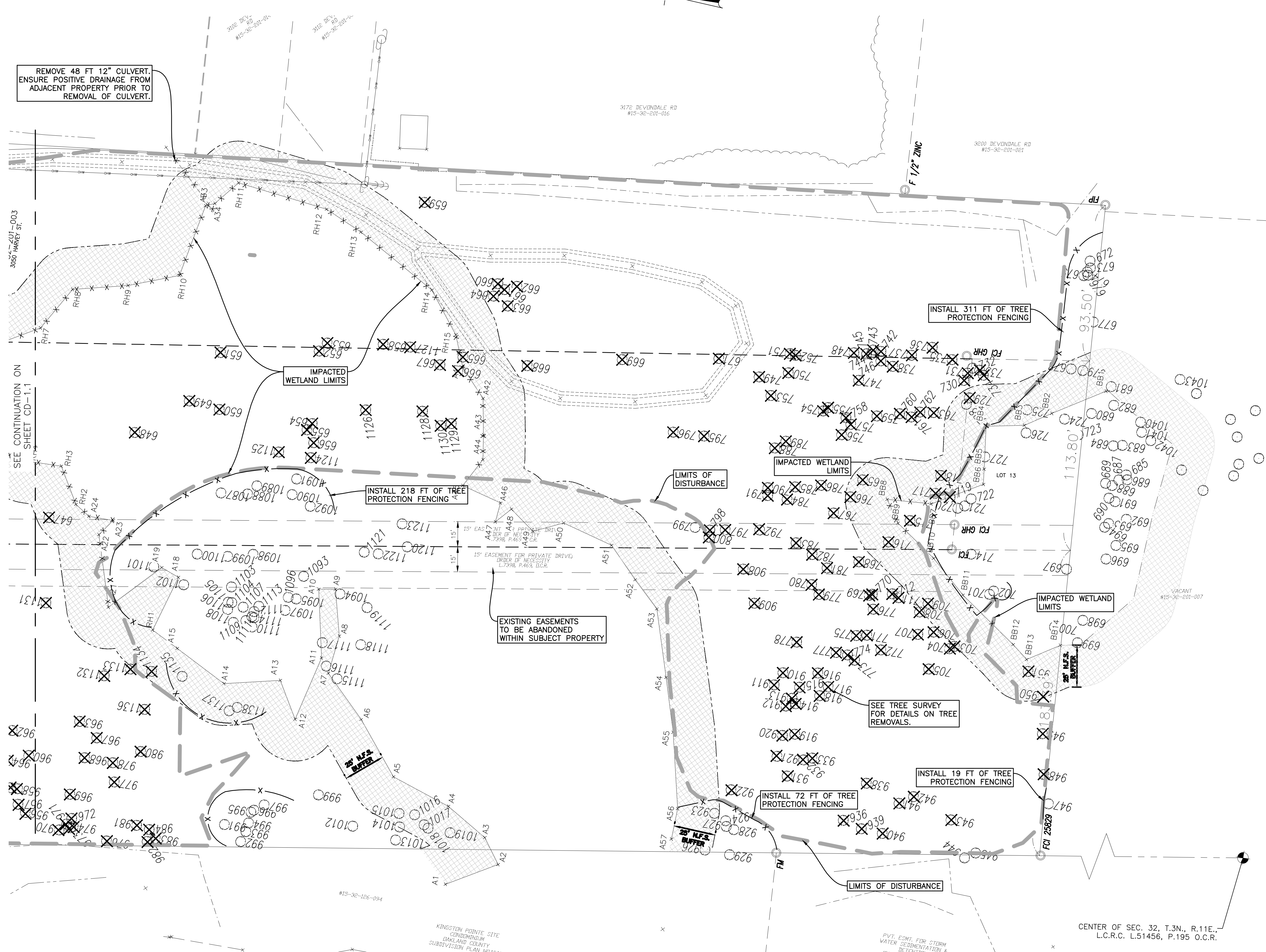
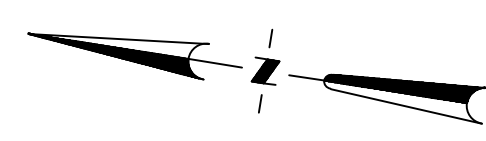
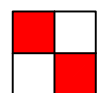
0 1/2" 1"

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**CD-11**

NOT FOR CONSTRUCTION





### DEMOLITION LEGEND

- ..... ABANDON IN PLACE
- ////// ABANDON LINEAR FEATURE
- ////// SAWCUT
- X X X X X X X X REMOVE LINEAR FEATURE
- LIMITS OF DISTURBANCE
- X REMOVE OBJECT
- XXXXXX WETLAND IMPACT

- ### DEMOLITION NOTES
- UTILITY OBJECTS SUCH AS GAS METER, TRANSFORMER, TELEPHONE PEDESTAL, UTILITY POLE & WIRES ARE TO BE REMOVED BY OTHERS IF APPLICABLE.
  - SEE SHEET LS-1 FOR TREE REMOVALS. ANY TREES NOT MARKED PER PLAN ARE TO BE PROTECTED & PRESERVED DURING CONSTRUCTION.
  - WETLAND AREAS THAT ARE NOT SHOWN TO BE IMPACTED ARE TO BE PROTECTED FROM ANY DAMAGE. INSTALL SILT FENCE PRIOR TO ANY OTHER WORK ADJACENT TO THE WETLAND.
  - REMOVAL LIMITS SHOWN FOR UNDERGROUND CONSTRUCTION ARE APPROXIMATE ONLY. CONTRACTOR TO DETERMINE REMOVALS NEEDED FOR SAFE EXCAVATION PRACTICES AND TO COMPLY WITH APPLICABLE SAFETY STANDARDS.
  - SEE SHEET C-2.3 FOR WETLAND IMPACTS.

### LEGEND:

- FOUND IRON
- SET IRON
- R RECORD DISTANCE
- M MEASURED DISTANCE
- EXISTING GRAVEL
- EXISTING PAVER STONE
- EXISTING BUILDING
- EXISTING CONCRETE
- EXISTING ASPHALT
- EXISTING LANDSCAPED AREA
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING OVERHEAD WIRES
- EXISTING FENCE
- EXISTING UTILITY POLE
- EXISTING WATER SHUT OFF
- EXISTING GATE VALVE
- EXISTING HYDRANT
- EXISTING WELL
- EXISTING GAS SHUT OFF
- EXISTING SANITARY STRUCTURE
- EXISTING STORM STRUCTURE
- EXISTING DOWN SPOUT
- EXISTING UTILITY PEDESTAL
- EXISTING BOULDER RET. WALL
- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED CONCRETE
- PROPOSED BUILDING
- PROPOSED SILT FENCE
- PROP. DRAINAGE ARROW
- PROP. MAJOR CONTOURS
- PROP. MINOR CONTOURS

NOTE: WETLAND A DRAINS TO WETLAND B, WHICH IS HYDRAULICALLY CONNECTED TO A LARGER WETLAND COMPLEX THAT EXTENDS OFF SITE TO THE SOUTH.

SEE SHEET C-2.2 (WETLAND PLAN) FOR DETAILS OF DISTURBANCE TO WETLANDS AND NATURAL FEATURE SETBACKS.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)

KEVIN C. McDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Utility Notification Organization

1-800-482-7171  
www.missdig.org

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**DEMOLITION PLAN - SOUTH**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	RESUBMIT TO MOOT
01/23/2024	REVISED SITE PLAN SUBMITTAL
03/17/2024	REVISED SITE PLAN PER CITY AND MOOT
03/28/2024	REVISED SITE PLAN PER MOOT
07/24/2024	PRELIMINARY SITE PLAN / WETLAND FLAGS
08/13/2024	REVISED SITE PLAN / WETLAND FLAGS
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 30'

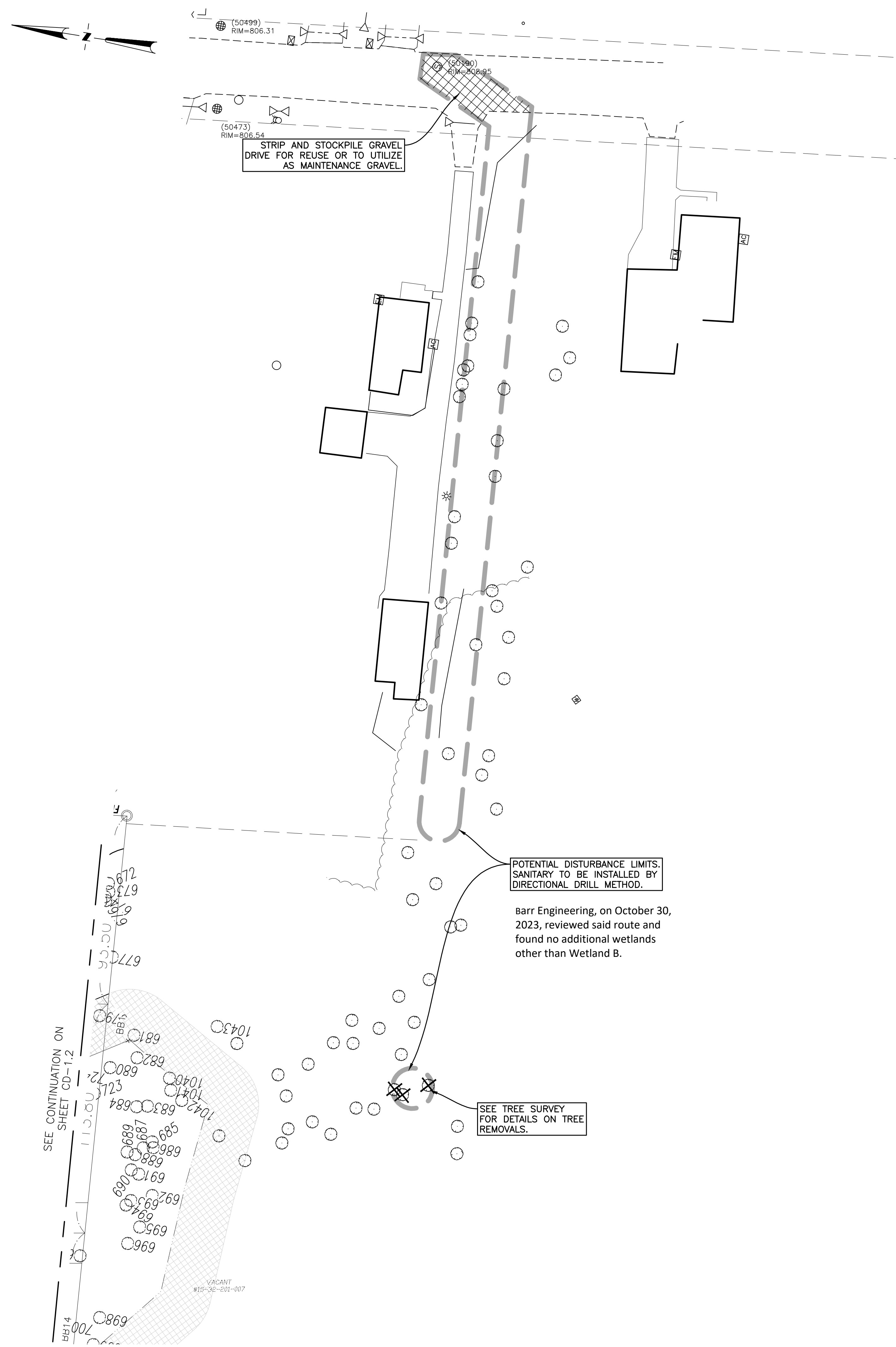
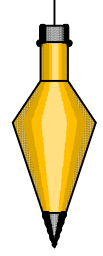
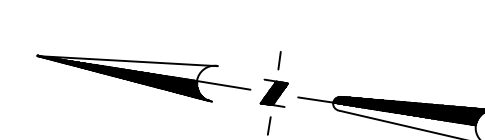
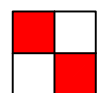
0 1/2" 1"

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: MN  
CHECK BY: AP

**CD-12**

NOT FOR CONSTRUCTION





STRIP AND STOCKPILE GRAVEL DRIVE FOR REUSE OR TO UTILIZE AS MAINTENANCE GRAVEL.

POTENTIAL DISTURBANCE LIMITS. SANITARY TO BE INSTALLED BY DIRECTIONAL DRILL METHOD.

Barr Engineering, on October 30, 2023, reviewed said route and found no additional wetlands other than Wetland B.

SEE TREE SURVEY FOR DETAILS ON TREE REMOVALS.

SEE CONTINUATION ON SHEET CD-1.2

### DEMOLITION LEGEND

- ..... ABANDON IN PLACE
- ////// ABANDON LINEAR FEATURE
- ////// SAWCUT
- X-X-X-X-X-X-X- REMOVE LINEAR FEATURE
- LIMITS OF DISTURBANCE
- X REMOVE OBJECT
- XXXX REMOVE PAVEMENT

### DEMOLITION NOTES

1. UTILITY OBJECTS SUCH AS GAS METER, TRANSFORMER, TELEPHONE PEDESTAL, UTILITY POLE & WIRES ARE TO BE REMOVED BY OTHERS IF APPLICABLE.
2. SEE SHEET LS-1 FOR TREE REMOVALS. ANY TREES NOT MARKED PER PLAN ARE TO BE PROTECTED & PRESERVED DURING CONSTRUCTION.
3. REMOVAL LIMITS SHOWN FOR UNDERGROUND CONSTRUCTION ARE APPROXIMATE ONLY. CONTRACTOR TO DETERMINE REMOVALS NEEDED FOR SAFE EXCAVATION PRACTICES AND TO COMPLY WITH APPLICABLE SAFETY STANDARDS.

### LEGEND:

- FOUND IRON
- SET IRON
- R RECORD DISTANCE
- M MEASURED DISTANCE
- EXISTING GRAVEL
- EXISTING PAVER STONE
- EXISTING BUILDING
- EXISTING CONCRETE
- EXISTING ASPHALT
- EXISTING LANDSCAPED AREA
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING OVERHEAD WIRES
- EXISTING FENCE
- EXISTING UTILITY POLE
- EXISTING WATER SHUT OFF
- EXISTING GATE VALVE
- EXISTING HYDRANT
- EXISTING WELL
- EXISTING GAS SHUT OFF
- EXISTING SANITARY STRUCTURE
- EXISTING STORM STRUCTURE
- EXISTING DOWN SPOUT
- EXISTING UTILITY PEDESTAL
- EXISTING BOULDER RET. WALL
- EXISTING GRADE
- PROPOSED GRADE
- PROPOSED CONCRETE
- PROPOSED BUILDING
- PROPOSED SILT FENCE
- PROP. DRAINAGE ARROW
- PROP. MAJOR CONTOURS
- PROP. MINOR CONTOURS

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSSB)

KEVIN C. McDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig:

Michigan's Utility One-Call Notification Organization

1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE INDIVIDUALLY RESPONSIBLE FOR DETERMINING THE EXACT UTILITIES, DEPTHS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**DEMOLITION PLAN - OFFSITE**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

PLAN SUBMITTALS/REVISIONS	DATE
RESUBMIT TO MOOT	09/13/2023
REVISED SITE PLAN SUBMITTAL	01/23/2024
REVISED SITE PLAN PER CITY AND MDCD	03/14/2024
REVISED SITE PLAN PER MOOT	03/28/2024
PRELIMINARY SITE PLAN TO CITY	05/16/2024
REVISED SITE PLAN / WETLAND FLAGS	07/24/2024
REVISED SITE PLAN / WETLAND FLAGS	09/13/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/04/2024

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

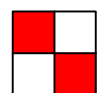
SCALE: 1" = 30'

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**CD-13**

NOT FOR CONSTRUCTION

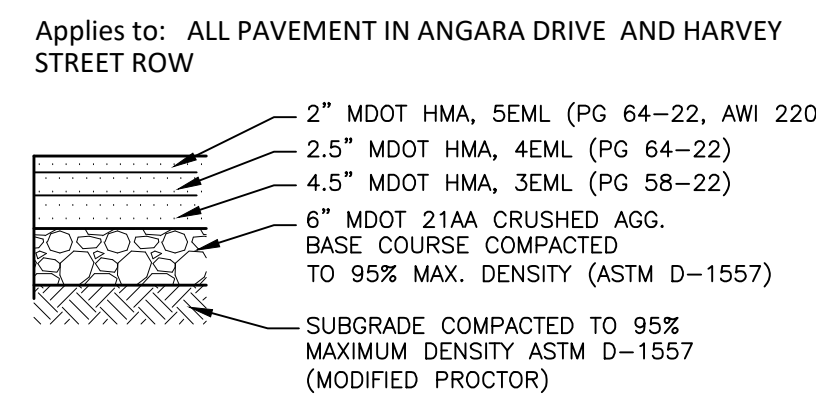




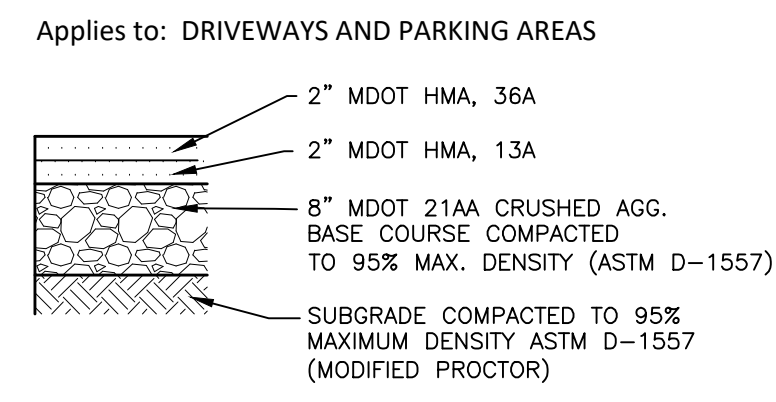
NOTES

- MULTIFAMILY BUILDINGS HAVE INTERNAL TRASH HANDLING. SINGLE FAMILY UNITS HAVE RESIDENTIAL CURB SIDE ROLL-OFF CONTAINERS STORED IN THE GARAGES. FARM STAND TO HAVE CURB SIDE ROLL-OFF CONTAINER STORED IN THE BUILDING.
- SCREENING SHALL BE PROVIDED FOR ALL MECHANICAL EQUIPMENT.
- ALL AREAS NOT PAVED SHALL BE FINISHED IN GRASS OR OTHER PERMEABLE SURFACE.
- MULTIFAMILY BUILDINGS WILL BE FIRE SUPPRESSED.
- SEE LS SHEETS FOR DETAILS RELATED TO THE PLAZA.
- SEE REMOVAL PLANS AND WETLAND PLAN FOR WETLAND IMPACT NOTES.
- ALL GROUND MOUNTED MECHANICAL EQUIPMENT SHALL BE SCREENED FROM VIEW. SEE LS SHEETS.
- STREETS WITHIN (AND ADJACENT TO) THE F8 OVERLAY ZONING HAVE THE FOLLOWING CLASSIFICATIONS:
  - AUBURN ROAD - ARTERIAL (MDOT ROW)
  - ANGARA DRIVE - MAIN STREET (PRIVATE ROAD)
  - HARVEY STREET - MINOR STREET (PRIVATE ROAD)
- ENTIRE DEVELOPMENT IS TO BE GOVERNED BY ONE HOMEOWNERS ASSOCIATION. ALL COMMON AND YARD AREAS (INCLUDING SINGLE FAMILY) ARE TO BE MAINTAINED BY THE ASSOCIATION.
- ALL SIGNS MUST MEET THE REQUIREMENTS OF THE CITY AND BE APPROVED UNDER SEPARATE PERMITS ISSUED BY THE BUILDING DEPARTMENT.
- PRIVATE ROAD EASEMENTS FOR HARVEY STREET AND ANGARA DRIVE WILL ALSO INCLUDE BLANKET CROSS ACCESS EASEMENTS TO ADJACENT PROPERTIES.
- SIDEWALKS ADJACENT TO COMMON ELEMENTS AND OPEN SPACES IN THE DEVELOPMENT ARE TO BE CONSTRUCTED PRIOR TO SINGLE FAMILY HOME CONSTRUCTION.
- A CONSERVATION EASEMENT WILL BE PROVIDED FOR NATURAL FEATURES SETBACKS ON SINGLE FAMILY UNITS. SIGNING WILL BE PROVIDED AT 25' SPACING ALONG THE BUFFER LIMITS IDENTIFYING THE BUFFER AND RESTRICTING MOWING, PESTICIDE AND FERTILIZER USE WITHIN IT.

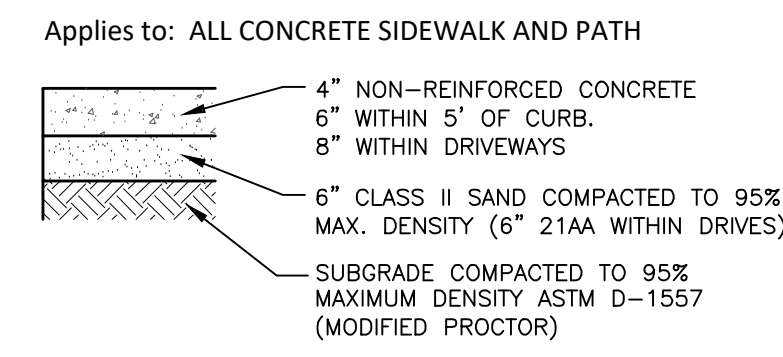
CITY ROAD PAVING SECTION



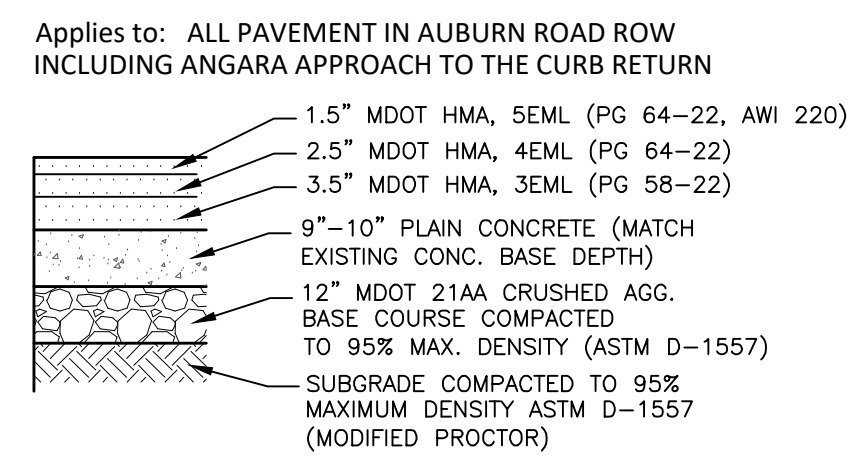
STANDARD DUTY PAVEMENT SECTION



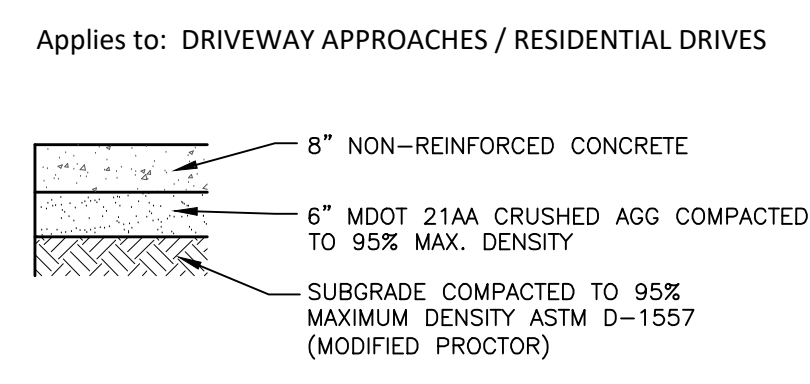
CONCRETE SIDEWALK SECTION



MDOT ROAD PAVING SECTION



CONCRETE DRIVEWAY SECTION

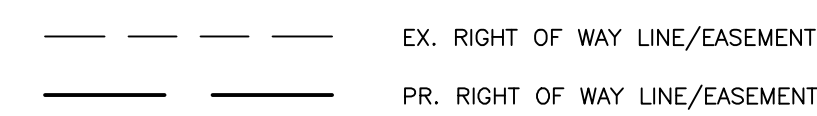


DIMENSIONING NOTE

1. DIMENSIONS ARE TO THE BACK OF CURB UNLESS OTHERWISE SPECIFIED.

FC = FACE OF CURB

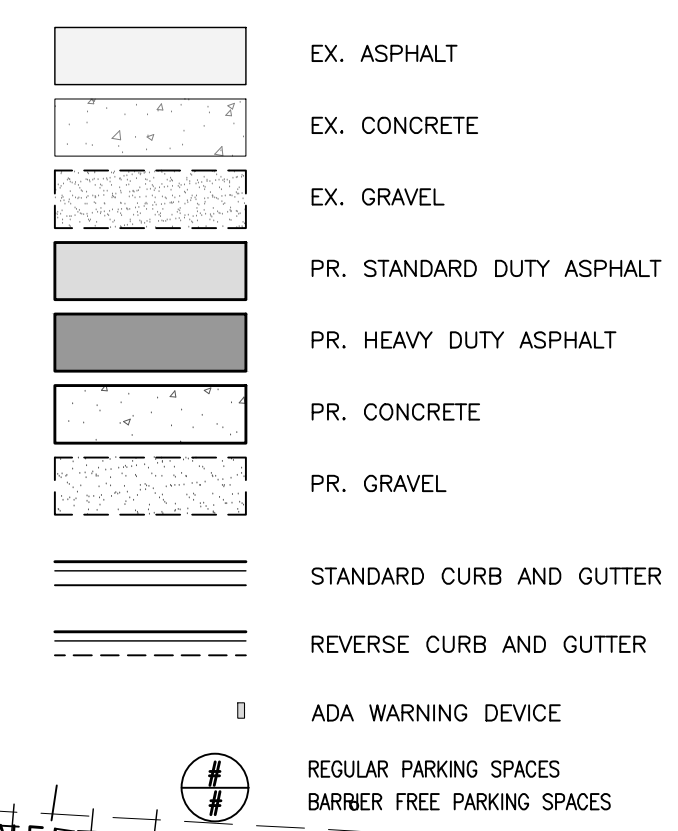
RIGHT OF WAY LINE LEGEND



ADA NOTE

ALL ROADSIDE SIDEWALK RAMPS SHALL BE DESIGNED AND CONSTRUCTED PER MDOT STANDARD PLAN R-28 SERIES. ALL ONSITE SIDEWALKS AND RAMPS TO BE CONSTRUCTED PER ADA.

PAVEMENT LEGEND



INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

298 VETERANS DRIVE  
FOWLERVILLE,  
MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM  
SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOBS)

KEVIN C. MCDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Michigan's  
One-Call

Utility  
Notification  
Organization

1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE INDIVIDUALLY RESPONSIBLE FOR DETERMINING THE EXACT DEPTHS, LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

**AUBURN ANGARA OAKS, LLC**  
14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**SITE PLAN - OVERVIEW**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	PLAN SUBMITTALS/REVISIONS
01/12/2024	RESUBMIT TO MDOT
01/23/2024	REVISED SITE PLAN PER CITY AND MDOT
03/14/2024	REVISED SITE PLAN PER MDOT
03/28/2024	PRELIMINARY SITE PLAN TO CITY
05/16/2024	PRELIMINARY SITE PLAN / WETLAND FLAGS
07/24/2024	REVISED SITE PLAN TO CITY
09/13/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

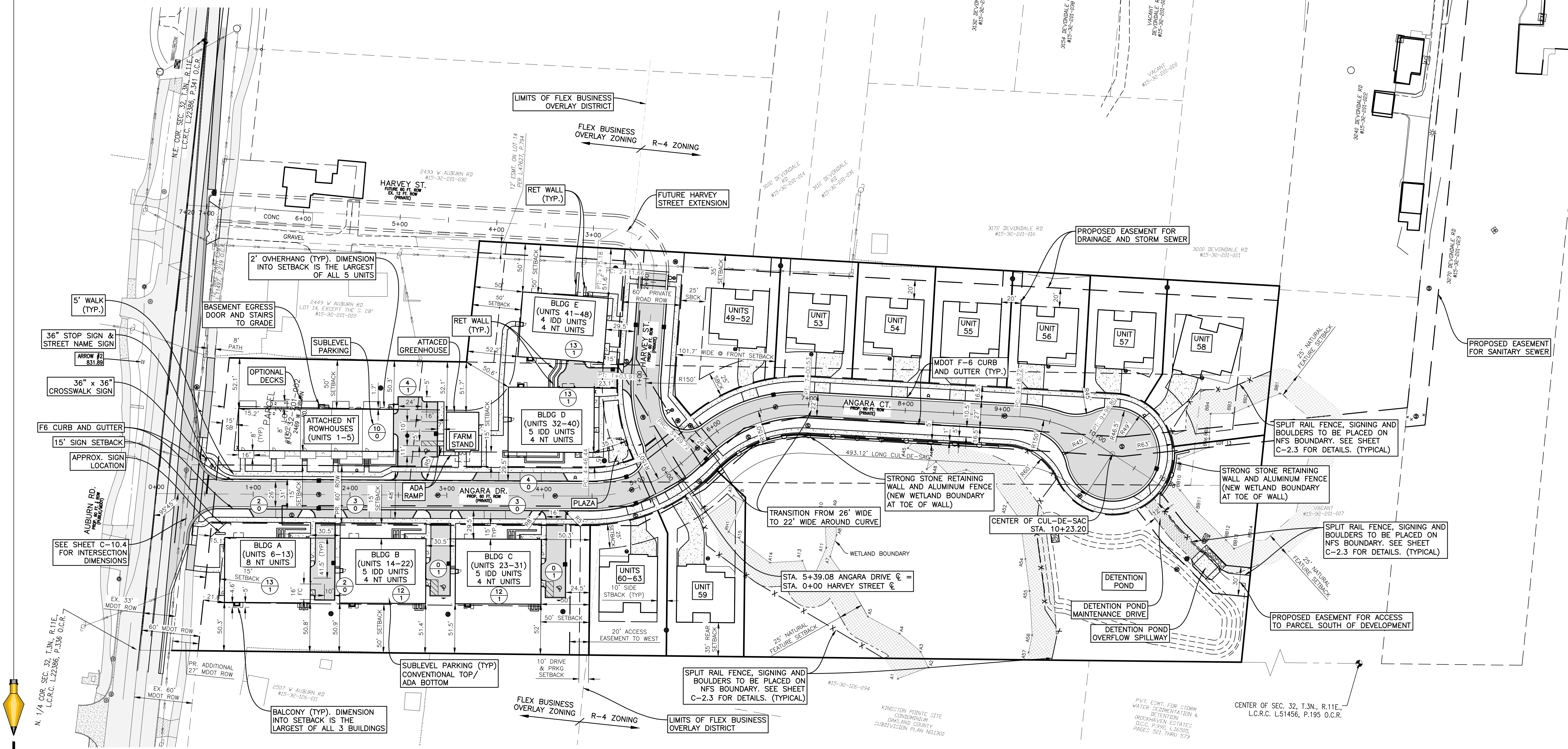
SCALE: 1" = 50'

0 1/2" 1"

FIELD: REICHERT  
DRAWN BY: NM  
DESIGN BY: NM  
CHECK BY: AP

**C-10**

NOT FOR CONSTRUCTION







### ZONING INFORMATION

THIS ZONING INFORMATION IS TAKEN FROM ROCHESTER HILLS ZONING ORDINANCE DATED: 02/14/2024 (INCL FB OVERLAY ORDINANCE)

Table with columns: SUBJECT PARCEL ZONING, SUBJECT PARCEL (AREA, WIDTH, BLDG AREA, BLDG D.E AREA), PROPOSED BUILDING, MAXIMUM HEIGHT OF BUILDING, BUILDING SETBACKS (FRONT, SIDE, REAR), PARKING SETBACKS (FRONT, SIDE, REAR).

- 1. SETBACK LISTED FOR 2 STORY BUILDINGS UNDER 30 FEET TALL.
2. SETBACK FROM RESIDENTIAL ZONING DISTRICTS ONLY.

Table with columns: SUBJECT PARCEL ZONING, SUBJECT PARCEL (AREA, WIDTH, IN STORIES, IN FEET), MAXIMUM HEIGHT OF BUILDING, BUILDING SETBACKS (FRONT, SIDE, REAR), MAXIMUM % LOT AREA COVERED BY ALL BUILDINGS, MINIMUM FLOOR AREA (SF).

### ADJACENT ZONING

NORTH: R-4 ONE-FAMILY RESIDENTIAL
EAST: R-4 ONE-FAMILY RESIDENTIAL
WEST: R-4 ONE-FAMILY RESIDENTIAL

### PROPOSED USE

#### MULTIFAMILY

SEE UNIT COUNT TABLE FOR DISTRIBUTION OF NEUROTYPICAL (NT) AND INTELLECTUALLY AND DEVELOPMENTALLY DISABLED (IDD) UNITS.

ATTACHED ROWHOUSES (UNITS 1-5): CONDOS AGE TARGETED FOR ACTIVE ADULTS (AGE 45-74) (NT)

#### SINGLE FAMILY

RANCH TOWNHOMES: 7 SINGLE FAMILY HOMES (UNITS 53-59 ARE CONDOS AGE TARGETED TO ACTIVE ADULTS (AGE 45-75) (NT)
2 SINGLE FAMILY HOMES (UNITS 49 - 52 AND 60 - 63) ARE CONDOS WITH SUITES FOR IDD

#### PLACES OF INTEREST

1,329 SQ FT (GFA) COMMUNITY GARDEN / GREENHOUSE (NO SALES)

PLAZA W/ LANDSCAPE GARDENS AND BENCHES

SEE LANDSCAPE PLANS FOR MORE INFORMATION ON PLACES OF INTEREST

### PROPOSED PARKING

REQUIRED PARKING
NON-RESIDENTIAL (FARMSTAND): 1.0 PARKING SPACE PER 400 SFT
FARMSTAND = 1329 SFT / 400 = 5 SPACES

MULTIFAMILY (SEE TABLE TO RIGHT FOR REQUIREMENTS)
APARTMENTS/ROWHOUSES = 74 SPACES

MINIMUM REQUIRED PARKING = 79 SPACES MINIMUM

MINIMUM REQUIRED FOR VISITORS = 0.5 PER MULTIFAMILY NT UNIT = 12 SPACES (INCLUDED IN ABOVE)

MAXIMUM PARKING = 1.25 X MIN PARKING = 99 SPACES MAXIMUM

#### PARKING PROVIDED:

RESIDENT PARKING (INSIDE BUILDINGS)
PARKING ON MULTIFAMILY SUBLEVELS = 73 STANDARD SPACES
5 BARRIER FREE SPACES

RESIDENT/VISITOR PARKING SPACES (OUTSIDE BUILDINGS)
BARRIER FREE PARKING = 3 SPACES
STANDARD SPACES IN BUILDING A DRIVE = 2 SPACES
STANDARD SPACES IN LOT AT ROWHOUSES = 4 SPACES
PARALLEL PARKING ON STREET = 12SPACES

TOTAL PARKING PROVIDED = 91 STANDARD SPACES
8 BARRIER FREE (ALL VAN ACCESSIBLE)
91 REGULAR SPACES
8 BARRIER FREE SPACES

NOTE: SINGLE FAMILY DETACHED HOMES EACH HAVE 2 CAR GARAGES AND SPACE FOR 2+ VEHICLES IN DRIVEWAY.

### UNIT COUNT / TYPE / PARKING

Table with columns: BLDG/UNIT #, UNIT TYPE, BLDG, MULTIFAMILY UNITS, PARKING (IDD, NT, REQUIRED SPACES).

Table with columns: UNIT #, UNIT TYPE, GRADE, FLOOR PLAN, LOT WIDTH (FT), LOT DEPTH (FT), LOT AREA (SFT).

UNIT TYPES
NT = NEURO-TYPICAL
IDD = INTELLECTUALLY/DEVELOPMENTALLY DISABLED

### TRIP GENERATION - ITE 10TH EDITION

#### ITE (10TH EDITION) TRIP GENERATION

Project No.: 21-051 Date: 1/12/2024
Project Name: Angara Drive Senior Living Development Calculated by: Kevin C. McDevitt, P.E.

#### Single Family

Table with columns: Land Use, ITE Code, Amount, Units, ITE 10th Edition - Per Unit, Average Daily Traffic, AM Peak Hour, PM Peak Hour.

#### Multi Family - Intellectually/Developmentally Disabled

Table with columns: Land Use, ITE Code, Amount, Units, ITE 10th Edition - Per Unit, Average Daily Traffic, AM Peak Hour, PM Peak Hour.

#### Multi Family - Neotraditional

Table with columns: Land Use, ITE Code, Amount, Units, ITE 10th Edition - Per Unit, Average Daily Traffic, AM Peak Hour, PM Peak Hour.

#### Farm Stand - ITE 10th Ed. did not provide ADT Numbers - Assuming closed mid-day, open morning and afternoon so just added a.m. and p.m. peaks for ADT

Table with columns: Land Use, ITE Code, Amount, Units, ITE 10th Edition - Per Unit, Average Daily Traffic, AM Peak Hour, PM Peak Hour.

#### Total Development - Angara Drive Mixed Use Residential

Table with columns: Land Use, ITE Code, Amount, Units, Average Daily Traffic, AM Peak Hour, PM Peak Hour.



Call MISS DIG
3 full working days before you dig.
Michigan's One-Call Utility Notification Organization
1-800-482-7171 www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT:
AUBURN ANGARA OAKS, LLC
14496 N SHELDON RD SUITE 230
PLYMOUTH, MI 48170
BRUCE MICHAEL (248) 703-4653

SITE PLAN - BUILDING DATA
AUBURN ANGARA OAKS
PART OF SEC. 32, T3N, R11E
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

Table with columns: DATE, PLAN SUBMITTALS/REVISIONS, RESUBMIT TO WOOT, REVISIONS.

ORIGINAL ISSUE DATE: 05/19/2022

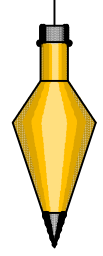
PROJECT NO: 22-051

SCALE: 1" = 50'

FIELD: REICHERT
DRAWN BY: MN
DESIGN BY: KM
CHECK BY: AP

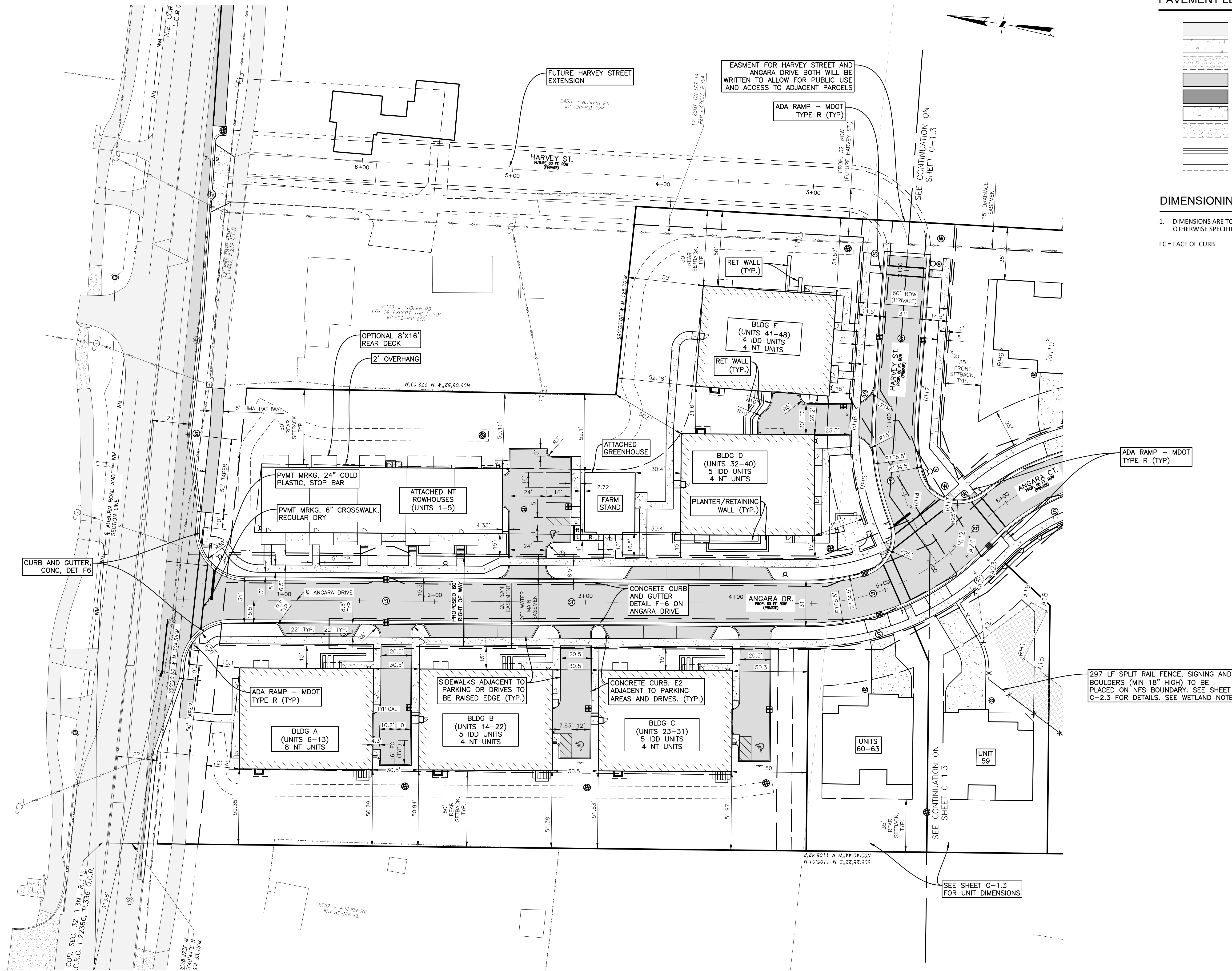
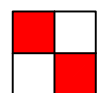
C-11

CITY FILE #22-037 SECTION #32



NOT FOR CONSTRUCTION





### PAVEMENT LEGEND

[Symbol]	EX. ASPHALT
[Symbol]	EX. CONCRETE
[Symbol]	EX. GRAVEL
[Symbol]	PR. STANDARD DUTY ASPHALT
[Symbol]	PR. HEAVY DUTY ASPHALT
[Symbol]	PR. CONCRETE
[Symbol]	PR. GRAVEL
[Symbol]	STANDARD CURB AND GUTTER
[Symbol]	REVERSE CURB AND GUTTER

### DIMENSIONING NOTE

1. DIMENSIONS ARE TO THE BACK OF CURB UNLESS OTHERWISE SPECIFIED.

FC = FACE OF CURB

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**  
MONUMENT ENGINEERING GROUP ASSOCIATES, INC.

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)

**KEVIN C. McDEVITT**  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Michigan's Utility Notification Organization  
1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, DEPTH AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

**CLIENT :**

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**DIMENSION & PAVING PLAN - NORTH**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

PLAN SUBMITTALS/REVISIONS	DATE
RESUBMIT TO MDOT	09/13/2023
REVISED SITE PLAN SUBMITTAL	01/23/2024
REVISED SITE PLAN PER CITY AND MDOT	03/14/2024
REVISED SITE PLAN PER MDOT	03/28/2024
PRELIMINARY SITE PLAN TO CITY	05/16/2024
REVISED SITE PLAN / WETLAND FLAGS	07/24/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/13/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/04/2024

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

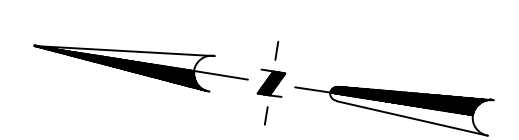
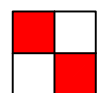
SCALE: 1" = 30'

FIELD:  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**C-12**

NOT FOR CONSTRUCTION





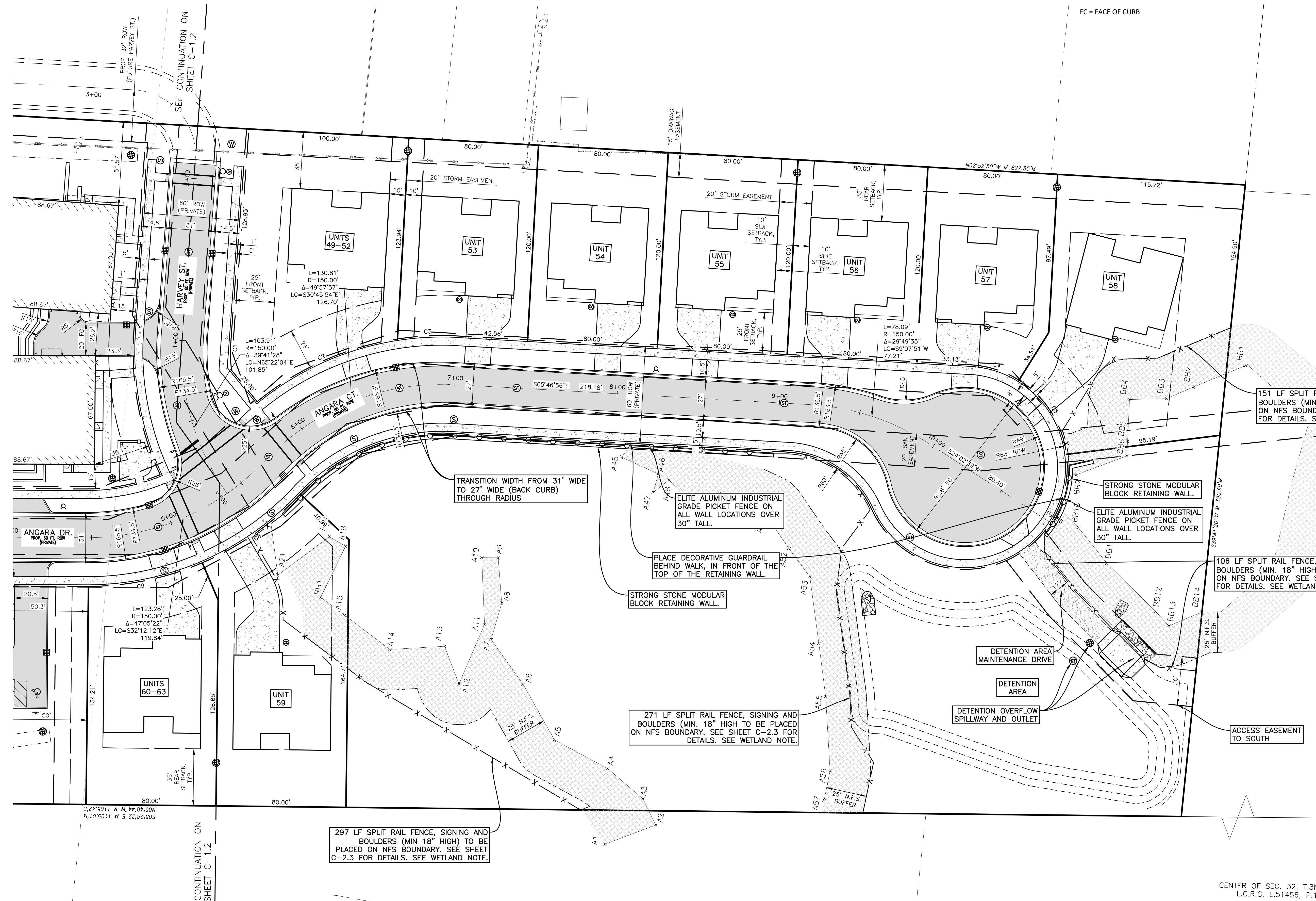
### DIMENSIONING NOTE

- DIMENSIONS ARE TO THE BACK OF CURB UNLESS OTHERWISE SPECIFIED.
- FC = FACE OF CURB

### PAVEMENT LEGEND

- EX. ASPHALT
- EX. CONCRETE
- EX. GRAVEL
- PR. STANDARD DUTY ASPHALT
- PR. HEAVY DUTY ASPHALT
- PR. CONCRETE
- PR. GRAVEL
- STANDARD CURB AND GUTTER
- REVERSE CURB AND GUTTER

CURVE #	LENGTH	RADIUS	DELTA	CHORD
C1	19.95'	120.00'	9°31'29"	N80°28'11"E 19.93'
C2	95.71'	180.00'	30°27'58"	N33°01'13"W 94.59'
C3	37.71'	180.00'	12°00'18"	N11°47'05"W 37.65'
C4	31.59'	63.00'	28°43'37"	N08°34'53"E 31.26'
C5	56.06'	63.00'	50°58'58"	N48°26'11"E 54.23'
C8	74.21'	180.00'	23°37'21"	S43°59'38"E 73.69'
C9	72.04'	180.54'	22°51'47"	S20°43'55"E 71.57'



151 LF SPLIT RAIL FENCE, SIGNING AND BOULDERS (MIN. 18" HIGH) TO BE PLACED ON NFS BOUNDARY. SEE SHEET C-2.3 FOR DETAILS. SEE WETLAND NOTE.

STRONG STONE MODULAR BLOCK RETAINING WALL.

ELITE ALUMINUM INDUSTRIAL GRADE PICKET FENCE ON ALL WALL LOCATIONS OVER 30" TALL.

PLACE DECORATIVE GUARDRAIL BEHIND WALK, IN FRONT OF THE TOP OF THE RETAINING WALL.

STRONG STONE MODULAR BLOCK RETAINING WALL.

271 LF SPLIT RAIL FENCE, SIGNING AND BOULDERS (MIN. 18" HIGH) TO BE PLACED ON NFS BOUNDARY. SEE SHEET C-2.3 FOR DETAILS. SEE WETLAND NOTE.

106 LF SPLIT RAIL FENCE, SIGNING AND BOULDERS (MIN. 18" HIGH) TO BE PLACED ON NFS BOUNDARY. SEE SHEET C-2.3 FOR DETAILS. SEE WETLAND NOTE.

297 LF SPLIT RAIL FENCE, SIGNING AND BOULDERS (MIN. 18" HIGH) TO BE PLACED ON NFS BOUNDARY. SEE SHEET C-2.3 FOR DETAILS. SEE WETLAND NOTE.

CENTER OF SEC. 32, T.3N., R.11E., L.C.R.C. L.51456, P.195 O.C.R.

### WETLAND / NATURAL FEATURES BUFFER

PLACE SIGNS IMMEDIATELY BEHIND THE SPLIT RAIL FENCE SPACED AT 50 FEET ON CENTER. SIGNS SHALL BE A MINIMUM 18" X 12" AND SHALL STATE "TO PROTECT THE ADJACENT WETLAND, NO MOWING OR APPLICATION OF CHEMICALS SHALL BE ALLOWED BEHIND THE FENCE PURSUANT TO CITY ORDINANCE ARTICLE 9 NATURAL FEATURES BUFFER".

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**  
Engineering Group Associates, Inc.

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOBS)

KEVIN C. McDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Utility Notification Organization  
1-800-482-7171  
www.missdig.org

THE LOCATIONS AND DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR VERIFYING THE LOCATION, DEPTHS AND ELEVATIONS PRIOR TO THE START OF ANY WORK.

CLIENT :

**AUBURN ANGARA OAKS, LLC**  
14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**DIMENSION & PAVING PLAN - SOUTH**

AUBURN ANGARA OAKS

PART OF SEC. 32, T.3N., R.11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	PLAN SUBMITTALS/REVISIONS
01/23/2024	RESUBMIT TO MOOT
03/14/2024	REVISED SITE PLAN SUBMITTAL
03/28/2024	REVISED SITE PLAN PER CITY AND MOOT
05/16/2024	REVISED SITE PLAN PER MOOT
07/24/2024	PRELIMINARY SITE PLAN / WETLAND FLAGS
09/13/2024	REVISED SITE PLAN / WETLAND FLAGS
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 30'

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**C-13**

NOT FOR CONSTRUCTION









INFORMATION ON THIS SHEET HAS BEEN COPIED FROM THE ARCHITECTURAL PLANS. SEE ARCHITECTURAL PLAN SET FOR SEAL AND SIGNATURE OF DESIGN PROFESSIONAL.

Call MISS DIG  
3 full working days before you dig.



Michigan's Utility Notification Organization  
1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, DEPTH AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**CODE ANALYSIS**

AUBURN ANGARA OAKS

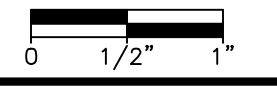
PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	RESUBMIT TO MOOT
01/23/2024	REVISED SITE PLAN SUBMITTAL
03/14/2024	REVISED SITE PLAN PER CITY AND MOOT
03/28/2024	REVISED SITE PLAN PER MOOT
07/24/2024	REVISED SITE PLAN / WETLAND FLAGS
09/13/2024	REVISED SITE PLAN TO CITY
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 50'



FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**C-2.2**

NOT FOR CONSTRUCTION

**BUILDING CODE ANALYSIS - SINGLE FAMILY HOMES**

**Project Address:**  
Auburn Anagra Oaks Development - Single Family Style homes  
3046 Anagra Drive  
Rochester Hills, Michigan 48309

**Description of Work:**  
Proposed new single family detached homes.

**Reference Standards:**  
2015 Michigan Residential Code  
2015 International Energy Code  
2013 ASHRAE-2013  
2015 International & Michigan Mechanical Code  
2015 International Plumbing Code  
2009 ICC/ANSI A117.1 and Michigan Barrier Free Design Law  
2015 International Fire Code  
2013 NFPA 13, 13D, 13R - Fire Sprinkler Systems  
2013 NFPA 72 - Fire Alarm Code

Revise codes to current codes:  
2021 Michigan Plumbing Code  
2021 Michigan Mechanical Code  
2023 NEC

**BUILDING CODE ANALYSIS - MULTIFAMILY BUILDINGS**

**Code Analysis summary, tagged to Planning Review comments. See Architectural sheet T1.2 for complete information**

**Project Address:**  
Auburn Anagra Oaks Development - Charlevoix Model Multi-Family Building.  
3046 Anagra Drive  
Rochester Hills, Michigan 48309

**Description of Work:**  
Proposed new 9 unit, residential apartment (condominium) building.

**Reference Standards:**  
Michigan Building Code (2015) ICC/ANSI A117.1 and Michigan Barrier Free Design Law (2009)  
International Energy Code (2015) International Fire Code (2015)  
ASHRAE 90.1 (2013) NFPA 13 - Fire Sprinkler Systems (2013)  
Michigan Mechanical Code (2015) NFPA 72 - Fire Alarm Code (2013)  
Michigan Plumbing Code (2018) Michigan Electrical Code (IEC + Part 8 State amendments) (2017)

Residential (Primary use - dwelling units/ accessory spaces) Use Group R-2  
Storage (Low-hazard storage / parking garage) Use Group S-2

**Separated Mixed Use:** Per Sect. 508.4, requires min. 1 hour fire separation between S and R uses (in building w/ 903.3.1.1 [full NFPA-13] compliant sprinkler system)

**Type of Construction:** 5B - (2) stories above grade w/ (1) story below grade garage

ALLOWABLE HEIGHT and BUILDING AREAS (per TABLES 504.3, 504.4 & 506.2):  
ALLOWABLE HEIGHT:

Use Group:	Height (Feet)	Height (Stories)
S-2 (Parking garage) @ Type 5B constr'n	60 feet	3 stories
R-2 (Permanent dwelling) @ Type 5B constr'n	60 feet	3 stories
ACTUAL building height in Feet/Stories	29'-11"	2 Stories

\*NFPA 13 complying with Section 903.3.1.1 (and **NOT** NFPA13R 903.3.1.2)  
ALLOWABLE BUILDING AREA (per story):

Floor (Use Groups):	Max. Allowed* (sf)	Provided (sf)
Basement (Garage) Level: (S-2)	40,500	5,588
First Floor: (S-2)	21,000	5,700
Second Floor: (R-2)	21,000	5,708
TOTAL ACTUAL BLDG. AREA		16,996

\*NFPA 13 complying with Section 903.3.1.1 (and **NOT** NFPA13R 903.3.1.2)

**CHAPTER 9 Fire Protection Systems**

	Yes	X	No	13R
(903) Automatic Sprinkler System Fully Sprinkled	Yes	X	No	X
NFPA 13 or 13R	Yes	X	No	X
(905) Standpipe System *	Yes	X	No	X
(907) Alarm System	Yes	X	No	X
Smoke Control System	Yes	X	No	X
Fire Control Room	Yes	X	No	X

\* highest floor is 21'-4" = less than 30' above lowest fire vehicle access

Separation of multiple buildings on site per Sect. 503.1.2, 602

**Exterior Rating based on Fire Separation Distance per Table 602**

	Fire Sep'n Dist. (ft)	Req'd Rating	UL Listing and Notes
North	10' or more	0 hr.	n/a
East	10' or more	0 hr.	n/a
South	10' or more	0 hr.	n/a
West	10' or more	0 hr.	n/a

**BUILDING CODE ANALYSIS - FARM STAND BUILDING**

**Code Analysis summary, tagged to Planning Review comments. See Architectural sheet T1.2 for complete information**

**Project Address:**  
Auburn Anagra Oaks Development - Produce Sales Market Building and Greenhouse.  
3046 Anagra Drive  
Rochester Hills, Michigan 48309

**Description of Work:**  
Proposed new one-story Market building for fresh produce sales and attached agricultural greenhouse for produce production.

**Reference Standards:**  
Michigan Building Code (2015) ICC/ANSI A117.1 and Michigan Barrier Free Design Law (2009)  
International Energy Code (2015) International Fire Code (2015)  
ASHRAE 90.1 (2013) NFPA 13 - Fire Sprinkler Systems (2013)  
Michigan Mechanical Code (2015) NFPA 72 - Fire Alarm Code (2013)  
Michigan Plumbing Code (2018) Michigan Electrical Code (IEC + Part 8 State amendments) (2017)

Mercantile (Retail market space for produce sales) Use Group M  
Utility (Agricultural greenhouse for production of fresh produce) Use Group U

**Unseparated Mixed Use:** Per Sect. 508.3, most restrictive allowances shall apply to the entire building.

**Type of Construction:** 5B - (1) stories above grade on slab-on-grade

ALLOWABLE HEIGHT and BUILDING AREAS (per TABLES 504.3, 504.4 & 506.2):  
ALLOWABLE HEIGHT:

Use Group:	Height (Feet)	Height (Stories)
M (Mercantile) - Type 5B constr'n*	40 feet	1 stories
U (Greenhouse) - Type 5B constr'n*	40 feet	2 stories
ACTUAL building height in Feet/Stories	17'-8 1/2"	1 Story

ALLOWABLE AREA SUMMARY (per story): \*no sprinkler system required, per Section 903.2

Floor (Use Groups):	Max. Allowed (sf)	Provided (sf)
M (Mercantile) - Type 5B constr'n*	9,000	476
U (Greenhouse) - Type 5B constr'n*	5,500	801
TOTAL ACTUAL BLDG. AREA (unseparated)	9,000	1,277

\*no sprinkler system required, per Section 903.2

**CHAPTER 9 Fire Protection Systems**

	Yes	X	No	13R
(903) Automatic Sprinkler System Fully Sprinkled	Yes	X	No	X
NFPA 13 or 13R	Yes	X	No	X
(905) Standpipe System *	Yes	X	No	X
(907) Alarm System	Yes	X	No	X
Smoke Control System	Yes	X	No	X
Fire Control Room	Yes	X	No	X

Separation of multiple buildings on site per Sect. 503.1.2, 602

**Exterior Rating based on Fire Separation Distance per Table 602**

	Fire Sep'n Dist. (ft)	Req'd Rating	UL Listing and Notes
North	10' or more	0 hr.	n/a
East	10' or more	0 hr.	n/a
South	10' or more	0 hr.	n/a
West	10' or more	0 hr.	n/a

**BUILDING CODE ANALYSIS - ROWHOUSE STYLE ATTACHED CONDOS**

**Code Analysis summary, tagged to Planning Review comments. See Architectural sheet T1.2 for complete information**

**Project Address:**  
Auburn Anagra Oaks Development - Rowhouse-style Multi-Family Building.  
3046 Anagra Drive  
Rochester Hills, Michigan 48309

**Description of Work:**  
Proposed new 5 unit, residential apartment (condominium) building.

**Reference Standards:**  
Michigan Building Code (2015) ICC/ANSI A117.1 and Michigan Barrier Free Design Law (2009)  
International Energy Code (2015) International Fire Code (2015)  
ASHRAE 90.1 (2013) NFPA 13 - Fire Sprinkler Systems (2013)  
Michigan Mechanical Code (2015) NFPA 72 - Fire Alarm Code (2013)  
Michigan Plumbing Code (2018) Michigan Electrical Code (IEC + Part 8 State amendments) (2017)

Residential (Primary use - dwelling units/ accessory spaces) Use Group R-2  
Storage (Low-hazard storage / parking garage) Use Group S-2

**Separated Mixed Use:** Per Sect. 508.4, requires min. 1 hour fire separation between S and R uses (in building w/ 903.3.1.1 [full NFPA-13] compliant sprinkler system)

**Type of Construction:** 5B - (2) stories above grade w/ (1) story below grade garage

ALLOWABLE HEIGHT and BUILDING AREAS (per TABLES 504.3, 504.4 & 506.2):  
ALLOWABLE HEIGHT:

Use Group:	Height (Feet)	Height (Stories)
S-2 (Parking garage) @ Type 5B constr'n	60 feet	3 stories
R-2 (Permanent dwelling) @ Type 5B constr'n	60 feet	3 stories
ACTUAL building height in Feet/Stories	27'-9"	2 Stories

\*NFPA 13 complying with Section 903.3.1.1 (and **NOT** NFPA13R 903.3.1.2)  
ALLOWABLE BUILDING AREA (per story):

Floor (Use Groups):	Max. Allowed* (sf)	Provided (sf)
Basement (Garage) Level: (S-2)	40,500	4,315
First Floor: (S-2)	21,000	6,782
Second Floor: (R-2)	21,000	7,347
TOTAL ACTUAL BLDG. AREA		18,444

\*NFPA 13 complying with Section 903.3.1.1 (and **NOT** NFPA13R 903.3.1.2)

**CHAPTER 9 Fire Protection Systems**

	Yes	X	No	13R
(903) Automatic Sprinkler System Fully Sprinkled	Yes	X	No	X
NFPA 13 or 13R	Yes	X	No	X
(905) Standpipe System *	Yes	X	No	X
(907) Alarm System	Yes	X	No	X
Smoke Control System	Yes	X	No	X
Fire Control Room	Yes	X	No	X

\* highest floor is 21'-1" = less than 30' above lowest fire vehicle access

Separation of multiple buildings on site per Sect. 503.1.2, 602

**Exterior Rating based on Fire Separation Distance per Table 602**

	Fire Sep'n Dist. (ft)	Req'd Rating	UL Listing and Notes
North	10' or more	0 hr.	n/a
East	10' or more	0 hr.	n/a
South	10' or more	0 hr.	n/a
West	10' or more	0 hr.	n/a



**UTILITY CROSSING NOTE**

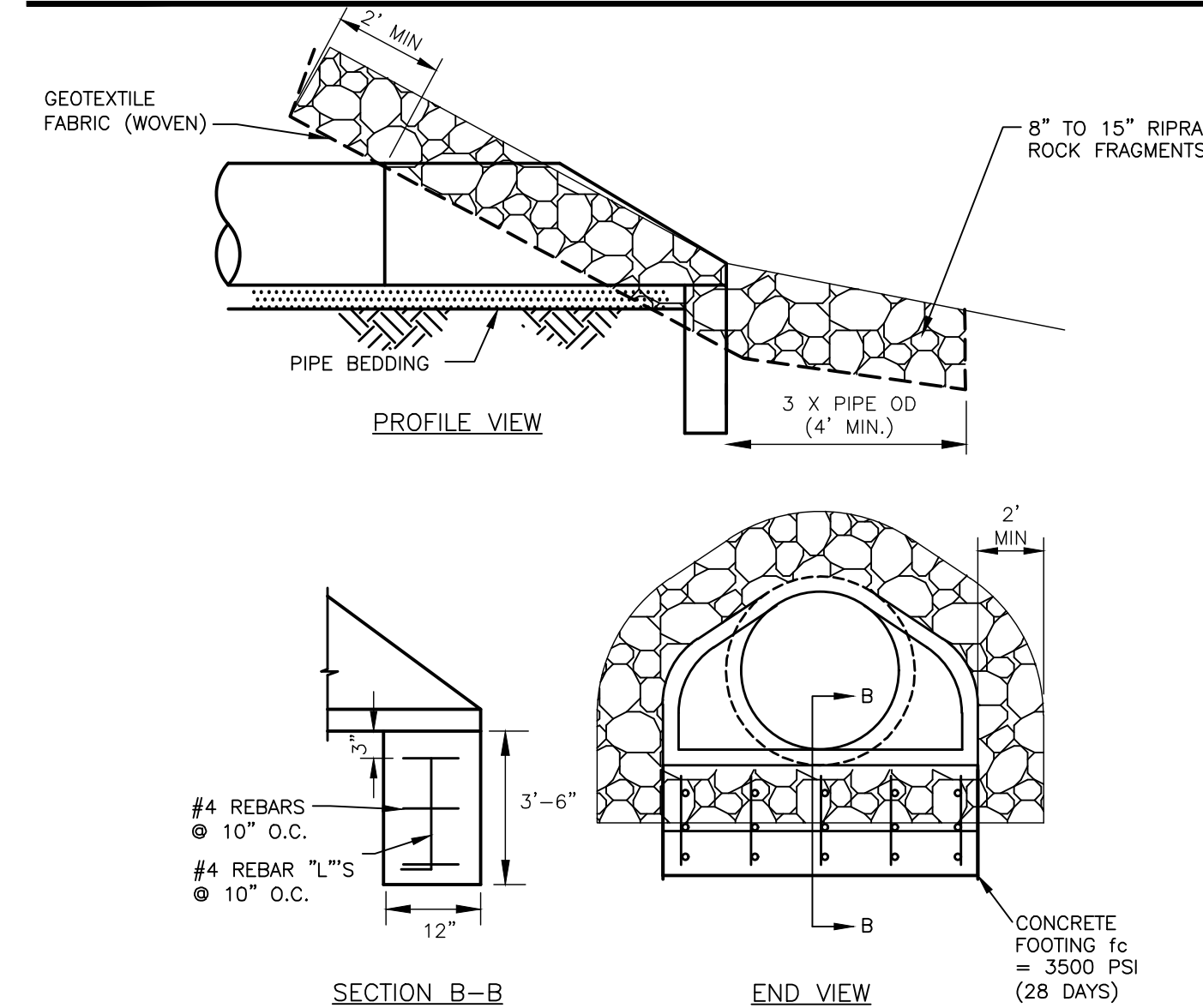
SANITARY SEWER CROSSING OF THE WETLAND B MUST BE SLEEVED TO PROTECT THE WETLAND. ALL OTHER WETLANDS TO BE CROSSED BY UTILITIES ARE PROPOSED TO BE FILLED. SEE PLAN FOR LOCATION.

UTILITY CROSSINGS			
WETLAND	SANITARY	WATERMAIN	STORM SEWER
WETLAND A	248 LF - 8" SEWER	264 LF - 8" WATER MAIN	257 LF - 36" STORM SEWER 138 LF - 12" STORM SEWER
WETLAND B	112 LF - 8" SEWER (DIRECTIONAL DRILL)	NA	12 INCH OUTLET W/ RIPRAP

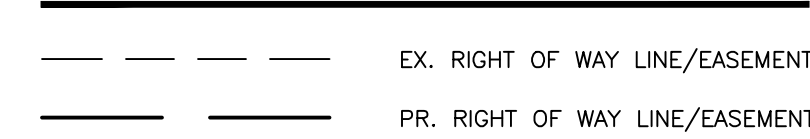
25' NATURAL FEATURES SETBACK DISTURBANCES			
WETLAND	LENGTH OF 25' SETBACK	LENGTH OF DISRUPTION OF 25' SETBACK	REDUCTION
WETLAND A - DISTURBANCE 1	1,297 LF	744 LF	20,396 SF (PERMANENT)
WETLAND A - DISTURBANCE 2	1,297 LF	123 LF	2,704 SF (TEMP RESTORED)
WETLAND B	344 LF	344 LF	2,122 SF (PERMANENT) 3,318 SF (TEMP RESTORED)

WETLAND DISTURBANCES			
WETLAND	AREA OF WETLAND (ONSITE)	AREA OF DISRUPTION OF WETLAND	WETLAND VOLUME
WETLAND A - DISTURBANCE 1	88,117 SF	38,949 SF	6,120 CY (FILL) / 66 CY (CUT)
WETLAND A - DISTURBANCE 2	88,117 SF	25 SF	<1 CY (FILL)
WETLAND B - DISTURBANCE 1	9,367 SF	361 SF	79 CY (FILL)
WETLAND B - DISTURBANCE 2	9,367 SF	69 SF	1 CY (CUT)

**END SECTION DETAIL - WITH FOOTING**



**RIGHT OF WAY LINE LEGEND**



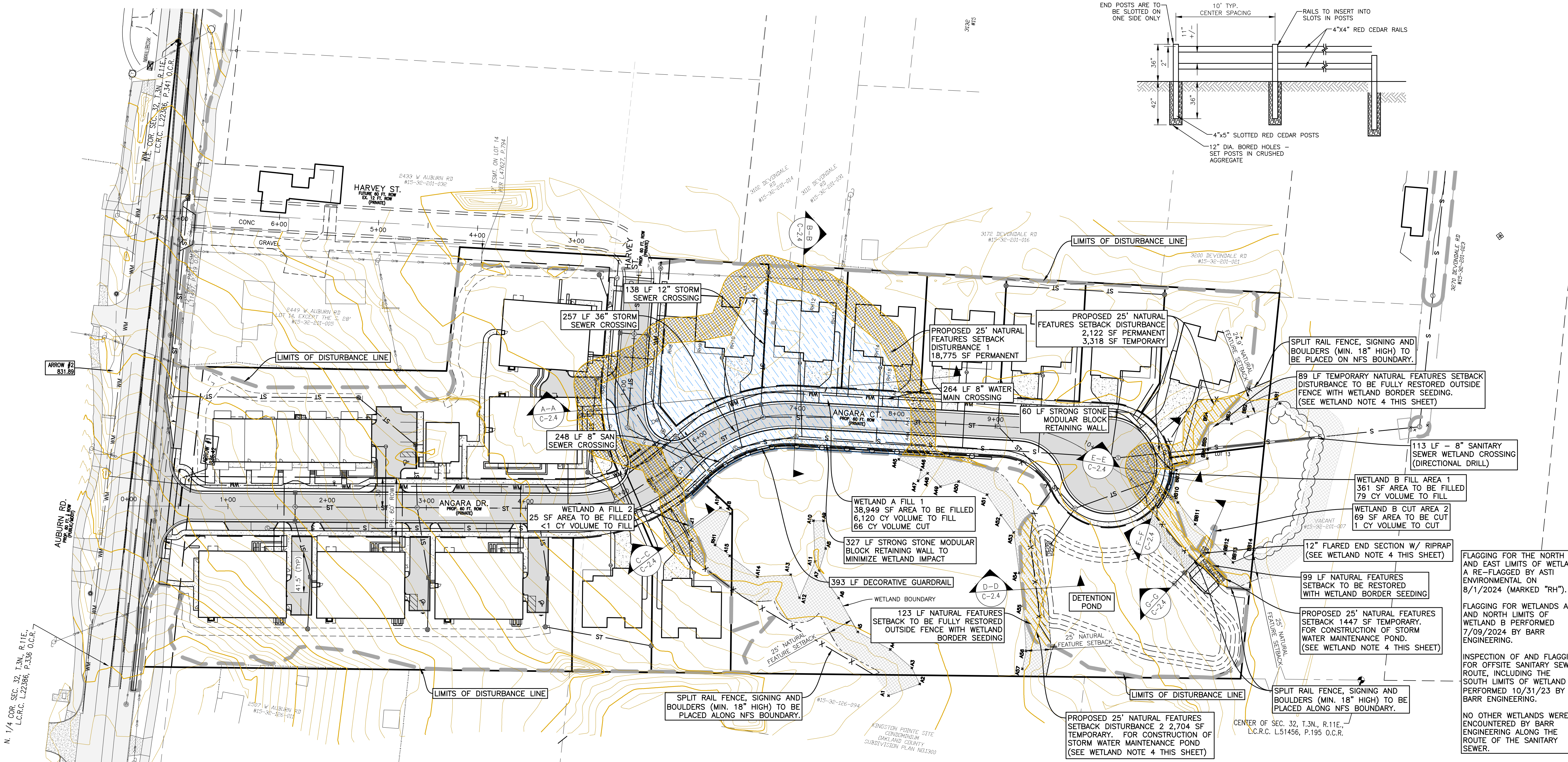
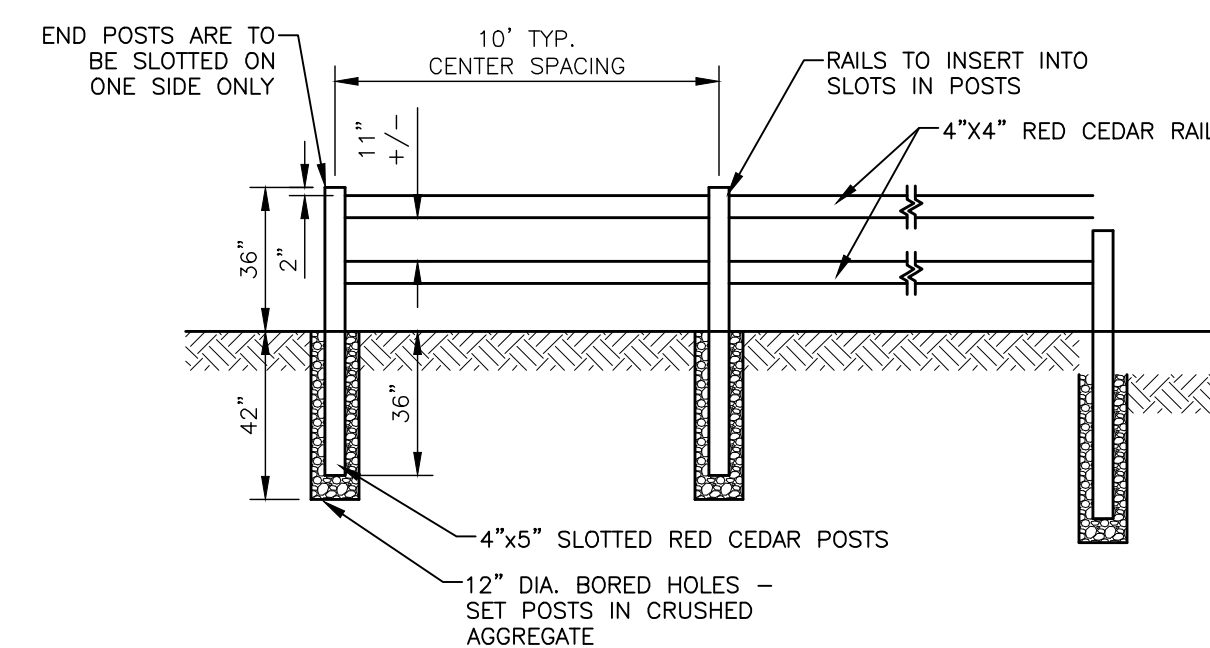
**WETLAND NOTES**

- MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY PERMIT WILL BE REQUIRED FOR FILLING IN THE WETLAND AS SHOWN ON THIS PLAN. OAKLAND COUNTY WATER RESOURCE COMMISSIONER PERMIT WILL BE REQUIRED FOR DISCHARGING THE STORM WATER EFFLUENT INTO THE LEUDER'S DRAIN.
- POST CONSTRUCTION, A CITY-APPROVED WETLAND SEED MIX COMPRISED OF NATIVE MICHIGAN SPECIES MUST BE INSTALLED IN ANY AREAS OF UNPLANNED IMPACTS TO WETLANDS, AS WELL AS ALONG THE WETLAND SIDE OF THE FINAL RETAINING WALL STRUCTURES.
- CITY APPROVED WETLAND SOIL AND SEED MIXTURE SHALL BE USED TO RESTORE ANY IMPACTS TO WETLANDS A AND B IDENTIFIED ON THIS PLAN.
- PRIOR TO ANY WORK BEING PERFORMED WITHIN THE WETLANDS OR NATURAL FEATURES SETBACKS ON THIS PROJECT:
  - THE CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CITY ENGINEER. WORK SHALL NOT COMMENCE UNTIL CONSENT HAS BEEN OBTAINED FROM THE CITY MAYOR.
  - WORK SHALL BE CONDUCTED USING BEST MANAGEMENT PRACTICES (BMP'S) TO ENSURE FLOW AND CIRCULATION PATTERNS AND CHEMICAL AND BIOLOGICAL CHARACTERISTICS OF THE WETLANDS ARE NOT IMPACTED.
  - THE WORK SHALL BE CONDUCTED SUCH THAT ALL IMPACTS TO THE AQUATIC ENVIRONMENT ARE MINIMIZED.

**WETLAND / NATURAL FEATURES BUFFER**

PLACE SIGNS IMMEDIATELY BEHIND THE SPLIT RAIL FENCE SPACED AT 50 FEET ON CENTER. SIGNS SHALL BE A MINIMUM 18" X 12" AND SHALL STATE "TO PROTECT THE ADJACENT WETLAND, NO MOWING OR APPLICATION OF CHEMICALS SHALL BE ALLOWED BEHIND THE FENCE PURSUANT TO CITY ORDINANCE ARTICLE 9 NATURAL FEATURES BUFFER".

**FENCE DETAIL - SPLIT RAIL - 2 RAIL**



INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)

KEVIN C. McDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Michigan's Utility Notification Organization

1-800-482-7171  
www.missdig.org

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**WETLAND PLAN**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	DATE
01/23/2024	REVISIONS
03/14/2024	REVISIONS
03/28/2024	REVISIONS
07/24/2024	REVISIONS
08/13/2024	REVISIONS
09/04/2024	REVISIONS

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 50'

FIELD: REICHT

DRAWN BY: AN

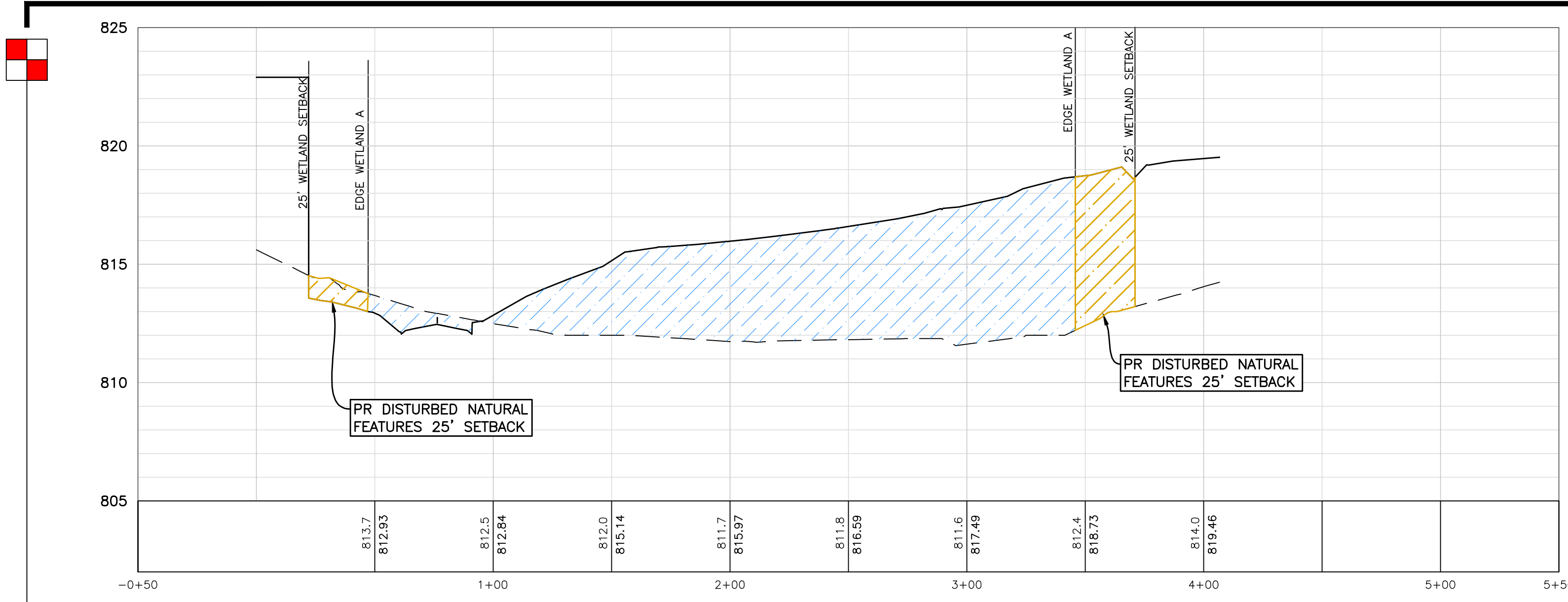
DESIGN BY: KM

CHECK BY: AP

**C-23**

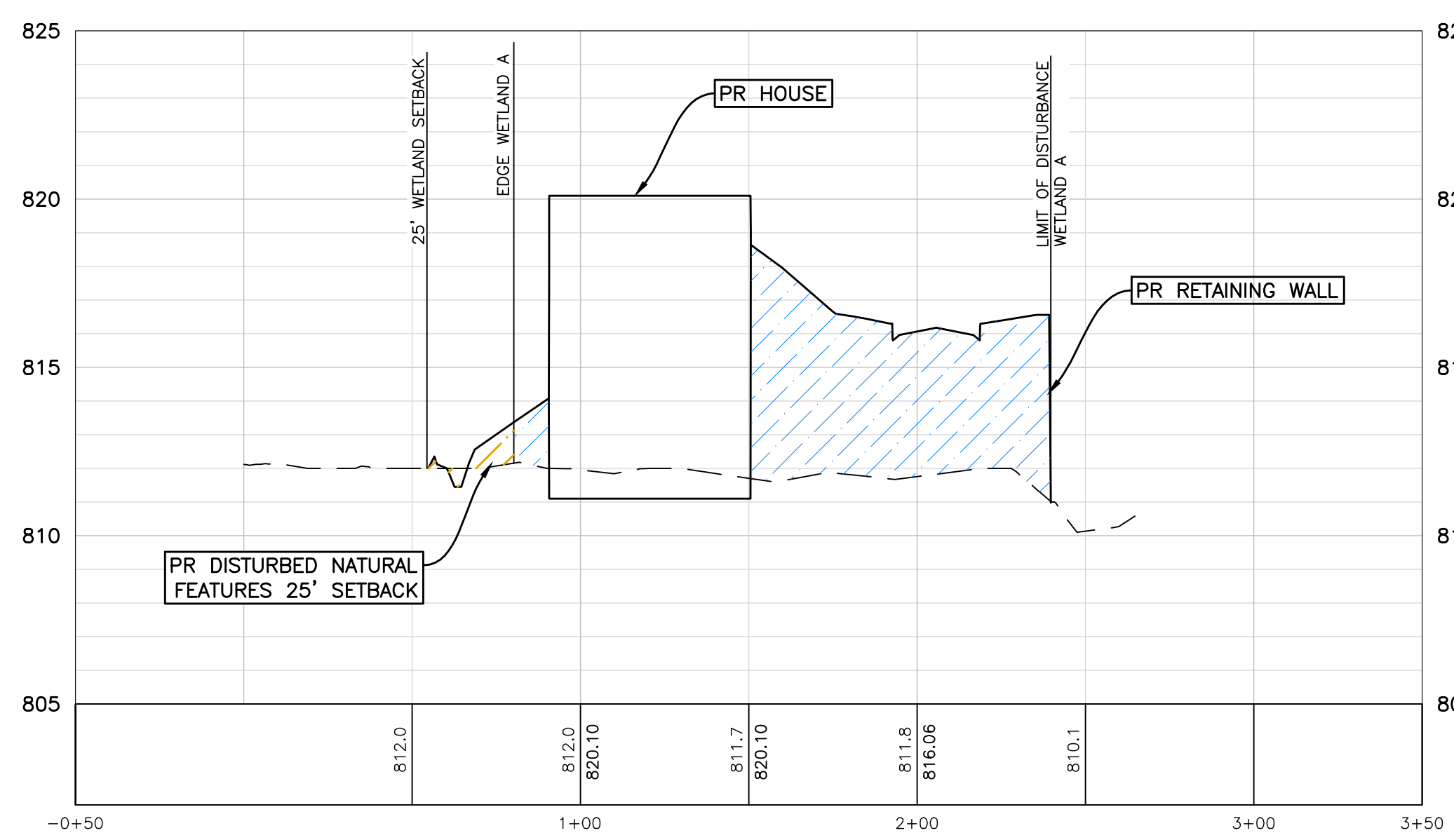
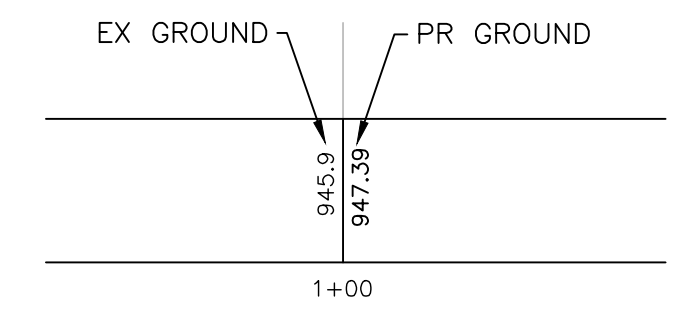
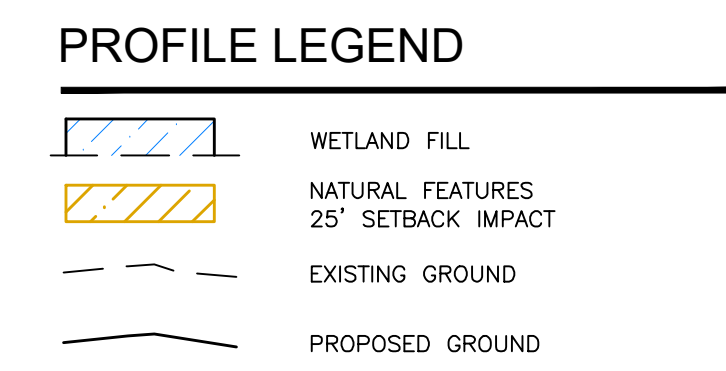
NOT FOR CONSTRUCTION





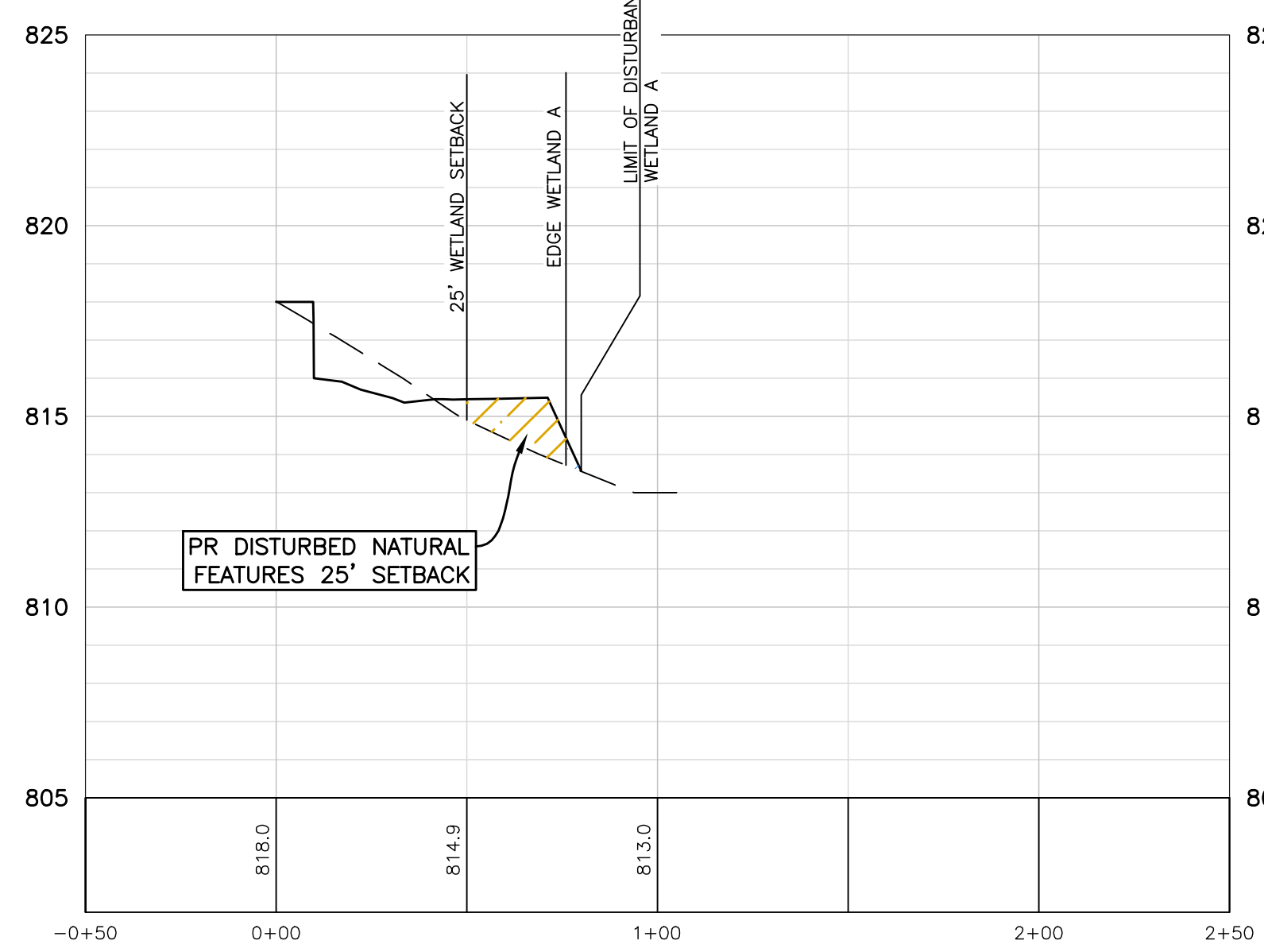
**CROSS SECTION A-A**

PROFILE SCALE  
HORIZ: 1"=40'  
VERT: 1"=4'



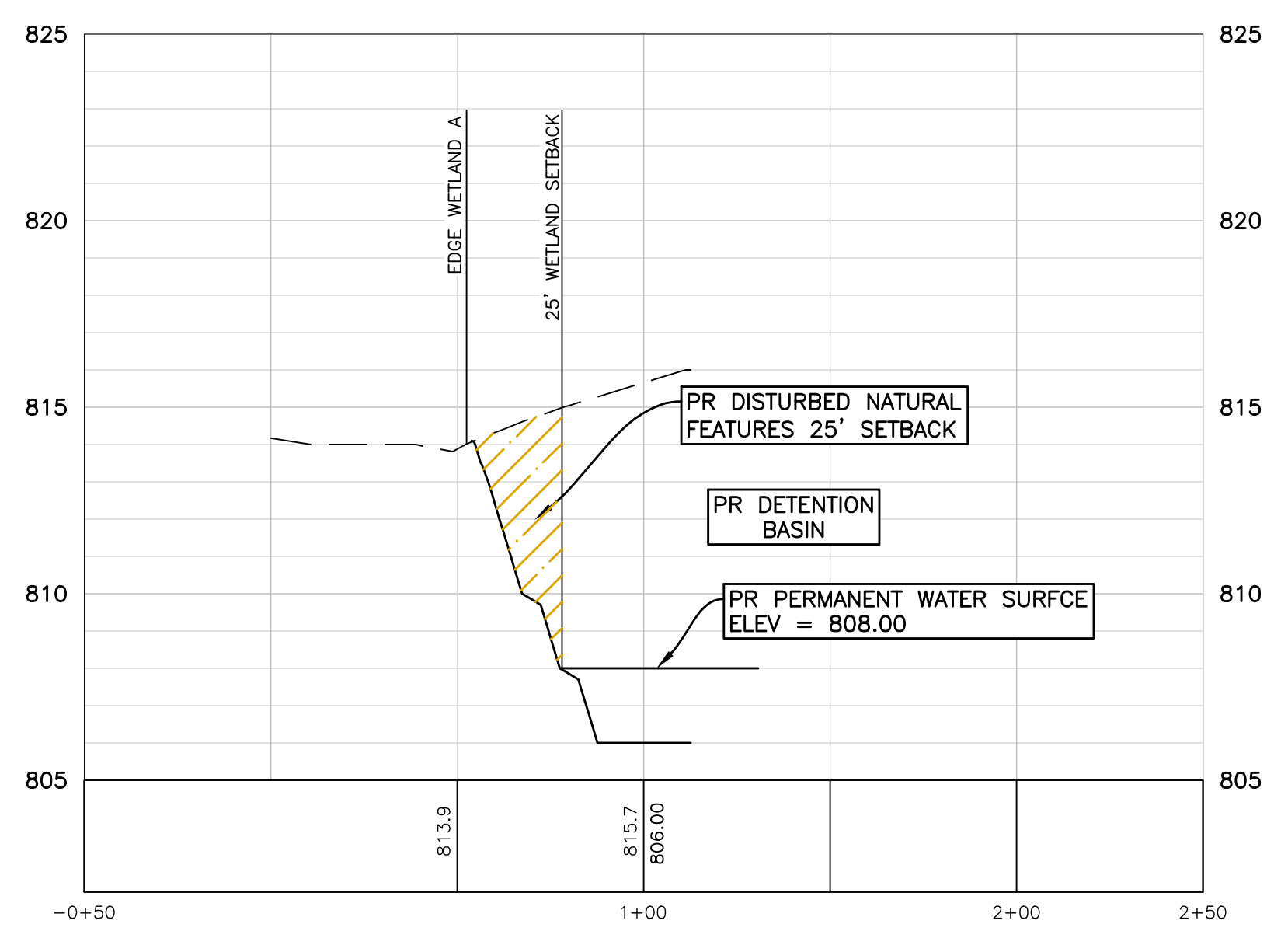
**CROSS SECTION B-B**

PROFILE SCALE  
HORIZ: 1"=40'  
VERT: 1"=4'



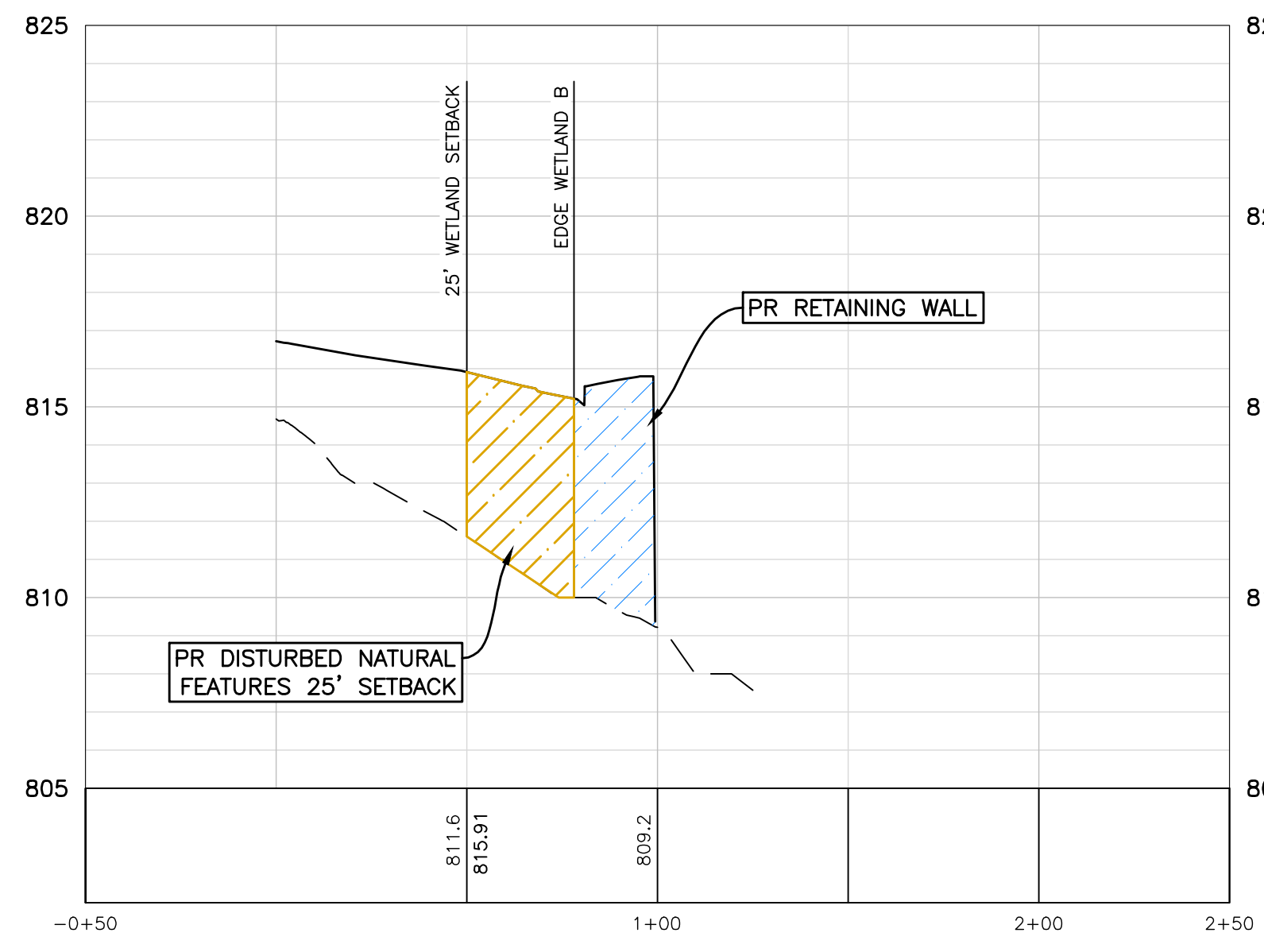
**CROSS SECTION C-C**

PROFILE SCALE  
HORIZ: 1"=40'  
VERT: 1"=4'



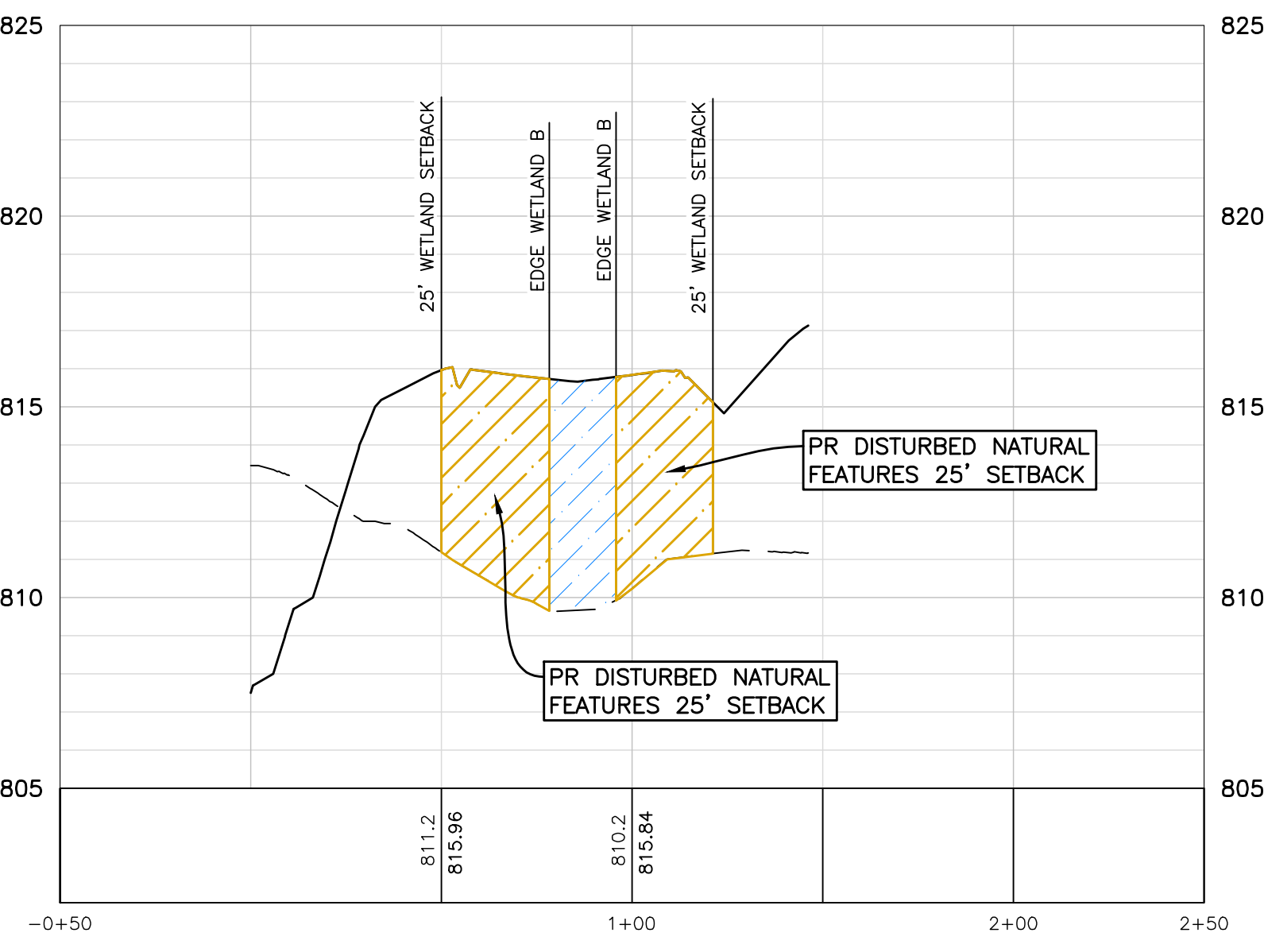
**CROSS SECTION D-D**

PROFILE SCALE  
HORIZ: 1"=40'  
VERT: 1"=4'



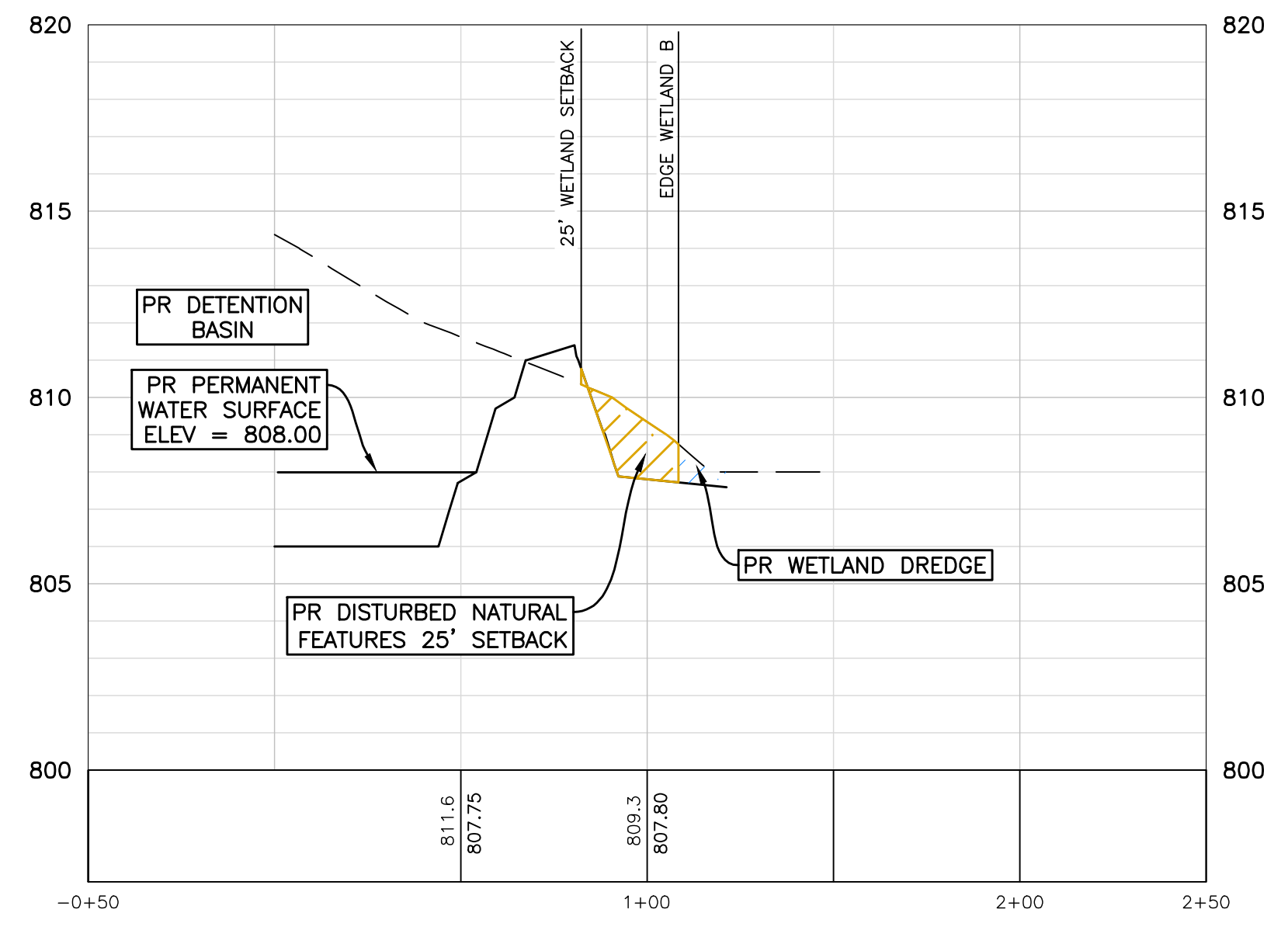
**CROSS SECTION E-E**

PROFILE SCALE  
HORIZ: 1"=40'  
VERT: 1"=4'



**CROSS SECTION F-F**

PROFILE SCALE  
HORIZ: 1"=40'  
VERT: 1"=4'



**CROSS SECTION G-G**

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)

Kevin C. McDevitt

Call MISS DIG  
3 full working days before you dig.

Michigan's Utility One-Call

Utility Notification Organization

1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, DEPTH AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**WETLAND CROSS SECTIONS**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

PLAN SUBMITTALS/REVISIONS	DATE
REVISIT TO MOOT	09/13/2023
REVISIT TO MOOT	01/23/2024
REVISIT TO MOOT	03/14/2024
REVISIT TO MOOT	03/28/2024
REVISIT TO MOOT	05/16/2024
REVISIT TO MOOT	09/13/2024
REVISIT TO MOOT	09/04/2024

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 40'

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

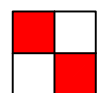
**C-24**

NOT FOR CONSTRUCTION



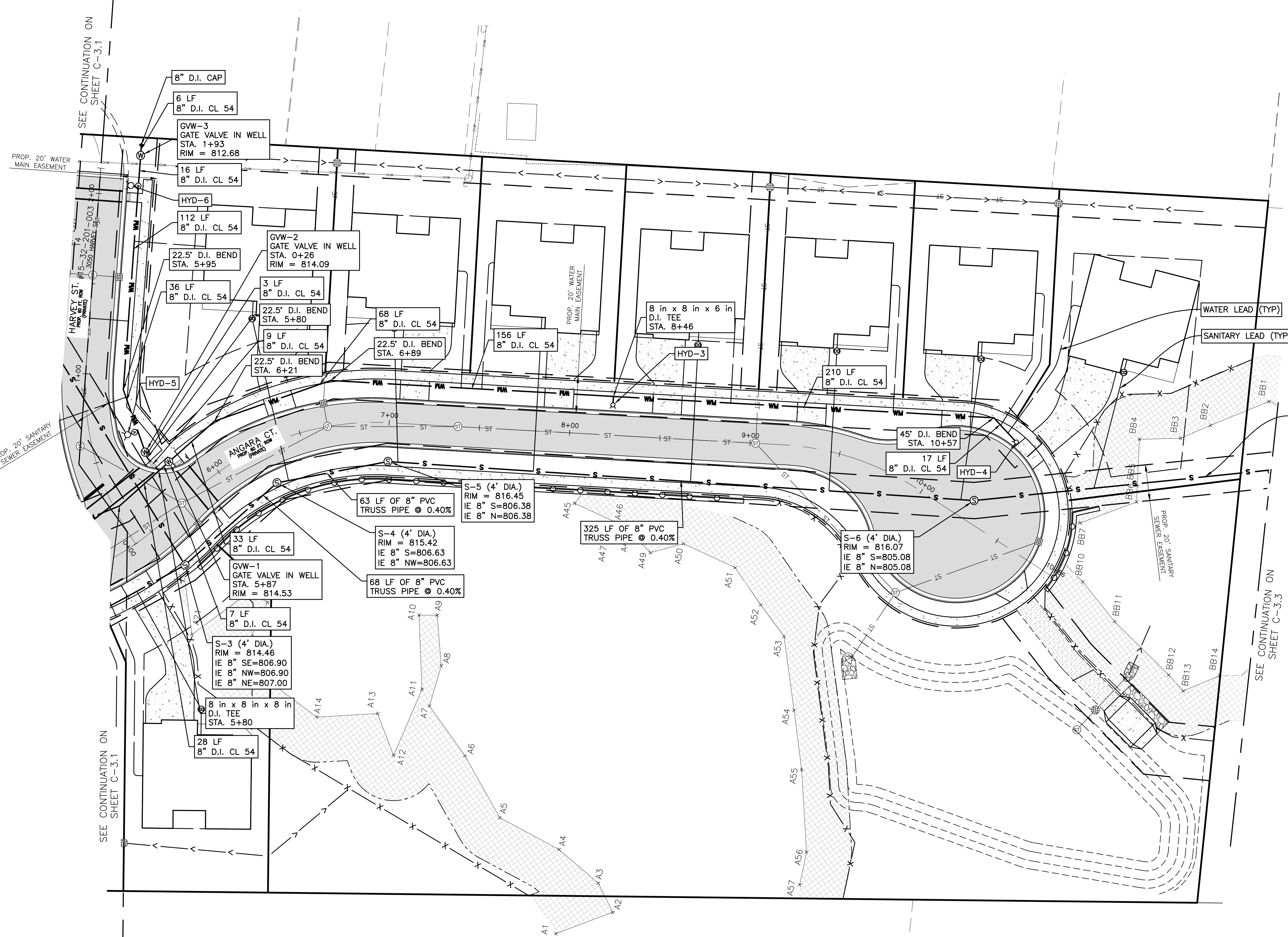
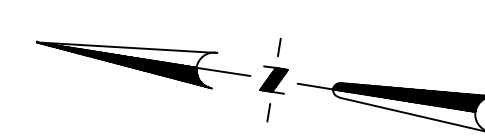






### UTILITY LEGEND

PROPOSED	EXISTING	DESCRIPTION
		WATER MAIN, MH, VALVE IN BOX, HYDRANT
		WATER WELL, METER, STOP BOX, POST INDICATOR VALVE
		STORM SEWER, MH, CB, INLET, DOWN SPOUT, YARD DRAIN
		CULVERT/ END SECTION
		SANITARY SEWER, MH, CLEAN OUT
		UG GAS, MH, VALVE, LINE MARKER
		UG ELEC (ELEC, CABLE, FIBER)



SEWER FROM S-6 TO S-7 TO BE INSTALLED BY DIRECTIONAL DRILLING. CONTRACTOR TO ACCESS S-7 BY ROUTE THAT AVOIDS ANY IMPACTS TO WETLAND B.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSSB)

KEVIN C. MCDEVITT  
ENGINEER  
NO. 6201043260

*Kevin C. McDevitt*

Call MISS DIG  
3 full working days before you dig.

Michigan's Utility One-Call Notification Organization

1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE INDIVIDUALLY RESPONSIBLE FOR DETERMINING THE EXACT UTILITIES, DEPTHS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**SANITARY & WM PLAN - SOUTH**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

PLAN SUBMITTALS/REVISIONS	DATE
RESUBMIT TO MOOT	09/13/2023
REVISED SITE PLAN SUBMITTAL	01/23/2024
REVISED SITE PLAN PER CITY AND MDOT	03/14/2024
REVISED SITE PLAN PER MDOT	03/28/2024
PRELIMINARY SITE PLAN TO CITY	05/16/2024
REVISED SITE PLAN / WETLAND FLAGS	07/24/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/04/2024

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 30'

0 1/2" 1"

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

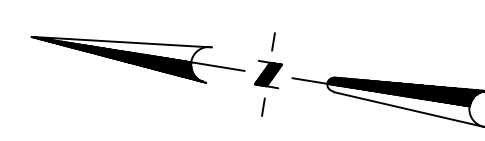
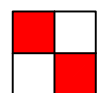
**C-3.2**

NOT FOR CONSTRUCTION

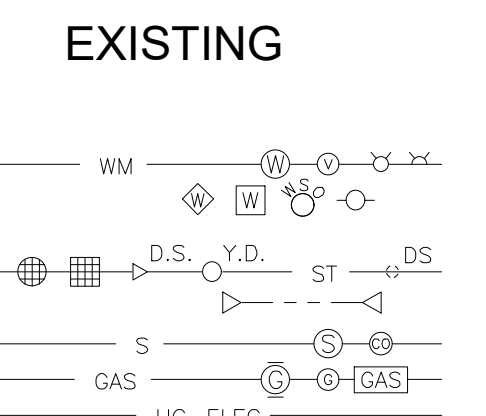
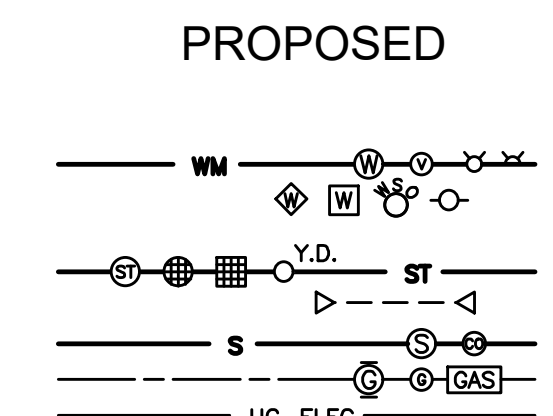




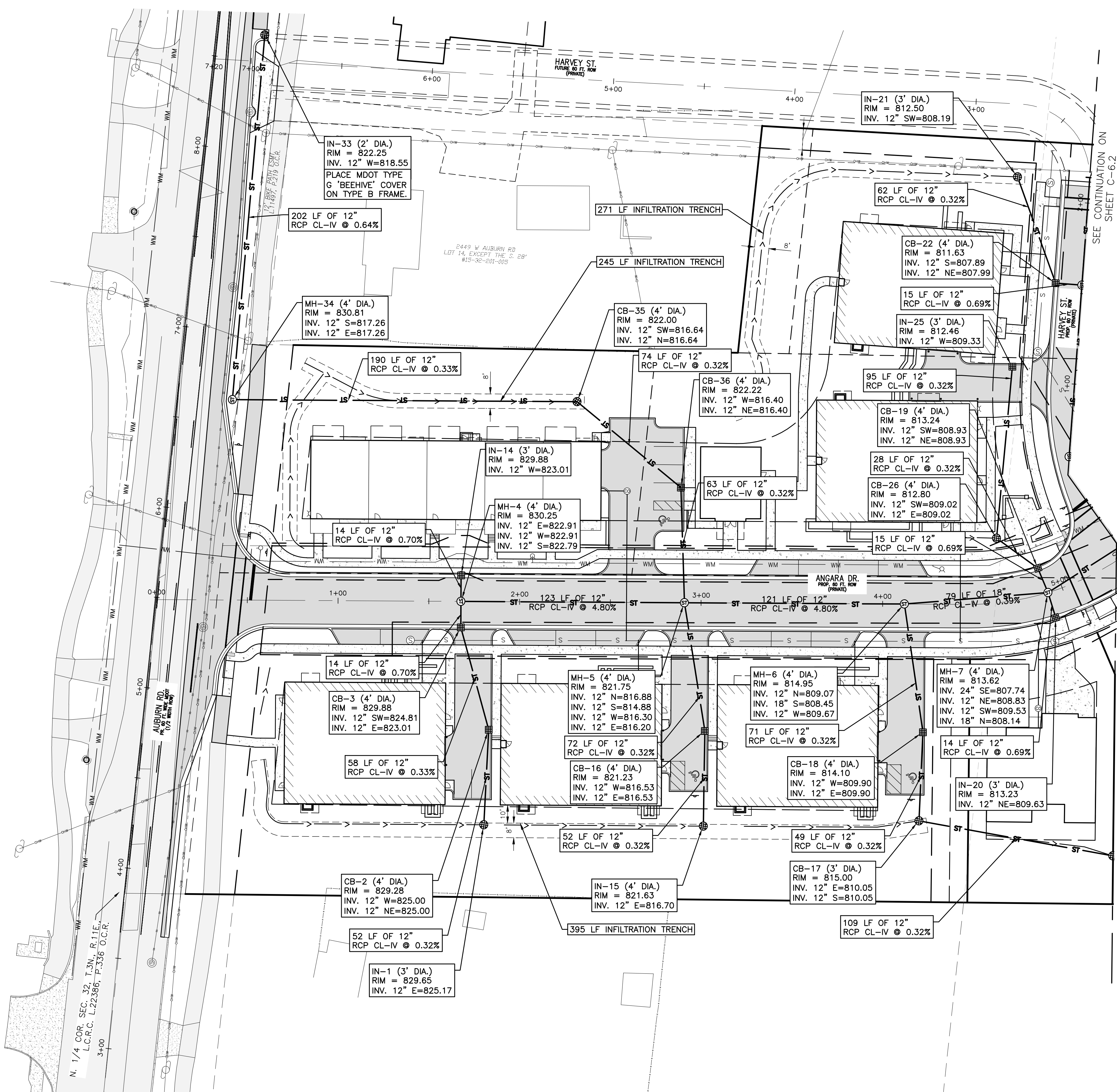




UTILITY LEGEND



WATER MAIN, MH, VALVE IN BOX, HYDRANT  
WATER WELL, METER, STOP BOX, POST INDICATOR VALVE  
STORM SEWER, MH, CB, INLET, DOWN SPOUT, YARD DRAIN  
CULVERT/ END SECTION  
SANITARY SEWER, MH, CLEAN OUT  
UG GAS, MH, VALVE, LINE MARKER  
UG ELEC (ELEC, CABLE, FIBER)



SEE CONTINUATION ON SHEET C-6.2

SEE CONTINUATION ON SHEET C-6.2

STORM SEWER NOTES

- 1. "IN" & "CB" STRUCTURES SHALL HAVE EIJW 1040 FRAME WITH TYPE M1 GRATE.
2. CURB "IN" & "CB" STRUCTURES SHALL HAVE EIJW 7065 FRAME WITH TYPE M1 GRATE.
3. STORM "MH" STRUCTURES SHALL HAVE EIJW 1040 FRAME WITH A TYPE A PERFORATED COVER.
4. ALL ROOF AREAS SHALL BE DRAINED TO STORM SEWERS USING SCHEDULE 40 PVC DOWNSPOUT LEADS. LEADS SHALL BE COORDINATED WITH ARCHITECTURAL PLANS.

MEGA logo and contact information for Monument Engineering Group, including address and phone number.

Professional Engineer seal for Kevin C. McDevitt, No. 6201043260.

Call MISS DIG 3 full working days before you dig. Michigan's One-Call Utility Notification Organization. 1-800-482-7171 www.missdig.org

CLIENT: AUBURN ANGARA OAKS, LLC. 14496 N SHELDON RD SUITE 230 PLYMOUTH, MI 48170 BRUCE MICHAEL (248) 703-4653

STORM SEWER PLAN - NORTH. AUBURN ANGARA OAKS. PART OF SEC. 32, T3N, R11E. CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

Table with columns: PLAN SUBMITTALS/REVISIONS, DATE. Rows detailing revisions to the plan, including dates from 09/13/2023 to 09/04/2024.

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

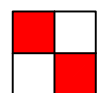
SCALE: 1" = 30'. Graphic scale bar showing 0, 1/2", 1".

FIELD: REICHERT. DRAWN BY: MN. DESIGN BY: KM. CHECK BY: AP.

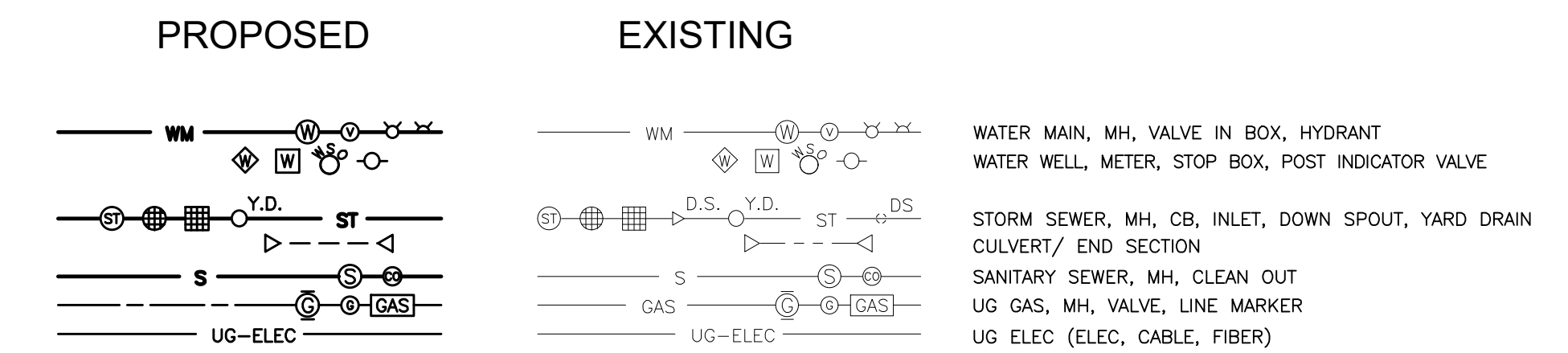
C-6.1

NOT FOR CONSTRUCTION



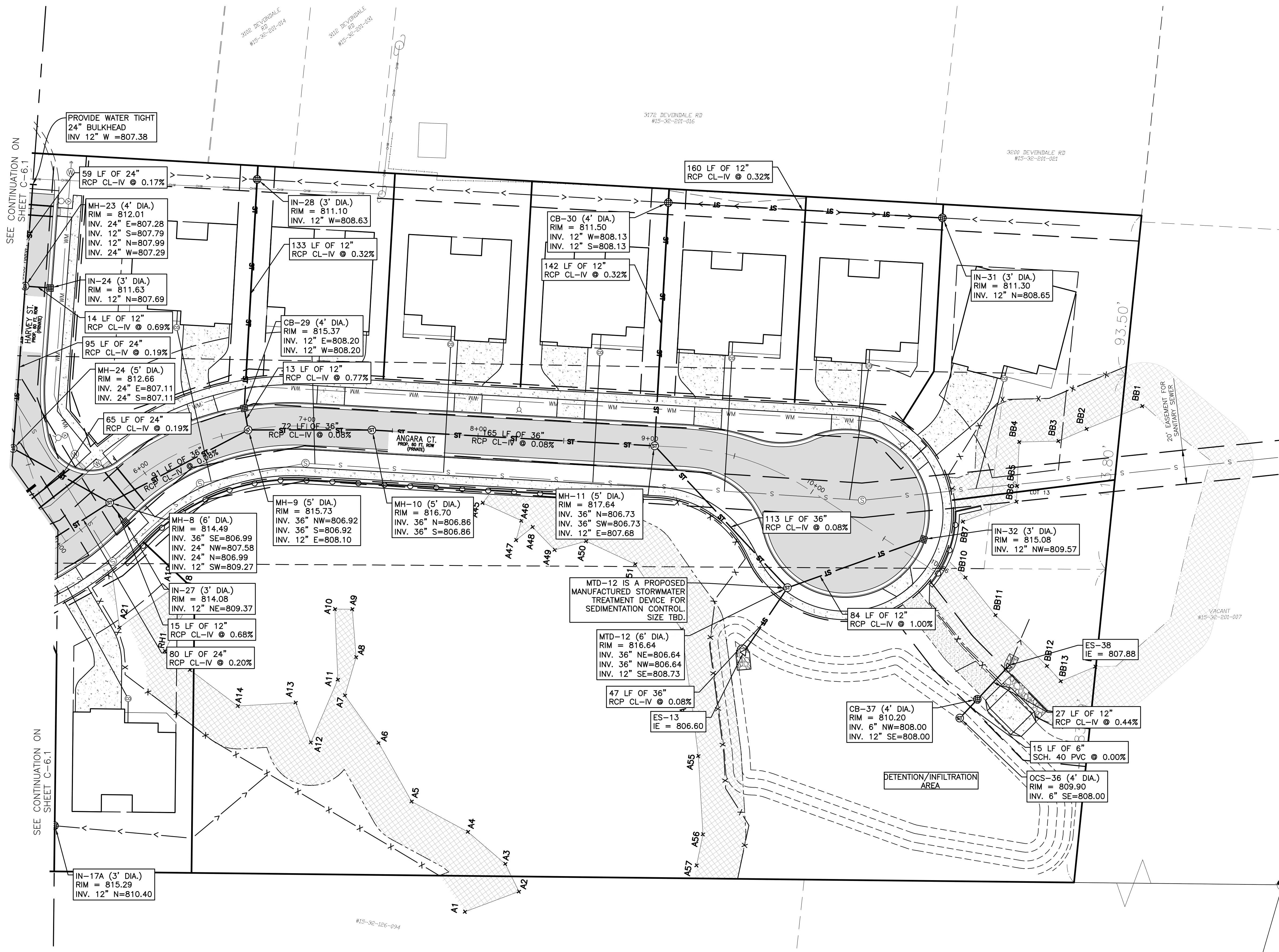


### UTILITY LEGEND



### STORM SEWER NOTES

- "IN" & "CB" STRUCTURES SHALL HAVE EI1W 1040 FRAME WITH TYPE M1 GRATE.
- CURB "IN" & "CB" STRUCTURES SHALL HAVE EI1W 7065 FRAME WITH TYPE M1 GRATE.
- STORM "MH" STRUCTURES SHALL HAVE EI1W 1040 FRAME WITH A TYPE A PERFORATED COVER.
- ALL ROOF AREAS SHALL BE DRAINED TO STORM SEWERS USING SCHEDULE 40 PVC DOWNSPOUT LEADS. LEADS SHALL BE COORDINATED WITH ARCHITECTURAL PLANS.



INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**  
Engineering Group Associates, Inc.

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSS)

KEVIN C. MCDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Utility Notification Organization  
1-800-482-7171  
www.missdig.org

CLIENT :

**AUBURN ANGARA OAKS, LLC**  
14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**STORM SEWER PLAN - SOUTH**  
AUBURN ANGARA OAKS  
PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	PLAN SUBMITTALS/REVISIONS
01/23/2024	RESUBMIT TO MOOT
03/14/2024	REVISED SITE PLAN SUBMITTAL
03/28/2024	REVISED SITE PLAN PER CITY AND MOOT
05/17/2024	PRELIMINARY SITE PLAN TO CITY
07/24/2024	REVISED SITE PLAN / WETLAND FLAGS
09/13/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

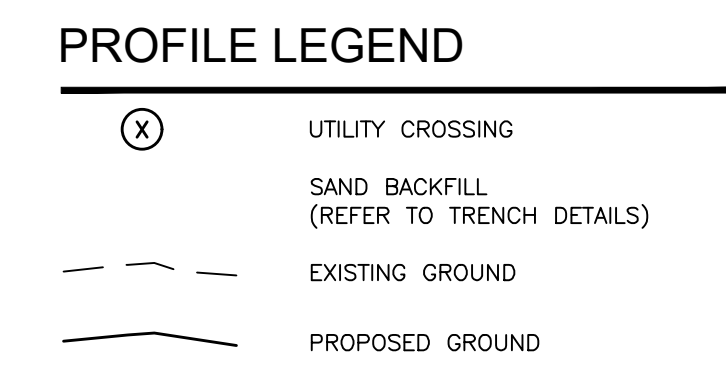
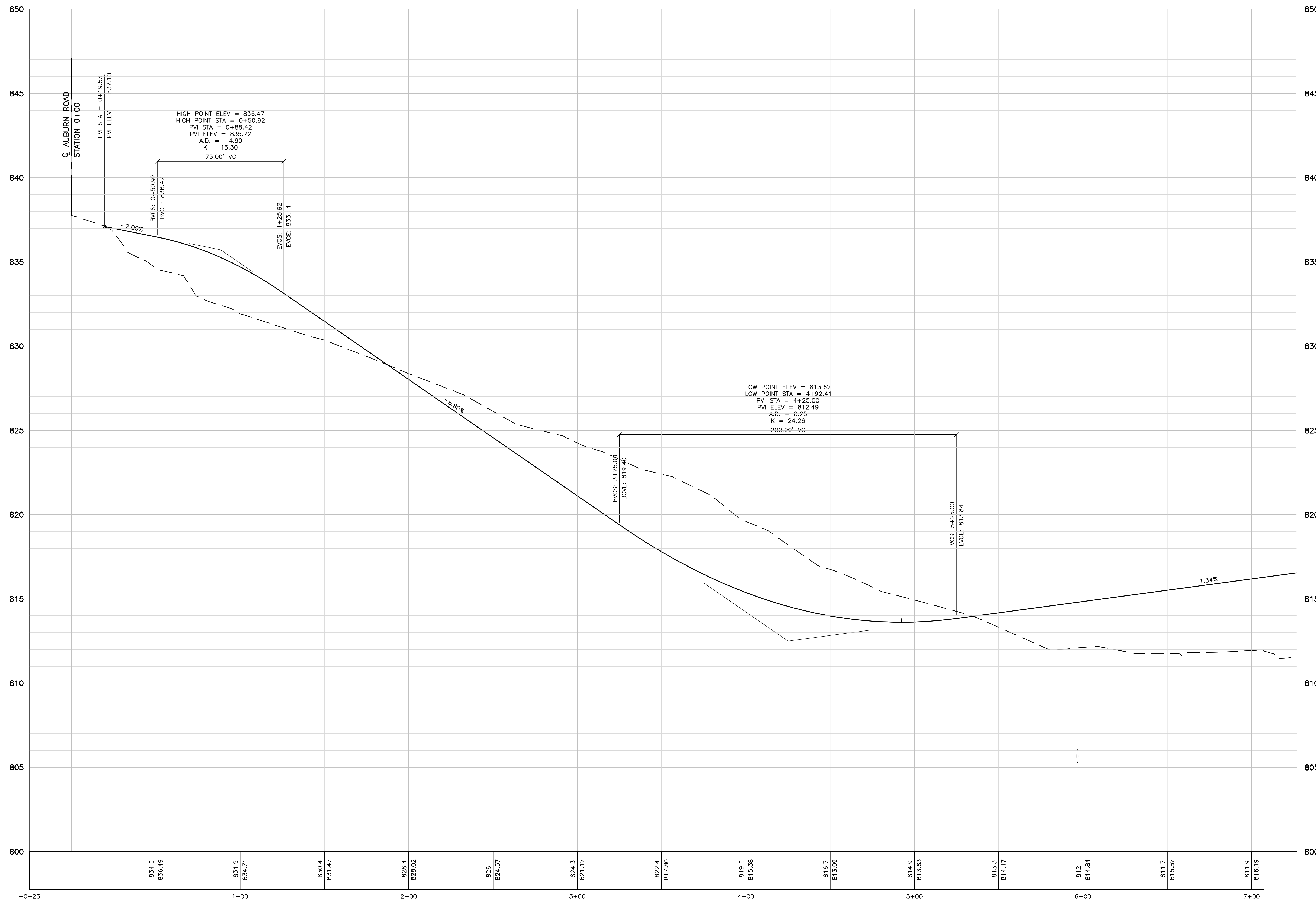
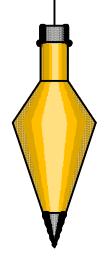
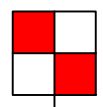
SCALE: 1" = 30'  
0 1/2" 1"

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**C-6.2**

NOT FOR CONSTRUCTION





- NOTES**
- SAND BACKFILL AND BEDDING TO BE MDOT CL II.
  - MAINTAIN MINIMUM 18" VERTICAL CLEARANCE BETWEEN ALL UTILITIES.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**  
 ENGINEERING GROUP ASSOCIATES, INC.

298 VETERANS DRIVE  
 FOWLERVILLE, MICHIGAN 48836  
 (OFFICE) 517-223-3512  
 MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
 SMALL BUSINESS (SDVOSB)

KEVIN C. MCDEVITT  
 ENGINEER  
 NO. 6201043260

*Kevin C. McDevitt*

Call MISS DIG  
 3 full working days before you dig:

Michigan's Utility One-Call Notification Organization

1-800-482-7171  
 www.missdig.org

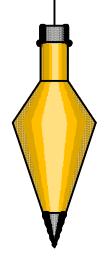
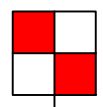
THE LOCATIONS AND DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITIES, DEPTHS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

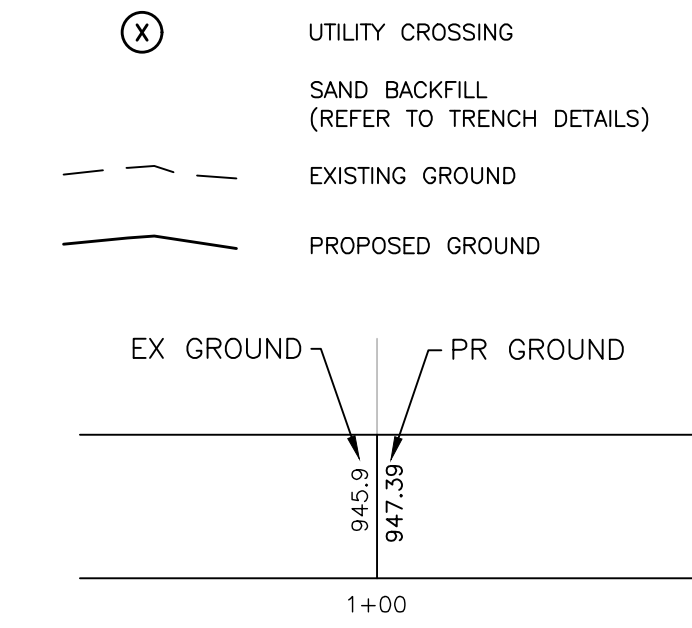
**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
 SUITE 230  
 PLYMOUTH, MI 48170  
 BRUCE MICHAEL  
 (248) 703-4653





### PROFILE LEGEND



### NOTES

- SAND BACKFILL AND BEDDING TO BE MDOT CL II.
- MAINTAIN MINIMUM 18" VERTICAL CLEARANCE BETWEEN ALL UTILITIES.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)

Call MISS DIG  
3 full working days before you dig:

Michigan's Utility One-Call Notification Organization  
1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITIES, LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

**AUBURN ANGARARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**ANGARA DRIVE / STORM SEWER PROFILES**

AUBURN ANGARARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

PLAN SUBMITTALS/REVISIONS	DATE
RESUBMIT TO MDOT	09/13/2023
REVISED SITE PLAN SUBMITTAL	01/23/2024
REVISED SITE PLAN PER CITY AND MDOT	03/14/2024
REVISED SITE PLAN PER MDOT	03/28/2024
PRELIMINARY SITE PLAN TO CITY	05/16/2024
REVISED SITE PLAN / WETLAND FLAGS	07/24/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/13/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/04/2024

ORIGINAL ISSUE DATE:  
05/19/2022

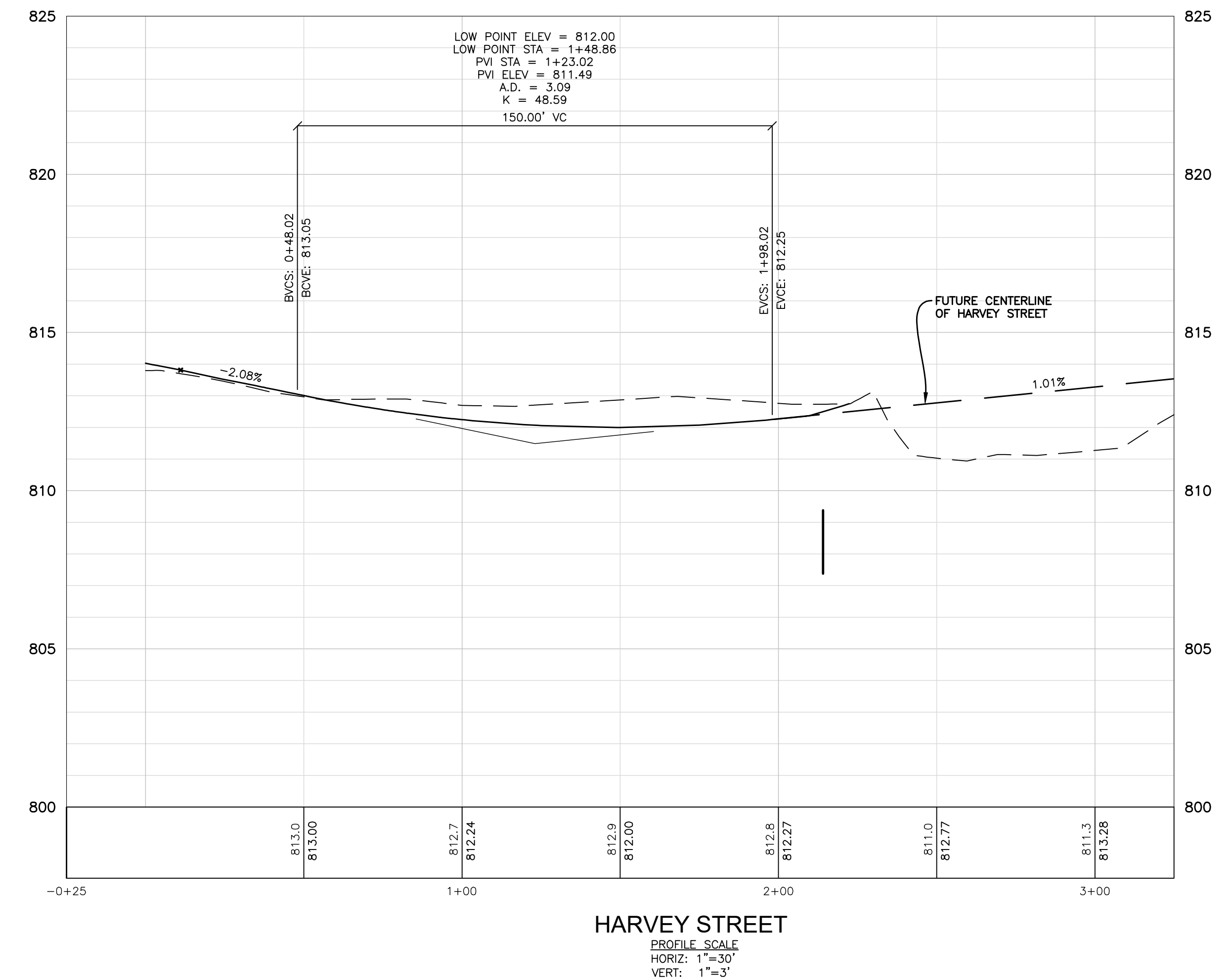
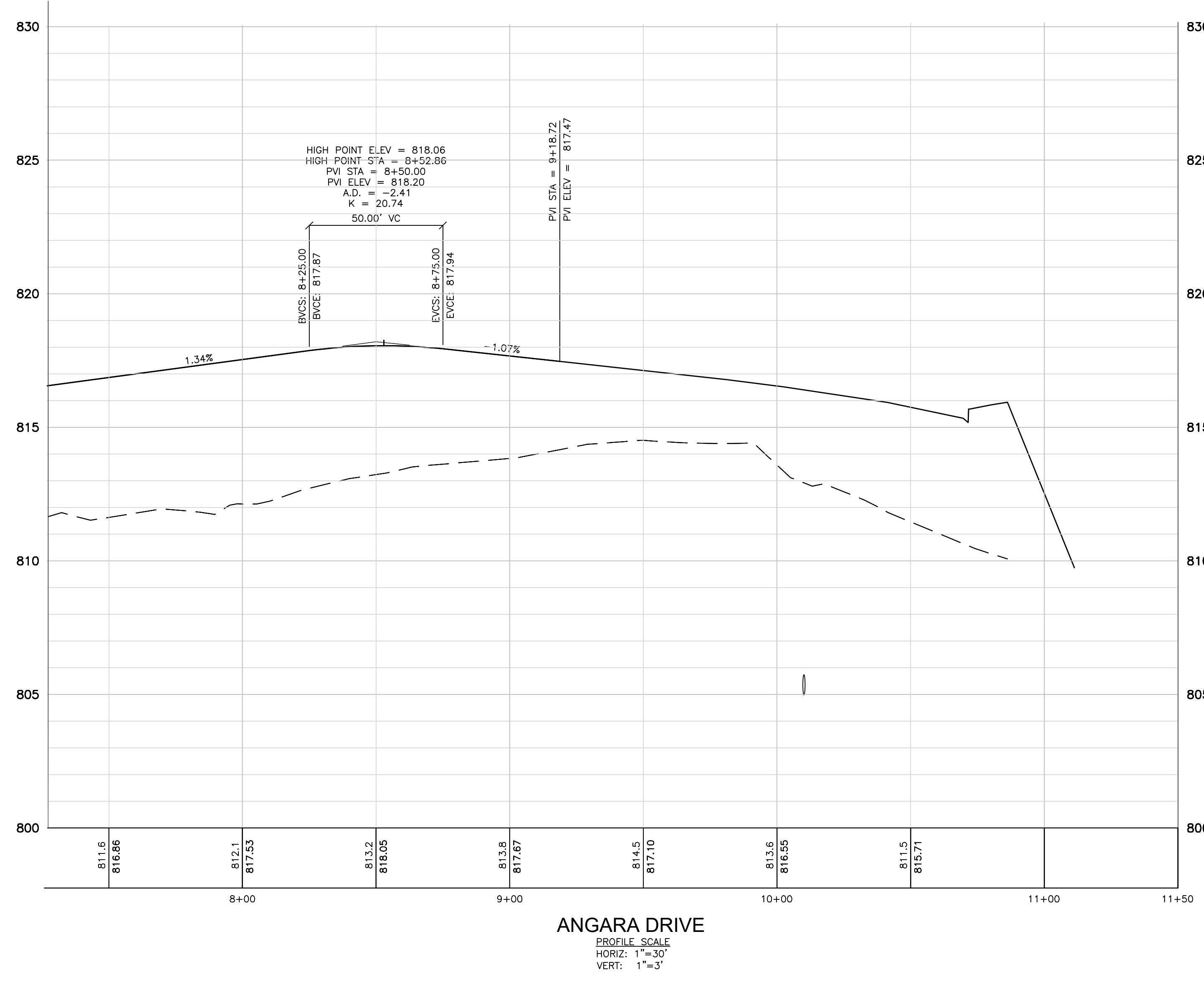
PROJECT NO: 22-051

SCALE: SEE ABOVE

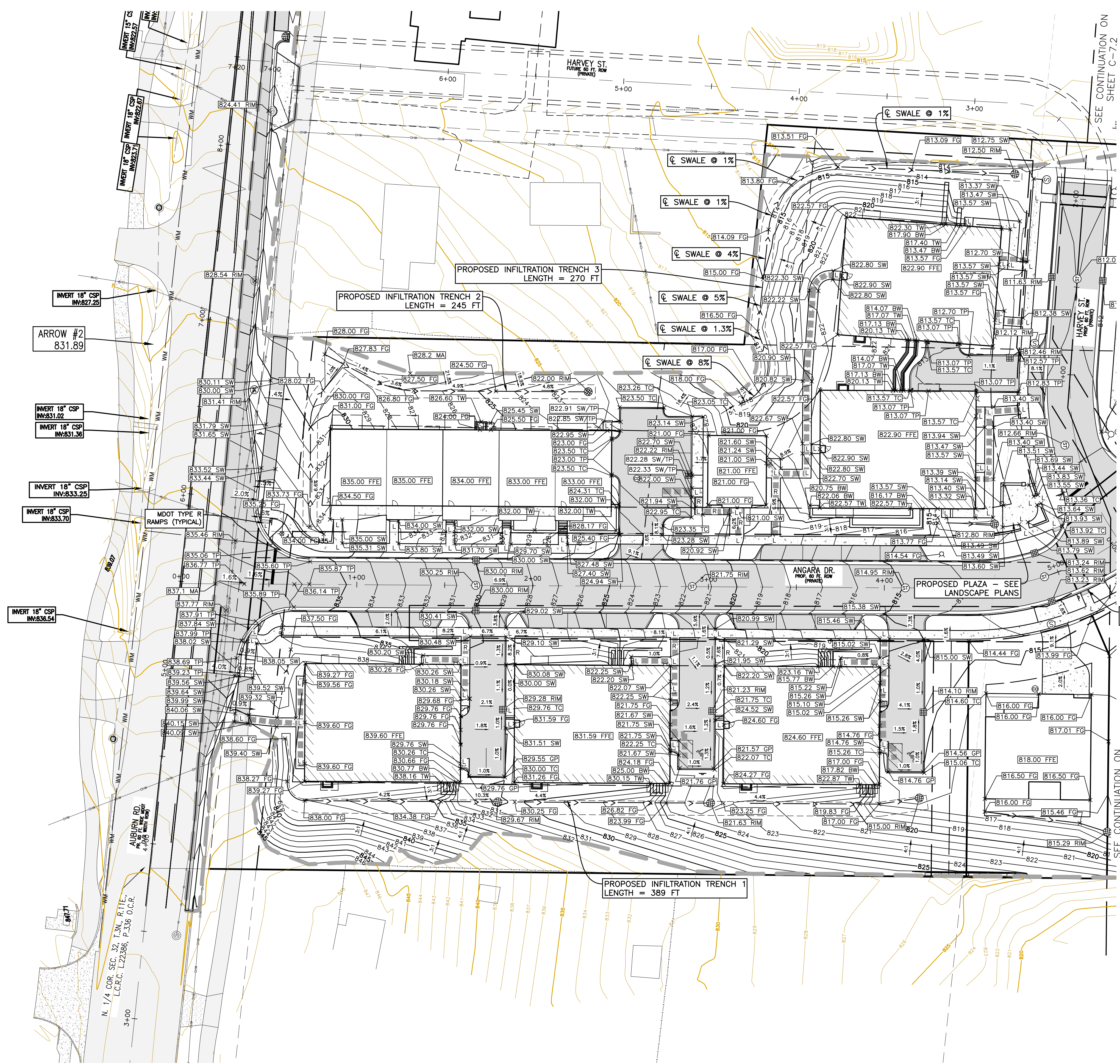
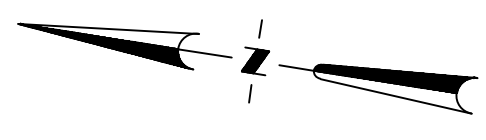
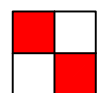
FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**C-6.4**

NOT FOR CONSTRUCTION







### GRADING LEGEND

- X 940.00 TP PROPOSED TOP OF PAVEMENT GRADE
- X 840.00 SW PROPOSED SIDEWALK GRADE
- X 940.00 FG PROPOSED FINISH GRADE
- X 940.00 TC PROPOSED TOP OF CURB GRADE
- X 840.00 GP PROPOSED GUTTER PAN GRADE
- X 840.00 TW PROPOSED TOP OF WALL GRADE
- X 840.00 BW PROPOSED BOTTOM OF WALL GRADE
- X 940.0 MA MATCH EXISTING GRADE
- X 940.0 FFE PROPOSED FINISH FLOOR GRADE
- X 940.00 RIM PROPOSED RIM GRADE
- X 940.00 ADJ-RIM ADJUSTED RIM GRADE
- X 840.00 INV PROPOSED INVERT GRADE
- R ADA COMPLIANT SIDEWALK RAMP
- L ADA COMPLIANT SIDEWALK LANDING
- EXISTING ELEVATION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- LIMITS OF DISTURBANCE
- OVERFLOW ROUTE
- ACCESSIBLE PEDESTRIAN ROUTE

### BENCHMARKS

- BM #1 ARROW ATOP FIRE HYDRANT AT THE N.W. CORNER OF LOT 11 ELEVATION 835.42 N.A.V.D. 88 DATUM
  - BM #2 ARROW ATOP FIRE HYDRANT N. SIDE OF AUBURN ROAD OPPOSITE N.E. CORNER OF LOT 11 ELEVATION 831.89 N.A.V.D. 88 DATUM
- NOTE: CONTRACTOR TO SET NEW BENCHMARK TO REPLACE BENCHMARK 1 PRIOR TO REMOVING HYDRANT.

### GRADING NOTES

1. ALL CURB SPOT ELEVATIONS ARE TO TOP OF BACK OF CURB, UNLESS OTHERWISE NOTED.
2. ANY RETAINING WALLS OVER 4' TALL FROM BOTTOM OF FOUNDATION TO TOP OF WALL ARE TO BE DESIGNED, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
3. ALL SIDEWALK SHALL BE CONSTRUCTED WITH MAXIMUM 2 PERCENT CROSS SLOPE. ALL SIDEWALK CONSTRUCTED WITHIN THE RIGHT OF WAY SHALL DRAIN TOWARDS THE CURB.
4. ALL SIDEWALK RAMP WILL MEET THE REQUIREMENTS OF A117.1-2009, SECTION 405 AND ARE GRADED AT 2% MAXIMUM CROSS SLOPE / 1:12 MAXIMUM RUNNING SLOPE WITH 2% MAX LANDINGS AT TOP AND BOTTOM.
5. MAXIMUM GRASS SLOPES TO BE 3 ON 1.
6. MINIMUM GRASS SLOPES TO BE 1 PERCENT. INFILTRATION TRENCHES MAY SLOPE AT LESS THAN 1 PERCENT.
7. EXISTING TOPSOIL SHALL BE STRIPPED FROM ALL DISTURBED AREAS PRIOR TO BEGINNING CONSTRUCTION AND STOCKPILED ON SITE. EXISTING TOPSOIL FROM WETLAND AREAS SHALL BE STOCKPILED SEPARATELY FOR RE-USE IN DISTURBED WETLAND AREAS AND BUFFER ZONES.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM  
SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOBS)

KEVIN C. McDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Michigan's One-Call

1-800-482-7171  
www.missdig.org

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**GRADING PLAN - NORTH**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	PLAN SUBMITTALS/REVISIONS
01/23/2024	RESUBMIT TO MDOT
03/14/2024	REVISED SITE PLAN SUBMITTAL
03/14/2024	REVISED SITE PLAN PER CITY AND MDOT
03/28/2024	REVISED SITE PLAN PER MDOT
05/24/2024	PRELIMINARY SITE PLAN TO CITY
07/24/2024	REVISED SITE PLAN / WETLAND FLAGS
08/13/2024	REVISED SITE PLAN TO CITY
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

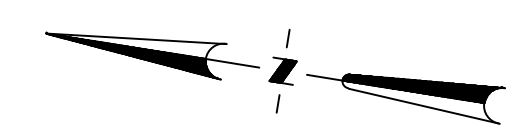
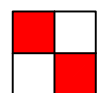
SCALE: 1" = 30'

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**C-7.1**

NOT FOR CONSTRUCTION





### GRADING LEGEND

- X 940.00 TP PROPOSED TOP OF PAVEMENT GRADE
- X 840.00 SW PROPOSED SIDEWALK GRADE
- X 940.00 FG PROPOSED FINISH GRADE
- X 940.00 TC PROPOSED TOP OF CURB GRADE
- X 840.00 GP PROPOSED GUTTER PAN GRADE
- X 840.00 TW PROPOSED TOP OF WALL GRADE
- X 840.00 BW PROPOSED BOTTOM OF WALL GRADE
- X 940.0 MA MATCH EXISTING GRADE
- X 940.0 FFE PROPOSED FINISH FLOOR GRADE
- X 940.0 RIM PROPOSED RIM GRADE
- X 940.0 ADJ-RIM ADJUSTED RIM GRADE
- X 840.0 INV PROPOSED INVERT GRADE
- R ADA COMPLIANT SIDEWALK RAMP
- L ADA COMPLIANT SIDEWALK LANDING
- EXISTING ELEVATION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- LIMITS OF DISTURBANCE
- OVERFLOW ROUTE

### BENCHMARKS

B.M. #1 ARROW ATOP FIRE HYDRANT AT THE N.W. CORNER OF LOT 11 ELEVATION 835.42 N.A.V.D. 88 DATUM  
 B.M. #2 ARROW ATOP FIRE HYDRANT N. SIDE OF AUBURN ROAD OPPOSITE N.E. CORNER OF LOT 11 ELEVATION 831.89 N.A.V.D. 88 DATUM

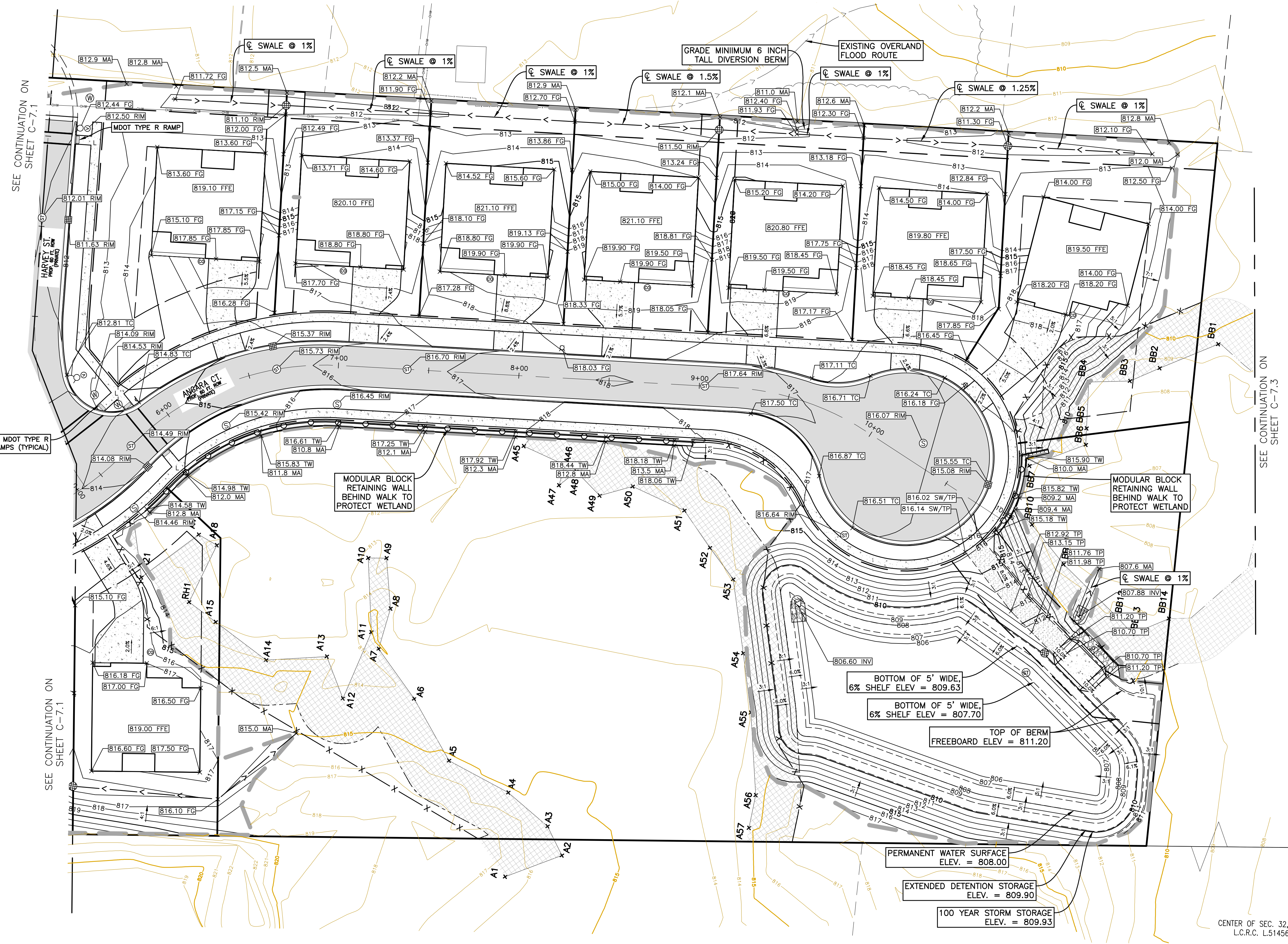
### GRADING NOTES

1. ALL CURB SPOT ELEVATIONS ARE TO TOP OF BACK OF CURB, UNLESS OTHERWISE NOTED.
2. ANY RETAINING WALLS OVER 4' TALL ARE TO BE DESIGNED, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
3. ALL SIDEWALK SHALL BE CONSTRUCTED WITH MAXIMUM 2 PERCENT CROSS SLOPE. ALL SIDEWALK CONSTRUCTED WITHIN THE RIGHT OF WAY SHALL DRAIN TOWARDS THE CURB.
4. ALL SIDEWALK RAMPS WILL MEET THE REQUIREMENTS OF ADA.
5. MAXIMUM GRASS SLOPES TO BE 3 ON 1.
6. MINIMUM GRASS SLOPES TO BE 1 PERCENT. INFILTRATION TRENCHES MAY SLOPE AT LESS THAN 1 PERCENT.

### WETLAND / NATURAL FEATURES NOTE

THIS PROPOSED ACTION QUALIFIES FOR AN EXEMPTION TO THE WETLAND AND WATERCOURSE ORDINANCE PROVIDED THAT:

- (1) A PRIOR WRITTEN NOTICE IS GIVEN TO THE CITY ENGINEER AND WRITTEN CONSENT IS OBTAINED FROM THE CITY MAYOR PRIOR TO WORK COMMENCING;
- (2) THE WORK IS CONDUCTED USING BEST MANAGEMENT PRACTICES (BMPs) TO ENSURE FLOW AND CIRCULATION PATTERNS AND CHEMICAL AND BIOLOGICAL CHARACTERISTICS OF WETLANDS ARE NOT IMPACTED; AND
- (3) SUCH THAT ALL IMPACTS TO THE AQUATIC ENVIRONMENT ARE MINIMIZED.



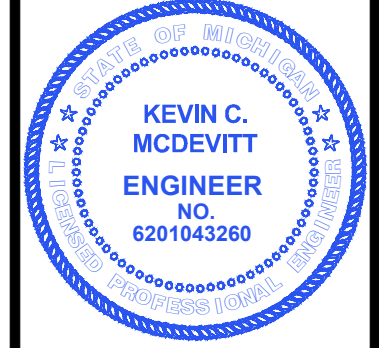
SEE CONTINUATION ON SHEET C-7.1

SEE CONTINUATION ON SHEET C-7.3

SEE CONTINUATION ON SHEET C-7.1

PERMANENT WATER SURFACE ELEV. = 808.00  
 EXTENDED DETENTION STORAGE ELEV. = 809.90  
 100 YEAR STORM STORAGE ELEV. = 809.93  
 BOTTOM OF 5' WIDE, 6% SHELF ELEV = 809.63  
 BOTTOM OF 5' WIDE, 6% SHELF ELEV = 807.70  
 TOP OF BERM FREEBOARD ELEV = 811.20

CENTER OF SEC. 32, T.3N., R.11E.,  
 L.C.R.C. L51456, P.195 O.C.R.



Call MISS DIG  
 3 full working days before you dig.  
 Utility Notification Organization  
 1-800-482-7171  
 www.missdig.org

CLIENT :  
**AUBURN ANGARA OAKS, LLC**  
 14496 N SHELDON RD  
 SUITE 230  
 PLYMOUTH, MI 48170  
 BRUCE MICHAEL  
 (248) 703-4653

**GRADING PLAN - SOUTH**  
 AUBURN ANGARA OAKS  
 PART OF SEC. 32, T.3N., R.11E  
 CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	PLAN SUBMITTALS/REVISIONS
01/23/2024	REVISIT TO WDOT
03/14/2024	REVISED SITE PLAN SUBMITTAL
03/14/2024	REVISED SITE PLAN PER CITY AND WDOT
03/28/2024	REVISED SITE PLAN PER WDOT
05/16/2024	PRELIMINARY SITE PLAN TO CITY
07/24/2024	REVISED SITE PLAN / WETLAND FLAGS
08/13/2024	REVISED SITE PLAN TO CITY
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE:  
 05/19/2022

PROJECT NO: 22-051

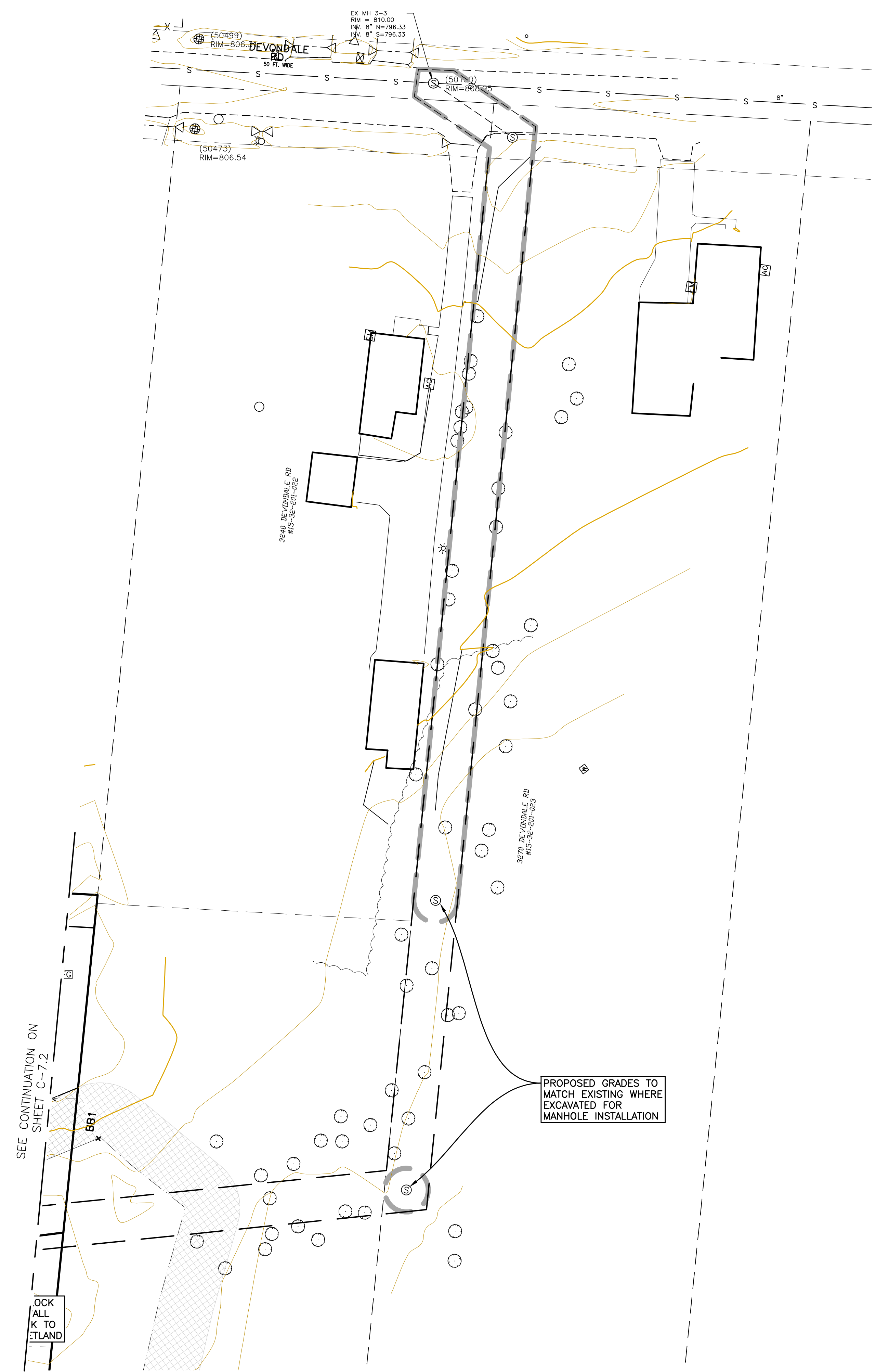
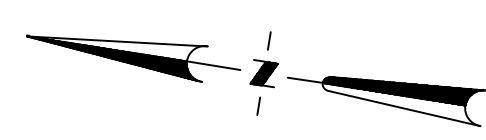
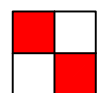
SCALE: 1" = 30'  
 0 1/2" 1"

FIELD: REICHERT  
 DRAWN BY: MN  
 DESIGN BY: KM  
 CHECK BY: AP

**C-7.2**

NOT FOR CONSTRUCTION





**GRADING LEGEND**

- X 940.00 TP PROPOSED TOP OF PAVEMENT GRADE
- X 940.00 SW PROPOSED SIDEWALK GRADE
- X 940.00 FG PROPOSED FINISH GRADE
- X 940.00 TC PROPOSED TOP OF CURB GRADE
- X 940.00 GP PROPOSED GUTTER PAN GRADE
- X 940.00 TW PROPOSED TOP OF WALL GRADE
- X 940.00 BW PROPOSED BOTTOM OF WALL GRADE
- X 940.0 MA MATCH EXISTING GRADE
- X 940.0 FFE PROPOSED FINISH FLOOR GRADE
- X 940.00 RIM PROPOSED RIM GRADE
- X 940.00 ADJ-RIM ADJUSTED RIM GRADE
- X 940.00 INV PROPOSED INVERT GRADE
- R ADA COMPLIANT SIDEWALK RAMP
- L ADA COMPLIANT SIDEWALK LANDING
- EXISTING ELEVATION
- 900 EXISTING CONTOUR
- 900 PROPOSED CONTOUR
- LIMITS OF DISTURBANCE
- ⇨ OVERFLOW ROUTE

**BENCHMARKS**

BM #1 ARROW ATOP FIRE HYDRANT AT THE N.W. CORNER OF LOT 11 ELEVATION 835.42 N.A.V.D. 88 DATUM  
 BM #2 ARROW ATOP FIRE HYDRANT N. SIDE OF AUBURN ROAD OPPOSITE N.E. CORNER OF LOT 11 ELEVATION 831.89 N.A.V.D. 88 DATUM

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

298 VETERANS DRIVE  
 FOWLERVILLE, MICHIGAN 48836  
 (OFFICE) 517-223-3512  
 MONUMENTENGINEERING.COM  
 SERVICE DISABLED VETERAN OWNED  
 SMALL BUSINESS (SDVOSSB)

KEVIN C. MCDEVITT  
 ENGINEER  
 NO. 6201043260

Call MISS DIG  
 3 full working days before you dig:  
 Michigan's Utility One-Call  
 1-800-482-7171  
 www.missdig.org

CLIENT :  
**AUBURN ANGARA OAKS, LLC**  
 14496 N SHELDON RD  
 SUITE 230  
 PLYMOUTH, MI 48170  
 BRUCE MICHAEL  
 (248) 703-4653

**GRADING PLAN - OFFSITE**  
 AUBURN ANGARA OAKS  
 PART OF SEC. 32, T3N, R11E  
 CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

PLAN SUBMITTALS/REVISIONS	DATE
RESUBMIT TO MDOT	09/13/2023
REVISED SITE PLAN SUBMITTAL	01/23/2024
REVISED SITE PLAN PER CITY AND MDOT	03/14/2024
PRELIMINARY SITE PLAN TO CITY	05/15/2024
REVISED SITE PLAN / WETLAND FLAGS	07/24/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/13/2024

ORIGINAL ISSUE DATE:  
 05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 30'

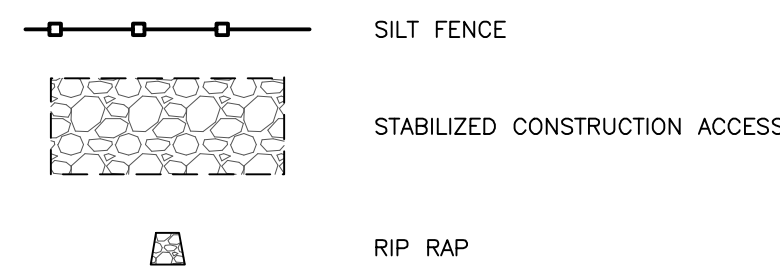
FIELD: REICHERT  
 DRAWN BY: MN  
 DESIGN BY: KM  
 CHECK BY: AP

**C-7.3**

NOT FOR CONSTRUCTION



**SESC LEGEND**



**EROSION CONTROL QUANTITIES**

Disturbed Area: 7.03 Acres

QTY	UNIT	ITEM
3,711	LF	SILT FENCE
24	EA	INLET FILTER
1	EA	STABILIZED CONSTRUCTION ACCESS
1000	SY	RIP-RAP

NOTE: QUANTITIES ARE FOR ENTIRE SITE

**SOILS INFO**

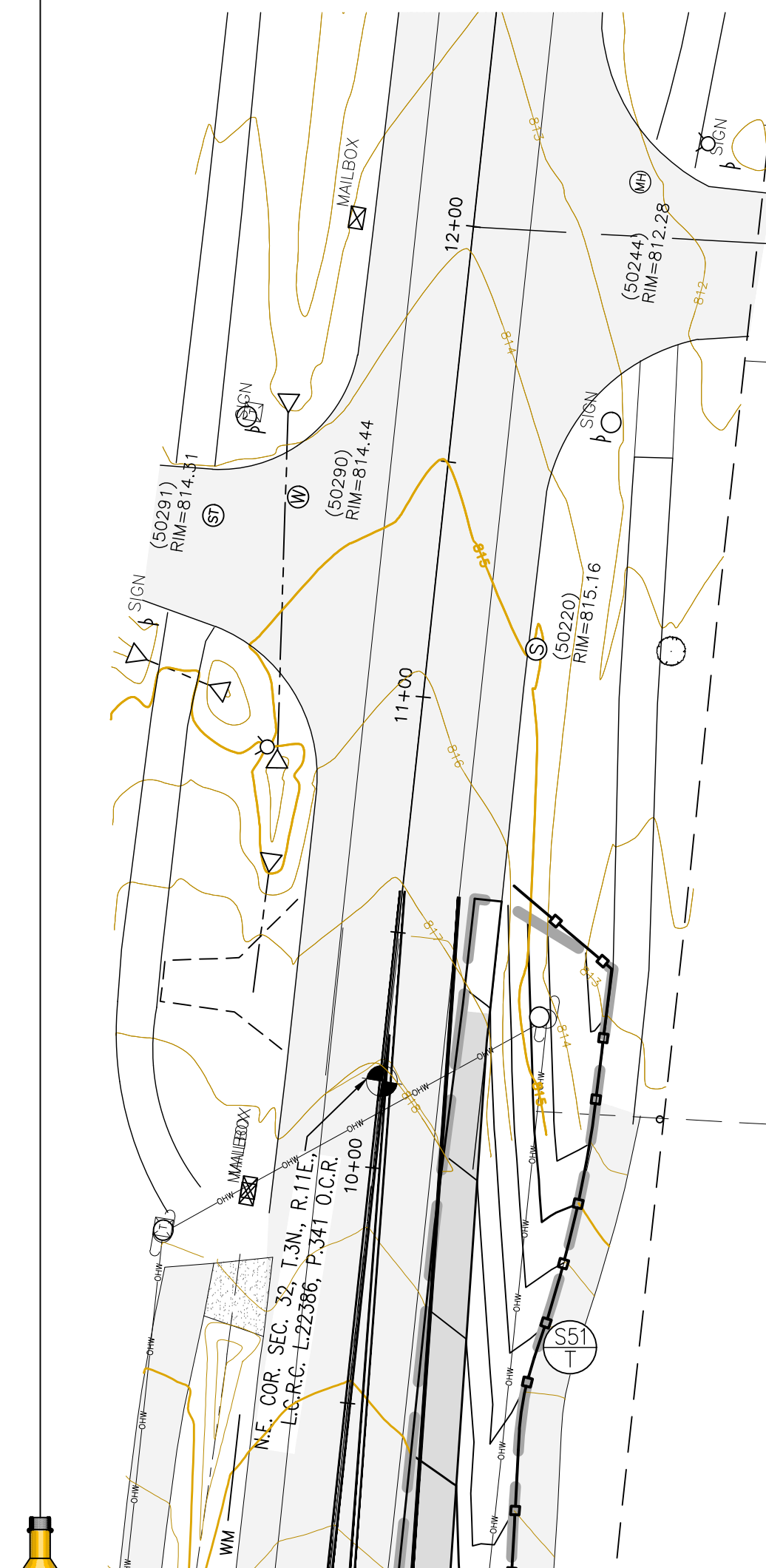
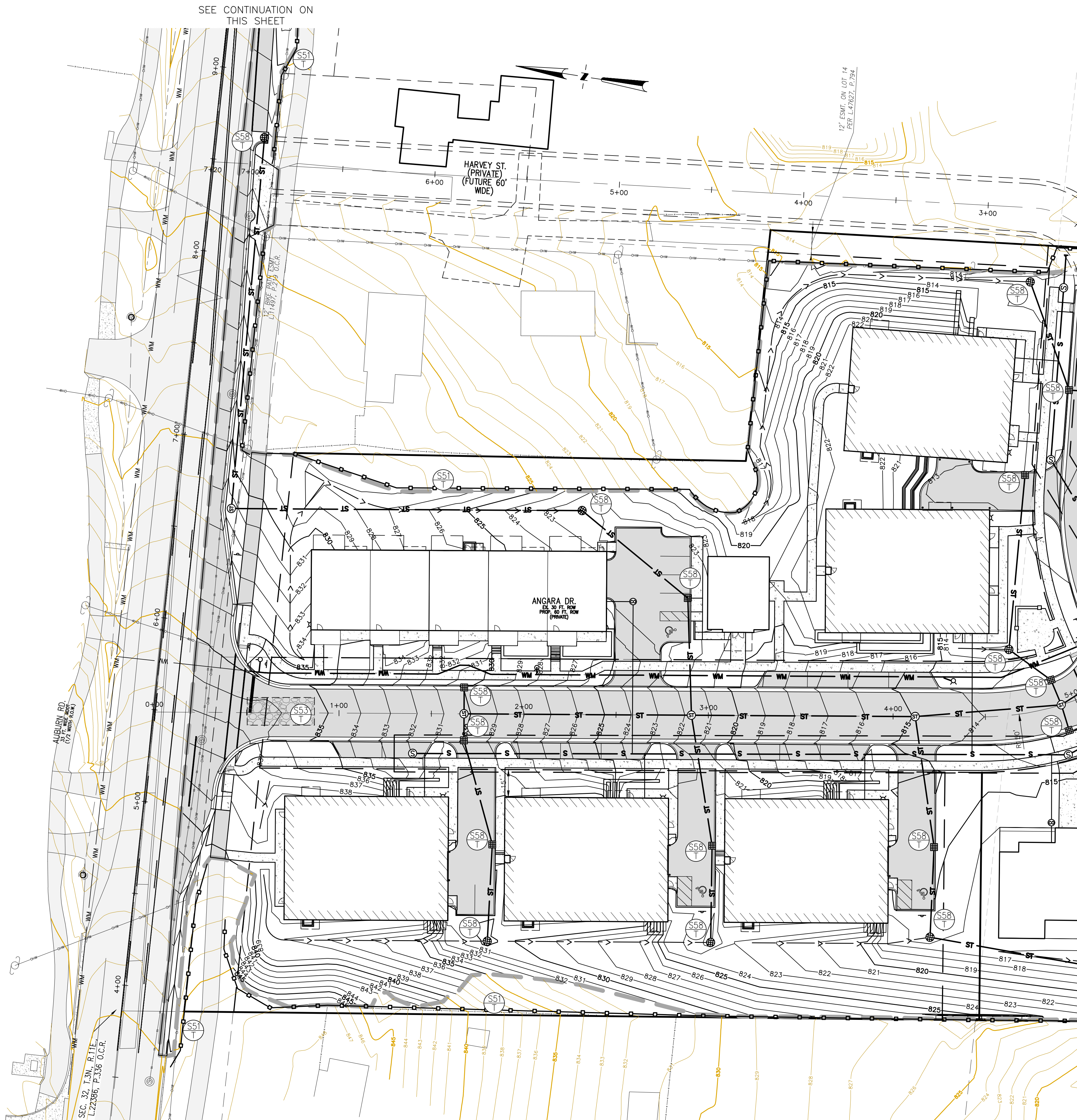
SOIL TYPES ARE ACCORDING TO THE USDA SOIL SURVEY WEB SITE (https://websoilsurvey.sc.gov.usda.gov/App/HomePage.htm)

THE MAJORITY OF THE BUILDABLE AREAS OF THE SITE ARE COMPRISED OF THE FOLLOWING SOIL TYPES:

- 62B: URBAN LAND-SPINKS COMPLEX, 0 TO 8 PERCENT SLOPES
- 18B: FOX SANDY LOAM, TILL PLAIN, 2 TO 6 PERCENT SLOPES
- 35A: THETFORD LOAMY FINE SANDS, 0 TO 3 PERCENT SLOPES

THE WETLAND AREAS ARE COMPRISED OF THE FOLLOWING SOIL TYPE:

- 39: GRANBY LOAMY SAND



**DTMB SOIL EROSION & SEDIMENTATION CONTROL MEASURES**

MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT, AND BUDGET (DTMB)

EROSION CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E6	MULCH		FOR USE IN AREAS SUBJECT TO ERODING SURFACE FLOWS OR SEVERE WIND OR ON NEWLY SEEDDED AREAS.
E8	PERMANENT SEEDING		STABILIZATION METHOD UTILIZED ON SITES WHERE EARTH CHANGE HAS BEEN COMPLETED (FINAL GRADING ATTAINED).

SEDIMENT CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
S51	SILT FENCE		USE ADJACENT TO CRITICAL AREAS, TO PREVENT SEDIMENT LADEN SHEET FLOW FROM ENTERING THESE AREAS.
S53	STABILIZED CONSTRUCTION ACCESS		USED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE.
S55	SEDIMENT BASIN		AT THE OUTLET OF DISTURBED AREAS AND AT THE LOCATION OF A PERMANENT DETENTION BASIN.
S58	INLET PROTECTION FABRIC DROP		USE AT STORMWATER INLETS, ESPECIALLY AT CONSTRUCTION SITES.

EROSION & SEDIMENT CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
ES31	CHECK DAM		USED TO REDUCE SURFACE FLOW VELOCITIES WITHIN CONSTRUCTED AND EXISTING FLOW CORRIDORS.

**EROSION CONTROL STANDARDS**

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE OAKLAND COUNTY WATER RESOURCE COMMISSIONER'S OFFICE.
2. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES, AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
4. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER CHANGES HAS BEEN ACCOMPLISHED.
5. STAGING OF THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLACES AND AS REQUIRED TO INSURE PROGRESSIVE STABILIZATION OF DISTURBED AREAS.
6. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
7. A CERTIFIED STORM WATER OPERATOR WILL BE NAMED ON THE MDEQ NOTICE OF COVERAGE FOR NPDES AS REQUIRED.
8. ALL DISTURBED AREAS ARE TO BE TOP SOILED AND SEEDED WITH THE FOLLOWING MIN RATIO: TOP SOIL 3" IN DEPTH, GRASS SEED 218 LBS PER ACRE, FERTILIZER 150 LBS PER ACRE, STRAW MULCH 3" DEPTH 1.5 TO 2 TONS PER ACRE.
9. HYDRO-SEEDING IS NOT ACCEPTABLE FOR SLOPES EXCEEDING 1%. ON SLOPES OVER 1%, STABILIZATION SHALL BE DONE WITH SEED AND STRAW MULCH WITH A TACKIFIER, OR STRAW BLANKETS PEGGED IN PLACE.

**SOIL EROSION CONTROL MAINTENANCE SCHEDULE AND NOTES.**

1. CONTRACTOR MUST OBTAIN A SOIL EROSION AND SEDIMENTATION CONTROL PERMIT FROM THE OAKLAND COUNTY WATER RESOURCE COMMISSIONER'S OFFICE PRIOR TO COMMENCING WORK.
2. EARTHWORK SHALL BE LIMITED TO THE PROPOSED SITE AS SHOWN ON THE PLAN.
3. CONTRACTOR SHALL INSPECT THE SOIL EROSION/SEDIMENTATION CONTROL DEVICES ONCE A WEEK AND/OR WITHIN 24 HOURS OF A RAINFALL EVENT WHICH RESULTS IN A STORM WATER DISCHARGE FROM THE SITE. ANY DAMAGE TO EROSION CONTROL MEASURES MUST BE REPAIRED IMMEDIATELY.
4. ALL MUD OR DEBRIS TRACKED ONTO EXISTING PUBLIC ROADS FROM THE SITE DUE TO CONSTRUCTION SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
5. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT-UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR RE-BACKFILL THE SILTATION FENCE SHOULD IT FAIL OR BE DAMAGED DURING CONSTRUCTION.
6. PERMANENT STABILIZATION MUST BE COMPLETED WITHIN 30 DAYS OF FINAL GRADING.
7. ACCESS ROADS MUST BE MAINTAINED AS NECESSARY, TO KEEP THEM EFFECTIVE, NEW LAYERS OF STONE MAY BE ADDED AS OLD LAYERS BECOME COMPACTED. STEPS SHOULD ALSO BE TAKEN TO REPAIR THE ACCESS ROADS IF RUTS OR PONDING WATER APPEARS.
8. INLET FILTERS SHOULD BE INSPECTED FOR BUILDUP OF SILT AND OTHER DEBRIS. THIS IS EVIDENT IF GEOTEXTILE/SOD STRUCTURE IS CAUSING FLOODING. MAINTENANCE WOULD CONSIST OF REMOVING OF SEDIMENTS WITH A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTER IS BEYOND THIS LEVEL OF REPAIR, IT MAY BE NECESSARY TO REPLACE BOTH THE SOD AND GEOTEXTILE FILTER.
9. IF SOIL EROSION/SEDIMENT CONTROL MEASURES ARE INADEQUATE FOR THE SITE, THE PROPER EROSION CONTROL AUTHORITY MUST BE NOTIFIED.

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOBS)

KEVIN C. MCDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Utility Notification Organization  
1-800-482-7171  
www.missdig.org

**CLIENT :**

**AUBURN ANGARA OAKS, LLC**  
14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**SESC PLAN - MULTI FAMILY**

AUBURN ANGARA OAKS  
PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	RESUBMIT TO MDOT
01/23/2024	REVISED SITE PLAN SUBMITTAL
03/14/2024	REVISED SITE PLAN PER CITY AND MDOT
03/28/2024	REVISED SITE PLAN PER MDOT
07/24/2024	REVISED SITE PLAN / WETLAND FLAGS
09/13/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

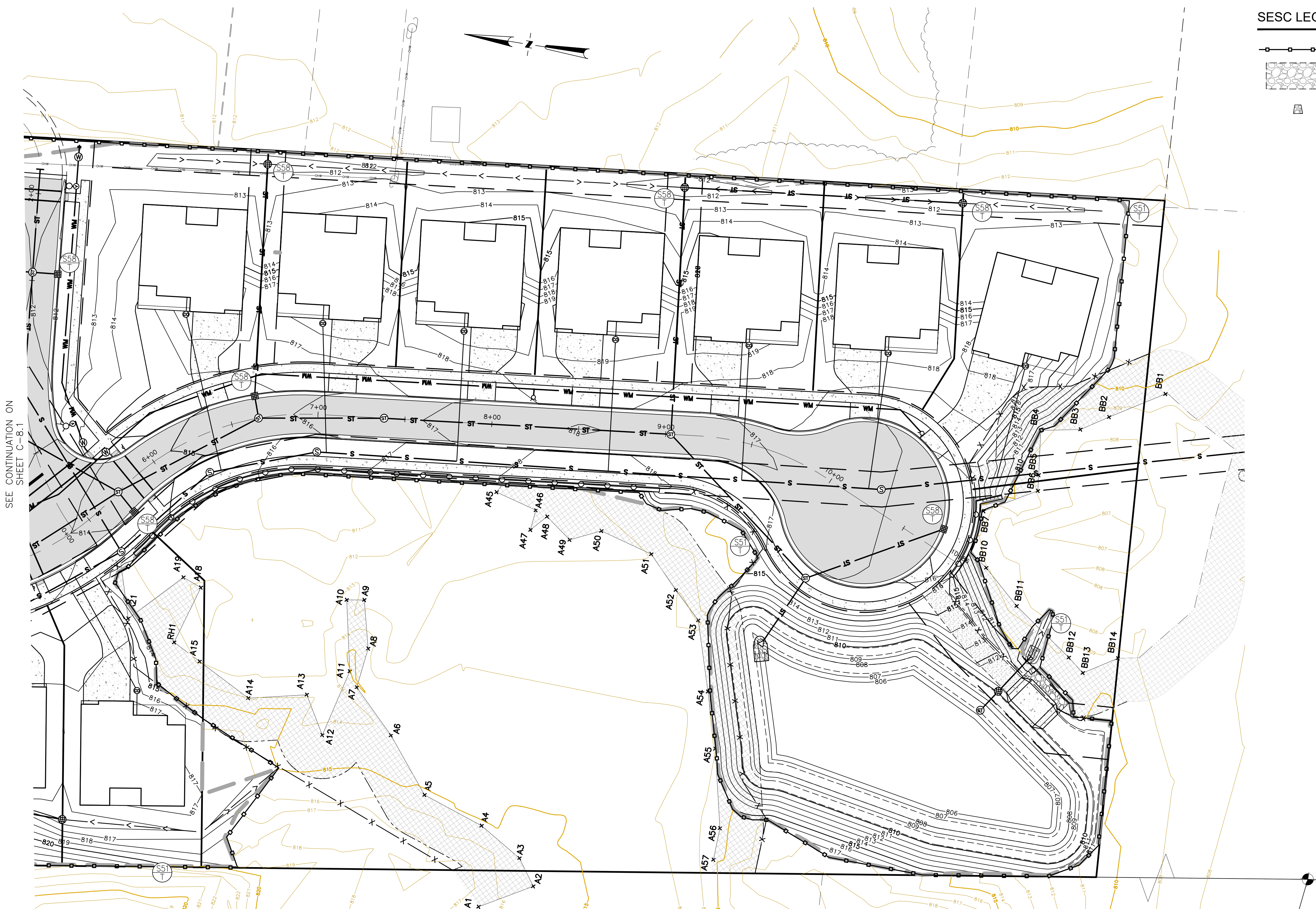
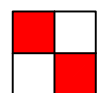
SCALE: 1" = 30'

FIELD: REICHT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**C-8.1**

NOT FOR CONSTRUCTION





**SESC LEGEND**

- SILT FENCE
- STABILIZED CONSTRUCTION ACCESS
- RIP RAP

SEE CONTINUATION ON SHEET C-8.1

CONSTRUCTION SEQUENCE	OPERATION TIME SCHEDULE - BEGINNING SEPTEMBER 2024												
	SEP 2024	OCT 2024	NOV 2024	DEC 2024	JAN 2025	FEB 2025	MAR 2025	APR 2025	MAY 2025	JUN 2025	JUL 2025		
1 CONTRACTOR SHALL INSTALL SILT FENCE AS SHOWN ON APPROVED PLANS.													
2 DETENTION BASIN SHALL BE EXCAVATED, TOP SOILED, AND SEEDED IMMEDIATELY AFTER DEMOLITION WORK IS COMPLETED.													
3 REMOVE ALL TOPSOIL AND ORGANIC MATTER. TOPSOIL SHALL BE STORED ON SITE IN DESIGNATED AREA TO BE USED FOR FUTURE PLANTING AND FILL AREAS. TRUCK REMAINING TOP SOIL OFFSITE AND PROPERLY DISPOSE.													
4 ROUGH GRADE AND INSTALL NEW UNDERGROUND UTILITIES. PLACE INLET FILTERS AT PROPOSED CATCH BASINS THROUGHOUT SITE.													
5 CONSTRUCT ROAD GRADE AND BUILDINGS.													
6 CURB AND GUTTER CONSTRUCTION, CONCRETE SIDEWALKS IN COMMON AREAS.													
7 FINISH GRADE AROUND BUILDINGS AND STABILIZE AS SOON AS POSSIBLE. STABILIZE ALL DISTURBED AREAS WITH CLASS A SEED AND MULCH. IN AREAS OF SLOPES OF 1:4 OR STEEPER, CONTRACTOR TO SEED AND INSTALL PEGGED IN PLACE EROSION CONTROL BLANKETS. CONSTRUCT ROADWAY LEVELING COURSE.													
8 REPAIR/CLEAN INLET FILTERS AS REQUIRED.													
9 INSTALL FINAL LANDSCAPING PER LANDSCAPE PLAN.													
10 STONE AROUND OUTLET STANDPIPE STRUCTURE SHALL BE REFRESHED. TOP COURSE AND PAVEMENT MARKING.													
11 REMOVE TEMPORARY SOIL EROSION MEASURES ONCE SEEDED VEGETATION HAS BEEN ESTABLISHED. CLEAN ALL AFFECTED STORM STRUCTURES AS NECESSARY.													

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**  
MONUMENT ENGINEERING GROUP ASSOCIATES, INC.

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOB)

KEVIN C. McDEVITT  
ENGINEER  
NO. 6201043260

*Kevin C. McDevitt*

Call MISS DIG  
3 full working days before you dig.

Michigan's Utility Notification One-Call Organization

1-800-482-7171  
www.missdig.org

THE LOCATIONS AND DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, DEPTHS AND ELEVATIONS PRIOR TO THE START OF ANY WORK.

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**GRADING PLAN - SINGLE FAMILY**

AUBURN ANGARA OAKS

PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	PLAN SUBMITTALS/REVISIONS
01/23/2024	REVISOR TO MOOT
03/14/2024	REVISED SITE PLAN PER CITY AND MOOT
03/28/2024	REVISED SITE PLAN PER MOOT
07/24/2024	PRELIMINARY SITE PLAN TO CITY
08/13/2024	REVISED SITE PLAN / WETLAND FLAGS
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 30'

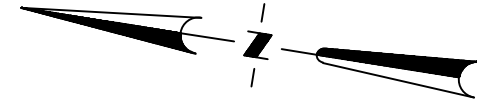
0 1/2" 1"

FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

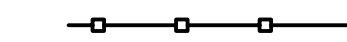
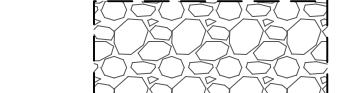

**C-8.2**

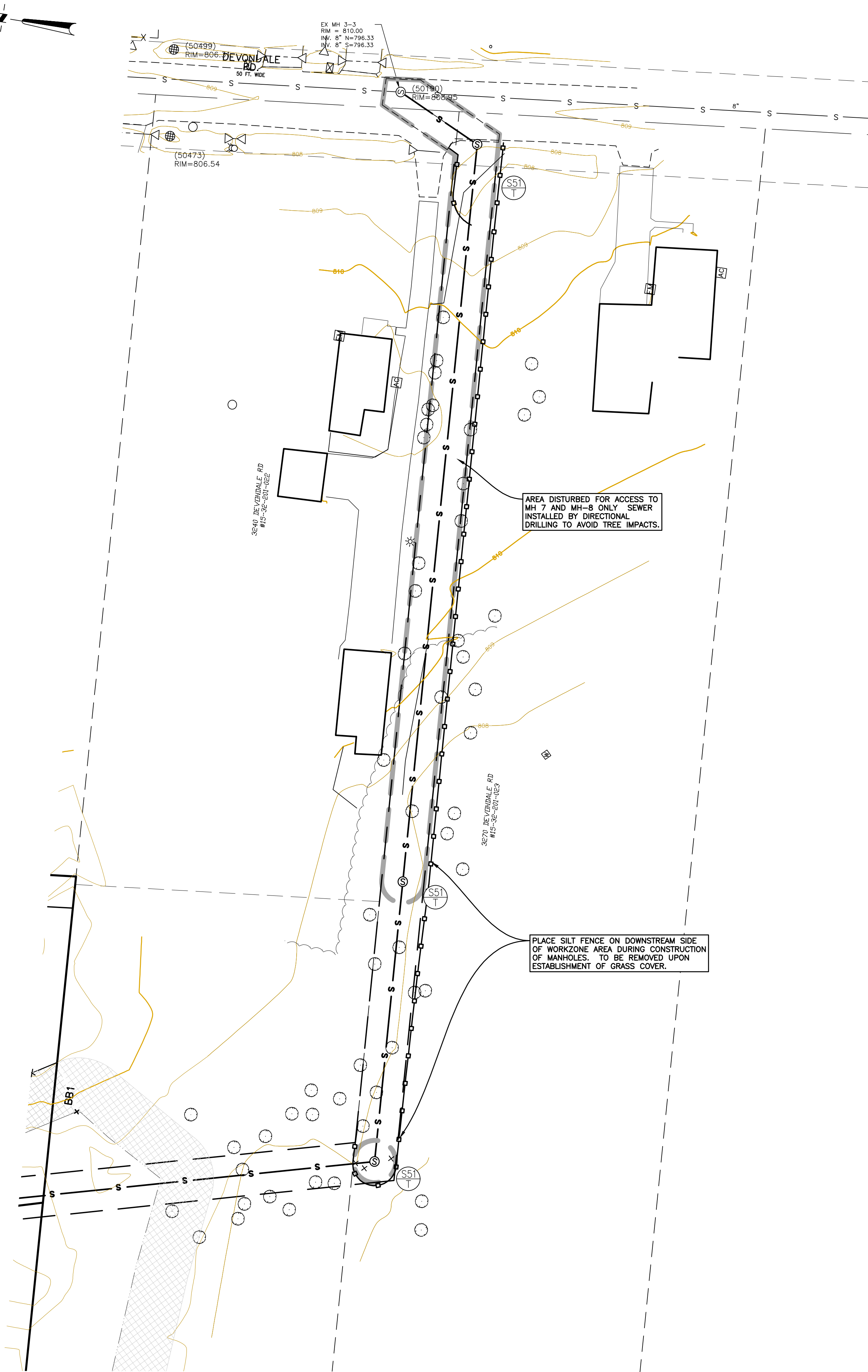
NOT FOR CONSTRUCTION





### SESC LEGEND

-  SILT FENCE
-  STABILIZED CONSTRUCTION ACCESS
-  RIP RAP



INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS



298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSS)



KEVIN C. MCDEVITT  
ENGINEER  
NO. 6201043260

*Kevin C. McDevitt*

Call MISS DIG  
3 full working days before you dig:

Michigan's Utility One-Call Notification Organization

1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITIES, LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT :

**AUBURN ANGARA OAKS, LLC**

14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**GRADING PLAN - OFFSITE**

AUBURN ANGARA OAKS

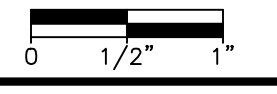
PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

PLAN SUBMITTALS/REVISIONS	DATE
RESUBMIT TO MDOT	09/13/2023
REVISED SITE PLAN SUBMITTAL	01/23/2024
REVISED SITE PLAN PER CITY AND MDOT	03/14/2024
PRELIMINARY SITE PLAN TO CITY	03/28/2024
REVISED SITE PLAN / WETLAND FLAGS	05/16/2024
REVISED PRELIMINARY SITE PLAN TO CITY	09/13/2024

ORIGINAL ISSUE DATE:  
05/19/2022

PROJECT NO: 22-051

SCALE: 1" = 30'

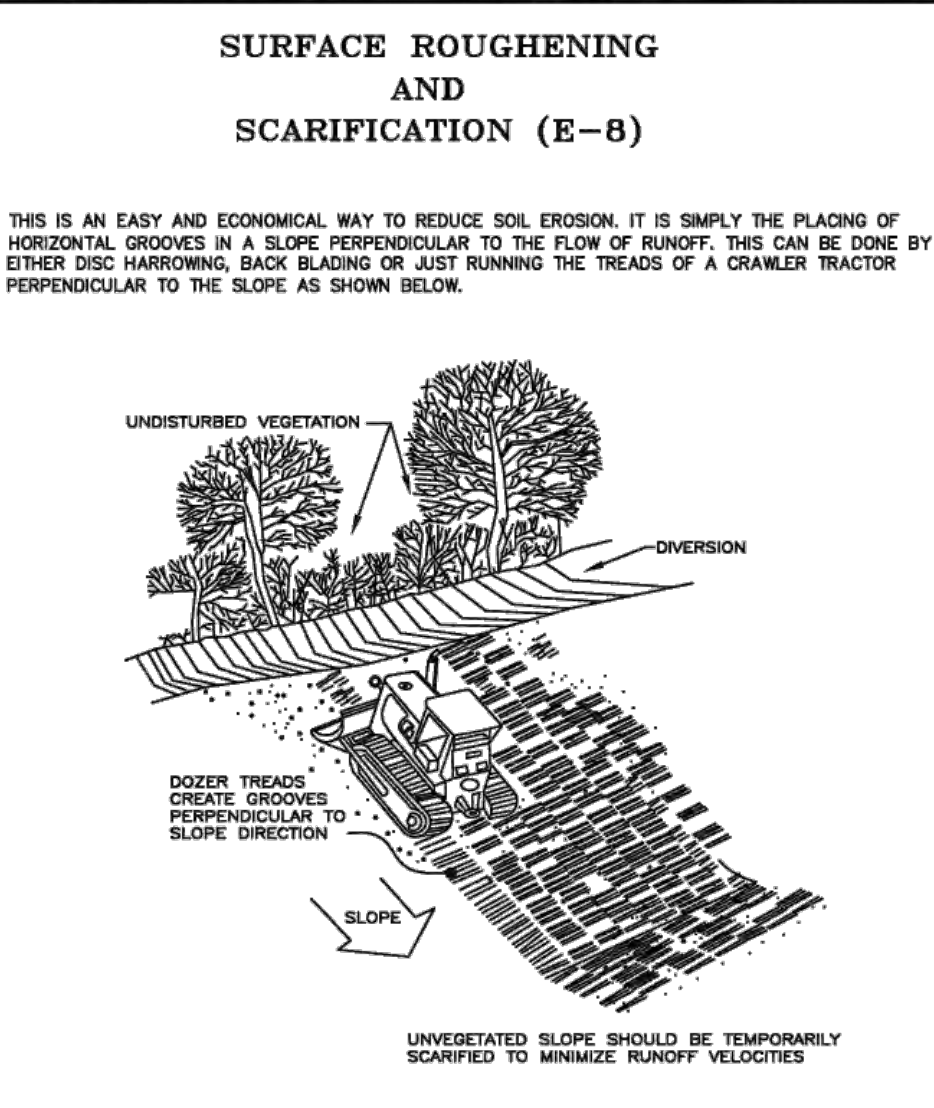
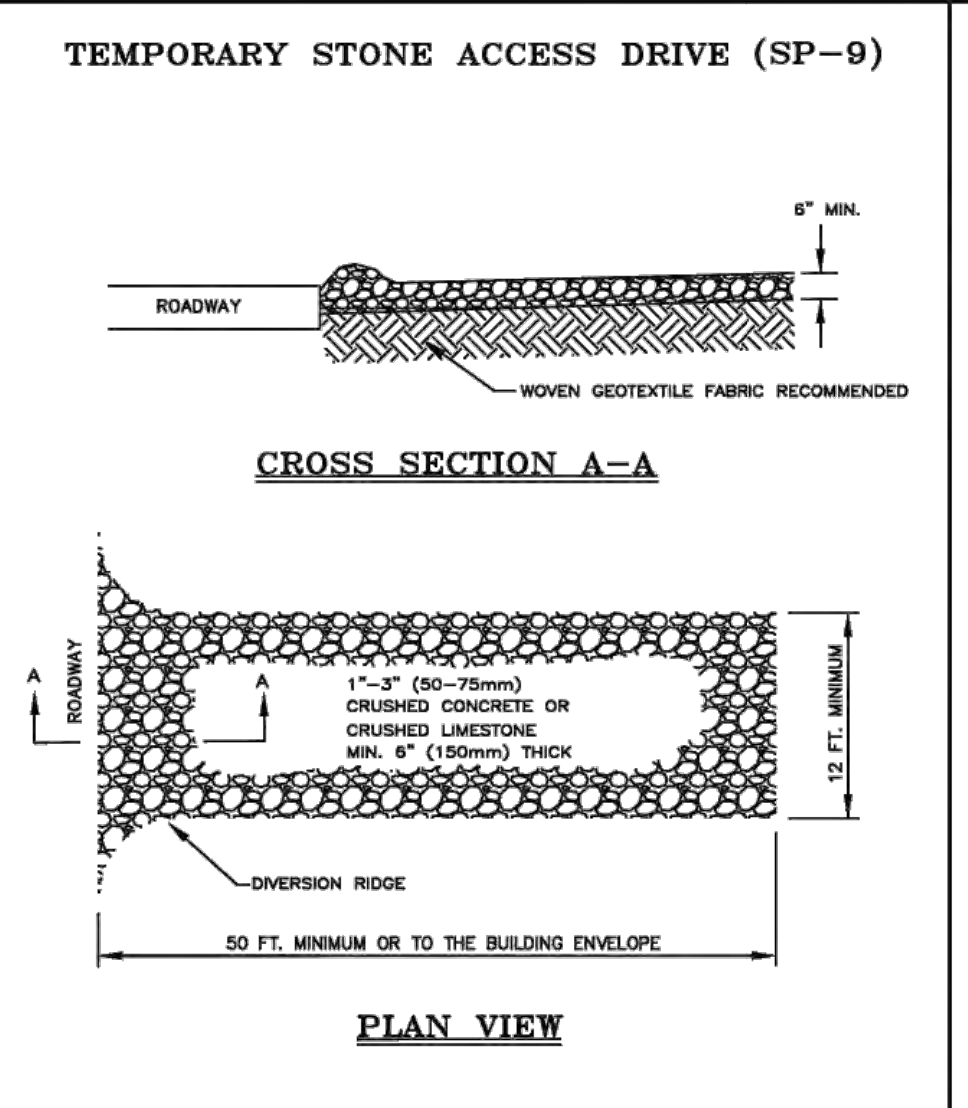
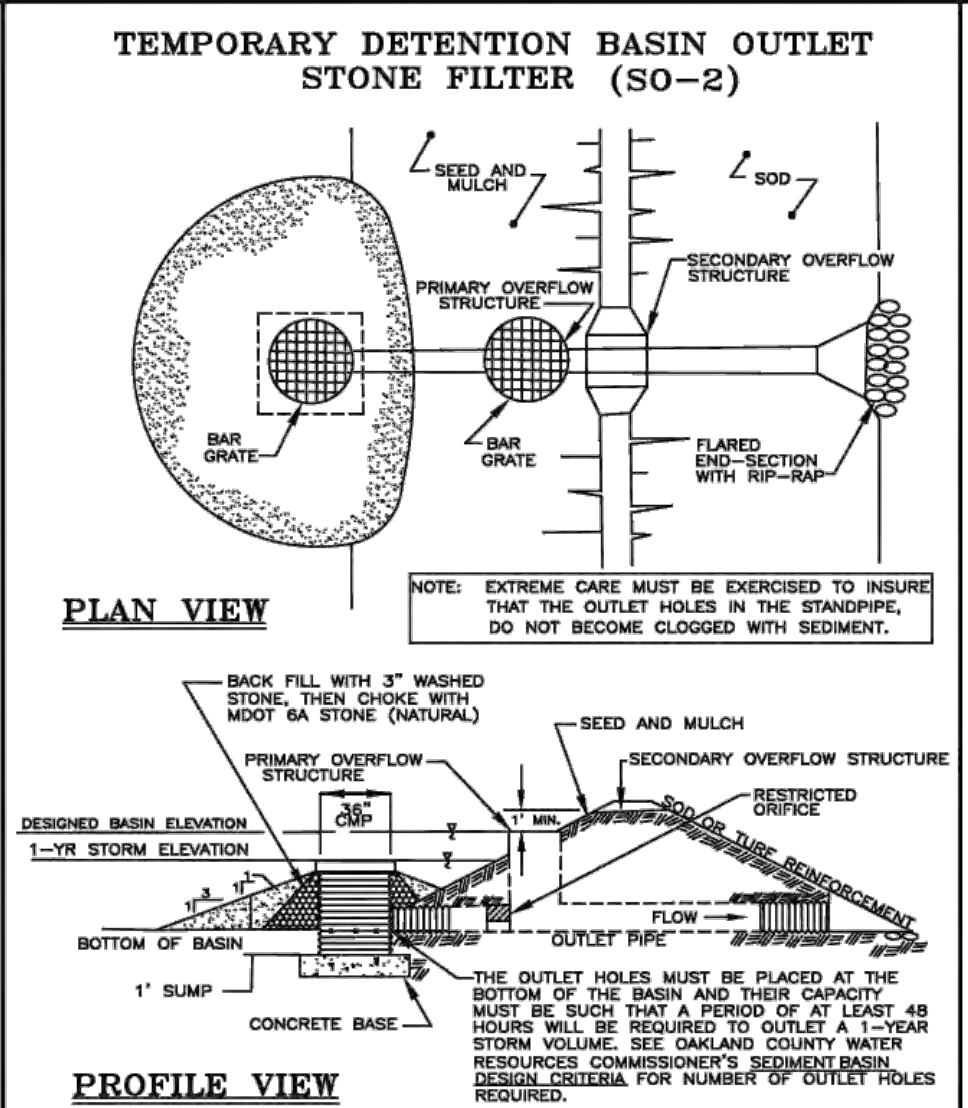
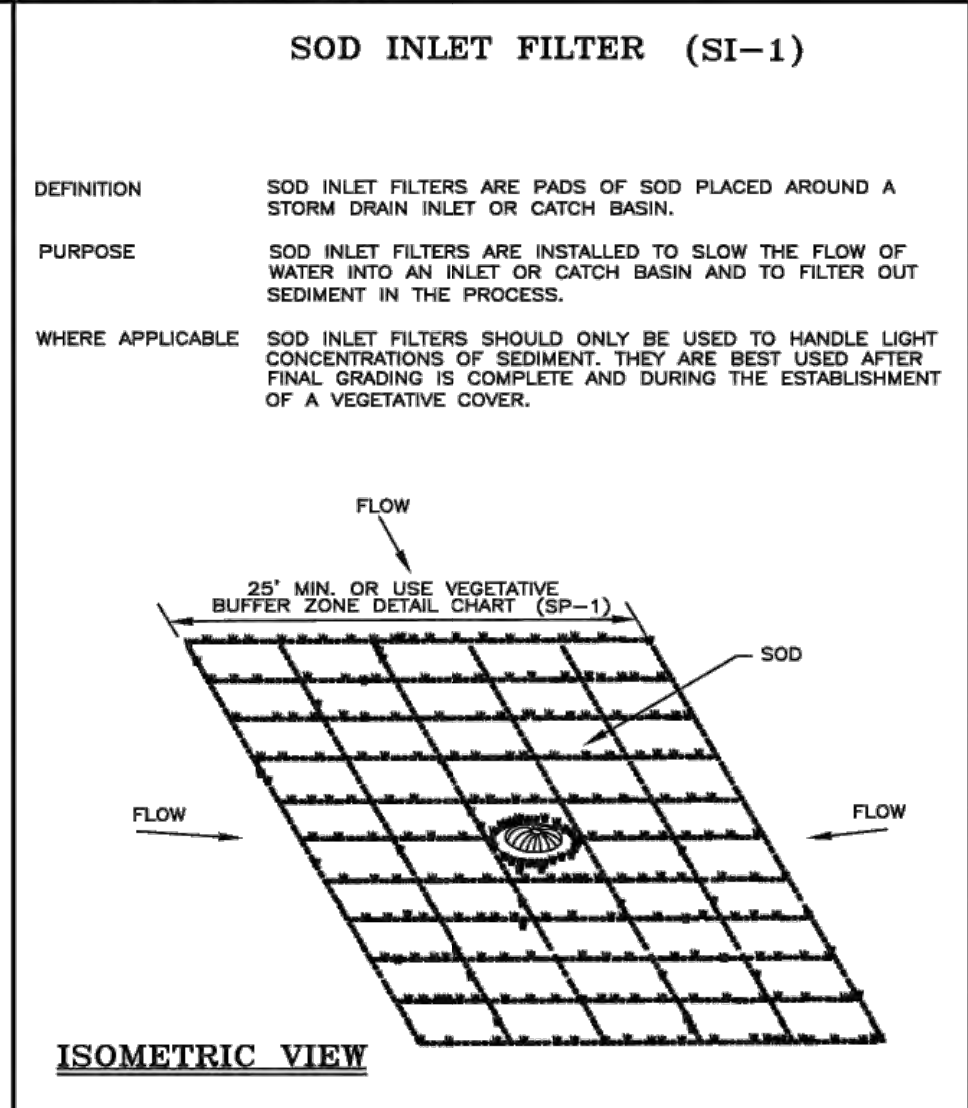
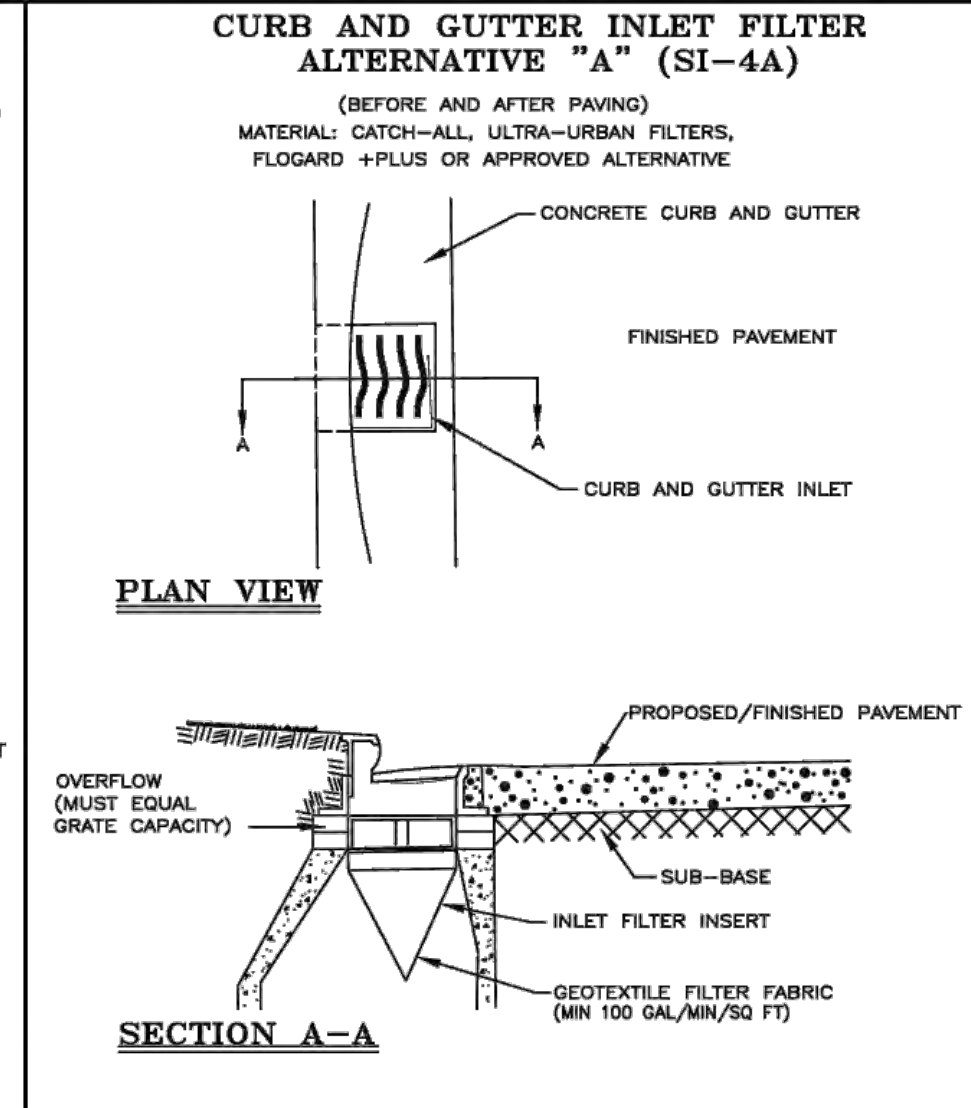
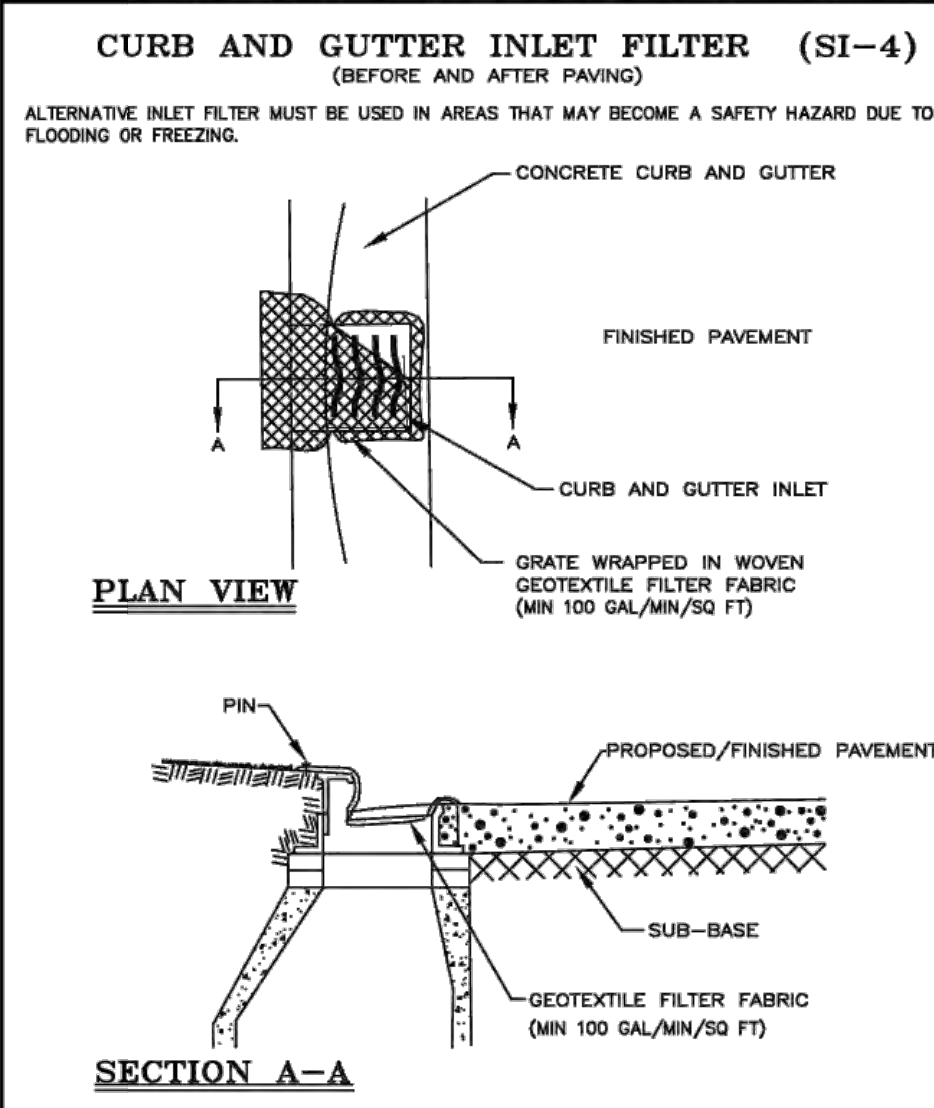
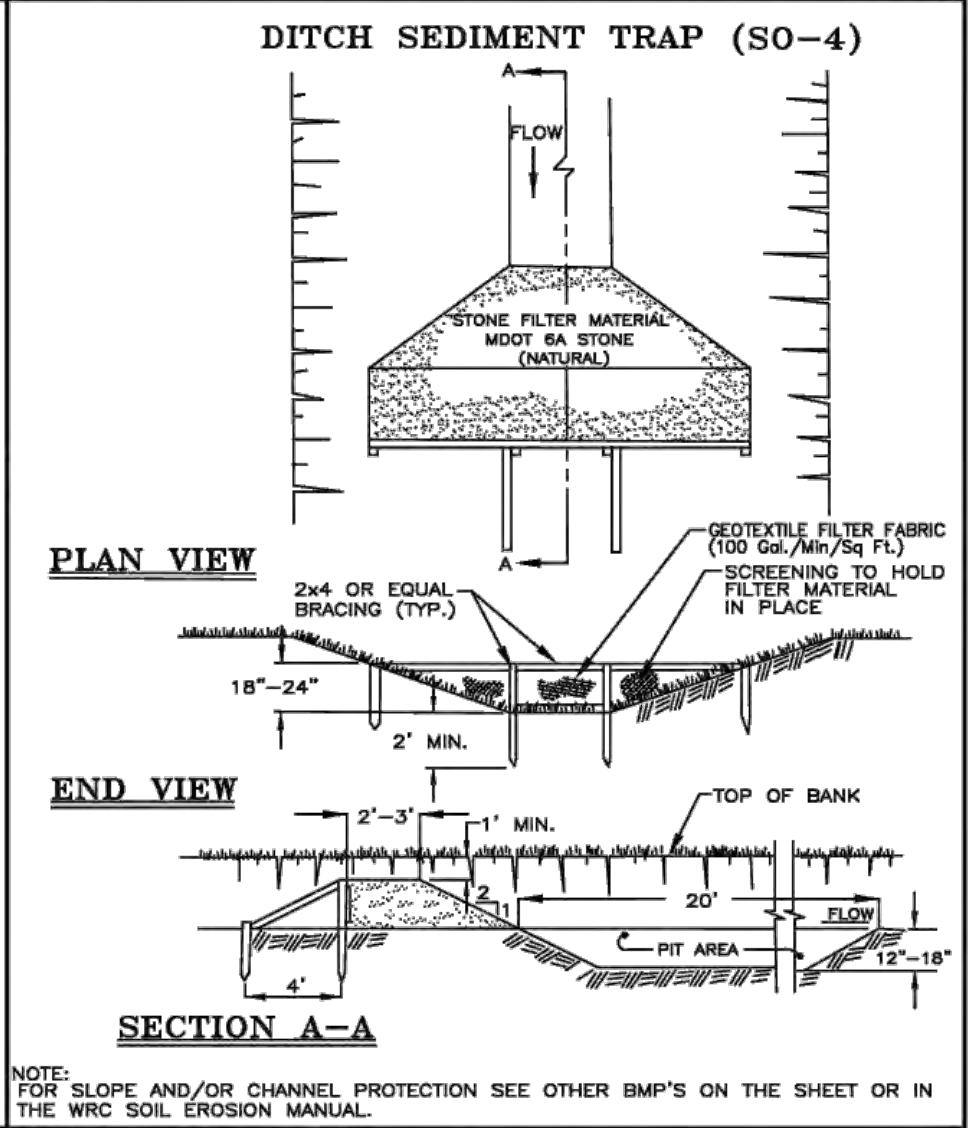
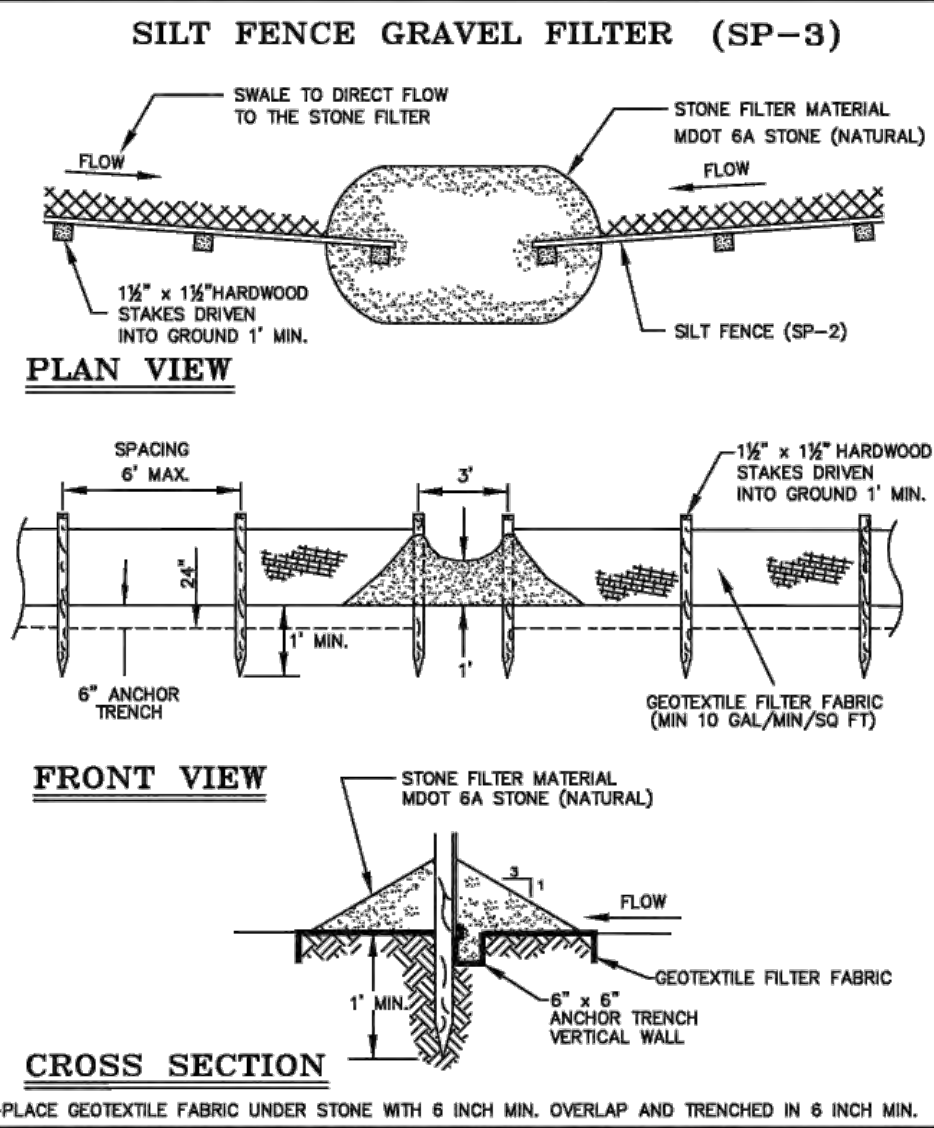
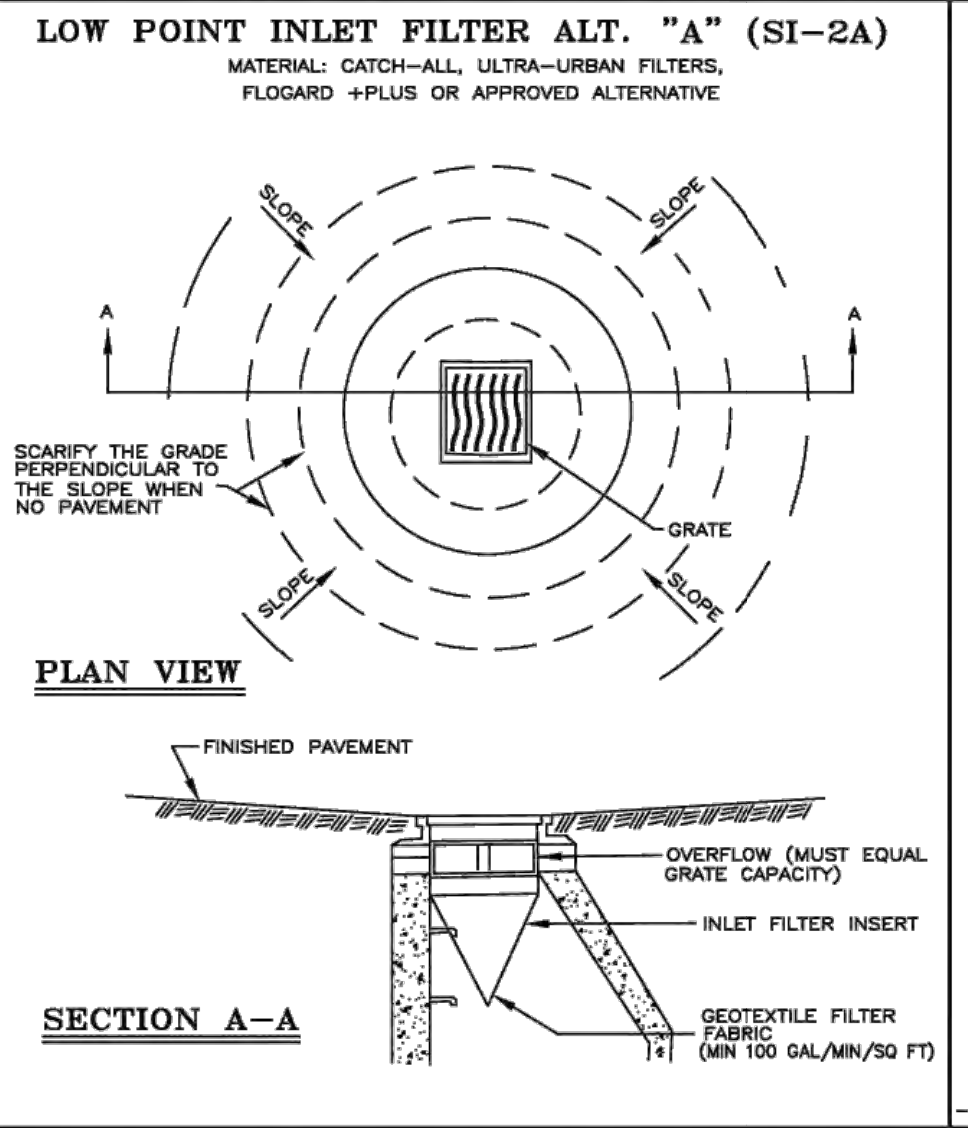
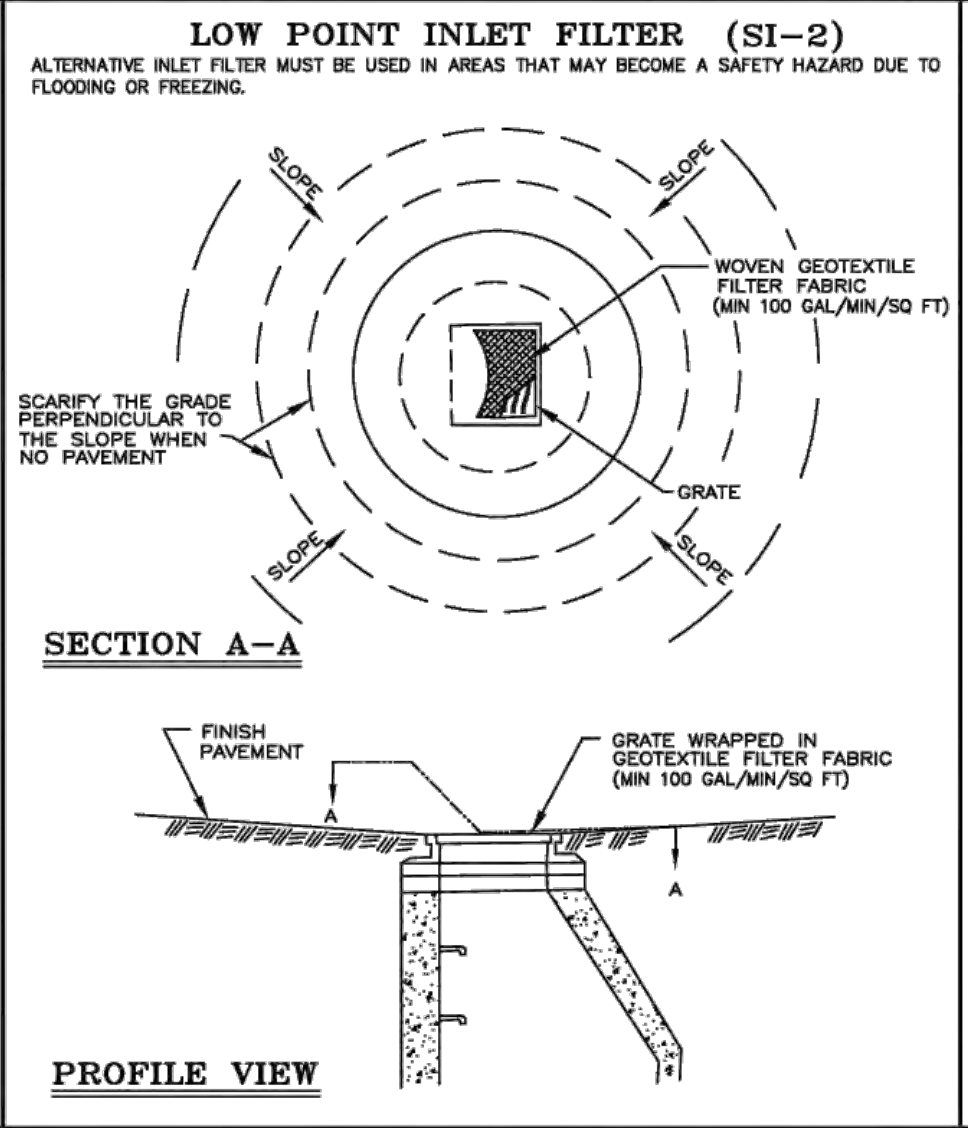
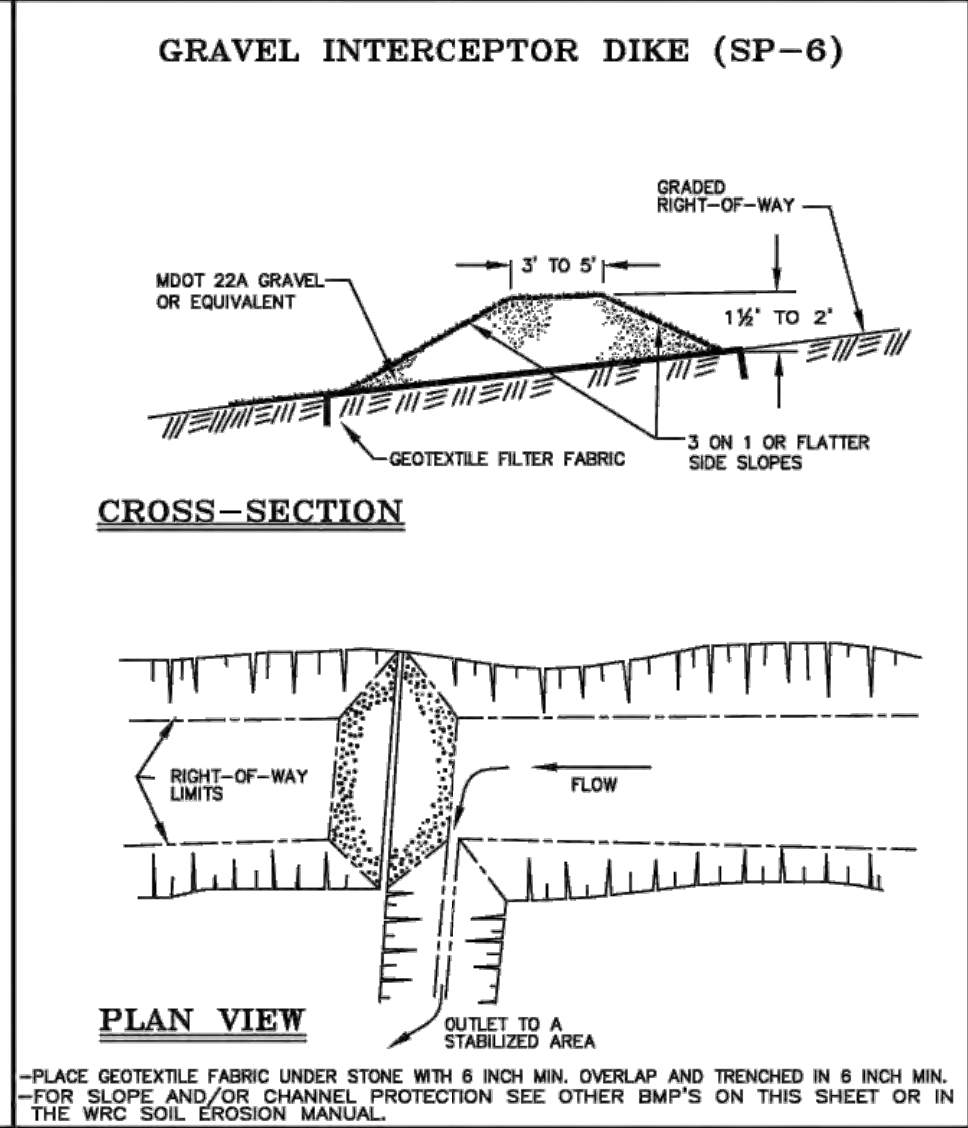
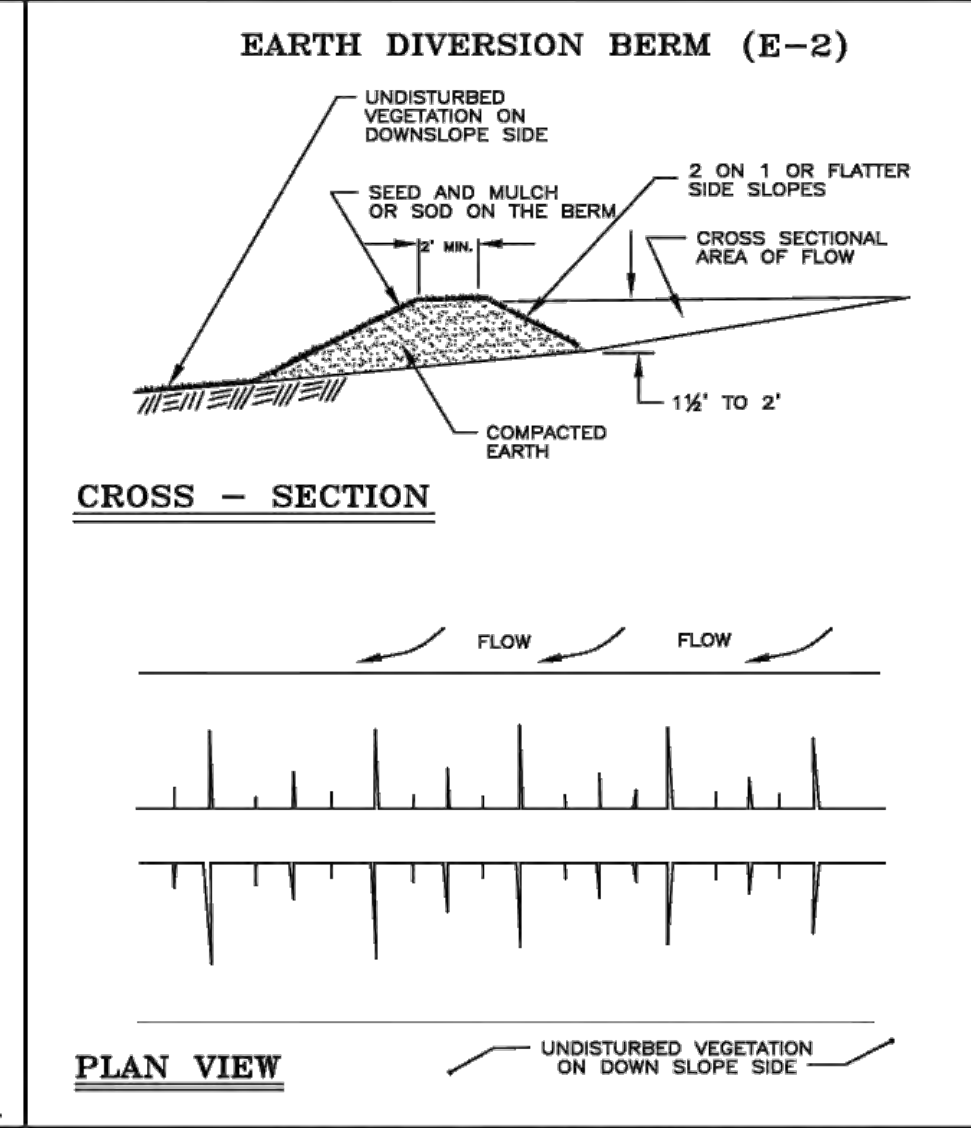
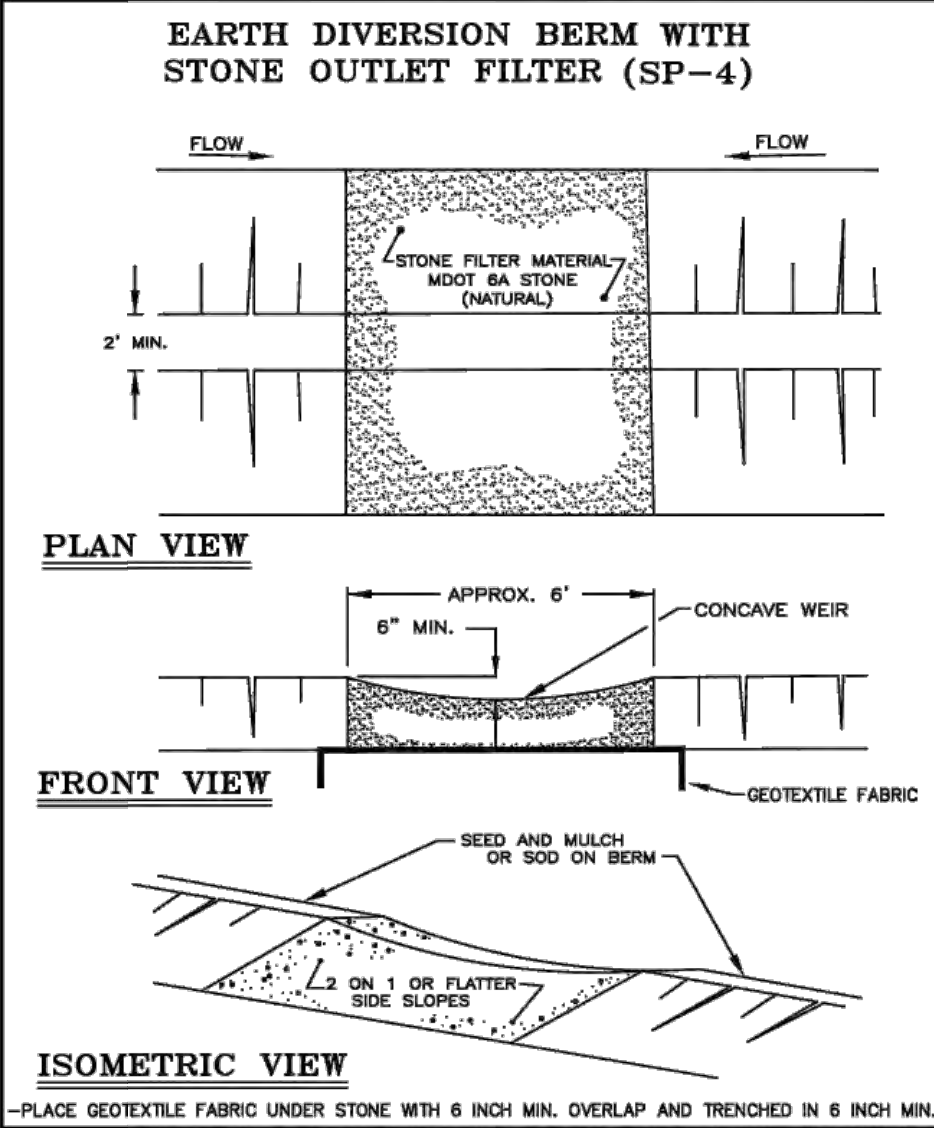
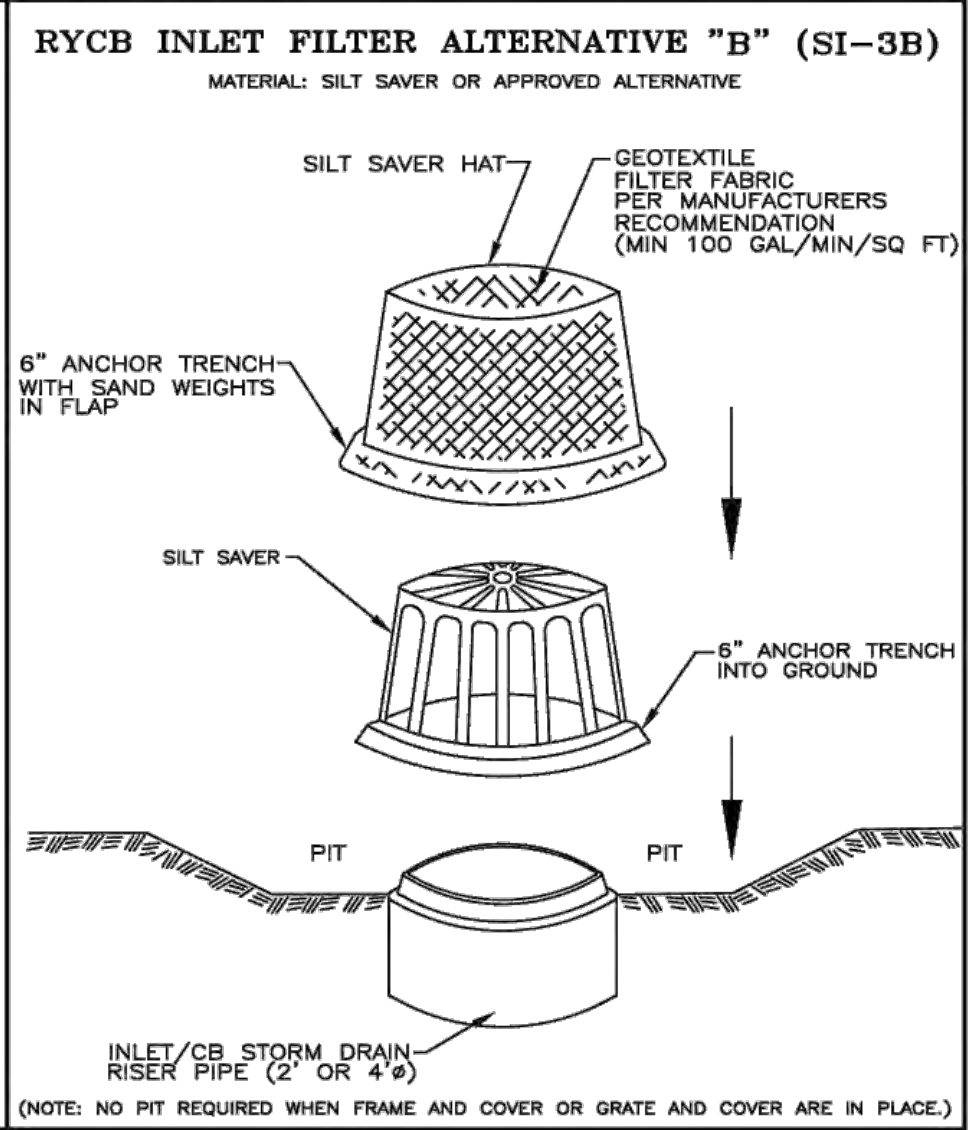
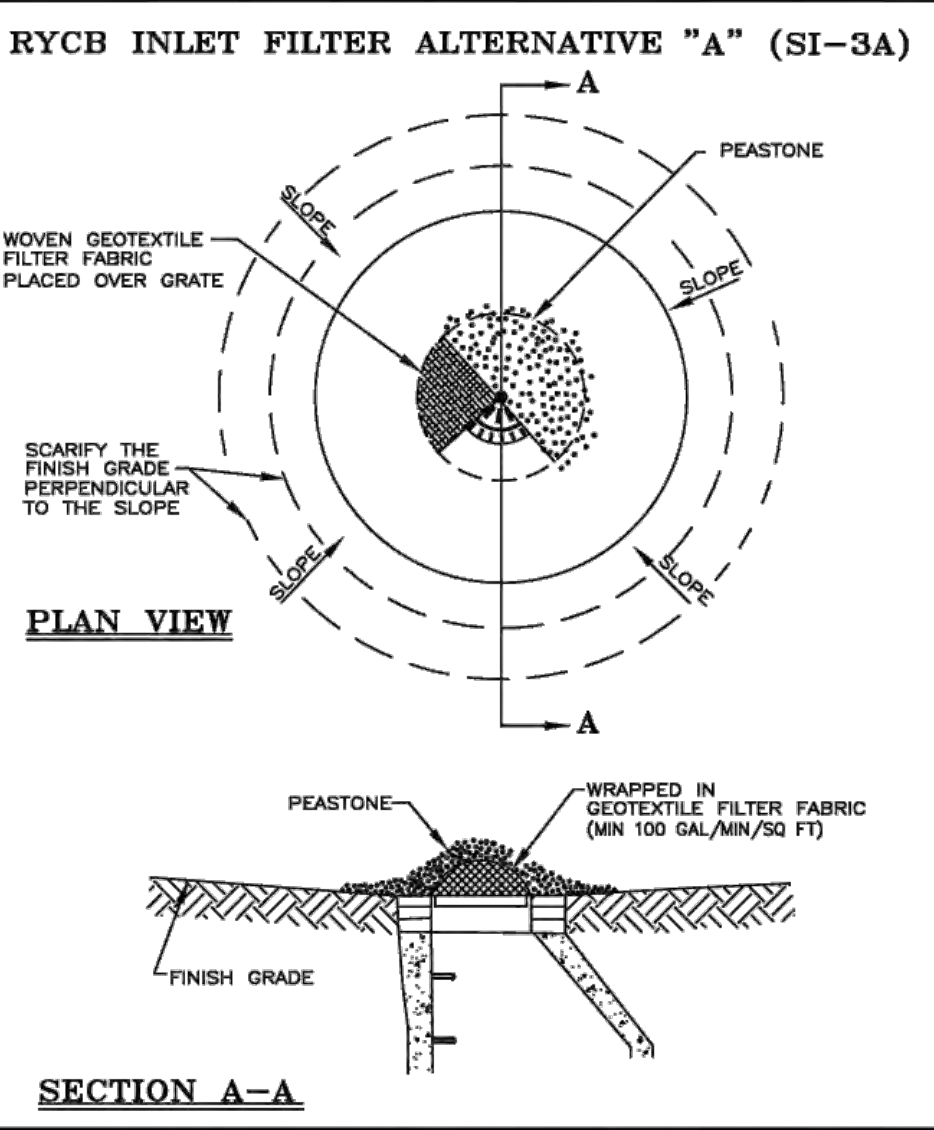
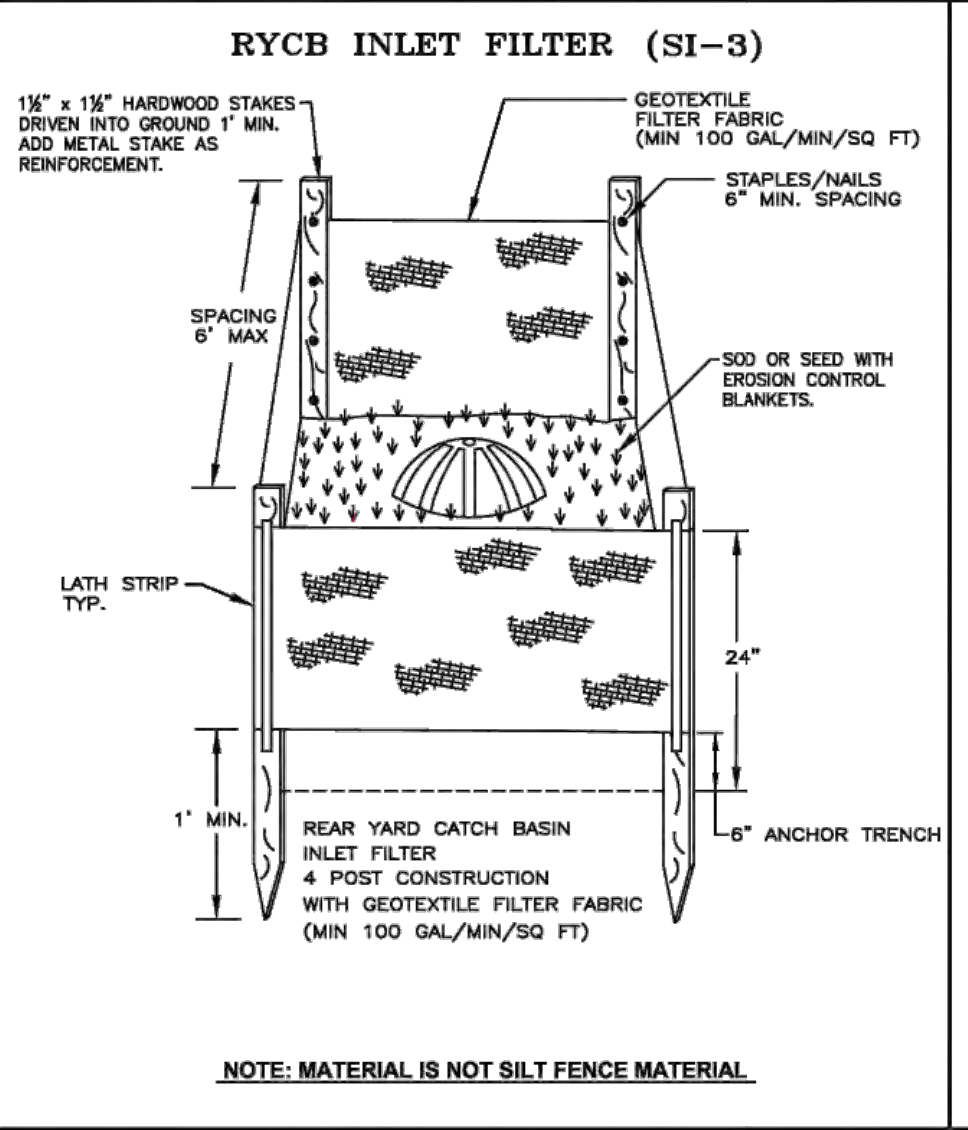
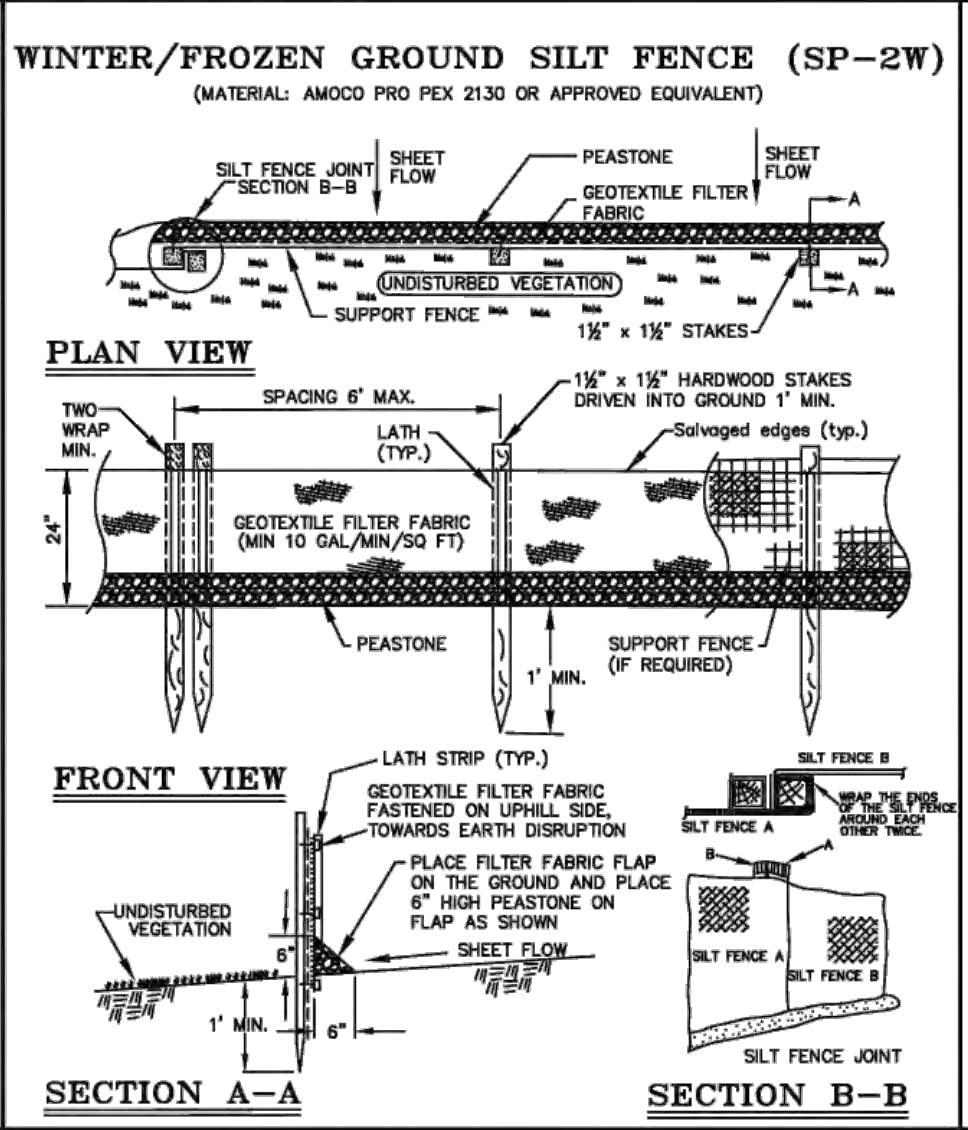
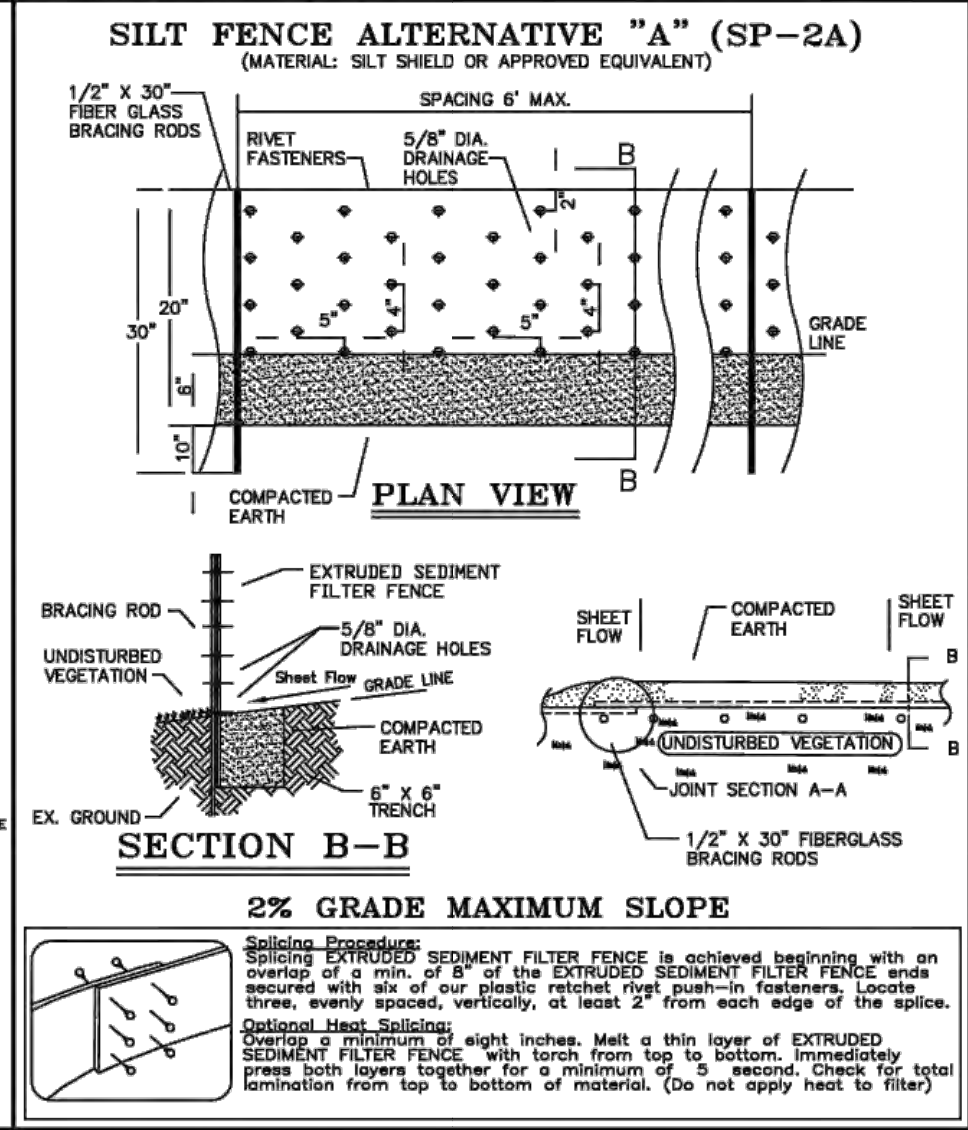
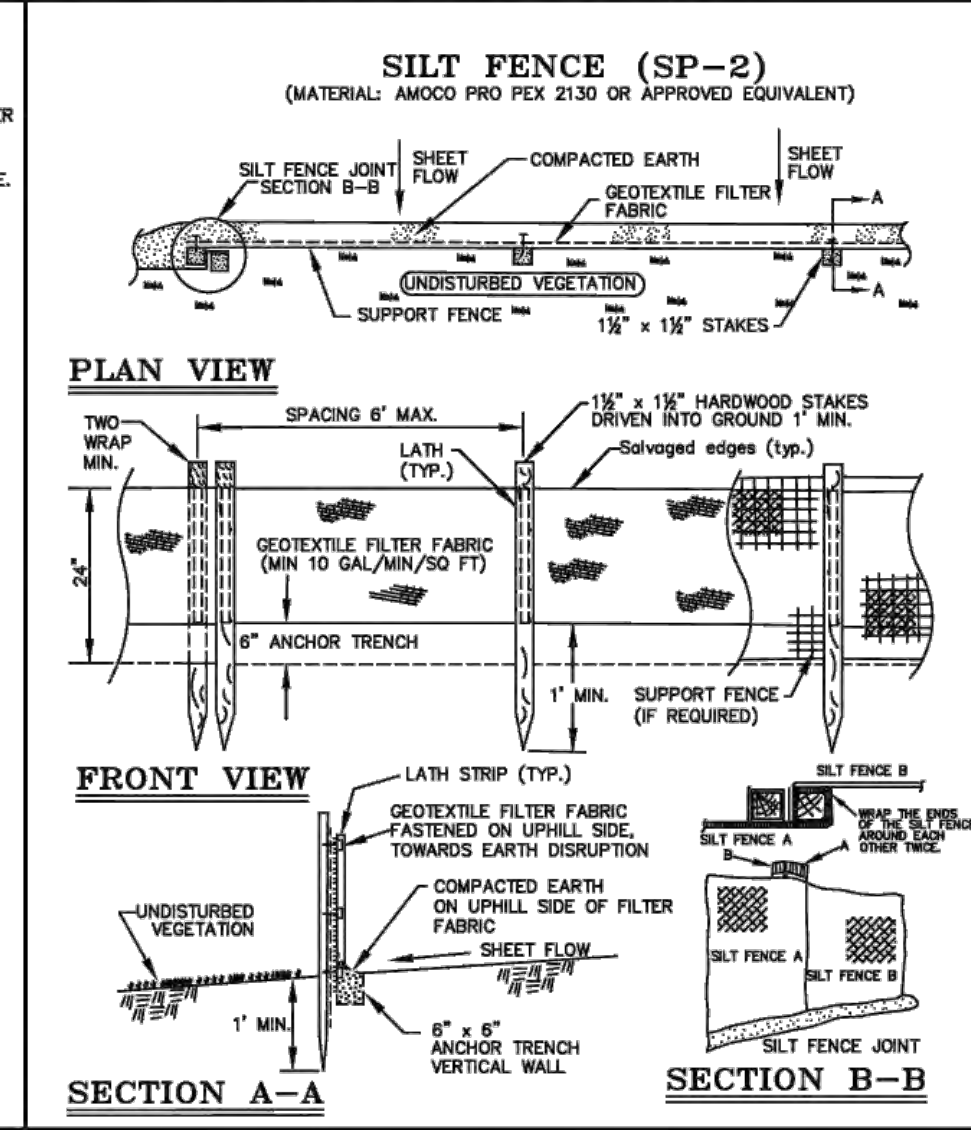
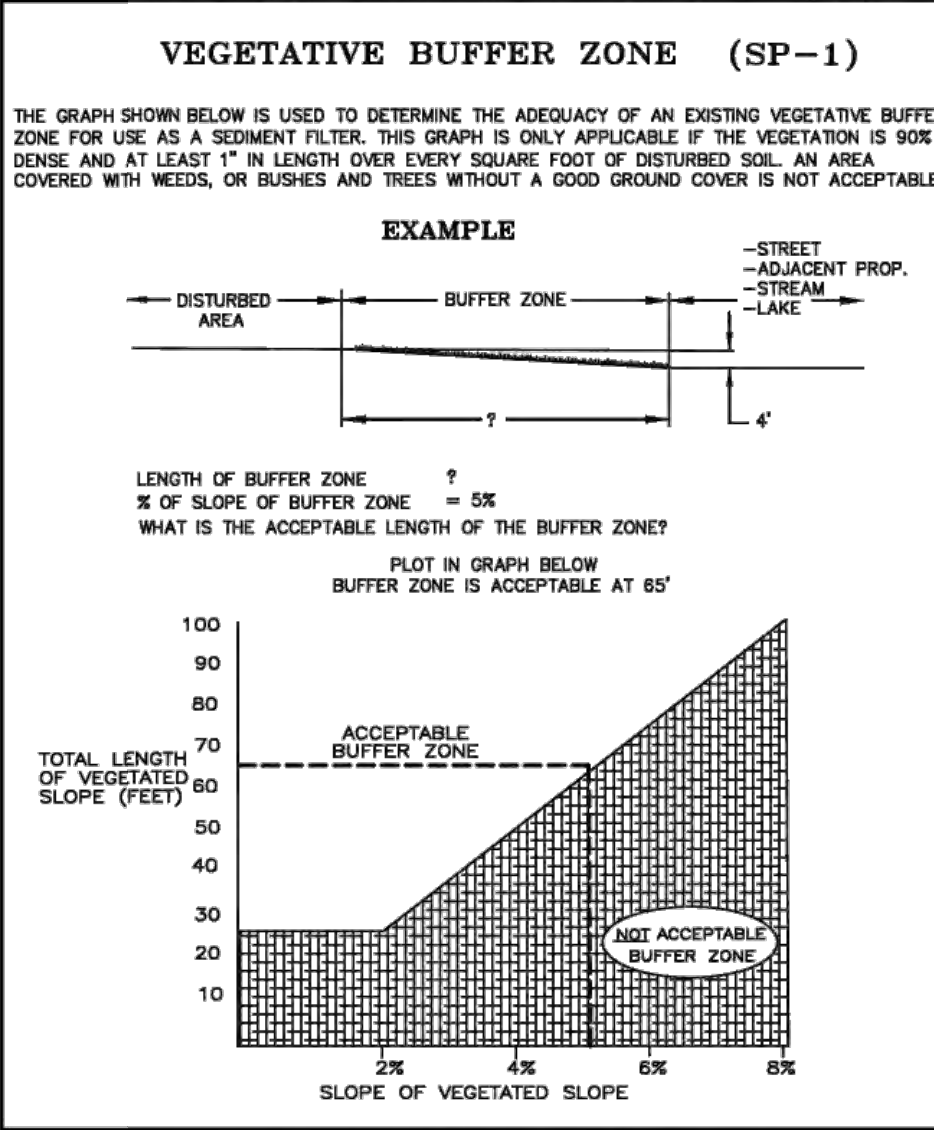
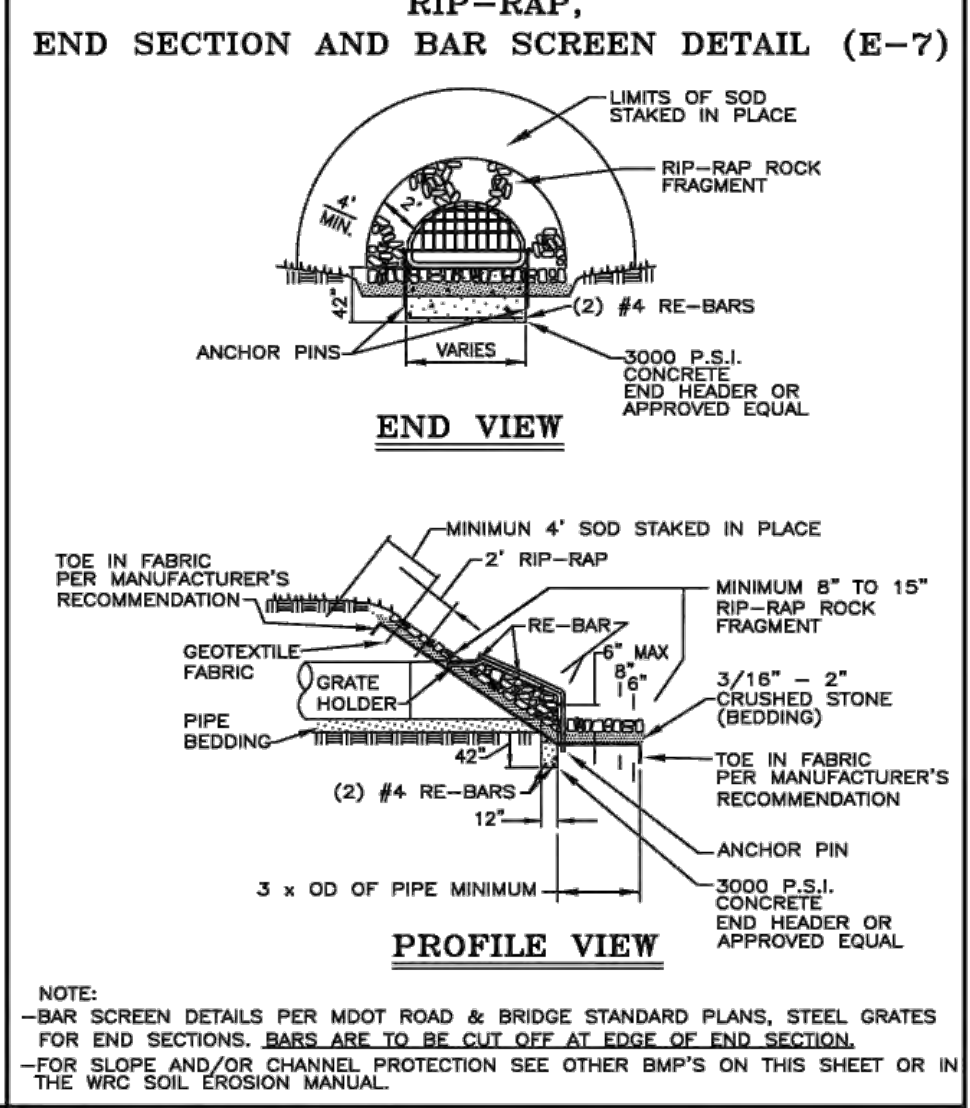
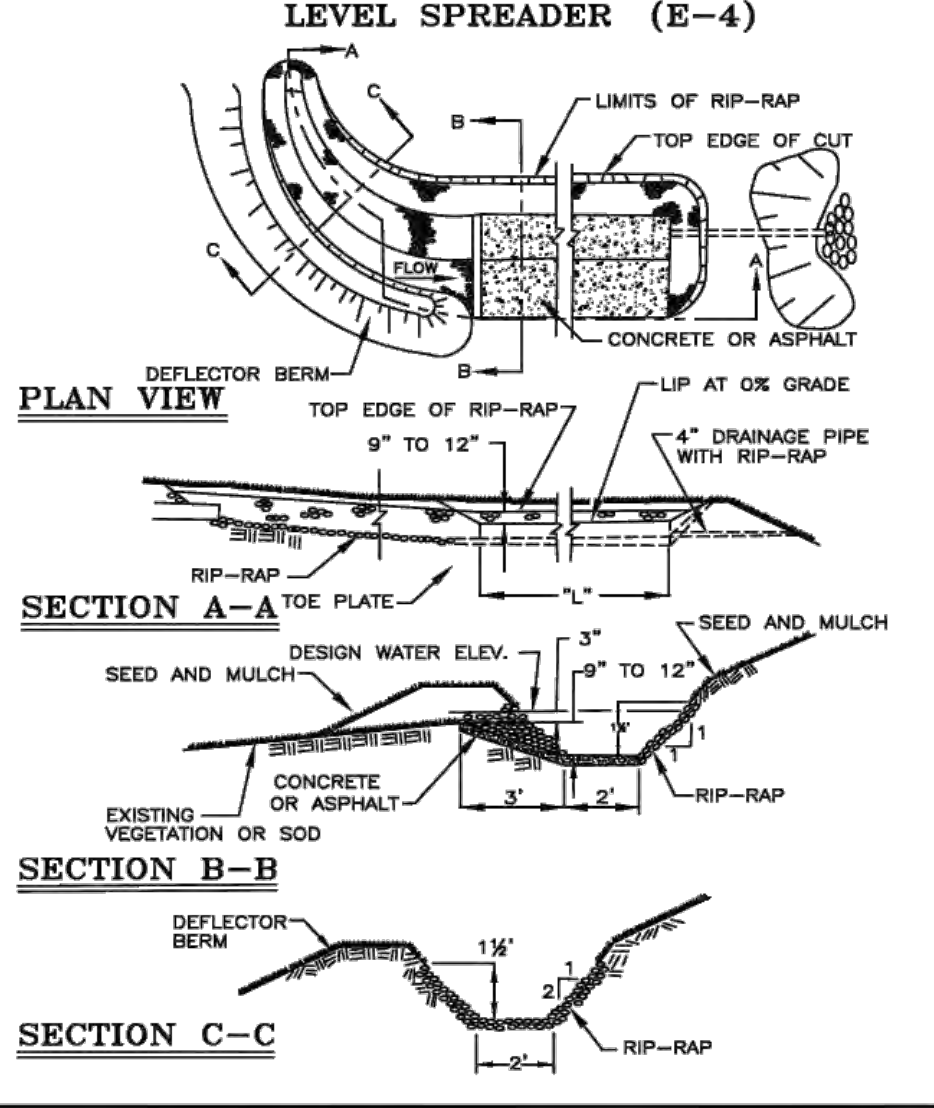
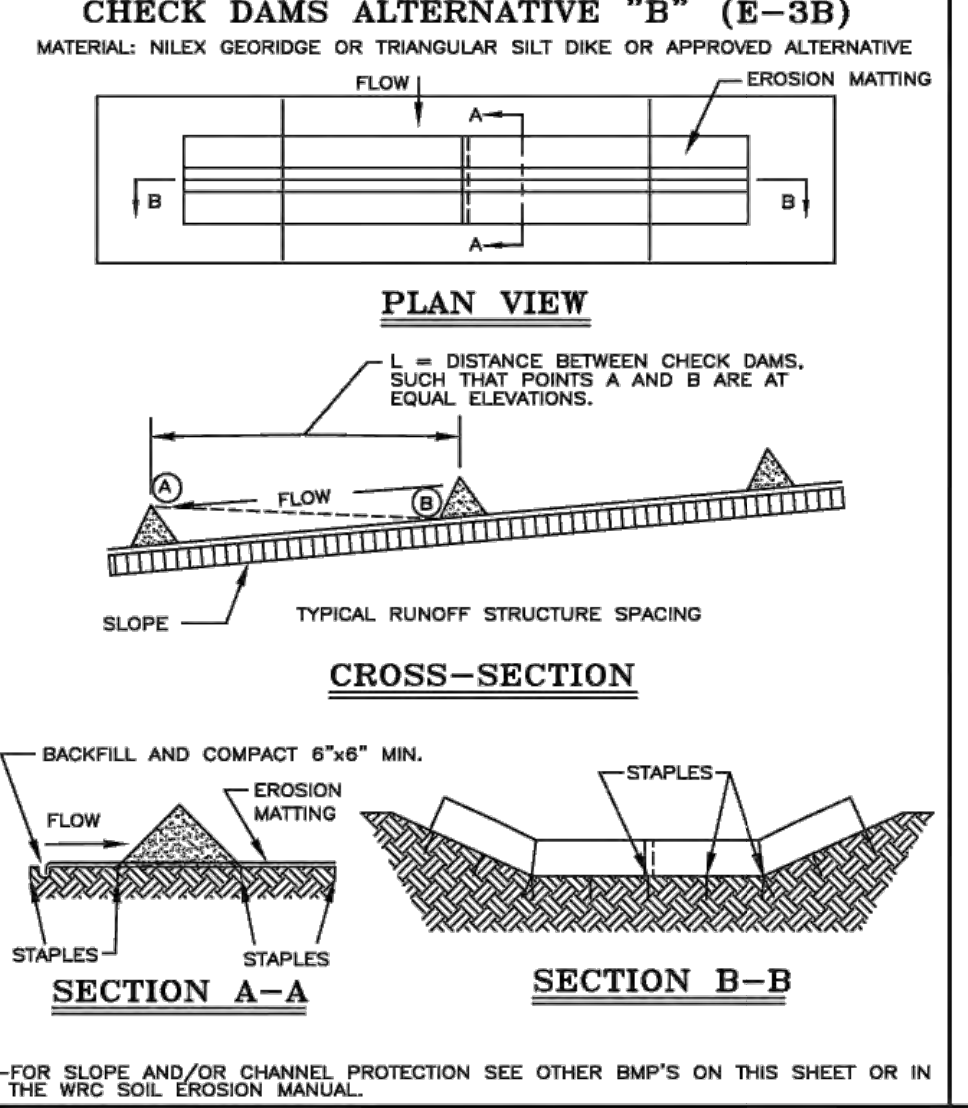
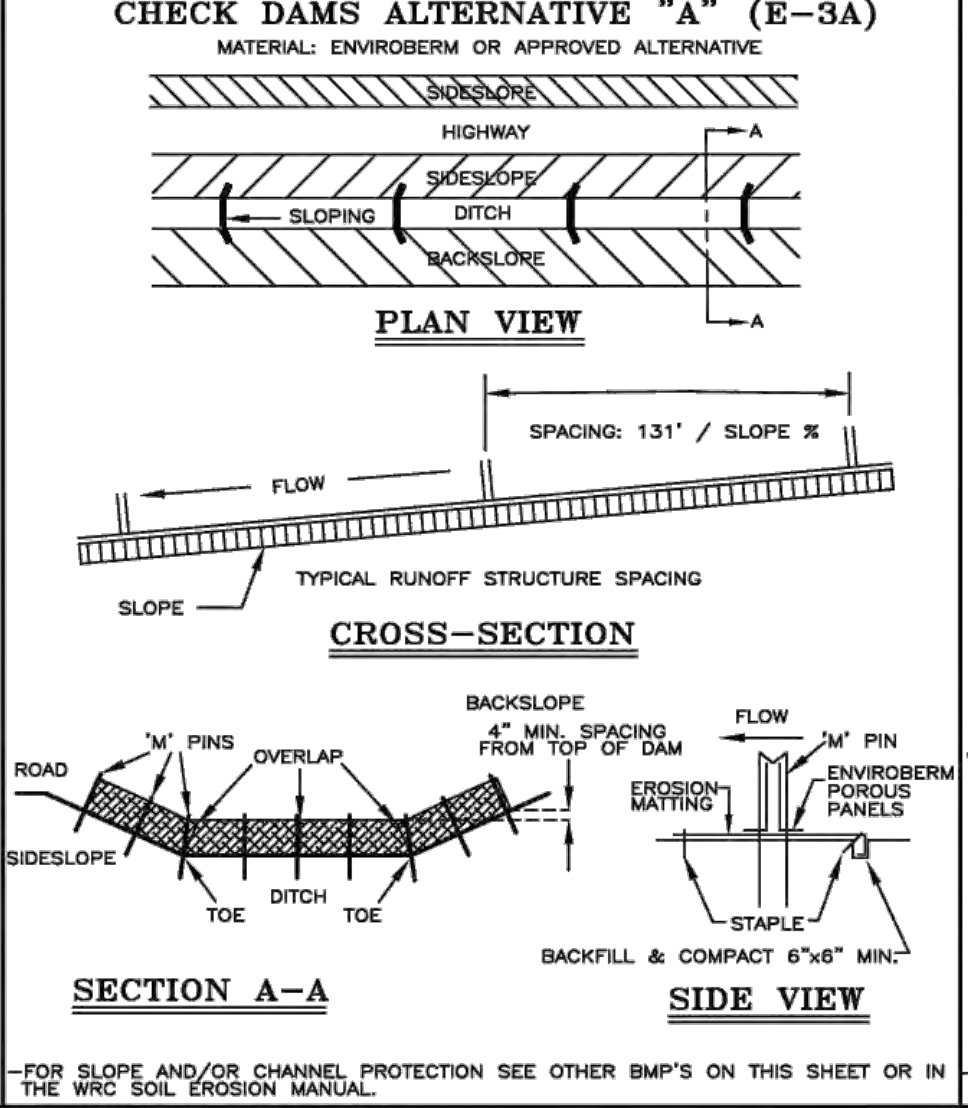
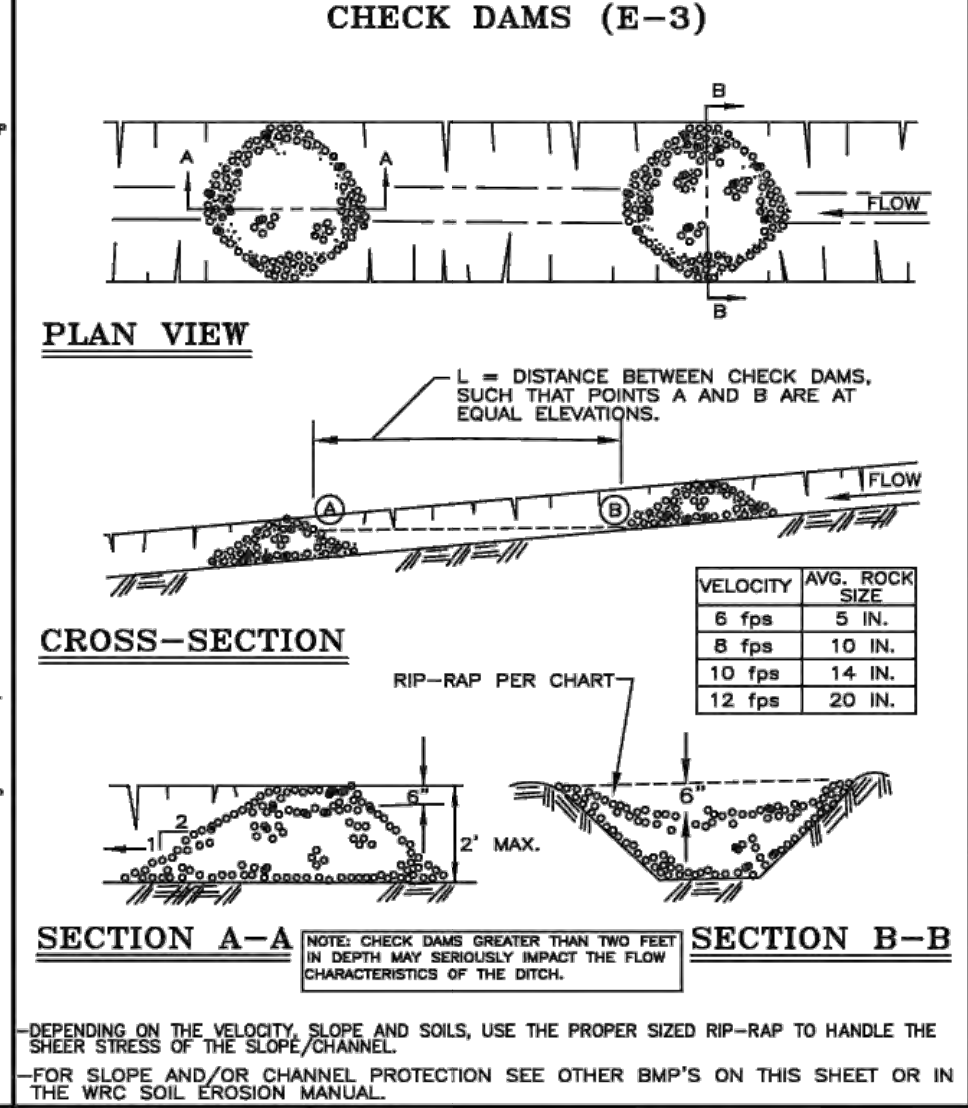
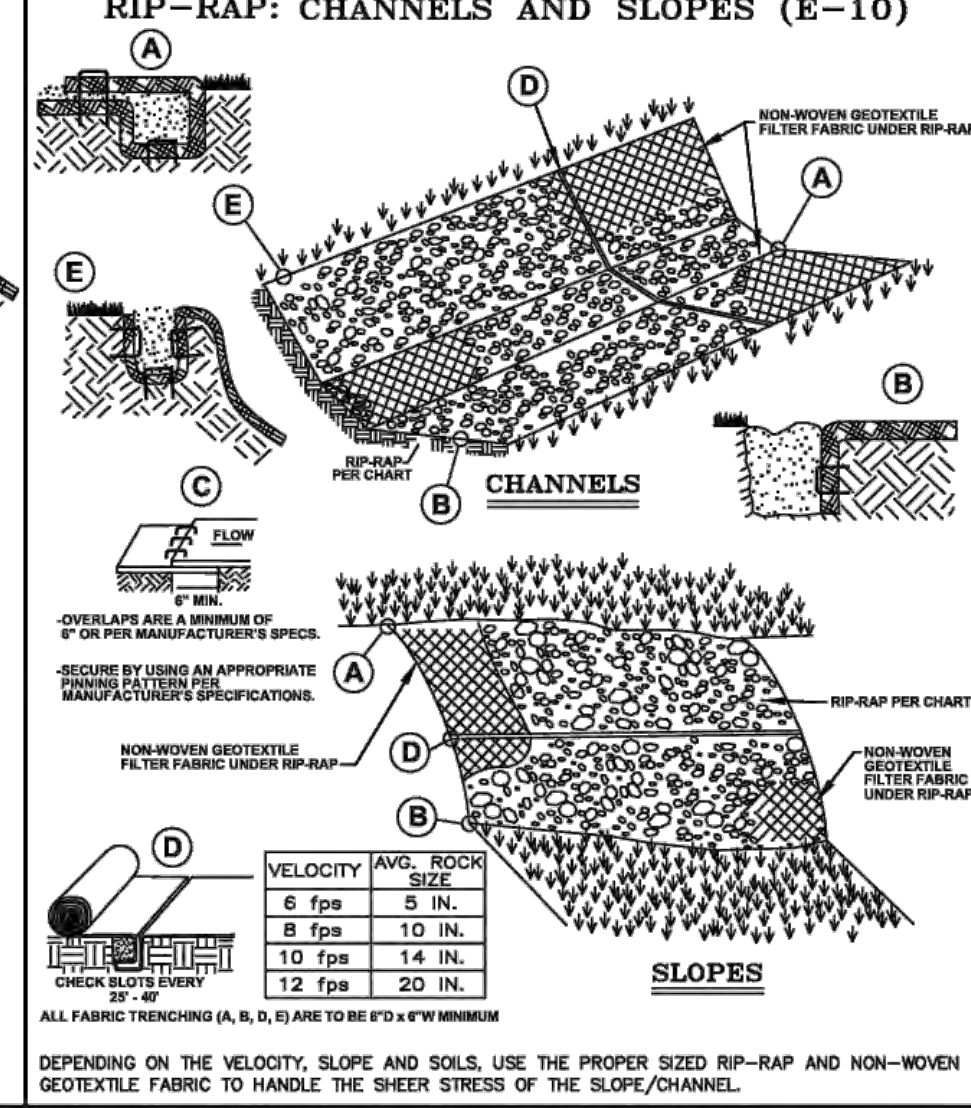
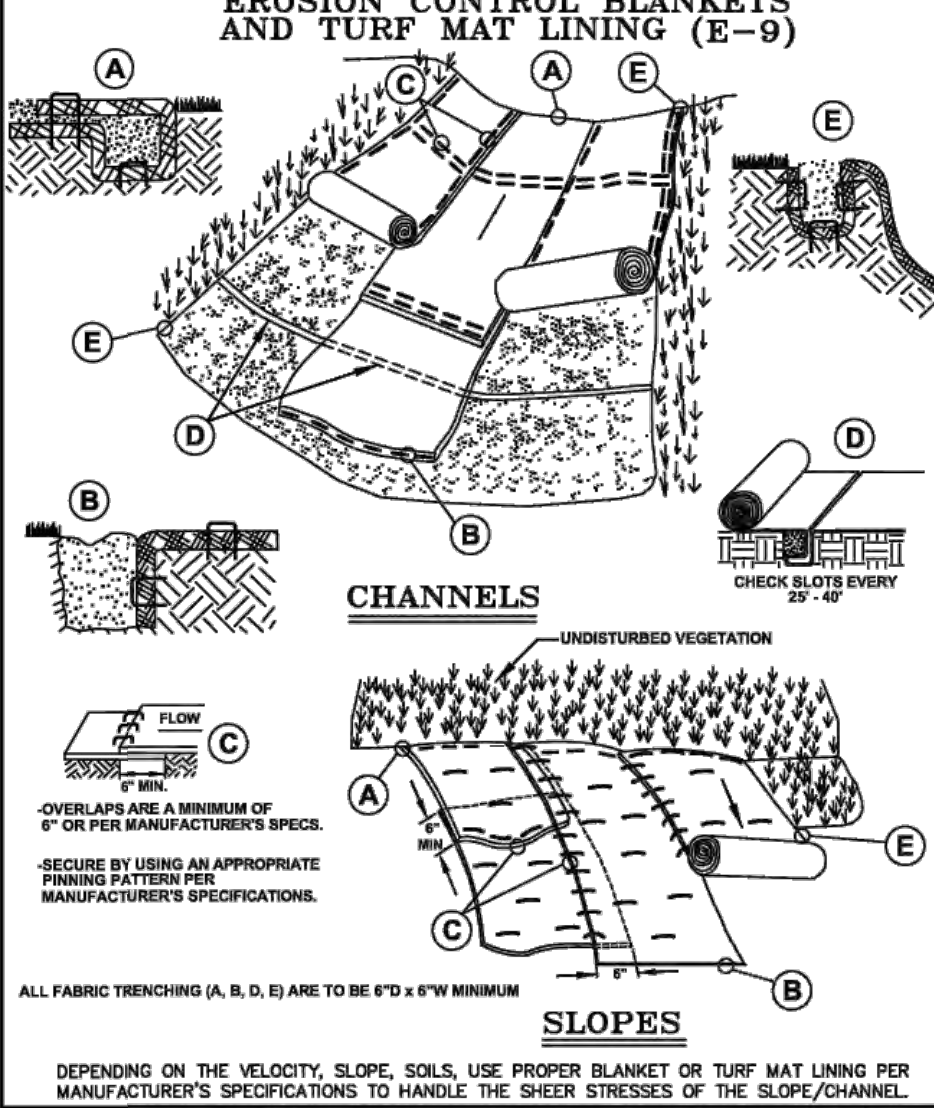


FIELD: REICHERT  
DRAWN BY: MN  
DESIGN BY: KM  
CHECK BY: AP

**C-8.3**

NOT FOR CONSTRUCTION





### SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

**NOTE:** WHILE PERFORMING WORK INVOLVING GROUNDS MAINTENANCE AND/OR THE CONSTRUCTION/MAINTENANCE OF ANY INFRASTRUCTURE, INCLUDING ROADS, WATER MAINS, SANITARY SEWERS, STORM DRAINS AND STORM WATER BEST MANAGEMENT PRACTICES (BMPs), CONTRACTORS SHALL MINIMIZE POLLUTION FROM STORM WATER RUNOFF THAT CAN AFFECT WATER QUALITY RELATED TO WORK ACTIVITIES. POLLUTANTS THAT COULD IMPAIR WATER QUALITY MAY INCLUDE FUEL, GREASE AND OIL, NUTRIENTS, BACTERIA AND PATHOGENS, LITTER AND DEBRIS, AND SOIL EROSION AND SEDIMENTATION. APPLICABLE BMPs SHALL BE IMPLEMENTED BY THE CONTRACTOR TO THE MAXIMUM EXTENT PRACTICABLE TO PROTECT WATER QUALITY AND WILDLIFE HABITAT.

**REVISION LOG**

Rev.	Date	Description
1	11/11/11	ISSUED FOR PERMIT
2	11/11/11	ISSUED FOR PERMIT
3	11/11/11	ISSUED FOR PERMIT
4	11/11/11	ISSUED FOR PERMIT

ORIG. DATE: 01/01/01

SCALE: NONE

DESIGNED BY: WRC

DRAWN BY: Mapping

ONE PUBLIC WORKS DRIVE, SUITE 900 WEST WATERSIDE, MICHIGAN 48308-1907

SHEET NO.: 1 of 1



WEIGHTED 'C' VALUE CALCULATIONS

COMPOUND RUNOFF COEFFICIENT FOR AREA 1 (TO IN-1)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	9757	0.22		
CONTRIBUTING	9757	0.22		
FLOWING OFF	0	0.00		
A X C				
BUILDING	2501	0.95	0.95	2375.95
PAVEMENT	0	0.95	0	0
LAWN	7256	0.20	0.20	1451.2
TOTALS	9757			3827.15

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{3827.15}{9757} = 0.39$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 2 (TO CB-2)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	6922	0.16		
CONTRIBUTING	6922	0.16		
FLOWING OFF	0	0.00		
A X C				
BUILDING	3668	0.95	0.95	3484.6
PAVEMENT	2240	0.95	0.95	2128
LAWN	1014	0.20	0.20	202.8
TOTALS	6922			5815.4

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{5815.4}{6922} = 0.84$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 3 (TO CB-3)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	5127	0.12		
CONTRIBUTING	5127	0.12		
FLOWING OFF	0	0.00		
A X C				
BUILDING	742	0.95	0.95	704.9
PAVEMENT	2479	0.95	0.95	2355.05
LAWN	1906	0.20	0.20	381.2
TOTALS	5127			3441.15

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{3441.15}{5127} = 0.67$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 4 (TO IN-14)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	2478	0.06		
CONTRIBUTING	2478	0.06		
FLOWING OFF	0	0.00		
A X C				
BUILDING	0	0.95	0	0
PAVEMENT	2003	0.95	0.95	1902.85
LAWN	475	0.20	0.20	95
TOTALS	2478			1997.85

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{1997.85}{2478} = 0.81$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 5 (TO IN-15)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	8410	0.19		
CONTRIBUTING	8410	0.19		
FLOWING OFF	0	0.00		
A X C				
BUILDING	1982	0.95	0.95	1882.9
PAVEMENT	0	0.95	0	0
LAWN	6428	0.20	0.20	1285.6
TOTALS	8410			3168.5

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{3168.5}{8410} = 0.38$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 6 (TO CB-16)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	6876	0.16		
CONTRIBUTING	6876	0.16		
FLOWING OFF	0	0.00		
A X C				
BUILDING	3975	0.95	0.95	3776.25
PAVEMENT	2271	0.95	0.95	2157.45
LAWN	630	0.20	0.20	126
TOTALS	6876			6059.7

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{6059.7}{6876} = 0.88$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 7 (TO CB-17)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	9812	0.23		
CONTRIBUTING	9812	0.23		
FLOWING OFF	0	0.00		
A X C				
BUILDING	1965	0.95	0.95	1866.75
PAVEMENT	0	0.95	0	0
LAWN	7847	0.20	0.20	1569.4
TOTALS	9812			3436.15

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{3436.15}{9812} = 0.35$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 8 (TO CB-18)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	8289	0.19		
CONTRIBUTING	8289	0.19		
FLOWING OFF	0	0.00		
A X C				
BUILDING	2970	0.95	0.95	2821.5
PAVEMENT	1781	0.95	0.95	1691.95
LAWN	3538	0.20	0.20	707.6
TOTALS	8289			5221.05

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{5221.05}{8289} = 0.63$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 9 (TO CB-19)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	15981	0.37		
CONTRIBUTING	15981	0.37		
FLOWING OFF	0	0.00		
A X C				
BUILDING	1688	0.95	0.95	1603.6
PAVEMENT	9549	0.95	0.95	9071.55
LAWN	4744	0.20	0.20	948.8
TOTALS	15981			11623.95

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{11623.95}{15981} = 0.73$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 10 (TO IN-20)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	23401	0.54		
CONTRIBUTING	23401	0.54		
FLOWING OFF	0	0.00		
A X C				
BUILDING	3440	0.95	0.95	3268
PAVEMENT	13324	0.95	0.95	12657.8
LAWN	6637	0.20	0.20	1327.4
TOTALS	23401			17253.2

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{17253.2}{23401} = 0.74$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 11 (TO IN-21)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	15653	0.36		
CONTRIBUTING	15653	0.36		
FLOWING OFF	0	0.00		
A X C				
BUILDING	2683	0.95	0.95	2548.85
PAVEMENT	712	0.95	0.95	676.4
LAWN	12258	0.20	0.20	2451.6
TOTALS	15653			5676.85

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{5676.85}{15653} = 0.36$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 12 (TO IN-25)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	9243	0.21		
CONTRIBUTING	9243	0.21		
FLOWING OFF	0	0.00		
A X C				
BUILDING	5146	0.95	0.95	4888.7
PAVEMENT	1380	0.95	0.95	1311
LAWN	2717	0.20	0.20	543.4
TOTALS	9243			6743.1

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{6743.1}{9243} = 0.73$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 13 (TO CB-26)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	2400	0.06		
CONTRIBUTING	2400	0.06		
FLOWING OFF	0	0.00		
A X C				
BUILDING	1518	0.95	0.95	1442.1
PAVEMENT	133	0.95	0.95	126.35
LAWN	749	0.20	0.20	149.8
TOTALS	2400			1718.25

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{1718.25}{2400} = 0.72$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 14 (TO CB-22)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	11704	0.27		
CONTRIBUTING	11704	0.27		
FLOWING OFF	0	0.00		
A X C				
BUILDING	1800	0.95	0.95	1710
PAVEMENT	5780	0.95	0.95	5491
LAWN	4124	0.20	0.20	824.8
TOTALS	11704			8025.8

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{8025.8}{11704} = 0.69$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 15 (TO IN-24)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	18410	0.42		
CONTRIBUTING	18410	0.42		
FLOWING OFF	0	0.00		
A X C				
BUILDING	1780	0.95	0.95	1691
PAVEMENT	7606	0.95	0.95	7225.7
LAWN	9024	0.20	0.20	1804.8
TOTALS	18410			10721.5

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{10721.5}{18410} = 0.58$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 16 (TO IN-27)

	AREA (SF)	AREA (AC)	C	A X C
OVERALL	7762	0.18		
CONTRIBUTING	7762	0.18		
FLOWING OFF	0	0.00		
A X C				
BUILDING	0	0.95	0	0
PAVEMENT	4990	0.95	0.95	4740.5
LAWN	2772	0.20	0.20	554.4
TOTALS	7762			5294.9

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{5294.9}{7762} = 0.68$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 17 (TO CB-29)

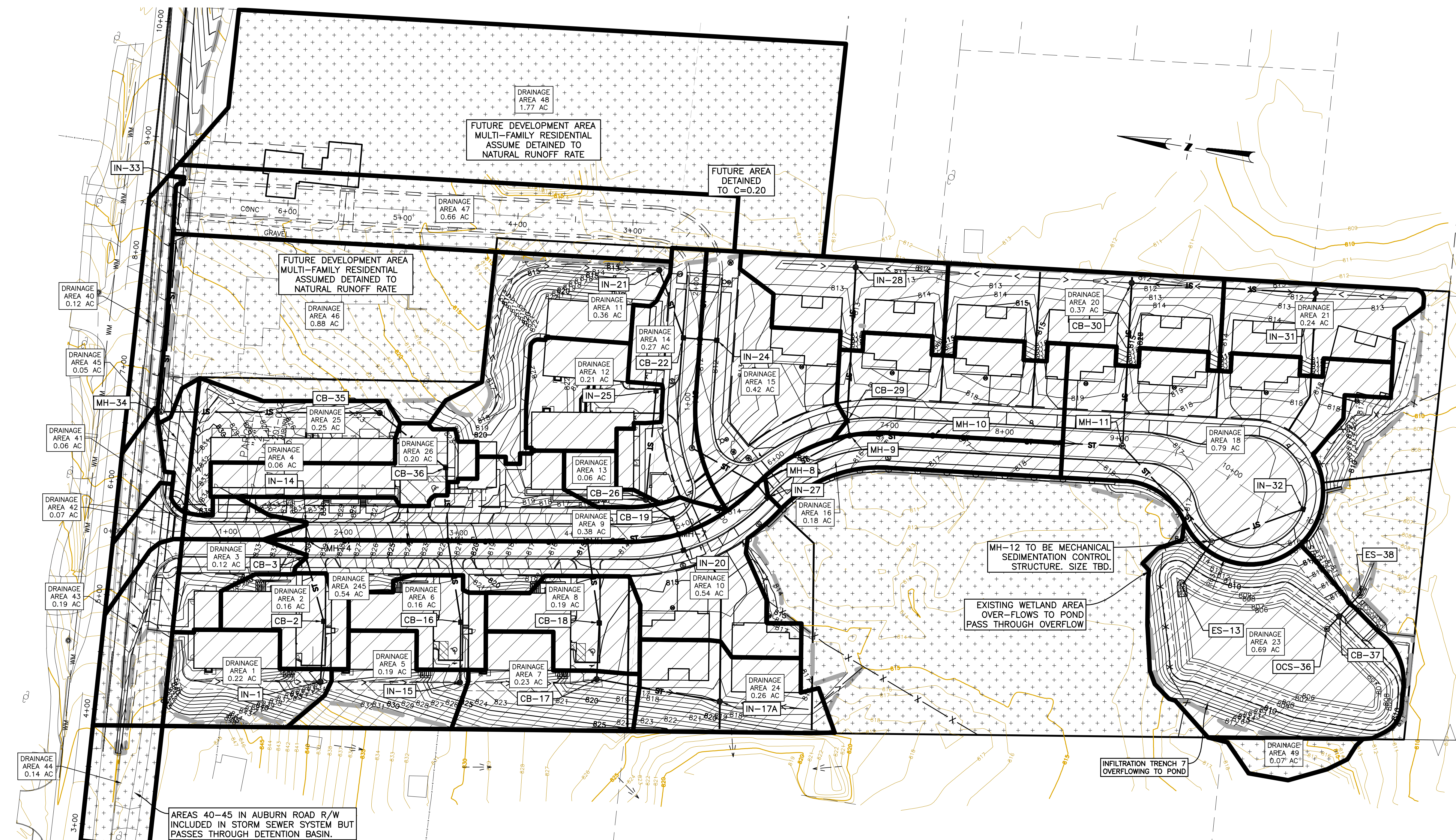
	AREA (SF)	AREA (AC)	C	A X C
OVERALL	15210	0.35		
CONTRIBUTING	15210	0.35		
FLOWING OFF	0	0.00		
A X C				
BUILDING	4096	0.95	0.95	3891.2
PAVEMENT	5197	0.95	0.95	4937.15
LAWN	5917	0.20	0.20	1183.4
TOTALS	15210			10011.75

$$\text{COMPOUND } C = \frac{\text{TOTAL } A \times C}{\text{CONTRIBUTING AREA}} = \frac{10011.75}{15210} = 0.66$$

HATCH LEGEND

- [Hatched Box] AREA TO DETENTION BASIN
- [Cross-hatched Box] OFF-SITE AREA (PASS THROUGH OR NOT TO BASIN)

DRAINAGE AREA MAP



AREAS 40-45 IN AUBURN ROAD R/W INCLUDED IN STORM SEWER SYSTEM BUT PASSES THROUGH DETENTION BASIN.

EXISTING WETLAND AREA OVER-FLOWS TO POND PASS THROUGH OVERFLOW

INFILTRATION TRENCH 7 OVERFLOWING TO POND

FUTURE AREA DETAINED TO C=0.20

FUTURE DEVELOPMENT AREA MULTI-FAMILY RESIDENTIAL ASSUME DETAINED TO NATURAL RUNOFF RATE

FUTURE DEVELOPMENT AREA MULTI-FAMILY RESIDENTIAL ASSUME DETAINED TO NATURAL RUNOFF RATE

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

**MEGA**

298 VETERANS DRIVE  
FOWLERVILLE, MICHIGAN 48836  
(OFFICE) 517-223-3512  
MONUMENTENGINEERING.COM

SERVICE DISABLED VETERAN OWNED  
SMALL BUSINESS (SDVOSB)

KEVIN C. McDEVITT  
ENGINEER  
NO. 6201043260

Call MISS DIG  
3 full working days before you dig.

Michigan's Utility Notification Organization  
1-800-482-7171  
www.missdig.org

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE RESPONSIBLY RESPONSIBLE FOR DETERMINING THE EXACT DEPTHS, LOCATIONS AND ELEVATIONS PRIOR TO THE START OF WORK.

CLIENT :

**AUBURN ANGARA OAKS, LLC**  
14496 N SHELDON RD  
SUITE 230  
PLYMOUTH, MI 48170  
BRUCE MICHAEL  
(248) 703-4653

**DRAINAGE AREA PLAN**  
AUBURN ANGARA OAKS  
PART OF SEC. 32, T3N, R11E  
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI

DATE	DESCRIPTION
09/13/2023	PLAN SUBMITTALS/REVISIONS
01/23/2024	REVISIT TO PLAN SUBMITTALS
03/17/2024	REVISED SITE PLAN PER CITY AND MDT
03/28/2024	REVISED SITE PLAN PER MDT
05/16/2024	PRELIMINARY SITE PLAN TO CITY
07/24/2024	REVISED SITE PLAN / WETLAND FLAGS
08/13/2024	REVISED SITE PLAN TO CITY
09/04/2024	REVISED PRELIMINARY SITE PLAN TO CITY

ORIGINAL ISSUE DATE: 05/19/2022



WEIGHTED 'C' VALUE CALCULATIONS (CONTINUED)

COMPOUND RUNOFF COEFFICIENT FOR AREA 18 (TO CB-32)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	34331	0.79	
CONTRIBUTING	34331	0.79	
FLOWING OFF	0	0.00	
A X C			
BUILDING	6583	0.95	6253.85
PAVEMENT	17328	0.95	16461.6
LAWN	10420	0.20	2084
TOTALS	34331		24799.45

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{24799.45}{34331} = 0.72$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 19 (TO IN-28)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	10836	0.25	
CONTRIBUTING	10836	0.25	
FLOWING OFF	0	0.00	
A X C			
BUILDING	3124	0.95	2967.8
PAVEMENT	0	0.95	0
LAWN	7712	0.20	1542.4
TOTALS	10836		4510.2

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{4510.2}{10836} = 0.42$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 20 (TO IN-30)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	16320	0.37	
CONTRIBUTING	16320	0.37	
FLOWING OFF	0	0.00	
A X C			
BUILDING	4686	0.95	4451.7
PAVEMENT	0	0.95	0
LAWN	11634	0.20	2326.8
TOTALS	16320		6778.5

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{6778.5}{16320} = 0.42$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 21 (TO IN-31)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	10667	0.24	
CONTRIBUTING	10667	0.24	
FLOWING OFF	0	0.00	
A X C			
BUILDING	3124	0.95	2967.8
PAVEMENT	0	0.95	0
LAWN	7543	0.20	1508.6
TOTALS	10667		4476.4

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{4476.4}{10667} = 0.42$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 23 (DETENTION POND AREA)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	30084	0.69	
CONTRIBUTING	30084	0.69	
FLOWING OFF	0	0.00	
A X C			
BUILDING	0	0.95	0
PAVEMENT	0	0.95	0
LAWN	11740	0.20	2348
WATER SURFACE	18344	1.00	18344
TOTALS	30084		20692

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{20692}{30084} = 0.69$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 24 (TO IN-17A)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	11144	0.26	
CONTRIBUTING	11144	0.26	
FLOWING OFF	0	0.00	
A X C			
BUILDING	3240	0.95	3078
PAVEMENT	0	0.95	0
LAWN	7904	0.20	1580.8
TOTALS	11144		4658.8

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{4658.8}{11144} = 0.42$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 25 (CB-35)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	10898	0.25	
CONTRIBUTING	10898	0.25	
FLOWING OFF	0	0.00	
A X C			
BUILDING	3472	0.95	3298.4
PAVEMENT	0	0.95	0
LAWN	7426	0.20	1485.2
TOTALS	10898		4783.6

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{4783.6}{10898} = 0.44$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 26 (CB-36)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	8693	0.20	
CONTRIBUTING	8693	0.20	
FLOWING OFF	0	0.00	
A X C			
BUILDING	5287	0.95	5022.65
PAVEMENT	3129	0.95	2972.55
LAWN	277	0.20	55.4
TOTALS	8693		8050.6

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{8050.6}{8693} = 0.93$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 40 (AUBURN ROW - INTO IN-33 - PASS THROUGH)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	5436	0.12	
CONTRIBUTING	5436	0.12	
FLOWING OFF	0	0.00	
A X C			
BUILDING	0	0.95	0
PAVEMENT	5436	0.95	5164.2
LAWN	0	0.20	0
TOTALS	5436		5164.2

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{5164.2}{5436} = 0.95$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 41 (AUBURN ROW - INTO CB-34 - PASS THROUGH)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	2706	0.06	
CONTRIBUTING	2706	0.06	
FLOWING OFF	0	0.00	
A X C			
BUILDING	0	0.95	0
PAVEMENT	2706	0.95	2570.7
LAWN	0	0.20	0
TOTALS	2706		2570.7

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{2570.7}{2706} = 0.95$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 42 (AUBURN ROW - INCLUDE IN IN-14 - PASS THROUGH)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	3014	0.07	
CONTRIBUTING	3014	0.07	
FLOWING OFF	0	0.00	
A X C			
BUILDING	0	0.95	0
PAVEMENT	3014	0.95	2863.3
LAWN	0	0.20	0
TOTALS	3014		2863.3

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{2863.3}{3014} = 0.95$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 43 (AUBURN ROW - INCLUDE IN CB-3 - PASS THROUGH)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	8439	0.19	
CONTRIBUTING	8439	0.19	
FLOWING OFF	0	0.00	
A X C			
BUILDING	0	0.95	0
PAVEMENT	5555	0.95	5277.25
LAWN < 4%	2884	0.20	576.8
TOTALS	8439		5854.05

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{5854.05}{8439} = 0.69$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 44 (AUBURN ROW - INCLUDE IN CB-3 - PASS THROUGH)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	6194	0.14	
CONTRIBUTING	6194	0.14	
FLOWING OFF	0	0.00	
A X C			
BUILDING	0	0.95	0
PAVEMENT	3872	0.95	3678.4
LAWN	2322	0.20	464.4
TOTALS	6194		4142.8

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{4142.8}{6194} = 0.67$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 45 (AUBURN ROW - INCLUDE IN CB-35 - PASS THROUGH)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	2187	0.05	
CONTRIBUTING	2187	0.05	
FLOWING OFF	0	0.00	
A X C			
BUILDING	0	0.95	0
PAVEMENT	488	0.95	463.6
LAWN	1699	0.20	339.8
TOTALS	2187		803.4

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{803.4}{2187} = 0.37$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 49 (OFFSITE AREA - DIRECTLY TO POND - PASS THROUGH)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	2079	0.05	
CONTRIBUTING	2079	0.05	
FLOWING OFF	0	0.00	
A X C			
BUILDING	0	0.95	0
PAVEMENT	0	0.95	0
LAWN	0	0.20	0
NATURAL AREAS	2079	0.20	415.8
TOTALS	2079		415.8

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{415.8}{2079} = 0.20$$

RUNOFF FOR AREA 46 (FUTURE MULTIFAMILY - INCLUDE IN MH-23) (INCLUDE AS DETAINED FLOW TO NATURAL RUNOFF RATE IN SEWER CALCS - PASS THROUGH POND)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	38327	0.88	
CONTRIBUTING	38327	0.88	
FLOWING OFF	0	0.00	
A X C			
Detained - Offsite	38327	0.20	7665.4
TOTALS	38327		7665.4

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{7665.4}{38327} = 0.20$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 47 (FUTURE PRIVATE ROAD R/W - INCLUDE IN MH-23) (INCLUDE AS DETAINED FLOW TO NATURAL RUNOFF RATE IN SEWER CALCS - PASS THROUGH POND)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	28594	0.66	
CONTRIBUTING	28594	0.66	
FLOWING OFF	0	0.00	
A X C			
Detained - Offsite	28594	0.20	5718.8
TOTALS	28594		5718.8

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{5718.8}{28594} = 0.20$$

COMPOUND RUNOFF COEFFICIENT FOR AREA 48 (FUTURE MULTIFAMILY - INCLUDE IN MH-23) (INCLUDE AS DETAINED FLOW TO NATURAL RUNOFF RATE IN SEWER CALCS - PASS THROUGH POND)

CONTRIBUTING FLOWING OFF	AREA (SF)	AREA (AC)	C
OVERALL	77174	1.77	
CONTRIBUTING	77174	1.77	
FLOWING OFF	0	0.00	
A X C			
Detained - Offsite	77174	0.20	15434.8
TOTALS	77174		15434.8

$$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA} = \frac{15434.8}{77174} = 0.20$$

NOTE: AREAS 46, 47 AND 48 ARE FUTURE DEVELOPMENTAL AREAS. AREA TO BE DETAINED ON THOSE SITES TO A NATURAL RUNOFF COEFFICIENT (0.20). AREA INCLUDED IN STORM SEWER BUT CONSIDERED PASS THROUGH FOR ANGARA OAKS DETENTION SYSTEM.

STORM SEWER CALCULATIONS

STORM SEWER DESIGN										MONUMENT ENGINEERING GROUP ASSOCIATES, LLC 298 VETERANS DRIVE FOWLERVILLE, MI 48836 517-223-3512														
Q = C I A Q = A x 1.486/n x R <sup>2/3</sup> x S <sup>1/2</sup> I = 175/(L+25)										t = 20 n1 = 0.013 HDPE & PVC (Oakland County) n2 = 0.013 CONC.														
FROM STR TO STR	AREA A	COEFF. C	A x C	AREA TOTAL At	TOTAL C x A	TIME t	INT. I	FLOW Q	PIPE CAP.	PIPE AREA	PIPE LENGTH	PIPE DIA.	PIPE SLOPE	MIN PIPE SLOPE	H.G. ELEV. UP STREAM	H.G. ELEV. DOWN STREAM	INVERT ELEV. UP STREAM	INVERT ELEV. DOWN STREAM	RIM ELEV. UP STREAM	RIM ELEV. DOWN STREAM				
ac	ac			ac	cfs	min	in/hr	cfs	cfs	sq ft	ft	in	%	%	ft/sec	min								
<b>MAIN RUN</b>	IN-1 TO CB-2	0.22	0.39	0.087	0.224	0.087	20.00	3.89	0.34	2.01	0.79	51	12	0.32	0.30	0.32	2.56	0.33	825.97	825.80	825.17	825.00	829.65	829.23
	CB-2 TO CB-3	0.16	0.84	0.134	0.383	0.221	20.00	3.33	0.85	2.01	0.79	60	12	0.32	0.30	0.32	2.56	0.39	825.80	825.61	825.00	824.81	829.23	829.61
	CB-3 TO MH-4	0.45	0.68	0.308	0.837	0.529	20.73	3.86	2.02	3.18	0.79	13	12	0.80	0.30	0.80	4.06	0.05	823.69	823.59	822.89	822.89	829.61	829.86
	MH-4 TO MH-5			0.000	0.963	0.641	20.78	3.82	2.45	7.80	0.79	123	12	4.80	0.30	4.80	9.93	0.21	823.59	817.68	822.79	816.88	829.86	821.55
	MH-5 TO MH-6			0.000	2.001	1.345	23.14	3.64	4.89	7.80	0.79	121	12	4.80	0.30	4.80	9.93	0.20	815.69	809.87	814.89	809.07	821.55	814.90
	MH-6 TO MH-7			0.000	2.672	1.651	23.35	3.62	5.98	6.55	1													