

Fire

Natural

Resources

Planning

Traffic

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



epartment	Reviewer	Approved
Assessing	Assessing	Yes
Building	Jason Rhoades 248-841-2435 RhoadesJa@RochesterHills.org	Yes with conditions
ngineering - Utilities	Jason Boughton 248-841-2490 BoughtonJ@RochesterHills.org	Yes
ingineering	Seth Bucholz 248-841-2491	YES

Capt. Ann Echols 248-841-2701

EcholsA@RochesterHills.org

Chris McLeod 248-841-2572

mcleodc@RochesterHills.org

Keith Depp 248-841-2503

DeppK@RochesterHills.org

Matt Einheuser 248-841-2551









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

PRELIMINARY SITE PLAN DRAWING FOR

AUBURN ANGARA OAKS



SITE PERMIT APPROVAL INDEX									
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	ROCHSTER 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.

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SITE PLAN

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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 MDC	REVISED SITE PLAN PER MDOT	PRELIMINARY SITE PLAN TO CITY	REVISED SITE PLAN / WETLAND FLAG	REVISED SITE PLAN / WETLAND FLAG	REV PRELIMINARY SITE PLAN TO CITY			
05/23/2022	11/11/2022	04/28/2023	08/23/2023	9/13/2023	1/22/2024	3/14/2024	3/28/2024	5/17/2024	7/24/2024	8/13/2024	9/4/2024			
							NCL	JDED	SH	EETS				

ullet

CITY OF ROCHESTER HILLS, OAKLAND COUNTY STANDARD DETAILS

PLAN SUBMITTALS

KEVIN C.

** O MCDEVITT

** O ENGINEER

NO.
6201043260

INNOVATIVE GEOSPATIAL

& ENGINEERING SOLUTIONS

298 VETERANS DRIVE

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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 C O N S T R U C T I O N.

CLIENT :

AUBURN ANGARA OAKS, LLC

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

> ANGARA OAKS EC. 32, T3N, R11E HILLS, OAKLAND COUNTY, M

COVER AUBURN ANGARA PART OF SEC. 32. T3

09/13/2023 01/22/2024 MDOT 03/14/2024 03/28/2024 05/16/2024 AGS 07/24/2024 AGS 08/13/2024

PLAN SUBMITTALS/REVISIONS
AIT TO MDOT

SITE PLAN SUBMITTAL

SITE PLAN PER CITY AND MDOT

SITE PLAN PER MDOT

NARY SITE PLAN TO CITY

NARY SITE PLAN / WETLAND FLAGS

ORIGINAL ISSUE DATE:

05/19/2022 PROJECT NO: 22-051

SCALE: N/A

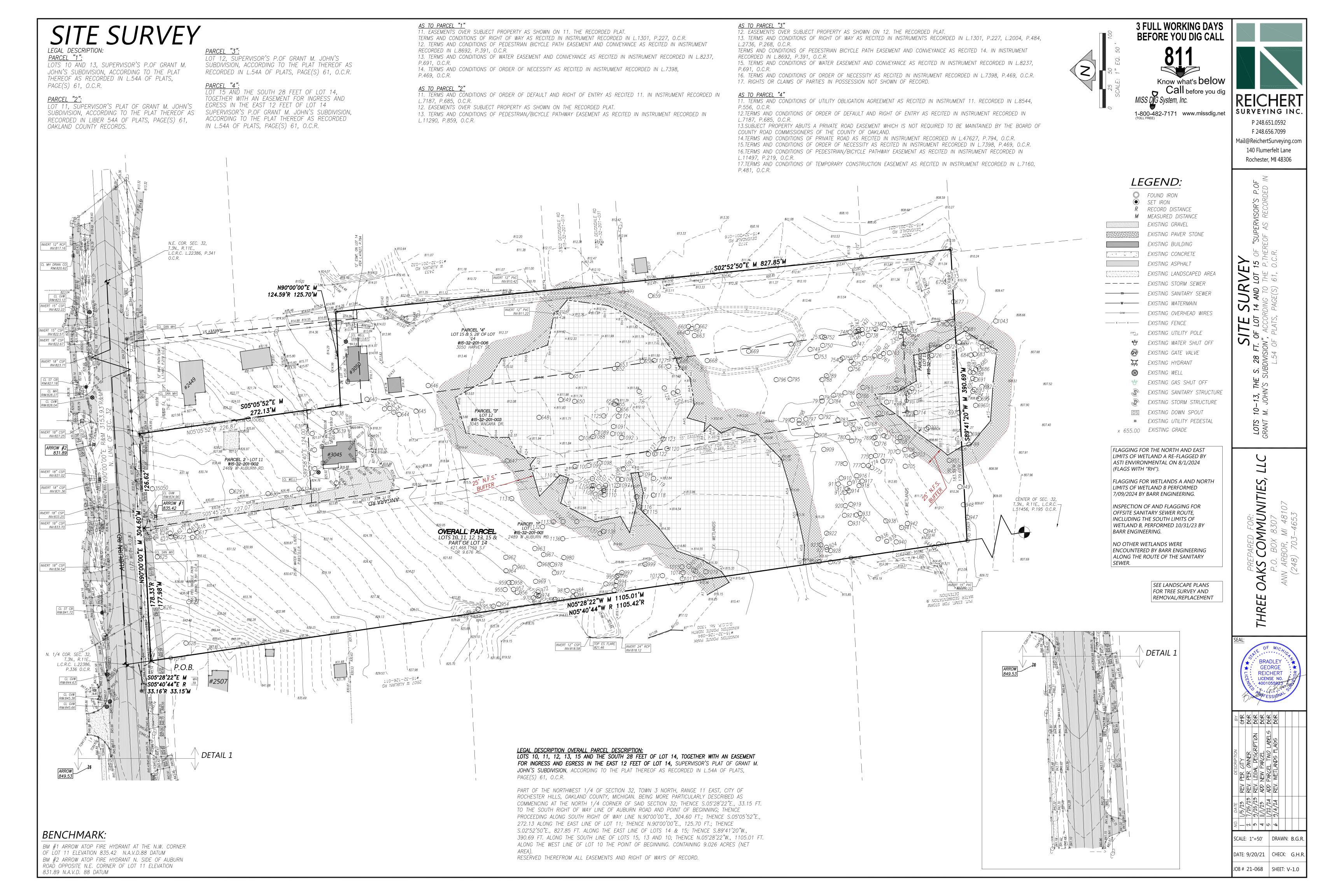
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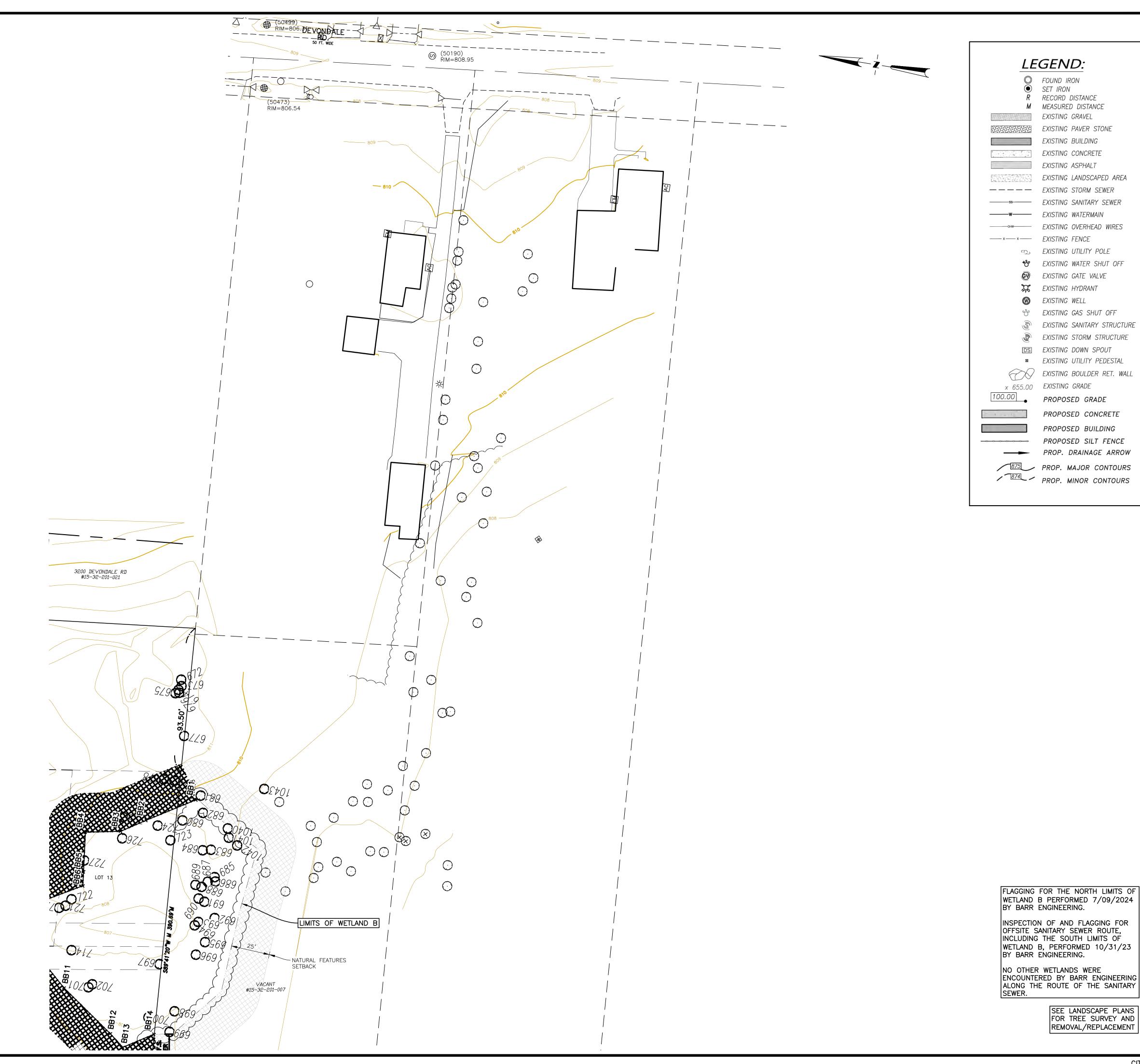
FIELD: REICHERT

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

G-1.0

FILE:P:\Projects\2022\22-051 Auburn Angara Sub\Dwg\Engineering\22-051_G-1.0_Cover.dwg PLOT DATE:9/4/2024 10:01 AM





LEGEND:

O 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

———w—— EXISTING WATERMAIN ----×---- EXISTING FENCE

> D EXISTING UTILITY POLE * EXISTING WATER SHUT OFF

EXISTING GATE VALVE EXISTING HYDRANT EXISTING WELL

👸 EXISTING GAS SHUT OFF © EXISTING SANITARY STRUCTURE © EXISTING STORM STRUCTURE

DS 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

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

KEVIN C. MCDEVITT ENGINEER NO. 6201043260

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THE LOCATIONS AND ELEVATIONS O
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DETERMINING THE EXACT UTILITY LOCATION
AND ELEVATIONS PRIOR TO THE START (
C O N S T R U C T I O N

CLIENT :

AUBURN ANGARA OAKS, LLC

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

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051 SCALE: 1" = 30'

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

SEE LANDSCAPE PLANS FOR TREE SURVEY AND REMOVAL/REPLACEMENT

McDOWELL & ASSOCIATES Geotechnical, Environmental, & Hydrogeologic Services 21355 Hatcher Avenue • Ferndale, MI 48220

BORING NO. ____ PROJECT _ Soils Investigation Phone: (248) 399-2066 • Fax: (248) 399-2157 LOCATION 2489 West Auburn Road JOB NO. 22-146 **DATE** 7-11-22 Rochester Hills, Michigan SURFACE ELEV._ Penetration Moisture Natural Dry Den Unc. Comp. S Blows for 6" Wt. P.C.F. Wt. P.C.F. Strength PSF. of SOIL DESCRIPTION Moist dark brown sandy TOPSOIL with vegetation and gravel, fill Compact moist brown SAND with trace of silt and Very compact moist brown SAND with traces of silt and gravel 3 19.2 117 Compact wet brown fine SAND with trace of silt and occasional trace of gravel Very compact wet brown SAND with traces of silt and Extremely compact wet brown gravelly SAND with trace of silt and occasional wet silt seams

Extremely compact wet grey silty gravelly SAND

1) Used automatic hammer

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

TYPE OF SAMPLE

- DISTURBED

L. - UNDIST. LINER

T. - SHELBY TUBE

S. - SPLIT SPOON

C. - ROCK CORE

) - PENETROMETER

LOG OF SOIL 1

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT G.W. ENCOUNTERED AT G.W. AFTER COMPLETION G.W. AFTER HRS. G.W. VOLUMES Me

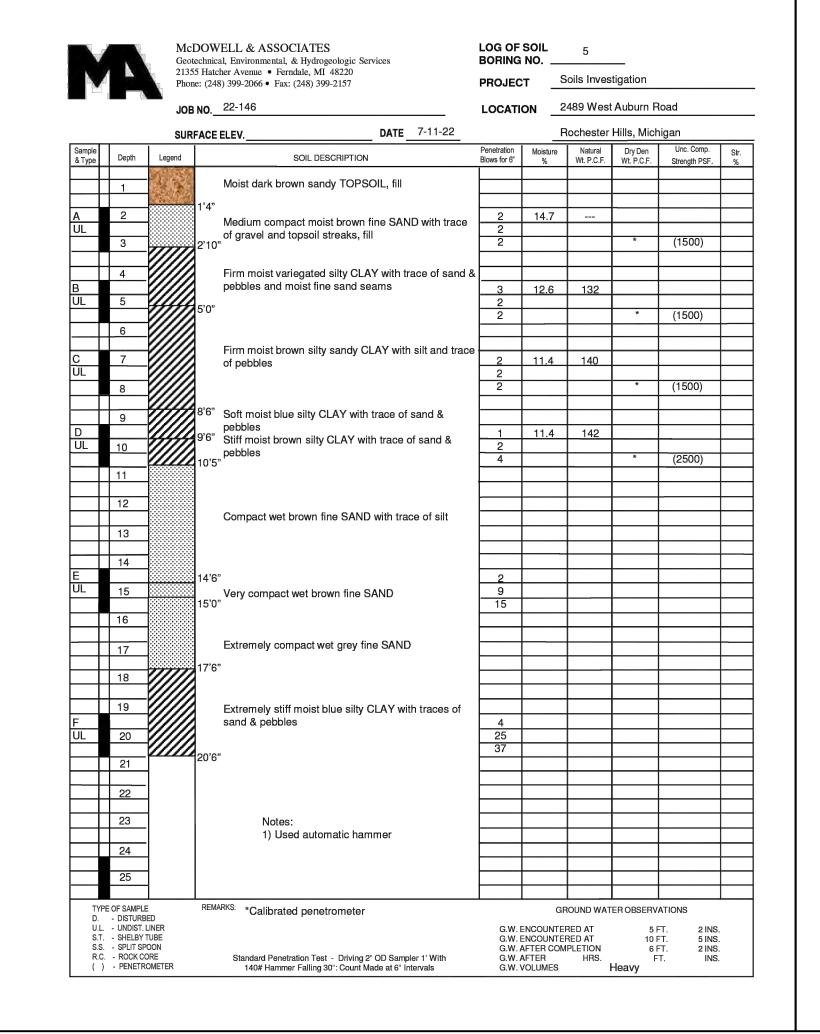
		Phor	ie: (248) 39	Avenue • Ferndale, MI 48220 9-2066 • Fax: (248) 399-2157	PROJEC	т _	Soils Inves	tigation		_
	1000	JOB	NO. 22	-146	LOCATION	ON _	2489 West	Auburn R	load	
		SUR	FACE ELE	V DATE			Rochester	Hills, Mich		
Sample & Type	Depth	Legend		SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	I
	I	800000000000000000000000000000000000000	0'5" Mo	st dark brown sandy TOPSOIL						1
-+	1		4,5 Moi	st brown fine SAND with trace of silt						ł
Α	2		1		4	12.0		-		t
UL			2'6" Stif	f moist brown silty sandy CLAY with pebbles	2					1
	3				4					4
\vdash	4		Me	dium compact moist brown fine SAND with traces						+
В	4		1 1	ravel and silt	2	5.9				†
ÜL	5		4'6"		2	0.0				1
					2					1
	6		Cor	mpact moist light brown fine SAND with trace of silt	.		-			+
С	7			•	1	3.2				+
ÜL			7'0"		2	0.2				1
	8				2					Ţ
\vdash	+				<u> </u>		-			4
D	9				3	16.5	124			$\frac{1}{1}$
ÜL	10				3	10.5	124			t
			Ext	remely compact moist to wet brown silty SAND n layers of silt and sand	7					1
\vdash	11		VVIII	riayers of silt and sand						4
\vdash	12									+
\vdash	12									t
	13		13'0"							†
										1
E	14									4
UL	15		Ver	y compact wet brown silty fine SAND	<u>6</u> 8		-			†
	10		4 5 '0"		10					1
	16		15'6"							1
	 						-			4
$\vdash \vdash \vdash$	17				\vdash		+			+
	18									f
				Notes:						1
	19			1) Used automatic hammer			-			4
F UL	20						-			+
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	21									1
$\vdash \rightarrow$							1			+
$\vdash \vdash \vdash$	22						1			+
	23									t
]
G	24						-			4
UL	25						+			+
										f
	E OF SAMPLE		REMARKS:			G	ROUND WAT	ER OBSERV	ATIONS	
	- DISTURBE				GW F	ENCOUNTE	RED AT	9 F	-T. 2 INS	

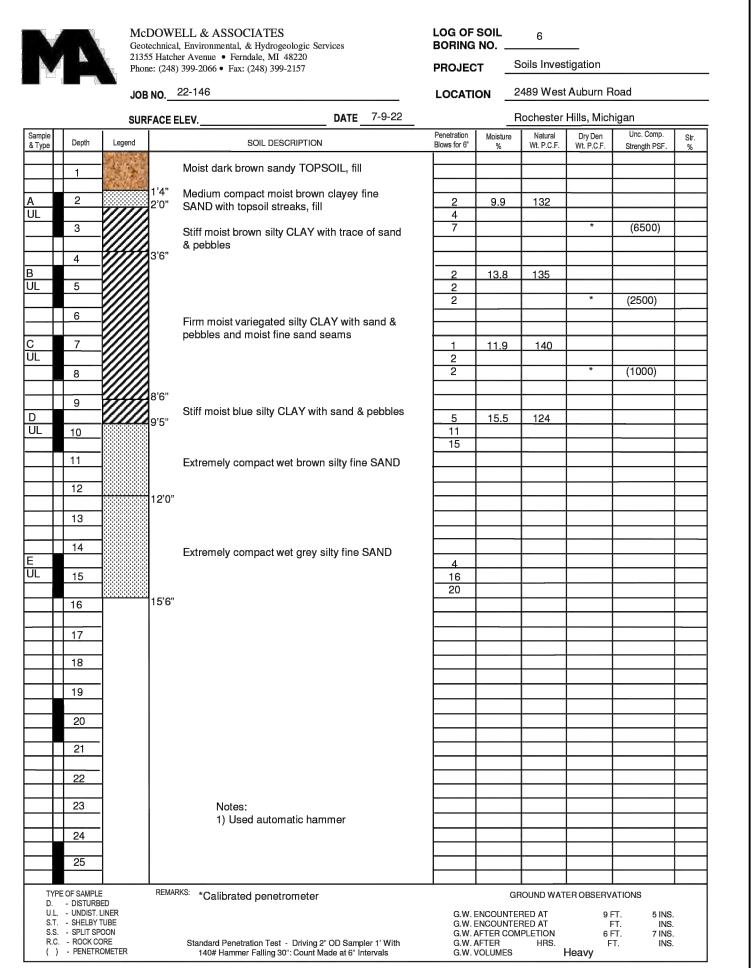
	JOB	NO. 22-146		LOCAT	ION _	2489 Wes	t Auburn R	load
		ACE ELEV	DATE 7-11-22			Rochester	Hills, Mich	nigan
Sample & Type Depth			SOIL DESCRIPTION	Penetration Blows for 6"	Moisture	Natural Wt. P.C.F.	Dry Den	Unc. Comp.
& Type	25goria	Moist dark	brown sandy TOPSOIL, fill	blows for 6	%	Wt. P.C.F.	Wt. P.C.F.	Strength PSF.
1								
A 2	1	l'4" Compact n	noist brown silty fine SAND with trace of		10.7		-	
A 2 UL		gravel and	occasional stones, fill	<u>6</u> 4	13.7	+		
3	/////	2'6"		3				
	_/////	Stiff moist	brown silty sandy CLAY with trace of					
<u>4</u>	- <i>\\\\\\</i>	pebbles	, ,			1	-	
B UL 5	- ////// /	1'6"		<u>6</u> 9	14.8	132		
<u> </u>	<i>-{/////</i> }	Extremely	stiff moist variegated silty CLAY with trace			1	*	(9000+)
6	_(////	of sand & p				1		
	- <i>\\\\\</i>			-	4.5.5	1		
C 7 UL		7'0" Eutramalu	stiff maint blue pills, OLAV with trees	<u>8</u> 10	12.9	140		
8	<i>-(////</i>)	sand 9 pal	stiff moist blue silty CLAY with trace of obles	17	 		*	(9000+)
		7'10" Sand & per						
9	_				<u> </u>	1		
D UL 10	—			8 10	10.4	137	-	
<u> 10</u>	—[:::::::::::]	Extremely	compact wet grey silty gravelly SAND with	13	1	+		
11		moist blue	silty clay seams					
								_
12	_			-				
13		13'0"		-	<u> </u>			
		13.0						
14	1100	Extremely	compact wet grey SAND & GRAVEL					
E UL ₁₅	A 100 Sept	•		3				
UL 15	111111	15'0" Extremely	stiff moist blue silty CLAY with sand &	12 18	 	+		
16	1	5'6" pebbles						
17	- I			<u> </u>	-	+		
18	\dashv \vdash			 	 	+		
	_	Me+-						
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	_							
22	⊣ ∣			-		+		
23	⊣					1		
	_							
24	⊣ ∣							
25	⊣ ∣			-		+		
20						1		
TYPE OF SAM		REMARKS: *Calibr	ated penetrometer		C	ROUND WAT	TER OBSERV	ATIONS
D DISTI U.L UNDI			·	G W	ENCOUNT	ERED AT	7 F	T. 10 INS

LOG OF SOIL 3

McDOWELL & ASSOCIATES

LOG OF SOIL 4 McDOWELL & ASSOCIATES Geotechnical, Environmental, & Hydrogeologic Services 21355 Hatcher Avenue • Ferndale, MI 48220 Soils Investigation PROJECT Phone: (248) 399-2066 • Fax: (248) 399-2157 LOCATION 2489 West Auburn Road JOB NO. 22-146 **DATE** 7-9-22 Rochester Hills, Michigan SURFACE ELEV._ Penetration Moisture Natural Dry Den Unc. Comp. Str Blows for 6" % Wt. P.C.F. Wt. P.C.F. Strength PSF. % SOIL DESCRIPTION Moist dark brown sandy TOPSOIL Moist brown fine SAND with trace of gravel Stiff moist variegated silty CLAY with sand & pebbles and fine sand seams Very stiff moist variegated silty CLAY with sand & (9000+) Extremely compact wet brown silty fine SAND Extremely stiff moist blue silty CLAY with sand & pebbles and wet sand lenses (9000+) Extremely compact wet brown silty fine SAND Extremely compact wet grey silty fine SAND with wet Compact wet grey fine SAND with trace of gravel Used automatic hammer REMARKS: *Calibrated penetrometer TYPE OF SAMPLE GROUND WATER OBSERVATIONS . - DISTURBED
.L. - UNDIST. LINER
T. - SHELBY TUBE
.S. - SPLIT SPOON
.C. - ROCK CORE G.W. ENCOUNTERED AT G.W. AFTER COMPLETION G.W. AFTER HRS. Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals) - PENETROMETER





ORIGINAL ISSUE DATE: PROJECT NO: 22-051 REICHERT

V-2.0

05/19/2022

1/2"

SCALE: N/A

DRAWN BY: MN

DESIGN BY: KM

CHECK BY: AP

FIELD:

INNOVATIVE GEOSPATIAL & ENGINEERING SOLUTIONS

ing Group

298 VETERANS DRIVE FOWLERVILLE.

MICHIGAN 48836

(OFFICE) 517-223-3512 MONUMENTENGINEERING.COM SERVICE DISABLED VETERAN OWNE

SMALL BUSINESS (SDVOSB)

KEVIN C. MCDEVITT

ENGINEER

6201043260

Kevin C /// Jevil

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THE LOCATIONS AND ELEVATIONS C EXISTING UNDERGROUND UTILITIES AS SHOW ON THIS DRAWING ARE ONLY APPROXIMAT NO GUARANTEE IS EITHER EXPRESSED C IMPLIED AS TO THE COMPLETENESS C ACCURACY THEREOF. THE CONTRACTO SHALL BE EXCLUSIVELY RESPONSIBLE FO DETERMINING THE EXACT UTILITY LOCATION AND ELEVATIONS PRIOR TO THE START C C O N S T R U C T I O N

AUBURN ANGARA OAKS, LLC 14496 N SHELDON RD SUITE 230

PLYMOUTH, MI 48170 BRUCE MICHAEL (248) 703-4653

CLIENT:

FOGS

OAKS

AUBU



LOG OF SOIL 7 BORING NO. _____ PROJECT Soils Investigation

		JOB N	NO. 22-146	LOCAT	ION _	2489 Wes	t Auburn F	load	
		SURF	ACE ELEV DATE7-1	1-22	_	Rochester	Hills, Mich	nigan	
Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	S
		A SHORE	Moist dark brown sandy TOPSOIL with trace	of					
	1		gravel, fill						
						<u> </u>			
Α	2		Compact moist brown fine SAND with traces	2 2	5.7	ļ			
UL	_		gravel and silt and topsoil streaks, fill			-			L
	3		g, ,	3	-				┝
-	1	20000000000000000000000000000000000000	8'5" Maint DEA ODAVEL #111			-			┝
В	4		Noist PEA GRAVEL, fill			-	-		⊢
JL	5	-	Medium compact moist brown clayey fine to	medium 2	5.3				┝
		-	SAND with trace of gravel, fill	2		1			H
	6	-				1			┢
		Y/////	6'0" Firm moist brown silty CLAY with trace of sa	nd and					Г
C	7		6'6" pebbles	2	10.9	138			
ĴL		<i>/////</i>		3					
	8	<i>/////</i>		3			*	(2500)	
		<i>\\\\\</i>				ļ			L
	9	<i>\$////</i> }				ļ			L
D		<i>\$////</i>		4	9.1	140			L
UL	10	<i>\\\\\</i>		<u> </u>	-	-	*	(4500)	┞
	44	<i>\\\\\</i>	Stiff moist blue silty CLAY with sand and pe	obles and		-		(4500)	⊢
11	<i>\\\\\</i>	moist fine sand seams	-	+	+			┝	
-+	12	<i>\////</i>				-		_	┝
-+	, '-	//////				1			H
\dashv	13	/////				1			H
	1.5	/////				1			Т
	14	/////							
E			4'6"	4					
UL	15	<i>/////</i>	Extremely stiff moist blue silty CLAY with sa	nd and 10					
			5'6" pebbles and occasional stones	18					L
_	16	-				-			L
	 _	-			 		-		<u> </u>
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GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT FT.
G.W. AFTER COMPLETION None FT.
G.W. AFTER HRS. FT.
G.W. VOLUMES

REMARKS: *Calibrated penetrometer

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

TYPE OF SAMPLE

D. - DISTURBED
J.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE

) - PENETROMETER

V				er Avenue • Ferndale, MI 399-2066 • Fax: (248) 39		PROJ	ECT	S	oils Inves	tigation		
	100	JOB	NO2	22-146		LOCA	ATION	_2	489 West	Auburn F	load	
		SUR	FACE E	LEV	DATE 7-11-22			_R		Hills, Mich		
Sample & Type	Depth	Legend		SOIL DE	SCRIPTION	Penetrati Blows for	IVION	sture 6	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
-	1											
				Modium compact m	noist dark brown sandy							
Α	2			TOPSOIL, fill	ioisi daik biowii saildy	2	13	.5	128			
UL	3					3	-					
	T I		3'0"		noist brown fine SAND with							
	4		3'10"	topsoil streaks, fill								
B UL						1/6		.0				_
OL	5			Loose to slightly co	mpact moist to wet brown f	ne 1/12	-					
	6			SAND with trace of possible fill	gravel and layers of silty cl	y,						
				possible IIII								
C UL	_7		710"			1	14	.7	129			\vdash
	8		7'6"			2						
					o compact wet brown SANE of silt, occasional stones a							
_	9			seams of clay	or siit, occasionai stones a							
D UL	10	-				<u>3</u> 5	12	.6	134			
			10'0"	Extremely stiff mois	st blue silty CLAY with sand	19						
	11		11'0"	and pebbles and oc								
12											-	
	'-						+					
	13											
_	14											<u> </u>
E	14			Very stiff moist blue pebbles	silty CLAY with sand and	3						
UL	15			P-2-2-0-5		6						
	10					7						
\rightarrow	16		1									
\dashv	17		16'6"									
\dashv	18			Extremely etiff main	st blue silty CLAY with sand		-					_
\dashv	19			and pebbles and oc								
				-		7						
	20					18 26						
	21		20'6"			20	+					\vdash
-	22											
\dashv	23			Notes:			+					
					matic hammer							
	24											
	25						+					\vdash
	E OF SAMPLE - DISTURBEI		REMAR	KS:				GF	OUND WAT	ER OBSERV	ATIONS	
	- UNDIST. LI					G.	W. ENCO	JNTER	RED AT	41	-T. 2 INS	

			e: (248) 399-2066 • Fax: (2	48) 399-2137	PROJEC		Soils Inves		NI	
			NO. 22-146	DATE 7-8-22	LOCAT			Auburn R		
Sample	_	SURF	FACE ELEV.	DATE	Penetration		Rochester Hills, Michigan ture Natural Dry Den Unc. Comp.			
& Type	Depth	Legend	So	DIL DESCRIPTION	Blows for 6"	Moisture %	Wt. P.C.F.	Wt. P.C.F.	Strength PSF.	\downarrow
	1		Moist brown fine	SAND with trace of gravel, fill						+
			1'C"	_						1
A	2		Stiff moist disco	lored brown silty CLAY with	2	20.9				4
UL	3		20		4					+
				prown CLAY with topsoil, fill	<u> </u>					\dagger
	4		3'6"							1
B UL	5			olored brown silty CLAY, fill	1	19.1	123			+
UL	5		4'10" Medium compa	ct wet grey fine SAND with trac	e 2 4			*	(2000)	+
	6		6'0" of silt and a laye						` '	1
										\downarrow
C UL	7				2	11.6				+
	8			t wet grey silty fine SAND with of gravel & moist clayey silt	2					†
			seams	or graver a moisi dayey sill						1
	9					40-				+
D UL	10		9'6"		<u>2</u> 4	16.3	122			+
					4					1
\perp	11									\int
-+	12			C CAND						+
\dashv	15		Compact wet br	own fine SAND with trace of si	t					†
	13									1
-	ļ.,									\downarrow
E	14		14'6"		2					+
ÜL	15			silty CLAY with sand & pebble	2					1
	4.5		15'6"	any ola i with saild a peoble	4					Ţ
\dashv	16		150		-					+
\dashv	17									+
]								1
\dashv	18						-			\downarrow
\dashv	19									+
		j								†
	20									Ţ
	21						-			+
										†
	22									Ţ
\dashv	23		Notes:				-			+
\dashv	+==		1) Used	track rig						†
	24									#
	25						-			\downarrow
	20									+
	E OF SAMPLE		REMARKS: *Calibrated	penetrometer		GF	ROUND WAT	ER OBSERV	ATIONS	
U.L.	- DISTURBI - UNDIST. I	INER				ENCOUNTE			FT. 10 IN	
	- SHELBY 1					ENCOUNTE AFTER COM			FT. IN: FT. 4 IN:	

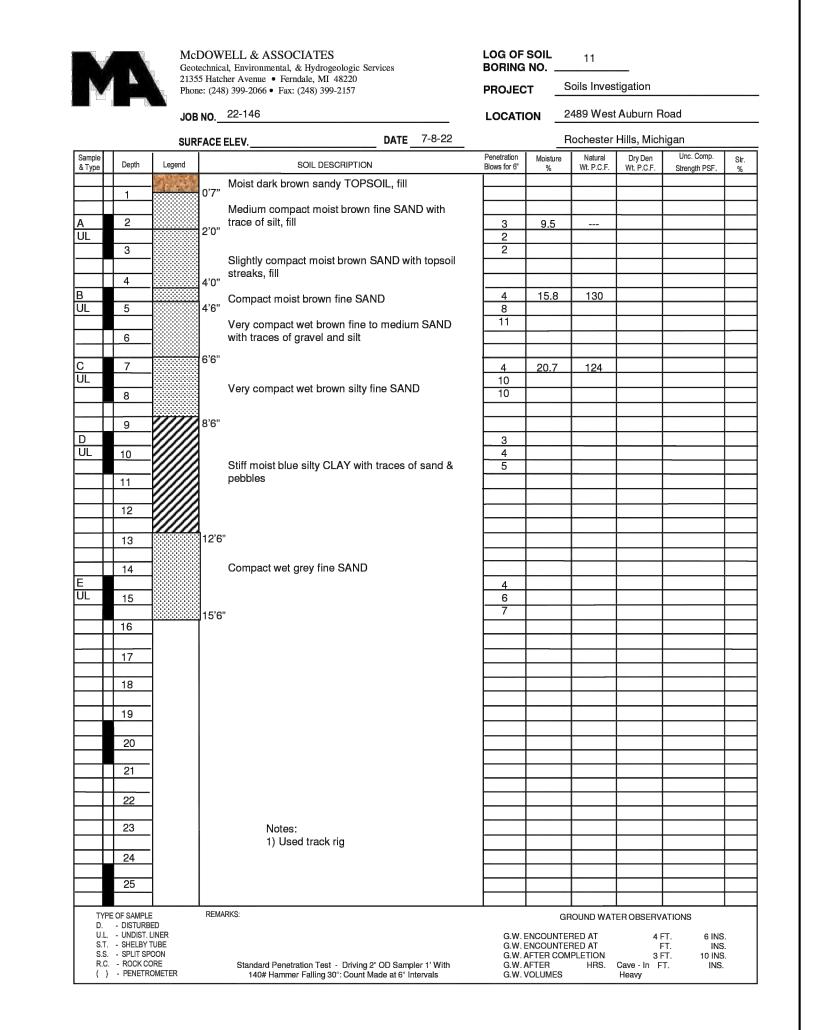
LOG OF SOIL 10 McDOWELL & ASSOCIATES Geotechnical, Environmental, & Hydrogeologic Services 21355 Hatcher Avenue • Ferndale, MI 48220 Soils Investigation PROJECT Phone: (248) 399-2066 • Fax: (248) 399-2157 LOCATION 2489 West Auburn Road JOB NO. 22-146 **DATE** 7-8-22 Rochester Hills, Michigan SURFACE ELEV._ Penetration Moisture Natural Dry Den Unc. Comp. Str Blows for 6" % Wt. P.C.F. Wt. P.C.F. Strength PSF. % SOIL DESCRIPTION 0'5" Moist dark brown sandy TOPSOIL, fill Moist brown clayey fine SAND with trace of silt and gravel, fill Soft moist discolored brown silty sandy CLAY with moist black clayey topsoil seams, fill Medium compact wet brown fine to medium SAND with trace of silt Very compact wet brown fine SAND with trace of gravel, silt and occasional stones Very stiff moist brown silty CLAY with sand & 10 Medium compact wet ζ 10'6" & occasional stones Medium compact wet grey fine SAND with gravel Firm moist blue silty CLAY with sand & pebbles Used track rig 24 TYPE OF SAMPLE GROUND WATER OBSERVATIONS - DISTURBED

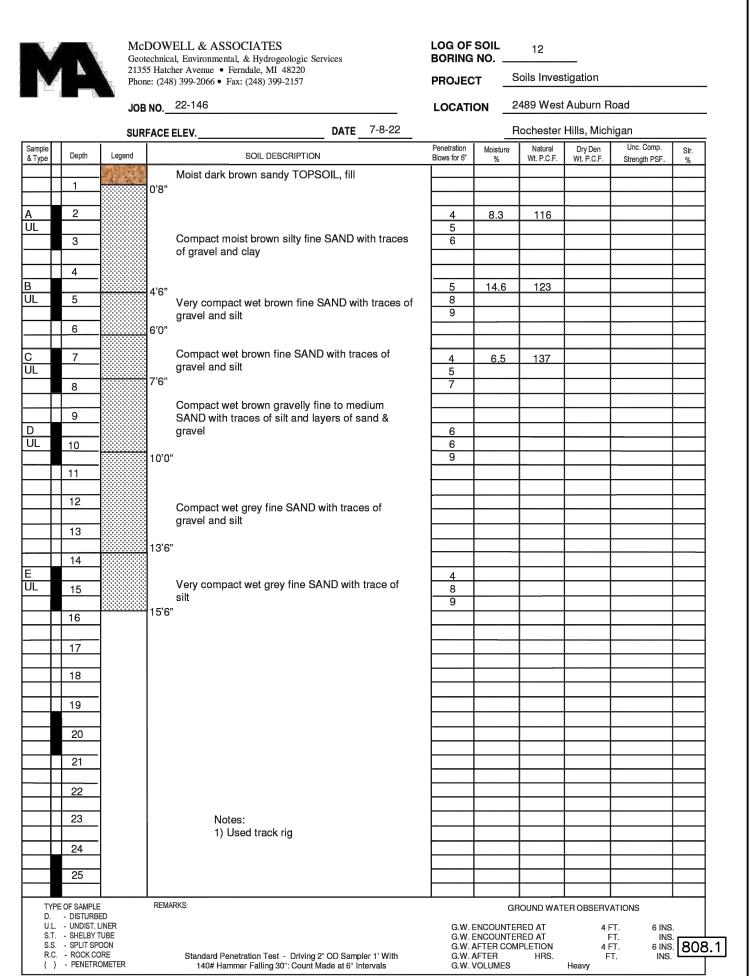
L. - UNDIST. LINER

T. - SHELBY TUBE

S.S. - SPLIT SPOON

R.C. - ROCK CORE G.W. ENCOUNTERED AT G.W. AFTER COMPLETION
G.W. AFTER HRS.
G.W. VOLUMES Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals) - PENETROMETER







ORIGINAL ISSUE DATE: 05/19/2022 PROJECT NO: 22-051

1/2" FIELD: REICHERT DRAWN BY: MN DESIGN BY: KM CHECK BY: AP

SCALE: N/A

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THE LOCATIONS AND ELEVATIONS C
EXISTING UNDERGROUND UTILITIES AS SHOV
ON THIS DRAWING ARE ONLY APPROXIMAT
NO GUARANTEE IS EITHER EXPRESSED C
IMPLIED AS TO THE COMPLETENESS C
ACCURACY THEREOF. THE CONTRACTC
SHALL BE EXCLUSIVELY RESPONSIBLE FO
DETERMINING THE EXACT UTILITY LOCATION
AND ELEVATIONS PRIOR TO THE START C
C O N S T R U C T I O N

AUBURN ANGARA OAKS, LLC

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

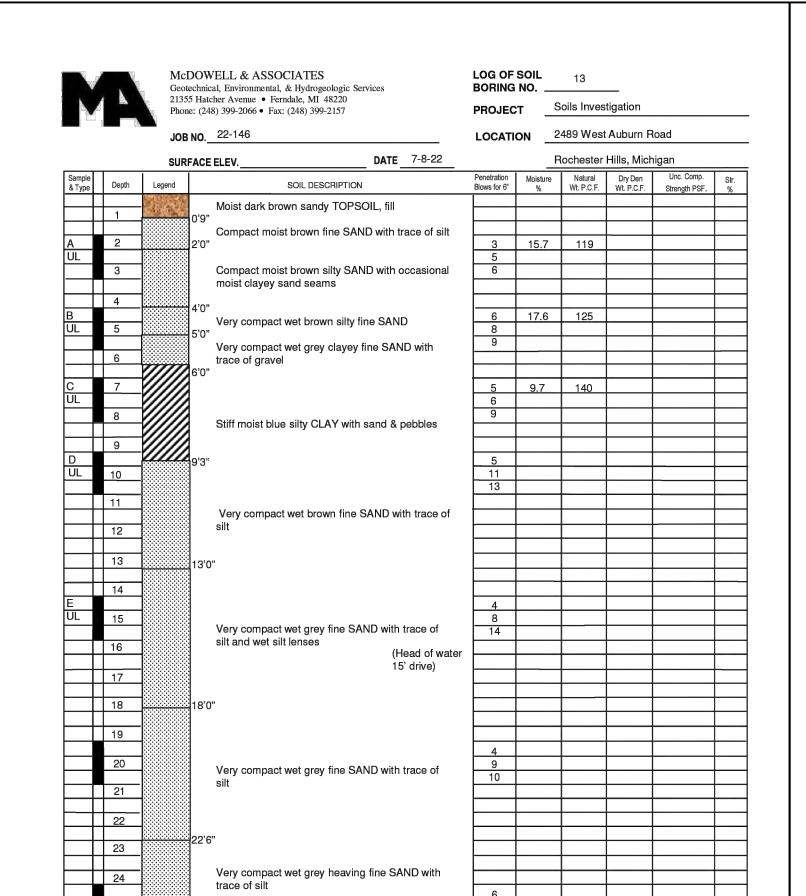
CLIENT :

FOGS

OAKS

AUBU

V-2.1



GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT
G.W. AFTER COMPLETION
G.W. AFTER HRS.
G.W. VOLUMES Heavy

0 INS. 808.3 3 INS. 3 INS. INS.

(Spooned out hole for sample)

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

Used track rig

TYPE OF SAMPLE

- DISTURBED

L. - UNDIST. LINER

T. - SHELBY TUBE

S. - SPLIT SPOON

C. - ROCK CORE

) - PENETROMETER

		\$	Soil Boring #: _	2	
MicDowell	& Associates	Infilt	ration Test #: _	1	
Job Number:	22-146		Date: _	7/9/202	22
Project: Infiltrat	tion Study - 2489 West Auburn Road			Sunn	
Location: Roches	ter Hills, Michigan		Ground Elv.: _	N/A	
	Soil Stratigraphy:			Pipe Installation	#1
			Soil De	epth: 4	·'0"
			Inner Pipe I	Dia.:	3"
			Casing Ler	gth:	5'
			Embedn	nent:	
See Boring 2 fo	or soil and groundwater conditions.		Stick	-up:1	'3"
		ŀ		Pipe Installation	#2
			Soil De	epth: N	J/A
				•	J/A
			Casing Ler		J/A
			Embedn	ient: N	J/A
			Stick	-up:N	J/A
Groundwater Depth:			Pipe Dista	nce: N	I/A
Soak I	Period (Pipe #1)		Soak P	eriod (Pipe #2)	
tart 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:			
	Period (Pipe #1)		Test Po	eriod (Pipe #2)	
Test P	Water Drop: 0.16 feet	Time:		Water Drop:	inches
Time: 30 min					
	2.01' below TOC	110003.		Water Drop:	inches
Time: 30 min	Water Drop: 0.15 feet				
Time: 30 min Notes: Filled water to	Water Drop: 0.15 feet				
Time: 30 min Notes: Filled water to Time: 30 min	Water Drop: 0.15 feet	Time: _ Notes: _		Water Drop:	inches
Time: 30 min Notes: Filled water to Time: 30 min Notes: Filled water to	Water Drop: 0.15 feet 2.0' below TOC Water Drop: 0.14 feet	Time: _ Notes: _ Time: _		Water Drop:	inches
Time: 30 min Notes: Filled water to Time: 30 min Notes: Filled water to Time: 30 min	Water Drop: 0.15 feet 2.0' below TOC Water Drop: 0.14 feet	Time: _ Notes: _ Time: _ Notes: _		Water Drop:	
Time: 30 min Notes: Filled water to Time: 30 min Notes: Filled water to Time: 30 min Notes: Filled water to	Water Drop:	Time: _ Notes: _ Time: _ Notes: _ Time: _			
Time: 30 min Notes: Filled water to Time: 30 min Notes: Filled water to Time: 30 min Notes: Filled water to Time: 30 min	Water Drop:	Time: _ Notes: _ Time: _ Notes: _ Time: _ Notes: _ Notes: _			inches
Time: 30 min Notes: Filled water to 30 min Notes: 30 min Notes: Time: 30 min	Water Drop:	Time: _ Notes: _ Time: _ Notes: _ Time: _ Notes: _ Notes: _		Water Drop:	inches

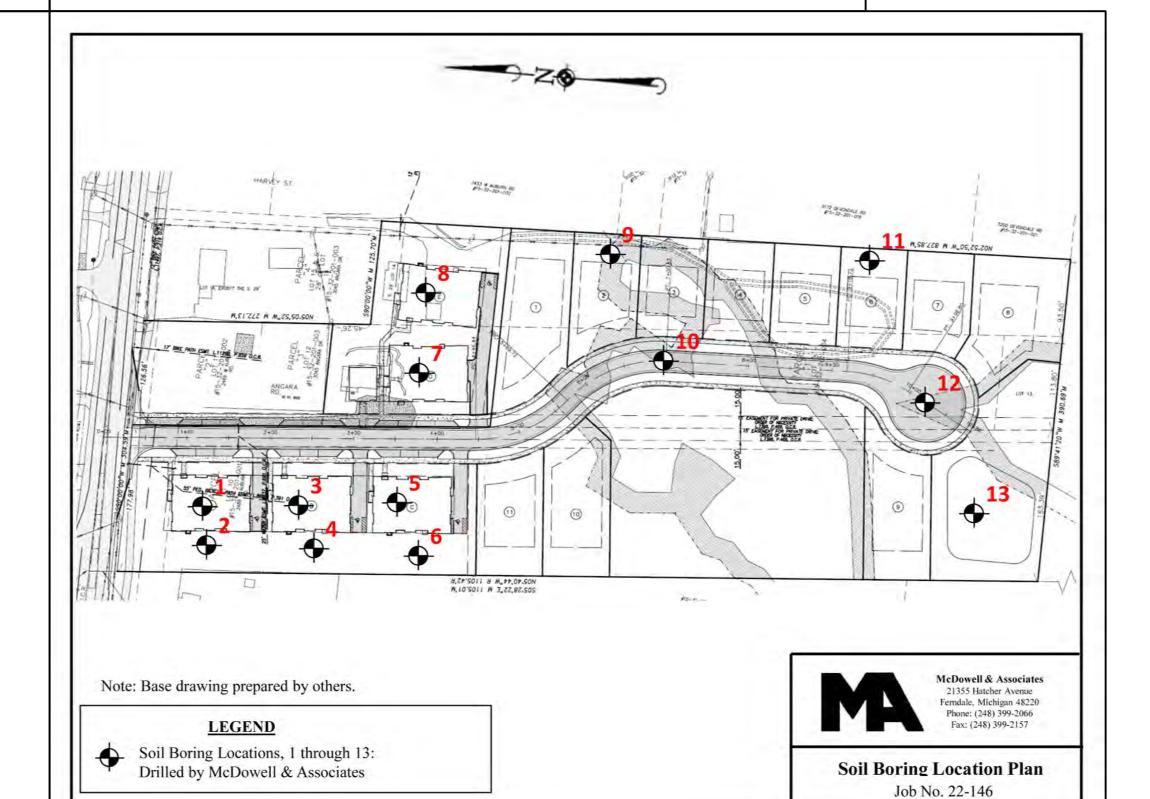
	A	Section 1		5	Soil Boring #: _		11
McI	ocwell & Ass	ociates			ration Test #: _		2
Job Numbe	er:	22-146				7/9	/2022
Proje	et: Infiltration Study	y - 2489 West A	uburn Road			Su	
Locatio	Rochester Hills,	Michigan			Ground Elv.: _		N/A
	Soil St	tratigraphy:		Т		Pipe Installati	ion #1
	Son Si	irangrapny.			Soil De	epth:	
						Dia.:	
						igth:	
Q	Doning 11 for soil	ad amound-water -	onditions			nent:	
See	Boring 11 for soil ar	iu groundwater (conditions.		Stick	:-up:	1.3"
E to Town	3818					Pipe Installati	ion #2
Note	e: Infiltartion test per	rformed in appar	ent fill soils.			epth:	
					Inner Pipe I	Dia.:	N/A
						igth:	
					Embedn	nent:	N/A
					Stick	-up:	N/A
				ŀ			
Groundwa	ater Depth:				Pipe Dista	nce:	N/A
	Soak Period (P	ipe #1)			Soak P	eriod (Pipe #2)	
tart Date:7	/9/2022 Start	Time:		Start Date:	N/A	Start Time:	
						Start Time	
Notes: Fille	ed water to 2.11' belo	ow top of casing	(TOC)	I -	_	_	
				Notes:			
Time:	ed water to 2.11' belo	Drop: 0.78		Notes:	_		
Time: Fille	ad water to 2.11' below to 30 min Water ad water to 2.00' below	Drop: 0.78	feet	Notes: _ Time: _ Notes: _	_		
Time: Fille	ad water to 2.11' below to 30 min Water ad water to 2.00' below	Drop: 0.78 ow TOC Drop: 0.42	feet	Notes: _ Time: _ Notes: _ Time: _		Water Drop: _	
Time: Fille	ad water to 2.11' below and water to 2.00' below and min Water water to 2.00' below and min Water	Drop: 0.78 ow TOC Drop: 0.42 ow TOC	feet	Notes: _ Time: _ Notes: _ Time: _		Water Drop: _	
Time:	ed water to 2.11' below and water to 2.00' bel	Drop: 0.78 ow TOC Drop: 0.42 ow TOC ipe #1)	feet	Notes: _ Time: _ Notes: _ Time: _ Notes: _		Water Drop: _	
Time:	and water to 2.11' below and water to 2.00' be	Drop: 0.78 OW TOC Drop: 0.42 OW TOC ipe #1) Drop: 0.12	feet	Notes: _ Time: _ Notes: _ Time: _ Notes: _	Test Pe	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _	
Time:	and water to 2.11' below and water to 2.00' below and water to 1.99' be	Drop: 0.78 OW TOC Drop: 0.42 OW TOC ipe #1) Drop: 0.12	feet	Notes: Time: Notes: Time: Notes:	Test Po	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _	
Time:	and water to 2.11' below and water to 2.00' below and water to 1.99' be	Drop: 0.78 OW TOC Drop: 0.42 OW TOC ipe #1) Drop: 0.12 OW TOC Drop: 0.12	feet	Notes: _ Time: _ Notes: _ Time: _ Notes: _ Time: _ Time: _ Time: _ Time: _	Test Po	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _	
Time:	d water to 2.11' below and water to 2.00' below and water to 1.99' belo	Drop: 0.78 Drop: 0.42 Drop: 0.42 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.12	feet	Notes: _ Time: _ Notes: _	Test Pe	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _	
Time:	d water to 2.11' below and water to 2.00' below and water to 1.99' below and water to 1.99' below and water to 2.00' belo	Drop: 0.78 Drop: 0.42 Drop: 0.42 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.11	feetfeetfeetfeetfeetfeet	Notes: Time: Notes: Time: Notes: Time: Notes: Time: Notes: Time: Time: Time:	Test Po	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _ Water Drop: _	
Time:	d water to 2.11' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 1.99' belowed water to 1.99' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 2.01' below	Drop: 0.78 Drop: 0.42 Drop: 0.42 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.11	feet	Notes: Time: Notes: Time: Notes: Time: Notes: Time: Notes: Time: Notes: Time: Notes:	Test Po	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _ Water Drop: _	
Time:	d water to 2.11' belowed water to 2.00' belowed water to 1.99' belowed water to 1.99' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 2.01' below	Drop: 0.78 Drop: 0.42 Drop: 0.42 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.11 Drop: 0.11	feet	Notes: Time: Notes: Time: Notes: Time: Notes: Time: Notes: Time: Notes: Time: Time: Time:	Test Po	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _ Water Drop: _	
Time:	d water to 2.11' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 1.99' belowed water to 1.99' belowed water to 2.00' belowed water to 2.00' belowed water to 2.01' below	Drop: 0.78 Drop: 0.42 Drop: 0.42 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.11 Drop: 0.11	feet feet feet feet feet feet	Notes: Time: Notes: Notes:	Test Po	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _ Water Drop: _	
Time:	d water to 2.11' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 1.99' belowed water to 1.99' belowed water to 2.00' belowed water to 2.00' belowed water to 2.00' belowed water to 2.01' below	Drop: 0.78 Drop: 0.42 Drop: 0.42 Drop: 0.12 Drop: 0.12 Drop: 0.12 Drop: 0.11 Drop: 0.11 Drop: 0.11	feet feet feet feet feet feet feet	Notes: Time: Notes: Notes:	Test Po	Water Drop: _ Water Drop: _ eriod (Pipe #2) Water Drop: _ Water Drop: _ Water Drop: _	

Cased Borehole Infiltration Test Log 7/9/2022 Project: Infiltration Study - 2489 West Auburn Road Location: Rochester Hills, Michigan Ground Elv.: Soil Stratigraphy: Pipe Installation #1 Soil Depth: Inner Pipe Dia.: Casing Length: Embedment: See Boring 13 for soil and groundwater conditions. Pipe Installation #2 Soil Depth: Inner Pipe Dia.: N/A N/A Casing Length: 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) Time: 12 min 42 sec Water Drop: 2.00 feet Time: _____ inches Notes: Filled water to 2.01' below TOC Time: <u>22 min 28 sec</u> Water Drop: <u>2.00</u> feet Time: _____ inches Notes: Filled water to 2.00' below TOC Test Period (Pipe #2) Test Period (Pipe #1) Water Drop: _____inches Time: 10 min Water Drop: 0.70 feet Notes: Filled water to 2.02' below TOC Time: ____10 min ____ Water Drop: ____0.67 ___ feet Time: _____ inches Notes: Filled water to 2.01' below TOC Time: ____10 min ____ Water Drop: ___0.66 ___feet Water Drop: _____inches Notes: Filled water to 2.00' below TOC Time: ____10 min ____ Water Drop: ___0.66 ___feet Water Drop: _____ inches Notes: Filled water to 2.00' below TOC Time: ____10 min ____ Water Drop: ___0.65 ___feet Water Drop: _____inches Notes: Average of last 4 readings = 0.66 ft/10 min Notes: N/A

Job No. 22-146

SIEVE ANALYSIS

Boring	<u>Sample</u>	% 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	В	99.7	97.4	78.8	15.1	9.3
11	В	97.6	93.0	64.9	12.5	6.0
12	C	58.9	47.8	26.1	10.8	6.1
13	В	100.0	100.0	98.3	43.7	14.7



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.

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THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATION OF GUARANTEE IS EITHER EXPRESSED OF LIBRARY OF THE COMPLETENESS OF ACCURACY THEREOF. THE CONTRACTO SHALL BE EXCLUSIVELY RESPONSIBLE DETERMINING THE EXACT UTILITY LOCATION AND ELEVATIONS PRIOR TO THE START OF THE CONTRACTORY.

CLIENT :

AUBURN ANGARA OAKS, LLC

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

1<u>E</u>

SOIL BORING LOGS
AUBURN ANGARA OAKS

AN SUBMITTAL 09/13

AN SUBMITTAL 01/22

AN PER CITY AND MDOT 03/14

AN PER MOOT 03/28

AN / WETLAND FLAGS 07/24

AN / WETLAND FLAGS 08/13

PLAN SUBMITTALS/REVISION
VISED SITE PLAN SUBMITTAL
SUBMIT TO MDOT
VISED SITE PLAN PER CITY ANI
VISED SITE PLAN PER MDOT
VISED SITE PLAN PER MDOT
ELIMINARY SITE PLAN TO CITY
VISED SITE PLAN / WETLAND F

ORIGINAL ISSUE DATE:

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

SCALE: N/A

0 1/2" 1"

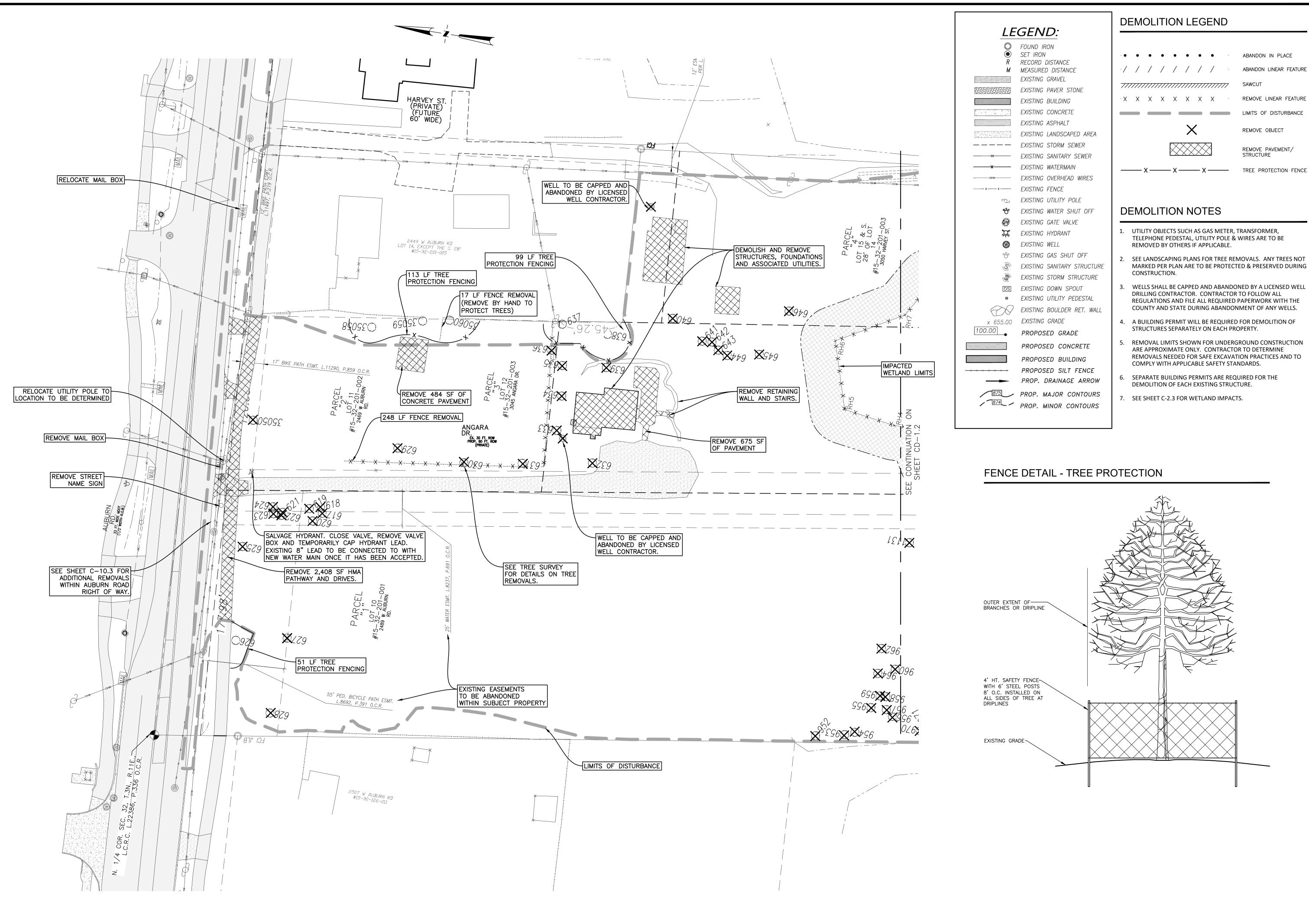
FIELD: REICHERT

DRAWN BY: MN

DESIGN BY: KM

V-2.2

CHECK BY: AP



ing Group ABANDON IN PLACE ABANDON LINEAR FEATURE

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ACCURACY THEREOF. THE CONTRACT

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DETERMINING THE EXACT UTILITY LOCATIO

AND ELEVATIONS PRIOR TO THE START

CONSTRUCTOR

CLIENT:

AUBURN ANGARA OAKS, LLC

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

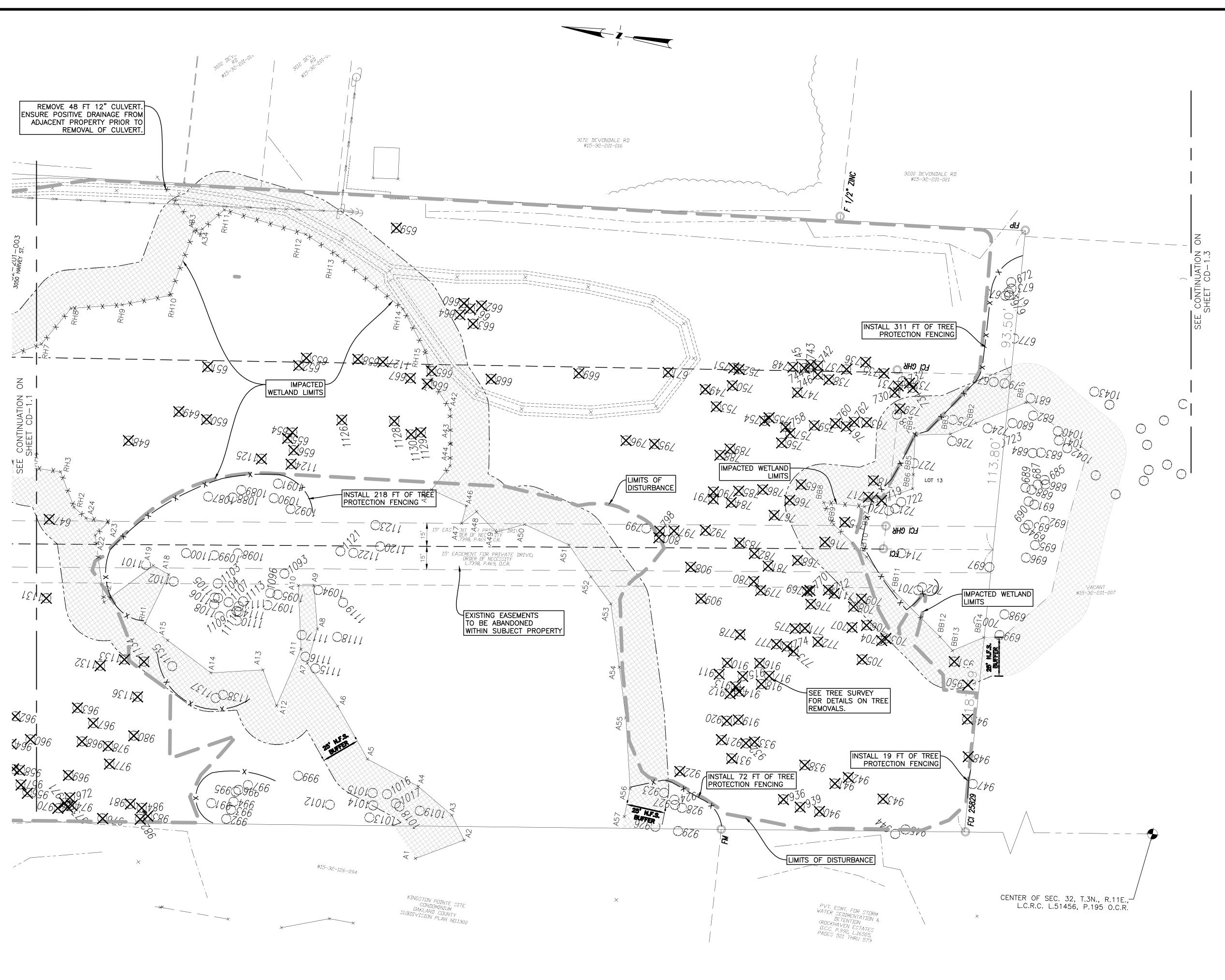
AUBURN

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051 SCALE: 1" = 30'

FIELD: REICHERT DRAWN BY: MN DESIGN BY: KM

CHECK BY: AP



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DEMOLITION LEGEND

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REMOVE OBJECT

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CLIENT:

AUBURN

WETLAND IMPACT

DEMOLITION NOTES

- 1. 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
- 5. SEE SHEET C-2.3 FOR WETLAND IMPACTS.

LEGEND:

O FOUND IRON SET IRON R RECORD DISTANCE **M** MEASURED DISTANCE EXISTING GRAVEL EXISTING PAVER STONE EXISTING BUILDING EXISTING CONCRETE EXISTING LANDSCAPED AREA ———— EXISTING STORM SEWER -----ss----- EXISTING SANITARY SEWER ——w—— EXISTING WATERMAIN -----OHW------ EXISTING OVERHEAD WIRES ----×--- EXISTING FENCE D EXISTING UTILITY POLE * EXISTING WATER SHUT OFF EXISTING GATE VALVE EXISTING HYDRANT EXISTING WELL

EXISTING GAS SHUT OFF EXISTING SANITARY STRUCTURE EXISTING STORM STRUCTURE DS EXISTING DOWN SPOUT EXISTING UTILITY PEDESTAL

EXISTING BOULDER RET. WALL x 655.00 EXISTING GRADE PROPOSED GRADE

PROPOSED CONCRETE PROPOSED BUILDING

PROPOSED SILT FENCE PROP. DRAINAGE ARROW

PROP. MAJOR CONTOURS PROP. MINOR CONTOURS

> ORIGINAL ISSUE DATE: 05/19/2022

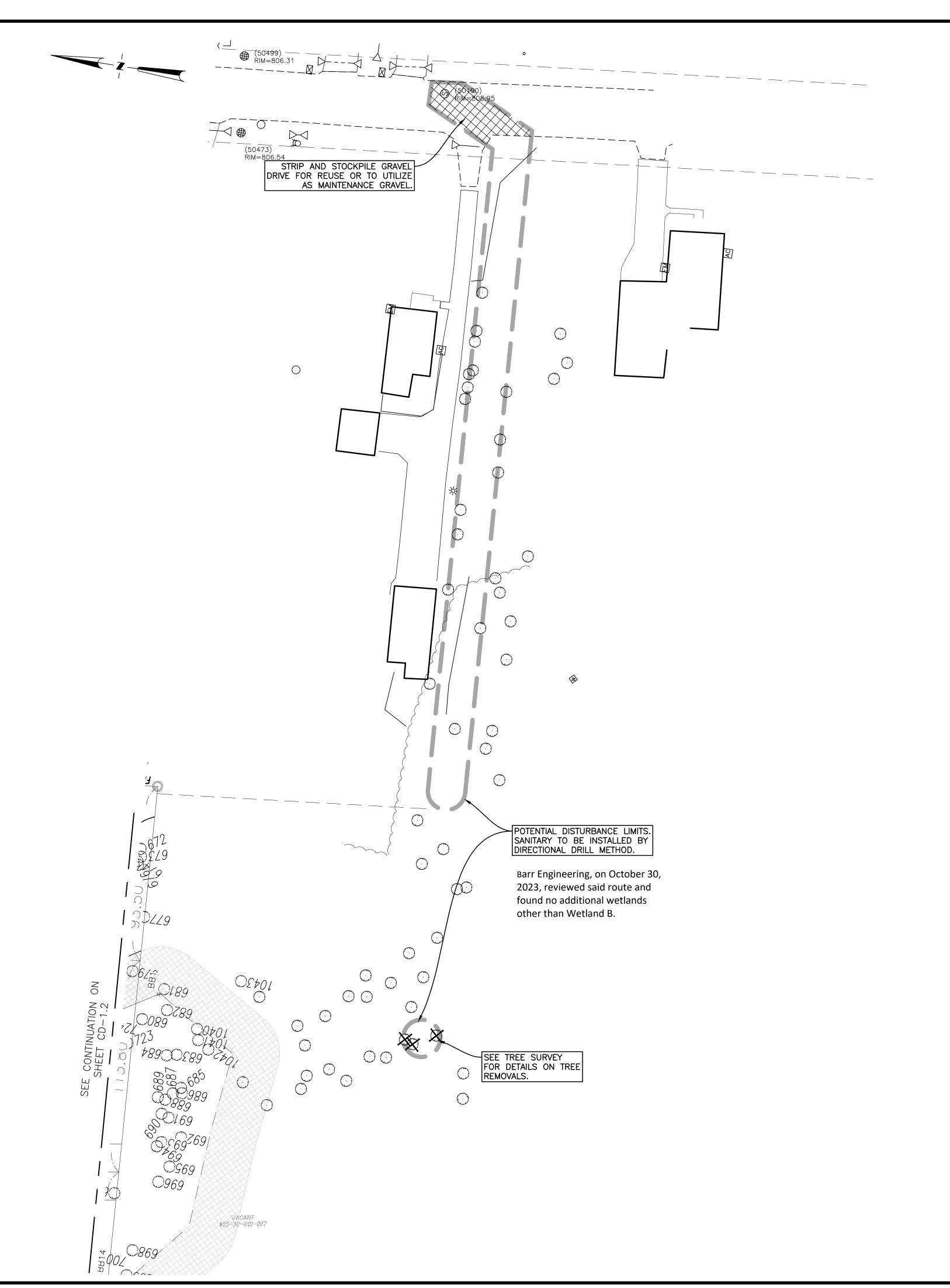
PROJECT NO: 22-051

SCALE: 1" = 30'

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

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.



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igotimes FOUND IRON

R RECORD DISTANCE M MEASURED DISTANCE

EXISTING PAVER STONE

EXISTING BUILDING

EXISTING ASPHALT

EXISTING LANDSCAPED AREA

— — — EXISTING STORM SEWER

----×--- EXISTING FENCE

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ന്യ EXISTING UTILITY POLE

 EXISTING GATE VALVE EXISTING HYDRANT

@ EXISTING WELL

x 655.00 EXISTING GRADE 100.00 PROPOSED GRADE

* EXISTING WATER SHUT OFF

* EXISTING GAS SHUT OFF

DS EXISTING DOWN SPOUT EXISTING UTILITY PEDESTAL

EXISTING BOULDER RET. WALL

EXISTING SANITARY STRUCTURE

PROPOSED CONCRETE

PROPOSED BUILDING

PROP. DRAINAGE ARROW

PROP. MAJOR CONTOURS

PROP. MINOR CONTOURS

PROPOSED SILT FENCE

© EXISTING STORM STRUCTURE

SET IRON

EXISTING GRAVEL

EXISTING CONCRETE

REMOVE PAVEMENT

KEVIN C. MCDEVITT ENGINEER 6201043260

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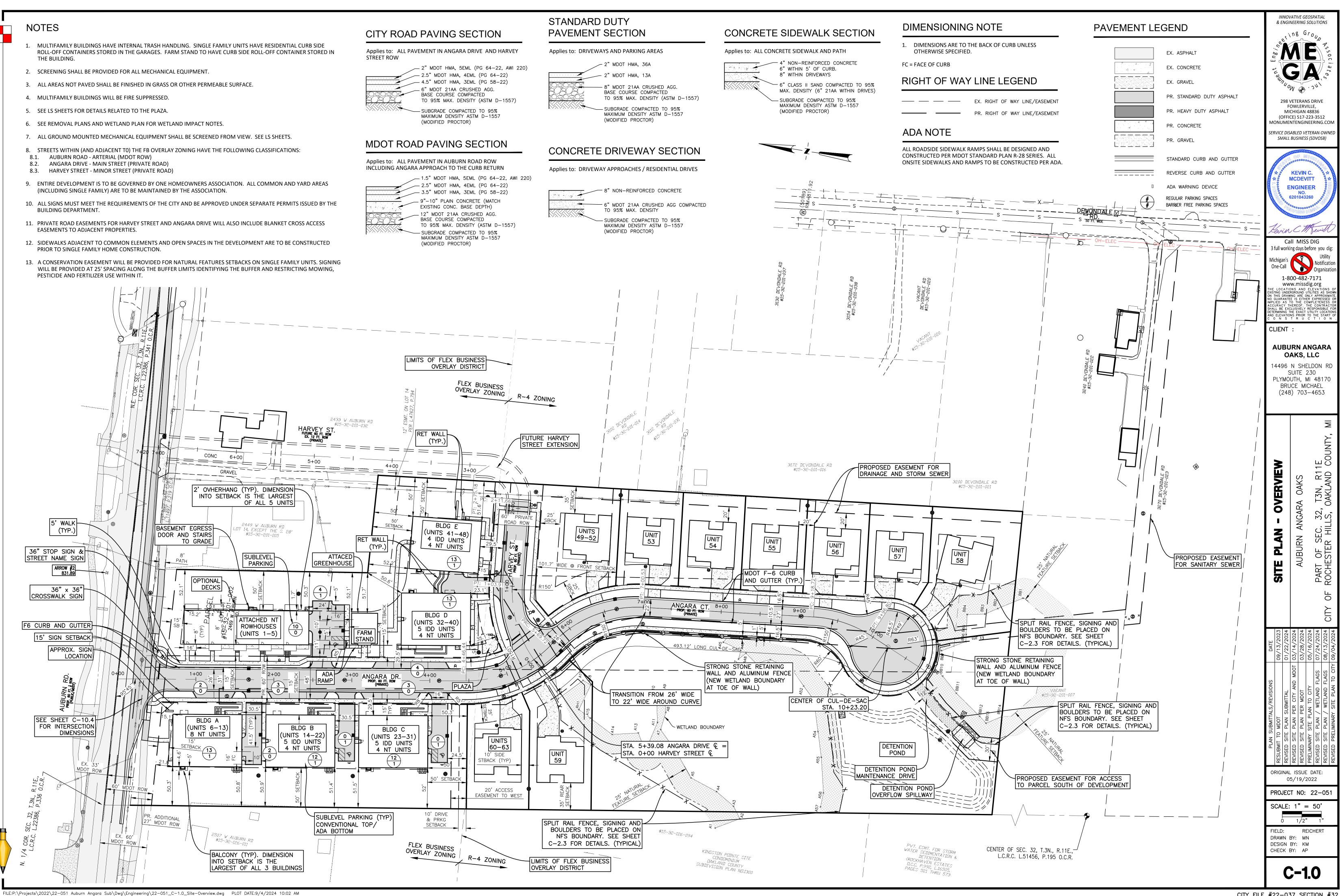
OFFS ANGARA PLAN MOLITION AUBURN

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CD-1.3





ZONING INFORMATION

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

SUBJECT PARCEL ZONING:	SUBJECT PARCEL		PROPOSED BUILDING		MAXIMUM HEIGHT OF BUILDING		BUILDING SETBACKS (FT)				PARKING SETBACKS (FT)			
FB FLEX BUSINESS OVERLAY	AREA (AC)	WIDTH AT BUILDING SITE (FT)	BLDG A,B,C AREA (SF)	BLDG D,E AREA (SF)	IN STORIES	IN FEET	FRONT (MIN/MAX)	SIDE (INTERIOR)	SIDE (PERIMETER) (1)	REAR	FRONT FACADE	SIDE (2)	REAR (2)	
REQUIRED	2	N/A	N/A	N/A	2 / 3	30 / 45	15 / 70	0	25 (50' ADJACENT TO RESIDENTIAL	50	40	10	10	
PROVIDED	9.03	_	-	_	2	_	15 / 46.6	N/A	-	50	41.5	24.5	57.6	

1. SETBACK LISTED FOR 2 STORY BUILDINGS UNDER 30 FEET TALL.

2. SETBACK FROM RESIDENTIAL ZONING DISTRICTS ONLY.

SUBJECT PARCEL ZONING: R-4 RESIDENTIAL	SUBJECT	PARCEL	MAXIMUM OF BU	1 HEIGHT JILDING	В	JILDING SI	T)	MAXIMUM % LOT AREA	MINIMUM FLOOR ARFA	
	AREA (SF)	WIDTH AT BUILDING SITE (FT)	IN STORIES	IN FEET	FRONT (MIN/MAX)	SIDE (EACH)	SIDE (TOTAL)	REAR	COVERED BY ALL BUILDINGS	AREA (SF)
REQUIRED	9,600	80 FEET	2	30	25	10	20	35	30%	912
PROVIDED	9,600	80 FEET	1	N/A	25	10	20	35	30%	2,033

ADJACENT ZONING

R-4 ONE-FAMILY RESIDENTIAL R-4 ONE-FAMILY RESIDENTIAL R-4 ONE-FAMILY RESIDENTIAL

PROPOSED USE

MULTIFAMILY

SEE UNIT COUNT TABLE FOR DISTRIBUTION OF NEUROTYPICAL (NT) AND INTELECTUALLY AND DEVELOPMENTALLY DISABLED (IDD)

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

MIMINUM 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 STANARD 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 91 STANDARD SPACES TOTAL PARKING PROVIDED =

91 REGULAR SPACES 8 BARRIER FREE (ALL VAN ACCESSIBLE) BARRIER FREE SPACES

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

UNIT COUNT / TYPE / PARKING

MULTIF	AMILY U	JNITS		PARKING	
BLDG/UNIT#	UNIT	BLDG	IDD8 SPACES PER UNIT	NT - 1.5 PER UNIT + .5 VISITOR	REQUIREI SPACES
1	NT	ROWHOUSE		2	2
2	NT	ROWHOUSE		2	2
3	NT	ROWHOUSE		2	2
4	NT	ROWHOUSE		2	2
5	NT	ROWHOUSE		2	2
Bldg A-6	NT	Α		2	2
Bldg A-7	NT	Α		2	2
Bldg A-8	NT	Α		2	2
Bldg A-9	NT	Α		2	2
Bldg A-10	NT	Α		2	2
Bldg A-11	NT	Α		2	2
Bldg A-12	NT	Α		2	2
Bldg A-13	NT	Α		2	2
Bldg B-14	IDD	В	0.8		0.8
Bldg B-15	IDD	В	0.8		0.8
Bldg B-16	IDD	В	0.8		0.8
Bldg B-17	IDD	В	0.8		0.8
Bldg B-17	IDD	В	0.8		0.8
Bldg B-19	NT	В	0.8	2	2
Bldg B-19	NT	В		2	2
Bldg B-20	NT	В		2	2
Bldg B-21	NT	В		2	2
Bldg C-23	IDD	С	0.8	2	0.8
Bldg C-23	IDD	С	0.8		0.8
Bldg C-24	IDD	С	0.8		0.8
Bldg C-25	IDD	С	0.8		0.8
Bldg C-27	IDD	С	0.8		0.8
Bldg C-28	NT	С	0.8	2	2
Bldg C-29	NT	С		2	2
Bldg C-30	NT	С		2	2
Bldg C-31	NT	С		2	2
Bldg D-32	IDD	D	0.8	2	0.8
Bldg D-32	IDD	D	0.8		0.8
Bldg D-33	IDD	D	0.8		0.8
Bldg D-34	IDD	D	0.8		0.8
Bldg D-35	IDD	D	0.8		0.8
Bldg D-37	NT	D	0.6	2	2
Bldg D-37	NT	D		2	2
Bldg D-38	NT	D		2	2
Bldg D-39	NT	D		2	2
Bldg E-41	IDD	E	0.8	-	0.8
Bldg E-41	IDD	E	0.8		0.8
Bldg E-42	IDD	E	0.8		0.8
Bldg E-43	IDD	E	0.8		0.8
	NT	E	0.0	2	2
Bldg E-45 Bldg E-46	NT	E		2 2	2
Bldg E-46 Bldg E-47	 	E		 	2
_	NT	E		2 2	2
Bldg E-48	NT	ш			

			SINGLE FAMILY U	NITS		
UNIT#	UNIT TYPE	GRADE	FLOOR PLAN	LOT WIDTH (FT)	LOT DEPTH (FT)	LOT AREA (SFT)
Unit 49-52	IDD	Flat	Michigan (MI)	101.7	123.9	14,549
Unit 53	ТИ	Daylight	Michigan (MI)	80	120	9,649
Unit 54	NT	Daylight	Michigan (MI)	80	120	9,600
Unit 55	NT	Daylight	Michigan (MI)	80	120	9,600
Unit 56	NT	Daylight	Michigan (MI)	80	120	9,600
Unit 57	NT	Daylight	Michigan (MI)	80	120	9,554
Unit 58	NT	Daylight	Michigan (MI)	111.2	154.9	18,483
Unit 59	NT	Flat	Michigan (MI)	80	154	14,058
Unit 60-63	IDD	Flat	Michigan (MI)	80	134.2	11,140
		TOTAL SING	LE FAMILY UNITS =	9		

UNIT TYPES

NT = NEURO-TYPICAL IDD = INTELLECUTALLY/DEVELOPMENTALLY DISABLED

TRIP GENERATION - ITE 10TH EDITION

(1.5TH	
TTE (10 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

Land Use	ITE Code	Amount	Units	ITE 10th Edition - Per Unit			Average Daily Traffic			AM Peak Hour			PM Peak Hour		
	ITE Code	Amount	Omis	ADT	a.m. Peak	p.m. Peak	In (50%)	Out (50%)	Total	In (33%)	Out (67%)	Total	In (61%)	Out (39%)	Total
Senior Adult Housing - Detached	251	9	Dwellings	4.27	0.24	0.3	19	19	38	0.7	1.5	2.2	1.6	1.1	2.7

Multi Family - Intellectually/Developmentally Disabled

Land Use	ITE Code Amount		Units	ITE 10th Edition - Per Unit			Average Daily Traffic			AM Peak Hour			PM Peak Hour		
	TIE Code	Amount	Omis	ADT	a.m. Peak	p.m. Peak	In (50%)	Out (50%)	Total	In (33%)	Out (67%)	Total	In (61%)	Out (39%)	Total
Continuing Care Retirement Community	255	19	Dwellings	2.4	0.14	0.16	23	23	46	0.9	1.8	2.7	1.8	1.2	3.0

Multi Family - Neotraditional

Land Use	ITE Code Amo	Amount	TInita	11E 10th Edition - Per Unit			Average Daily Traffic			AM Peak Hour			PM Peak Hour		
			Units	ADT	a.m. Peak	p.m. Peak	In (50%)	Out (50%)	Total	In (33%)	Out (67%)	Total	In (61%)	Out (39%)	Total
Senior Adult Housing - Attached	252	29	Dwellings	3.7	0.2	0.26	54	54	107	1.9	3.9	5.8	4.6	2.9	7.5

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 Average Daily Traffic

				ADI	a.m. Peak	p.m. Peak	In (50%)	Out (50%)	Lotal	In (33%)	Out (67%)	Lotal	In (61%)	Out (39%)	Lotal
Farmers Market	858	0.0305	Acres	354.74	174.9	179.84	6	6	11	1.7	3.6	5.3	3.4	2.1	5.5
Total Development - Angara Drive	e Mixed	Use Resi	dential												

otal Development - Angara Drive Mixed Use Residential													
I and I I a													

Land Use				Aver	age Daily T	raffic	A	M Peak Ho	ur	P	M Peak Hou	ır
Land Ose				In (50%)	Out (50%)	Total	In (33%)	Out (67%)	Total	In (61%)	Out (39%)	Total
Mixed Use Age Restricted Residential				102	102	202	5.2	10.8	16.0	11.4	7.3	18.7

PROJECT NO: 22-051 FIELD: REICHERT

CHECK BY: AP **C-1.1**

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> **KEVIN C. MCDEVITT**

ENGINEER

NO. 6201043260

Kevin CM Ferrie

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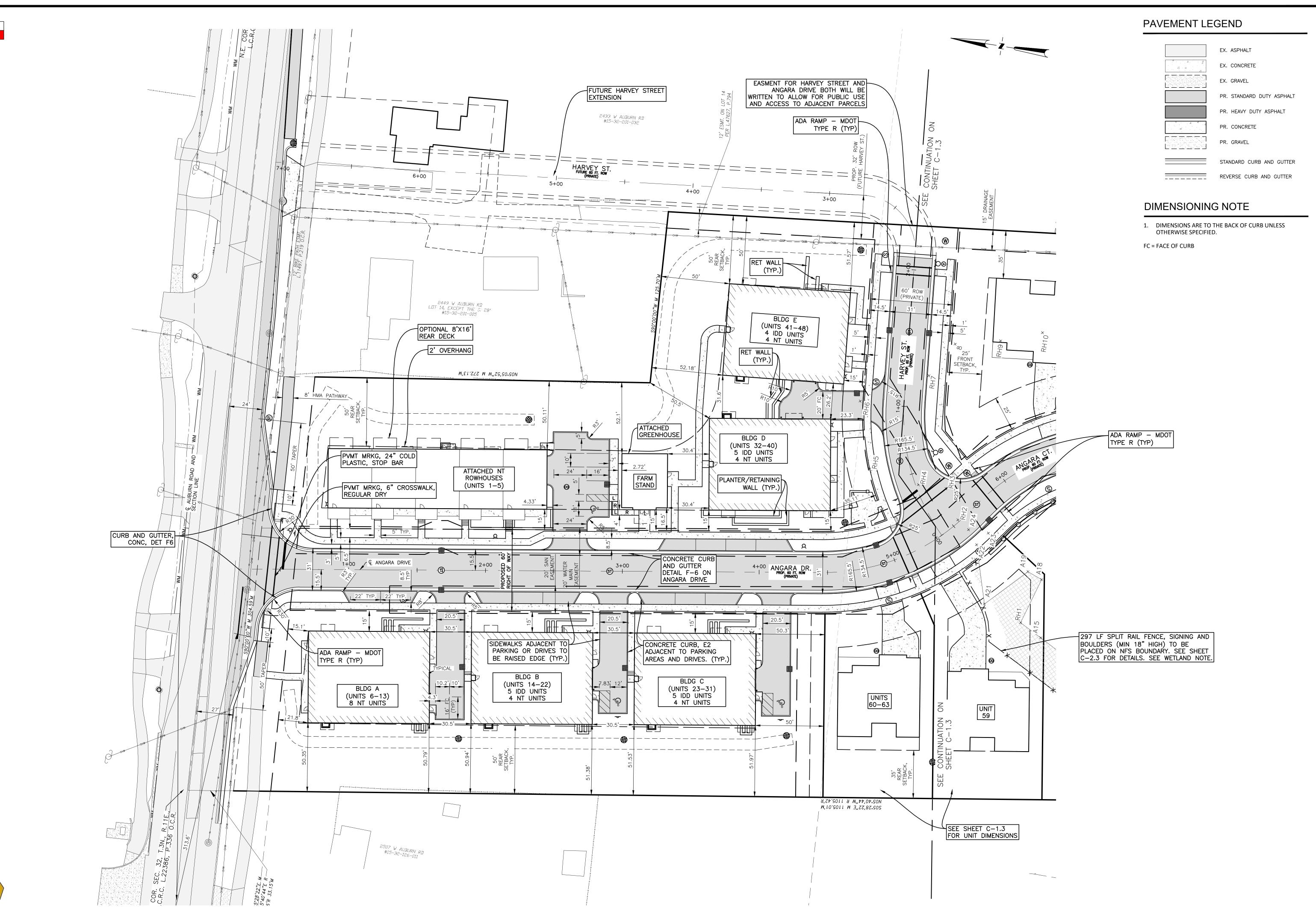
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SCALE: 1" = 50'

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E PLAN SUBMITIAL 01/22/202
E PLAN PER CITY AND MDOT 03/14/202
E PLAN PER MDOT 03/28/202
SITE PLAN TO CITY 05/16/202
E PLAN / WETLAND FLAGS 08/13/202
E PLAN / WETLAND FLAGS 08/13/202
ELIMINARY SITE PLAN TO CITY 09/04/202

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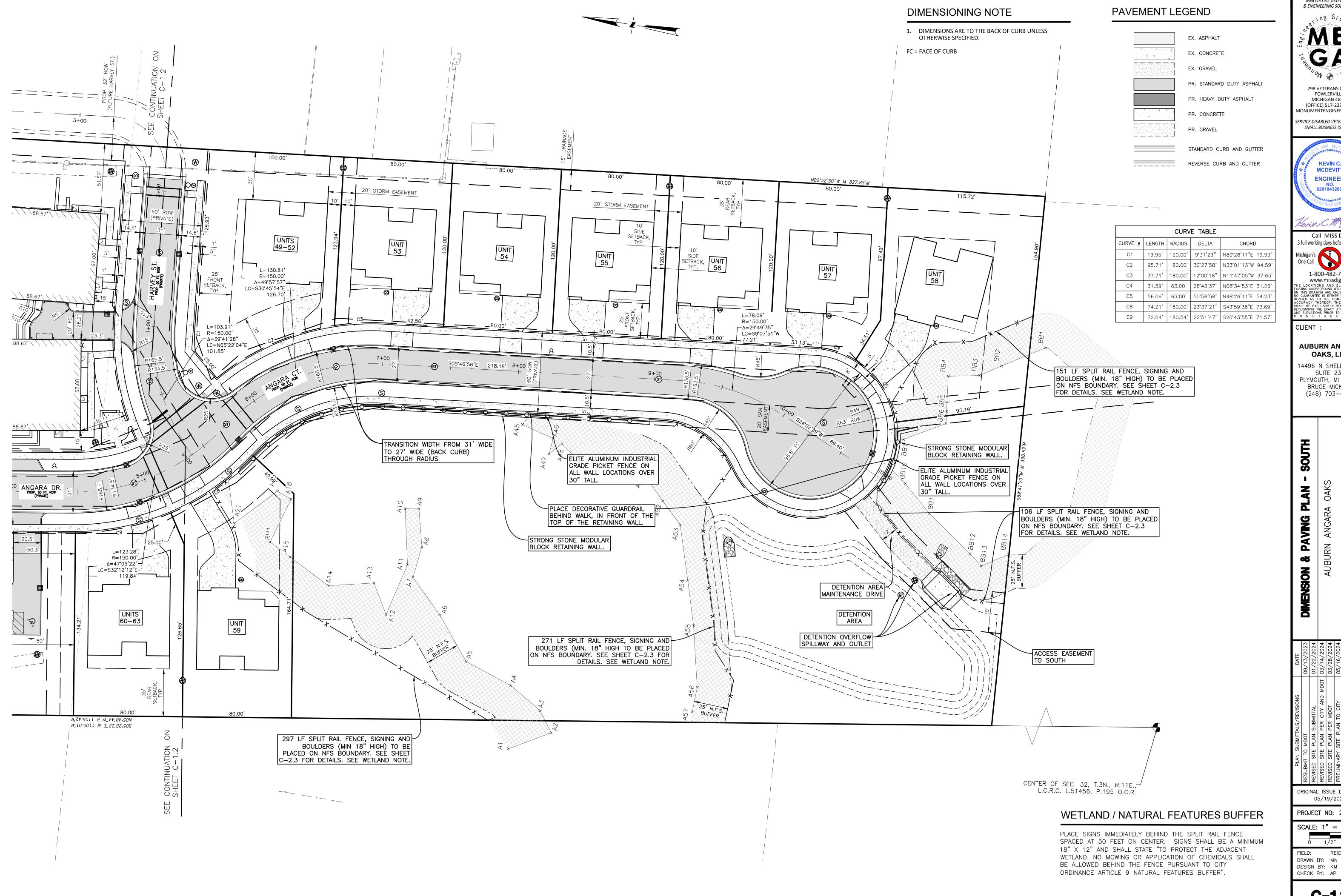
FIELD: REICHERT

DRAWN BY: MN

DESIGN BY: KM

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> **KEVIN C. MCDEVITT ENGINEER** 6201043260

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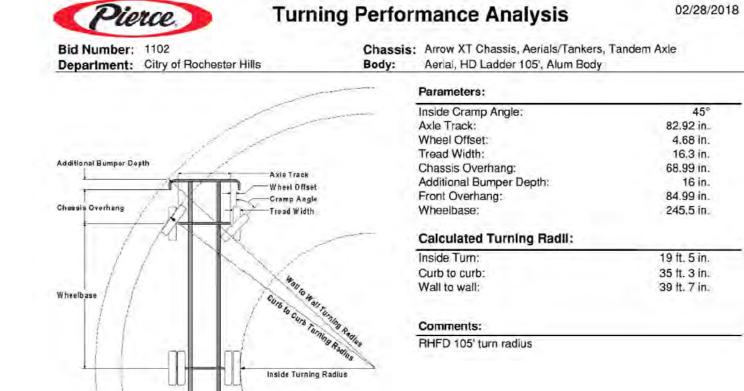
PROJECT NO: 22-051

SCALE: 1" = 30'

1/2" FIELD: REICHERT DRAWN BY: MN DESIGN BY: KM

C-1.3

EMERGENCY VEHICLE WAS PROVIDED BY THE FIRE MARSHALL WITHIN THE MARKED UP SITE PLAN SUBMITTAL FOR PSP2022-0031 ON DATE 01/03/2023.



Category	Option	Description
Axle, Front, Custom	0018453	Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Qtm/AX
Wheels, Front	0019611	Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot
Tires, Front	0594821	Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply
Bumpers	0606536	Bumper, 16" Extended, Steel Painted, Arrow XT
Aerial Devices	0673137	Aerial, 105' Heavy Duty Ladder (500 dry/500 water)

CONC / 6+00

148 FT FIRE ACCESS ROUTE

140 FT FIRE

ACCESS ROUTE

2.5' CURB AND GUTTER

5 UNIT ROWHOUSE STYLE CONDOS (NT)

146 FT FIRE

ACCESS ROUTE

ACCESS ROUTE

Actual Inside cramp angle may be less due to highly specialized options.

Curb to Curb turning radius calculated for 9.00 inch curb.

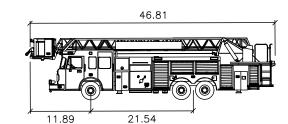
CITY PERFORMED

FIRE HYDRANT

10/31/2022

PRESSURE TEST

AUTOTURN EMERGENCY VEHICLE



MFPD 100' Aerial Platform Pierce Arrow XT



148 FT FIR ACCESS ROUTE

144 FT FIRE ACCESS ROUTE

141 FT FIRE ACCESS ROUTE

ATTACHED GREENHOUSE

3+00 ANGARA DR.
PROP. 60 FT. ROW

146 FT FIRE ₩

149 FT FIRE ACCESS ROUTE

ACCESS ROUTE

IDD/NT

FARMSTAND

BUILDING

Note: THE ABOVE TEMPLATE IS THE CLOSEST TRUCK AVAILABLE FOR USE IN THE STANDARD AUTOTURN LIBRARIES. IT HAS A SIMILAR PHYSICAL LAYOUT, WITH THE SAME LOCK ANGLE AND SLIGHTLY LARGER WHEELBASE AND TRACK.

FLEX BUSINESS

8 UNIT

IDD/NT

RET WALL

OVERLAY ZONING

SINGLE FAMILY

FLEX BUSINESS
OVERLAY ZONING
R-4 ZONING

SINGLE

FAMILY

R-4 ZONING

SINGLE FAMILY

SINGLE FAMILY

SINGLE FAMILY

WETLAND BOUNDARY

FIRE DEPARTMENT NOTES

- 1. A KNOX KEY SYSTEM SHALL BE INSTALLED ON EACH MULTI-UNIT BUILDING IN A LOCATION APPROVED BY THE FIRE CODE OFFICIAL. ORDERING INFORMATION IS AVAILABLE THROUGH THE KNOX COMPANY AT WWW.KNOXBOX.COM (IFC 2006 SEC.1028.2)
- 2. FIRE LANES SHALL BE DESIGNATED BY THE FIRE CODE OFFICIAL, AND SHALL BE CONSPICUOUSLY POSTED ON BOTH SIDES OF THE FIRE LANE, WITH FIRE LANE SIGNS SPACED NOT MORE THAN 100 FEET APART. FIRE LANE SIGNS SHALL READ "NO STOPPING, STANDING, PARKING, FIRE LANE" AND SHALL CONFORM TO THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (FIRE PREVENTION ORDINANCE CHAPTER 58, SEC 503)
- 3. CONSTRUCTION SITES SHALL BE SAFEGUARDED IN ACCORDANCE WITH IFC 2006 CHAPTER 14.
- 4. OPEN BURNING IS NOT PERMITTED, INCLUDING THE BURNING OF TRASH, DEBRIS, OR LAND CLEARING. OPEN BURNING FOR WARMING OF SAND AND / OR WATER FOR THE PREPARATION OF MORTAR SHALL BE WITHIN THE CITY OF ROCHESTER HILLS BURN PERMIT GUIDELINES FIRE PREVENTION ORDINANCE CHAPTER 58, SEC 307.6.2 & 307.6.2.3) MORTAR PERMIT CAN BE APPLIED FOR ONLINE AT WWW.ROCHESTERHILLS.ORG/FIRE IN THE "FOR YOUR BUSINESS"
- PROVIDE A "NO PARKING FIRE DEPARTMENT CONNECTION" SIGN OVER EACH FIRE DEPARTMENT CONNECTION.
- 6. FDC'S SHALL NOT BE OBSTRUCTED BY LANDSCAPING, PARKING, OR ANY OTHER PERMANENT OR TEMPORARY MATERIALS OR DEVICES.
- 7. IF THE FIRE DEPARTMENT CONNECTION IS NOT LOCATED ON THE STREET FRONT OF THE BUILDING, A WHITE / CLEAR STROBE LIGHT SHALL BE TIED INTO THE FIRE ALARM SYSTEM AND INSTALLED OVER THE FDC.
- 8. SEE ARCHITECTURAL PLANS FOR BUILDING CONSTRUCTION MATERIALS AND INFORMATION PERTAINING TO BUILDING FIRE CODES.
- 9. ON STREET PARKING (EXCEPT FOR THE 12 NOTED PARKING SPACES) WILL NOT BE PERMITTED IN THE AREA OF THE MULTI-FAMILY BUILDINGS DUE TO THE NATURE OF THE ROADWAY BEING USED AS THE AERIAL FIRE APPARATUS ACCESS ROAD. FIRE LANE SIGNS WILL BE POSTED AND ENFORCED IN THESE AREAS.
- 10. THIS PROJECT MAY BE REQUIRED TO PERFORM EMERGENCY RADIO SIGNAL STRENGTH TESTING. TESTING FAILURE WILL REQUIRE INSTALLATION OF AN IN-BUILDING TWO-WAY EMERGENCY RESPONDER COMMUNICATION SYSTEM. CONTACT RHFD FOR MORE INFORMATION REGARDING THIS EQUIPMENT.

250' RADIUS FIRE

(TYPICAL)

SINGLE FAMILY

HYDRANT COVERAGE

SINGLE FAMILY

SINGLE FAMILY

SINGLE

FAMILY

- WETLAND BOUNDARY

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

CITY OF ROCHESTER HILLS

HYDRANT PRESSURE TEST

Location: Auburn Rd @ Angara Calculations Performed By: Wagne Rubet

HYDRANT FLOW TEST

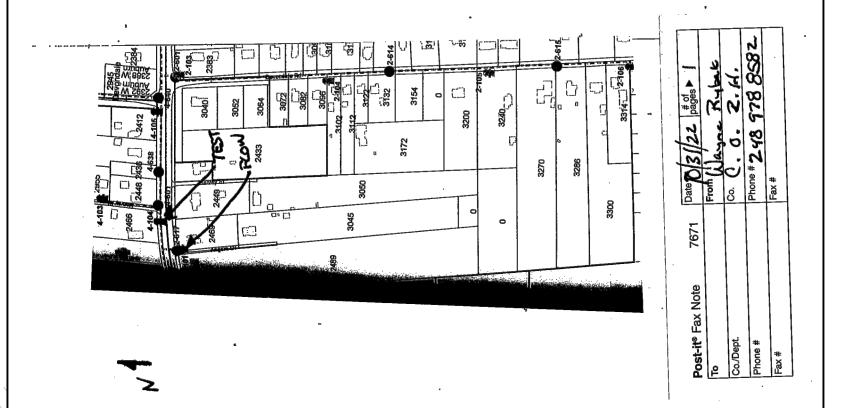
Number of Hydranta Flowing: Number of Outlets Open: Size of Outlet, D (inches): Friction Loss Coefficient, od: Static Pressure, P_s (psi): Residual Pressure, Pr (psi): Pito Pressure, Pp (psi): ___Residual Flow, Qr (GPM);-

—Q; = 29:830dD²(Pp)**#Outlets Fire Flow at 20 psi, Q_f (GPM): Supply Main Size (plio hydrant):

 $Q_f = Q_f[(P_s - 20) / (P_s - P_s)]^{0.64}$

Supply Main Size (static hydrant):

Drawing of Flow Test Site (include location of flow & test hydrant):



DIMENSIONING NOTE

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

MULTIFAMILY					
BUILDING/UNIT	TOTAL SF				
ROWHOUSE STYLE CO	ONDOS				
TOP 2 FLOORS (LIVING)	11,097				
(BASEMENT)	7,347				
APARTMENT BUILDII	NGS				
A (TOP 2 FLOORS - LIVING)	11,792				
A (BASEMENT)	5,896				
B (TOP 2 FLOORS)	11,792				
B (BASEMENT)	5,896				
C (TOP 2 FLOORS)	11,792				
C (BASEMENT)	5,896				
D (TOP 2 FLOORS)	11,792				
D (BASEMENT)	5,896				
E (TOP 2 FLOORS)	11,792				
E (BASEMENT)	5,896				
SINGLE FAMI	LY				
1	2,449 (GROSS)				
2	2,449 (GROSS)				
3	2,449 (GROSS)				
4	2,449 (GROSS)				
5	2,449 (GROSS)				
6	2,449 (GROSS)				
7	2,449 (GROSS)				
8	2,449 (GROSS)				
9	2,449 (GROSS)				

BUILDING SQUARE FOOTAGE

MULTIFAMIL`	Y
BUILDING/UNIT	TOTAL S
ROWHOUSE STYLE CO	ONDOS
TOP 2 FLOORS (LIVING)	11,097
(BASEMENT)	7,347
APARTMENT BUILDI	NGS
A (TOP 2 FLOORS - LIVING)	11,792
A (BASEMENT)	5,896
B (TOP 2 FLOORS)	11,792
B (BASEMENT)	5,896
C (TOP 2 FLOORS)	11,792
C (BASEMENT)	5,896
D (TOP 2 FLOORS)	11,792
D (BASEMENT)	5,896
E (TOP 2 FLOORS)	11,792
E (BASEMENT)	5,896
SINGLE FAMI	LY
1	2,449 (GROS
2	2,449 (GROS
3	2,449 (GROS
4	2,449 (GROS
5	2,449 (GROS
6	2,449 (GROS
7	2,449 (GROS
8	2,449 (GROS
9	2,449 (GROS

& ENGINEERING SOLUTIONS

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

SMALL BUSINESS (SDVOSB)

KEVIN C. MCDEVITT ENGINEER 6201043260

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www.missdig.org

CLIENT:

AUBURN ANGARA OAKS, LLC

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

PROTECTION

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051 SCALE: 1" = 50"REICHERT DRAWN BY: MN DESIGN BY: KM

C-2.1

146 FT FIRE ACCESS ROUTE

ACCESS ROUTE

CHECK BY: AP

MICHIGAN 48836 (OFFICE) 517-223-3512 MONUMENTENGINEERING.COM SERVICE DISABLED VETERAN OWNED SMALL BUSINESS (SDVOSB)

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

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Michigan's
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 EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF C O N S T R U C T I O N .

Call MISS DIG

CLIENT :

AUBURN ANGARA
OAKS, LLC

14496 N SHELDON RD
SUITE 230

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

ANGARA OAKS

CODE ANALYSIS
AUBURN ANGARA OAK

DATE 09/13/2023 01/22/2024 ADOT 03/14/2024 03/28/2024 05/16/2024 3S 07/24/2024

BMIT TO MDOT

ED SITE PLAN SUBMITTAL

ED SITE PLAN PER CITY AND MDOT

ED SITE PLAN PER MDOT

MINARY SITE PLAN TO CITY

ED SITE PLAN WETLAND FLAGS

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

Auburn Anagra Oaks Development - Single Family Style homes

Project Address:

3046 Anagra Drive

Description of Work:

2013 ASHRAE-2013

Rochester Hills, Michigan 48309

Reference Standards:
2015 Michigan Residential Code
2015 International Energy Code

2015 International Plumbing Code

2013 NFPA 72 - Fire Alarm Code

2015 International Fire Code

Proposed new single family detached homes.

2015 International & Michigan Mechanical Code

2013 NFPA 13, 13D, 13R - Fire Sprinkler Systems

2009 ICC/ANSI A117.1 and Michigan Barrier Free Design Law

BUILDING CODE ANALYSIS - SINGLE FAMILY HOMES

Revise codes to current codes:

2021 Michigan Plumbing Code
2021 Michigan Mechanical Code
2023 NEC

2023 NEC

BUILDING CODE ANALYSIS - FARM STAND BUILDING

Code Analysis summary, tagged to Planning F	Review comments	s. See Architectur	ral			
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, residiential apartment (c	condominium) buil	ding.				
Reference Standards:						
	SI A117.1 and Mic onal Fire Code	chigan Barrier Fre	ee Design Law (2009) (2015)			
3 ,	3 - Fire Sprinkler	Systems	(2013)			
` ,	2 - Fire Alarm Coo		(2013)			
Michigan Plumbing Code (2018) Michigan	n Electrical Code	(IEC + Part 8 Sta	te amendments) (2017)			
Residential (Primary use - dwelling units/ accessorage (Low-hazard storage / parking garage		Use Group R Use Group S				
0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
			on between S and R bliant sprinkler system)			
Type of Construction: 5B - (2) stories	above grade w/ (1) story below gra	ade garage			
ALLOWABLE HEIGHT and BUILDING AREA	S (per TABLES 5	04.3, 504.4 & 506	3.2):			
ALLOWABLE HEIGHT:	Sprinkler sys	tom equipped*	1			
Use Group:	Height (Feet)	Sprinkler system equipped* leight (Feet) Height (Stories)				
S-2 (Parking garage) @ Type 5B constr'n	60 feet	3 stories				
R-2 (Permanent dwelling) @ Type 5B constr'n		3 stories				
ACTUAL building height in Feet/Stories	29'-11"	2 Stories				
*NFPA 13 complying with Section 903.3.1.1(and						
ALLOWABLE BUILDING AREA (per story):	u <u>NOT</u> NI PAISIN	903.3.1.2)				
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	d <u>NOT</u> NFPA13R	903.3.1.2)	•			
CHAPTER 9 Fire Protection Systems						
(903) Automatic Sprinkler System F	ully Sprinkled	Yes X N	lo			
NFPA 13 or 13R			3R			
(905) Standpipe System * (907) <mark>Alarm System</mark>		Yes N	lo X lo			
Smoke Control System Yes No X						
Fire Control Room Yes No X * highest floor is 21'-4" = less than 30' above lowest fire vehicle access						
Separation of multiple buildings on site per Se						
Exterior Rating based on Fire S		ce per Table 602				
Fire Sep'n Dist. (Notes			
North 10' or more	<u> </u>	n/a				
East 10' or more South 10' or more	0 hr. 0 hr.	n/a n/a				
West 10' or more	0 hr.	n/a				
-						

BUILDING CODE ANALYSIS - MULTIFAMILY BUILDINGS

	ysis summary, ta for complete inf		Review comments	s. See Architectu	<u>ıral</u>
3046 Anag	agra Oaks Deve ra Drive Hills, Michigan 4	•	e Sales Market Bu	ilding and Greer	nhouse.
		arket building for reenhouse for pro	fresh produce sale duce production.	es	
Michigan E Internatona ASHRAE 9 Michigan M	Standards: Building Code al Energy Code 90.1 Mechnical Code Plumbing Code	(2015) Internat (2013) NFPA (2015) NFPA	ISI A117.1 and Mid tional Fire Code 13 - Fire Sprinkler 72 - Fire Alarm Cod an Electrical Code	Systems de	(201 (201 (201
		pace for produce use for production	sales) n of fresh produce)		Jse Group <u>M</u> Jse Group <u>U</u>
<u>Unseparat</u>	ed Mixed Use:	Per Sect. 508 entire building	.3, most restrictive	allowances sha	ll apply to the
Type of Co	onstruction:	5B - (1) storie	s above grade on s	slab-on-grade	
ALLOWAE	BLE HEIGHT and	BUILDING AREA	AS (per TABLES 5	04.3, 504.4 & 50	06.2):
ALLOWAE	BLE HEIGHT:		NOT apripklar a	watam aguinnad	*
Use Group	,		Height (Feet)	ystem equipped Height (Stories	=
	tile) - Type 5B co	netr'n*	40 feet	1 stories	<u>/</u>
<u> </u>	ouse) - Type 5B co		40 feet	2 stories	+
· ` · · · · · · · · · · · · · · · · · ·	uilding height in		17-8 1/2"	1 Story	1
		MARY (per story)	*		 d, per Section 903.2
		(per story)	· ·		·. ¬
Floor (Use	. ,	4 *	Max. Allowed (sf)		4
<u> </u>	tile) - Type 5B co		9,000	476	_
	ouse) - Type 5B		5,500	801	
TOTAL AC	TUAL BLDG. AI	REA (unseparated	<u>'l</u>	1,277 system required	」 d, per Section 903.2
?)	NFPA 13 or 905) Standpipe 9 907) Alarm Syste	Sprinkler System I 13R System * em trol System	Fully Sprinkled	13 Yes Yes Yes	No <u>X</u> 13R <u>n/a</u> No <u>X</u> No <u>X</u> No <u>X</u> No <u>X</u>
Separatior	of multiple build	ings on site per S	ect. 503.1.2, 602		
·	Exterior Rati	ng based on Fire	Separation Distand	ce per Table 602	2
	North East	Fire Sep'n Dist. 10' or more 10' or more	(ft) Req'd Rating 0 hr. 0 hr.	g UL Listing and n/a n/a	d Notes
	South	10' or more	<u>0</u> 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

	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							
	<u>Description of Work:</u> Proposed new 5 unit, residiential 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 Mechnical 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/ accesstorage (Low-hazard storage / parking garage	• • •	Use Group R-2 Use Group S-2					
			hour fire separation between S and R ll NFPA-13] compliant sprinkler system)					
	<u>Type of Construction:</u> 5B - (2) stories	above grade w/ (1) story below grade garage					
	ALLOWABLE HEIGHT and BUILDING AREA	S (per TABLES 50	04.3, 504.4 & 506.2):					
	ALLOWABLE HEIGHT:	Sprinkler syst	tem equipped*					
Г	Use Group:	Height (Feet)	Height (Stories)					
İ	S-2 (Parking garage) @ Type 5B constr'n	60 feet	3 stories					
ţ	R-2 (Permanent dwelling) @ Type 5B constr'n		3 stories					
-	ACTUAL building height in Feet/Stories	27'-9"	2 Stories					
L *	NFPA 13 complying with Section 903.3.1.1(and ALLOWABLE BUILDING AREA (per story):	NOT NFPA13R	903.3.1.2)					
ſ	Floor (Use Groups):	Max. Allowed* (sf)	Provided (sf)					
Ī	Basement (Garage) Level: (S-2)	40,500	4,315					
Ī	First Floor: (S-2)	21,000	6,782					
Ī	Second Floor: (R-2)	21,000	7,347					
Ī	TOTAL ACTUAL BLDG. AREA		18,444					
*	NFPA 13 complying with Section 903.3.1.1(and	NFPA13R	903.3.1.2)					
	CHAPTER 9 Fire Protection Systems							
	(903) Automatic Sprinkler System F NFPA 13 or 13R (905) Standpipe System * (907) Alarm System Smoke Control System Fire Control Room	ully Sprinkled	Yes X No					
	* highest floor is 21'-1" = less than 30)' above lowest fir						
	Separation of multiple buildings on site per Sect. 503.1.2, 602							
	Exterior Rating based on Fire S		ce per Table 602					
	Fire Sep'n Dist. (in North 10' or more East 10' or more South 10' or more		UL Listing and Notes n/a n/a					
	West 10' or more	0 hr.	n/a n/a					

WETLAND B

PROPOSED TO BE FILLED. SEE PLAN FOR	R LOCATION.		
	UTILITY C	ROSSINGS	
WETLAND	SANITARY	WATERMAIN	STORM SEWER
WETLAND A	248 LF - 8" SEWER	264 LF - 8" WATER MAIN	257 LF - 36" STORM SEWER

112 LF - 8" SEWER (DIRECTIONAL

	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	ETLAND A - DISTURBANCE 2 88,117 SF		6,120 CY (FILL) / 66 CY (CUT)			
WETLAND A - DISTURBANCE 2			<1 CY (FILL)			
WETLAND B — DISTURBANCE 1			79 CY (FILL)			
WETLAND B — DISTURBANCE 2	9,367 SF	69 SF	1 CY (CUT)			

RIGHT OF WAY LINE LEGEND

WETLAND NOTES

- 8" TO 15" RIPRAF ROCK FRAGMENTS

= 3500 PSI

(28 DAYS)

(4' MIN.)

END VIEW

EX. RIGHT OF WAY LINE/EASEMENT PR. RIGHT OF WAY LINE/EASEMENT

IMPACT LEGEND

WETLAND FILL

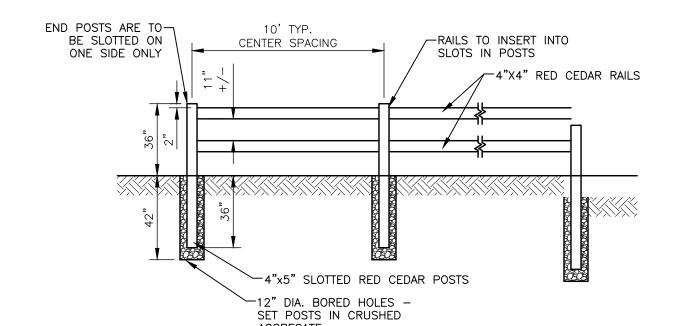


- MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY PERMIT WILL BE REQUIRED FOR FILLING IN THE THE WETLAND AS SHOWN ON THIS PLAN. OAKLAND COUNTY WATER RESOURCE COMMISSIONER PERMIT WILL BE REQUIRED FOR DISCHARGING THE STORM WATER EFFLUENT INTO THE LEUDER'S DRAIN.
- 2. POST CONSTRUCTION, A CITY-APPROVED 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.
- 3. CITY APPROVED WETLAND SOIL AND SEED MIXTURE SHALL BE USED TO RESTORE ANY IMPACTS TO WETLANDS A AND B IDENTIFIED ON THIS PLAN.
- 4. 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. 4.3. 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



|FLAGGING FOR THE NORTH

AND EAST LIMITS OF WETLAND
A RE-FLAGGED BY ASTI
ENVIRONMENTAL ON 8/1/2024 (MARKED "RH"). FLAGGING FOR WETLANDS A AND NORTH LIMITS OF WETLAND B PERFORMED

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

CHECK BY: AP

ORIGINAL ISSUE DATE:

05/19/2022

PROJECT NO: 22-051

1/2"

FIELD: REICHERT

DRAWN BY: MN

DESIGN BY: KM

SCALE: 1" = 50'

INNOVATIVE GEOSPATIAL

& ENGINEERING SOLUTIONS

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MICHIGAN 48836

(OFFICE) 517-223-3512

MONUMENTENGINEERING.COI

ERVICE DISABLED VETERAN OWNI

SMALL BUSINESS (SDVOSB)

KEVIN C. MCDEVITT

ENGINEER 6201043260

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www.missdig.org

AUBURN ANGARA OAKS, LLC

14496 N SHELDON RE SUITE 230 PLYMOUTH, MI 48170 BRUCE MICHAEL

(248) 703-4653

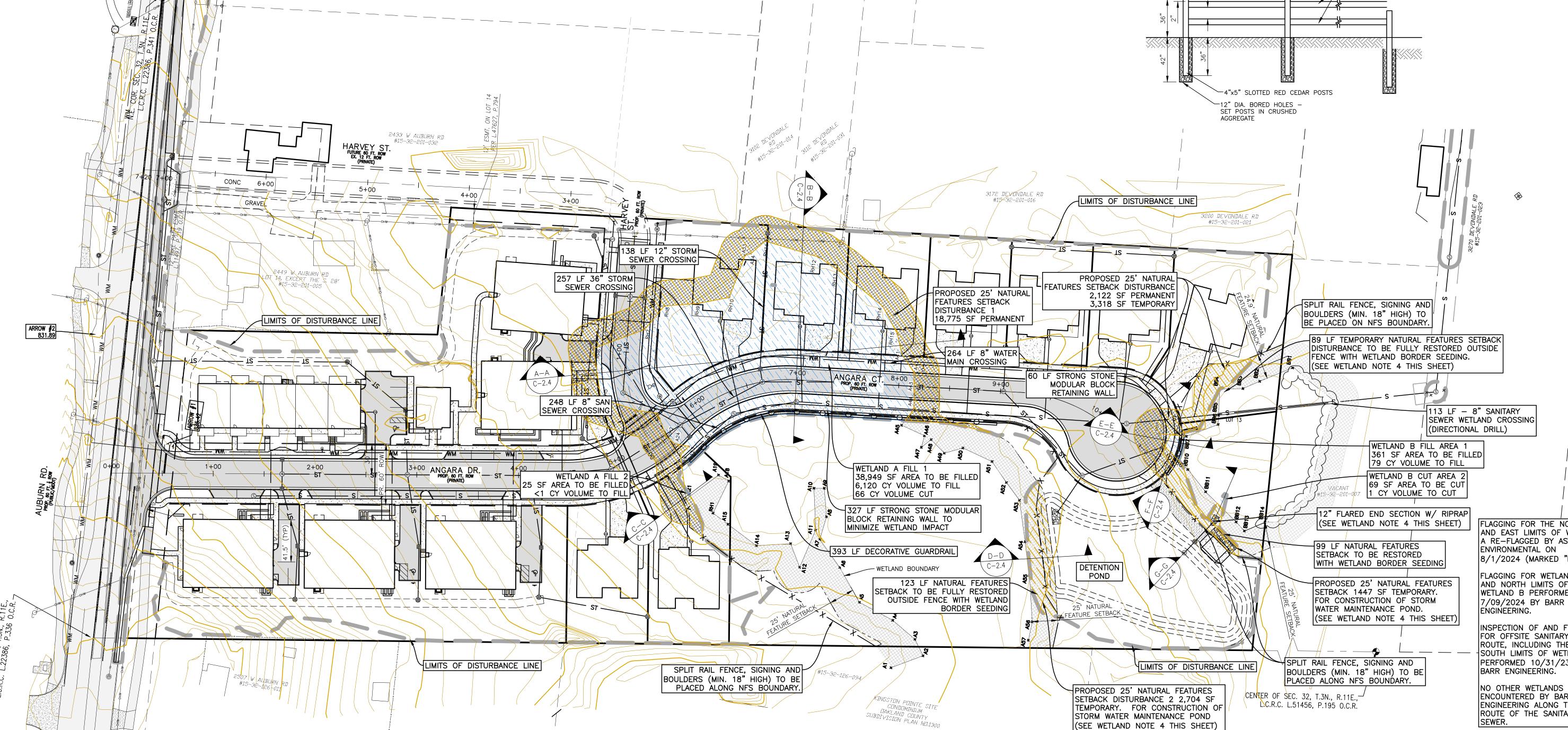
OAKS

AUBURN

Kevin C/1

One-Call

CLIENT:



END SECTION DETAIL - WITH FOOTING

PIPE BEDDING

#4 REBARS © 10" O.C.

© 10" O.C.

#4 REBAR "L"'S

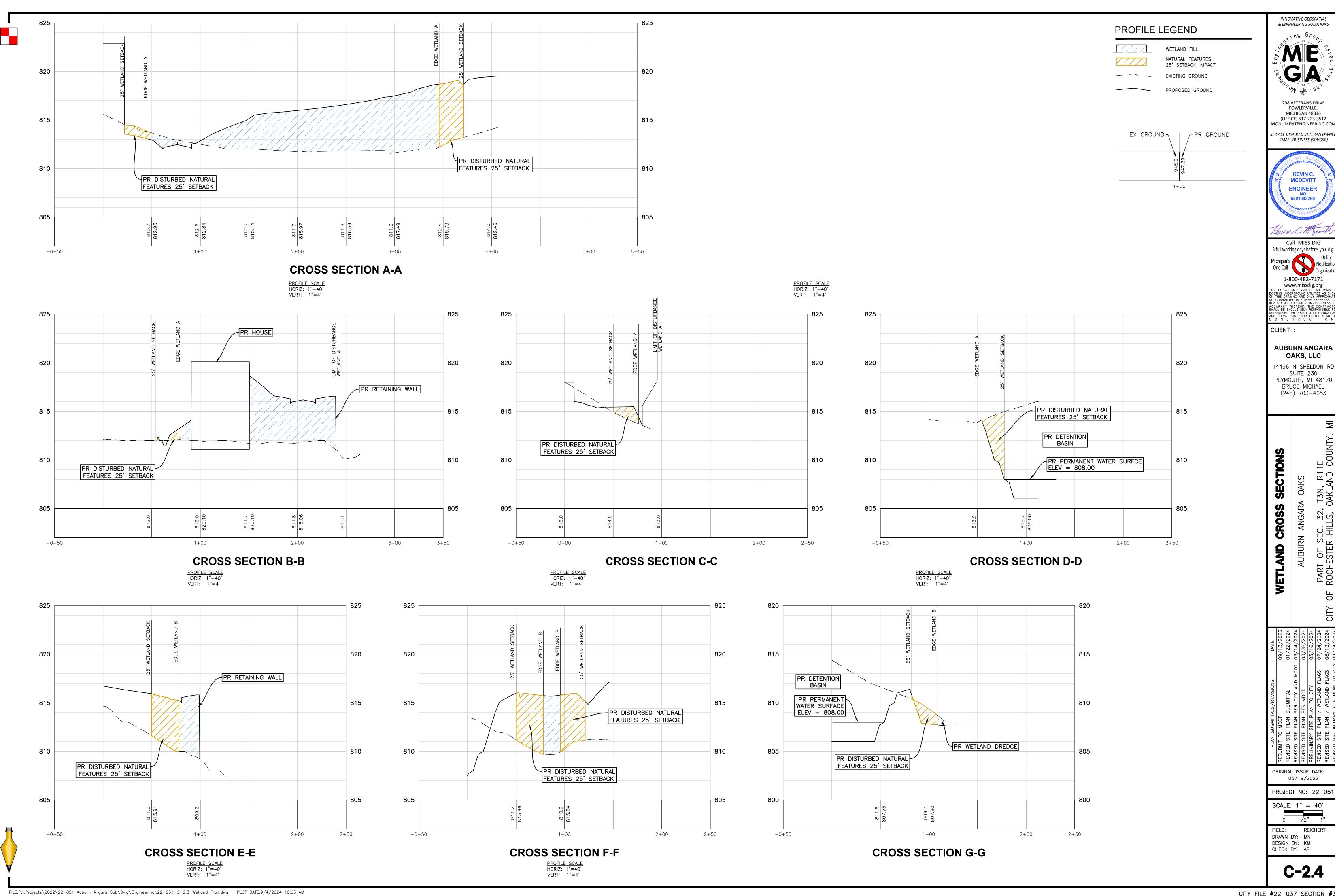
PROFILE VIEW

SECTION B-B

GEOTEXTILE

12 INCH OUTLET W/ RIPRAP

FABRIC (WOVEN) —



REICHERT

KEVIN C.

OAKS

AUBURN

UTILITY LEGEND

PROPOSED

EXISTING

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

GAS GAS GAS GAS UG GAS UG GAS, MH, VALVE, LINE MARKER

UG-ELEC UG ELEC (ELEC, CABLE, FIBER)

SANITARY SEWER NOTES

1. SANITARY "MH" SHALL HAVE EJIW 1040 FRAME WITH TYPE A COVER.

WATER NOTES

- 1. WATER MAIN TO BE INSTALLED WITH 6' EARTH COVER PER CITY OF ROCHESTER HILLS DESIGN STANDARDS.
- PROPOSED MULTIFAMILY BUILDINGS A THROUGH E ARE TO HAVE SPRINKLED FIRE SUPPRESSION. SIAMESE CONNECTION TO BE INSTALLED NEAR MAIN ENTRANCE ON SIDE FACING STREET.

SANITARY SEWER BASIS OF DESIGN

Monument Engineering Group Associates, Inc.

298 Veterans Drive, Fowlerville, MI 48836 (517) 223-3512 monumentengineering.com

Date: 3/13/2024

PROJECT NAME: Angara Drive Site Condominium
PROJECT LOCATION: City of Rochester Hills, Oakland County, Michigan
MEGA PROJECT NO.: 22-051

THE FOLLOWING CALCULATIONS UTILIZE A MODIFED OAKLAND COUNTY METHODOLOGY WHERE 1 UNIT EQUALS ONE MULTI-FAMILY RESIDENTIAL DWELLING WITH AN ASSUMED NUMBER OF PERSONS PER DWELLING OF 2.44.

NUMBER OF UNITS = 49 MF UNITS AND 9 SF UNITS = 58 UNITS
ASSUMED NUMBER OF PEOPLE PER UNIT = 2.44

ASSUMED NUMBER OF PEOPLE PER UNIT = 2.44

EQUIVALENT POPULATION = UNITS x PEOPLE PER UNIT = 58 x 2.44 = 141.52 PEOPLE

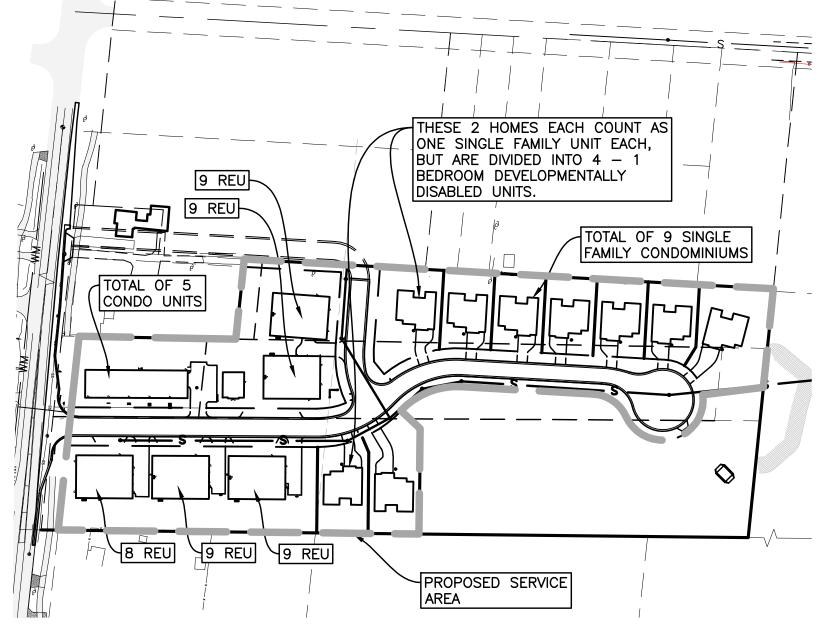
AVERGAGE DAILY FLOW = POPULATION x 100 GPDPC = 141.52 x 100 = 14152 GPD

= 0.0219 CFS

PEAKING FACTOR = $(18 + (P^0.5)/(4 + (P^0.5)) = 4.199128784$ PEAK HOUR FLOW = PEAKING FACTOR x AVERAGE DAILY FLOW = 4.1991

784 4.1991 x 14152 = 59426 GPD = 0.0920 CFS = 41.3 GPM

SANITARY SERVICE AREA MAP



& ENGINEERING SOLUTIONS

REPORT OF THE PROPERTY OF THE PROPERT

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CLIENT :

AUBURN ANGARA OAKS, LLC

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

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SITE PLAN / WETLAND FLAGS

SITE PLAN / WETLAND FLAGS

PROJECT NO: 22-051

SCALE: 1" = 30'

0 1/2" 1"

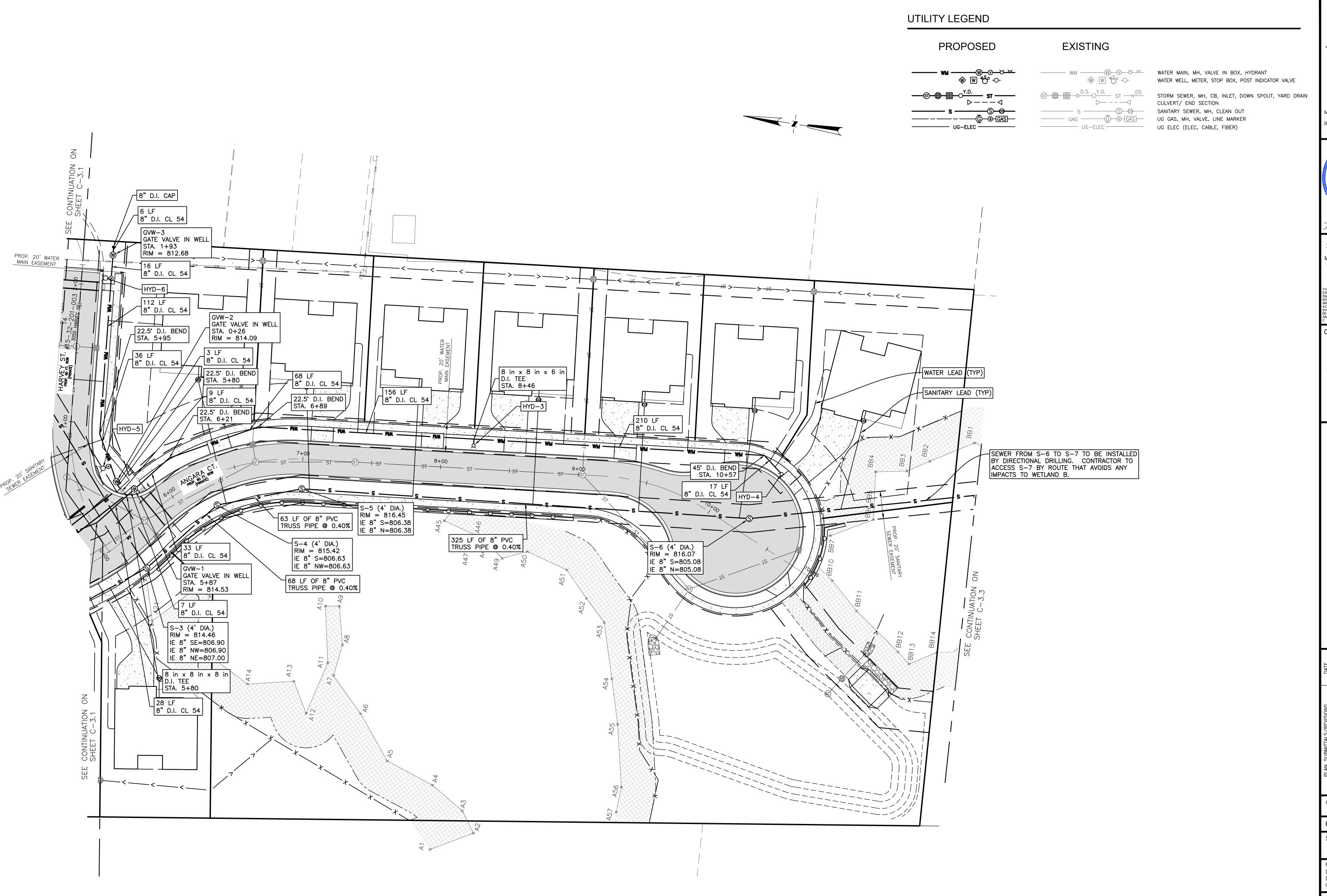
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> RA OAKS , T3N, R11E OAKLAND COUNTY, N

AUBURN ANGARA (PART OF SEC. 32, T31

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ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051SCALE: 1" = 30'

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FIELD: REICHERT

DRAWN BY: MN

DESIGN BY: KM

CHECK BY: AP

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UTILITY LEGEND

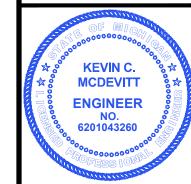
PROPOSED

EXISTING

SANITARY SEWER, MH, CLEAN OUT UG-ELEC UG ELEC (ELEC, CABLE, FIBER)

WATER MAIN, MH, VALVE IN BOX, HYDRANT WATER WELL, METER, STOP BOX, POST INDICATOR VALVE

CULVERT/ END SECTION



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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-3.3

UTILITY LEGEND

PROPOSED

EXISTING

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)

STORM SEWER NOTES

- 1. "IN" & "CB" STRUCTURES SHALL HAVE EJIW 1040 FRAME WITH TYPE M1 GRATE.
- 2. CURB "IN" & "CB" STRUCTURES SHALL HAVE EJIW 7065 FRAME WITH TYPE M1 GRATE.
- 3. STORM "MH" STRUCTURES SHALL HAVE EJIW 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.

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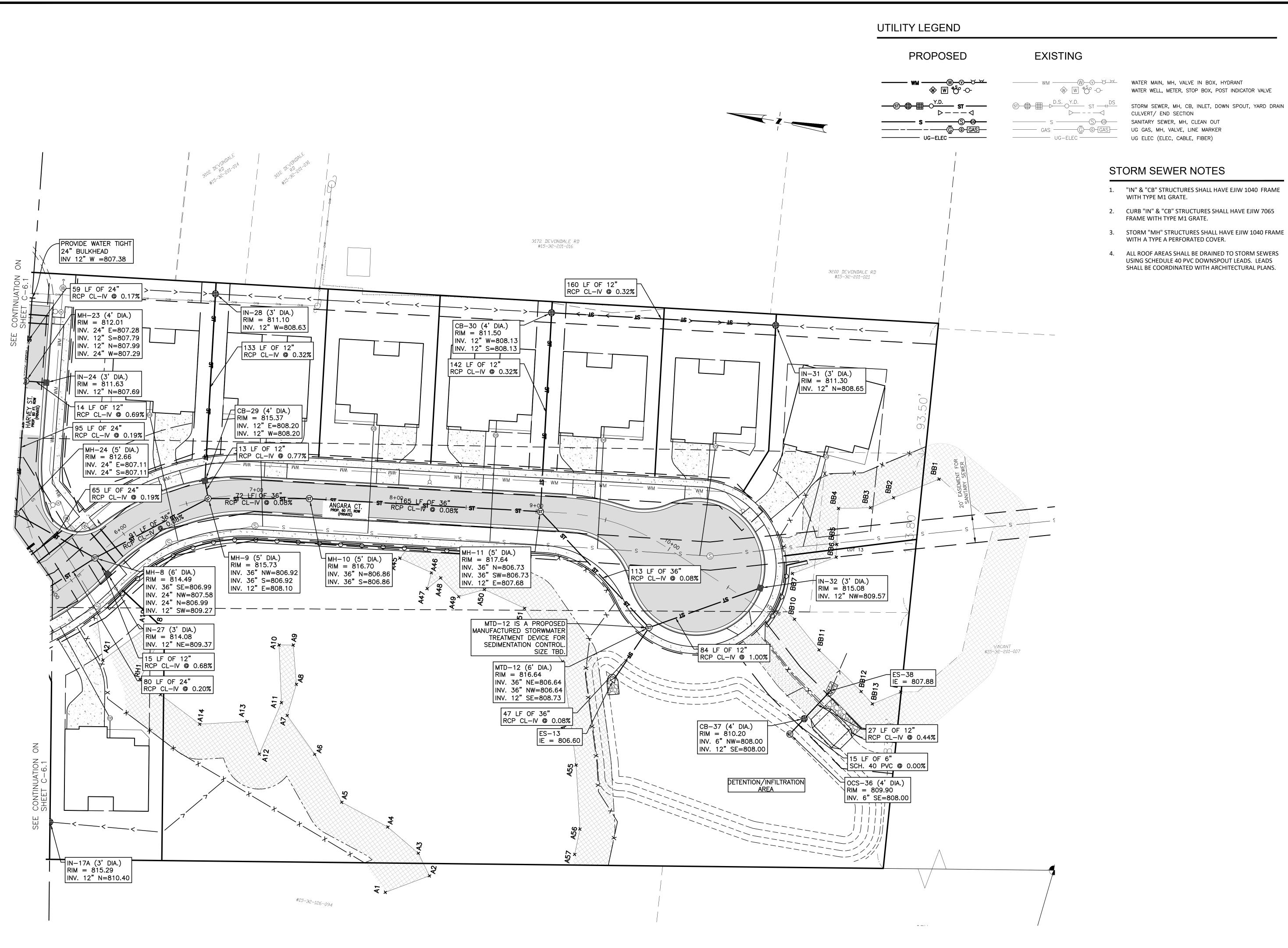
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PROJECT NO: 22-051

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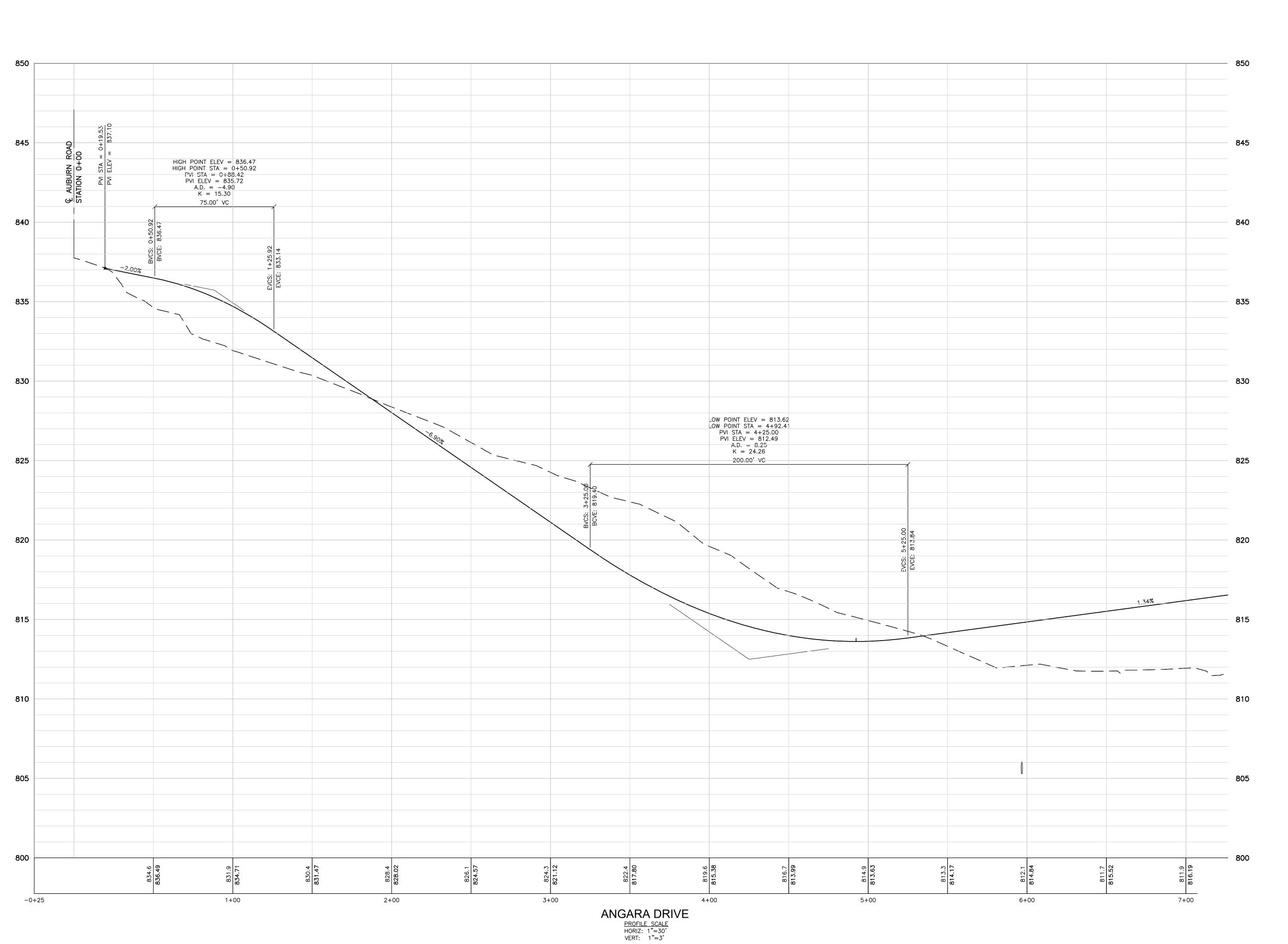
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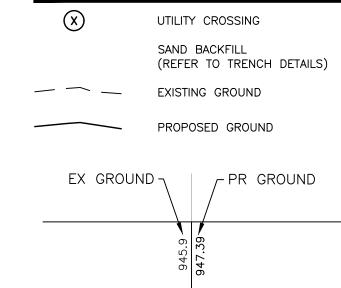
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PROFILE LEGEND



NOTES

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

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RT OF SEC. 32, T3N, R1

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ORIGINAL ISSUE DATE:

05/19/2022 PROJECT NO: 22-051

SCALE: SEE ABOVE

0 1/2" 1"

FIELD: REICHERT

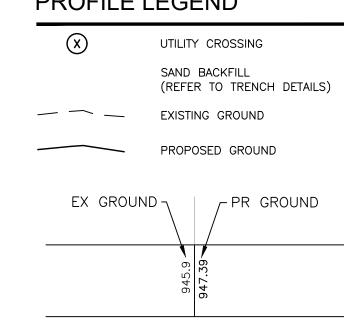
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PROFILE LEGEND



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> **KEVIN C. MCDEVITT ENGINEER**

NO. 6201043260

CLIENT :

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STORM

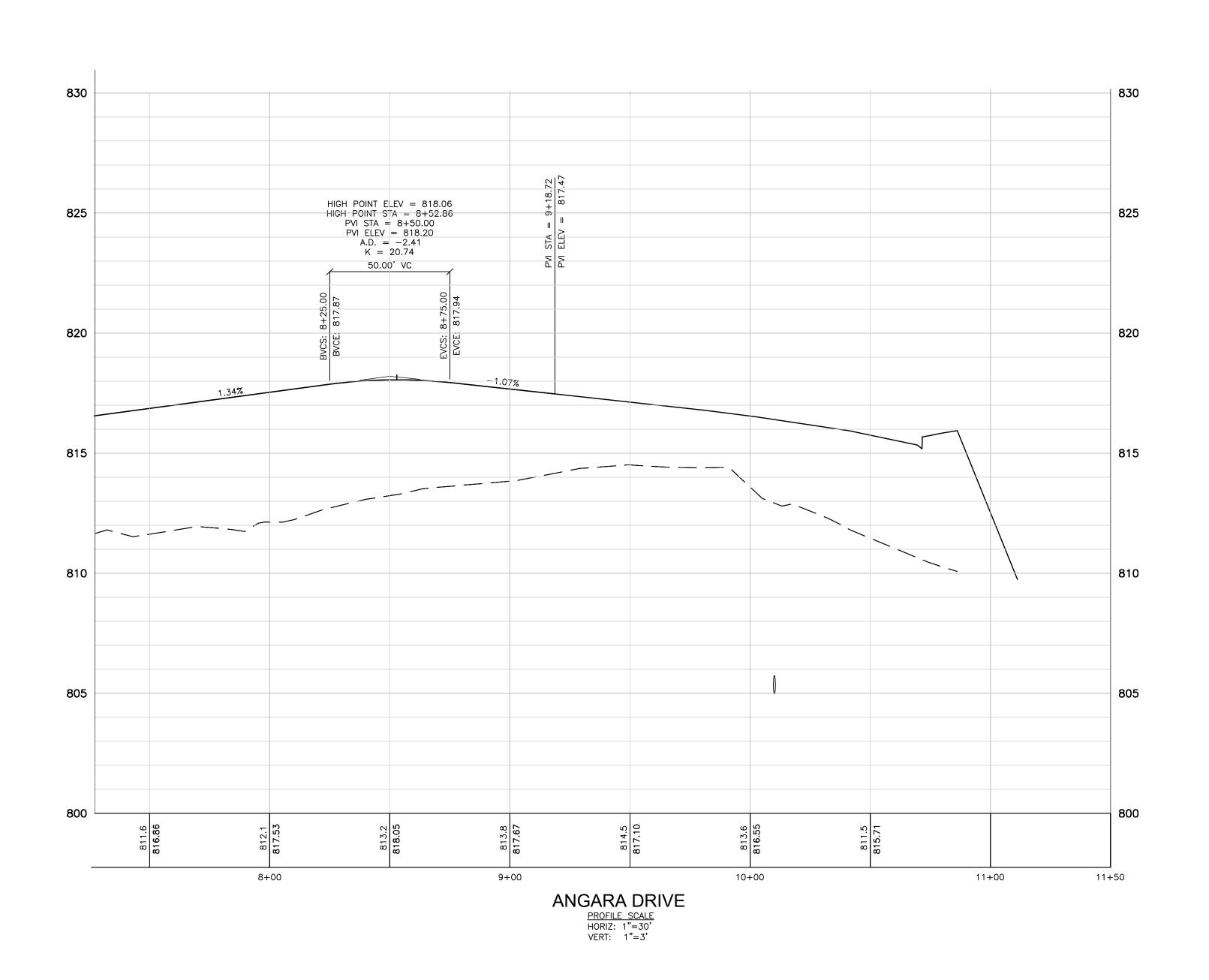
ORIGINAL ISSUE DATE: 05/19/2022

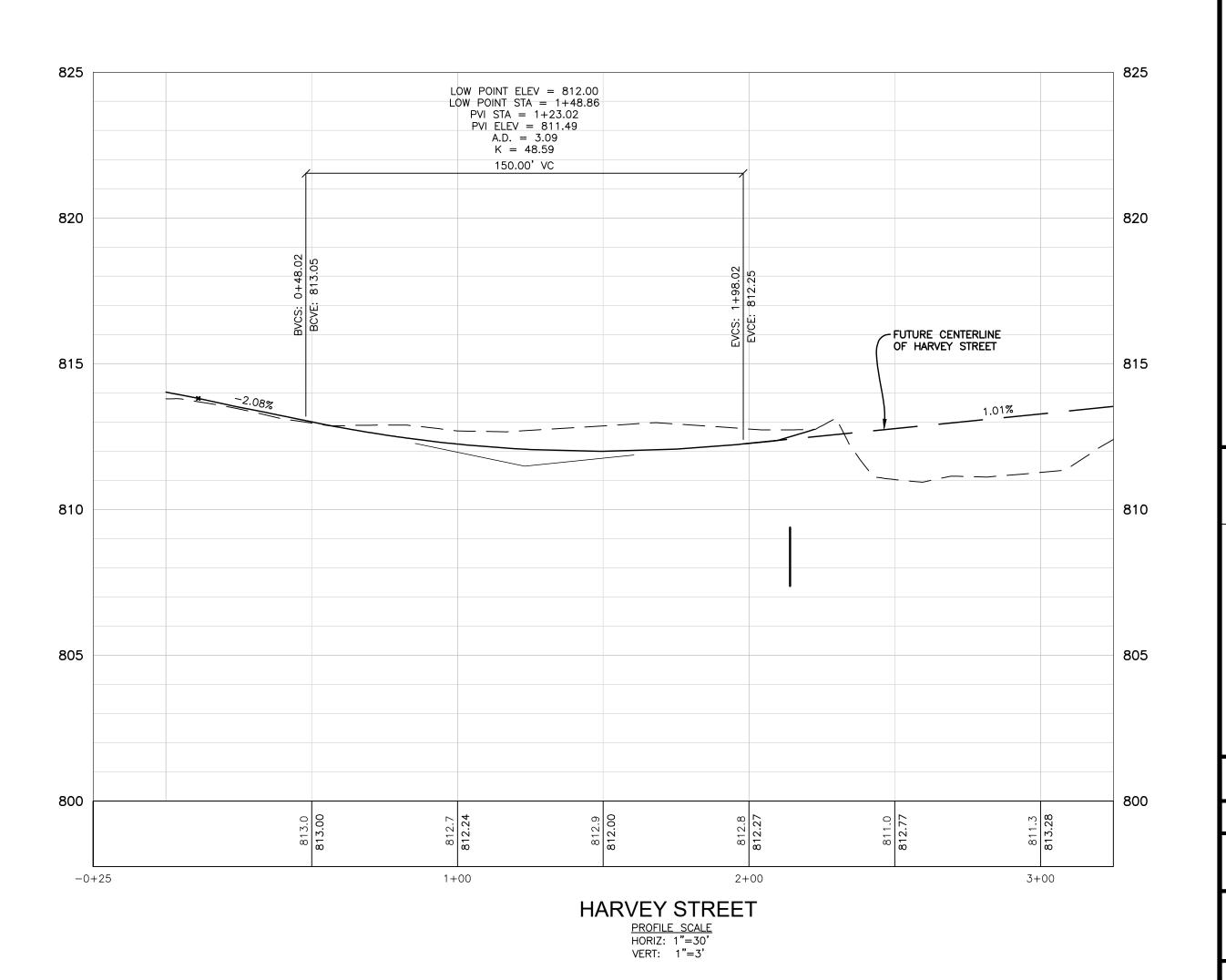
PROJECT NO: 22-051 SCALE: SEE ABOVE

FIELD: REICHERT

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GRADING LEGEND

PROPOSED TOP OF PAVEMENT GRADE 940.00 SW PROPOSED SIDEWALK GRADE ×____940.00 FG PROPOSED FINISH GRADE ×___940.00 TC PROPOSED TOP OF CURB GRADE ×___940.00 GP PROPOSED GUTTER PAN GRADE 940.00 TW PROPOSED TOP OF WALL GRADE 940.00 BW PROPOSED BOTTOM OF WALL GRADE 940.0 MA MATCH EXISTING GRADE ×___940.0_FFE PROPOSED FINISH FLOOR GRADE 940.00 RIM PROPOSED RIM GRADE 940.00 ADJ-RIM ADJUSTED RIM GRADE 940.00 INV PROPOSED INVERT GRADE ADA COMPLIANT SIDEWALK RAMP 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

- ALL CURB SPOT ELEVATIONS ARE TO TOP OF BACK OF CURB, UNLESS OTHERWISE NOTED.
- 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.
- ALL SIDEWALK SHALL BE CONSTRUCTED WITH MAXIMUM 2 PERCENT CROSS SLOPE. ALL SIDEWALK CONSTRUCTED WITHIN THE RIGHT OF WAY SHALL DRAIN TOWARDS THE
- 4. ALL SIDEWALK RAMPS 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.
- 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

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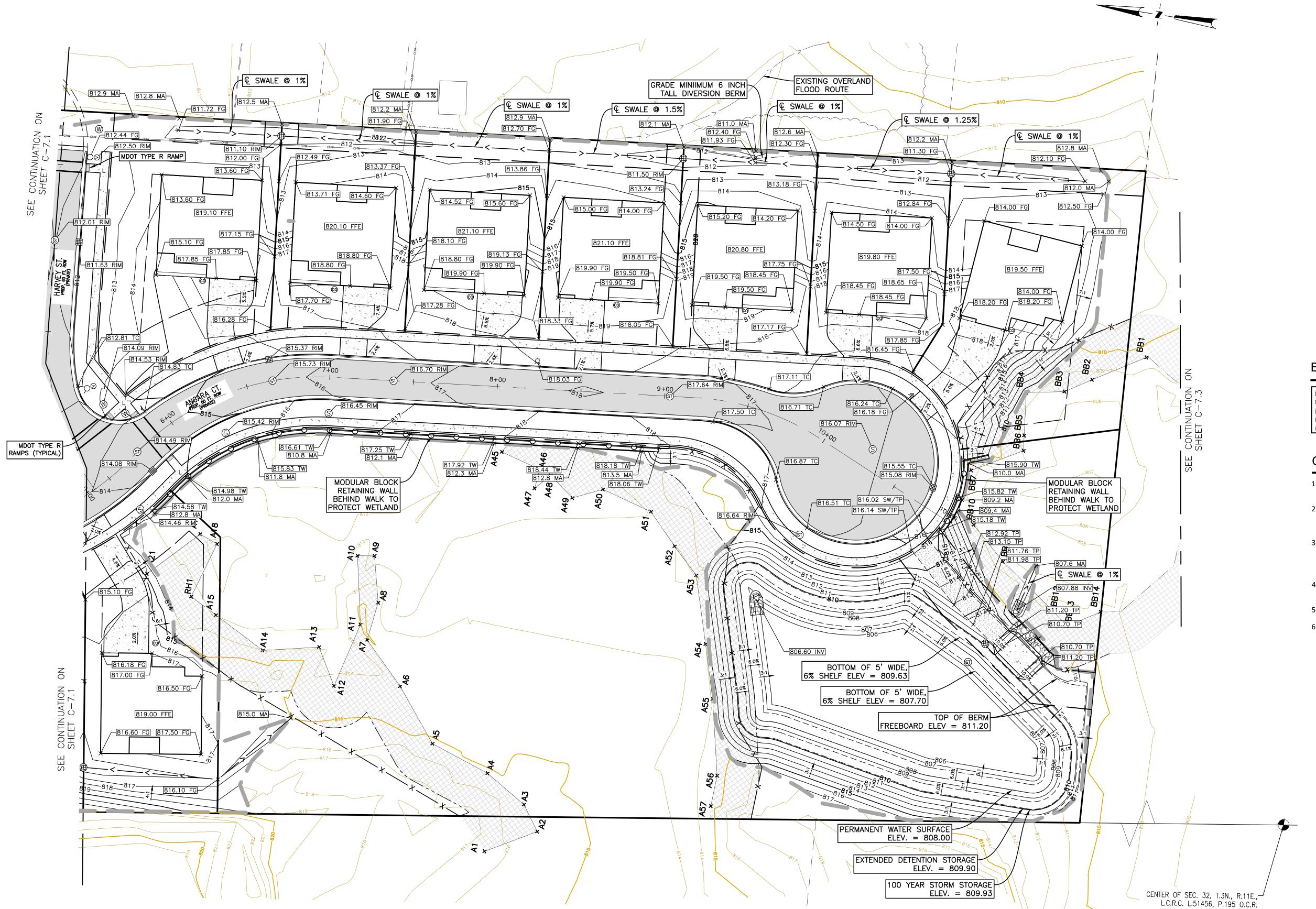
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ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051 SCALE: 1" = 30'

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

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GRADING LEGEND

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- 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.

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MICHIGAN 48836
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T3N, R11E

AUBURN ANGARA OAKS

2024 2024 2024 2024 CITY OF RC

SUBMITTAL 01/22/20
PER CITY AND MDOT 03/14/20
PER MDOT 03/28/20
PLAN TO CITY 05/16/20
/ WETLAND FLAGS 07/24/20
/ WETLAND FLAGS 08/13/20

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LIMINARY SITE PLAN TO CITY
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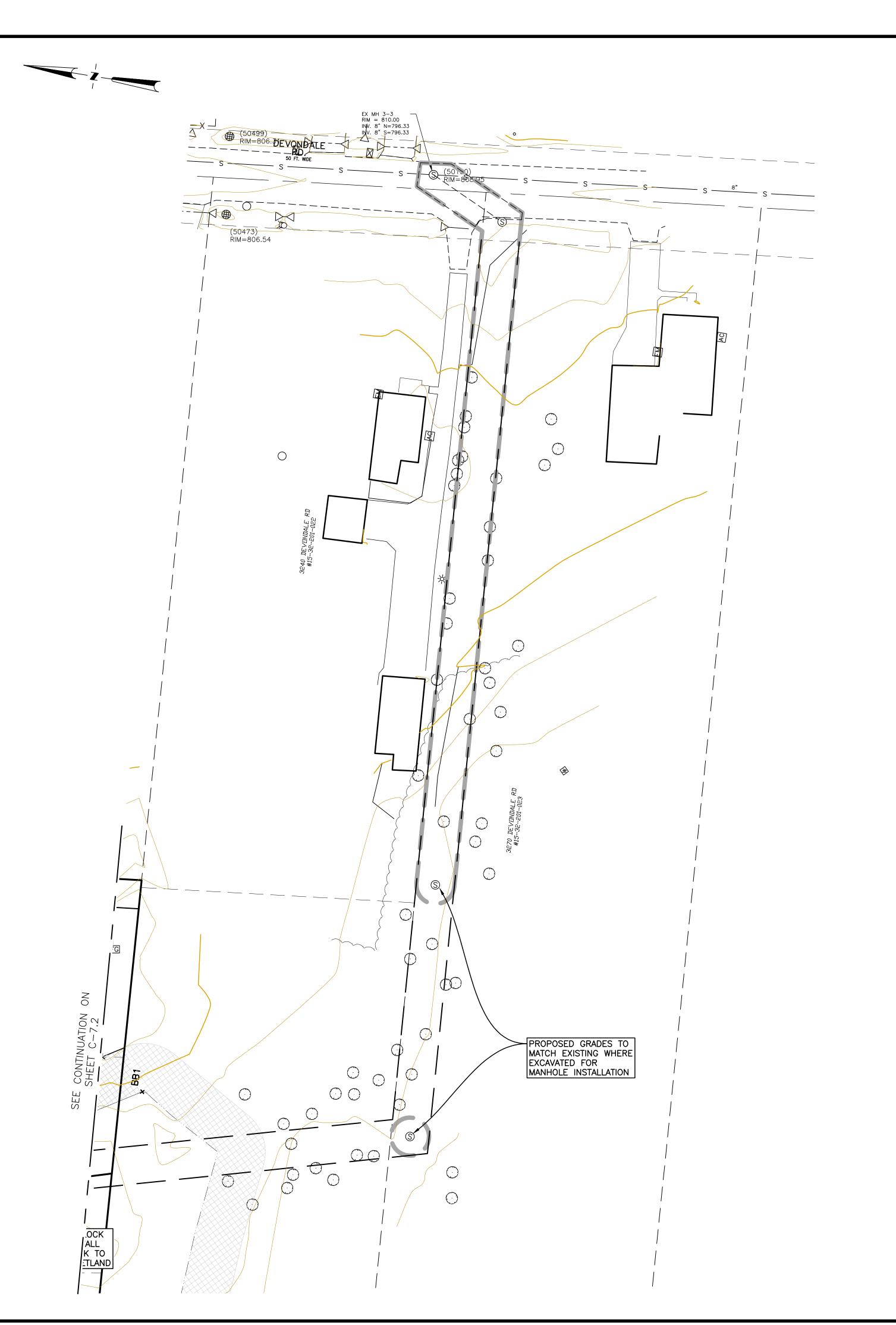
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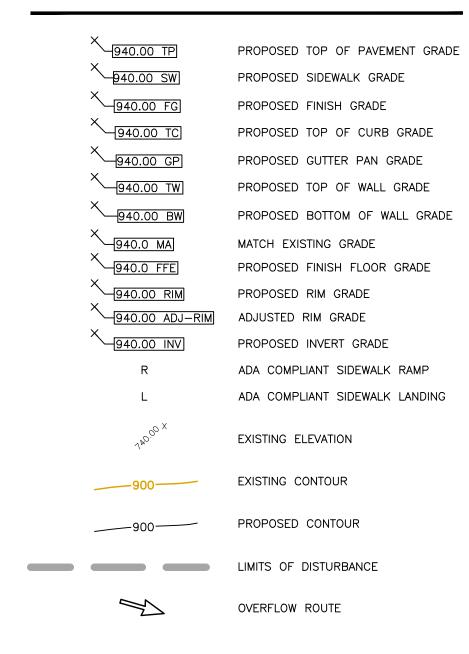
DESIGN BY: KM

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CHECK BY: AP



GRADING LEGEND



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> **KEVIN C. MCDEVITT ENGINEER** NO. 6201043260

Levin CM Ferril

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SHALL BE EXCLUSIVELY RESPONSIBLE FO
DETERMINING THE EXACT UTILITY LOCATION
AND ELEVATIONS PRIOR TO THE START C
C O N S T R U C T I O N

CLIENT:

AUBURN ANGARA OAKS, LLC

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

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051

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

C-7.3

SESC LEGEND

STABILIZED CONSTRUCTION ACCESS

RIP RAP

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

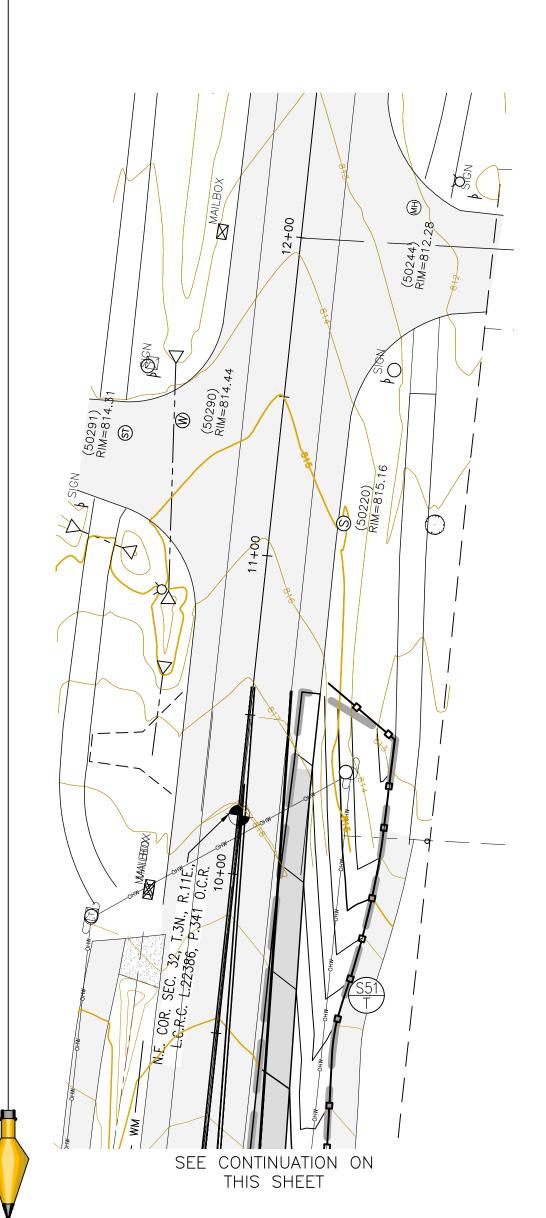
SOIL TYPES ARE ACCORDING TO THE USDA SOIL SURVEY WEB SITE (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)

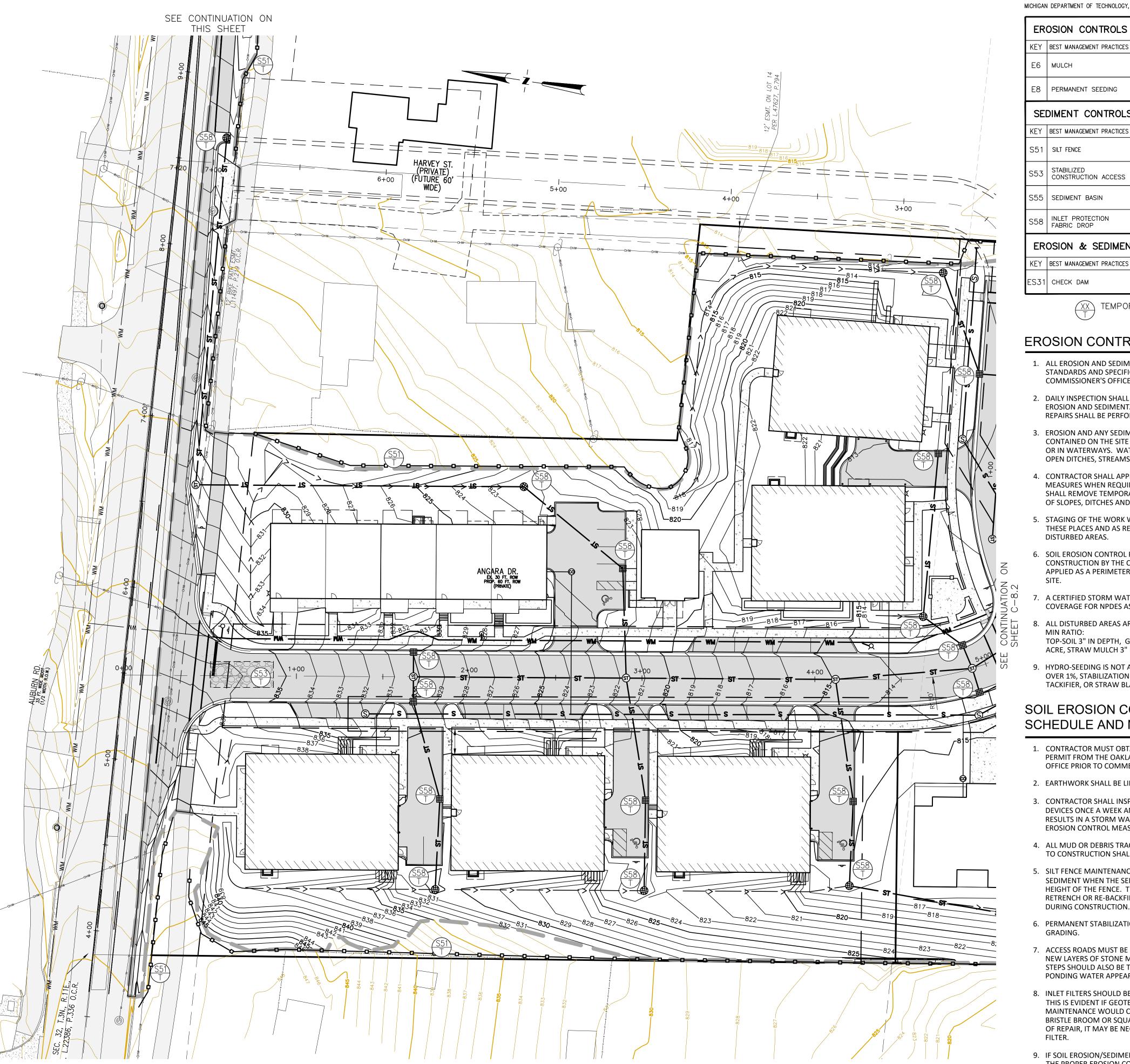
THE MAJORITY OF THE BUILDABLE AREAS OF THE SITE ARE COMPRISED OF THE FOLLOWING SOIL TYPES:

- URBAN LAND-SPINKS COMPLEX, 0 TO 8 PERCENT SLOPES
- 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

• 39: GRANBY LOAMY SAND





DTMB SOIL EROSION & SEDIMENTATION CONTROL MEASURES

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

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E6	MULCH		FOR USE IN AREAS SUBJECT TO EROSIVE SURFACE FLOWS OR SEVERE WIND OR ON NEWLY SEEDED AREAS.
E8	PERMANENT SEEDING	A TOTAL MANAGEMENT AND MANAGEMENT AN	STABILIZATION METHOD UTILIZED ON SITES WHERE EARTH CHANGE HAS BEEN COMPLETED (FINAL GRADING ATTAINED).
SE	DIMENT CONTROLS	3	
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
ER	OSION & SEDIMEN	T 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

XX TEMPORARY

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE OAKLAND COUNTY WATER RESOURCE COMMISSIONER'S OFFICE.

PERMANENT

- 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.
- 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.
- . 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
- 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.

OF SLOPES, DITCHES AND OTHER CHANGES HAS BEEN ACCOMPLISHED.

- 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
- 7. A CERTIFIED STORM WATER OPERATOR WILL BE NAMED ON THE MDEQ NOTICE OF COVERAGE FOR NPDES AS REQUIRED.
- ALL DISTURBED AREAS ARE TO BE TOP SOILED AND SEEDED WITH THE FOLLOWING 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.
- 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.
- 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.
- PERMANENT STABILIZATION MUST BE COMPLETED WITHIN 30 DAYS OF FINAL
- 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.

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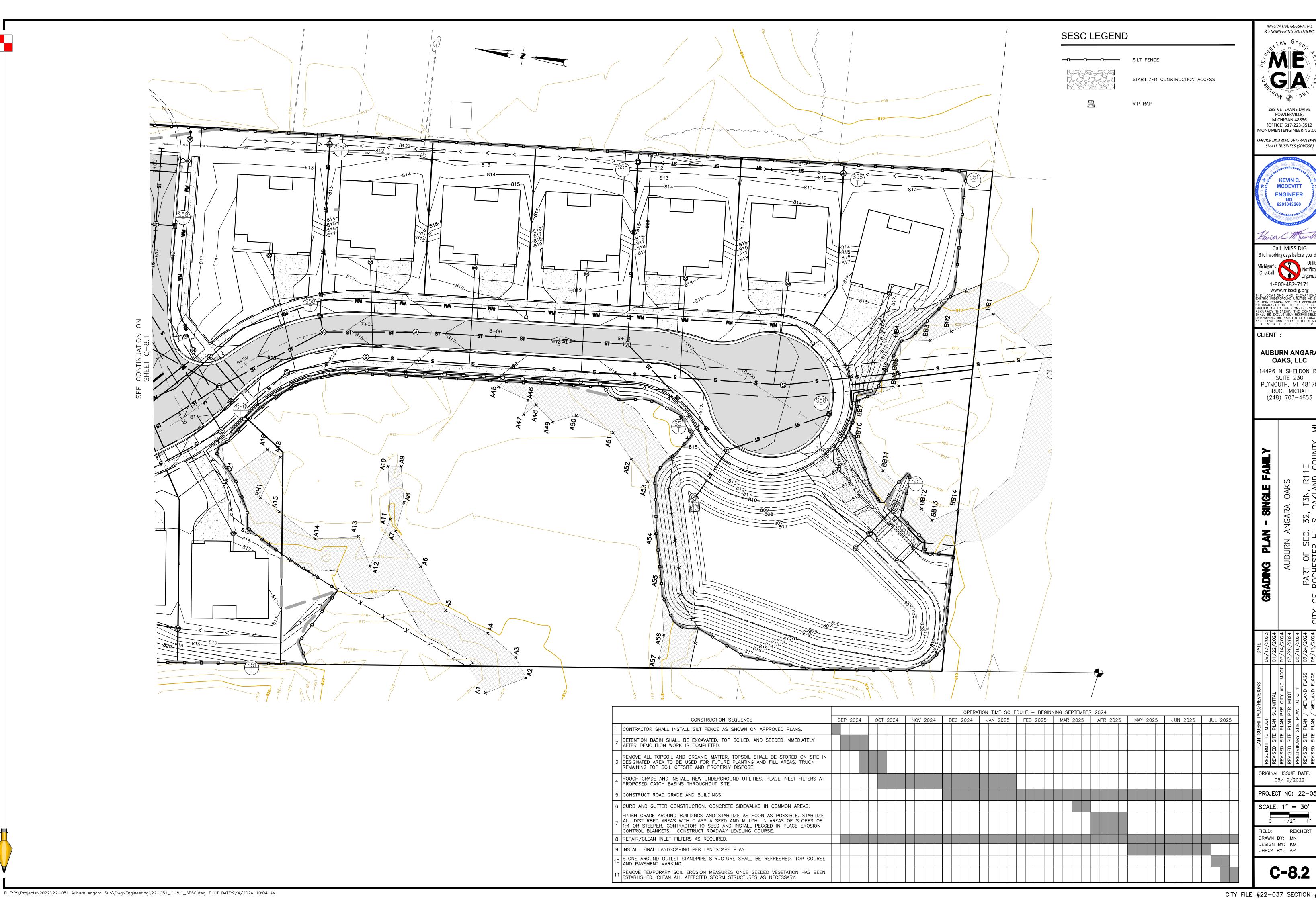
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ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051 SCALE: 1" = 30'

1/2" FIELD: REICHERT DRAWN BY: MN DESIGN BY: KM

CHECK BY: AP **C-8.1**



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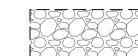
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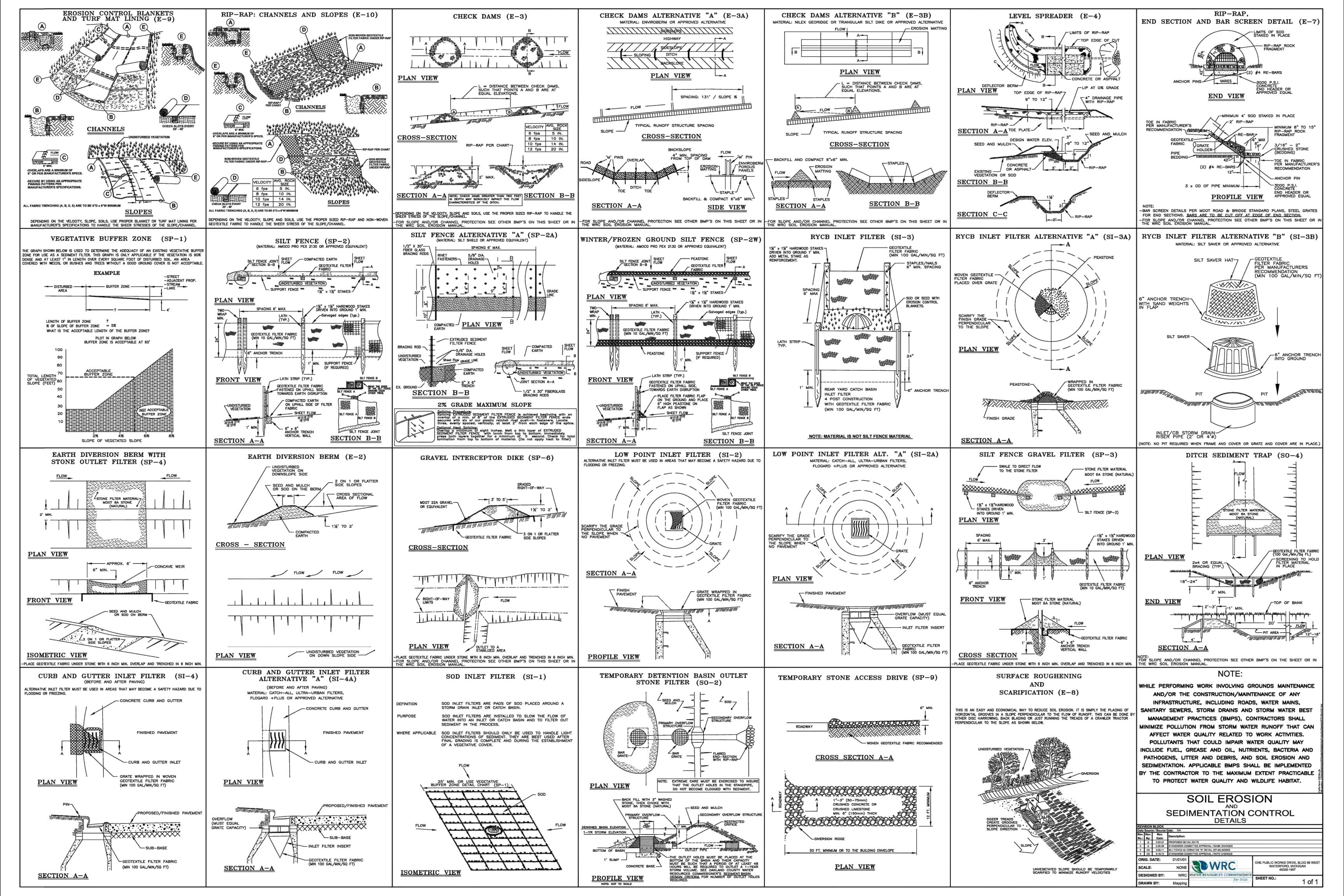
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WEIGHTED 'C' VALUE CALCULATIONS

COMPOUND RU	JNOF	F COEFFICIEN	T FOR A	REA 1 (TO I	N-1)
		AREA (SF)	AREA (AC	c) C	
OVERALL		9757	0.2	2	
CONTRIBUTING		9757	0.2	2	
FLOWING OFF		0	0.0	0	
					AXC
BUILDING		2501		0.95	2375.95
PAVEMENT		0		0.95	0
LAWN		7256		0.20	1451.2
TO ⁻	TALS	9757			3827.15
gownouwn g		$TOTAL\ A \times C$		3827.15	0.39
COMPOUND C	$=\frac{1}{CO}$	NTDIDIITINC	1DEA	9757	

	TOTALS	9757		3827.15
СОМР	$COUND C = \frac{1}{CO}$	TOTAL A × C NTRIBUTING AREA	3827.15 9757	0.39

$COMPOUND C = \frac{1}{CO}$	AREA	9757					
COMPOUND RUNOFF COEFFICIENT FOR AREA 2 (TO CB-2)							
	AREA (SF)	AREA (AC)	С				
OVERALL	6922	0.16					
CONTRIBUTING	6922	0.16					
FLOWING OFF	0	0.00					
				AXC			
BUILDING	3668		0.95	3484.6			
PAVEMENT	2240		0.95	2128			
LAWN	1014		0.20	202.8			
TOTALS	6922			5815.4			
$COMPOUND C = \frac{1}{CO}$	$TOTAL\ A \times C$ $NTRIBUTING\ A$		5815.4 6922	0.84			

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

V 0.88 AC |

DRAINAGE AREA MAP

DRAINAGE AREA 40 0.12 AC

DRAINAGE AREA 45 0.05 AC

DRAINAGE AREA 41 0.06 AC

DRAINAGE AREA 42 0.07 AC

DRAINAGE

DRAINAGE AREA 44 0.14 AC

MH-34

	AREA (SF)	AREA (AC)	С	
OVERALL	5127	0.12		
CONTRIBUTING	5127	0.12		
FLOWING OFF	0	0.00		
				AXC
BUILDING	742		0.95	704.9
PAVEMENT	2479		0.95	2355.05
LAWN	1906		0.20	381.2
TOTAL	S 5127			3441.15
COMPOUND C -	$TOTAL\ A \times$	C	3441.15	0.67
COMPOUND C = -	CONTRIBUTING	G AREA	5127	
COMPOUND RUN	OFF COEFFICIE	NT FOR ARI	EA 4 (TO II	N-14)
	AREA (SF)	AREA (AC)	С	
OVERALL	AREA (SF) 2478	AREA (AC) 0.06	С	
	, ,	, ,	С	
OVERALL CONTRIBUTING FLOWING OFF	2478	0.06	С	

BUILDING

PAVEMENT

 $COMPOUND C = \frac{1}{CONTRIBUTING AREA}$

FUTURE DEVELOPMENT AREA

MULTI-FAMILY RESIDENTIAL

ASSUME DETAINED TO

NATURAL RUNOFF RATE

0.95

0.95 1902.85

1997.85

0.81

DETAINED

DRAINAGE AREA 15 0.42 AC

DRAINAGE AREA 24 0.26 AC

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

COMPOUND RUI	NOFF COEFFICIEN	IT FOR ARE	A 5 (TO II	N-15)
	AREA (SF)	AREA (AC)	С	
OVERALL	8410	0.19		
CONTRIBUTING	8410	0.19		
FLOWING OFF	0	0.00		
				AXC
BUILDING	1982		0.95	1882.9
PAVEMENT	0		0.95	0
LAWN	6428		0.20	1285.6
TOTA	ALS 8410			3168.5
COMPOUND	$TOTAL\ A \times C$;	3168.5	0.38
COMPOUND C =	CONTRIBUTING	AREA -	8410	
COMPOUND RUI	NOFF COEFFICIEN	IT FOR ARE	A 6 (TO C	B-16)
	AREA (SF)	AREA (AC)	С	
OVED ALL	6076	0.16		

TOTALS	8410			3106.3			
$COMPOUND C = \frac{1}{CO}$	$TOTAL \ A \times C$ $NTRIBUTING \ A$	IREA -	3168.5 8410	0.38			
COMPOUND RUNOFF COEFFICIENT FOR AREA 6 (TO CB-16)							
	AREA (SF)	AREA (AC)	С				
OVERALL	6876	0.16					
CONTRIBUTING	6876	0.16					
FLOWING OFF	0	0.00					
				AXC			
BUILDING	3975		0.95	3776.25			
PAVEMENT	2271		0.95	2157.45			
LAWN _	630		0.20	126			
TOTALS	6876			6059.7			
COMPOUND C =	$TOTAL A \times C$		6059.7	0.88			
$\frac{COMFOONDC}{CO}$	NTRIBUTING A	REA	6876				

	AREA (SF)	AREA (AC)	С	
OVERALL	9812	0.23		
CONTRIBUTING	9812	0.23		
FLOWING OFF	0	0.00		
				AXC
BUILDING	1965		0.95	1866.75
PAVEMENT	0		0.95	0
LAWN	7847		0.20	1569.4
TOTALS	9812			3436.15
COMPOUND C =	$TOTAL A \times$	<u> </u>	3436.15	0.35
com	NTRIBUTING	GAREA	9812	

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

DOILDING		1303		0.55	1000.75
PAVEMENT		0		0.95	0
LAWN	_	7847		0.20	1569.4
	TOTALS	9812			3436.15
COMPOUN	$D C = \frac{1}{CC}$	$TOTAL\ A \times C$		3436.15	0.35
	LO	NTRIBUTING	AREA	9812	
COMPOUNI	D RUNOF	F COEFFICIEN	IT FOR ARI	EA 8 (TO C	B-18)
		AREA (SF)	AREA (AC)	С	
OVERALL		8289	0.19		
CONTRIBUTING	ŝ	8289	0.19		
FLOWING OFF		0	0.00		
					AXC
BUILDING		2970		0.95	2821.5
PAVEMENT		1781		0.95	1691.95
LAWN	_	3538		0.20	707.6
	TOTALS	8289			5221.05

0.63

ES-13 DRAINAGE

INFILTRATION TRENCH 7 OVERFLOWING TO POND

0.69 AC

 $COMPOUND C = \frac{1}{CONTRIBUTING AREA}$

MH-12 TO BE MECHANICAL SEDIMENTATION CONTROL

EXISTING WETLAND AREA
OVER-FLOWS TO POND +
PASS THROUGH OVERFLOW +

STRUCTURE. SIZE TBD.

	AREA (SF)	AREA (AC)	С		
OVERALL	15981	0.37			
CONTRIBUTING	15981	0.37			
FLOWING OFF	0	0.00			
				AXC	
BUILDING	1688		0.95	1603.6	
PAVEMENT	9549		0.95	9071.55	
LAWN	4744		0.20	948.8	
TOTALS	15981			11623.95	
$COMPOUND C = \frac{1}{100}$	$TOTAL\ A \times C$	C	11623.95	0.73	
$COMPOUND C = \frac{1}{CO}$	NTRIBUTING	AREA	15981		
COMPOUND RUNOFF COEFFICIENT FOR AREA 10 (TO IN-20)					
	AREA (SF)	AREA (AC)			
OVERALL	23401	0.54			

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

$COMPOUND C = \frac{1}{C}$	ONTRIBUTING	AREA	15981	
COMPOUND RUNO	FF COEFFICIEN	IT FOR ARE	EA 10 (TO	IN-20)
	AREA (SF)	AREA (AC)		
OVERALL	23401	0.54		
CONTRIBUTING	23401	0.54		
FLOWING OFF	0	0.00		
			С	AXC
BUILDING	3440		0.95	3268
PAVEMENT	13324		0.95	12657.8
LAWN _	6637		0.20	1327.4
TOTALS	23401			17253.2
COMPOUND C	$TOTAL\ A \times$	С	17253.2	0.74
$COMPOUND C = \frac{1}{C}$	ONTRIBUTING	AREA	23401	

	COMPOUND RUNOFF COEFFICIENT FOR AREA 11 (TO IN-21)						
			AREA (SF)	AREA (AC)			
	OVERALL		15653	0.36			
	CONTRIBUTIN	IG	15653	0.36			
	FLOWING OF	F	0	0.00			
					С	AXC	
.6	BUILDING		2683		0.95	2548.85	
55	PAVEMENT		712		0.95	676.4	
3.8	LAWN		12258		0.20	2451.6	
95		TOTALS	15653			5676.85	

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SUITE 230

PLYMOUTH, MI 48170

BRUCE MICHAEL

(248) 703-4653

CLIENT:

DRAINAGE

TOTALS	15653		56/6.85
COMPOUND C = -	$TOTAL A \times C$	5676.85	0.36
$COMPOUND C = \frac{1}{COMPOUND}$	ONTRIBUTING AREA	15653	

COMPOUND RUNOF	F COEFFICIENT	FOR ARE	A 12 (TO	IN-25)
	AREA (SF)	AREA (AC)	С	
OVERALL	9243	0.21		
CONTRIBUTING	9243	0.21		
FLOWING OFF	0	0.00		
				AXC
BUILDING	5146		0.95	4888.
PAVEMENT	1380		0.95	131
LAWN	2717		0.20	543.
TOTALS	9243			6743.
$COMPOUND C = \frac{1}{CON}$	TOTAL $A \times C$	REA –	6743.1 9243	0.7

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

	AREA (SF)	AREA (AC)	С	
OVERALL	2400	0.06		
CONTRIBUTING	2400	0.06		
FLOWING OFF	0	0.00		
				AXC
BUILDING	1518		0.95	1442.1
PAVEMENT	133		0.95	126.35
LAWN	749		0.20	149.8
TOTALS	2400			1718.25
COMPOUND C =	$TOTAL\ A \times$	<u>C</u>	1718.25	0.72
$\frac{com cond}{co} = \frac{co}{co}$	NTRIBUTING	G AREA	2400	

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

	AREA (SF)	AREA (A	.C) C	
OVERALL	11704	0.2	27	
CONTRIBUTING	11704	0.2	27	
FLOWING OFF	0	0.0	00	
				AXC
BUILDING	1800		0.95	1710
PAVEMENT	5780		0.95	5493
LAWN	4124		0.20	824.8
TOTALS	11704			8025.8
$COMPOUND C = \frac{1}{C}$	TOTAL A >		8025.8 11704	0.69

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

	AREA (SF)	AREA (AC)	С	
OVERALL	18410	0.42		
CONTRIBUTING	18410	0.42		
FLOWING OFF	0	0.00		
				AXC
BUILDING	1780		0.95	169
PAVEMENT	7606		0.95	7225.
LAWN	9024		0.20	1804.
TOTAL	LS 18410			10721.
COMPOUND C =	TOTAL A	< <i>C</i>	10721.5	0.5
SOM COMB C =	CONTRIBUTIN	G $AREA$	18410	

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

	AREA (SF)	AREA (AC)	С	
OVERALL	7762	0.18		
CONTRIBUTING	7762	0.18		
FLOWING OFF	0	0.00		
				AXC
BUILDING			0.95	0
PAVEMENT	4990		0.95	4740.5
LAWN	2772		0.20	554.4
TOTALS	7762			5294.9
COMPOUND C -	$TOTAL\ A \times C$		5294.9	0.68

$COMPOUND C = \frac{}{CONTRIBUTING AREA}$

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

	AREA (SF)	AREA (AC)	С	
OVERALL	15210	0.35		
CONTRIBUTING	15210	0.35		
FLOWING OFF	0	0.00		
				AXC
BUILDING	4096		0.95	3891
PAVEMENT	5197		0.95	4937.
LAWN	5917		0.20	1183
TOTALS	15210			10011.
governous g	$TOTAL\ A \times$	C	10011.75	0.
$COMPOUND C = \frac{1}{CC}$	AITTOIDITTIALC	1 ADE 4	15210	

	4096	0.95	3891.2
	5197	0.95	4937.15
_	5917	0.20	1183.4
TOTALS	15210		10011.75
$IND C = \frac{1}{CO}$	$\frac{TOTAL \ A \times C}{NTRIBUTING \ AREA}$	10011.75 15210	0.66

HATCH LEGEND

AREA TO DETENTION BASIN

+ + + + + OFF-SITE AREA (PASS THROUGH OR NOT TO BASIN)

ORIGINAL ISSUE DATE: 05/19/2022 PROJECT NO: 22-051 SCALE: 1" = 50'REICHERT

C-9.0

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

FIELD:

DRAWN BY: MN

DESIGN BY: KM CHECK BY: AP

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

	AREA (SF)	AREA (AC)	С	
OVERALL	34331	0.79		
CONTRIBUTING	34331	0.79		
FLOWING OFF	0	0.00		
				AXC
BUILDING	6583		0.95	6253.85
PAVEMENT	17328		0.95	16461.6
LAWN _	10420		0.20	2084
TOTALS	34331			24799.45
COMPOUND C = -	$TOTAL A \times C$	_	24799.45	0.72
$COMFOONDC = \frac{CC}{CC}$	NTRIBUTING A	REA	34331	

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

OVERALL 10836 0.25 CONTRIBUTING 10836 0.25	
CONTRIBUTING 10836 0.25	
FLOWING OFF 0 0.00	
AXC	
BUILDING 3124 0.95 2967.	8
PAVEMENT 0 0.95	0
LAWN 7712 0.20 1542.4	4_
TOTALS 10836 4510.3	2
$COMPOUND C = \frac{TOTAL \ A \times C}{4510.2} \qquad 0.43$	2
CONTRIBUTING AREA 10836	

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

	AREA (SF)	AREA (AC)	С		
OVERALL	16320	0.37			
CONTRIBUTING	16320	0.37			
FLOWING OFF	0	0.00			
				AXC	
BUILDING	4686		0.95	4451.7	
PAVEMENT	0		0.95	0	
LAWN	11634		0.20	2326.8	
TOTALS	16320			6778.5	
COMPOUND C = -	$TOTAL\ A \times C$	· 	6778.5	0.42	
CO	NTRIBUTING .	AREA -	16320		

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

	AREA (SF)	AREA (AC)	С	
OVERALL	10667	0.24		
CONTRIBUTING	10667	0.24		
FLOWING OFF	0	0.00		
				AXC
BUILDING	3124		0.95	2967.8
PAVEMENT	0		0.95	0
LAWN	7543		0.20	1508.6
TOTALS	10667			4476.4
COMPOUND C = -	$TOTAL\ A \times C$		4476.4	0.42
$\frac{comicond}{cc} = \frac{comicond}{cc}$	ONTRIBUTING	\overline{AREA}	10667	

COMPOUND RUNOFF COEFFICIENT FOR AREA 23 (DETENTION POND AREA)

	AREA (SF)	AREA (AC)	С	
	, ,	ANLA (AC)	C	
OVERALL	30084	0.69		
CONTRIBUTING	30084	0.69		
FLOWING OFF	0	0.00		
				AXC
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 = -	$TOTAL\ A \times$	С	20692	0.69
$COMFOUND C = \frac{CO}{CO}$	ONTRIBUTING	AREA	30084	

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

	AREA (SF)	AREA (AC)	С	
OVERALL	11144	0.26	Ū	
CONTRIBUTING	11144	0.26		
FLOWING OFF	0	0.00		
				AXC
BUILDING	3240		0.95	3078
PAVEMENT	0		0.95	0
LAWN	7904		0.20	1580.8
TOTALS	11144			4658.8
COMPOUND C =	$TOTAL\ A \times C$	<u> </u>	4658.8	0.42
$\frac{COMI \ OOND \ C}{CO}$	NTRIBUTING A	AREA	11144	

COMPOUND RUNOFF COEFFICIENT FOR AREA 25 (CB-35)

			(,
	AREA (SF)	AREA (AC)	С	
OVERALL	10898	0.25		
CONTRIBUTING	10898	0.25		
FLOWING OFF	0	0.00		
				AXC
BUILDING	3472		0.95	3298
PAVEMENT	0		0.95	
LAWN _	7426		0.20	1485
TOTALS	10898			4783
$COMPOUND C = \frac{1}{CO}$	$TOTAL \ A \times C$ $NTRIBUTING$		4783.6 10898	0.4

COMPOUND RUNOFF COEFFICIENT FOR AREA 26 (CB-36)

OVERALL CONTRIBUTING FLOWING OFF BUILDING PAVEMENT LAWN TOTALS	AREA (SF) AR 8693 8693 0 5287 3129 277 8693	EA (AC) C 0.20 0.20 0.00 0.95 0.95 0.20	A X C 5022.65 2972.55 55.4 8050.6
COMPOUND C = -	TOTAL A × C ONTRIBUTING AREA	8050.6 8693	0.93

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

	AREA (SF)	AREA (AC)	С	
OVERALL	5436	0.12		
CONTRIBUTING	0	0.00		
FLOWING OFF	5436	0.12		
				AXC
BUILDING	0		0.95	0
PAVEMENT	5436		0.95	5164.2
LAWN	0		0.20	0
TOTALS	5436			5164.2
$COMPOUND C = \frac{1}{CC}$	TOTAL A ×	_	5164.2 5436	0.95

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

	AREA (SF)	AREA (AC)	С	
OVERALL	2706	0.06		
CONTRIBUTING	0	0.00		
FLOWING OFF	2706	0.06		
				AXC
BUILDING	0		0.95	
PAVEMENT	2706		0.95	2570
LAWN	0		0.20	
TOTALS	2706			2570
COMPOUND C =	$TOTAL\ A \times C$		2570.7	0.9
$\frac{COMFOONDC-}{CO}$	NTRIBUTING A	\overline{REA}	2706	

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

		AREA (SF)	AREA (AC)	С	
OVERALL		3014	0.07		
CONTRIBUTING		0	0.00		
FLOWING OFF		3014	0.07		
					AXC
BUILDING		0		0.95	0
PAVEMENT		3014		0.95	2863.3
LAWN	_	0		0.20	0
TC	TALS	3014			2863.3
COMPOUND	, _	$TOTAL\ A \times C$		2863.3	0.95

$COMPOUND C = \frac{1}{CONTRIBUTING AREA}$ COMPOUND RUNOFF COEFFICIENT FOR AREA 43

(AUBURN ROW - IN	CLUDE IN CB-3	B - PASS T	HROUGH)	
	AREA (SF)	AREA (AC)	С	
OVERALL	8439	0.19		
CONTRIBUTING	0	0.00		
FLOWING OFF	8439	0.19		
				AXC
BUILDING	0		0.95	0
PAVEMENT	5555		0.95	5277.25
LAWN < 4%	2884		0.20	576.8
TOTALS	8439			5854.05
$COMPOUND C = \frac{1}{CO}$	$\frac{TOTAL\ A \times C}{NTRIBUTING\ A}$	IREA -	5854.05 8439	0.69

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

	AREA (SF)	AREA (AC)	С	
OVERALL	6194	0.14		
CONTRIBUTING	0	0.00		
FLOWING OFF	6194	0.14		
				AXC
BUILDING	0		0.95	0
PAVEMENT	3872		0.95	3678.4
LAWN	2322		0.20	464.4
TOTALS	6194			4142.8
COMPOUND C =	$TOTAL\ A \times C$	<i>C</i> _	4142.8	0.67
$COMFOONDC - \frac{1}{CO}$	NTRIBUTING	AREA	6194	

COMPOUND RUNOFF COEFFICIENT FOR AREA 45

(AUBURN ROW - INCLUDE IN CB-35 - PASS THROUGH)						
	AREA (SF)	AREA (AC)	С			
OVERALL	2187	0.05				
CONTRIBUTING	0	0.00				
FLOWING OFF	2187	0.05				
				AXC		
BUILDING	0		0.95	0		
PAVEMENT	488		0.95	463.6		
LAWN	1699		0.20	339.8		
TOTALS	2187			803.4		
COMPOUND C -	$TOTAL A \times C$	_	803.4	0.37		
$COMPOUND C = \frac{1}{CO}$	NTRIBUTING A	REA -	2187			

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

(OFFSITE AREA - DIRECTLY TO POND - PASS THROUGH)						
	AREA (SF)	AREA (AC)	С			
OVERALL	2079	0.05				
CONTRIBUTING	0	0.00				
FLOWING OFF	2079	0.05				
				AXC		
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		
$COMPOUND C = \frac{1}{CO}$	$TOTAL \ A \times C$ $NTRIBUTING \ AR$	<u>'EA</u> –	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)

	AREA (SF)	AREA (AC)	С	
OVERALL	38327	0.88		
CONTRIBUTING	38327	0.88		
FLOWING OFF	0	0.00		
				AXC
Detained - Offsite	38327		0.20	7665
TOTALS	38327			7665
$COMPOUND C = \frac{1}{CO}$	TOTAL A × 0		7665.4 38327	0.

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)

	AREA (SF)	AREA (AC)	С	
OVERALL	28594	0.66		
CONTRIBUTING	28594	0.66		
FLOWING OFF	0	0.00		
				AXC
Detained - Offsite	28594		0.20	5718.8
TOTALS	28594			5718.8
COMPOUND	$TOTAL A \times C$		5718.8	0.20

CONTRIBUTING AREA

28594

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)

COMPOUND C = -

	AREA (SF)	AREA (AC)	С	
OVERALL	77174	1.77		
CONTRIBUTING	77174	1.77		
FLOWING OFF	0	0.00		
				AXC
Detained - Offsite	77174		0.20	15434.8
TOTALS	77174			15434.8
COMPOUND C = -	$TOTAL\ A \times C$		15434.8	0.20
$\frac{COMIOONDC}{CO}$	NTRIBUTING A	REA	77174	

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.

TOTAL AREA C FACTOR CALCULATION

COMPOUND RU	INOFF COE	FFICIENT			
	A	AREA (SF)	AREA (AC)		
OVERALL		484,199	11.12		
CONTRIBUTING		310,049	7.12		
FLOWING OFF		174,150	4.00		
				С	$A \times C$
EX BUILDING		0		0.95	0
EX PAVEMENT		0		0.95	0
PR BUILDING		69,470		0.95	65,997
PR PAVEMENT		79,902		0.95	75,907
POND AREA		18,344		1.00	18,344
GRASS		142,333		0.15	21,350
	TOTALS	310,049			181,597
COMPOUND C	_ <i>TO</i>	$TALA \times C$		181,597	0.59
COMFOUNDC	CONTR	IBUTING A	I <i>REA</i>	310,049	

SITE INFO

OVERALL AREA	=	11.12 AC
CONTRIBUTING AREA (A)	=	7.12 AC
ALLOWABLE DISCHARGE (Qa)	=	0.20 CFS/AC
COMPOUND C	=	0.59

	REQUIRED CHANNEL PROTECTION VOLUME				OEFFICIENT	COMPOUND RUNOFF CO
19673 CF	$V_{cp} = \frac{1.3"}{12"} \times 43560 \times A \times C =$			AREA (AC) 11.12	AREA (SF) 484,199	OVERALL
				7.12	310,049	CONTRIBUTING
				4.00	174,150	FLOWING OFF
	REQUIRED WATER QUALITY RATE (FOR MTS)	$A \times C$	С			
		0	0.95		0	EX BUILDING
26.69 MIN	$T_c =$	0	0.95		0	EX PAVEMENT
	30.20	65,997	0.95		69,470	PR BUILDING
6.93 CFS	$Q_{wq} = \frac{30.20}{(T_c + 9.17)^{0.81}} \times A \times C =$	75,907	0.95		79,902	PR PAVEMENT
	$(T_c + 9.17)^{0.81}$	18,344	1.00		18,344	POND AREA
		21,350	0.15		142,333	GRASS
	REQUIRED EXTENDED DETENTION VOLUME	181,597			310,049	TOTALS
28753 CF	$V_{ED} = \frac{1.9"}{12"} \times 43560 \times A \times C =$	0.59	181,597 310 049		$TOTALA \times C$	$COMPOUND C = \frac{T}{CONT}$

EXTENDED DETENTION DISCHARGE RATE

OUND C	=	0.59	$Q_{100in} = C \times A \times \frac{30.2033 \times 100^{0.2203}}{(T_c + 9.1747)^{0.8069}}$	=	22.22 CFS
			100 YR STORM ALLOWABLE OUTLET RATE		
			$Q_{100all} = A \times Q_a$	=	1.42 CFS
			STORAGE CURVE FACTOR		
			$R = 0.206 - 0.15 \times ln \left(\frac{Q_{100all}}{Q_{100in}} \right)$	=	0.62
			100 YR STORM VOLUME IN		

100 YR STORM STORAGE VOLUME

 $V_{100in} = 18985 \times C \times A$

MONUMENT ENGINEERING GROUP ASSOCIATES, LLC

100 YR STORM INLET RATE

$V_{100det} = V_{100in} \times R - V_{cp}$	=	29254 CF

0.17 CFS

= 79147 CF

REQUIRED DETENTION VOLUME =	29254 CF
100 YR STORM STORAGE VOLUME CONTROLS	

STORM SEWER CALCULATIONS

STORM SEWER DESIGN

				t = 20 n1 = 0.013 HDPE & PVC (Oakland County)								MONUMENT ENGINEERING GROUP ASSOCIATES, LLC 298 VETERANS DRIVE											-	
	Q = C I A					20											VILLE, MI							_
0 - 4	A x 1.486/n x R^2/3 x	CALIO		-	-		HDDE 0 E	N/C (Oakla	nd County)							517-223-3		40030						-
Q = A	I = 175/(t+25)	5"1/2			n1 = n2 =		CONC.	VC (Oakia	na County)							317-223-3	312							-
	1 - 175/(1125)				112 -	0.013	OONO.												H.G. ELE	V	INVERT E	I FV	RIM ELEV.	RIM ELEV.
	FROM STR	AREA	COEFF.	-	AREA	TOTAL	TIME	INT.	FLOW	PIPE	PIPE	PIPE	PIPE	PIPE	MIN PIPE	H.G.	VEL.	TIME	UP	DOWN	UP	DOWN	UP.	DOWN
	TO STR	Α	C	AxC	TOTAL	CxA	t	1	Q	CAP.	AREA	LENGTH		SLOPE	100000000000000000000000000000000000000		FULL	FLOW				STREAM	10.0	STREAM
					At		•				,,									·	• · · · · · · · · · · · · · · · · · · ·			
		ac.			ac.		min	in/hr	c.f.s.	c.f.s.	sq. ft.	ft	in.	%		%	ft/sec	min.						-
																								-
MAIN RUN	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	20.33	3.86	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	3.83	2.02	3.18	0.79	13	12	0.80	0.30	0.80	4.06	0.05	823.69	823.59	822.89	822.79	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	1.77	79	18	0.39	0.18	0.39	3.71	0.36	809.86	809.55	808.45	808.14	814.90	813.61
	MH-7 TO MH-8			0.000	3.843	2.511	23.70	3.59	9.02	10.11	3.14	80	24	0.20	0.12	0.20	3.22	0.42	809.55	809.39	807.74	807.58	813.61	814.49
	MH-8 TO MH-9			0.000	8.380	3.853	24.12	3.56	13.73	18.85	7.07	91	36	0.08	0.07	0.08	2.67	0.57	809.39	809.32	806.99	806.92	814.49	815.73
	MH-9 TO MH-10			0.000	8.978	4.188	24.69	3.52	14.75	18.85	7.07	72	36	0.08	0.07	0.08	2.67	0.45	809.32	809.26	806.92	806.86	815.73	816.70
	MH-10 TO MH-11			0.000	8.978	4.188	25.14	3.49	14.62	18.85	7.07	165	36	0.08	0.07	0.08	2.67	1.03	809.26	809.13	806.86	806.73	816.70	817.64
	MH-11 TO MH-12			0.000	9.598	4.449	26.17	3.42	15.21	18.85	7.07	113	36	0.08	0.07	0.08	2.67	0.71	809.13	809.04	806.73	806.64	817.64	815.76
	MH-12 TO ES-13			0.000	10.386	5.016	26.88	3.37	16.92	18.85	7.07	47	36	0.08	0.07	0.08	2.67	0.29	809.04	809.00	806.64	806.60	815.76	809.50
																								,
LATERAL	IN-14 TO MH-4	0.13	0.89	0.112	0.126	0.112	20.00	3.89	0.43	3.18	0.79	13	12	0.80	0.30	0.80	4.06	0.05	823.81	823.71	823.01	822.91	829.61	829.86
	W. 45 TO OD 40	0.40			0.400	0.070		0.00		0.04	0.70		40		0.00		0.50		0.17.40	0.17.00	0.40.00	040.50	204.00	201.00
LATERAL	IN-15 TO CB-16	0.19	0.38	0.073	0.193	0.073	20.00	3.89	0.29	2.01	0.79	51	12	0.32	0.30	0.32	2.56	0.33	817.49	817.33	816.69	816.53	821.63	821.23
	CB-16 TO MH-5	0.16	0.88	0.139	0.351	0.212	20.33	3.86	0.82	2.01	0.79	72	12	0.32	0.30	0.32	2.56	0.46	817.33	817.10	816.53	816.30	821.23	821.55
LATERAL	IN-17A TO CB-17	0.26	0.42	0.107	0.256	0.107	20.00	3.89	0.42	2.01	0.79	109	12	0.32	0.30	0.32	2.56	0.71	811.20	810.85	810.40	810.05	815.70	815.00
EATEINAE	CB-17 TO CB-18	0.23	0.35	0.079	0.481	0.186	20.71	3.83	0.71	2.01	0.79	48	12	0.32	0.30	0.32	2.56	0.31	810.85	810.70	810.05	809.90	815.00	814.00
	CB-18 TO MH-6	0.19	0.63	0.120	0.671	0.306	21.02	3.80	1.16	2.01	0.79	71	12	0.32	0.30	0.32	2.56	0.46	810.70	810.47	809.90	809.67	814.00	814.90
	OB-10 10 WIII-0	0.13	0.00	0.120	0.071	0.500	21.02	3.00	1.10	2.01	0.75	- ' '	12	0.52	0.50	0.52	2.50	0.40	010.70	010.47	003.30	003.07	014.00	014.50
LATERAL	IN-25 TO CB-26	0.21	0.73	0.155	0.212	0.155	20.00	3.89	0.60	2.01	0.79	96	12	0.32	0.30	0.32	2.56	0.62	810.05	809.74	808.44	808.13	812.50	812.80
	CB-26 TO CB-19	0.06	0.72	0.040	0.267	0.195	20.62	3.84	0.75	2.01	0.79	28	12	0.32	0.30	0.32	2.56	0.18	809.74	809.65	808.13	808.04	812.80	813.23
	CB-19 TO MH-7	0.37	0.73	0.268	0.634	0.462	20.81	3.82	1.77	2.96	0.79	15	12	0.69	0.30	0.69	3.77	0.06	809.65	809.55	808.04	807.94	813.23	813.61
																							100 100 100 100	
LATERAL	IN-20 TO MH-7	0.54	0.74	0.398	0.537	0.398	20.00	3.89	1.55	2.96	0.79	14	12	0.69	0.30	0.69	3.77	0.06	810.43	810.33	809.63	809.53	813.23	813.61
	IN 04 TO 57 55				0.050	0.455	00.00					- 25		0.00	10100	0.05	0.50		000 00	000 ==	000 15	007.55	040.55	044.65
LATERAL	IN-21 TO CB-22	0.36	0.36	0.129	0.359	0.129	20.00	3.89	0.50	2.01	0.79	62	12	0.32	0.30	0.32	2.56	0.40	809.99	809.79	808.19	807.99	812.33	811.65
	CB-22 TO MH-23	0.27	0.69	0.185	0.628	0.315	20.40	3.85	1.21	2.96	0.79	15	12	0.69	0.30	0.69	3.77	0.06	809.79	809.69	807.99	807.89	811.65	812.03
	MH-23 TO MH-24			0.000	4.359	1.221	20.47	3.85	4.70	9.85	3.14	95	24	0.19	0.12	0.19	3.14	0.50	809.69	809.51	807.29	807.11	812.03	812.92
	MH-24 TO MH-8			0.000	4.359	1.221	20.97	3.81	4.65	9.85	3.14	65	24	0.19	0.12	0.19	3.14	0.34	809.51	809.39	807.11	806.99	812.92	814.49
LATERAL	IN-24 TO MH-23	0.42	0.58	0.245	0.423	0.245	20.00	3.89	0.95	2.96	0.79	15	12	0.69	0.30	0.69	3.77	0.06	809.79	809.69	807.79	807.69	811.82	812.03
LATERAL	111 24 10 1111 20	0.42	0.00	0.240	0.420	0.240	20.00	0.00	0.00	2.00	0.10	- 10	12	0.00	0.00	0.00	0.77	0.00	000.10	000.00	001.10	007.00	011.02	012.00
LATERAL	IN-27 TO MH-8	0.18	0.68	0.121	0.178	0.121	20.00	3.89	0.47	2.96	0.79	15	12	0.69	0.30	0.69	3.77	0.06	809.49	809.39	808.29	808.19	814.14	814.49
		111111111111111111111111111111111111111																						
LATERAL	IN-28 TO CB-29	0.25	0.42	0.104	0.249	0.104	20.00	3.89	0.41	2.01	0.79	133	12	0.32	0.30	0.32	2.56	0.87	809.85	809.42	808.63	808.20	811.00	815.37
	CB-29 TO MH-9	0.35	0.66	0.230	0.598	0.335	20.87	3.82	1.28	3.18	0.79	13	12	0.80	0.30	0.80	4.06	0.05	809.42	809.32	808.20	808.10	815.37	815.73
LATERAL	IN-31 TO CB-30	0.24	0.42	0.103	0.245	0.103	20.00	3.89	0.40	2.01	0.79	160	12	0.32	0.30	0.32	2.56	1.04	810.09	809.58	808.65	808.13	811.20	811.20
	CB-30 TO MH-11	0.37	0.42	0.157	0.620	0.260	21.04	3.80	0.99	2.01	0.79	142	12	0.32	0.30	0.32	2.56	0.92	809.58	809.13	808.13	807.68	811.20	817.64
																								_
LATERAL	FUTURE TO MH-23	3.31	0.20	0.662	3.308	0.662	20.00	3.89	2.57	9.32	3.14	59	24	0.17	0.12	0.17	2.97	0.33	809.79	809.69	807.39	807.29	N/A	812.92
LATERAL	IN-32 TO MH-12	0.79	0.72	0.567	0.788	0.567	20.00	3.89	2.21	3.56	0.79	84	12	1.00	0.30	1.00	4.53	0.31	810.37	809.53	809.57	808.73	815.08	815.76
LAILINAL	114-52 10 1/111-12	0.78	0.72	0.507	0.700	0.507	20.00	3.08	2.21	3.30	0.18	04	12	1.00	0.50	1.00	4.55	0.51	010.37	009.00	000.51	000.73	010.00	013.70
LATERAL	IN-33 TO CB-34	0.12	0.95	0.119	0.125	0.119	20.00	3.89	0.46	2.31	0.79	202	12	0.42	0.30	0.42	2.94	1.15	819.11	818.26	818.31	817.46	822.25	831.17
	CB-34 TO CB-35	0.06	0.95	0.059	0.187	0.178	21.15	3.79	0.67	2.31	0.79	194	12	0.42	0.30	0.42	2.94	1.10	818.26	817.44	817.46	816.64	831.17	822.25
	CB-35 TO CB-36	0.30	0.43	0.129	0.487	0.306	22.25	3.70	1.13	2.01	0.79	74	12	0.32	0.30	0.32	2.56	0.48	817.44	817.20	816.64	816.40	822.25	822.22
	CB-36 TO MH-5	0.20	0.93	0.186	0.687	0.492	22.73	3.67	1.80	2.01	0.79	63	12	0.32	0.30	0.32	2.56	0.41	817.20	817.00	816.40	816.20	822.22	821.55
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CLIENT:

AUBURN ANGARA OAKS, LLC

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

ORIGINAL ISSUE DATE: 05/19/2022

PROJECT NO: 22-051	
SCALE: N/A	
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FSIGN BY: KM	ı

CHECK BY: AP C-9.1