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CITY OF MUSKEGON

PLAN AND PROFILE OF PROPOSED

INDUSTRIAL PARK ROADWAY EXPANSION PROJECT

OLTHOFF DRIVE EXTENSION AND SITE IMPROVEMENT PLANS

MUSKEGON

West Michigan's Shoreline City

www.shorelinecity.com

UTILITIES

ELECTRIC
JOEL BROWN
CONSUMERS ENERGY
700 E STERNBERG RD
NORTON SHORES, MI 49441
(231) 332-2682

CABLE
JIM STITZEL
COMCAST
700 W BROADWAY AVE
MUSKEGON, MI 49441
(810) 217-1642

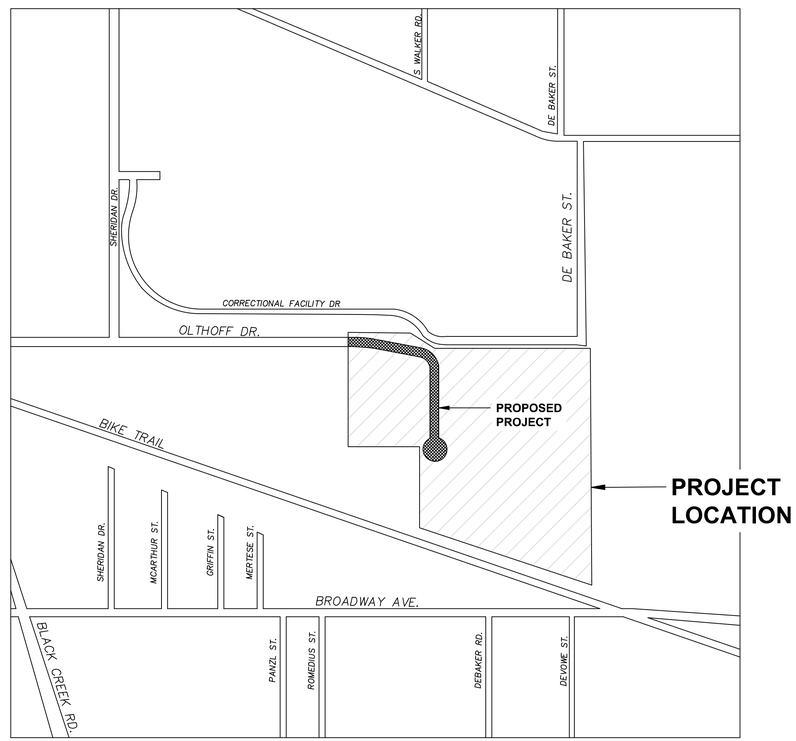
GAS
VINCENT DUCA
DTE ENERGY
2359 OLTHOFF DR
MUSKEGON, MI 49444
(231) 578-0488 (CELL)

TELEPHONE
DAVID B. FLERMOEN
FRONTIER COMMUNICATIONS
860 TERRACE ST
MUSKEGON, MI 49440
(231) 727-1319

WATER & SEWER
DAVE BAKER
CITY OF MUSKEGON - DPW
1350 E KEATING AVE
MUSKEGON, MI 49442
(231) 724-4100

FIBER OPTIC
ERICA FILKINS
US SIGNAL COMPANY, LLC
ERIC FILKINS
201 IONIA AVE SW
GRAND RAPIDS, MI 49503
(616) 233-7144

811 3 WORKING DAYS EXCLUDING SAT, SUN & HOLIDAYS
BEFORE YOU DIG CALL MISS DIG
Know what's below. Call before you dig.



VICINITY MAP
NO SCALE

GENERAL NOTES:

1. UPON REQUEST AND APPROVAL, THE CONTRACTOR MAY OBTAIN A WATER SUPPLY FROM THE CITY OF MUSKEGON FIRE HYDRANTS AT NO COST, PROVIDED THAT THEY FOLLOW THE CONDITIONS OF THE CITY WATER DEPARTMENT.
2. FOR PROTECTION OF UNDERGROUND UTILITIES, THE CONTRACTOR SHALL CALL MISS DIG, 1-800-482-7171, A MINIMUM OF THREE (3) WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS, PRIOR TO EXCAVATING IN THE VICINITY OF ANY UTILITY LINES. ALL MISS DIG PARTICIPATING MEMBERS WILL THUS BE NOTIFIED, THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING OWNERS, WHO MAY NOT BE PART OF THE MISS DIG ALERT SYSTEM.
3. ALL PUBLIC UTILITIES HAVE BEEN SHOWN ON THE PLANS USING AVAILABLE INFORMATION, BUT ARE NOT GUARANTEED AS ACCURATE OR THAT UTILITIES OTHER THAN THOSE SHOWN ARE NOT PRESENT. THE CONTRACTOR SHALL CALL MISS DIG (1-800-482-7171) THREE (3) WORKING DAYS (EXCLUDING SAT., SUN., AND HOLIDAYS) BEFORE DIGGING.
4. EXISTING TRAFFIC CONTROL SIGNS THAT NEED TO BE REMOVED TO ALLOW THE CONTRACTOR TO WORK WILL BE REMOVED BY THE CONTRACTOR AND STORED IN A SAFE PLACE TO AVOID DAMAGE. THE CONTRACTOR SHALL THEN REINSTALL THE SIGNS IN THEIR ORIGINAL LOCATION, OR AS DIRECTED BY THE ENGINEER, UPON COMPLETION OF THE CONSTRUCTION IN THAT AREA. REMOVAL AND REINSTALLATION OF THE SIGNS WILL BE INCLUDED IN THE BID ITEM OF "MINOR TRAF DEVICES." SIGNS THAT ARE DAMAGED OR LOST BY THE CONTRACTOR WILL BE REPLACED BY CITY FORCES, AND THE CONTRACTOR WILL PAY THE CITY FOR THE COST OF REPLACEMENT.
5. THE CONTRACTOR SHALL SAWCUT ALL MEETS RELATIVE TO SIDEWALK OR PAVEMENT CONSTRUCTION, UNLESS WAIVED BY THE ENGINEER. PAYMENT FOR SAWCUTTING SHALL BE INCLUDED IN THE PAYMENT FOR THE BID ITEMS "CURB AND GUTTER, REM," AND "HMA SURFACE, REM." NO ADDITIONAL PAYMENT WILL BE ALLOWED FOR SAWCUTTING.
6. THE CONTRACTOR SHALL PREVENT EROSION AND CONTROL SEDIMENTATION ASSOCIATED WITH THE PROJECT. CONTRACTOR SHALL KEEP SEDIMENTATION WITHIN THE RIGHT-OF-WAY AND OUT OF SURFACE WATERS, CONSTRUCT AND MAINTAIN TEMPORARY EROSION AND SEDIMENTATION CONTROLS (CONTROLS TO INCLUDE EROSION CONTROL, INLET PROTECTION, AND FABRIC DROPS ON ALL INLET STRUCTURES, NEW AND EXISTING), AND INSTALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL REMOVE, ON A DAILY BASIS, SOIL TRACKED ONTO EXISTING PAVED ROADS, (VACUUM METHODS ARE PREFERRED BUT BROOM SWEEPING IS ACCEPTABLE, IF THE MATERIAL IS REMOVED). THE CONTRACTOR SHALL INSPECT ALL SOIL EROSION / SEDIMENTATION CONTROL MEASURES ON A WEEKLY BASIS OR AFTER EACH RAIN FALL EVENT. CONTRACTOR SHALL CLEAN, REPAIR, OR REPLACE ANY SOIL EROSION / SEDIMENTATION CONTROL MEASURE, AS NECESSARY, TO ENSURE PROPER FUNCTION. ALL SOIL EROSION / SEDIMENTATION CONTROLS SHALL REMAIN UNTIL ALL DISTURBED AREAS ARE STABILIZED. ALL SOIL EROSION / SEDIMENTATION CONTROLS (EXCEPT FOR THE EROSION CONTROL, INLET PROTECTION, AND FABRIC DROP), SHALL BE INCLUDED WITH THE BID ITEM "PROJECT CLEAN UP," AND NO OTHER ADDITIONAL PAYMENT SHALL BE MADE, THEREFOR.
7. PAYMENT FOR GRADING AND COMPACTING THE CONC. CURB AND GUTTER AND HAND PATCHING SHALL BE INCLUDED IN PAYMENT FOR THE BID ITEMS "CURB AND GUTTER, CONC, DET F4" AND "HAND PATCHING."

BENCHMARK:

HORIZONTAL DATUM: NAD83 (2011) STATE PLANE COORDINATES SOUTH ZONE 2113
VERTICAL DATUM: NAVD88 (GEOID18)

BM - 300
ELEV. 638.57'

(CHECKED WITH CNTRL #3000 AND #3001)

NOTE:

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION, LATEST EDITION, THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD), LATEST EDITION, AND THE PROJECT SPECIFICATIONS.

DESCRIPTION OF PROJECT

THIS PROJECT INCLUDES THE CONSTRUCTION OF 0.29 MILES OF NEW ROAD AND THE EXPANSION OF SANITARY SEWER, WATERMAIN, AND STORM SEWER SYSTEMS FROM THE EXISTING WEST OLTHOFF DRIVE ALIGNMENT TO THE APPROXIMATE MIDDLE OF THE FUTURE INDUSTRIAL PARK DEVELOPMENT. ADDITIONALLY, THIS PROJECT INCLUDES SOME SITE IMPROVEMENTS FOR THE INDUSTRIAL PARK EXPANSION.

CITY APPROVAL
CITY OF MUSKEGON, MICHIGAN

BY: Leo Evans, P.E. DPW Director City of Muskegon — Leo Evans Sep 28 2022 10:40 AM

LEO EVANS, P.E., DIRECTOR OF PUBLIC WORKS — DATE

HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
1925 BRETON ROAD NE SUITE 100
GRAND RAPIDS, MI 49506

PREPARED UNDER THE SUPERVISION OF:

STATE OF MICHIGAN — RANDALL V. WILCOX — ENGINEER — No. 6201034587 — LICENSED PROFESSIONAL ENGINEER

Randall V. Wilcox — Digitally signed by Randall V. Wilcox
DN: C=US, E=rwilcox@hrcengr.com, O="Hubbell, Roth & Clark, Inc.", CN=Randall V. Wilcox
Date: 2022.06.29 12:11:27-04'00'

RANDY WILCOX, P.E., PROJECT MANAGER — DATE

Project File No.	LL Notes No.	GPF No.	Sheet No.
20210307			1 of 18

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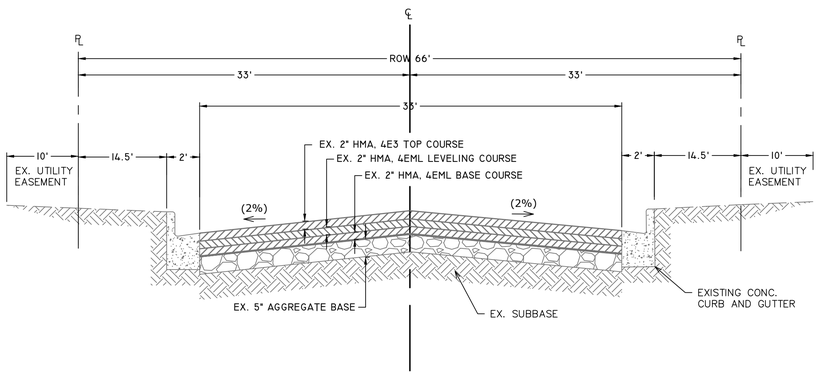
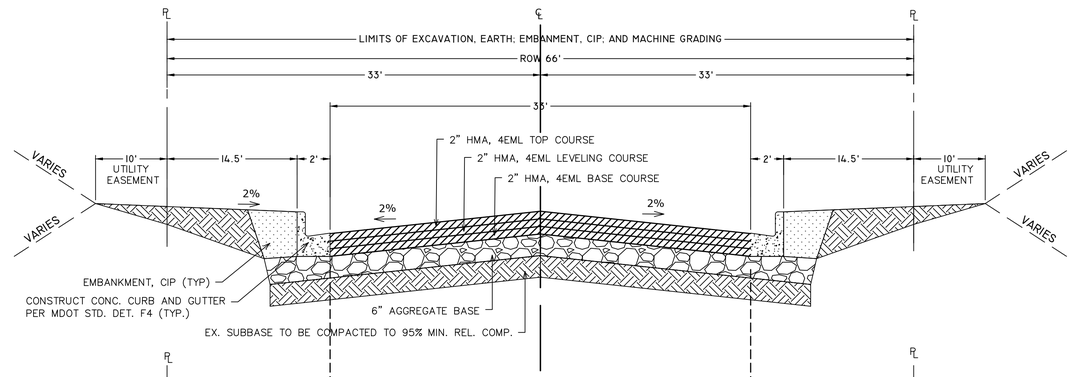
Marion, Lucas, N



EXISTING OLTHOFF DRIVE CROSS SECTION

STA 34+50 TO 36+00



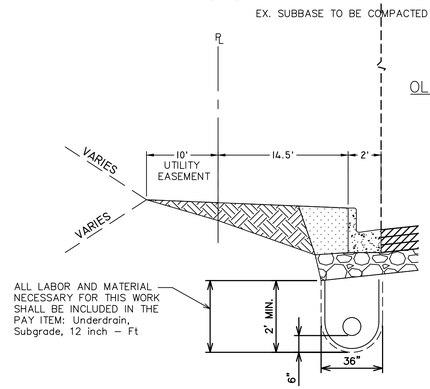
OLTHOFF DRIVE EXTENSION CROSS SECTION

STA 34+50 TO 49+27

HMA APPLICATION TABLE.

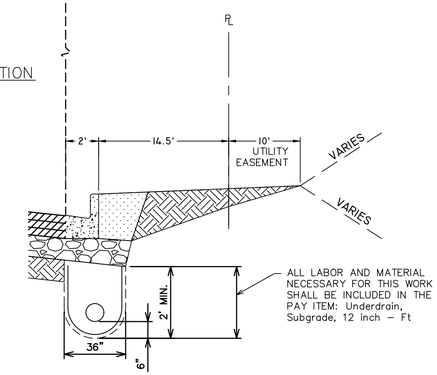
HMA MIX	RATE	PERFORMANCE GRADE	
HMA, 4EML (TOP COURSE)	110# / SYD	70-28(P)	2 INCH - ONE LIFT (AWI 260, MIN)
HMA, 4EML (LEVEL COURSE)	110# / SYD	64-28	2 INCH - ONE LIFT
HMA, 4EML (BASE COURSE)	110# / SYD	58-22	2 INCH - ONE LIFT
HAND PATCHING	110# / SYD	64-28	3 INCH - TWO LIFTS

HMA BOND COAT, SS-1H, AT 0.05 GAL/SY, SHALL BE PLACED BETWEEN EACH LIFT. THE COST IS INCLUDED WITH THE "HMA, 4EML" BID ITEM.



UNDERDRAIN DETAIL

STA 44+87 TO 49+24



UNDERDRAIN DETAIL

STA 44+87 TO 49+24

MUSKEGON

West Michigan's Shoreline City

www.shorelinecity.com

HRC

HUBBELL, ROTH & CLARK, INC

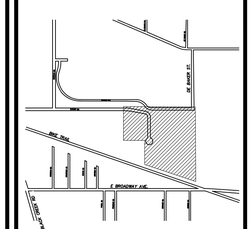
CONSULTING ENGINEERS SINCE 1915

1925 BRETON ROAD SE SUITE 100
GRAND RAPIDS, MI. 49506

PHONE: (616) 454-4286
FAX: (616) 454-4278

WEB SITE: http:// www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF MUSKEGON

OLTHOFF DRIVE EXTENSION

CROSS SECTIONS

HRC JOB NO.	SCALE
20210307	
DATE July 2022	SHEET NO. 2 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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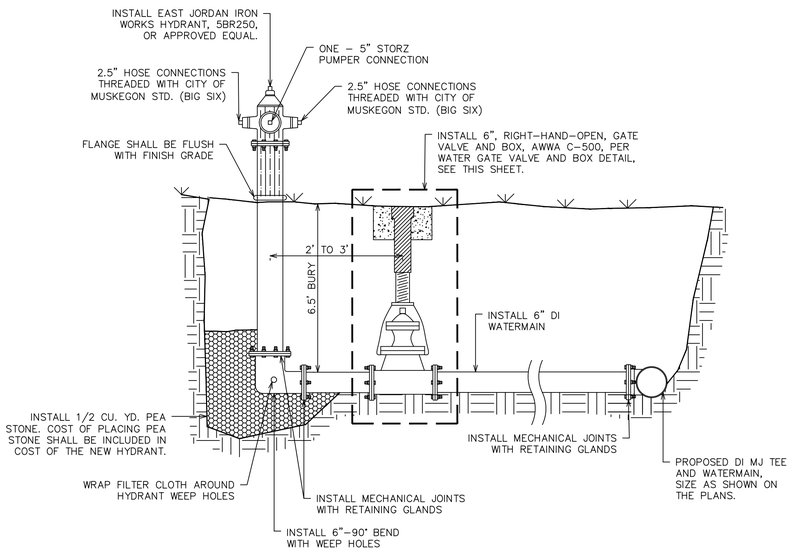
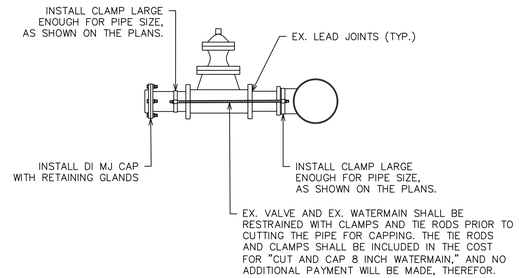
Marion, Lucas, N



HYDRANT, 6 INCH, STANDARD

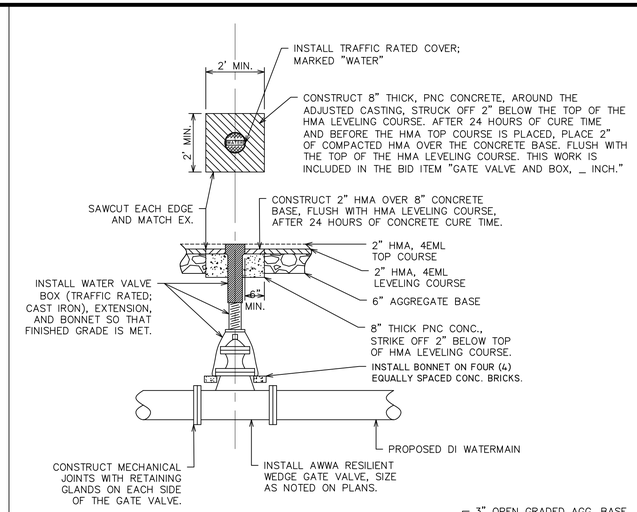
NOT TO SCALE

NOTES:
1. DI MJ TEE WILL BE PAID FOR SEPERATELY.

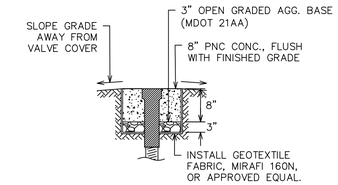


CUT AND CAP 8 INCH WATERMAIN

NOT TO SCALE



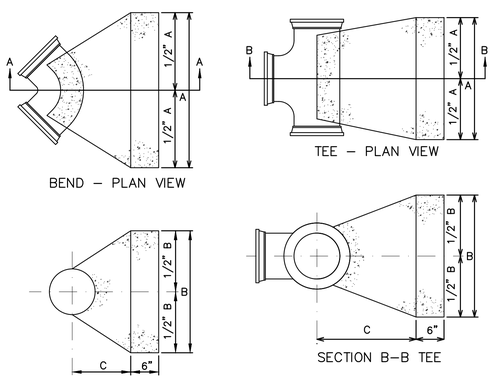
NOTE:
1. WHEN NO ADJACENT HMA SECTION IS PRESENT, CONTRACTOR SHALL CONSTRUCT 8" PNC CONC. OVER 3" AGGREGATE BASE, IN-LIEU OF THE TWO LIFTS OF 2" HMA AND THE 8" PNC CONC., SEE BELOW RIGHT.



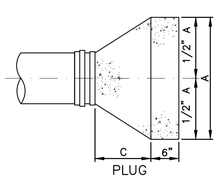
VALVE BOX FOUNDATION WITHOUT ADJACENT HMA

WATER GATE VALVE AND BOX

NOT TO SCALE



NOTES:
1. CONTRACTOR SHALL USE GCDC-WWS APPROVED RESTRAINED JOINTS IN ADDITION TO THRUST BLOCKS.
2. USE 3000 PSI CONCRETE FOR ALL THRUST BLOCKS.
3. POUR AGAINST UNDISTURBED SOIL.
4. KEEP BOLTS, FITTINGS AND JOINTS CLEAR OF CONCRETE.
5. BEARING AREA IS FIGURED ON 2000-PSI SOIL CAPACITY.



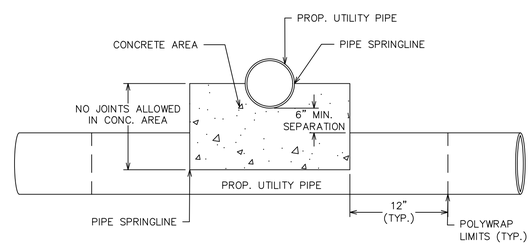
PLUG

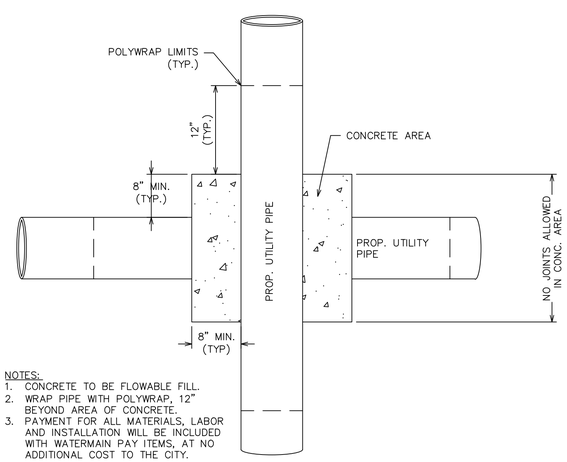
TABLE INDICATES MINIMUM BEARING

DIA. OF PIPE OR BRANCH OF TEE	90° BEND OR SMALLER			45° BEND			22 1/2° BEND			PLUGS, HYDRANTS AND TEES		
	A	B	C	A	B	C	A	B	C	A	B	C
6"	2'-0"	2'-0"	0'-9"	2'-0"	1'-0"	0'-9"	2'-0"	1'-0"	0'-9"	2'-0"	2'-0"	1'-0"
8"	3'-0"	2'-0"	1'-0"	2'-0"	2'-0"	1'-3"	2'-0"	1'-0"	1'-0"	3'-0"	2'-0"	1'-9"
12"	4'-0"	3'-0"	1'-6"	3'-0"	3'-0"	1'-6"	2'-0"	2'-0"	1'-6"	4'-0"	3'-0"	2'-0"
16"	6'-0"	4'-0"	1'-6"	4'-0"	4'-0"	1'-6"	3'-0"	3'-0"	1'-6"	5'-0"	4'-0"	2'-0"
24"	8'-0"	6'-6"	2'-0"	5'-0"	5'-0"	2'-0"	4'-0"	4'-0"	2'-0"	8'-0"	6'-0"	2'-6"

THRUST BLOCK

NOT TO SCALE





NOTES:
1. CONCRETE TO BE FLOWABLE FILL.
2. WRAP PIPE WITH POLYWRAP, 12" BEYOND AREA OF CONCRETE.
3. PAYMENT FOR ALL MATERIALS, LABOR AND INSTALLATION WILL BE INCLUDED WITH WATERMAIN PAY ITEMS, AT NO ADDITIONAL COST TO THE CITY.

CONCRETE CRADLE

NOT TO SCALE

PIPE RESTRAINT SCHEDULE

PIPE SIZE \ DEFLECTION ANGLE	LENGTH OF RESTRAINT REQUIRED * (FEET) 22 ½°	33 ¾°	45°	56 ¼°	67 ½°	78 ¾°	90° OR TEE	DESIGN STRENGTH OF RESTRAINT REQ'D (KIPS)** 45°	90° OR TEE
6"	4'	8'	14'	20'	30'	37'	47'	3.0	6.0
8"	5'	10'	19'	28'	40'	52'	64'	4.0	12.0
10"	6'	14'	23'	36'	49'	63'	78'	5.0	18.0
12"	8'	17'	28'	42'	58'	75'	93'	8.0	26.0
14"	9'	18'	32'	47'	66'	87'	107'	10.0	36.0
16"	10'	20'	34'	51'	72'	94'	116'	14.0	46.0
18"	10'	22'	38'	58'	81'	105'	131'	18.0	59.0
20"	10'	22'	39'	59'	81'	106'	131'	22.0	73.0
24"	12'	26'	44'	68'	95'	123'	153'	31.0	103.0
30"	14'	31'	53'	79'	111'	143'	180'	47.0	162.0
36"	16'	36'	62'	93'	130'	169'	210'	69.0	234.0
42"	17'	39'	67'	101'	141'	184'	228'	93.0	319.0
48"	19'	43'	75'	113'	157'	206'	255'	123.0	417.0

* IN EACH DIRECTION FROM POINT OF DEFLECTION EXCEPT FOR TEE, AT WHICH ONLY THE BRANCH WHERE FLOW CHANGES DIRECTION.
** IF TIE RODS ARE USED, ADD 1/8" TO BAR DIA. AS CORROSION ALLOWANCE.

BASIS OF DESIGN FOR ABOVE TABLE:

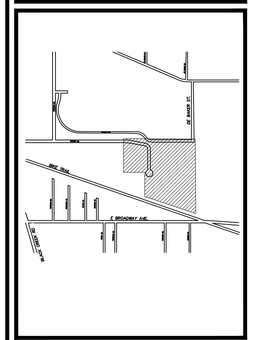
1. COVER OVER PIPE = 5.0 FEET MINIMUM
2. EARTH FRICTION COEFFICIENT = 0.4/1.5 SAFETY FACTOR = 0.26

NOTE
THE ABOVE LENGTH OF RESTRAINT REQUIRED IS MINIMUM. FOR LESS COVER OR POOR SOIL CONDITIONS, THE RESTRAINT LENGTH SHALL INCREASE AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.

HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
1925 BRETON ROAD SE
GRAND RAPIDS, MI.
SUITE 100
49506
PHONE: (616) 454-4286
FAX: (616) 454-4278
WEB SITE: http:// www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
8/15/22	REVISION 1

DESIGNED LNM
DRAWN LNM
CHECKED RVW
APPROVED RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

DETAIL SHEET

HRC JOB NO. 20210307
SCALE
DATE July 2022
SHEET NO. 3 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)
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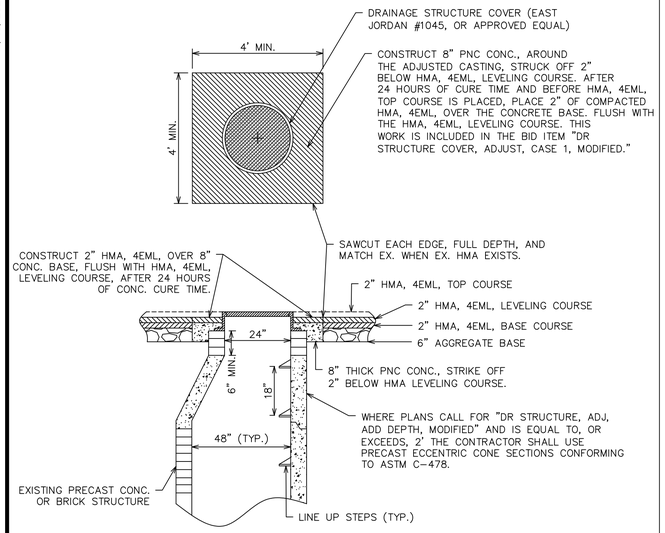
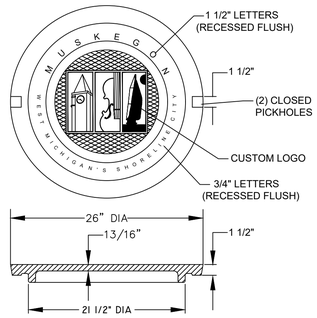
Marion, Lucas, N



NOTE:
ADJUSTMENT OF MANHOLE SPECIAL DETAIL WILL BE INCLUDED IN THE COST OF THE NEW MANHOLE. ADJUSTMENT OF THE NEW MANHOLES WILL BE DONE IN ACCORDANCE WITH "DR STRUCTURE COVER, ADJ, CASE 1, MODIFIED" DETAIL.

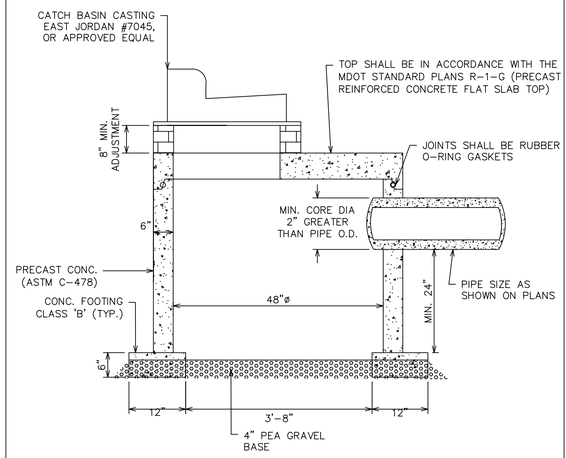
DR STRUCTURE COVER, ADJ, CASE 1, MODIFIED

NO SCALE



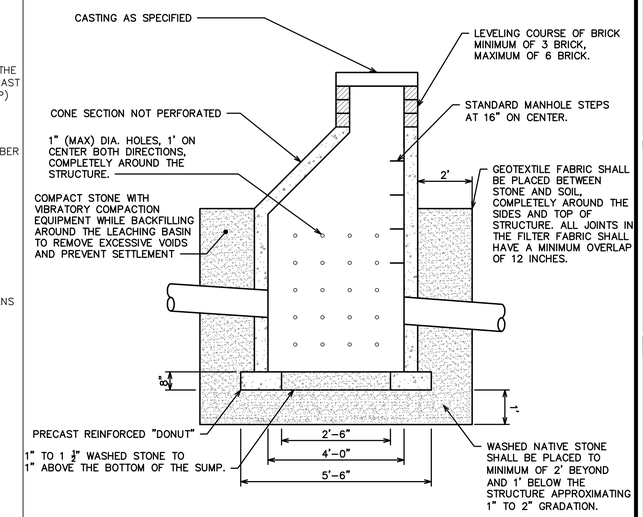
MANHOLE COVER

NO SCALE



CATCH BASIN, SPECIAL, 48 INCH DIA DETAIL

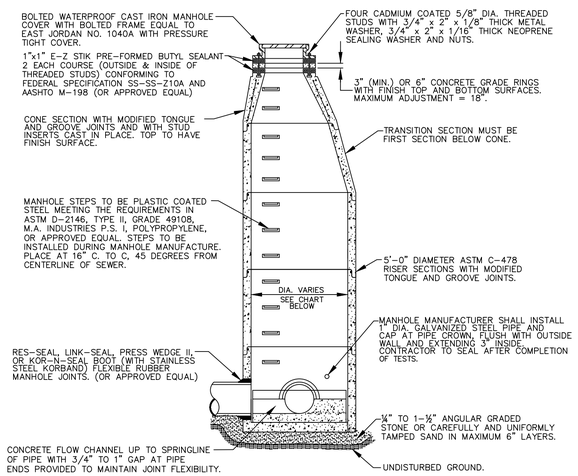
NO SCALE



LEACHING BASIN DETAIL

NO SCALE

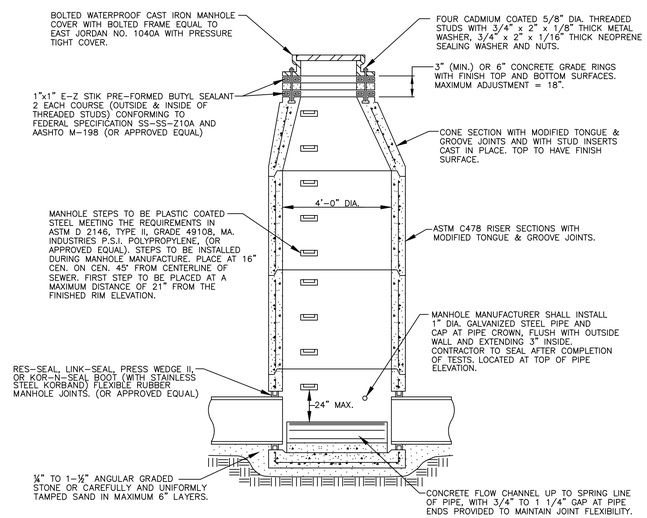
NOTE: ALL ITEMS INCLUDED IN: LEACHING BASIN, 48 INCH DIA



MANHOLE SIZING CHART

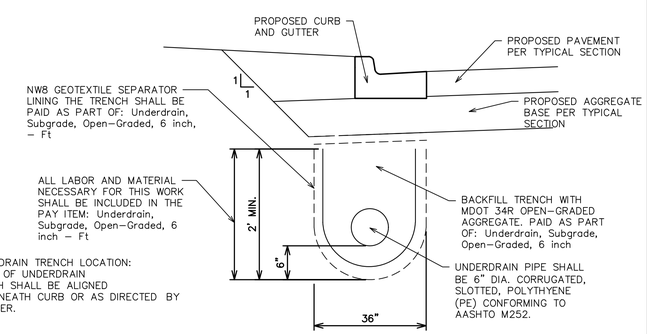
MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.	MAX. PIPE SIZE FOR RIGHT ANGLE INST.
5'	36"	24"
6'	42"	36"
7'	60"	42"

STANDARD OVERSIZED MANHOLE



MAX. PIPE SIZE FOR STRAIGHT THRU INSTALLATION	MAX. PIPE SIZE FOR RIGHT ANGLE INSTALLATION
24"	18"

STANDARD MANHOLE



NOTE:
1. UNDERDRAIN TRENCH LOCATION: FRONT OF UNDERDRAIN TRENCH SHALL BE ALIGNED UNDERNEATH CURB OR AS DIRECTED BY ENGINEER.

UNDERDRAIN, SUBGRADE, 12 INCH

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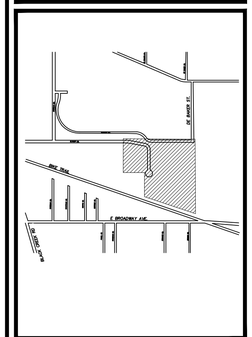
GRAND RAPIDS, MI. 49506
PHONE: (616) 454-4286
FAX: (616) 454-4278
WEB SITE: http:// www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

DETAIL SHEET

HRC JOB NO.	SCALE
20210307	
DATE: July 2022	SHEET NO. 4 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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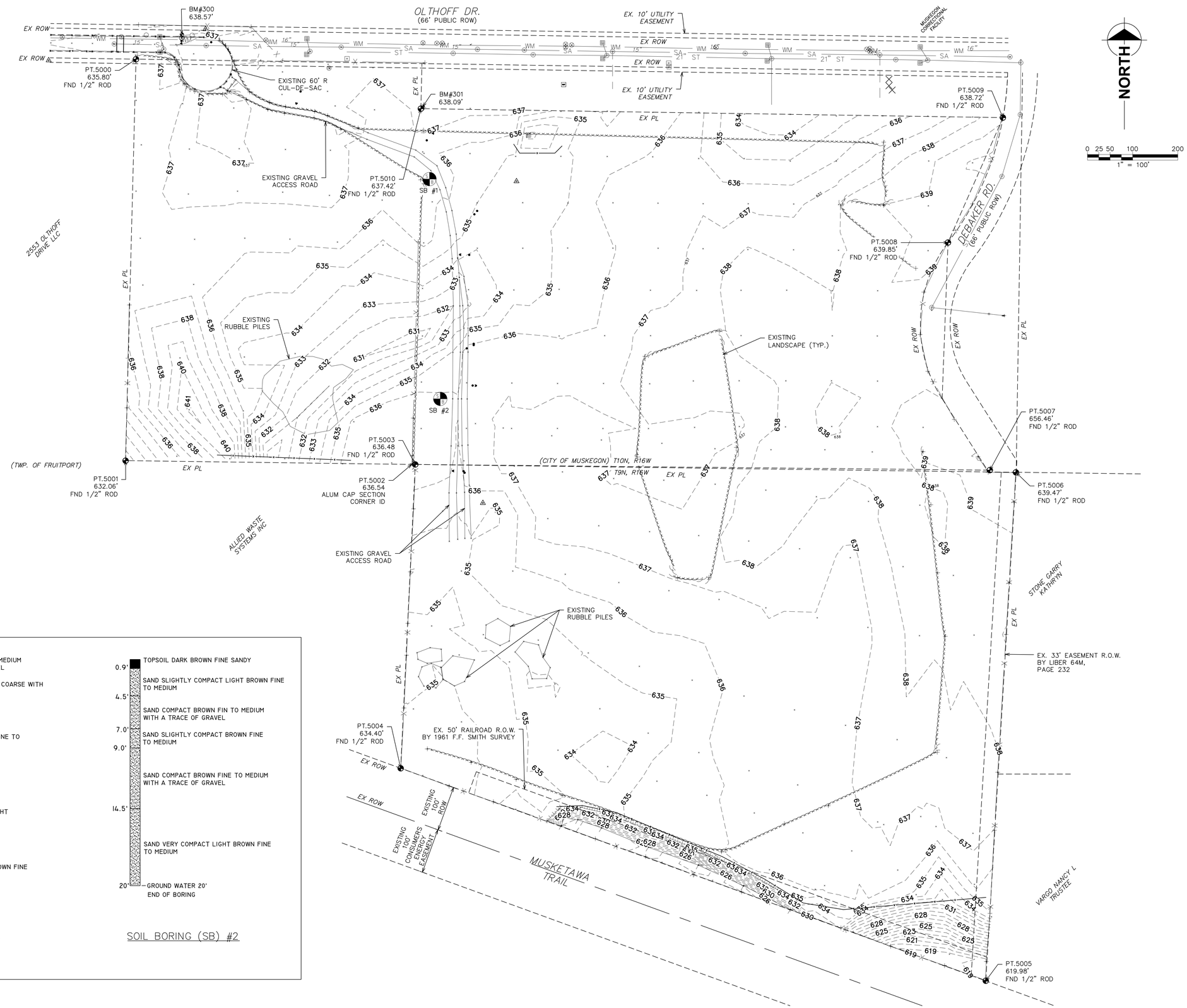
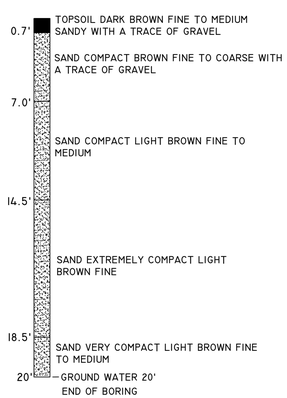
Marion, Lucas, N





SOIL BORING (SB) #1

SOIL BORING (SB) #2

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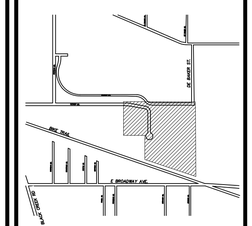
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

EXISTING SITE PLAN

HRC JOB NO.	SCALE
20210307	1"=100'
DATE June 2022	SHEET NO. 5 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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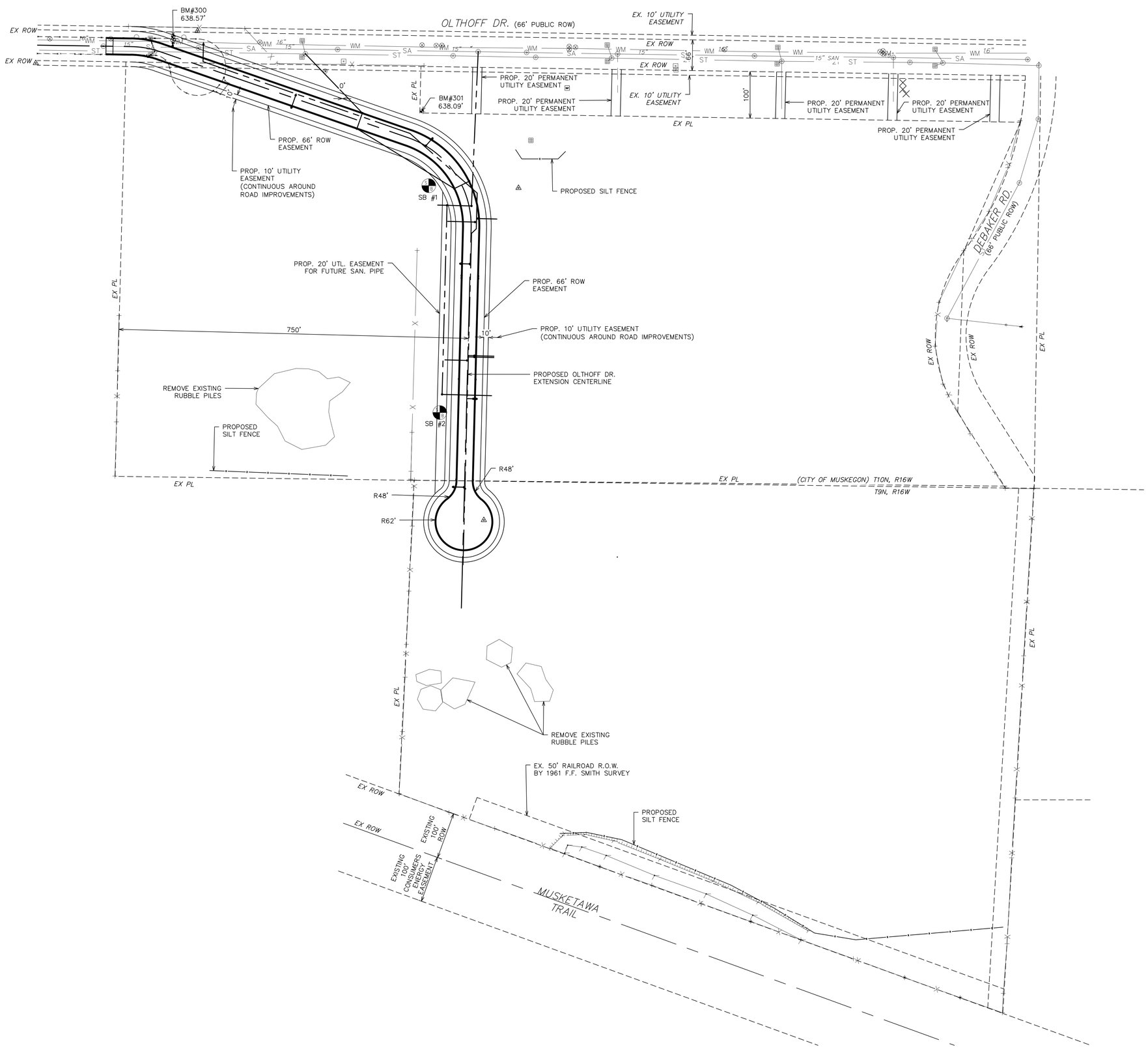
Marion, Lucas, N



NORTH

0 25 50 100 200
1" = 100'

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
1	LSUM	Mobilization, Max
4060	Cyd	Excavation, Earth
1421	Ft	Erosion Control, Silt Fence

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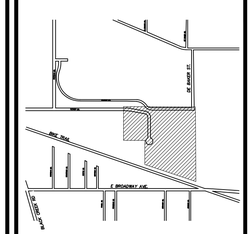
DATE	ADDITIONS AND/OR REVISIONS

DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

PROPOSED SITE PLAN

HRC JOB NO.	SCALE
20210307	1"=100'
DATE June 2022	SHEET NO. 6 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)
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Marion, Lucas, N

11/10/2022 7:32 AM
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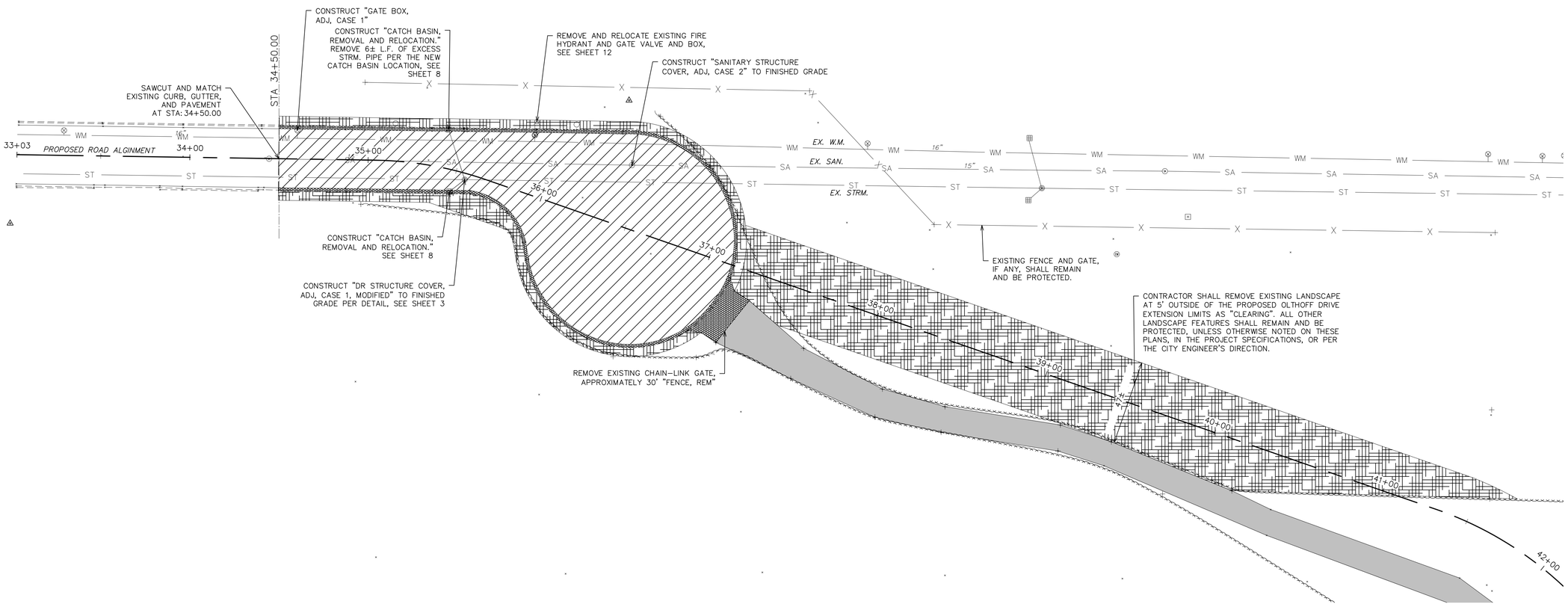
Marion, Lucas, N



REMOVAL LEGEND

	REMOVE EXISTING PAVEMENT SECTION. (APPROXIMATELY 6" "HMA SURFACE, REM" APPROXIMATELY 6" "EXCAVATION, EARTH"-AB) CONTRACTOR SHALL REMOVE ENOUGH MATERIAL TO ALLOW FULL PROPOSED PAVEMENT SECTION.
	REMOVE EXISTING CONCRETE FEATURE ("CURB AND GUTTER, REM," AND "EXCAVATION, EARTH"-DWY), UNLESS OTHERWISE NOTED ON THESE PLANS, THE PROJECT SPECIFICATIONS, OR PER THE CITY ENGINEERING'S DIRECTION.
	REMOVE EXISTING LANDSCAPE AS "CLEARING".
	REMOVE EXISTING GRAVEL ACCESS ROAD AS "HMA SURFACE, REM" CONTRACTOR SHALL REMOVE THE EXISTING ACCESS ROAD 5' PAST THE LIMITS OF THE PROPOSED CUL-DE-SAC, SEE SHEET 11.

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
1	Acre	Clearing
6	Ft	Sewer, Rem, Less than 24 inch
630	Ft	Curb and Gutter, Rem
30	Ft	Fence, Rem
265	Cyd	Excavation, Earth
2	Ea	Catch Basin, Removal and Relocation
1	Ea	Dr Structure Cover, Adj, Case 1, Modified
4485	Syd	HMA Surface, Rem
1	Ea	Hydrant, Relocate, Case 2
1	Ea	Gate Box, Adj, Case 1
1	Ea	Sanitary Structure Cover, Adj, Case 2

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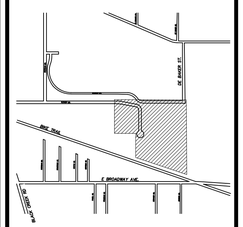
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

REMOVAL SHEET

HRC JOB NO.	SCALE
20210307	1"=20'
DATE May 2022	SHEET NO. 7 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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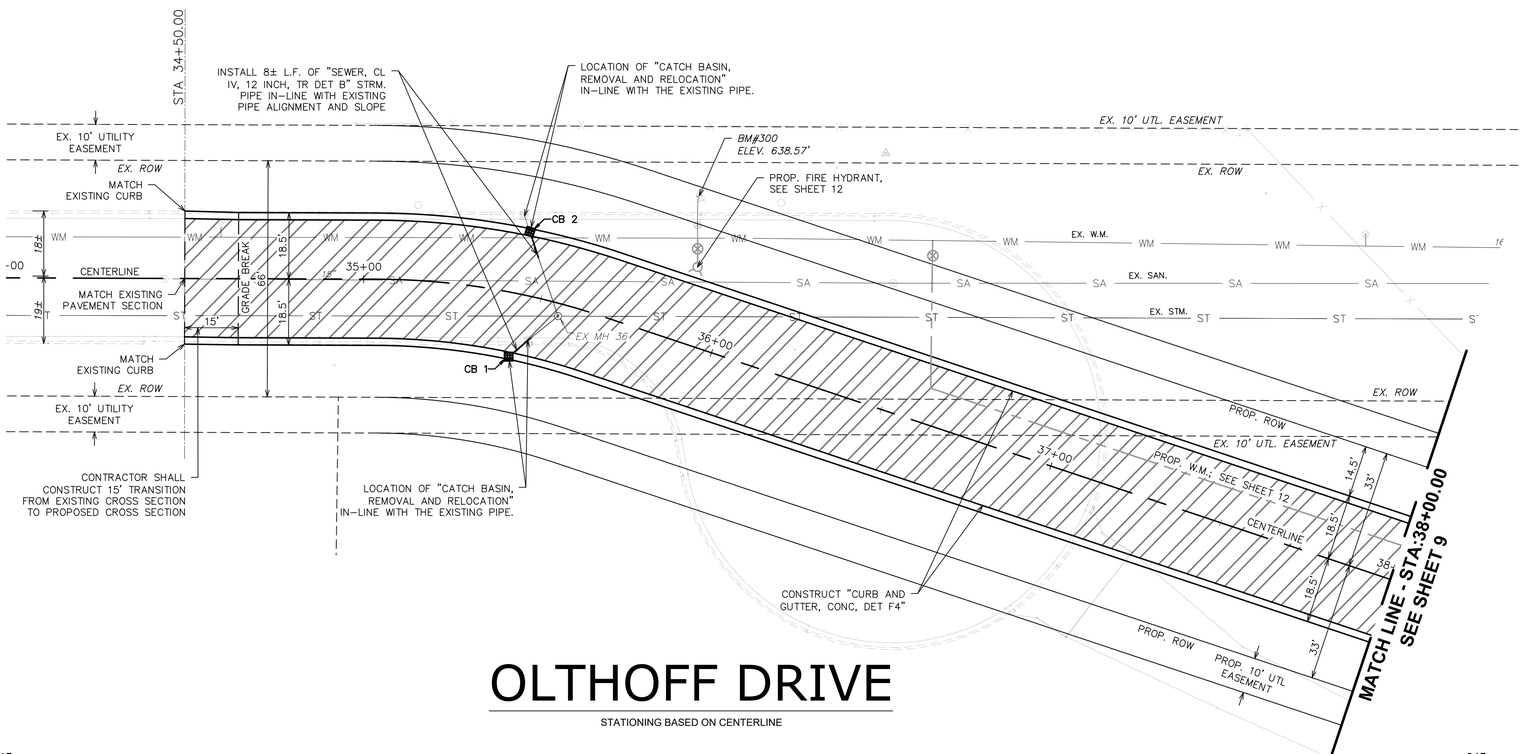
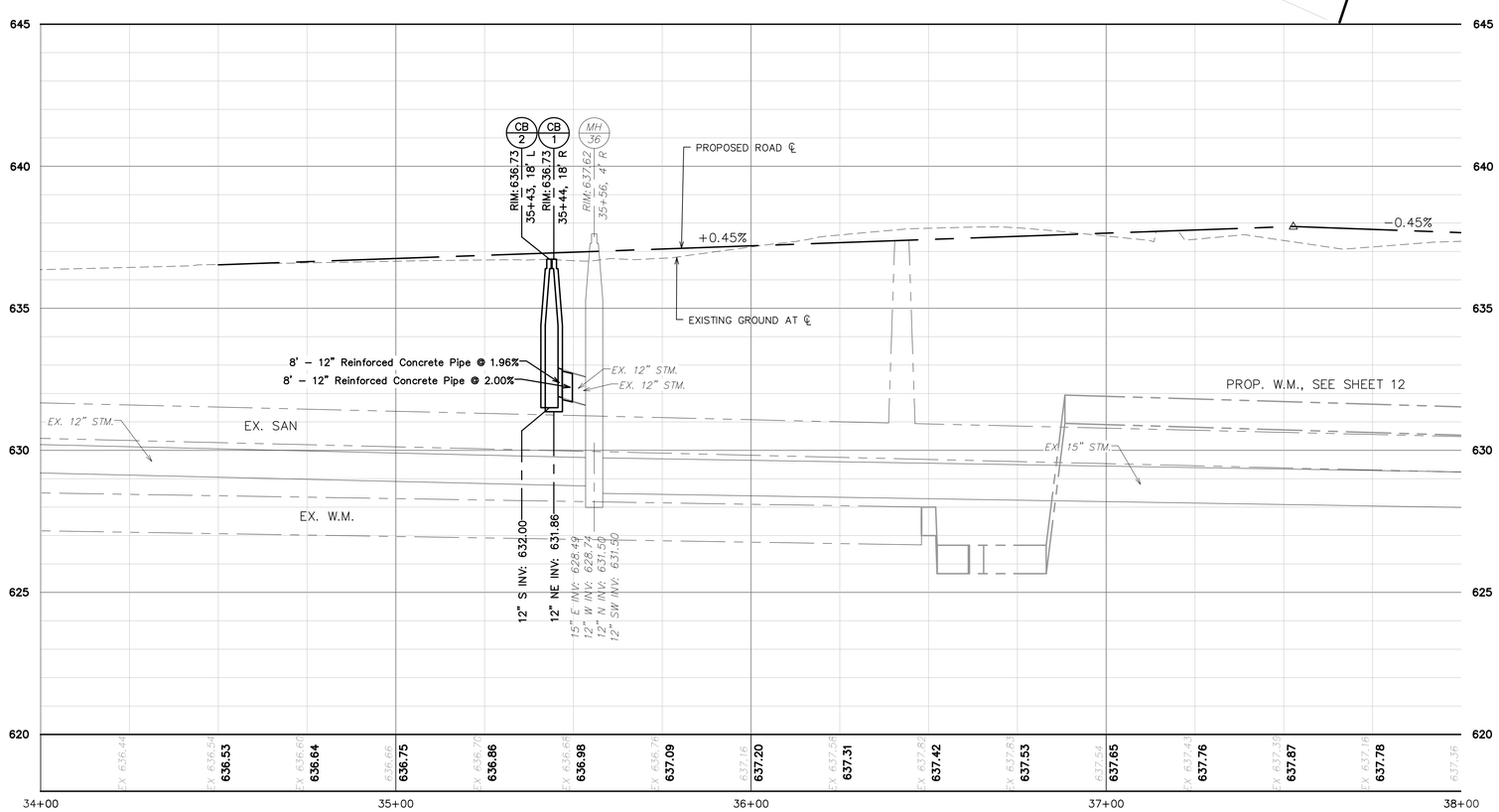


OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



NORTH

1"=20' 0 5 10 20 40 Feet/Inches

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
90	Cyd	Embankment, CIP
7	Sta	Machine Grading
1675	Syd	Aggregate Base, 6 inch
16	Ft	Sewer, Cl IV, 12 inch, Tr Det B
2	Ea	Catch Basin, Removal and Relocation
2	Ea	Dr Structure Cover, Type K, Modified
446	Ton	HMA, 4EML
700	Ft	Curb and Gutter, Conc, Det F4

STRUCTURE SCHEDULE

STR. NO.	STATION/OFFSET	STR. DIA.	STR. TYPE	COVER TYPE
CB 1	35+44, 18' R	4.0'	CB	K
CB 2	35+43, 18' L	4.0'	CB	K

CONSTRUCTION LEGEND

CONSTRUCT PAVEMENT SECTION
2" HMA, 4EML TOP COURSE
2" HMA, 4EML LEVELING COURSE
2" HMA, 4EML BASE COURSE
AGGREGATE BASE, 6 INCH
6" C.N.S. @ 95% MIN. REL. COMP.

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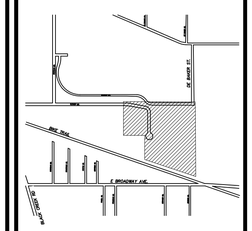
DATE	ADDITIONS AND/OR REVISIONS

DESIGNED LNM
DRAWN LNM
CHECKED RVW
APPROVED RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

ROAD IMPROVEMENTS – STA. 34+50 TO STA. 38+00

HRC JOB NO. 20210307
SCALE 1"=20'
DATE July 2022
SHEET NO. 8 OF 18

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ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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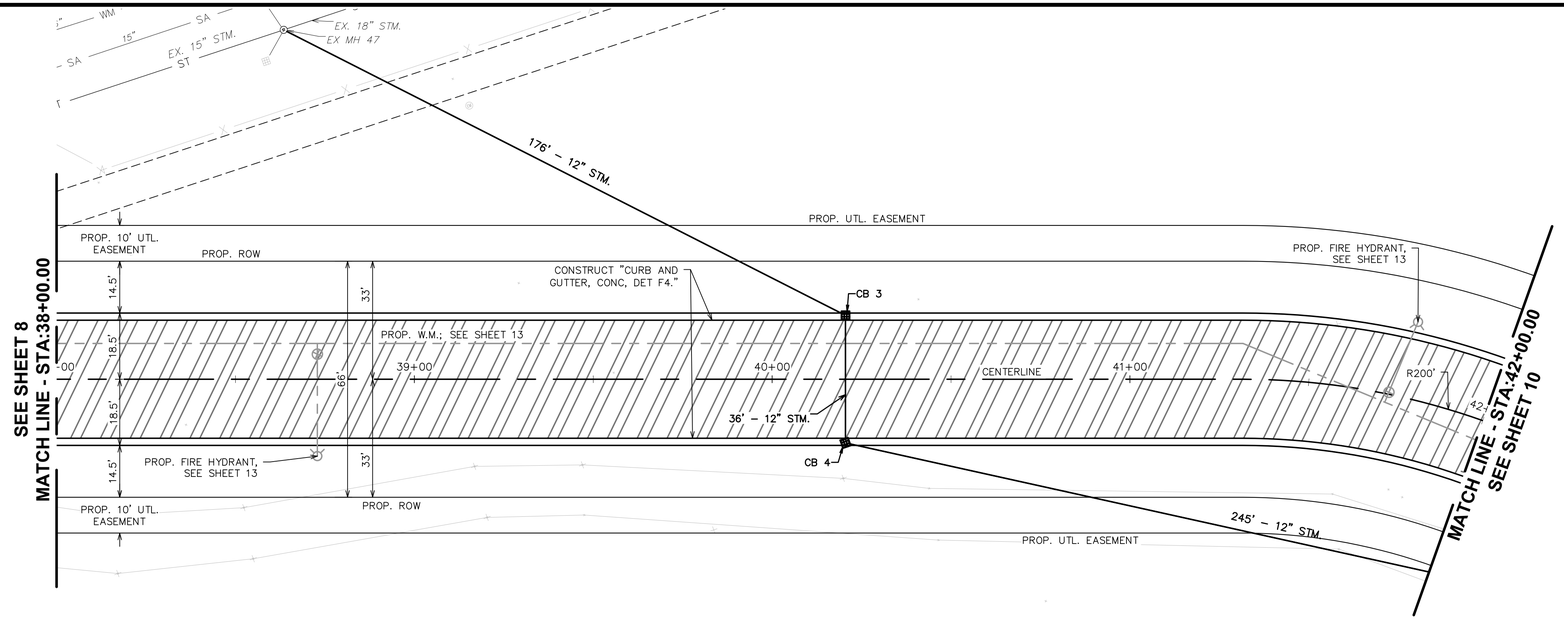
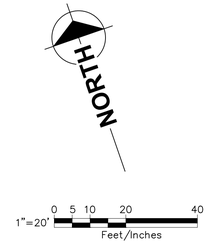
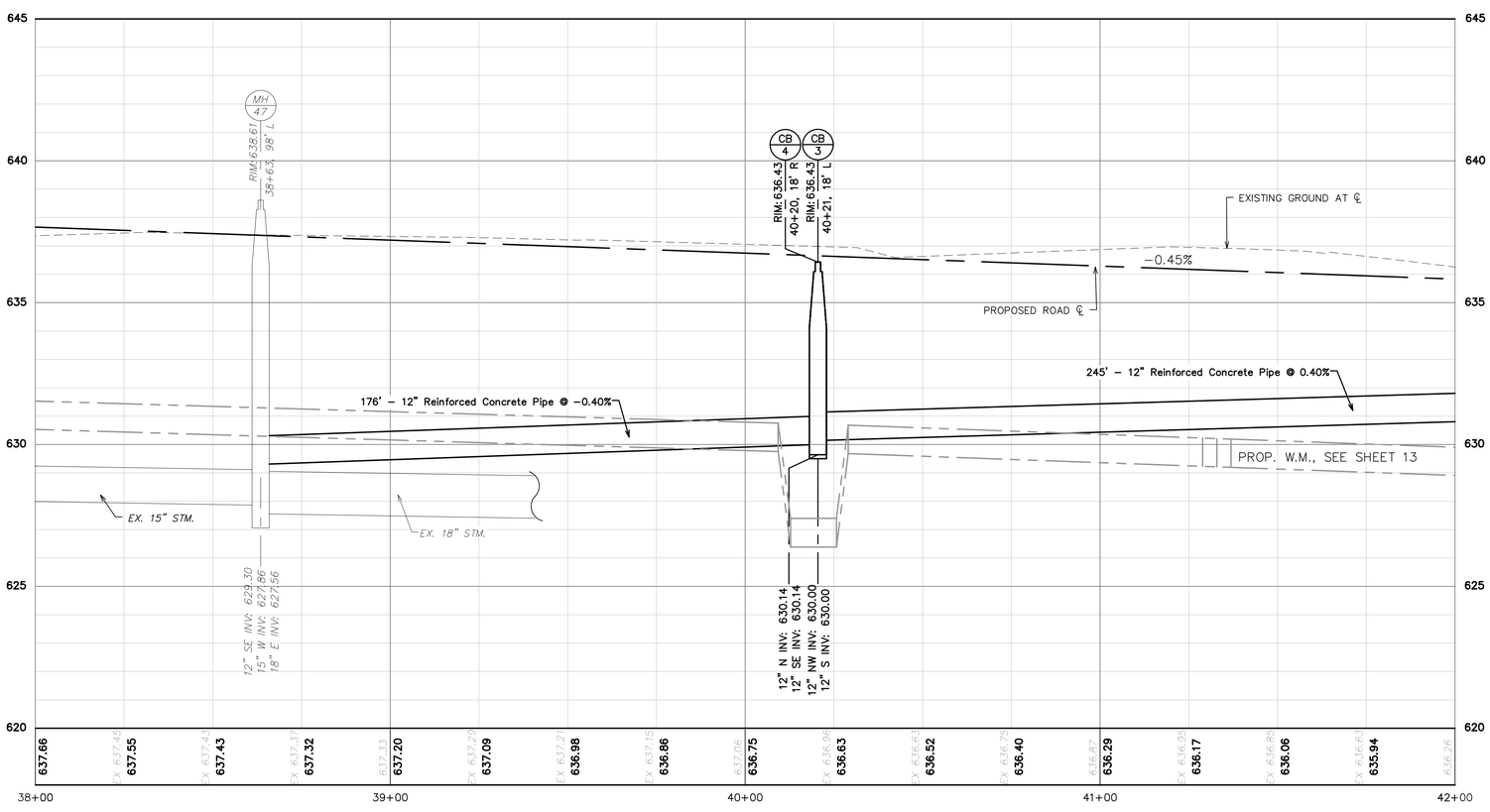
Marion, Lucas, N





OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
103	Cyd	Embankment, CIP
8	Sta	Machine Grading
1914	Syd	Aggregate Base, 6 inch
343	Ft	Sewer, Cl IV, 12 inch, Tr Det A
36	Ft	Sewer, Cl IV, 12 inch, Tr Det B
379	Ft	Video Taping Sewer and Culv Pipe
1	Ea	Dr Structure, Tap, 12 inch
2	Ea	Catch Basin, Special, 48 inch dia
2	Ea	Dr Structure Cover, Type K, Modified
509	Ton	HMA, 4EML
800	Ft	Curb and Gutter, Conc, Det F4

STRUCTURE SCHEDULE

STR. NO.	STATION/OFFSET	STR. DIA.	STR. TYPE	COVER TYPE
CB 3	40+21, 18' L	4.0'	CB	K
CB 4	40+20, 18' R	4.0'	CB	K

CONSTRUCTION LEGEND

	CONSTRUCT PAVEMENT SECTION 2" HMA, 4EML TOP COURSE 2" HMA, 4EML LEVELING COURSE 2" HMA, 4EML BASE COURSE AGGREGATE BASE, 6 INCH 6" C.N.S. @ 95% MIN. REL. COMP.

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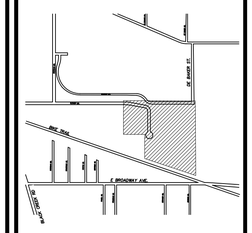
DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

ROAD IMPROVEMENTS – STA. 38+00 TO STA. 42+00

HRC JOB NO.	SCALE
20210307	1"=20'
DATE: July 2022	SHEET NO. 9 OF 18

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Marion, Lucas, N

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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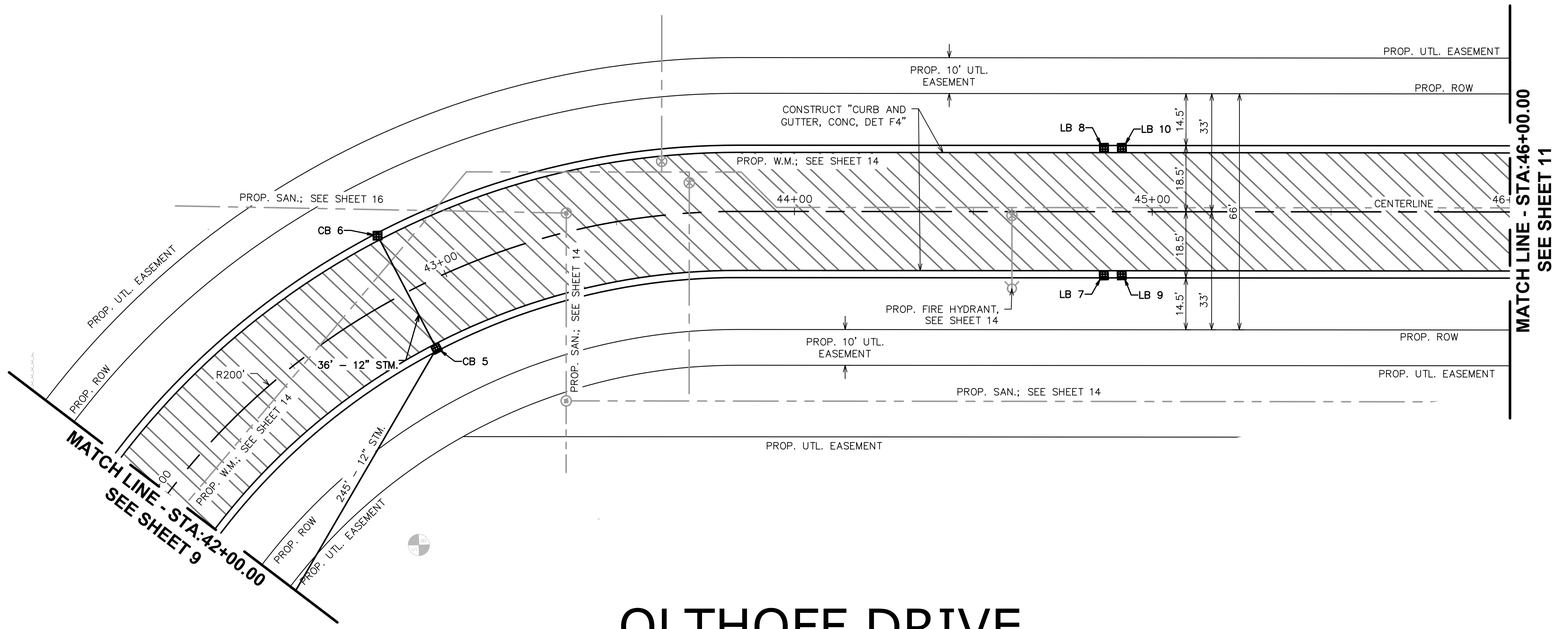
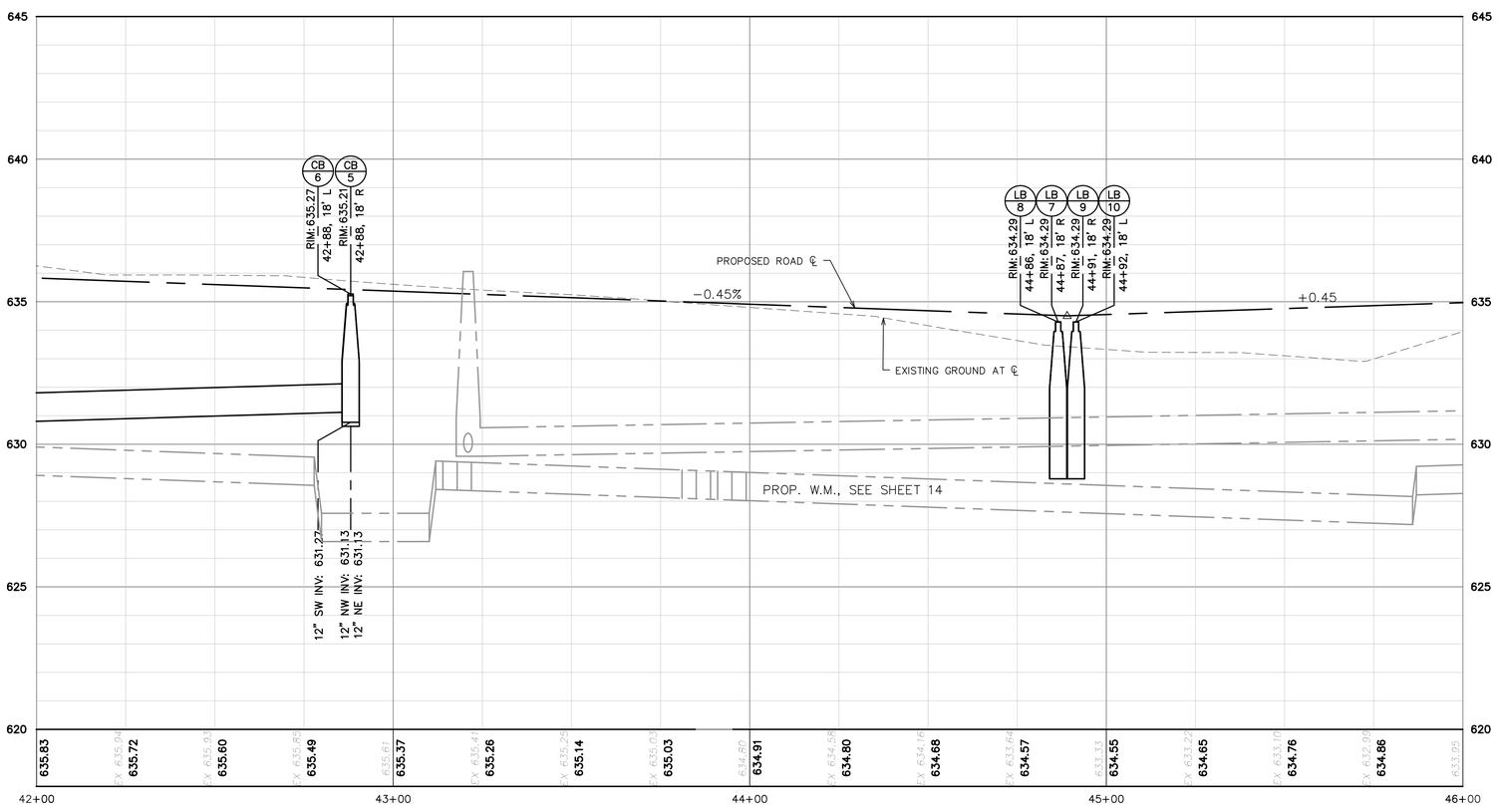
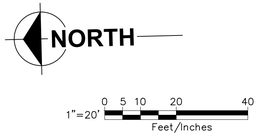


OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE





QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
103	Cyd	Embankment, CIP
8	Sta	Machine Grading
1914	Syd	Aggregate Base, 6 inch
78	Ft	Sewer, Cl IV, 12 inch, Tr Det A
36	Ft	Sewer, Cl IV, 12 inch, Tr Det B
114	Ft	Video Taping Sewer and Culv Pipe
2	Ea	Catch Basin, Special, 48 inch dia
6	Ea	Dr Structure Cover, Type K, Modified
4	Ea	Leaching Basin, 48 inch dia
226	Ft	Underdrain, Subgrade, 12 inch
509	Ton	HMA, 4EML
801	Ft	Curb and Gutter, Conc, Det F4

CONSTRUCTION LEGEND

CONSTRUCT PAVEMENT SECTION
2" HMA, 4EML TOP COURSE
2" HMA, 4EML LEVELING COURSE
2" HMA, 4EML BASE COURSE
AGGREGATE BASE, 6 INCH
6" C.N.S. @ 95% MIN. REL. COMP.

STRUCTURE SCHEDULE

STR. NO.	STATION/OFFSET	STR. DIA.	STR. TYPE	COVER TYPE
CB 5	42+88, 18' R	4.0'	CB	K
CB 6	42+88, 18' L	4.0'	CB	K
LB 7	44+87, 18' R	4.0'	LB	K
LB 8	44+86, 18' L	4.0'	LB	K
LB 9	44+91, 18' R	4.0'	LB	K
LB 10	44+92, 18' L	4.0'	LB	K

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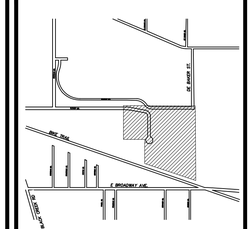
CHECKED	RVW
APPROVED	RVW



CITY OF
MUSKEGON
OLTHOFF DRIVE EXTENSION

ROAD IMPROVEMENTS –
STA. 42+00 TO STA. 46+00

HRC JOB NO.	SCALE
20210307	1"=20'
DATE July 2022	SHEET NO. 10 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)
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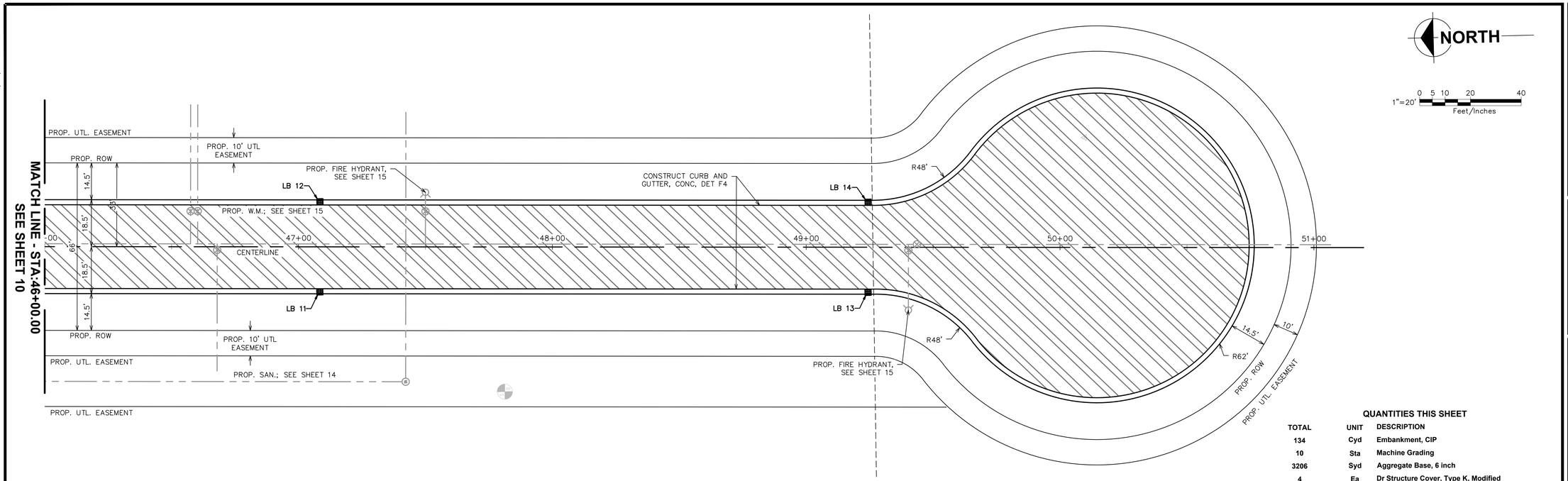
Marion, Lucas, N

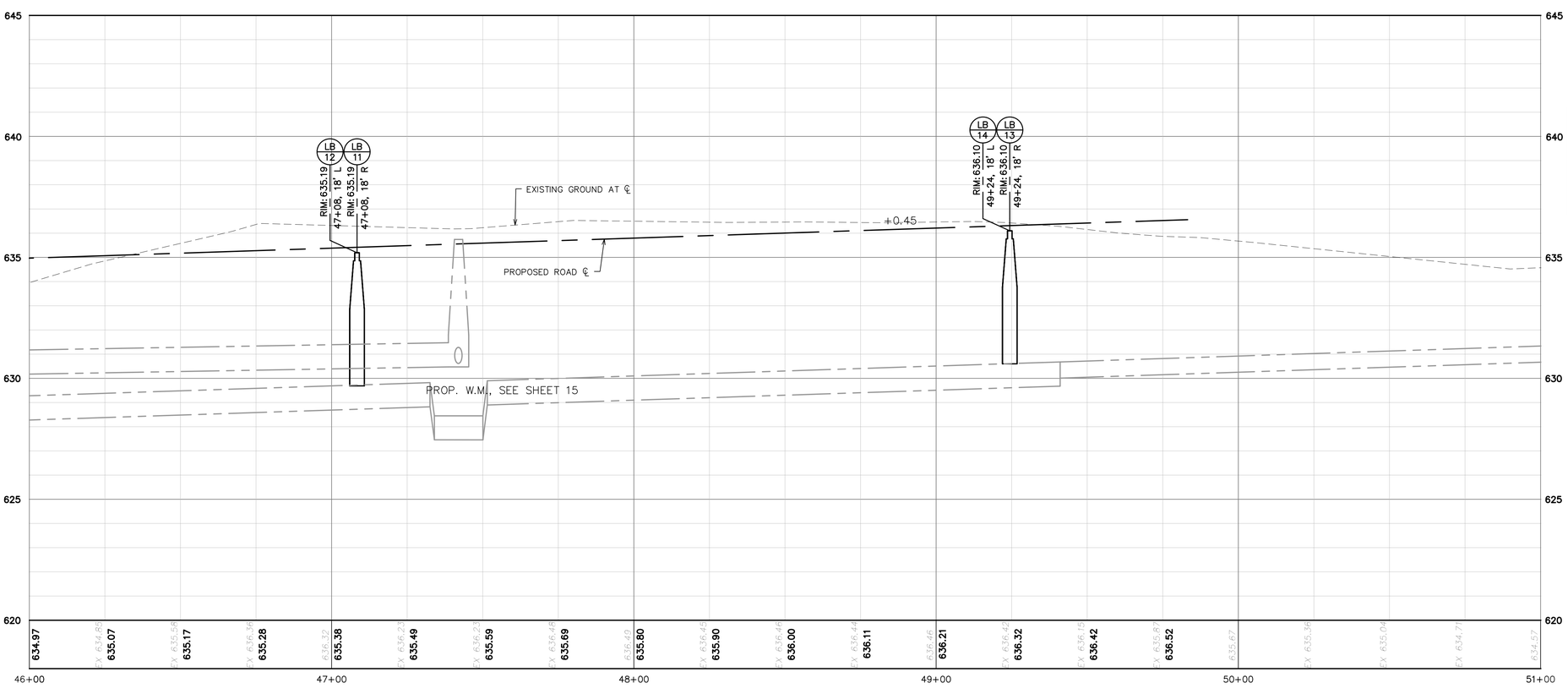


OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
134	Cyd	Embankment, CIP
10	Sta	Machine Grading
3206	Syd	Aggregate Base, 6 inch
4	Ea	Dr Structure Cover, Type K, Modified
4	Ea	Leaching Basin, 48 inch dia
650	Ft	Underdrain, Subgrade, 12 inch
299	Ton	HMA, 4EML
1045	Ft	Curb and Gutter, Conc, Det F4



CONSTRUCTION LEGEND

CONSTRUCT PAVEMENT SECTION
2" HMA, 4EML TOP COURSE
2" HMA, 4EML LEVELING COURSE
2" HMA, 4EML BASE COURSE
AGGREGATE BASE, 6 INCH
6" C.N.S. @ 95% MIN. REL. COMP.

STRUCTURE SCHEDULE

STR. NO.	STATION/OFFSET	STR. DIA.	STR. TYPE	COVER TYPE
LB 11	47+08, 18' R	4.0'	LB	K
LB 12	47+08, 18' L	4.0'	LB	K
LB 13	49+24, 18' R	4.0'	LB	K
LB 14	49+24, 18' L	4.0'	LB	K

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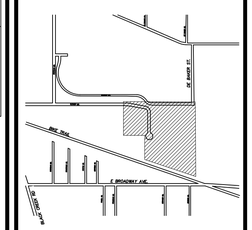
APPROVED RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

ROAD IMPROVEMENTS – STA. 46+00 TO STA. 51+00

HRC JOB NO. 20210307
SCALE 1"=20'
DATE July 2022
SHEET NO. 11 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)
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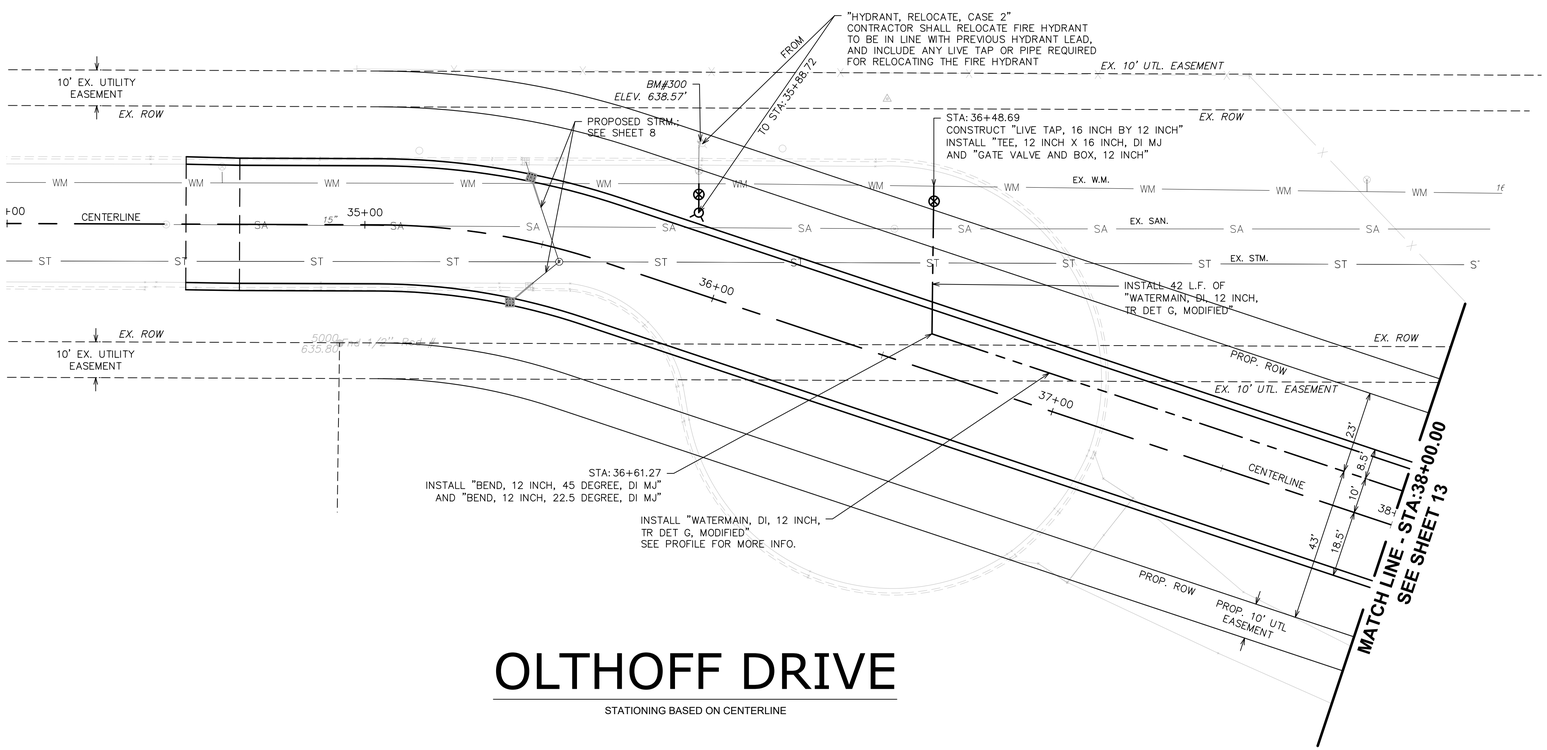
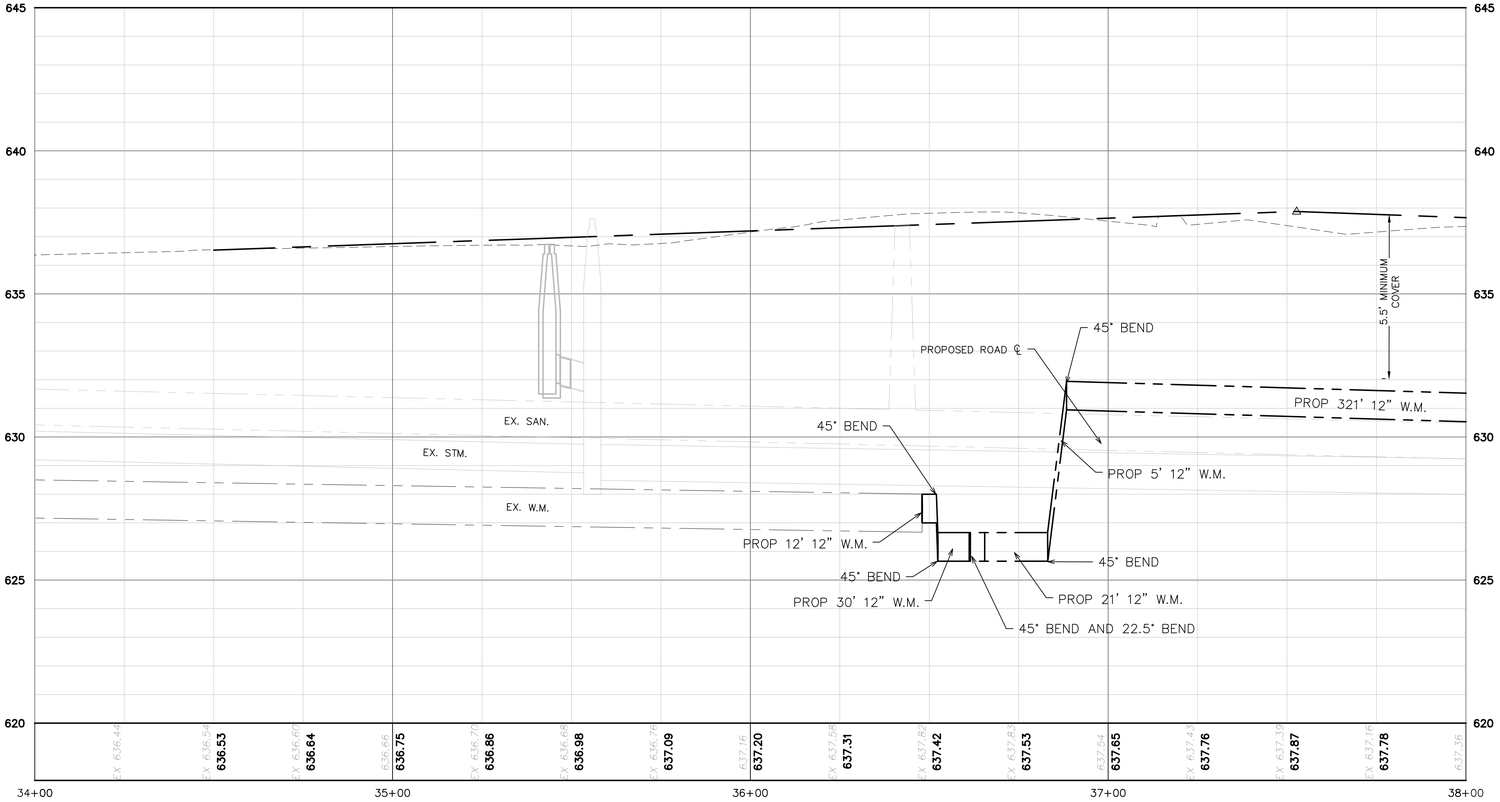
Marion, Lucas, N



OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



NORTH

0 5 10 20 40

1" = 20'

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
1	Ea	Gate Valve and Box, 12 inch
1	Ea	Hydrant, Relocate, Case 2
1	Ea	Live Tap, 12 inch by 16 inch
180	Ft	Water Main, DI, 12 inch, Tr Det G
1	Ea	Bend, 12 inch, 22.5 Degree, DI MJ
5	Ea	Bend, 12 inch, 45 Degree, DI MJ
1	Ea	Tee, 16 inch X 12 inch, DI MJ

MUSKEGON
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www.shorelinecity.com

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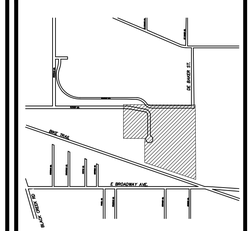
1925 BRETON ROAD, SE
GRAND RAPIDS, MI
SUITE 100
49506
PHONE: (616) 454-4286
FAX: (616) 454-4278
WEB SITE: http: // www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS

DESIGNED LNM
DRAWN LNM
CHECKED RVW
APPROVED RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

UTILITY IMPROVEMENTS – STA.34+50 TO STA.38+00

HRC JOB NO.	SCALE
20210307	1"=20'
DATE November 2022	SHEET NO. 12 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)
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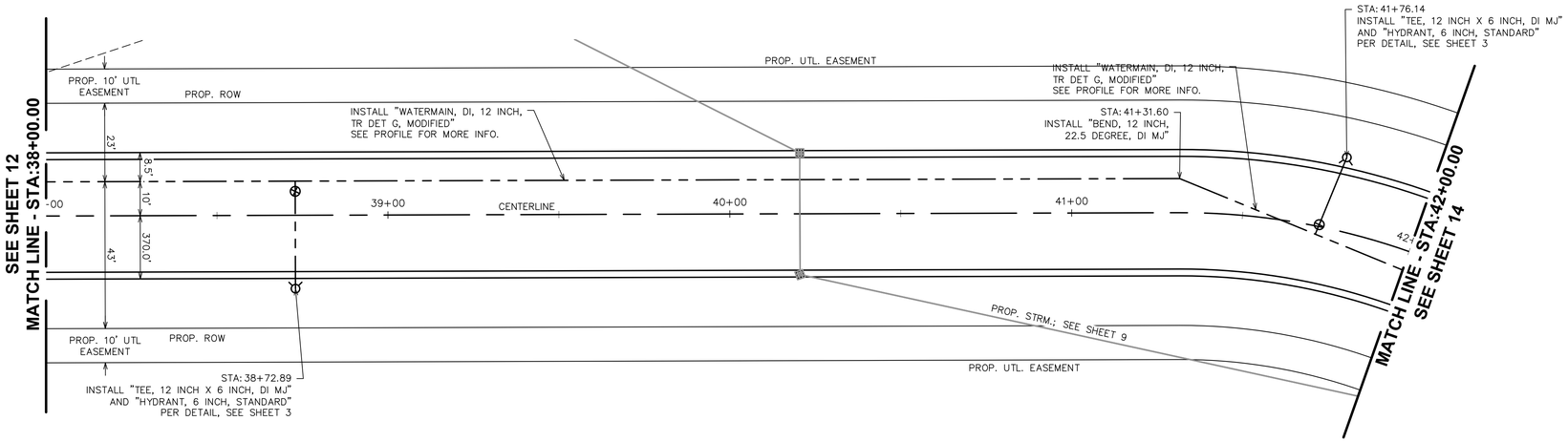
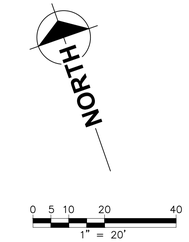
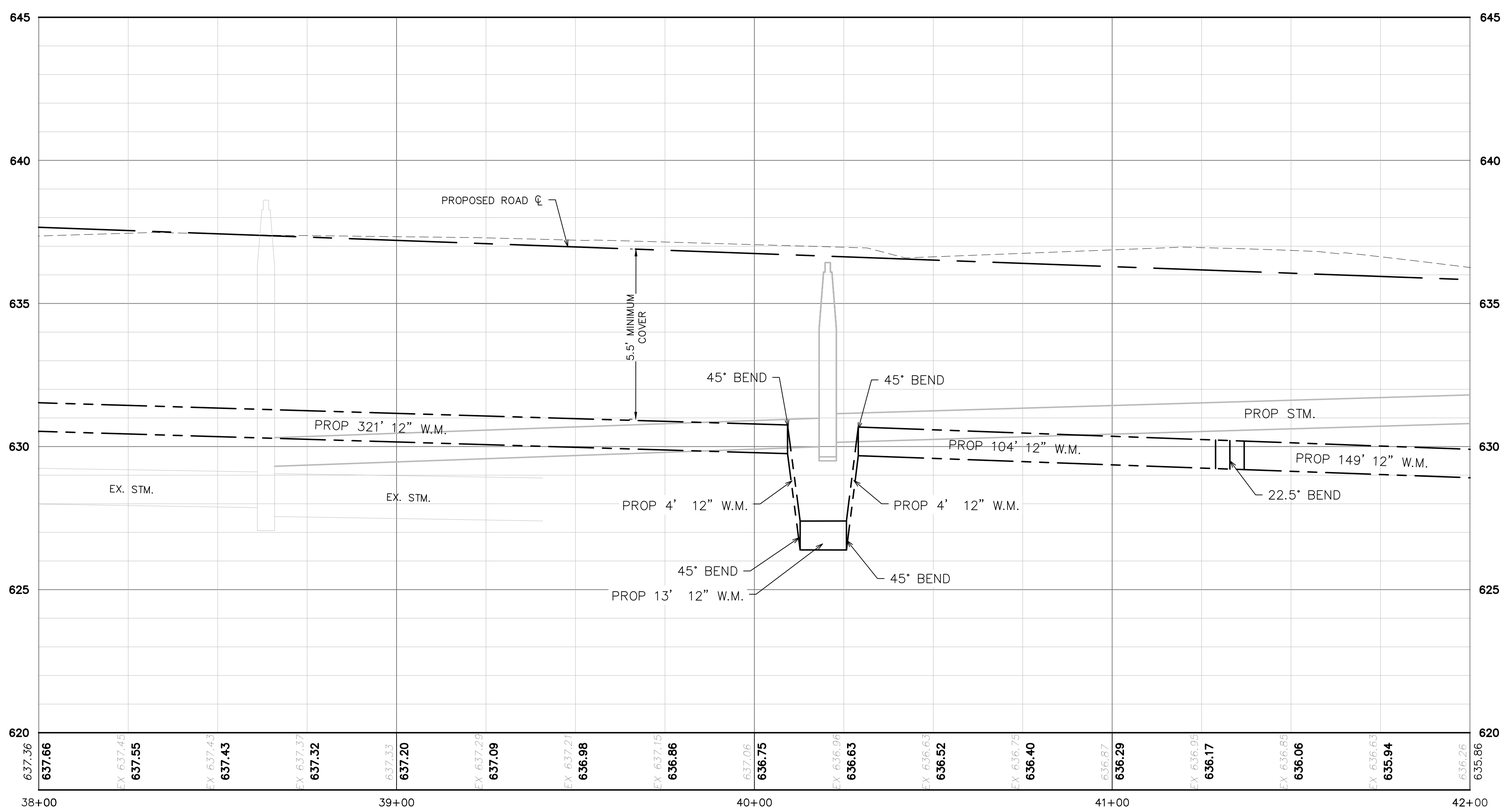
Marion, Lucas, N





OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
405	Ft	Water Main, DI, 12 inch, Tr Det G
1	Ea	Bend, 12 inch, 22.5 Degree, DI MJ
4	Ea	Bend, 12 inch, 45 Degree, DI MJ
2	Ea	Hydrant, 6 inch, Standard
2	Ea	Tee, 12 inch X 6 inch, DI MJ

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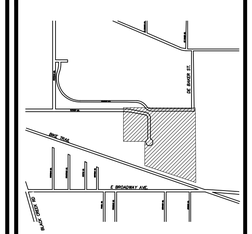
GRAND RAPIDS, MI 49506
PHONE: (616) 454-4286
FAX: (616) 454-4278
WEB SITE: http:// www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
8/15/22	REVISION 1

DESIGNED LNM
DRAWN LNM
CHECKED RVW
APPROVED RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

UTILITY IMPROVEMENTS – STA.38+00 TO STA.42+00

HRC JOB NO. 20210307
SCALE 1"=20'
DATE November 2022
SHEET NO. 13 OF 18

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ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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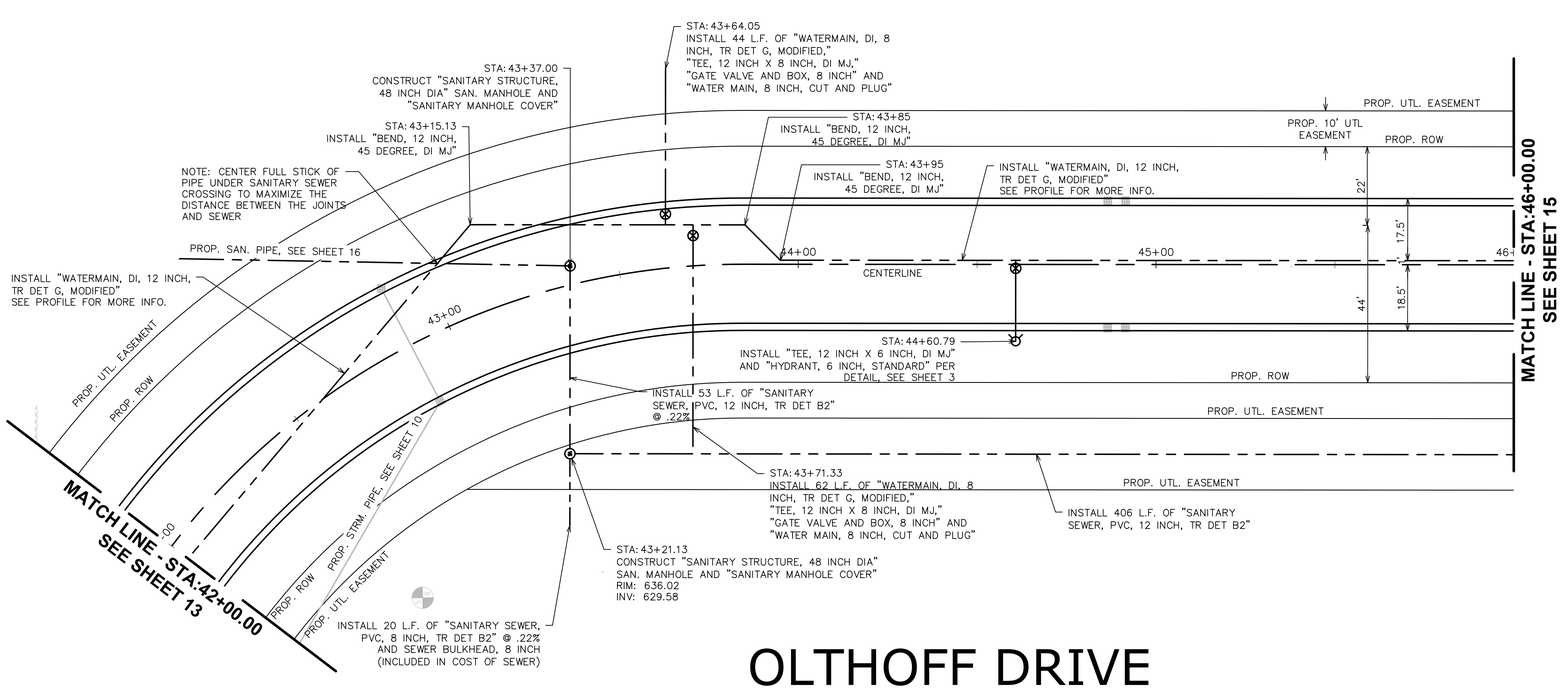
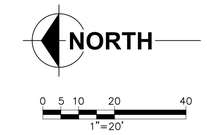
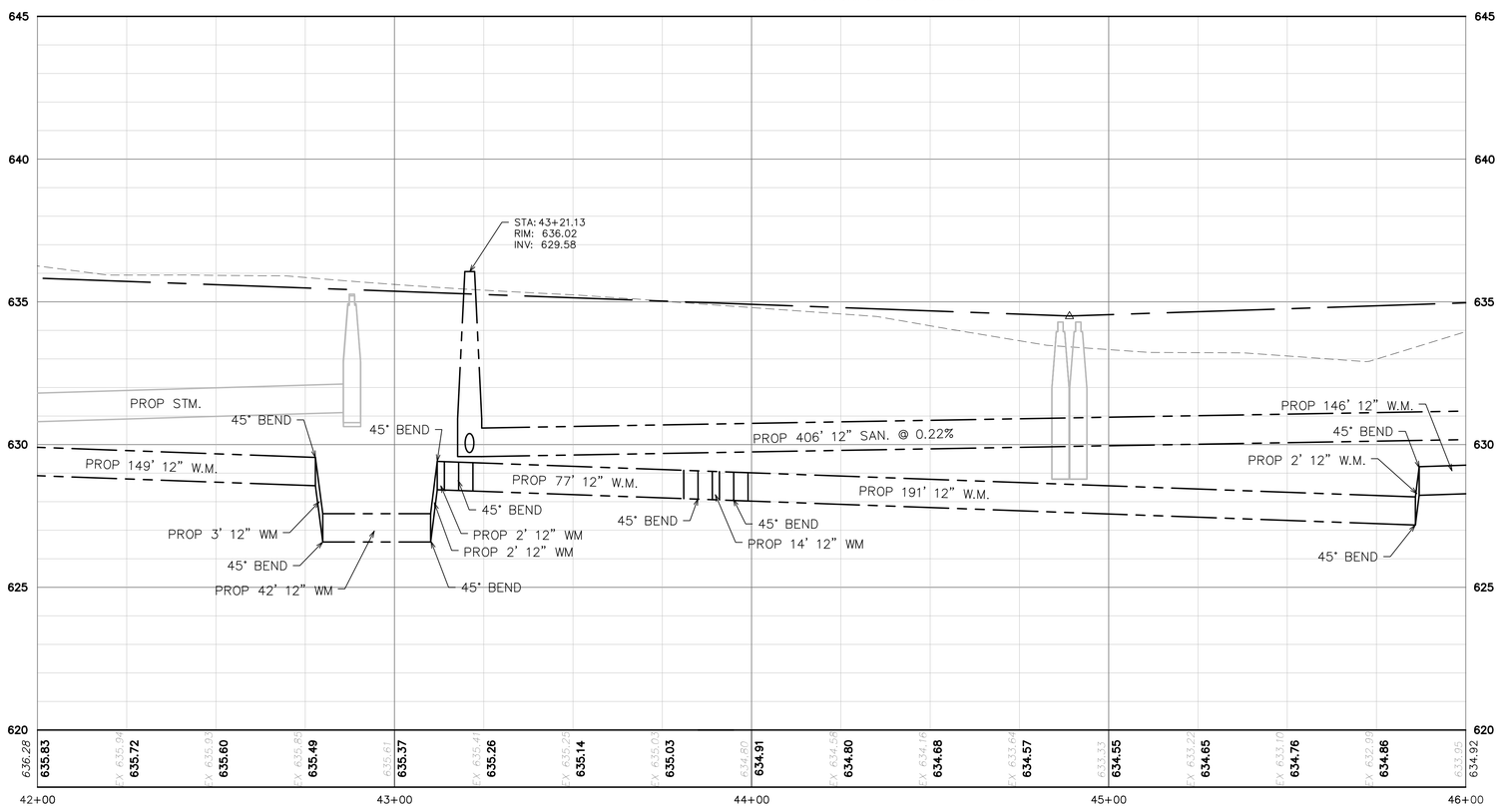
Marion, Lucas, N





OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE



QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
337	Ft	Video Taping Sewer and Culv Pipe
2	Ea	Sanitary Manhole Cover
2	Ea	Gate Valve and Box, 8 inch
2	Ea	Water Main, 8 inch, Cut and Plug
425	Ft	Water Main, DI, 12 inch, Tr Det G
106	Ft	Water Main, DI, 8 inch, Tr Det G
9	Ea	Bend, 12 inch, 45 Degree, DI MJ
1	Ea	Hydrant, 6 inch, Standard
1	Ea	Tee, 12 inch X 6 inch, DI MJ
2	Ea	Tee, 12 inch X 8 inch, DI MJ
20	Ft	Sanitary Sewer, PVC, 8 inch, Tr Det B2
317	Ft	Sanitary Sewer, PVC, 12 inch, Tr Det B2
2	Ea	Sanitary Structure, 48 inch dia

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GRAND RAPIDS, MI
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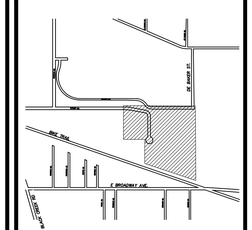
49506
PHONE: (616) 454-4286
FAX: (616) 454-4278
WEB SITE: http: // www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
8/15/22	REVISION 1

DESIGNED LNM
DRAWN LNM
CHECKED RVW
APPROVED RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

UTILITY IMPROVEMENTS – STA.42+00 TO STA.46+00

HRC JOB NO. 20210307
SCALE 1"=20'
DATE November 2022
SHEET NO. 14 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)
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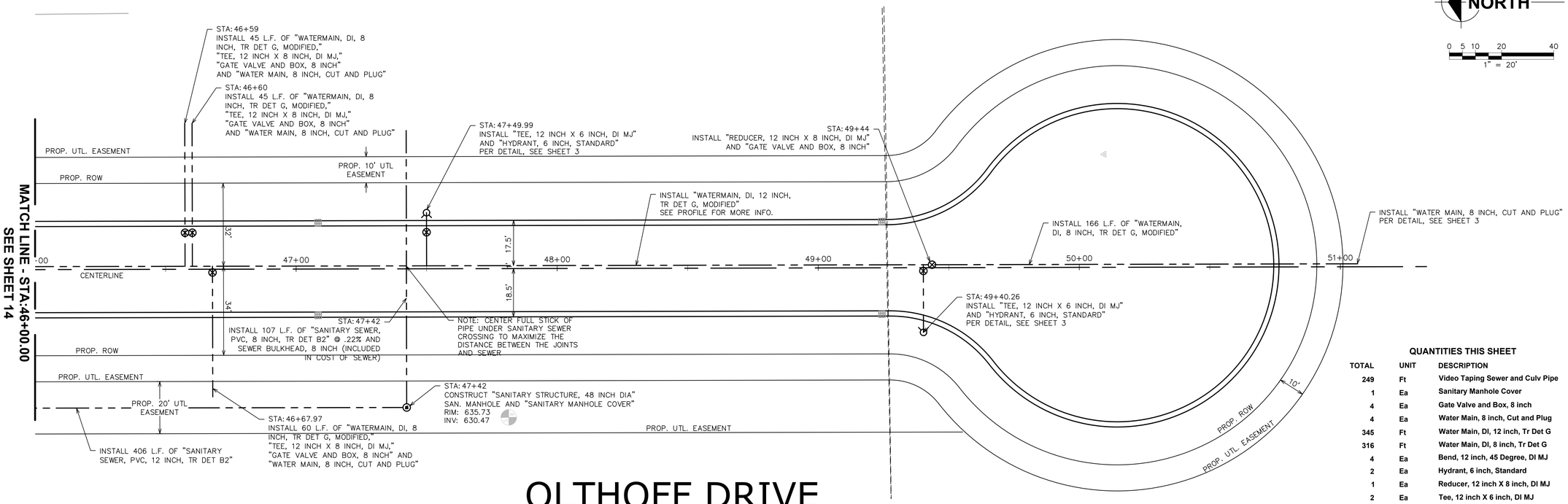
Marion, Lucas, N

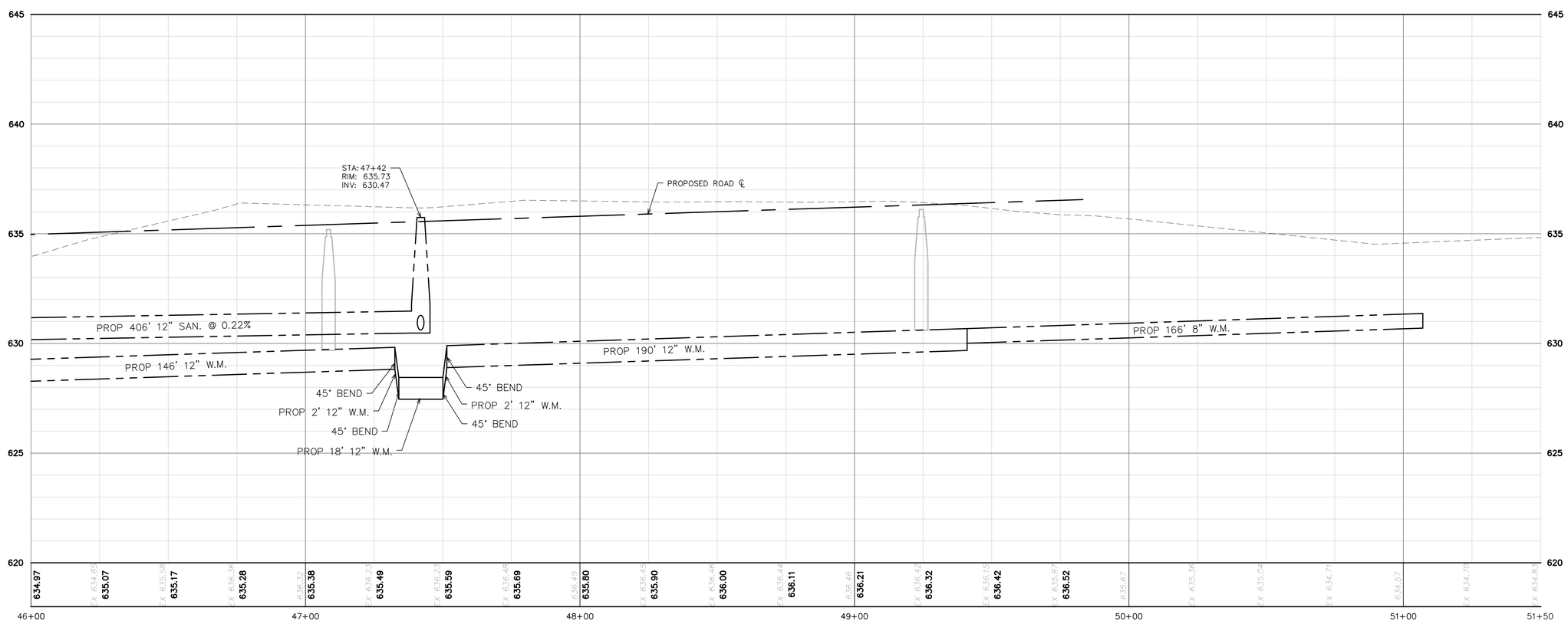


OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
249	Ft	Video Taping Sewer and Culv Pipe
1	Ea	Sanitary Manhole Cover
4	Ea	Gate Valve and Box, 8 inch
4	Ea	Water Main, 8 inch, Cut and Plug
345	Ft	Water Main, DI, 12 inch, Tr Det G
316	Ft	Water Main, DI, 8 inch, Tr Det G
4	Ea	Bend, 12 inch, 45 Degree, DI MJ
2	Ea	Hydrant, 6 inch, Standard
1	Ea	Reducer, 12 inch X 8 inch, DI MJ
2	Ea	Tee, 12 inch X 6 inch, DI MJ
3	Ea	Tee, 12 inch X 8 inch, DI MJ
107	Ft	Sanitary Sewer, PVC, 8 inch, Tr Det B2
142	Ft	Sanitary Sewer, PVC, 12 inch, Tr Det B2
1	Ea	Sanitary Structure, 48 inch dia



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GRAND RAPIDS, MI 49506
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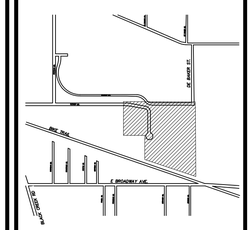
FAX: (616) 454-4278
WEB SITE: http:// www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
8/15/22	REVISION 1

DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

UTILITY IMPROVEMENTS – STA.46+00 TO STA.51+00

HRC JOB NO.	SCALE
20210307	1"=20'
DATE: November 2022	SHEET NO. 15 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)
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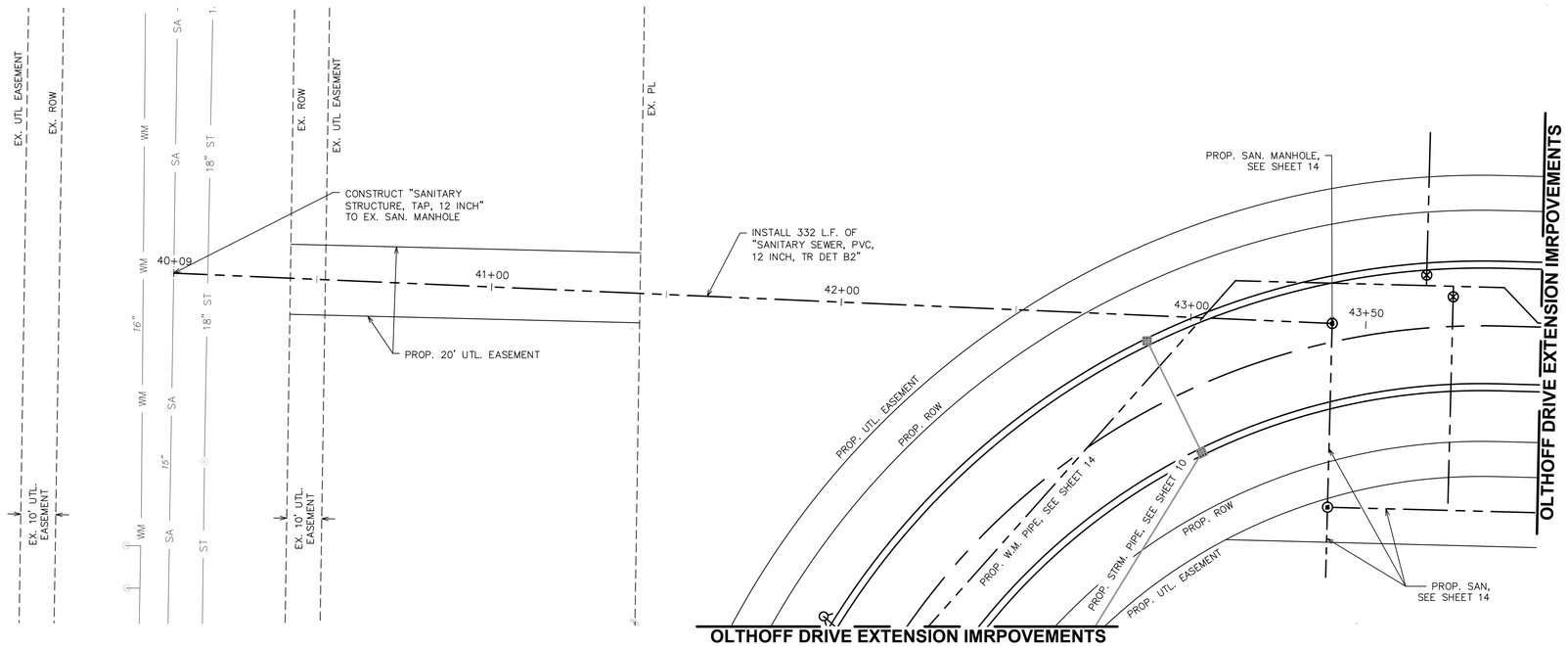
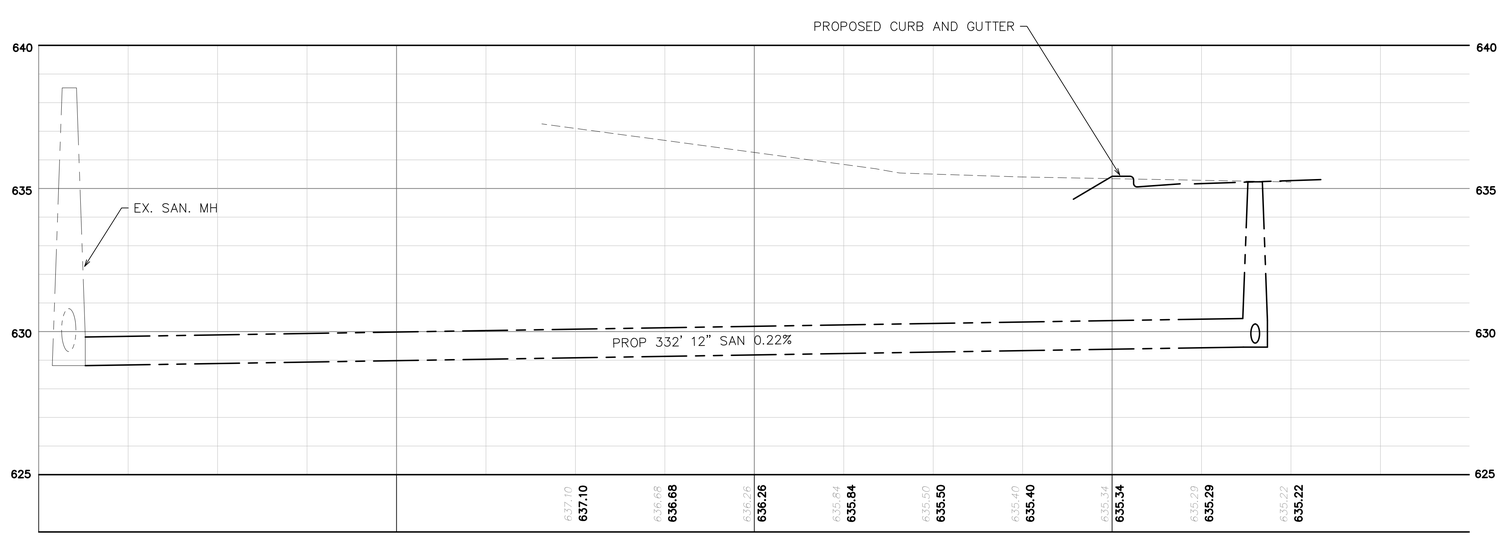
Marion, Lucas, N



SAN. PIPE CONNECTION

STATIONING BASED ON PIPE CENTERLINE



NORTH

0 5 10 20 40

1" = 20'

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
332	Ft	Video Taping Sewer and Culv Pipe
332	Ft	Sanitary Sewer, PVC, 12 inch, Tr Det B2
1	Ea	Sanitary Structure, Tap, 12 inch

MUSKEGON

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CONSULTING ENGINEERS SINCE 1915

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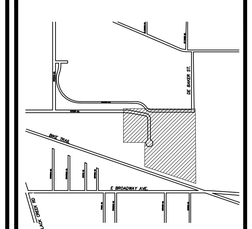
GRAND RAPIDS, MI

SUITE 100
49506

PHONE: (616) 454-4286
FAX: (616) 454-4278

WEB SITE: http:// www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF MUSKEGON

OLTHOFF DRIVE EXTENSION

UTILITY IMPROVEMENTS – SANITARY PIPE CONNECTION

HRC JOB NO.	SCALE
20210307	1"=20'
DATE November 2022	SHEET NO. 16 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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Marion, Lucas, N

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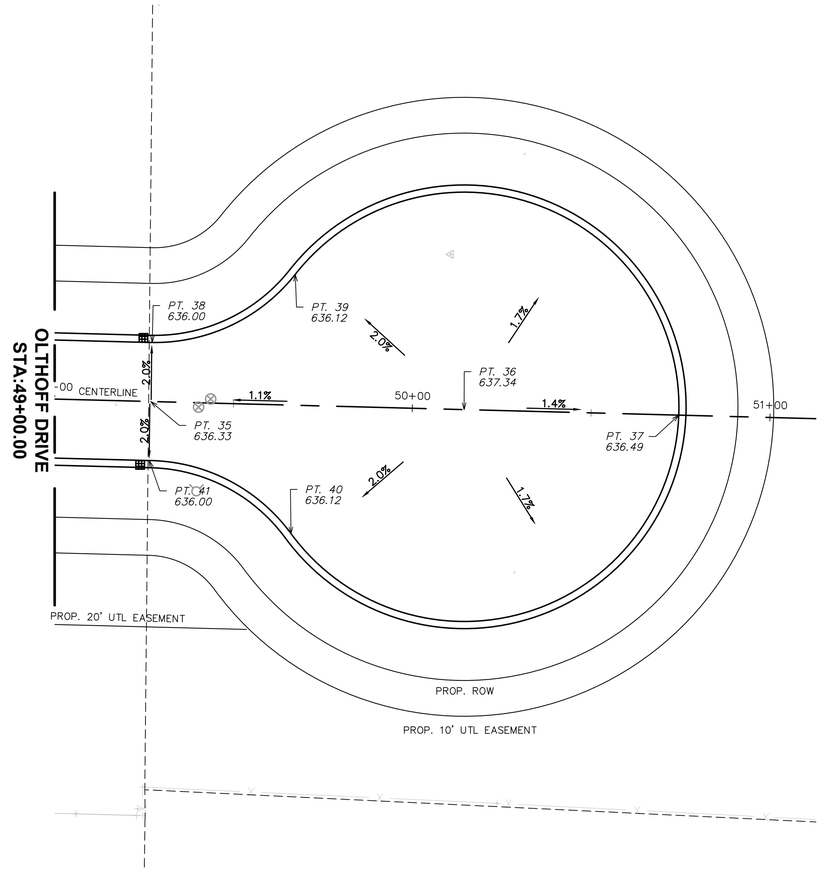
Marion, Lucas, N

NORTH

1"=20' 0 5 10 20 40
Feet/Inches



CONTROL POINTS			
Point #	Elevation	Northing	Northing
35	636.33	626597.3972	12641460.6813
36	637.34	626509.8035	12641458.4237
37	636.49	626449.8234	12641456.8778
38	636.00	626596.9720	12641477.1759
39	636.12	626556.9937	12641496.1847
40	636.12	626558.1928	12641423.6937
41	636.00	626597.8223	12641444.1868

OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE

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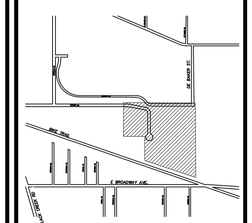
DATE	ADDITIONS AND/OR REVISIONS
DESIGNED	LNM
DRAWN	LNM
CHECKED	RVW
APPROVED	RVW



CITY OF
MUSKEGON
OLTHOFF DRIVE EXTENSION

CUL-DE-SAC DETAIL GRADES

HRC JOB NO.	SCALE
20210307	1"=20'
DATE July 2022	SHEET NO. 17 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)

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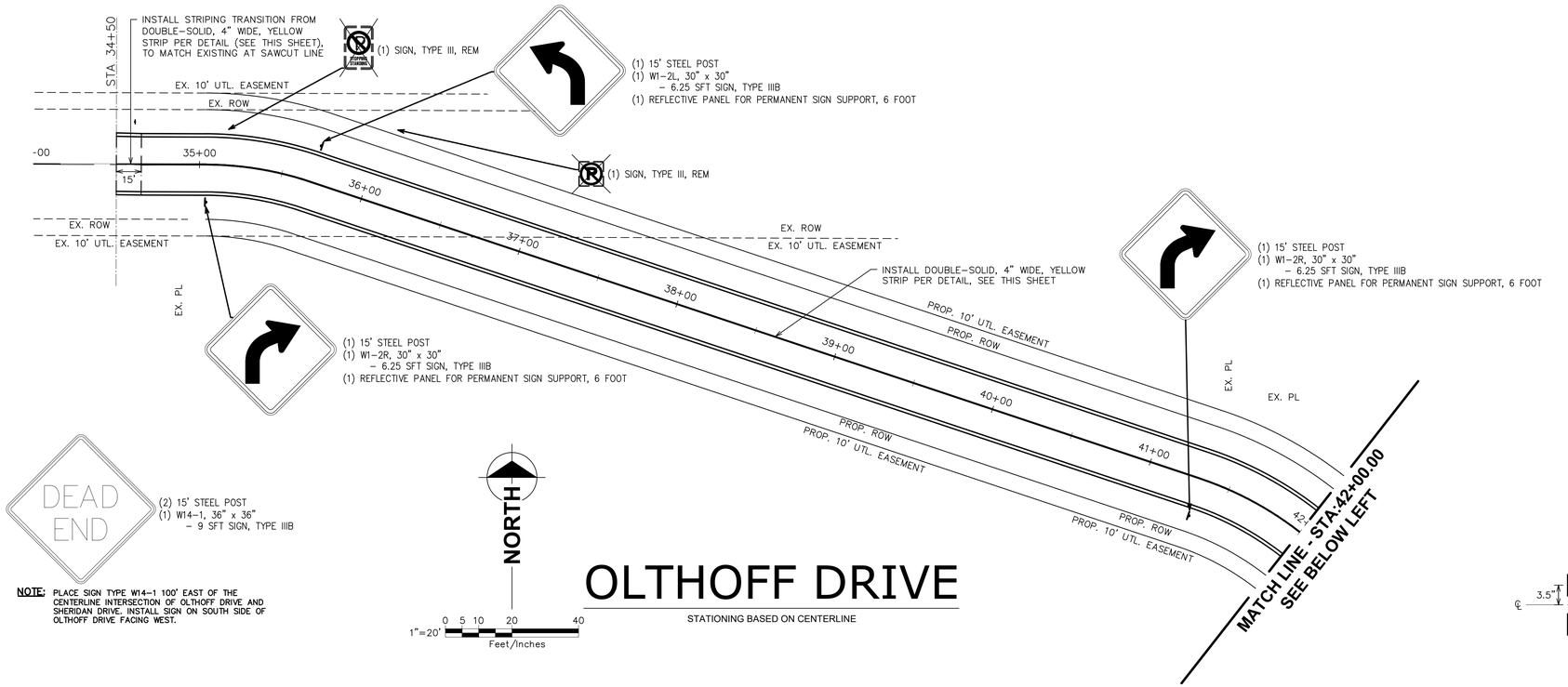


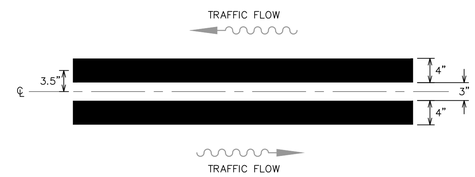
NOTE: PLACE SIGN TYPE W14-1 100' EAST OF THE CENTERLINE INTERSECTION OF OLTHOFF DRIVE AND SHERIDAN DRIVE. INSTALL SIGN ON SOUTH SIDE OF OLTHOFF DRIVE FACING WEST.

OLTHOFF DRIVE

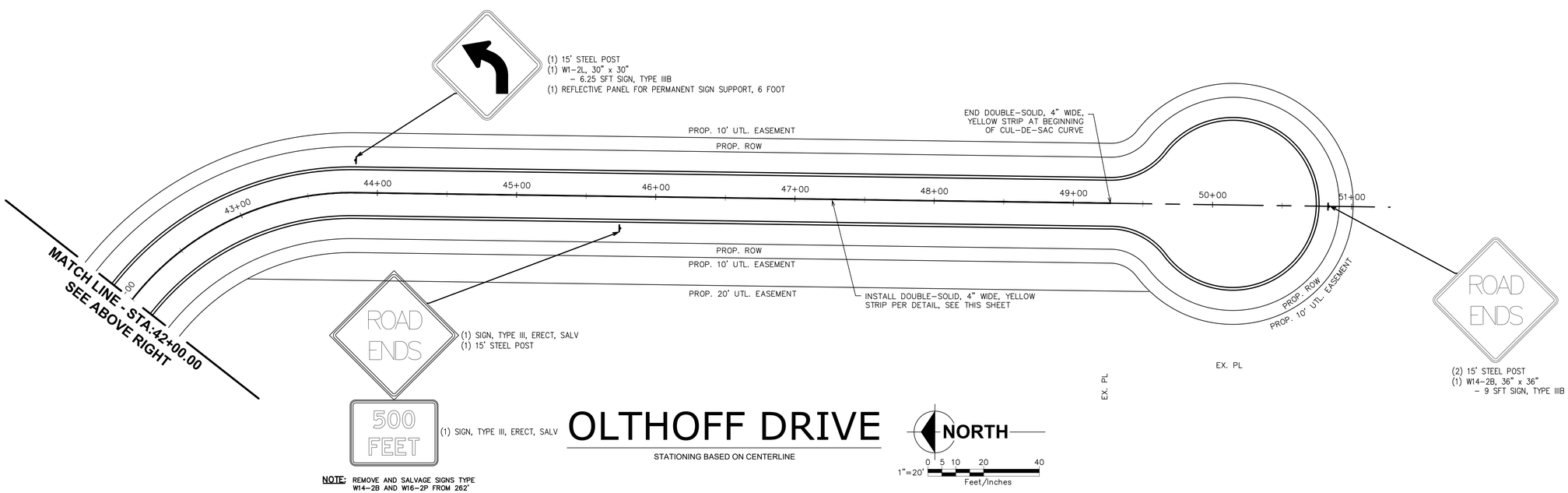
STATIONING BASED ON CENTERLINE

QUANTITIES THIS SHEET

TOTAL	UNIT	DESCRIPTION
120	Ft	Post, Steel, 3 lb
2	Ea	Sign, Type III, Erect, Salv
2	Ea	Sign, Type III, Rem
43	Sft	Sign, Type IIIB
4	Ea	Reflective Panel for Permanent Sign Support, 6 foot
2954	Ft	Pavt Mrkg, Waterborne, 4 inch, Yellow



DOUBLE-SOLID, 4" YELLOW LINE



OLTHOFF DRIVE

STATIONING BASED ON CENTERLINE

NOTE: REMOVE AND SALVAGE SIGNS TYPE W14-2B AND W16-2P FROM 262' WEST OF THE P.O.B. ON SOUTH SIDE OF OLTHOFF DRIVE AND RELOCATE TO STA 45+74, RT

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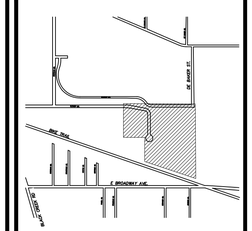
DATE	ADDITIONS AND/OR REVISIONS
8/9/22	REVISION 1

DESIGNED LNM
DRAWN LNM
CHECKED RVW
APPROVED RVW



CITY OF MUSKEGON
OLTHOFF DRIVE EXTENSION

PAVEMENT MARKING AND SIGNAGE PLAN

HRC JOB NO. 20210307
SCALE 1"=20'
DATE August 2022
SHEET NO. 18 OF 18

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (24.00 X 36.00 INCHES)
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Marion, Lucas, N