

CITY OF MUSKEGON
MUSKEGON COUNTY, MICHIGAN



REMEMBERANCE DRIVE

FROM K L OUTDOOR TO KEATING AVE.

-2018-

CITY OF MUSKEGON PROJECT NO.
H-1720 / S-681 / W-792

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UTILITY COMPANIES

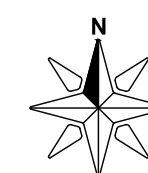
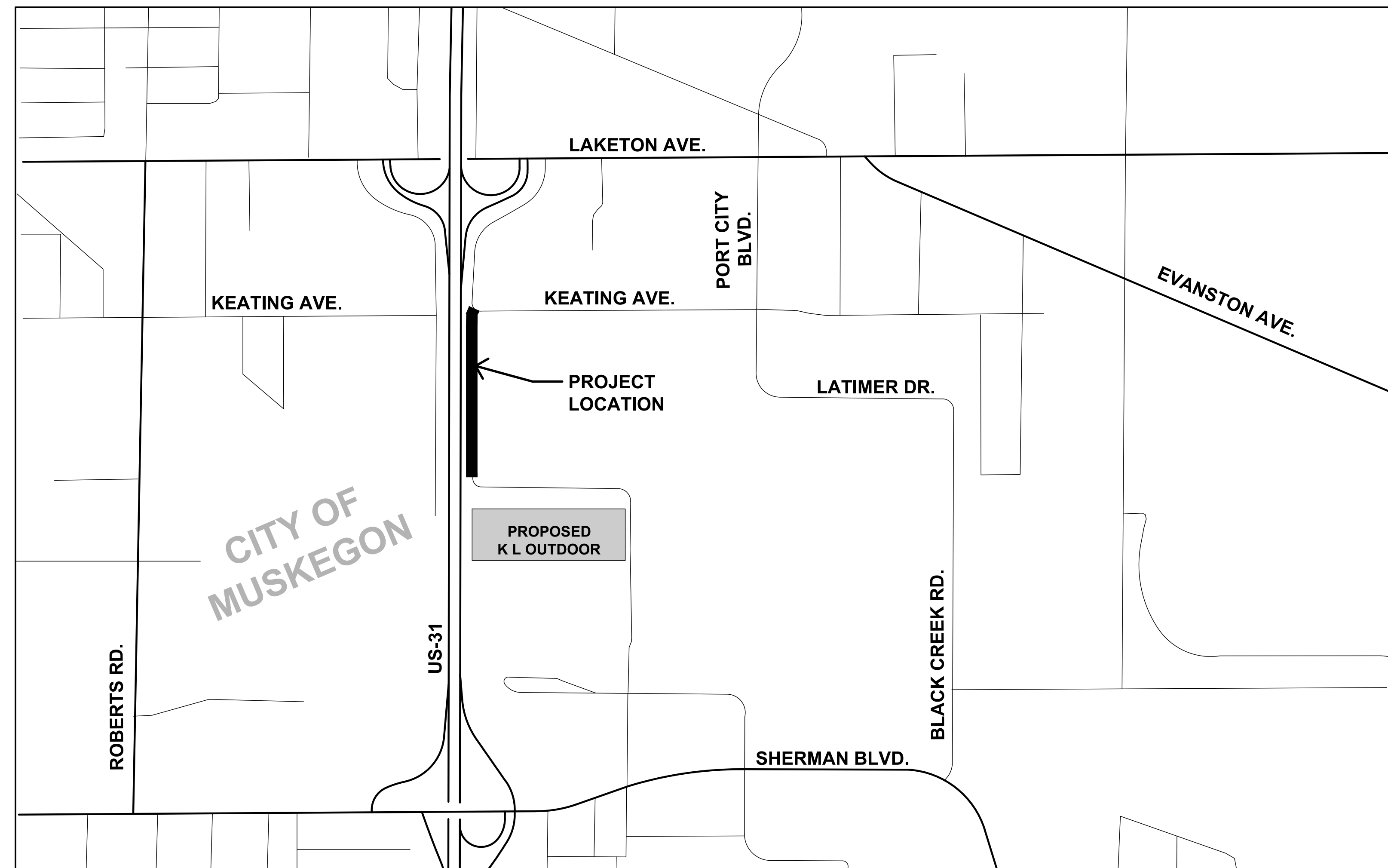
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CONSUMERS ENERGY
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700 E STERNBERG RD.
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VINCENT DUCA
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MUSKEGON, MI 49444
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CABLE
COCAS
JIM ZAWACKI
700 W BROADWAY AVE.
MUSKEGON HEIGHTS MI 49444
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WATER & SEWER
CITY OF MUSKEGON DPW
WYATT EARP, DAVE BAKER
1350 E KEATING AVE.
MUSKEGON MI 49442
231-724-4100



PROJECT LOCATION MAP

NOT TO SCALE

CONTRACT FOR:
0.24 MILES OF SANITARY SEWER, STORM SEWER, AGGREGATE BASE, CONCRETE CURB & GUTTER, ADA SIDEWALK RAMP UPGRADES, HMA RESURFACING AND PERMANENT PAVEMENT MARKINGS.

SURVEYED & DESIGNED BY:
MOORE & BRUGGINK, INC.
Consulting Engineers
2020 Monroe Avenue N.W.
Grand Rapids, Michigan 49505-6298
Phone: (616) 363-9801 Web: www.mbce.com

CITY APPROVAL

LEO EVANS, P.E. _____ DATE _____
CITY ENGINEER

PREPARED UNDER SUPERVISION OF

RYAN M. ARENDS P.E. _____ **56998** _____
ENGINEER, P.E. REGISTRATION NO.

MOORE & BRUGGINK, INC. _____
ORGANIZATION

2020 MONROE NW GRAND RAPIDS, MI 49505 _____
ADDRESS

P:\180151.02\CADD\DWG\180151.02_COVER.dwg, 8/10/2018 2:07:34 PM, CHUCK F. BARTHOLOMEW



Utility locations are approximate only.
Please contact "Miss Dig" three working
days prior to the start of construction
for exact locations. (1-800-482-7171)

GENERAL PLAN NOTES

UNDERGROUND UTILITIES

THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT THEIR OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174, 2013, THE CONTRACTOR SHALL DIAL 1-800-482-7171 OR 811 A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

SLOPES AND EMBANKMENTS

CLASS A SLOPES WILL BE REQUIRED ON THIS PROJECT.

SOIL BORINGS

THE SOIL BORING LOGS AND/OR PAVEMENT CORES REPRESENT POINT INFORMATION ONLY. NO INFERENCE SHOULD BE MADE THAT SUBSURFACE OF PAVEMENT CONDITIONS ARE THE SAME AT OTHER LOCATIONS.

SOIL EROSION MEASURES

A SOIL EROSION CONTROL PERMIT SHALL BE OBTAINED BY THE CONTRACTOR FROM THE CITY OF MUSKEGON AT NO COST TO THE CONTRACTOR.

TEMPORARY SOIL EROSION CONTROLS SHALL BE PLACED PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE, AND CLEANING OF ALL SOIL EROSION CONTROLS. TEMPORARY SOIL EROSION CONTROLS NOT SPECIFICALLY CALLED FOR ON THE DRAWINGS SHALL BE PLACED BY THE CONTRACTOR AS DEEMED NECESSARY BY THE CONTRACTOR, ENGINEER, ENGINEER'S REPRESENTATIVE, THE MDEQ, OR THE CITY OF WALKER. TEMPORARY EROSION CONTROLS SHALL REMAIN IN PLACE UNTIL PERMANENT EROSION CONTROLS HAVE BEEN ESTABLISHED.

GRADES FOR INTERSECTIONS

ALL INTERSECTIONS ARE TO BE CONSIDERED AS COMPLETE UNITS AND THEIR GRADES DETERMINED BEFORE CONSTRUCTION IS STARTED.

EXISTING WATER MAINS AND SEWERS

THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING WATER MAINS AND/OR EXISTING SANITARY SEWERS AND/OR EXISTING STORM SEWERS DURING THE CONSTRUCTION OF THIS PROJECT.

SAW CUTTING

ALL JOINTS BETWEEN EXISTING PAVEMENT AND PAVEMENT REMOVED FOR CONSTRUCTION SHALL BE SAW CUT BY AN APPROVED METHOD. PAYMENT FOR SAW CUTTING SHALL BE INCLUDED IN MAJOR WORK ITEMS NO ADDITIONAL PAYMENT SHALL BE MADE.

ADJUSTING MONUMENT BOXES

IT IS THE INTENT, THAT ALL GOVERNMENT CORNERS ON THIS PROJECT BE PRESERVED AND THAT, WHERE NECESSARY, MONUMENT BOXES BE PLACED OR ADJUSTED, WHETHER SHOWN OR NOT.

PERMANENT PAVEMENT MARKINGS

PRIOR TO OPENING THE PROJECT TO THRU TRAFFIC, THE ENGINEER WILL DETERMINE EXACT LOCATIONS AND LIMITS OF PAVEMENT MARKINGS AND PLACEMENT OF PERMANENT TRAFFIC CONTROL (SIGNS OR OTHER DEVICES).

RESTORATION

ALL AREAS GRADED FLATTER THAN 1 VERTICAL TO 3 HORIZONTAL SHALL BE RESTORED WITH 4" OF SCREENED TOPSOIL, SEED, FERTILIZER, & MULCH MATERIALS AS SPECIFIED IN THE SPECIAL PROVISIONS FOR TURF ESTABLISHMENT. ALL AREAS GRADED AT 1 VERTICAL TO 3 HORIZONTAL OR STEEPER SHALL BE RESTORED WITH 4" OF SCREENED TOPSOIL, SEED, FERTILIZER, & MULCH MATERIALS. THESE AREAS SHALL ALSO RECEIVE MULCH BLANKET. SEPARATE PAYMENT FOR MULCH BLANKET WILL BE MADE.

TRENCH PROTECTION

THE CONTRACTOR SHALL SCHEDULE WORK SO THAT NO TRENCHES ARE LEFT OPEN OVERNIGHT. IN THE EVENT THAT TRENCHES MUST REMAIN OPEN THE CONTRACTOR SHALL PROTECT ANY OPEN TRENCHES WITH LIGHTED BARRICADES AND FENCING. THE COST TO FURNISH AND INSTALL SAID BARRICADES AND FENCING SHALL BE CONSIDERED INCLUDED IN CONTRACT ITEMS.

STORM SEWER

ALL JOINTS BETWEEN PROPOSED AND EXISTING STORM SEWER SHALL BE ENCASED WITH 1 FOOT WIDE BY 3 INCHES THICK CONCRETE COLLAR. THIS WORK WILL BE CONSIDERED AS INCLUDED IN THE PAY ITEM OF THE STORM SEWER.

RIM ELEVATIONS FOR ALL MANHOLES AND CATCH BASINS SHALL MATCH THE FINISHED GRADE OF THE SURROUNDING MATERIAL (PAVT, CURB, DITCH, ETC). OR TOPSOIL AS SHOWN.

UTILIZING EXISTING GRANULAR SOILS FOR SUBBASE

ONCE THE CRUSHED MATERIAL AND TOPSOIL HAS BEEN REMOVED, THE ENGINEER WILL DETERMINE WHETHER THE EXISTING GRANULAR MATERIAL MEETS SUBBASE REQUIREMENTS. IF IT MEETS SPECIFICATION, THEN THE EXISTING MATERIAL WILL BE GRADED AND COMPACTED TO AT LEAST 95% OF ITS MAXIMUM UNIT WEIGHT TO A MINIMUM DEPTH OF 10 INCHES AS EXPLAINED IN THE THIRD PARAGRAPH OF SECTION 205.03G OF THE 2012 STANDARD SPECIFICATION FOR CONSTRUCTION. PAYMENT FOR GRADING AND COMPACTING THIS MATERIAL WILL NOT BE PAID FOR SEPARATELY BUT WILL BE INCLUDED IN THE ROADWAY GRADING PAY ITEM OR SIMILAR ITEMS OF WORK. GRADING TOLERANCE WILL BE THE SAME AS IF SUBBASE WERE SPECIFIED.

EXPLORATORY INVESTIGATION, VERTICAL

EXPLORATORY INVESTIGATION, VERTICAL SHALL BE USED AS DIRECTED BY THE ENGINEER TO ALLEVIATE ANY PRIVATE UTILITY CONFLICTS WITH THE PROPOSED IMPROVEMENTS. FILED LOCATING THE EXISTING PRIVATE UTILITIES AFTER THE MISS DIG MARKING WILL NOT BE COMPENSATED AS EXPLORATORY INVESTIGATION, VERTICAL.

GENERAL PLAN NOTES (CONT'D)

DEWATERING

IT IS ANTICIPATED THAT DEWATERING WILL BE REQUIRED FOR THE PLACEMENT OF THE SANITARY SEWER. ANY DEATERING REQUIRED SHALL BE INCLUDED IN THE SANITARY SEWER PAY ITEMS AS SEPARATE PAYMENT WILL NOT BE MADE.

SITE MAINTENANCE

NO BURNING OR INCINERATION OF RUBBISH WILL BE PERMITTED ON SITE.

THE CONTRACTOR SHALL PROVIDE FOR THE SAFE AND ORDERLY PASSAGE OF TRAFFIC AND PEDESTRIANS WHERE HIS OPERATIONS ABUT PUBLIC THOROUGHFARES AND ADJACENT PROPERTY.

CONSTRUCTION OPERATIONS SHALL BE CONDUCTED IN SUCH A WAY AS TO PREVENT TRACKING OF MUD OR SOIL ONTO PUBLIC THOROUGHFARES, AT THE END OF EACH DAY THE CONTRACTOR SHALL CLEAN UP ALL MUD OR SOIL WHICH HAS BEEN TRACKED ONTO THE PUBLIC STREETS. THIS WORK WILL NOT BE PAID FOR SEPARATELY BUT WILL BE CONSIDERED AS HAVING BEEN INCLUDED IN THE OTHER MAJOR PAY ITEMS

FOR DISPOSAL OF EXCESS OR UNSUITABLE MATERIAL OR STORAGE OF MATERIAL OR EQUIPMENT (TEMP CONSTRUCTION YARD), THE CONTRACTOR WILL BE REQUIRED TO PROVIDE TO THE ENGINEER A WRITTEN CONSENT FROM THE PROPERTY OWNER FOR THE USE OF THE SITE AND A RELEASE FROM THE OWNER AFTER RESTORATION OF THE SITE.

ALL TREES TO REMAIN SHALL BE PROTECTED FROM DAMAGE TO TRUNKS, BRANCHES AND ROOTS. NO EXCAVATING, FILLING, OR GRADING IS TO BE DONE INSIDE THE DRIP LINE OF TREES UNLESS OTHERWISE INDICATED.

ALL DEWATERING PERFORMED DURING CONSTRUCTION OF UNDERGROUND UTILITIES SHALL BE AT THE CONTRACTOR'S EXPENSE AND WILL NOT BE MEASURED OR PAID FOR SEPARATELY.

ALL APPLICABLE PROVISIONS OF THE CURRENT OCCUPATIONAL SAFETY AND HEALTH ACT ARE HEREIN INCORPORATED BY REFERENCE. THE MICHIGAN DEPARTMENT OF TRANSPORTATION "2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION", AND ALL ADDENDA THERETO, SHALL GOVERN THE EARTHWORK, PAVING AND UNDERGROUND WORK UNDER THIS CONTRACT, EXCEPT AS MODIFIED BY THE SPECIFICATIONS.

ALL EXISTING SITE TOPOGRAPHY, UTILITIES, RIGHT-OF-WAY AND HORIZONTAL CONTROL SHOWN ON THE DRAWINGS WERE OBTAINED FROM SURVEY DATA

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MBCE.COM

COPIES OF THE SURVEY ARE AVAILABLE FROM THE ENGINEER.

ALL EXISTING TOPOGRAPHY, UNDERGROUND UTILITIES, STRUCTURES AND ASSOCIATED FACILITIES SHOWN ON THESE DRAWINGS HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, THEREFORE, THEIR LOCATIONS AND ELEVATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHER FACILITIES, THE EXISTENCE OF WHICH ARE NOT PRESENTLY KNOWN. CONTRACTOR IS TO VERIFY ALL EXISTING STRUCTURES AND FACILITIES AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO STARTING WORK.

PRIOR TO NEW WORK THE CONTRACTOR SHALL FIELD CHECK ALL DIMENSIONS AND ELEVATIONS AND VERIFY THE LOCATION AND ELEVATION OF EXISTING UTILITY LINES AND STRUCTURES TO BE CONNECTED TO PROPOSED WORK. DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY IN WRITING.

BEFORE EXCAVATING OVER OR ADJACENT TO ANY EXISTING UTILITIES, NOTIFY THE OWNER OF SUCH UTILITIES TO ENSURE THAT PROTECTIVE WORK WILL BE COORDINATED AND PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH THE SERVICE LINES. ANY UTILITIES AND UTILITY STRUCTURES WHICH ARE TO REMAIN IN SERVICE AND UNCOVERED OR ENCOUNTERED DURING THIS OPERATION SHALL BE SAFEGUARDED, PROTECTED FROM DAMAGE AND SUPPORTED IF NECESSARY.

STREET PAVING AND CURBS TO REMAIN SHALL BE PROTECTED FROM DAMAGE AND IF DAMAGED, SHALL BE REPLACED PROMPTLY TO MEET MDOT'S 2012 STANDARD SPECIFICATIONS IN MATERIALS AND WORKMANSHIP. PROPOSED ELEVATIONS INDICATE FINISHED CONDITIONS. FOR ROUGH GRADING ELEVATIONS ALLOW FOR THICKNESS OF PROPOSED PAVING (ROADS, WALKS, DRIVES, ETC.) OR TOPSOIL AS SHOWN.

NOTES APPLYING TO STANDARD PLANS

WHERE THE FOLLOWING ITEMS ARE CALLED FOR ON PLANS, THEY ARE TO BE CONSTRUCTED ACCORDING TO THE STANDARD PLAN GIVEN BELOW EACH ITEM UNLESS OTHERWISE INDICATED.

DRAINAGE STRUCTURES	R-1-G*
COVER B	R-7-F
COVER K	R-15-F
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS	R-28-J*
DRIVEWAY OPENINGS & APPROACHES AND CONCRETE SIDEWALKS	R-29-I
CONCRETE CURB AND CONCRETE CURB & GUTTER	R-30-G
BEDDING AND FILLING AROUND PIPE CULVERTS	R-82-D
UTILITY TRENCHES	R-83-C
SOIL EROSION & SEDIMENTATION CONTROL MEASURES	R-96-E
SEEDING AND TREE PLANTING	R-100-H

TRAFFIC AND SAFETY STANDARD PLANS

GROUND DRIVEN SIGN SUPPORTS FOR TEMP SIGNS	WZD-100-A*
TEMPORARY TRAFFIC CONTROL DEVICES	WZD-125-E*

*DENOTES SPECIAL DETAIL INCLUDED IN CONTRACT DOCUMENTS

SUMMARY OF PAY ITEMS

THE FOLLOWING ITEMS OF WORK SHALL BE DONE AS THEY APPLY THROUGHOUT THE PROJECT. THESE ITEMS MAY NOT BE DETAILED OR INCLUDED ON THE PLAN SHEETS BUT ARE TO BE USED AS DIRECTED BY THE ENGINEER:

ITEMS FOR SOIL EROSION AND SEDIMENTATION CONTROL

_ Turf Establishment	Syd	4500
Erosion Control, Silt Fence	Ft	1000
_ Erosion Control, Inlet Protection, Silt Bag	Ea	6

ITEMS FOR MAINTAINING TRAFFIC

Barricade, Type III, High Intensity, Lighted, Furn	Ea	8
Barricade, Type III, High Intensity, Lighted, Oper	Ea	8
Channelizing Device, 42 inch, Furn	Ea	50
Channelizing Device, 42 inch, Oper	Ea	50
Minor Traf Devices	LSUM	1
Sign, Type B, Temp, Prismatic, Furn	Sft	400
Sign, Type B, Temp, Prismatic, Oper	Sft	400
Sign, Type B, Temp, Prismatic, Special, Furn	Sft	75
Sign, Type B, Temp, Prismatic, Special, Oper	Sft	75

ITEMS FOR ROADWAY IMPROVEMENTS

Mobilization, Max 10%	LSUM	1
Tree, Rem, 19 inch to 36 inch	Ea	4
Tree, Rem, 6 inch to 18 inch	Ea	3
Sewer, Rem, Less than 24 inch	Ft	15
Curb and Gutter, Rem	Ft	130
Curb, Rem	Ft	800
Pavt, Rem	Syd	75
Exploratory Investigation, Vertical	Ft	25
Subgrade Undercutting, Type II	Cyd	675
_ Roadway Grading	Sta	14
_ Aggregate Base, 8 inch, 21AA, Modified	Syd	1650
HMA Base Crushing and Shaping	Syd	2900
_ Salvaged Crushed Material, 8 inch	Syd	3200
_ Storm Sewer, Dual Wall Perforated ADS N12 w/ Sock, 18 inch, Tr Det B	Ft	420
_ Catch Basin Special Detail	Ea	4
_ Dr Structure Cover, Type K, Modified	Ea	4
HMA Surface, Rem	Syd	550
Hand Patching	Ton	15
HMA, 3E3	Ton	900
HMA, 4E3	Ton	590
HMA Approach	Ton	50
_ Curb and Gutter, Conc, Det F4, Modified	Ft	2780
_ Driveway Opening, Conc, Det M, Modified	Ft	150
Curb Ramp Opening, Conc	Ft	30
Sidewalk Ramp, Conc, 6 inch	Sft	400
_ Detectable Warning Surface, Modified	Ft	25
Post, Steel, 3 lb	Ft	65
Sign, Type III, Erect, Salv	Ea	3
Sign, Type III B	Sft	45
Pavt Mrkg, Ovly Cold Plastic, 12 inch, Crosswalk	Ft	110
Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar	Ft	15
Pavt Mrkg, Waterborne, 4 inch, Yellow	Ft	600
_ Landscape Mulch, Wood	Cyd	25
_ Valve Box, Adjust	Ea	2

ITEMS FOR SANITARY SEWER

Curb and Gutter, Rem	Ft	200
Pavt, Rem	Syd	25
Exploratory Investigation, Vertical	Ft	25
_ Aggregate Base, 8 inch, 21AA, Modified	Syd	550
HMA Base Crushing and Shaping	Syd	550
Sewer, Cl E, 12 inch, Tr Det B	Ft	48
Dr Structure, Tap, 12 inch	Ea	1
_ Catch Basin Special Detail	Ea	1
_ Dr Structure Cover, Adj, Case I, Modified	Ea	1
_ Dr Structure Cover, Type B, Modified	Ea	1
_ Dr Structure Cover, Type K, Modified	Ea	1
_ Dr Structure Cover, Type Q, Modified	Ea	6
HMA, 3E3	Ton	80
HMA, 4E3	Ton	65
Driveway, Nonrein Conc, 6 inch	Syd	25
_ Curb and Gutter, Conc, Det F4, Modified	Ft	200
_ Sanitary Sewer, Rem, Less than 24 inch	Ft	55
_ Sanitary Manhole Special Detail	Ea	5
_ Sanitary Manhole Special Detail, w/ Drop Connection	Ea	1
_ Sanitary Sewer Bulkhead, 12 inch	Ea	2
_ Sanitary Sewer Tap, 12 inch	Ea	2
_ Sanitary Sewer, PVC SDR 35, 12 inch, Tr Det B	Ft	1370
Sanitary Sewer Lateral, PVC SDR 35, 6 inch, Tr Det B	Ft	70

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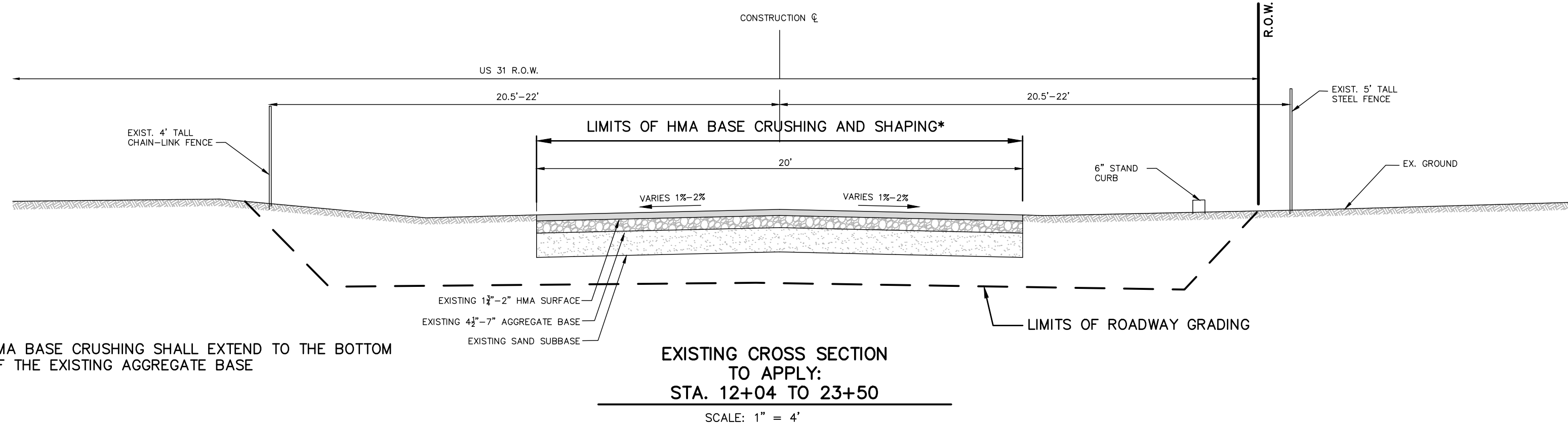
PLAN REVISIONS	
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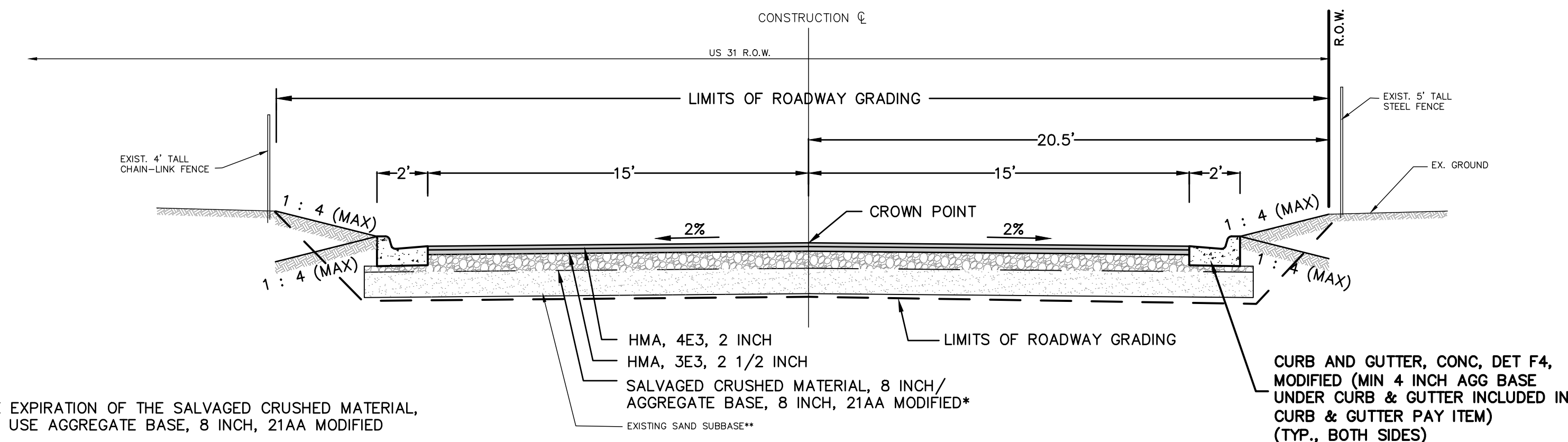
DESIGN DRAWN BY:	CFB
DESIGNED BY:	RMA
CHECKED BY:	JFL
PLAN DATE:	8/3/18

GENERAL NOTES
FOR
REMEMBRANCE DRIVE
FROM K L OUTDOOR TO KEATING AVE.
CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN

FIELD SURVEY / DATE	M&B
PROJECT NO.:	180151.02
SHEET NUMBER	2 OF 9



* HMA BASE CRUSHING SHALL EXTEND TO THE BOTTOM OF THE EXISTING AGGREGATE BASE



* AT THE EXPIRATION OF THE SALVAGED CRUSHED MATERIAL, 8 INCH USE AGGREGATE BASE, 8 INCH, 21AA MODIFIED

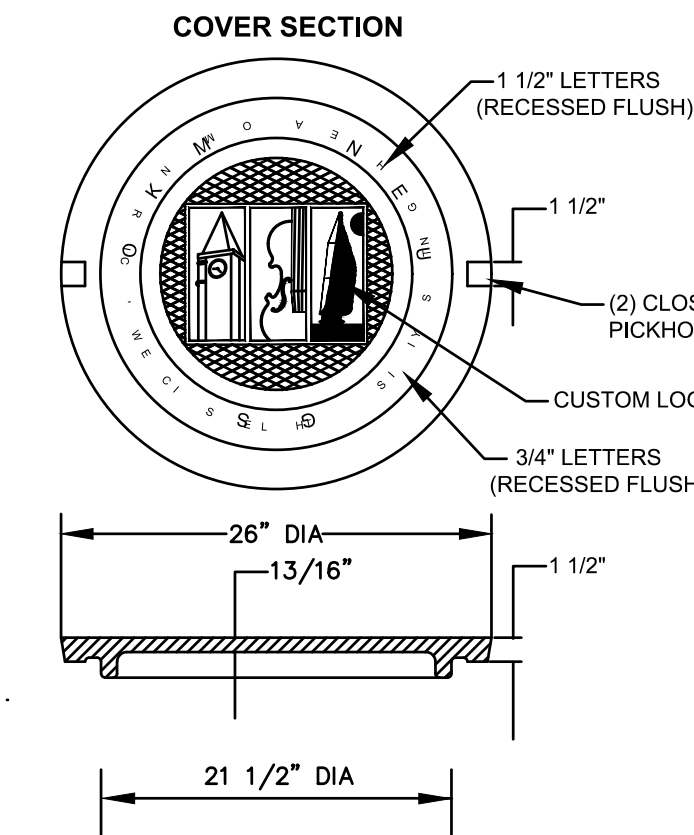
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HMA APPLICATION TABLE

MIX ID	ITEM	RATE (LBS/SYD.)	ASPHALT PERFORMANCE GRADE	REMARKS	AGGREGATE WEAR INDEX
4E3T	HMA, 4E3	220	PG 64-28	HMA 4E3, TOP COURSE	AWI-260 (MIN)
3E3B	HMA, 3E3	275	PG 64-28	HMA 3E3, LEVELING COURSE	
HMA APPROACH	HMA, 13A	330	PG 58-28	HMA 13A, PLACED IN TWO EQUAL LIFTS (DRIVE APPROACHES)	
HAND PATCHING	HMA, 13A	440	PG 58-28	HMA 13A, PLACED IN TWO EQUAL LIFTS (BIKE PATH)	

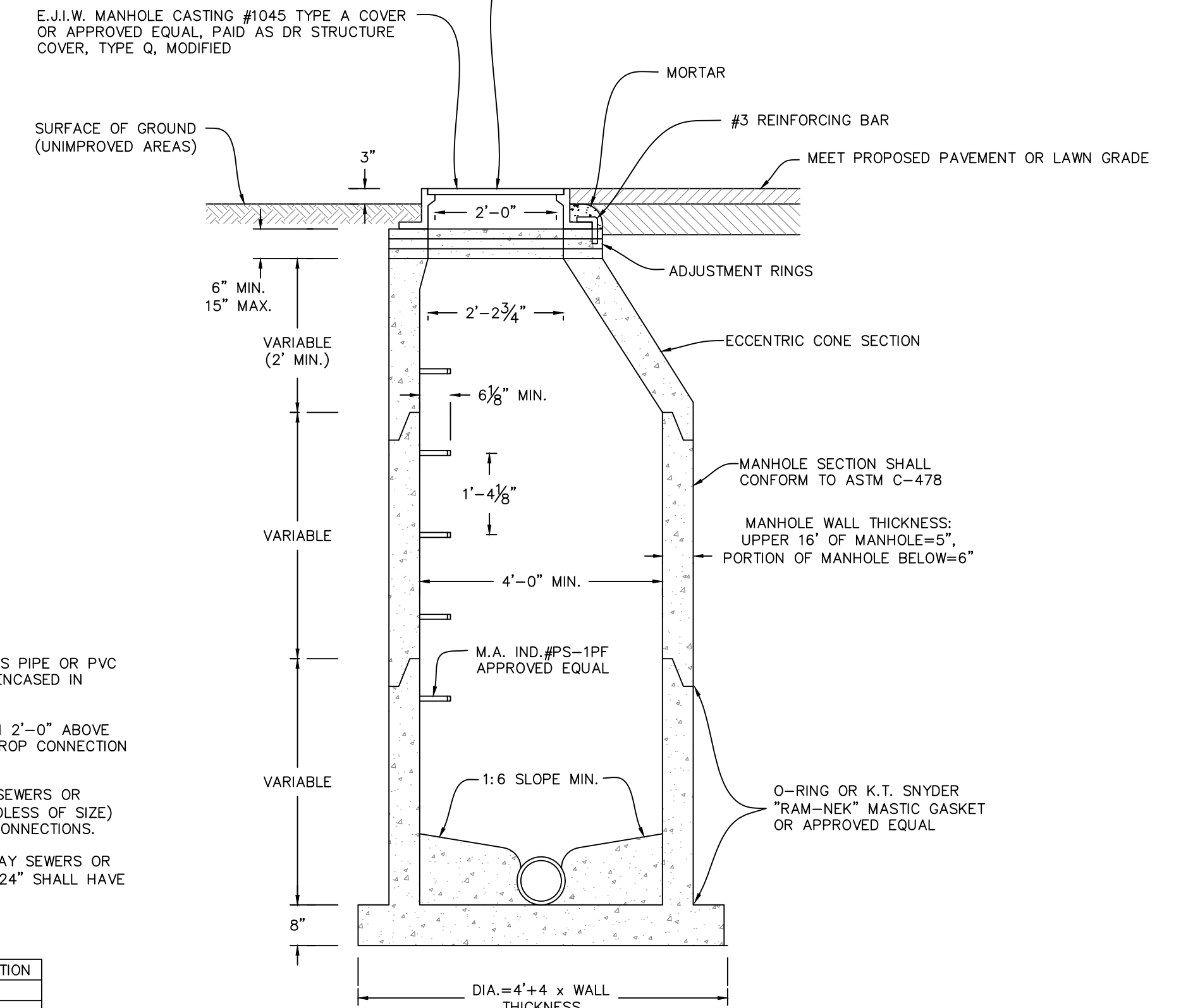
NOTE: 1. INTERSECTIONS TO BE PAID AS MAINLINE QUANTITIES
2. HMA BOND COAT 0.05-.15 GAL/SYD PART OF HMA ITEMS

DETAIL FOR COVER
1045 A LOGO MANHOLE COVER



NOTE: MANHOLE COVER SHALL HAVE A 2 INCH "S" EMBOSSED ON IT. COVER SHALL HAVE TWO HOLES FOR MAINTENANCE AND REMOVAL.

WHERE PRESSURE TIGHT COVER IS SPECIFIED USE:
-E.J.J.W. TYPE 1040-PT
-(4) #3 REINFORCING BARS, BENT AND PLACED IN MORTAR AS SHOWN



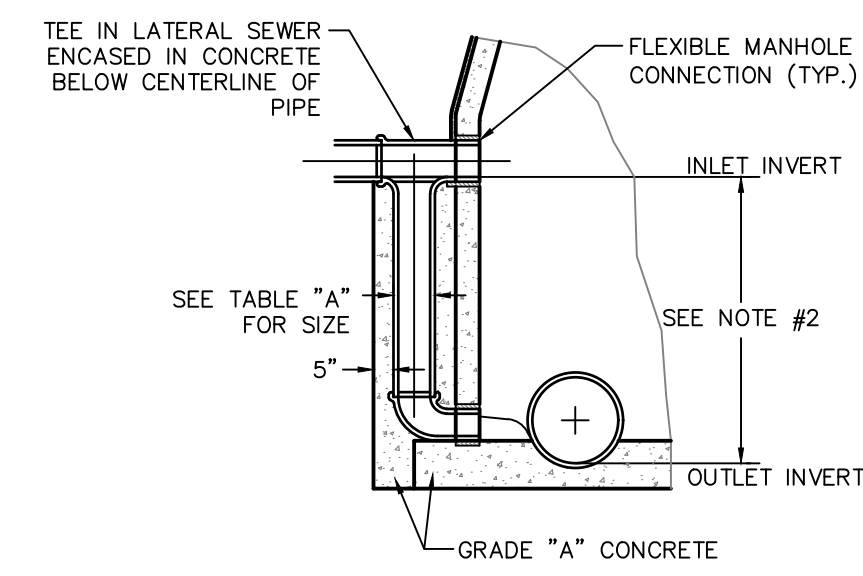
SANITARY MANHOLE SPECIAL DETAIL
SCALE: 1"=2"

NOTE:

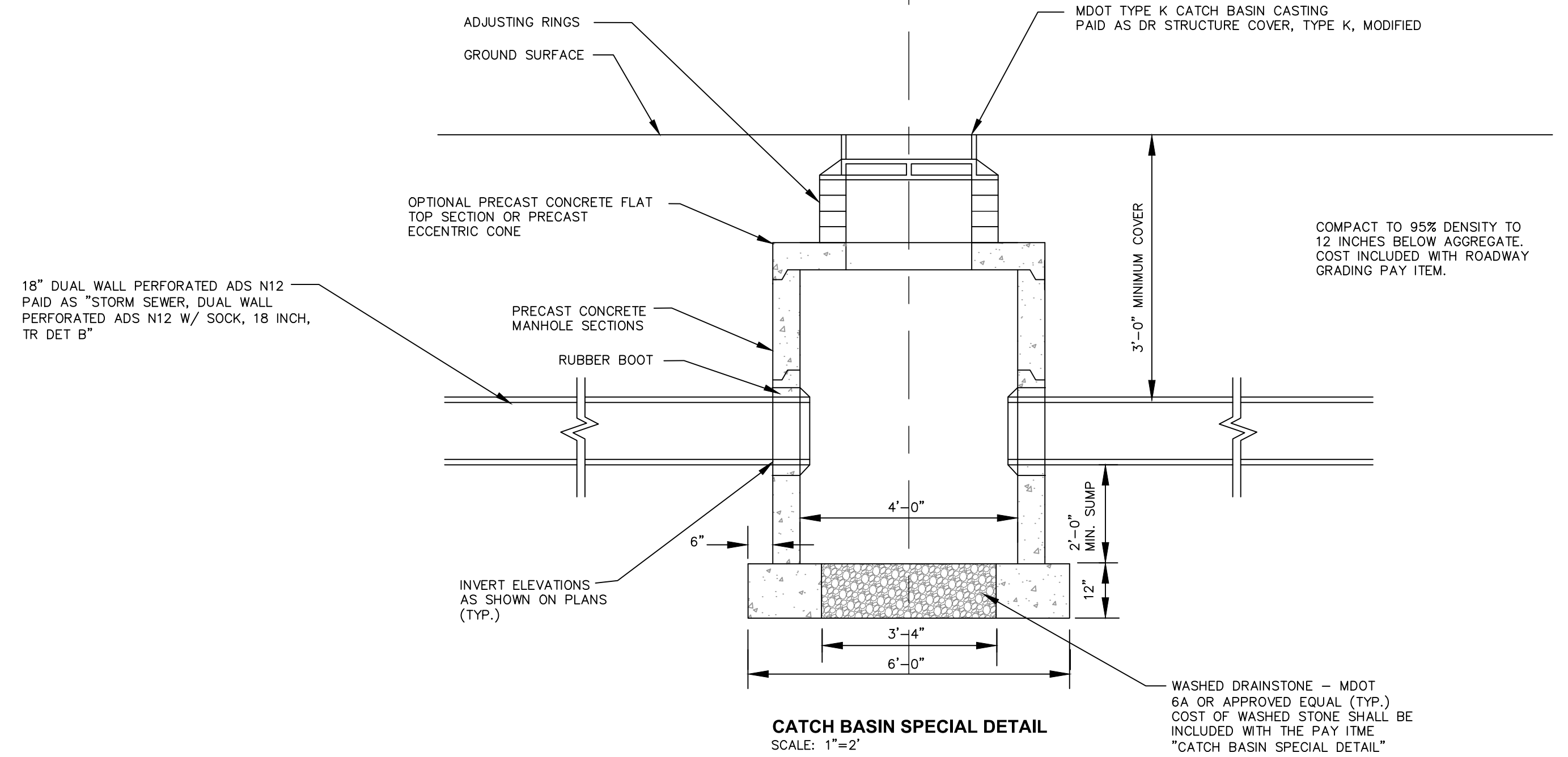
- DROP CONNECTIONS ON PVC TRUSS PIPE OR PVC SOLID WALL PIPE SHALL NOT BE ENCASED IN CONCRETE.
- ALL INLET INVERTS GREATER THAN 2'-0" ABOVE OUTLET INVERT WILL REQUIRE A DROP CONNECTION CONSTRUCTED PER THIS DETAIL.
- ON PVC TRUSS AND SOLID WALL SEWERS OR LATERALS, ALL OPENINGS (REGARDLESS OF SIZE) SHALL HAVE FLEXIBLE MANHOLE CONNECTIONS.
- OPENINGS FOR CONCRETE AND CLAY SEWERS OR LATERALS UP TO AND INCLUDING 24" SHALL HAVE FLEXIBLE MANHOLE CONNECTIONS.

TABLE "A"

SIZE OF SEWER	DROP CONNECTION
8"	8"
10"	8"
12"	8"
15"	10"
18"	10"
21"	12"
24"	12"
27"	12"
30"	15"
36"	15"



DROP CONNECTION DETAIL
SCALE: 1"=4"



CATCH BASIN SPECIAL DETAIL
SCALE: 1"=2"



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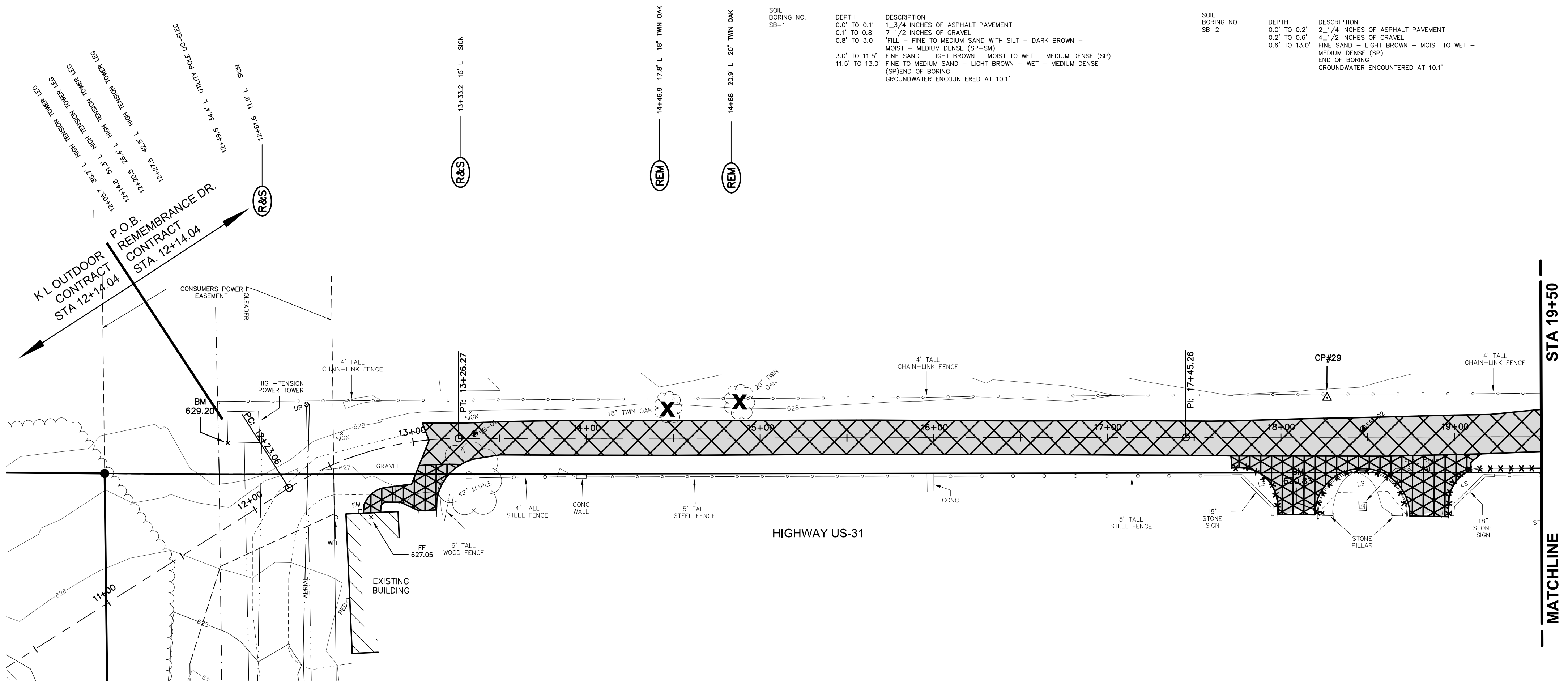
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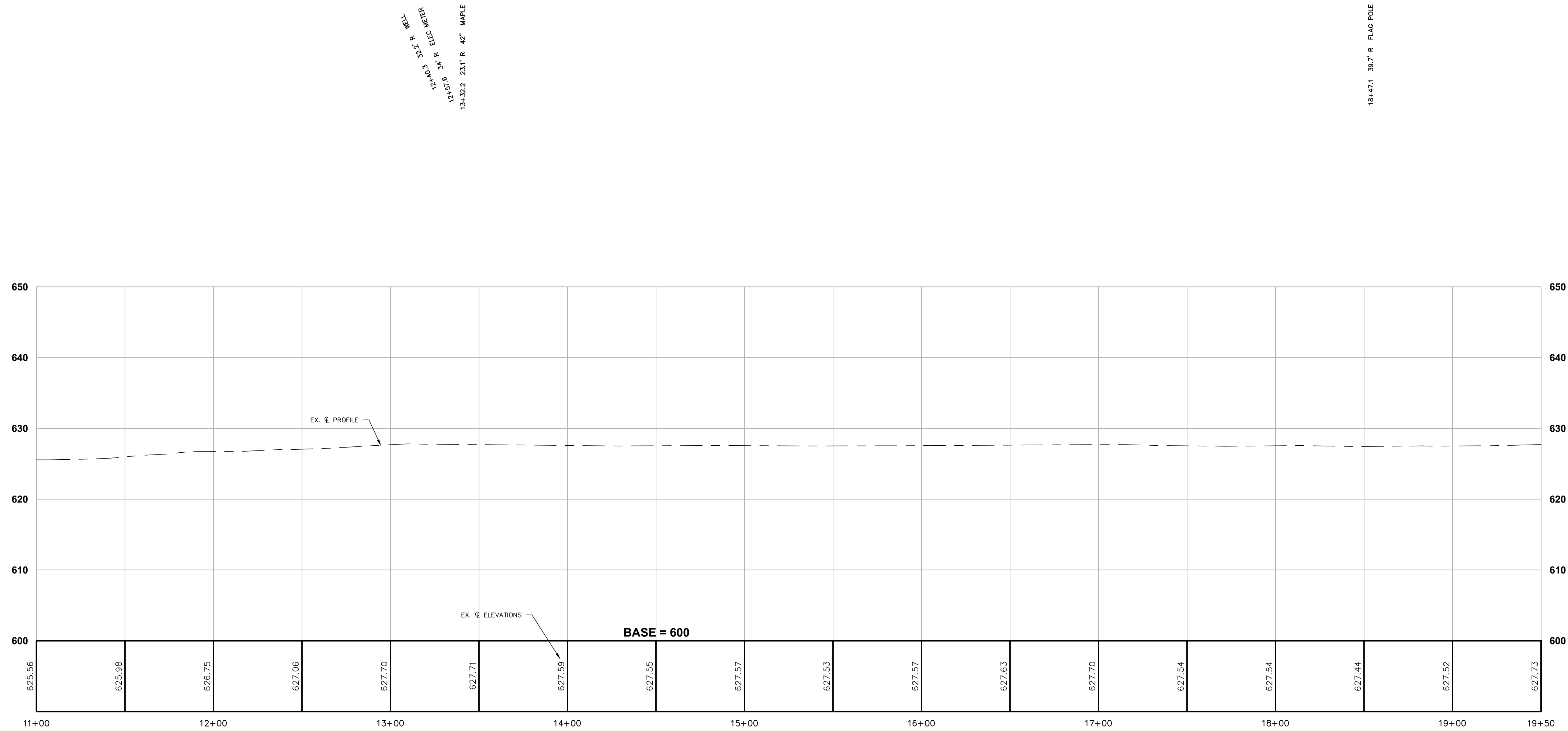
BENCHMARKS - NAVD 88 (GPS CORS)
 ELEVATION 630.83
 TOP SOUTHWEST CORNER OF A 1.5'x6' BRICK
 PILLAR LOCATED 15'± NORTH OF SOUTH DRIVE INTO
 CEMETERY OFF REMEMBRANCE DRIVE & 45'± EAST
 OF REMEMBRANCE DRIVE (2.5' ABOVE GROUND)

CONTROL POINTS
 CP#29
 M&B RED CAP
 N 5394.2332
 E 7616.5624
 ELEV 627.22



PLAN SCALE: 1" = 40'
PROFILE SCALES:
HORZ: 1" = 40'
VERT: 1" = 10'

SOL BORING NO.	DEPTH	DESCRIPTION	SOL BORING NO.	DEPTH	DESCRIPTION
SB-1	0.0' TO 0.1'	1.3/4 INCHES OF ASPHALT PAVEMENT	SB-2	0.0' TO 0.2'	2.1/4 INCHES OF ASPHALT PAVEMENT
	0.1' TO 0.8'	7.1/2 INCHES OF GRAVEL		0.2' TO 0.6'	4.1/2 INCHES OF GRAVEL
	0.8' TO 3.0'	FILL - FINE TO MEDIUM SAND WITH SILT - DARK BROWN - MOST - MEDIUM DENSE (SP-08)		0.6' TO 13.0'	FINE SAND - LIGHT BROWN - MOIST TO WET - MEDIUM DENSE (SP)
	3.0' TO 11.5'	FINE SAND - LIGHT BROWN - MOIST TO WET - MEDIUM DENSE (SP)			END OF BORING
	11.5' TO 13.0'	FINE TO MEDIUM SAND - LIGHT BROWN - WET - MEDIUM DENSE (SP)			GROUNDWATER ENCOUNTERED AT 10.1'



REMOVAL LEGEND

	HMA BASE CRUSHING
	HMA SURFACE, REM
	PAVT, REM
*****	CURB AND GUTTER, REM OR CURB, REM
X	TREE, REM
(R/O)	RELOCATE BY OTHERS
(R&S)	REMOVE & SALVAGE
(REM)	REMOVE ITEM
(ADJ)	DRAINAGE STRUCTURE ADJUST VALVE BOX ADJUST

PLAN REVISIONS

08-07-18	REV. PER CITY OF MUSKEGON
08-10-18	REV. PER CITY OF MUSKEGON

MOORE & BRUGGINK, INC.
 Consulting Engineers
 2020 Monroe Avenue N.W.
 Grand Rapids, Michigan 49505-6298
 Phone: (616) 363-9801 Web: www.mbce.com

DESIGN DRAWN BY: CFB
 DESIGNED BY: RMA
 CHECKED BY: JFL
 PLAN DATE: 8/3/18

REMOVALS
 IN
REMEMBRANCE DRIVE
 FROM K L OUTDOOR TO KEATING AVE.
 CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN

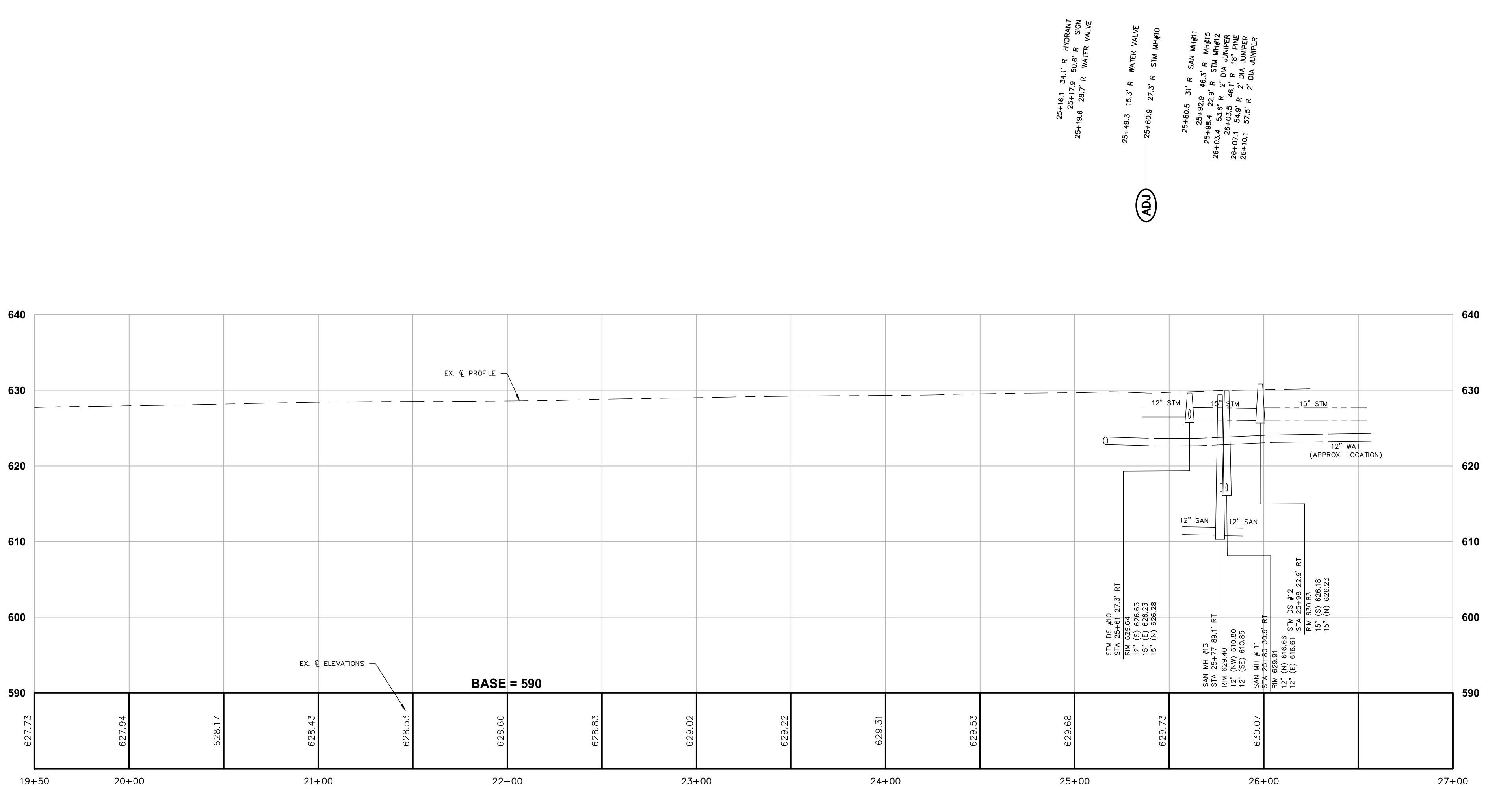
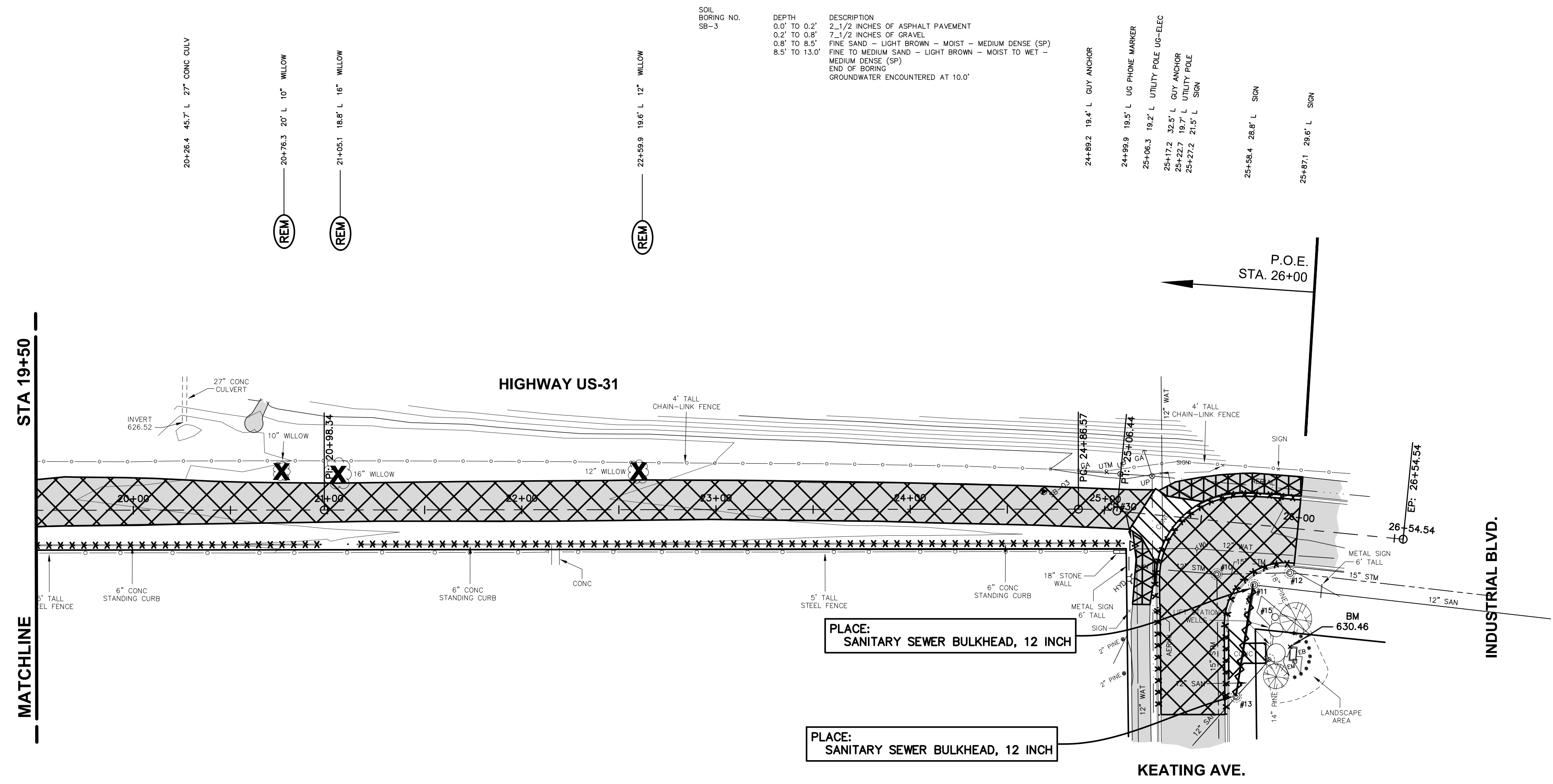
FIELD SURVEY / DATE
 SPH & CJB / 4-16-18
 PROJECT NO.: 180151.02
 SHEET NUMBER
4 OF 9

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BENCHMARKS - NAVD 88 (GPS CORS)
 ELEVATION 630.46
 SOUTHWEST CORNER OF A 4'x7.5' CONC PAD TO ELECTRIC BOX
 LOCATED 60'± EAST OF CENTERLINE OF INDUSTRIAL DRIVE &
 30'± NORTH OF KEATING AVENUE (0.3' ABOVE GROUND)

NORTH →
PLAN SCALE: 1" = 40'
PROFILE SCALES:
HORZ: 1" = 40'
VERT: 1" = 10'



SOIL BORING NO.	DEPTH	DESCRIPTION
SB-3	0.0' TO 0.3'	2 1/2 INCHES OF ASPHALT PAVEMENT
	0.3' TO 0.8'	7 1/2 INCHES OF GRAVEL
	0.8' TO 8.5'	FINE SAND - LIGHT BROWN - MOIST - MEDIUM DENSE (SP)
	8.5' TO 13.0'	FINE TO MEDIUM SAND - LIGHT BROWN - MOIST TO WET - MEDIUM DENSE (SP)
		END OF BORING
		GROUNDWATER ENCOUNTERED AT 10.0'

REMOVAL LEGEND

	HMA BASE CRUSHING
	HMA SURFACE, REM
	PAVT, REM
	CURB AND GUTTER, REM OR CURB, REM
	SANITARY SEWER, REM, LESS THAN 24 INCH
	TREE, REM
	RELOCATE BY OTHERS
	REMOVE & SALVAGE
	REMOVE ITEM
	DRAINAGE STRUCTURE ADJUST
	VALVE BOX ADJUST

PLAN REVISIONS
08-07-18 REV. PER CITY OF MUSKEGON
08-10-18 REV. PER CITY OF MUSKEGON

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 PLAN DATE: 8/3/18

REMOVALS
 IN
REMEMBRANCE DRIVE
 FROM K L OUTDOOR TO KEATING AVE.
 CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN

FIELD SURVEY / DATE
 SPH & CJB / 4-16-18
 PROJECT NO.: 180151.02
 SHEET NUMBER
5 OF 9

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BENCHMARKS - NAVD 88 (GPS CORS)
 ELEVATION 630.83
 TOP SOUTHWEST CORNER OF A 1.5'x6' BRICK
 PILLAR LOCATED 15'± NORTH OF SOUTH DRIVE INTO
 CEMETERY OFF REMEMBRANCE DRIVE & 45'± EAST
 OF REMEMBRANCE DRIVE (2.5' ABOVE GROUND)

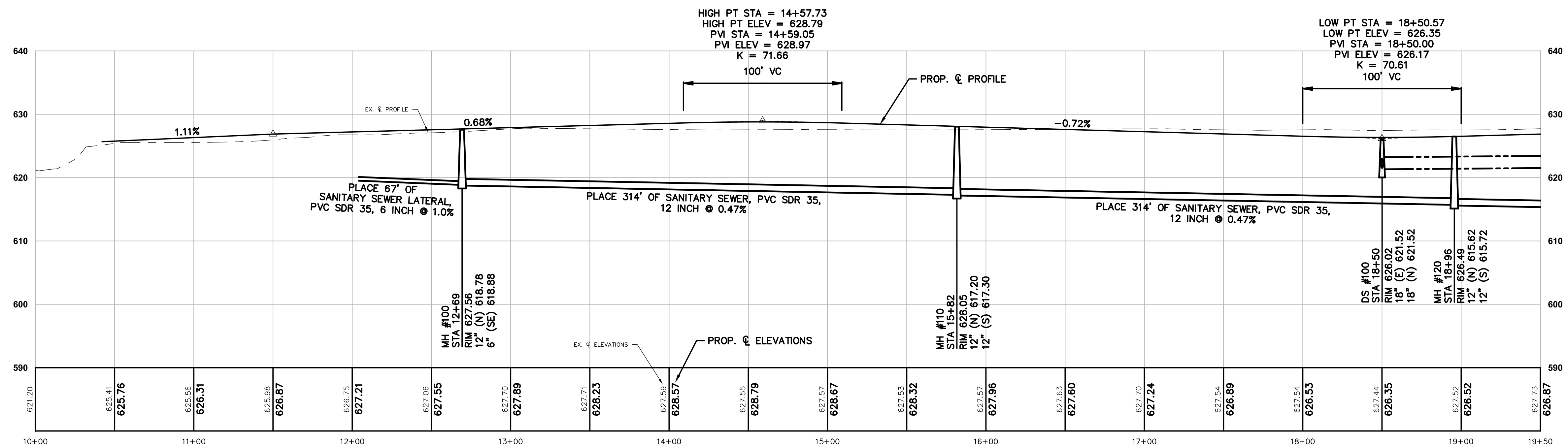
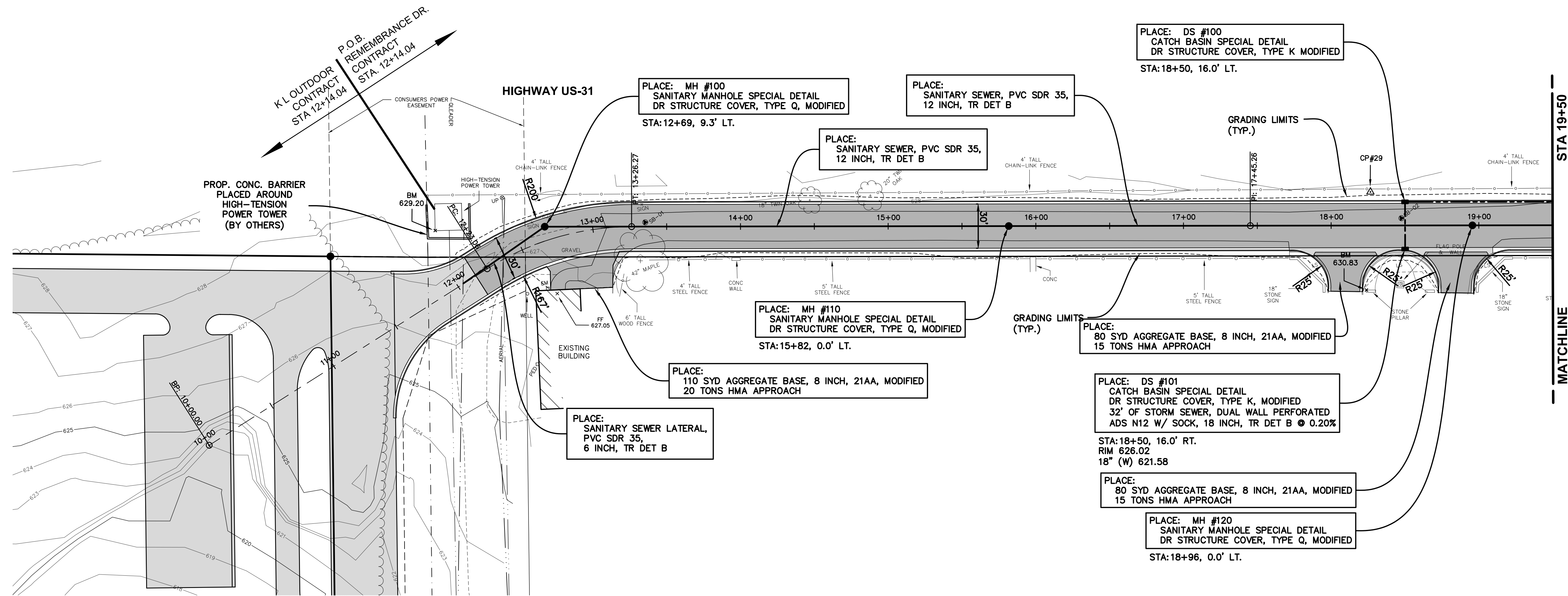
CONTROL POINTS

CP#29
 M&B RED CAP
 N 8394.2332
 E 7616.5624
 ELEV 627.22

SOL BORING NO. SB-1
 DEPTH DESCRIPTION
 0.0' TO 0.1' 1.3/4 INCHES OF ASPHALT PAVEMENT
 0.1' TO 0.8' 7.1/2 INCHES OF GRAVEL
 0.8' TO 3.0' FILL - FINE TO MEDIUM SAND WITH SILT - DARK BROWN - MOIST - MEDIUM DENSE (SP-5M)
 3.0' TO 11.5' FINE SAND - LIGHT BROWN - MOIST TO WET - MEDIUM DENSE (SP)
 11.5' TO 13.0' FINE TO MEDIUM SAND - LIGHT BROWN - WET - MEDIUM DENSE (SP)
 (SPEND OF BORING)
 GROUNDWATER ENCOUNTERED AT 10.1'

SOL BORING NO. SB-2
 DEPTH DESCRIPTION
 0.0' TO 0.2' 2.1/4 INCHES OF ASPHALT PAVEMENT
 0.2' TO 0.6' 4.1/2 INCHES OF GRAVEL
 0.6' TO 13.0' FINE SAND - LIGHT BROWN - MOIST TO WET - MEDIUM DENSE (SP)
 END OF BORING
 GROUNDWATER ENCOUNTERED AT 10.1'

NORTH
 PLAN SCALE: 1" = 40'
 PROFILE SCALES:
 HORZ: 1" = 40'
 VERT: 1" = 10'



PLAN REVISIONS	
08-07-18	REV. PER CITY OF MUSKEGON
08-10-18	REV. PER CITY OF MUSKEGON

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 Consulting Engineers
 2020 Monroe Avenue N.W.
 Grand Rapids, Michigan 49505-6298
 Phone: (616) 363-9801 Web: www.mbce.com

DESIGN DRAWN BY: CFB
 DESIGNED BY: RMA
 CHECKED BY: RMA
 PLAN DATE: 8/3/18

IMPROVEMENTS IN REMEMBRANCE DRIVE
 FROM K L OUTDOOR TO KEATING AVE.
 CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN

FIELD SURVEY / DATE
 SPH & CJB / 4-16-18
 PROJECT NO.: 180151.02
 SHEET NUMBER
6 OF 9

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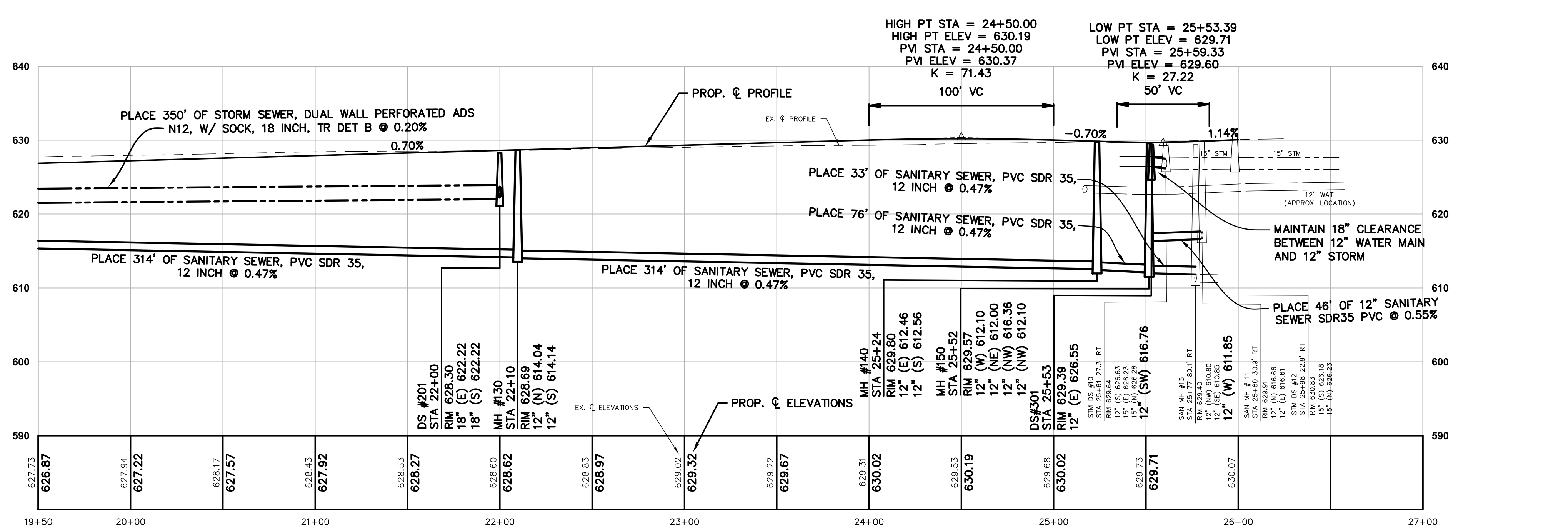
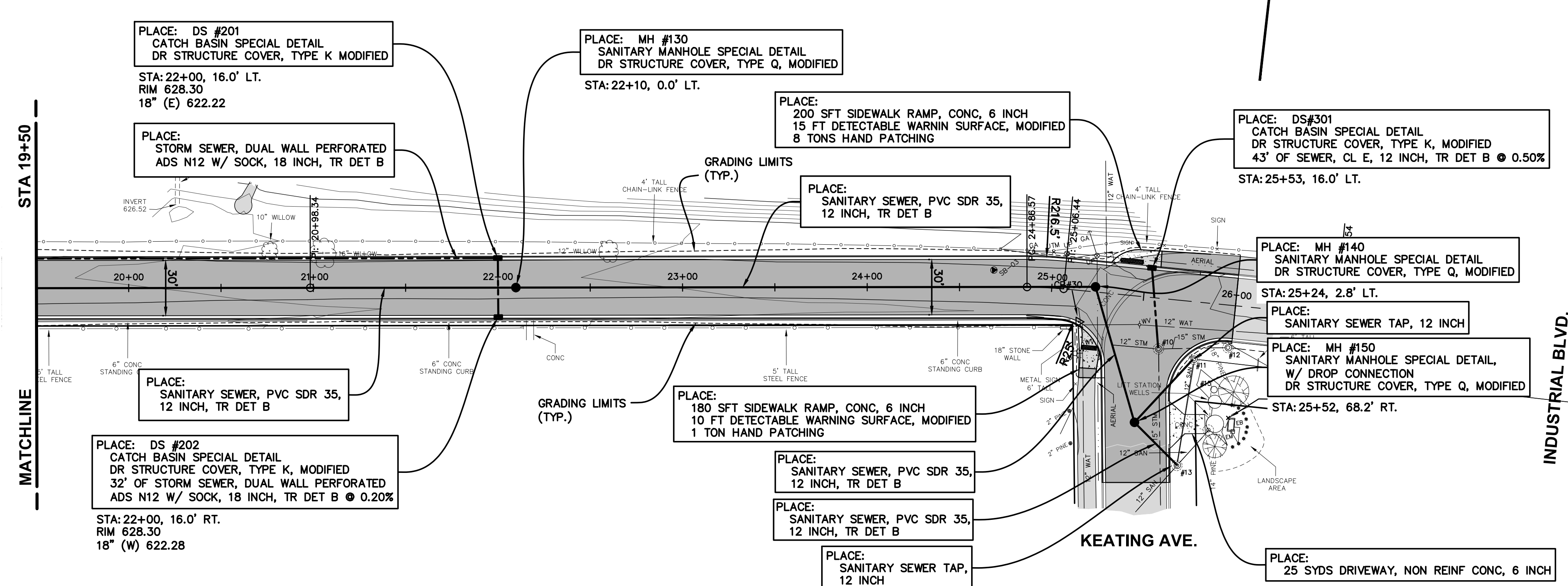
BENCHMARKS - NAVD 88 (GPS CORS)
 ELEVATION 630.46
 SOUTHWEST CORNER OF A 4'x7.5' CONC PAD TO ELECTRIC BOX
 LOCATED 60'± EAST OF CENTERLINE OF INDUSTRIAL DRIVE &
 30'± NORTH OF KEATING AVENUE (0.3' ABOVE GROUND)

SOL BORING NO. SB-3

DEPTH	DESCRIPTION
0.0' TO 0.2'	2-1/2" INCHES OF ASPHALT PAVEMENT
0.2' TO 0.8'	7-1/2" INCHES OF GRAVEL
0.8' TO 8.5'	FINE SAND - LIGHT BROWN - MOIST - MEDIUM DENSE (SP)
8.5' TO 13.0'	FINE TO MEDIUM SAND - LIGHT BROWN - MOIST TO WET - MEDIUM DENSE (SP)
	END OF BORING
	GROUNDWATER ENCOUNTERED AT 10.0'



PLAN SCALE: 1" = 40'
PROFILE SCALES:
HORZ: 1" = 40'
VERT: 1" = 10'



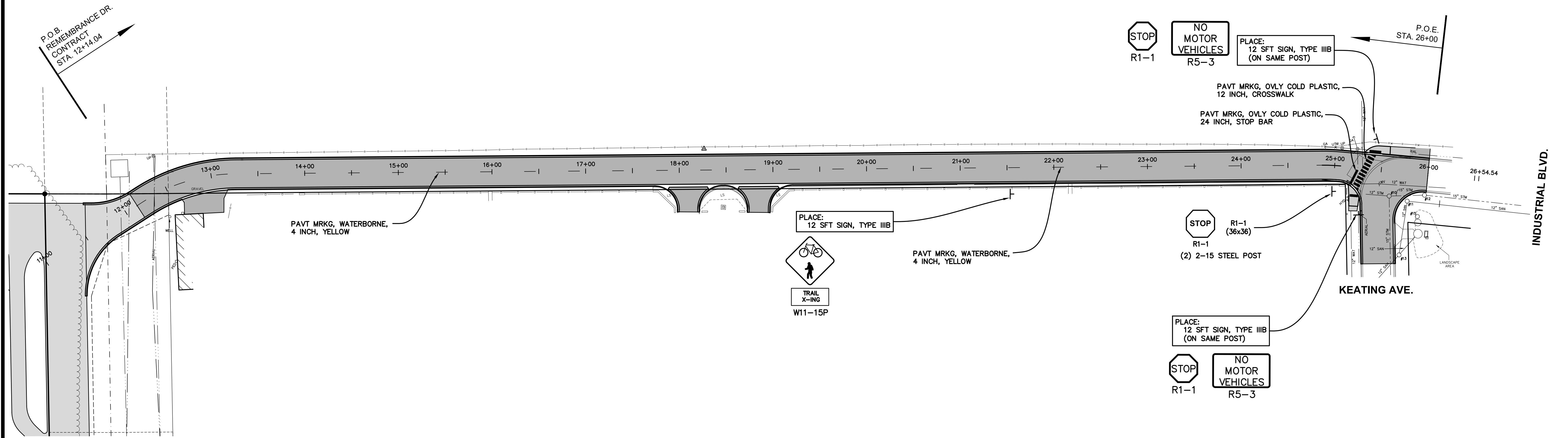
PLAN REVISIONS		MOORE & BRUGGINK, INC. Consulting Engineers 2020 Monroe Avenue N.W. Grand Rapids, Michigan 49505-6298 Phone: (616) 363-9801 Web: www.mbce.com	DESIGN DRAWN BY:	IMPROVEMENTS IN REMEMBRANCE DRIVE		FIELD SURVEY / DATE
08-07-18 REV. PER CITY OF MUSKEGON			CFB	FROM K L OUTDOOR TO KEATING AVE.		SPH & CJB / 4-16-18
08-10-18 REV. PER CITY OF MUSKEGON			RMA	CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN		PROJECT NO. 180151.02
			JFL			SHEET NUMBER 7 OF 9
			PLAN DATE: 8/3/18			

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PLAN SCALE: 1" = 50'



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PLAN REVISIONS
08-07-18 REV. PER CITY OF MUSKEGON
08-10-18 REV. PER CITY OF MUSKEGON

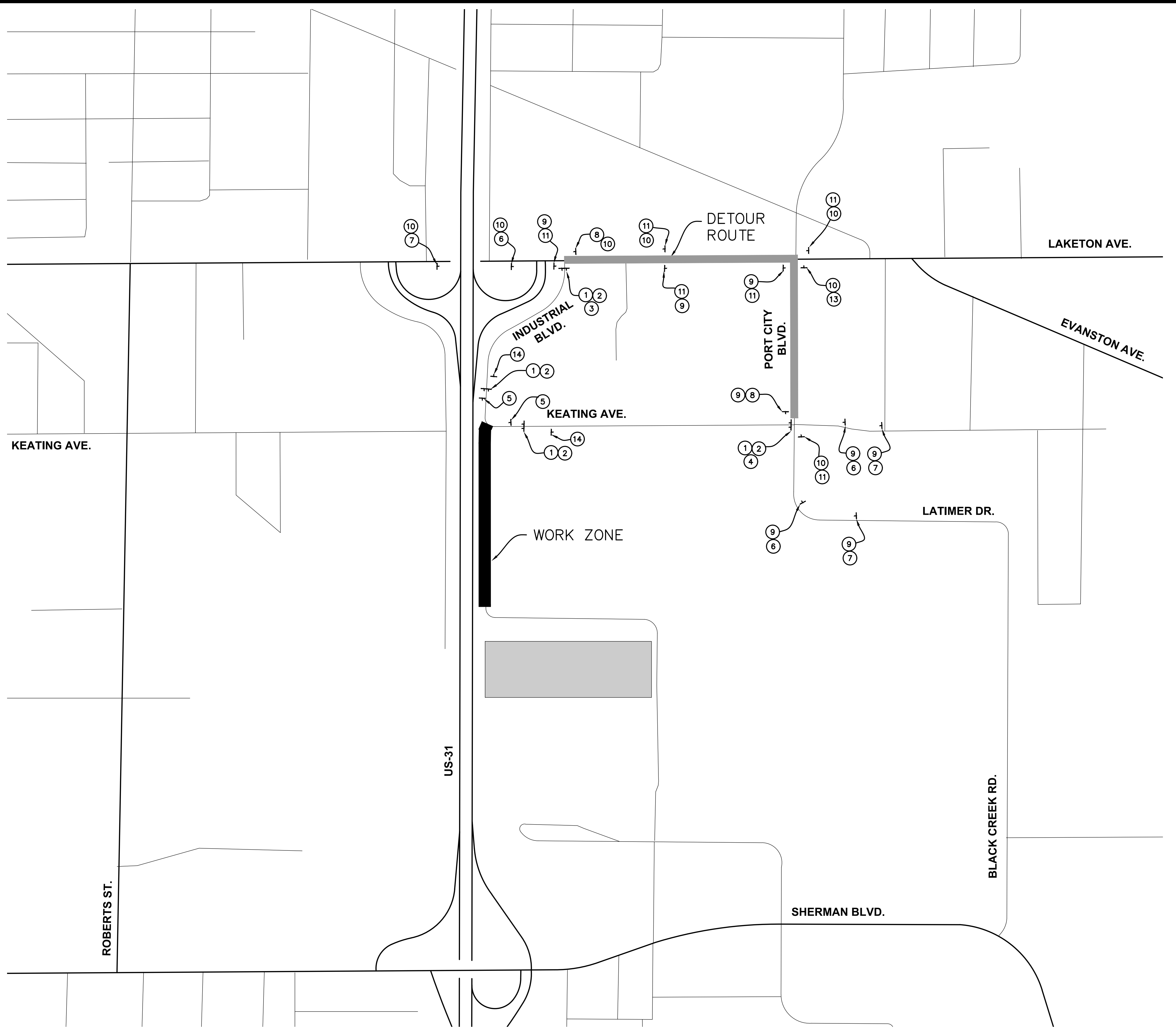
MOORE & BRUGGINK, INC.
 Consulting Engineers
 2020 Monroe Avenue N.W.
 Grand Rapids, Michigan 49505-6298
 Phone: (616) 363-9801 Web: www.mbce.com

DESIGN DRAWN BY:	CFB
DESIGNED BY:	RMA
CHECKED BY:	JFL
PLAN DATE:	8/3/18

PAVEMENT MARKINGS
 IN
REMEMBRANCE DRIVE
 FROM K L OUTDOOR TO KEATING AVE.
 CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN

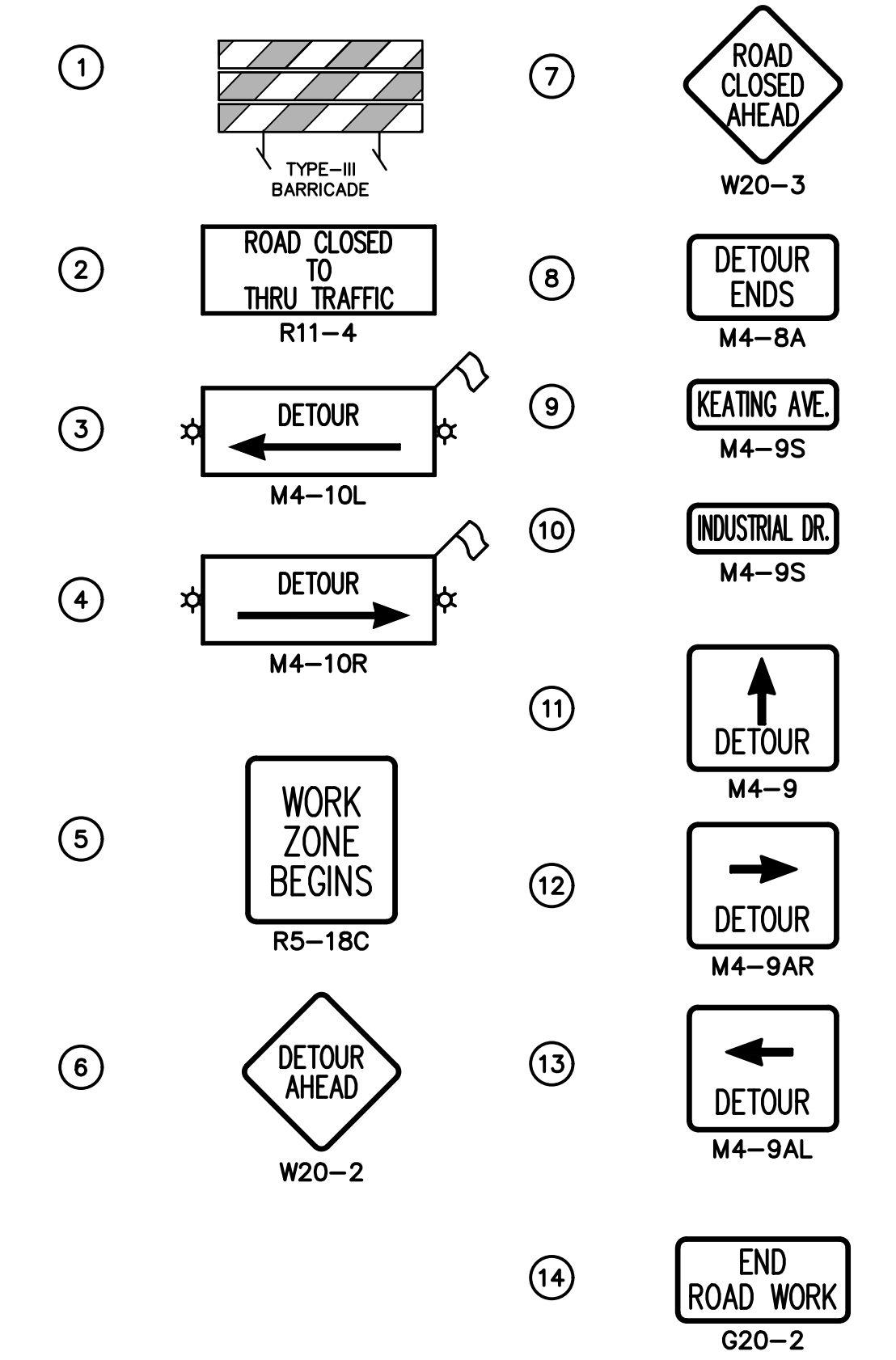
FIELD SURVEY / DATE	SPH & CJB / 4-16-18
PROJECT NO.	180151.02
SHEET NUMBER	8 OF 9

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ESTIMATE OF TEMPORARY SIGN QUANTITIES

SIGN	MESSAGE	QTY.	IN. x IN.	SQ. FT.
SIGN, TYPE B TEMPORARY				
W20-3	ROAD CLOSED AHEAD	3	48 x 48	48
W20-2	DETOUR AHEAD	3	48 x 48	48
R5-18C	WORK ZONE BEGINS	2	48 x 48	32
R11-4	ROAD CLOSED TO THRU TRAFFIC	4	60 x 30	50
M4-10R	DETOUR & ARROW SYM. →	1	60 x 30	12.5
M4-10L	DETOUR & ARROW SYM. ←	1	60 x 30	12.5
M4-9	DETOUR & ARROW SYM. ↑	5	30 x 24	25
M4-9AL	DETOUR & ARROW SYM. ←	1	30 x 24	5
M4-9AR	DETOUR & ARROW SYM. →	1	30 x 24	5
M4-9S	REMEMBRANCE DR.	8	12 x 30	20
M4-9S	INDUSTRIAL BLVD.	7	12 x 30	17.5
M4-8A	DETOUR ENDS	2	24 x 18	6
G20-2	END ROAD WORK	2	48 x 24	16
TOTAL, SIGN TYPE B TEMP				297.5



PLAN REVISIONS	
08-07-18	REV. PER CITY OF MUSKEGON
08-10-18	REV. PER CITY OF MUSKEGON

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DESIGN DRAWN BY: CFB
 DESIGNED BY: RMA
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 PLAN DATE: 8/3/18

MAINTAINING TRAFFIC
 IN
REMEMBRANCE DRIVE
 FROM K L OUTDOOR TO KEATING AVE.
 CITY OF MUSKEGON, MUSKEGON COUNTY, MICHIGAN

FIELD SURVEY / DATE
 SPH & CJB / 4-16-18
 PROJECT NO. 180151.02
 SHEET NUMBER
9 OF 9