

# MIDLAND COUNTY ROAD COMMISSION

## MIDLAND, MICHIGAN

### WEST RIVER ROAD BRIDGE RECONSTRUCTION

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	COVER SHEET
2	TYPICAL SECTIONS
3	LEGEND SHEET
4	LOG OF BORINGS
5	REMOVAL SHEET
6	GENERAL PLAN OF SITE
7	GENERAL PLAN OF STURCTURE
8	ABUTMENTS – GENERAL PLAN OF STRUCTURE
9	ELEVATION VIEW – GENERAL PLAN OF STRUCTRE
10	DETAIL SHEET
11–12	MAINTAINING TRAFFIC

PROJECT LOCATION

M.D.O.T. STANDARD PLANS	
TITLE	PLAN NO.
GUARDRAIL AT BRIDGES AND EMBANKMENTS	R-59-E
GUARDRAIL TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D	R-60-J*
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS	R-67-G*
SOIL EROSION & SEDIMENTATION CONTROL MEASURES	R-96-E
SEEDING AND TREE PLANTING	R-100-H
GRADING CROSS-SECTIONS	R-105-D

\* SPECIAL DETAILS

M.D.O.T WORK ZONE DEVICES	
TITLE	PLAN NO.
GROUND DRIVEN SIGN SUPPORTS FOR TEMP SIGNS	WZD-100-A
TEMPORARY TRAFFIC CONTROL DEVICES	WZD-125-D

#### NOTES:

THE WORK COVERED BY THESE PLANS INCLUDES ROAD WORK, EARTH EXCAVATION, REMOVAL OF THE CULVERTS, CONSTRUCTION OF THE PROPOSED BRIDGE, GUARDRAIL, MAINTENANCE OF TRAFFIC, HMA PAVING, PLACING GRANULAR MATERIAL, SLOPE PROTECTION, AND RIPRAP TO THE LIMITS SHOWN.

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

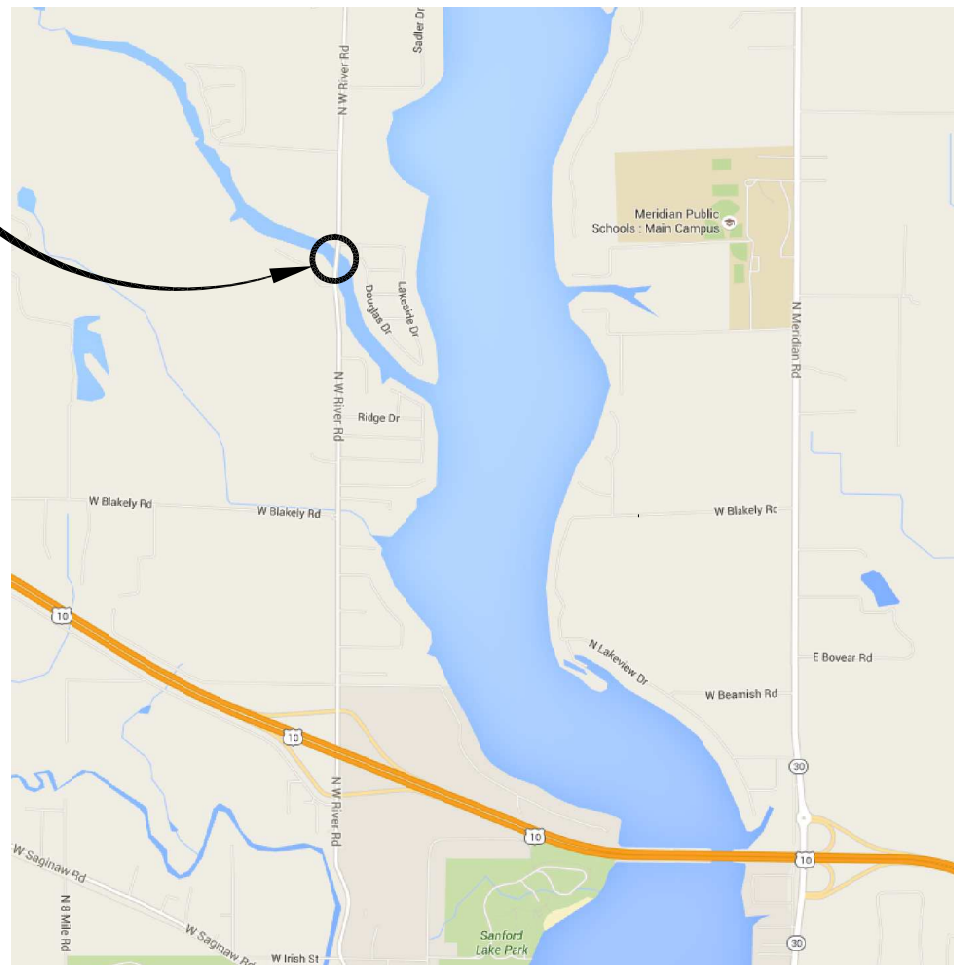
WEST RIVER ROAD TRAFFIC IS TO BE DETOURED OVER OTHER EXISTING ROADS.

PLAN ELEVATIONS REFER TO NAVD88.

WATER LEVEL IS SUBJECT TO CHANGE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING A DETERMINATION OF WATER LEVELS THAT MAY EXIST DURING CONSTRUCTION.

MEASURES SHALL BE TAKEN TO PREVENT DEBRIS IN WATERWAY. IF DEBRIS FALLS INTO THE WATERWAY, IT SHALL BE REMOVED WITHIN 24 HOURS. SINCE DISTURBANCE OF THE WATERWAY BOTTOM MAY BE AS HARMFUL AS THE DEBRIS ITSELF, THE PREVENTATIVE MEASURES MUST BE EFFECTIVE.


IMMEDIATELY AFTER THE CONSTRUCTION OF AN ABUTMENT IS COMPLETED, SLOPE PROTECTION AND SEEDING OR SODDING SHALL BE PLACED ON THE ADJACENT EMBANKMENT SLOPES.



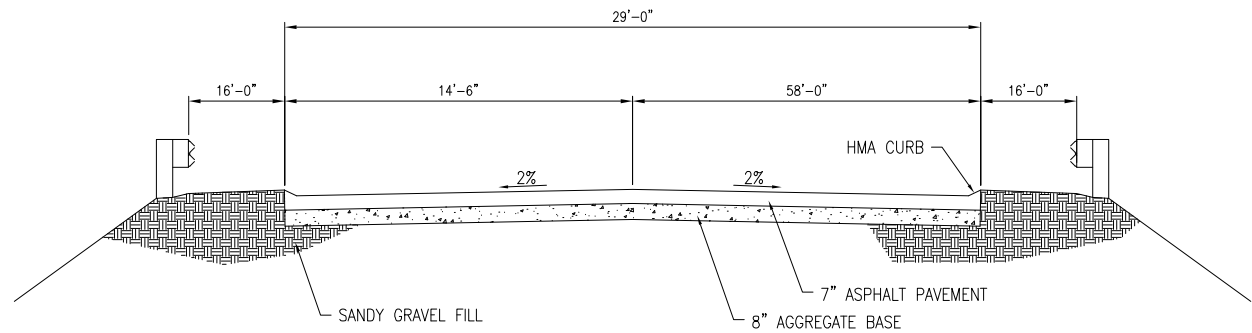
#### LOCATION MAP

N.T.S.

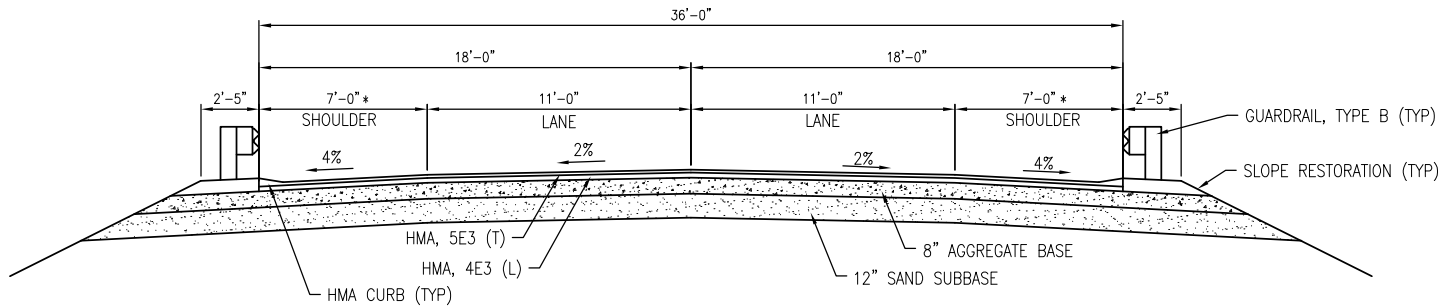
APPLICATION DATE	PERMITS	APPROVAL DATE
	MDEQ WATER MAIN PERMIT	
	MCRC SOIL EROSION PERMIT	

CONTRACT FOR: CONSTRUCTION OF NEW BRIDGE USING GEOSYNTHETICALLY REINFORCED SOIL ABUTMENTS AND TIMBER SUPERSTRUCTURE.	
<div><div>Advancing Communities</div><div>1005 Corporate Drive   Mt. Pleasant, MI 48858 P (734) 522-6711   F (734) 522-6427</div></div>	
PREPARED UNDER THE SUPERVISION OF:	
<div><div>CRAIG D. SCHRIPSEMA</div><div><div>45096</div><div>Registration No.</div><div>3-9-16</div><div>Date</div></div></div>	
REVISIONS	
PROJECT NO.	SHEET NO.
5025-16-0011	1 OF 12

DRAWING PATH: P:\5000\_5499\5025160010\_West\_River\_Bridge\Drawings\Civil\Misc160010TYP.dwg    Mar 10, 2016 - 1:33pm



EXISTING TYPICAL SECTION  
STA 1+25.00 (POB) TO STA 3+27.50 (POE)



TYPICAL SECTION  
STA 1+25.00 (POB) TO STA 2+10.50  
STA 2+40.50 TO STA 3+27.50 (POE)

\* HMA SHOULDER VARIES IN WIDTH FROM 3'-6" WIDE TO MATCH EXISTING AT P.O.B. AND P.O.E. TO 7'-0" AT END OF APPROACH GUARDRAIL. TAPER IN ALONG CENTERLINE.

INFORMATIONAL EARTH QUANTITIES (POB TO POE)

MACHINE GRADING, MODIFIED	
ITEM	VOLUME
EXCAVATION, EARTH	1200 CYDS
EMBANKMENT, CIP	100 CYDS
NOTE: QUANTITIES SHOWN FOR INFORMATIONAL PURPOSES ONLY AND ARE INCLUDED WITH PAYMENT FOR MACHINE GRADING, MODIFIED	

HMA APPLICATION ESTIMATE				
IDENT NO.	ITEM	RATE (#/SYD)	PERF. GRADE	REMARKS
L	HMA, 4E3	220	58-28	LEVERING COURSE
T	HMA, 5E3	220	58-28	TOP COURSE
NOTES: 1) THE AGGREGATE WEAR INDEX (AWI) FOR THE TOP COURSE SHALL BE 220. 2) RECLAIMED ASPHALT PAVEMENT (RAP) IS LIMITED TO 15% IN THE HMA TOP COURSES 3) PLACE HMA BOND COAT AT 0.05 TO 0.15 GAL/SYD BETWEEN LAYERS AS DIRECTED BY THE ENGINEER (INCLUDED IN PAYMENT FOR HMA PAVING ITEMS)				



Know what's below.  
Call before you dig.

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WATER & SEWER UTILITY SYMBOLS

EXISTING

- STORM MANHOLE
- SQUARE CATCH BASIN
- ROUND CATCH BASIN
- CULVERT
- CULVERT W/O END SECTION
- CULVERT W/END SECTION
- SANITARY MANHOLE
- CLEAN OUT
- GATE VALVE & WELL
- GATE VALVE & BOX
- WATER STOP BOX
- FIRE HYDRANT
- METER PIT
- WATER METER
- SPRINKLER HEAD
- IRRIGATION VALVE

PROPOSED

- STORM MANHOLE
- INLET/CATCH BASIN
- CULVERT END SECTION
- SANITARY MANHOLE
- GATE VALVE & WELL
- GATE VALVE & BOX
- TAPPING SLEEVE VALVE & WELL
- TAPPING SLEEVE VALVE & BOX
- FIRE HYDRANT

REAL ESTATE SYMBOLS

- CONTIGUOUS PROPERTY SYMBOL
- PARCEL NUMBER BOX
- NO ROW IMPACTS

MISCELLANEOUS UTILITY SYMBOLS

EXISTING

- GUY WIRE
- GUY POLE
- UTILITY POLE
- UTILITY POLE W/LIGHT
- LIGHT/DECOR LAMP POLE
- FLOOD LIGHT
- GAS VALVE
- GAS VENT
- GAS METER
- GAS RISER
- TRAFFIC SIGNAL
- PEDESTRIAN RISER
- TRANSFORMER PAD
- PRIVATE UTILITY MANHOLE
- RAILROAD CROSSING
- ELECTRIC METER
- PHONE BOOTH
- TRAFFIC SIGNAL CONTROLLER
- HAND HOLE
- ELECTRIC RISER
- TELEPHONE RISER
- CABLE TV RISER
- MONITORING WELL
- UNDERGROUND MARKER

MISCELLANEOUS SYMBOLS

EXISTING

- RIPRAP
- SIGN
- FLOW DIRECTION
- STUMP
- WETLAND
- CONIFEROUS TREE  
CL 1 1" TO 5"  
CL 2 6" TO 17"  
CL 3 18" TO 35"  
CL 4 36" AND UP
- DECIDUOUS TREE
- CONIFEROUS SHRUB
- DECIDUOUS SHRUB
- SOIL BORING
- SECTION CORNER
- MONUMENT
- IRON ROD/PIPE
- PK NAIL
- BENCHMARK
- TRAVERSE POINT
- MAIL/NEWSPAPER BOX
- FLAG POLE
- POST

HAZARDOUS OR  
FLAMMABLE MATERIAL

USED WITH UNDERGROUND GAS &  
ELECTRICAL LINES

CAUTION - CRITICAL  
UNDERGROUND UTILITY

USED WITH TELEPHONE &  
FIBER OPTIC LINES

PROPOSED

- RIPRAP
- SIGN
- FLOW DIRECTION
- STRUCTURE NUMBER  
WM SAN STM
- ADA SIDEWALK RAMP

UTILITY PATTERN

EXISTING

- ELECTRICAL \*
- GAS\OIL
- CABLE/TELEPHONE \*
- FIBER OPTIC \*
- WATER
- SANITARY
- STORM

PROPOSED

- STORM/SANITARY/WATER
- PRIMARY UTILITY WILL HAVE A  
CONTINUOUS LIFESTYLE, WITH THE  
SECONDARY UTILITY MATCHING ITS  
RESPECTIVE EXISTING UTILITY LIFESTYLE

\*OH = OVERHEAD , UG = UNDERGROUND

ROW PATTERN

EXISTING

- ROW
- SECTION
- PROPERTY/PARCEL

PROPOSED

- ROW

TOPO PATTERN

EXISTING

- HEDGE/TREE
- FENCE
- GUARDRAIL
- CENTERLINE OF DITCH
- RAILROAD
- WETLAND/EDGE OF WATER

PROPOSED

- GRADING LIMIT  
(SLOPE STAKE)
- CENTERLINE OF DITCH
- GUARDRAIL
- FENCE

REMOVAL LEGEND

- SIDEWALK REMOVAL
- BRICK REMOVAL
- HMA SURFACE REMOVAL
- PAVEMENT REMOVAL
- COLD MILLING HMA SURFACE
- HMA BASE CRUSHING AND SHAPING
- EXCAVATION, EARTH, MODIFIED
- CURB AND GUTTER, REM
- TREE, REM
- SALVAGE
- BULKHEAD
- ABANDON
- REMOVE
- ADJUST
- RELOCATE
- RECONSTRUCT
- REMOVE BY OTHERS
- ADJUST BY OTHERS
- RELOCATE BY OTHERS

IF NECESSARY FOR CLARITY

- SALVAGE
- BULKHEAD
- ABANDON
- CLEARING
- REMOVE
- RELOCATE
- RECONSTRUCT
- RELOCATE BY OTHERS
- ADJUST BY OTHERS

SPECIAL LEGEND

- DETECTABLE WARNING SURFACE
- DIRECTIONAL TACTILE PAVERS



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REVISIONS:	DATE	DESCRIPTION

DATE	PROJ NUMBER	ENG	PROJ LEADER	CDS	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	H	N	V	NTS	NTS	NTS	VERT DATUM	NAV DIB
3/15/16	5025-16-0311	OHM				MIDLAND	SANFORD									
MIDLAND COUNTY ROAD COMMISSION																
WEST RIVER ROAD BRIDGE																
LEGEND SHEET																

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McDOWELL & ASSOCIATES  
GEOTECHNICAL, ENVIRONMENTAL & HYDROGEOLOGICAL SERVICES  
3730 JAMES SAVAGE ROAD - MIDLAND, MI 48642  
PHONE: (989) 496-3610 - FAX: (989) 496-3190

JOB No.:16-64342

SURFACE ELEV.: DATE:2/12/2016

LOG OF SOIL  
BORING No.: 3

SOIL BORING - WEST RIVER ROAD OVER  
PROJECT:BLACK CREEK  
WEST RIVER RD., NORTH BOUND LANE, ~7'  
LOCATION:E OF CENTERLINE, ~CENTER OF CULVERTS

JEROME TWP., MIDLAND Co., MICHIGAN

SAMPLE & TYPE	DEPTH	LEGEND	SOIL DESCRIPTION	PENETRATION BLOWS FOR 6"	MOISTURE, %	NATURAL WT, PCF	UNC. COMP. STRENGTH, PSF	OTHER TESTING
	1		0'7" ASPHALT					
	2		1'3" COMPACT MOIST BROWN SAND AND GRAVEL, FILL, FROST TO 1'0" BELOW TOP OF PAVEMENT	10				
A SS	3		EXTREMELY COMPACT MOIST VARIEGATED BROWN SAND WITH CLAY, FILL	14	7.9	128		
	4		4'0"	16				
B SS	5		VERY COMPACT MOIST VARIEGATED SAND WITH CLAY, FILL	5				
	6			9	7.1	132		
	7		6'6"	8				
C SS	8		MEDIUM COMPACT MOIST CHANGING TO WET LIGHT BROWN SAND, FILL	1				
	9			2	6.8	113		
	10		10'0"	1				
D SS	11		VERY SOFT WET LIGHT BROWN CLAY WITH TRACE SAND, FILL	1	33.2	121	1,070	
	12							
	13							
	14		14'0"					
E SS	15		SOFT WET LIGHT BROWN CLAY WITH TRACE SAND, FILL	1				
	16			2	32.9	119	1,200	
	17							
	18		18'0"					
F SS	19		FIRM WET LIGHT BROWN CLAY WITH TRACE SAND AND PEBBLES, FILL					
	20			2				
	21		20'3" MEDIUM COMPACT WET VARIEGATED BROWN CLAY SAND WITH SILT, ORGANICS AND WOOD, FORMER RIVER BOTTOM	2	31.0	121	2,600	
	22			3				
	23							
	24		MEDIUM COMPACT WET LIGHT GRAY SILT					
G SS	25		CONTINUED ON NEXT PAGE	1	44.1	99		
	25'3"			1				
				5	21.6	134		
TYPE OF SAMPLE: D - DISTURBED UL - UNDIST. LINER ST - SHELBY TUBE SS - SPLIT SPOON RC - ROCK CORE				REMARKS: STANDARD PENETRATION TEST BLOWS COMPLETED WITH AUTOMATIC HAMMER, DRIVING 2" OD SAMPLER 1', WITH 140# HAMMER FALLING 30". BORING BACKFILLED WITH AUGER CUTTINGS AND ASPHALT COLD PATCH.				GROUND WATER OBSERVATIONS: GROUND WATER WAS ENCOUNTERED AT: 9'0" GROUND WATER AFTER COMPLETION: CAVE IN AT 5'0" GROUND WATER VOLUMES: HEAVY



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SURFACE ELEV.: DATE:2/12/2016

LOG OF SOIL  
BORING No.: 3 CONT.

SOIL BORING - WEST RIVER ROAD OVER  
PROJECT:BLACK CREEK  
WEST RIVER RD., NORTH BOUND LANE, ~7'  
LOCATION:E OF CENTERLINE, ~CENTER OF CULVERTS

JEROME TWP., MIDLAND Co., MICHIGAN

SAMPLE & TYPE	DEPTH	LEGEND	SOIL DESCRIPTION	PENETRATION BLOWS FOR 6"	MOISTURE, %	NATURAL WT, PCF	UNC. COMP. STRENGTH, PSF	OTHER TESTING
	26							
	27		MEDIUM COMPACT WET LIGHT GRAY SILT					
	28							
	29		29'0"					
H SS	30		FIRM MOIST LIGHT BROWN CLAY WITH TRACE SAND	2				
	31			2	12.8	124	2,120	
	32			3				
	33							
	34		34'0"					
I SS	35		STIFF WET LIGHT BROWN SILTY CLAY WITH TRACE SAND	2				
	36			3	40.3	131	930	
	37							
	38		38'0"					
	39		EXTREMELY STIFF MOIST GRAY CLAY WITH SAND AND PEBBLES, HARDPAN					
J SS	40			14				
	41			18				
	42			23	8.1	149	28,920	
	43							
	44							
K SS	45		45'6"	8				
	46			17				
	47			24	9.2	146	19,440	
	48							
	49							
	50							
TYPE OF SAMPLE: D - DISTURBED UL - UNDIST. LINER ST - SHELBY TUBE SS - SPLIT SPOON RC - ROCK CORE				REMARKS: STANDARD PENETRATION TEST BLOWS COMPLETED WITH AUTOMATIC HAMMER, DRIVING 2" OD SAMPLER 1', WITH 140# HAMMER FALLING 30". BORING BACKFILLED WITH AUGER CUTTINGS AND ASPHALT COLD PATCH.				GROUND WATER OBSERVATIONS: GROUND WATER WAS ENCOUNTERED AT: 9'0" GROUND WATER AFTER COMPLETION: CAVE IN AT 5'0" GROUND WATER VOLUMES: HEAVY



Know what's below.  
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MIDLAND COUNTY ROAD COMMISSION  
WEST RIVER ROAD BRIDGE  
LOG OF BORINGS

DRAWING PATH: P:\5000\_5499\5025\60010\_West\_River\_Road\_Bridge\Drawings\Civil\Removal\60010REM\_01.dwg Mar 10, 2016 - 11:49pm

JOB BENCHMARK #201  
SET TIE IN E SIDE OF POWER POLE,  
32' W OF W RIVER RD  
ELEV 646.49

JOB BENCHMARK #202  
FOUND SPIKE IN E SIDE OF POWER  
POLE, 26' W OF E W RIVER RD  
ELEV 643.02

TRAVERSE POINT #101  
N 804230.17  
E 13116200.31 ELEV 646.48

TRAVERSE POINT #102  
N 804829.20  
E 13116312.74 ELEV 640.60

W RIVER ROAD

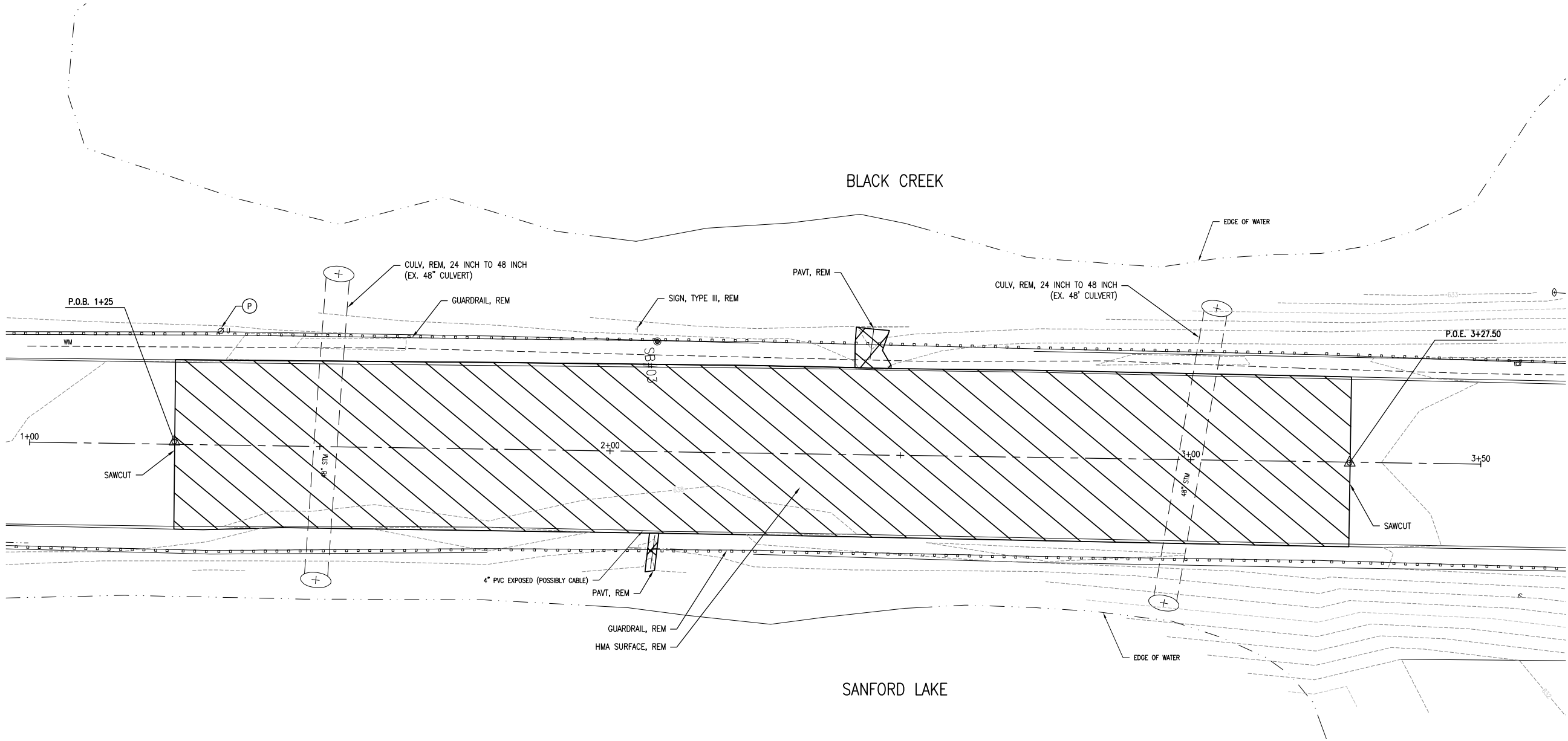




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QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
2	Ea	Culv, Rem, 24 inch to 48 inch
406	Ft	Guardrail, Rem
6	Syd	Pavt, Rem
50	Cyd	Subgrade Undercutting, Type II
2	Sta	Machine Grading, Modified
1470	Cyd	Excavation, Fdn
656.0	Syd	HMA Surface, Rem
1.0	Ea	Sign, Type III, Rem



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DATE 3/15/16 PROJ NUMBER 5025-16-0311 ENG OHM PROJ MGR CDS CADD CSMCH COUNTY MIDLAND CITY/VILLAGE/TOWNSHIP SANFORD SCALE H: 1"=20' V: 1"=20' VERT DATUM NAVD83 HORIZ DATUM NAD83

MIDLAND COUNTY ROAD COMMISSION  
WEST RIVER ROAD BRIDGE  
REMOVAL SHEET

SHEET 5 OF 12

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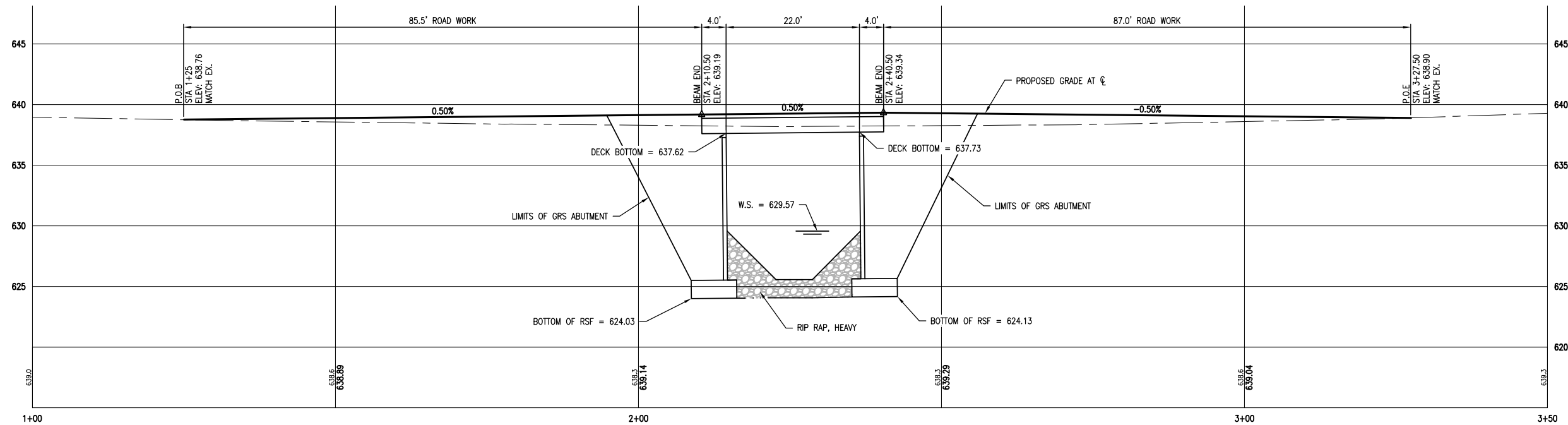
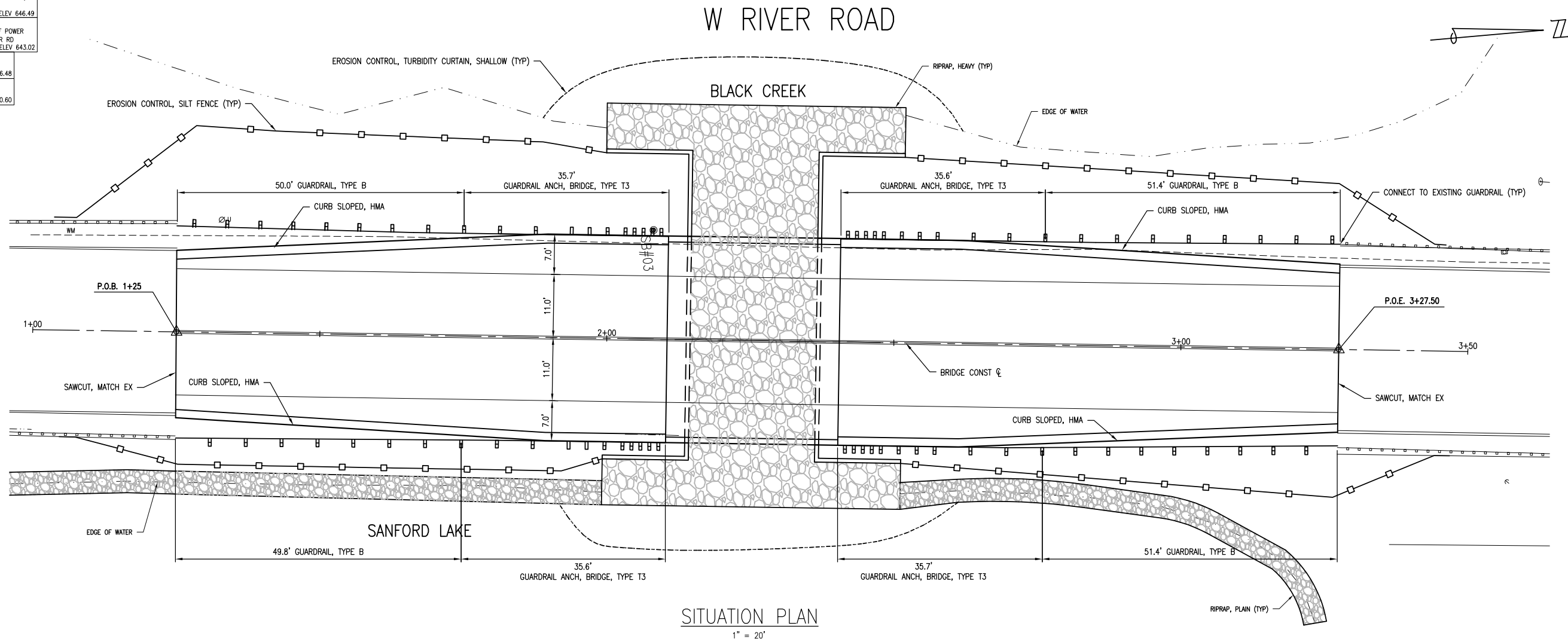
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W RIVER ROAD



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DATE: 3/15/16  
PROJ NUMBER: 502516-0011  
ENG: OHM

CADD: C-MANCH  
CITY/VILLAGE/TOWNSHIP: SANFORD  
COUNTY: MIDLAND

SCALE: H: 1"=20' V: 1"=10'

HORIZ DATUM: NAVD83  
VERT DATUM: NAVD83

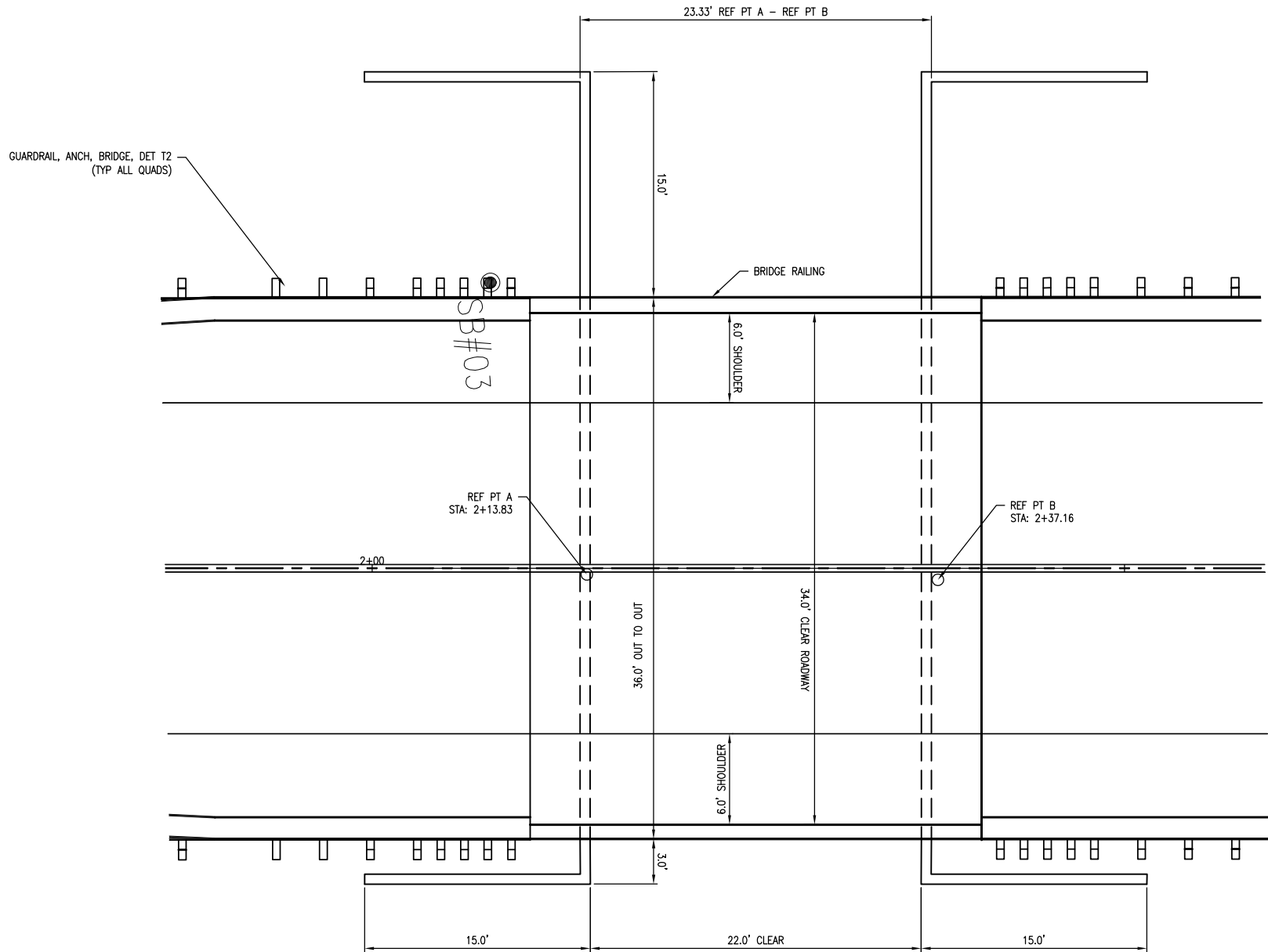
MIDLAND COUNTY ROAD COMMISSION  
WEST RIVER ROAD BRIDGE  
GENERAL PLAN OF SITE

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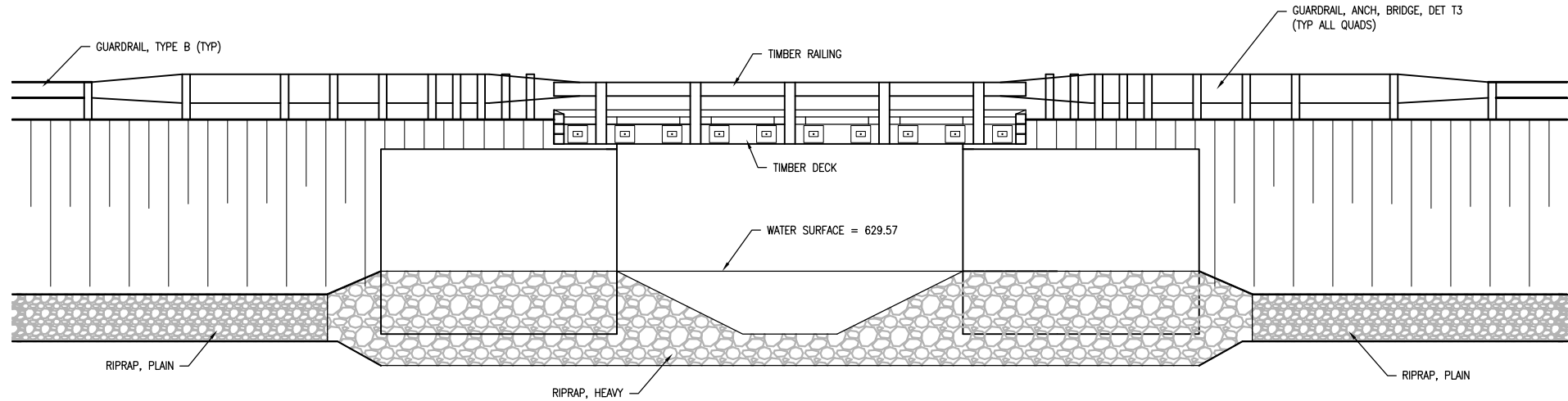
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JOB BENCHMARK #201	
SET TIE IN E SIDE OF POWER POLE, 32' W OF W RIVER RD	
ELEV 646.49	
JOB BENCHMARK #202	
FOUND SPIKE IN E SIDE OF POWER POLE, 26' W OF E W RIVER RD	
ELEV 643.02	
TRAVERSE POINT #101	
N 804230.17	
E 13116200.31	ELEV 646.48
TRAVERSE POINT #102	
N 804829.20	
E 13116312.74	ELEV 640.60

W RIVER ROAD

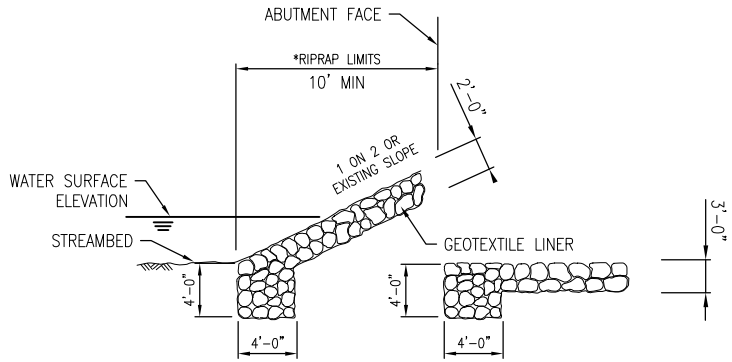


PLAN  
1" = 10'



ELEVATION  
1" = 10'

QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
1	LS	Motilization, Max. ____
394	Ft	Erosion Control, Silt Fence
156	Ft	Erosion Control, Turbidity Curtain, Shallow
178	Cyd	Subbase, CIP
534	Syd	Aggregate Base, 8 inch
88	Ton	HMA, 4E3
85	Ton	HMA, 5E3
1	LS	Cofferdams
1	LS	Decking, Timber, Modified
346	Ft	Curb Sloped, HMA
203	Ft	Guardrail, Type B
4	Ea	Guardrail Anch, Bridge, Det T3
406	Ft	Pav: Mrkg, Thermopl, 6 inch, White
406	Ft	Pav: Mrkg, Thermopl, 6 inch, Yellow
225	Syd	Riprap, Heavy, Modified
126	Syd	Riprap, Plain, Modified
502	Syd	Slope Restoration



TOE HEADER      SIDE HEADER  
RIPRAP HEADER DETAILS

TOP OF RIPRAP MUST BE AT OR BELOW EXISTING STREAMBED/  
SLOPE ELEVATION.

AN APPROPRIATE METHOD OF WATER DIVERSION FOR PLACING  
RIPRAP SHALL BE PROPOSED BY THE CONTRACTOR AND APPROVED  
BY THE ENGINEER. IF WATER IS SHALLOW (LESS THAN TWO FEET),  
TEMPORARY CONCRETE BARRIERS OR SANDBAGS MAY BE USED  
TO DIVERT FLOW.

THE RIPRAP SCHEME SHOWN IS A MINIMUM REQUIREMENT FOR SCOUR.

\*RIPRAP LIMITS ARE APPROXIMATE. RIPRAP SHALL EXTEND FROM TOP OF  
BANK TO BOTTOM OF EXISTING CHANNEL AT A 1 ON 2 SLOPE.



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Call before you dig.



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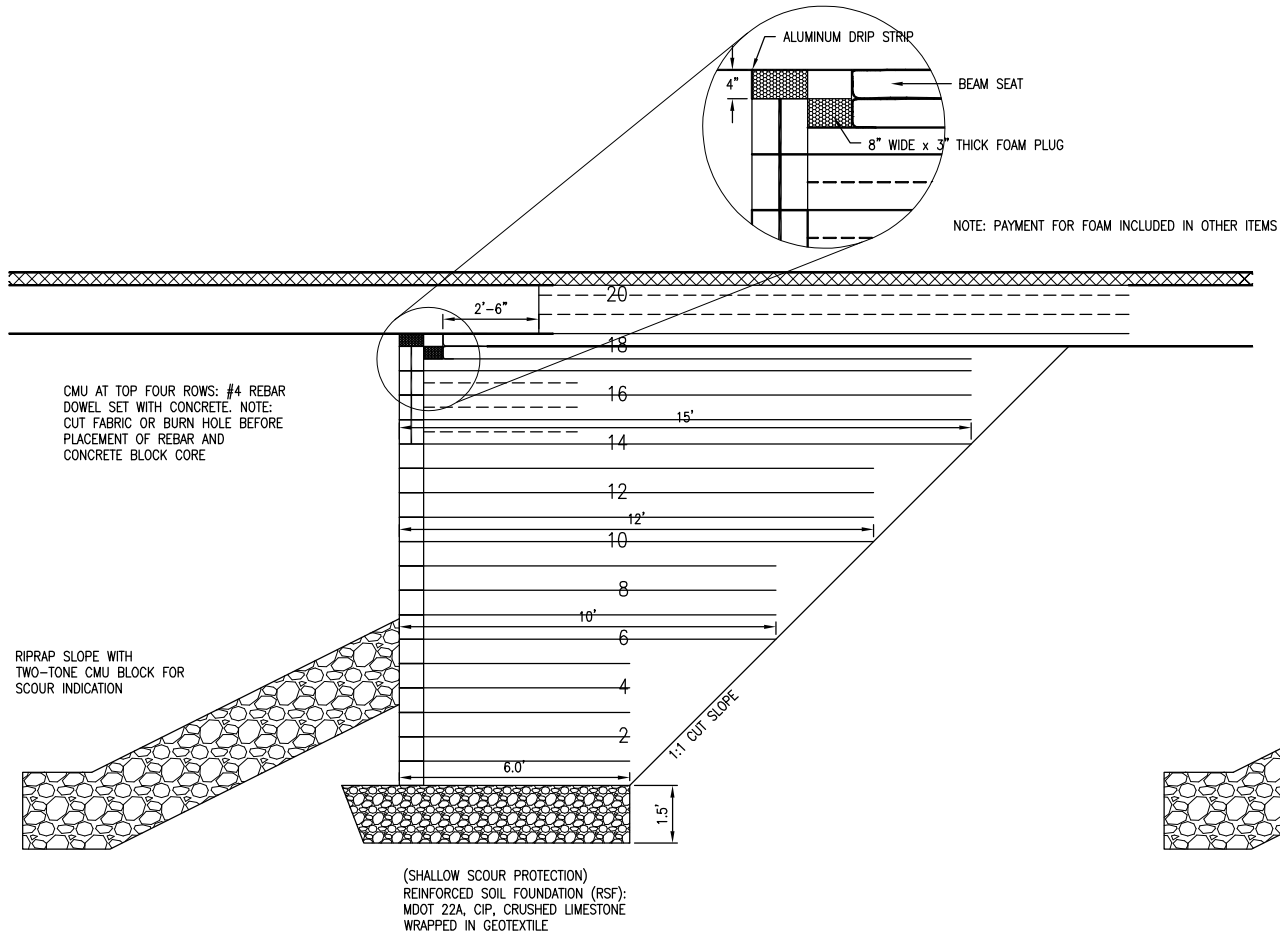
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DATE	PROJ NUMBER	ENG	OHM	PROJ LEADER	CDS	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	H	V	VERT DATUM	HORIZ DATUM	NAVD83
3/15/16	5025-16-011						MIDLAND	SANFORD	1"=10'	1"=10'				

MIDLAND COUNTY ROAD COMMISSION  
WEST RIVER ROAD BRIDGE  
GENERAL PLAN OF STURCTURE



DRAWING PATH: P:\5000\_449\5025\60010\_West\_River\_Road\_Bridge\Drawings\Civil\Details\60010DET.dwg Mar 10, 2016 - 1:15pm

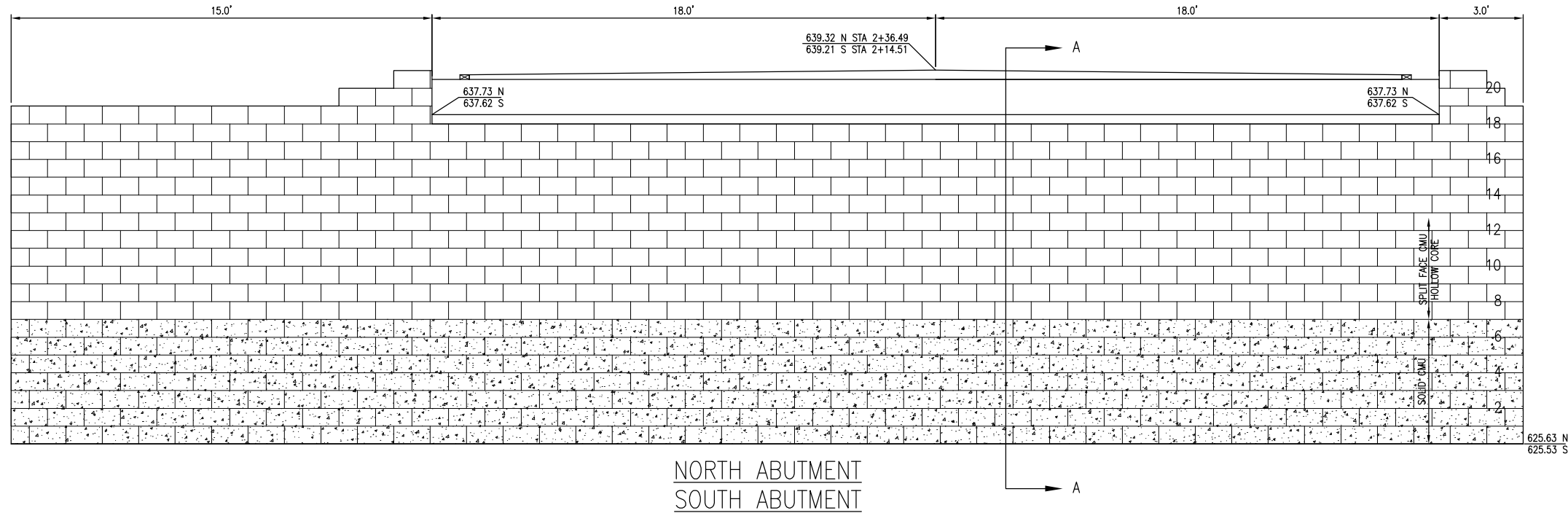


SECTION A-A

—— HIGH STRENGTH GEOTEXTILE [4800 LBS/FT(70Kn/M) WIDE WIDTH TENSILE STRENGTH  
- - - MEDIUM STRENGTH GEOTEXTILE [2400 LBS/FT(35Kn/M) WIDE WIDTH TENSILE STRENGTH

BACKFILL BETWEEN FABRIC SHALL BE #89 STONE  
CMU ~ CONCRETE MASONRY UNIT  
GRS ~ GEOSYNETHICALLY REINFORCED SOIL

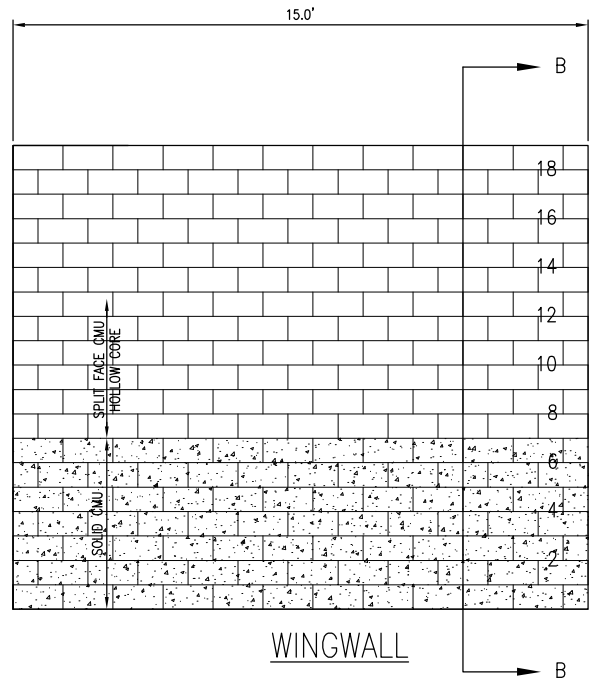
SECTION B-B  
WINGWALL CONSTRUCTION



LOADING INFORMATION  
DECK WEIGHT: 108,185 LB  
BEARING PRESSURE: 100 LBS/SFT DEAD LOAD  
BEARING PRESSURE: 1000 LBS/SFT LIVE LOAD HL93 WITH IMPACT

QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
719	Cyd	Granular Embankment, AASHTO #89 Stone
60	Cyd	MDOT 22A, CIP, Crushed Limestone
4402	Syd	High Strength Woven Polypropylene Fabric
421	Syd	Medium Strength Woven Polypropylene Fabric
285	Ft	Reinforcement; Steel, Epoxy Coated Dowel
72	Ft	Aluminum Drip Strip
1486.0	Ea	Splitface Concrete Masonry Block
889.0	Ea	Solid Concrete Masonry Block

- NOTES:
- SPLITFACE CONCRETE MASONRY BLOCK - THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING SPLITFACE HOLLOW CORE CONCRETE MASONRY UNITS (CMU) MEETING ASTM C90 WITH THE MODIFICATIONS THAT THE BLOCK SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AND A MAXIMUM ABSORPTION RATE OF 6.5%. PLACE CMU BLOCKS SIDE BY SIDE FOR THE FULL LENGTH OF EACH COURSE OF THE WALL. CHECK WALL PLUMBNESS A MINIMUM OF EVERY 3 LAYERS AND CORRECT DEVIATIONS GREAT THAN 1/4". CORRECT MISALIGNED, IMPROPERLY SEATED OR OUT OF LEVEL CMU BLOCKS. ASSURE THAT THE TOPS OF ALL CMU BLOCKS ARE FREE OF LOOSE MATERIAL PRIOR TO THE PLACEMENT OF THE NEXT LAYER OF GEOTEXTILE AND CMU BLOCKS.
  - SOLID CONCRETE MASONRY BLOCK - THIS ITEM SHALL CONSIST OF FURNISHING AND PLACING SOLID CONCRETE MASONRY UNITS (CMU) COLORED RED MEETING ASTM C90 WITH THE MODIFICATIONS THAT THE BLOCK SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AND A MAXIMUM ABSORPTION RATE OF 6.5%. BEGIN CONSTRUCTION OF THE ABUTMENT BY PLACING ONE FULL LENGTH OF COURSE OF CMU BLOCK AT A TIME. PLACE THE FIRST COURSE OF CMU BLOCK ON TOP AND IN FULL CONTACT WITH THE REINFORCED SOIL FOUNDATION. THE FIRST ROW OF CMU BLOCK MUST BE CAREFULLY LEVELLED IN BOTH DIRECTIONS TO ENSURE PROPER ALIGNMENT FOR THE BALANCE OF THE WALL. CHECK WALL PLUMBNESS A MINIMUM OF EVERY 3 LAYERS AND CORRECT DEVIATIONS GREATER THAN 1/4". CORRECTED MISALIGNED, IMPROPERLY SEATED OR OUT OF LEVEL CMU BLOCKS. ASSURE THAT THE TOPS OF ALL CMU BLOCKS ARE FREE OF LOOSE MATERIAL PRIOR TO THE PLACEMENT OF THE NEXT LAYER OF GEOTEXTILE AND CMU BLOCKS.
  - HIGH STRENGTH WOVEN POLYPROPYLENE FABRIC - THIS ITEM SHALL HAVE A WIDE WIDTH TENSILE STRENGTH OF 4800/LBS PER FOOT IN BOTH DIRECTIONS AS PER ASTM D-4595. THE GEOSYNTHETIC REINFORCEMENT SHALL BE PLACED AS SHOWN ON SHEET. THE WIDTH AND LENGTH VARY AS SHOWN ON THE DRAWING. GEOSYNTHETIC REINFORCEMENT SHALL EXTEND BETWEEN THE LAYERS OF CMU BLOCK TO PROVIDE A FRICITIONAL CONNECTION. THE GEOSYNTHETIC REINFORCEMENT SHALL NEARLY COMPLETELY COVER THE TOP OF THE CMU BLOCK. PULL THE GEOSYNTHETIC REINFORCEMENT TAUT PRIOR TO BACKFILLING TO REMOVE WRINKLES. THE PRICED BID SHALL INCLUDE FURNISHING AND PLACING THIS MATERIAL TO LIMIT CONSTRUCTION DAMAGE TO THE GEOTEXTILE REINFORCEMENT, CONSTRUCTION EQUIPMENT SHALL NOT DRIVE DIRECTLY OVER THE GEOTEXTILE. AN AGGREGATE THICKNESS OF 6" IS SUFFICIENT TO PREVENT EQUIPMENT FROM DAMAGING THE GEOTEXTILE. NO LAPPING OF FABRIC SHALL BE PERMITTED ALONG THE FACE. WHERE LAPPED ELSEWHERE A 0.25" THICKNESS OF STONE SHALL BE SPREAD BETWEEN PIECES OF FABRIC.
  - MEDIUM STRENGTH WOVEN POLYPROPYLENE FABRIC - THIS ITEM SHALL HAVE A WIDE WIDTH TENSILE STRENGTH OF 2400/LBS PER FOOT IN BOTH DIRECTIONS AS PER ASTM D-4595. THE GEOSYNTHETIC REINFORCEMENT SHALL BE PLACED AS SHOWN ON SHEET. THE WIDTH AND LENGTH VARY AS SHOWN ON THE DRAWING. GEOSYNTHETIC REINFORCEMENT SHALL EXTEND TO THE BACK OF LAYERS OF CMU BLOCK WITH CONNECTION. PULL THE GEOSYNTHETIC REINFORCEMENT TAUT PRIOR TO BACKFILLING TO REMOVE WRINKLES. THE PRICE BID SHALL INCLUDE FURNISHING AND PLACING THIS MATERIAL TO LIMIT CONSTRUCTION DAMAGE TO THE GEOTEXTILE REINFORCEMENT, CONSTRUCTION EQUIPMENT SHALL NOT DRIVE DIRECTLY OVER THE GEOTEXTILE. AN AGGREGATE THICKNESS OF 6" IS SUFFICIENT TO PREVENT EQUIPMENT FROM DAMAGING THE GEOTEXTILE.
  - THE STONE BACKFILL SHALL BE PLACED BEHIND EACH LAYER OF CMU BLOCK IN A LIFT THICKNESS NOT TO EXCEED THE CMU BLOCK HEIGHT. PLACEMENT OF THE AGGREGATE SHALL BE FROM THE WALL FACE BACKWARD TO PREVENT THE FORMATION OF AND TO REMOVE ANY WRINKLES IN THE GEOTEXTILE. FILL SHALL BE PLACED IN A MANNER TO AVOID WRINKLING OF THE GEOSYNTHETIC REINFORCEMENT. COMPACTION GENERALLY ACHIEVED BY:
    - 1) RODDING THE AGGREGATE FILL BEHIND EACH CMU BLOCK APPROXIMATELY EVERY FOOT WHILE EXERTING DOWNWARD PRESSURE ON THE CMU BLOCK TO PREVENT LATERAL MOVEMENT
    - 2) USING A VIBRATORY PLATE COMPACTOR (> 4 PASSES) DIRECTLY BEHIND THE CMU BLOCK WHILE EXERTING DOWNWARD PRESSURE ON THE CMU BLOCK TO PREVENT LATERAL MOVEMENT
    - 3) LARGER VIBRATORY COMPACTORS MAY BE USED FOR THE BALANCE OF THE AREA MORE THAN 2' BEHIND THE CMU BLOCK. MULTIPLE PASSES OF A VIBRATORY PLATE COMPACTOR CAN ALSO ACHIEVE PROPER DENSITY.
  - AT THE END OF A DAY'S OPERATIONS, SLOPE THE LAST LIFT OF BACKFILL AWAY FROM THE WALL FACE TO DIRECT SURFACE RUNOFF AWAY FROM THE WALL. DO NOT ALLOW SURFACE RUNOFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION AREA.



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REVISIONS:

NO.	DATE	DESCRIPTION
1	03/10/16	ISSUED FOR BIDDING

DATE: 3/10/16

PROJECT NUMBER: 5025-16-011

ENGINEER: CMH

DRAWN: CDS

CHECKED: CDS

COUNTY: CLASH

CITY/VILLAGE/TOWNSHIP: SANFORD

STATE: MI

SCALE: H: 1"=1'-0" V: 1"=1'-0"

VERT. DATUM: NAVD83

HORIZ. DATUM: NAVD83

MIDLAND COUNTY ROAD COMMISSION

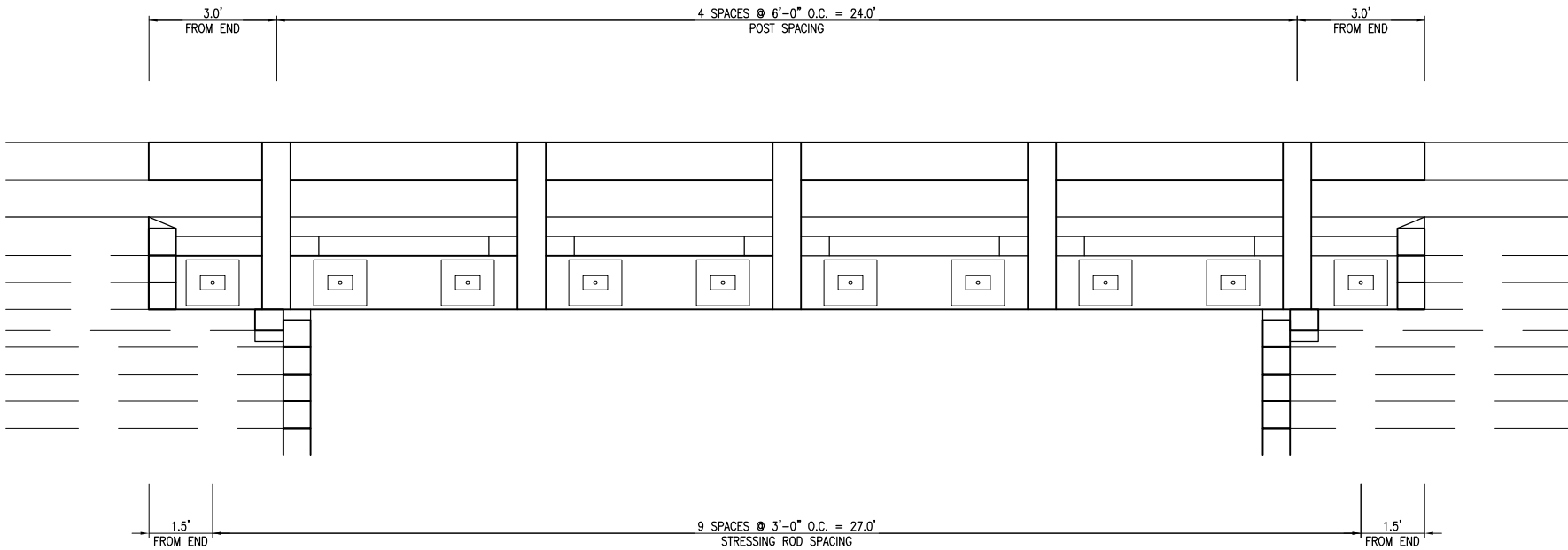
WEST RIVER ROAD BRIDGE

ABUTMENTS - GENERAL PLAN OF STRUCTURE


SHEET 8 OF 12



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SUMMARY PER BRIDGE  
BRIDGE RAIL = FHWA APPROVED PL-1 GLU-LAM TIMBER RAIL SYSTEM  
GLU-LAM DECK = 144 INDIVIDUAL 3" WIDE x 15 $\frac{1}{8}$ " DEEP x 30'-0" LONG GLU-LAM BEAMS TREATED PER AWP/PA WITH PENTA IN LIGHT OIL POST FABRICATION. FABRICATED WITH HOLES FOR 1" DIAMETER THREADBAR AT 3'-0" O.C.  
STRESSING RODS = 1" DIAMETER D4WID6 THREADBAR, PER ASTM A722 AND 157 KSI U.S. WITH ANCHORING NUTS, 4"x7"x1" ANCHOR PLATES AND 13"x15"x1" BEARING PLATES. ALL STRUCTURAL STEEL SHALL BE HOT DIPPED GALVANIZED PER ASTM A153



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3/15/16	502516-0011	OHM	CDS	C.S.M.C.H	MIDLAND	SANFORD	H: 1"=10' V: 1"=10'	NAVD83	NAVD83

MIDLAND COUNTY ROAD COMMISSION

WEST RIVER ROAD BRIDGE

ELEVATION VIEW - GENERAL PLAN OF STRUCTURE

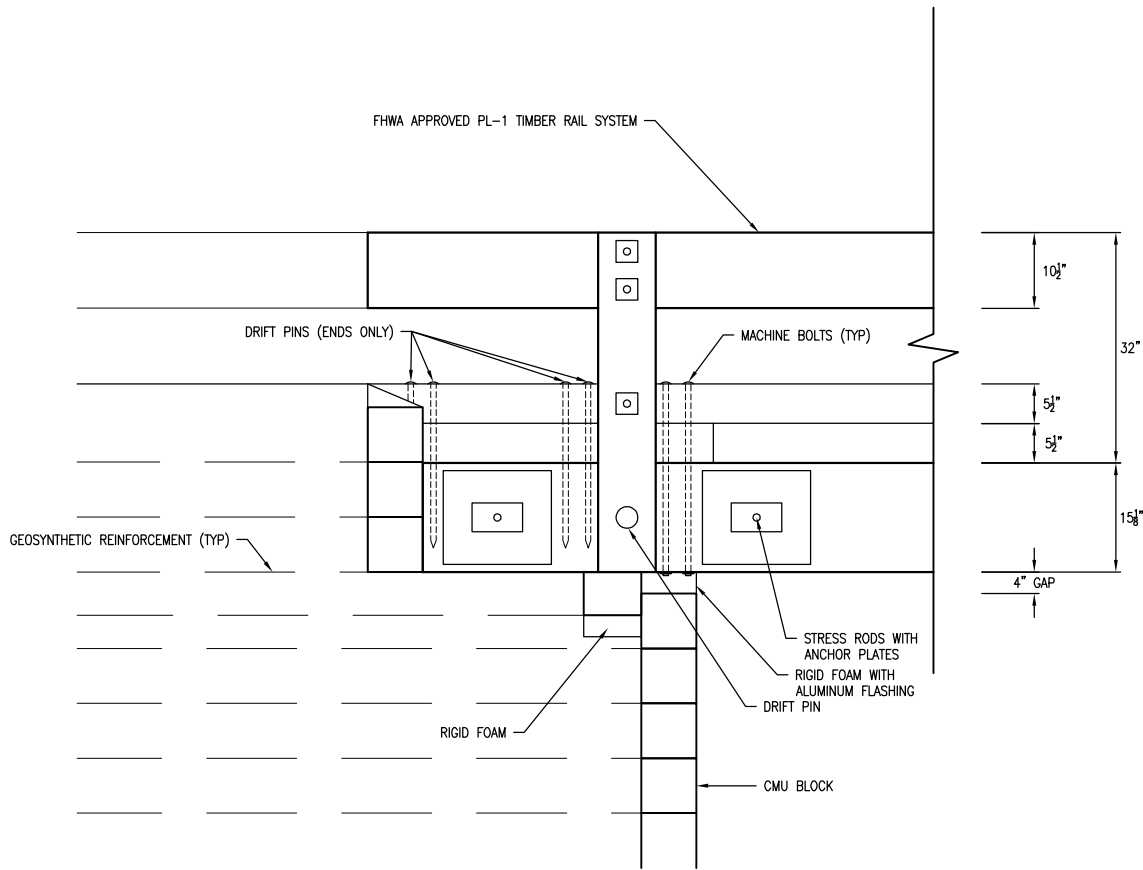
SHEET

9

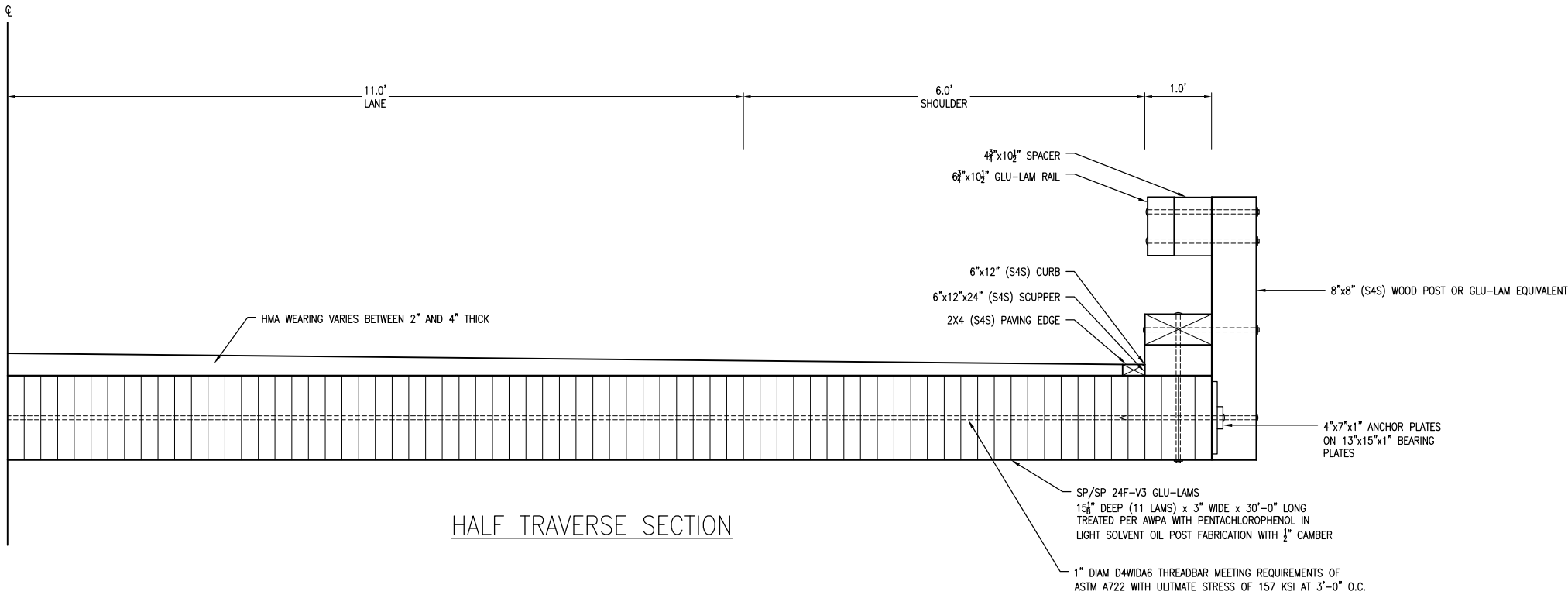
OF 12

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END SECTION DETAIL



HALF TRAVERSE SECTION



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REVISIONS:

DATE3/15/16PROJ NUMBER5025-16-0311ENG OHM

CITY/VILLAGE/TOWNSHIP SANFORD

COUNTY MIDLAND

CADD C:\ARCH

SCALE H: 1"=40'

HORZ DATUM INADS

VERT DATUM NAVD83

MIDLAND COUNTY ROAD COMMISSION

WEST RIVER ROAD BRIDGE

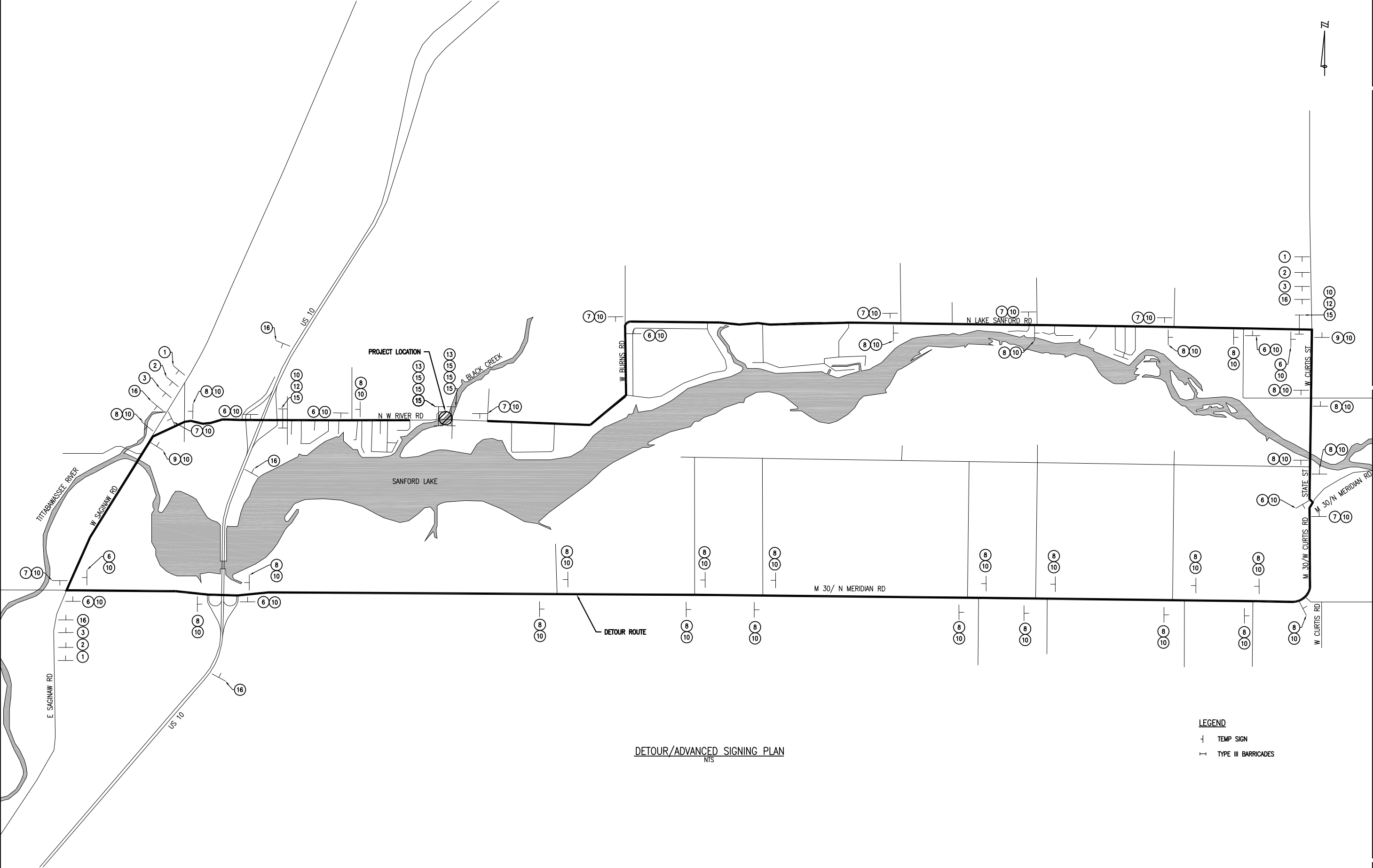
DETAIL SHEET

SHEET 10

OF 12

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DETOUR/ADVANCED SIGNING PLAN  
NTS

- LEGEND
- TEMP SIGN
  - TYPE III BARRICADES





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DATE	PROJ NUMBER	ENG	PROJ LEADER	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	H	V	HOPE DATUM	VERT DATUM
3/15/16	0712150311	OHM	CDS		MIDLAND	SANFORD	1"=10'		1"=20'	NAVD83	NAVD83

MIDLAND COUNTY ROAD COMMISSION  
WEST RIVER ROAD BRIDGE  
MAINTAINING TRAFFIC

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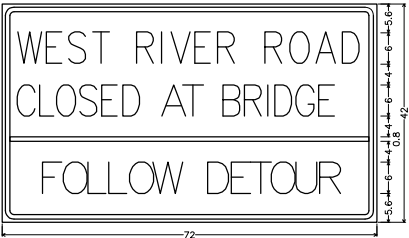
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SIGN LEGEND					
NO	SIGN	SIGN DESIGNATION	SIZE	NUMBER REQUIRED (FOR INFORMATION ONLY)	AREA (SQ. FT)
1		W20-1	48"x48"	3	32
2		W20-2	48"x48"	3	32
3		W20-3	48"x48"	3	32
4		R5-18cLA	60"x42"	0	0
5		R5-18bLA	60"x42"	0	0
6		M4-9(R)	30"x24"	9	45
7		M4-9(L)	30"x24"	8	40
8		M4-9(S)	30"x36"	28	210
9		M4-8a	24"x18"	2	6
10		D3-1A	30"x12"	49	123
12		R11-3	30"x48"	2	20
13		R11-2	30"x48"	2	20
14		G20-2	48"x24"	0	0
15		TYPE III* BARRICADE	60"x48"	8	
16		SS#1	72"x42"	6	126

\* THESE SIGNS ARE NOT IDENTIFIED ON THE PLAN SHEET AND ARE TO BE PLACED AS NEEDED OR AS SHOWN ON THE MDOT MAINTAINING TRAFFIC TYPICAL M0140a DURING ANY FLAG CONTROL OPERATIONS.

TRAFFIC NOTES:

- DISTANCES SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER TO AVOID CONFLICT OR OBSTRUCTION BY EXISTING TREES, SIGNS, DRIVEWAYS ETC, PRESENT IN THE FIELD BUT NOT SHOWN ON THE PLANS.
- ALL CONSTRUCTION SIGNS SHALL CONFORM WITH THE CURRENT EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
- ALL TRAFFIC CONTROL DEVICES INCLUDING SIGNS, BARRICADES, PLASTIC DRUMS AND WARNING LIGHTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- SIGNS, IF REQUIRED WITH THE TYPE III BARRICADES, SHALL BE MOUNTED ABOVE THE BARRICADES ON SEPARATE SUPPORTS.
- TRAFFIC CONTROL DEVICES ARE TO BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF THE PROJECT. NIGHT PATROLS OF THE CONSTRUCTION AREA AND DETOUR ROUTE SHALL BE CONDUCTED BY THE CONTRACTOR AND WILL NOT BE PAID SEPARATELY, BUT WILL BE INCLUDED IN THE UNIT PROCESS BID FOR TEMPORARY TRAFFIC CONTROL ITEMS.
- ALL SIGNS USED AT NIGHT SHALL BE RETRO-REFLECTIVE WITH A MATERIAL THAT HAS A SMOOTH, SEALED OUTER SURFACE.
- ALL SPECIAL SIGNS SHALL BE PLACED ONE (1) WEEK PRIOR TO CONSTRUCTION.



SPECIAL SIGN SS-#1

QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
8	Ea	Barricade, Type III, High Intensity, Double Sided, Furn
8	Ea	Barricade, Type III, High Intensity, Double Sided, Oper
1	LS	Minor Traf Devices
686	St	Sign, Type B, Temp, Prismatic, Furn
686	St	Sign, Type B, Temp, Prismatic, Oper



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DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	H:	V:	NTS	NTS	HORIZ DATUM	VERT DATUM
3/15/16	5025-16-0011	OHM	CDS	CJ-MCH	MIDLAND	SANFORD						NAVD83	NAVD83
MIDLAND COUNTY ROAD COMMISSION WEST RIVER ROAD BRIDGE MAINTAINING TRAFFIC DETAILS													

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