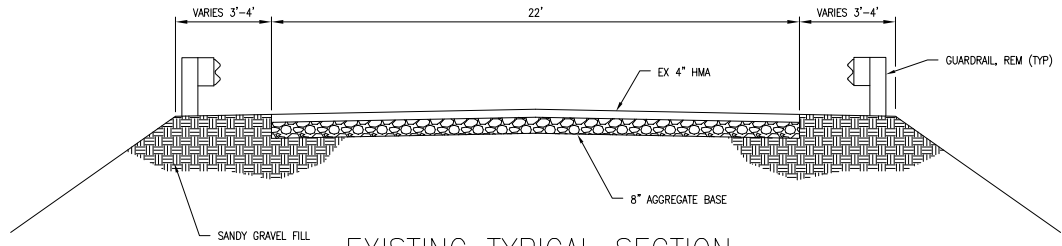
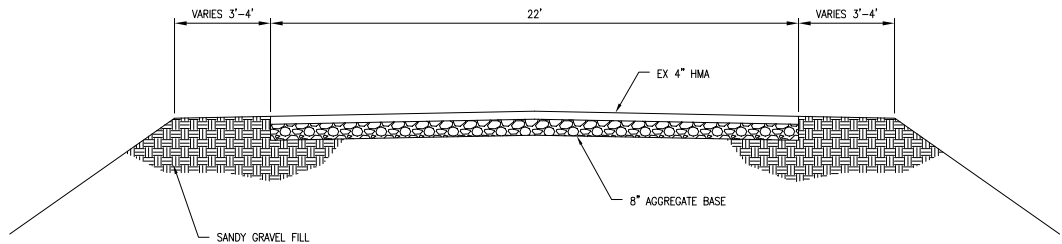


DRAWING PATH: P:\5000_5499\5025170050_9-mile over south_carroll_creek\Drawings\Civil\Typicals\70050TYP.dwg Sep 12, 2017 11:26am



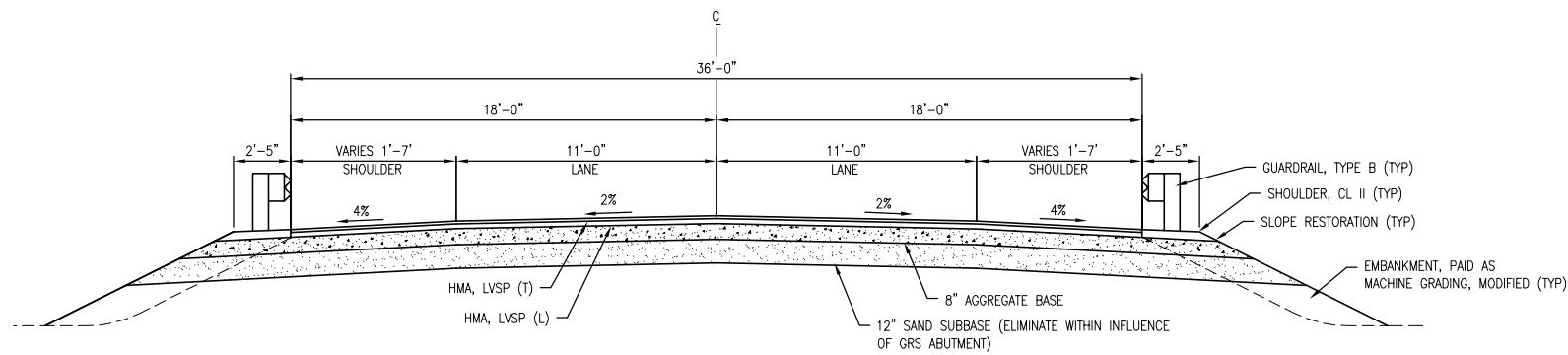
EXISTING TYPICAL SECTION

SOUTH CARROLL CREEK BRIDGE
STA 1+79.75 (POB) TO STA 4+01.75 (POE)



EXISTING TYPICAL SECTION

NORTH CARROLL CREEK BRIDGE
STA 51+39.42 (POB) TO STA 53+61.42 (POE)



TYPICAL SECTION

SOUTH CARROLL CREEK BRIDGE
STA 1+79.75 (POB) TO STA 2+75.75
STA 3+05.75 TO STA 4+01.75 (POE)

NORTH CARROLL CREEK BRIDGE
STA 51+39.42 (POB) TO STA 52+35.42
STA 52+65.42 TO STA 53+61.42 (POE)

INFORMATIONAL EARTH QUANTITIES (POB TO POE)

MACHINE GRADING, MODIFIED	
ITEM	VOLUME
EXCAVATION, EARTH	420 CYDS
EMBANKMENT, CIP	350 CYDS
NOTE: QUANTITIES SHOWN FOR INFORMATIONAL PURPOSES ONLY AND ARE INCLUDED WITH PAYMENT FOR MACHINE GRADING, MODIFIED. CONTRACTOR RESPONSIBLE FOR DETERMINING OWN CUT/FILL QUANTITIES.	

HMA APPLICATION ESTIMATE				
IDENT NO.	ITEM	RATE (#/SYD)	PERF. GRADE	REMARKS
L	HMA, LVSP	220	58-28	LEVELING COURSE
T	HMA, LVSP	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.



ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020

OHM-ADVISORS.COM

REVISIONS:

DATE
9/12/17

PROJ NUMBER
5025-17-0010

ENG
OHM

PROJ MGR
CDS

CADD
Vale

COUNTY
MIDLAND

CITY/VILLAGE/TOWNSHIP
SANDORD

SCALE
H: NTS
V: NTS

HORIZ DATUM

VERT DATUM

MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
TYPICAL SHEET

2
OF 14

COPYRIGHT 2015 OHM. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM.

DRAWING PATH: P:\5000_5499\5025170050_9-mile_over_south_carroll_creek\Drawings\Civil\Misc\170050LEG.dwg Sep 12, 2017 - 11:26am

WATER & SEWER UTILITY SYMBOLS

EXISTING	
	ST 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
	USED WITH UNDERGROUND GAS & ELECTRICAL LINES
	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

	HEAVY RIPRAP
	SILT FENCE



Know what's below.
Call before you dig.

ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020

OHM-ADVISORS.COM

REVISIONS:

DATE

PROJ NUMBER

ENG

OHM

5025-17-0050

CAD

COUNTY

CITY/VILLAGE/TOWNSHIP

SCALE

H

V

NTS

NTS

NTS

VERT DATUM

HORIZ DATUM

MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
LEGEND SHEET

COPYRIGHT 2015 OHM. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM.

DRAWING PATH: P:\5000_5493\5025170050_9-mile over south_carroll_creek\Drawings\Civil\Removal\170050REM.dwg Sep 12 2017 - 11:27am

9 MILE ROAD
S. CARROLL CREEK

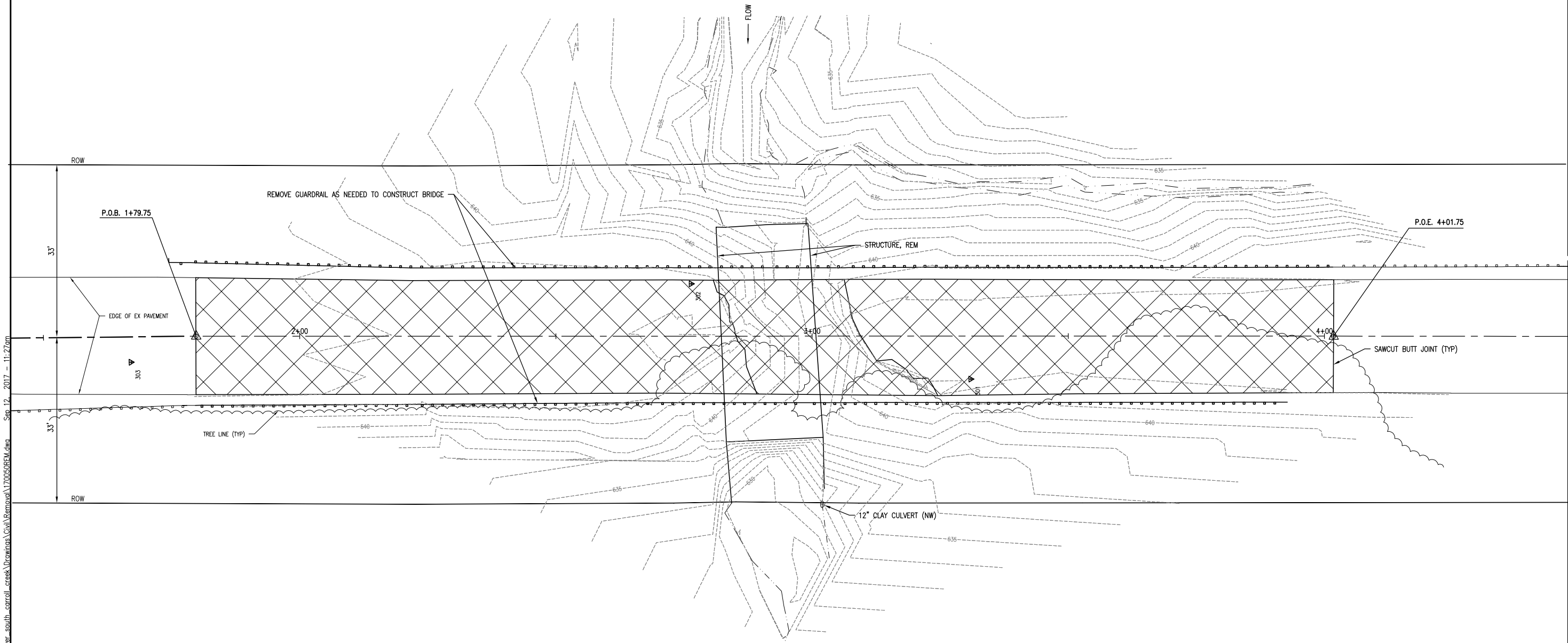


EXISTING STRUCTURE: 3 BARREL TIMBER BOX CULVERT



ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020
OHM-ADVISORS.COM



QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
441	Ft	Guardrail, Rem
1	LSUM	Structure, Rem
50	Cyd	Subgrade Undercutting, Type II
2	Sta	Machine Grading, Modified
2347	Cyd	Excavation, Fdn
550	Syd	HMA Surface, Rem



Know what's below.
Call before you dig.

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
9/12/17	5025-17-0050	OHM	CDS	Value	MIDLAND	SANFORD	H: 1"=10' V: 1"=10'	---	---

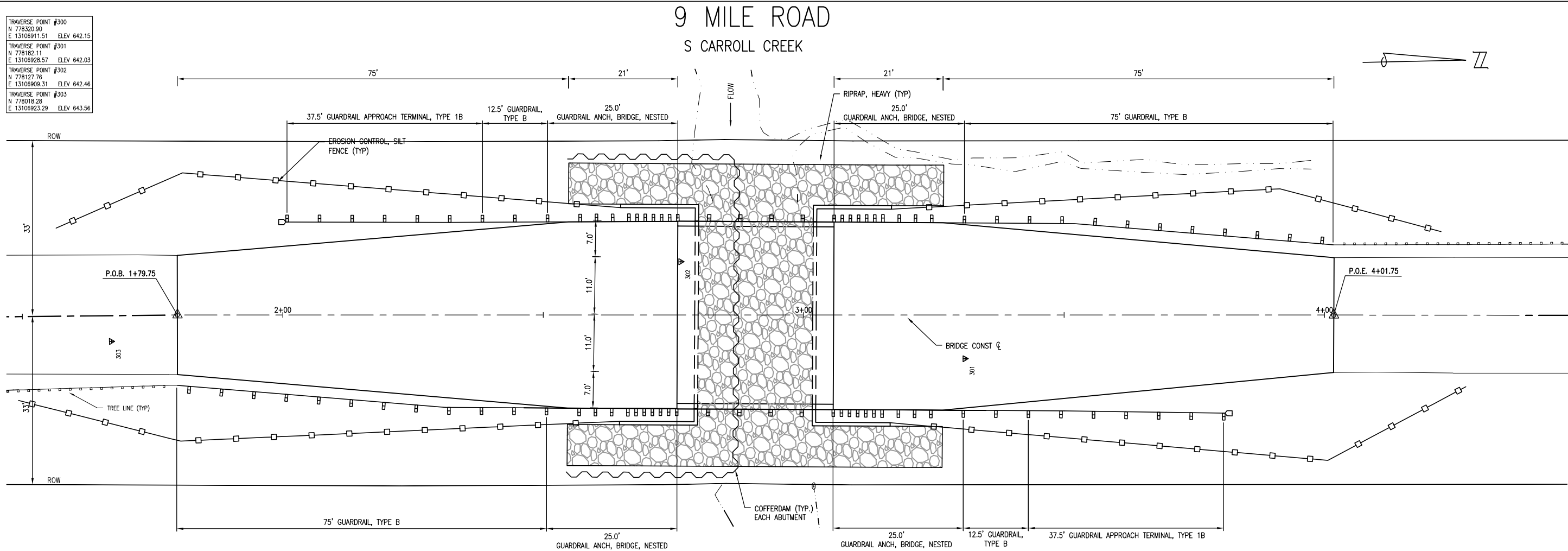
MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
REMOVAL SHEET - SOUTH CARROLL CREEK

REVISIONS:

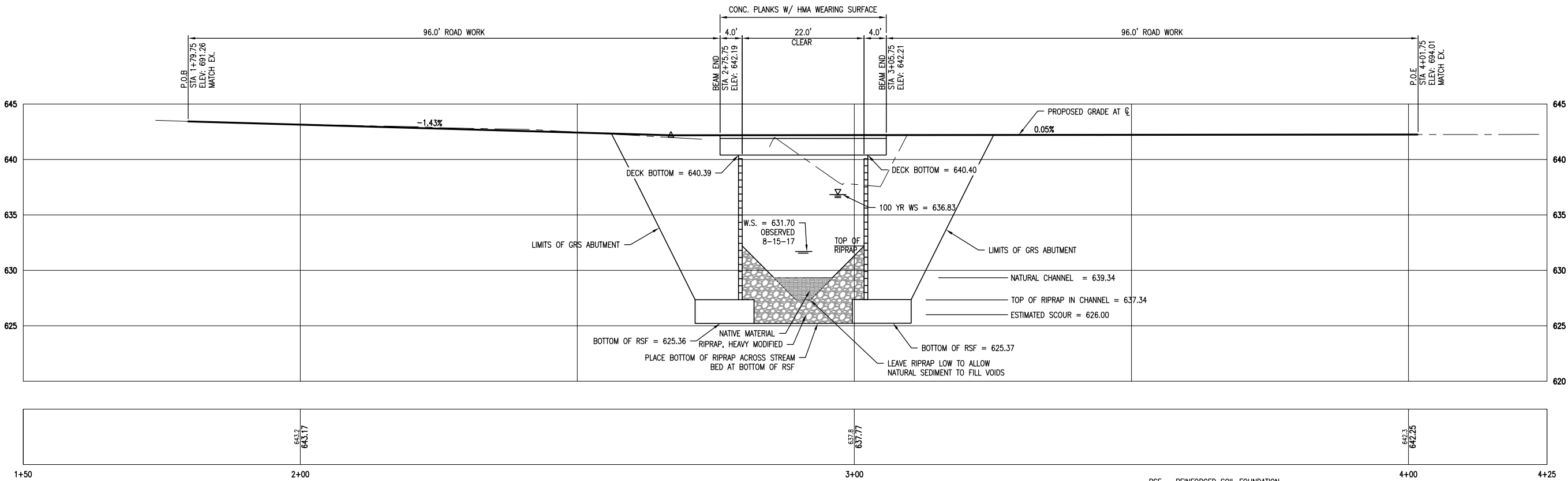
COPYRIGHT 2015 OHM. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM.

DRAWING PATH: P:\5000_5493\5025170050_9-mile over south_carroll_creek\Drawings\Civil\Plans_Const\17005000M.dwg Sep 12, 2017 - 11:27am

TRAVERSE POINT #300		
N	778350.90	ELEV 642.15
TRAVERSE POINT #301		
N	778182.11	ELEV 642.03
E	13106928.57	ELEV 642.03
TRAVERSE POINT #302		
N	778127.76	ELEV 642.46
E	13106909.31	ELEV 642.46
TRAVERSE POINT #303		
N	778018.28	ELEV 643.56
E	13106923.29	ELEV 643.56



SITUATION PLAN
1" = 20'



PROFILE ALONG CONSTRUCTION C/L - 9 MILE ROAD

RSF = REINFORCED SOIL FOUNDATION
GRS = GEOSYNTHETIC REINFORCED SOIL





ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020

OHM-ADVISORS.COM

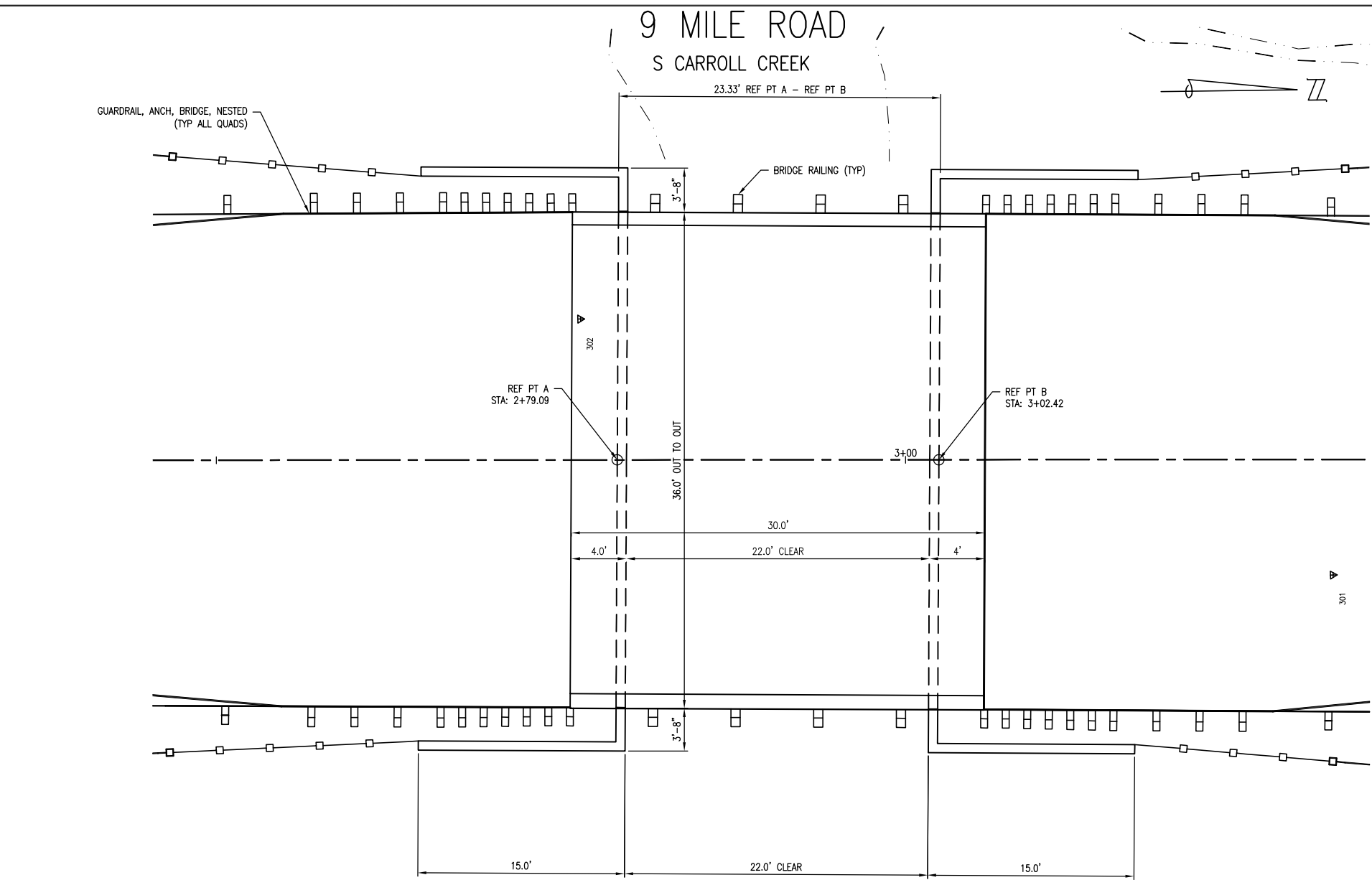
REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
9/7/17	5025-17-0050	OHM	CDS	Value	MIDLAND	SANFORD	H: 1"=20' V: 1"=10'	---	---

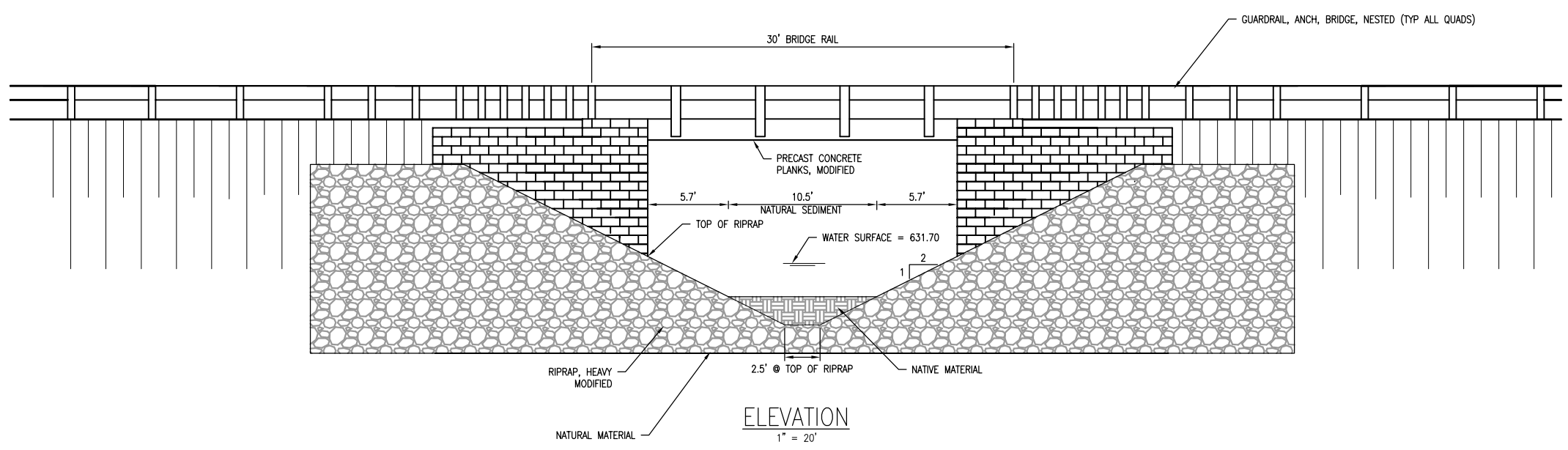
MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
GENERAL PLAN OF SITE - SOUTH CARROLL CREEK

COPYRIGHT 2015 OHM. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM.

DRAWING PATH: P:\5000_5493\5025170050_9-mile over south_carroll_creek Drawings\Civil\Plans_Const\17005000M.dwg Sep 12, 2017 - 11:27am

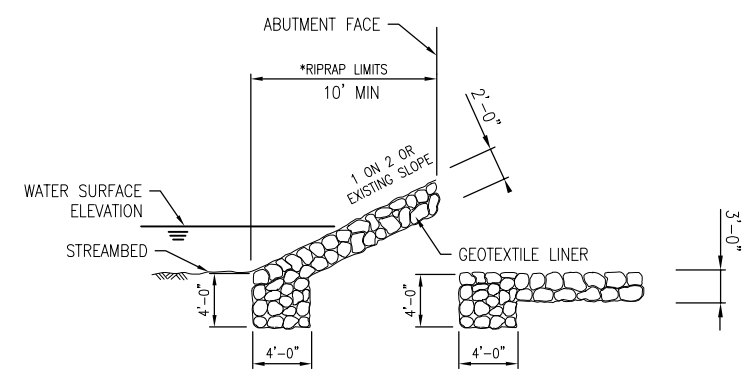


PLAN
1" = 10'



ELEVATION
1" = 20'

SUMMARY OF HYDRAULIC ANALYSIS							
EXISTING				PROPOSED			
FLOOD DATA	DISCHARGE (CFS)	WATER SURFACE ELEV. AT U/S FACE OF STRUCTURE	VELOCITY IN D/S CHANNEL IN (FPS)	WATER SURFACE ELEVATION AT U/S FACE OF STRUCTURE	VELOCITY IN D/S CHANNEL IN (FPS)	WATERWAY AREA (SFT) AT D/S FACE	CHANGE IN WS EL U/S OF PROPOSED STRUCTURE
50-YEAR	360	635.39	3.48	635.36	3.39	115.94	-0.03
100-YEAR	480	636.90	3.72	636.83	3.46	148.27	-0.07
MAXIMUM BRIDGE AREA BELOW LOW CHORD IS 226.73 SQUARE FT							
SOUTH CARROLL CREEK AT 9 MILE ROAD, SECTION 4, T14N, R1W, LEE TOWNSHIP, MIDLAND COUNTY, HAS A DRAINAGE AREA OF 13.1 SQUARE MILES. THE 50%, 2%, AND 1% CHANCE PEAK FLOWS ARE ESTIMATED TO BE 60 CUBIC FEET PER SECOND (CFS), 360 CFS, AND 480 CFS, RESPECTIVELY. (WATERSHED BASIN NO. 32D TITTABAWASSEE).							



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.

QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
1	LSUM	Mobilization, 9 Mile South
400	Ft	Erosion Control, Silt Fence
50	Ft	Erosion Control, Turbidity Curtain, Shallow
183	Cyd	Subbase, CIP
711	Syd	Aggregate Base, 8 inch
171	Ton	HMA, LVSP
1	LSUM	Cofferdams
1	LSUM	Precast Concrete Planks, Modified
60	Ft	Bridge Railing
175	Ft	Guardrail, Type B
2	Ea	Guardrail Approach Terminal, Type 1B
4	Ea	Guardrail Anch, Bridge, Nested
444	Ft	Pavt Mrkg, Waterborne, 6 inch, White
278	Ft	Pavt Mrkg, Waterborne, 6 inch, Yellow
230	Syd	Riprap, Heavy, Modified
889	Syd	Slope Restoration, Modified



Know what's below.
Call before you dig.

ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020

OHM-ADVISORS.COM

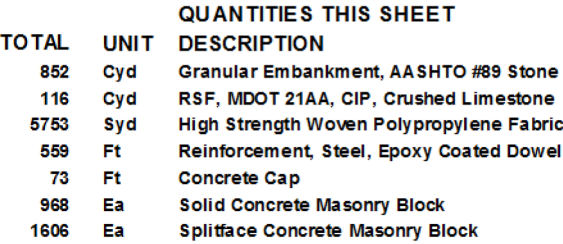
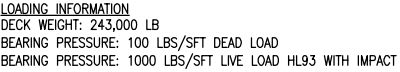
REVISIONS:

NO.	DATE	DESCRIPTION
1	9/12/17	ISSUED FOR PERMIT

MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
GENERAL PLAN OF STRUCTURE - SOUTH CARROLL CREEK

COPYRIGHT 2015 OHM. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM.

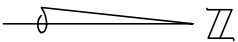
SHEET
6
OF 14



WINGWALL

DRAWING PATH: P:\5000_5499\5025170040_9-Mile over North Carroll Creek Drawings\Civil Removal\70040REM.dwg Sep 12, 2017 - 11:27am

9 MILE ROAD
N CARROLL CREEK



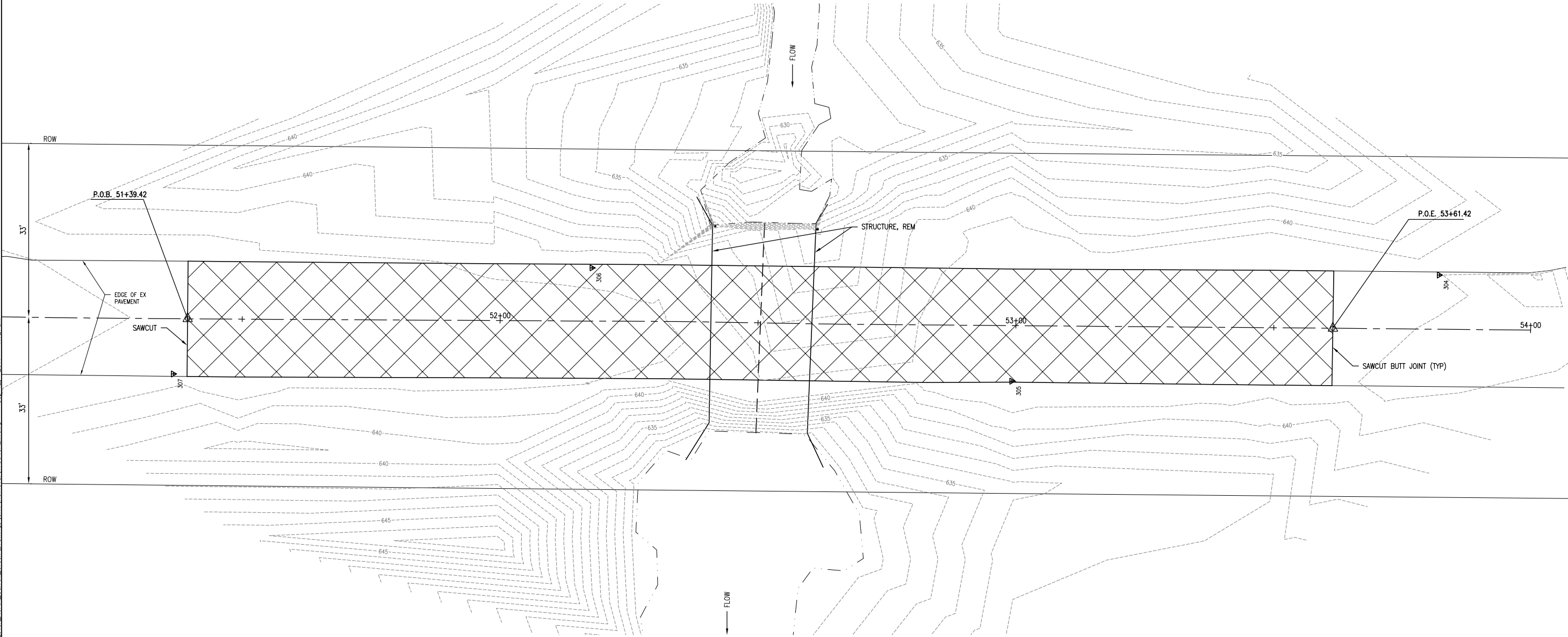
EXISTING STRUCTURE: 3 BARREL TIMBER BOX CULVERT



ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020

OHM-ADVISORS.COM



QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
1	LSUM	Structure, Rem
50	Cyd	Subgrade Undercutting, Type II
2	Sta	Machine Grading, Modified
2307	Cyd	Excavation, Fdn
548	Syd	HMA Surface, Rem



Know what's below.
Call before you dig.

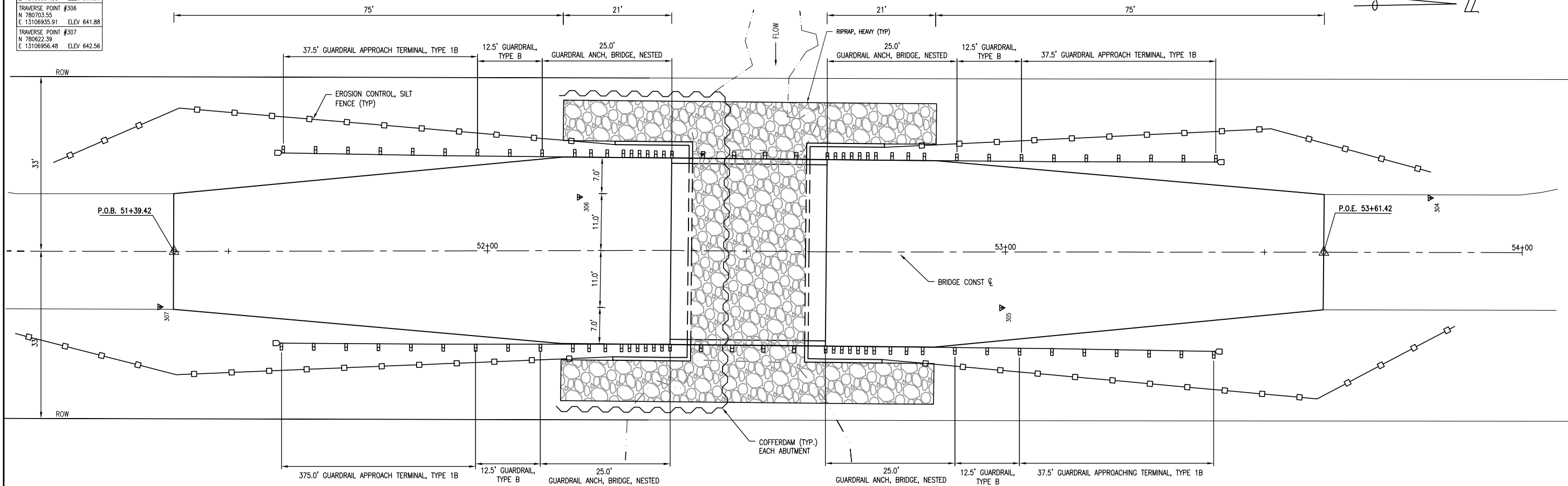
DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
9/12/17	5025-17-0050	OHM	CDS	Value	MIDLAND	SANFORD	H: 1"=10' V: 1"=10'	---	---

MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
REMOVAL SHEET - NORTH CARROLL CREEK

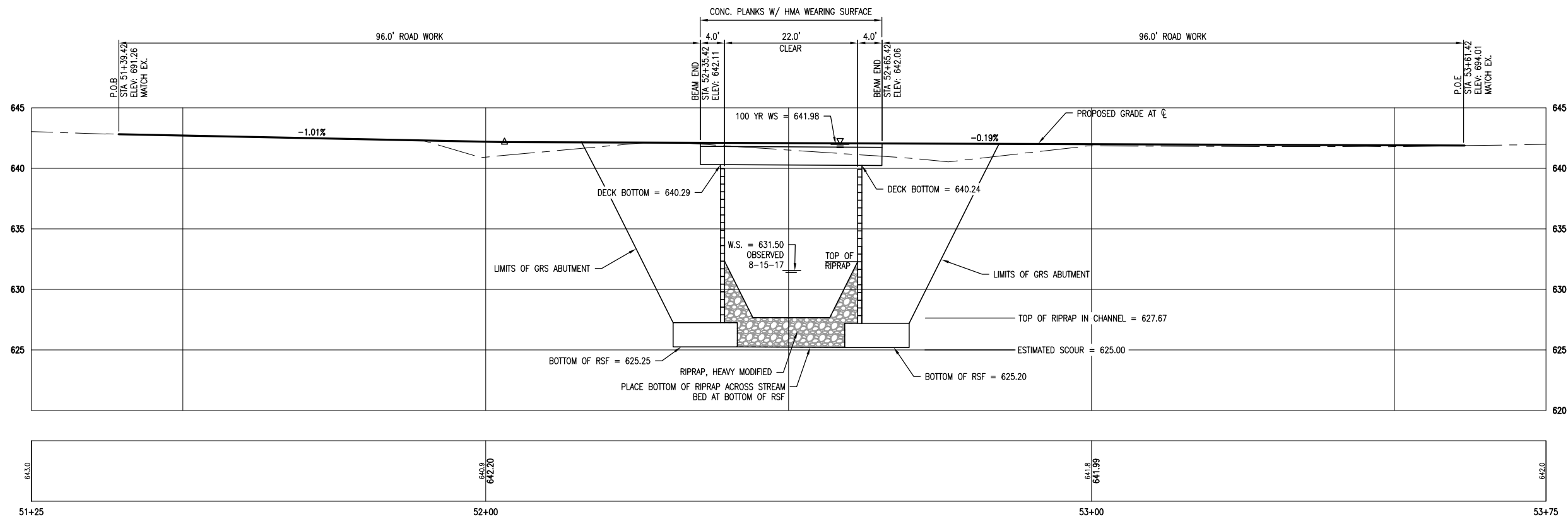
COPYRIGHT 2015 OHM. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM.

TRAVERSE POINT #304	
N 780867.78	
E 13106937.30	ELEV 641.92
TRAVERSE POINT #305	
N 780784.90	
E 13106957.88	ELEV 641.61
TRAVERSE POINT #306	
N 780703.55	
E 13106935.91	ELEV 641.88
TRAVERSE POINT #307	
N 780622.39	
E 13106956.48	ELEV 642.56

9 MILE ROAD
N CARROLL CREEK



SITUATION PLAN

$$1'' = 20'$$


PROFILE ALONG CONSTRUCTION C- 9 MILE ROAD

VERT SCALE: 1" = 10'
HORIZ SCALE: 1" = 20'

RSF = REINFORCED SOIL FOUNDATION
GRS = GEOSYNTHETIC REINFORCED SOIL



DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN

DATE	TIME	LOCATION	STATUS	REMARKS	START DATE	END DATE
9/12/17	5025-17-0050	OHH	CDS	Value	MIDLAND	SANFORD
				H:	$\Gamma^{\circ}=20^{\circ}$	V: $\Gamma^{\circ}=10^{\circ}$

MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
GENERAL PLAN OF SITE - NORTH CARROLL CREEK

OF RIGHT 2013 OHM ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM

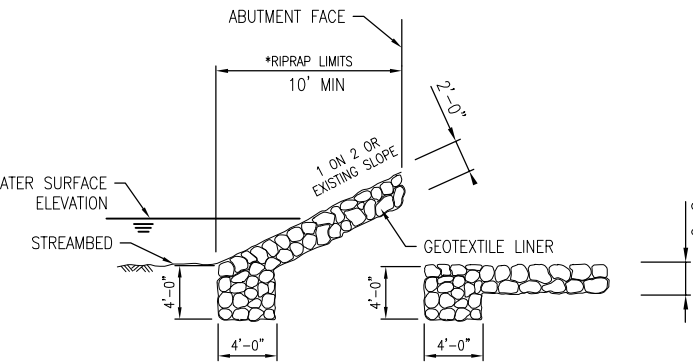
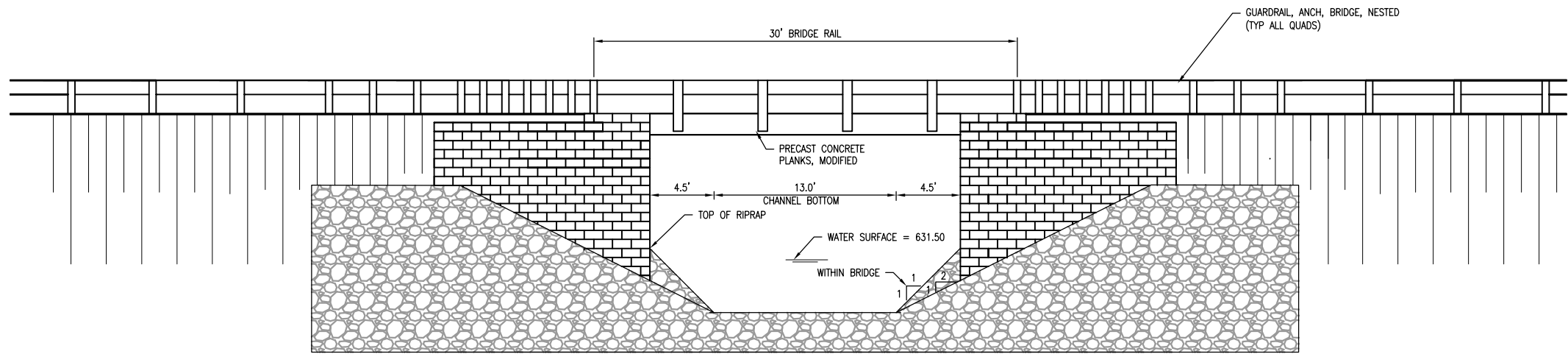
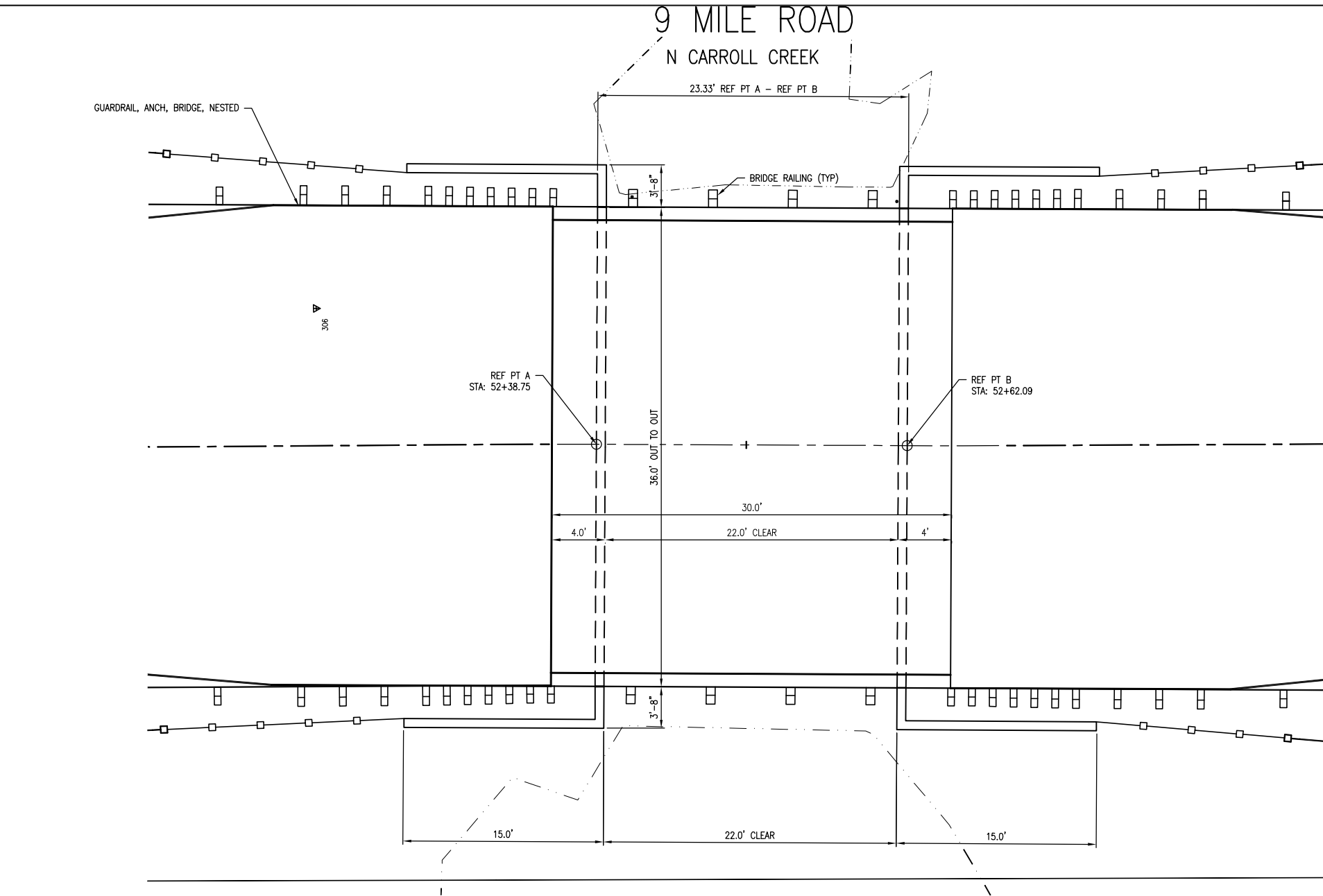


Know what's below.
Call before you dig.

9
OF 14

DRAWING PATH: P:\5000_5499\5025170040_9-Mile over North Carroll Creek Drawings\Civil\Plans Const\170040CON.dwg Sep 12, 2017 - 11:28am

DRAWING PATH: P:\5000-5493\5025170040-9-Mile over North Carroll Creek\Drawings\Civil\Plans_Const\17004000M.dwg Sep 12, 2017 - 11:28am



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.

QUANTITIES THIS SHEET		
TOTAL	UNIT	DESCRIPTION
1	LSUM	Mobilization, 9 Mile North
400	Ft	Erosion Control, Silt Fence
50	Ft	Erosion Control, Turbidity Curtain, Shallow
183	Cyd	Subbase, CIP
711	Syd	Aggregate Base, 8 inch
86	Ton	HMA, LVSP
1	LSUM	Cofferdams
1	LSUM	Precast Concrete Planks, Modified
60	Ft	Bridge Railing
50	Ft	Guardrail, Type B
4	Ea	Guardrail Approach Terminal, Type 1B
4	Ea	Guardrail Anch, Bridge, Nested
444	Ft	Pavt Mrkg, Waterborne, 6 inch, White
278	Ft	Pavt Mrkg, Waterborne, 6 inch, Yellow
230	Syd	Riprap, Heavy, Modified
889	Syd	Slope Restoration, Modified



Know what's below.
Call before you dig.

SUMMARY OF HYDRAULIC ANALYSIS							
EXISTING				PROPOSED			
FLOOD DATA	DISCHARGE (CFS)	WATER SURFACE ELEV. AT U/S FACE OF STRUCTURE	VELOCITY IN D/S CHANNEL IN (FPS)	WATER SURFACE ELEVATION AT U/S FACE OF STRUCTURE	VELOCITY IN D/S CHANNEL IN (FPS)	WATERWAY AREA (SFT) AT D/S FACE	CHANGE IN WS EL. U/S OF PROPOSED STRUCTURE
50-YEAR	480	638.98	2.59	638.83	2.45	225.32	-0.15
100-YEAR	650	642.07	3.45	641.98	2.87	256.54	-0.09
MAXIMUM BRIDGE AREA BELOW LOW CHORD IS 256.54 SQUARE FT							
NORTH CARROLL CREEK AT 9 MILE ROAD, SECTION 33, T15N, R1W, JEROME TOWNSHIP, MIDLAND COUNTY, HAS A DRAINAGE AREA OF 16.9 SQUARE MILES. THE 50%, 2%, AND 1% CHANCE PEAK FLOWS ARE ESTIMATED TO BE 90 CUBIC FEET PER SECOND (CFS), 480 CFS, AND 650 CFS, RESPECTIVELY. (WATERSHED BASIN NO. 320 TITTABAWASSEE).							

ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020

OHM-ADVISORS.COM

REVISIONS:

NO.	DATE	DESCRIPTION
1	9/12/17	ISSUED FOR PERMIT

DATE: 9/12/17
PROJ NUMBER: 5025-17-0050
CITY/VILLAGE/TOWNSHIP: SANFORD
COUNTY: MIDLAND
CADD: Value
PROJ MGR: CDS
ENG: OHM

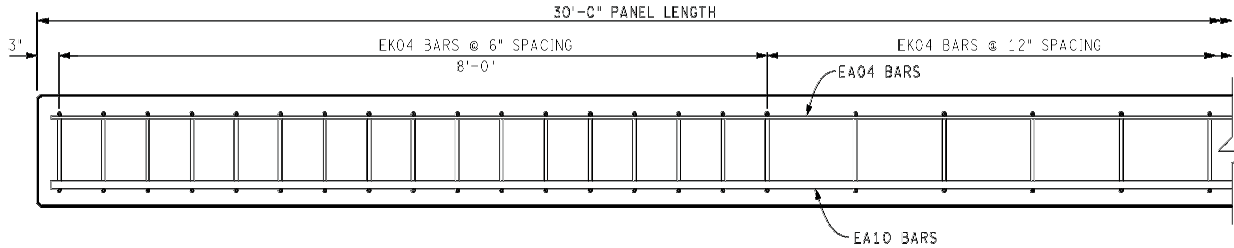
MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
GENERAL PLAN OF STRUCTURE - NORTH CARROLL CREEK

COPYRIGHT 2015 OHM. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM.

10
OF 14

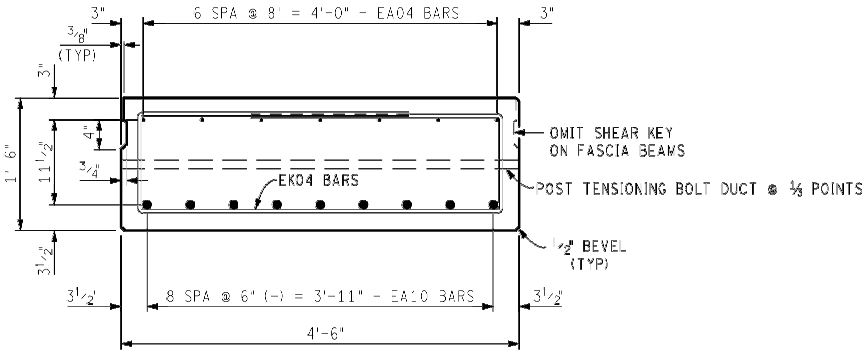


DRAWING PATH: P:\5000_5499\5025170050_9-mile_over_south_carroll_creek\Drawings\Civil\Details\1700500E1.dwg Sep 12, 2017 - 11:28am

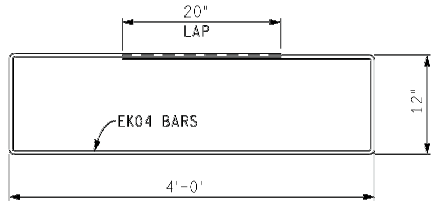


DECK PANEL ELEVATION

{ADJUST EK04 SPACING TO ACCOMMODATE POST-TENSIONING DUCTS}
{EK04 BARS SYMMETRICAL ABOUT DECK PANEL}



DECK PANEL SECTION



K BAR DETAIL

NOTES:

THE INITIAL FORCE IN THE TRANSVERSE POST-TENSIONING TENDONS SHALL BE 120,000 LBS. EACH. LOCATE POST TENSIONING DUCTS AT 1/3 POINTS ON BEAMS

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) 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 LEVELED 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 FRICTIONAL 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.
- 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.

	NO SCALE			DATE: 02/10/17	
		JN: 5025-17-0010	SHAFFER ROAD BRIDGE RECONSTRUCTION	DRAWING	SHEET
			MIDLAND COUNTY ROAD COMMISSION		
			DECK PANEL REINFORCEMENT DETAILS		1

ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020

OHM-ADVISORS.COM

REVISIONS:

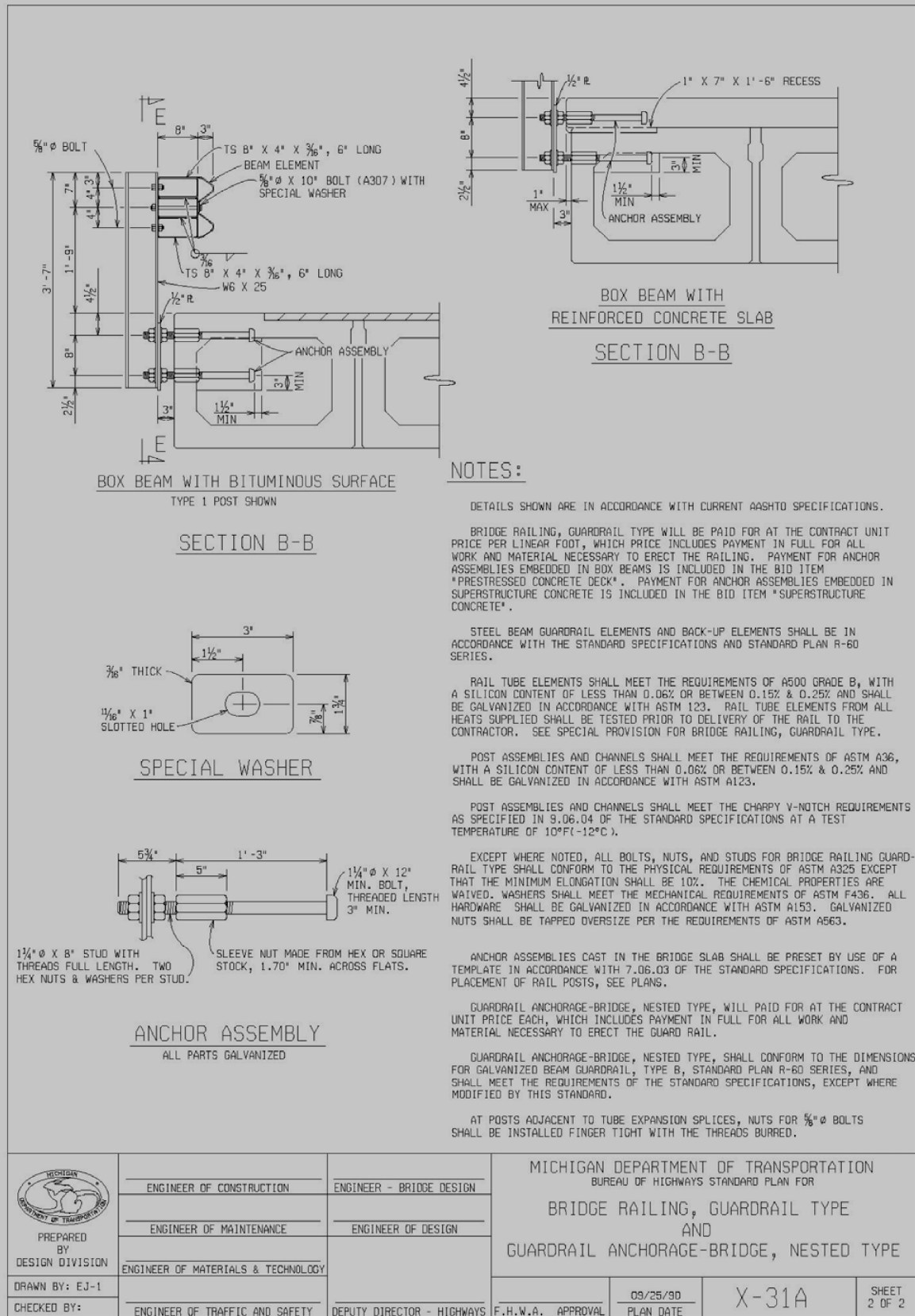
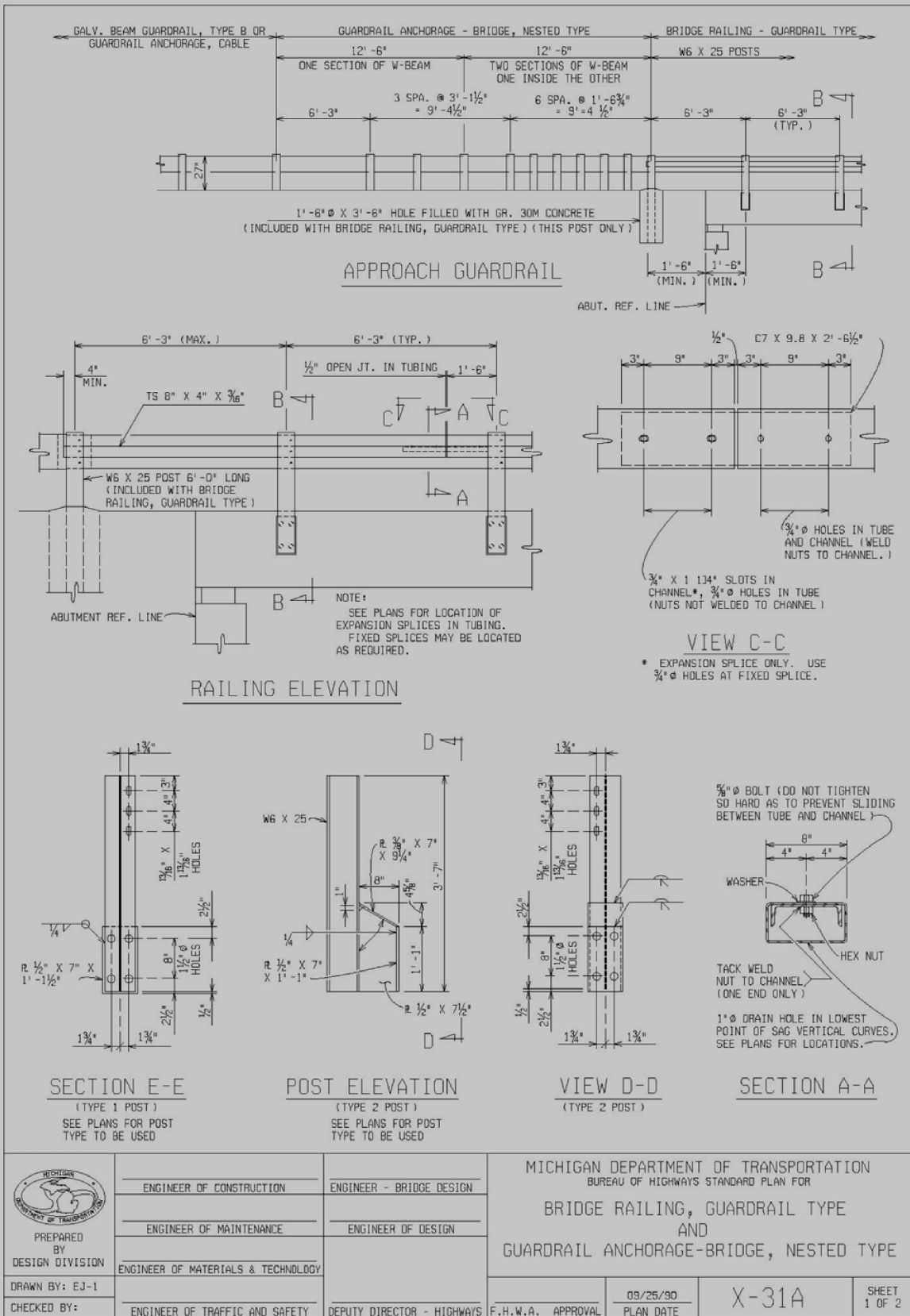
DATE	PROJ NUMBER	ENG	PROJ MGR	CAD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
9/12/17	5025-17-0050	OHM	CDS	Value	MIDLAND	SANFORD	H: 1"=40' V:	----	----

MIDLAND COUNTY ROAD COMMISSION
9-MILE OVER SOUTH AND NORTH CARROLL CREEK
DECK PANEL REINFORCEMENT DETAILS

SHEET

12
OF 14

Copyright 2015 OHM. All drawings and written materials appearing herein constitute the original and unpublished work of OHM and the same may not be duplicated, distributed, or disclosed without prior written consent of OHM.



DRAWING PATH: P:\3000_5493\5025170050_9-mile over south_carroll_creek\Drawings\Civil\Stage1\7004001R.dwg Sep 12, 2017 - 11:28am

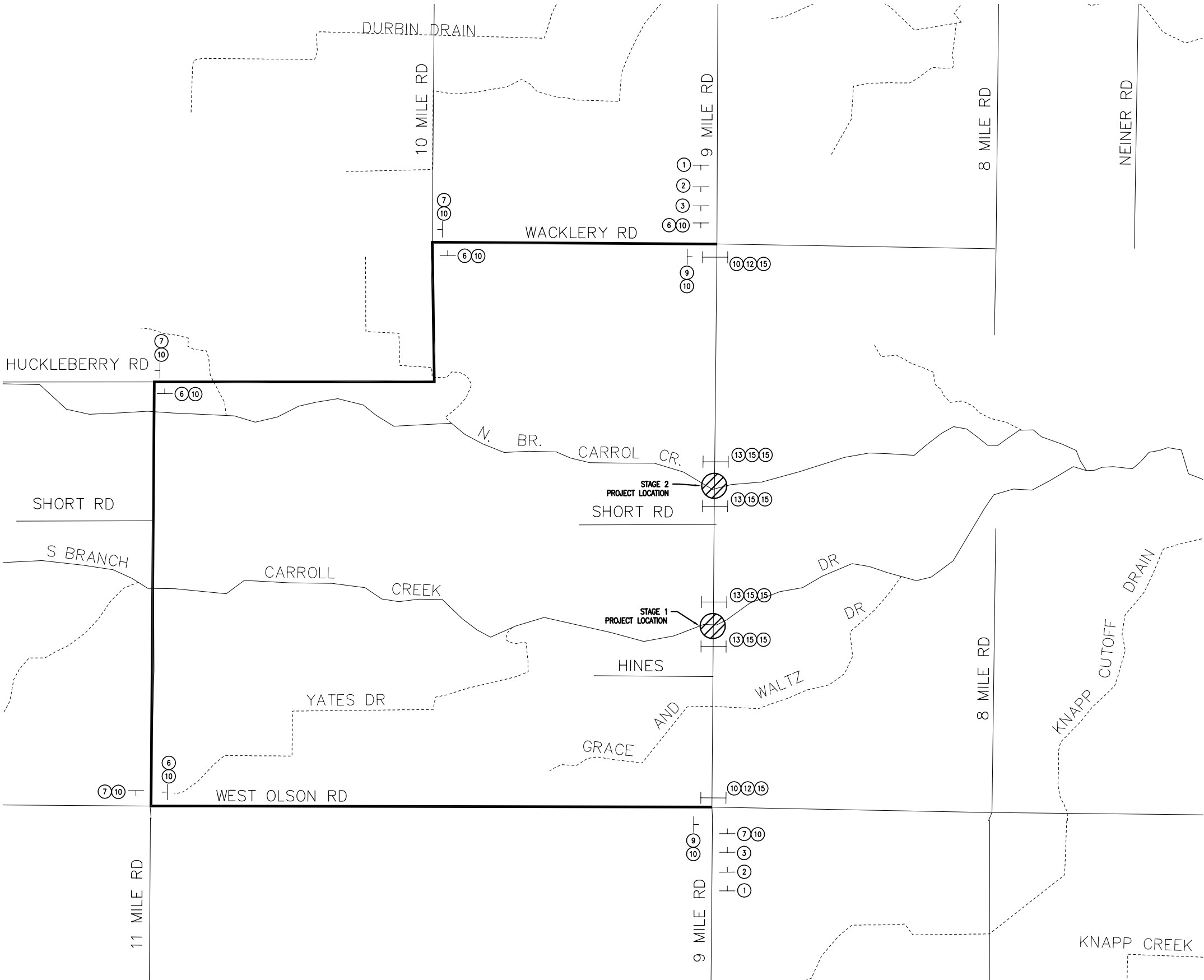
SIGN LEGEND					
NO	SIGN	SIGN DESIGNATION	SIZE	NUMBER REQUIRED (FOR INFORMATION ONLY)	AREA (SQ. FT)
1		W20-1	48"x48"	2	32
2		W20-2	48"x48"	2	32
3		W20-3	48"x48"	2	32
4		R5-18cLA	60"x42"	0	0
5		R5-18bLA	60"x42"	0	0
6		M4-9(R)	30"x24"	4	20
7		M4-9(L)	30"x24"	4	20
8		M4-9(S)	30"x36"	0	0
9		M4-8a	24"x18"	2	6
10		D3-1A	30"x12"	12	30
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	8'	6	

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.

STAGING:

- SOUTHERN BRIDGE SHALL BE COMPLETED FIRST WHILE TRAFFIC IS ALLOWED OVER NORTHERN BRIDGE
- NORTH BRIDGE CAN BE CLOSED WHEN SOUTH BRIDGE IS OPEN TO TRAFFIC



LEGEND

- TEMP SIGN
- TYPE III BARRICADES

DETOUR/ADVANCED SIGNING PLAN
NTS

ARCHITECTS ENGINEERS PLANNERS

415 E Main St
Midland, MI 48640
P (989) 956-2020

OHM-ADVISORS.COM

REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
9/12/2017	5493	DAIR	SOUTH AND NORTH CARROLL CREEK	CDS	MIDLAND	SANFORD	H: NTS V: NTS	---	---

MIDLAND COUNTY ROAD COMMISSION

9-MILE OVER SOUTH AND NORTH CARROLL CREEK

MAINTAINING TRAFFIC - SOUTH CARROLL CREEK

14

OF 14

COPYRIGHT 2015 OHM. ALL DRAWINGS AND WRITTEN MATERIALS APPEARING HEREIN CONSTITUTE THE ORIGINAL AND UNPUBLISHED WORK OF OHM AND THE SAME MAY NOT BE DUPLICATED, DISTRIBUTED, OR DISCLOSED WITHOUT PRIOR WRITTEN CONSENT OF OHM.