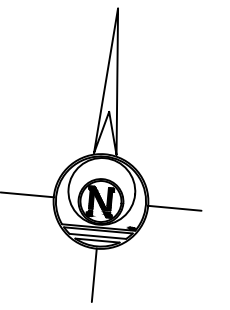
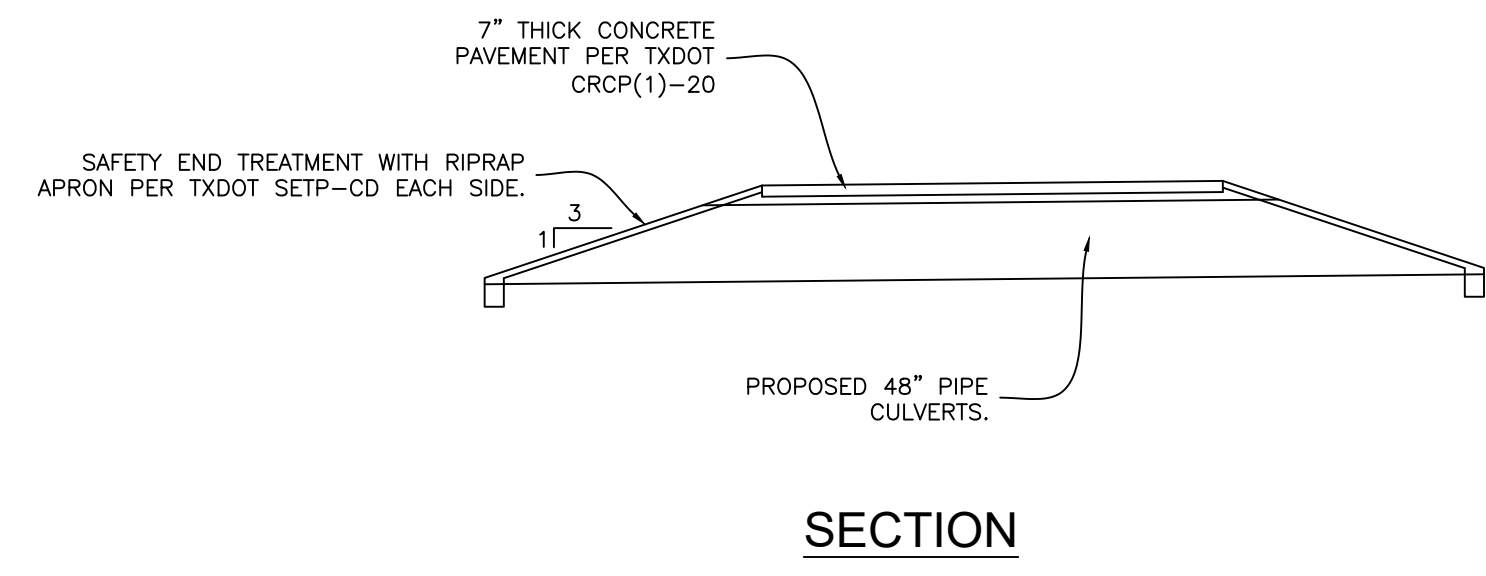


GENERAL NOTES:

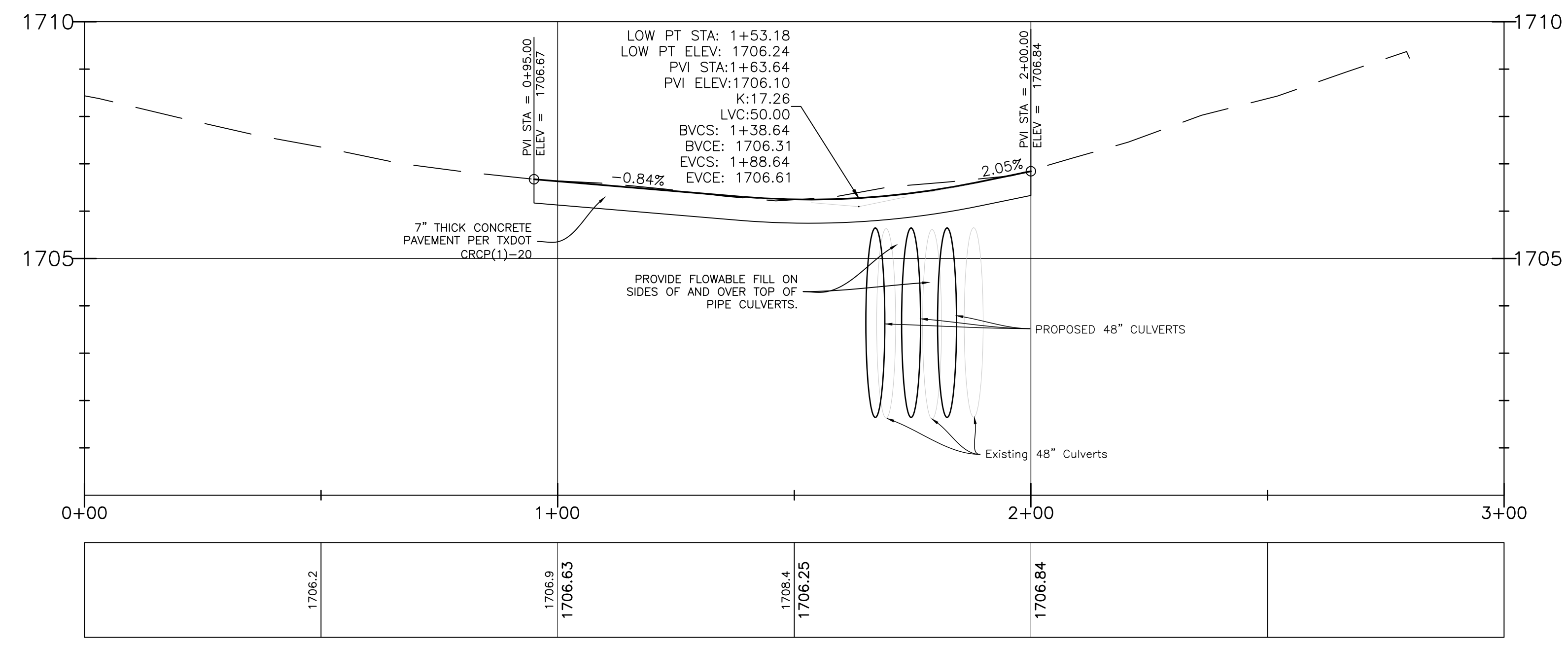
- All work shall be performed in accordance with the 2014 TXDOT Standards Unless otherwise modified herein.
- Coordinate with County and adjacent property owners before making any changes to the fence lines.
- Contractor to implement and maintain traffic control measures throughout construction process per the Texas Manual of Uniform Traffic Control Devices.
- Post electronic informational signs at least three days in advance of road closures.



Scale: 1"=20'H
1"=2'V



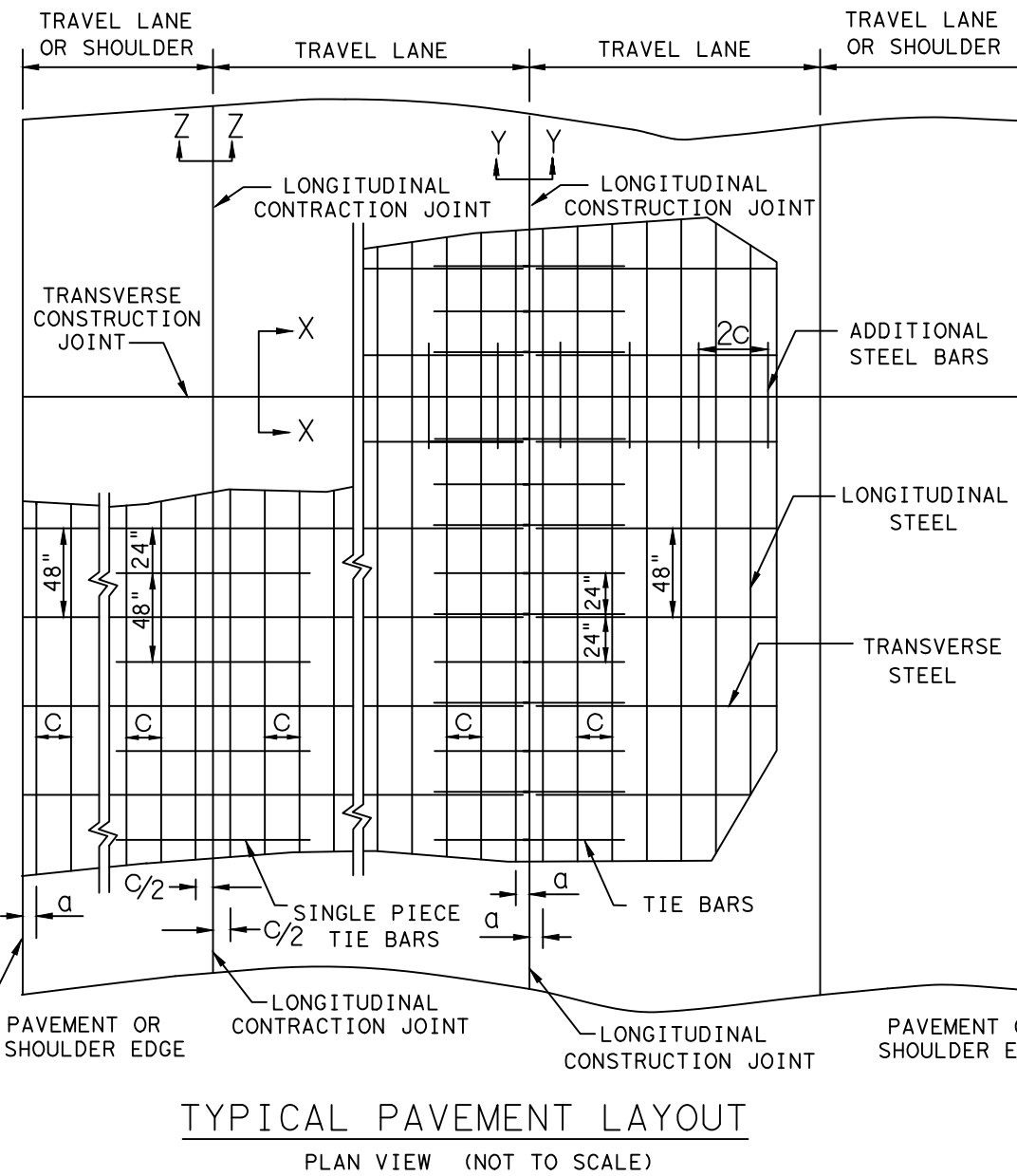
McMillan Road PROFILE



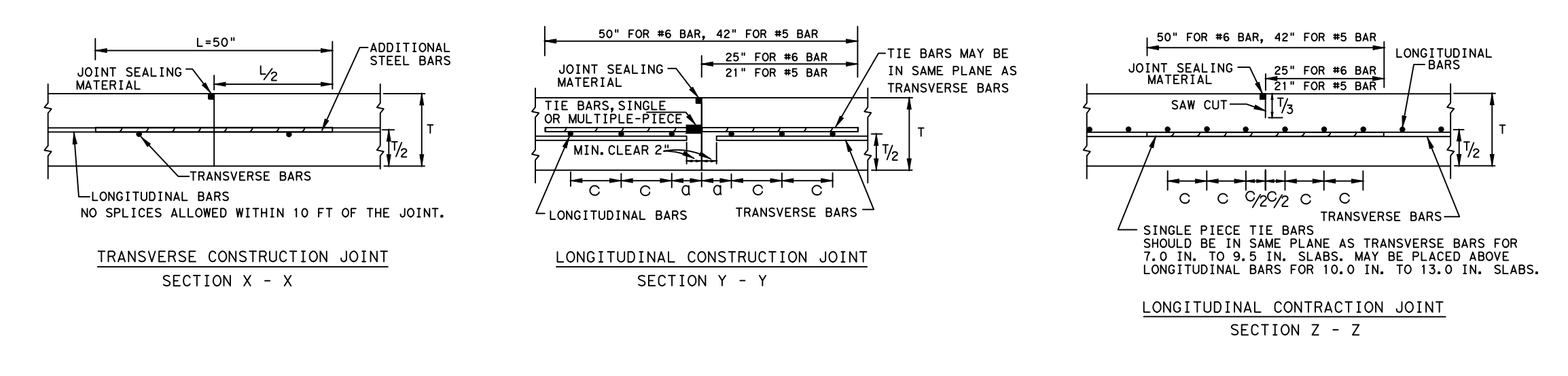
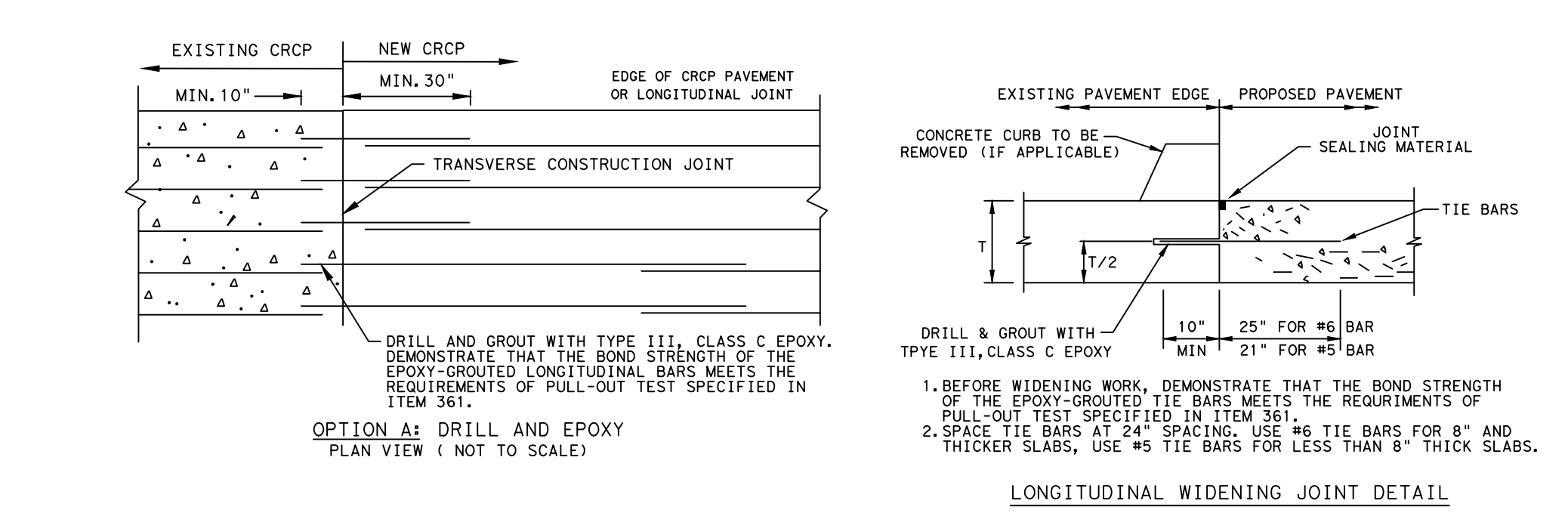
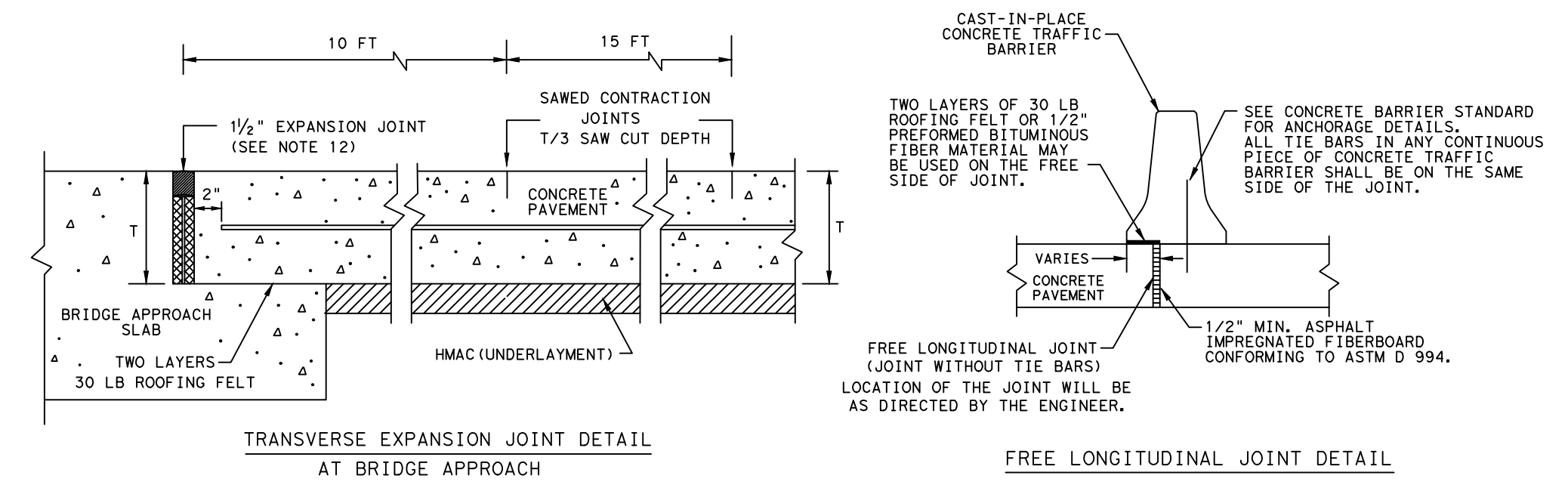
N:\Engineering\2020\20E1442 TGC_McMillan Rd_Topo_Culvert Design\20E1442.dwg

SLAB THICKNESS AND BAR SIZE	REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING 2' X C (IN.)
7.0	#5	6.5	3 TO 4
7.5	#5	6.0	3 TO 4
8.0	#6	9.0	3 TO 4
8.5	#6	8.5	3 TO 4
9.0	#6	8.0	3 TO 4
9.5	#6	7.5	3 TO 4
10.0	#6	7.0	3 TO 4
10.5	#6	6.75	3 TO 4
11.0	#6	6.5	3 TO 4
11.5	#6	6.25	3 TO 4
12.0	#6	6.0	3 TO 4
12.5	#6	5.75	3 TO 4
13.0	#6	5.5	3 TO 4

SLAB THICKNESS (IN.)	TRANSVERSE STEEL	TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Z-Z)	TIE BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)
	BAR SIZE	SPACING (IN.)	BAR SIZE
7.0 - 7.5	#5	48	#5
8.0 - 13.0	#5	48	#6



- GENERAL NOTES
- DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
 - USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (COTE) OF NOT MORE THAN 5.5×10^{-6} IN/IN °F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
 - ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 80) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO. 1 AND TABLE NO. 2.
 - STEEL BAR PLACEMENT TOLERANCE SHALL BE $\pm 1/4$ IN. HORIZONTALLY AND ± 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO. 1.
 - PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
 - THE SAW CUT DEPTH FOR THE LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLAB THICKNESS (T/3).
 - WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
 - REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
 - OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
 - LONGITUDINAL REINFORCING STEEL SPLICES SHALL BE A MINIMUM OF 25 IN. STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT.
 - THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



SHEET 1 OF 2

Texas Department of Transportation

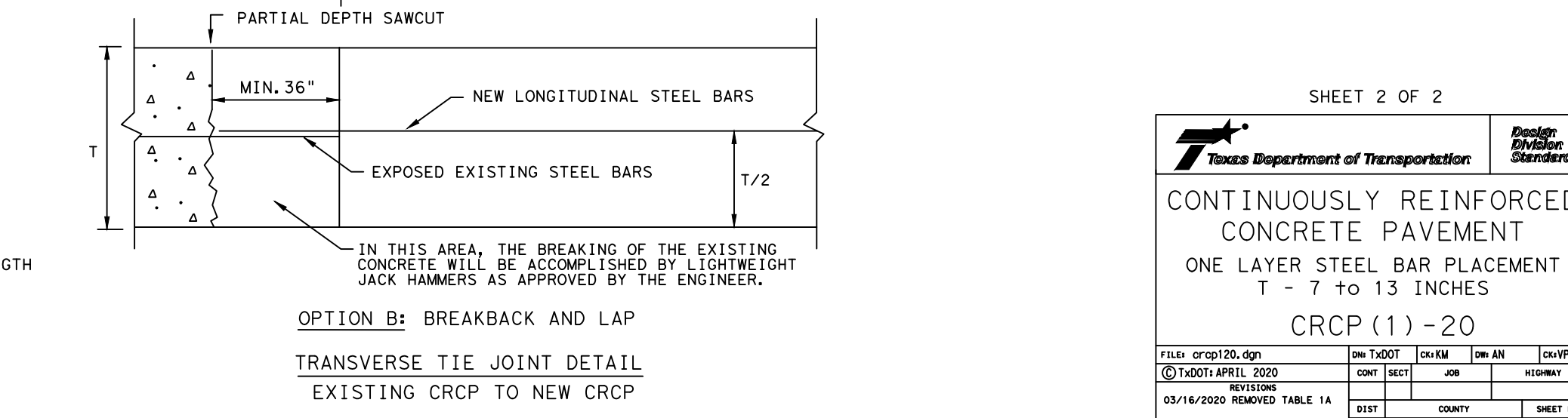
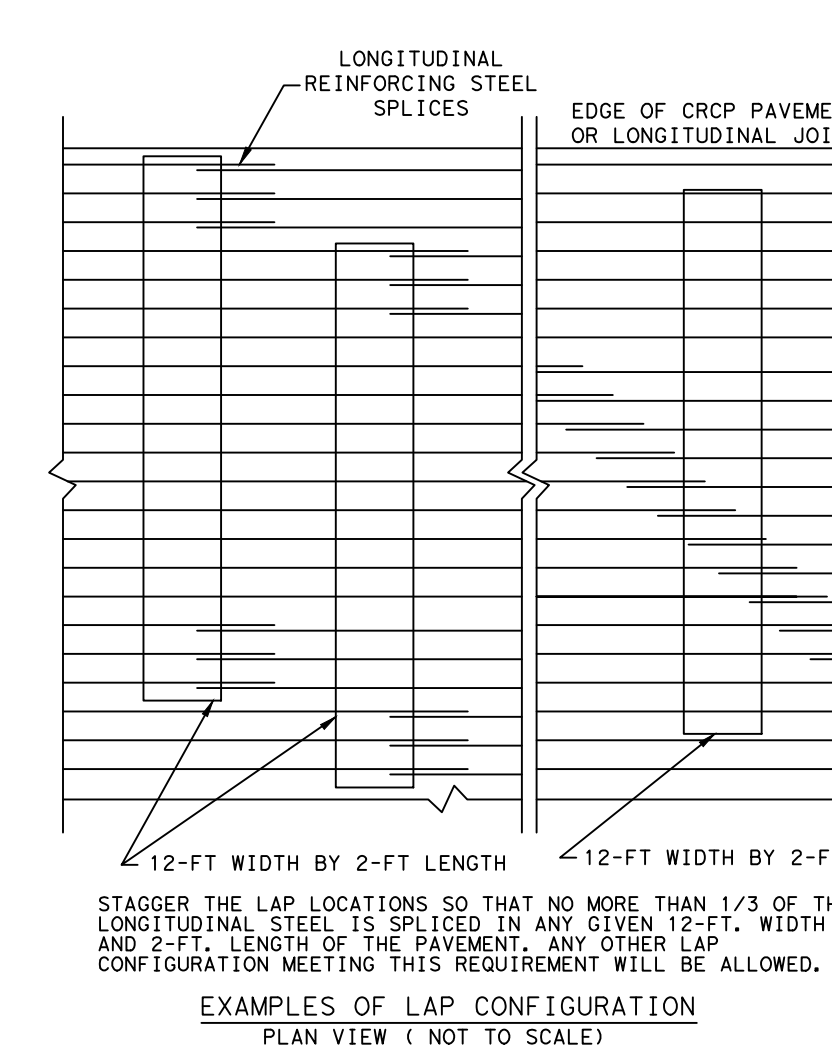
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT

T - 7 TO 13 INCHES

CRCP (1) - 20

FILE: 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020



SHEET 2 OF 2

Texas Department of Transportation

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

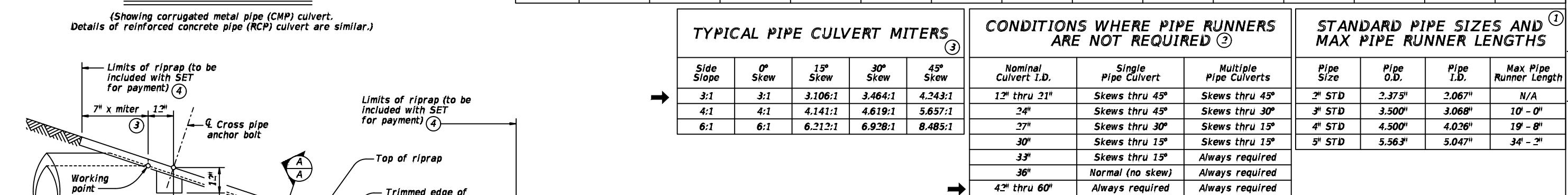
ONE LAYER STEEL BAR PLACEMENT

T - 7 TO 13 INCHES

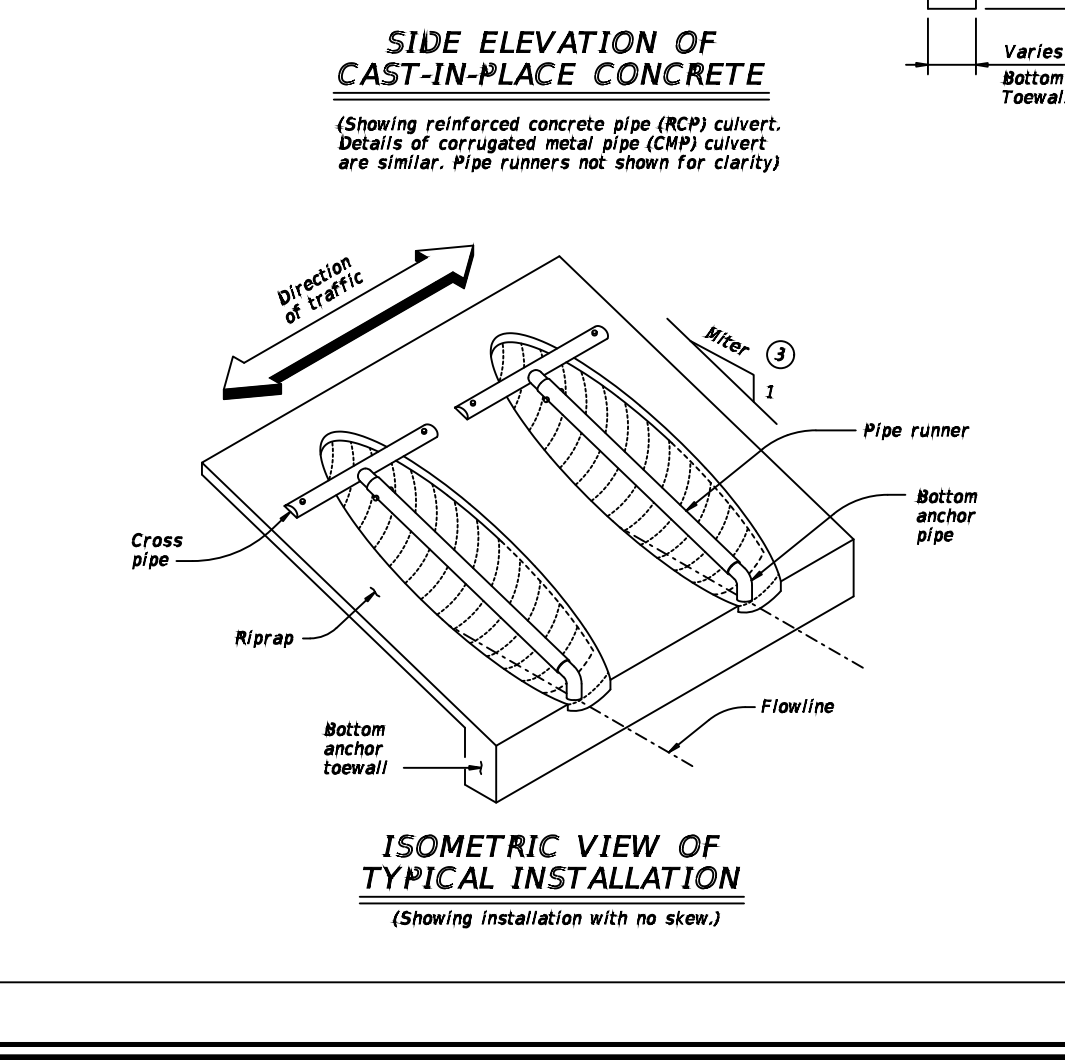
CRCP (1) - 20

FILE: 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020 03/16/2020

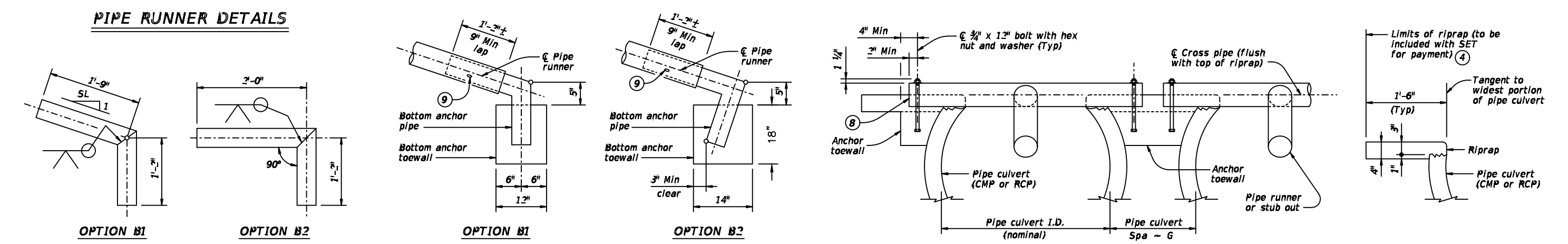
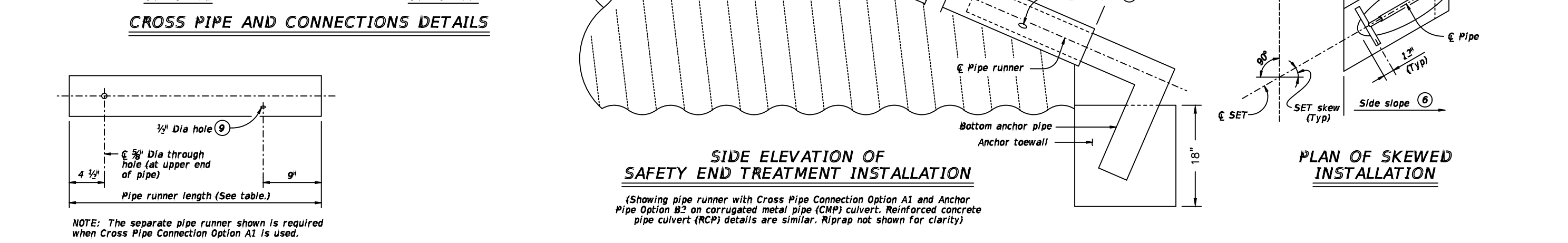
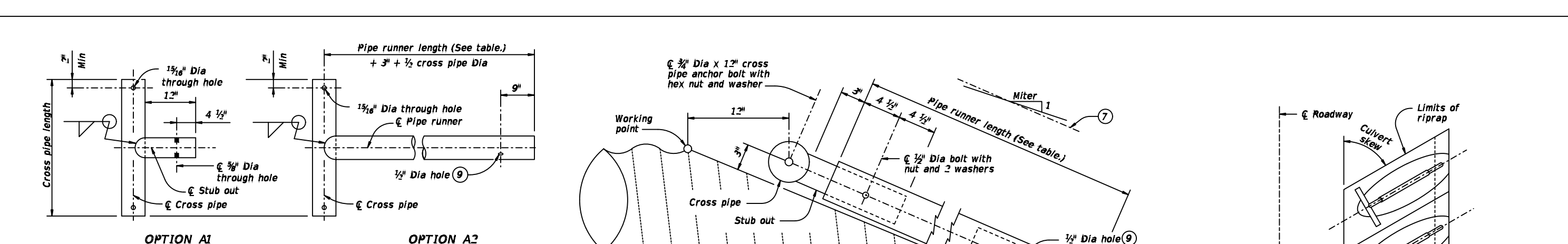
Nominal Culvert I.D.	Pipe Culvert Spa - G	Cross Pipe Length	3:1 Side Slope						4:1 Side Slope						6:1 Side Slope							
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew								
36"	1'-2"	3'-5"	N/A	N/A	N/A	5'-10"	N/A	N/A	N/A	8'-1"	N/A	N/A	N/A	12'-9"	N/A	N/A	N/A	12'-9"	N/A	N/A	N/A	12'-9"
37"	1'-8"	3'-8"	N/A	N/A	N/A	5'-9"	6'-11"	N/A	N/A	7'-7"	9'-2"	N/A	N/A	11'-11"	N/A	N/A	N/A	11'-11"	N/A	N/A	N/A	11'-11"
38"	1'-10"	3'-11"	N/A	N/A	N/A	6'-4"	8'-0"	N/A	N/A	8'-9"	11'-0"	N/A	N/A	13'-6"	N/A	N/A	N/A	13'-6"	N/A	N/A	N/A	13'-6"
39"	1'-11"	4'-2"	6'-2"	6'-9"	7'-3"	9'-1"	8'-10"	10'-0"	12'-5"	13'-3"	15'-9"	19'-2"	N/A	N/A	N/A	N/A	N/A	19'-2"	N/A	N/A	N/A	19'-2"
40"	2'-1"	4'-5"	6'-5"	7'-2"	8'-2"	10'-2"	9'-11"	11'-2"	12'-10"	14'-9"	17'-3"	21'-2"	21'-2"	N/A	N/A	N/A	21'-2"	N/A	N/A	N/A	21'-2"	
42"	2'-4"	4'-11"	6'-6"	8'-10"	9'-11"	12'-4"	11'-7"	12'-0"	13'-6"	16'-6"	17'-9"	18'-5"	30'-8"	29'-7"	N/A	N/A	30'-8"	N/A	N/A	N/A	29'-7"	
48"	2'-7"	5'-5"	10'-1"	10'-5"	11'-9"	11'-9"	N/A	14'-2"	15'-10"	14'-9"	20'-9"	21'-6"	34'-2"	N/A	N/A	34'-2"	N/A	N/A	N/A	N/A	N/A	
54"	3'-0"	5'-11"	11'-8"	12'-1"	N/A	N/A	N/A	19'-8"	16'-3"	N/A	N/A	23'-10"	24'-8"	N/A	N/A	24'-8"	N/A	N/A	N/A	N/A	N/A	
60"	3'-3"	6'-3"	13'-3"	N/A	N/A	N/A	N/A	17'-9"	16'-3"	N/A	N/A	26'-10"	N/A	N/A	N/A	26'-10"	N/A	N/A	N/A	N/A	N/A	



Nominal Culvert I.D.	0° Skew	3:1 Side Slope			4:1 Side Slope			6:1 Side Slope				
		15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.7	0.7	0.8
18"	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.7	0.7	0.9
24"	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8	1.0
30"	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.9	1.1
36"	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	1.0	1.0	1.0	1.2
42"	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	1.1	1.1	1.1	1.3
48"	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.4
54"	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.6
60"	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.7	N/A	N/A	N/A



- Provide pipe runner of the size shown in the tables. Provide cross pipe pipe of the same size as the pipe runner. Provide cross pipe stub out and bottom anchor pipe of the next smaller size pipe as shown in the Standard Pipe Sizes and Max Pipe Runner Lengths table.
- This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:
 - For 60" culvert pipes, the skew must not exceed 0°.
 - For 54" culvert pipes, the skew must not exceed 15°.
 - For 48" culvert pipes, the skew must not exceed 30°.
 - For all culvert pipe sizes 42" and less, the skew must not exceed 45°.
- If the above conditions cannot be met, the designer should consider using a safety and treatment with riprap and toewall. For further information, refer to the TxDOT Roadway Design Manual.
- Miter = slope of mitered end of pipe culvert.
- Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap."
- Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.



- Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap."
 - Recommended values of side slope are 3:1, 4:1, and 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.
 - Note that actual slope of pipe runner may vary slightly from side slope of riprap and trimmed culvert pipe edge.
 - Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the sanded connection to allow cleanout access.
 - After installation, inspect the 1/2" hole to ensure that the lap of the pipe runner with the bottom anchor pipe is adequate.
 - At fabricator's option, a heat bend to a smooth 9° radius or a manufactured elbow of the same material as the culvert may be substituted for the mitered and welded joint in the bottom anchor pipe.
- MATERIAL NOTES:
- Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
 - Provide pipe runners, cross pipes, and anchor pipes conforming to the quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.
 - Provide ASTM A307 bolts and nuts.
 - Galvanize all steel components, except concrete reinforcing, after fabrication.
 - Repair galvanizing damaged during transport or construction in accordance with the specifications.
- GENERAL NOTES:
- Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 300-1, "Safety Treatment of Roadside Cross-Drainage Structures," Texas Transportation Institute, March 1981.
 - Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.
 - Payment for riprap and toewall is included in the price bid for each safety end treatment.
 - Concrete concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap."

SKG ENGINEERING LLC SURVEYING • ENVIRONMENTAL • LABORATORY

706 SOUTH ABE STREET SAN ANGELO, TEXAS 76903

PHONE: 325.655.1888 FAX: 325.652.8188

FIRM REGISTRATION NUMBER F-7608

STATE OF TEXAS RUSSELL T. GULLY 8/7/27 LICENSED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DRAWING WAS AUTHORIZED BY RUSSELL T. GULLY, P.E. 8/7/27 SKG ENGINEERING LLC OCT. 08, 2020

TOM GREEN COUNTY 112 W. BEAUREGARD AVE. SAN ANGELO, TEXAS 76903

CULVERT DESIGN McMILLAN ROAD TOM GREEN COUNTY, TEXAS

DETAILS

REVISIONS

DWG BY: RTG DWG DATE: OCT. 08, 2020

JOB NO: 20-E-1442 SHEET NO: ST2

SCALE: N.T.S.