

Replace 25' MBGF and SGT

Replace 30' x 30' Concrete Riprap

Replace 62.5' MBGF and Install a 12.5' MBGF Radius with a Michigan End Shoe

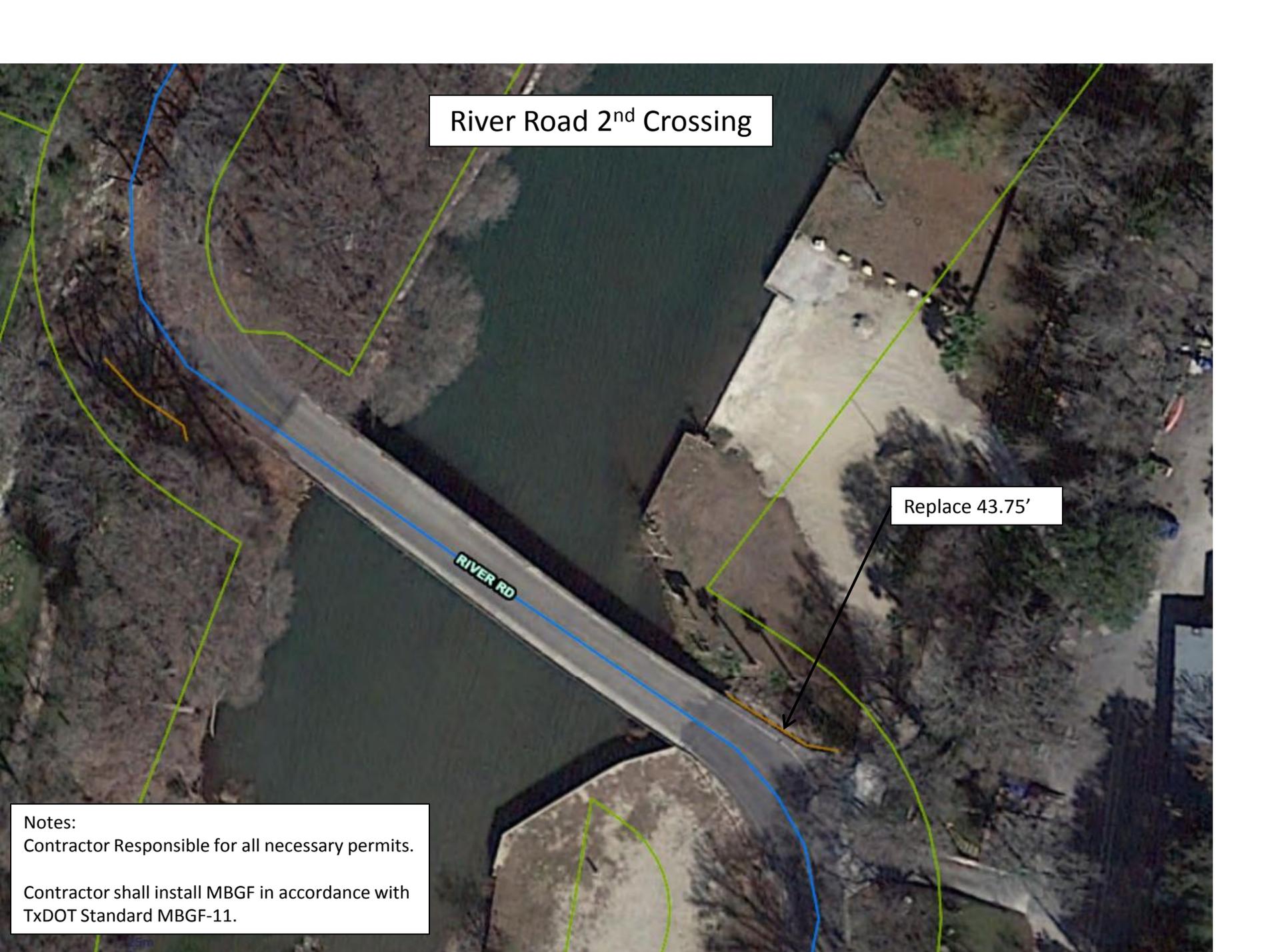
Replace 25' MBGF and SGT

Replace 30' x 30' Concrete Riprap

Replace 25' MBGF and SGT

Notes:
Contractor Responsible for all necessary permits.
Contractor shall install MBGF in accordance with TxDOT Standard MBGF-11.
Contractor shall install SGTs in accordance with TxDOT Standard SGT(7)31-11 Type I.
Contractor shall install Radius in accordance with TxDOT Standard MBGF(SR)-11
Plans for Concrete Riprap attached.

Adjacent to 1015 Acacia Parkway



River Road 2nd Crossing

Replace 43.75'

Notes:

Contractor Responsible for all necessary permits.

Contractor shall install MBGF in accordance with TxDOT Standard MBGF-11.

Village Top Just East of Spring Mountain

Replace ~25' of MBGF

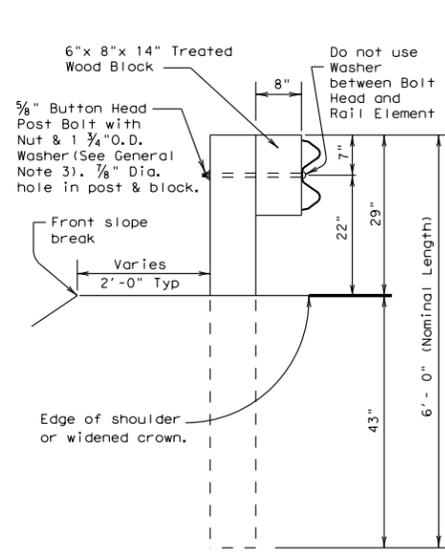
VILLAGE TOP

Replace ~175' of MBGF and SGT on both ends.

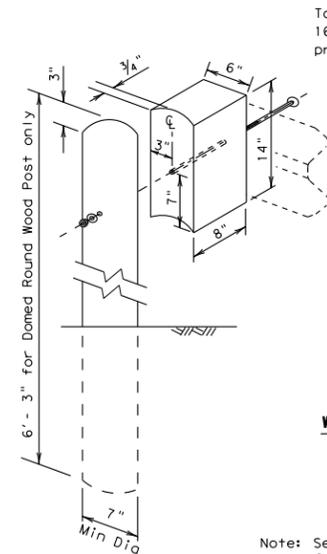
Notes:
Contractor Responsible for all necessary permits.
Contractor shall install MBGF in accordance with TxDOT Standard MBGF-11.
Contractor shall install SGTs in accordance with TxDOT Standard SGT(7)31-11 Type I.

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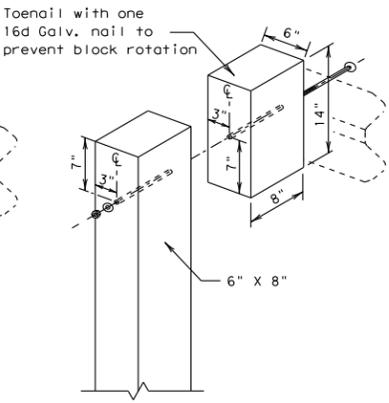
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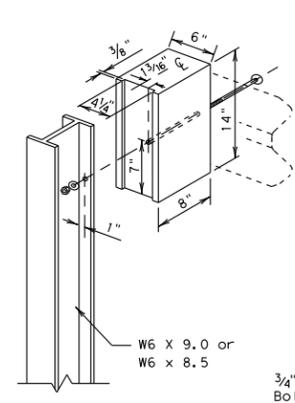
TYPICAL POST



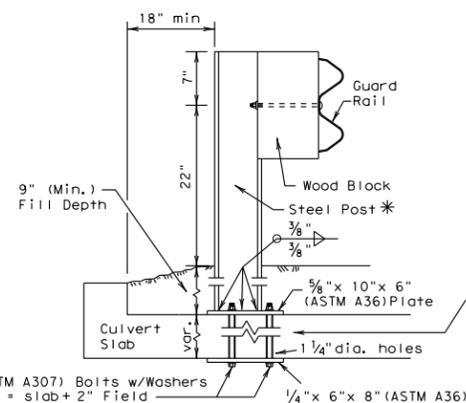
WOOD BLOCK TO ROUND WOOD POST



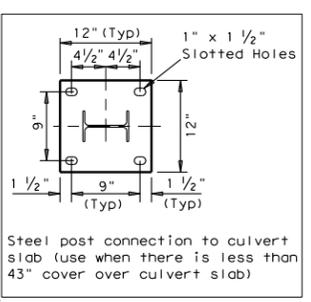
WOOD BLOCK TO RECTANGULAR WOOD POST



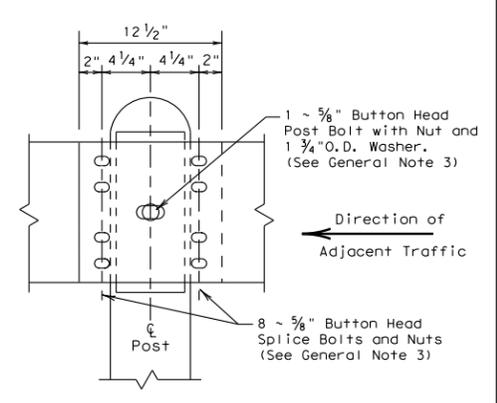
WOOD BLOCK TO STEEL POST



LOW FILL CULVERT POST FOR USE ON NON-BRIDGE CLASS CULVERTS ONLY



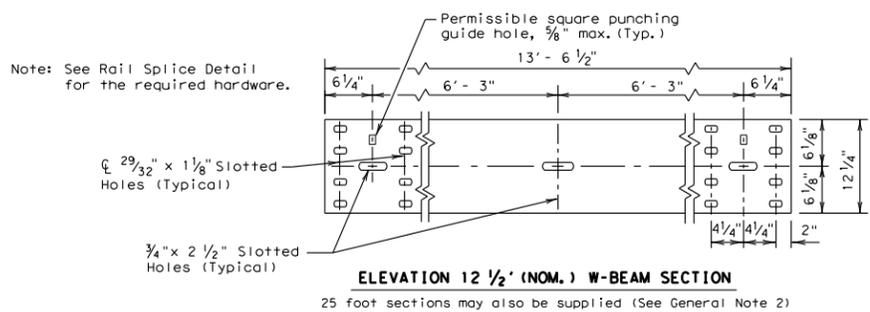
* Post(s) may require field modifications to ensure proper guardrail height.



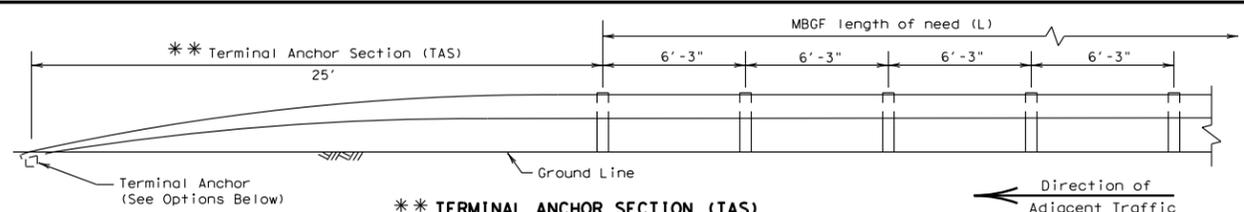
RAIL SPLICE DETAIL

GENERAL NOTES

- The type of post (round wood post, rectangular wood post, or steel post) will be shown elsewhere in the plans. The exact position of MBSF shall be shown elsewhere in the plans or as directed by the Engineer. Steel posts to be galvanized in accordance with Item 445, "Galvanizing."
- Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified on the plans. The Contractor may furnish rail elements of 12 1/2 or 25 foot nominal lengths.
- Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1 3/4" O.D.) washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are 5/8" x 1 1/4" (or 2" long at triple rail splices) with a 5/8" double recessed nut (ASTM A563).
- Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
- Crown shall be widened to accommodate the Metal Beam Guard Fence.
- The lateral approach to the guard fence, shall have a slope rate of not more than 1V:10H.
- Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be positioned so that the face of curb is located directly below or behind the face of the block. Rail placed over curbs shall be installed so that the post bolt is located approximately 21 inches above the gutter pan or roadway surface.
- If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, 24" into the rock, or drill two 12" dia. front to back overlapping holes, 24" into the rock. If solid rock is encountered below 18", drill a 12" dia. hole, 12" into the rock or to the standard embedment depth, whichever is less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
- Posts shall not be set in concrete, of any depth.
- Special fabrication will be required at installations having a curvature of less than 150 ft. radius.
- The terminal anchor section (TAS) post shall be set in Class A concrete (unless otherwise shown in the plans) in accordance with Item 421, "Hydraulic Cement Concrete." Concrete shall be subsidiary to the bid item requiring construction of the terminal anchor section (TAS). Terminal anchor post to be galvanized in accordance with Item 445, "Galvanizing."
- Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL can furnish composite material posts and/or blocks.

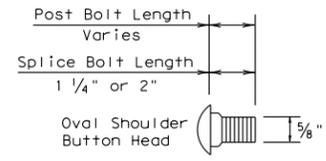


ELEVATION 12 1/2' (NOM.) W-BEAM SECTION

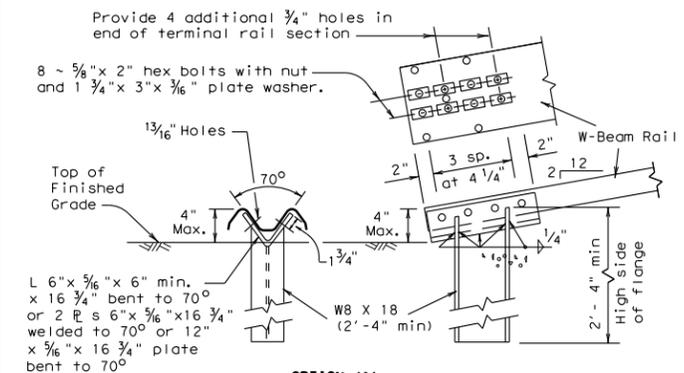


TERMINAL ANCHOR SECTION (TAS)

Terminal anchor sections are only for downstream use, when located outside the horizontal clearance area of opposing traffic.

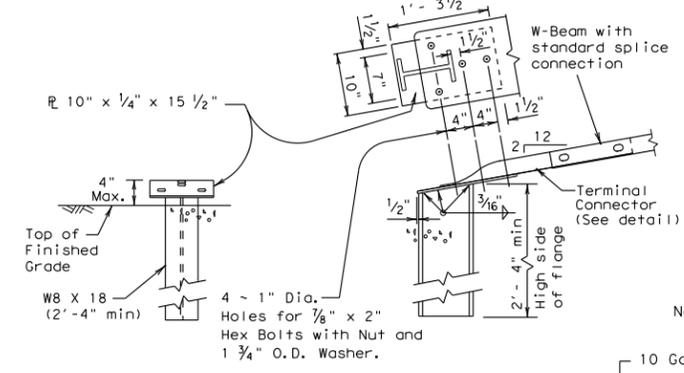


BUTTON HEAD BOLT



OPTION (1)

Note: This anchor post requires four additional 3/4 inch holes (shop or field) in the rail member with eight 5/8 inch hex bolts with nut and plate washer.

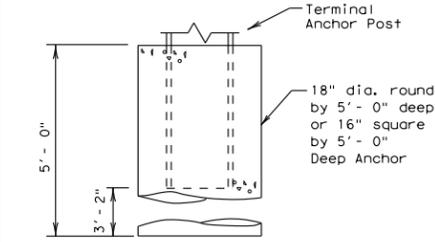


OPTION (2)

Note: This anchor post requires the use of the 10 ga. terminal connector with four 5/8 inch hex bolts with nut and washer.

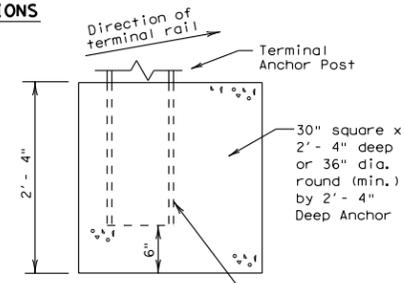
Note: Terminal Connector to be used with terminal anchor post options 2.

TERMINAL ANCHOR POST OPTIONS

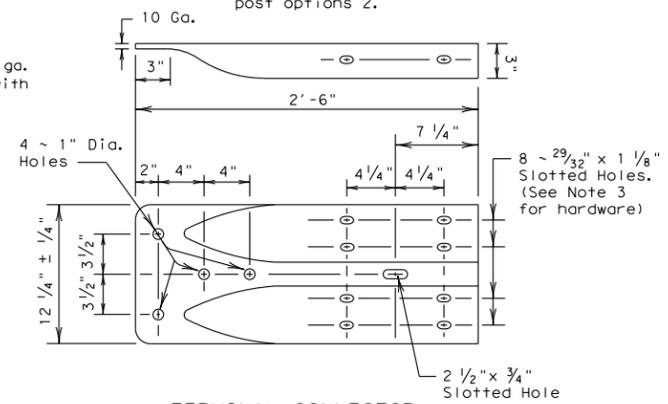


Notes: Either concrete anchor may be used with either post option above. No construction joint is allowed in the concrete anchor. Terminal rail may be bolted to post and in twist position prior to placing concrete anchor. If concrete anchor is precast, the area should be compacted as directed by the Engineer, when placed in the field.

TERMINAL CONCRETE ANCHOR OPTIONS



Place face of post approx. on center of anchor



TERMINAL CONNECTOR

For connection hardware to concrete rails, see the MBSF transition standards.

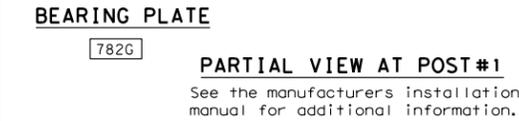
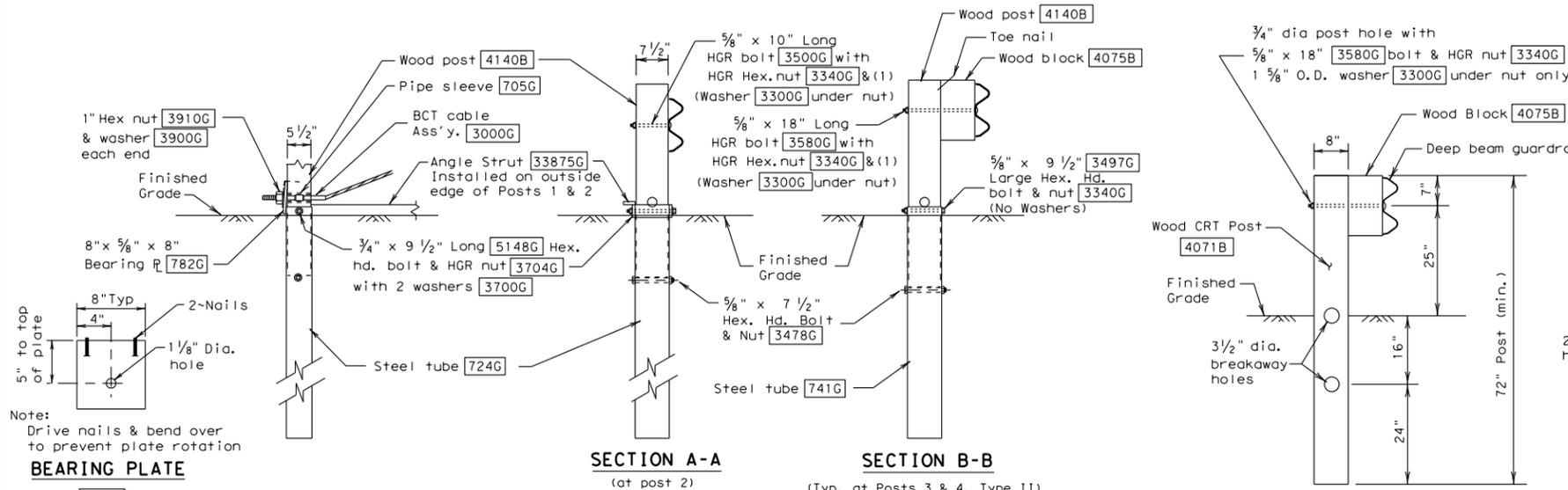
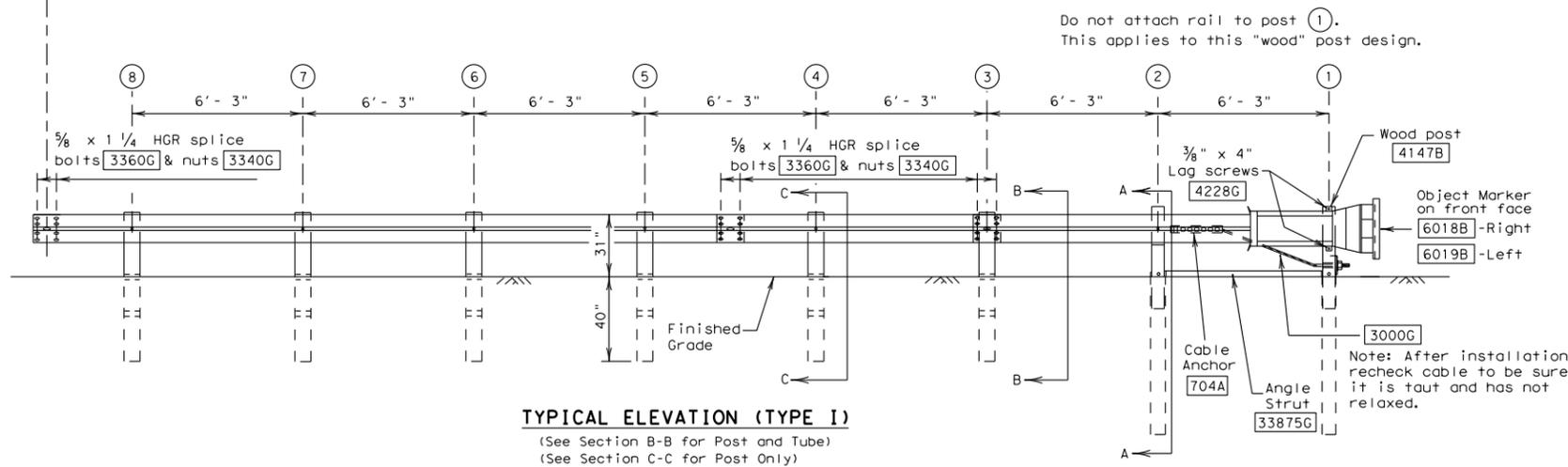
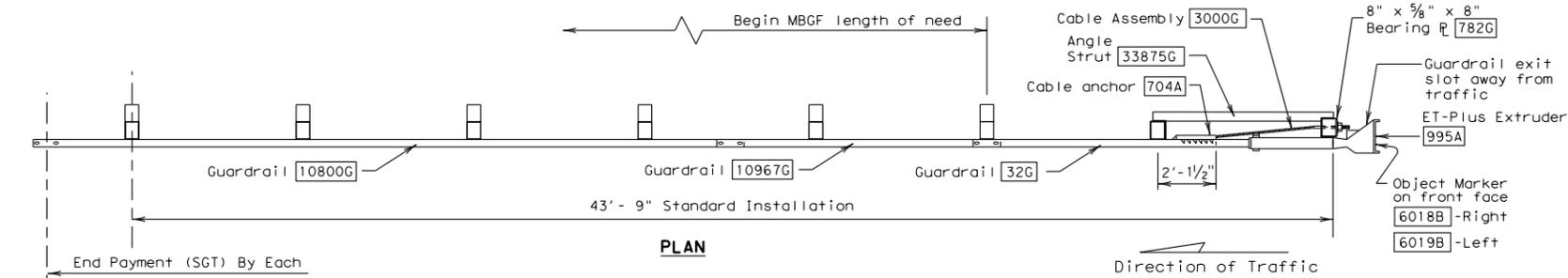
METAL BEAM GUARD FENCE

MBSF - 11

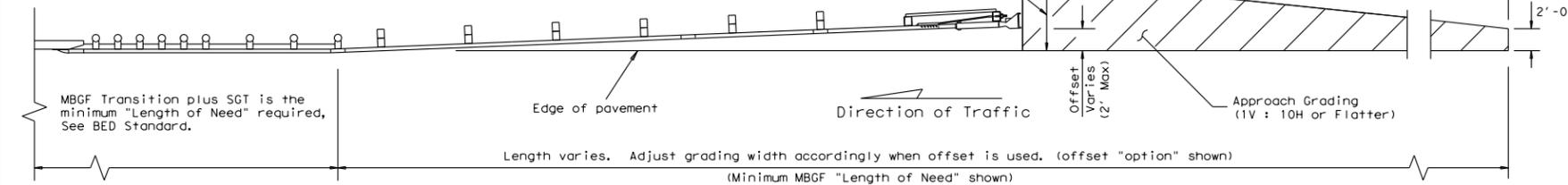
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© TxDOT July 1994	CONT	SECT	JOB	HIGHWAY
12-2011	REVISIONS			
	DIST	COUNTY	SHEET NO.	

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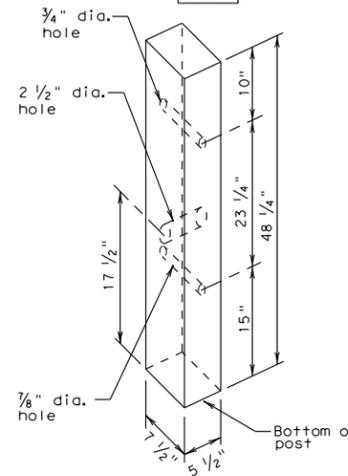
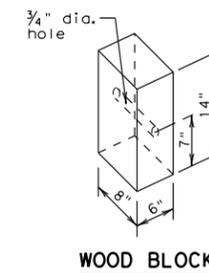
Note: Site Condition(s)
Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.



GRADING AT GUARDRAIL END TREATMENTS

- ### GENERAL NOTES
- For additional information contact: Trinity Highway Products, 1-800-527-6050.
 - The Type of SGT unit will be specified elsewhere in the plans. Numbers in circles indicate post position. The Type of SGT unit chosen is a maintenance consideration and does not affect the systems performance.

	Post & Tube Options	Post Only
Type I	Posts ① thru ②	Posts ③ thru ⑧
Type II	Posts ① thru ④	Posts ⑤ thru ⑧
Type III	Posts ① thru ⑧	
 - SGT's placed within the "minimum" 150 ft. radius, shall be installed straight. Standard rail elements may be installed within the radius, without special fabrication.
 - All bolts, nuts, cable assemblies, cable anchors, steel tubes & bearing plates shall be galvanized.
 - A flare rate of 25:1 may be used to prevent the terminal head from encroaching on the shoulder. The flare may be decreased or eliminated for specific installations, if directed by the Engineer.
 - The steel tubes shall not protrude more than 4 inches above ground. Site grading may be necessary to meet this requirement.
 - The steel tubes may be driven with an approved driving head. They shall not be driven with the wood post in the tube. If the steel tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent tube settlement.
 - If solid rock is encountered. See the manufacturer's installation manual for the proper installation guidance.
 - The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening the nuts.
 - The wood blocks shall be "toe nailed" to the rectangular wood posts to prevent them from turning when the wood shrinks.
 - For curb installations, the soil tubes and posts shall be installed at the proper ground elevation behind the curb. The posts will then require field drilling new holes to accommodate the rail to post connection bolt to maintain the proper height of the rail above the gutter pan. The excess post length above the rail will be removed as directed by the Engineer.
 - An object marker shall be installed on the front of the impact head as detailed on D&M(VIA).
 - A special site evaluation should be considered, prior to using this end treatment where there is less than 25 feet between the extrusion side of the end treatment and any adjacent driving lane.



All measurements should be taken from bottom of posts.

WOOD POST
4140B

POST & TUBE OPTIONS		
Type I	Posts	① thru ②
Type II	Posts	① thru ④
Type III	Posts	① thru ⑧

Code #	POST & TUBE OPTIONS			DESCRIPTION
	Type I Qty.	Type II Qty.	Type III Qty.	
32G	1	1	1	Guardrail (12 Ga) at 12'-6" (ANC)
10967G	1	1	1	Guardrail (12 Ga) at 9'-4 1/2"
10800G	1	1	1	Guardrail (12 Ga) at 25'-0"
724G	2	2	2	Steel Tube - 6"x 8"x 72"x 1/8" min
741G	0	2	6	Steel Tube - 6" x 8" x 54" x 1/8" min
4140B	2	4	8	Wood Posts - 5 1/2" x 7 1/2" x 48 1/4"
4071B	6	4	0	Wood CRT Posts - 6"x 8"x 72"
4075B	6	6	6	Wood Block - 6"x 8"x 14"
705G	1	1	1	Pipe Sleeve - 2" std. pipe x 5 1/2"
782G	1	1	1	Bearing Plate - 8"x 8"x 5/8"
704A	1	1	1	Cable Anchor Bracket
3000G	1	1	1	Cable Assembly (3/4" x 78")
33875G	1	1	1	Angle Strut
995A	1	1	1	ET-Plus Extruder
5148G	2	2	2	3/4" x 9 1/2" Hex Hd (Top of tubes 1&2)A325
3300G	7	7	7	5/8" Washers
3478G	2	4	8	5/8" x 7 1/2" Hex Bolt
3500G	1	1	1	5/8" x 10" Post Bolt (Post ②)
3580G	6	6	6	5/8" x 18" Post Bolt (Posts ③ thru ⑧)
3360G	24	24	24	5/8" x 1 1/4" Splice Bolt
3340G	33	37	45	5/8" Hex Nut
4228G	2	2	2	3/8" x 4" Lag Screw
3910G	2	2	2	1" Hex Nut
3900G	2	2	2	1" Washer
6018B	1	1	1	Right - Object Marker
6019B	1	1	1	Left - Object Marker
3700G	4	4	4	3/4" Washer
3704G	2	2	2	3/4" Heavy Hex Nut
3497G	0	2	6	5/8" x 9 1/2" Hex Hd (Top of Tubes 3-8)A307

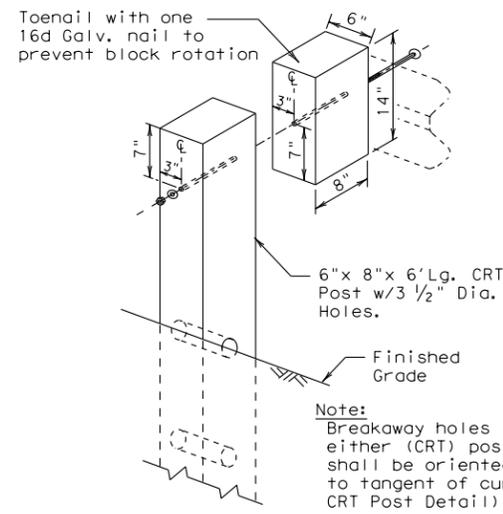
Texas Department of Transportation
Design Division Standard

SINGLE GUARDRAIL TERMINAL (ET-31) (WOOD POST) SGT (7) 31-11

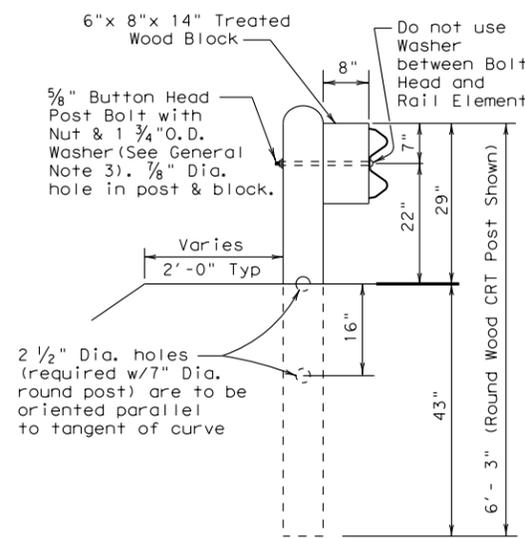
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© TxDOT December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS				
DIST	COUNTY			SHEET NO.

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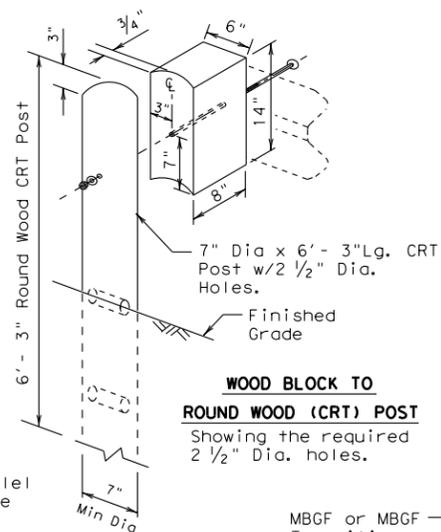


WOOD BLOCK TO RECTANGULAR WOOD (CRT) POST
Showing the required 3 1/2" Dia. holes.

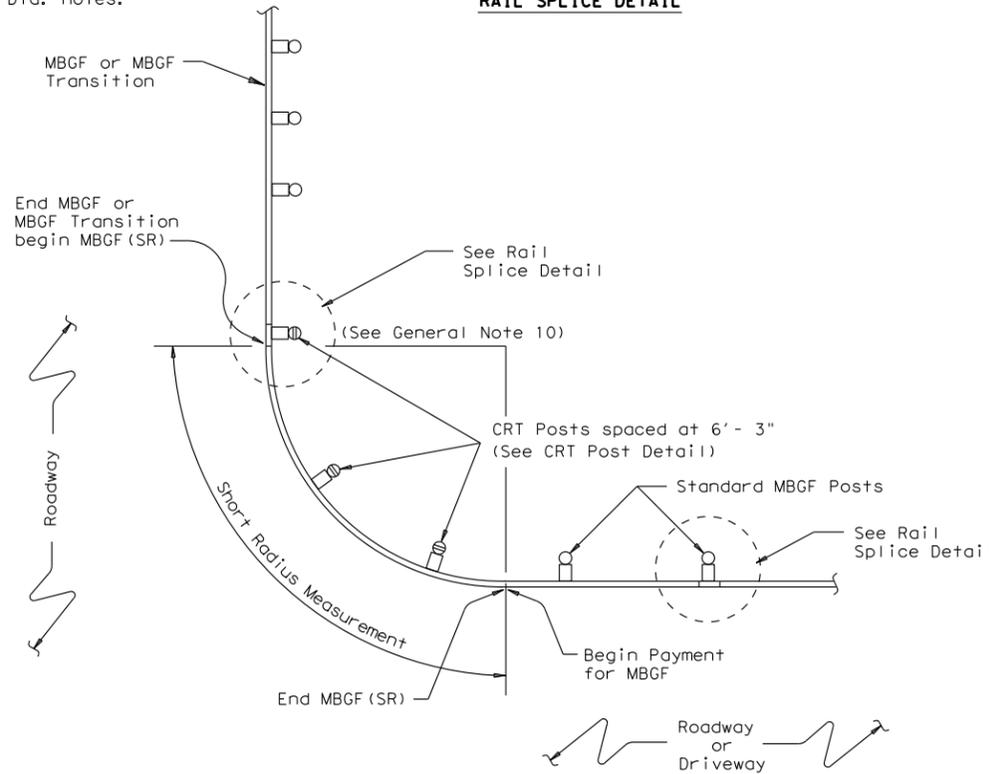


(CRT) POST DETAIL CONTROLLED RELEASE TERMINAL POST

Two or more wood CRT post(s) are required at any radius installation located at intersecting roadways or driveways.

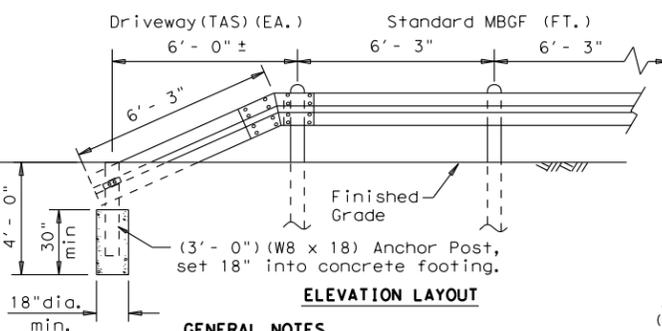


WOOD BLOCK TO ROUND WOOD (CRT) POST
Showing the required 2 1/2" Dia. holes.



PLAN VIEW SHOWING TYPICAL RADIUS

The required radius is shown elsewhere on the plans.



ELEVATION LAYOUT

GENERAL NOTES

1. The "Driveway" Terminal Anchor Section is ONLY to be used within driveway locations, where the ROW is limited and a standard 25 ft. (TAS) Terminal Anchor Section, is too long.
2. Terminal anchor post shall be set in Class A concrete.
3. All steel shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."

"DRIVEWAY" TERMINAL ANCHOR SECTION

Only for use within driveway locations, where a standard (TAS) Terminal Anchor Section can not be installed.

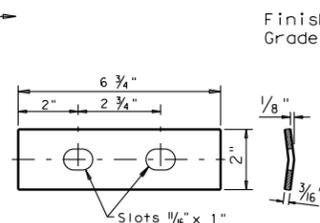
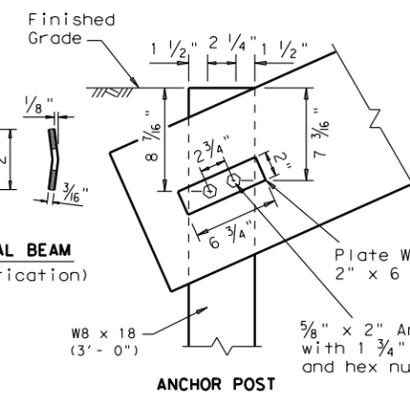
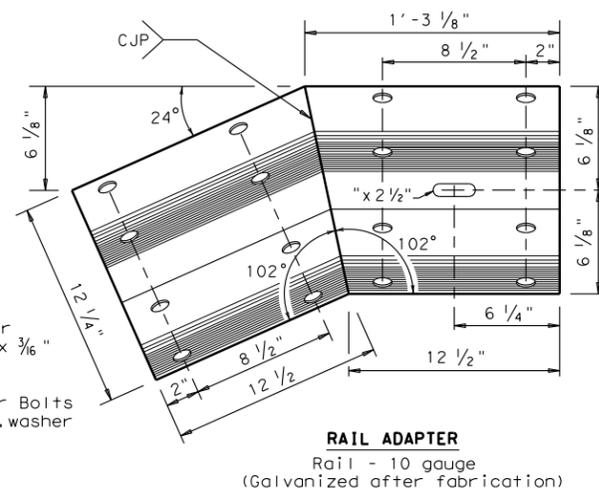


PLATE WASHER FOR METAL BEAM
(Galvanized after fabrication)



ANCHOR POST

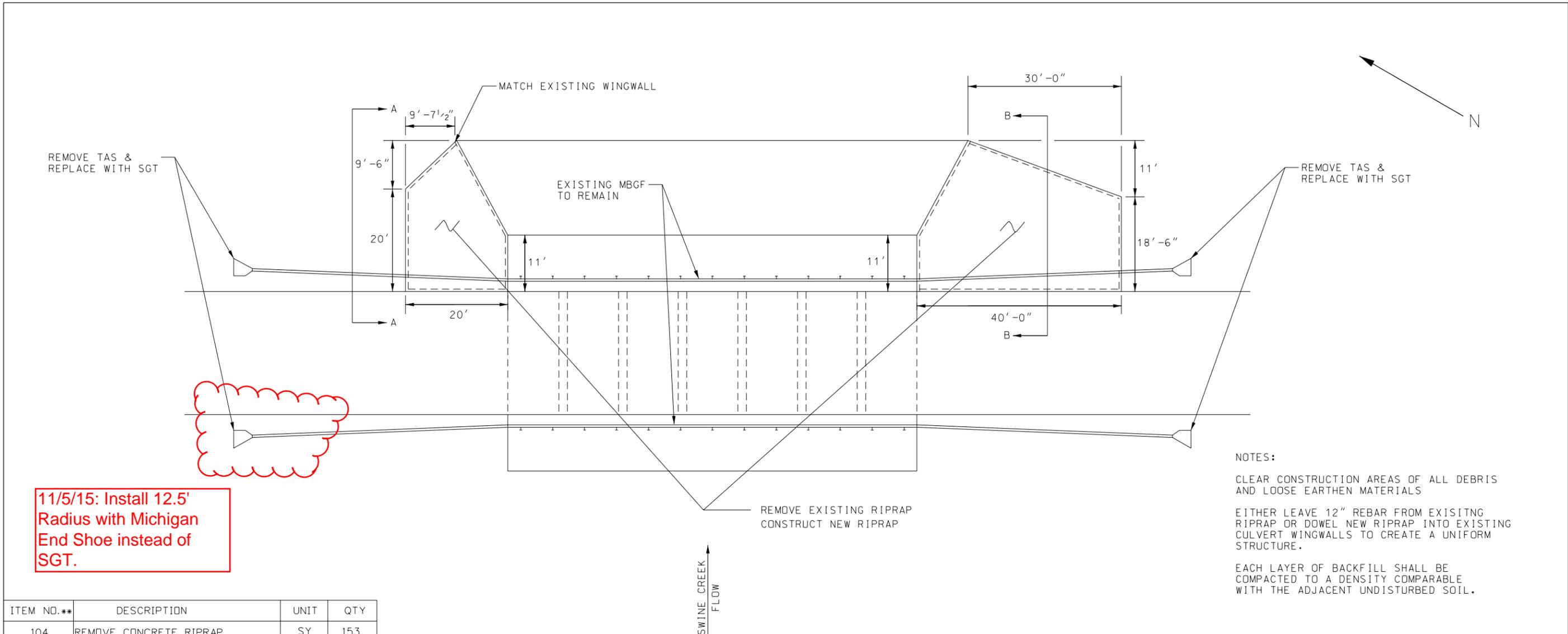


RAIL ADAPTER
Rail - 10 gauge
(Galvanized after fabrication)

GENERAL NOTES

1. The type of (CRT) post (round wood post, or rectangular wood post) will be shown elsewhere in the plans. The exact position of MBGF shall be shown elsewhere in the plans or as directed by the Engineer.
2. Steel posts are not permitted at CRT post positions.
3. Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified on the plans. The Contractor may furnish rail elements of 12 1/2 or 25 foot nominal lengths.
4. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1 3/4" O.D.) washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are 5/8" x 1 1/4" (or 2" long at triple rail splices) with a 5/8" double recessed nut (ASTM A563).
5. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
6. Crown shall be widened to accommodate the Metal Beam Guard Fence.
7. The lateral approach to the guard fence, shall have a slope rate of not more than 1V:10H.
8. Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be positioned so that the face of curb is located directly below or behind the face of the block. Rail placed over curbs shall be installed so that the post bolt is located approximately 21 inches above the gutter pan or roadway surface.
9. If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, 24" into the rock, or drill two 12" dia. front to back overlapping holes, 24" into the rock. If solid rock is encountered below 18", drill a 12" dia. hole, 12" into the rock or to the standard embedment depth, whichever is less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
10. Guardrail posts shall not be set in concrete, of any depth.
11. Special rail fabrication will be required at installations having a curvature of less than 150 ft. radius. The required radius shall be shown on the plans.
12. The terminal anchor section (TAS) post shall be set in Class A concrete (unless otherwise shown in the plans) in accordance with Item 421, "Hydraulic Cement Concrete." Concrete shall be subsidiary to the bid item requiring construction of the terminal anchor section (TAS). Terminal anchor post to be galvanized in accordance with Item 445, "Galvanizing."
13. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL can furnish composite material posts and/or blocks.

		Design Division Standard	
METAL BEAM GUARD FENCE (SHORT RADIUS) MBGF (SR) - 11			
FILE: mbgfsr11.dgn	DN: TxDOT	CK: AM	DW: BD
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REVISIONS	DIST		COUNTY
12-2011	SHEET NO.		



11/5/15: Install 12.5' Radius with Michigan End Shoe instead of SGT.

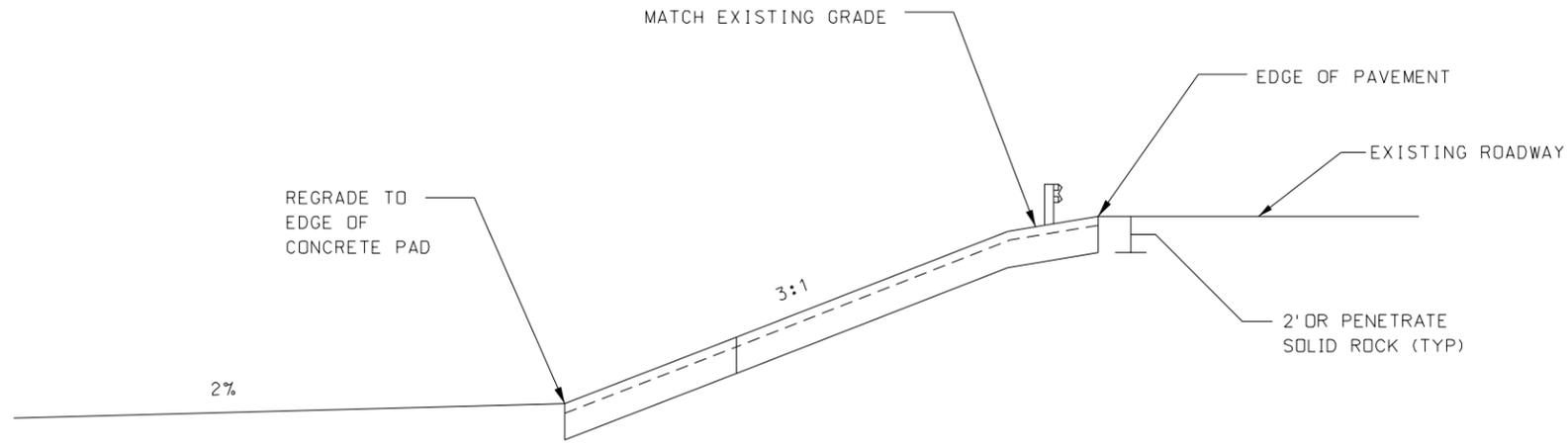
NOTES:
 CLEAR CONSTRUCTION AREAS OF ALL DEBRIS AND LOOSE EARTHEN MATERIALS
 EITHER LEAVE 12" REBAR FROM EXISTING RIPRAP OR DOWEL NEW RIPRAP INTO EXISTING CULVERT WINGWALLS TO CREATE A UNIFORM STRUCTURE.
 EACH LAYER OF BACKFILL SHALL BE COMPACTED TO A DENSITY COMPARABLE WITH THE ADJACENT UNDISTURBED SOIL.

ITEM NO.**	DESCRIPTION	UNIT	QTY
104	REMOVE CONCRETE RIPRAP	SY	153
400	BACKFILL	CY	60
432	RIPRAP (6")	CY	31
542	REMOVE TERMINAL ANCHOR SECTION	EA	4
5819	SINGLE GUARDRAIL TERMINAL	EA	4

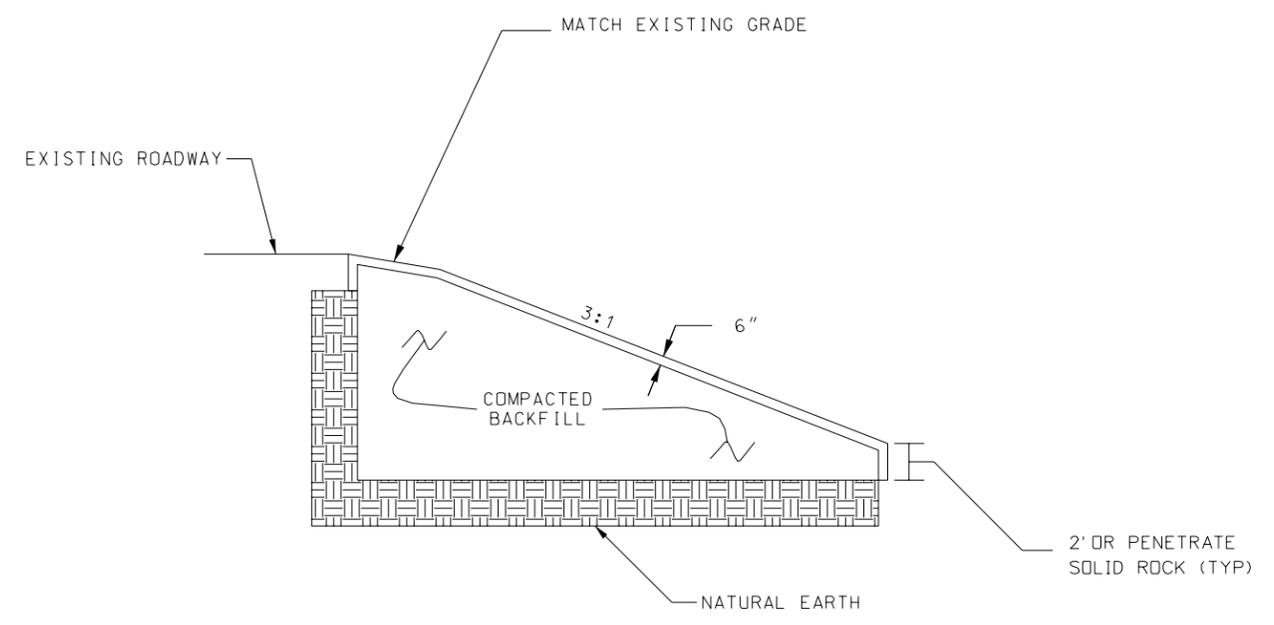
** REFERS TO TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES 1993 EDITION.



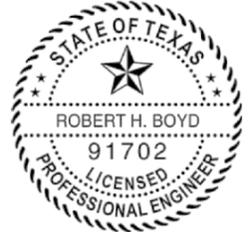
195 David Jonas Drive New Braunfels, TX 78132 Phone: (830) 608-2090 Fax: (830) 608-2009	ACACIA PARKWAY CULVERT SAFETY IMPROVEMENTS	Date: 08/04/03	REVISIONS		SCALE: 1"=20'
		Drawn by: RHB	No.	Date:	
		Checked by: THH	1	11/05/15	
					Sheet 1 of 2



SECTION A-A



SECTION B-B



195 David Jonas Drive New Braunfels, TX 78132 Phone: (830) 608-2090 Fax: (830) 608-2009	ACACIA PARKWAY CULVERT SAFETY IMPROVEMENTS	Date: 08/04/03	REVISIONS		SCALE: NTS
		Drawn by: RHB	No.	Date:	
		Checked by: THH			
				Sheet 2 of 2	