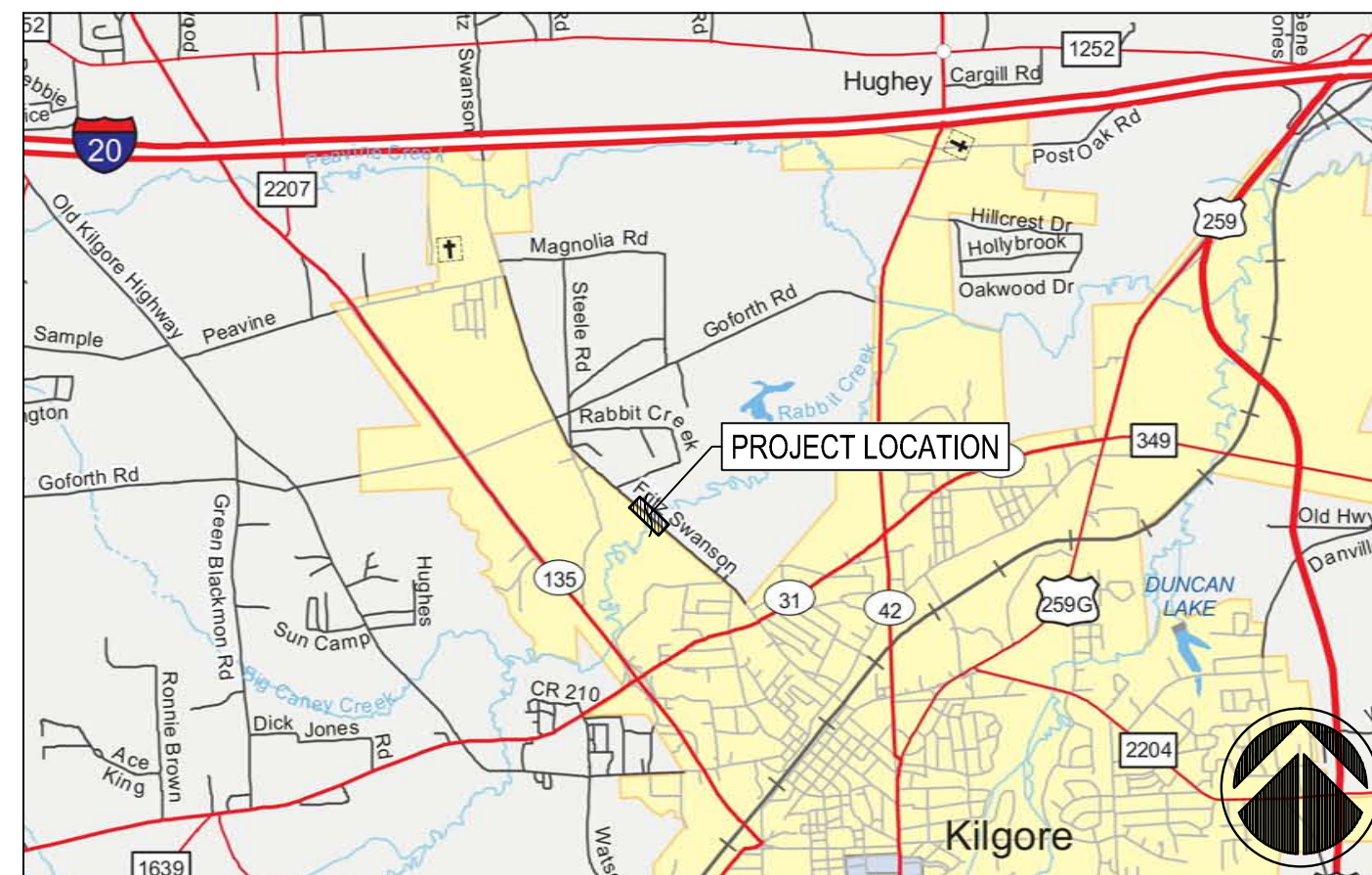


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ESTIMATE SUMMARY						
ITEM-CODE			DESCRIPTION	UNIT	TOTAL	
ITEM NO.	DESC CODE	SP NO			EST.	FINAL
104	6037		REMOVE CONC (RAIL)	LF	400	
354	6174		PLANE ASPH CONC PAV (1.5" TO 5")	SY	935	
432	2039		RIP RAP (MOW STRIP)(4 IN)	CY	10	
451	6004		RETROFIT RAIL (TY T131RC)	LF	400	
500	2001		MOBILIZATION	LS	1	
502	2001		BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1	
540	2011		MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4	
544	2011		GUARDRAIL END TREATMENT (INSTALL)	EA	4	



VICINITY MAP

TABLE OF CONTENTS

- C1.0 COVER SHEET
- C2.0 ORIGINAL BRIDGE PLAN - FOR REFERENCE
- C3.0 TRAFFIC CONTROL PLAN
- C4.0 DEMOLITION PLAN
- C5.0 GUARDRAIL RETROFIT PLAN
- C6.0-C6.3 T131RC RETROFIT RAIL ON CURBS
- C7.0 METAL BEAM GUARD FENCE MOW STRIP GF(31) MS-11
- C8.0 METAL BEAM GUARD FENCE TRANSITION GF(31) TR-14
- C9.0 SINGLE GUARDRAIL TERMINAL SGT(8) 31-14



JOB # 2563-004

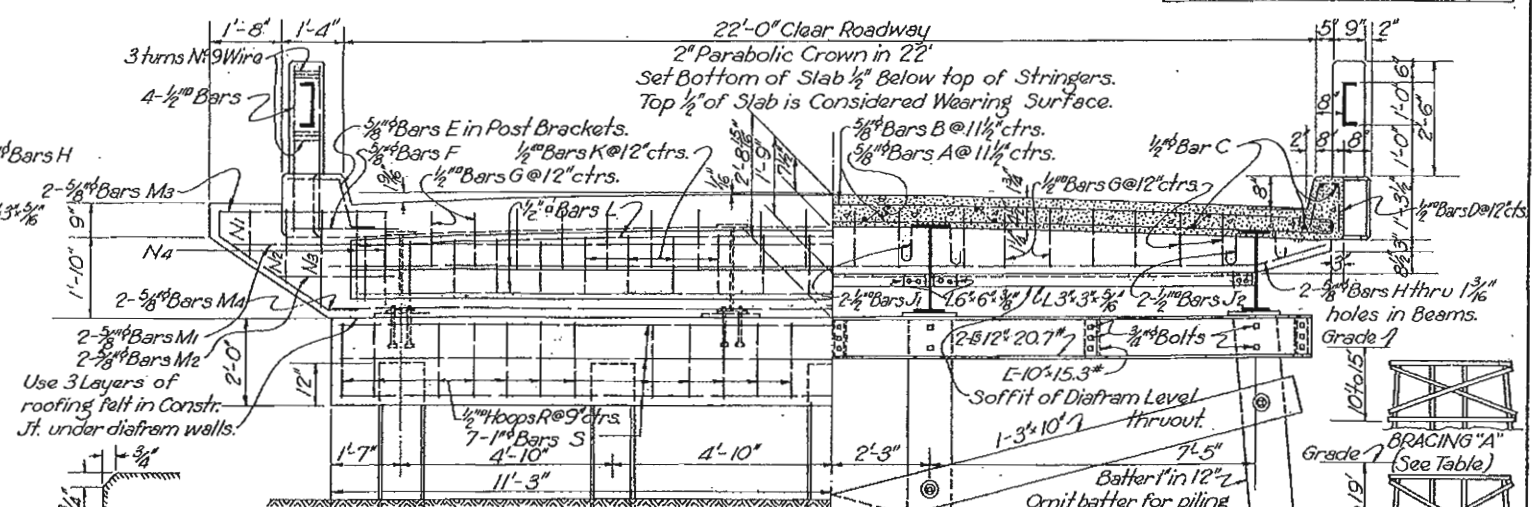
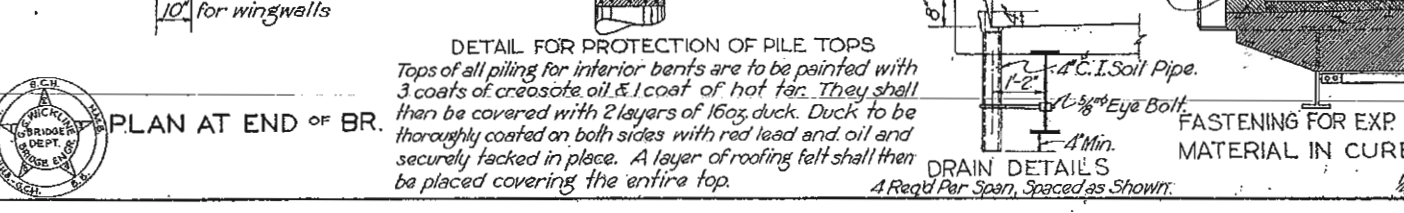
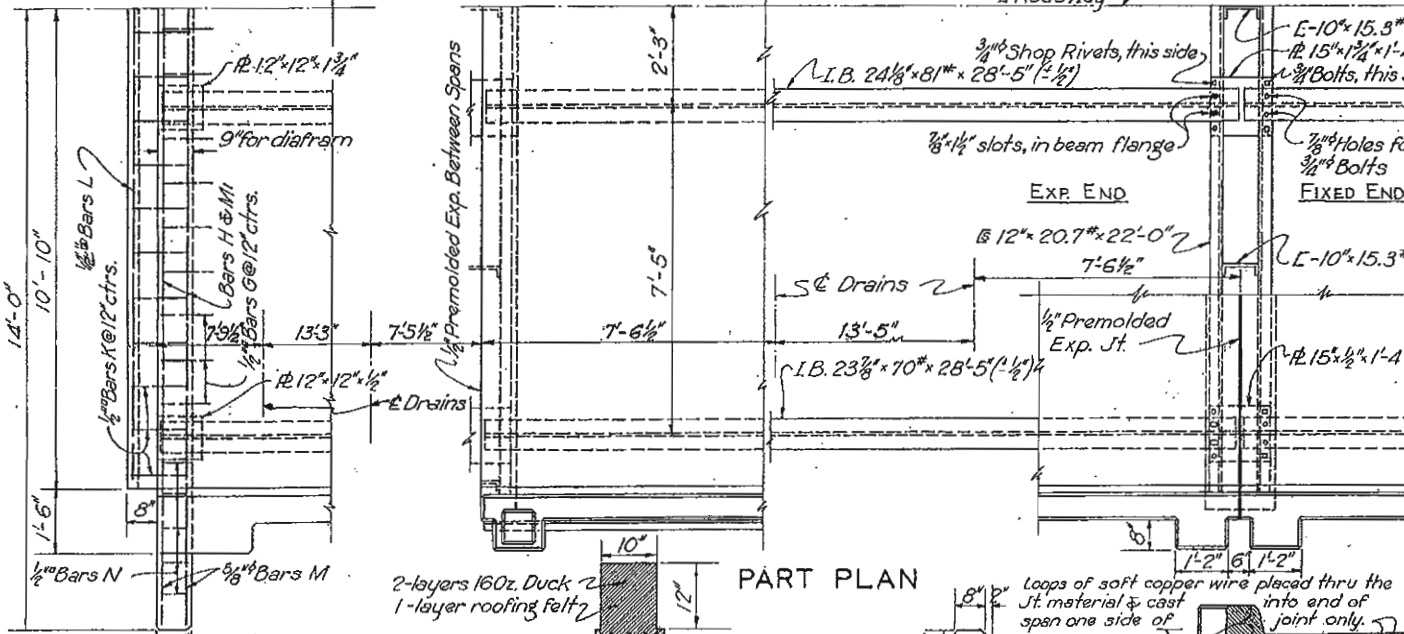
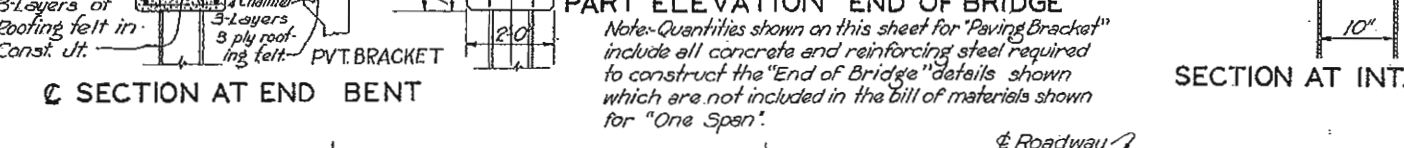
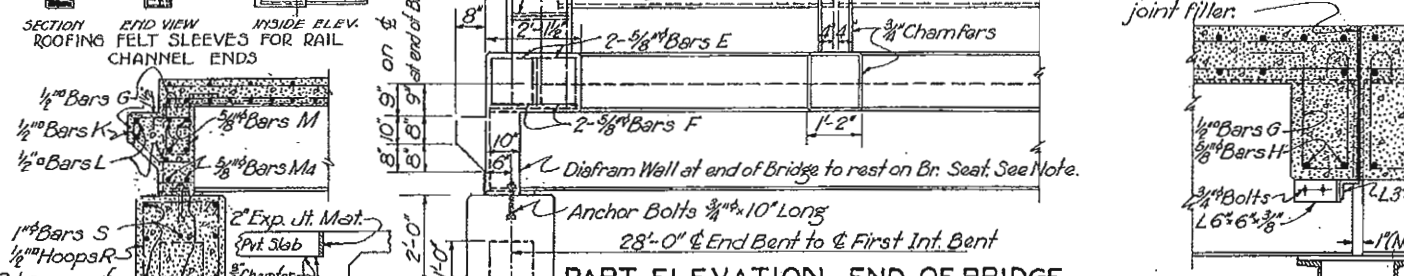
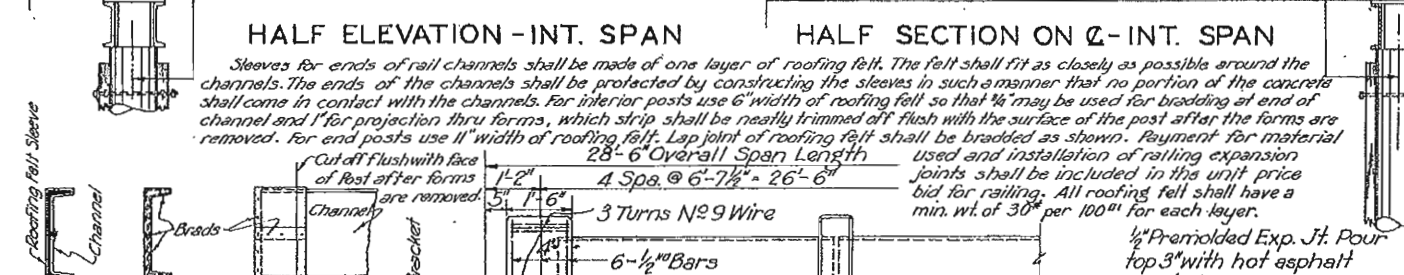
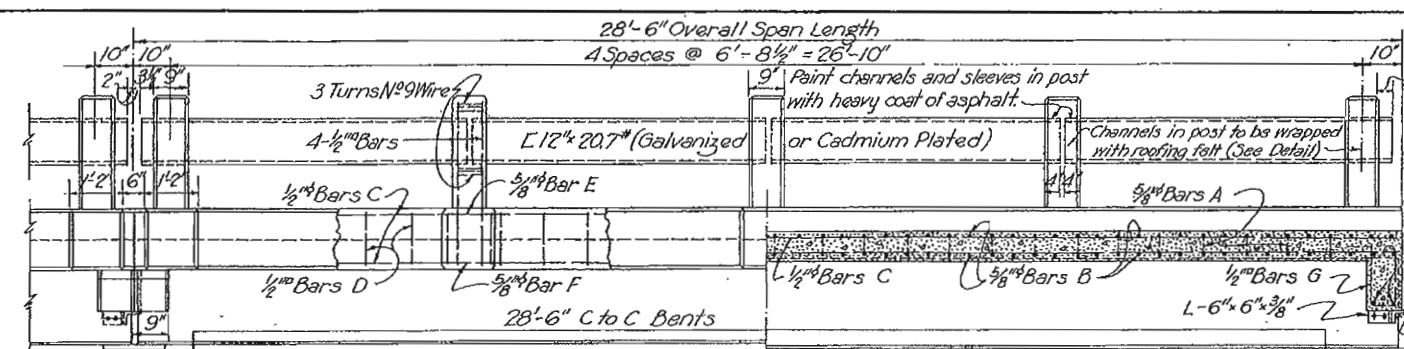
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**RABBIT CREEK BRIDGE
 GUARDRAIL REPLACEMENT
 FRITZ SWANSON ROAD
 GREGG COUNTY, TEXAS**

C1.0 COVER SHEET

FED. ROAD DIST. NO.	STATE	FISCAL YEAR	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
6	TEXAS				
STATE DIST. NO.	COUNTY	PROJECT NO.	STATE PROJECT NO.	HIGHWAY NO.	

NOTES ON RAILING: The unit price bid for railing shall include the channels concrete in posts, tie wire and all reinforcing not shown in the bill of steel for the span. The channels shall be galvanized by the hot dip method with 2 ounces per square foot or plated with cadmium by the Udylite Process.



UNIT BAR WEIGHTS

Size	Wt. P.L.F.
1/2"	.663
3/8"	.85
5/8"	1.043
1"	2.67

TABLE OF SWAY BRACING

MARK	SIZE	Nº	LENGTH	F.B.M. HARDWARE
A	3" x 10" x 24"	2	24'	180 53"
B	3" x 10" x 24"	1	24'	190 53"
C	3" x 10" x 24"	2	24'	375 106"

BILL OF REINFORCING STEEL FOR ONE PAVING BRACKET, ETC.

Mark	Spa.	Size	Nº	Length	Weight
A	12"	3/8"	29	25'-4"	766
L	1/2"	3	21'-2"	54	
M1	3/8"	2	27'-0"	56	
M2	1/2"	4	2'-9"	11	
M3	1/2"	4	7'-6"	31	
M4	1/2"	2	22'-8"	47	
N1	9"	1/2"	6	3'-10 1/2"	20
N2	9"	1/2"	4	5'-1"	17
E	5/8"	2	7'-1"	15	
F	5/8"	2	5'-5"	11	
Total					327
REINF. FOR ONE END BENT					
R	9"	1/2"	24	7'-8"	156
S	1"	7	22'-2"	414	
Total					570

BILL OF REINFORCING STEEL FOR ONE SPAN

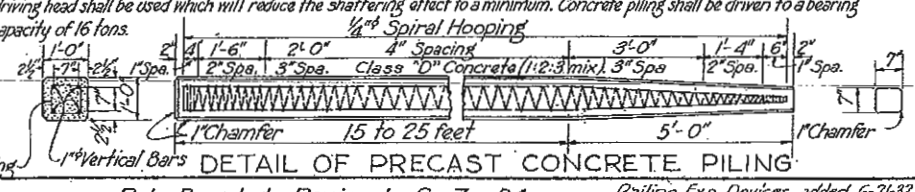
Mark	Spa.	Size	Nº	Length	Weight
A	11 1/2"	3/8"	29	25'-4"	766
B	1/2"	3	21'-2"	54	
C	1/2"	20	28'-3"	377	
D	12"	5/8"	58	3'-0"	148
E	5/8"	10	7'-1"	74	
F	1"	10	5'-5"	56	
G	12"	1/2"	36	4'-8"	143
H	5/8"	4	22'-7"	94	
J1	1/2"	8	3'-11"	27	
J2	1"	8	3'-5"	23	
Total Reinf. One Span					3236

TABLE OF TOTAL QUANTITIES

ITEM	ONE SPAN	ONE PAVING INTERIOR BRACKET	ONE END BENT
Class A Concrete Cu.Yds.	18.1	1.4	3.14
Reinforcing Steel Lbs.	3236	327	570
Structural Steel Lbs.	8900		1350**200
Bridge Railing Lin.Ft.	57.0		

* Steel for cap and bearing plates.
** Bearing plates and anchor bolts at End of Bridge.

TEXAS STATE HIGHWAY DEPARTMENT
28' 6" STEEL I-BEAM SPAN
CONCRETE FLOOR 22' ROADWAY
MARCH 1932
I 32-22-28.5



Pvt. Bracket Revised 6-7-54 Railing Exp. Devices added 6-21-32. Revised 10-20-34. Rev. 11-22-32.

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT
<http://www.txdot.gov>

COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL – SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes prequalified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
 Traffic Operations Division – TE
 Phone (512) 416-3118



WORKER SAFETY APPAREL NOTES:

- Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

LEGEND

Type III Barricade

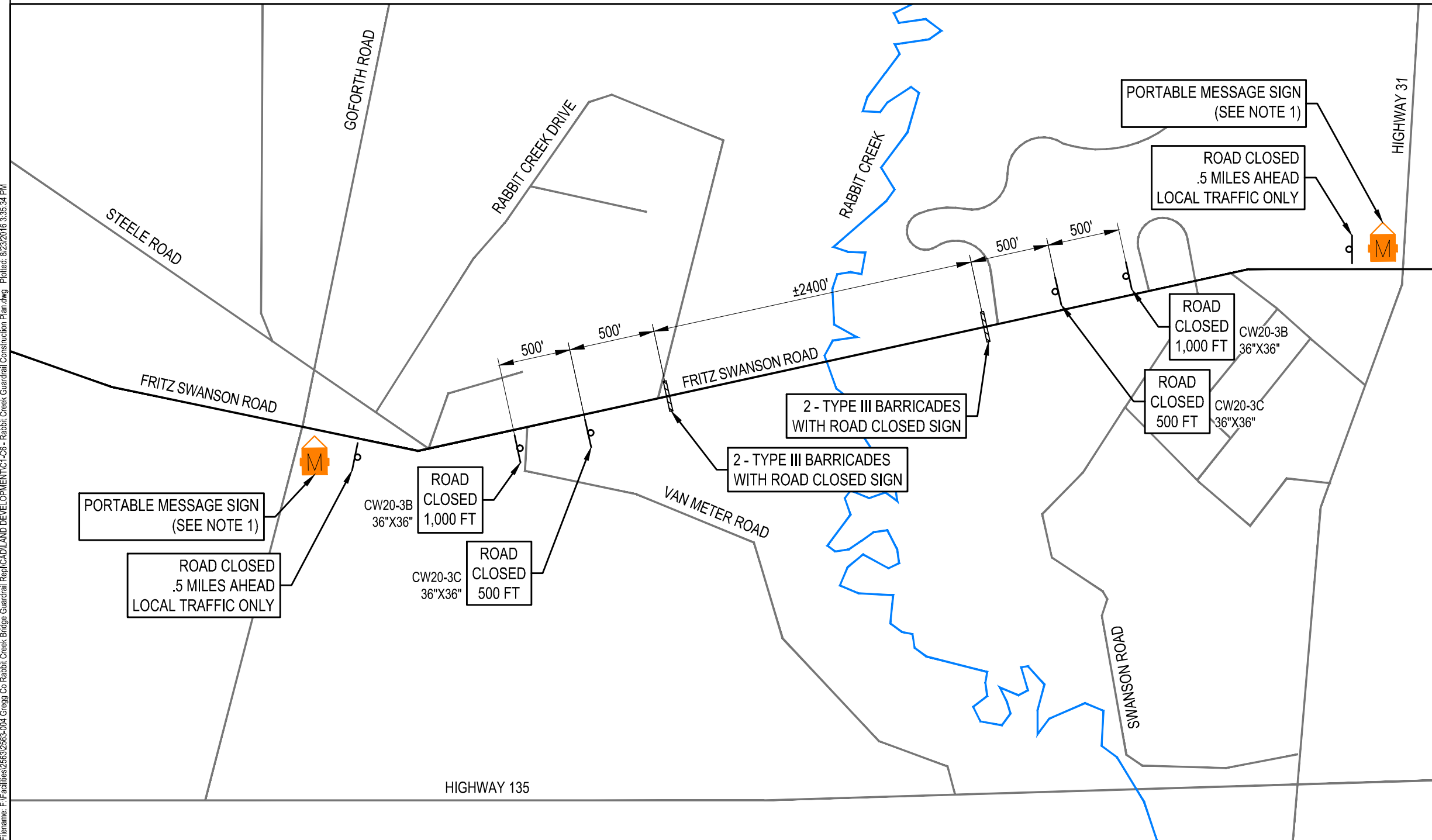
Portable Changeable Message Sign

NOTES:

- USE THE FOLLOWING TEXT FOR THE PORTABLE CHANGEABLE MESSAGE SIGNS:

1-WEEK PRIOR TO CLOSURE
 (1) FRITZ SWANSON ROAD
 CLOSED
 9/15-10/15
 (2) THRU
 TRAF USE
 HIGHWAY 135

DURING CLOSURE
 (1) FRITZ SWANSON ROAD
 CLOSED
 AHEAD
 (2) THRU
 TRAF USE
 HIGHWAY 135



JOB # 2563-004

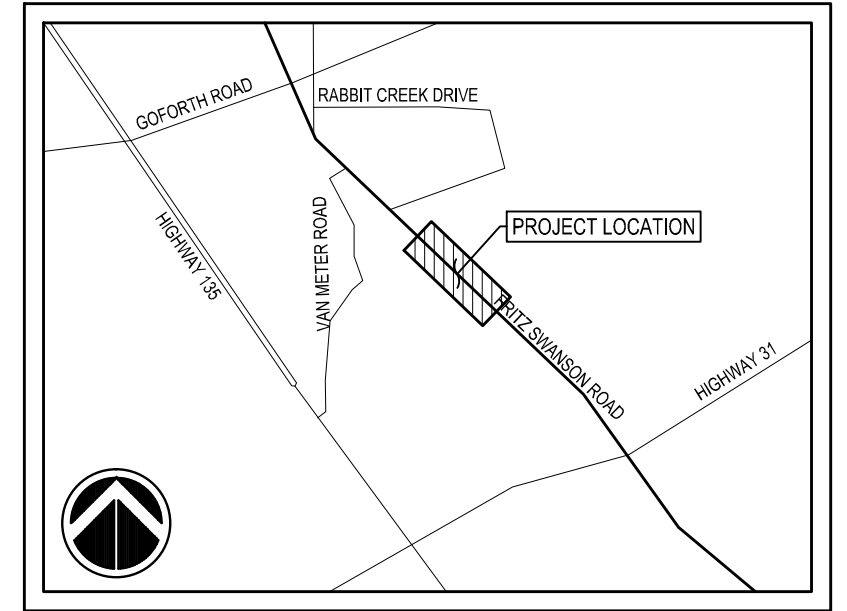


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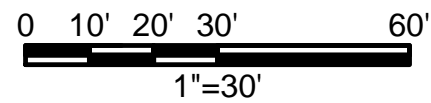
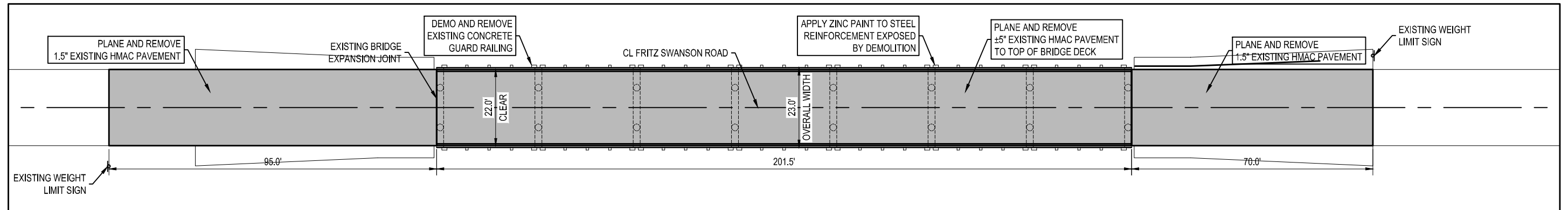
**RABBIT CREEK BRIDGE
 GUARDRAIL REPLACEMENT
 FRITZ SWANSON ROAD
 GREGG COUNTY, TEXAS**

C3.0 TRAFFIC CONTROL PLAN

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VICINITY MAP

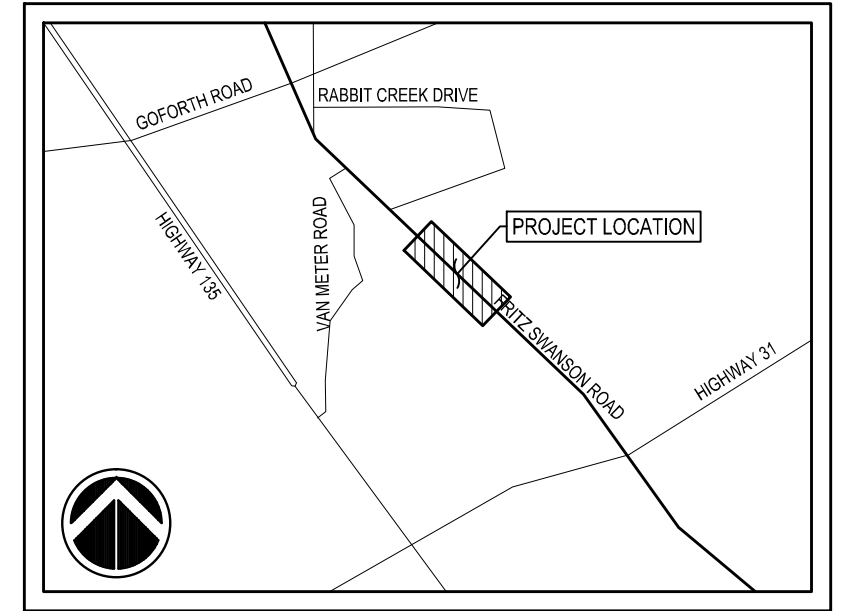


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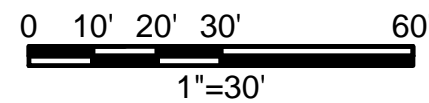
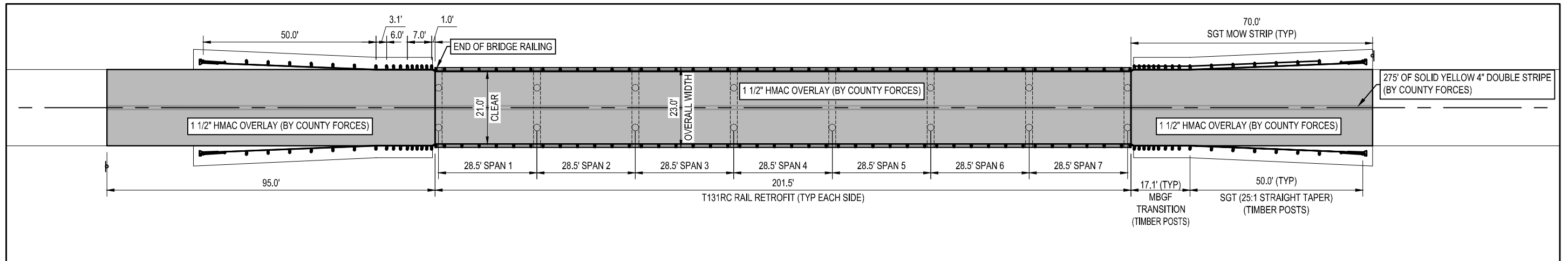
**RABBIT CREEK BRIDGE
GUARDRAIL REPLACEMENT
FRITZ SWANSON ROAD
GREGG COUNTY, TEXAS**

C4.0 DEMOLITION PLAN

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VICINITY MAP



JOB # 2563-004

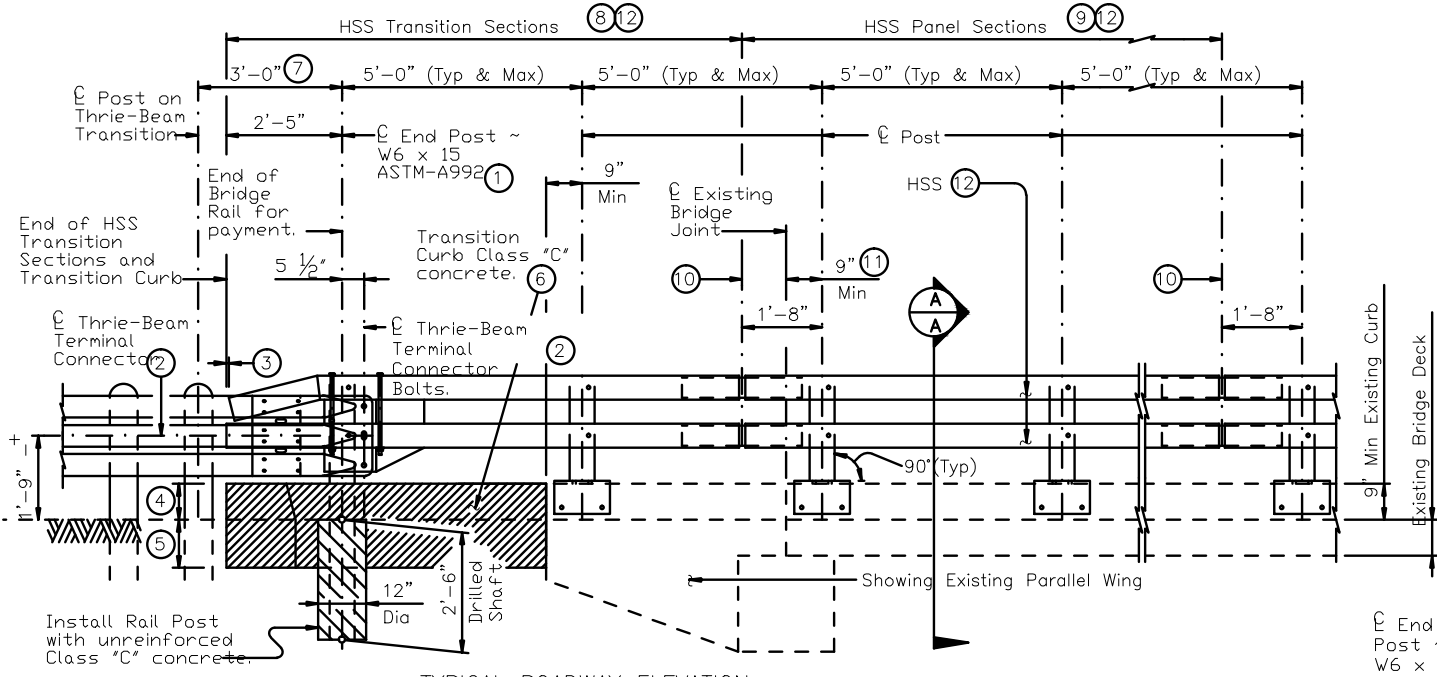
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**RABBIT CREEK BRIDGE
GUARDRAIL REPLACEMENT
FRITZ SWANSON ROAD
GREGG COUNTY, TEXAS**

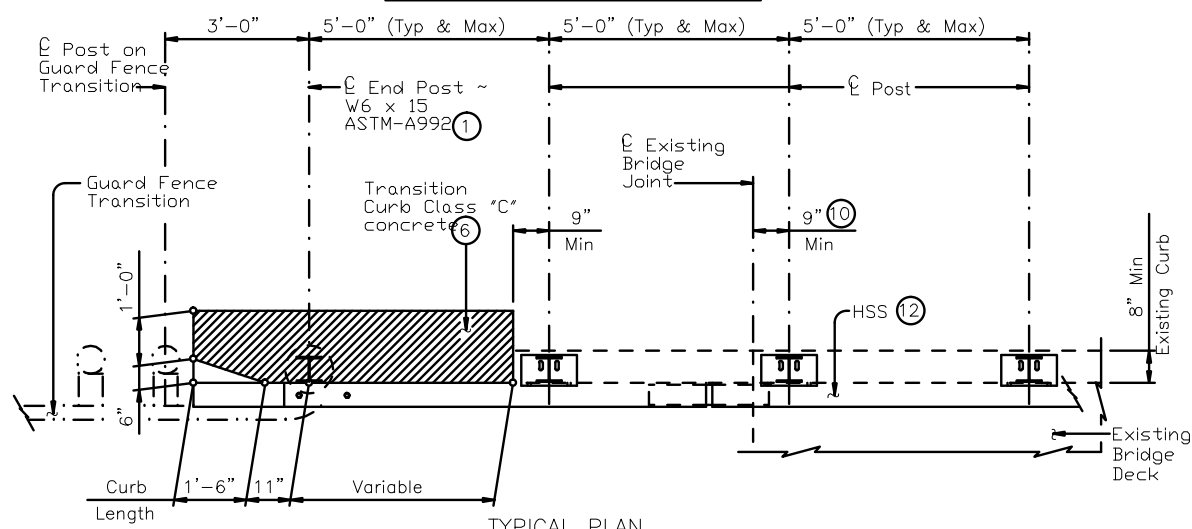
C5.0 GUARDRAIL RETROFIT PLAN

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FILE:



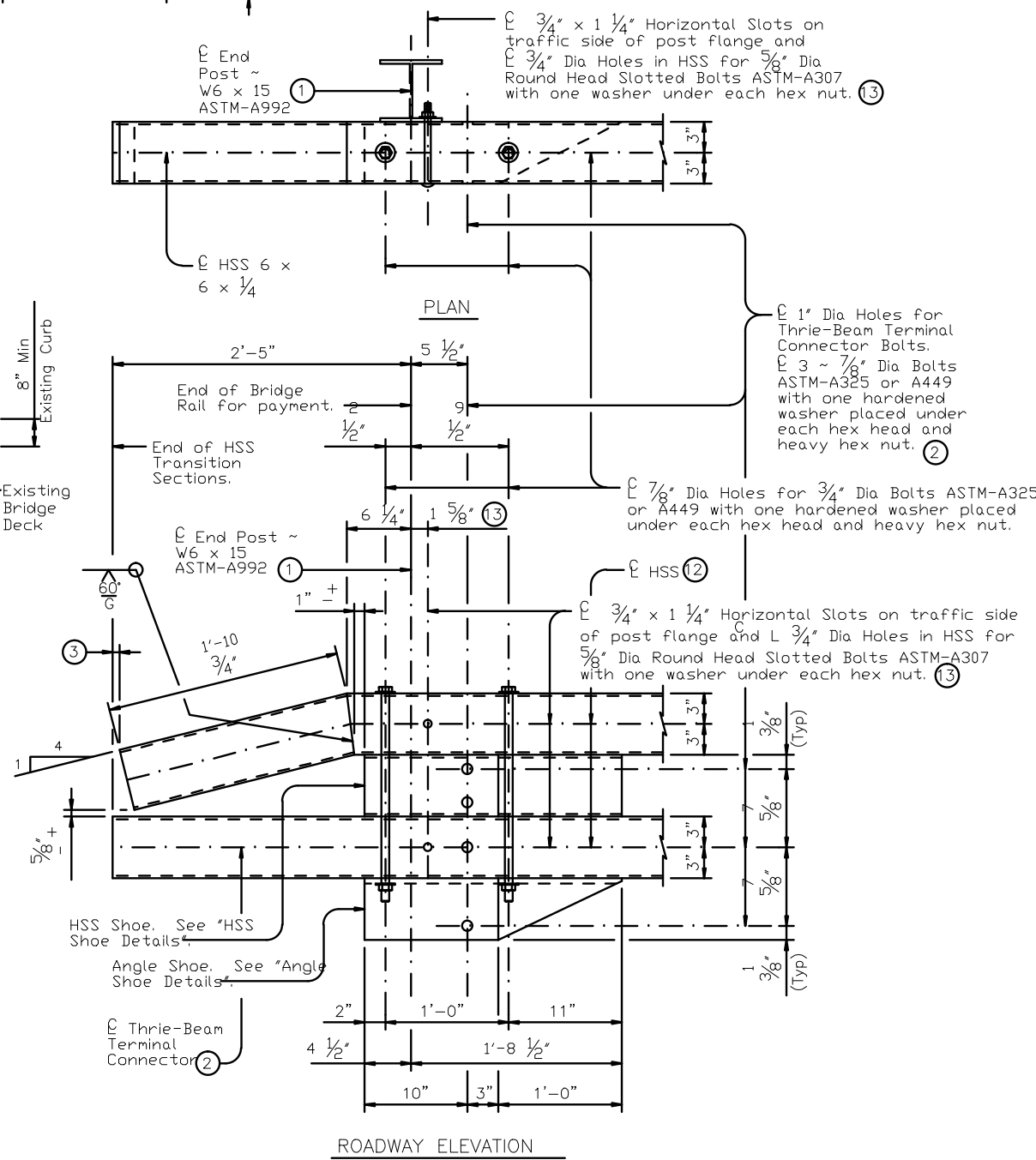
TYPICAL ROADWAY ELEVATION



TYPICAL PLAN

EXAMPLE "A" RETROFIT WITH PARALLEL WING
(Showing 9" high and 8" wide curbs, higher and wider curbs similar)

- ① Post length = Top of rail elevation minus bottom of drilled shaft elevation.
- ② Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach the appropriate Metal Beam Guard Fence Transitions or Downstream Anchor Terminal to the bridge rail using 3 bolts as shown, and extend along the embankment.
- ③ Top HSS can be shorter than bottom HSS $\frac{5}{8}$ " plus or minus.
- ④ Match existing bridge curb height.
- ⑤ Cast transition curb 1'-0" into soil or top of concrete approach slab. Remove any asphaltic concrete or mow strip if present.
- ⑥ Match existing bridge curb face on traffic side of transition curb. Transition curb 6" x 1'-6" taper will remain vertical.
- ⑦ Showing first post for a TL-3 rated guard fence transition.
- ⑧ HSS Transition Sections must have one soil mounted end post embedded in an unreinforced, Class "C" concrete drilled shaft as shown, and a minimum of one curb mounted post per transition section.
- ⑨ HSS Panel Sections must have a minimum of three posts and a maximum of eight posts per panel section.
- ⑩ L HSS Expansion Joint or L HSS Splice Joint as required.
- ⑪ Use 9" minimum for both expansion joints and construction/controlled joints.
- ⑫ HSS 6 x 6 x $\frac{1}{4}$ ASTM-A1085 or A500 Grade C.
- ⑬ May be placed on either side of W6 x 15 web.



ROADWAY ELEVATION

HSS TRANSITION SECTION END DETAILS

Thrie-Beam Terminal Connector not shown for clarity.

CONSTRUCTION NOTES:
 Provide Type VIII epoxy mortar under post base plates if gaps larger than $\frac{1}{16}$ " exist.
 One shop splice per rail member section is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Round or chamfer exposed edges of HSS rail, rail post and plate to approximately $\frac{1}{16}$ " by grinding.
 Submit erection drawings showing panel lengths, splice locations, post placement, anchor bolt locations and adhesive anchor test data to demonstrate pullout strength to the Engineer for approval. Shop drawings are not required.

MATERIAL NOTES:
 Galvanize all steel components except reinforcing steel.
 Provide Grade 60 reinforcing steel.
 Provide Class "C" concrete. As an alternate, provide Class "K" concrete, or a Type A-2 or Type C concrete repair material per DMS-4655 "Concrete Repair Materials". Do not use Type "B" (Ultra-Rapid) concrete repair materials.

Anchor bolts must be $\frac{3}{4}$ " Dia ASTM-A193 Gr B7 or ASTM-A449 fully threaded rods with one heavy hex nut and one hardened washer each. Embed threaded rods $6\frac{3}{4}$ " Min into concrete curb using a Type III, Class C, D, E, or F epoxy adhesive anchorage system capable of obtaining an ultimate load, per threaded rod, of 30 kips in tension. Submit evidence of the proposed epoxy adhesive anchorage system's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean-out, must be in accordance with the manufacturer's instructions.

DESIGN NOTES:
 This retrofit railing has been successfully evaluated by full-scale crash test to meet MASH TL-3 criteria. This retrofit railing can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used.
 Rail anchorage details shown on this guide may require modification for select structure types.
 See "Section A-A" for limits on existing overlay/seal coats thickness based on existing curb height.
 This rail is to be paid for as "Retrofit Rail (Ty T131RC)" under Item 451 "Retrofit Railing".
 Average weight with no overlay:
 55 plf (9", 11" & 12" Curbs)
 53 plf (18" Curbs)

Cover dimensions are clear dimensions, unless noted otherwise.

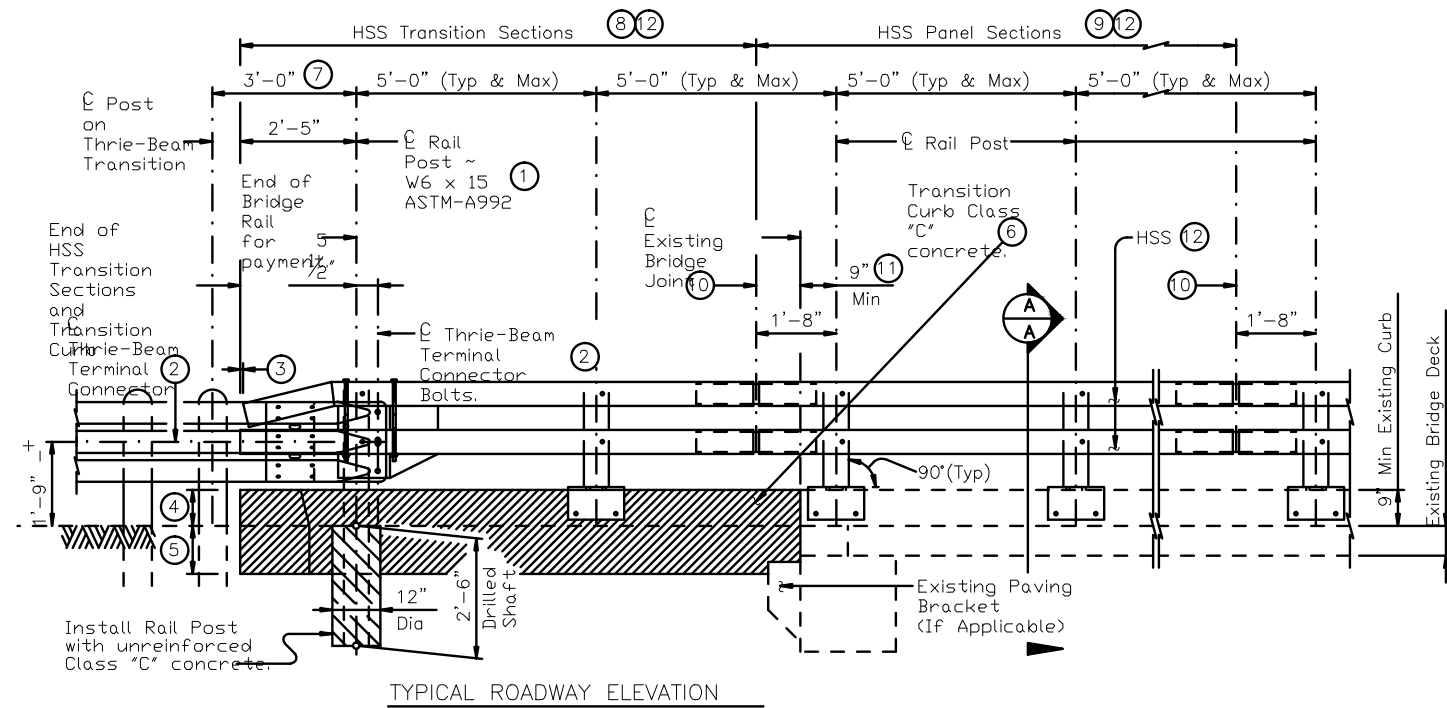


SHEET 1 OF 4

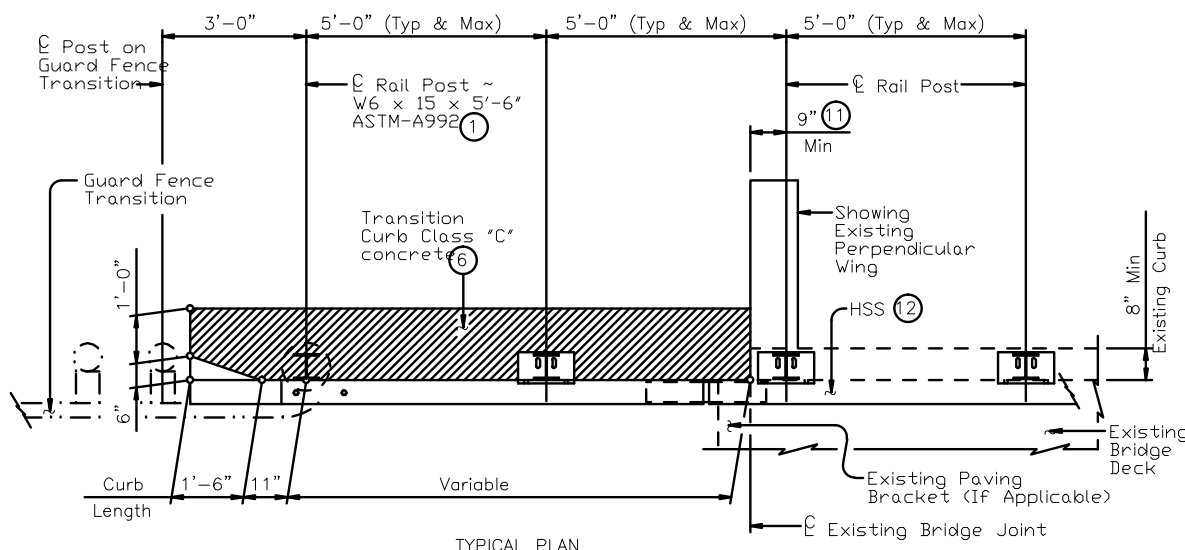
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				RETROFIT GUIDE FOR T131RC RAIL ON CURBS RABBIT CREEK BRIDGE FRITZ SWANSON ROAD TYPE T131RC (MOD)	
FILE: r1stds34.dgn	DW: TxDOT	CHK: JMH	DWG: JTR	CHK: MAS	
© TxDOT July 2014		CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY	SHEET NO. C6.0	
03-16: Revised Material Notes.					

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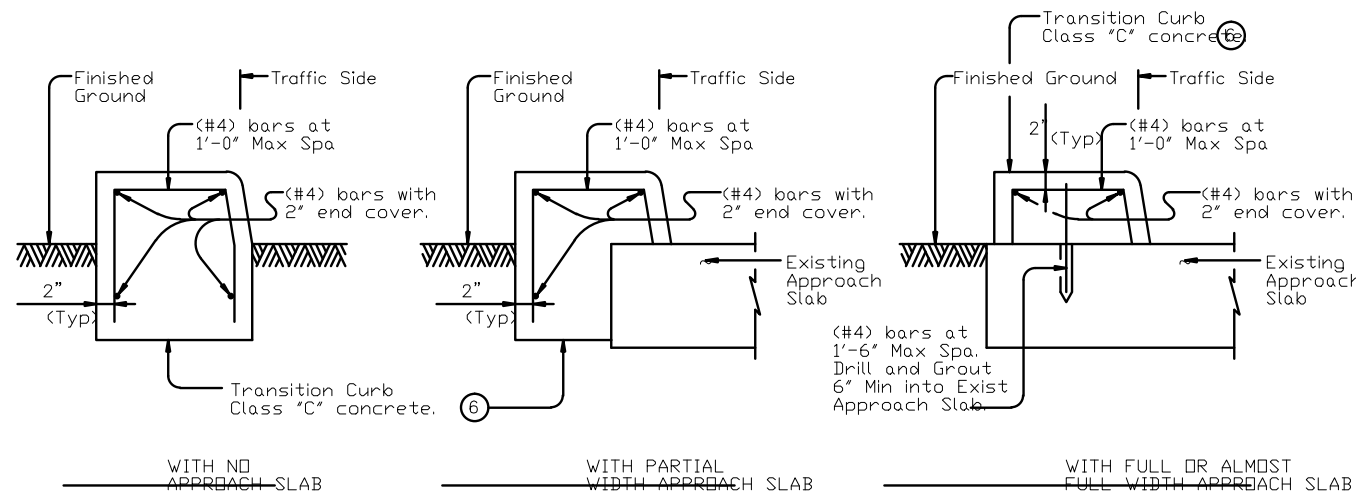
TYPICAL ROADWAY ELEVATION



TYPICAL PLAN

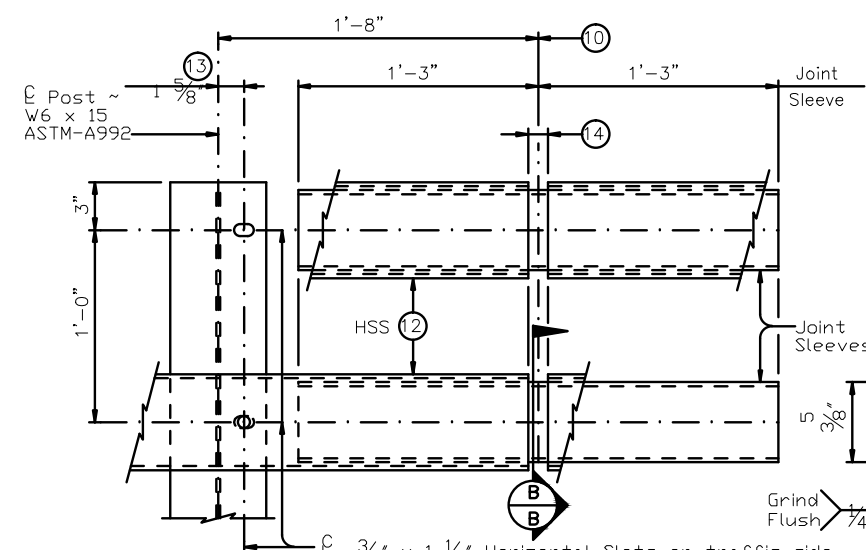
EXAMPLE "B" RETROFIT WITH PERPENDICULAR WING

(Showing 9" high and 8" wide curbs, higher and wider curbs similar)



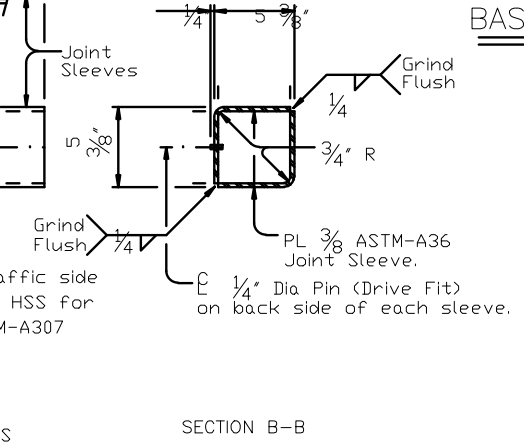
EXAMPLES OF TRANSITION CURB SECTIONS

- 1 Post length = Top of rail elevation minus bottom of drilled shaft elevation.
- 2 Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach the appropriate Metal Beam Guard Fence Transitions or Downstream Anchor Terminal to the bridge rail using 3 bolts as shown, and extend along the embankment.
- 3 Top HSS can be shorter than bottom HSS 5/8" plus or minus.
- 4 Match existing bridge curb height.
- 5 Cast transition curb 1'-0" into soil or top of concrete approach slab. Remove any asphaltic concrete or mow strip if present.
- 6 Match existing bridge curb face on traffic side of transition curb. Transition curb 6" x 1'-6" taper will remain vertical.
- 7 Showing first post for a TL-3 rated guard fence transition. First post for a TL-2 rated guard fence transition or a guard fence downstream anchor terminal is 4'-4 3/4".
- 8 HSS Transition Sections must have one soil mounted end post embedded in an unreinforced, Class "C" concrete drilled shaft as shown, and a minimum of one curb mounted post per transition section.
- 9 HSS Panel Sections must have a minimum of three posts and a maximum of eight posts per panel section.
- 10 L HSS Expansion Joint or L HSS Splice Joint as required.
- 11 Use 9" minimum for both expansion joints and construction/controlled joints.
- 12 HSS 6 x 6 x 1/4 ASTM-A1085 or A500 Grade C.
- 13 May be placed on either side of W6 x 15 web.
- 14 Place HSS Expansion Joints in rail at every slab Expansion Joint. For Expansion and Splice Joints openings, use the greater of 1" or (slab opening plus 1/2").



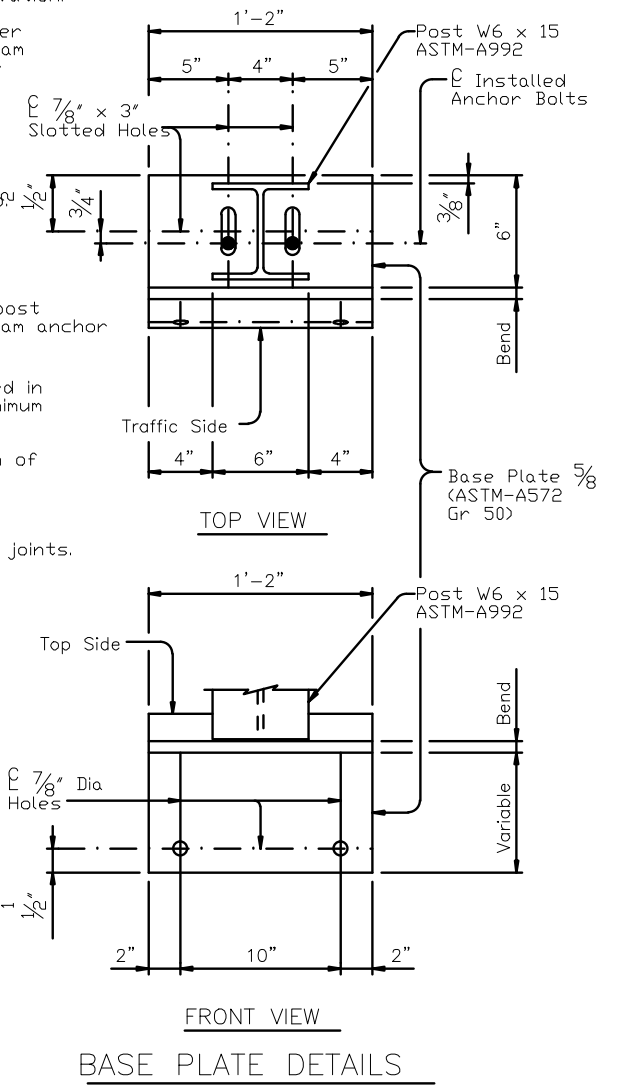
TYPICAL POST CONNECTION AND SPLICE DETAIL FOR HSS

Showing post with HSS and HSS splice.



SECTION B-B

Showing typical joint sleeve.



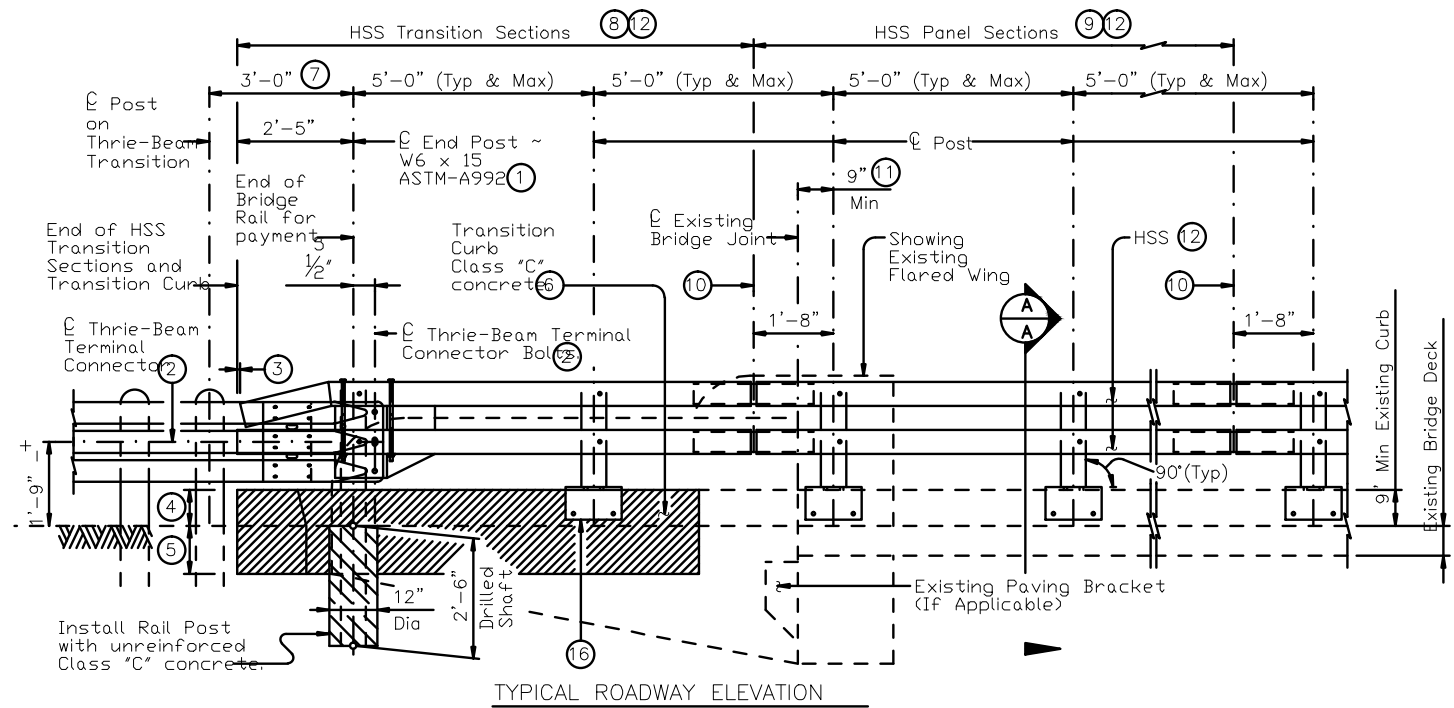
BASE PLATE DETAILS



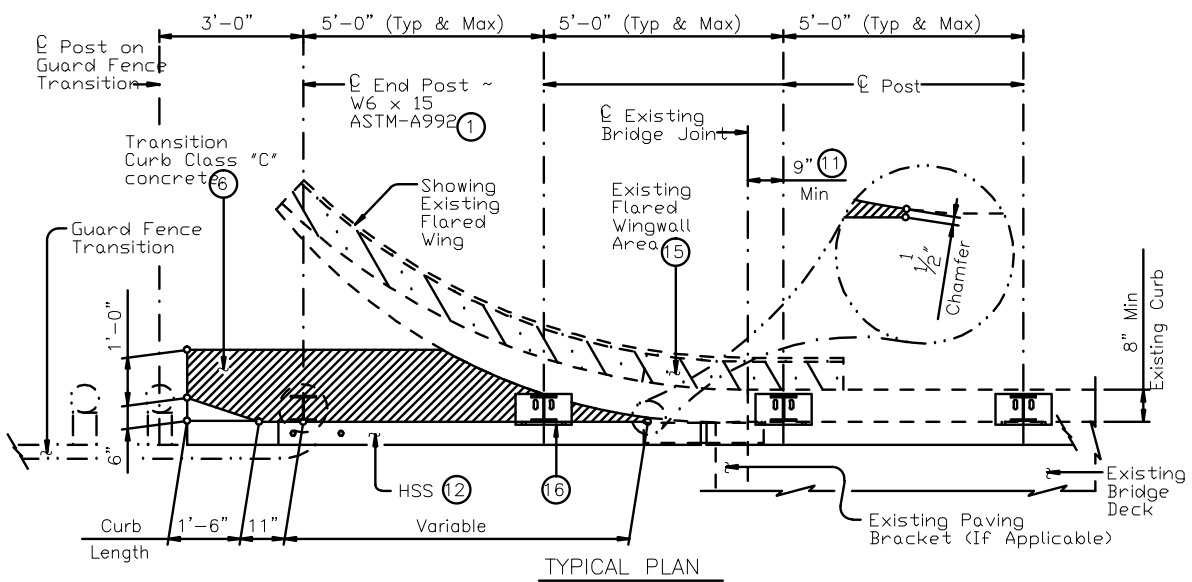
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RETROFIT GUIDE FOR T131RC RAIL ON CURBS RABBIT CREEK BRIDGE FRITZ SWANSON ROAD TYPE T131RC (MOD)			
FILE: r1stds34.dgn	DN: TxDOT	CK: JMH	DW: JTR
©TxDOT July 2014	CONT	SECT	JOB
REVISIONS			
03-18: Revised Material Notes.	DIST	COUNTY	SHEET NO.
			C6.1

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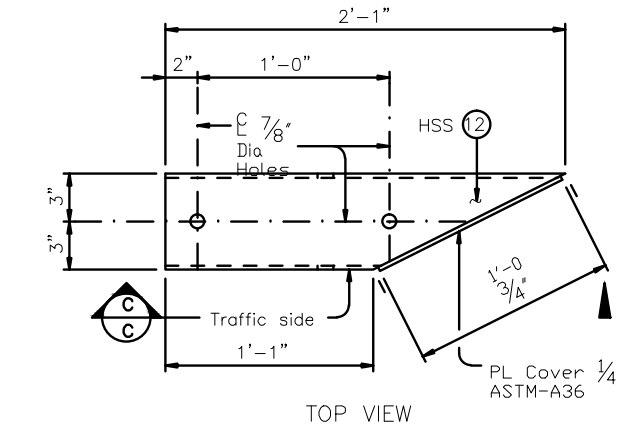
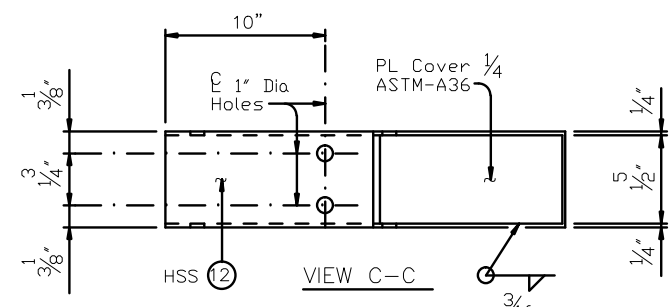
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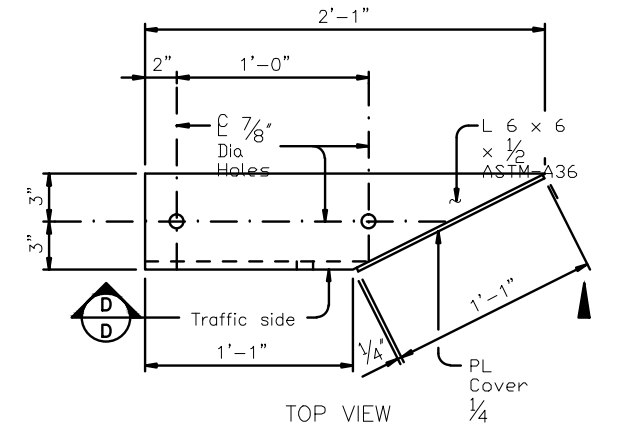
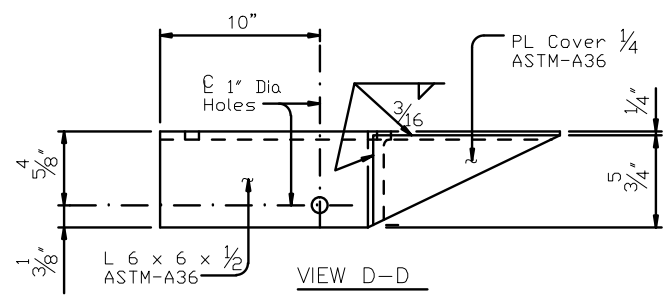
TYPICAL ROADWAY ELEVATION



EXAMPLE "C" RETROFIT WITH FLARED WING
(Showing 9" high and 8" wide curbs, higher and wider curbs similar)



HSS SHOE DETAILS



ANGLE SHOE DETAILS

Angle Shoe shown is detailed for one side only, other side similar. For other side shoe must be built for opposite hand.

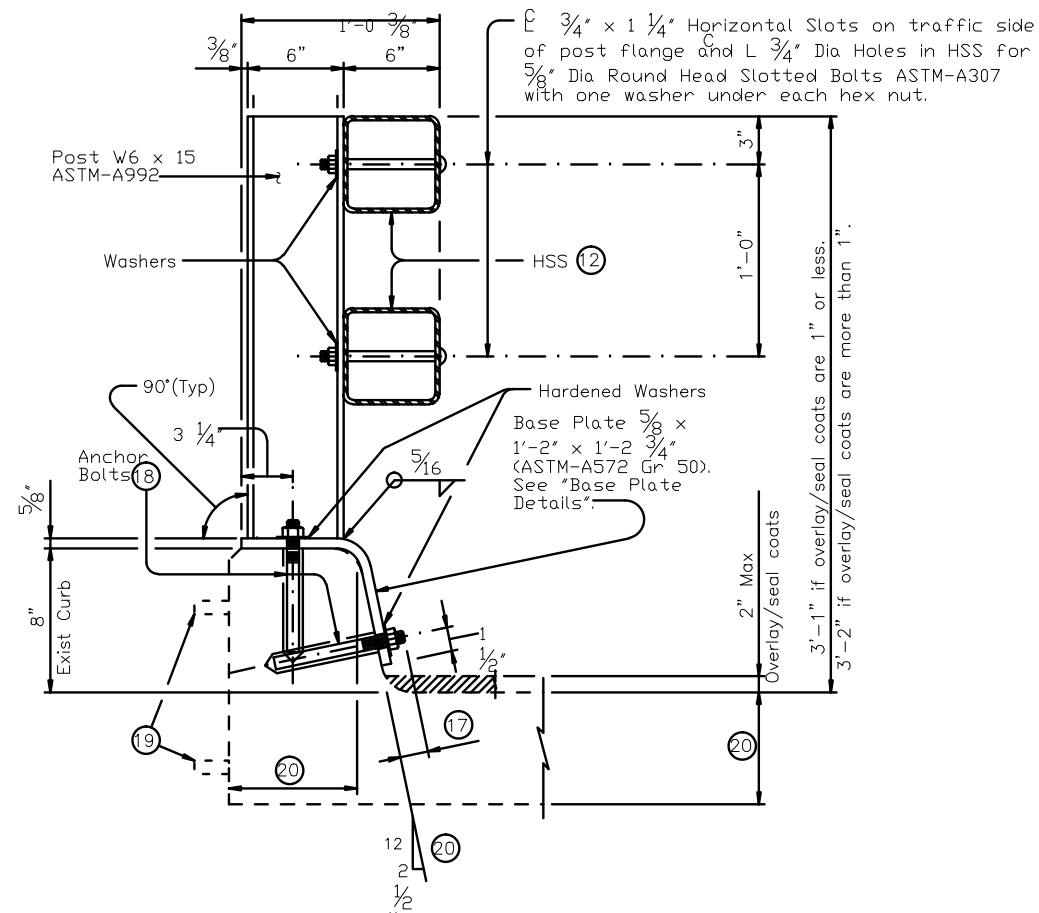
- 1 Post length = Top of rail elevation minus bottom of drilled shaft elevation.
- 2 Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". The appropriate Metal Beam Guard Fence Transitions or Downstream Anchor Terminal must be attached to the bridge rail and extended along the embankment.
- 3 Top HSS can be shorter than bottom HSS 5/8" plus or minus.
- 4 Match existing bridge curb height.
- 5 Cast transition curb 1'-0" into soil or top of concrete approach slab. Remove any asphaltic concrete or mow strip if present.
- 6 Match existing bridge curb face on traffic side of transition curb. Transition curb 6" x 1'-6" taper will remain vertical.
- 7 Showing first post for a TL-3 rated guard fence transition. First post for a TL-2 rated guard fence transition or a guard fence downstream anchor terminal is 4'-4 3/4".
- 8 HSS Transition Sections must have one soil mounted end post embedded in an unreinforced, Class "C" concrete drilled shaft as shown, and a minimum of one curb mounted post per transition section.
- 9 HSS Panel Sections must have a minimum of three posts and a maximum of eight posts per panel section.
- 10 HSS Expansion Joint or HSS Splice Joint as required.
- 11 Use 9" minimum for both expansion joints and construction/controlled joints.
- 12 HSS 6 x 6 x 1/4 ASTM-A1085 or A500 Grade C.
Remove all existing structure area from top of existing curb. Cut and grind flush all existing reinforcing extending from top of
- 15 existing curb and paint ends with two coats of zinc-rich paint conforming to the Item "Galvanizing".
- 16 Only one post can be mounted to the transition curb as shown and the transition curb must be supported laterally by the existing wingwall/curb when doing so.



SHEET 3 OF 4

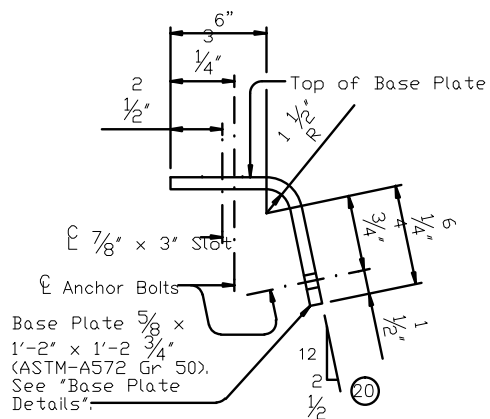
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RETROFIT GUIDE FOR T131RC RAIL ON CURBS RABBIT CREEK BRIDGE FRITZ SWANSON ROAD TYPE T131RC (MOD)			
FILE: r1stds34.dgn	DN: TxDOT	CK: JMH	DW: JTR
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REVISIONS		HIGHWAY	
05-18: Revised Material Notes.	DIST	COUNTY	SHEET NO.
			C6.2

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SECTION A-A OF 8" HIGH CURBS

(Showing example of 8" Min width curb, wider curbs similar)



9" HIGH CURB BASE PLATE DETAIL

- ⑫ HSS 6 x 6 x 1/4 ASTM-A1085 or A500 Grade C.
- ⑬ 1 3/4" Bolt Projection (Typ).
- ⑭ See "Material Notes" for anchor Bolt information.
- ⑮ Remove existing railing (including posts), cut and grind anchor bolts flush and paint ends with two coats of zinc-rich paint conforming to the Item "Galvanizing".
- ⑯ See elsewhere in plans for dimensions (curb width and height, slab and overlay thickness). Slope of curb may differ from what is shown. Adjust base plate as necessary to conform to curb face geometry.

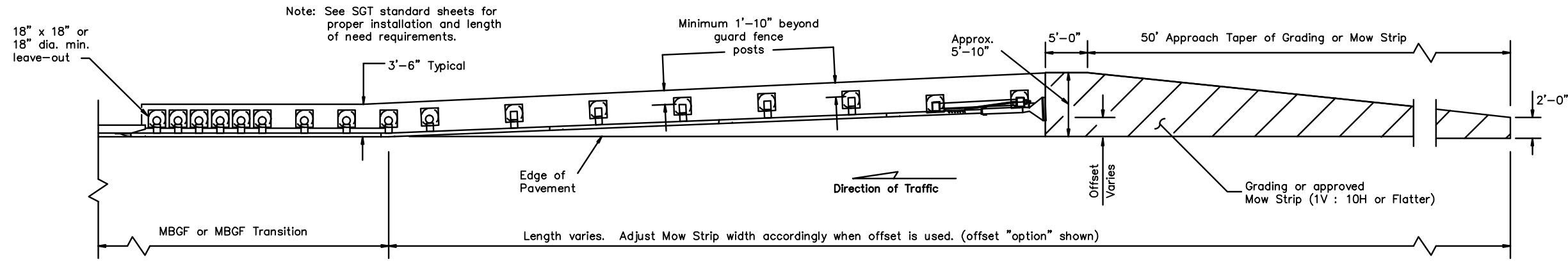


SHEET 4 OF 4

		Bridge Division Standard	
RETROFIT GUIDE FOR T131RC RAIL ON CURBS RABBIT CREEK BRIDGE FRITZ SWANSON ROAD TYPE T131RC (MOD)			
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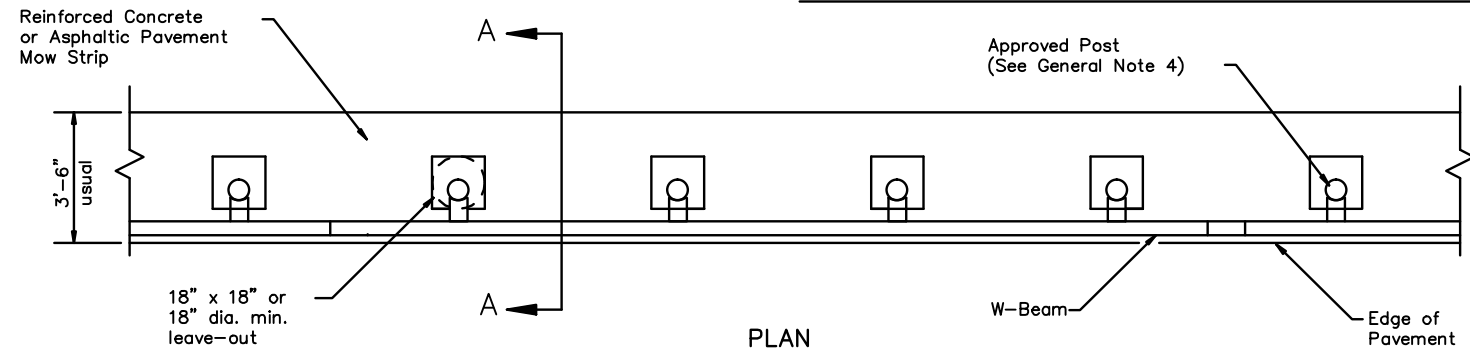
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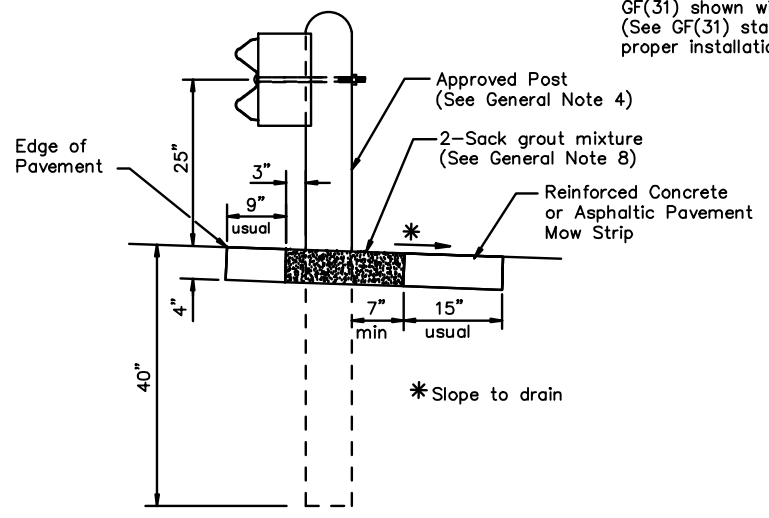
GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

Note: Site Condition(s)
 Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.
 Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

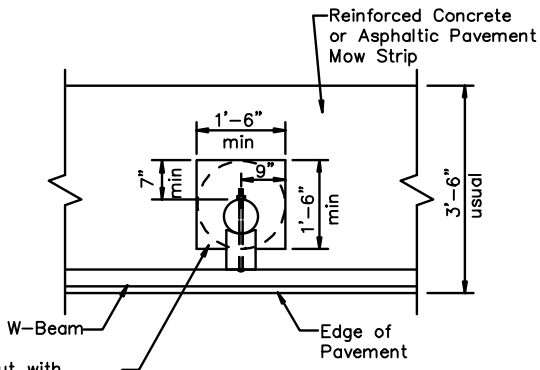


PLAN

GF(31) shown with Mow Strip (See GF(31) standard sheet for proper installation)



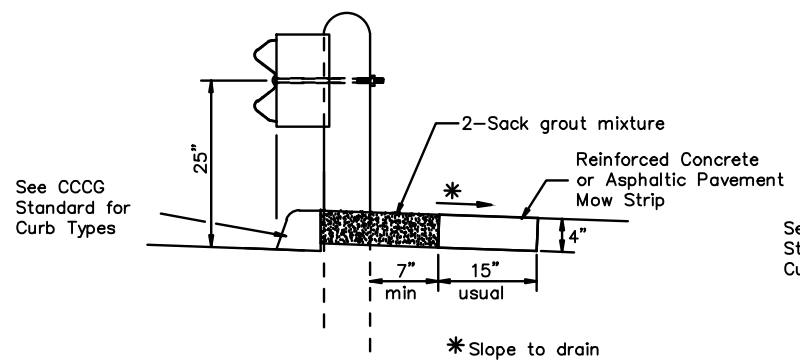
SECTION A-A
Typical



MOW STRIP DETAIL

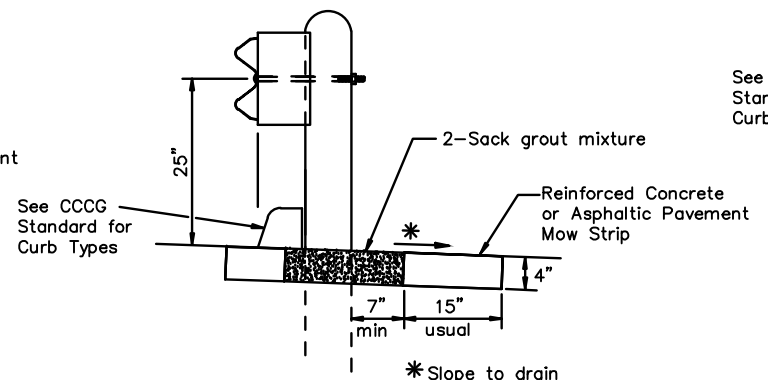
Reinforced Concrete or Asphaltic Pavement Mow Strip with 18" x 18" or 18" dia. minimum leave-out.

Fill leave-out with 2-Sack grout mixture (See General Note 8)



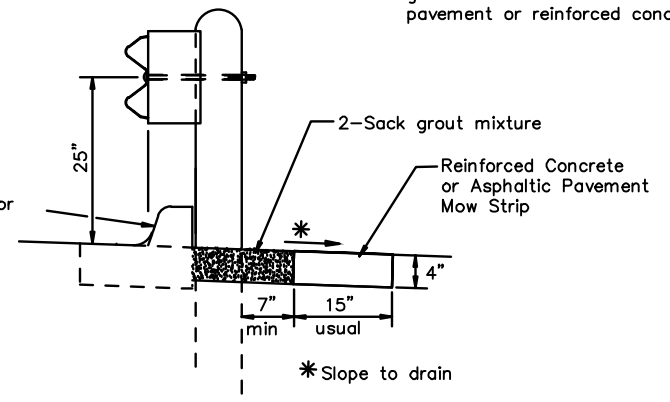
CURB OPTION (1)

This option will increase the post embedment through out the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments (See SGT standards for proper SGT installation).
2. Mow strips shall be asphaltic pavement or reinforced concrete (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Asphaltic pavement shall meet the requirements of the item, and be placed in accordance with the pertinent bid item as shown in the plans. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. The type of approved post will be as shown in the plans. See the applicable standard sheets for additional details and information.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for asphaltic pavement or reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with no more than a 2-sack grout mixture and placed in accordance with Section 421.2.F, "Mortar and Grout." Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of asphaltic pavement or reinforced concrete.

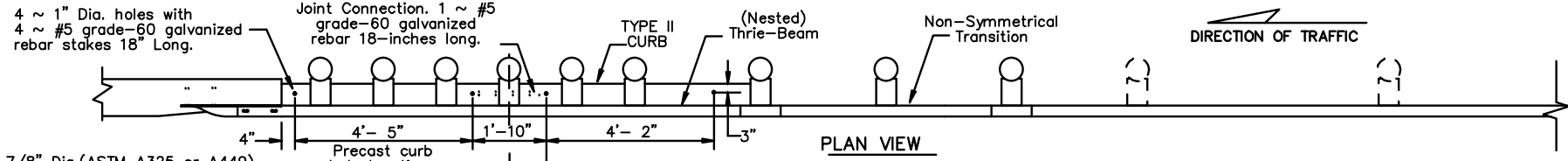


METAL BEAM GUARD FENCE (MOW STRIP)
GF(31)MS-11

FILE: gf31ms11.dgn	DWG: TxDOT	CHK: AM	DWG: BD	CHK:
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5 ~ 7/8" Dia. (ASTM A325 or A449) Heavy Hex Head Bolts, with two 1 3/4" O.D. washers under each head and nut. Bolts shall be of sufficient length to extend through the full thickness of the rail, washer, and nut. Install with bolt heads on traffic face.

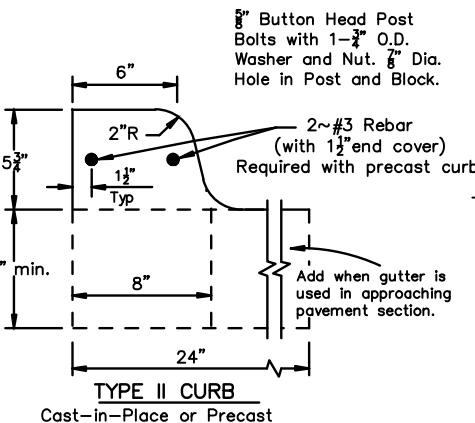
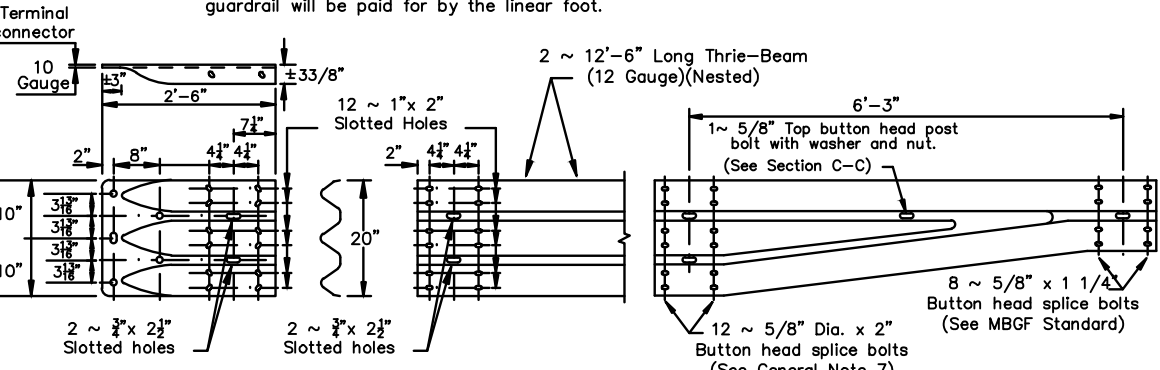
Chamfer required on concrete rails that extend beyond the face of the curb and/or guardrail transition.

4-#5 Gr.60 Galv. Rebar 18" Long

Type II Curb Joint Connection (See precast curb note)

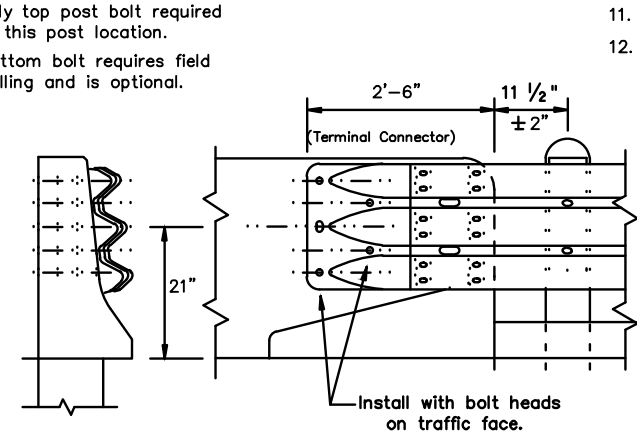
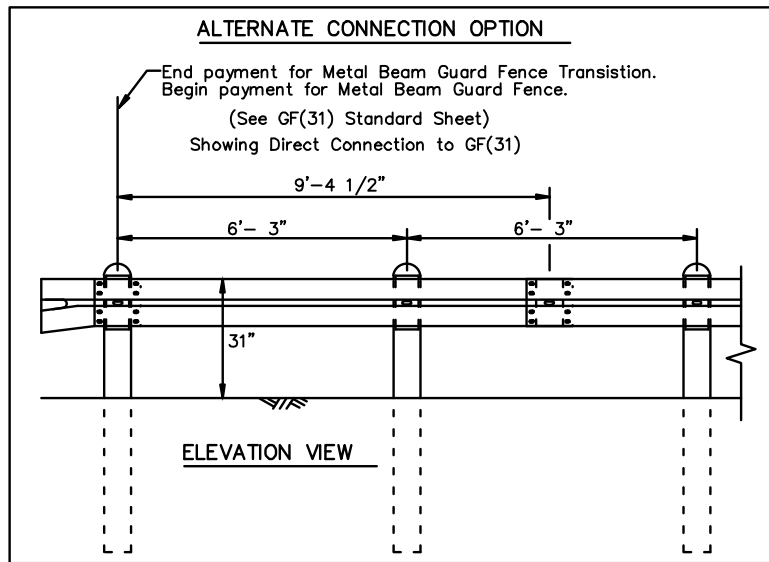
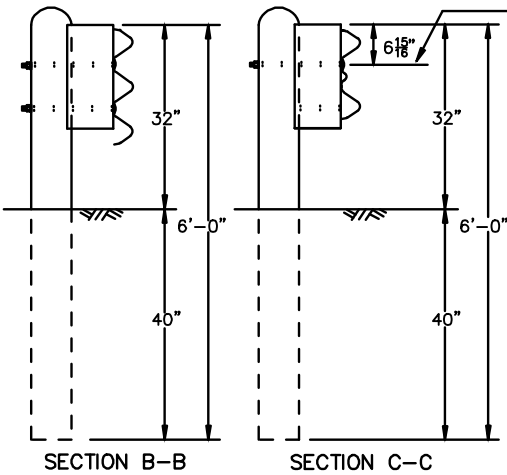
Concrete curb Type II subsidiary to "Metal Beam Guard Fence Transitions". If no additional curb is indicated beyond the transition, then any curb height greater than 4" will be tapered down beginning at the last 7 ft. post to a maximum height of 4" at the first 6 ft post.

If shown elsewhere in the plans, additional curb underneath guardrail will be paid for by the linear foot.

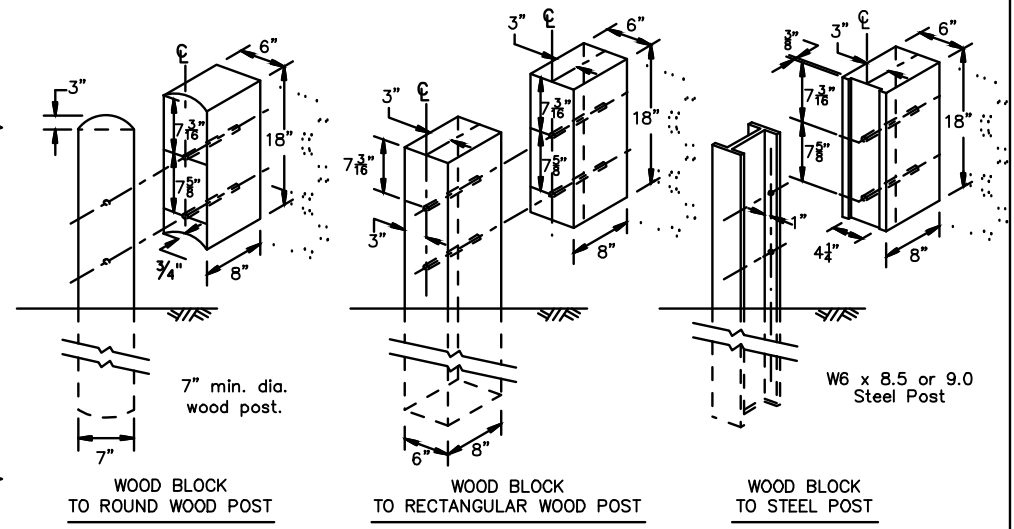


PRECAST CURB: Type II Precast Curb secured with 4-#5 Gr.60 Galv. Rebar stakes 18" long. The 12'-2" section of curb may be cast in two sections. Section 1 5'-8" long Section 2 6'-6" long with the last 3'-6" of curb tapered to a 4" height. The Joint Connection is two 9" long 1" Dia. female ends connected with 1-#5 Gr.60 Galv. Rebar 18" long.

*Note: (All post types) (See General Note 3)



(12) Galvanized rectangular washers (FWR03) are required under the recessed nut at the terminal connector splice to nested thrie-beam. (See General Notes 6 & 7).



- GENERAL NOTES**
- Concrete curb may be cast-in-place or precast as shown on this sheet. When used in conjunction with thrie-beam guard fence transitions, curb shall be Type II (Typically 5 3/4" height above surface; See CCCG standard sheet) unless otherwise shown in the plans. If other curb heights are shown in the plans in conjunction with the transition, the curb height may be from 4" to 8" with a relatively vertical face. Concrete curb shall be continuous to the seventh post.
 - Contact the Design Division for drainage cut options needed within the curb section of the transition.
 - The type of post (round wood post, rectangular wood post or steel post) will be as shown in the plans.
 - The post length shall be marked on all 7'-0" long posts by the Manufacturer. The mark shall be located within the top 1 ft. region of the post, at least 5/8" in height, and visible after installation. Wooden posts shall be marked with a brand, and steel posts with a stencil before galvanizing.
 - Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified on the plans. The thrie-beam terminal connector and the thrie-beam transition to w-beam shall be of the same material, but shall not be less than 10 gauge. Contractor shall verify that the locations of bolt holes match those in the thrie-beam terminal connector prior to ordering materials.
 - Unless otherwise shown in the plans, transitions shall be placed with the block face in front of or directly above the curb face.
 - Galvanized washers used with the 5/8" dia. post bolts shall be Type A 1 3/4" O.D. washers. The (12) plate washers (FWR03) required at the terminal connector splice.
 - Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) 5/8" Dia. x 2" (at triple rail splices) with 5/8" double recessed nuts.
 - 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 transitions.
 - If solid rock is encountered. See the MBGF standard sheet for the proper installation guidance.
 - Posts shall not be set in concrete.
 - 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.

Texas Department of Transportation

Design Division Standard

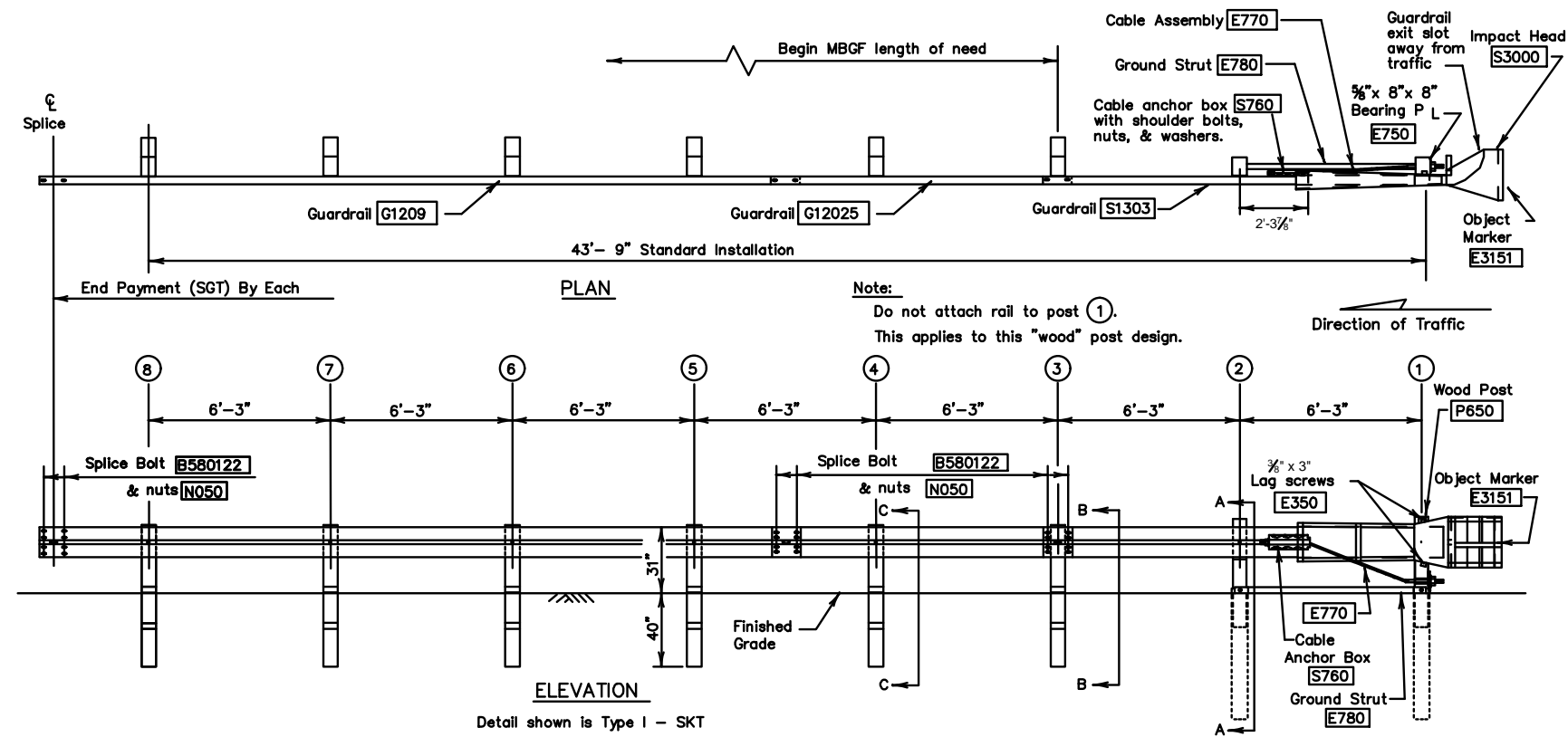
METAL BEAM GUARD FENCE TRANSITION (Thrie-Beam Transition) GF(31)TR-14

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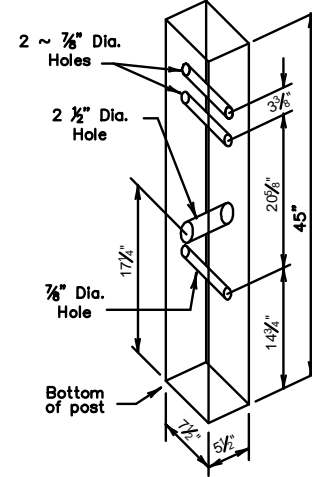
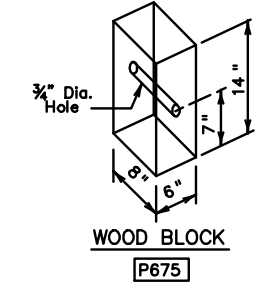
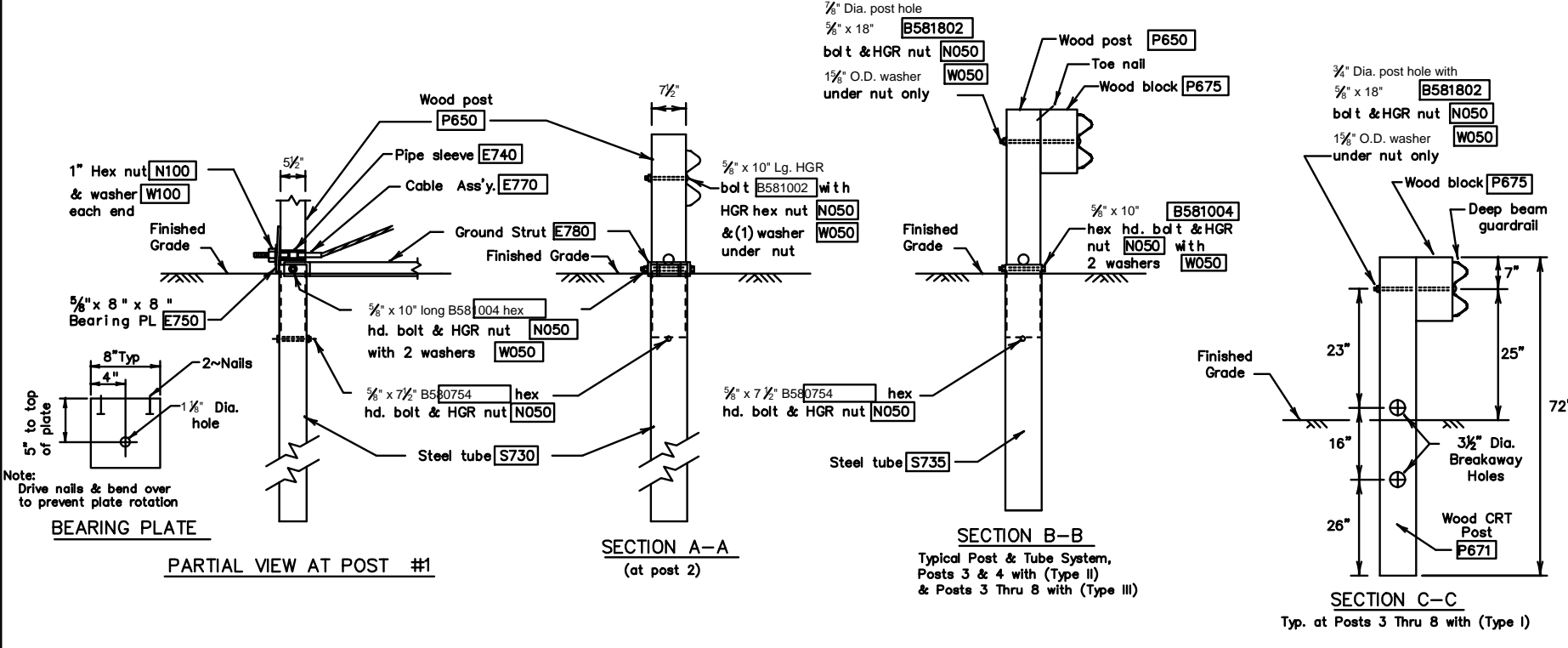
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- GENERAL NOTES**
- For additional information contact: Interstate Steel Inc. (432) 263-3735
 - The Type of SGT unit will be specified elsewhere in the plans. The numbers in the circles indicate post position. The Type of SGT unit chosen is a maintenance consideration and does not affect the systems performance.

Post & Tube Options		Post Only	
Type I Posts	1 thru 2	Type II Posts	1 thru 8
Type II Posts	3 thru 8	Type III Posts	1 thru 8
Type III Posts	1 thru 8		None
 - 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 over the first 50 ft. of the system to prevent the terminal head from encroaching 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. The bearing plate on the front post shall also be "toe nailed" to prevent rotation.
 - 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 if directed by the Engineer.
 - An object marker shall be installed on the front of the impact head as detailed on D&OM(VIA).

Detail shown is Type I - SKT

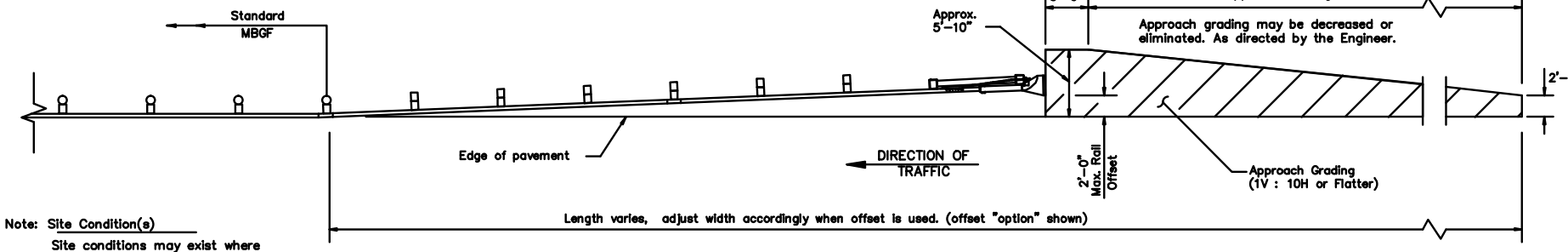


All measurements should be taken from bottom of posts.

UNIVERSAL WOOD POST (P650)

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

Item #	POST & TUBE OPTIONS			DESCRIPTION
	Type I	Type II	Type III	
S1303	1	1	1	Guardrail (12 Ga.) 12'- 6" SKT
G12025	1	1	1	Guardrail (12 Ga.) 9'- 4 1/2"
G1209	1	1	1	Guardrail (12 Ga.) 25'- 0"
S730	2	2	2	Steel Tube - 6" x 8" x 72" x 1/8" min. or 3/16"
S735	0	2	6	Steel Tube - 6" x 8" x 54" x 1/8" min. or 3/16"
P650	2	4	8	Wood Posts - 5 1/2" x 7 1/2" x 45"
P671	6	4	0	Wood CRT Posts - 6" x 8" x 72"
P675	6	6	6	Wood Block - 6" x 8" x 14"
E740	1	1	1	Pipe Sleeve - 2" Std. Pipe x 5 1/2"
E750	1	1	1	Bearing Plate - 1/2" x 8" x 8"
S760	1	1	1	Cable Anchor Box
E770	1	1	1	Cable Assembly
E780	1	1	1	Ground Strut
S3000	1	1	1	Impact Head
HARDWARE				
B580754	2	4	8	5/8" x 7 1/2" Hex Hd. Bolt
B581004	2	4	8	5/8" x 10" Hex Hd. Bolt (Top of Tubes)
W050	11	15	23	3/8" Washers
B581002	1	1	1	5/8" x 10" HGR Post Bolt (Post 2)
B580122	16	16	16	1/2" x 1 1/2" HGR Splice Bolt
B581802	6	6	6	5/8" x 18" HGR Post Bolt (Posts 3 thru 8)
N050	35	39	47	3/8" HGR Nut (24-Spl, Varies-Posts, 2-Strut)
E350	2	2	2	3/8" x 3" Lag Screw
N100	2	2	2	1" Hex Nut (Anchor Cable)
W100	2	2	2	1" Washer (Anchor Cable)
SB12A	8	8	8	Cable Anchor Box Shoulder Bolts
N012A	8	8	8	1/2" Structural Nut
W012A	8	8	8	1/2" Structural Washer
E3151	1	1	1	Object Marker - (18" x 18")



APPROACH GRADING AT GUARDRAIL END TREATMENTS

Design Division Standard

SINGLE GUARDRAIL TERMINAL (SKT-31) (WOOD POST) SGT(8)31-14

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