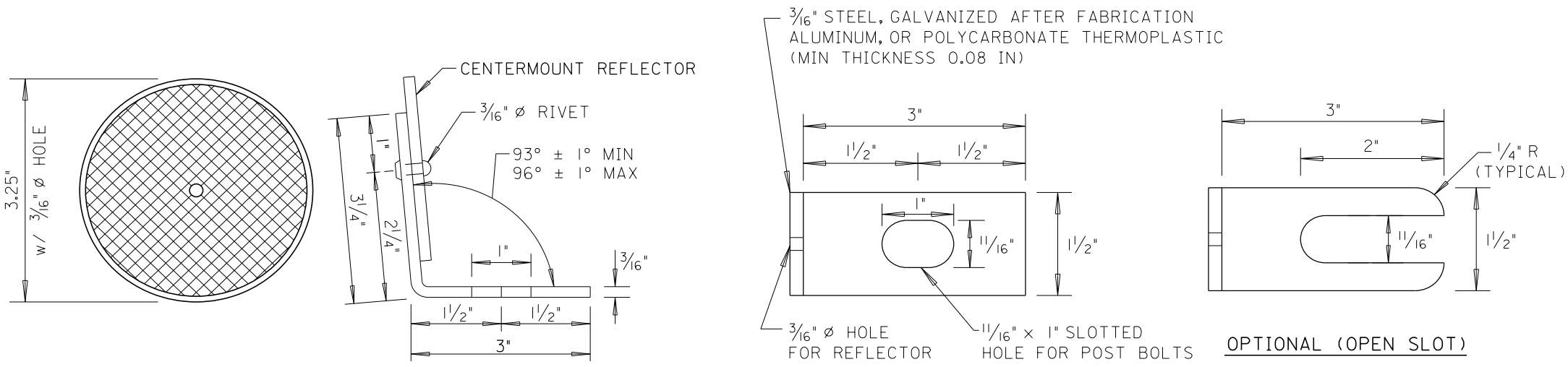
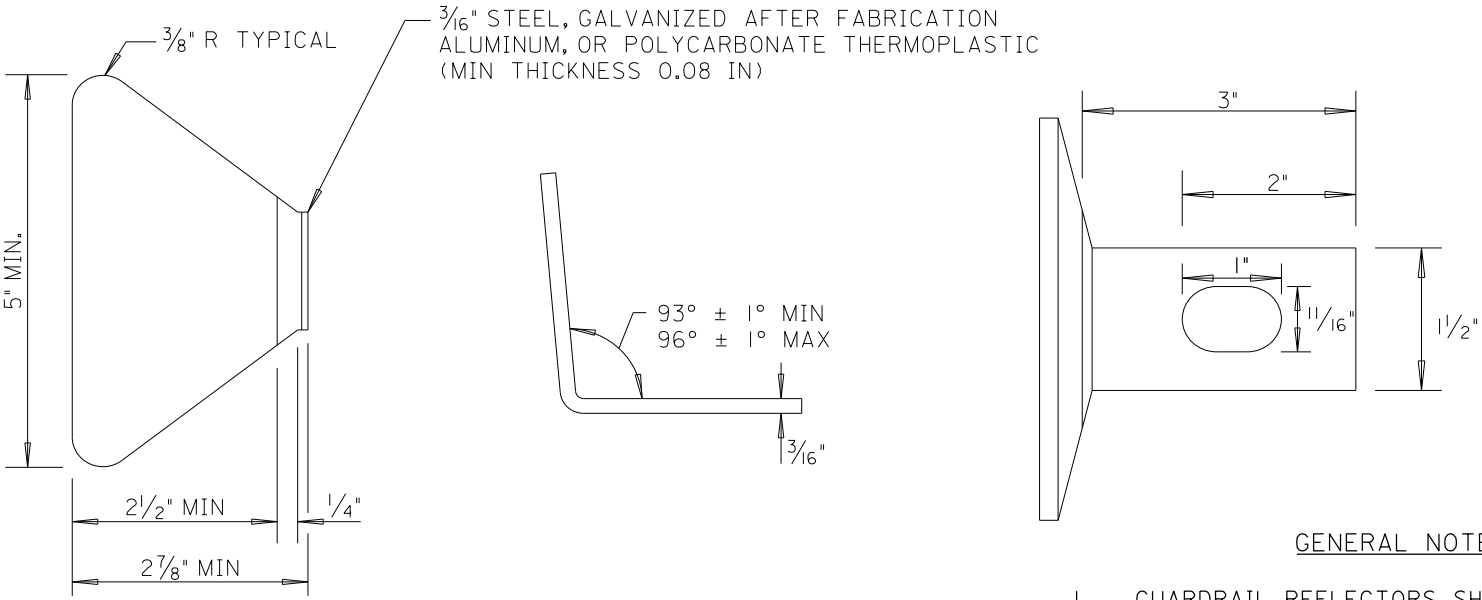


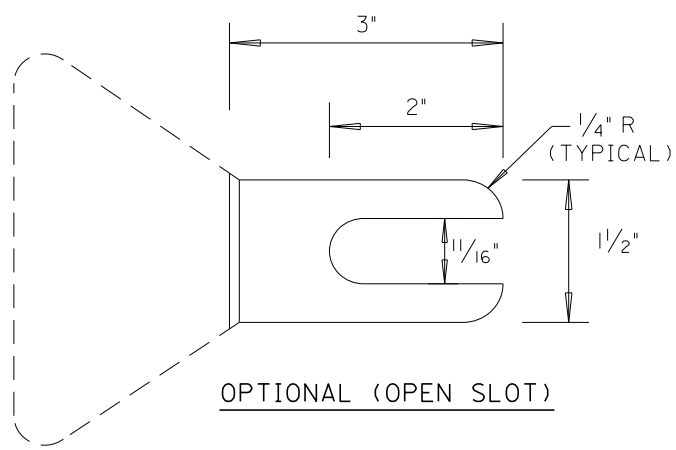
DELINEATORS (REFLECTORS)



GUARDRAIL REFLECTOR "Y"

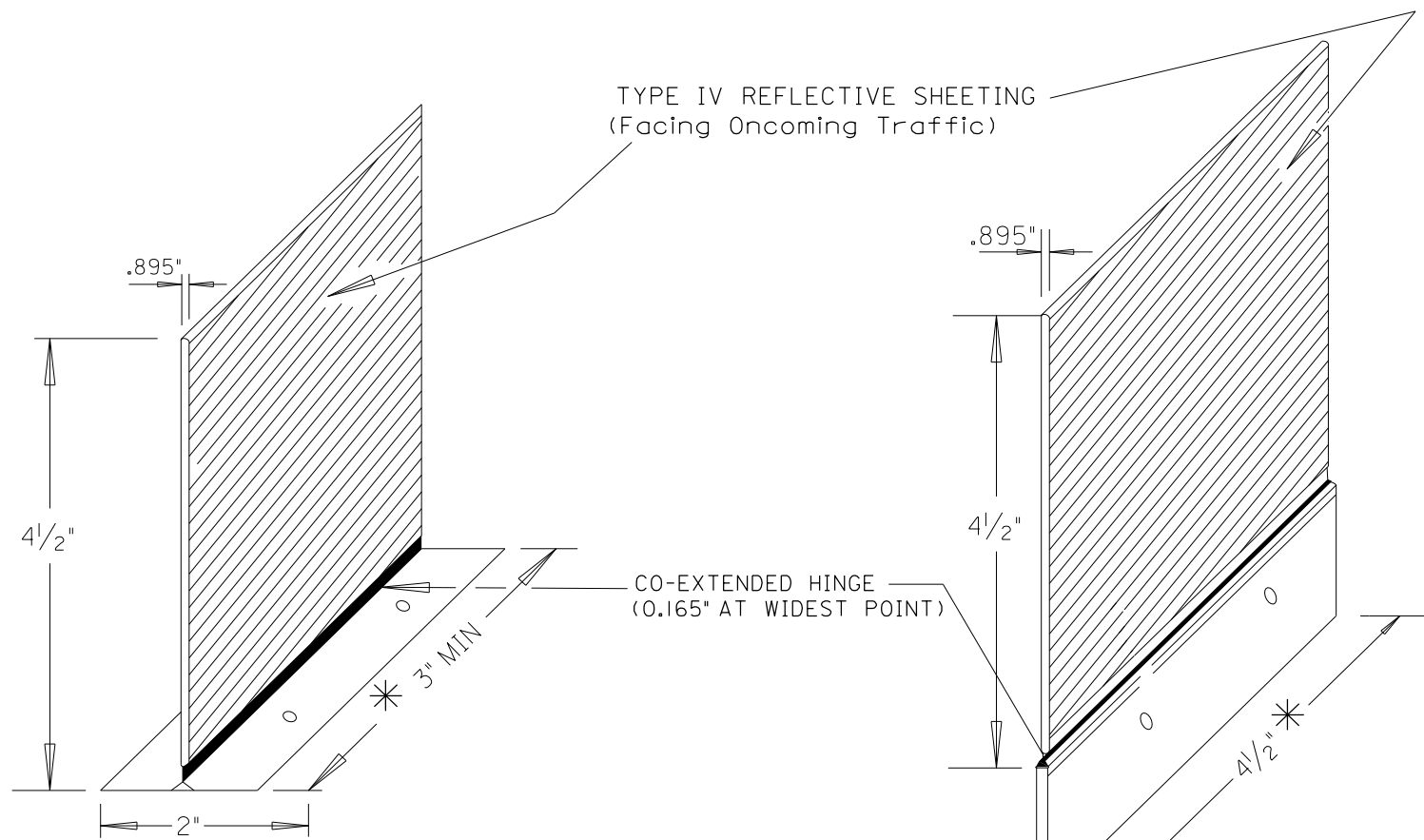


GUARDRAIL REFLECTOR "X"



OPTIONAL (OPEN SLOT)

- GENERAL NOTES:
- GUARDRAIL REFLECTORS SHALL BE THE SAME COLOR AS ADJACENT PAVEMENT EDGE STRIPE.
  - GUARDRAIL POSTS ARE SPACED 6'-3" CENTER TO CENTER UNLESS OTHERWISE NOTED ON PLANS.
  - COST OF DELINEATORS (REFLECTORS) SHALL BE INCLUDED IN THE COST BID FOR THE GUARDRAIL AND BARRIER RAIL INSTALLATION. IF THE GUARDRAIL OR THE BARRIER RAIL IS IN PLACE AND THE REFLECTORS ARE BEING ADDED AS A RETROFIT, THE REFLECTORS SHALL BE PAID AS ITEM 707-C OR 707-G.
  - REFLECTORS SHALL BE PLACED ADJACENT TO BRIDGE END AND AT ALL FREE ENDS, BOTH APPROACH AND TRAILING. TYPE X AND Y REFLECTORS SHALL BE PLACED ALONG THE GUARDRAIL LINE AT MID-SPAN SPLICE LOCATIONS ONLY AT 50 FEET MAX. INTERVALS, WITH A MINIMUM OF 3 (THREE) REFLECTORS ON ANY LENGTH OF RAIL. IT IS THE CONTRACTORS OPTION TO USE EITHER REFLECTOR "X", "Y" OR "Z". DO NOT PLACE A REFLECTOR IN THE LIMIT OF AN APPROACH END ANCHOR.
  - SPECIFICATIONS FOR GUARDRAIL REFLECTORS: REFLECTIVE SHEETING SHALL BE TYPE IV SHEETING OR APPROVED EQUAL. CENTERMOUNT REFLECTOR SHALL CONFORM TO REQUIREMENTS OF CENTERMOUNT DELINEATORS.



FOR USE WITH WOOD OR SYNTHETIC/COMPOSITE BLOCKOUT

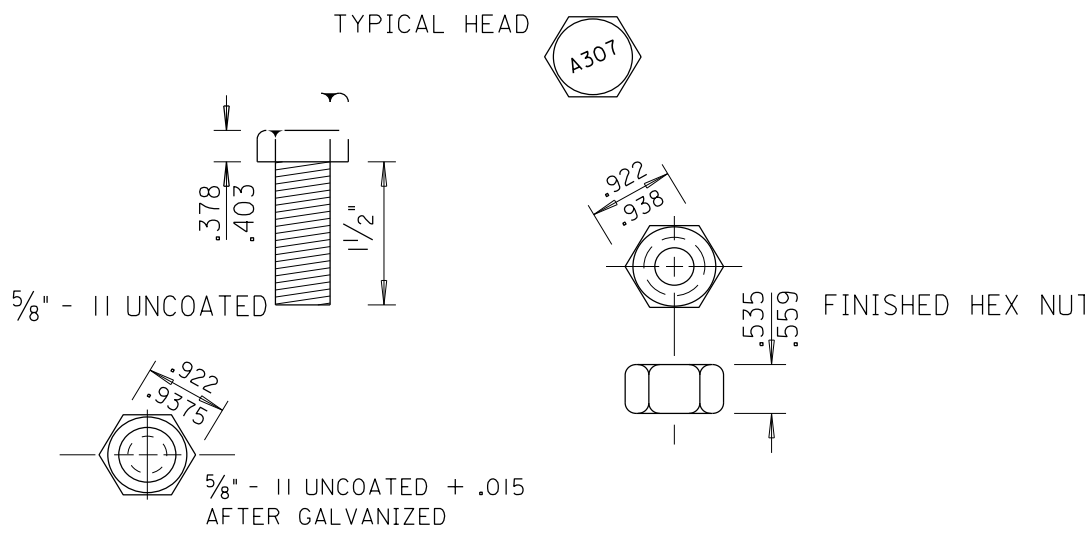
\* WIDTH CAN BE VARIED TO ACCOMODATE ALTERNATIVE REFLECTIVE SURFACE REQUIREMENTS

GUARDRAIL OR CONCRETE BARRIER REFLECTOR "Z"

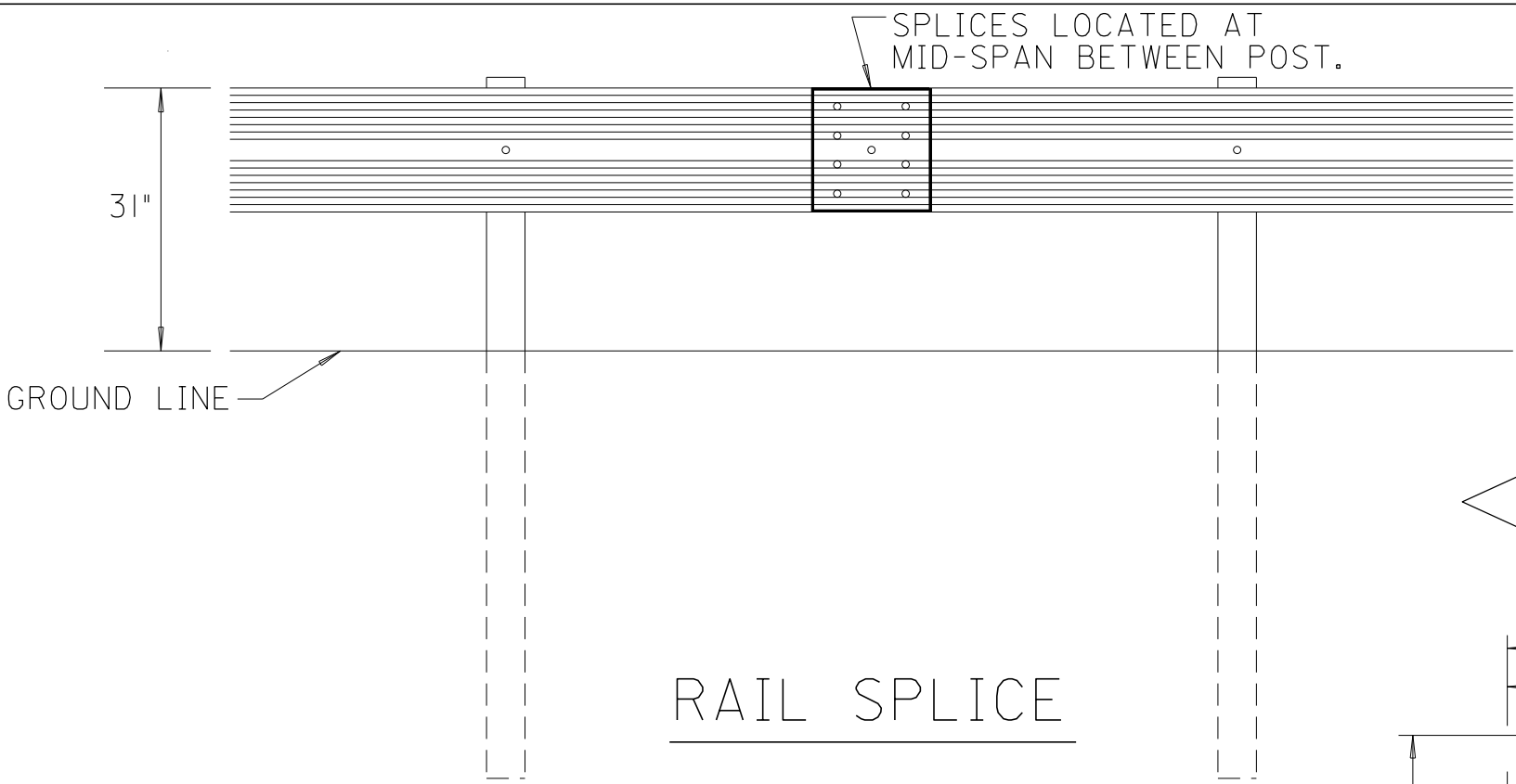
FOR USE WITH WOOD OR SYNTHETIC/COMPOSITE BLOCKOUT OR STEEL BLOCKOUT (WHERE RETROFITTING)

1" INSIDE DIA x 2" OUTSIDE DIA NARROW TYPE "A" PLAIN WASHER

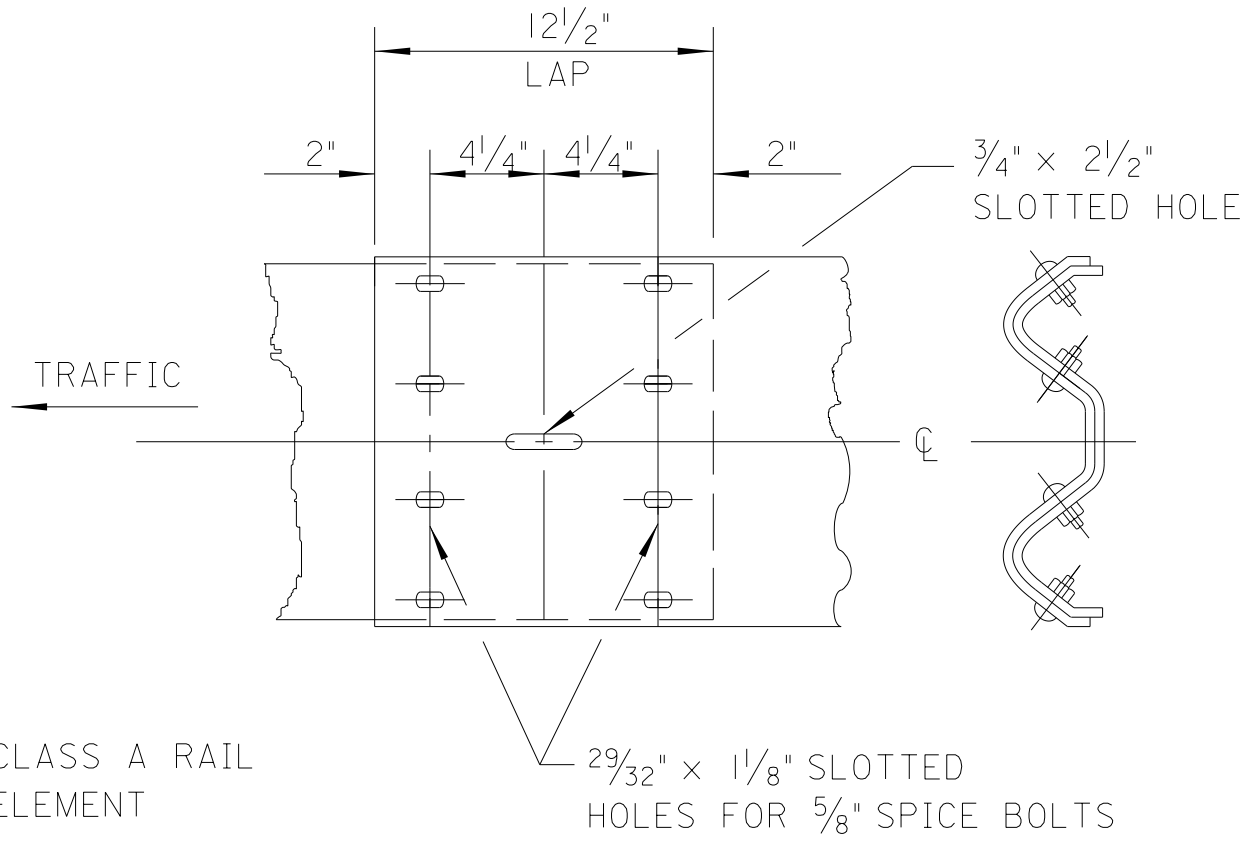
USE UNDER BUTTON HEAD BOLT WHEN ATTACHING TERMINAL CONNECTOR (END SHOE) TO W-BEAM



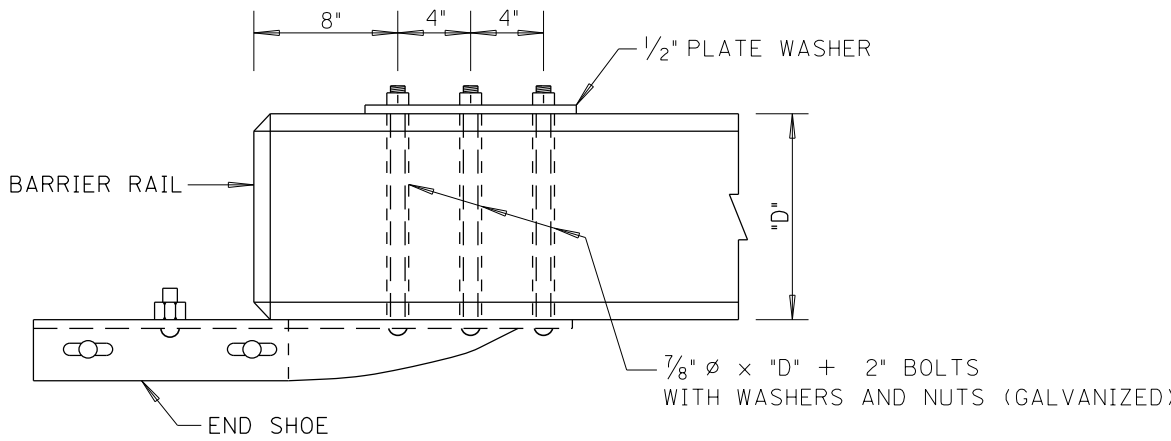
DETAIL OF BOLTS FOR FASTENING BLOCK OUTS TO GUADRAIL POST



RAIL SPLICE



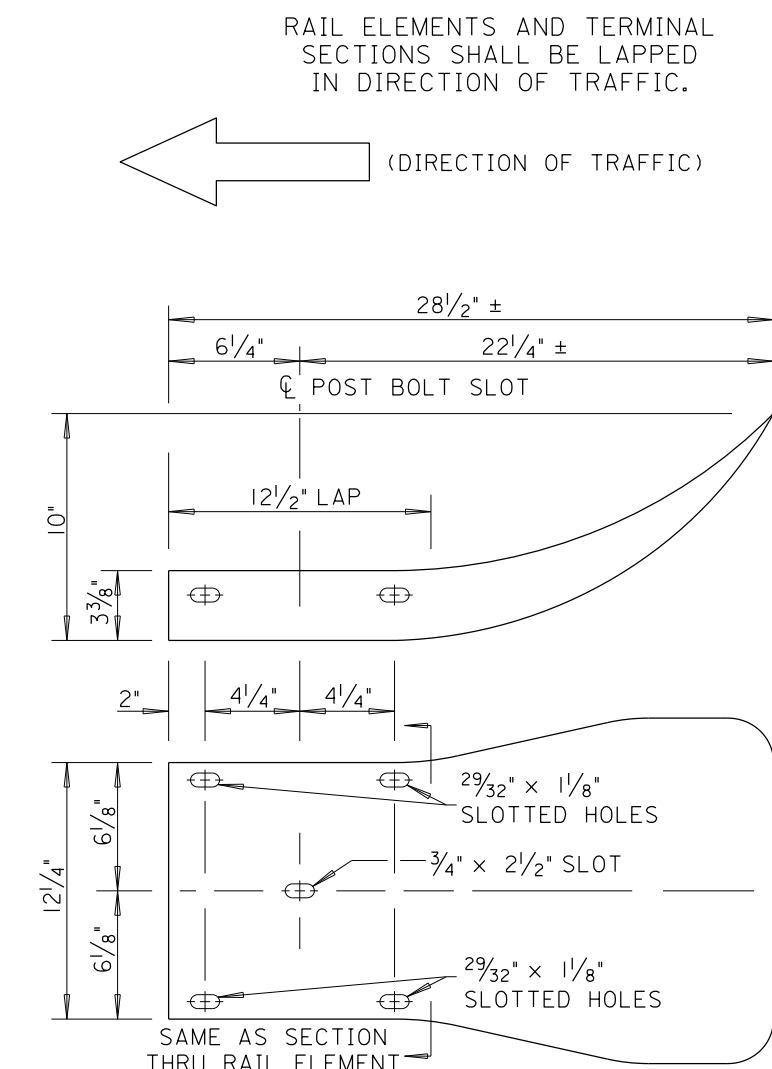
MID SPAN RAIL SPLICE



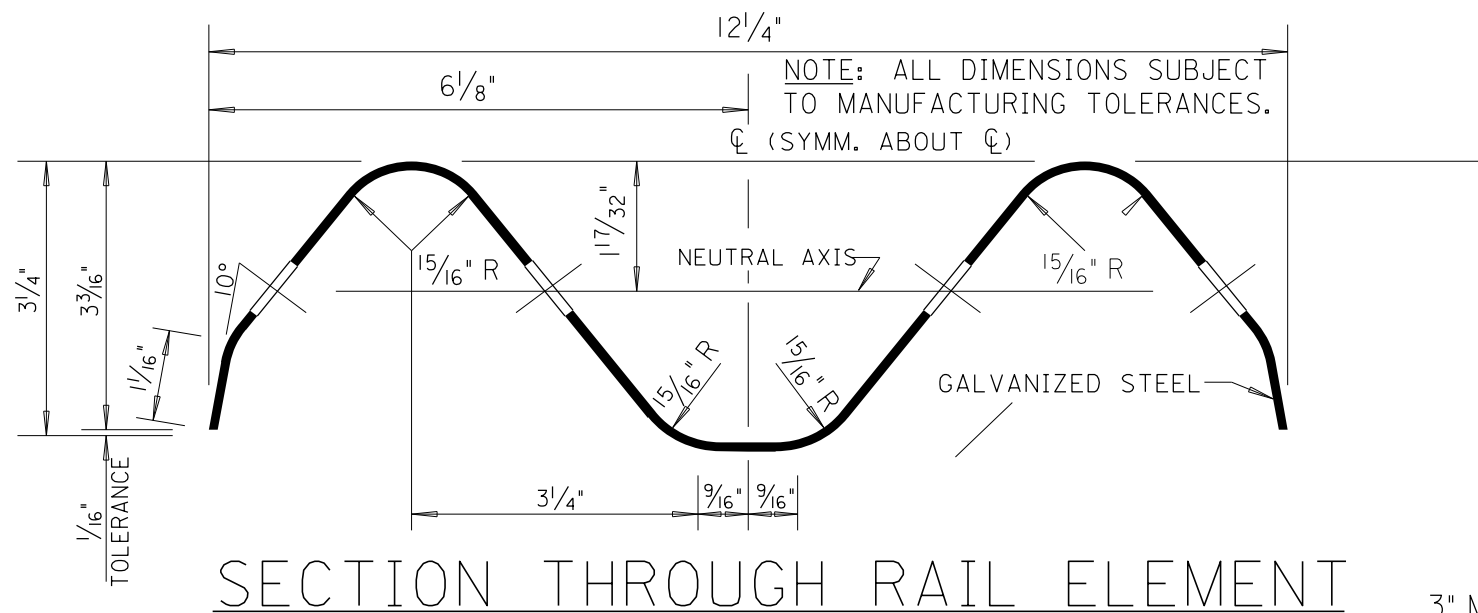
FINISHED GRADE (BRIDGE DECK, END SLAB, SIDEWALK OR CURB)

DETAIL FOR CONNECTING GUARDRAIL AT DEPARTING END OF BRIDGE

NOTE: END SHOE AND CONNECTION TO BE PAID FOR AS GUARDRAIL



FLARED TERMINAL SECTION



NOTE: RAIL ELEMENT SHALL BE CLASS 'A' (12 GAUGE TYPE 2 GALVANIZED) WHEN USED AS HIGHWAY GUARDRAIL AND CLASS 'B' (10 GAUGE TYPE 2 GALVANIZED) WHEN USED AS BRIDGE GUARDRAIL.

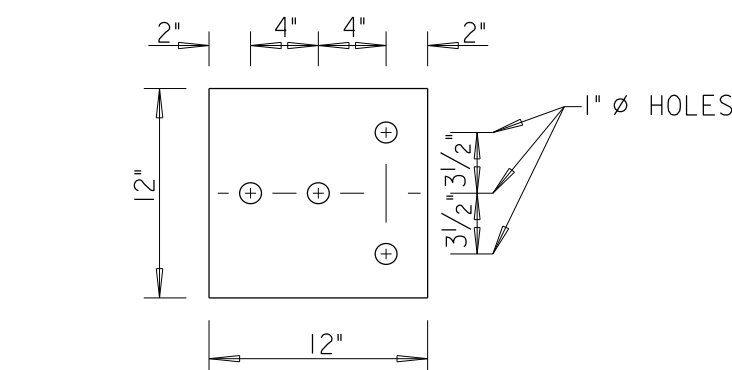
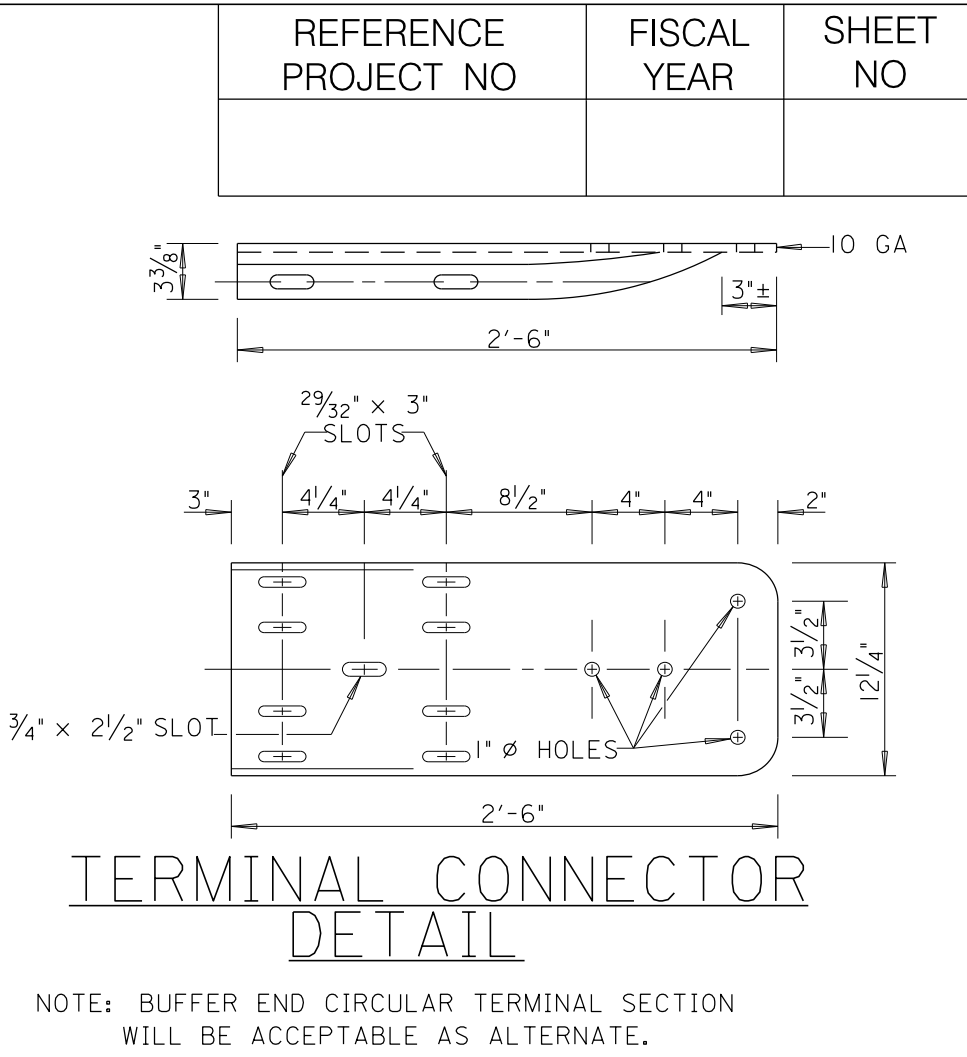


PLATE WASHER - 1/2"



TERMINAL CONNECTOR DETAIL

NOTE: BUFFER END CIRCULAR TERMINAL SECTION WILL BE ACCEPTABLE AS ALTERNATE.

END SECTION ROUNDED

--SPECIFICATIONS--  
CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION

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- REVISIONS
- Added mid-span rail splice details and deleted washer on block out detail on 05-15-17 by LVS.
  - Changed General Note 4 to prohibit the use of reflectors within the limits of an approach end anchor and only place them at splice locations on 9-24-19 by D.J.W.

Bureau Std Engr: D.J.W.  
DRAWN BY: \_\_\_\_\_ DATE DRAWN: 02-24-88

ALABAMA DEPARTMENT OF TRANSPORTATION  
1409 COLISEUM BOULEVARD  
MONTGOMERY, AL 36130-3050

DESIGN BUREAU SPECIAL DRAWING  
GALVANIZED STEEL BEAM GUARDRAIL WITH BLOCKED OUT TREATED TIMBER OR GALVANIZED STEEL POSTS (DELINEATORS/REFLECTORS FOR GUARDRAIL OR CONCRETE BARRIER RAIL)

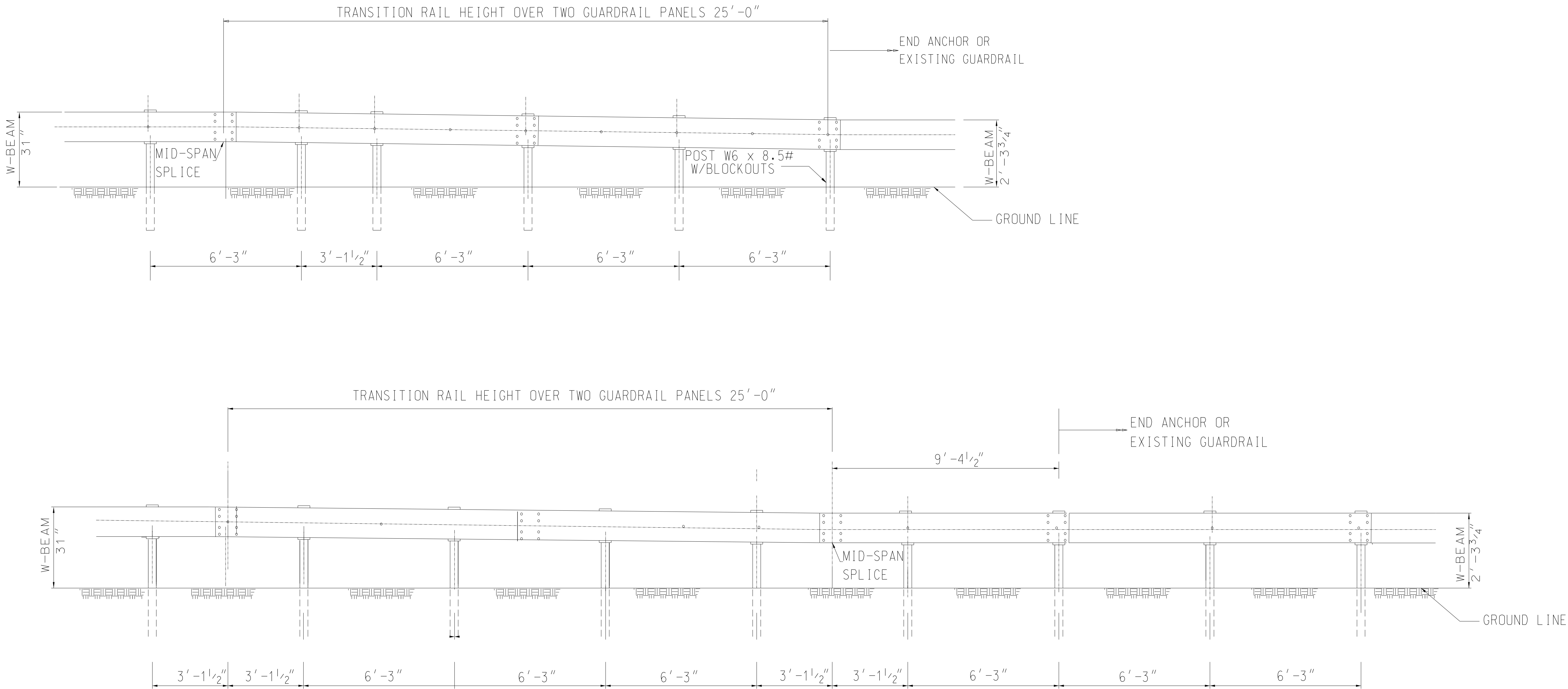
SPECIAL DRAWING NO

GR-630-S (SHEET 1 OF 3)

INDEX NO

63001

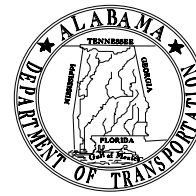
NOT TO SCALE



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REVISIONS



**ALABAMA DEPARTMENT  
OF TRANSPORTATION**  
1409 COLISEUM BOULEVARD  
MONTGOMERY, AL 36130-3050

DESIGN BUREAU SPECIAL DRAWING

(MASH) GUARDRAIL HEIGHT  
TRANSITION DETAIL

Bureau Std Engr: D.J.W.  
DRAWN BY: \_\_\_\_\_ DATE DRAWN: \_\_\_\_\_

SPECIAL DRAWING NO

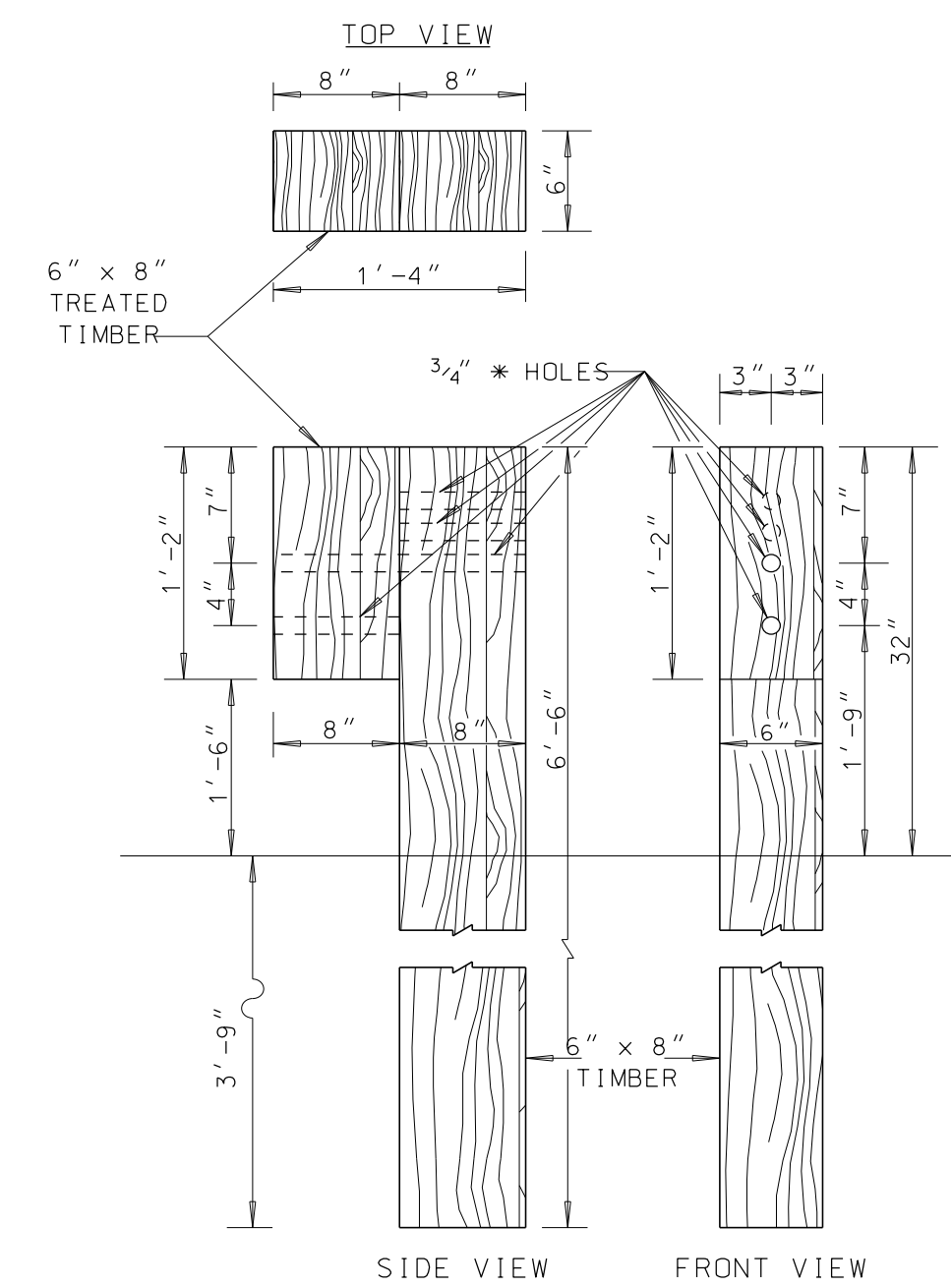
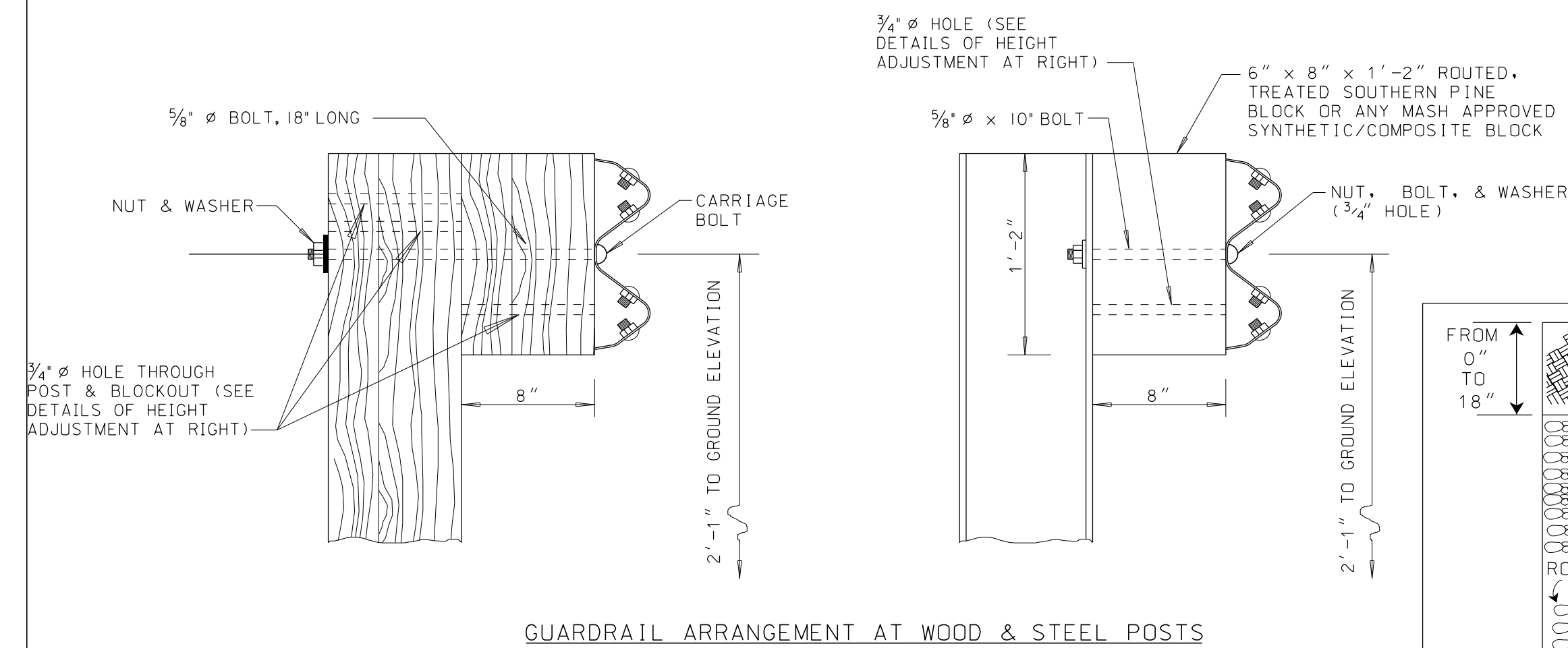
GR-630-S (SHEET 2 OF 3)

INDEX NO

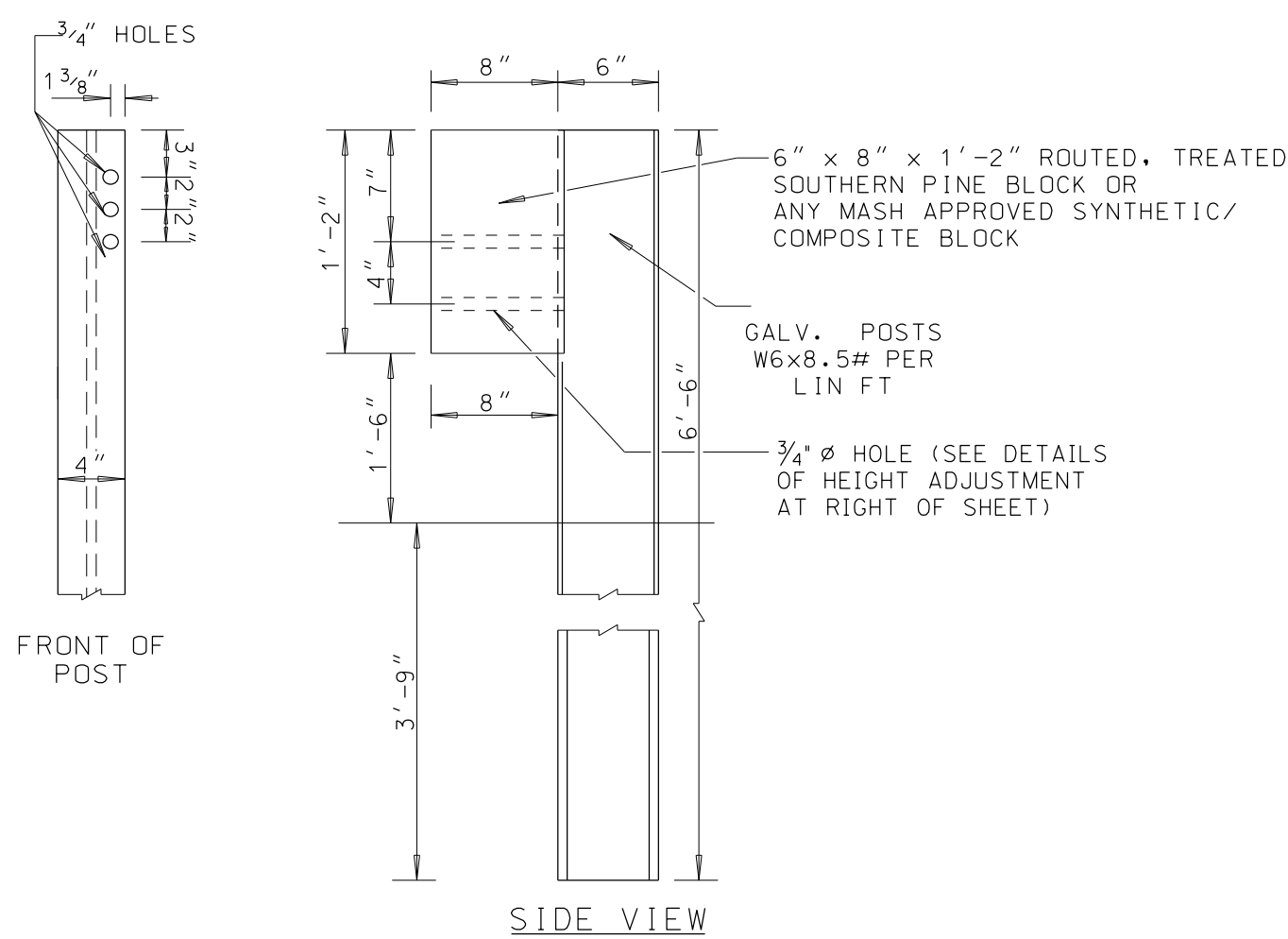
63002

NOT TO SCALE

REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO

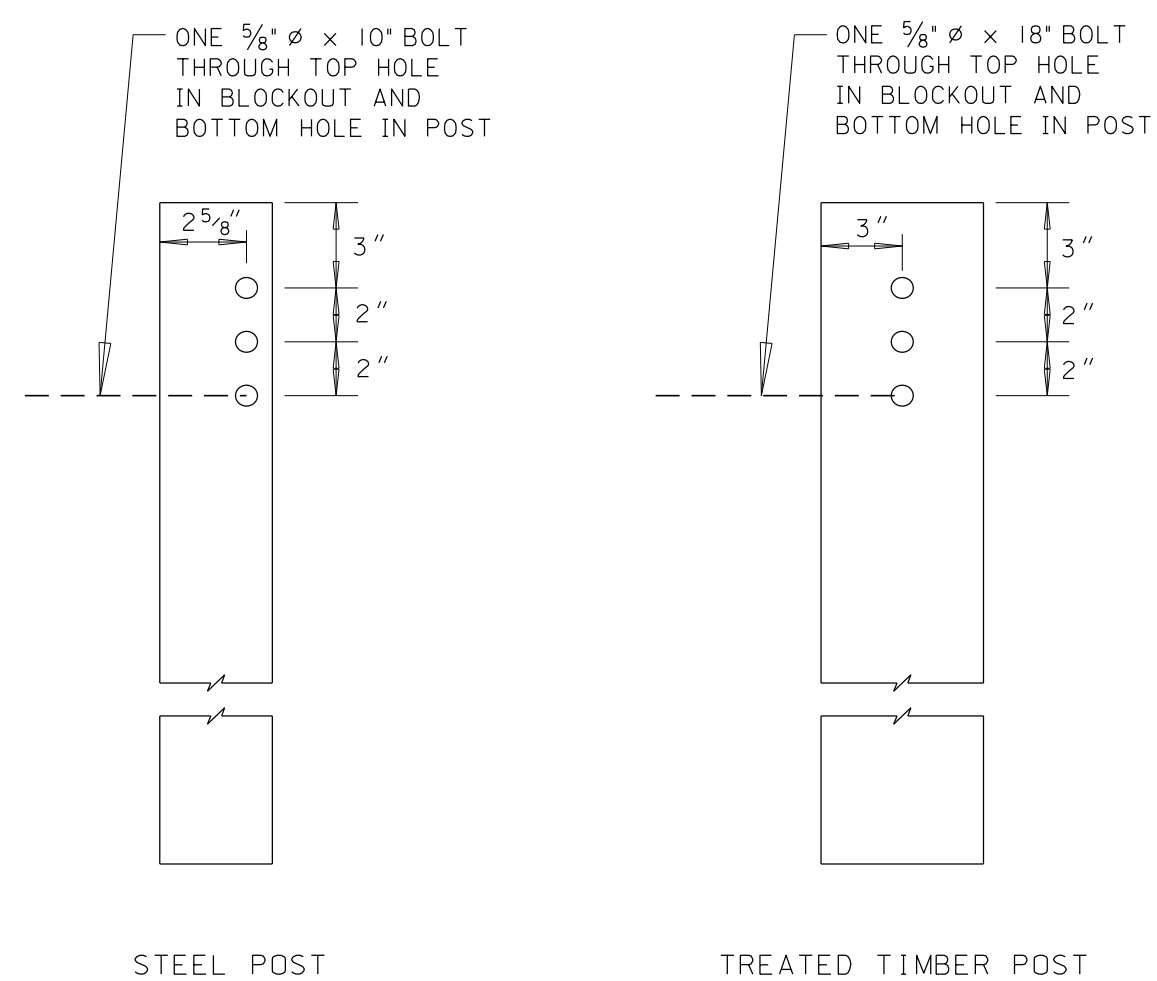
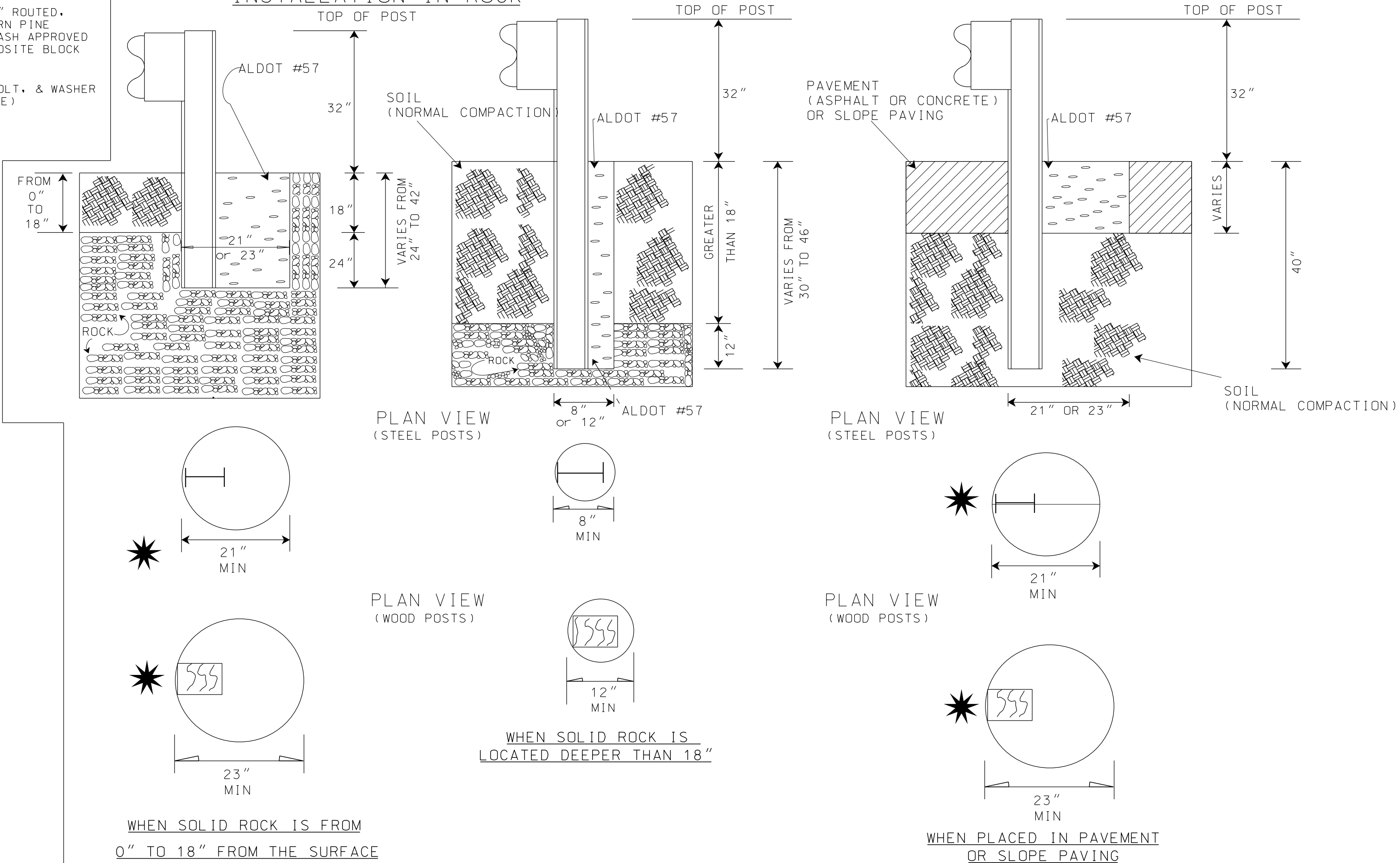


TIMBER (RECTANGULAR) POST  
WOOD POSTS SHALL BE TREATED



GALVANIZED STEEL "H" POST WITH ADJUSTABLE HEIGHT, ROUTED, TREATED SOUTHERN PINE OR ANY APPROVED SYNTHETIC/COMPOSITE BLOCKOUT

## INSTALLATION IN ROCK



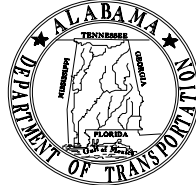
REQUIRED HOLES IN POSTS FOR FUTURE HEIGHT ADJUSTMENT

\* ATTENTION SHOULD BE GIVEN TO FLUSHING WITH BACKFILL MATERIAL AROUND POSTS TO MAINTAIN PROPER RAIL HEIGHT.

NOTE: THE HOLES SHOWN ON STEEL POST  
ARE DRILLED ON THE RIGHT SIDE OF THE  
CENTER OF THE POST. THE SUPPLIER MAY PROVIDE  
EITHER LEFT OR RIGHT SIDE DRILLED HOLES,  
OR ON BOTH SIDES.

NOTE: THE BOTTOM BOLT SHALL  
BE INSERTED FROM THE ROAD  
SIDE OF THE BARRIER SO THAT  
ITS NUT IS LOCATED ON THE  
BACK SIDE OF THE FLANGE.

--SPECIFICATIONS--  
CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION

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<p><b>REVISIONS</b></p> <ol style="list-style-type: none"> <li>Adjusted Guardrail height from ground line to 31" on 05-08-17 by LVS.</li> <li>Added MSGH requirement to composite blockout requirements on 7-10-2020 by DJW.</li> <li>Cleared up details for holes for future height adjustment based on SPB for guardrail height adjustment details on 7-17-2020.</li> <li>Added detail for posts driven through pavement on 9-21-2020 by DJW.</li> </ol>		
<div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;"> <p><b>ALABAMA DEPARTMENT OF TRANSPORTATION</b></p> <p>1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050</p> </div> </div>		
<p style="text-align: center;">DESIGN BUREAU SPECIAL DRAWING</p> <p style="text-align: center; font-size: 1.2em;">GALVANIZED STEEL BEAM GUARDRAIL WITH BLOCKED OUT TREATED TIMBER OR GALVANIZED STEEL POSTS</p>		
<p style="text-align: center;">SPECIAL DRAWING NO</p>		
<p>Bureau Std Engr: <u>DJW.</u></p> <p>DRAWN BY: _____ DATE DRAWN: <u>02-24-88</u></p>		<p style="text-align: center;">INDEX NO</p> <p style="text-align: center; font-size: 1.2em;">63003</p>
<p style="text-align: center; font-size: 1.2em;">GR-630-S ( SHEET 3 OF 3 )</p>		

NOT TO SCALE

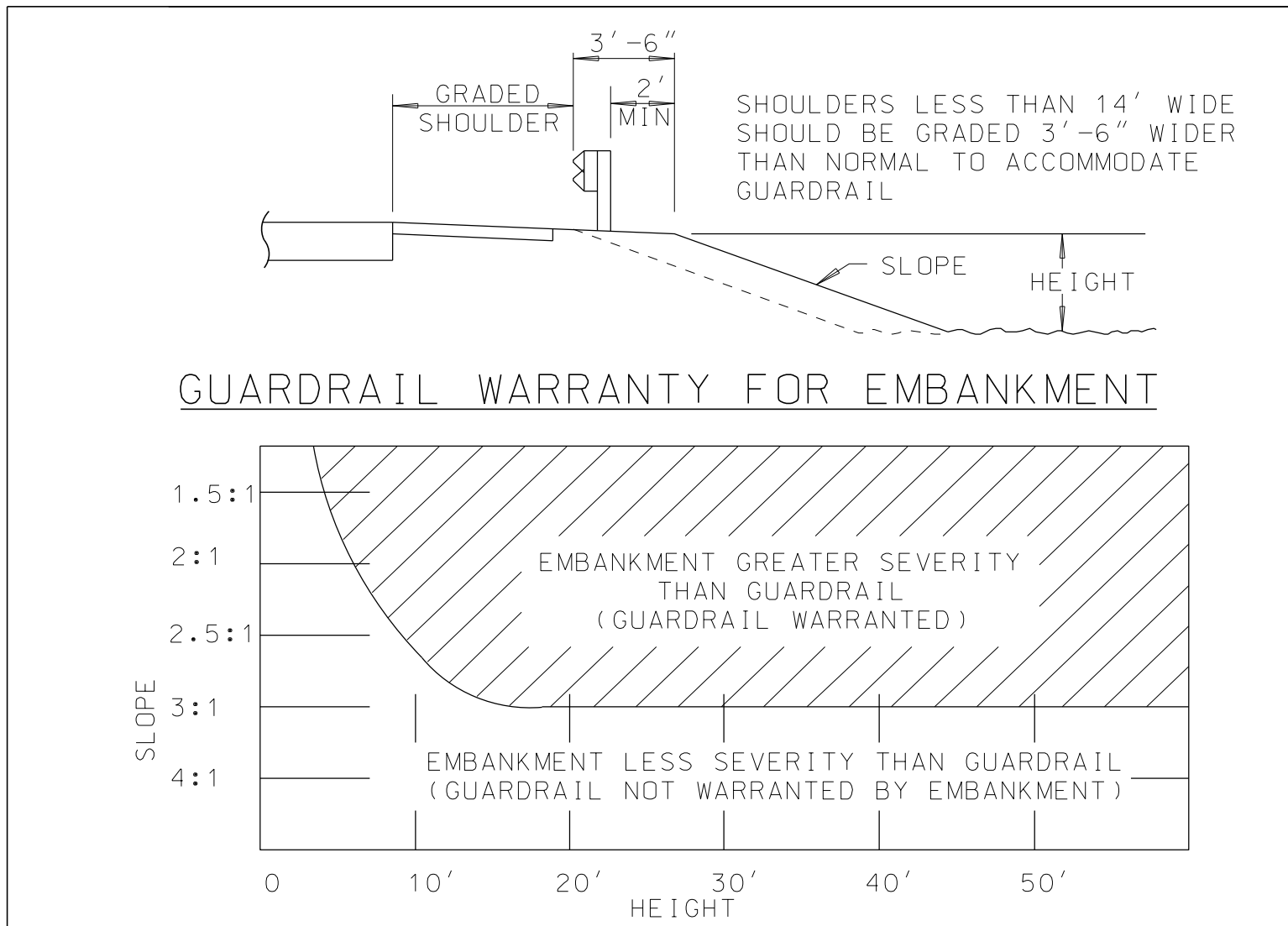


Design Speed	Design ADT	FILL SLOPES			CUT SLOPES		
		6:1 or flatter	5:1 to 4:1	3:1	3:1	4:1 or 5:1	6:1 or flatter
40 MPH  or  less	UNDER 750	7-10	7-10	**	7-10	7-10	7-10
	750-1500	10-12	12-14	**	10-12	10-12	10-12
	1500-6000	12-14	14-16	**	12-14	12-14	12-14
	OVER 6000	14-16	16-18	**	14-16	14-16	14-16
45-50  MPH	UNDER 750	10-12	12-14	**	8-10	8-10	10-12
	750-1500	14-16	16-20	**	10-12	12-14	14-16
	1500-6000	16-18	20-26	**	12-14	14-16	16-18
	OVER 6000	20-22	24-28	**	14-16	18-20	20-22
55  MPH	UNDER 750	12-14	14-18	**	8-10	10-12	10-12
	750-1500	16-18	20-24	**	10-12	14-16	16-18
	1500-6000	20-22	24-30	**	14-16	16-18	20-22
	OVER 6000	22-24	26-32*	**	16-18	20-22	22-24
60  MPH	UNDER 750	16-18	20-24	**	10-12	12-14	14-16
	750-1500	20-24	26-32*	**	12-14	16-18	20-22
	1500-6000	26-30	32-40*	**	14-18	18-22	24-26
	OVER 6000	30-32*	36-44*	**	20-22	24-26	26-28
65-70  MPH	UNDER 750	18-20	20-26	**	10-12	14-16	14-16
	750-1500	24-26	28-36*	**	12-16	18-20	20-22
	1500-6000	28-32*	34-42*	**	16-20	22-24	26-28
	OVER 6000	30-34*	38-46*	**	22-24	26-30	28-30

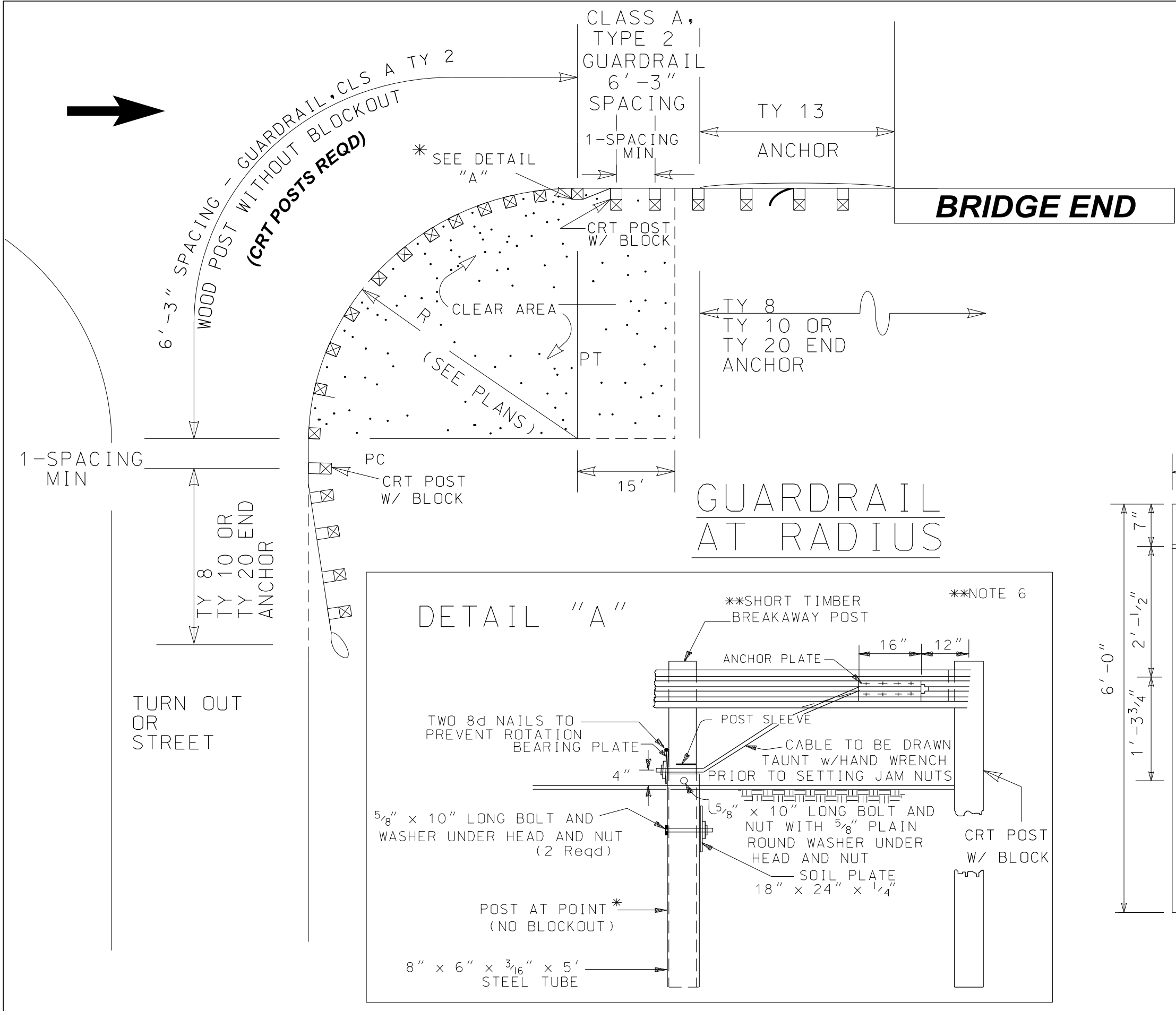
CLEAR ZONE DISTANCES (In feet from edge of driving lane)

\* CLEAR ZONE DISTANCES SHOULD BE PROVIDED AS SHOWN ON NEW CONSTRUCTION AND RECONSTRUCTION PROJECTS. WHERE LIMITED AREA EXISTS CLEAR ZONES MAY BE LIMITED TO 30' FOR PRACTICALITY IF NOT IN A HIGH ACCIDENT PROBABILITY AREA.

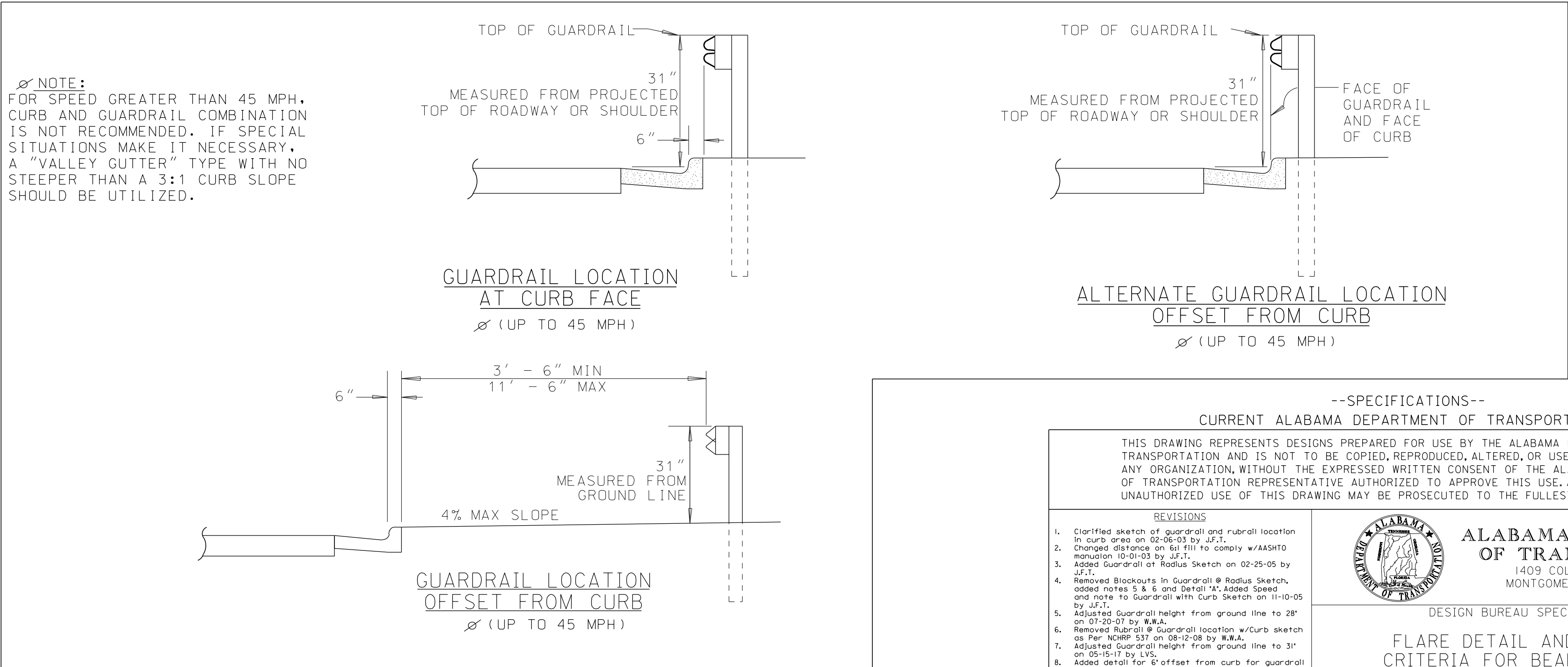
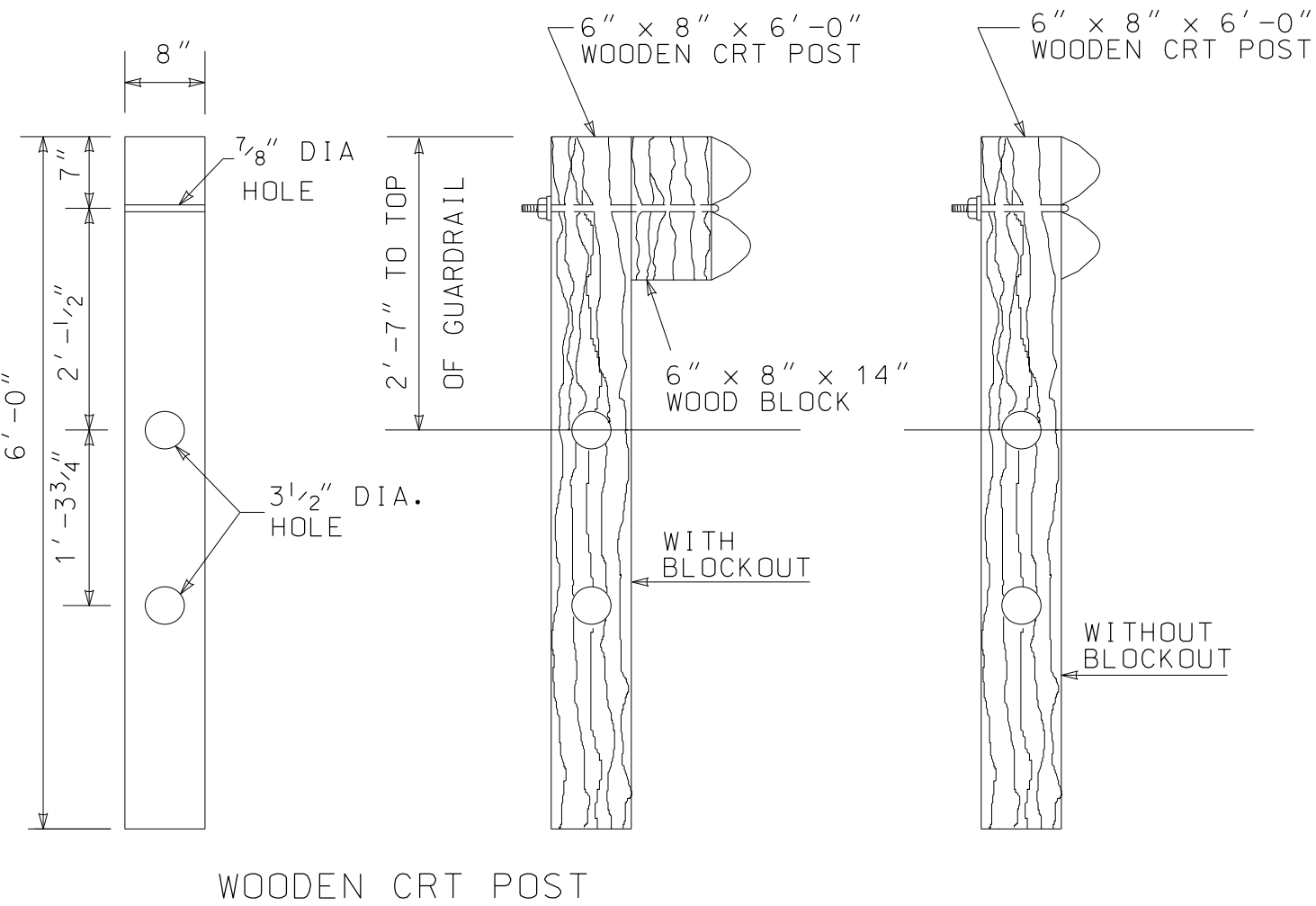
\*\* SINCE RECOVERY IS LESS LIKELY ON THE UNSHIELDED, TRAVERSABLE 3:1 SLOPES, FIXED OBJECTS SHOULD NOT BE PRESENT IN THE VICINITY OF THE TOE OF THESE SLOPES. CLEAR RECOVERY AREA OF 10' MIN SHOULD BE PROVIDED AT THE TOE OF SLOPE IF RIGHT-OF-WAY PERMITS.




(See General Note NO 2, Index NO 323)



1. TO BE USED FOR SIDEROADS AND DRIVEWAYS WHERE APPROACH MAIN LINE TRAFFIC CAN IMPACT THE RADIUS GUARDRAIL.
2. GUARDRAIL RADIUS TO BE A MAXIMUM 35'. MINIMUM RADIUS TO BE 17'.
3. SHOP BEND RAIL.
4. CLEAR AREA TO BE CLEAR OF TREES AND UTILITY POLES AS PRACTICAL.
5. RADIUS GUARDRAIL INCLUDING SOIL TUBE AND CABLE TO BE PAID AS GUARDRAIL CLASS A, TYPE 2.
6. SEE DRAWING GA-630-8, INDEX 303, FOR DETAILS OF SHORT TIMBER BREAKAWAY POST.

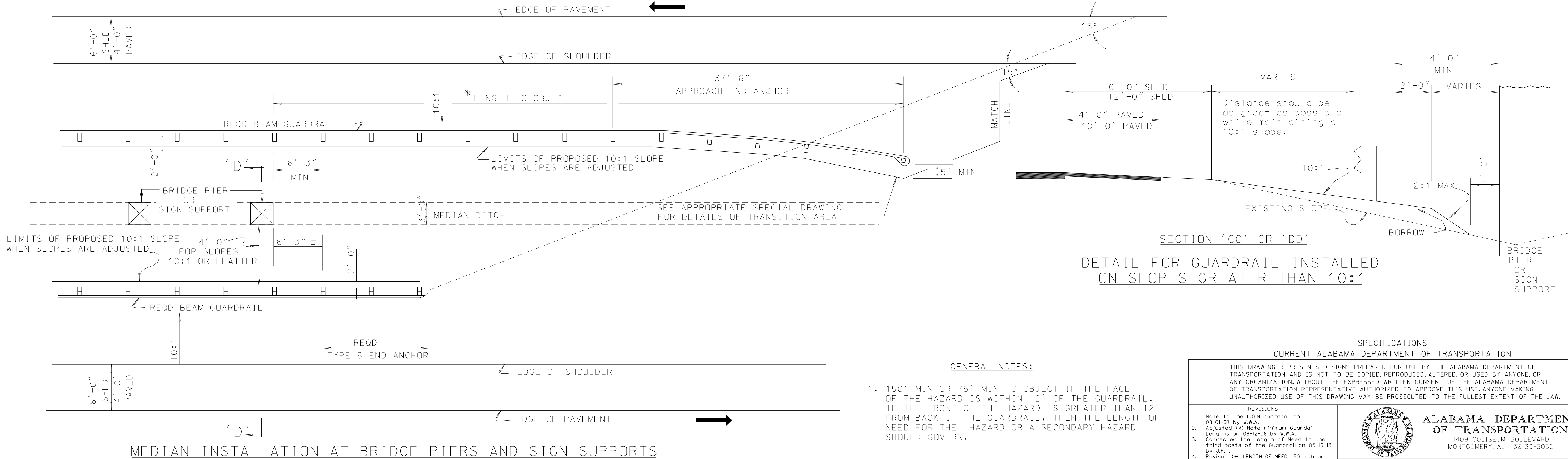
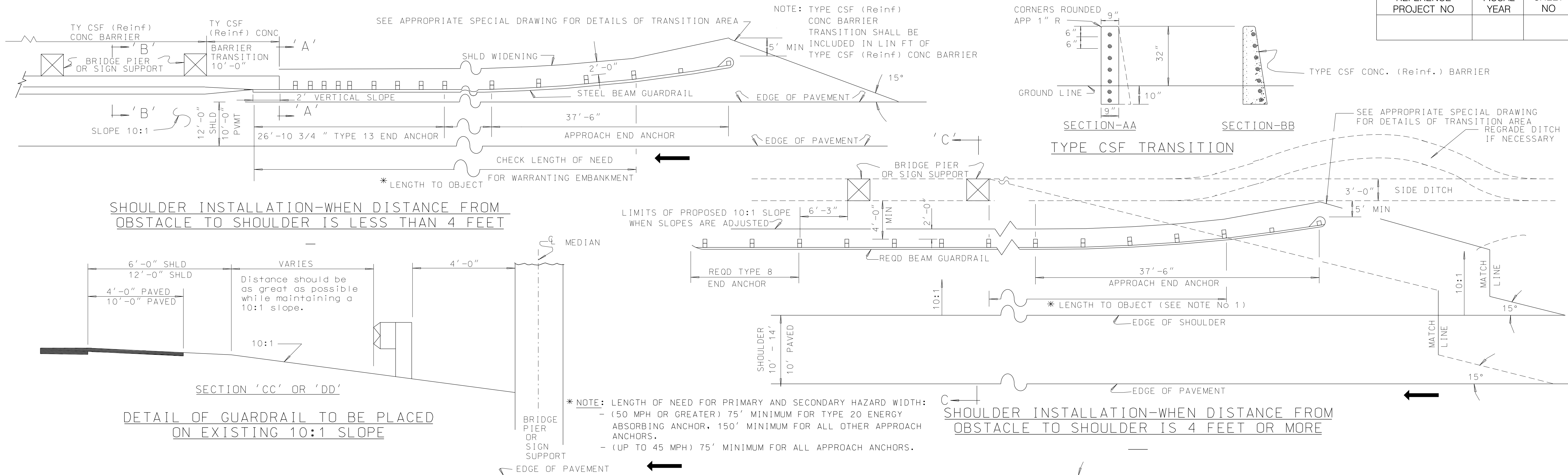


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<div>REVISIONS</div> <div>1. Clarified sketch of guardrail and rubrail location in curb area on 02-06-93 by J.J.T.</div> <div>2. Changed distance on 6:1 fill to comply w/AASHTO manual 10-01-03 by J.J.T.</div> <div>3. Added Guardrail at Radius Sketch on 02-25-05 by J.J.T.</div> <div>4. Removed Blockouts in Guardrail @ Radius Sketch, added notes 5 &amp; 6 and Detail "A". Added Speed and note to Guardrail with Curb Sketch on 11-10-05 by J.J.T.</div> <div>5. Adjusted Guardrail height from ground line to 28" on 07-20-07 by W.B.A.</div> <div>6. Removed Rubrail @ Guardrail location w/Curb sketch as Per NC&amp;RP 537, on 08-12-08 by W.B.A.</div> <div>7. Adjusted Guardrail height from ground line to 31" on 05-15-17 by L.V.S.</div> <div>8. Added detail for 6" offset from curb for guardrail and amended callouts on other two curb details on 10-1-2020 by D.W.</div>		
<div> <b>ALABAMA DEPARTMENT OF TRANSPORTATION</b> 1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050</div> <div>DESIGN BUREAU SPECIAL DRAWING</div> <div>FLARE DETAIL AND WARRANTY CRITERIA FOR BEAM GUARDRAIL &amp; GUARDRAIL AT RADIUS</div>		
Bureau Std Engr: D.J.W. DRAWN BY: _____ DATE DRAWN: 11-16-93		SPECIAL DRAWING NO GR-630-FD (SHEET 2 OF 2)
		INDEX NO 63007

NOT TO SCALE



REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO



--SPECIFICATIONS--

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REVISIONS

1. Note to the L.O.N. guardrail on 08-01-07 by W.W.A.
2. Adjusted (\*) Note minimum Guardrail Lengths on 08-12-08 by W.W.A.
3. Corrected the Length of Need to the third posts of the Guardrail on 05-16-13 by J.F.T.
4. Revised (\*) LENGTH OF NEED (50 mph or greater) 75' MINIMUM for TYPE 20 SERIES ENERGY ABSORBING ANCHORS, 150' MINIMUM for all other Approach Anchors and (up to 45 mph) 75' MINIMUM for all Approach Anchors on 09-28-16 by J.F.T.
5. Revised drawing to show Constant Slope Face Barrier in details on 10/18/17 by LVS



ALABAMA DEPARTMENT  
OF TRANSPORTATION  
1409 COLISEUM BOULEVARD  
MONTGOMERY, AL 36130-3050

DESIGN BUREAU SPECIAL DRAWING

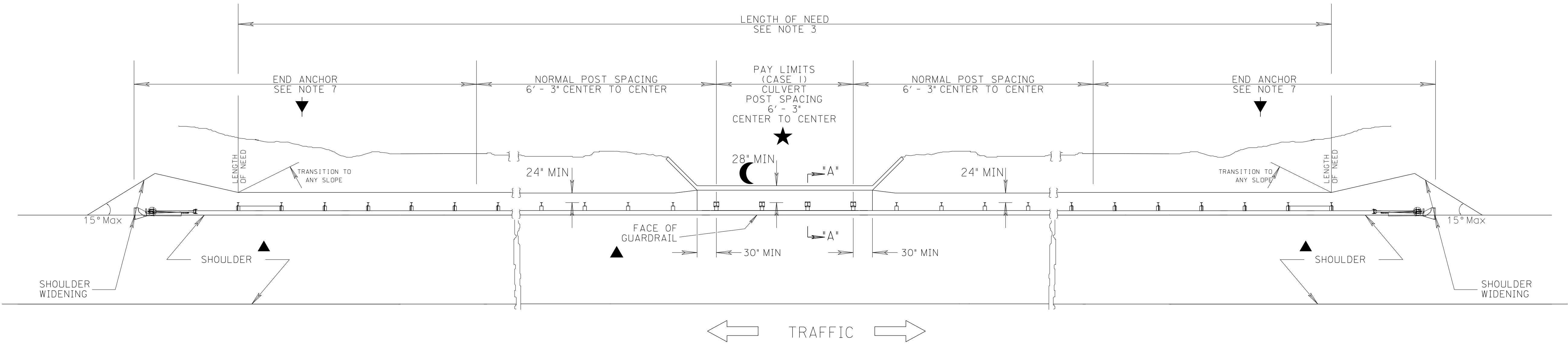
DETAILS OF GUARDRAIL AT BRIDGE PIER  
PROTECTION ON EXISTING PROJECTS  
WITH SLOPES GREATER THAN 10:1

Bureau Std Engr: D.J.W.  
DRAWN BY: \_\_\_\_\_ DATE DRAWN: 08-03-93

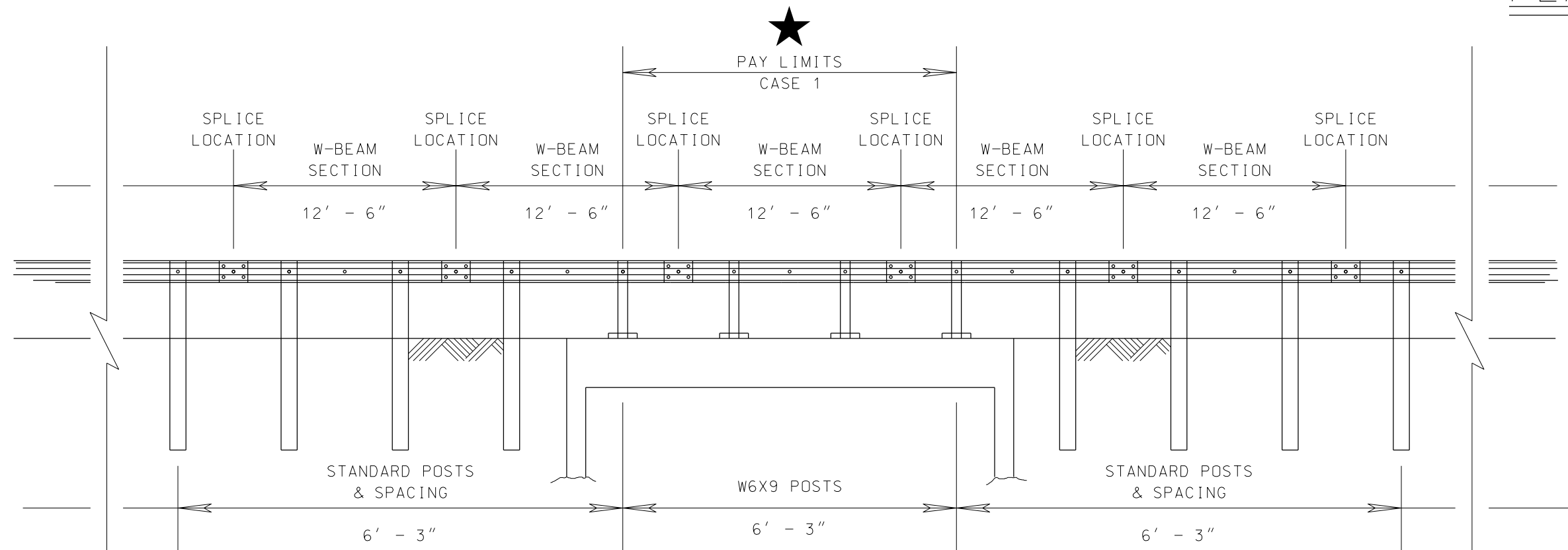
SPECIAL DRAWING NO  
GR-630-PP

INDEX NO  
63010

NOT TO SCALE



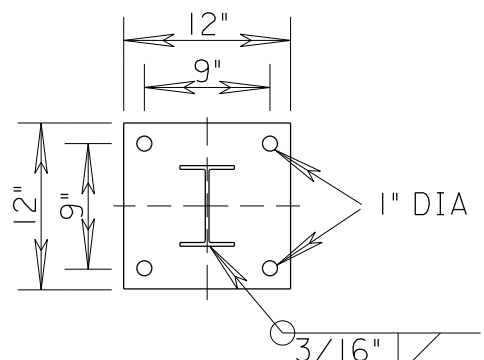
PLAN - CASE I



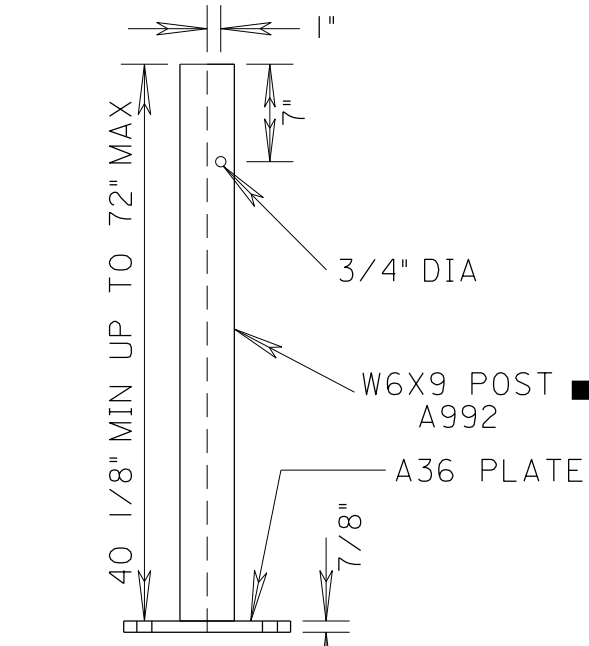
PROFILE - CASE I

VERTICAL DEPICTION NOT TO SCALE.

POST WITH WELDED BASE

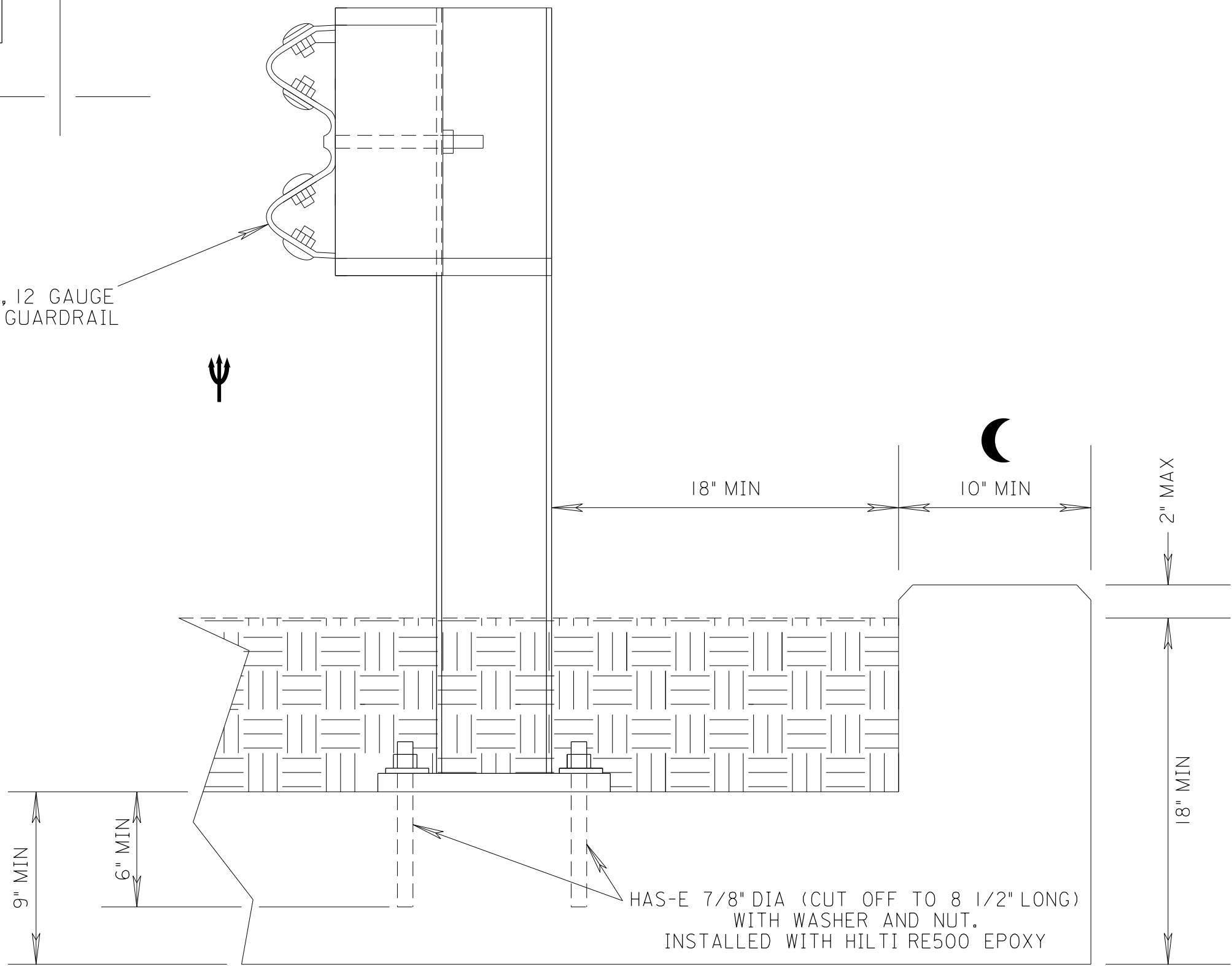


TOP VIEW



FRONT VIEW

CLASS A, 12 GAUGE W-BEAM GUARDRAIL



SECTION "A - A"

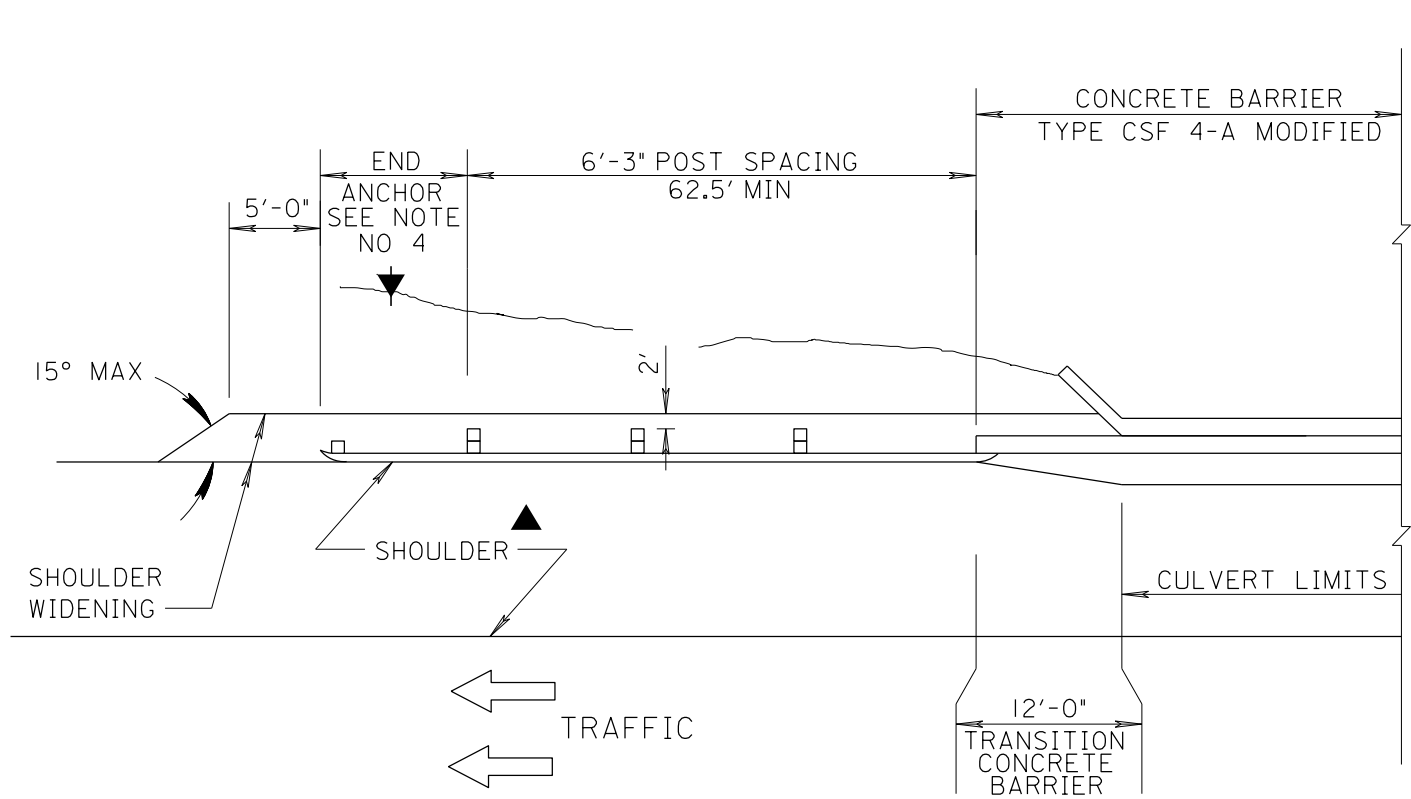
GENERAL NOTES

1. ANY FIELD MODIFICATIONS REQUIRED (CUTTING, PUNCHING, DRILLING, ETC.) SHALL REQUIRE THE AFFECTED AREA TO BE GALVANIZED IN THE FIELD. COST OF THIS WORK SHALL BE PART OF THE CASE I PAY ITEM.
2. THE GUARDRAIL POSTS DEPICTED IN THESE DETAILS ARE FOR PICTORIAL PURPOSES AND SHALL NOT BE CONSTRUED AS INDICATING THE NUMBER OF POSTS REQUIRED.
3. THE LENGTH OF NEED SHOWN IS FOR THE GUARDRAIL SYSTEM REQUIREMENT. ADDITIONAL GUARDRAIL LENGTH MAY BE NEEDED FOR SECONDARY HAZARDS SUCH AS SLOPE, WATERWAY, ETC...
4. FACE OF GUARDRAIL SHOULD (WHERE PRACTICAL) BE LOCATED A MINIMUM OF 4' FROM THE EDGE OF PAVEMENT, OR LOCATED AT THE EDGE OF SHOULDER, WHICHEVER IS GREATER.
5. CASE I POSTS SHALL BE A MINIMUM OF 40 1/8" AND A MAXIMUM OF 72" LONG W6X9 STEEL POSTS, MODIFIED AS PER THE DETAILS PROVIDED. OTHER POSTS MAY BE EITHER WOOD OR STEEL.
6. SEE APPROPRIATE GUARDRAIL DETAILS FOR SPLICE DETAILS, MOUNTING HEIGHT, ETC.
7. ANY APPROVED END ANCHOR THAT HAS BEEN DESIGNED TO FUNCTION PROPERLY IN THE SITE CONDITIONS GIVEN MAY BE USED IN LIEU OF THE TYPE 20 SERIES END ANCHOR SHOWN. SEE SPECIFIC END ANCHOR DETAIL DRAWINGS FOR DESIGN CRITERIA AND INSTALLATION GUIDELINES.
8. THE PAY LIMITS FOR CASE I SHALL BE FROM THE FROM THE FIRST POST MOUNTED TO THE TOP OF CULVERT TO THE LAST. THE PAY LIMITS SHALL INCLUDE ALL REQUIRED DRILLING, HARDWARE, POSTS, ETC. NECESSARY FOR THE INSTALLATION.
9. THE CULVERT PARAPET SHALL BE 2 INCHES OR LESS ABOVE THE GROUND LINE. TALLER PARAPETS MUST BE REDUCED IN HEIGHT OR THE GROUND LINE RAISED TO MEET THIS REQUIREMENT. ANY CUT OR GROUND SURFACE SHALL BE TREATED WITH AN APPROVED EPOXY COATING FROM THE ALDOT APPROVED PRODUCTS LIST. IF THE 2 INCHES OR LESS REQUIREMENT CANNOT BE MET, THEN THE LATERAL OFFSET FROM THE FACE OF THE GUARDRAIL TO THE PARAPET WALL SHALL BE INCREASED TO 4' MIN. THE COST OF THIS WORK (GRINDING, CUTTING, COATING, ETC) SHALL BE A SUBSIDIARY OF THE COST OF THE GUARDRAIL.
10. THE REQUIRED W6X9 POSTS MAY BE SUBSTITUTED WITH W6X8.5 POSTS AT THE CONTRACTOR'S DISCRETION, BUT THE TWO POST SIZES MAY NOT BE MIXED IN ANY SINGLE INSTALLATION.

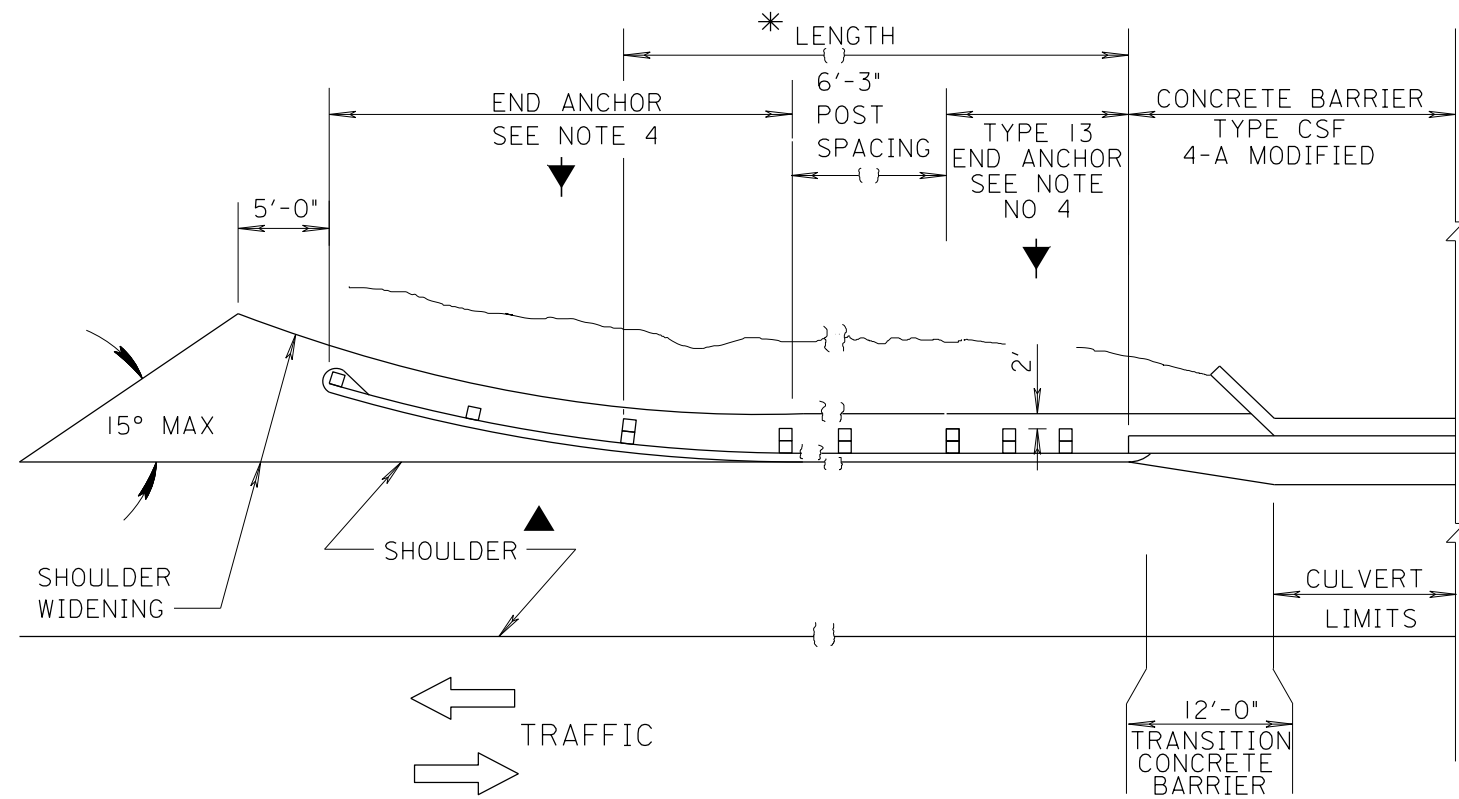
--SPECIFICATIONS-- CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION		
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REVISIONS 1. Completely redraw sheet to meet MASH standards on 08-26-2019 by DJW. 2. Reversed callouts on post and base detail and added note size on 01-30-2020 by DJW. 3. Added General Note 10 on 2-13-2020 by DJW. 4. General Note 1 modified on 3/13/2020 by DJW.		
ALABAMA DEPARTMENT OF TRANSPORTATION 1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050		
DESIGN BUREAU SPECIAL DRAWING DETAILS FOR GUARDRAIL (MASH) AT CULVERTS WHERE POSTS ARE BOLTED TO THE TOP OF THE CULVERT		
Bureau Std Engr: D.J.W. DRAWN BY: D.J.W. DATE DRAWN: 8-26-2019	GR-630-CL (SHEET 1 OF 4)	INDEX NO 63013

NOT TO SCALE

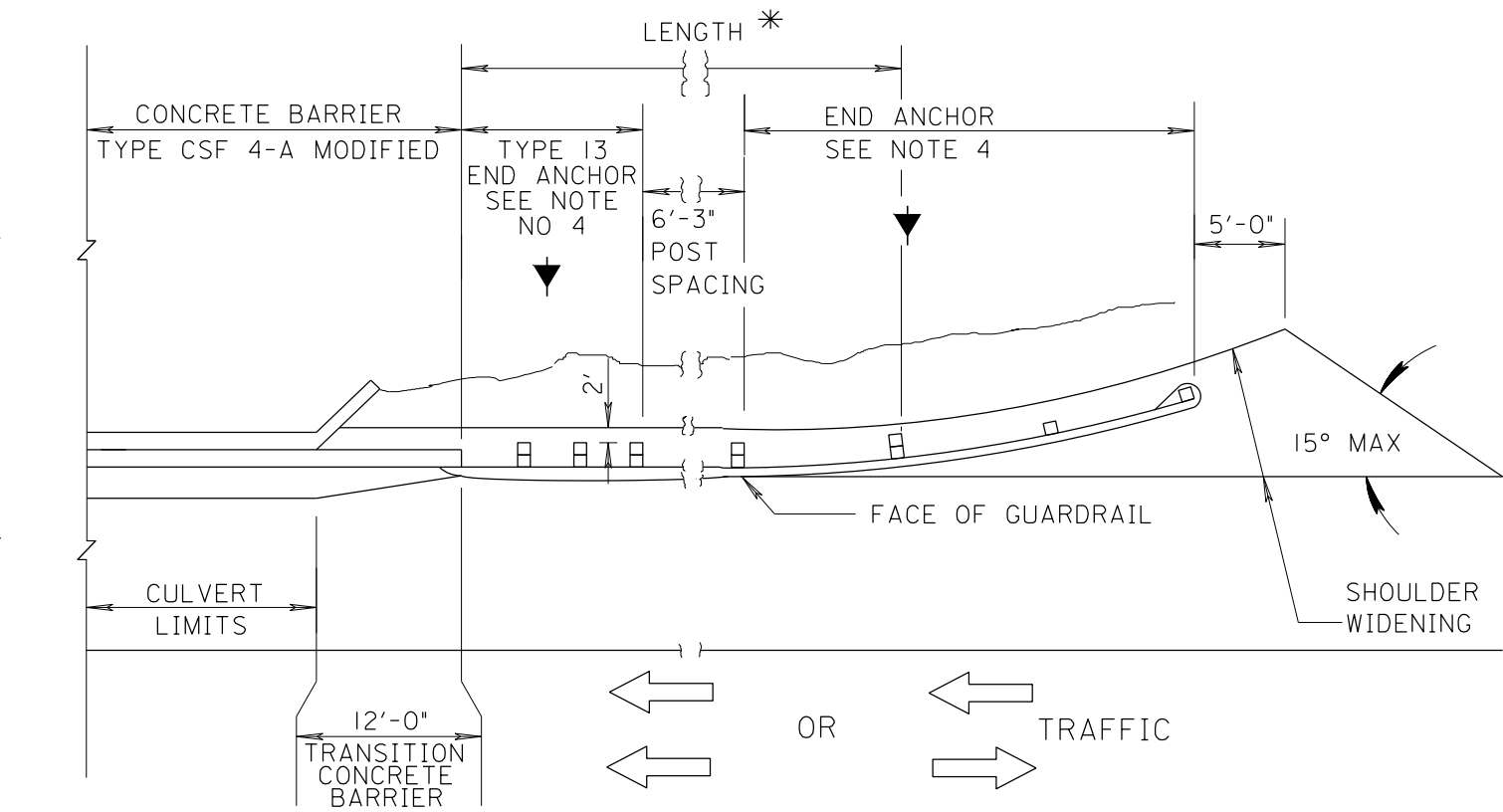
REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO



DETAIL FOR DEPARTURE END OF BARRIER FOR ONE WAY TRAFFIC  
(NO DEPARTURE END RAIL NEEDED IF CLEAR ZONE IS PRESENT)

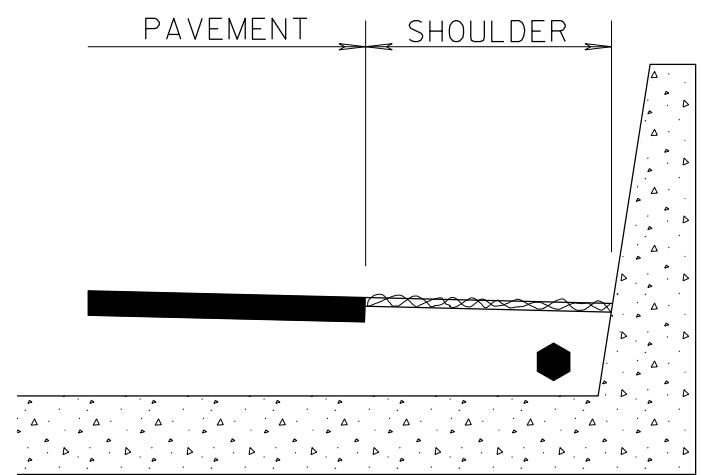


DETAIL FOR DEPARTURE END OF BARRIER FOR TWO WAY TRAFFIC  
PLAN - CASE 2

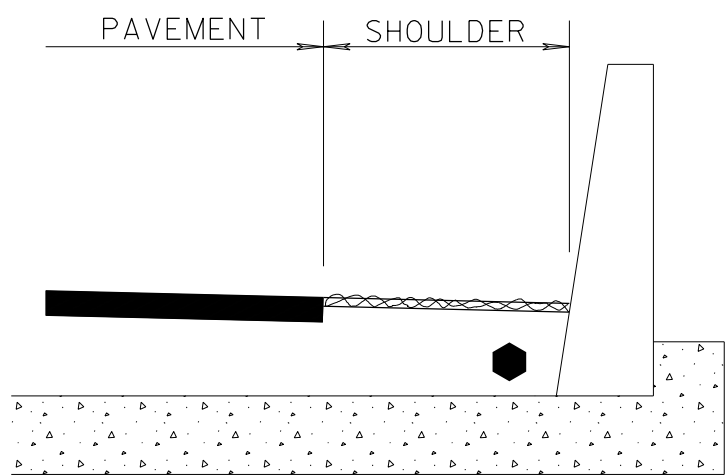


DETAIL FOR APPROACH END OF BARRIER FOR ONE WAY AND TWO WAY TRAFFIC

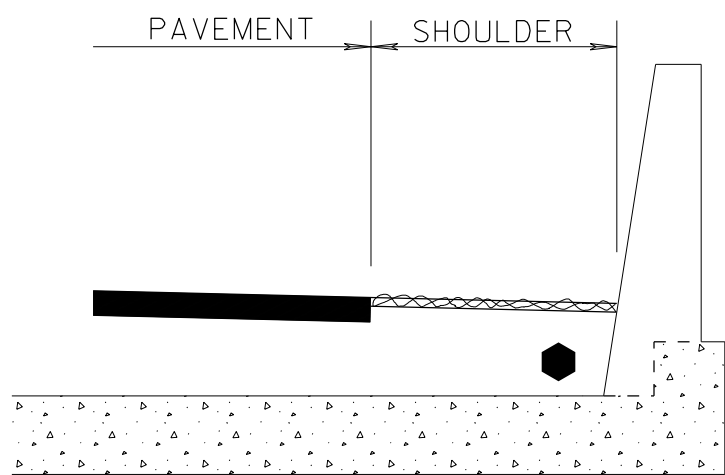
\*NOTE: 150' MINIMUM FOR TL-3 (50 MPH OR GREATER) WITH ANY APPROACH ANCHOR. 75' MINIMUM IF A TYPE 20 SERIES ENERGY ABSORBING ANCHOR IS USED.  
- 75' MINIMUM FOR TL-2 (UP TO 45 MPH).  
(SEE NOTE 4)



ALTERNATE NO I (SEE NOTE #8)



ALTERNATE NO II (SEE NOTE #8)




ALTERNATE NO III (SEE NOTE #8)

HALF ELEVATION - CASE 2

CONCRETE BARRIER TYPE CSF (MODIFIED) INSTALLATION AT CULVERTS WHEN SAFETY BARRIER IS REQ'D

GENERAL NOTES

- NO PUNCHING, DRILLING, CUTTING, OR WELDING WILL BE PERMITTED AFTER GALVANIZATION IS APPLIED.
- FOR ATTACHING TERMINAL CONNECTOR (END SHOE) TO CONCRETE BARRIER SEE APPROPRIATE SPECIAL DRAWING.
- THE GUARDRAIL POSTS DEPICTED IN THESE DETAILS ARE FOR PICTORIAL PURPOSES ONLY AND SHALL NOT BE CONSTRUED AS INDICATING THE NUMBER OF POSTS REQUIRED
- ▼ FOR DETAILS OF ANY APPROVED END ANCHOR, STANDARD GUARDRAIL, AND HARDWARE SEE APPROPRIATE SPECIAL DRAWINGS. THE LENGTH OF NEED SHOWN IS FOR THE CULVERT ONLY. ADDITIONAL PROTECTION LENGTH MAY BE NEEDED FOR SECONDARY HAZARDS SUCH AS SLOPE, WATERWAY, ETC....
- ◆ SEE BRIDGE STANDARD DRAWING NO. CBR-I FOR DETAILS OF ALTERNATIVES I, II, AND III FOR CASE 2
- THE TYPE CSF 4-A (MODIFIED) CONCRETE SAFETY BARRIER SHALL BE PAID FOR UNDER PAY ITEM 629A, CONCRETE MEDIAN OR SAFETY BARRIER, TYPE 4A (MODIFIED). THE PRICE BID PER LIN FT OF BARRIER SHALL BE FULL COMPENSATION FOR AL FOOTINGS, END TRANSITIONS, CONCRETE, STEEL REINFORCEMENT, EXCAVATION, AND BACK FILLING REQUIRED FOR THE COMPLETE INSTALLATION OF ALTERNATIVES I, II, AND III CONCRETE SAFETY BARRIER.
- ▲ THE FACE OF GUARDRAIL SHOULD (WHERE PRACTICAL) BE LOCATED A MINIMUM OF 4' FROM THE EDGE OF PAVEMENT OR LOCATED AT THE EDGE OF SHOULDER, WHICHEVER IS GREATER.
- SEE DRAWING CSF-629 FOR TYPE CSF 4-A DETAILS.

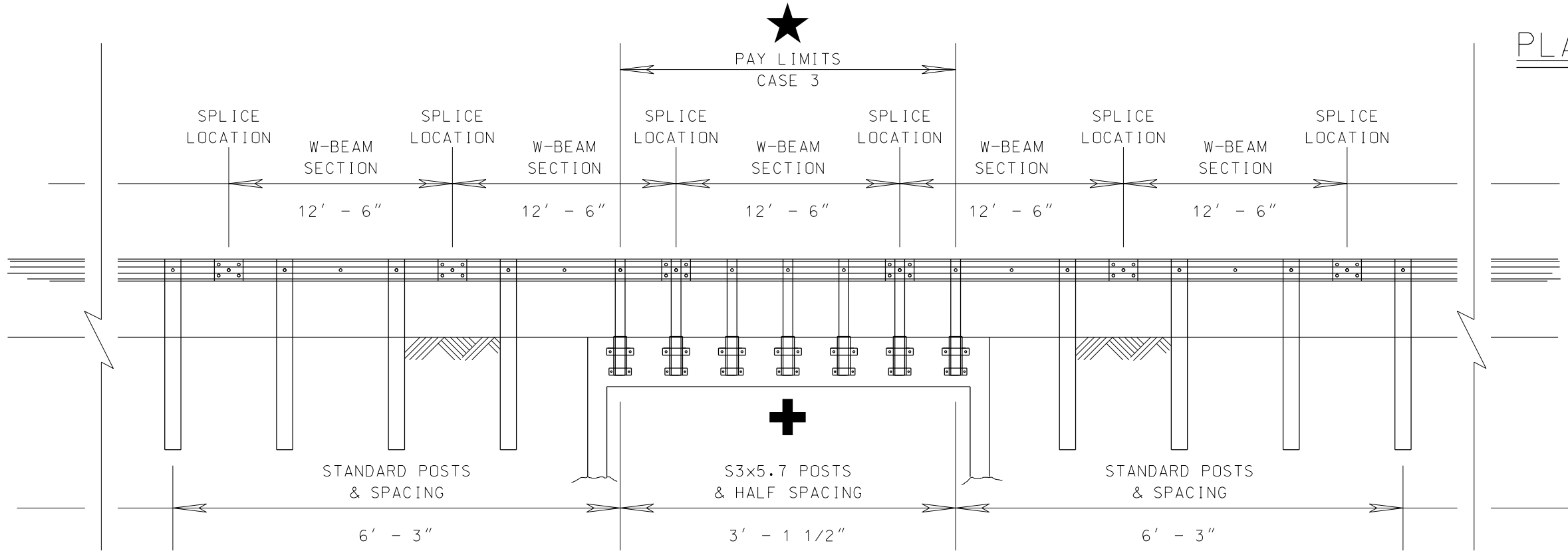
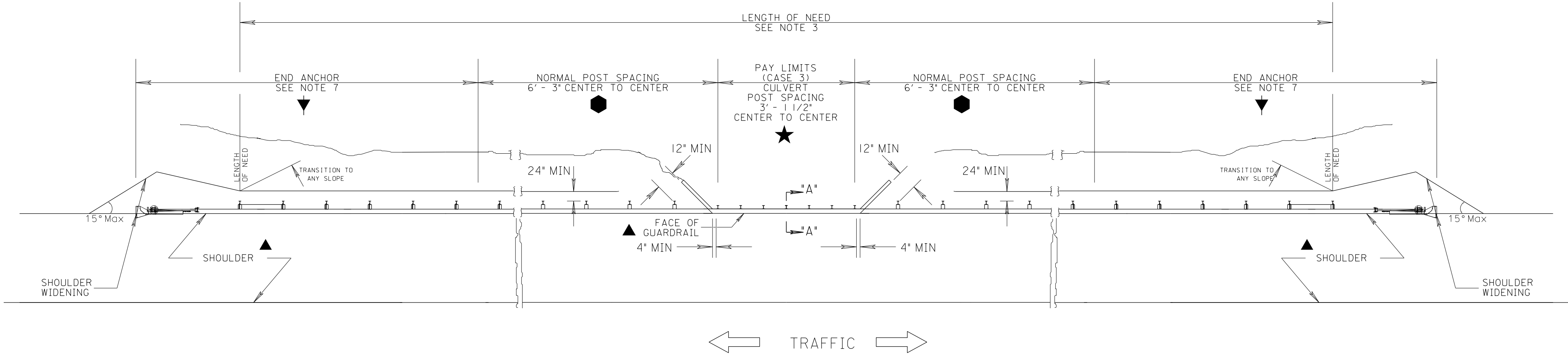
--SPECIFICATIONS-- CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION		
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REVISIONS 1. No changes to Case 2. Moved to separate sheet due to changes in Cases 1, 3, 4, 5, and 6 on 08-26-2019 by D.J.W.	 <b>ALABAMA DEPARTMENT OF TRANSPORTATION</b> 1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050	
	DESIGN BUREAU SPECIAL DRAWING DETAILS FOR CONCRETE BARRIER TYPE CSF 4-A (MODIFIED) AT CULVERTS WHERE SHALLOW FILL HEIGHTS WILL NOT ACCOMMODATE NORMAL GUARDRAIL POSTS	
Bureau Std Engr: <u>D.J.W.</u> DRAWN BY: <u>C.J.J.Sc.</u> DATE DRAWN: <u>04-21-92</u>	SPECIAL DRAWING NO GR-630-CL (SHEET 2 OF 4)	INDEX NO 63014

NOT TO SCALE



GENERAL NOTES

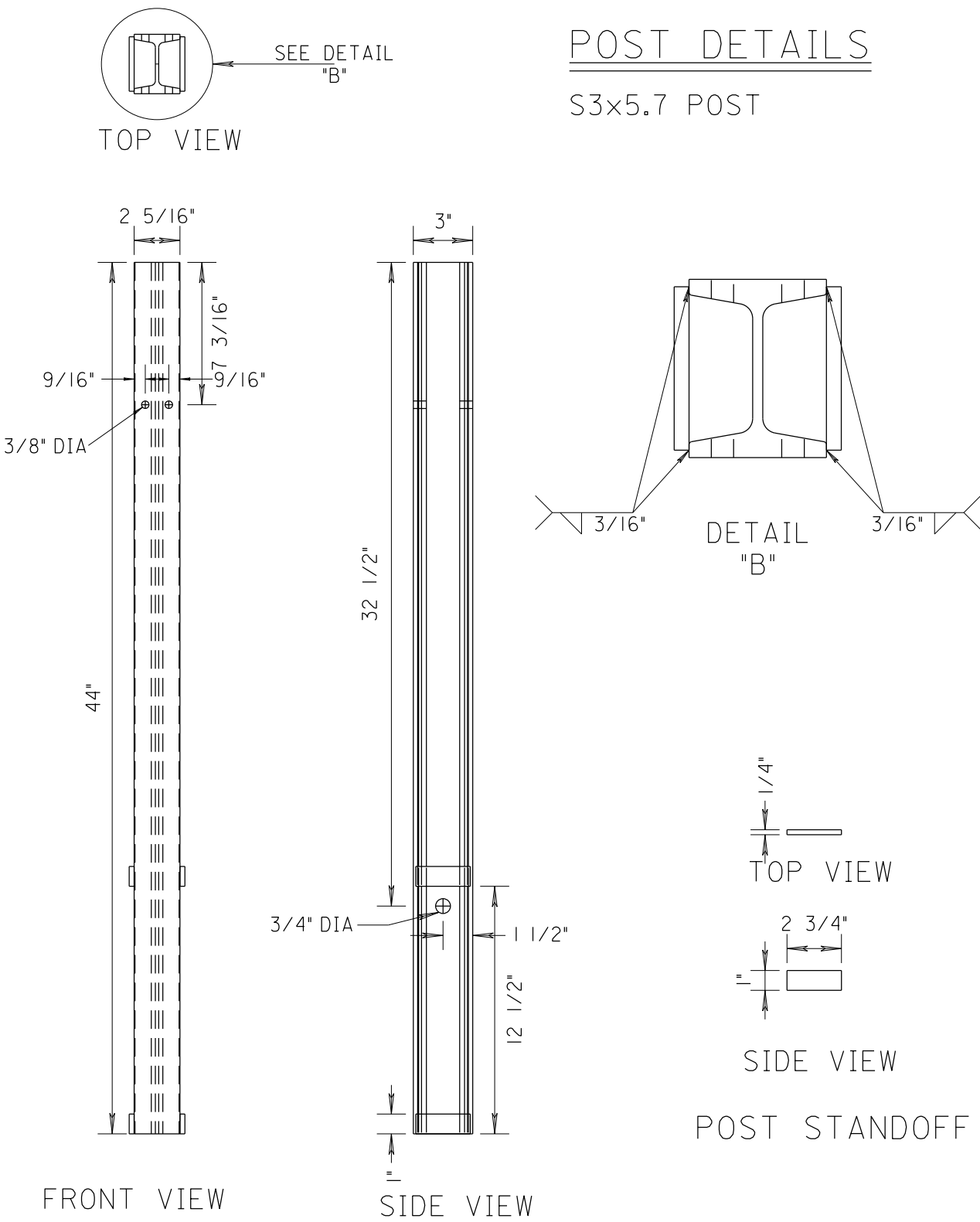
- NO PUNCHING, DRILLING, CUTTING OR WELDING WILL BE PERMITTED AFTER GALVANIZATION IS APPLIED.
- THE GUARDRAIL POSTS DEPICTED IN THESE DETAILS ARE FOR PICTORIAL PURPOSES AND SHALL NOT BE CONSTRUED AS INDICATING THE NUMBER OF POSTS REQUIRED.
- THE LENGTH OF NEED SHOWN IS FOR THE GUARDRAIL SYSTEM REQUIREMENT. ADDITIONAL GUARDRAIL LENGTH MAY BE NEEDED FOR SECONDARY HAZARDS SUCH AS SLOPE, WATERWAY, ETC...
- FACE OF GUARDRAIL SHOULD (WHERE PRACTICAL) BE LOCATED A MINIMUM OF 4' FROM THE EDGE OF PAVEMENT, OR LOCATED AT THE EDGE OF SHOULDER, WHICHEVER IS GREATER.
- POSTS ATTACHED TO THE PARAPET WALL SHALL BE S3x5.7 STEEL POSTS, MODIFIED AS PER THE DETAILS PROVIDED. OTHER POSTS MAY BE EITHER WOOD OR STEEL.
- SEE APPROPRIATE GUARDRAIL DETAILS FOR SPLICE DETAILS, MOUNTING HEIGHT, ETC.
- ANY APPROVED END ANCHOR THAT HAS BEEN DESIGNED TO FUNCTION PROPERLY IN THE SITE CONDITIONS GIVEN MAY BE USED IN LIEU OF THE TYPE 20 SERIES END ANCHOR SHOWN. SEE SPECIFIC END ANCHOR DETAIL DRAWINGS FOR DESIGN CRITERIA AND INSTALLATION GUIDELINES.
- THE PAY LIMITS FOR CASE 3 SHALL BE FROM THE FROM THE FIRST POST MOUNTED TO THE PARAPET TO THE LAST. THE PAY LIMITS SHALL INCLUDE ALL REQUIRED GUARDRAIL, BACKUP PLATES, POSTS, DRILLING, HARDWARE, BRACKETS, POSTS, ETC. NECESSARY FOR THE INSTALLATION.
- ALL NUTS, BOLTS, ETC. SHALL MEET GRADE 60 STEEL REQUIREMENTS. ALL EPOXY SHALL MEET 1,300 PSI MINIMUM BOND STRENGTH REQUIREMENTS.
- A MINIMUM OF 12' - 6' OF GUARDRAIL SHALL BE REQUIRED BETWEEN THE FIRST / LAST POST OF THE CASE 3 GUARDRAIL AND THE SPLICE OF A TYPE 20 SERIES GUARDRAIL END ANCHOR. THIS REQUIREMENT IS INCREASED TO A MINIMUM OF 25' - 0' WHEN TYPE 10 SERIES GUARDRAIL END ANCHORS ARE USED.
- NO PIECE OF W-BEAM GUARDRAIL SHORTER THAN 9' - 4 1/2' SHALL BE ALLOWED IN EITHER THE CASE 3 INSTALLATIONS, IN ADJACENT GUARDRAIL SECTIONS, OR IN THE TRANSITION BETWEEN THE TWO.
- THE POST BRACKETS FOR THE CASE 3 INSTALLATION SHALL BE LOCATED IN SUCH A MANNER THAT THEY DO NOT STRADDLE A CULVERT JOINT.



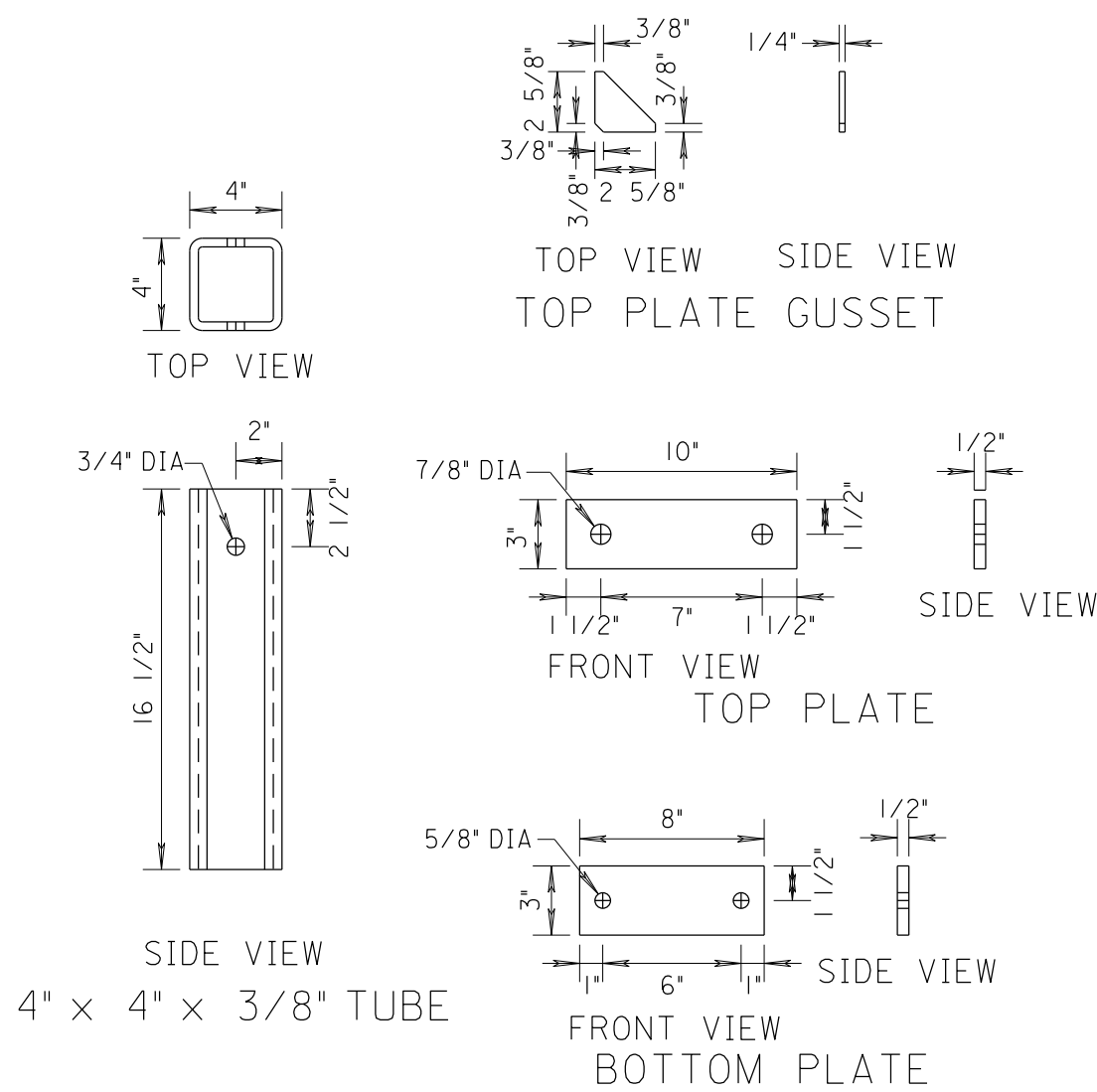
PLAN - CASE 3

PROFILE - CASE 3

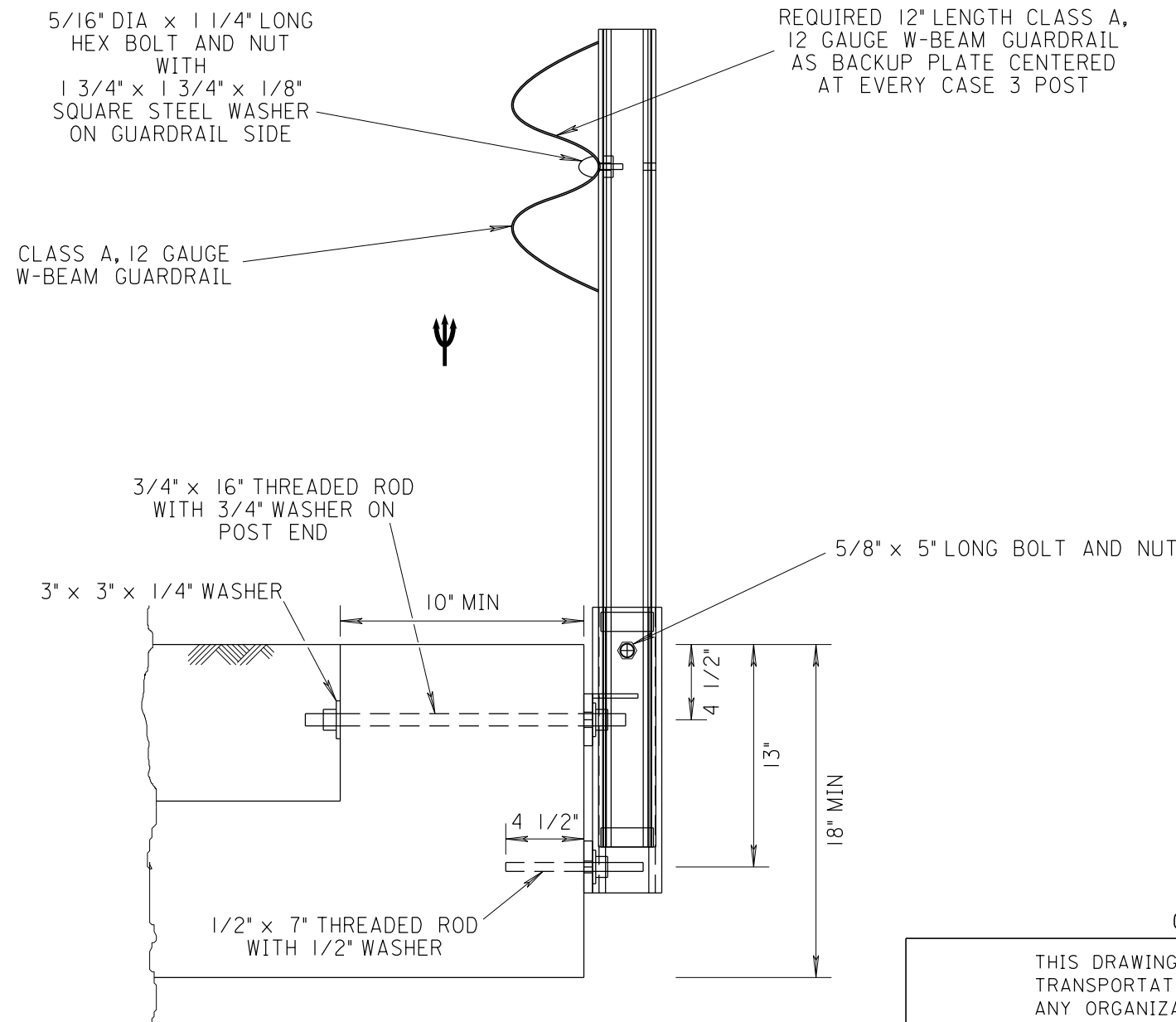
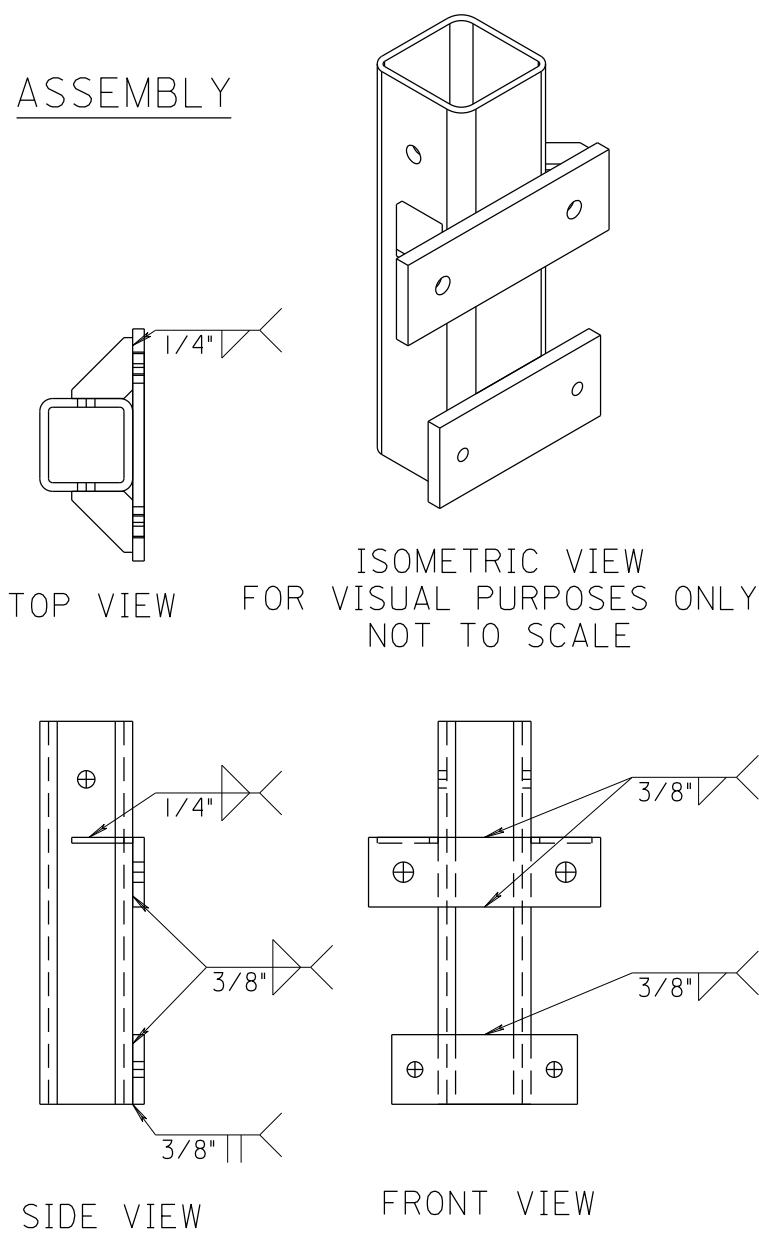
VERTICAL DEPICTION NOT TO SCALE.



POST MOUNTING BRACKET




ASSEMBLY

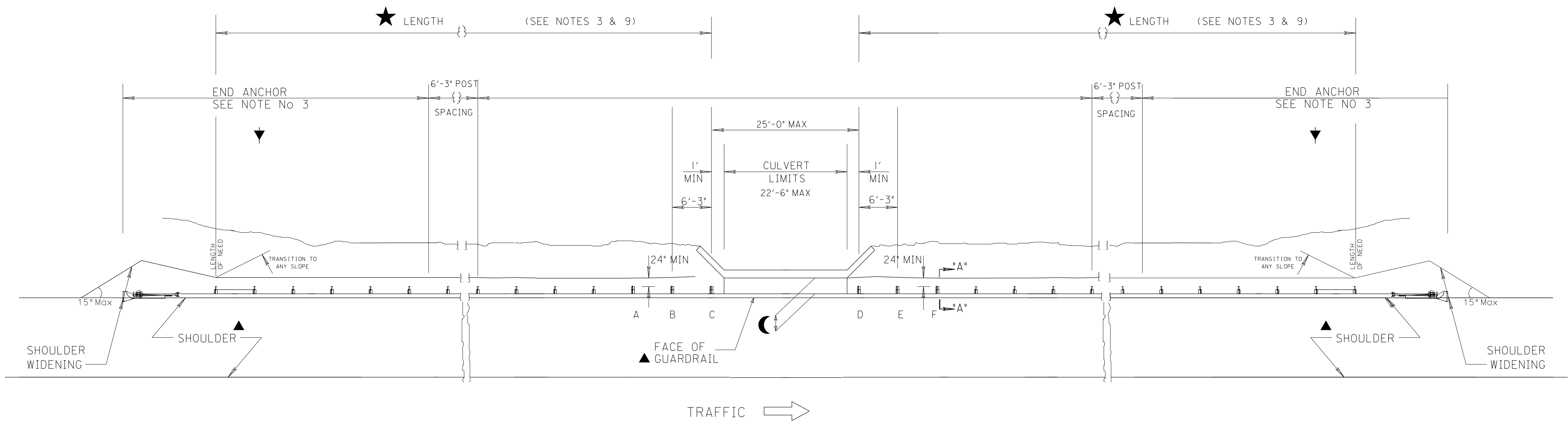


SECTION "A - A"

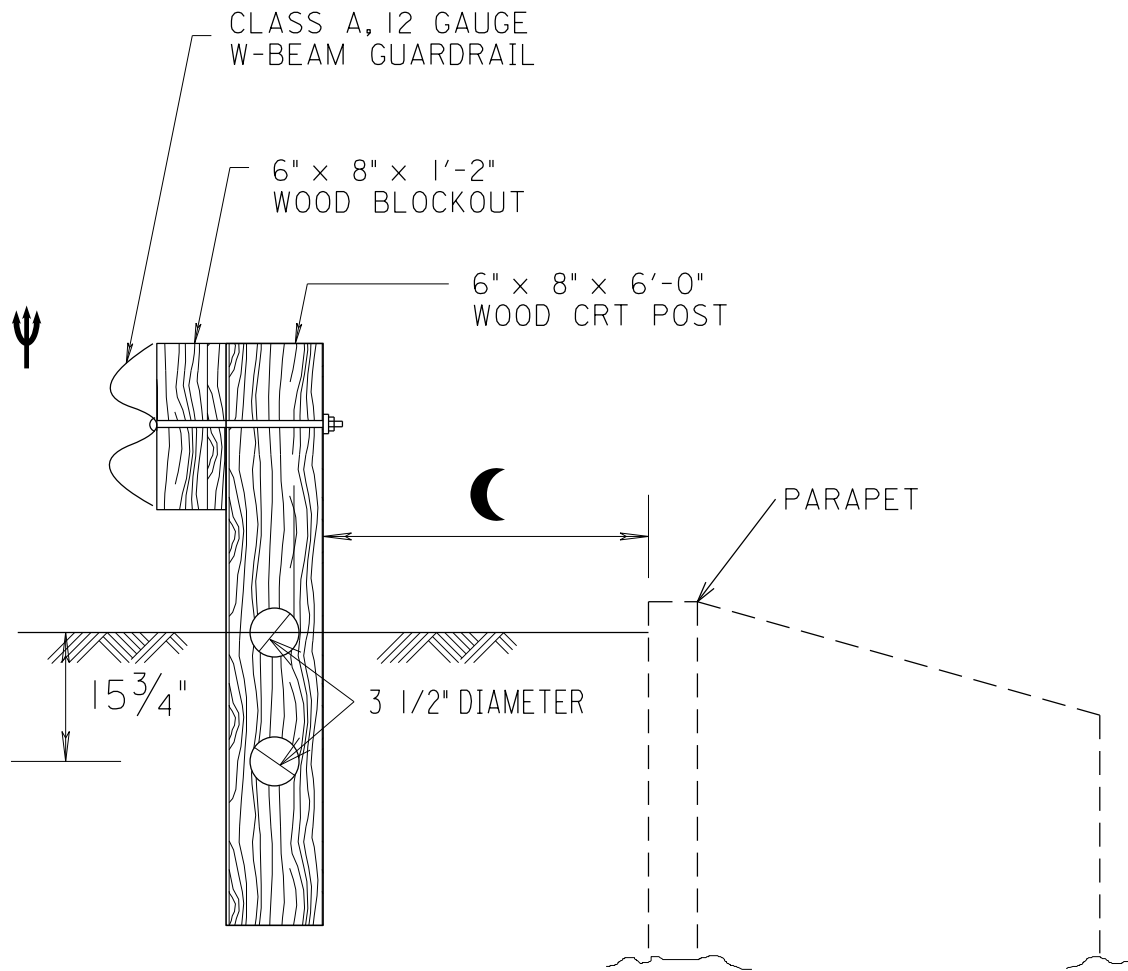
DRILL AND EPOXY BOTTOM BOLTS  
DRILL THROUGH TOP BOLTS

--SPECIFICATIONS-- CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION		
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<div>REVISIONS</div> <div>1. Completely redraw sheet to meet MASH standards on 10-25-2019 by DJW.</div> <div>2. Added Backup plate note to detail 'A-A' and General Notes 10, 11, and 12 on 11-20-19 by DJW.</div> <div>3. Modified Note 10 on 11-26-19 by DJW.</div> <div>4. Modified Backup Plate length on 3-25-20 by DJW.</div> <div>5. Removed the length from Note 4 on 9-30-2020 by DJW.</div>		
<div> <b>ALABAMA DEPARTMENT OF TRANSPORTATION</b> 1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050</div> <div>DESIGN BUREAU SPECIAL DRAWING</div> <div>DETAILS FOR GUARDRAIL (MASH) AT CULVERTS WHERE POSTS ARE BOLTED TO THE PARAPET OF THE CULVERT</div>		
Bureau Std Engr: <u>D.J.W.</u> DRAWN BY: <u>D.J.W.</u> DATE DRAWN: <u>10-25-2019</u>		INDEX NO <b>63015</b>
SPECIAL DRAWING NO <b>GR-630-CL (SHEET 3 OF 4)</b>		

NOT TO SCALE



PLAN - CASES 4, 5, & 6



SECTION "A-A"  
CASES 4, 5, & 6  
POSTS A,B,C,D,E, & F  
(SEE NOTE 5)

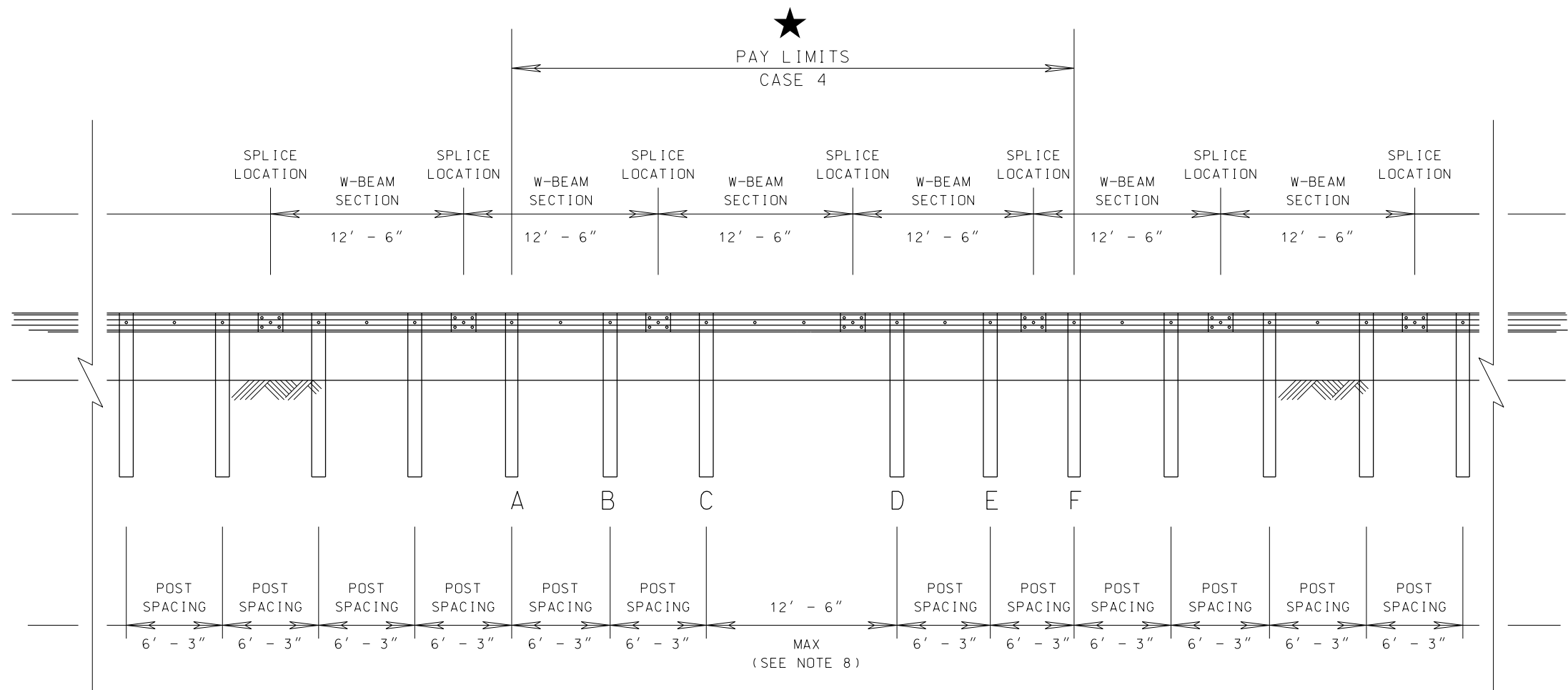
GENERAL NOTES

1. NO PUNCHING, DRILLING, CUTTING OR WELDING WILL BE PERMITTED AFTER GALVANIZATION IS APPLIED.
2. THE GUARDRAIL POSTS DEPICTED IN THESE DETAILS ARE FOR PICTORIAL PURPOSES AND SHALL NOT BE CONSTRUED AS INDICATING THE NUMBER OF POSTS REQUIRED.
3. THE LENGTH OF NEED SHOWN IS FOR THE GUARDRAIL SYSTEM REQUIREMENT. ADDITIONAL GUARDRAIL LENGTH MAY BE NEEDED FOR SECONDARY HAZARDS SUCH AS SLOPE, WATERWAY, ETC...
- ▲ 4. FACE OF GUARDRAIL SHOULD (WHERE PRACTICAL) BE LOCATED A MINIMUM OF 4' FROM THE EDGE OF PAVEMENT, OR LOCATED AT THE EDGE OF SHOULDER, WHICHEVER IS GREATER.
5. POSTS A, B, C, D, E, & F SHALL BE WOOD CRT. OTHER POSTS MAY BE EITHER WOOD OR STEEL.
- ψ 6. SEE APPROPRIATE GUARDRAIL DETAILS FOR SPLICE DETAILS, MOUNTING HEIGHT, ETC.
- ▼ 7. ANY APPROVED END ANCHOR THAT HAS BEEN DESIGNED TO FUNCTION PROPERLY IN THE SITE CONDITIONS GIVEN MAY BE USED IN LIEU OF THE TYPE 20 SERIES END ANCHOR SHOWN, SEE SPECIFIC END ANCHOR DETAIL DRAWINGS FOR DESIGN CRITERIA AND INSTALLATION GUIDELINES.
- ☾ 8. THE CULVERT PARAPET SHALL BE 2 INCHES OR LESS ABOVE THE GROUND LINE. TALLER PARAPETS MUST BE REDUCED IN HEIGHT OR THE GROUND LINE RAISED TO MEET THIS REQUIREMENT. ANY CUT OR GROUND SURFACE SHALL BE TREATED WITH AN APPROVED EPOXY COATING FROM THE ALDOT APPROVED PRODUCTS LIST. IF THE 2 INCHES OR LESS REQUIREMENT CANNOT BE MET, THEN THE LATERAL OFFSET FROM THE FACE OF THE GUARDRAIL TO THE PARAPET WALL SHALL BE INCREASED TO 8' MIN. THE COST OF THIS WORK (GRINDING, CUTTING, COATING, ETC) SHALL BE A SUBSIDIARY OF THE COST OF THE GUARDRAIL.
- ★ 9. THE PAY LIMITS FOR ALL THREE CASES SHALL BE FROM POST A TO POST F. THE APPROPRIATE GUARDRAIL OR END ANCHOR PAY ITEMS SHALL BE USED TO EXTEND THE INSTALLATION TO THE REQUIRED SYSTEM LENGTH. SEE ABOVE TABLE.

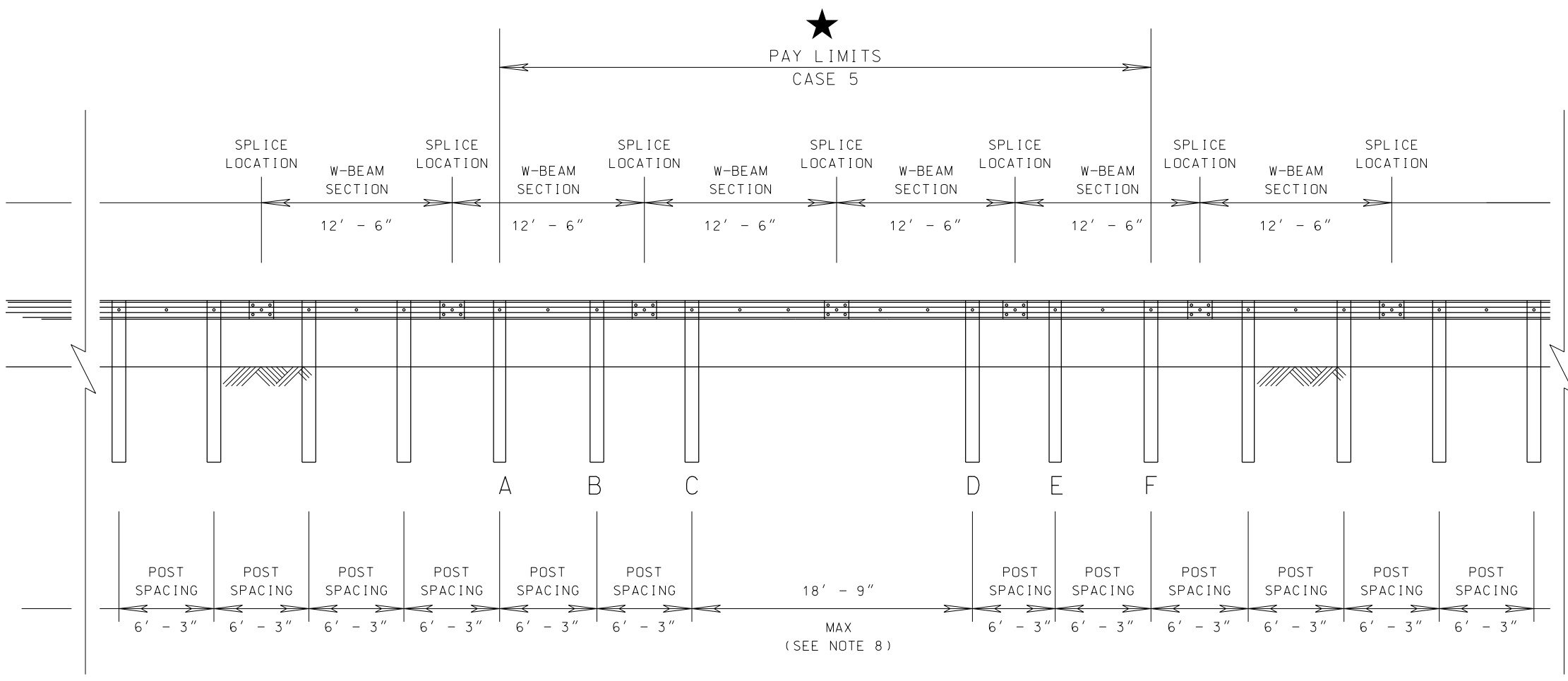
★ SYSTEM REQUIREMENTS

CASE	DESCRIPTION	UNSUPPORTED SPAN LENGTH	PAY LIMITS (POSTS A - F LENGTH)	REQUIRED APPROACH GUARDRAIL LENGTH (BOTH ENDS) *	REQUIRED MINIMUM SYSTEM LENGTH
4	1 POST REMOVED	12' - 6"	37' - 6"	37'-6"	112' - 6"
5	2 POSTS REMOVED	18' - 9"	43' - 9"	43'-9"	131' - 3"
6	3 POSTS REMOVED	25' - 0"	50' - 0"	50'-0"	150' - 0"

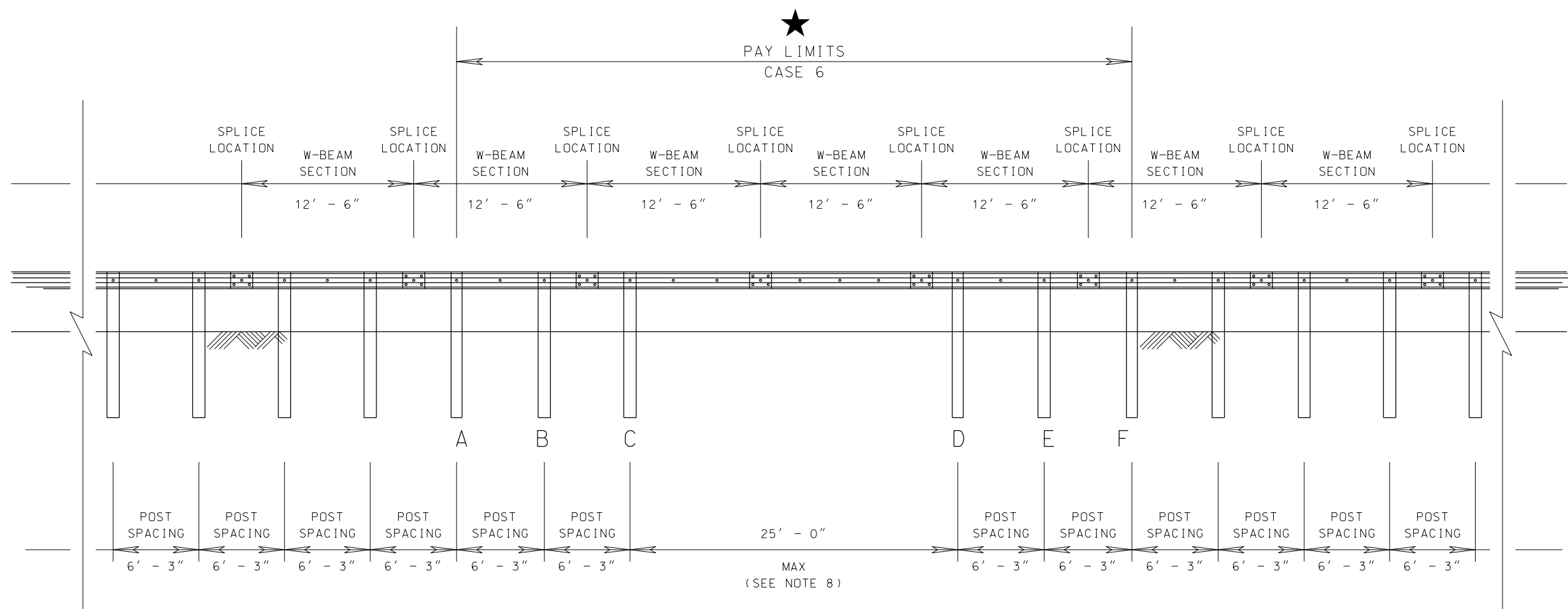
\* THIS LENGTH MAY BE ACCOUNTED FOR IN THE END ANCHOR LENGTH OF NEED.



PROFILE - CASE 4  
VERTICAL DEPICTION NOT TO SCALE.



PROFILE - CASE 5  
VERTICAL DEPICTION NOT TO SCALE.



PROFILE - CASE 6  
VERTICAL DEPICTION NOT TO SCALE.

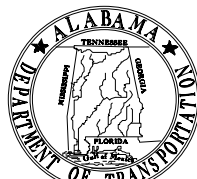
--SPECIFICATIONS--

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REVISIONS

1. Completely modified drawing to meet MASH standards on 8-26-2019 by D.J.W.
2. Changed the symbol in the Plan View to a crescent for the lateral offset to face of culvert on 10-25-2019 by D.J.W.



ALABAMA DEPARTMENT OF TRANSPORTATION  
1409 COLISEUM BOULEVARD  
MONTGOMERY, AL 36130-3050

DESIGN BUREAU SPECIAL DRAWING

DETAILS FOR LONG SPAN GUARDRAIL (MASH) AT CULVERTS WHERE SHALLOW FILL HEIGHTS WILL NOT ACCOMMODATE NORMAL POSTS

Bureau Std Engr: D.J.W.  
DRAWN BY: D.J.W. DATE DRAWN: 08-26-2019

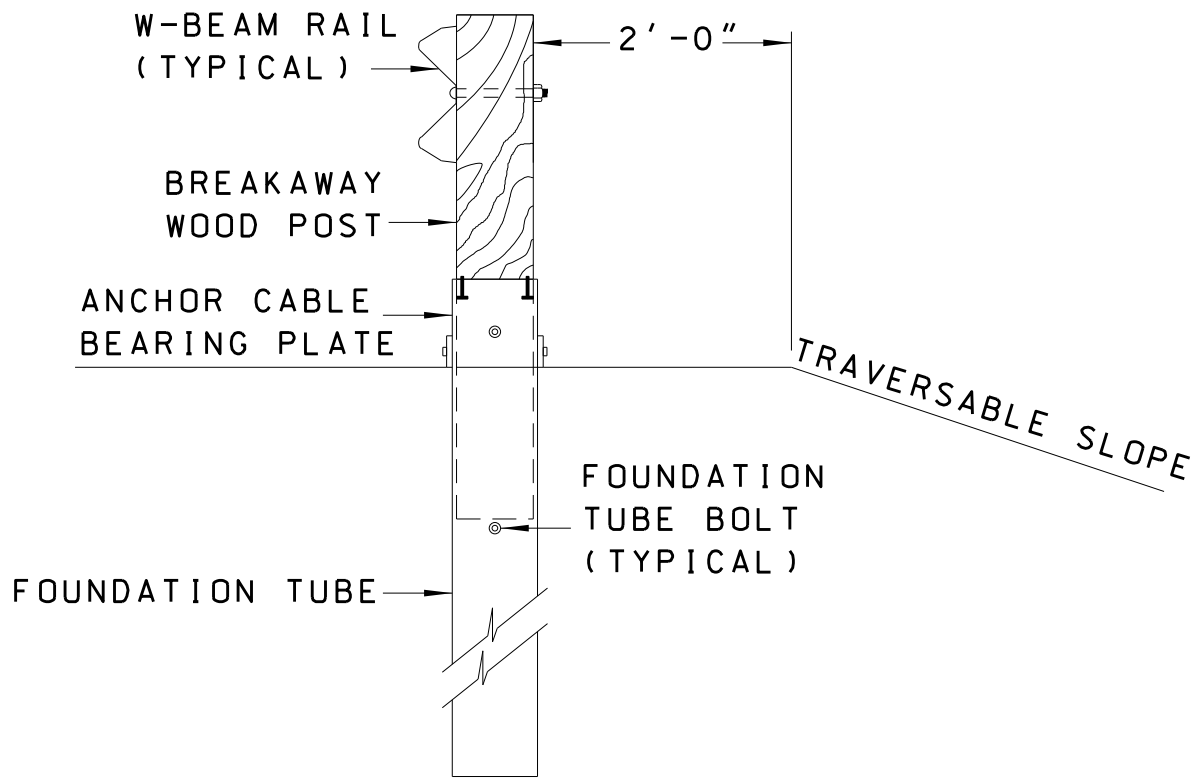
SPECIAL DRAWING NO  
GR-630-CL (SHEET 4 OF 4)

INDEX NO  
63016

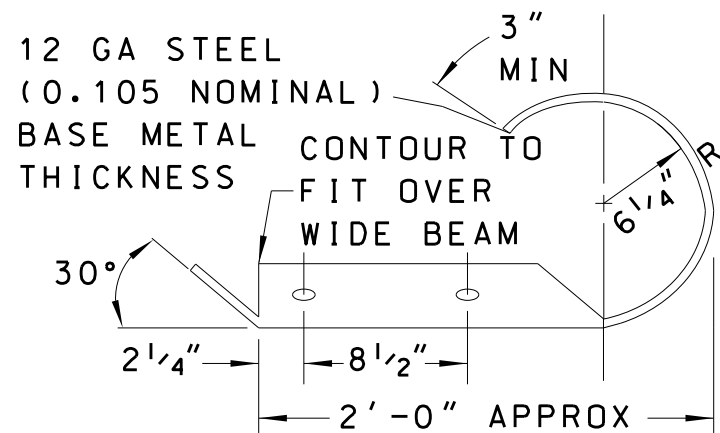
NOT TO SCALE

GENERAL NOTES

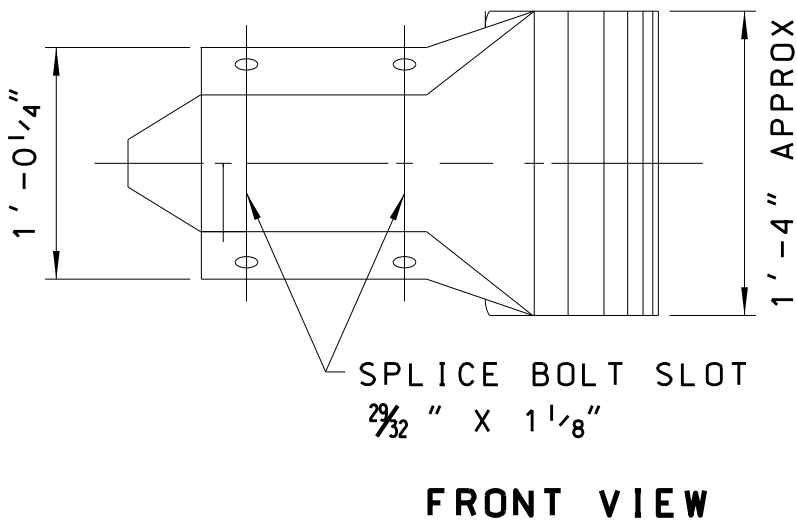
- ALL BOLTS, NUTS, CABLE ANCHORS, BEARING PLATES, ETC., SHALL BE GALVANIZED.
- END SECTIONS BOLTS AND NUTS HAVE THE SAME MATERIAL REQUIREMENTS AS SPLICE BOLTS.
- FOUNDATION TUBE BOLTS ARE 7/8" DIAMETER ASTM A307 HEX HEAD BOLT. FOUNDATION TUBE BOLTS REQUIRE ASTM A563 A NUT AND TWO ASTM F844 7/8" DIAMETER FLAT WASHERS. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.
- ANCHOR BRACKET AND GROUND STRUT BOLTS ARE 5/8" DIAMETER ASTM A307 HEX HEAD BOLT. ANCHOR BRACKET BOLTS REQUIRE ASTM A563 A NUT AND TWO ASTM F844 5/8" DIAMETER FLAT WASHERS. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.
- W-BEAM END SECTION ROUNDED HAS THE SAME MATERIAL PROPERTIES AS STANDARD STEEL RAIL.
- TOP OF FONDATION TUBE SHALL BE NO MORE THAN 3" ABOVE FINISHED GROUND.
- PAYMENT FOR THE GUARDRAIL END ANCHOR TYPE 8 (MASH) SHALL BE UNDER ITEM 630C. THE PRICE BID SHALL INCLUDE ALL RAIL, POSTS, CABLE, TUBES, BOLTS, ETC AS SHOWN ON THESE DRAWINGS.



SECTION A-A



PLAN VIEW



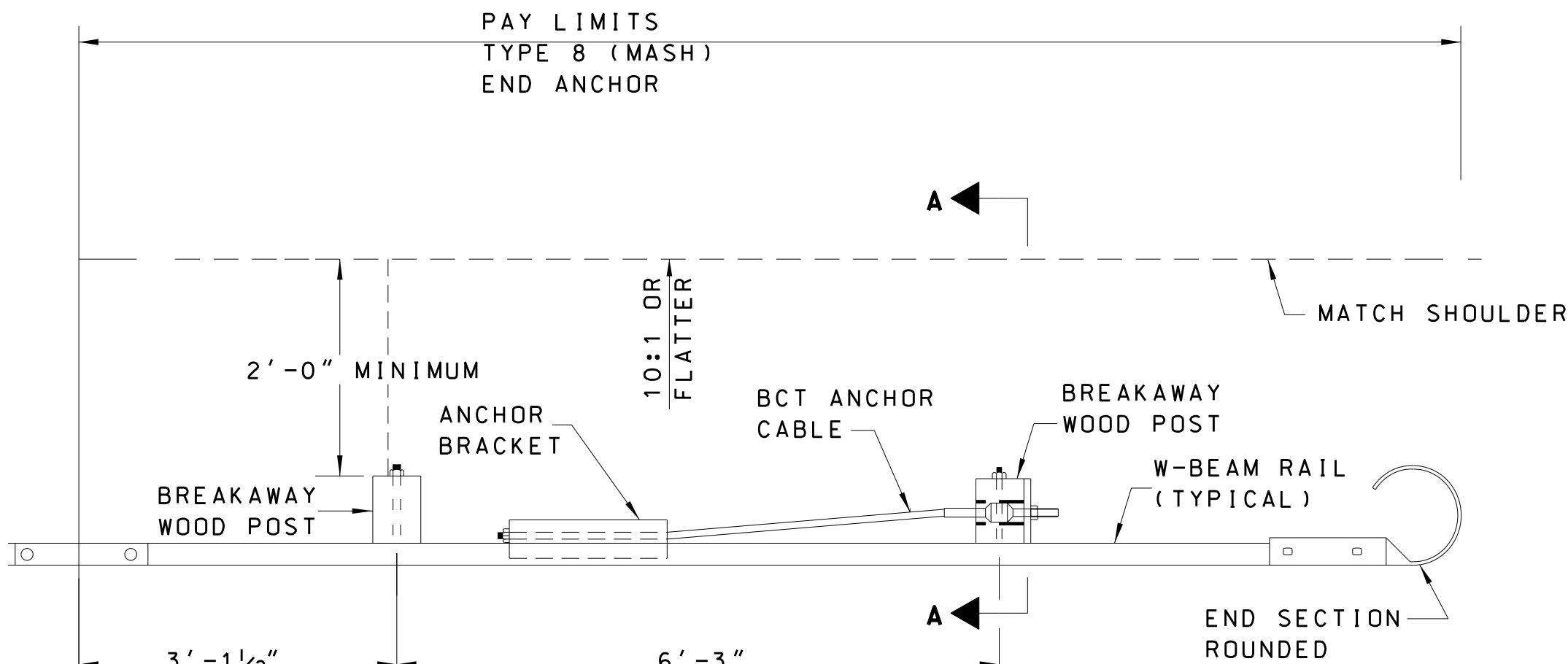
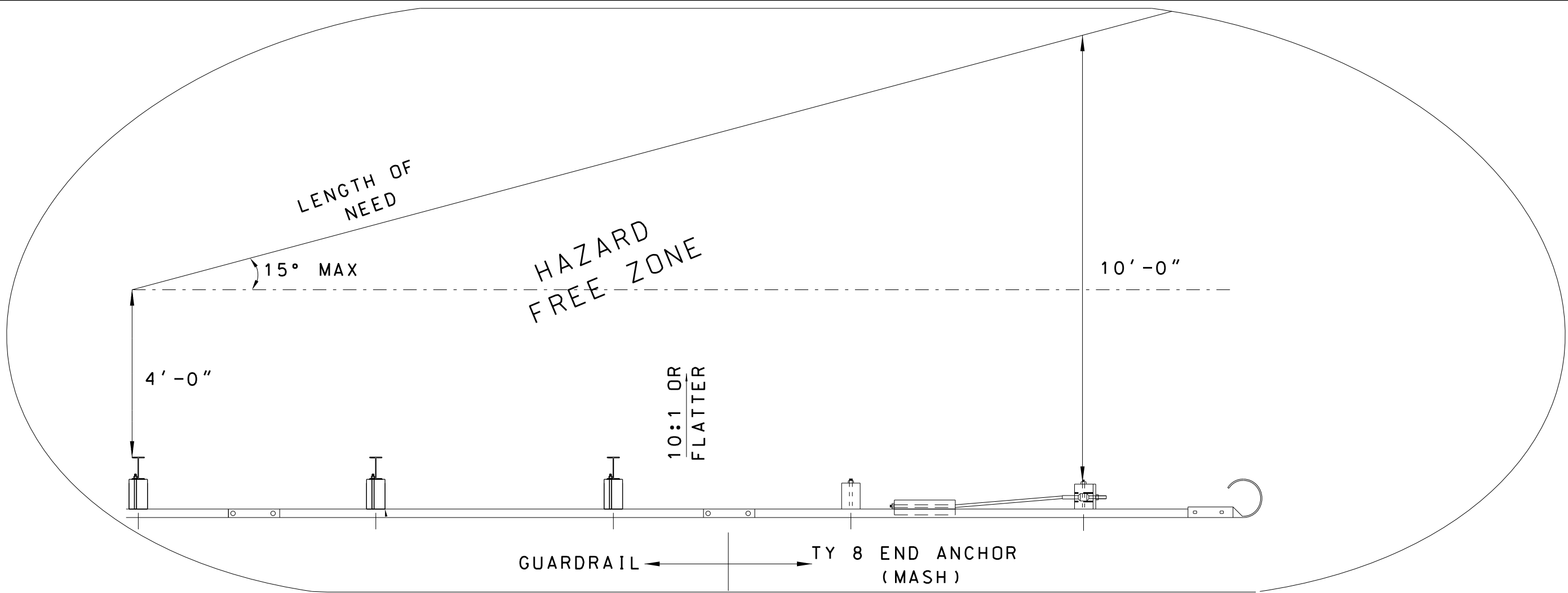
FRONT VIEW

W BEAM END  
SECTION ROUNDED

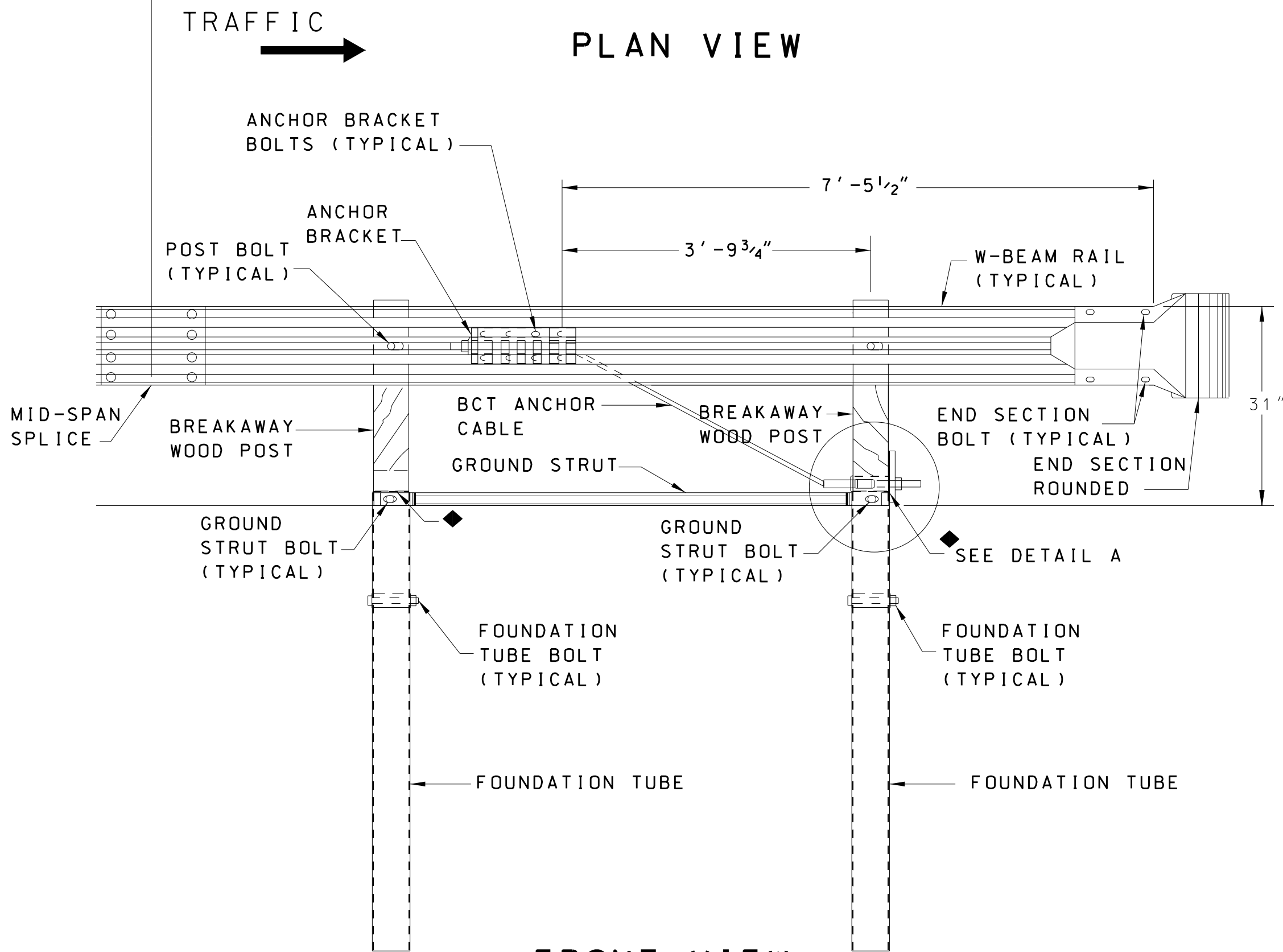
--SPECIFICATIONS--  
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<div>REVISIONS</div> <div>1. Sheet completely redrawn to meet MASH standards on 09-15-2020 by J.F.T.</div>		
<div>ALABAMA DEPARTMENT OF TRANSPORTATION</div> <div>1409 COLISEUM BOULEVARD</div> <div>MONTGOMERY, AL 36130-3050</div> <div>DESIGN BUREAU SPECIAL DRAWING</div>		
DETAILS OF GUARDRAIL END ANCHOR - TYPE 8 (MASH)		
Bureau Std Engr: D.J.W. DRAWN BY: J.F.T. DATE DRAWN: 09-15-2020	SPECIAL DRAWING NO GA-630-8 (SHEET 1 OF 2)	INDEX NO 63030

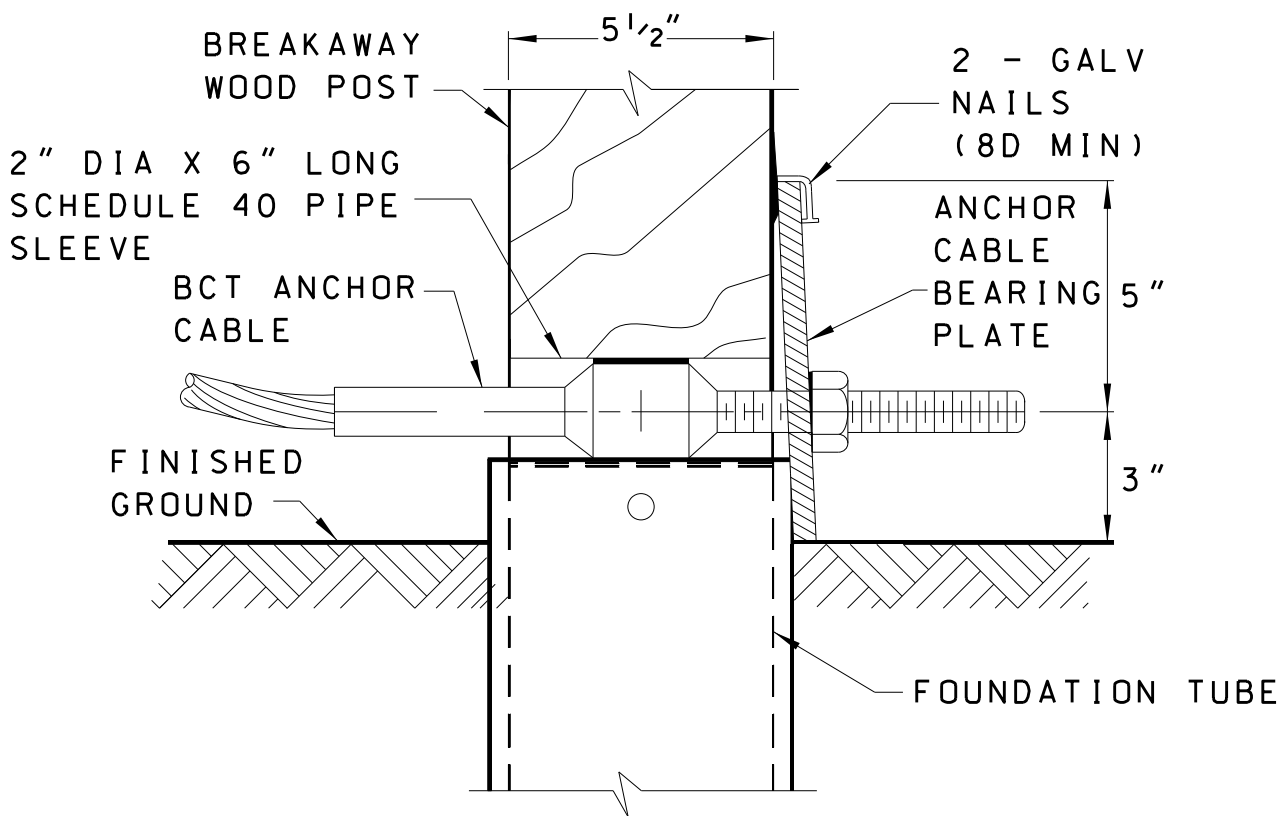
NOT TO SCALE



PLAN VIEW



FRONT VIEW

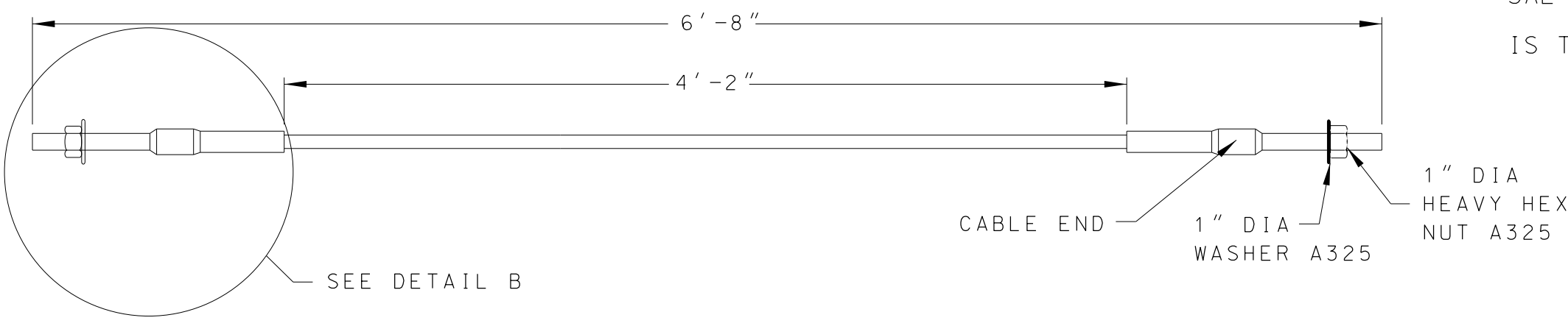
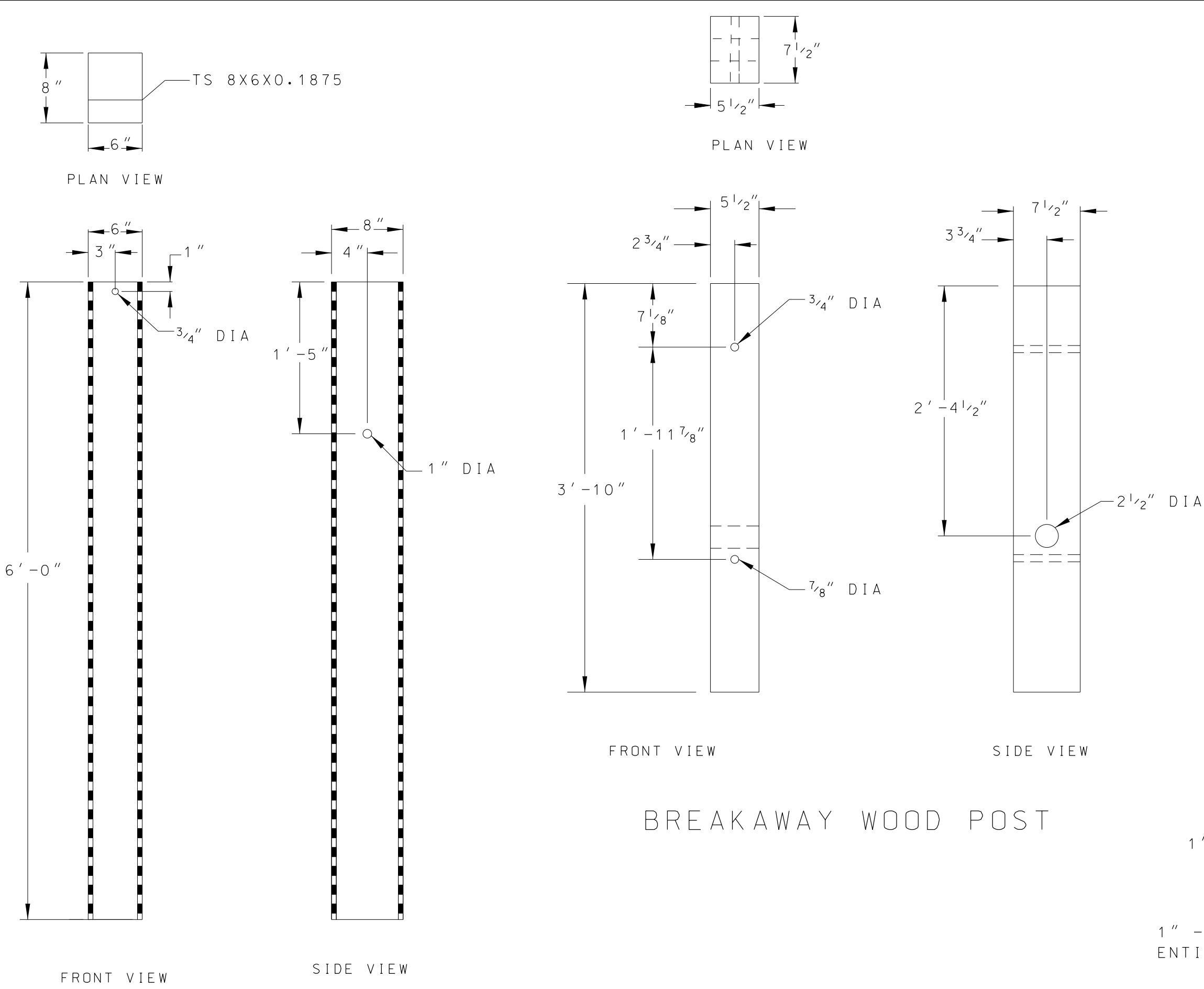


DETAIL A

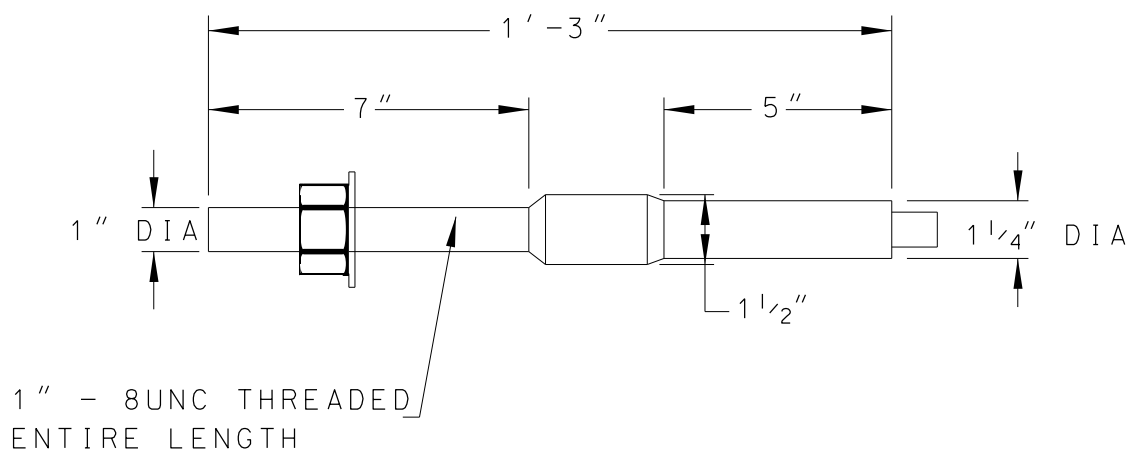
GROUND STRUT NOT SHOWN FOR CLARITY

GENERAL NOTES

BCT ANCHOR CABLE IS A 3/4" DIAMETER 6X19 IWRC IPS GALVANIZED WIRE ROPE. THE SWAGED FITTINGS AND STUD ARE REQUIRED. END FITTINGS SHALL BE MANCHINED FROM HOT-ROLL CARBON STEEL CONFORMING TO ASTM A576 GRADE 1035 AND GALVANIZED ACCORDING TO GALVANIZED ASTM A123. TREADED STUD SHALL CONFORM TO ASTM A325 OR SAE GRADE 5. MINIMUM BREAKING STRENGTH OF WIRE ROPE IS 43,000 LBS WIRE ROPE IS TO BE TAUT.

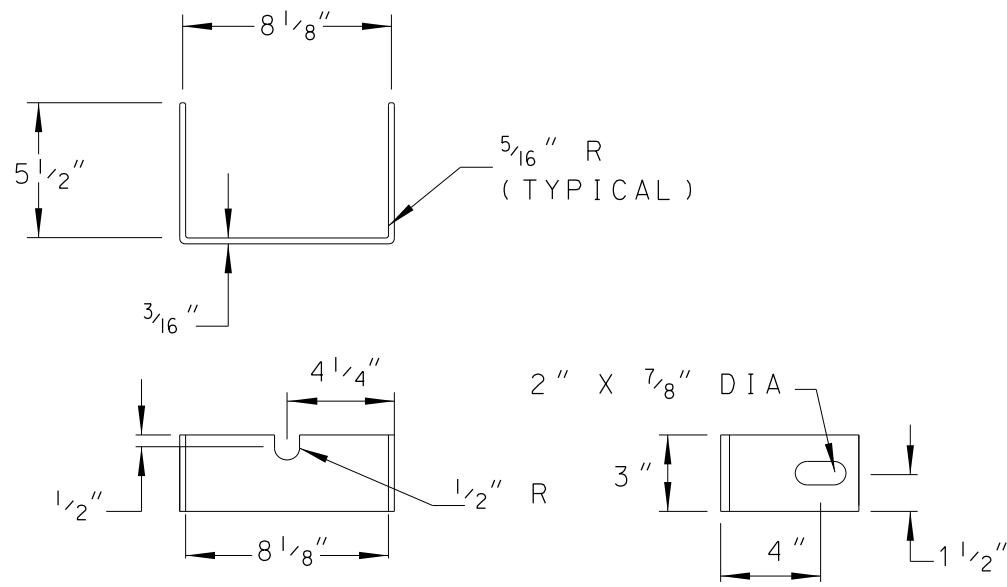
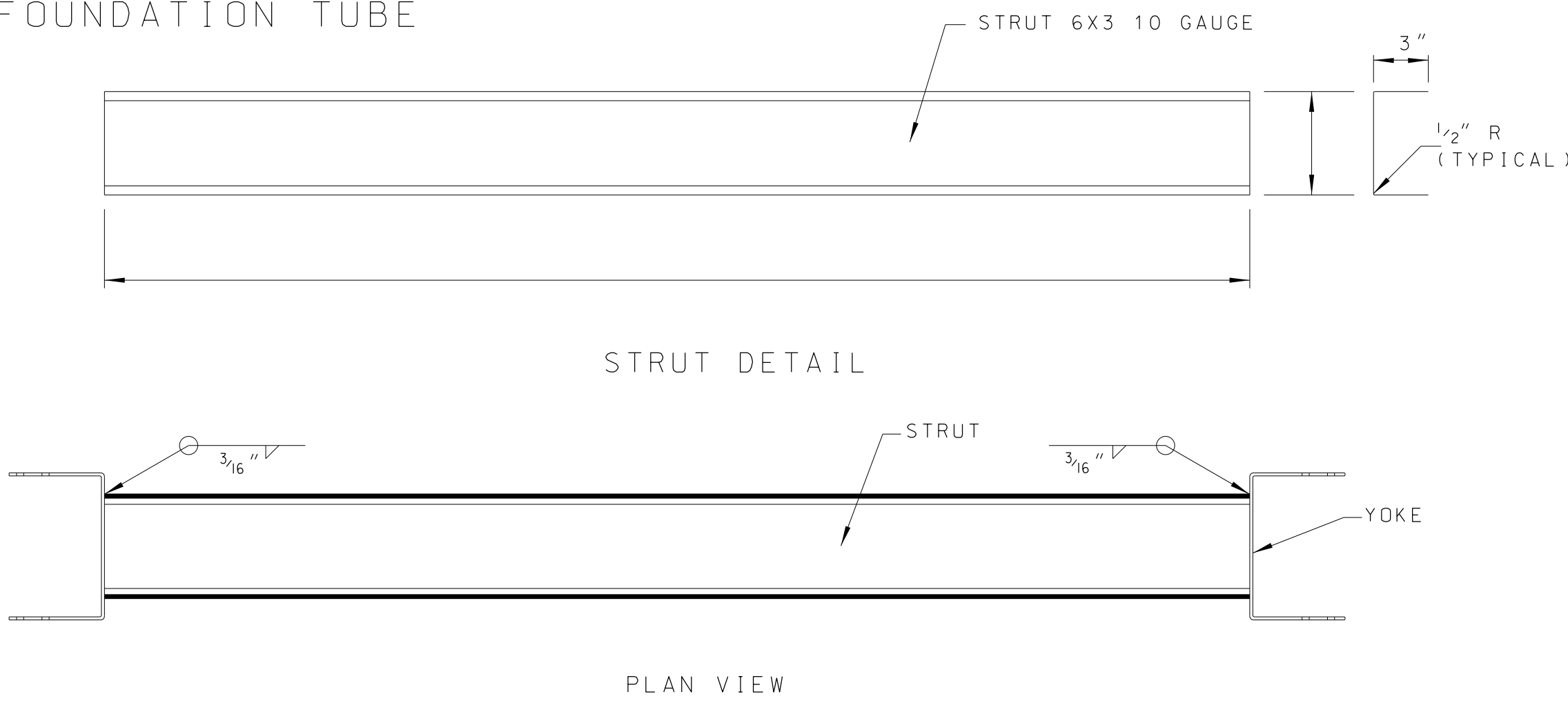


BCT ANCHOR CABLE

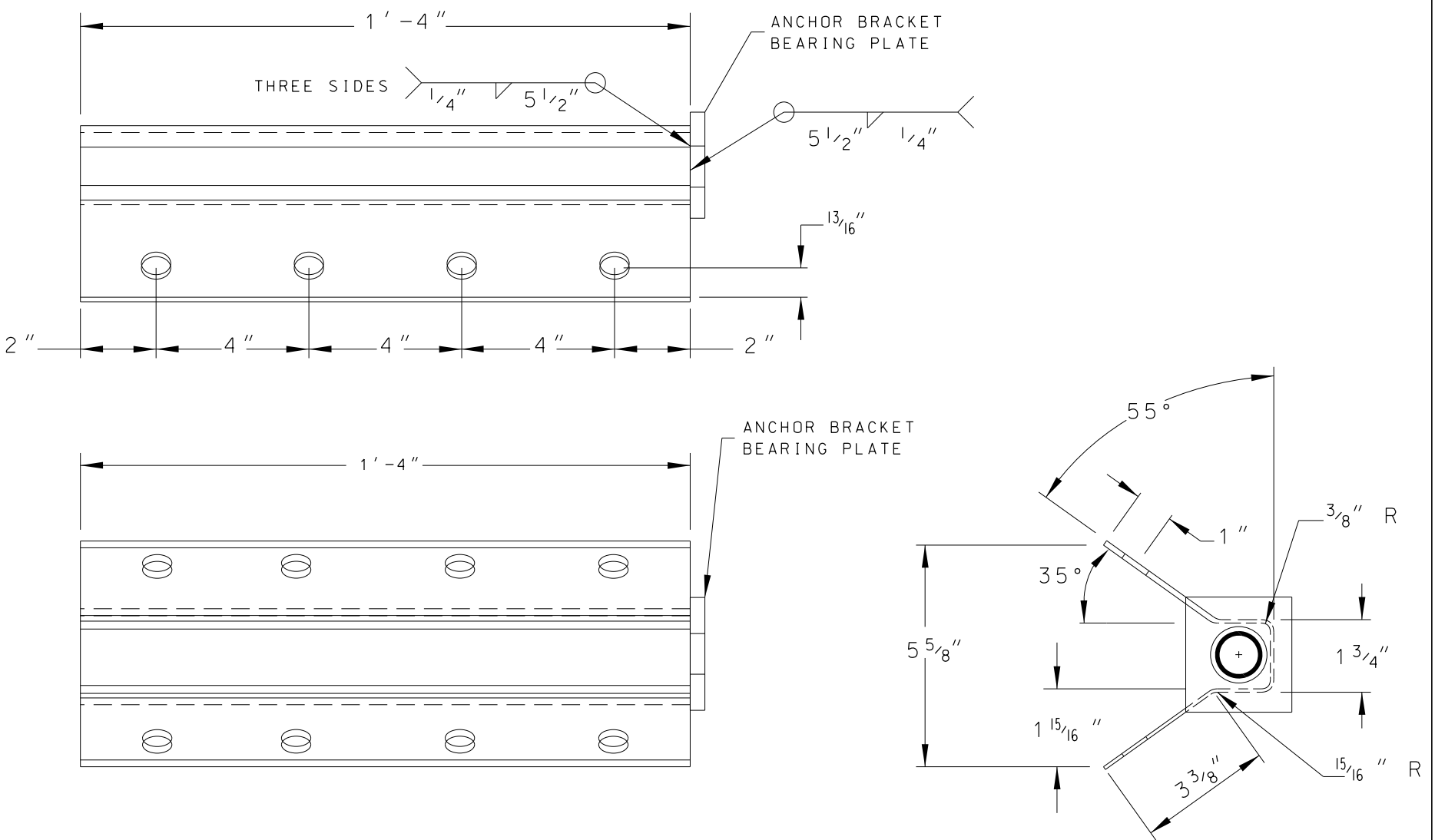


DETAIL B

FOUNDATION TUBE



YOKE DETAIL



ANCHOR BRACKET

--SPECIFICATIONS--

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ALABAMA DEPARTMENT  
OF TRANSPORTATION  
1409 COLISEUM BOULEVARD  
MONTGOMERY, AL 36130-3050

DESIGN BUREAU SPECIAL DRAWING

DETAILS OF GUARDRAIL END  
ANCHOR - TYPE 8 (MASH)

REVISIONS

Bureau Std Engr: D.J.W.  
DRAWN BY: J.F.T. DATE DRAWN: 9-15-2020

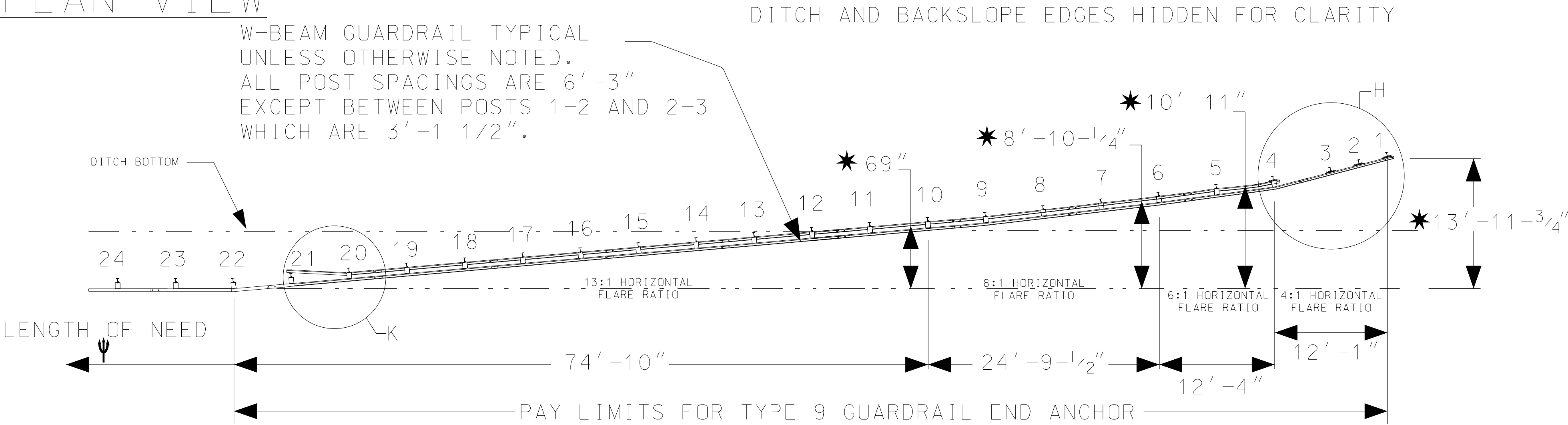
SPECIAL DRAWING NO  
GA-630-8 (SHEET 2 OF 2)

INDEX NO  
63031

NOT TO SCALE

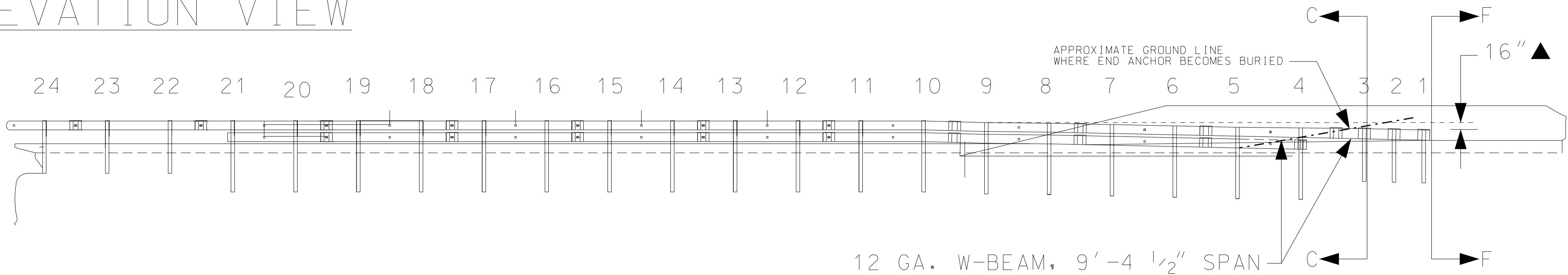


PLAN VIEW

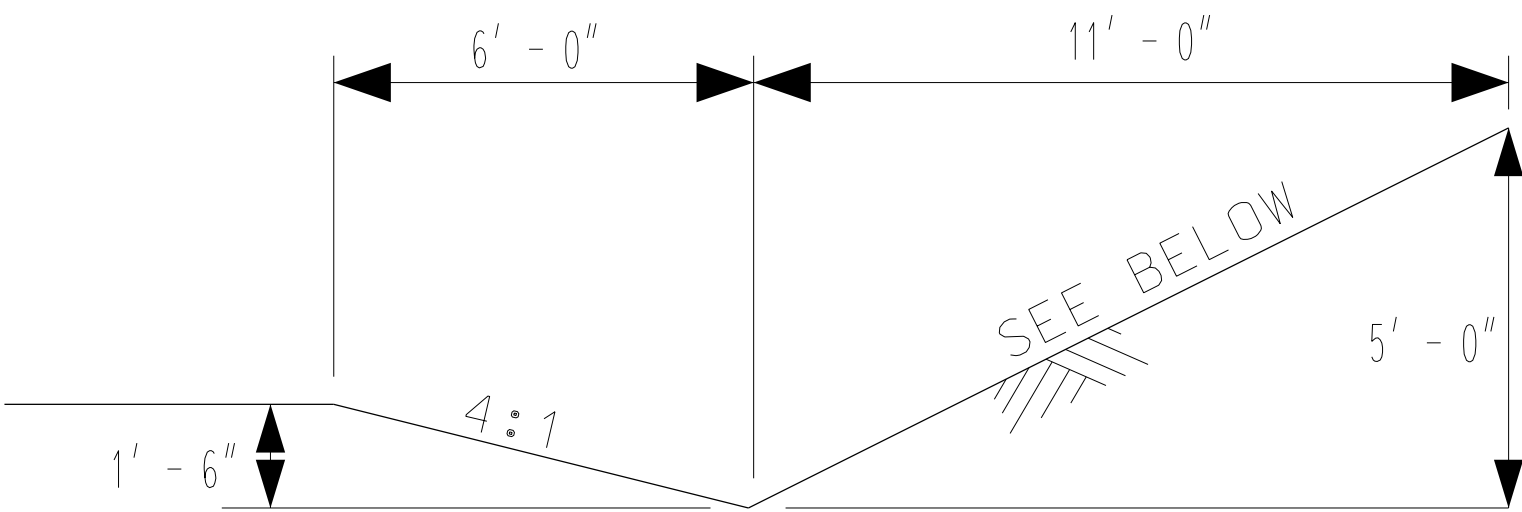


\* THESE DIMENSIONS INDICATE THE OFFSET TO THE BACK OF THE RAIL AT POSTS 1, 4, 6, AND 10

ELEVATION VIEW



SEE SHEET 2 OF 2 FOR SECTIONS AND DETAILS.

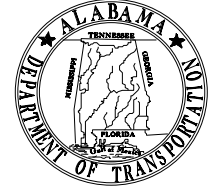


DITCH DETAILS  
SECTION C-C  
(POSTS 1 - 22)

REQUIRED BACKSLOPES:  
POSTS 1-4 2:1  
POSTS 5-22 2:1 MAX

GENERAL NOTES:

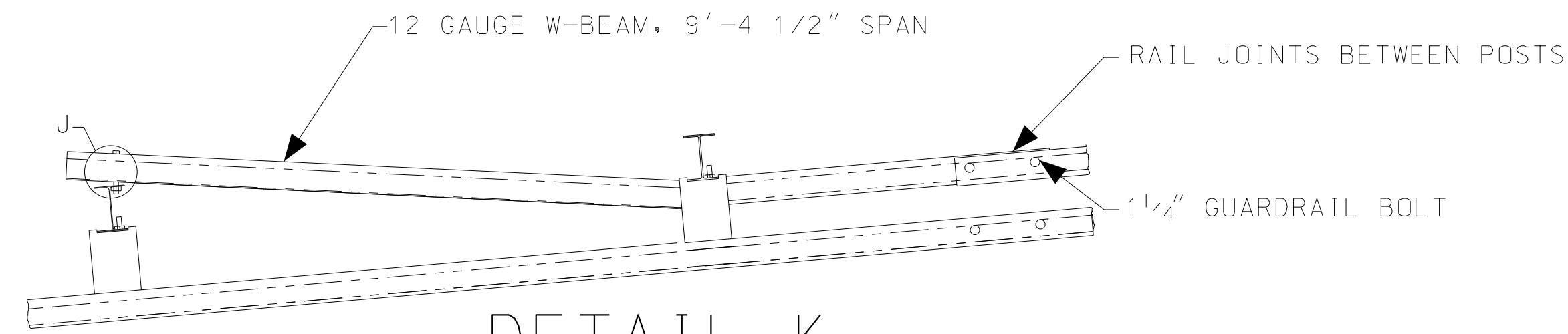
1. THE PAY LIMITS FOR THE TYPE 9 END ANCHOR SHALL EXTEND FROM POST 1 THROUGH POST 22 AND SHALL INCLUDE ALL POSTS, RAIL, NUTS, BOLTS, BLOCKOUTS, MISC HARDWARE, ETC FOR THE INSTALLATION OF THE END ANCHOR.
2. RECESSED GUARDRAIL NUTS TYPICAL ON ALL 5/8" BOLTS. ANCHOR PLATE AND HARDWARE ARE TYPICAL ON TOP OF RAIL AT POSTS 1, 2, AND 3 AND RUB RAIL AT POST 4. FIELD DRILL 1" DIA HOLES IN GUARDRAIL AS NEEDED FOR 7/8" BOLTS AT POSTS 1, 2, 3, AND 4.
3. ALL BOLTS, NUTS, ANCHOR PLATE, POSTS (AFTER FIELD MODIFICATIONS), ETC. SHALL BE GALVANIZED.
- ▲ 4. THE GUARDRAIL HEIGHT CHANGES 16" FROM POST 10 TO POST 1 TO ACHEIVE 12" OF SOIL COVERAGE AT POST 1. SEE SECTION F-F ON GA-630-9 SHEET 2 OF 2.
- ψ 5. THE TYPE 9 END ANCHOR MUST BE ANCHORED TO A MINIMUM OF 25' OF STANDARD GUARDRAIL BEFORE CONNECTING TO A TYPE 13 END ANCHOR. IF THE GUARDRAIL INSTALLATION DOES NOT INCLUDE A BRIDGE END THEN THE TYPE 9 END ANCHOR MUST BE ANCHORED BY A MINIMUM OF 50' OF STANDARD GUARDRAIL AND TYPE 8 END ANCHOR.

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REVISIONS 1. Drawing completely revised to meet MASH standards on 04-14-20 by J.F.T.	 <b>ALABAMA DEPARTMENT OF TRANSPORTATION</b> 1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050	
	DESIGN BUREAU SPECIAL DRAWING  DETAILS OF GUARDRAIL END ANCHOR-TYPE 9 (MASH)	
Bureau Std Engr: D.J.W. DRAWN BY: J.F.T. DATE DRAWN: 03-10-20	SPECIAL DRAWING NO GA-630-9 (SHEET 1 OF 2)	INDEX NO 63033

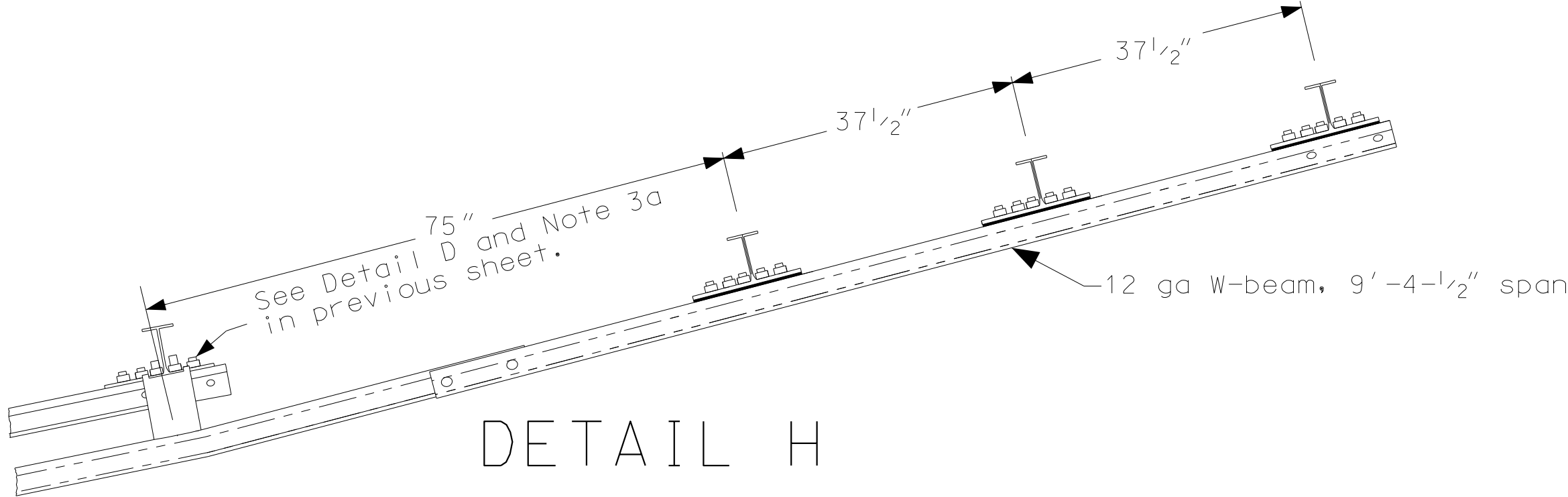
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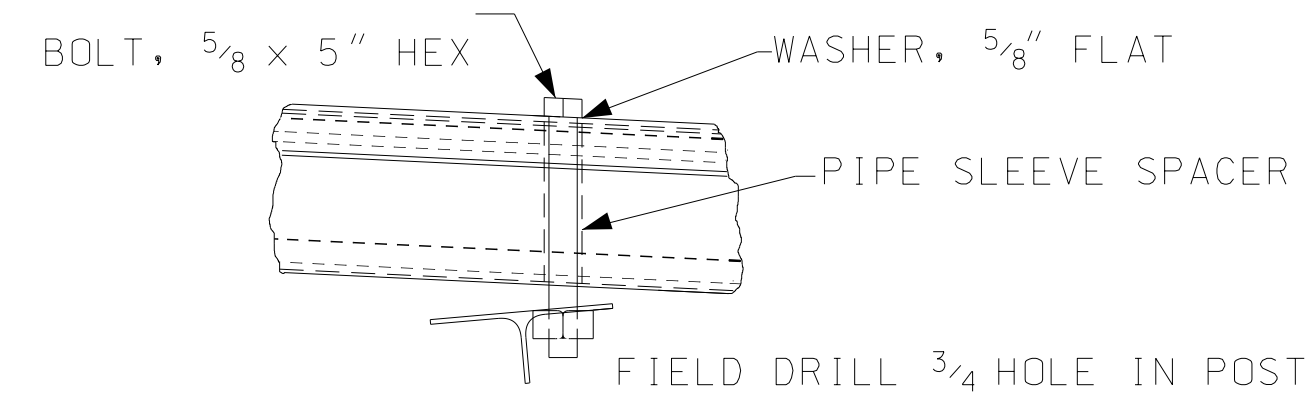
REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO



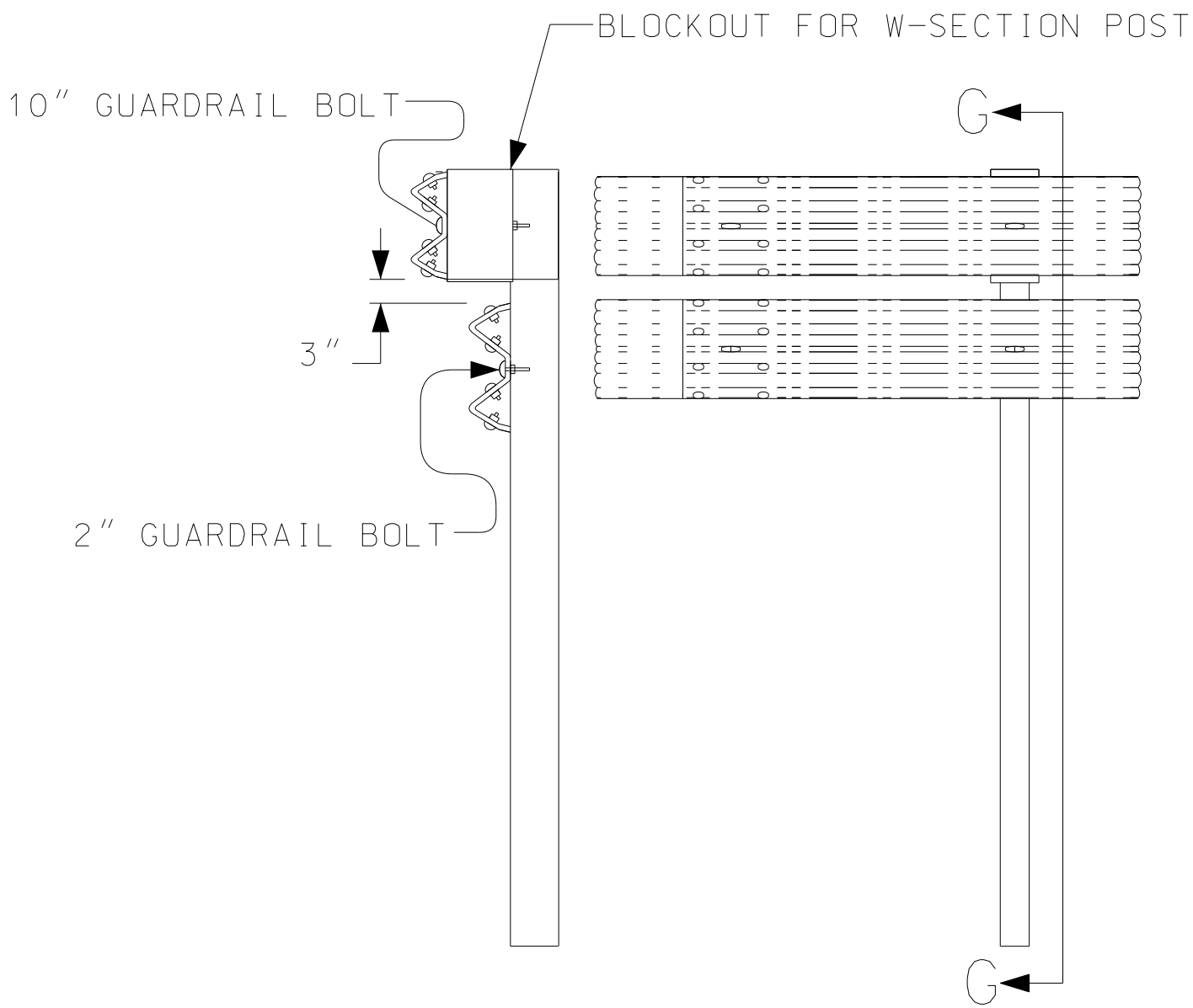
DETAIL K



DETAIL H



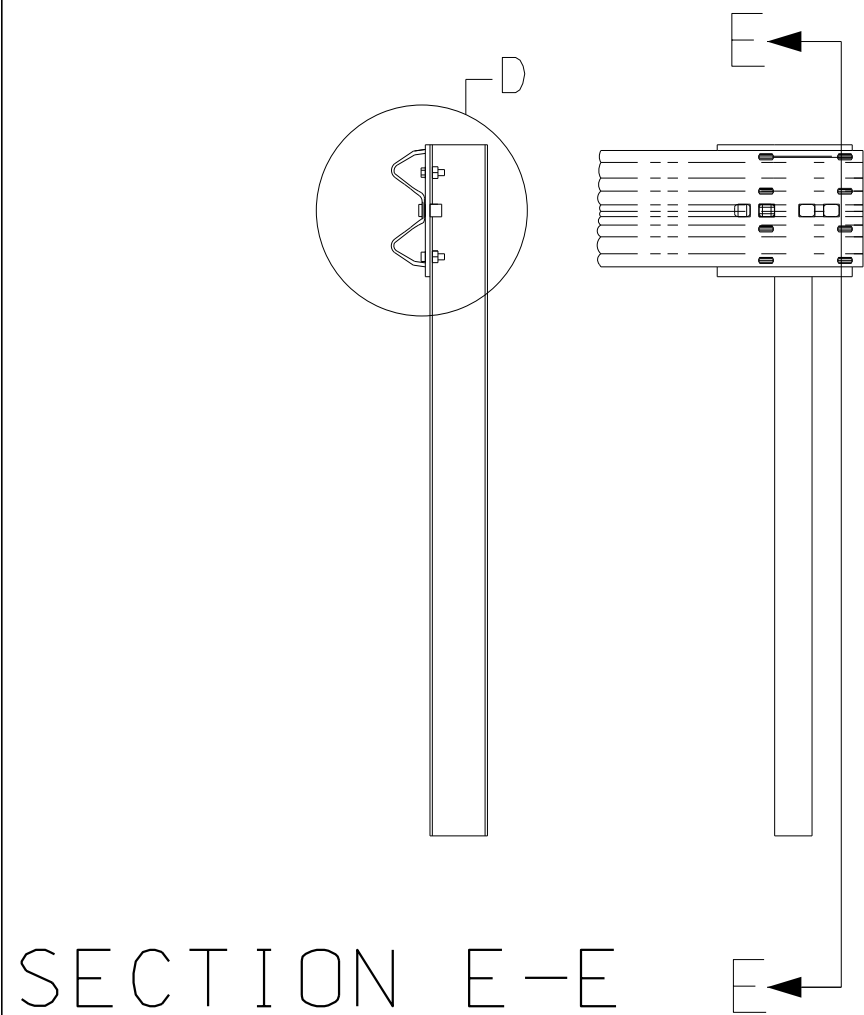
DETAIL J



DETAIL G-G

POST 7

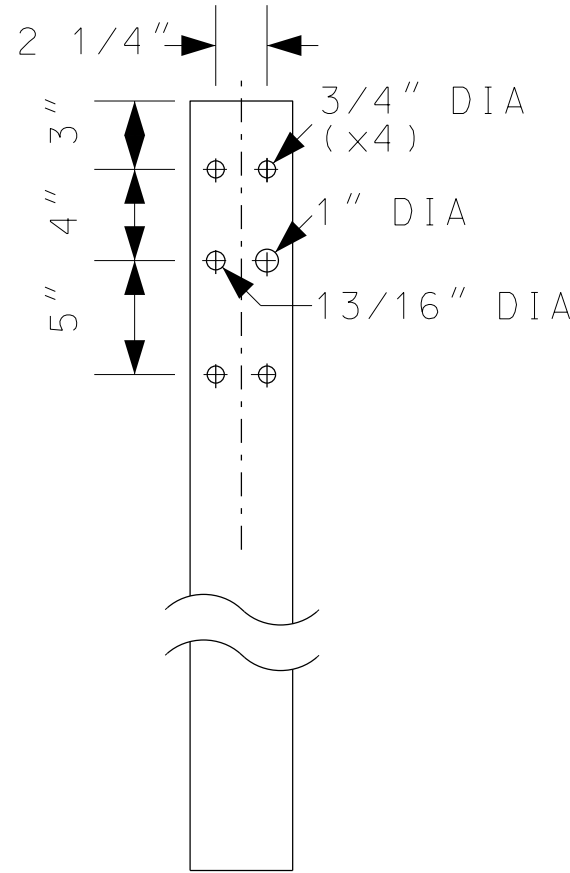
TYP @ POSTS 5-20



SECTION E-E

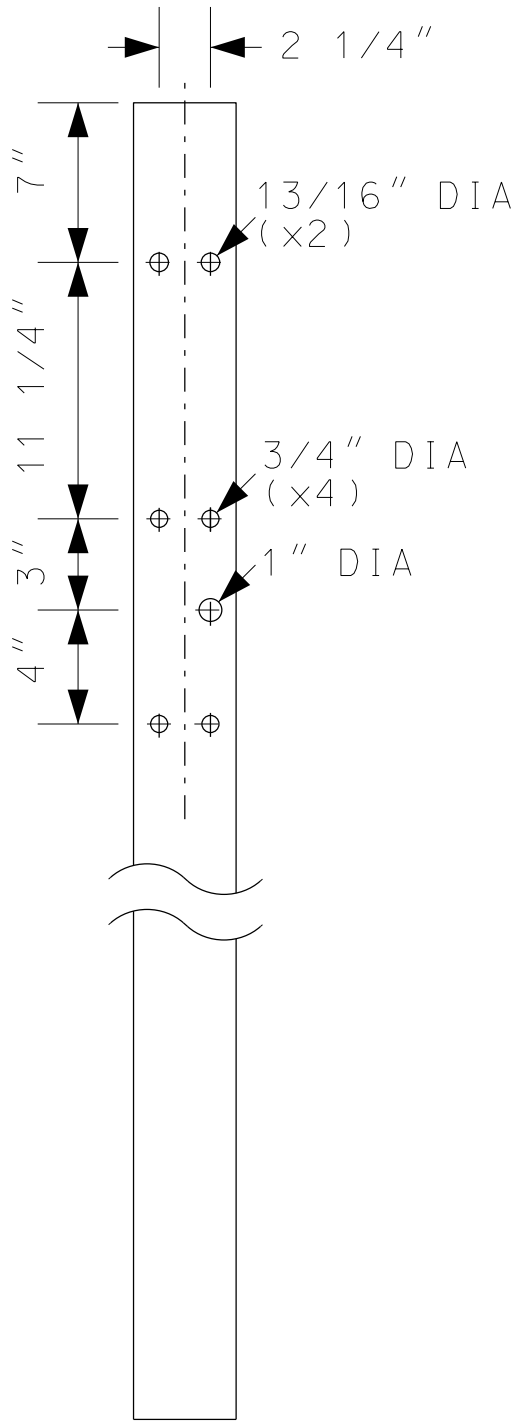
POST 1

TYP @ POSTS 1-3



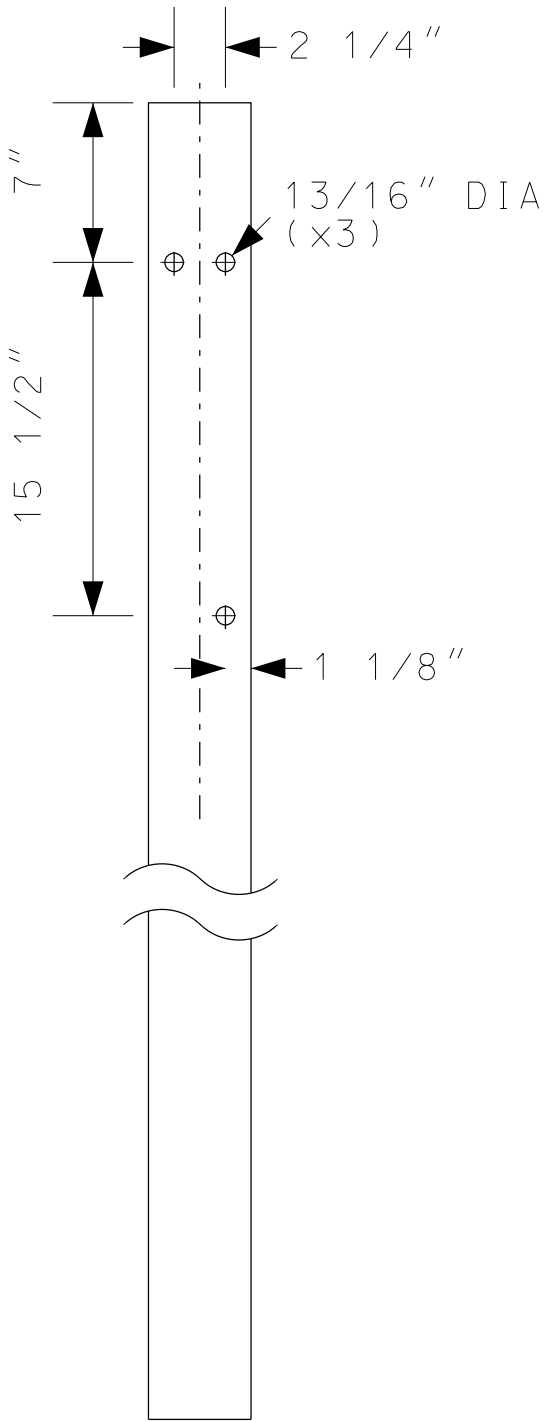
POSTS 1 - 3

W6x8.5  
72" LONG



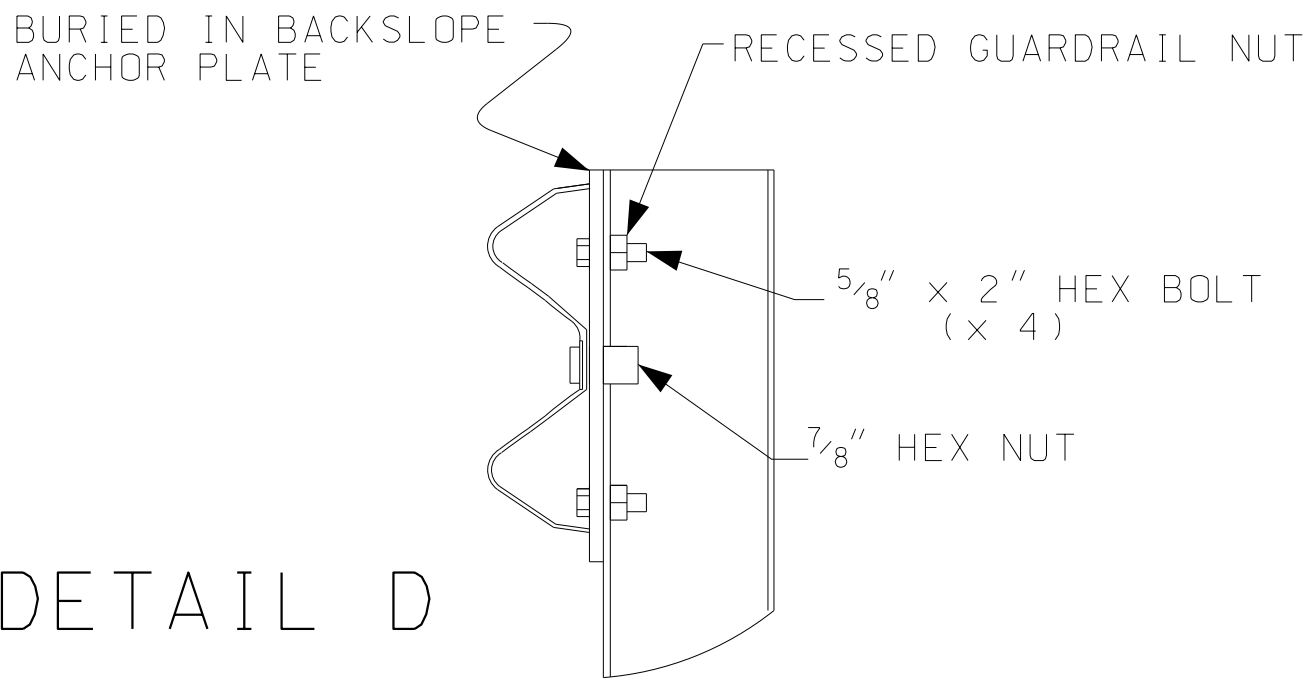
POST 4

W6x8.5  
96" LONG

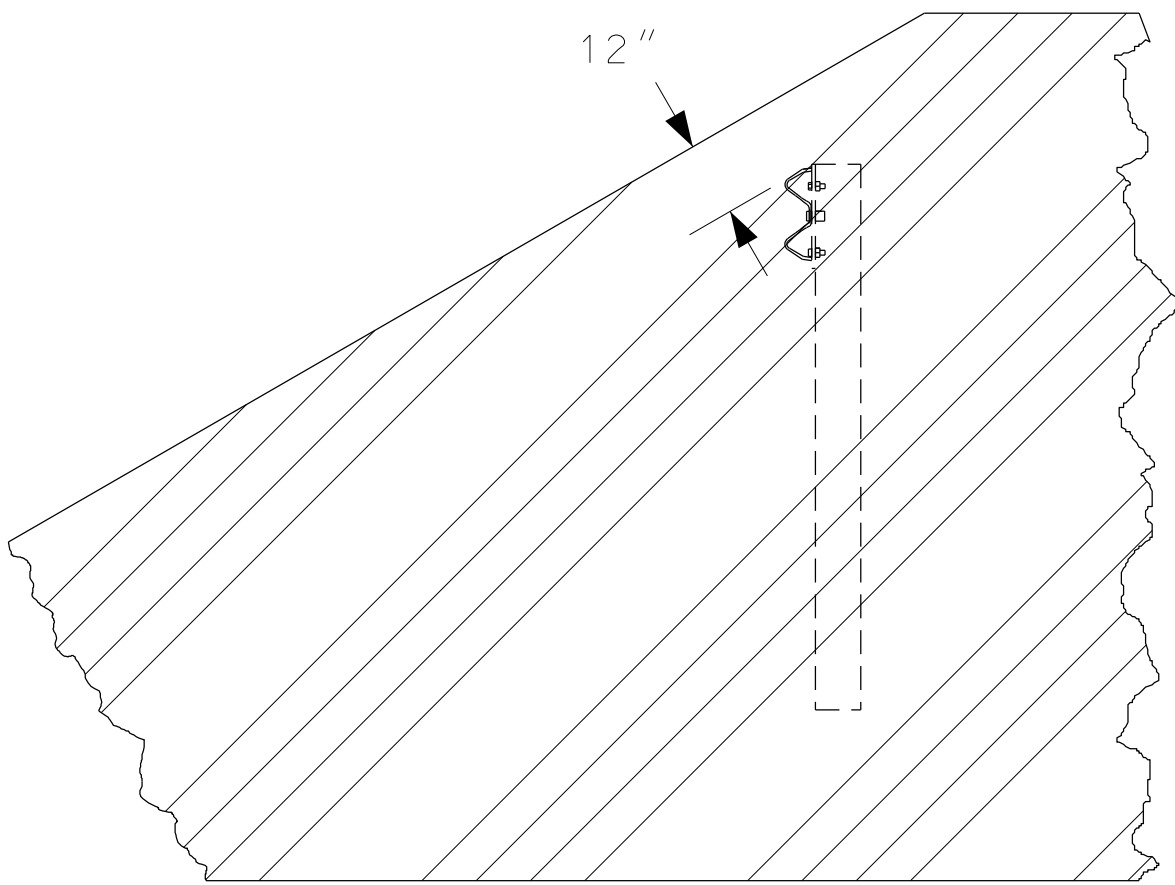


POSTS 5 - 22

W6x8.5  
96" LONG

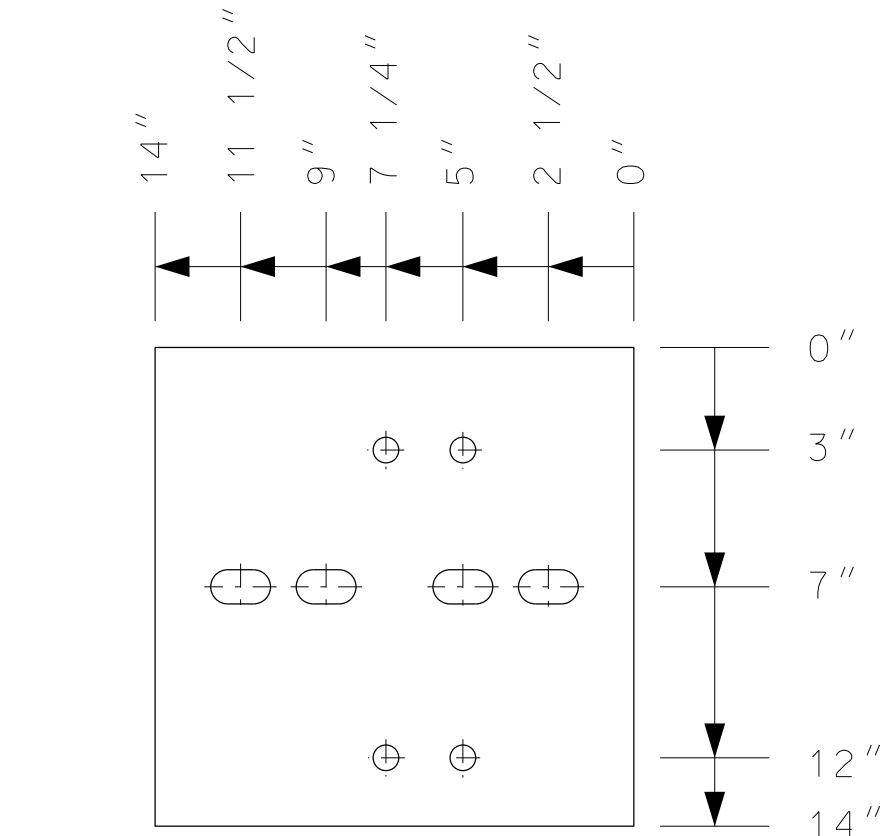


DETAIL D




SECTION F-F

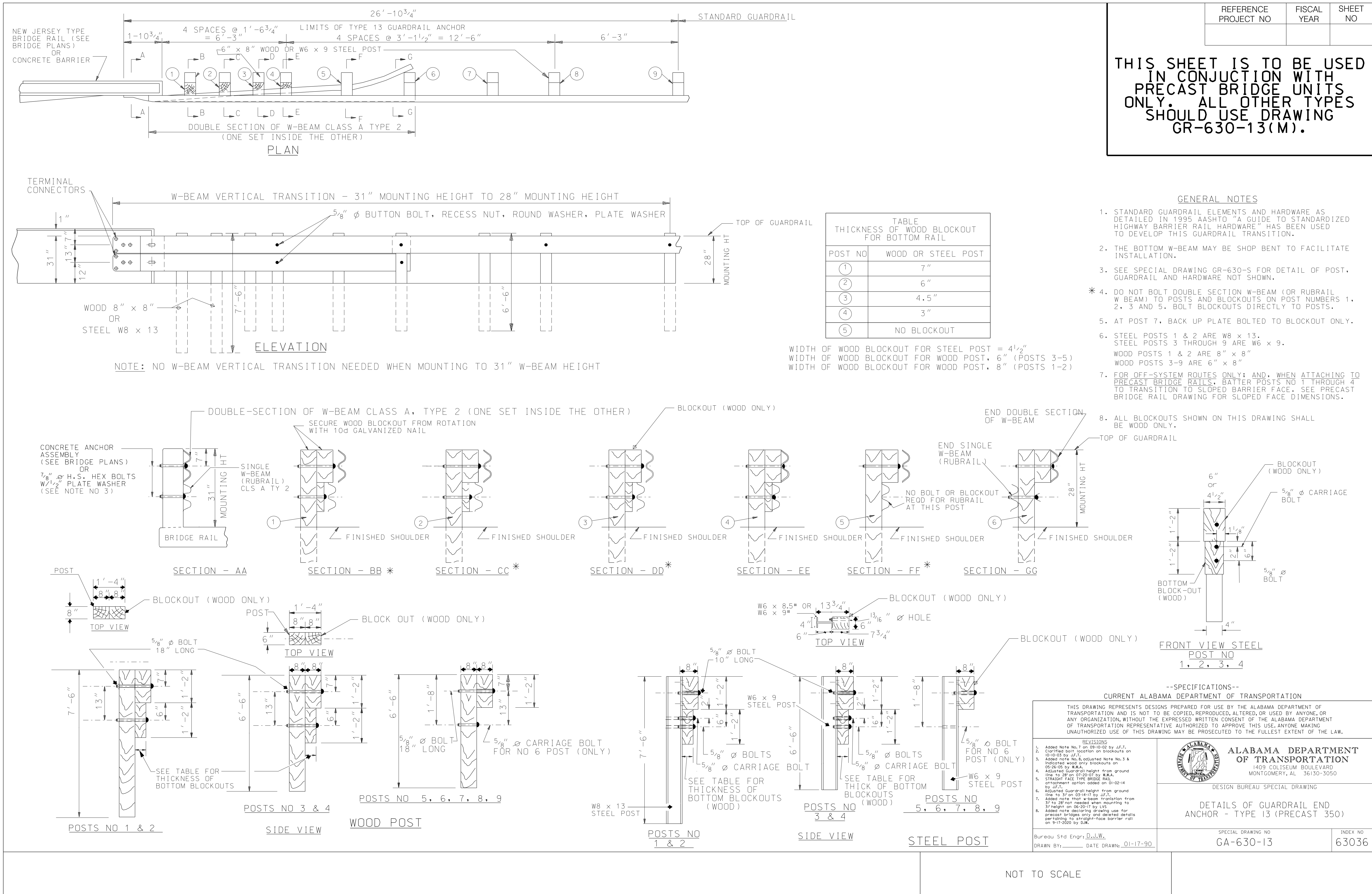
POST 1



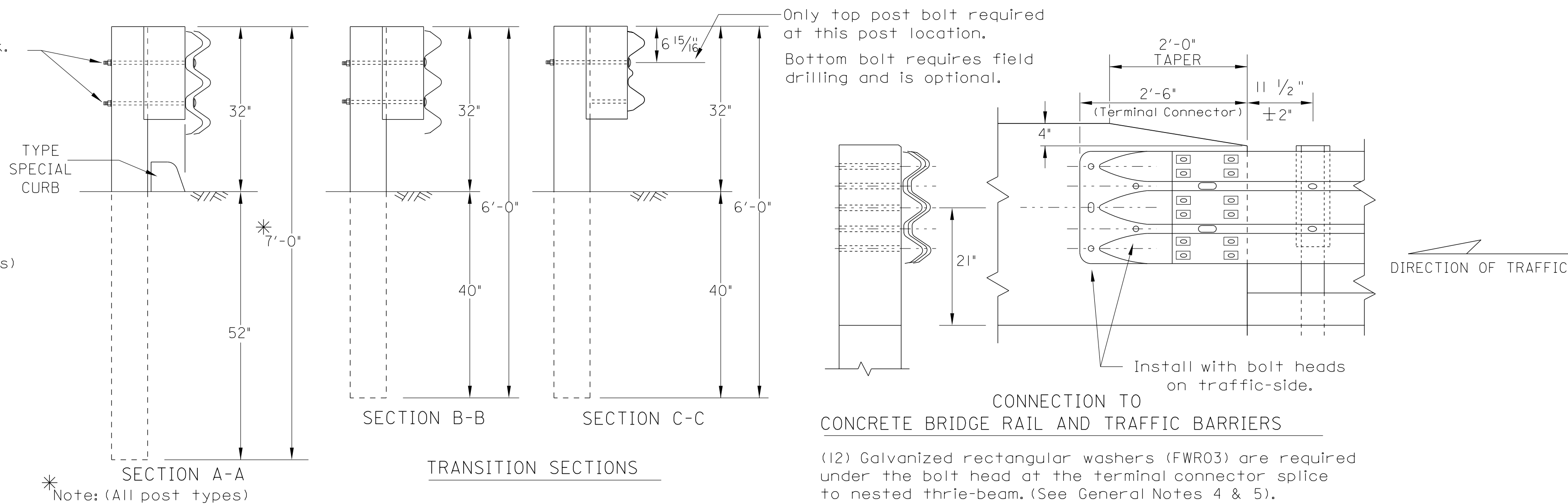
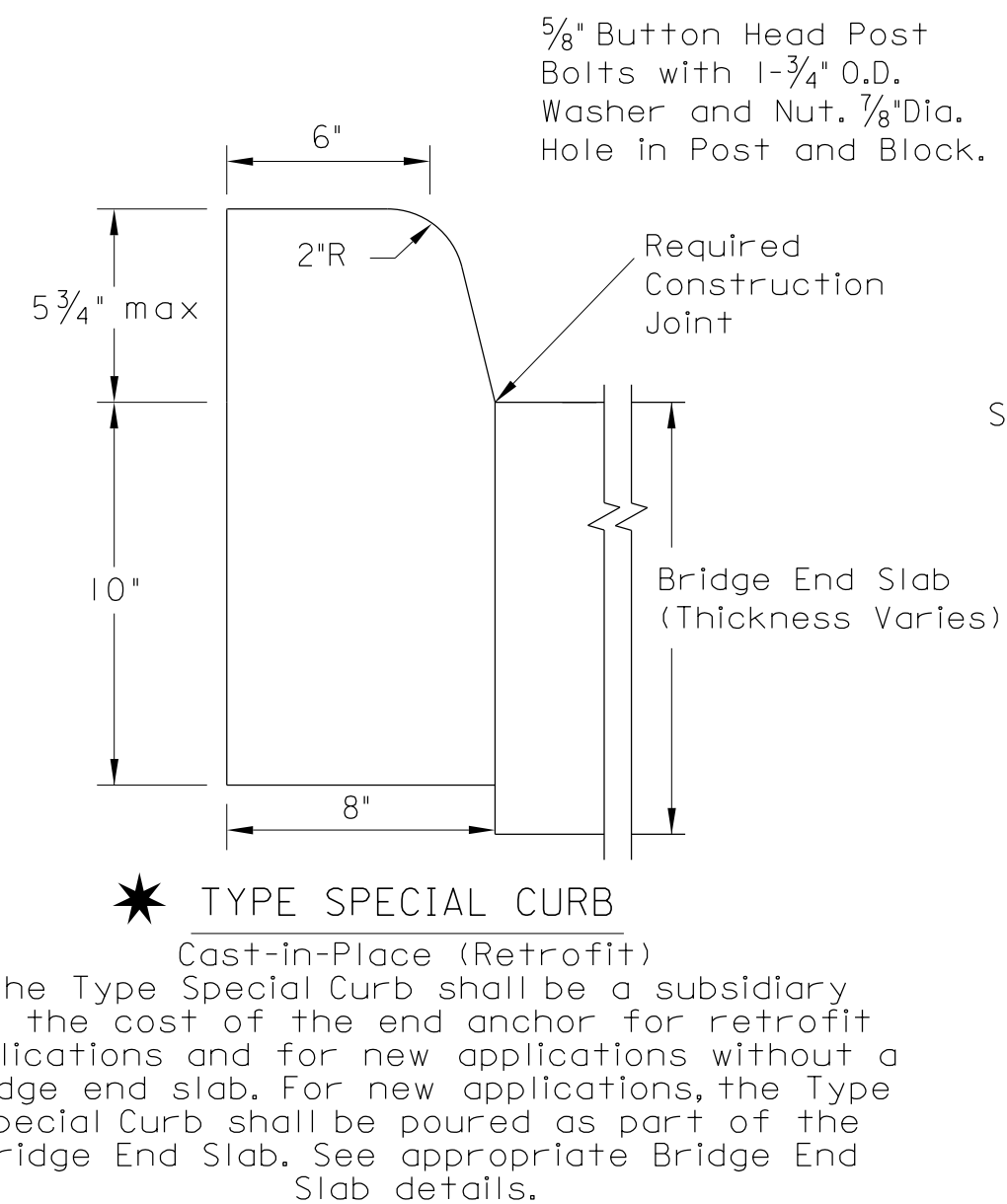
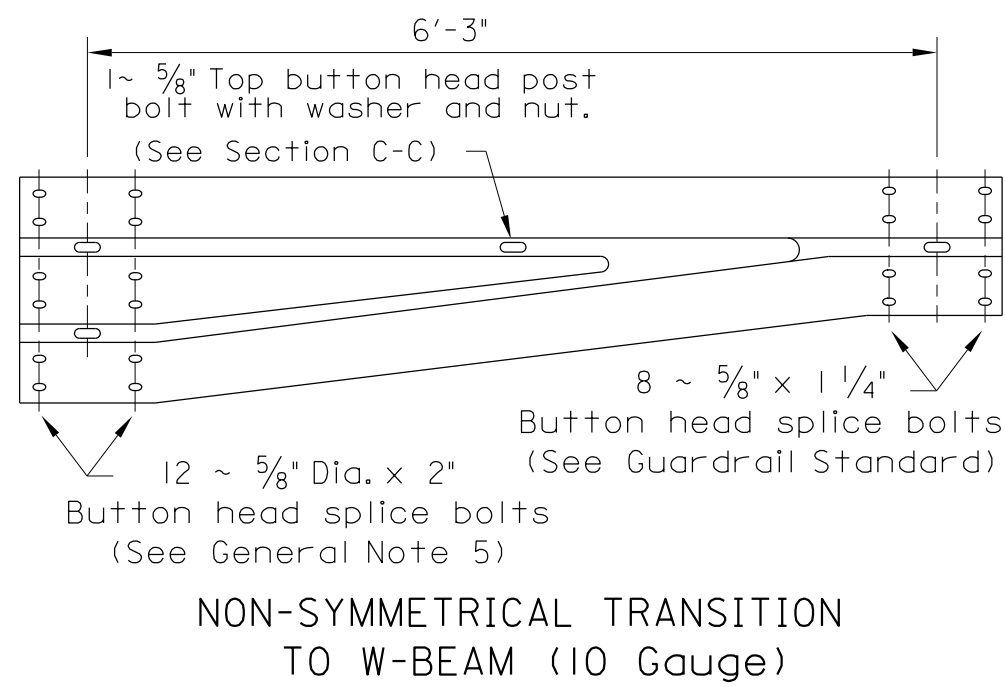
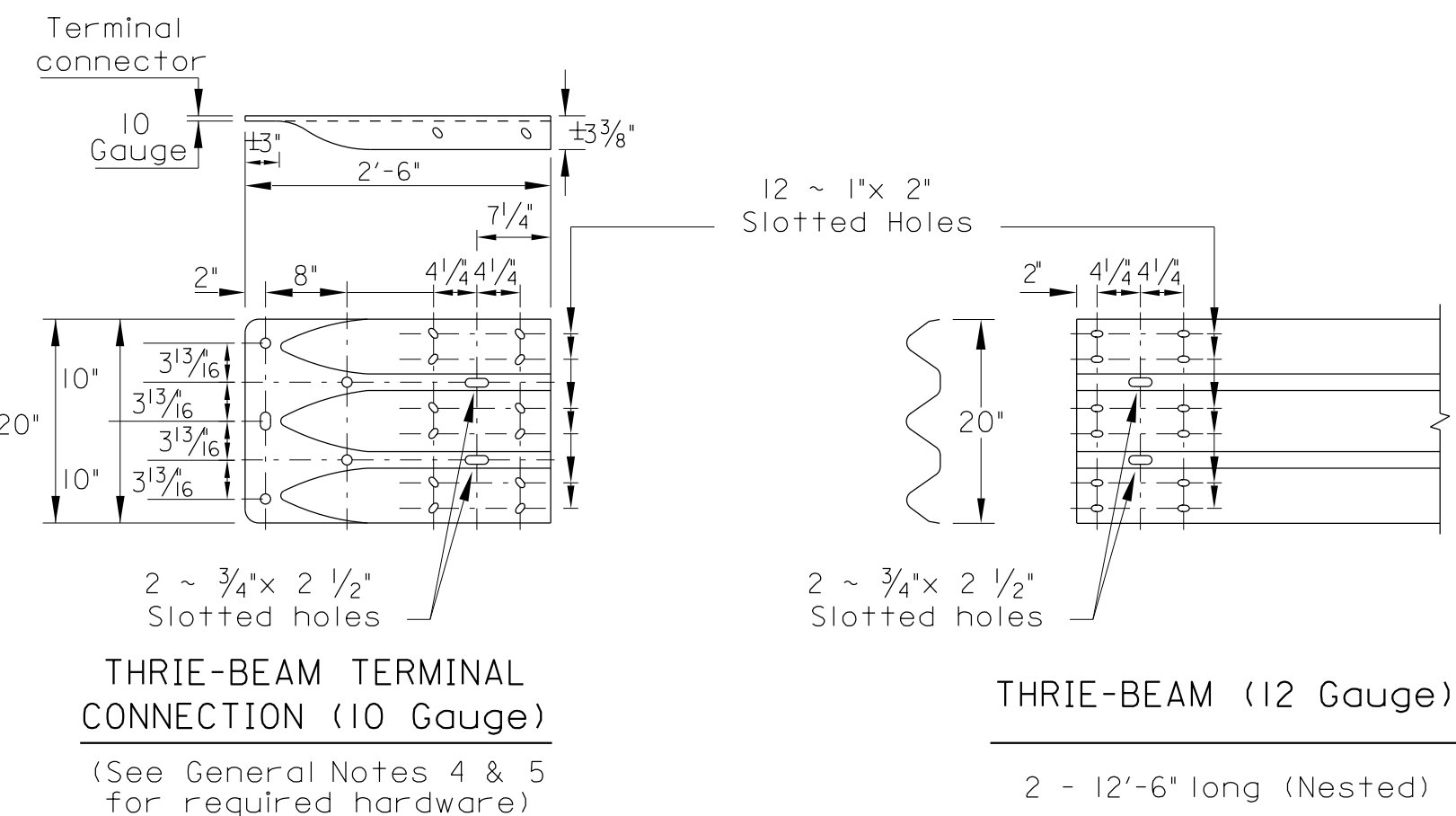
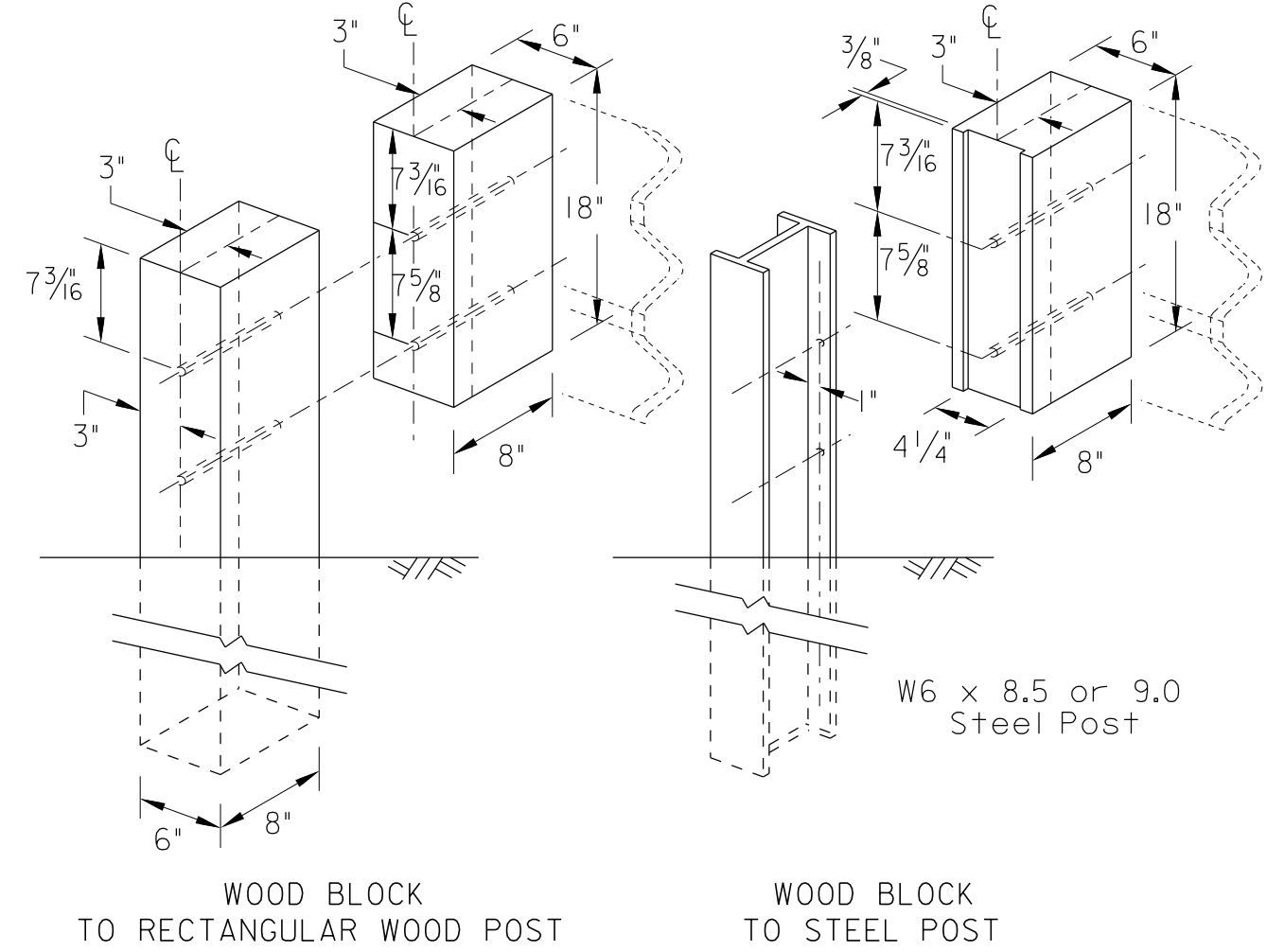
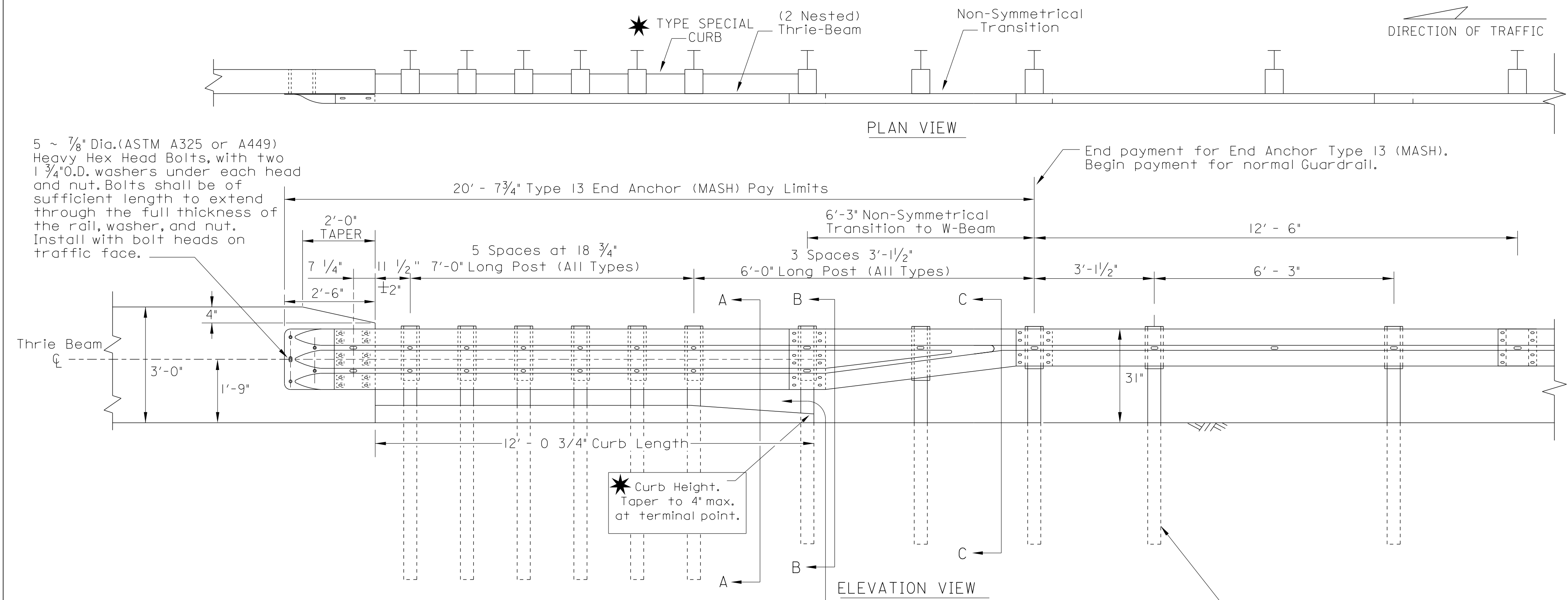
BURIED IN BACKSLOPE  
ANCHOR PLATE  
PLATE, 14" x 14" x 1/2"  
ASTM A36 STEEL


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I. REVISIONS	 <b>ALABAMA DEPARTMENT OF TRANSPORTATION</b> 1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050 DESIGN BUREAU SPECIAL DRAWING	
	DETAILS OF GUARDRAIL END ANCHOR-TYPE 9 (MASH)	
Bureau Std Engr: D.J.W. DRAWN BY: J.F.T. DATE DRAWN: 04-07-2020	SPECIAL DRAWING NO GA-630-9 (SHEET 2 OF 2)	INDEX NO 63034

NOT TO SCALE



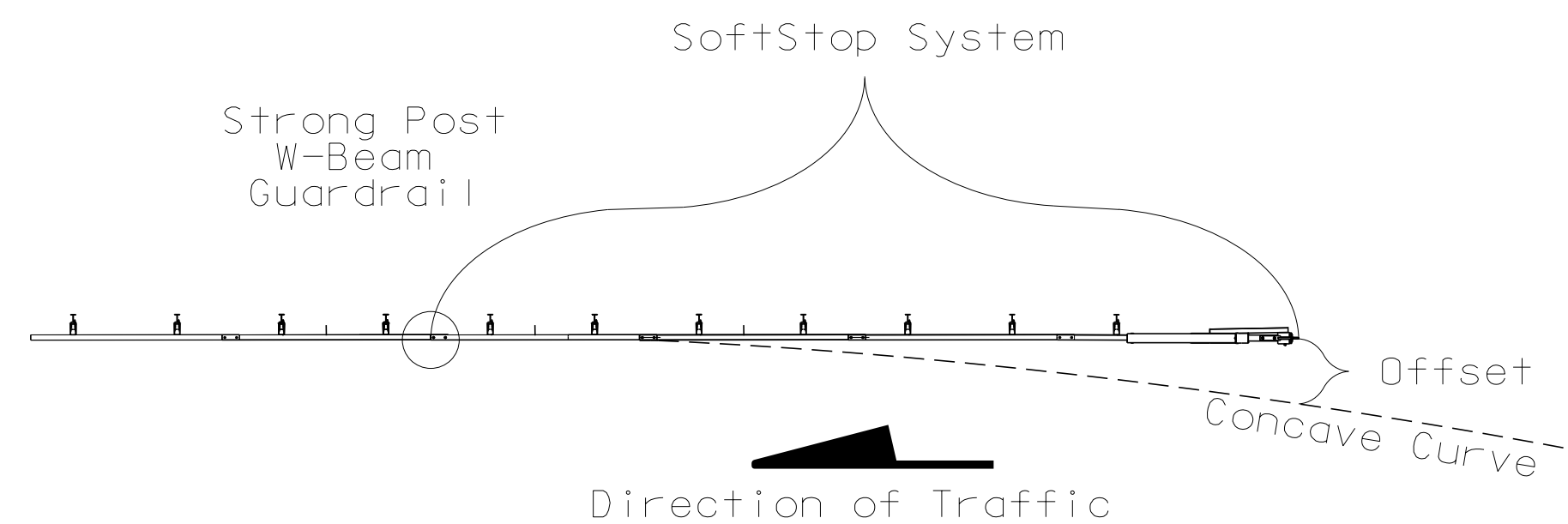
REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO



--SPECIFICATIONS--		
CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION		
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REVISIONS	 <div>ALABAMA DEPARTMENT OF TRANSPORTATION 1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050</div>	
	DESIGN BUREAU SPECIAL DRAWING	
DETAILS OF GUARDRAIL END ANCHOR - TYPE I3 (MASH)		
Bureau Std Engr: <u>D.J.W.</u> DRAWN BY: <u>D.J.W.</u> DATE DRAWN: <u>9-30-2020</u>		SPECIAL DRAWING NO GA-630-13(M)
		INDEX NO 63037

NOT TO SCALE

REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO



WHEN PAY ITEM 630-C, GUARDRAIL END ANCHOR, TYPE 20 SERIES (MASH), IS SET UP ON A PROJECT THE CONTRACTOR HAS THE OPTION OF CHOOSING ONE OF THE FOLLOWING END TREATMENTS FOR INSTALLATION:

- \*MSKT (AS DETAILED ON GA-630-20 SHEET 2 OF 3) AND
- \*MAXTENSION (AS DETAILED ON GA-630-20 SHEET 3 OF 3)

THE CONTRACTOR SHALL CONTACT THE APPROPRIATE MANUFACTURER FOR INSTALLATION INSTRUCTIONS AND GUIDELINES.

THIS DRAWING REPRESENTS DESIGNS PREPARED FOR USE BY THE ALABAMA DEPARTMENT OF TRANSPORTATION AND IS NOT TO BE COPIED, REPRODUCED, ALTERED, OR USED BY ANYONE, OR ANY ORGANIZATION, WITHOUT THE EXPRESSED WRITTEN CONSENT OF THE ALABAMA DEPARTMENT OF TRANSPORTATION REPRESENTATIVE AUTHORIZED TO APPROVE THIS USE. ANYONE MAKING UNAUTHORIZED USE OF THIS DRAWING MAY BE PROSECUTED TO THE FULLEST EXTENT OF THE LAW.

DESIGN BUREAU SPECIAL DRAWING

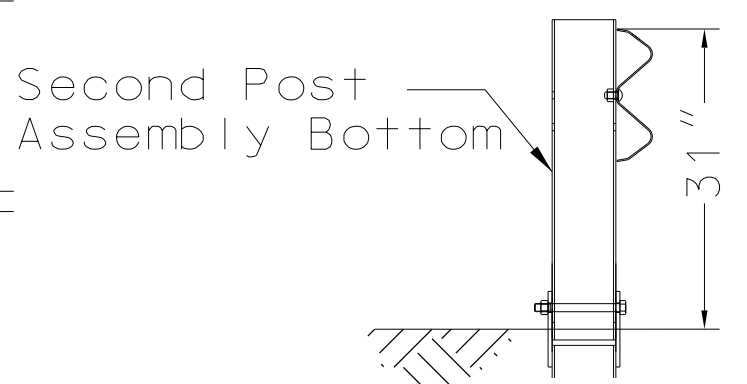
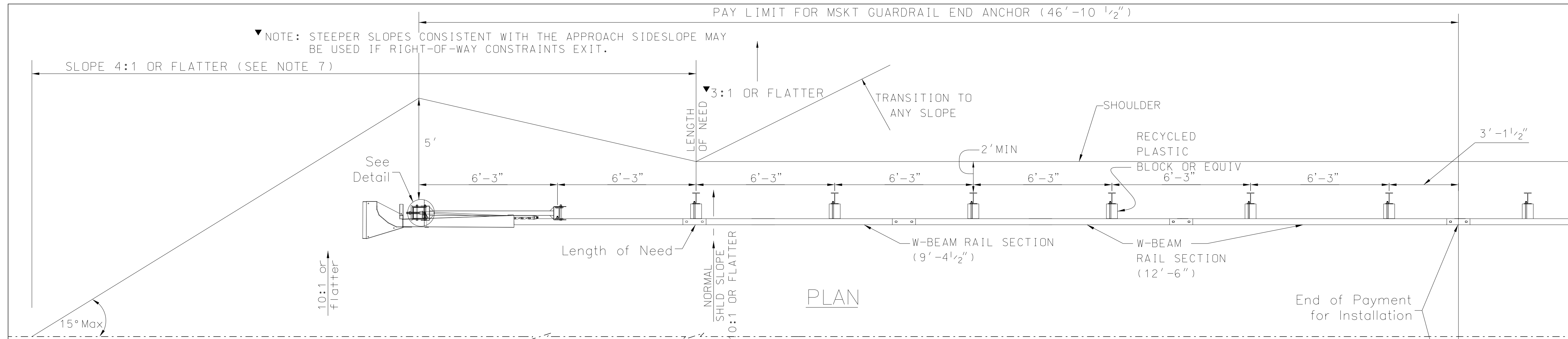
Bureau Std Engr: D.J.W.  
DRAWN BY: L.V.S. DATE DRAWN: 10-13-17

GA-630-20 (SHEET 1 OF 3)	63050
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INDEX NO	63050
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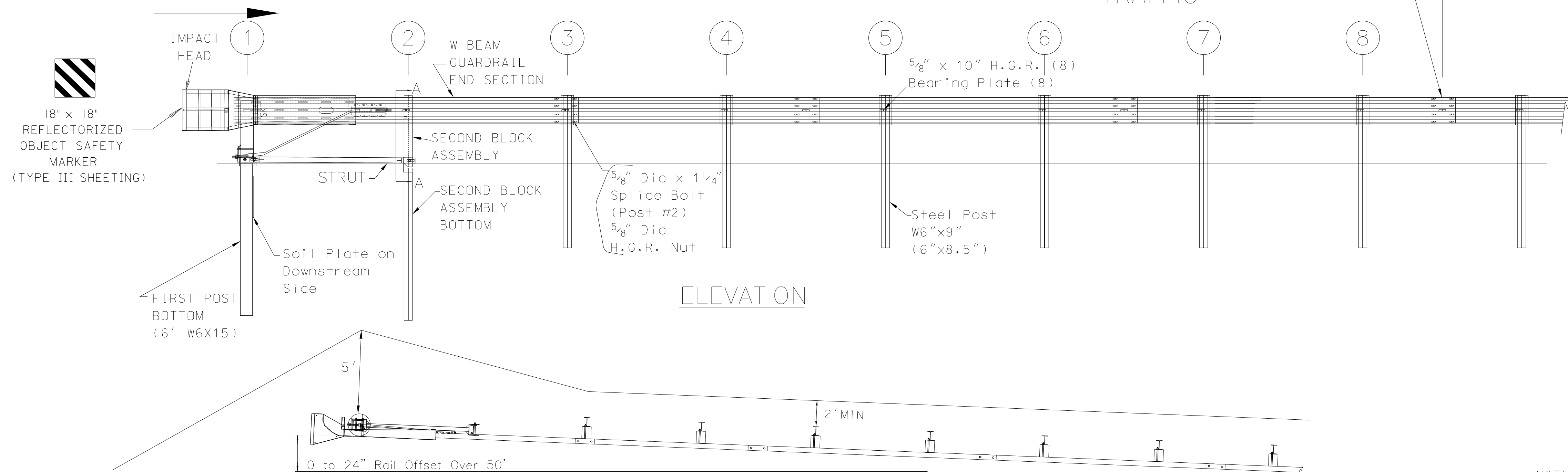
NOT TO SCALE

REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO



## SECTION A-A

Post #2



## GENERAL NOTES

1. THE MSKT END ANCHOR SHALL BE INSTALLED IN ACCORDANCE WITH INSTRUCTIONS AND RECOMMENDATIONS OF THE MANUFACTURER ROAD SYSTEMS INC.; 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRINGS, TX 79720, (432) 263-2435. [www.roadsystems.com](http://www.roadsystems.com)
2. ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS AND BEARING PLATES SHALL BE GALVANIZED
3. THE LOWER SECTIONS OF THE POSTS 1 & 2 SHALL NOT PROTRUDE MORE THAN 4" ABOVE GROUND (MEASURED ALONG A 5' CORD LONGITUDINAL TO THE SYSTEM). SITE GRADING MAY BE NECESSARY TO MEET THIS REQUIREMENT.
4. THE LOWER SECTION OF HINGED POST SHOULD NOT BE DRIVEN WITH THE UPPER POST ATTACHED. IF THE POST IS PLACED IN A DRILLED HOLE, THE BACKFILL MATERIAL MUST BE SATISFACTORILY COMPACTED TO PREVENT SETTLEMENT.
5. WHEN COMPETENT ROCK IS ENCOUNTERED, A 12" POST HOLE, 20" DEEP CORED INTO THE ROCK SURFACE MAY BE USED IF APPROVED BY THE ENGINEER FOR POSTS 1 AND/OR 2. GRANULAR MATERIAL WILL BE PLACED IN THE BOTTOM OF THE HOLE, APPROXIMATELY 2.5" DEEP TO PROVIDE DRAINAGE, THE FIRST AND/OR SECOND POST CAN BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH SUITABLE BACKFILL. THE SOIL PLATE MAY BE TRIMMED IF REQUIRED.
6. THE BREAKAWAY CABLE ASSEMBLY MUST BE TAUT. A LOCKING DEVICE (VICE GRIPS OR CHANNEL LOCK PLIERS) SHOULD BE USED TO PREVENT THE CABLE TWISTING WHEN TIGHTENING NUTS.
6. THE MSKT GUARDRAIL END ANCHOR SHALL BE PAID FOR UNDER ITEM 630-C, GUARDRAIL END ANCHOR, TYPE 20 SERIES (MASH). IF IT IS NECESSARY TO SET UP THIS END ANCHOR INDIVIDUALLY, PAYMENT SHALL BE MADE UNDER ITEM 630-C, GUARDRAIL END ANCHOR, TYPE MSKT. THE PRICE BID SHALL BE FULL COMPENSATION FOR ALL ITEMS OF WORK INCLUDING, BUT NOT LIMITED TO, ALL HARDWARE, INSTALLATION, EXCAVATION, REFLECTORIZED SHEETING, ETC.
7. A 4:1 SLOPE IS DESIRABLE. IF THE LENGTH OF NEED BEGINS ON A TRANSVERSABLE EMBANKMENT SLOPE (3:1 OR FLATTER) BUT LESS THAN A 4:1, AND THE GUARDRAIL CAN BE EXTENDED BACK 100' OR LESS TO PROVIDE A 4:1 SLOPE, THE GUARDRAIL SHOULD BE EXTENDED.


NOTICE CONCERNING GUARDRAIL END  
ANCHORS, TYPE 20 SERIES

WHEN PAY ITEM 630-C, GUARDRAIL END ANCHOR, TYPE 20 SERIES (MASH), IS SET UP ON A PROJECT THE CONTRACTOR HAS THE OPTION OF CHOOSING ONE OF THE FOLLOWING END TREATMENTS FOR INSTALLATION:

\*SOFTSTOP (AS DETAILED ON GA-630-20 SHEET 1 OF 3) AND \*MAXTENSION (AS DETAILED ON GA-630-20 SHEET 3 OF 3). THE CONTRACTOR SHALL CONTACT THE APPROPRIATE MANUFACTURER FOR INSTALLATION INSTRUCTIONS AND GUIDELINES.

--SPECIFICATIONS--

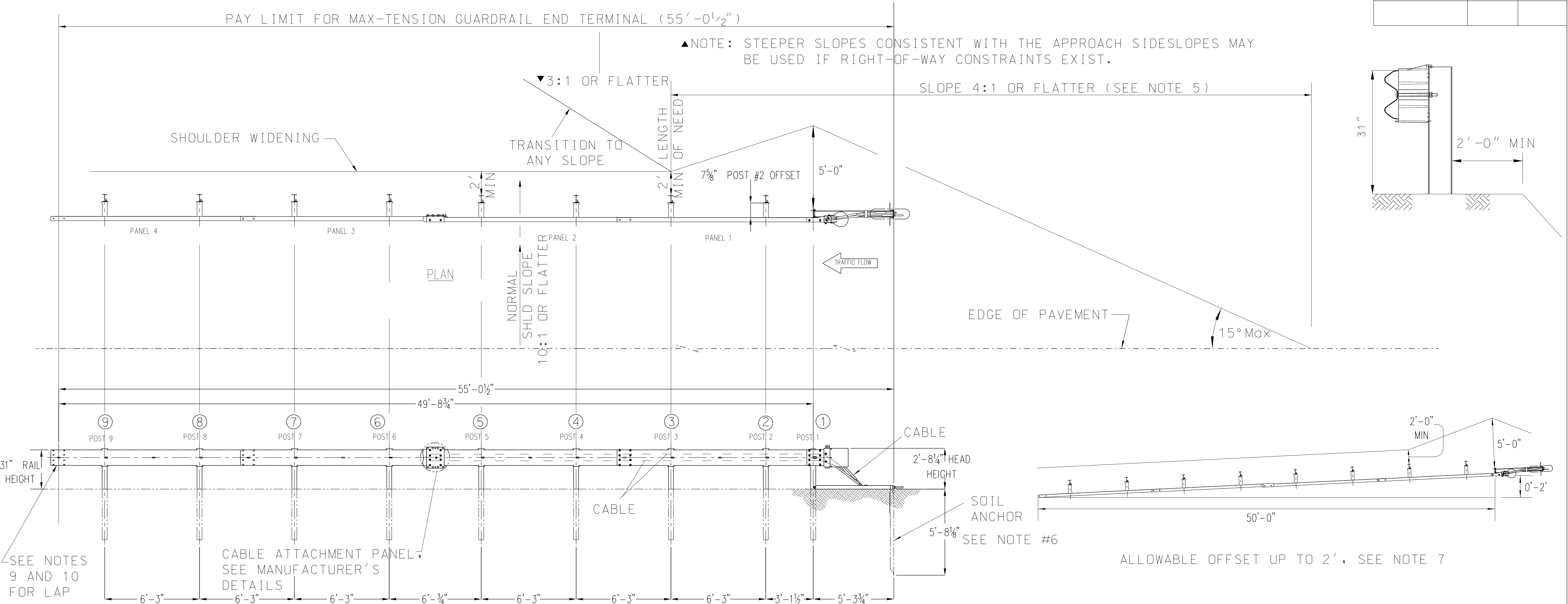
CURRENT ALABAMA DEPARTMENT OF TRANSPORTATION

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<p><b>REVISIONS</b></p> <p>1, Updated, Removed and Replace Guardrail drawing from DETAILS OF GUARDRAIL END ANCHORS SERIES 20 (ET-PLUS) to DETAILS OF GUARDRAIL END ANCHORS SERIES 20 (MSKT) (MSKH1TL-33). Drawing is MASH approved and added to CAD0 on 10-13-17 by L.V.S.</p>		
<div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;"> <p><b>ALABAMA DEPARTMENT OF TRANSPORTATION</b></p> <p>1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050</p> </div> </div>		
<p style="text-align: center;">DESIGN BUREAU SPECIAL DRAWING</p> <p style="text-align: center;">DETAILS OF GUARDRAIL END ANCHOR - TYPE 20 SERIES (MASH) (TL-3) (MSKT)</p>		
<p>Bureau Std Engr: <u>D.J.W.</u></p> <p>DRAWN BY: <u>L.V.S.</u>      DATE DRAWN: <u>10-13-17</u></p>		<p style="text-align: center;">SPECIAL DRAWING NO</p> <p style="text-align: center;">GA-630-20 (SHEET 2 OF 3)</p>
		<p style="text-align: center;">INDEX NO</p> <p style="text-align: center;">63051</p>

NOT TO SCALE



REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO




GENERAL NOTES

1. THE MAX-TENSION END ANCHOR SHALL BE INSTALLED IN ACCORDANCE WITH INSTRUCTIONS AND RECOMMENDATIONS OF THE MANUFACTURER LINDSAY TRANSPORTATION SOLUTIONS, INC., 180 RIVER ROAD, RIO VISTA, CA. [www.barriersystemsinc.com](http://www.barriersystemsinc.com)
2. ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS AND BEARING PLATES SHALL BE GALVANIZED.
3. REFLECTORIZED OBJECT SAFETY MARKER SHALL BE DIAGONAL YELLOW ON A BLACK BACKGROUND, TYPE III SHEETING, THE YELLOW DIAGONAL STRIPES SHOULD SLOPE DOWNWARD TO THE SIDE OF TRAFFIC FLOW.
4. THE MAX-TENSION GUARDRAIL END ANCHOR SHALL BE PAID FOR UNDER ITEM 630-C, GUARDRAIL END ANCHOR, TYPE 20 SERIES, (MASH). IF IT IS NECESSARY TO SET UP THIS END ANCHOR INDIVIDUALLY, PAYMENT SHALL BE MADE UNDER ITEM 630-C, GUARDRAIL END ANCHOR, TYPE MAX-TENSION. THE PRICE BID SHALL BE FULL COMPENSATION FOR ALL ITEMS OF WORK INCLUDING, BUT NOT LIMITED TO, ALL HARDWARE, INSTALLATION, EXCAVATION, REFLECTORIZED SHEETING, ETC.
5. A 4:1 SLOPE IS DESIRABLE. IF THE LENGTH OF NEED BEGINS ON A TRANSVERSABLE EMBANKMENT SLOPE (3:1 OR FLATTER) BUT LESS THAN A 4:1, AND THE GUARDRAIL CAN BE EXTENDED BACK 100' OR LESS TO PROVIDE A 4:1 SLOPE, THE GUARDRAIL SHOULD BE EXTENDED.
6. THE MAX-TENSION PARALLEL END TERMINAL IS AVAILABLE IN A STEEL POST CONFIGURATION ONLY. POST #1 IS A PROPRIETARY STEEL W6X8.5 OR W6X9 WIDE FLANGE POST. THE SOIL ANCHOR IN FRONT OF POST #1 IS A SPECIAL STEEL BENT CHANNEL DESIGN WITH AN INTEGRAL SOIL PLATE (SEE MANUFACTURER DETAILS).
7. THE MAX-TENSION PARALLEL END TERMINAL IS INTENDED FOR USE AS AN APPROACH TERMINAL FOR SHOULDER TERMINAL GUARDRAIL. THE BEGINNING OF THE LENGTH OF NEED IS LOCATED AT POST #3. THE EFFECTIVE LENGTH OF THE MAX-TENSION PARALLEL END TERMINAL CAN BE OFFSET UP TO 2'-0".
8. THE MAX-TENSION PARALLEL END TERMINAL CANNOT BE USED IN MEDIANS WHERE HORIZONTAL CLEARANCE REQUIRES THE USE OF DOUBLE-FACED GUARDRAIL.
9. REGARDING THE ORIENTATION OF PANEL LAP SPLICES, INSTALL THE MAX-TENSION SYSTEM AS SHOWN IN THE DRAWINGS, REGARDLESS OF THE DIRECTION OF TRAFFIC IN THE ADJACENT LANES (I.E. PANEL LAPPING MAY NOT BE IN THE DIRECTION OF TRAFFIC UNDER SOME CONDITIONS).
10. FOR THE MAX-TENSION SYSTEM TO FUNCTION PROPERLY, I.E. TELESCOPE TO ABSORB ENERGY, THE GUARDRAIL PANELS WITHIN THE END TERMINAL HEAD: FIRST PANEL IS LAPPED ON TOP OF SECOND PANEL, SECOND PANEL IS LAPPED OVER TOP OF THIRD PANEL, THIRD PANEL IS LAPPED OVER FOURTH PANEL, FOURTH PANEL IS LAPPED OVER EXISTING GUARDRAIL PANEL.

NOTICE CONCERNING GUARDRAIL END ANCHORS, TYPE 20 SERIES

WHEN PAY ITEM 630-C, GUARDRAIL END ANCHOR, TYPE 20 SERIES (MASH), IS SET UP ON A PROJECT THE CONTRACTOR HAS THE OPTION OF CHOOSING ONE OF THE FOLLOWING END TREATMENTS FOR INSTALLATION: \*SOFTSTOP (AS DETAILED ON GA-630-20 SHEET 1 OF 3) AND \*MSKT (AS DETAILED ON GA-630-20 SHEET 2 OF 3). THE CONTRACTOR SHALL CONTACT THE APPROPRIATE MANUFACTURER FOR INSTALLATION INSTRUCTIONS AND GUIDELINES.

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REVISIONS 1. Added to CAD00 on 09-17-18 by J.F.T.		
 <b>ALABAMA DEPARTMENT OF TRANSPORTATION</b> 1409 COLISEUM BOULEVARD MONTGOMERY, AL 36130-3050		DESIGN BUREAU SPECIAL DRAWING
DETAILS OF GUARDRAIL END ANCHOR - TYPE 20 SERIES (MASH) (TL-3) (MAX-TENSION)		
Bureau Std Engr: D.J.W. DRAWN BY: J.F.T. DATE DRAWN: 12-07-17		SPECIAL DRAWING NO GA-630-20 (SHEET 3 OF 3)
		INDEX NO 63052

NOT TO SCALE