



GUARD RAIL GENERAL NOTES:

- 1. DESIGN REFERENCE: THE LATEST EDITIONS OF THE AASHTO ROADSIDE DESIGN GUIDE (RDG) AND THE LADOTD BRIDGE DESIGN AND EVALUATION MANUAL (BDEM), PART II, VOLUME 4 - HIGHWAY SAFETY.
2. GUARD RAIL LENGTH: TOTAL GUARD RAIL LENGTH AND LENGTH OF NEED SHALL BE BASED ON THE LATEST AASHTO ROADSIDE DESIGN GUIDE LENGTH OF NEED REQUIREMENTS.
3. FOR BRIDGES WITH GUARD RAILS IN URBAN AREAS WITH A DESIGN SPEED OF 45 MPH OR LESS, SEE DOTD EDSM NO. II.3.1.4 FOR DESIGN INFORMATION.
4. FOR GUARD RAIL ON EXISTING HIGHWAYS, SEE DOTD EDSM NO. II.3.1.3 FOR DESIGN INFORMATION.
5. EMBANKMENT WIDENING IS TO PROVIDE SLOPES NOT STEEPER THAN 10H:1V IN FRONT OF THE GUARD RAIL.
6. ALL GUARD RAIL COMPONENTS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFIC PLAN LAYOUT DETAILS, GUARD RAIL DESIGN DATA, PAY ITEMS, AND QUANTITY TABLES PROVIDED IN THE PROJECT PLANS.
7. LONGITUDINAL DIMENSIONS FOR GUARD RAIL ARE MEASURED ALONG THE PROJECTED FACE OF RAILING.
8. THE QUANTITY FOR THE EMBANKMENT WIDENING IS TO BE INCLUDED IN THE EMBANKMENT PAY ITEM QUANTITY FOR THE ROADWAY.
9. A TANGENT END TREATMENT MAY BE USED AS AN ALTERNATE TO THE FLARED END TREATMENT. A ZERO FLARE RATE (b/a=0) IS REQUIRED WHEN THE TANGENT END TREATMENT IS USED AND THE LENGTH OF NEED "X" SHALL BE CALCULATED BASED ON A "ZERO" FLARE RATE.
10. THE POINT WITHIN THE GUARD RAIL END TREATMENT WHERE THE LENGTH OF NEED TERMINATES MAY VARY WITH EACH TYPE OF GUARD RAIL END TREATMENT. THE 2'-6" LENGTH APPLIES TO MOST END TREATMENTS.
11. RETROREFLECTIVE ADHESIVE SHEETING (12" X 2'-8" TYPE III HIGH INTENSITY OBJECT MARKER PATTERN) SHALL BE APPLIED TO THE END TREATMENT NOSE. SEE THE LATEST LA. STANDARD SPECS. FOR ROADS AND BRIDGES FOR SPECIFICATIONS AND THE SHEETING MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION. FOR PATTERN DETAIL, SEE OBJECT MARKER STANDARD PLANS.
12. GUARD RAIL INSTALLATIONS MAY BE PAVED BY USING CONCRETE PAVING OR ASPHALT CONCRETE. THE INCIDENTAL CONCRETE OR ASPHALT WILL BE USED IF A LAYOUT DETAIL, PAY ITEM, AND QUANTITY IS INDICATED IN THE PLANS. SEE SHEET 11 FOR REQUIRED POST DETAILS WHEN PAVING IS USED AROUND POSTS.
13. GUARD RAIL END TREATMENTS SHALL BE SELECTED FROM THE DOTD APPROVED MATERIALS LIST (AML), AND SHALL BE AASHTO MASH, TEST LEVEL 3 (TL-3) UNLESS OTHERWISE NOTED IN THE PLANS. IF TEST LEVEL 2 (TL-2) GUARD RAIL END TREATMENTS ARE USED, A DESIGN WAIVER SHALL BE REQUIRED. IF MASH FLARED END TREATMENTS ARE NOT AVAILABLE, USE GUARD RAIL END TREATMENT, NCHRP 350 - 31" (TL-3 FLARED), WITH APPROVAL OF PROJECT ENGINEER.
14. FLARED GUARD RAIL END TREATMENTS (12'-6" OR 18'-9"), (PAY ITEMS 704-10-00105 AND 704-10-00110) ARE GENERIC TEST LEVEL 2 (TL-2) NCHRP 350 SYSTEMS THAT CAN ONLY BE USED WITH PERMISSION FROM THE BRIDGE DESIGN ENGINEER ADMINISTRATOR AND AN APPROVED DESIGN WAIVER. SEE BRIDGE DESIGN SPECIAL DETAILS FOR THESE END TREATMENT DETAILS.
15. GUARD RAIL DESIGN VARIABLES FOR STANDARD PLAN SHEETS:

- L1 = LENGTH OF TANGENT SECTION OF RAIL IN ADVANCE OF OBJECT. (FT)
L2 = DISTANCE FROM EDGE OF TRAVEL LANE TO TANGENT SECTION OF RAIL. (FT)
L3 = DISTANCE FROM EDGE OF TRAVEL LANE TO OBJECT OF CONCERN.
LR = RUNOUT LENGTH (FT)
LC = REQUIRED CLEAR ZONE (FT)
LA = DISTANCE FROM THE EDGE OF THE TRAVEL LANE TO THE LATERAL EXTENT OF THE OBJECT. (FT)
LA = LC FOR BRIDGE APPLICATIONS
X = CALCULATED LENGTH OF NEED (FT)
Y = DISTANCE FROM EDGE OF THE TRAVEL LANE TO THE BEGINNING OF THE LENGTH OF NEED.
Z = DISTANCE FROM EDGE OF THE TRAVEL LANE TO THE EDGE OF EMBANKMENT.
b/a = FLARE RATE (VERTICAL/HORIZONTAL)

FOR CLEAR ZONE, RUNOUT, FLARE RATE, SHYLINE, AND HORIZONTAL CURVE ADJUSTMENTS, SEE LATEST AASHTO ROADSIDE DESIGN GUIDE AND THE DOTD BRIDGE DESIGN AND EVALUATION MANUAL.

- 16. STEEL POSTS MAY BE USED AS AN ALTERNATE TO WOOD POSTS, UNLESS SHOWN OTHERWISE.
17. INTERMIXING OF STEEL AND WOOD POSTS IN ANY ONE SECTION OF THE GUARD RAIL SHALL NOT BE PERMITTED.
18. ALL MATERIAL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
19. GUARD RAIL HEIGHT TOLERANCE ALLOWED FOR INSTALLATION IS 1 INCH ABOVE AND 0.5 INCH BELOW THE SPECIFIED HEIGHT.
20. GUARD RAIL TRAILING END ANCHORAGE SHALL BE USED TO ANCHOR DOWNSTREAM END OF GUARD RAIL ONLY WHEN TYPICAL GUARD RAIL END TREATMENTS ARE NOT REQUIRED.
21. STANDARD COMPONENTS: STANDARD GUARD RAIL COMPONENTS, INCLUDING POSTS, PANELS, AND BOLT SYSTEM ARE BASED UPON ENGLISH UNIT CONVERSIONS OF THE AASHTO-AGC-ARTBA JOINT COMMITTEE TASK FORCE 13 REPORT: A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE.
*22. IF OFF-SYSTEM BRIDGE OR BOX CULVERT DETAILS ARE USED, THE PLANS MUST ALSO INCLUDE THE COMMON DETAILS (SHTS. I-11).

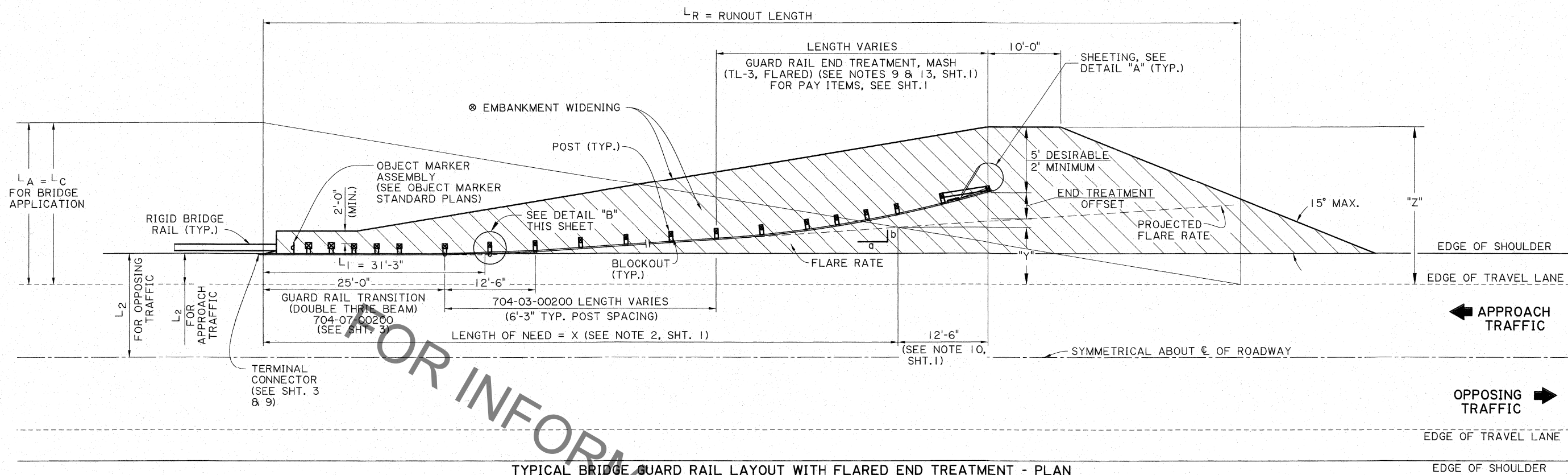
GUARD RAIL AND RELATED PAY ITEMS :

- 202-02-14500 REMOVAL OF GUARD RAIL, (LN FT)
704-01-01000 GUARD RAIL (SINGLE THRIE BEAM) (3'-1/2" POST SPACING), (LN FT)
704-01-01020 GUARD RAIL (SINGLE THRIE BEAM) (6'-3" POST SPACING), (LN FT)
704-01-02000 GUARD RAIL (DOUBLE THRIE BEAM) (3'-1/2" POST SPACING), (LN FT)
704-01-02020 GUARD RAIL (DOUBLE THRIE BEAM) (6'-3" POST SPACING), (LN FT)
704-03-00200 BLOCKED OUT GUARD RAIL - 31", (6'-3" POST SPACING), (LN FT)
704-04-00200 BLOCKED OUT GUARD RAIL - 31", (DOUBLE FACED, 6'-3" POST SPACING), (LN FT)
704-05-00300 GUARD RAIL ANCHOR SECTIONS - 31", (TRAILING END), (LN FT)
704-06-00100 GUARD RAIL BRIDGE ATTACHMENTS, (LN FT)
704-06-00200 GUARD RAIL BRIDGE ATTACHMENTS (SINGLE THRIE BEAM), (LN FT)
704-07-00200 GUARD RAIL TRANSITION, (DOUBLE THRIE BEAM), (LN FT)
704-09-00100 GUARD RAIL ANCHOR BLOCK, (EA.)
704-10-00105 GUARD RAIL END TREATMENT (FLARED, 12'-6" LENGTH), (EA.)
704-10-00110 GUARD RAIL END TREATMENT (FLARED, 18'-9" LENGTH), (EA.)
704-10-00120 GUARD RAIL END TREATMENT, MASH, (TL-3 FLARED), (EA.)
704-10-00204 GUARD RAIL END TREATMENT, MASH, (TL-2 TANGENT), (EA.)
704-10-00205 GUARD RAIL END TREATMENT, MASH, (TL-3 TANGENT), (EA.)
704-10-00305 GUARD RAIL END TREATMENT, MASH, (TL-3 BI-DIRECTIONAL), (EA.)
704-10-00310 GUARD RAIL END TREATMENT, NCHRP 350 - 31" (TL-3 FLARED), (EA.)
810-06-00100 CONCRETE PIER PROTECTION SYSTEM (VEHICLE), (LN FT)
SEE NOTE NO.13
SEE NOTE NO.14

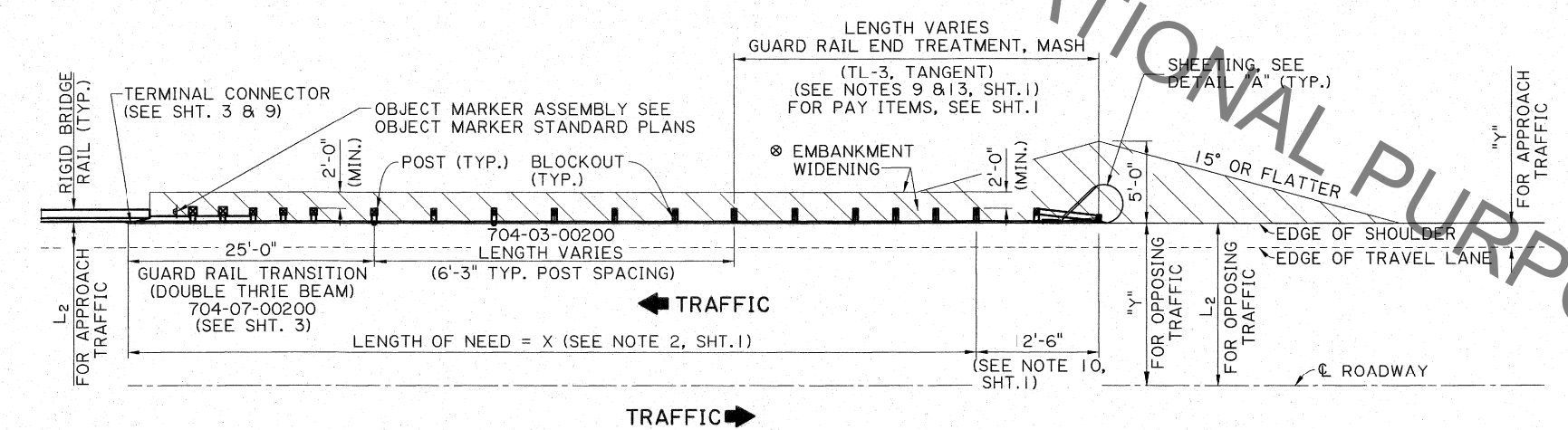
GUARD RAIL STANDARD PLAN INDEX

Table with 4 columns: BRIDGE STANDARD INDEX NO., SERIES, DESCRIPTION, and a category column. Rows include COMMON DETAILS, BRIDGE END AND NON-BRIDGE APPLICATIONS, OFF - SYSTEM BRIDGE, and BOX CULVERT DETAILS.

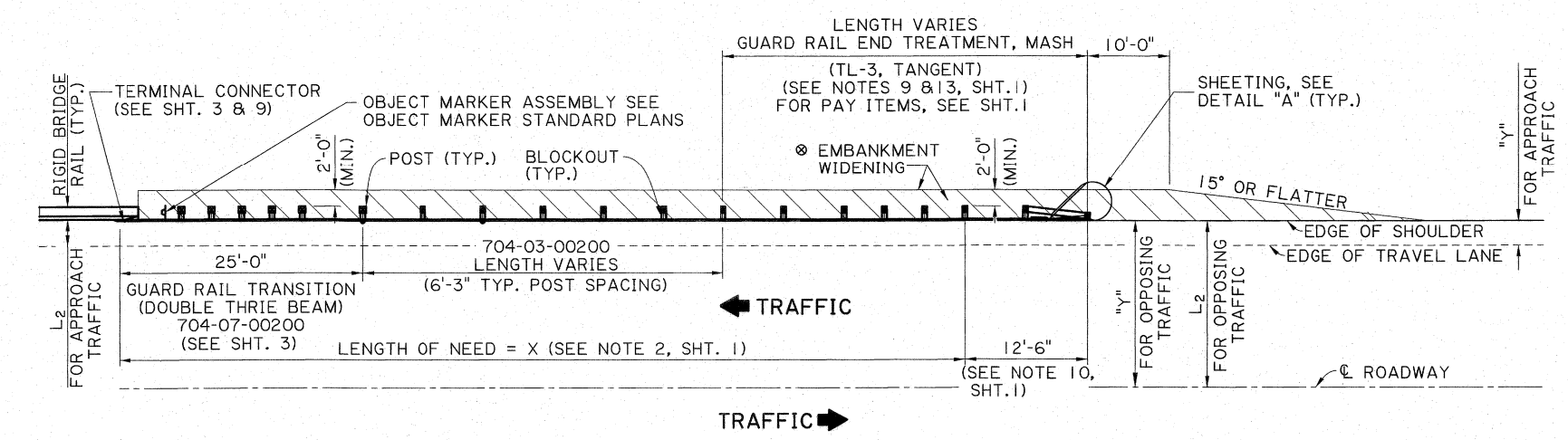
Vertical sidebar containing sheet number, design team (F. Fossier, K. Brauner, J. Doucet, K. Brauner, C. Guidry), professional engineer seal for Kurt M. Brauner, approval signature, date (4/13/2023), and project title (HIGHWAY GUARD RAIL (MASH) GENERAL NOTES, PAY ITEMS AND STANDARD PLAN INDEX).



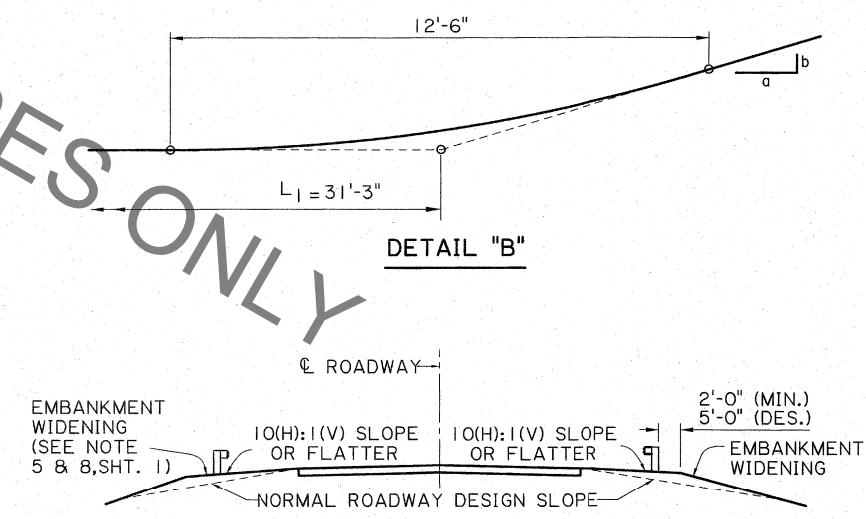
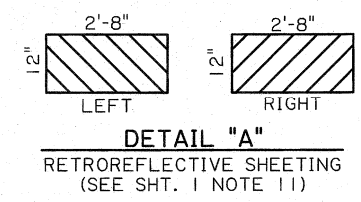
TYPICAL BRIDGE GUARD RAIL LAYOUT WITH FLARED END TREATMENT - PLAN
 NOTE: LAYOUT SIMILAR FOR OTHER QUADRANTS OF BRIDGE END
 SEE NOTES 5, 8, AND 12, SHT. 1.



TYPICAL BRIDGE GUARD RAIL LAYOUT WITH TANGENT END TREATMENT - PREFERRED GRADING - PLAN
 SEE NOTES 5, 8, AND 12, SHT. 1.



TYPICAL BRIDGE GUARD RAIL LAYOUT WITH TANGENT END TREATMENT - ALTERNATIVE GRADING - PLAN
 SEE NOTES 5, 8, AND 12, SHT. 1.



TYPICAL EMBANKMENT WIDENING SECTION

NOTES:
 THE DETAILS SHOWN ON THIS SHEET SHALL BE USED TO CONNECT GUARD RAIL TO RIGID BRIDGE RAILS. DETAILS FOR CONNECTING TO A FLEXIBLE BRIDGE RAIL ARE SHOWN ON STANDARD PLAN GRR-06, "APPROACH GUARD RAIL FOR STRUCTURES WITH FLEXIBLE RAILS."

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	P. FOSSIER	CHECK	K. BRAUNER	DETAIL	J. DOUCET	CHECK	K. BRAUNER
REVIEW	C. GUIDRY	SERIES		2 OF 11			

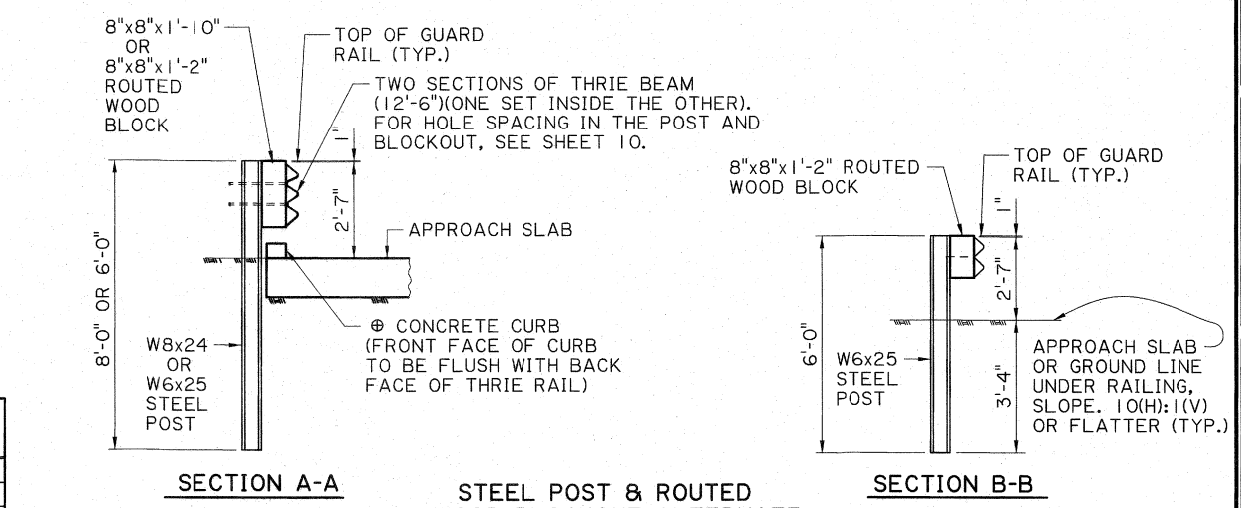
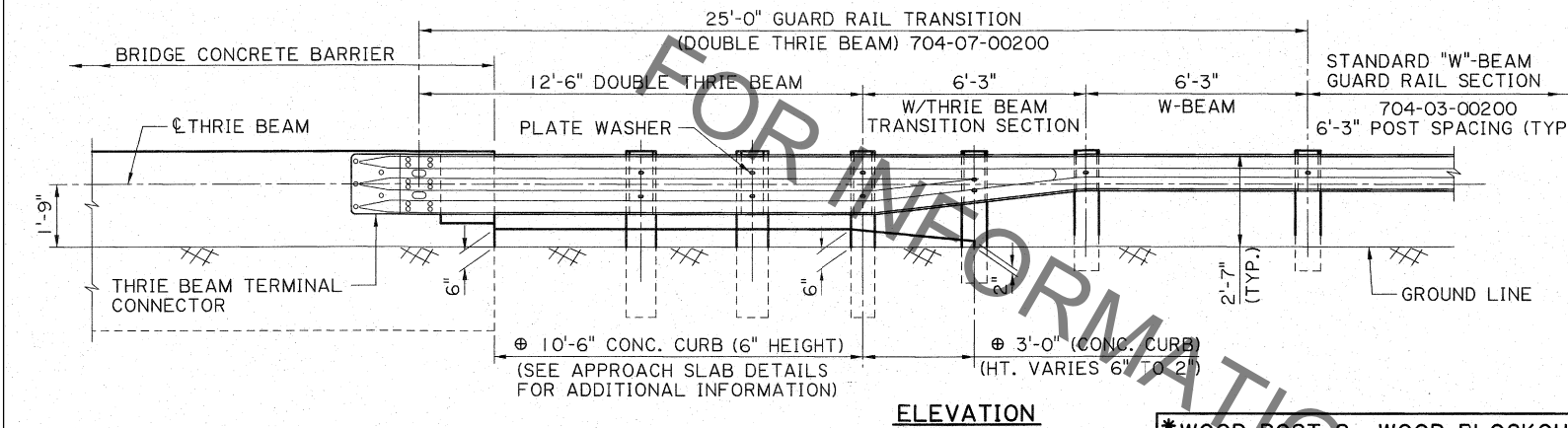
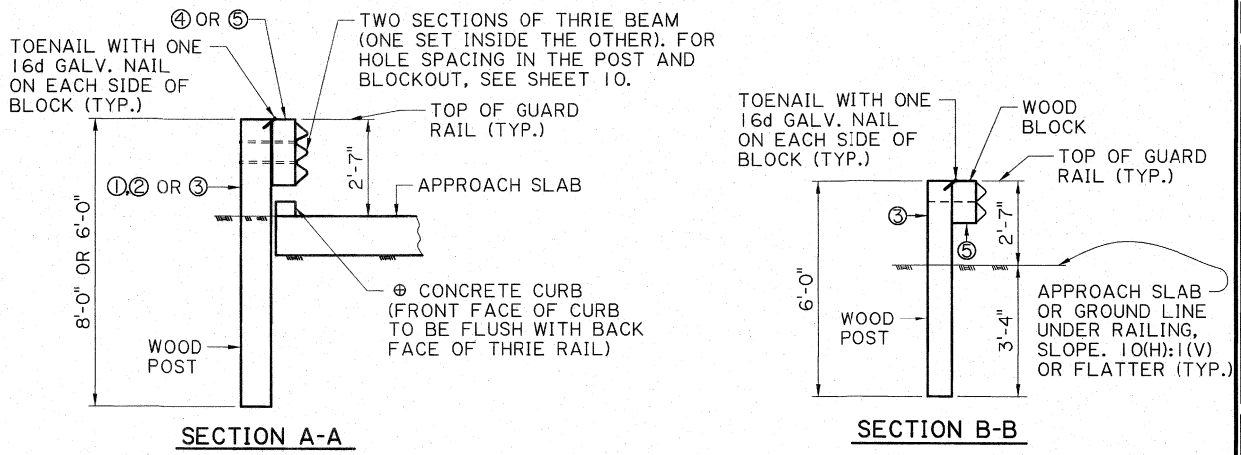
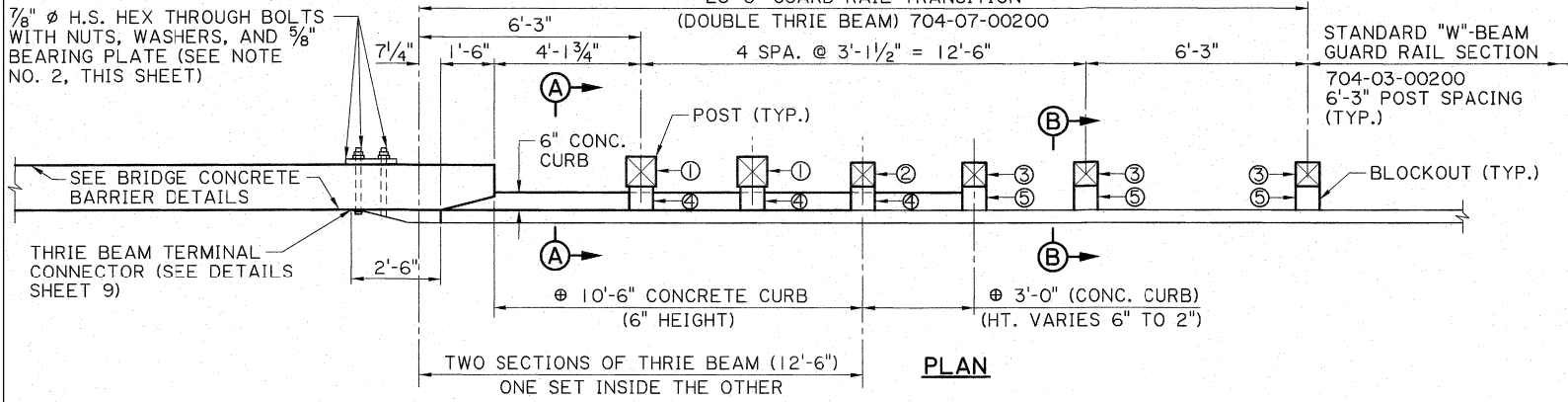
APPROVED BY CHIEF ENGINEER: *[Signature]* DATE: 4/13/2023

STATE OF LOUISIANA
 KURT M. BRAUNER
 License No. 30567
 PROFESSIONAL ENGINEER
 IN
 CIVIL ENGINEERING
 3/2/23

STANDARD PLAN
 GR-MASH-ON
 BD.1.1.0.02

HIGHWAY GUARD RAIL (MASH) BRIDGE APPLICATION (TYPICAL LAYOUT)

DOTD
 LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
 BRIDGE AND STRUCTURAL DESIGN



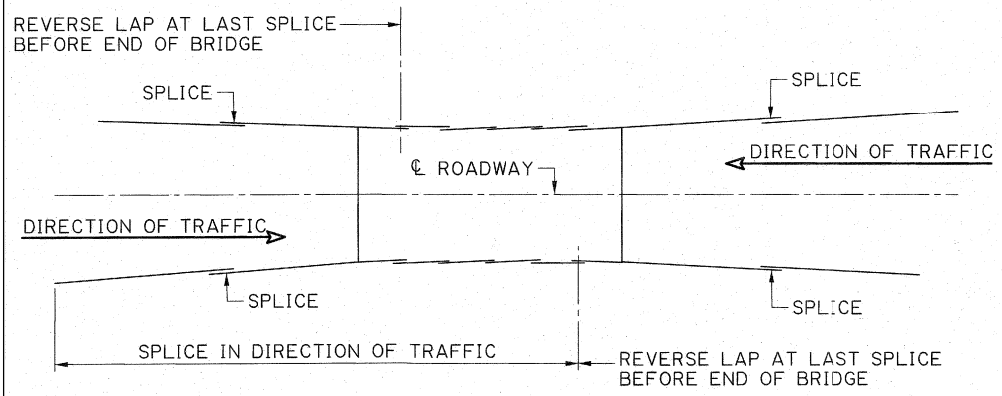
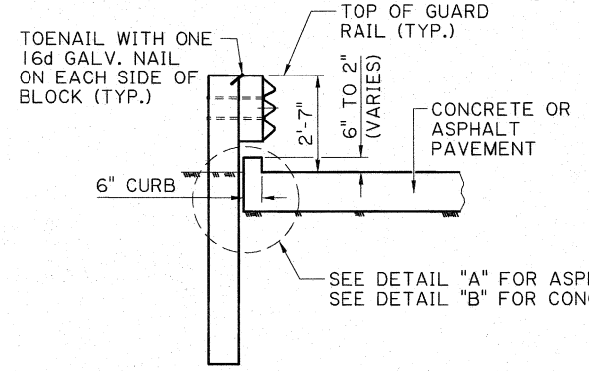
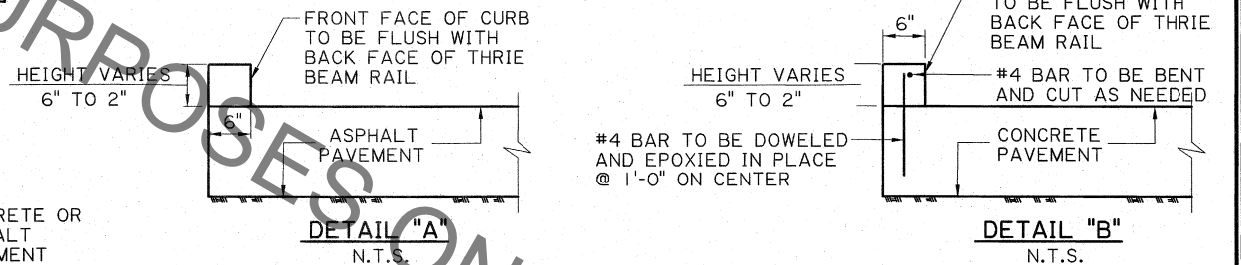
NOTES

- THIS GUARD RAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO THE CONCRETE BARRIER SHAPE AS SHOWN. SEE BRIDGE BARRIER RAILING DETAILS FOR INFORMATION.
- 7/8" Ø H.S. BOLTS FOR CONCRETE BARRIER AND THRIE BEAM TERMINAL CONNECTOR SHALL BE ASTM A449. FOR 5/8" STEEL BEARING PLATE, SEE SHEET 9. GALVANIZING SHALL BE IN ACCORDANCE WITH ASTM A153.
- STEEL POST ALTERNATES: STEEL POSTS ARE ALLOWED AS AN ALTERNATE TO WOOD POSTS. USE W8 x 24 STEEL POST ALTERNATE FOR 10" x 10" WOOD POST. USE W6 x 25 STEEL POST ALTERNATE FOR 8" x 8" WOOD POST. USE SAME LENGTHS AS WOOD POSTS.
- BLOCKOUTS: USE WOOD BLOCKOUTS ONLY, STEEL AND RECYCLED BLOCKOUTS ARE NOT PERMITTED FOR THE GUARD RAIL TRANSITION. ALL WOOD BLOCKOUTS ARE REQUIRED TO BE ROUTED WHEN USED WITH STEEL POSTS. SEE SHEET 10.
- INTERMIXING OF STEEL AND WOOD POSTS IN THE GUARD RAIL TO BRIDGE RAIL TRANSITION SECTION IS NOT ALLOWED.
- FOR GUARD RAIL TRANSITIONS CONSTRUCTED WITH NEW APPROACH SLABS, CONCRETE CURBS SHALL BE USED AND PAID FOR WITH THE APPROACH SLAB PAY ITEM. FOR GUARD RAIL TRANSITIONS CONSTRUCTED WHEN THE APPROACH SLAB OR PAVEMENT IS EXISTING AND A NEW CURB IS NEEDED, THE ASPHALT CURB ALTERNATE DETAIL SHALL BE USED ON ASPHALT PAVEMENTS, AND PAID FOR UNDER 707-04-00100, "ASPHALT CURB" OR AS INDICATED IN THE PLANS. ON EXISTING CONCRETE PAVEMENTS, THE CONCRETE CURB ALTERNATE DETAIL SHALL BE USED AND PAID FOR UNDER 707-01-00100, "CONCRETE CURB" OR AS INDICATED IN THE PLANS.
- THE USE OF THIS BRIDGE BARRIER TRANSITION HAS ONLY BEEN APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, THEIR CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

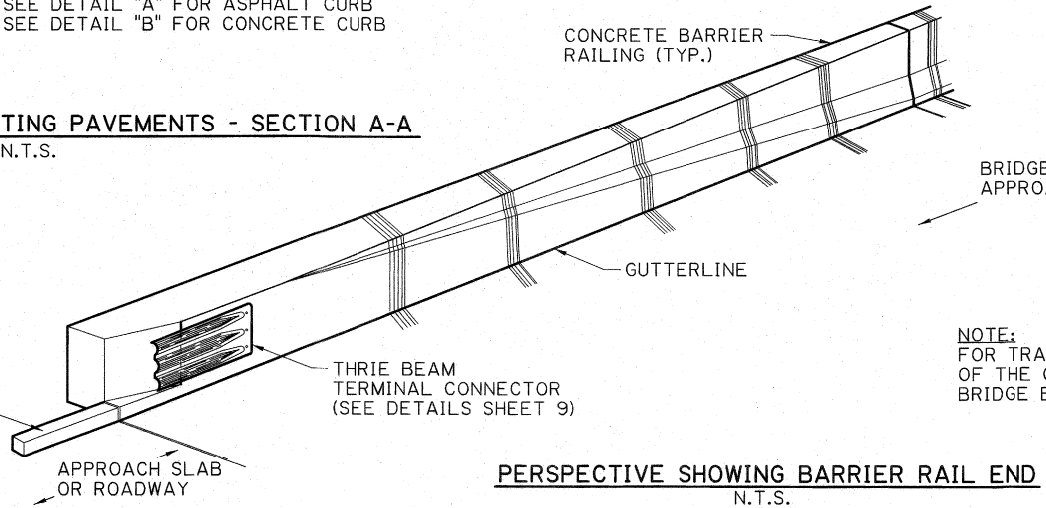
***WOOD POST & WOOD BLOCKOUT FOR GUARD RAIL TRANSITION**

NO.	SIZE (WIDTHxDEPTHxLENGTH)
1	10" x 10" x 8'-0" POST
2	8" x 8" x 8'-0" POST
3	8" x 8" x 6'-0" POST
4	8" x 8" x 1'-10" BLOCKOUT
5	8" x 8" x 1'-2" BLOCKOUT

*SEE NOTE FOR STEEL POST ALTERNATE



CURB ALTERNATE FOR EXISTING PAVEMENTS - SECTION A-A N.T.S.



PERSPECTIVE SHOWING BARRIER RAIL END N.T.S.

LAYOUT SHOWING DIRECTION OF GUARD RAIL SPLICE FOR TWO WAY TRAFFIC N.T.S.

13'-6" LENGTH OF CONCRETE OR ASPHALT CURB (TYP.) HEIGHT VARIES

NOTE: FOR TRANSITION LENGTH & DETAILS OF THE CONCRETE BARRIER, SEE BRIDGE BARRIER RAILING DETAILS.



SHEET NUMBER

PARRISH CONTROL SECTION STATE PROJECT

DESIGN P. FOSSIER CHECK K. BRAUNER DETAIL J. DOUCET CHECK K. BRAUNER REVIEW C. GUIDRY SERIES 3 OF 11

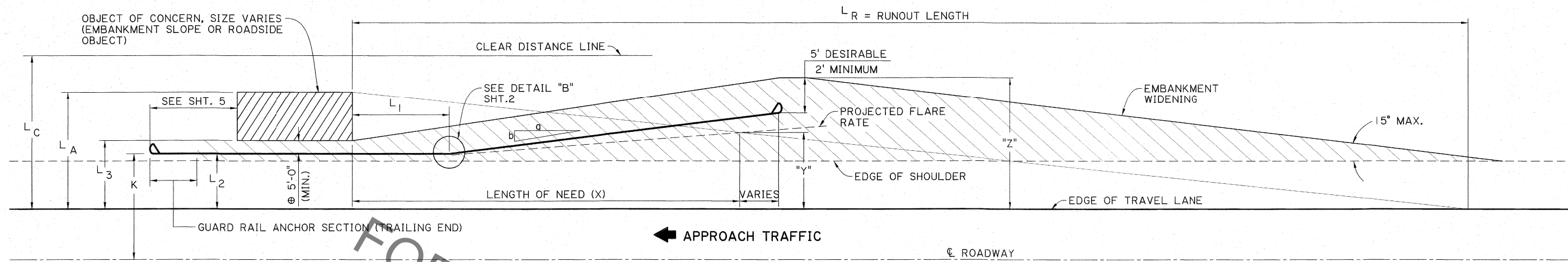
STATE OF LOUISIANA
 KURT M. BRAUNER
 License No. 30567
 PROFESSIONAL ENGINEER
 IN
 CIVIL ENGINEERING
 3/2/23

APPROVED BY: CHIEF ENGINEER
 DATE: 4/13/2023

STANDARD PLAN
 GR-MASH-ON

HIGHWAY GUARD RAIL (MASH) THRIE BEAM GUARD RAIL TRANSITION TO BRIDGE RAIL

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
 BRIDGE AND STRUCTURAL DESIGN



OPPOSING TRAFFIC →

← APPROACH TRAFFIC

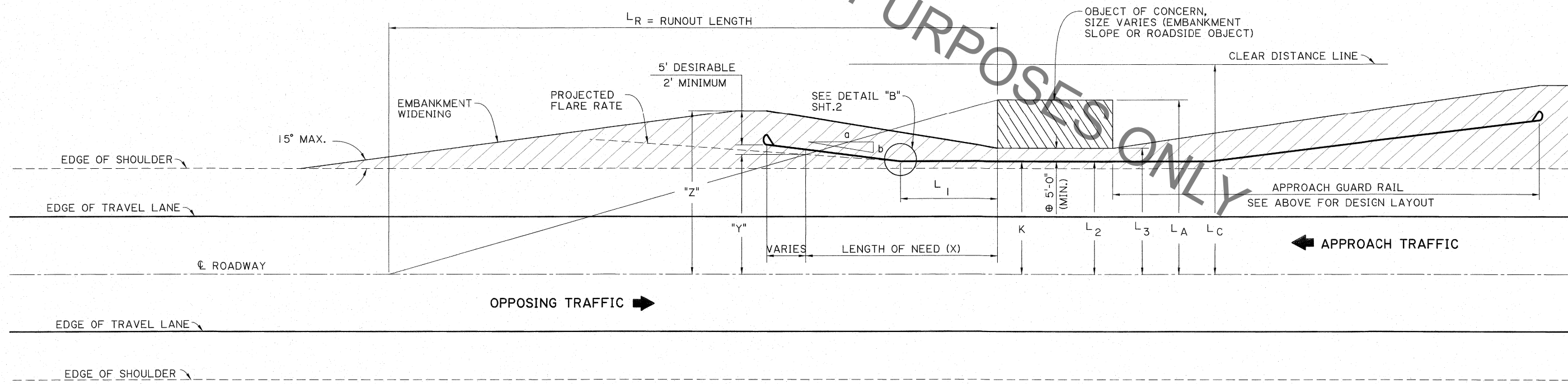
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GUARD RAIL LAYOUT FOR SHOULDER APPLICATIONS - APPROACH VARIABLES

(GUARD RAIL OUTSIDE OF OPPOSING TRAFFIC'S CLEAR ZONE ; $K > L_c$)
N.T.S.

⊕ MINIMUM DISTANCE MEASURED FROM BACK FACE OF GUARD RAIL TO FRONT FACE OF OBJECT OF CONCERN.

LAYOUT FOR TANGENT GUARD RAIL SECTIONS AND END TREATMENTS SIMILAR. FOR EMBANKMENT WIDENING DETAILS, SEE SHT. NO. 2.



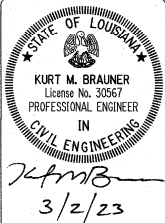
OPPOSING TRAFFIC →

← APPROACH TRAFFIC

GUARD RAIL LAYOUT FOR SHOULDER APPLICATIONS - OPPOSING VARIABLES

(GUARD RAIL INSIDE OF OPPOSING TRAFFIC'S CLEAR ZONE ; $K < L_c$)
N.T.S.

SHEET NUMBER	
PARISH	
CONTROL SECTION	
STATE PROJECT	
DESIGN	P. FOSSIER
CHECK	K. BRAUNER
DETAIL	J. DOUCET
CHECK	K. BRAUNER
REVIEW	C. GUIDRY
SERIES	4 OF 11



3/2/23

APPROVED BY CHIEF ENGINEER
Christoph P. Fossier
DATE: 4/13/2023

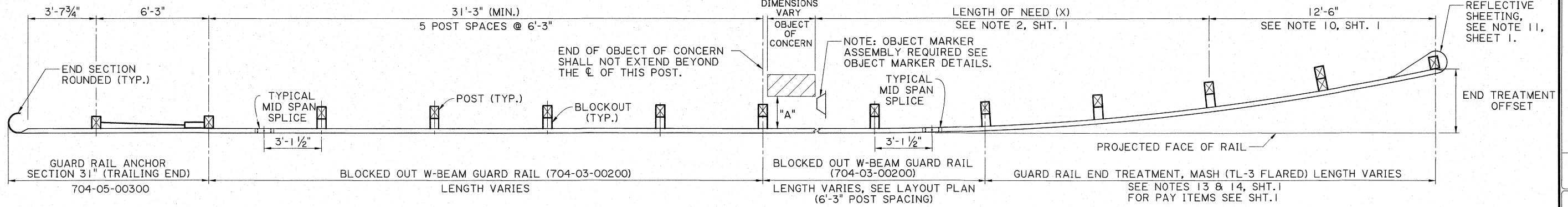


BD.1.1.0.04
GR-MASH-ON
STANDARD PLAN

HIGHWAY GUARD RAIL (MASH) NON-BRIDGE APPLICATION (TYPICAL LAYOUT)

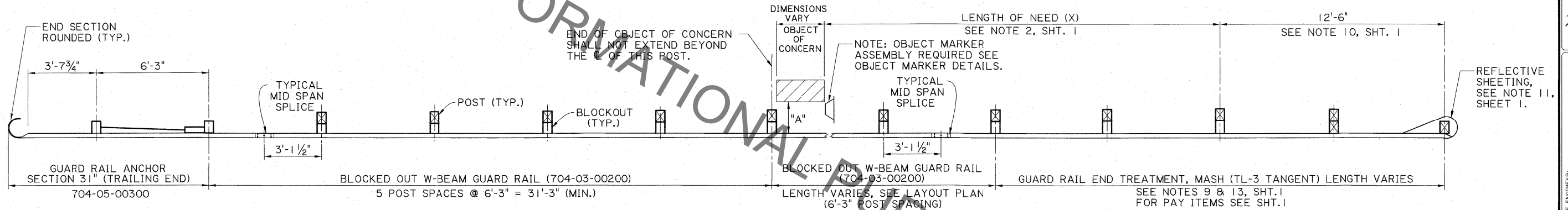
DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

BRIDGE AND STRUCTURAL DESIGN



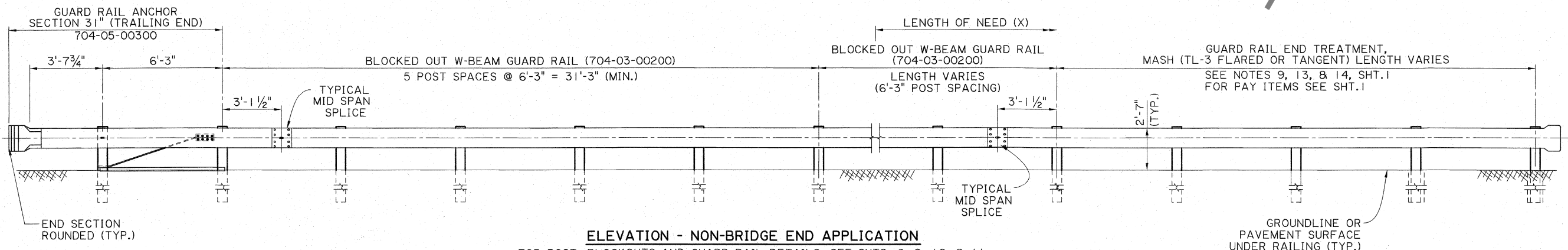
FOR TRAILING END TERMINAL DETAILS AND NOTES, SEE SHTS. 7 & 8.
 BACK FACE OF GUARD RAIL TO FRONT FACE OF OBJECT = "A" = 5'-0" MIN.

PLAN - NON-BRIDGE END APPLICATION - FLARED
 N.T.S.



FOR TRAILING END TERMINAL DETAILS AND NOTES, SEE SHTS. 7 & 8.
 BACK FACE OF GUARD RAIL TO FRONT FACE OF OBJECT = "A" = 5'-0" MIN.

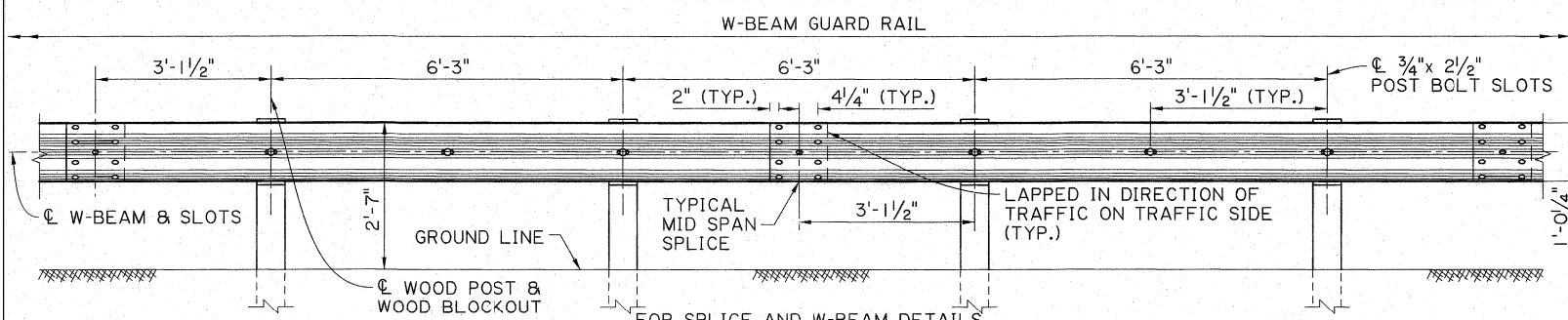
PLAN - NON-BRIDGE END APPLICATION - TANGENT
 N.T.S.



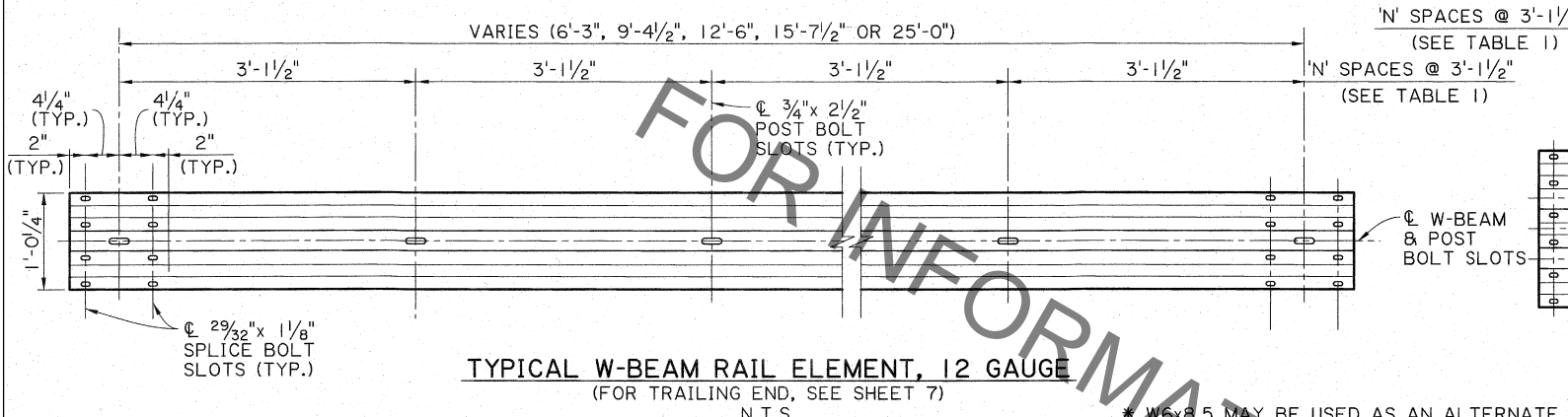
ELEVATION - NON-BRIDGE END APPLICATION
 FOR POST, BLOCKOUTS AND GUARD RAIL DETAILS, SEE SHTS. 6, 9, 10, & 11
 N.T.S.

FOR INFORMATIONAL PURPOSES ONLY

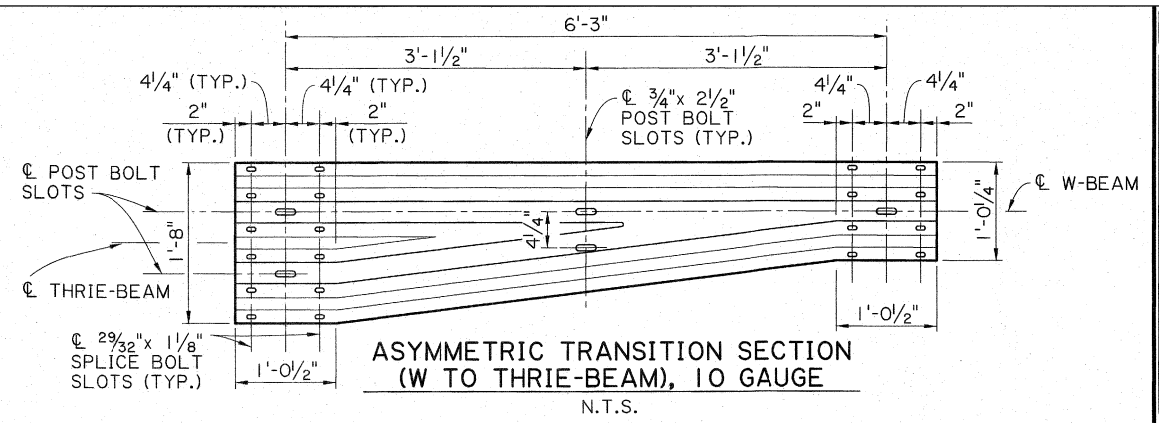
SHEET NUMBER									
PARISH	CONTROL SECTION	STATE PROJECT							
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES				
P. FOSSIER	K. BRAUNER	J. DOUCET	K. BRAUNER	C. GUIDRY	5 OF 11				
APPROVED BY CHIEF ENGINEER: <i>Kurt M. Brauner</i> DATE: 4/13/2023									
HIGHWAY GUARD RAIL (MASH) NON-BRIDGE APPLICATION (TYPICAL LAYOUT)									
BD.1.1.0.05 GR-MASH-ON STANDARD PLAN									
BRIDGE AND STRUCTURAL DESIGN									



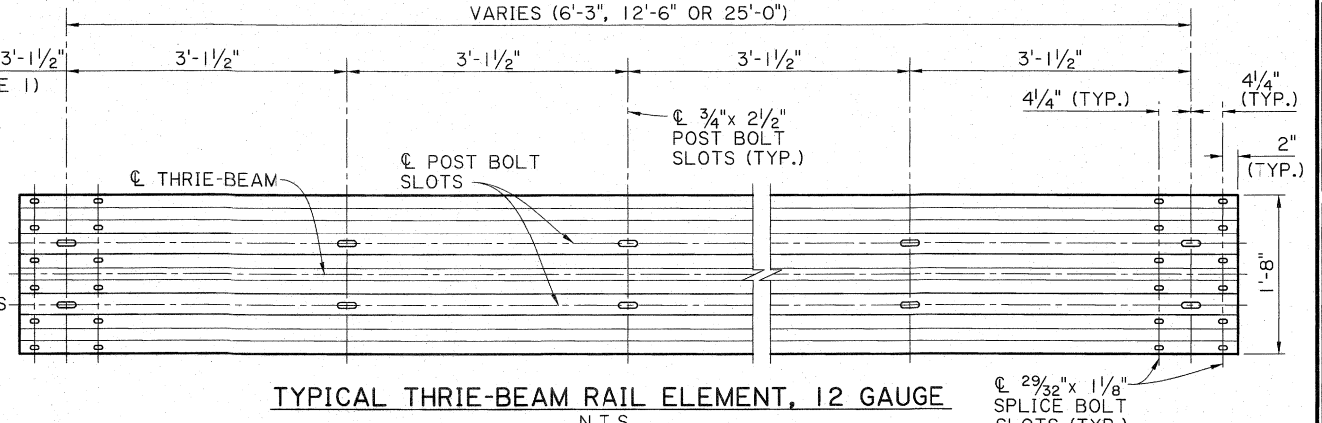
TYPICAL W-BEAM RAIL ELEMENT, 12 GAUGE
N.T.S.



TYPICAL W-BEAM RAIL ELEMENT, 12 GAUGE
(FOR TRAILING END, SEE SHEET 7)
N.T.S.



ASYMMETRIC TRANSITION SECTION
(W TO THRIE-BEAM), 10 GAUGE
N.T.S.

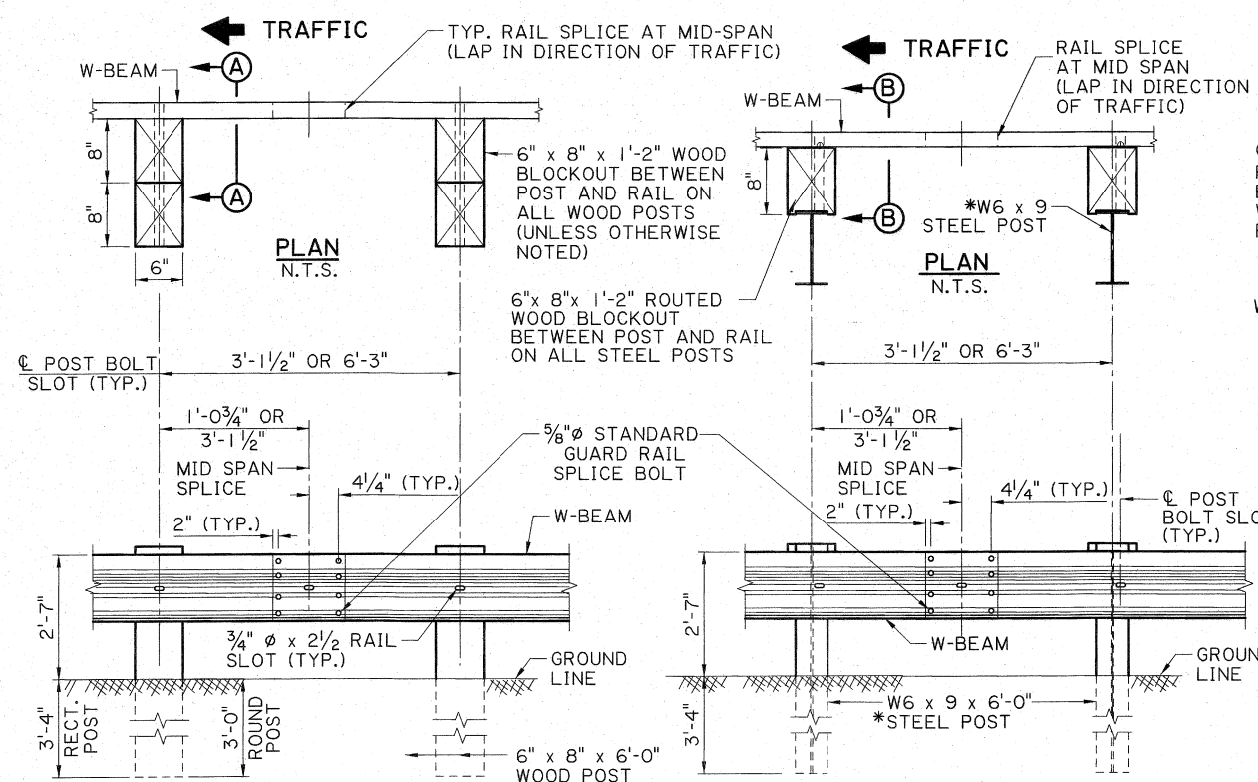


TYPICAL THRIE-BEAM RAIL ELEMENT, 12 GAUGE
N.T.S.

TABLE 1: ELEMENT SUMMARY TABLE:

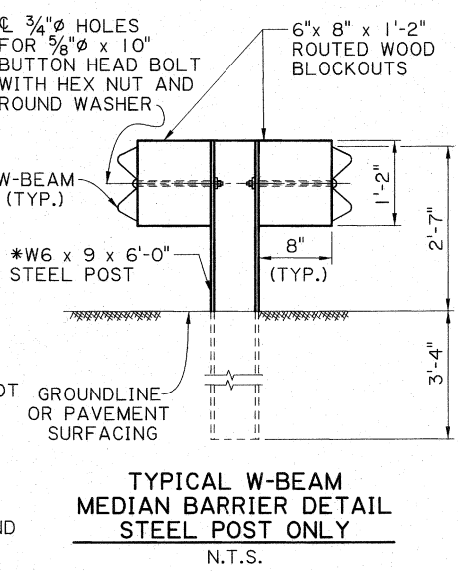
PANEL TYPE	NUMBER OF SPACES 'N'	GAUGE	PANEL TYPE	NUMBER OF SPACES 'N'	GAUGE
6'-3" W-BEAM	2	12	6'-3" THRIE-BEAM	2	12
9'-4 1/2" W-BEAM	3	12	12'-6" THRIE-BEAM	4	12
12'-6" W-BEAM	4	12	25'-0" THRIE-BEAM	8	12
15'-7 1/2" W-BEAM	5	12	THRIE-BEAM TRANSITION	2	10
25'-0" W-BEAM	8	12			

* W6x8.5 MAY BE USED AS AN ALTERNATE.

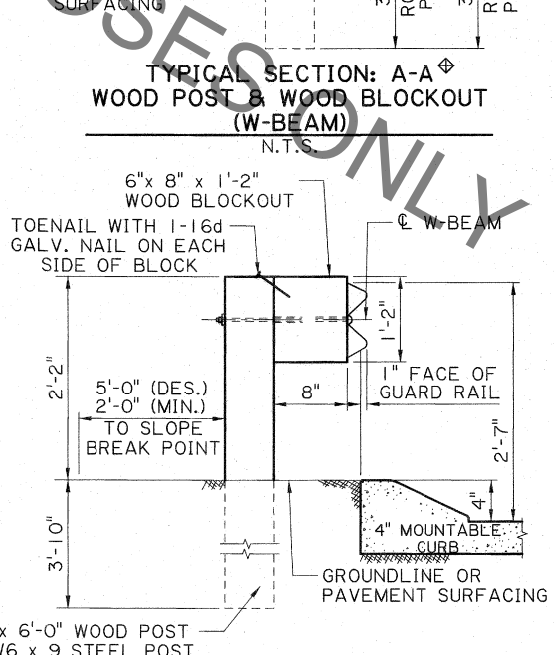


DETAIL OF 6" x 8" x 6'-0" WOOD POSTS AND WOOD BLOCKS-STD. GUARD RAIL
N.T.S.

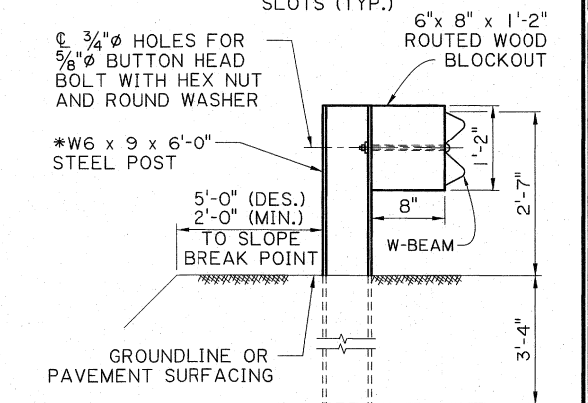
***DETAIL OF W6 x 9 STEEL POSTS AND WOOD BLOCKS-STD. GUARD RAIL**
N.T.S.



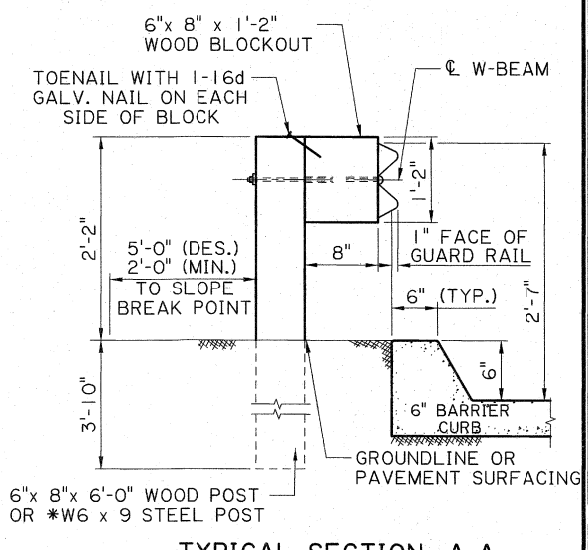
TYPICAL W-BEAM MEDIAN BARRIER DETAIL STEEL POST ONLY
N.T.S.



TYPICAL SECTION: A-A WOOD POST & WOOD BLOCKOUT WITH 4" MOUNTABLE CURB
N.T.S.



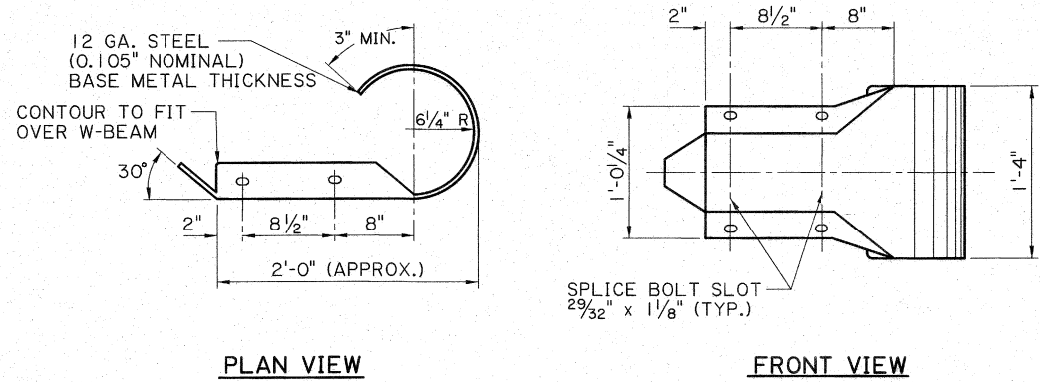
TYPICAL SECTION: B-B STEEL POST & WOOD BLOCKOUT (W-BEAM)
N.T.S.



TYPICAL SECTION: A-A WOOD POST & WOOD BLOCKOUT WITH 6" BARRIER CURB
N.T.S.

FOR INFORMATIONAL PURPOSES ONLY

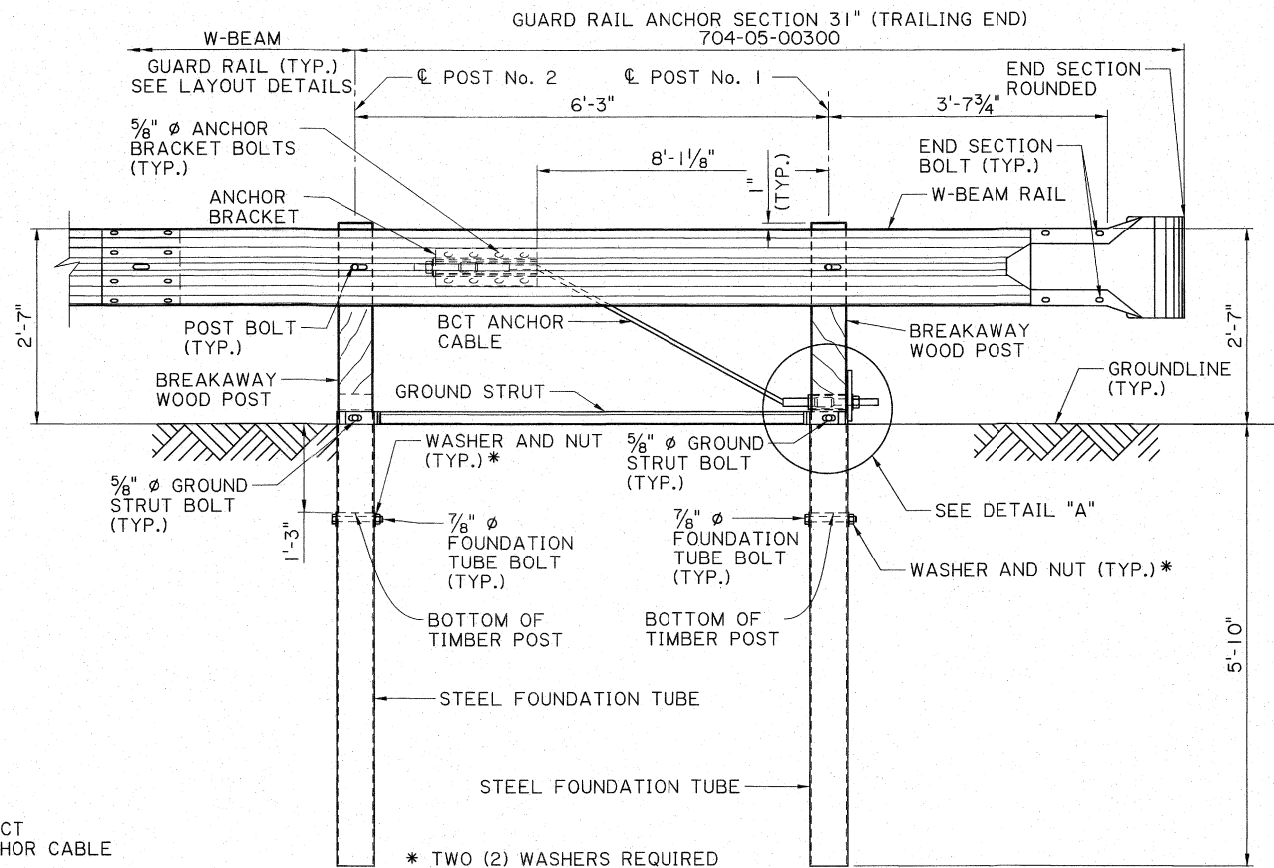
SHEET NUMBER	PARISH	CONTROL SECTION	STATE PROJECT
DESIGN P. FOSSIER	CHECK K. BRAUNER	DETAIL J. DOUCET	CHECK K. BRAUNER
REVIEW C. GUIDRY	SERIES # 6 OF 11		
APPROVED BY CHIEF ENGINEER: DATE: 4/13/2023			
HIGHWAY GUARD RAIL (MASH) TYPICAL DETAILS AND SECTIONS STANDARD PLAN GR-MASH-ON BD. 1.1.0.06			
BRIDGE AND STRUCTURAL DESIGN			



PLAN VIEW

FRONT VIEW

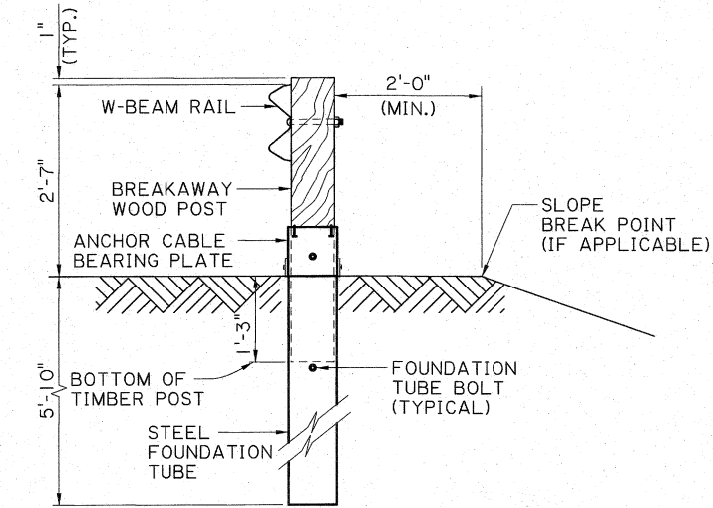
W BEAM END SECTION ROUNDED N.T.S.



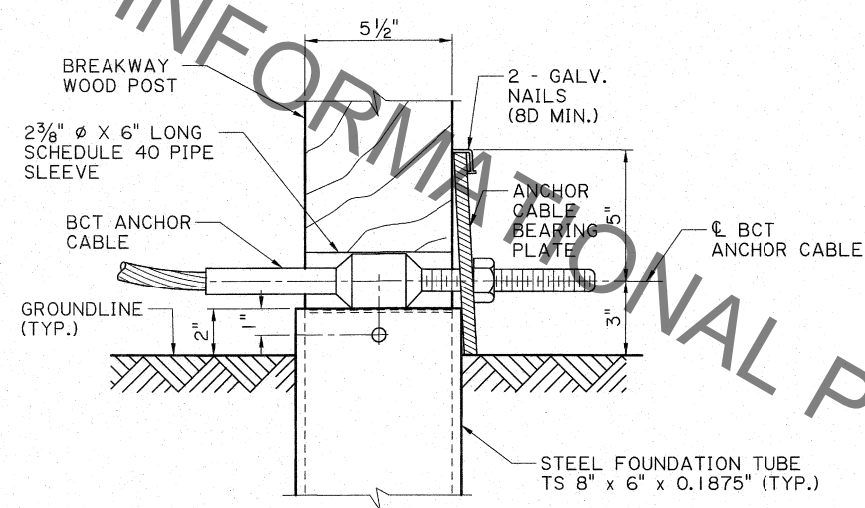
TRAILING END RAIL DETAIL - ELEVATION

NOTE: FOR OTHER TRAILING END TERMINAL DETAILS, SEE SHT. 8 OF 11.

N.T.S.



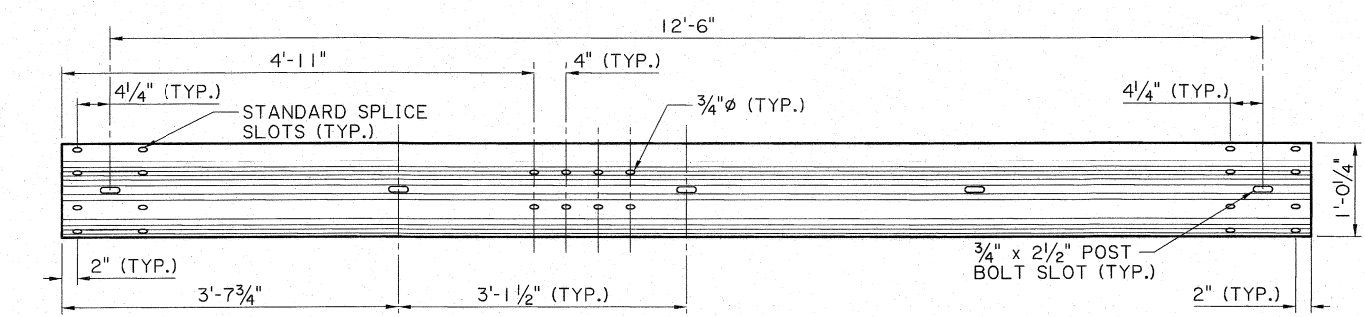
SECTION A-A - POST No. 1 N.T.S.



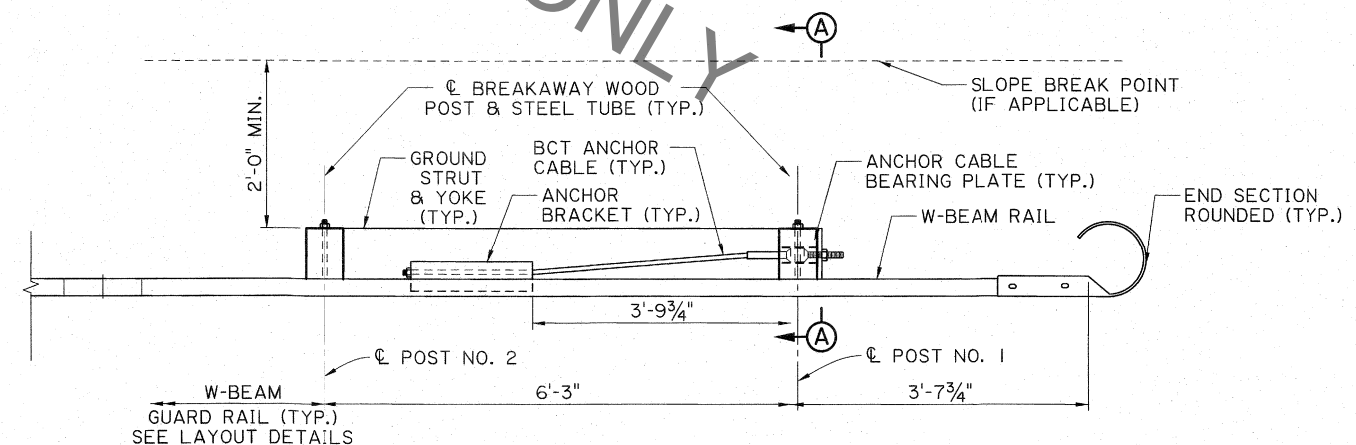
DETAIL "A" - POST No. 1

POST #1 GROUND STRUT NOT SHOWN FOR CLARITY. POST #2 SIMILAR W/O BCT ANCHOR CABLE AND BEARING PLATE.

N.T.S.



TYPICAL 12'-6" W-BEAM SECTION, 12 GAUGE, TRAILING END SECTION N.T.S.

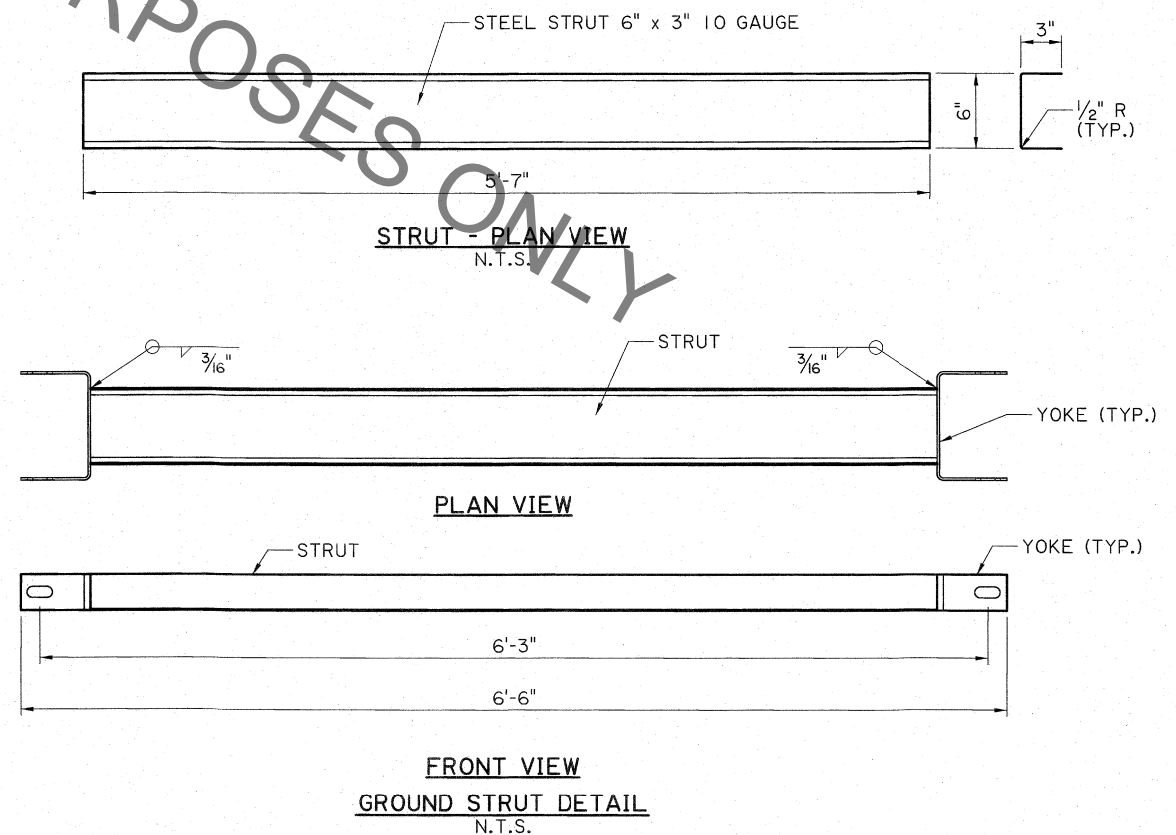
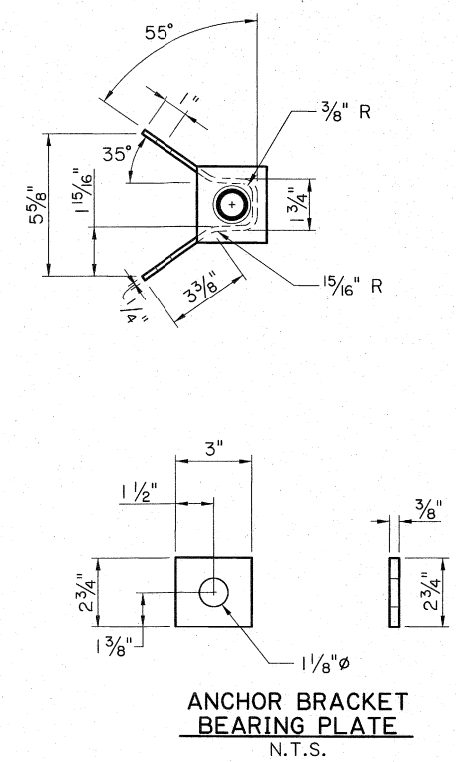
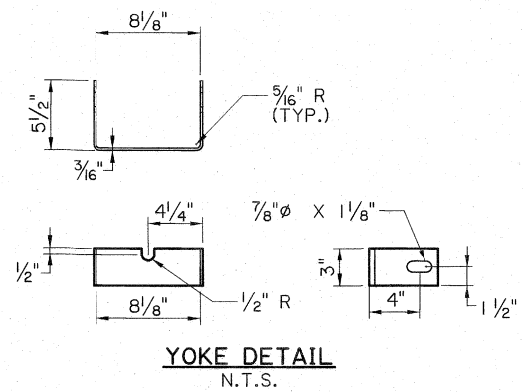
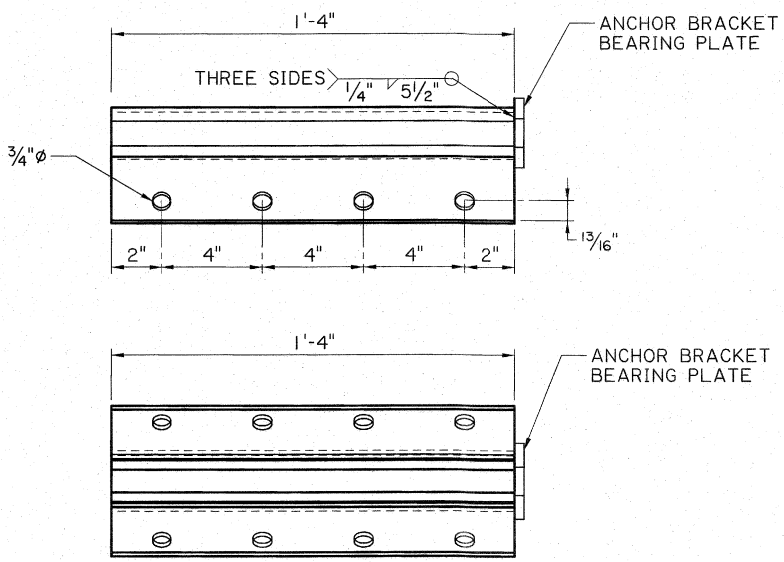
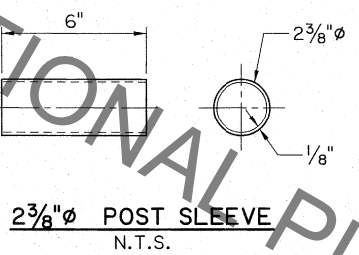
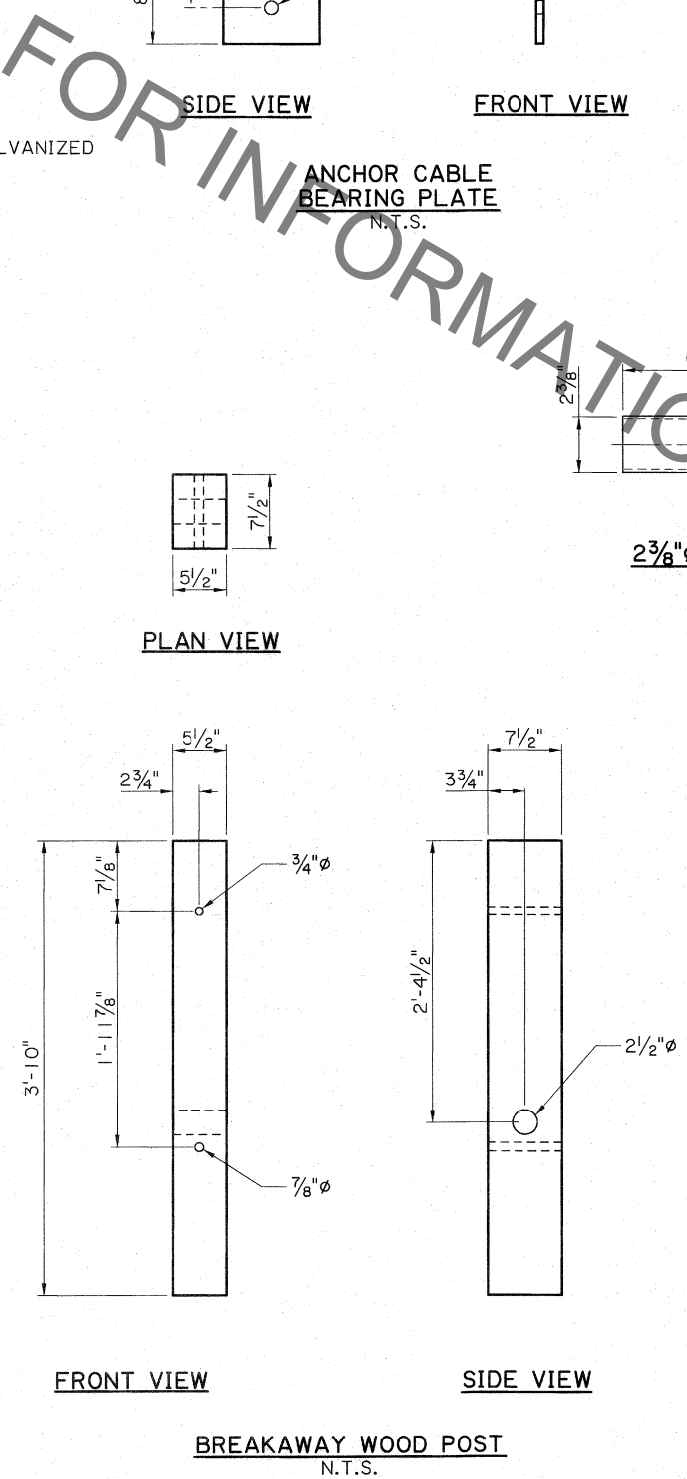
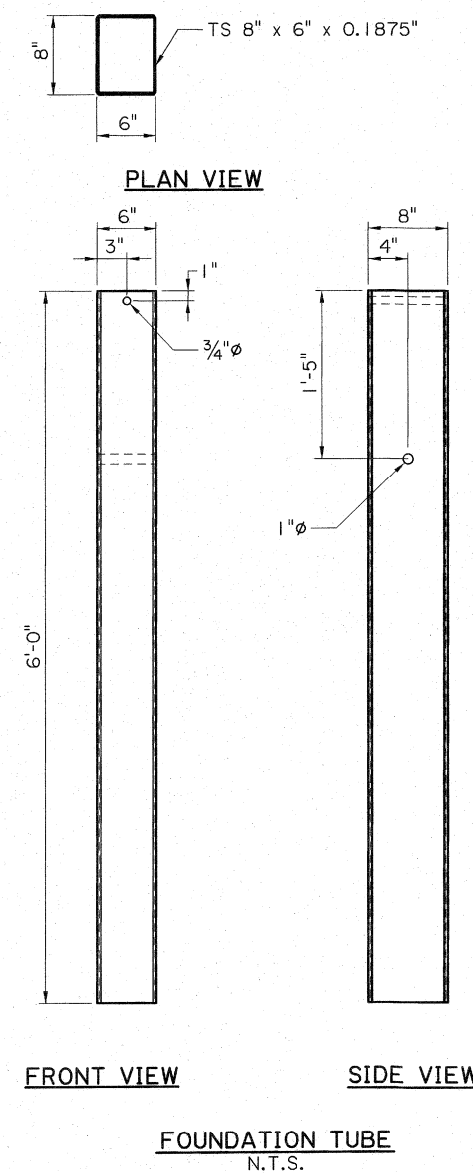
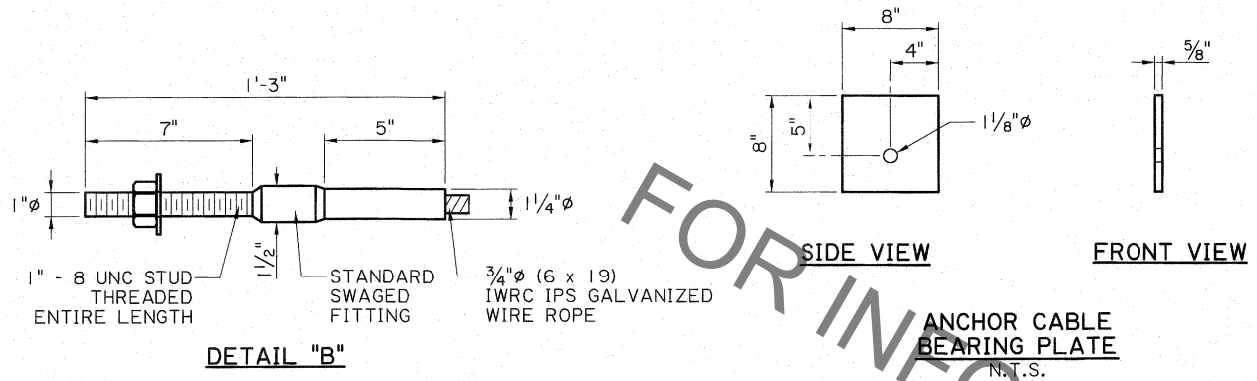
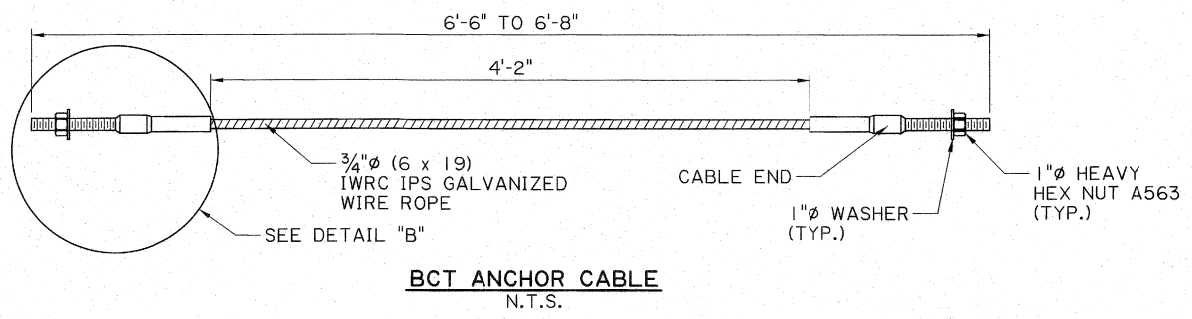


TRAILING END RAIL DETAIL - PLAN

N.T.S.

FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER		CONTROL SECTION		STATE PROJECT	
PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	P. FOSSIER	CHECK	K. BRAUNER	REVIEW	C. GUIDRY
DETAIL	J. DOUCET	CHECK	K. BRAUNER	SERIES	7 OF 11
APPROVED BY CHIEF ENGINEER: <i>Kurt M. Brauner</i> DATE: 4/13/2023					
HIGHWAY GUARD RAIL (MASH) TRAILING END DETAILS					
STANDARD PLAN					
BRIDGE AND STRUCTURAL DESIGN					



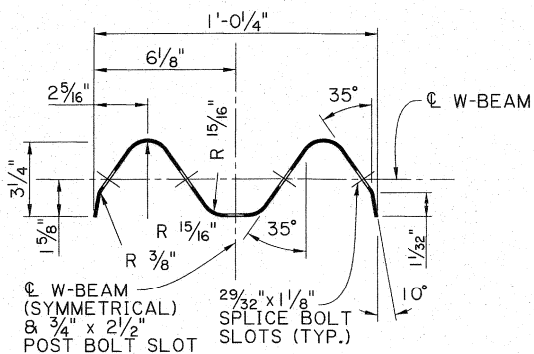
NOTES:

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 BOLTS AND REQUIRE ASTM A563 A NUTS AND TWO ASTM F844 5/8" DIAMETER FLAT WASHERS EACH. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.

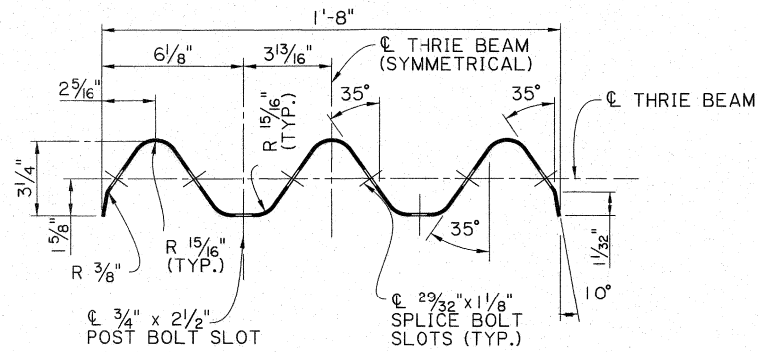
FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER	PARISH	CONTROL SECTION	STATE PROJECT
DESIGN P. FOSSIER	CHECK K. BRAUNER	DETAIL J. DOUCET	REVIEW C. GUIDRY
SERIES # 8 OF 11	 KURT M. BRAUNER License No. 30567 PROFESSIONAL ENGINEER IN CIVIL ENGINEERING 4/18/2023		
APPROVED BY CHIEF ENGINEER	DATE		
 KURT M. BRAUNER License No. 30567 PROFESSIONAL ENGINEER IN CIVIL ENGINEERING 4/18/2023			
HIGHWAY GUARD RAIL (MASH) TRAILING END DETAILS	BD.1.1.0.08	GR-MASH-ON	
 DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT BRIDGE AND STRUCTURAL DESIGN			



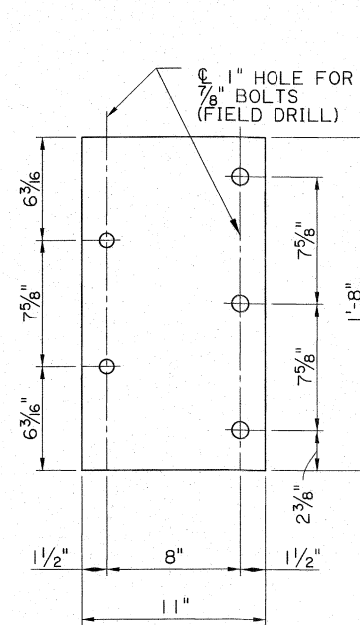
TYPICAL W BEAM

N.T.S.



TYPICAL THRIE BEAM

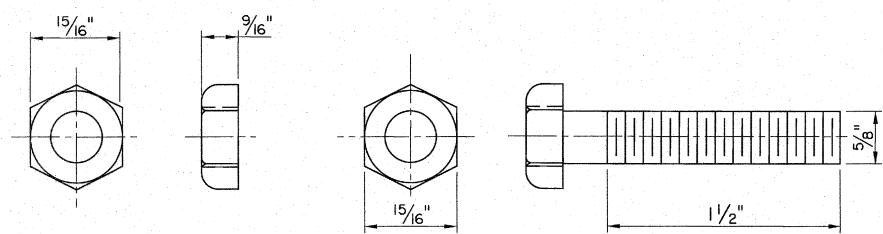
N.T.S.



5/8" Ø BEARING PLATE

(FOR ANCHORING THRIE BEAM TO CONCRETE BARRIER RAIL)

N.T.S.



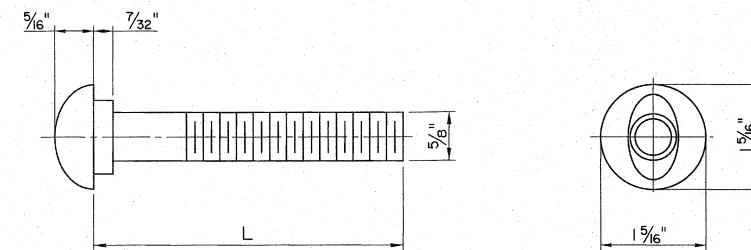
NUT

BOLT

5/8" Ø HEX BOLT & HEX NUT

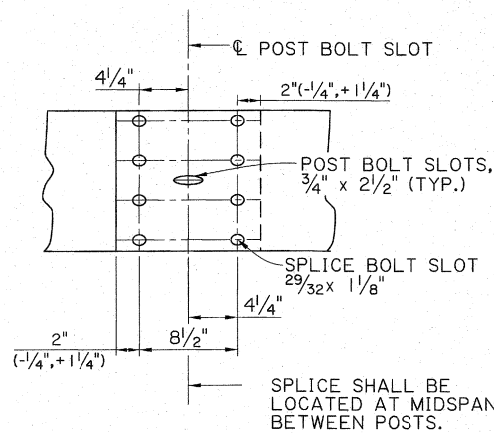
(FOR FASTENING THE ANCHOR BRACKET TO RAIL IN TRAILING END)

N.T.S.



5/8" Ø BUTTON HEAD BOLT

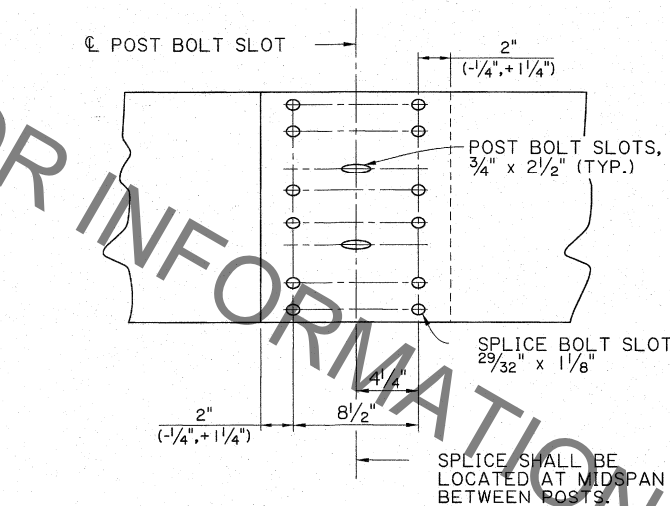
N.T.S.



TYPICAL W-BEAM SPLICE DETAIL - ELEVATION

5/8" Ø x 1 1/4" BUTTON HEAD OVAL SHOULDER BOLTS WITH 5/8" Ø RECESSED HEX NUTS-TOTAL 8 PER SPLICE. LAP IN DIRECTION OF TRAFFIC.

N.T.S.



TYPICAL THRIE BEAM SPLICE DETAIL - ELEVATION

5/8" Ø x 1 1/4" BUTTON HEAD OVAL SHOULDER BOLTS WITH 5/8" Ø RECESSED HEX NUTS-TOTAL 12 PER SPLICE. LAP IN DIRECTION OF TRAFFIC.

N.T.S.



5/8" Ø POST BOLT WASHERS

N.T.S.

5/8" Ø RECESS NUT

N.T.S.

L	THREAD LENGTH
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
1'-6"	4"
1'-8"	4"

NOTES:

5/8" Ø BUTTON HEAD BOLTS:

(1 1/4" LENGTH): THIS BOLT IS USED TO SPLICE RAIL ELEMENTS USED IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARD RAIL.

(2" LENGTH): THIS BOLT IS FOR FASTENING RAILS TO STEEL POSTS WHEN USED IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARD RAIL.

(10" LENGTH): THIS BOLT IS USED FOR FASTENING RAILS TO WOOD BLOCK AND STEEL POST IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARD RAIL.

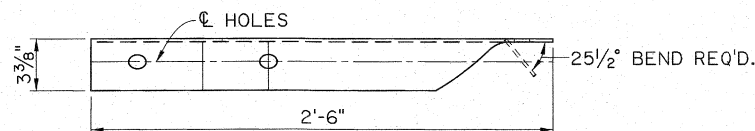
(1'-6" LENGTH): THIS BOLT IS FOR FASTENING WOOD BLOCKS & WOOD POSTS IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARD RAIL.

(1'-8" LENGTH): THIS BOLT IS FOR FASTENING NESTED THRIE BEAM TO WOOD BLOCKS AND POST AT THE FIRST TWO POST LOCATIONS IN THE GUARD RAIL TRANSITION AT THE ENDS OF RIGID (CONCRETE) STRUCTURES, UNLESS OTHERWISE SHOWN IN THE PLANS.

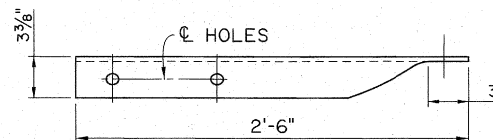
5/8" Ø BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 307 GRADE "A" AND NUTS SHALL BE IN ACCORDANCE WITH ASTM A 563 GRADE "A" OR BETTER. BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.

STEEL POST & PLATES:

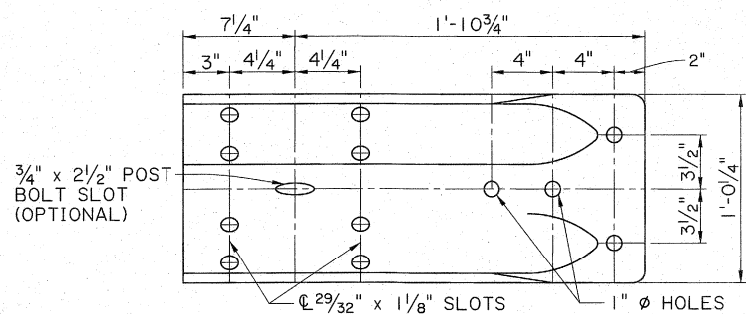
ALL STEEL POSTS AND PLATES SHALL CONFORM TO ASTM A 36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM 123, NO PUNCHING, DRILLING OR CUTTING WILL BE PERFORMED AFTER GALVANIZING.



PLAN



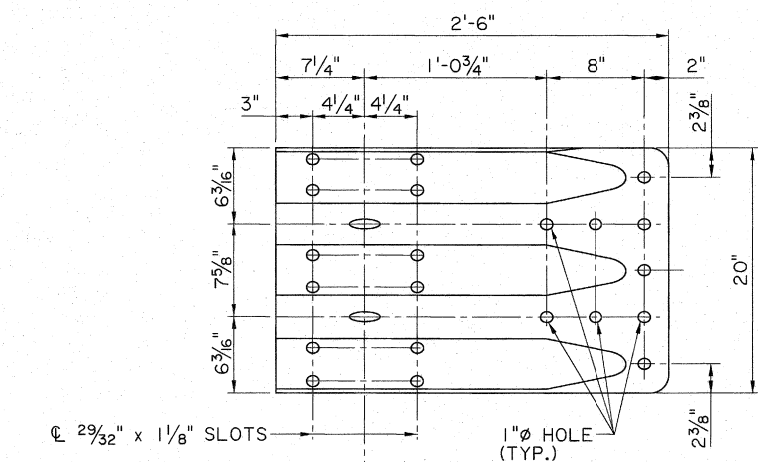
PLAN



ELEVATION

TYPICAL W BEAM TERMINAL CONNECTOR, 10 GAUGE

N.T.S.



ELEVATION

TYPICAL THRIE BEAM TERMINAL CONNECTOR, 10 GAUGE

N.T.S.

NOTES:

1. ALL RAIL COMPONENTS EXCEPT THE W AND THRIE BEAM TERMINAL CONNECTORS AND THE W TO THRIE BEAM TRANSITION SHALL MEET AASHTO M 180, CLASS "A" (12 GAUGE) METAL THICKNESS WITH A TYPE II COATING. THE W BEAM AND THRIE BEAM TERMINAL CONNECTORS AND TRANSITION SECTIONS SHALL BE CLASS "B" (10 GAUGE) METAL THICKNESS WITH TYPE II COATING.

FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER

DESIGN: P. FOSSIER
CHECK: K. BRAUNER
DETAIL: J. DOUCET
CHECK: K. BRAUNER
REVIEW: C. GUIDRY
SERIES: 9 OF 11

PARISH CONTROL SECTION STATE PROJECT

STATE OF LOUISIANA
KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

APPROVED BY CHIEF ENGINEER: *Christy P. Hays*
DATE: 4/13/2023

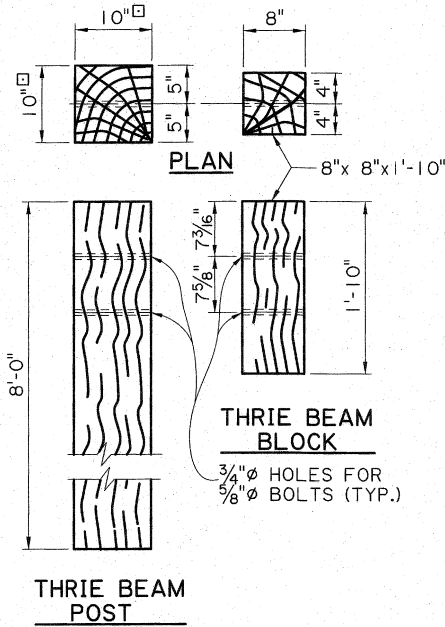
STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION & INFRASTRUCTURE

HIGHWAY GUARD RAIL (MASH)
RAIL STRUCTURAL DETAILS

BD.1.1.0.09
GR-MASH-ON
STANDARD PLAN

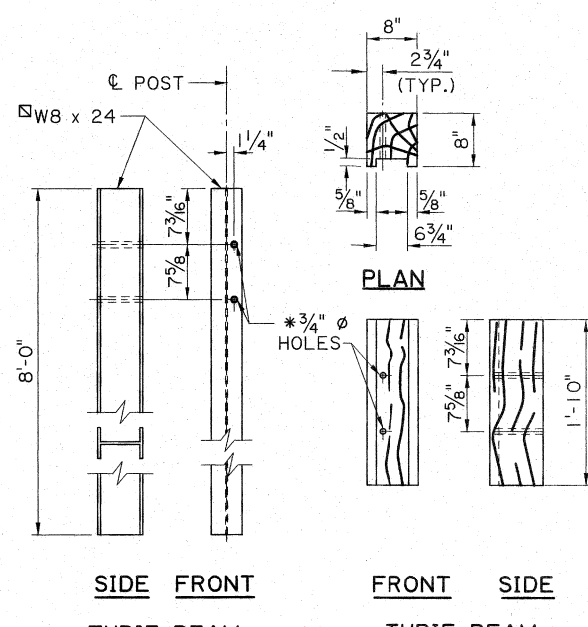
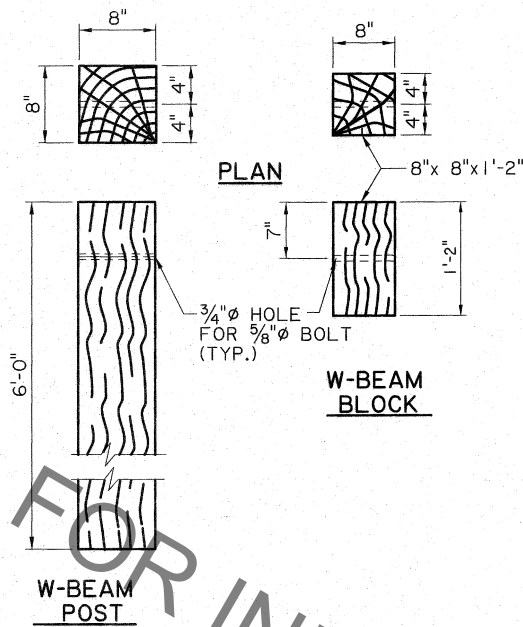
BRIDGE AND STRUCTURAL DESIGN

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & INFRASTRUCTURE



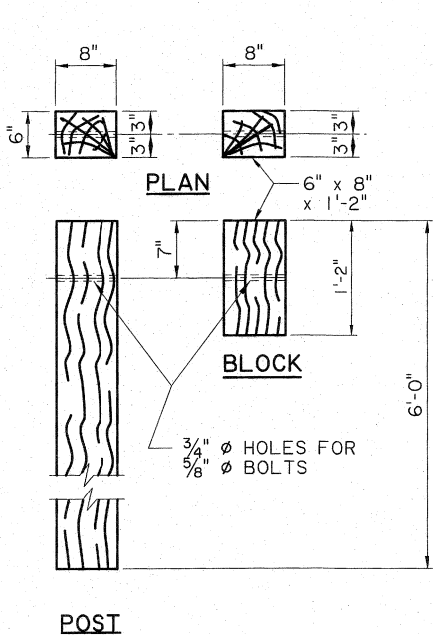
THRIE BEAM POST IS 8" x 8" x 8'-0" FOR TRANSITION POST No. 3.

WOOD POST AND WOOD BLOCK FOR THRIE BEAM TRANSITION TO BRIDGE RAIL
(POST SIZE, BLOCK SIZE AND HOLE LOCATIONS VARY WITH LOCATION IN TRANSITION, SEE SHT.3)
N.T.S.

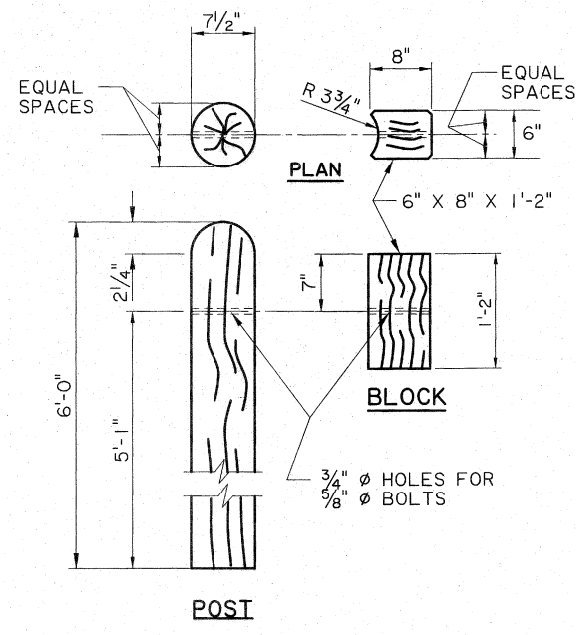


THRIE BEAM POST IS W6 x 25 (8'-0") FOR TRANSITION POST No. 3.

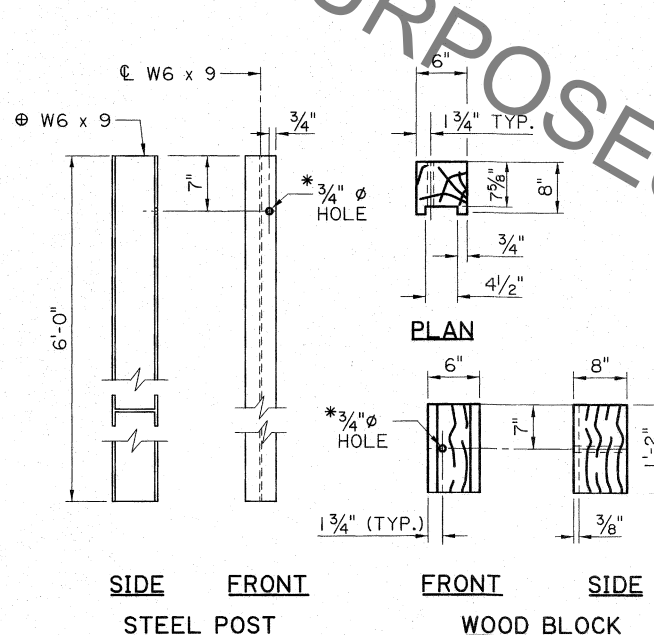
STEEL POST AND ROUTED WOOD BLOCK FOR THRIE BEAM TRANSITION TO BRIDGE RAIL
(POST SIZE, BLOCK SIZE AND HOLE LOCATIONS VARY WITH LOCATION IN TRANSITION, SEE SHT.3)
N.T.S.



WOOD POST AND WOOD BLOCK FOR STANDARD W-BEAM GUARD RAIL
N.T.S.



ROUND WOOD POST AND WOOD BLOCK FOR STANDARD W-BEAM GUARD RAIL
N.T.S.



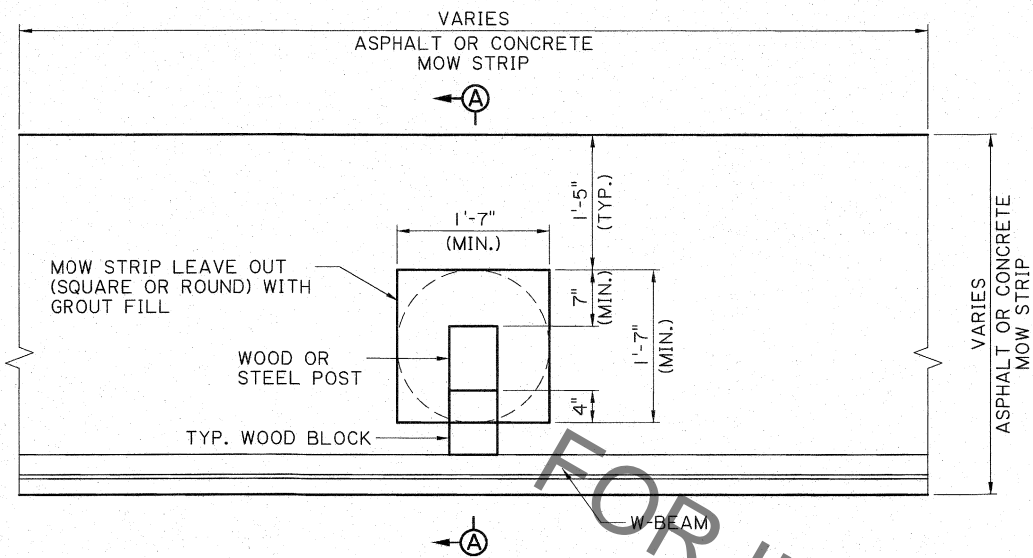
STEEL POST AND ROUTED WOOD BLOCK FOR STANDARD W-BEAM GUARD RAIL
N.T.S.

NOTES:

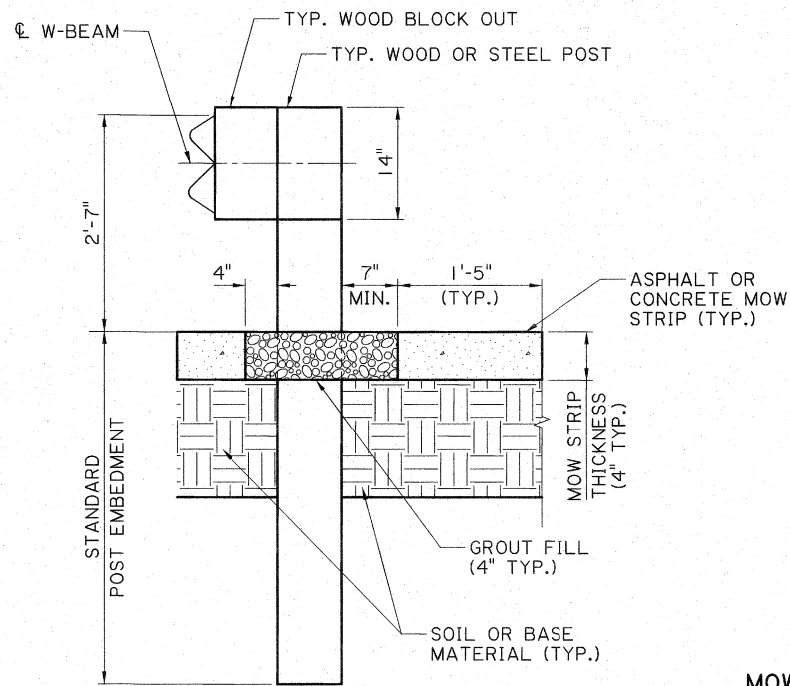
1. A RECYCLED BLOCK ALTERNATE IS ALLOWED AS A SUBSTITUTE FOR THE WOOD BLOCK ON A 1 FOR 1 BASIS IN A STANDARD BLOCKED-OUT SECTION AT NO ADDITIONAL PAYMENT. RECYCLED BLOCKS SHALL NOT BE USED IN TRANSITIONS, END TREATMENTS, OR IN TRAILING END SECTIONS. THE RECYCLED BLOCK SHALL HAVE FHWA HARDWARE ELIGIBILITY AND SHALL MEET AASHTO MASH REQUIREMENTS.
2. A W6 x 8.5 STEEL POST MAY BE USED AS AN ALTERNATE FOR A W6 x 9 POST.
3. POST AND BLOCK HOLES SHALL BE DRILLED ADJACENT TO THE DIRECTION OF THE ON-COMING TRAFFIC.
4. ALL WOOD BLOCKS SHALL BE TOE-NAILED TO WOOD POSTS AND BLOCKS (INCLUDING BLOCK COMBINATIONS) WITH A 16d GALVANIZED NAIL TO PREVENT BLOCK ROTATION. (ONE ON EACH SIDE)
5. THE ROUND WOOD POST AND WOOD BLOCKOUT IS ALLOWED TO REPLACE THE 6" x 8" STANDARD LINE POST AND BLOCKOUT FOR W BEAM. THE ROUND WOOD POSTS SHALL NOT BE USED AS AN ALTERNATE FOR CRT POSTS, BCT POSTS, OR THE POSTS IN THE GUARD RAIL TO BRIDGE RAIL TRANSITION SECTION. ROUND POSTS SHALL NOT BE USED IN THE TRAILING END SECTION, BEHIND A CURB, OR IN A GUARD RAIL END TREATMENT UNLESS SPECIFICALLY ALLOWED BY THE MANUFACTURER.

FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	K. BRAUNER	CHECK	B. ALLEN	DRAWING	B. ALLEN	REVIEW	C. GUIDRY
				DATE: 3/2/23			
APPROVED BY CHIEF ENGINEER: <i>Christy P. Pyles</i>				DATE: 4/13/2023			
HIGHWAY GUARD RAIL (MASH) POST AND BLOCK DETAILS							
BRIDGE AND STRUCTURAL DESIGN							



PLAN



SECTION A-A

ASPHALT OR CONCRETE MOW STRIPS
N.T.S.

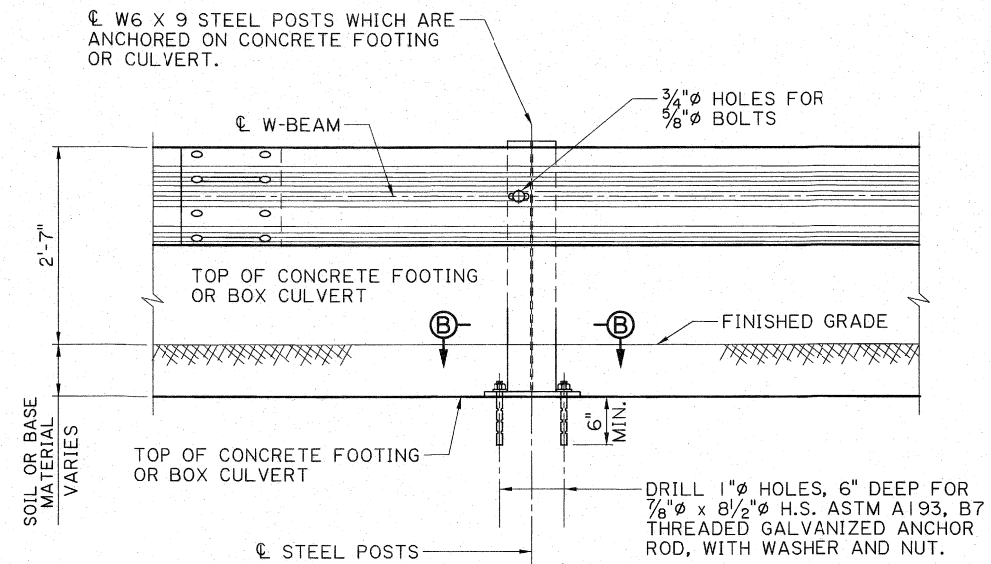
MOW STRIP NOTES:

ALL GUARD RAIL POSTS LOCATED WITHIN CONCRETE OR ASPHALT MOW STRIPS SHALL MEET INSTALLATION REQUIREMENTS SHOWN ON THIS SHEET.

THE LEAVE OUTS SHALL BE FILLED WITH A GROUT MIXTURE CONSISTING OF: 2719 POUNDS SAND, 188 POUNDS TYPE I OR II CEMENT, AND 550 POUNDS OF WATER PER CUBIC YARD WITH A 28 DAY COMPRESSIVE STRENGTH OF 230 PSI OR LESS. PROVIDE GROUT WITH A CONSISTENCY THAT WILL FLOW INTO AND COMPLETELY FILL ALL VOIDS.

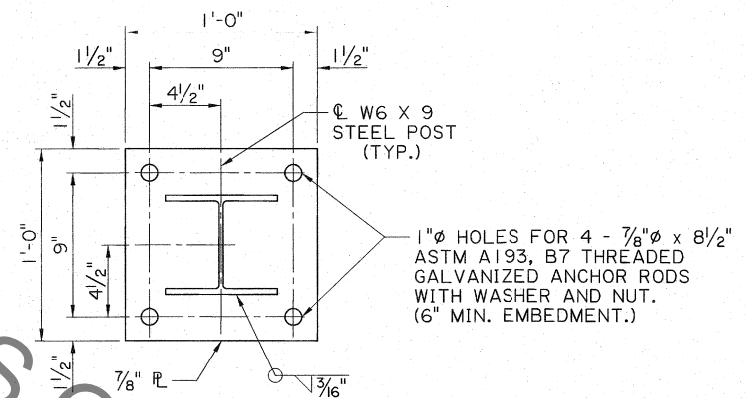
ALL LABOR AND MATERIALS TO PLACE GROUT FILL SHALL BE INCLUDED IN PAYMENT FOR CONCRETE OR ASPHALT PAVING PAY ITEMS.

THE USE OF 6" X 8" RECTANGULAR TIMBER POSTS IN MOW STRIPS HAS ONLY BEEN APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, THEIR CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.



GALVANIZED STEEL BASE PLATE & STEEL POST

SPECIAL POST WITH BASE PLATE TO BE USED WHEN REQUIRED EMBEDMENT OF CONVENTIONAL POST IN SOIL CANNOT BE OBTAINED, FOR BOX CULVERTS OR OTHER CONCRETE FOOTINGS.



SECTION B-B

ANCHOR ROD INSTALLATION

ALL HOLES DRILLED INTO AN EXISTING CONCRETE STRUCTURE SHALL BE CLEANED WITH COMPRESSED AIR AND MAKE THEM FREE OF ANY OIL OR RESIDUE. THREADED RODS TO BE ANCHORED USING THE HILTI RE500 EPOXY ANCHORING SYSTEM. PLACE ANCHOR BOLT IN HOLE IMMEDIATELY AND WAIT FOR THE MANUFACTURER'S CURE TIME. COST FOR LABOR, MATERIAL AND INSTALLMENT OF BASE PLATE & ANCHOR ROD TO BE PAID FOR AS PART OF GUARD RAIL PAY ITEM.

FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	K. BRAUNER	CHECK	B. ALLEN	DETAIL	K. BRAUNER	CHECK	B. ALLEN
REVIEW	C. GUIDRY	SERIES	11 OF 11	APPROVED BY CHIEF ENGINEER			
				DATE: 4/13/2023			
HIGHWAY GUARD RAIL (MASH) MOW STRIP AND CONCRETE ANCHOR DETAILS							
STANDARD PLAN							
BRIDGE AND STRUCTURAL DESIGN							