

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. TOTAL LENGTH OF GUARD RAIL SHALL NOT BE LESS THAN 75'-0" BASED ON A LENGTH OF LENGTH OF NEED OF X=62'-6". A DESIGN WAIVER IS REQUIRED FOR GUARD RAIL LENGTHS NOT MEETING THESE 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: IV 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 12'-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 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.
- L_R = RUNOUT LENGTH (FT)
- L_C = REQUIRED CLEAR ZONE (FT)
- L_A = DISTANCE FROM THE EDGE OF THE TRAVEL LANE TO THE LATERAL EXTENT OF THE OBJECT. (FT)
- L_A = L FOR BRIDGE APPLICATIONS, UNLESS OTHERWISE APPROVED BY THE BRIDGE DESIGN ADMINISTRATOR.
- 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. IF SHOWN IN DETAILS, STEEL POSTS MAY BE USED AS AN ALTERNATE TO WOOD POSTS.
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).

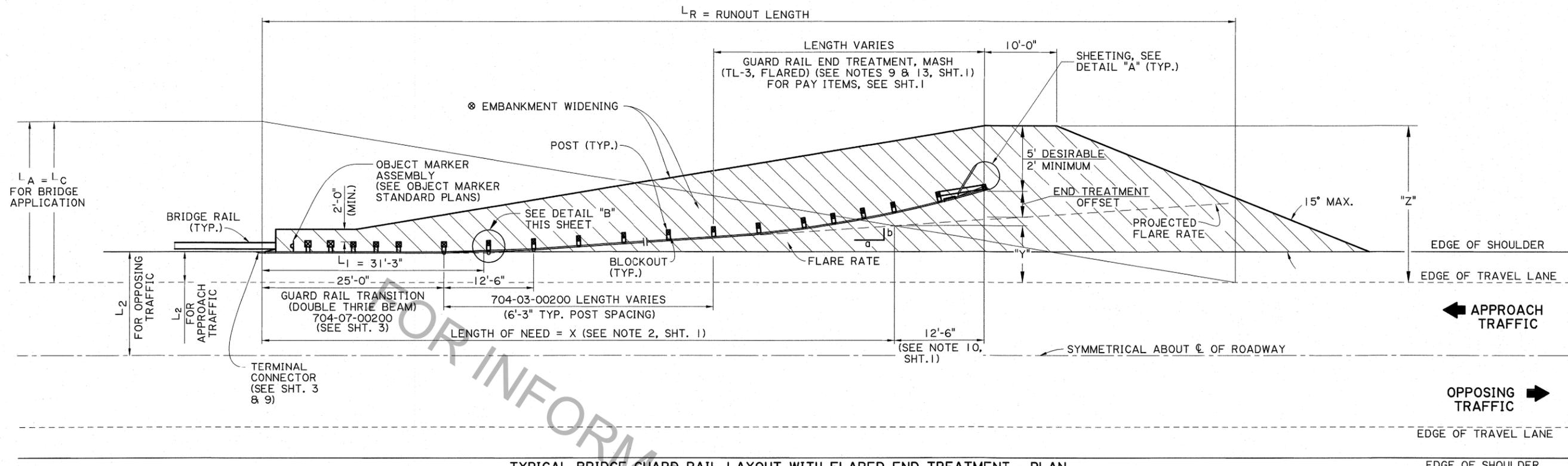
GUARD RAIL AND RELATED PAY ITEMS :

- 202-02-14500 REMOVAL OF GUARD RAIL, (LN FT)
- 704-01-01000 GUARD RAIL (SINGLE THRIE BEAM) (3'-1 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 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)
- 704-03-00300 BLOCKED OUT GUARD RAIL - 31", (3'-1 1/2" POST SPACING), (LN FT)
- 704-04-00200 BLOCKED OUT GUARD RAIL - 31", (DOUBLE FACED, 6'-3" POST SPACING), (LN FT)
- 704-04-00300 BLOCKED OUT GUARD RAIL - 31", (DOUBLE FACED, 3'-1 1/2" 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.)
- 704-10-00205 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

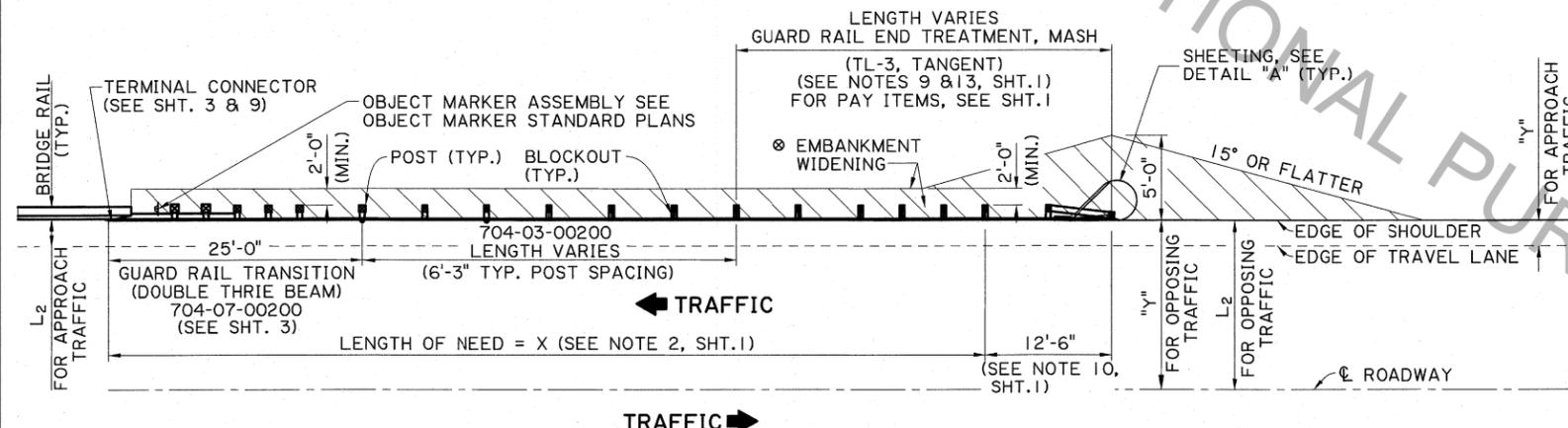
GUARD RAIL STANDARD PLAN INDEX

	BRIDGE STANDARD INDEX NO.	SERIES	DESCRIPTION
COMMON DETAILS BRIDGE END AND NON-BRIDGE APPLICATIONS	BD.1.1.0.01	1 OF 11	GENERAL NOTES, PAY ITEMS, STANDARD PLAN INDEX
	BD.1.1.0.02	2 OF 11	BRIDGE APPLICATION, TYPICAL LAYOUT
	BD.1.1.0.03	3 OF 11	THRIE BEAM GUARD RAIL TRANSITION TO BRIDGE RAIL
	BD.1.1.0.04	4 OF 11	NON BRIDGE APPLICATION, TYPICAL LAYOUT
	BD.1.1.0.05	5 OF 11	NON BRIDGE APPLICATION, TYPICAL LAYOUT
	BD.1.1.0.06	6 OF 11	TYPICAL DETAILS AND SECTIONS
	BD.1.1.0.07	7 OF 11	TRAILING END DETAILS
	BD.1.1.0.08	8 OF 11	TRAILING END DETAILS
	BD.1.1.0.09	9 OF 11	RAIL STRUCTURAL DETAILS
	BD.1.1.0.10	10 OF 11	GUARD RAIL POST AND BLOCK DETAILS
	BD.1.1.0.11	11 OF 11	MISCELLANEOUS DETAILS, MOW STRIPS AND CONCRETE ANCHORS
* OFF - SYSTEM BRIDGE	BD.1.2.0.01	1 OF 1	OFF-SYSTEM BRIDGE GUARD RAIL DETAILS
* BOX CULVERT DETAILS	BD.1.3.0.01	1 OF 1	BOX CULVERT GUARD RAIL DETAILS

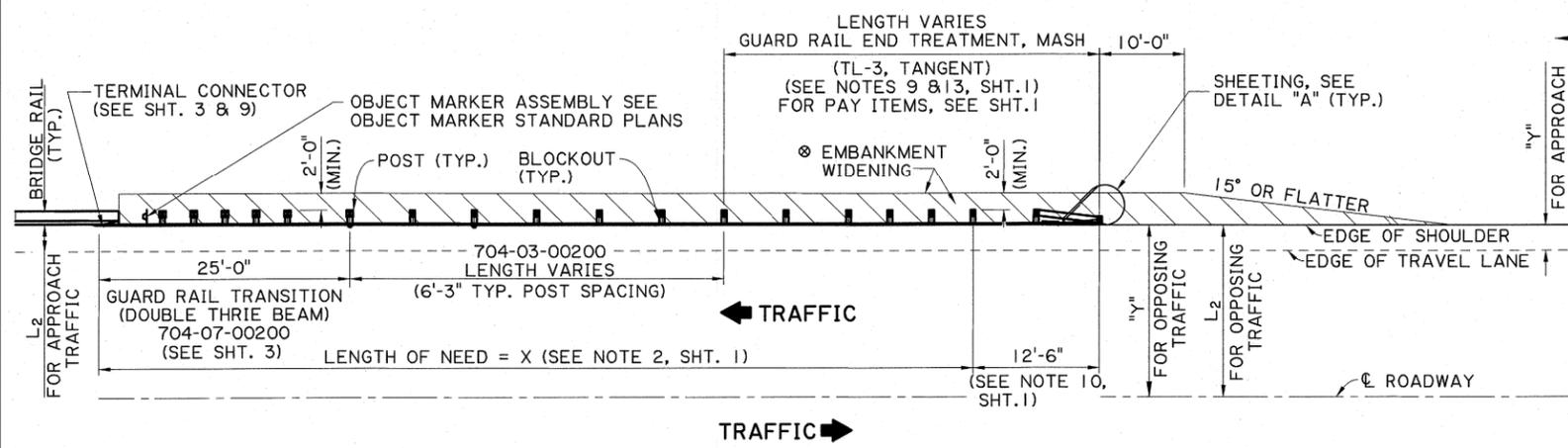
SHEET NUMBER							
PARISH	CONTROL SECTION	STATE	PROJECT	P. FOSSIER	K. BRAUNER	J. DOUCET	K. BRAUNER
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES #	I OF 11	I OF 11
APPROVED BY CHIEF ENGINEER: DATE: 1/3/19							
HIGHWAY GUARD RAIL (MASH) GENERAL NOTES, PAY ITEMS AND STANDARD PLAN INDEX BRIDGE AND STRUCTURAL DESIGN							



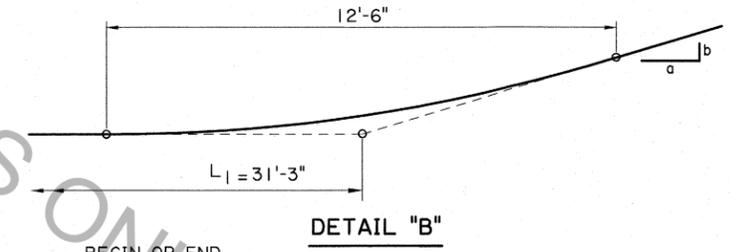
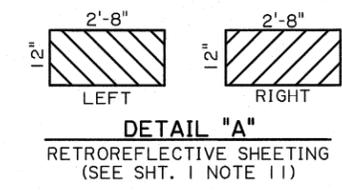
TYPICAL BRIDGE GUARD RAIL LAYOUT WITH FLARED END TREATMENT - PLAN
 NOTE: LAYOUT SIMILAR FOR OTHER QUADRANTS OF BRIDGE END
 SEE NOTES 5, 8, AND 12, SHT. 1.



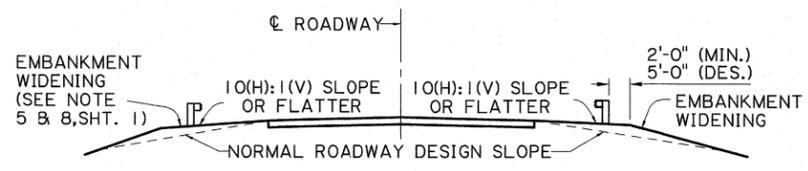
TYPICAL BRIDGE GUARD RAIL LAYOUT WITH TANGENT END TREATMENT - PREFERRED GRADING - PLAN
 SEE NOTES 5, 8, AND 12, SHT. 1.



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



BEAM TRANSITION FOR FLEXIBLE BRIDGE RAILING - PLAN



TYPICAL EMBANKMENT WIDENING SECTION

SHEET NUMBER	
DESIGN	P. FOSSIER
CHECK	K. BRAUNER
DETAIL	J. DOUCET
CHECK	K. BRAUNER
REVIEW	C. GUIDRY
SERIES #	2 OF 11

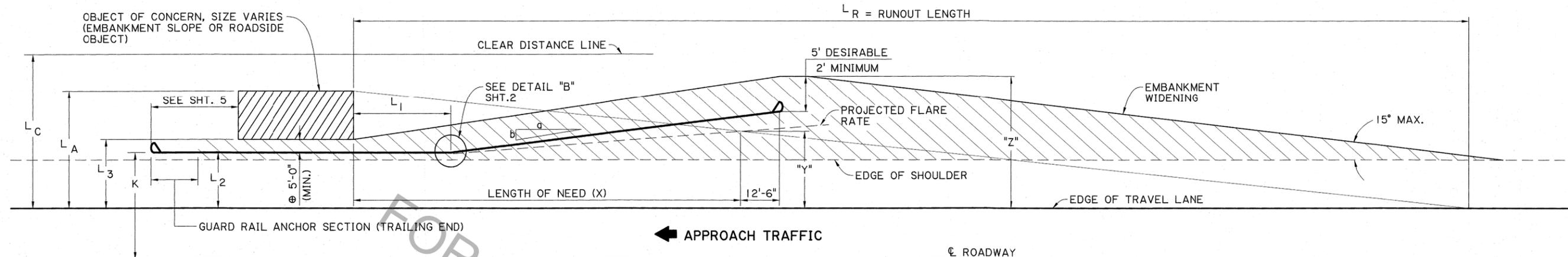
STATE OF LOUISIANA
 KURT M. BRAUNER
 License No. 30567
 PROFESSIONAL ENGINEER
 IN
 CIVIL ENGINEERING
 JMB
 12/14/18

APPROVED BY CHIEF ENGINEER:
[Signature]
 DATE: 1/9/19

STATE OF LOUISIANA
 BRIDGE AND STRUCTURAL DESIGN

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

BD.1.1.0.02
 GR-MASH-ON



OPPOSING TRAFFIC →

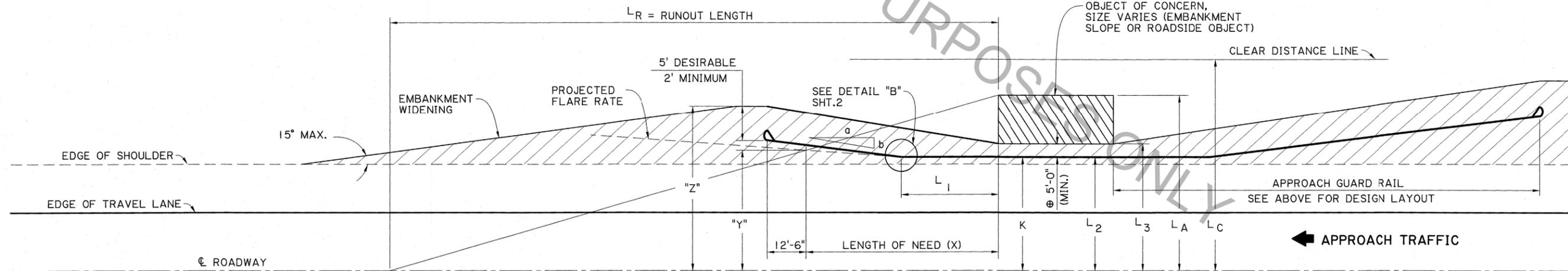
← APPROACH TRAFFIC

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.

FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER	
DESIGN	P. FOSSIER
CHECK	K. BRAUNER
DETAIL	J. DOUCET
CHECK	K. BRAUNER
REVIEW	C. GUIDRY
SERIES #	4 OF 11



APPROVED BY CHIEF ENGINEER:
Michael P. Healy
DATE: 1/3/19



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

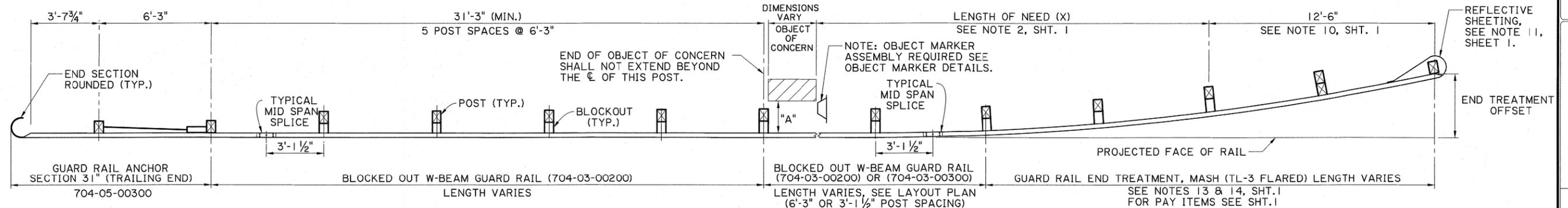
BD. I. 1.1.0.04
GR-MASH-ON

STANDARD PLAN

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

BRIDGE AND
STRUCTURAL
DESIGN

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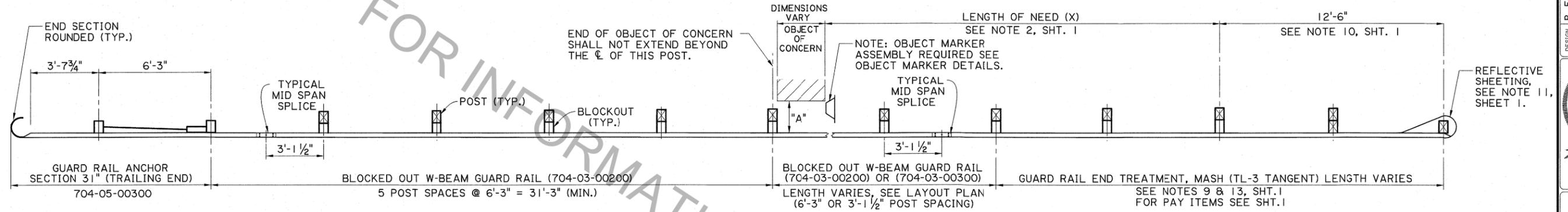


FOR TRAILING END TERMINAL DETAILS AND NOTES, SEE SHTS. 7 & 8.

PLAN - NON-BRIDGE END APPLICATION - FLARED

BACK FACE OF GUARD RAIL TO FRONT FACE OF OBJECT = "A" = 5'-0" MIN.

N.T.S.

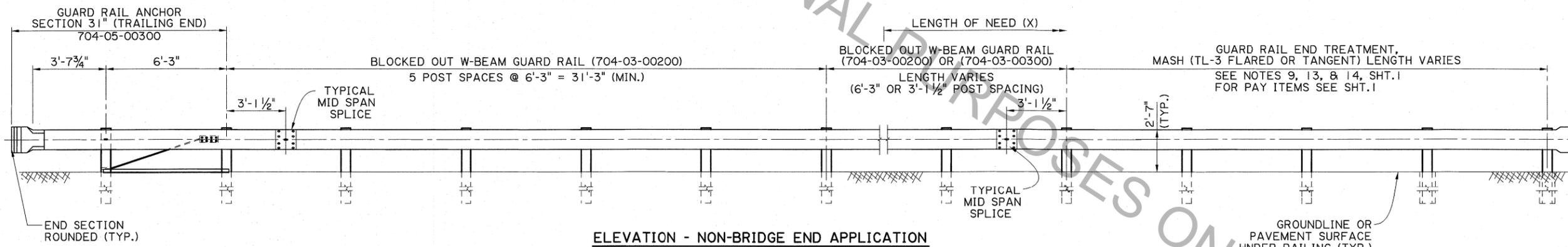


FOR TRAILING END TERMINAL DETAILS AND NOTES, SEE SHTS. 7 & 8.

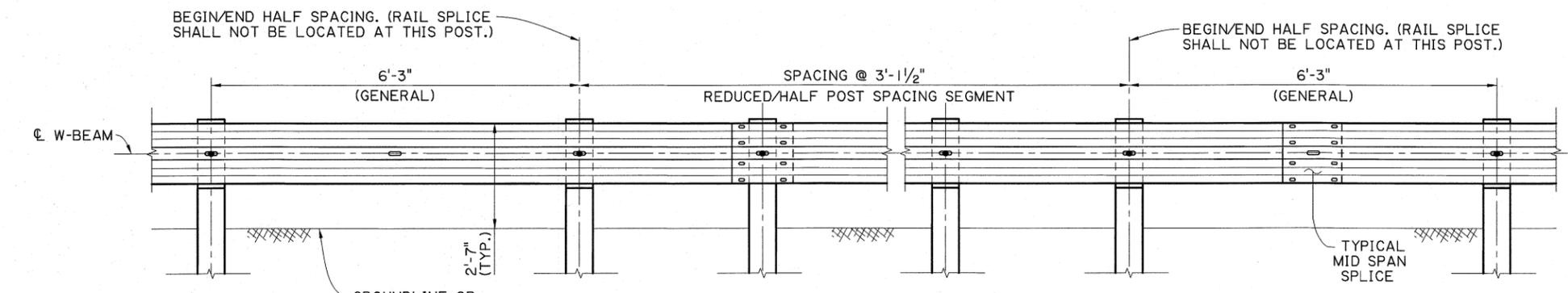
PLAN - NON-BRIDGE END APPLICATION - TANGENT

BACK FACE OF GUARD RAIL TO FRONT FACE OF OBJECT = "A" = 5'-0" MIN.

N.T.S.



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



ELEVATION - HALF SPACING TRANSITION
(POST SPACING 6'-3" TO 3'-1 1/2")
N.T.S.

PANEL SPLICES, FOR HALF POST SPACING TRANSITIONS

MIDSPAN PANEL SPLICES ARE NOT REQUIRED IN TRANSITION AND REDUCED POST SPACING SEGMENTS, HOWEVER THEY ARE REQUIRED FOR GENERAL SEGMENTS. TO PLACE MIDSPAN SPLICES IN GENERAL SEGMENTS NEAR A TRANSITION, USE ONE NON-GENERAL PANEL LENGTH (9'-4 1/2" OR 15'-7 1/2") OR ADD AN ADDITIONAL TRANSITION SPACED POST WHERE REQUIRED.

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SHEET NUMBER	
PARISH	CONTROL SECTION
STATE PROJECT	
DESIGN	REVIEW
CHECK	SERIES #
DETAIL	5 OF 11
CHECK	

P. FOSSIER
 K. BRAUNER
 J. DOUCET
 K. BRAUNER
 C. GUIDRY

SITE OF LOUISIANA
 KURT M. BRAUNER
 License No. 30557
 PROFESSIONAL ENGINEER
 IN
 CIVIL ENGINEERING
 12/18/18

APPROVED BY CHIEF ENGINEER:
 [Signature]
 DATE: 1/3/19

STATE OF LOUISIANA
 CONFIDENTIAL

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

BD.1.1.0.05
 STANDARD
 GR-MASH-ON

DOTD
 LOUISIANA DEPARTMENT OF
 TRANSPORTATION & DEVELOPMENT
 BRIDGE AND
 STRUCTURAL
 DESIGN

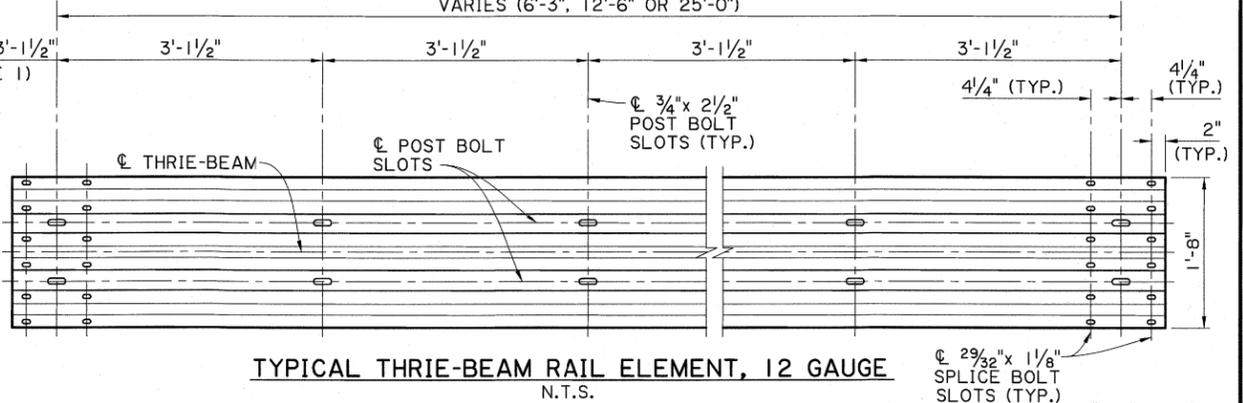
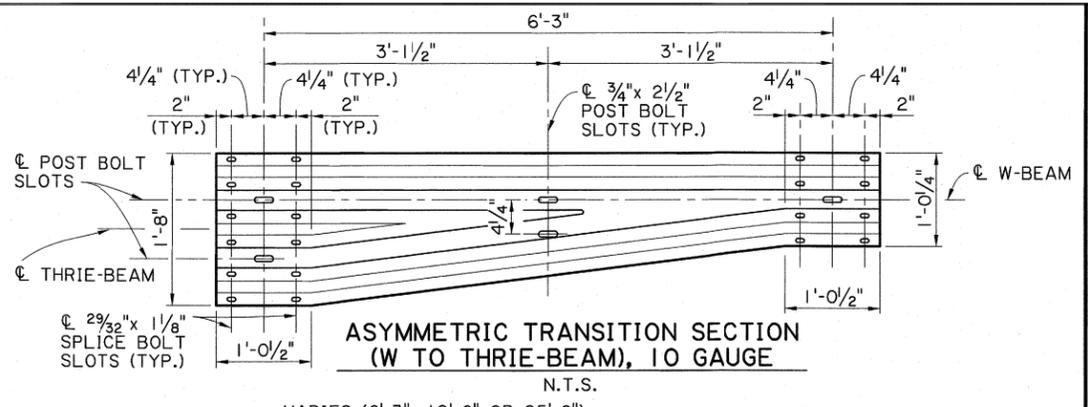
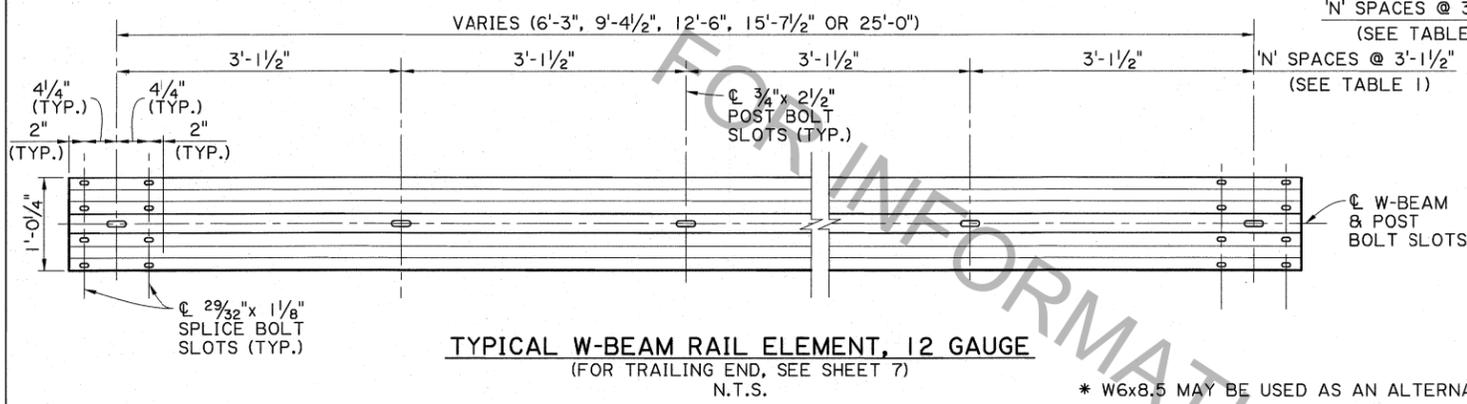
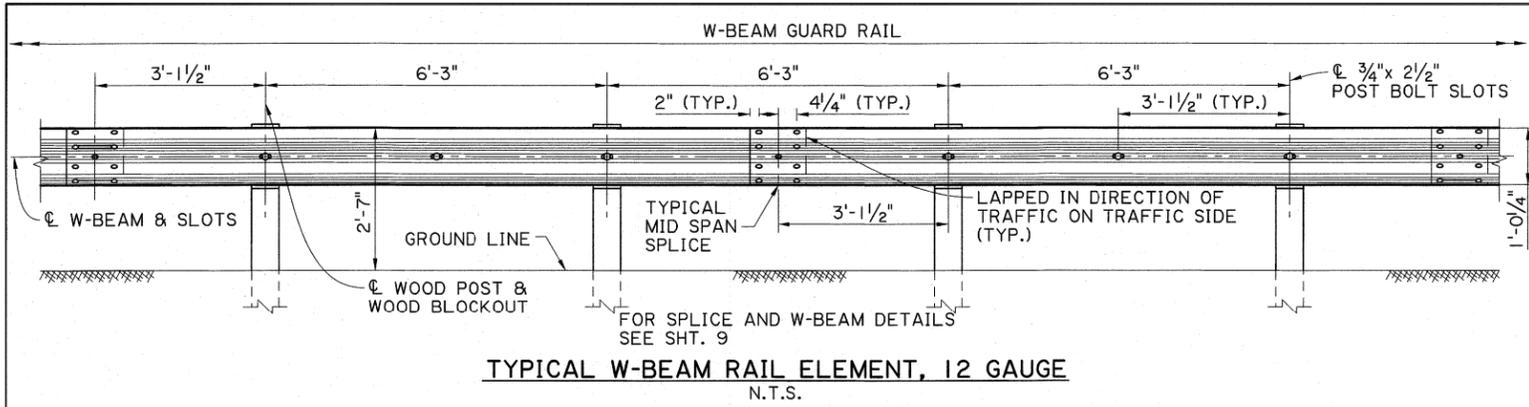
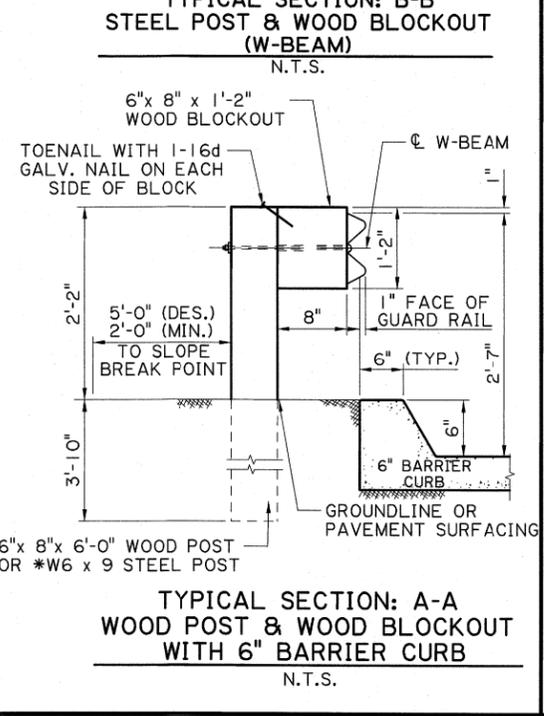
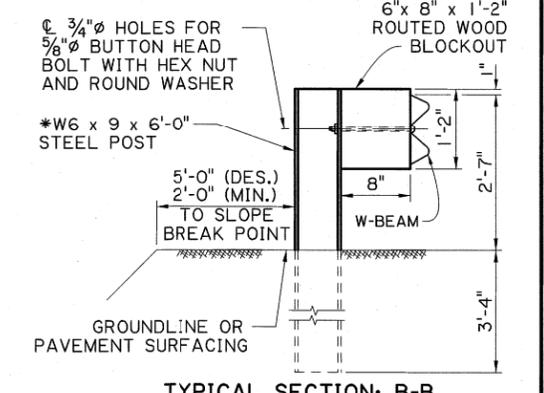
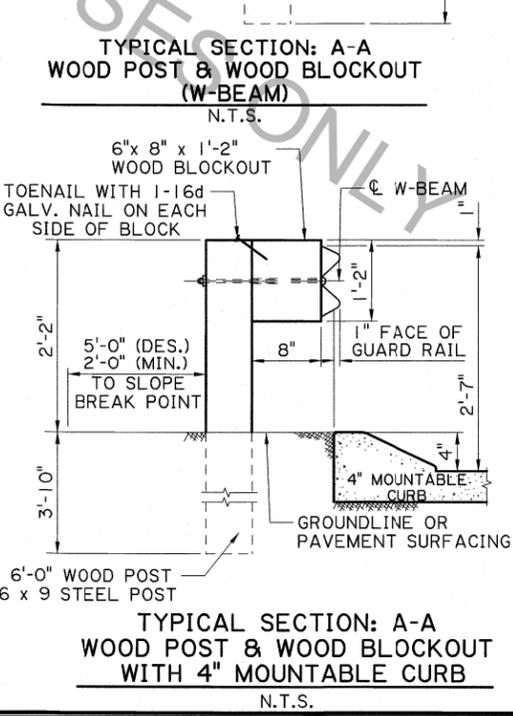
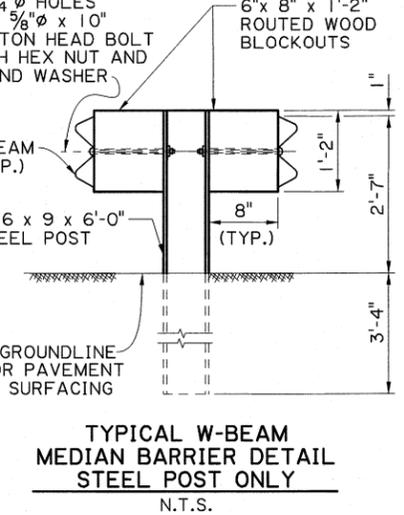
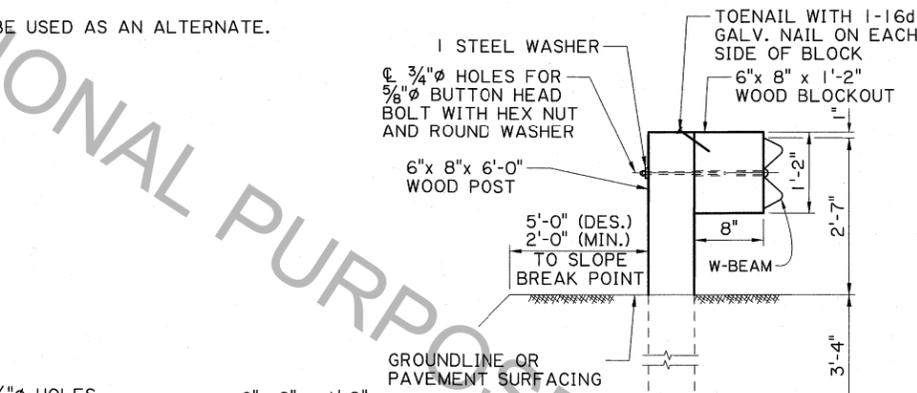
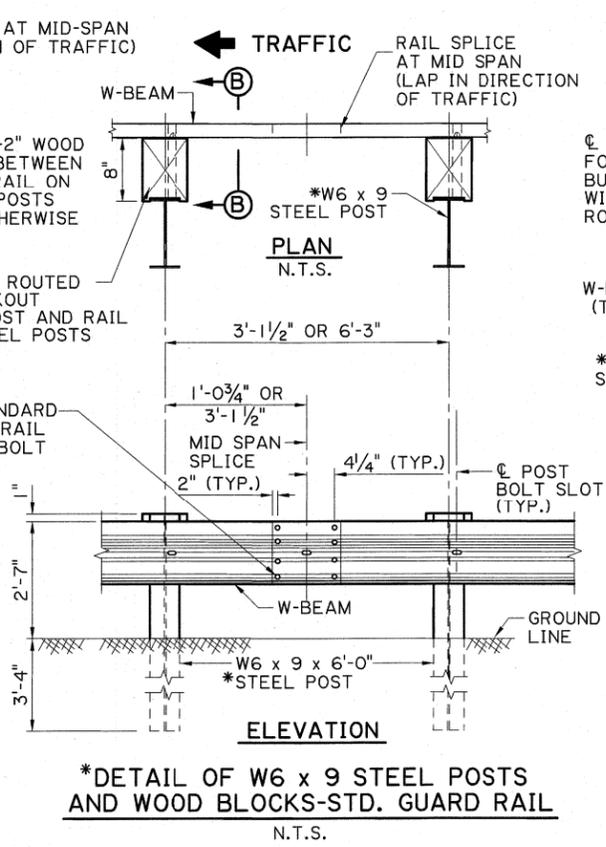
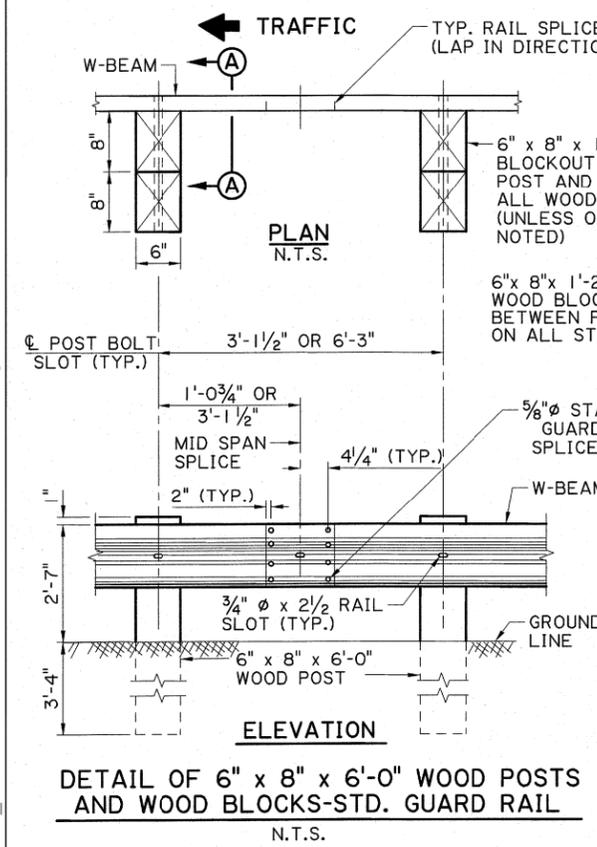


TABLE 1: ELEMENT SUMMARY TABLE:

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.



SHEET NUMBER

PARISH PROJECT

CONTROL SECTION

STATE PROJECT

DESIGN CHECK: P. FOSSIER, K. BRAUNER
 DETAIL CHECK: J. DOUCET, K. BRAUNER
 REVIEW: C. GUIDRY
 SERIES: 6 OF 11

STATE OF LOUISIANA
 KURT M. BRAUNER
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 IN
 CIVIL ENGINEERING
 12/12/18

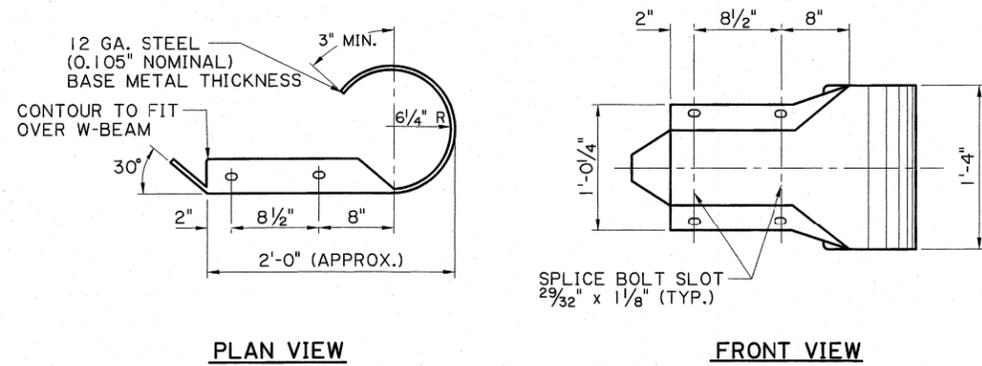
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STATE OF LOUISIANA
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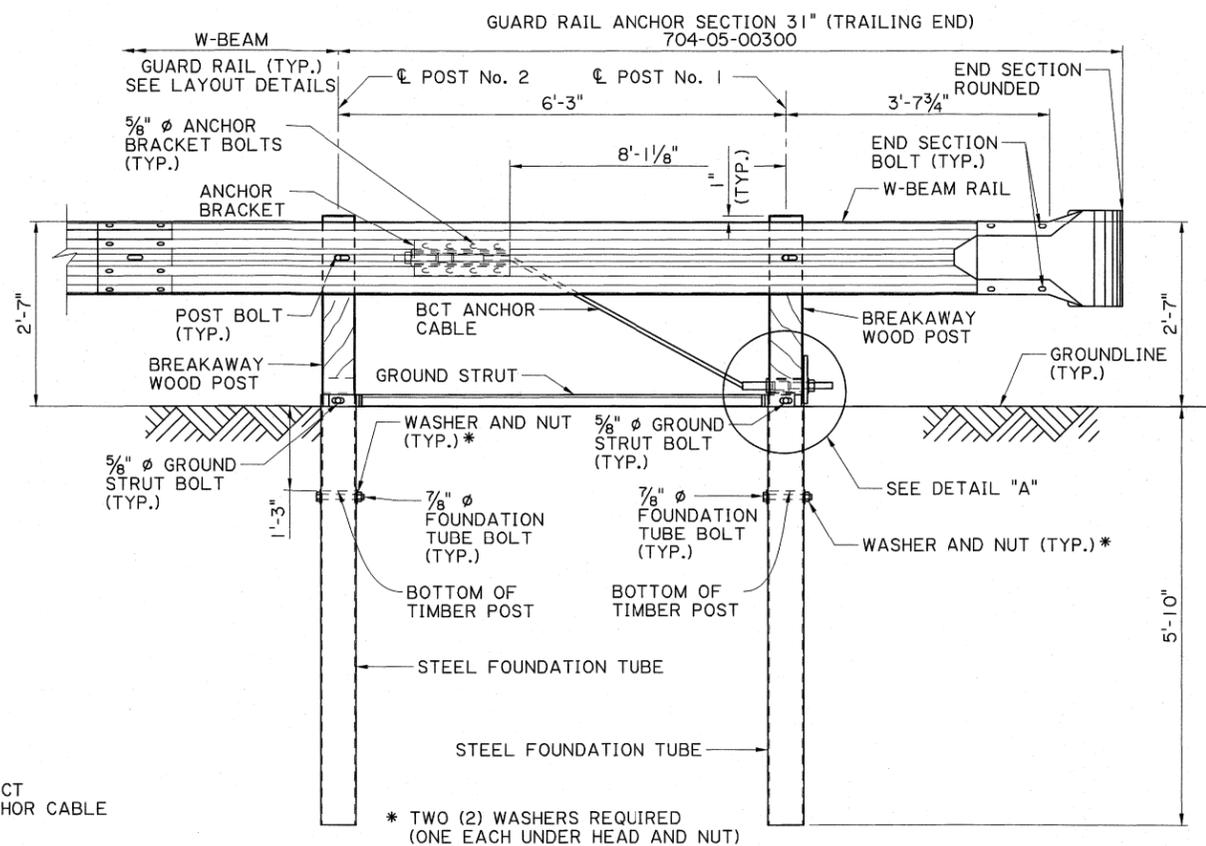
HIGHWAY GUARD RAIL (MASH) TYPICAL DETAILS AND SECTIONS

BD. I.1.0.06
 GR-MASH-ON
 STANDARD PLAN

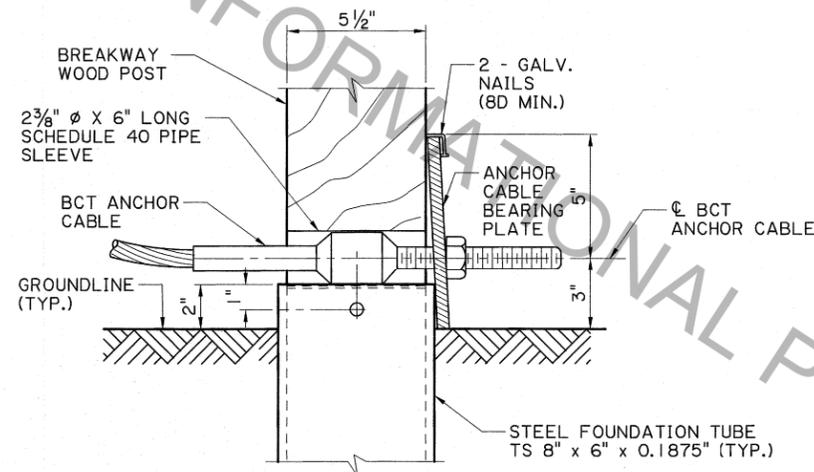
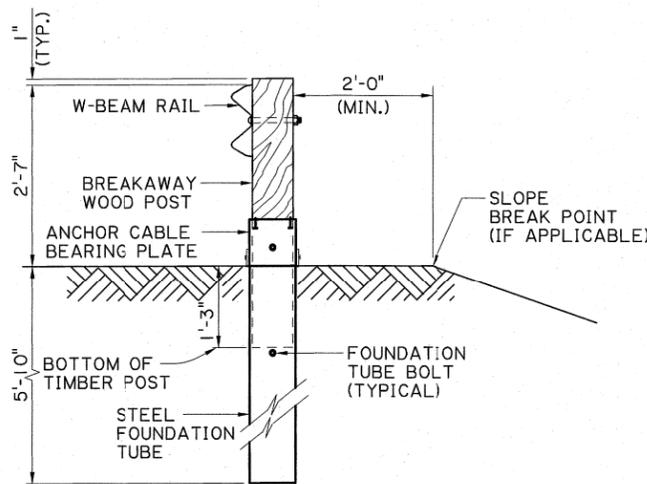
BRIDGE AND STRUCTURAL DESIGN



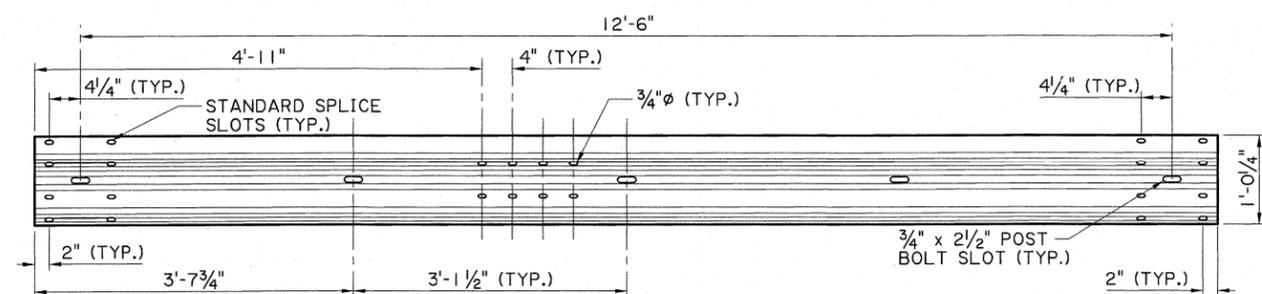
W BEAM END SECTION ROUNDED
N.T.S.



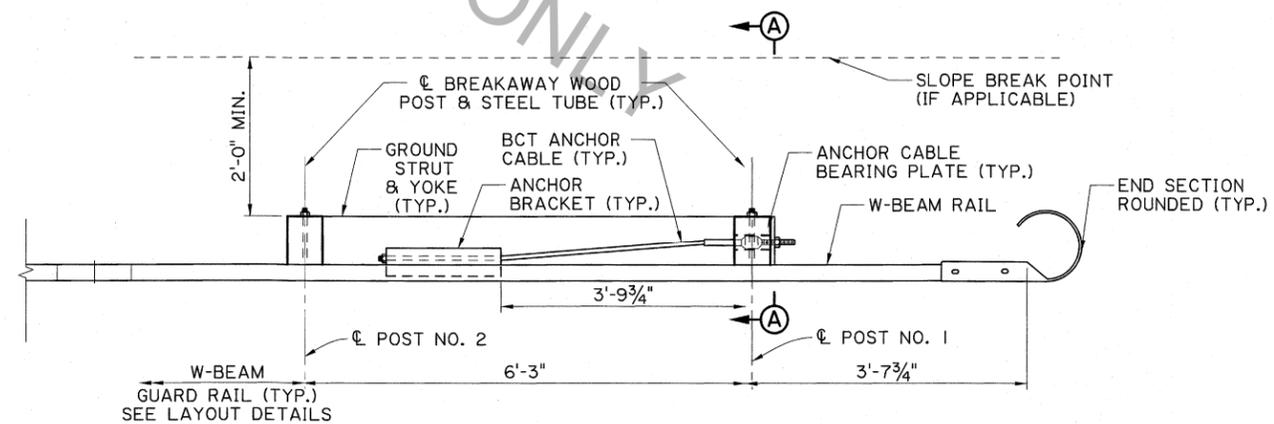
TRAILING END RAIL DETAIL - ELEVATION
NOTE: FOR OTHER TRAILING END TERMINAL DETAILS, SEE SH. 8 OF 11.
N.T.S.



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.

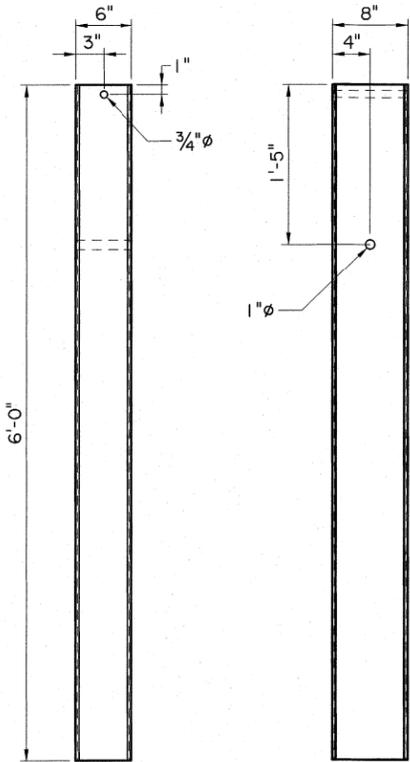
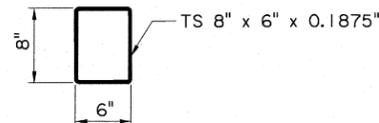
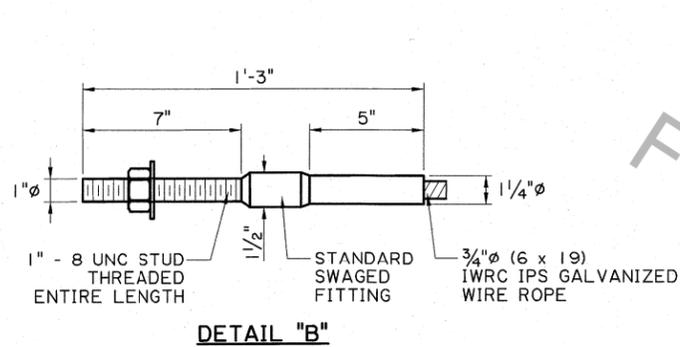
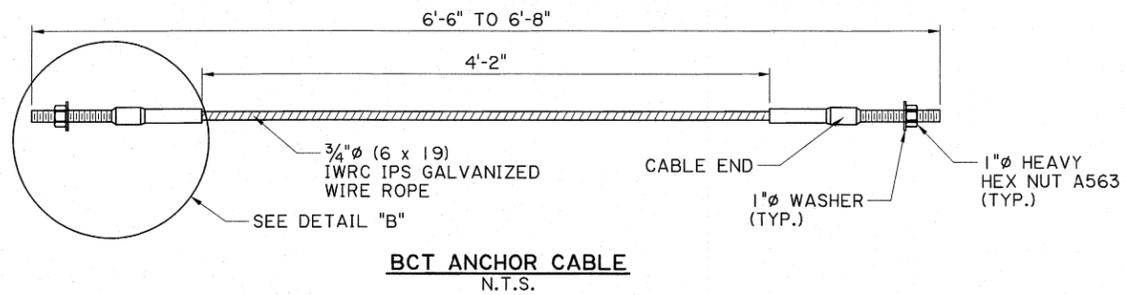
SHEET NUMBER	
PARISH	
CONTROL SECTION	
STATE PROJECT	
DESIGN	P. FOSSIER
CHECK	K. BRAUNER
DETAIL	J. DOUCET
CHECK	K. BRAUNER
REVIEW	C. GUIDRY
SERIES	7 OF 11

KURT M. BRAUNER
License No. 30267
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
12/18/18

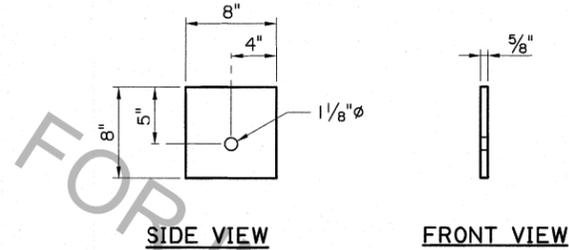
APPROVED BY CHIEF ENGINEER: *[Signature]* DATE: 1/3/19

HIGHWAY GUARD RAIL (MASH) TRAILING END DETAILS
BD.1.1.0.07
GR-MASH-ON
STANDARD PLAN

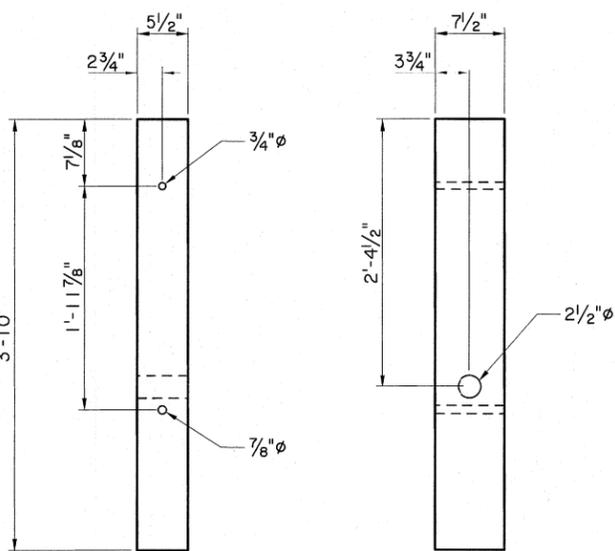
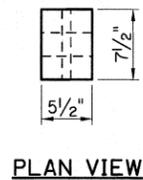
BRIDGE AND STRUCTURAL DESIGN



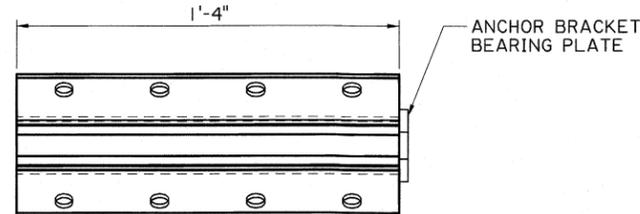
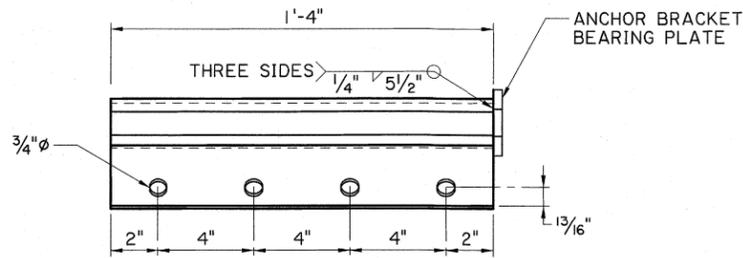
FOUNDATION TUBE
N.T.S.



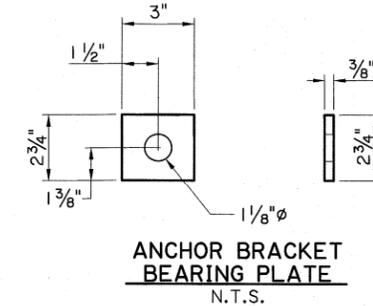
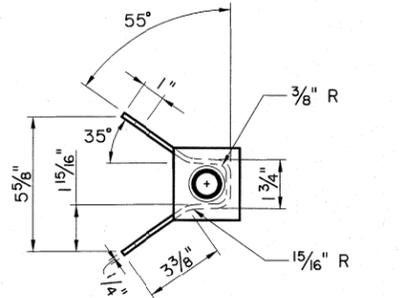
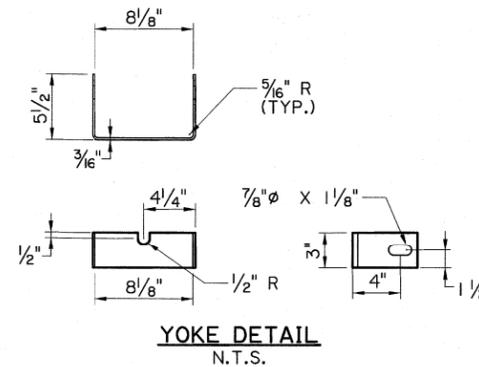
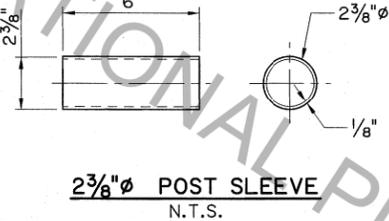
ANCHOR CABLE BEARING PLATE
N.T.S.



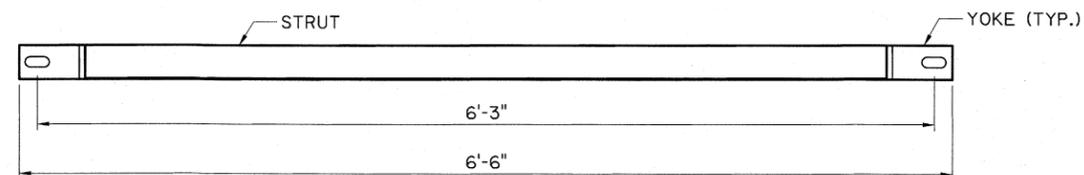
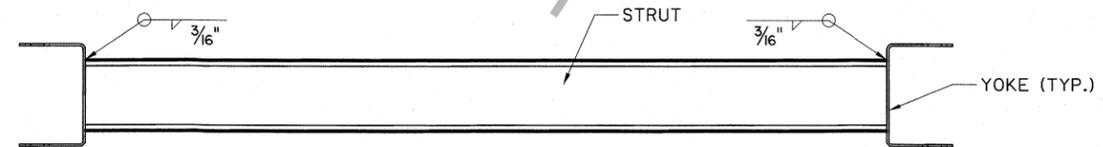
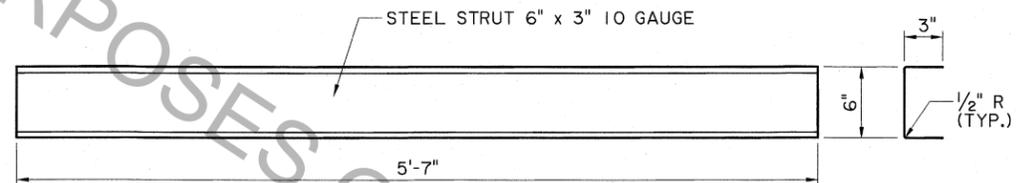
BREAKAWAY WOOD POST
N.T.S.



STEEL ANCHOR BRACKET
N.T.S.



ANCHOR BRACKET BEARING PLATE
N.T.S.



GROUND STRUT DETAIL
N.T.S.

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.

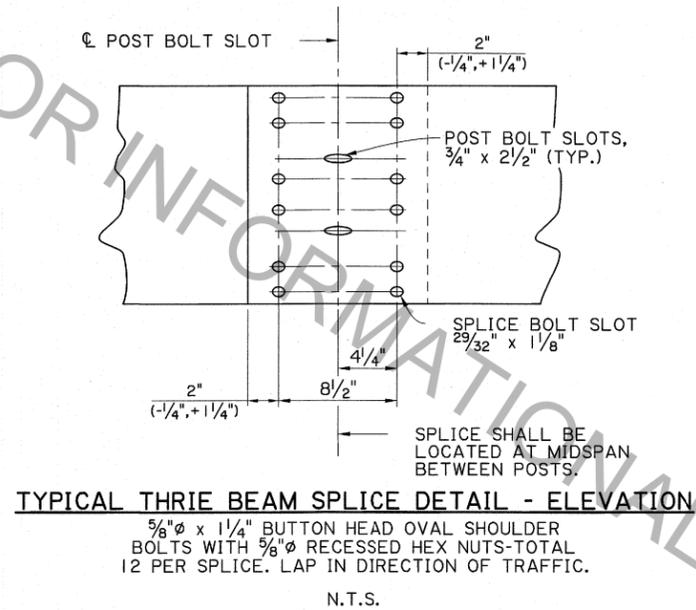
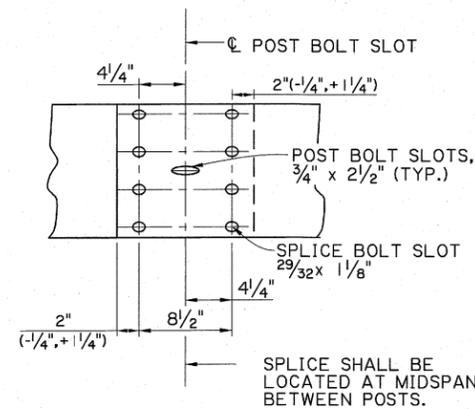
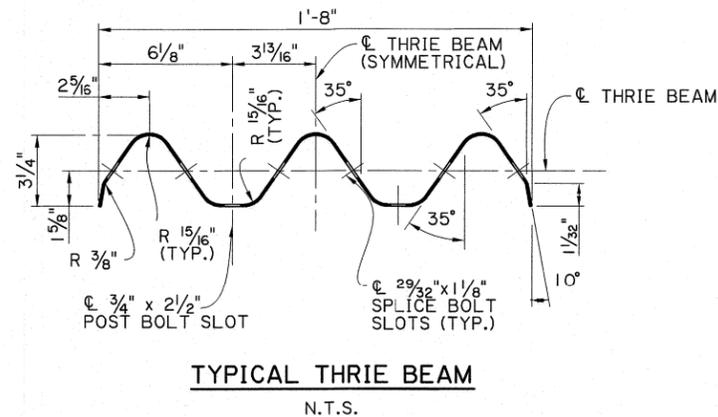
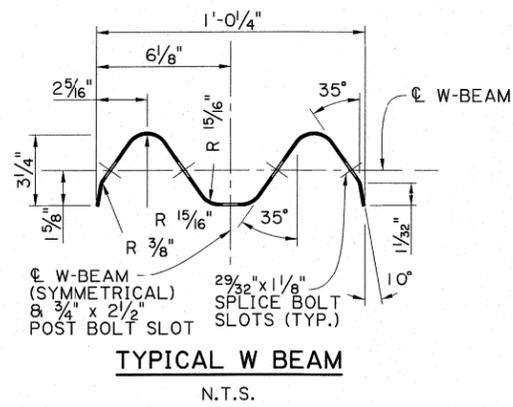
ANCHOR BRACKET AND GROUND STRUT BOLTS ARE 5/8" DIAMETER ASTM A307 HEX HEAD BOLTS AND REQUIRE ASTM A563 A NUTS AND TWO ASTM F844 5/8" DIAMETER FLAT WASHERS EACH. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.

SHEET NUMBER	
PARISH	
CONTROL SECTION	
STATE PROJECT	
DESIGN	P. FOSSIER
CHECK	K. BRAUNER
DETAIL	J. DOUCET
CHECK	K. BRAUNER
REVIEW	C. GUIDRY
SERIES #	8 OF 11



APPROVED BY CHIEF ENGINEER:
Kurt M. Brauner
DATE: 1/3/19





TYPICAL W-BEAM SPLICE DETAIL - ELEVATION

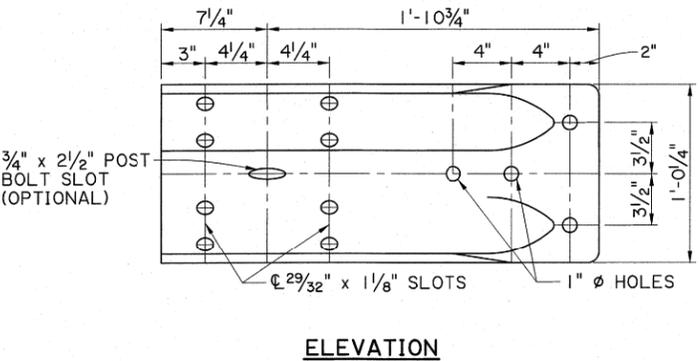
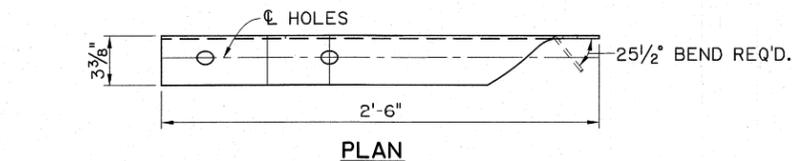
5/8" ϕ x 1 1/4" BUTTON HEAD OVAL SHOULDER BOLTS WITH 5/8" ϕ RECESSED HEX NUTS-TOTAL 8 PER SPLICE. LAP IN DIRECTION OF TRAFFIC.

N.T.S.

TYPICAL THRIE BEAM SPLICE DETAIL - ELEVATION

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

N.T.S.

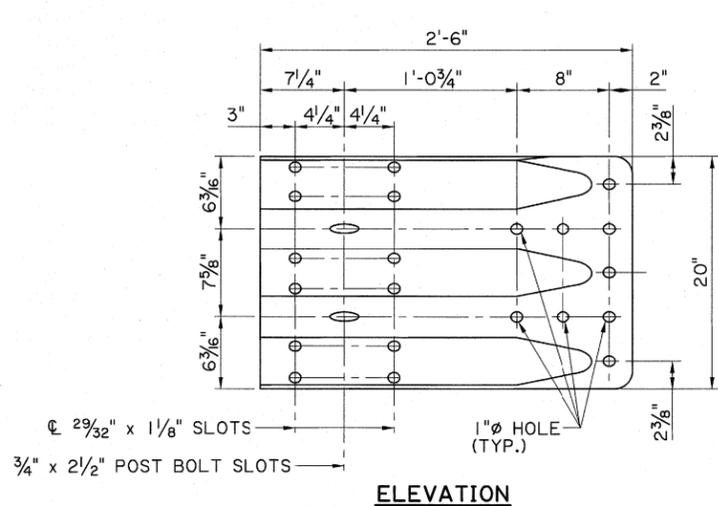
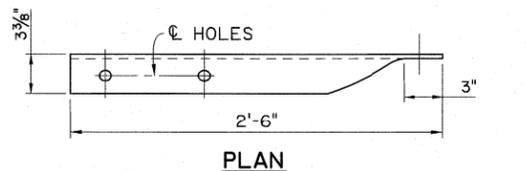


TYPICAL W BEAM TERMINAL CONNECTOR, 10 GAUGE

N.T.S.

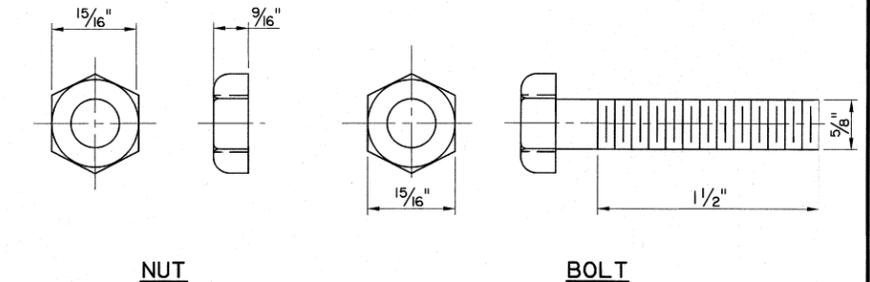
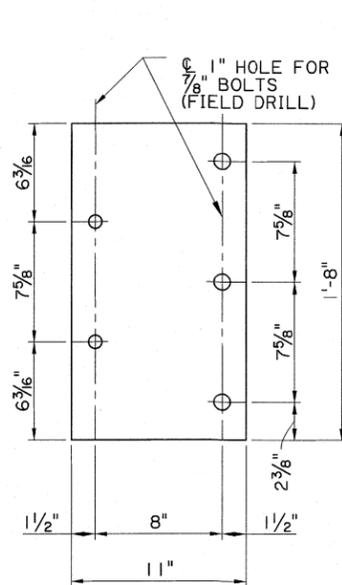
NOTES:

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.

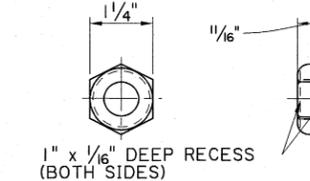
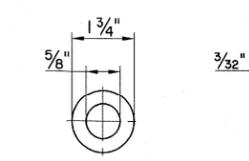
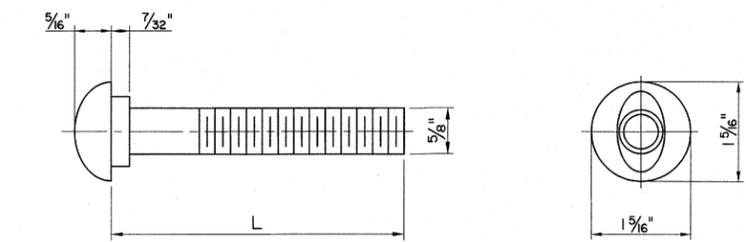


TYPICAL THRIE BEAM TERMINAL CONNECTOR, 10 GAUGE

N.T.S.



5/8" ϕ HEX BOLT & HEX NUT
(FOR FASTENING THE ANCHOR BRACKET TO RAIL IN TRAILING END)
N.T.S.



5/8" ϕ BUTTON HEAD NUT	
L	THREAD LENGTH
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
1'-6"	4"
1'-8"	4"

NOTES:

- 5/8" ϕ 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.

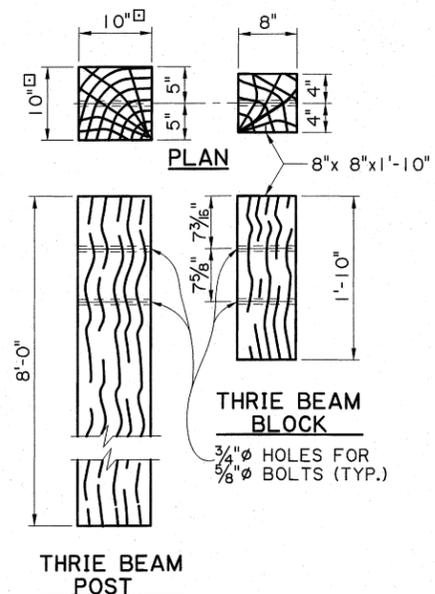
5/8" ϕ BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 307 GRADE "A" AND NUTS SHALL BE IN ACCORDANCE WITH ASTM A 563 GRADE "A" OR BETTER. BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.

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.

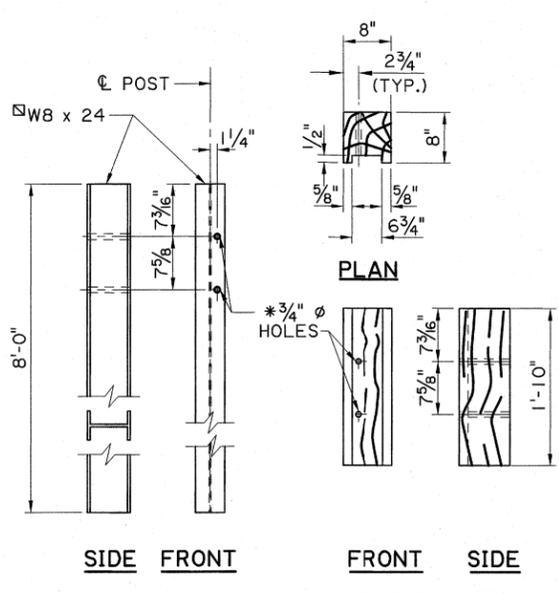
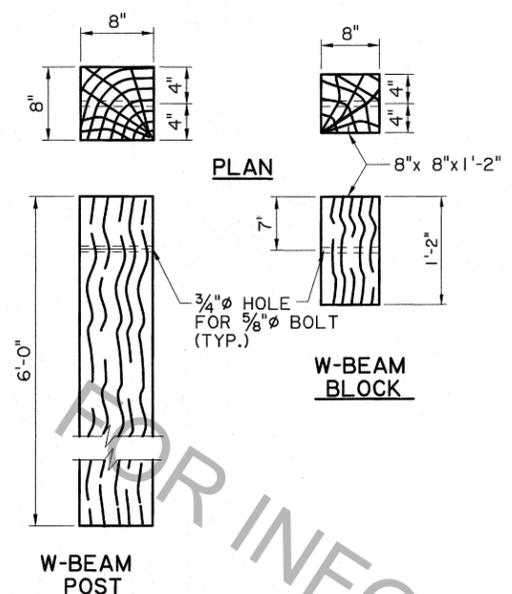
FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER									
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES #	PARISH	CONTROL SECTION	STATE	PROJECT
P. FOSSIER	K. BRAUNER	J. DOUCET	K. BRAUNER	C. GUIDRY	9 OF 11				
APPROVED BY CHIEF ENGINEER: <i>[Signature]</i> DATE: 1/3/19									
HIGHWAY GUARD RAIL (MASH) RAIL STRUCTURAL DETAILS									
BD.1.1.0.09 STANDARD PLAN GR-MASH-ON									
BRIDGE AND STRUCTURAL DESIGN									



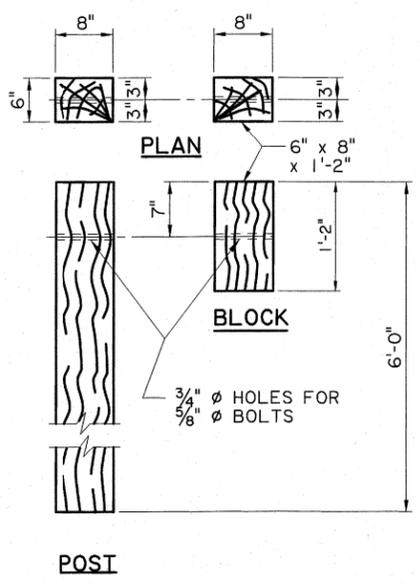
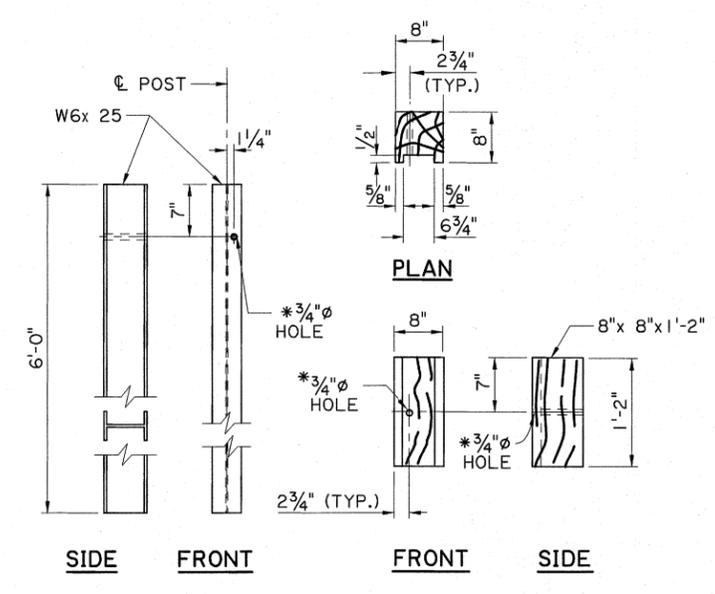
☐ THRIE BEAM POST IS 8" x 8" x 8'-0" FOR TRANSITION POST No. 3.

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.

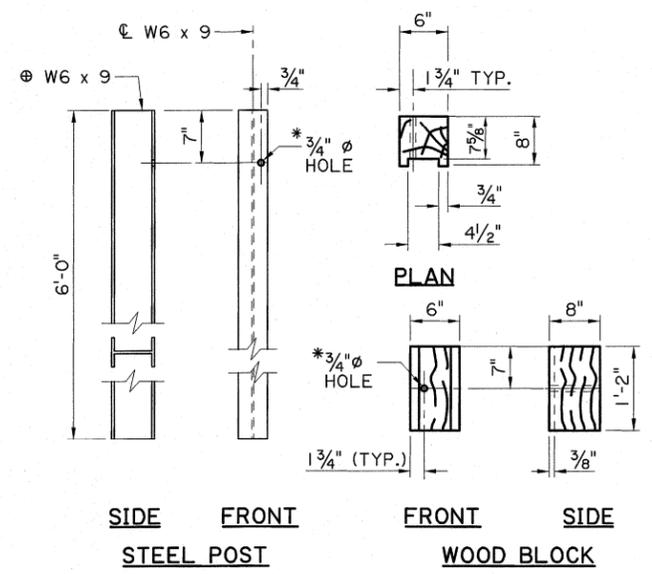


☑ THRIE BEAM POST IS W6 x 25 (8'-0") FOR TRANSITION POST No. 3.

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.



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)

FOR INFORMATIONAL PURPOSES ONLY

SHEET NUMBER		PARISH		STATE	
DESIGN	P. FOSSIER	CHECK	K. BRAUNER	CONTROL SECTION	
DETAIL	J. DOUCET	CHECK	K. BRAUNER	PROJECT	
REVIEW	C. GUIDRY	SERIES #	10 OF 11		

KURT M. BRAUNER
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PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

Kurt M. Brauner
12/18/19

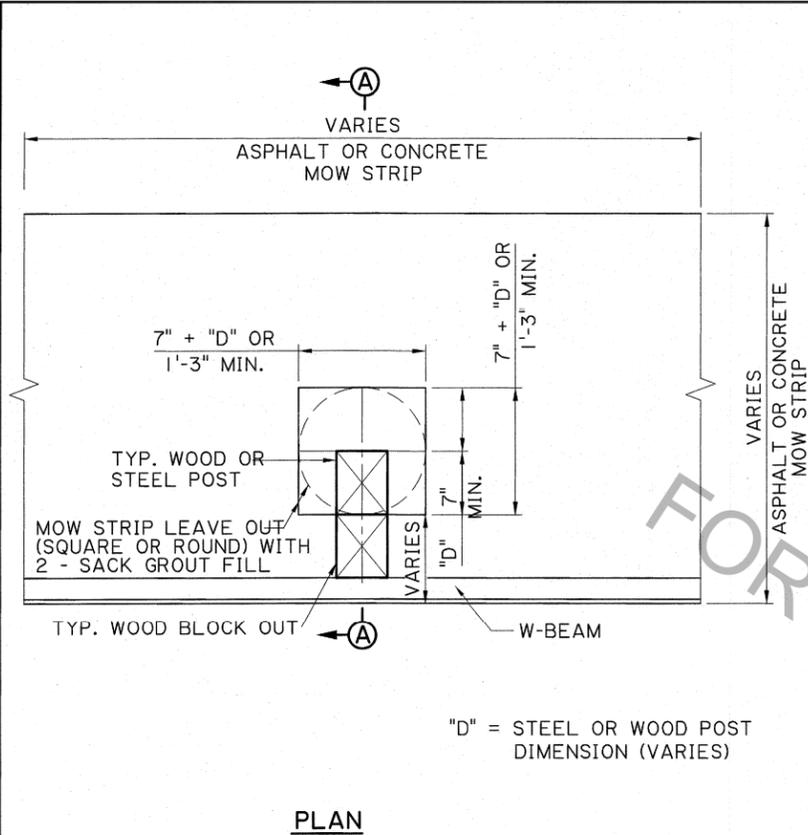
APPROVED BY CHIEF ENGINEER: *Christopher P. Hoff*

DATE: 1/3/19

HIGHWAY GUARD RAIL (MASH) POST AND BLOCK DETAILS

BD.1.1.0.10
GR-MASH-ON

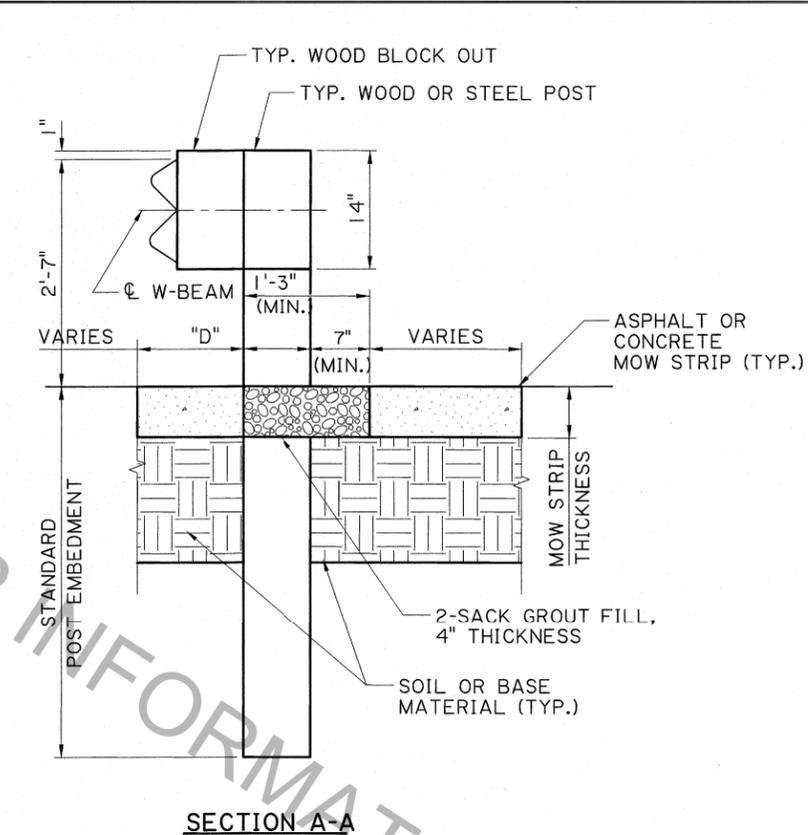
BRIDGE AND STRUCTURAL DESIGN



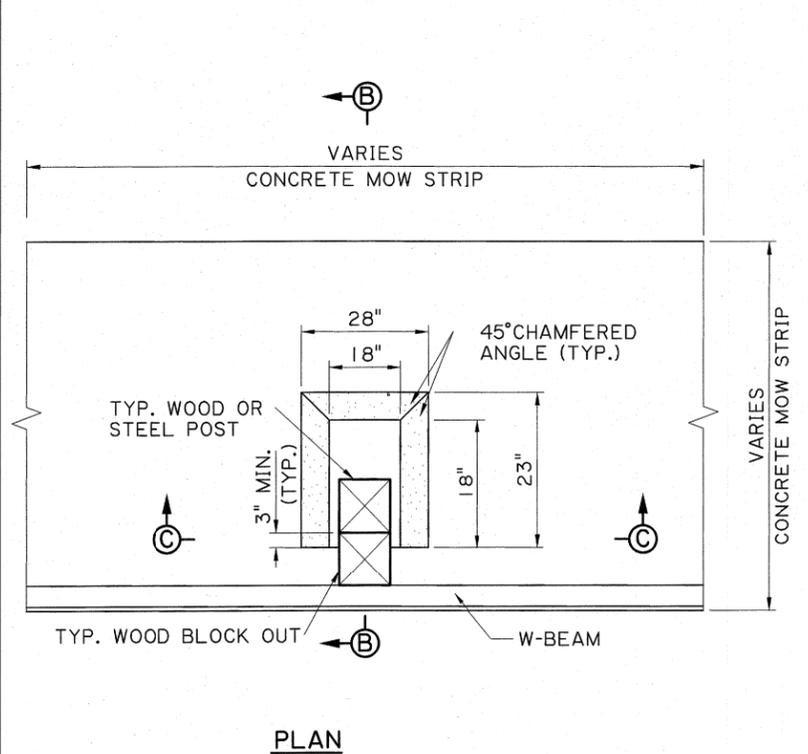
PLAN

"D" = STEEL OR WOOD POST DIMENSION (VARIES)

GROUT ALTERNATE FOR ASPHALT OR CONCRETE MOW STRIPS
N.T.S.

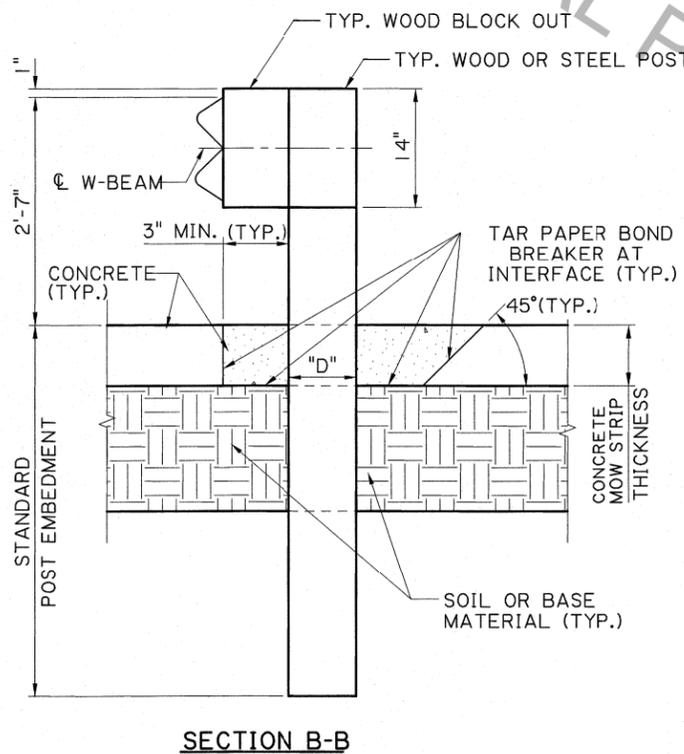


SECTION A-A

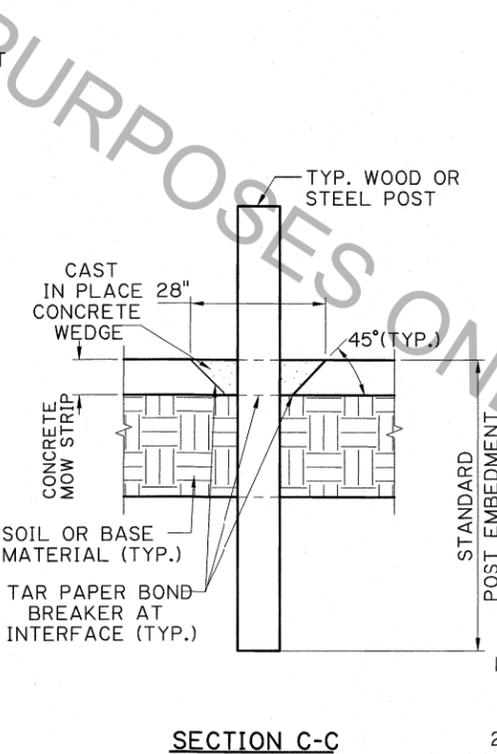


PLAN

CONCRETE WEDGE ALTERNATE FOR CONCRETE MOW STRIPS ONLY
N.T.S.



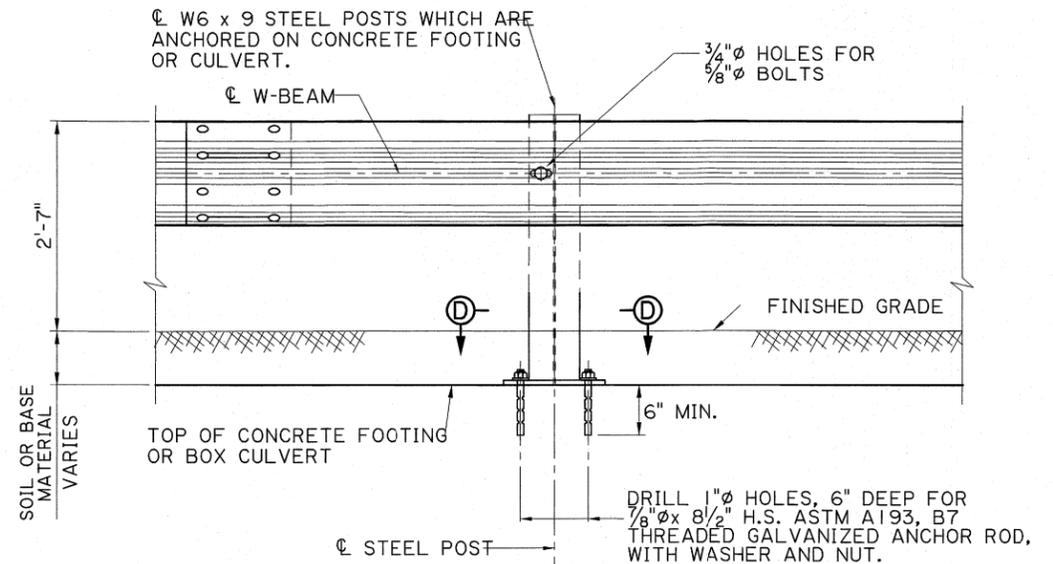
SECTION B-B



SECTION C-C

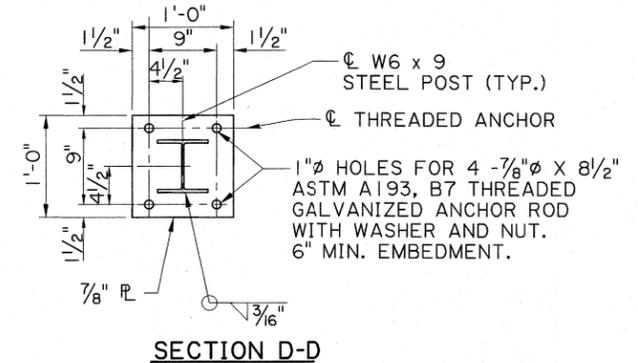
ANCHOR ROD INSTALLATION

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.



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 D-D

MOW STRIP NOTES:

- 1) ALL GUARD RAIL POSTS LOCATED WITHIN CONCRETE OR ASPHALT MOW STRIPS SHALL MEET INSTALLATION REQUIREMENTS SHOWN ON THIS SHEET.
- 2) USE A 2-SACK NON-SHRINK GROUT FILL WITH A MAXIMUM COMPRESSIVE STRENGTH OF 120 PSI FOR GROUT ALTERNATE.
- 3) ALL LABOR AND MATERIALS TO PLACE 2-SACK GROUT FILL (4" THICKNESS) OR CONCRETE WEDGE SHALL BE INCLUDED IN PAYMENT FOR CONCRETE OR ASPHALT PAVING PAY ITEMS.
- 4) CONCRETE PAY ITEM FOR WEDGE ALTERNATE TO BE SAME AS FOR CONCRETE MOW STRIP.

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



APPROVED BY CHIEF ENGINEER:
[Signature]
DATE: 1/3/19



HIGHWAY GUARD RAIL (MASH) MOW STRIP AND CONCRETE ANCHOR DETAILS

STANDARD PLAN
BD.1.1.0.11
GR-MASH-ON

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
BRIDGE AND STRUCTURAL DESIGN