



Letter of Transmittal

To: Chris Williams
VTRANS
61 VALLEY VIEW
MENDON, VT 05701
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Transmittal #: 16
Date: 5/6/2015
Job: M117 VTRANS CASTLETON BRF 015-2(10)

Subject: Submittal

- WE ARE SENDING YOU**
- Shop drawings
 - Copy of letter
 - Attached
 - Prints
 - Change order
 - Under separate cover via the following items:
 - Plans
 - Specifications
 - Samples
 - Other

Document Type	Copies	Date	No.	Description
Submittal	1		525.33-12 Rev 0	Guardrail

THESE ARE TRANSMITTED as checked below:

- For approval
- For your use
- As requested
- For review and comment
- FOR BIDS DUE
- Approved as submitted
- Approved as noted
- Returned for corrections
- Other
- PRINTS RETURNED AFTER LOAN TO US
- Resubmit ___ copies for approval
- Submit ___ copies for distribution
- Return ___ corrected prints

Remarks: Please see attached Bridge and Approach Rail for your approval from our sub Lafayette

Copy To: Jennifer Fitch (VTRANS), KEVIN TURE (W.M. SCHULTZ CONSTRUCTION)

From: MIKE GARN (W.M. SCHULTZ CONSTRUCTION)

Signature: 



PO Box 2620
Ballston Spa, NY 12020
Ph : 518 885-0060

Submittal

Job: M117
VTRANS CASTLETON BRF 015-2(10)
Castleton BRF 015-2
Route 30
Castleton, VT

Spec Section No: 525.33
Submittal No: 12
Revision No: 0
Sent Date: 5/6/2015

Spec Section Title:

Submittal Title: Guardrail

Contractor:

W.M. Schultz Construction, Inc

Contractor's Stamp

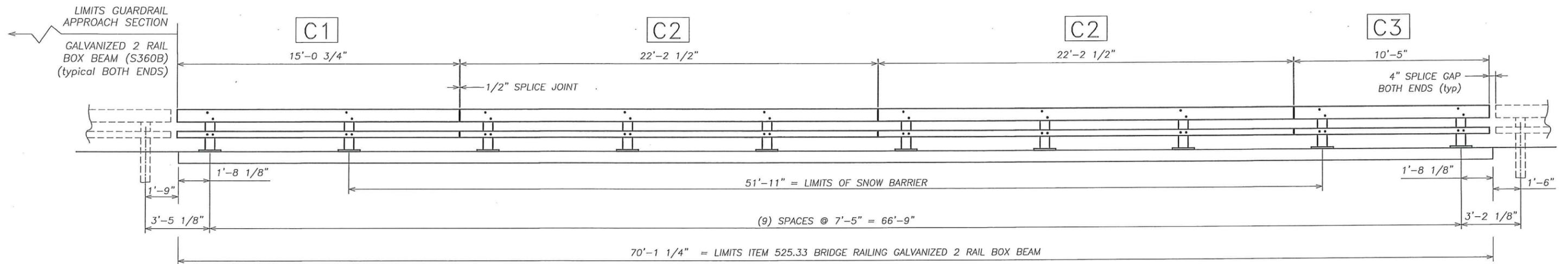
SCHULTZ CONSTRUCTION, INC.

CONTRACT NO. BRF 015-2
SUBMITTAL TITLE Guard Rail
ITEM & SECT. NO. 525.33 & 621.72
LOCATION OF WORK VT RT 30
SUB NO. 12 **DATE** 5/6/15
REVIEWED BY MG

VTRANS
Chris Williams

Architect's Stamp

Engineer's Stamp



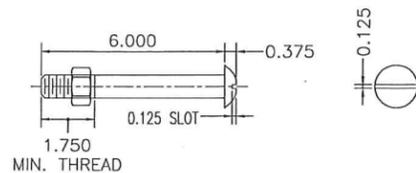
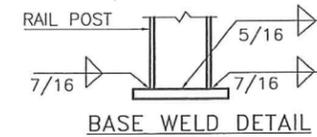
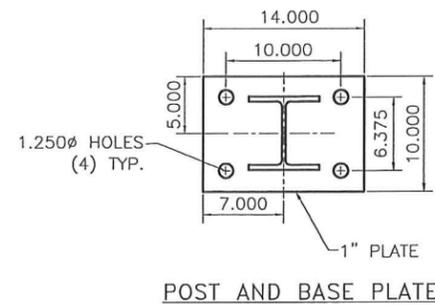
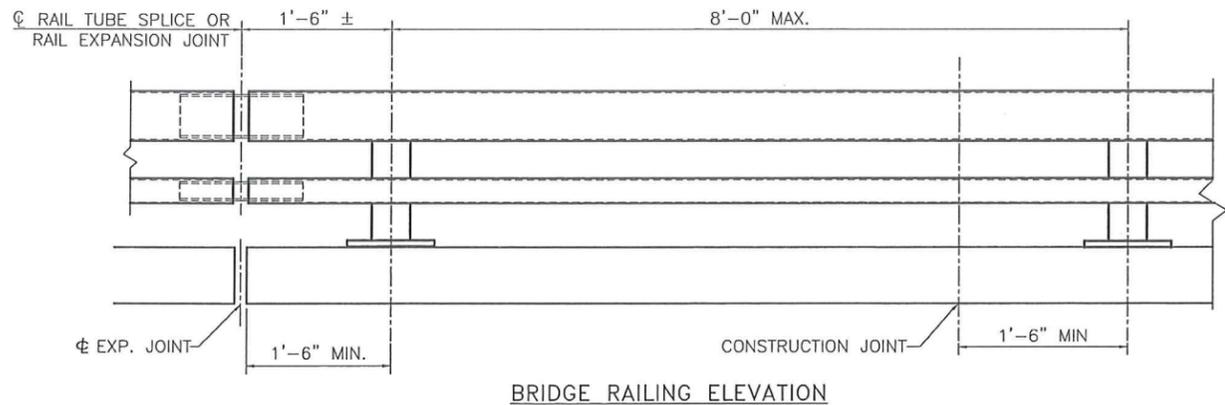
TYPICAL RAILING ELEVATION
 LOOKING AT FACE OF RAILING FROM CENTERLINE OF ROAD
 BOTH SIDES TYPICAL

BILL OF MATERIAL

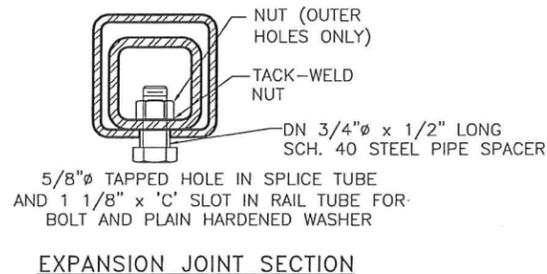
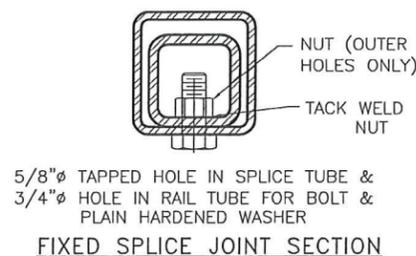
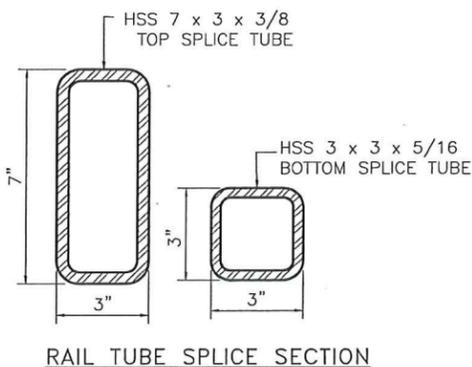
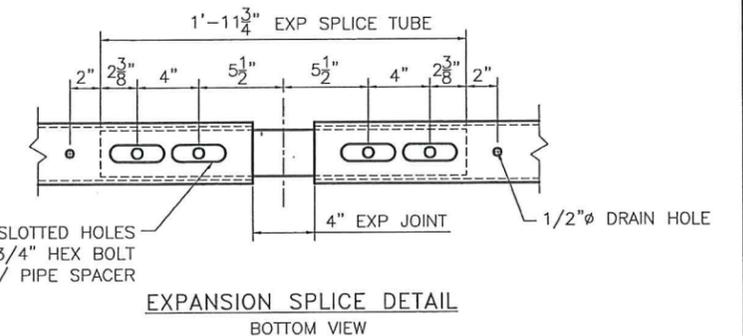
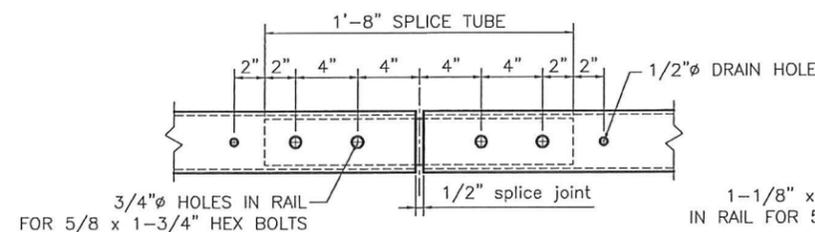
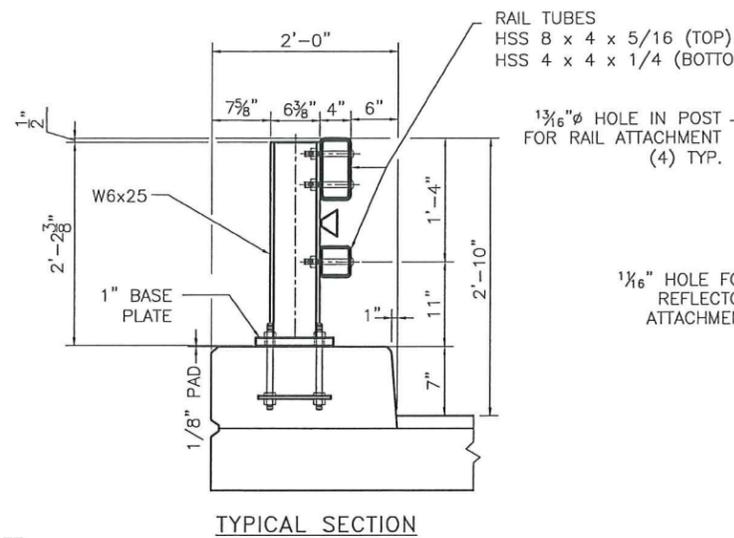
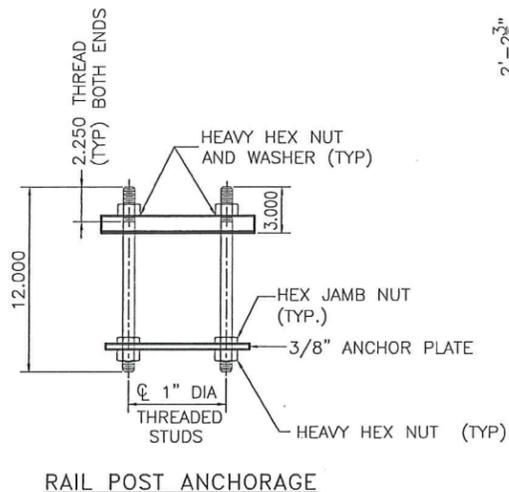
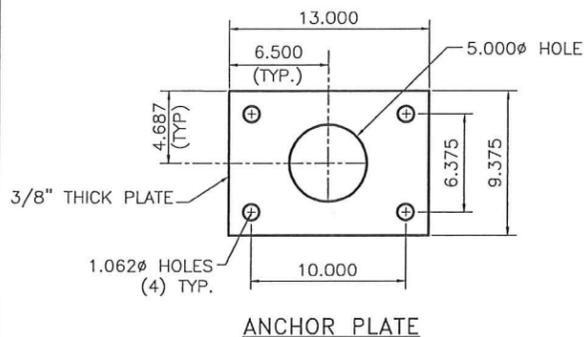
Qty	mk	Description	Spec.
141 LF		ITEM 525.33 BRIDGE RAILING GALVANIZED 2 RAIL BOX BEAM	
20		BRIDGE RAILING POST W6 x 25 x 2'-2.375" OAH WITH 1 x 10 x 14 BASE PLATE (GLV)	A709 gr 50
6		SPLICE TUBE (FOR 8X4 RAIL) HSS 7 x 3 x 3/8 x 1'-8.000" OAL w/ TAPPED HOLES & 2 WELDED NUTS (GLV)	A500 gr B
6		SPLICE TUBE (FOR 4X4 RAIL) HSS 3 x 3 x 5/16 x 1'-8.000" OAL w/ TAPPED HOLES & 2 WELDED NUTS (GLV)	A500 gr B
2	C1	UPPER RAIL TUBE HSS 8 X 4 X 5/16 X 15'-0.750" OAL (1 end fix splice, 1 end exp splice)	A500 gr B
4	C2	UPPER RAIL TUBE HSS 8 X 4 X 5/16 X 22'-2.500" OAL (fix splice both ends)	A500 gr B
2	C3	UPPER RAIL TUBE HSS 8 X 4 X 5/16 X 10'-5.000" OAL (1 end fix splice, 1 end exp splice)	A500 gr B
2	C1	LOWER RAIL TUBE HSS 4 X 4 X 1/4 X 15'-0.750" OAL (1 end fix splice, 1 end exp splice)	A500 gr B
4	C2	LOWER RAIL TUBE HSS 4 X 4 X 1/4 X 22'-2.500" OAL (fix splice both ends)	A500 gr B
2	C3	LOWER RAIL TUBE HSS 4 X 4 X 1/4 X 10'-5.000" OAL (1 end fix splice, 1 end exp splice)	A500 gr B
20		ANCHOR SPACER PLATE PL 0.375 x 13.000 x 9.375	A709 gr 36
80		ANCHOR STUD DBL END PART THREAD - 1" DIA x 12.000 w/ 2.250" THD EACH END (GLV)	A449
160		HEAVY HEX NUT 1" (GLV)	A563 DH
80		ROUND WASHER (SAE) - 1" DIA SMALL (GLV)	F436
80		JAM NUT 1" (GALV)	A563 DH
80		ROUND HEAD POST BOLT slot or wrench head - no shoulder 3/4" DIA x 6" LG. FULL BODY (GLV)	A449 / A325
80		LOCK NUT 3/4" (GLV)	A563 DH
80		ROUND WASHER (SAE) 3/4" (GLV)	F436
48		HEX HEAD BOLT 5/8" DIA x 1.75" LG. (GLV)	A325
48		ROUND WASHER (SAE) 5/8" (GLV)	F436
20		BEARING PAD 0.125" THICK x 10.000 x 14.000 (NEOPRENE 80 duro +/-10)	aashto M251

No.	Remarks	Date
0	initial submittal	5/5/15
	REVISIONS	

HIGHWAY SAFETY CORP GLASTONBURY, CT 860-633-9445		ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A) ITEM 621.72 GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM (S-360B) BRF 015-2(10) VT ROUTE 30 - BRIDGE 93 TOWN OF CASTLETON, RUTLAND COUNTY VT	CERTIFIED FABRICATOR
GENERAL CONTRACTOR LAFAYETTE		SHEET NO. 1 of 4	
DRAWN PAR	CHECKED 	DATE 05-05-15	SCALE NONE
		SIZE D	



3/4" DIA. A449
ROUND HEAD BOLT
(WITH WASHER AND PREVAILING TORQUE TYPE LOCK NUT)
(SEE NOTE #8)
ONLY FULL DIAMETER BODY BOLTS WILL BE ALLOWED.



NOTES:

- ALL WORK AND MATERIALS SHALL CONFORM TO SECTION 525.
- PRIOR TO GALVANIZING, ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 1/16" RADIUS AND BE FREE OF BURRS.
- ALL POSTS SHALL BE SET NORMAL TO GRADE.
- SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO (2) RAIL POSTS AND PREFERABLY TO AT LEAST FOUR (4) POSTS.
- RAIL TUBE EXPANSION JOINT SHALL BE PROVIDED IN ANY RAIL BAY SPANNING THE END OF AN INTEGRAL ABUTMENT BRIDGE AND AT ALL SUPERSTRUCTURE EXPANSION JOINTS. EXPANSION JOINT WIDTH SHALL BE 4" AT 45°F AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.
- HOLES IN RAILS FOR RAIL TUBE ATTACHMENT SHALL BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AND APPROVED ZINC-RICH PAINT DURING INSTALLATION.
- RAIL POST ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.
- RAIL TUBES SHALL BE ATTACHED USING 3/4" FULL DIAMETER BODY ASTM A449 ROUND HEAD BOLTS INSERTED THROUGH THE FACE OF THE TUBE. HOLES IN POSTS SHALL BE 1/16" LARGER THAN THE BOLT SIZE.
- ANY BENDING OR CURVING OF RAIL SHALL BE DONE IN A FABRICATION PLANT IN ACCORDANCE WITH SUBMITTED PROCEDURES.
- THE MINIMUM DISTANCE FROM A POST TO AN EXPANSION JOINT SHALL BE SUCH TO MAINTAIN MINIMUM EDGE DISTANCE OF 5" FROM ANY ANCHOR STUD TO THE END OF THE SLAB, OR TO THE EXPANSION JOINT RECESS POUR, IF ONE IS USED.
- A DELINEATOR (SEE VAOT STANDARD DRAWING C-1 FOR DETAILS) SHALL BE INSTALLED AT NEAREST POST TO 30 FT SPACING. WHITE IS TO BE INSTALLED ON THE DRIVER'S RIGHT. FOR ONE WAY BRIDGES, YELLOW IS TO BE INSTALLED ON THE DRIVER'S LEFT. PAYMENT SHALL BE INCIDENTAL TO OTHER ITEMS.
- THIS RAILING MEETS THE REQUIREMENTS FOR A TL-4 SERVICE LEVEL.

MATERIALS

RAIL TUBES.....ASTM A500 GRADE B OR ASTM A501
RAIL POSTS AND BASE PLATES.....ASTM A709/A709M, GRADE 50
ALL OTHER SHAPES AND PLATES.....ASTM A709/A709M, GARDE 36
ANCHOR STUDS.....ASTM A449
ALL OTHER BOLTS (UNLESS NOTED).....AASHTO M164, TYPE1

NUTS FOR AASHTO M164 BOLTS AND FOR ANCHOR STUDS SHALL COMPLY WITH AASTHO M291 (ASTM A563).

WASHERS SHALL COMPLY WITH AASHTO M293 (ASTM F436) SPECIFICATIONS.

1/8" PAD SHALL COMPLY WITH STANDARD SPECIFICATION SUBSECTION 731.01 OR 731.02.

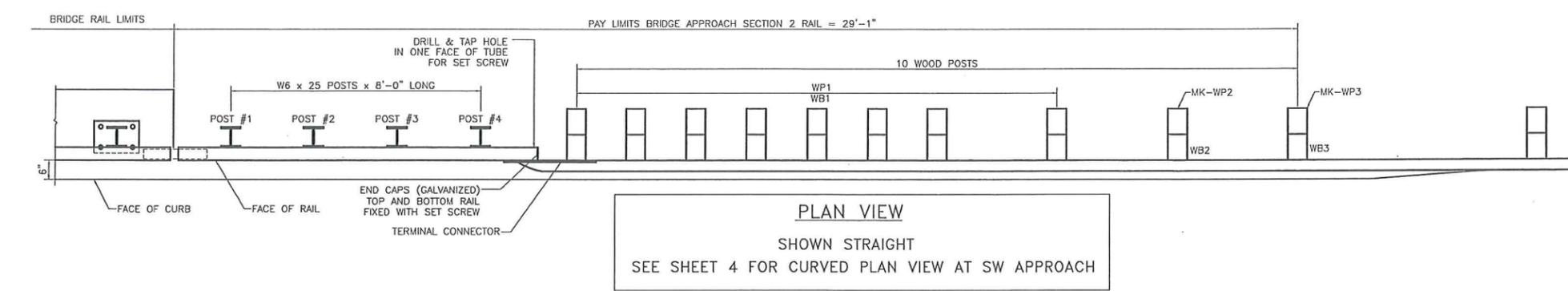
RAIL POSTS AND BASE PLATES SHALL BE TESTED FOR IMPACT PROPERTIES IN ACCORDANCE WITH ASTM A370 CHARPY IMPACT TESTING USING TYPE A SPECIMEN.

HIGHWAY SAFETY CORP
GLASTONBURY, CT
860-633-9445

ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A)
ITEM 621.72 GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM (S-360B)
BRF 015-2(10)
VT ROUTE 30 - BRIDGE 93
TOWN OF CASTLETON, RUTLAND COUNTY VT

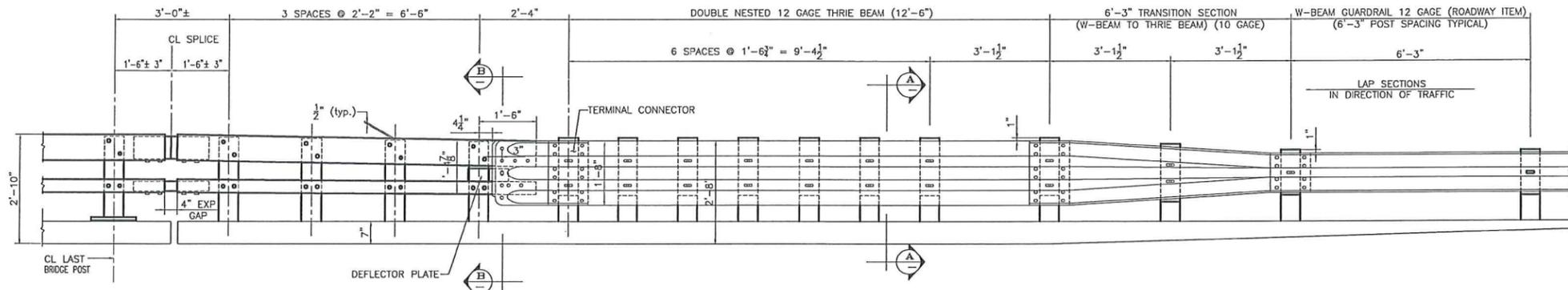
CERTIFIED FABRICATOR

GENERAL CONTRACTOR
SUB CONTRACTOR LAFAYETTE
DRAWN PAR CHECKED DATE 05-05-15 SCALE NONE SIZE 2 of 4

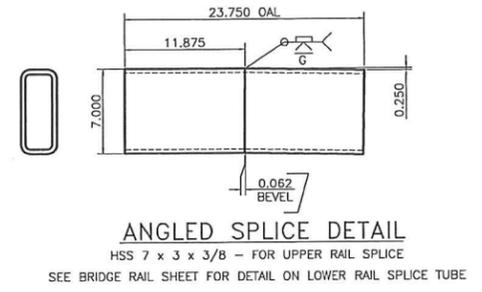


PLAN VIEW
SHOWN STRAIGHT
SEE SHEET 4 FOR CURVED PLAN VIEW AT SW APPROACH

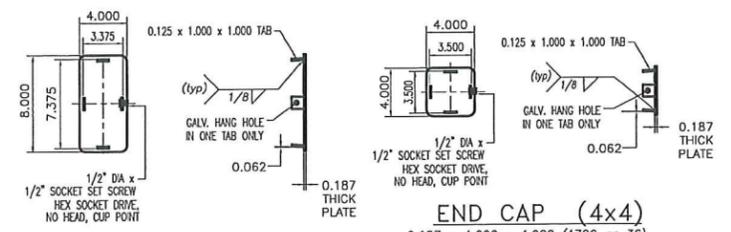
- NOTES:**
1. PAYMENT FOR GUARDRAIL APPROACH SECTION - GALVANIZED 2 RAIL, SHALL INCLUDE THE TERMINAL CONNECTOR, THE CONNECTION PLATE, THE DEFLECTOR PLATE, RAIL, POSTS, BLOCKS AND ATTACHMENT HARDWARE.
 2. ALL APPROACH RAIL SPLICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW.
 3. TUBE AND STEEL POST MATERIALS, DIMENSION SIZES AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL UNLESS OTHERWISE NOTED.
 4. APPROACH RAIL BOLTS SHALL BE ASTM A307 GRADE A AND NUTS SHALL BE ASTM M291 (ASTM 563 GRADE A OR BETTER (GALVANIZED)). WASHERS SHALL BE ASTM F844.
 5. WELD TOP SPLICE BAR TO FIT BEND. USE COMPLETE PENETRATION WELD (B-U2).



APPROACH RAIL ELEVATION
LEADING END (RIGHT) IS SHOWN (TYP AT NW & SE QUADRANT)
DEPARTURE END (LEFT) SIMILAR BUT OPPOSITE HAND (TYP AT NE & SW QUADRANT)

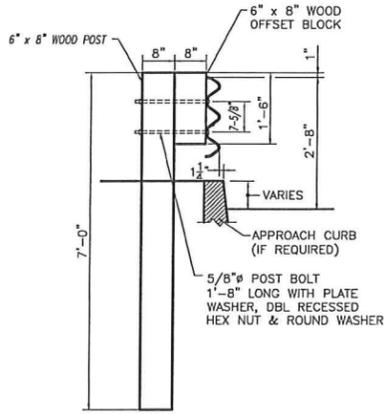


ANGLED SPLICE DETAIL
HSS 7 x 3 x 3/8 - FOR UPPER RAIL SPLICE
SEE BRIDGE RAIL SHEET FOR DETAIL ON LOWER RAIL SPLICE TUBE

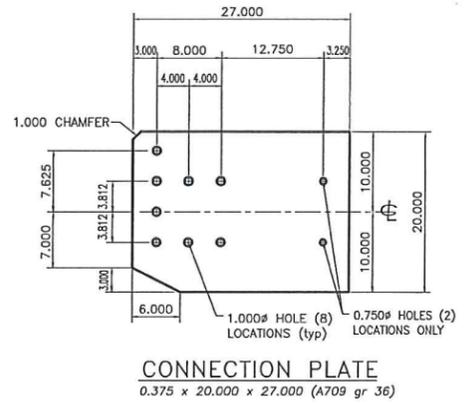


END CAP (8x8)
0.187 x 4.000 x 8.000 (A709 gr 36)

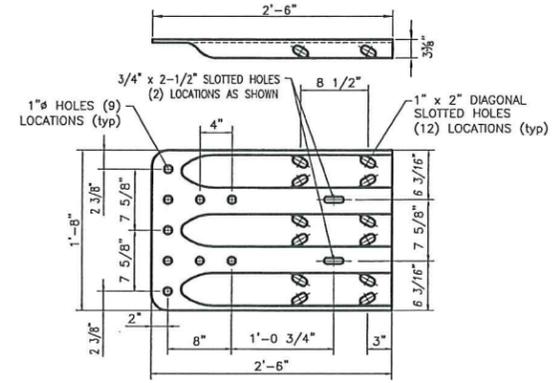
END CAP (4x4)
0.187 x 4.000 x 4.000 (A709 gr 36)



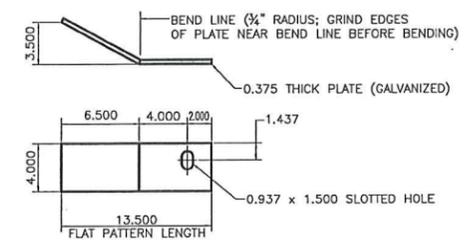
SECTION A-A



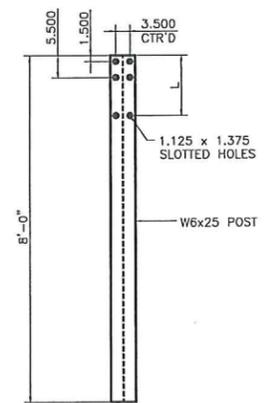
CONNECTION PLATE
0.375 x 20.000 x 27.000 (A709 gr 36)



TERMINAL CONNECTOR
10 GAUGE (AASHTO M180 B2)



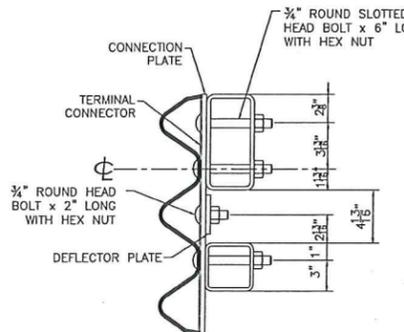
DEFLECTOR PLATE
0.375 x 4.000 x 13.500 (A709 gr 36)
RIGHT HAND APPROACH SHOWN - LEFT HAND BENT OPPOSITE



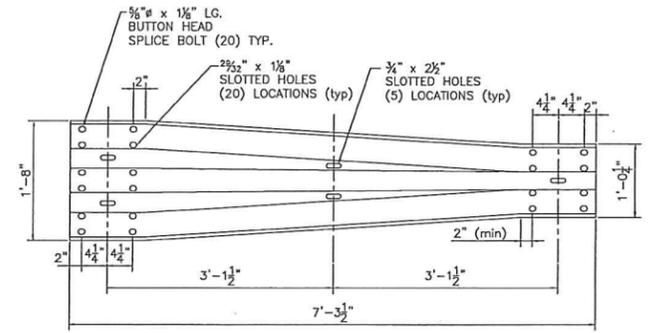
STEEL POST

STEEL POST CHART

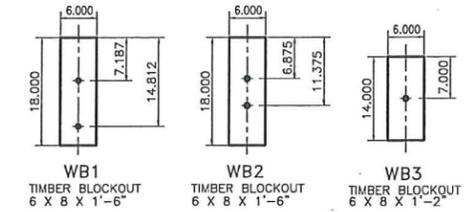
No.	L
#1	1'-3.250"
#2	1'-3.000"
#3	1'-2.687"
#4	1'-2.375"



SECTION B-B



THRIE TRANSITION PANEL
10 GAUGE (AASHTO M180 B2)



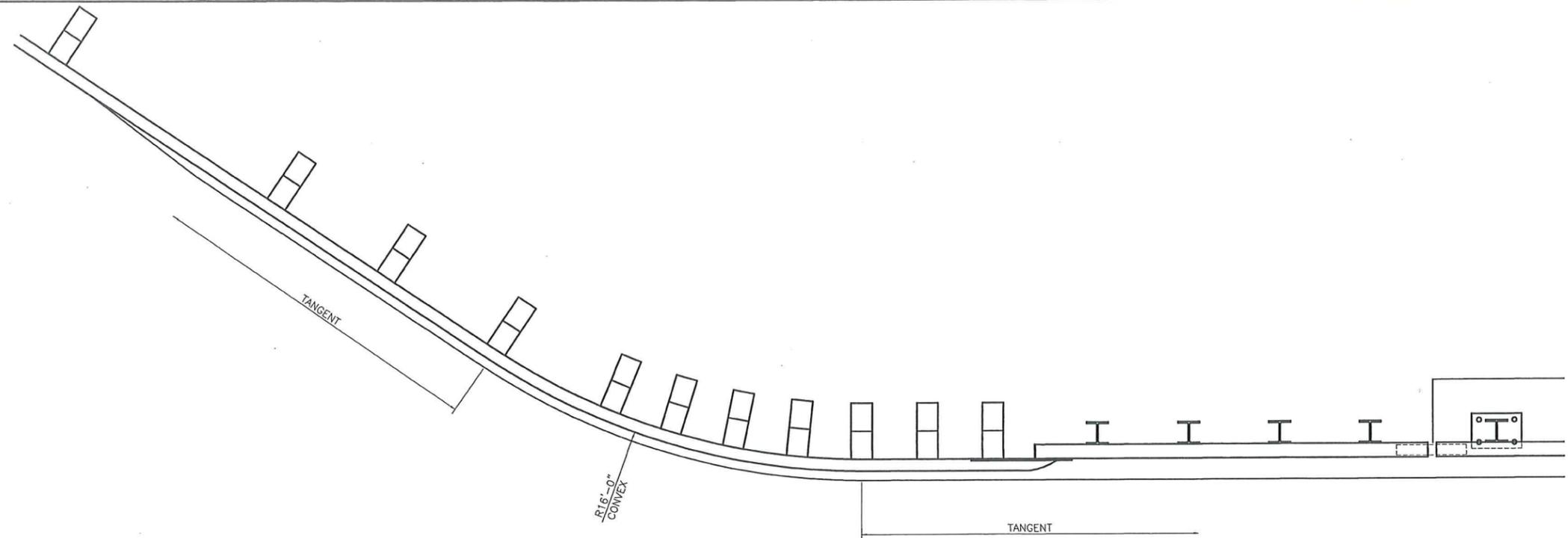
WOOD BLOCK DETAILS

HIGHWAY SAFETY CORP
GLASTONBURY, CT
860-633-9445

ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A)
ITEM 621.72 GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM (S-360B)
BRF 015-2(10)
VT ROUTE 30 - BRIDGE 93
TOWN OF CASTLETON, RUTLAND COUNTY VT

GENERAL CONTRACTOR: HSC JOB NO. 2043
SUB CONTRACTOR: LAFAYETTE
SHEET NO. 3 of 4

DRAWN: PAR CHECKED: DATE: 05-05-15 SCALE: NONE SIZE: D



BILL OF MATERIAL

Qty	mk	Description	Spec.
4 EA		ITEM 621.72 GUARDRAIL APPROACH SECTION 2 RAIL GALVANIZED BOX BEAM	
4	01	W6x25 APPROACH POST - #1 x 8'-0" OAL (GALV)	A709 gr 50
4	02	W6x25 APPROACH POST - #2 x 8'-0" OAL (GALV)	A709 gr 50
4	03	W6x25 APPROACH POST - #3 x 8'-0" OAL (GALV)	A709 gr 50
4	04	W6x25 APPROACH POST - #4 x 8'-0" OAL (GALV)	A709 gr 50
4		UPPER RAIL APPROACH TUBE HSS 8 x 4 x 5/16 x 9'-4.000" w/ 3.500 SLOTS FOR 4" EXP GAP (GALV)	A500 gr B
4		LOWER RAIL APPROACH TUBE HSS 4 x 4 x 5/16 x 9'-4.000" w/ 3.500 SLOTS FOR 4" EXP GAP (GALV)	A500 gr B
4		CONNECTION PLATE PL 0.375" x 20.000" x 27.000" (GALV)	A709 gr 36
2		DEFLECTOR PLATE (RIGHT) PL 0.375 x 4.000 x 13.375 (GALV)	A709 gr 36
2		DEFLECTOR PLATE (LEFT) PL 0.375 x 4.000 x 13.375 (GALV)	A709 gr 36
4		END CAP FOR 8x4 TUBE 0.187 THICK PLATE 8.000 x 4.000 w/ WELDED TABS (GALV)	A709 gr 36
4		END CAP FOR 4x4 TUBE 0.187 THICK PLATE 4.000 x 4.000 w/ WELDED TABS (GALV)	A709 gr 36
4		(ANGLED) SPLICE TUBE (EXPANSION) FOR 8x4 UPPER RAIL HSS 7 x 3 x 3/8 x 1'-11.750" OAL (GALV)	A500 gr B
4		SPLICE TUBE (EXPANSION) FOR 4x4 LOWER RAIL HSS 3 x 3 x 5/16 x 1'-11.750" OAL (GALV)	A500 gr B
32		WOOD POST (WP1) 6 x 8 x 7'-0"	TIMBER
32		WOOD BLOCKOUT (WB1) 6 x 8 x 1'-6"	TIMBER
4		WOOD POST (WP2) 6 x 8 x 7'-0"	TIMBER
4		WOOD BLOCKOUT (WB2) 6 x 8 x 1'-6"	TIMBER
4		WOOD POST (WP3) 6 x 8 x 7'-0"	TIMBER
4		WOOD BLOCKOUT (WB3) 6 x 8 x 1'-2"	TIMBER
4		THRIE FLAT LIP BRIDGE SHOE (MODIFIED) 10 GA. GALV	aashto M180 B2
4		THRIE TRANSITION PANEL 6'-3" / 3'-1 1/2" 10 GA. GALV.	aashto M180 B2
6		THRIE PANEL 12'-6" / 1'-6 3/4" 12 GA. GALV.	aashto M180 A2
2		THRIE PANEL 12'-6" / 1'-6 3/4" 12 GA. GALV. (PARTIAL RADIUS 9'-4 1/2" @ 16' R CONVEX)	aashto M180 A2
92		ROUND HEAD POST BOLT slot or wrench head - no shoulder 3/4" DIA x 6" LG. (GLV) w/ LOCK NUT & FLAT WASHER	A449
4		ROUND HEAD POST BOLT slot or wrench head - no shoulder 3/4" DIA x 2" LG. (GLV) w/ HEX NUT	A449
8		ROUND HEAD POST BOLT - oval shoulder 5/8" DIA x 1'-8" LG. (GALV) w/ DBL RECESS NUT, FLAT WASHER	A307
68		ROUND HEAD POST BOLT - oval shoulder 5/8" DIA x 1'-6" LG. (GALV) w/ DBL RECESS NUT, FLAT WASHER	A307
32		HEX HEAD BOLT 5/8 x 1-3/4" (GALV) w/ FLAT WASHER	A325
128		PANEL SPLICE BOLT 5/8 x 1-1/4" (GALV) w/ DOUBLE RECESSED NUT	A307
76		RECTANGULAR PLATE WASHER 0.187 x 1.750 x 3.000 (GALV)	A709 gr 36
32		SPACER PIPE - GALVANIZED 3/4" SCH. 40 x 1/2" LONG (GLV)	A53 gr B

PLAN VIEW
SOUTHWEST CORNER
SEE SHEET 3 FOR ADDITIONAL TYPICAL APPROACH DETAILS & DIMENSIONS

HIGHWAY SAFETY CORP	
GLASTONBURY, CT 860-633-9445	
ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A) ITEM 621.72 GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM (S-360B)	BRF 015-2(10) VT ROUTE 30 - BRIDGE 93 TOWN OF CASTLETON, RUTLAND COUNTY VT
GENERAL CONTRACTOR	2043
SUB CONTRACTOR	4 of 4
DRAWN: PAR	CHECKED: DATE: 05-05-15
SCALE: NONE	SIZE: D

Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

Material specification A572 gr 50, A709 Gr 50
 Welding process Gas Metal Arc Welding (GMAW) Spray Transfer
 Manual, semi-automatic, or automatic Semi-Automatic
 Position of welding Flat (1F) or Horizontal (2F)
 Filler metal specification AWS A5.18
 Filler metal classification ER70S-6
 Electrode and manufacturer Lincoln Electric Lincoln Weld L-56
 Flux and manufacturer N/A
 Shielding gas 86% Argon / 14% CO2 Flow rate 35-45 CFM
 Single or multiple pass Single or Multiple
 Single or multiple arc Single
 Welding current DCEP
 Polarity Reverse - electrode positive
 Welding progression Stringers
 Root treatment clean base metal
 Preheat and interpass temperature base metal up to 3/4" (50°F) ; over 3/4 thru 1-1/2" (150°F) : over 1-1/2" thru 2-1/2" (225°F)
 Postheat treatment None
 Electrode extension 3/4" ± 1/4"

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amperes	Volts		
5/16"	1	0.062"	300 A ± 30	29 V ± 2	15 ipm ± 2	<p>The diagram shows a cross-section of a W6x25 I-beam. There are four circular holes, one in each flange. Welds are indicated with arrows and labels: 7/16 on the top flange, 5/16 on the web, and 7/16 on the bottom flange.</p>
7/16"	1 & 2	0.062"	↓	↓	15 ipm ± 2	

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.5

WPS no. W-VTPEDPOST1
 Revision no. 0
 Supporting PQR no. Pre-Qualified
 Project Name Castleton, VT

Fabricator Highway Safety Corporation
 Prepared By: Paul Radice
 Date 4/8/15
 Project Number BRF 015-2(10)

Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

Material specification ASTM A500 gr B

Welding process Gas Metal Arc Welding (GMAW)

Manual, semi-automatic, or automatic Semi-Automatic

Position of welding Flat (1F) or Horizontal (2F)

Filler metal specification AWS A5.18

Filler metal classification ER70S-6

Electrode and manufacturer Lincoln Electric Lincoln Weld L-56

Flux and manufacturer N/A

Shielding gas 86% Argon / 14% CO2 Flow rate 35-45 CFM

Single or multiple pass Single

Single or multiple arc Single

Welding current DCEP

Polarity Reverse - electrode positive

Welding progression Stringers

Root treatment clean base metal

Preheat and interpass temperature base metal up to 3/4" (50°F)

Postheat treatment None

Electrode extension 3/4" ± 1/4"

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters		Travel speed	Joint detail
			Amperes	Volts		
	1	0.063"	300 A ± 30	29 V ± 2	15 ipm ± 2	<p>B-U2a-GF</p> <p>The diagram shows a cross-section of a butt joint between two metal plates. Each plate has a 45-degree bevel on its inner edge. The bevels meet at a central point, forming a V-shape. A dimension line indicates a gap of 1/4 inch between the bevels at the root. A weld is shown filling this gap. A welder's torch is positioned above the joint, with an arrow pointing to the weld area.</p>

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.1

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