

State of Vermont
PDD/Structures Design Section
National Life Building – Drawer 33
Montpelier, VT 05633-5001
www.aot.state.vt.us

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May 14, 2015

J. P. Sicard, Inc.
PO Box 508
1369 Glover Road
Barton, VT 05822

Project Name: Barton BRO 1449(31)

Structure Identification: TH 2, Bridge 8

The bearing fabrication drawings associated with Item 525.33 Bridge Railing, Galvanized 2 Rail Box Beam have been reviewed and are being returned herewith.

All sheets are approved.

You must provide at least 2 weeks notice to VTrans' fabrication inspector, Jeff Clark and the Agency's Engineer, as to the date fabrication represented by these drawings will begin. You may contact Jeff by phone at (802) 828 – 0044 or by email at jeff.clark@state.vt.us. Any material fabricated prior to the notification date is subject to rejection without further cause.

Sincerely,



Todd A. Sumner P.E.
Project Manager

cc Seth Hisman, Resident Engineer
Ron Gray, Regional Construction Engineer
J.P. Sicard, Contractor
Jeff Clark, Structural Steel Fabrication Inspector



PO Box 508
Barton, VT 05822
Phone: (802) 525-9506
Fax: (802) 525-4616
www.jpsicard.com

Submittal Data Sheet

Submittal #: 4

Submission #: 1

Date: 4/24/2015

Project Name: Barton BRO (1449) Bridge Replacement

Owner: Town of Barton, VT

Engineer: VTrans

Contractor: J.P. Sicard Inc.

Item Number: 525.33, 621.72

Supplier: Vermont Recreational Surfacing & Fencing, Inc.

Description of Item: Bridge Railing, Galvanized 2 Rail Box Beam / Guardrail Approach Section, Galvanized 2 Rail Box Beam

Substitution: NO

Engineers Review Comments:

Submitted By: Brad Drake
Title: Project Manager
Company: JP Sicard Inc

Vermont Agency of Transportation

Barton BRO (1449) Bridge Rail_active_STAMPED_FLAT1

RECEIVED

ON: **April 24, 2015**

and Checked for

CONFORMANCE

BY: Todd A. Sumner DATE: 05/14/2015

Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

SHOP DRAWING REVIEW

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REJECTED REVISE AND RESUBMIT APPROVED AS NOTED

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CHD Consulting Engineers
840 Commercial Street
Manchester, NH 03101
603-666-8223

Job Number: 128114
Reviewed by: AEG
Date: 05/14/2014

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	
7/16"	1 & 2	0.062"	↓	↓	15 ipm ± 2	
<p>Vermont Agency of Transportation RECEIVED ON: April 24, 2015 and Checked for CONFORMANCE BY: Todd A. Sumner DATE: 05/14/2015</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 D1.5

WPS no. W-VTPEDPOST1

Revision no. 0

Supporting PQR no. Pre-Qualified

Project Name Barton, Vermont

Fabricator Highway Safety Corporation

Prepared By: Paul Radice

Date 4/23/15

Project Number BRO 1449(31)

Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

SHOP DRAWING REVIEW		
<input checked="" type="checkbox"/>	REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.	
<input type="checkbox"/>	REJECTED	<input type="checkbox"/>
<input type="checkbox"/>	REVISE AND RESUBMIT	<input type="checkbox"/>
<input type="checkbox"/>	APPROVED AS NOTED	
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	CLD Consulting Engineers 540 Commercial Street Manchester, NH 03101 603-888-3444	Job Number: <u>120174</u> Reviewed by: <u>AEG</u> Date: <u>05/14/2014</u>

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

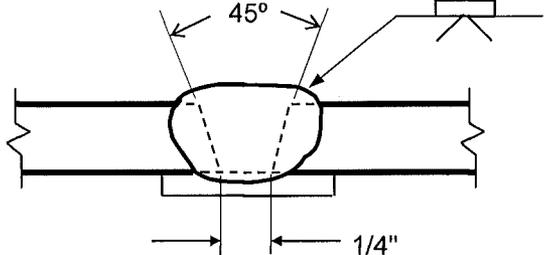
Root treatment clean base metal

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> 

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WPS no. W-VGwBCK

Revision no. 0

Supporting PQR no. Pre-Qualified

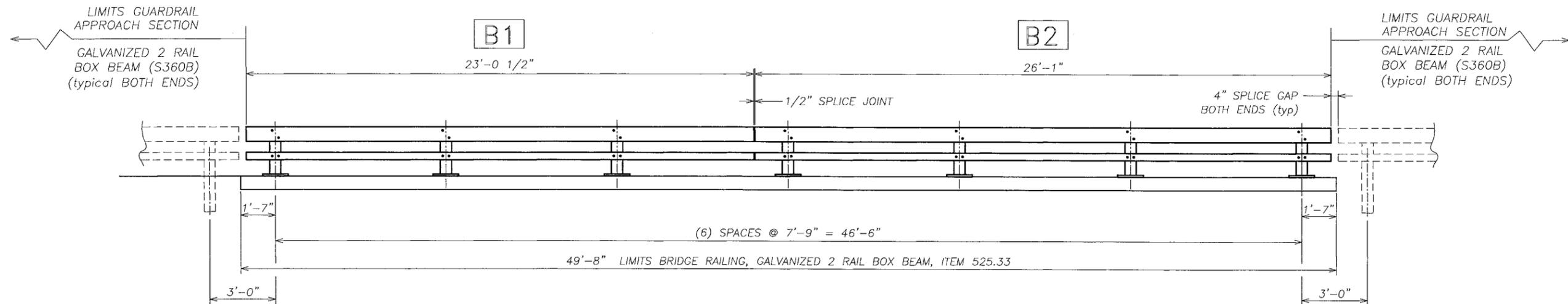
Project Name Barton, Vermont

Fabricator Highway Safety Corporation

Prepared By: Paul Radice

Date 4/23/15

Project Number BRO 1449(31)



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

BILL OF MATERIAL

Qty	mk	Description	Spec.
100 LF		ITEM 525.33 BRIDGE RAILING, GALVANIZED, 2 RAIL BOX BEAM	
14		BRIDGE RAILING POST W6 x 25 x 2'-2.375" OAH WITH 1 x 10 x 14 BASE PLATE (GLV)	A709 gr 50
2		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
2		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	B1	RAIL TUBE HSS 8 x 4 x 5/16 x 23 ft - 0.5 in OAL - FIX splice 1 end, EXP splice 1 end (GLV)	A500 gr B
2	B2	RAIL TUBE HSS 8 x 4 x 5/16 x 26 ft - 1 in OAL - FIX splice 1 end, EXP splice 1 end (GLV)	A500 gr B
2	B1	RAIL TUBE HSS 4 x 4 x 1/4 x 23 ft - 0.5 in OAL - FIX splice 1 end, EXP splice 1 end (GLV)	A500 gr B
2	B2	RAIL TUBE HSS 4 x 4 x 1/4 x 26 ft - 1 in OAL - FIX splice 1 end, EXP splice 1 end (GLV)	A500 gr B
14		ANCHOR SPACER PLATE PL 0.375 x 13.000 x 9.375	A709 gr 36
56		ANCHOR STUD DBL END PART THREAD - 1" DIA x 12.000 w/ 2.250" THD EACH END (GLV)	A449
112		HEAVY HEX NUT 1" (GLV)	A563 DH
56		ROUND WASHER (SAE) - 1" DIA SMALL (GLV)	F436
56		JAM NUT 1" (GALV)	A563 DH
56		ROUND HEAD POST BOLT slot or wrench head - no shoulder 3/4" DIA x 6" LG. FULL BODY (GLV)	A449 / A325
56		LOCK NUT 3/4" (GLV)	A563 DH
56		ROUND WASHER (SAE) 3/4" (GLV)	F436
16		HEX HEAD BOLT 5/8" DIA x 1.75" LG. (GLV)	A325
16		ROUND WASHER (SAE) 5/8" (GLV)	F436
14		BEARING PAD 0.125" THICK x 10.000 x 14.000 (NEOPRENE 80 duro +/-10)	aashto M251

Vermont Agency of Transportation

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OLD Consulting Engineers 540 Commercial Street Manchester, NH 03101 603-688-8223	Job Number: 120174 Reviewed by: AEG Date: 05/14/2014
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No.	Remarks	Date
0	Initial submittal	4/24/15

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)
 BRO 1449(31)
 ROARING BROOK ROAD (TH2) BRIDGE #8
 TOWN OF BARTON, ORLEANS COUNTY VT

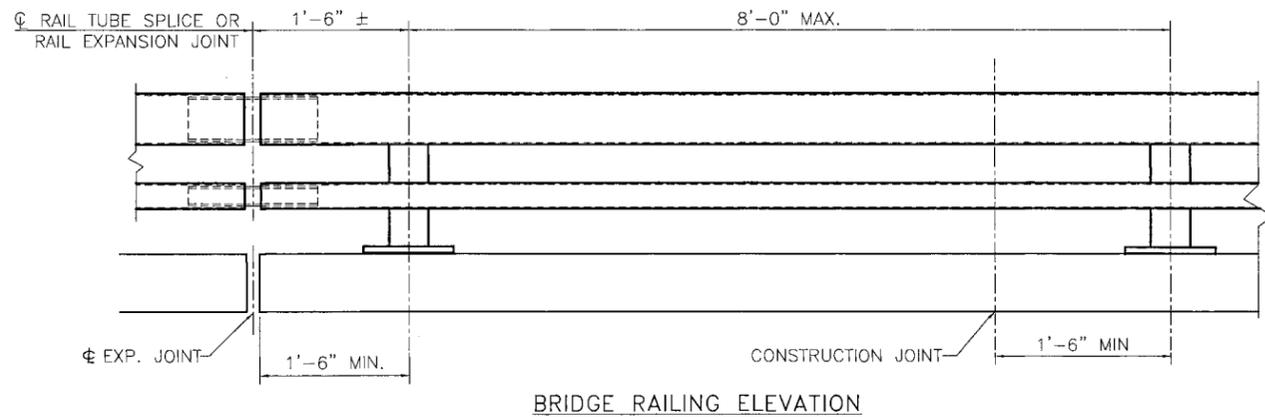
GENERAL CONTRACTOR: _____
 SUB CONTRACTOR: **VT REC**

SCALE: NONE SIZE: D

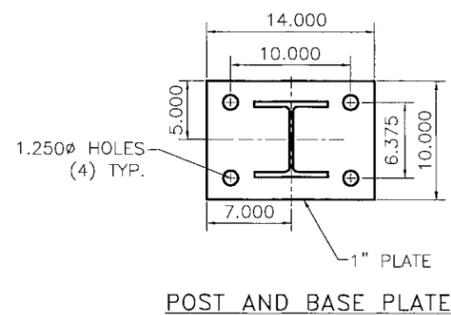
DATE: 04-22-15

CERTIFIED FABRICATOR

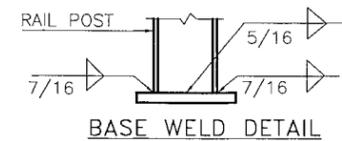
HSC JOB NO. **2045**
 SHEET NO. **1 of 4**



BRIDGE RAILING ELEVATION



POST AND BASE PLATE



BASE WELD DETAIL

NOTES:

1. ALL WORK AND MATERIALS SHALL CONFORM TO SECTION 525.
2. PRIOR TO GALVANIZING, ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 1/16" RADIUS AND BE FREE OF BURRS.
3. ALL POSTS SHALL BE SET NORMAL TO GRADE.
4. SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO (2) RAIL POSTS AND PREFERABLY TO AT LEAST FOUR (4) POSTS.
5. 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.
6. HOLES IN RAILS FOR RAIL TUBE ATTACHMENT SHALL BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AND APPROVED ZINC-RICH PAINT DURING INSTALLATION.
7. RAIL POST ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.
8. 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.
9. ANY BENDING OR CURVING OF RAIL SHALL BE DONE IN A FABRICATION PLANT IN ACCORDANCE WITH SUBMITTED PROCEDURES.
10. 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.
11. A DELINEATOR (SEE VAOT STANDARD DRAWING G--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.
12. 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, GRADE 36
- ANCHOR STUDS.....ASTM A449
- ALL OTHER BOLTS (UNLESS NOTED).....AASHTO M164, TYPE 1
- NUTS FOR AASHTO M164 BOLTS AND FOR ANCHOR STUDS SHALL COMPLY WITH AASHTO 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.

SHOP DRAWING REVIEW

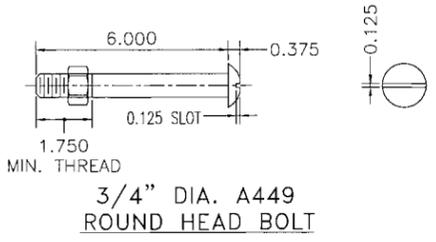
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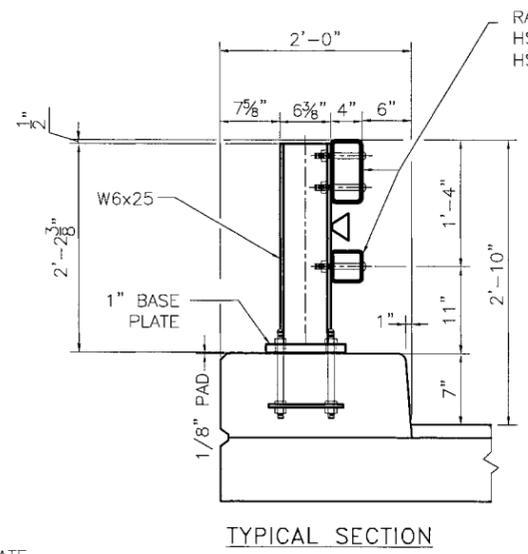
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GLD Consulting Engineers
540 Commercial Street
Manchester, NH 03101
603-688-9223

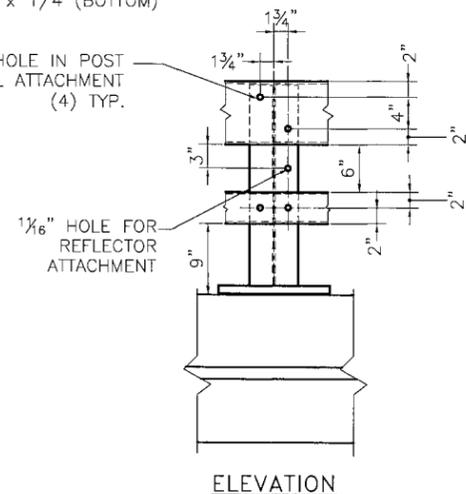
Job Number: 120174
Reviewed by: AEG
Date: 05/14/2014



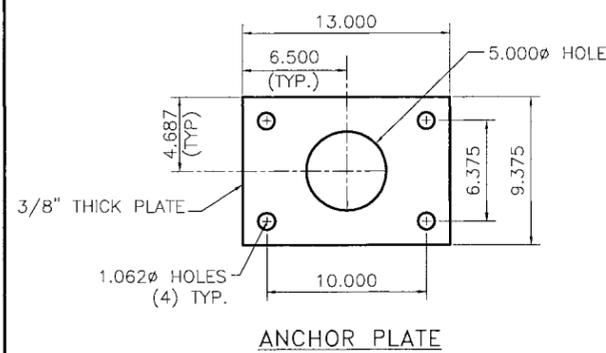
3/4" DIA. A449 ROUND HEAD BOLT
(WITH WASHER AND PREVAILING TORQUE TYPE LOCK NUT)
(SEE NOTE #8)
ONLY FULL DIAMETER BODY BOLTS WILL BE ALLOWED.



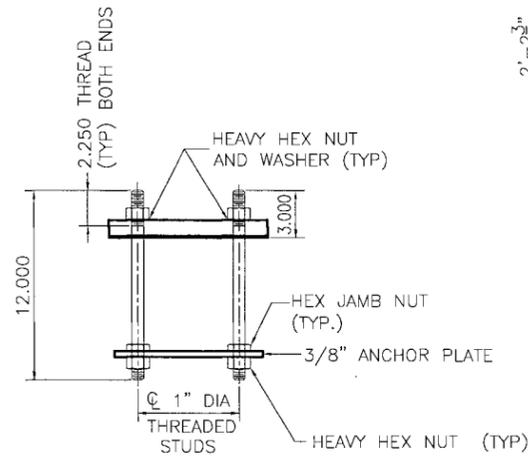
TYPICAL SECTION



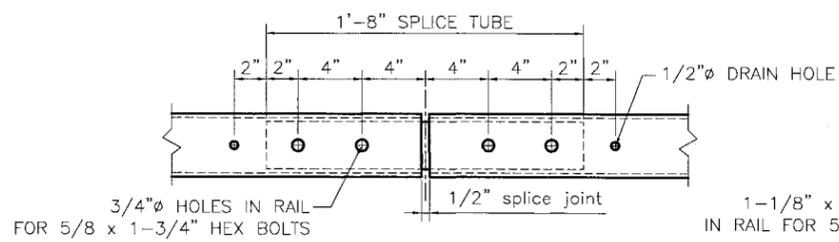
ELEVATION



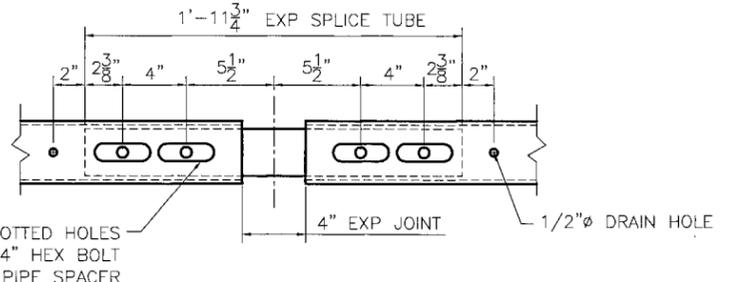
ANCHOR PLATE



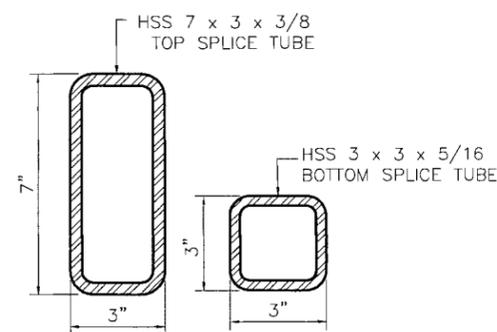
RAIL POST ANCHORAGE



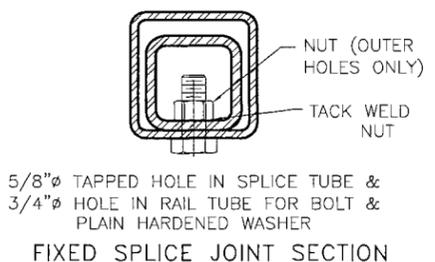
FIXED SPLICE JOINT DETAIL
BOTTOM VIEW



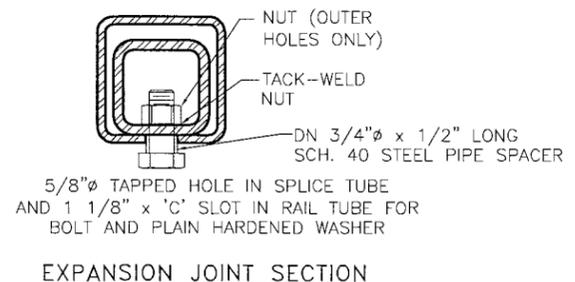
EXPANSION SPLICE DETAIL
BOTTOM VIEW



RAIL TUBE SPLICE SECTION



FIXED SPLICE JOINT SECTION



EXPANSION JOINT SECTION

Vermont Agency of Transportation

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BY: Todd A. Sumner DATE: 05/14/2015

HIGHWAY SAFETY CORP
GLASTONBURY, CT
860-633-9445

ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A)

ROARING BROOK ROAD (TH2) BRIDGE #8
TOWN OF BARTON, ORLEANS COUNTY VT

GENERAL CONTRACTOR: VT REC

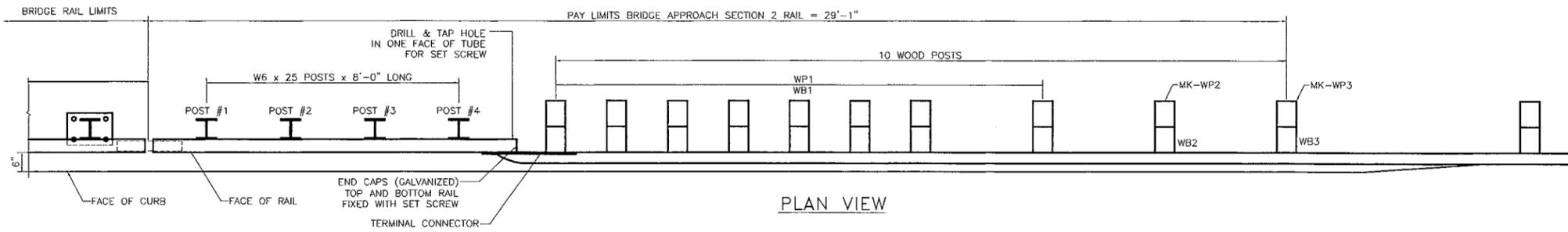
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DATE: 04-22-15 SCALE: NONE SIZE: D

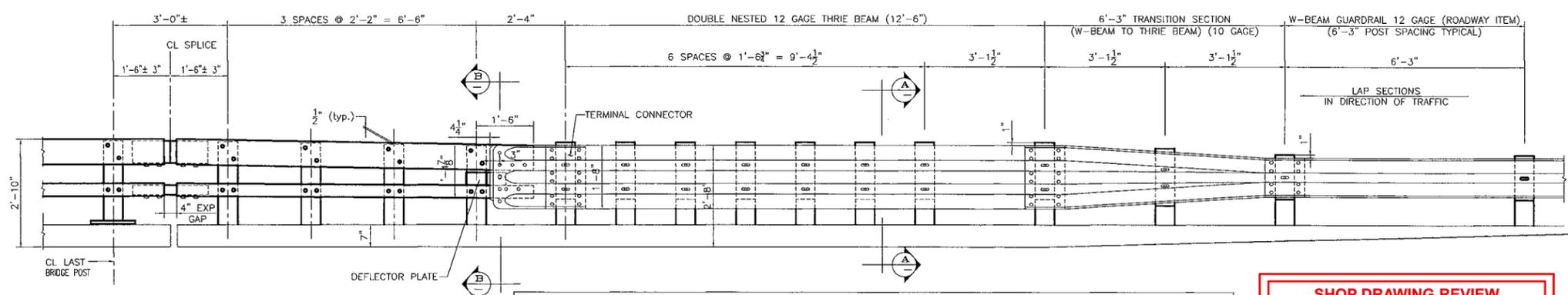
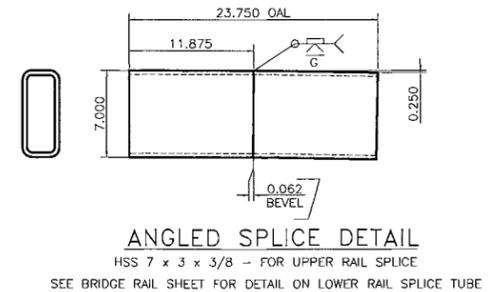
CERTIFIED FABRICATOR

HSC JOB NO. 2045

SHEET NO. 2 of 4



- 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 A307 GRADE A (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 SW QUADRANT)
DEPARTURE END (LEFT) SIMILAR BUT OPPOSITE HAND (TYP AT SE & NW QUADRANT)
SEE SHEET 4 FOR SPECIAL CURVED APPROACH AT NE QUADRANT

SHOP DRAWING REVIEW

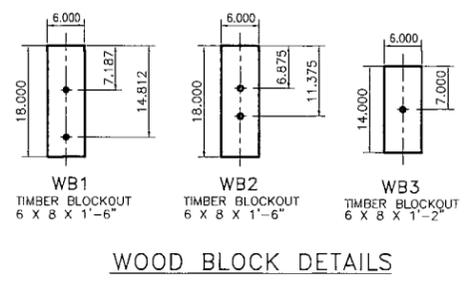
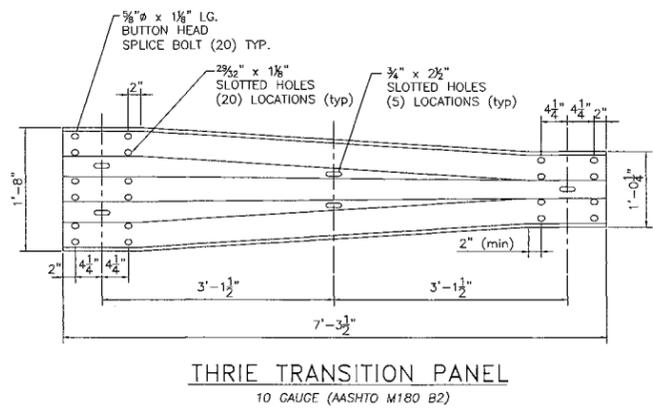
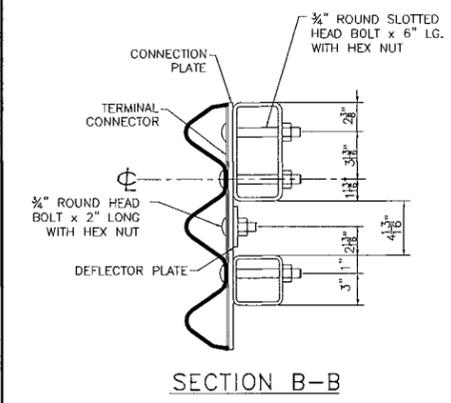
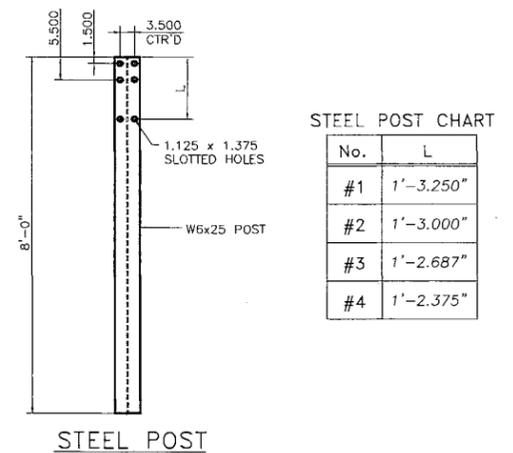
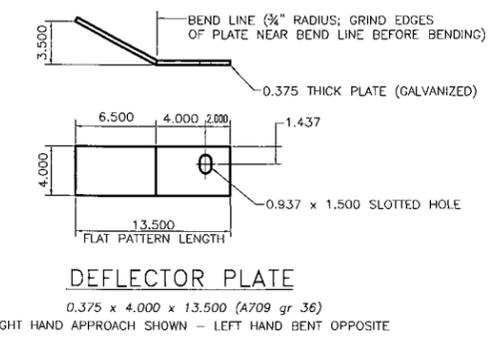
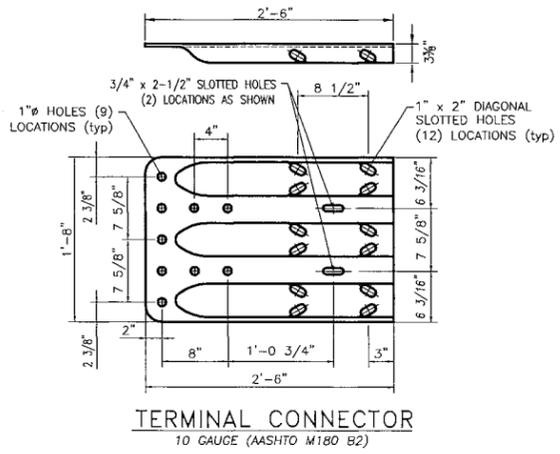
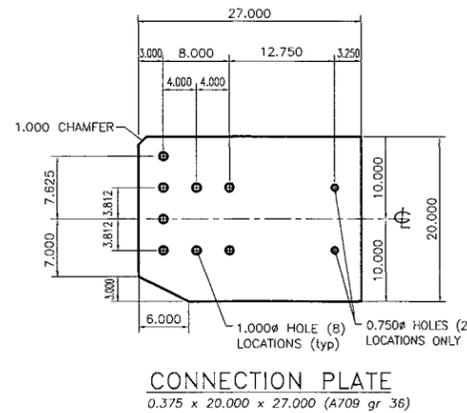
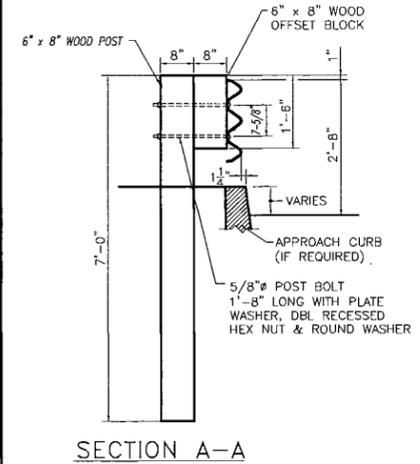
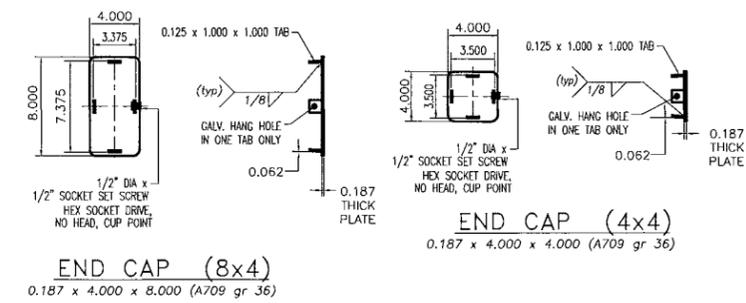
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CLD Consulting Engineers
540 Commercial Street
Manchester, NH 03101
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Job Number: 120174
Reviewed by: AEG
Date: 05/14/2014



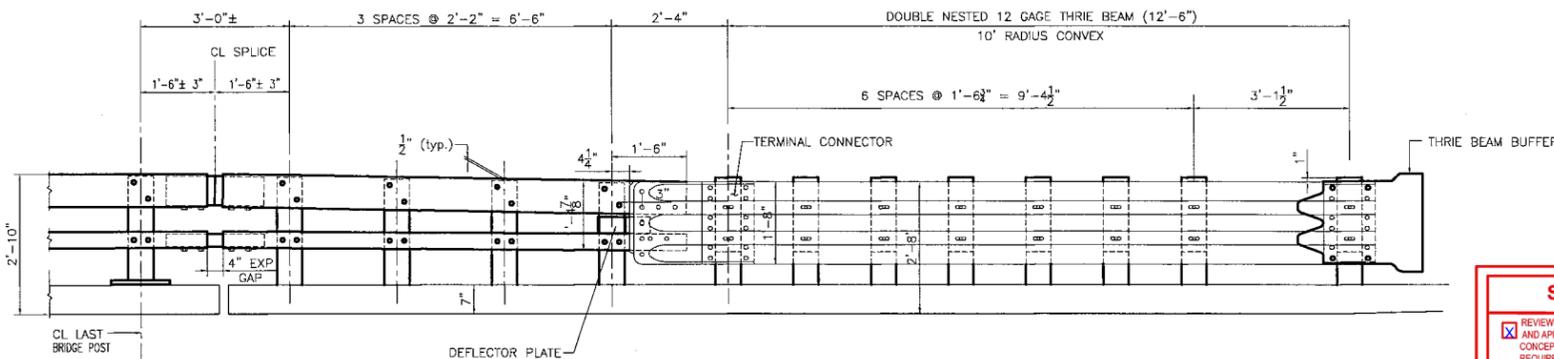
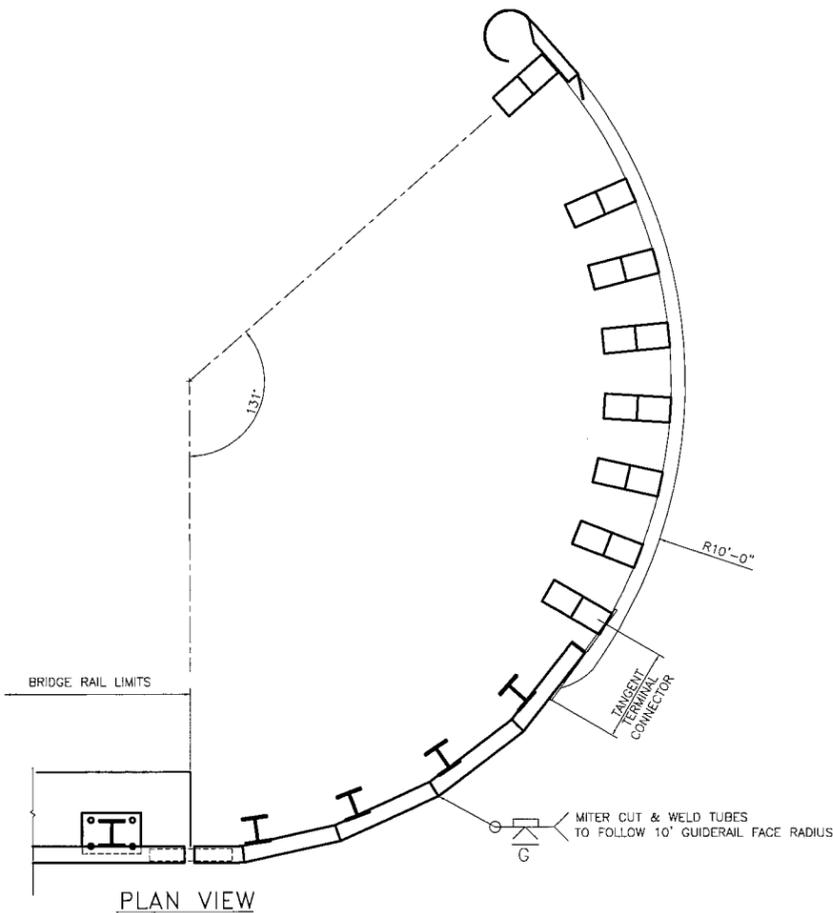
Vermont Agency of Transportation
HIGHWAY SAFETY CORP
GLASTONBURY, CT
860-633-9445

RECEIVED
ON: April 24, 2015
and Checked for CONFORMANCE
BY: Todd A. Sumner DATE: 05/14/2015

ITEM 621.72 GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM (S-3608)
BRO 1449(31)
ROARING BROOK ROAD (TH2) BRIDGE #8
TOWN OF BARTON, ORLEANS COUNTY VT

CERTIFIED FABRICATOR
HSC JOB NO. 2045
SHEET NO. 3 of 4
VT REC
DATE 04-22-15
SCALE NONE SIZE D

BILL OF MATERIAL



NE APPROACH RAIL ELEVATION

Qty	mk	Description	Spec.
4 EA		ITEM 621.72 GUARDRAIL APPROACH SECTION, GALVANIZED, 2 RAIL 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
		BRIDGE RAILING POST W6 x 25 x 2'-2.375" OAH WITH 1 x 10 x 14 BASE PLATE (GLV)	A709 gr 50
3		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
3		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
1		UPPER APP TUBE HSS 8 x 4 x 5/16 x 9'-4.000" w/ 3.500 SLOTS FOR 4" EXP GAP (GALV) miter cut & weld 10'R	A500 gr B
1		LOWER APP TUBE HSS 4 x 4 x 5/16 x 9'-4.000" w/ 3.500 SLOTS FOR 4" EXP GAP (GALV) miter cut & weld 10'R	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
3		WOOD POST (WP2) 6 x 8 x 7'-0"	TIMBER
3		WOOD BLOCKOUT (WB2) 6 x 8 x 1'-6"	TIMBER
3		WOOD POST (WP3) 6 x 8 x 7'-0"	TIMBER
3		WOOD BLOCKOUT (WB3) 6 x 8 x 1'-2"	TIMBER
4		THRIE FLAT LIP BRIDGE SHOE (MODIFIED) 10 GA. GALV	aashto M180 B2
3		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. shop curve 10'R convex	aashto M180 A2
1		THRIE BEAM BUFFER END 12 GA. GALV	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
65		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
132		PANEL SPLICE BOLT 5/8 x 1-1/4" (GALV) w/ DOUBLE RECESSED NUT	A307
73		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

Vermont Agency of Transportation

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