

# BILL OF MATERIAL

Qty	mk	Description	Spec.
952.35 LF		ITEM 525.33 BRIDGE RAILING, GALVANIZED, 2 RAIL BOX BEAM	
137		BRIDGE RAILING POST W6 x 25 x 2'-2.375" OAH WITH 1 x 10 x 14 BASE PLATE (GLV)	A709 gr B
36		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
36		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
6		EXP SPLICE (FOR 8X4 RAIL) HSS 7 x 3 x 3/8 x 1'-11.750" OAL w/ TAPPED HOLES & 2 WELDED NUTS (GLV)	A500 gr B
6		EXP SPLICE (FOR 4X4 RAIL) HSS 3 x 3 x 5/16 x 1'-11.750" OAL w/ TAPPED HOLES & 2 WELDED NUTS (GLV)	A500 gr B
3	G1	RAIL TUBE HSS 8 x 4 x 5/16 x 11 ft - 4.125 in OAL - EXP splice both ends (GLV)	A500 gr B
2	G2	RAIL TUBE HSS 8 x 4 x 5/16 x 12 ft - 9.75 in OAL - FIX splice 1 end, EXP splice 1 end (GLV)	A500 gr B
22	G3	RAIL TUBE HSS 8 x 4 x 5/16 x 23 ft - 11.5 in OAL - FIX splice both ends (GLV)	A500 gr B
10	G4	RAIL TUBE HSS 8 x 4 x 5/16 x 21 ft - 11.5 in OAL - FIX splice both ends (GLV)	A500 gr B
5	G5	RAIL TUBE HSS 8 x 4 x 5/16 x 20 ft - 9.75 in OAL - FIX splice 1 end, EXP splice 1 end (GLV)	A500 gr B
1	G6	RAIL TUBE HSS 8 x 4 x 5/16 x 20 ft - 1.625 in OAL - FIX splice 1 end, EXP splice 1 end (GLV)	A500 gr B
1	G7	RAIL TUBE HSS 8 x 4 x 5/16 x 17 ft - 8 in OAL - EXP splice both ends (GLV)	A500 gr B
3	G1	RAIL TUBE HSS 4 x 4 x 1/4 x 11 ft - 4.125 in OAL - EXP splice both ends (GLV)	A500 gr B
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137		ANCHOR SPACER PLATE PL 0.375 x 13.000 x 9.375	A709 gr B
548		ANCHOR STUD DBL END PART THREAD - 1" DIA x 12.000 w/ 2.250" THD EACH END (GLV)	A449
1096		HEAVY HEX NUT 1" (GLV)	A563 DH
548		ROUND WASHER (SAE) - 1" DIA SMALL (GLV)	F436
548		JAM NUT 1" (GALV)	A563 DH
548		ROUND HEAD POST BOLT slot or wrench head - no shoulder 3/4" DIA x 6" LG. FULL BODY (GLV)	A449 / A325
548		LOCK NUT 3/4" (GLV)	A563 DH
548		ROUND WASHER (SAE) 3/4" (GLV)	F436
336		HEX HEAD BOLT 5/8" DIA x 1.75" LG. (GLV)	A325
336		ROUND WASHER (SAE) 5/8" (GLV)	F436
48		SPACER PIPE - GALVANIZED 3/4" SCH. 40 x 1/2" LONG (GLV)	A53 gr B
137		BEARING PAD 0.125" THICK x 10.000 x 14.000 (NEOPRENE 80 duro +/-10)	aashto M251

Vermont Agency of Transportation

**RECEIVED**  
**ON: April 28, 2016**  
**and Checked for CONFORMANCE**  
**BY: Jennifer Fitch DATE: 05/02/16**

**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 AN APPROVED ZINC-RICH PAINT PRIOR TO 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 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.
- 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**

REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED BY THE DESIGNER ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK AND SUBJECT TO FURTHER LIVATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.

REJECTED  REVISE AND RESUBMIT  APPROVED AS NOTED

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DID NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRECTING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNICALS OF CONSTRUCTION, COORDINATING THEIR WORK WITH THAT OF ALL OTHER TRADES AND PERFORMANCE THEIR WORK IN A SAFE AND SATISFACTORY MANNER.

 C&D Consulting Engineers  
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Job Number: 150223  
 Reviewed by: SRB  
 Date: 04/29/2015

**HIGHWAY SAFETY CORP**  
 GLASTONBURY, CT  
 860-633-9445

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

TOWN OF IRASBURG, VERMONT  
 INTERSTATE 91 (PRINCIPAL ARTERIAL) BRIDGE NO. 107 N  
 ORLEANS COUNTY IM DECK (46)

GENERAL CONTRACTOR: LAFAYETTE

DATE: 04-27-16 SCALE: NONE SHEET: 4 of 5

**CERTIFIED FABRICATOR**

ISC JOB NO. 2103