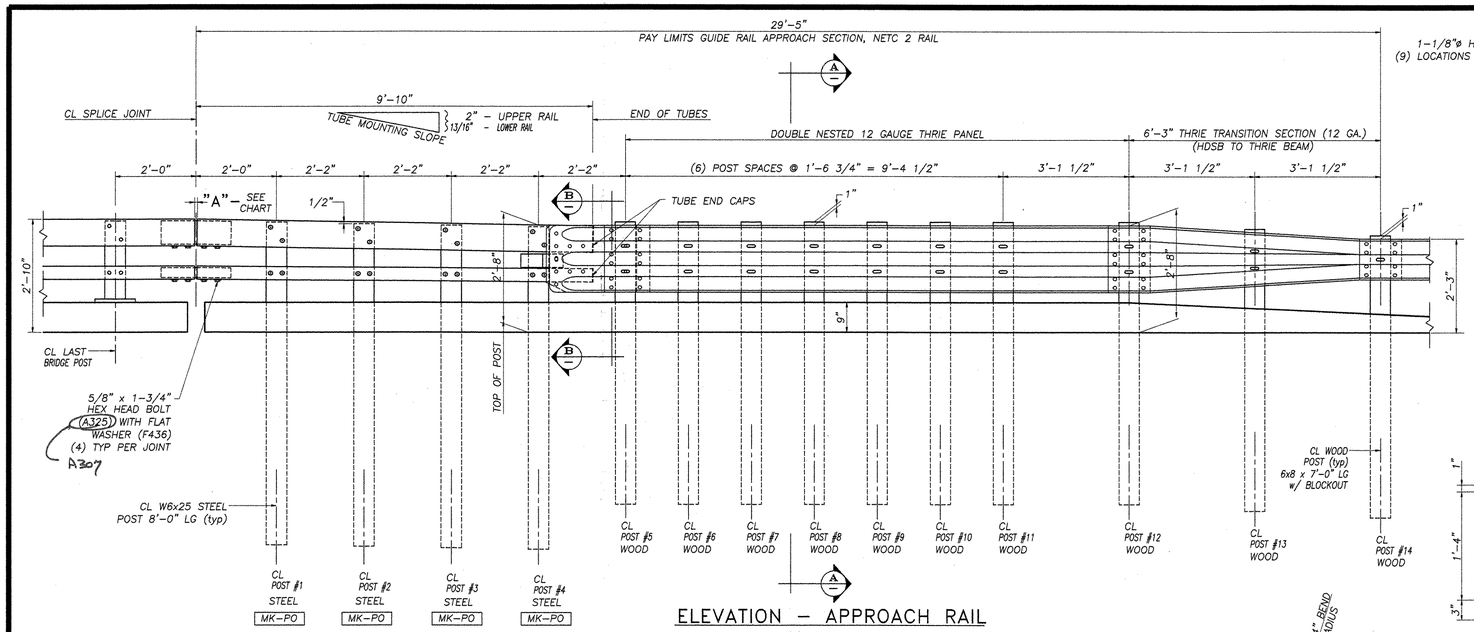
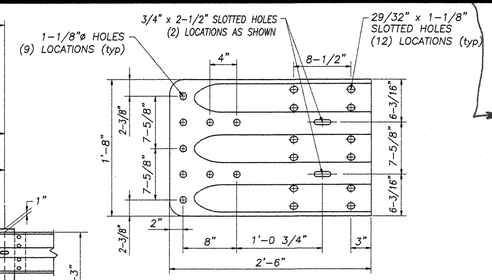


ELEVATION – APPROACH RAIL

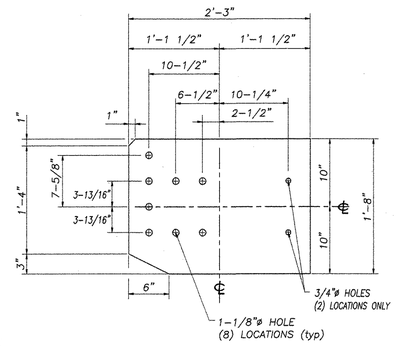
TYPICAL (4) LOCATIONS



TERMINAL CONNECTOR

10 GAUGE (AASHTO M180 B2)

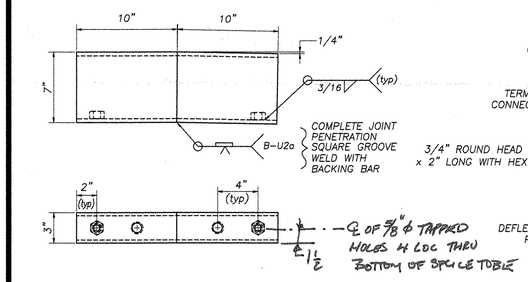
MK-TC



CONNECTION PLATE

3/8" x 1'-8" x 2'-3" (A709 gr 36)

MK-CP

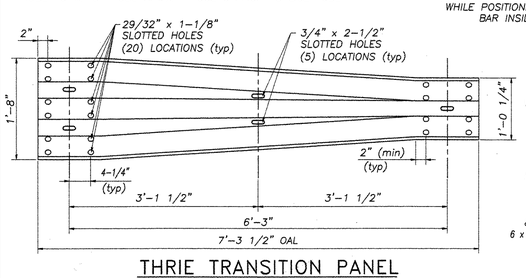


ANGLED SPLICE TUBE DETAIL

UPPER RAIL SPLICE SHOWN

SEE BRIDGE RAIL DETAILS (SHOP DRAWING #1354) FOR ADDITIONAL SPLICE TUBE FABRICATION & ASSEMBLY DETAILS

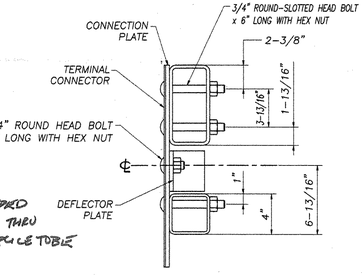
LOWER RAIL DOES NOT REQUIRE BENT SPLICE TUBE TO MATCH TUBE ANGLE – USE STRAIGHT SPLICE TUBE



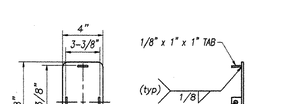
THRIE TRANSITION PANEL

12 GAUGE (AASHTO M180 A2)

MK-TTP



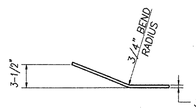
SECTION B–B

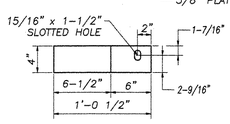


END CAP (8x4)

3/16" x 8" x 4" (A709 gr 36)

MK-ECU

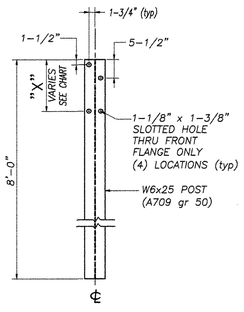




DEFLECTOR PLATE

3/8" x 4" PLATE (A709 gr 36)

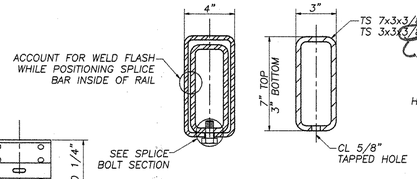
MK-DP



STEEL POST

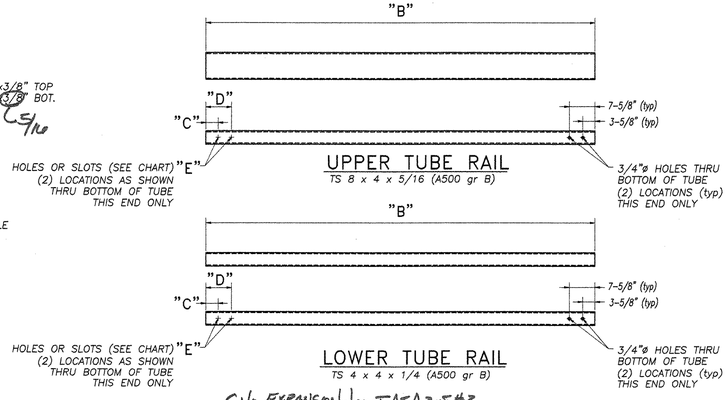
STEEL POST CHART

No.	" X "
#1	1'-3 3/4"
#2	1'-3 1/2"
#3	1'-3 3/16"
#4	1'-2 7/8"



SPLICE TUBE SECTION

MK-SPU
MK-SPL

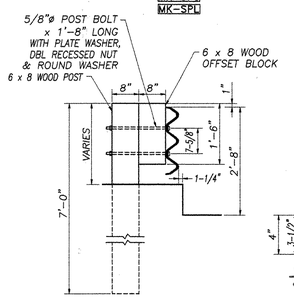


UPPER TUBE RAIL

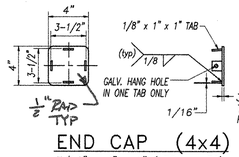
TS 8 x 4 x 5/16 (A500 gr B)

LOWER TUBE RAIL

TS 4 x 4 x 1/4 (A500 gr B)



SECTION A–A



END CAP (4x4)

3/16" x 4" x 4" (A709 gr 36)

MK-ECL

No EXPANSION JOINT AT ABUT #2
PER NOTE 6 ON SHEET 12

STEEL TUBE DIMENSIONS

No.	JOINT "A"	OAL "B"	"C"	"D"	"E"
TU-1	3/4" SPLICE	9'-9 5/8"	3-5/8"	7-5/8"	3/4" DIA HOLES
TU-2	2-1/2" EXPANSION	9'-8 3/4"	2-3/4"	6-3/4"	3/4" x 2-1/2" SLOTTED HOLES

SEE BRIDGE PLANS (SHOP DRAWING #1354) FOR LOCATIONS OF FIXED & EXPANSION JOINTS

No EXPANSION JOINT AT ABUT #2
PER NOTE 6 ON SHEET 12

BILL OF MATERIAL

BRIDGE No. 38

Mk.	Qty.	Description	Size/Shape	Length Qty. Per unit	Material
TU1	2	APPROACH RAIL TUBE (UPPER)	TS 8x4x5/16"	9'-9 5/8"	A500 Gr. B
	2	APPROACH RAIL TUBE (LOWER)	TS 4x4x1/4"	9'-9 5/8"	A500 Gr. B
TU2	2	APPROACH RAIL TUBE (UPPER)	TS 8x4x5/16"	9'-8 3/4"	A500 Gr. B
	2	APPROACH RAIL TUBE (LOWER)	TS 4x4x1/4"	9'-8 3/4"	A500 Gr. B
PO	16	STEEL POST	W6 x 25	8'-0"	A709 Gr. 50
	320	WOOD POST	6x8	7'-0"	
	320	WOOD OFFSET BLOCK	6x8	1'-6"	
SPU	4	SPLICE TUBE FOR 8 x 4 RAIL TUBE			TS 7x3x3/8
		TUBE	TS 7x3x5/16"	1'-8"	A500 Gr. B
		LOCK NUTS	5/8"	2 pcs.	A563
SPL	4	SPLICE TUBE FOR 4 x 4 RAIL TUBE			TS 3x3x5/16
		TUBE	TS 7x3x1/4"	1'-8"	A500 Gr. B
		LOCK NUTS	5/8"	2 pcs.	A563
TC	4	TERMINAL CONNECTOR	10 Ga.	2'-6"	M180 B2
CP	4	CONNECTION PLATE	PL 3/8 x 1'-8"	2'-3"	A709 Gr. 36
DP	4	DEFLECTOR PLATE	PL 3/8 x 4"	1'-9 1/2"	A709 Gr. 36
ECU	4	END CAP FOR 8 x 4 RAIL TUBE			
		PLATE	1/8 x 1" x1"	4 pcs.	A709 Gr. 36
		PLATE	PL 3/8 x 4"	8"	A709 Gr. 36
ECL	4	END CAP FOR 4 x 4 RAIL TUBE			1/8 x 1" x 1"
		PLATE	PL 3/16 x 1"	4 pcs.	A709 Gr. 36
		PLATE	PL 3/8 x 4"	4"	A709 Gr. 36
TTP	4	THRIE TRANSITION PANEL	12 Ga.	7'-3 1/2"	M180 A2
--	64	3/4"ø x 6" LG. ROUND HEAD BOLT W/NUT & ROUND WASHER			A325
--	4	3/4" x 2" LG. ROUND HEAD BOLT W/NUT			A307
--	76	5/8" x 1'-8" LG. POST BOLT W/DBL RECESSED NUT, PLATE & ROUND WASHER			A307
--	32	5/8" x 1 3/4" LG. HEX BOLT W/WASHER			A325
--	80	5/8" x 1 1/4" LG. PANEL SPLICE BOLT W/DBL RECESSED NUT			A307
--	32	3/4"x 1/2" LG. (SCH 40) SPACER PIPE			A53 Gr. B

A307

GENERAL ERECTION NOTES

1. ALL BRIDGE RAIL APPROACH RAIL MATERIALS, DIMENSION SIZES, AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGERAIL UNLESS OTHERWISE NOTED.
2. CARRIAGE BOLTS SHALL BE ASTM A307 AND NUTS SHALL BE ASTM A563 GRADE A OR BETTER (GALVANIZED)
3. CUT & WELD TOP SPLICE BAR TO FIT BEND. USE COMPLETE PENETRATION WELD B–L1A WITH BACKING BAR.
4. REFLECTORIZED ALUMINUM DELINEATION IS TO BE ERECTED EVERY 30 ft. (OR CLOSEST POST) WITH 2 NO. 8 x 3/4" SELF TAPPING SCREWS. DELINEATORS SHALL MEET SPECIFICATION REQUIREMENTS FOR ASTM B209 ALLOY 5052–H32.
5. REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.08 AND SHALL BE ENCAPSULATED LENS SILVER OR AMBER. AMBER IS TO BE INSTALLED ON THE DRIVERS LEFT AND SILVER ON THE RIGHT.
6. All work and materials shall conform to the provisions of Section 525 – Railings of the Vermont Standard Specifications for Construction.
7. Tubing & posts shall meet the requirements of Section 732 – Railing materials of the Standard Specifications for Construction.
8. All exposed cut or sheared edges shall be rounded to a 1/16" radius & be free of burrs.
9. Rail posts shall be set normal to grade.
10. Sections of rail bar shall be attached to a minimum of two (2) posts and preferably to at least four (4) posts.
11. Rail bar expansion joints shall be provided in any rail bay spanning a superstructure expansion joint. Expansion joint width shall be "X" at 45° F and will be adjusted in the field by the engineer.
12. All parts shall be galvanized after fabrication in accordance with AASHTO M111, except that hardware shall meet the requirements of AASHTO M232.
13. Rail bars shall be attached to steel posts using 3/4"ø full diameter body head bolts AASHTO M164 (Type–I) inserted through the face of the bar. Holes in post shall be 1/16" larger than the bolt size.
14. Holes in rails for attachment to posts will be field–drilled. Holes shall be coated with an approved zinc–rich paint prior to erection.
15. Radiused rails (if required) will be shop–curved. No field–bending of rail tubes.
16. The drop–weight tear test in section 732 shall not apply to the structure tubing on this standard.
17. The rail posts & base plates shall be tested for impact properties in accordance with ASTM A370 Charpy Impact Testing, using a type A specimen.

MATERIALS

Rail bars.....ASTM A500 GR B or ASTM A501
Rail posts.....ASTM A709 GR 50
All other shapes & plates.....ASTM A709 GR 36
Round–slotted head bolts for Rail–Post connections ..... M164 (type I)
Hex head bolts for tube splice joints ..... M164 (type 1)
All other bolts [unless noted].....ASTM A307

Nuts for ASTM A307 bolts & AASHTO M164 bolts shall comply with AASHTO M291. Nuts for anchor studs shall comply with ASTM A563.

washers shall comply with ASTM F436

1/8" pad shall comply with standard specification subsection 731.01 or 731.02 of Vermont Standard Specifications.

REVISIONS		
No.	Remarks	Date
0	Initial submittal	6/9/03

VENDOR SUBMITTAL REVIEW

REVIEW STATUS: APPROVED / APPROVED AS REVISED / REJECTED

CONTRACTOR ACTION: NONE / CONFIRM / RESUBMIT

REVIEW IS FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT AND CONTRACT DOCUMENTS. MARKINGS OF REVISIONS SHALL NOT BE CONSTRUED AS RELIEVING THE CONTRACTOR FROM COMPLIANCE WITH THE PROJECT PLANS AND SPECIFICATIONS NOR DEPARTURES THEREFROM. THE CONTRACTOR REMAINS RESPONSIBLE FOR DETAILS AND DIMENSIONS AND FOR SELECTING FABRICATION PROCESSES FOR THE PURPOSE OF ASSEMBLY AND FOR PERFORMING HIS WORK IN A SAFE MANNER.

BY [signature] DATE 8/5/03

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

ITEM 621.72 – GUARDRAIL APPROACH SECTION – NETC 2 RAIL
PROJECT No. IM-091-1(36)
TOWN OF HARTLAND
INTERSTATE ROUTE 91 BRIDGE No. 38
STATE OF VERMONT WINDSOR COUNTY

DRAWN	MHM
CHECKED	[signature]
DATE	5-28-03
SCALE	NONE
HSC REFERENCE NO.	1355
SIZE	D
REVISION	0
SHEET NO.	1 of 1
GENERAL CONTRACTOR	101
SUB CONTRACTOR	F.R. Lafayette, Inc.