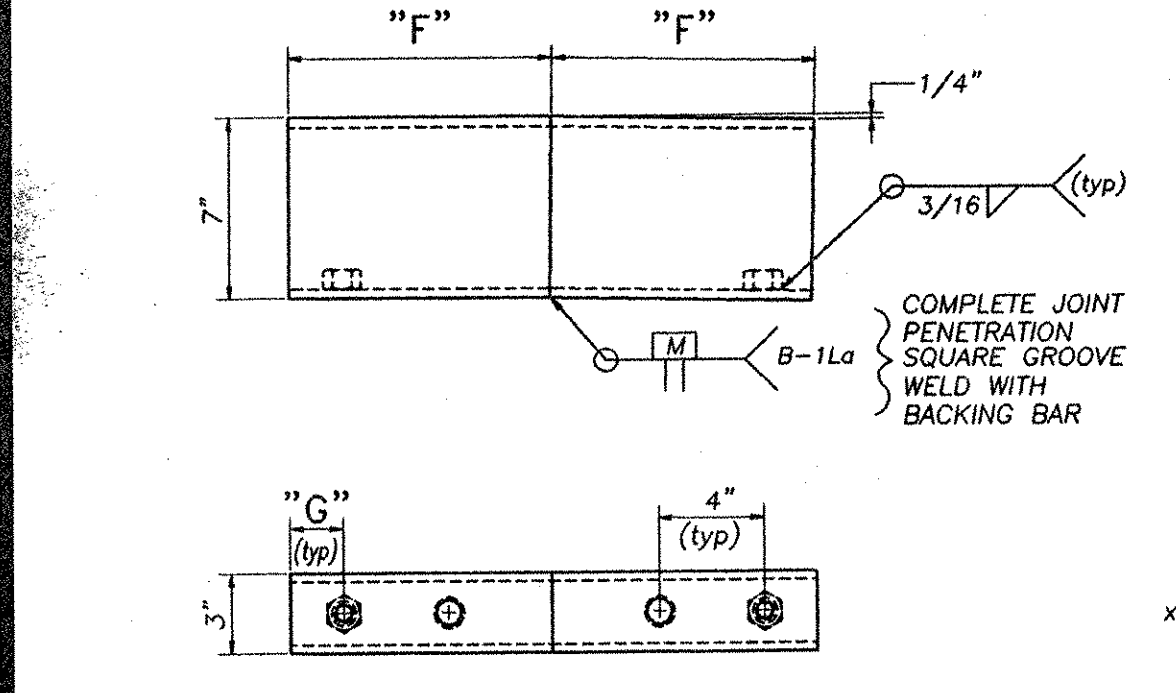


ELEVATION - APPROACH RAIL
TYPICAL (32) LOCATIONS



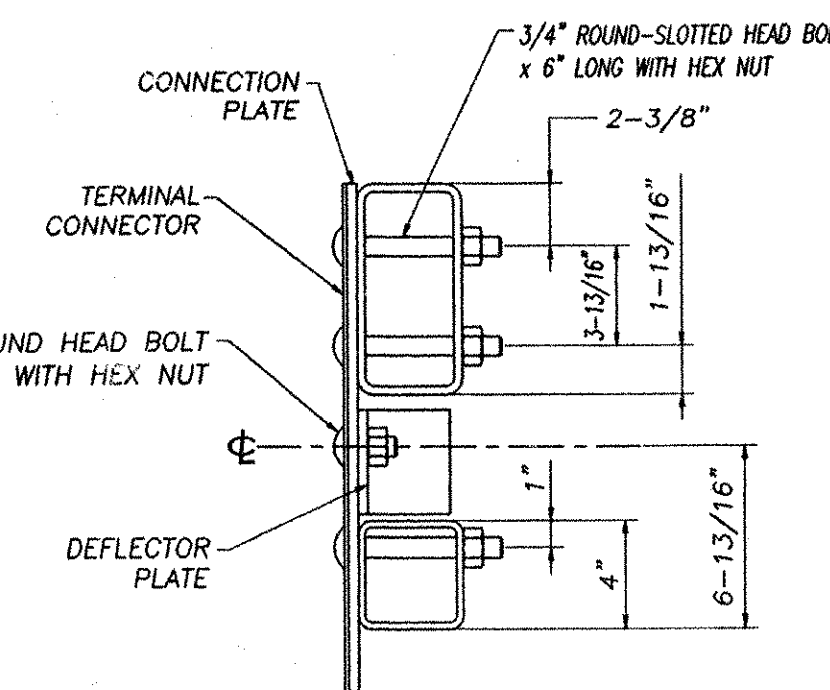
ANGLED SPLICE TUBE DETAIL
UPPER RAIL SPLICE SHOWN

SEE BRIDGE RAIL DETAILS (SHOP DRAWING #1237) FOR ADDITIONAL SPLICE TUBE FABRICATION & ASSEMBLY DETAILS

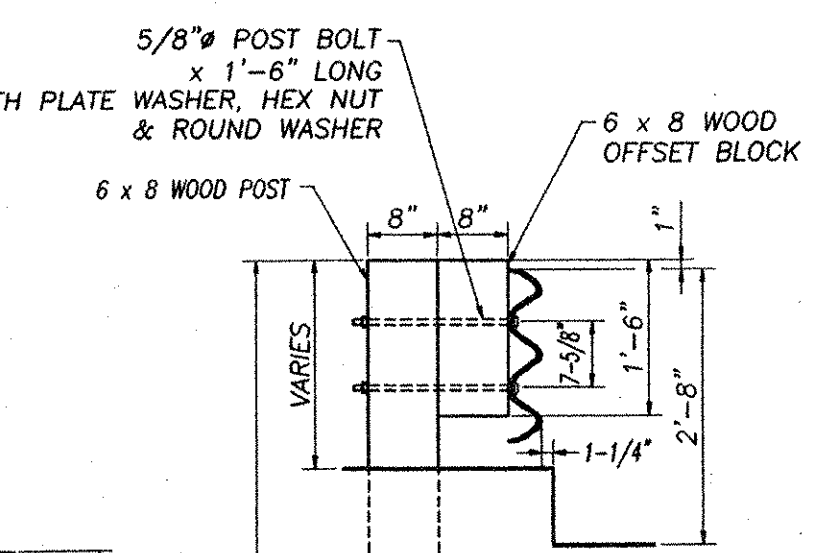
LOWER RAIL DOES NOT REQUIRE BENT SPLICE TUBE TO MATCH TUBE ANGLE - USE STRAIGHT SPLICE TUBE

SPLICE TUBE DIMENSIONS

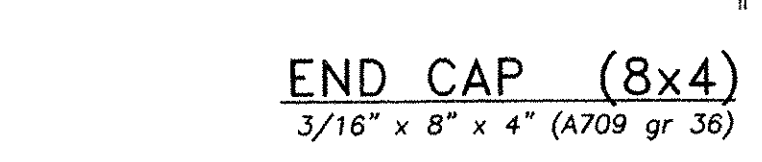
No.	JOINT "A"	"F"	"G"
SP-1	3/4" SPLICE	10"	2"
SP-2	2-1/2" EXPANSION	10"	2"
SP-3	4" EXPANSION	11-7/8"	2-3/8"



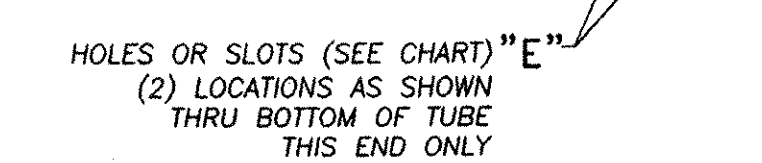
SECTION B-B



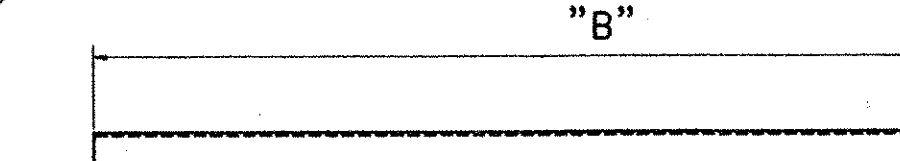
SECTION A-A



END CAP (8x4)
3/16" x 8" x 4" (A709 gr 36)



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)

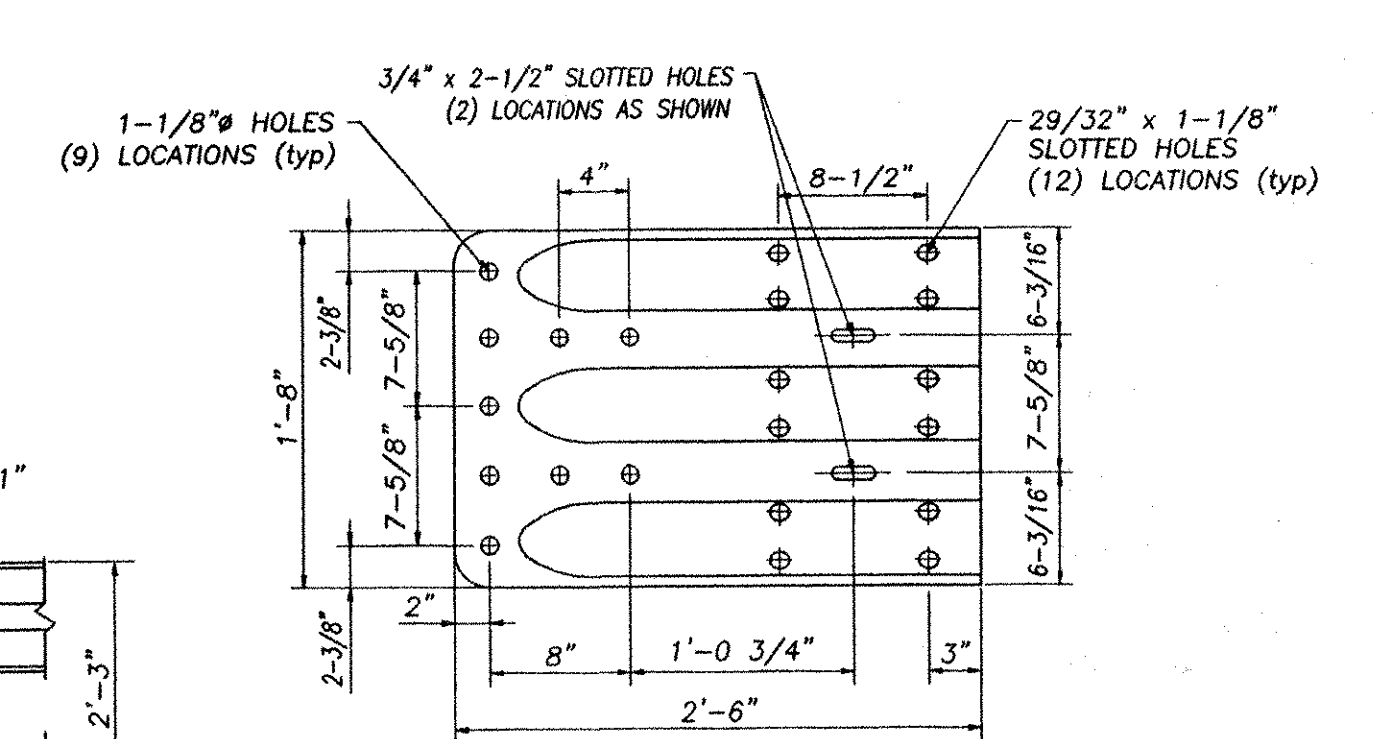
STEEL TUBE DIMENSIONS

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
TU-3	4" EXPANSION	9'-8"	3 1/2"	7 1/2"	3/4" x 3-1/2" SLOTTED HOLES

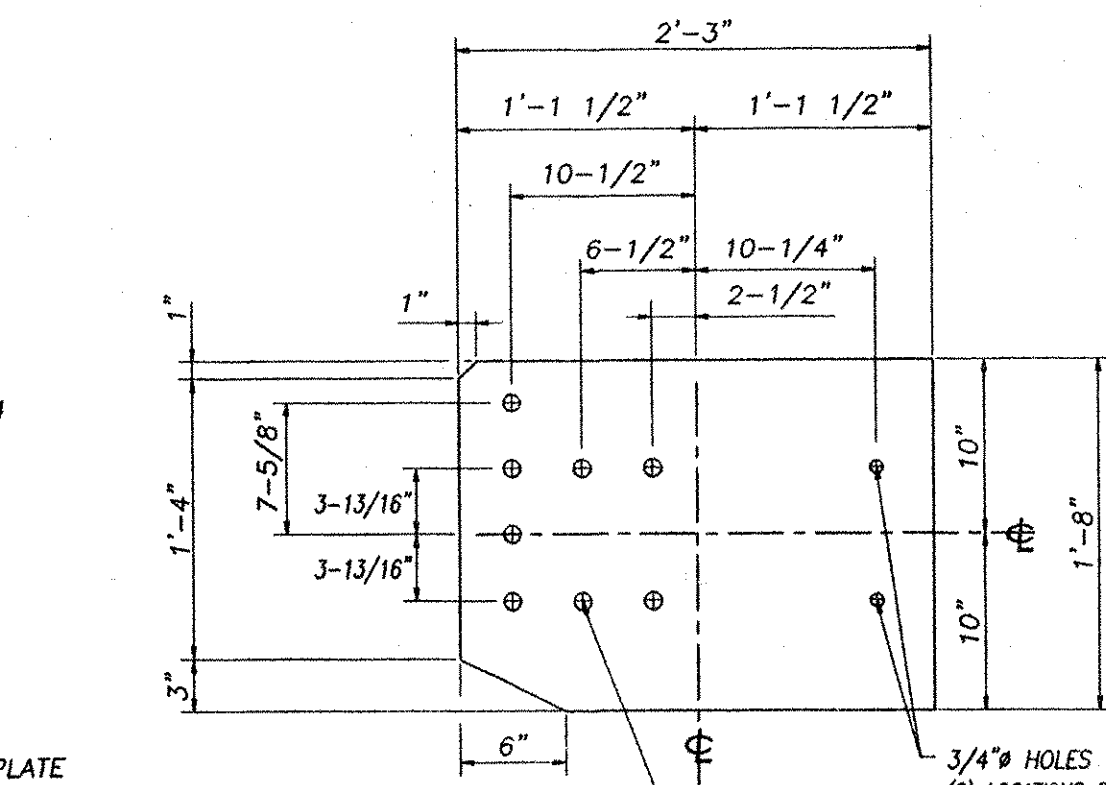
SEE BRIDGE PLANS (SHOP DRAWING #1237) FOR LOCATIONS OF FIXED & EXPANSION JOINTS

REVISIONS

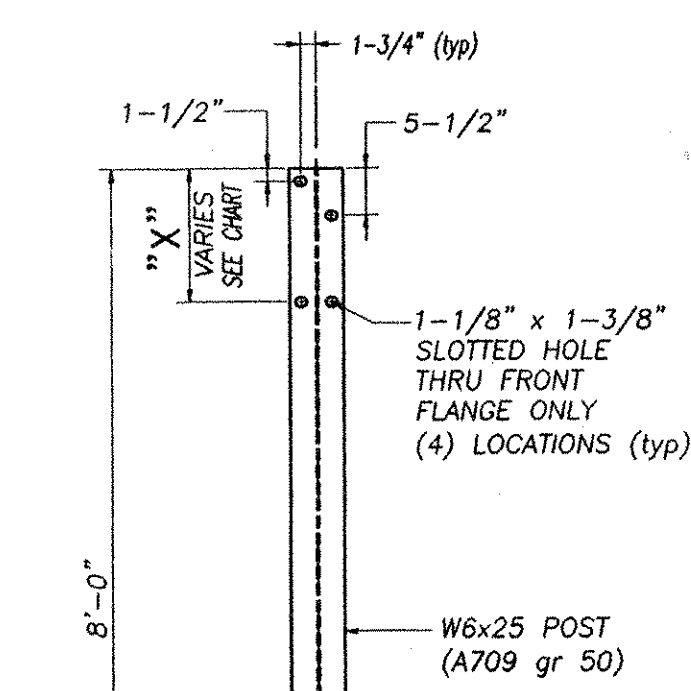
No.	Remarks	Date
0	Initial submittal	4/2/01



TERMINAL CONNECTOR
10 GAUGE (AASHTO M180 B2)



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



STEEL POST

STEEL POST CHART

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

BILL OF MATERIAL

Mk.	Qty.	Description	Material
128		STEEL POST W6x25 x 8'-8" OAL	A709 gr 50
320		WOOD POST 6x8 x 7'-0" OAL	
TU-1	16	RAIL (UPPER) TS 8x4x5/16 x 9'-9 5/8" (FIXED END)	A500 gr B
TU-2	16	RAIL (UPPER) TS 8x4x5/16 x 9'-8 3/4" (2-1/2" EXP END)	A500 gr B
TU-3	0	RAIL (UPPER) TS 8x4x5/16 x 9'-8" (4" EXP END)	A500 gr B
TU-1	16	RAIL (LOWER) TS 4x4x1/4 x 9'-9 5/8" (FIXED END)	A500 gr B
TU-2	16	RAIL (LOWER) TS 4x4x1/4 x 9'-8 3/4" (2-1/2" EXP END)	A500 gr B
TU-3	0	RAIL (LOWER) TS 4x4x1/4 x 9'-8" (4" EXP END)	A500 gr B
64		THRIE TRANSITION PANEL - 12 GA	M180 A2
32		THRIE FLAT LIP TERMINAL CONNECTOR (10 GA)	M180 B2
32		END CAP FOR 8 x 4 TUBE RAIL	A709 gr 36
32		END CAP FOR 4 x 4 TUBE RAIL	A709 gr 36
32		DEFLECTOR PLATE	A709 gr 36
32		CONNECTION PLATE 3/8" x 1'-8" x 2'-3"	A709 gr 36
320		WOOD OFFSET BLOCK 6x8 x 1'-6" LONG	
640		5/8" x 1'-6" LONG POST BOLT w/ PLATE WASHER, HEX NUT & ROUND WASHER	A307
768		3/4" x 6" LONG ROUND-SLOTTED HEAD BOLT WITH ROUND WASHER & LOCK NUT	A325
32		3/4" x 2" LONG ROUND HEAD BOLT WITH HEX NUT	A307
1024		5/8" x 1-1/4" SPLICE BOLT w/ DOUBLE RECESSED NUT	A307
SP1	SP2	32 UPPER RAIL SPLICE TUBE (ANGLED) - TS 7x3x3/8 1'-8" OAL	A500 gr B
SP3	0	UPPER RAIL SPLICE TUBE (ANGLED) - TS 7x3x3/8 1'-11 3/4" OAL	A500 gr B
0	32	LOWER RAIL SPLICE TUBE (STRAIGHT) - TS 3x3x5/16 1'-8" OAL	A500 gr B
0	0	LOWER RAIL SPLICE TUBE (STRAIGHT) - TS 3x3x5/16 1'-11 3/4" OAL	A500 gr B
256		5/8" x 1-3/4" HEX HEAD BOLT w/ ROUND WASHER	A325
128		SPACER PIPE 3/4"-in SCH 40 x 1/2" LONG	A53

GENERAL ERECTION NOTES

- ALL BRIDGE RAIL APPROACH RAIL MATERIALS, DIMENSION SIZES, AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGERAIL UNLESS OTHERWISE NOTED.
- CARRIAGE BOLTS SHALL BE ASTM A307 AND NUTS SHALL BE ASTM A563 GRADE A OR BETTER (GALVANIZED)
- CUT & WELD TOP SPLICE BAR TO FIT BEND. USE COMPLETE PENETRATION WELD B-11A WITH BACKING BAR.
- 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.
- 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.
- All work and materials shall conform to the provisions of Section 525 - Railings of the Vermont Standard Specifications for Construction.
- Tubing & posts shall meet the requirements of Section 732 - Railing materials of the Standard Specifications for Construction.
- All exposed cut or sheared edges shall be rounded to a 1/16" radius & be free of burrs.
- Rail posts shall be set normal to grade.
- Sections of rail bar shall be attached to a minimum of two (2) posts and preferably to at least four (4) posts.
- 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.
- All parts shall be galvanized after fabrication in accordance with AASHTO M111, except that hardware shall meet the requirements of AASHTO M232.
- Rail bars shall be attached to steel posts using 3/4" 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.
- Holes in rails for attachment to posts will be field-drilled. Holes shall be coated with an approved zinc-rich paint prior to erection.
- Radiused rails (if required) will be shop-curved. No field-bending of rail tubes.
- The drop-weight tear test in section 732 shall not apply to the structure tubing on this standard.
- 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.

TVGA
ENGINEERING, SURVEYING, P.C.

NO EXCEPTIONS TAKEN REJECTED
 FURNISH AS CORRECTED
 REVISE AND RESUBMIT

ENGINEER HAS REVIEWED SHOP DRAWINGS AND SAMPLES AND OTHER DATA WHICH CONTRACTOR IS REQUIRED TO SUBMIT, FOR CONFORMANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS AND COMPATIBILITY WITH THE DESIGN CONCEPT OF THE PROJECT AS A FUNCTIONING WHOLE AS INDICATED IN THE CONTRACT DOCUMENTS. SUCH REVIEW DOES NOT EXTEND TO METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OF CONSTRUCTION OR TO SAFETY PRECAUTIONS AND PROGRAMS INCIDENT HERETO. CONTRACTOR IS RESPONSIBLE FOR INFORMATION THAT IS OBTAINED AND CORRELATED AT THE JOB SITE FOR INFORMATION THAT WILL BE OBTAINED BY THE FABRICATION PROCESSES OR TO TECHNIQUES OF CONSTRUCTION; AND FOR COORDINATION OF THE WORK OF ALL TRADES.

BY: *BSC*
DATE: 5-15-01

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

ITEM 621.72 - GUARDRAIL APPROACH SECTION - NETC 2 RAIL
 PROJECT No. IM-089-2(26)
 TOWN OF MIDDLESEX & BOLTON
 INTERSTATE ROUTE 89

GENERAL CONTRACTOR: WINTERSSET, INC.
 SUB CONTRACTOR: F.R. LAFAYETTE INC.

DRAWN: P. Radice
 CHECKED: *[Signature]*
 DATE: 3/30/01
 SCALE: NONE
 HSC REFERENCE NO.: 1250
 SHEET NO.: 1 of 1