## NOTES

## METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A.  $\frac{1}{2}$ " PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B.  $\frac{3}{4}$ " STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A  $\frac{3}{4}$ " Ø X  $1\frac{5}{8}$ " BOLT WITH 2" O.D. WASHER IN PLACE. THE  $\frac{3}{4}$ " Ø X  $1\frac{5}{8}$ " BOLT SHALL HAVE N. C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- D. STANDARD CLAMP BARS (SEE STD. NO. BMR6 ).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE LUMP SUM COST FOR CONSTRUCTION OF SUPERSTRUCTURE.

THE  $\frac{3}{4}$ " STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE  $\frac{3}{4}$ " STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE  $\frac{1}{2}$ " PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE LUMP SUM COST FOR CONSTRUCTION OF SUPERSTRUCTURE.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE  $\frac{3}{4}$ "  $\frac{3}{4}$ 

## NOTES STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF  $1\frac{1}{2}$ ".
- B.  $1 \frac{3}{4}$ " Ø X  $1\frac{5}{8}$ " BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 1/4" Ø X 15/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A  $7_{16}$ " Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

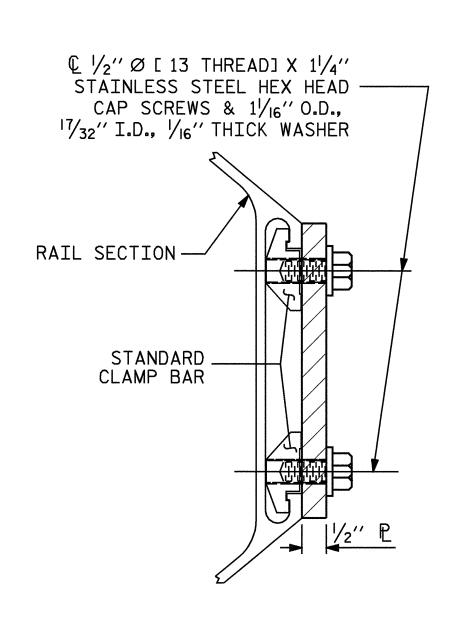
R.P.W.(TYP.ALL\

→ FERRULE

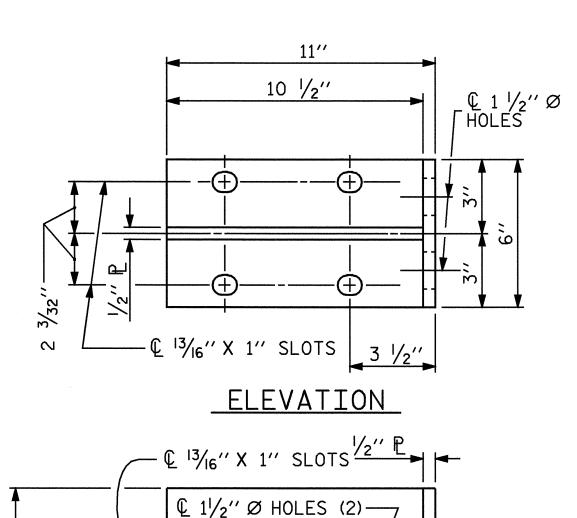
— 0.375" Ø -WIRE STRUT

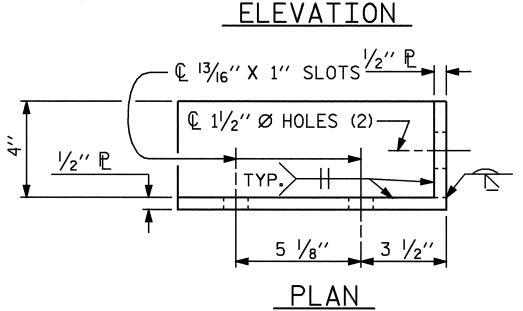
CONTACT POINTS )/

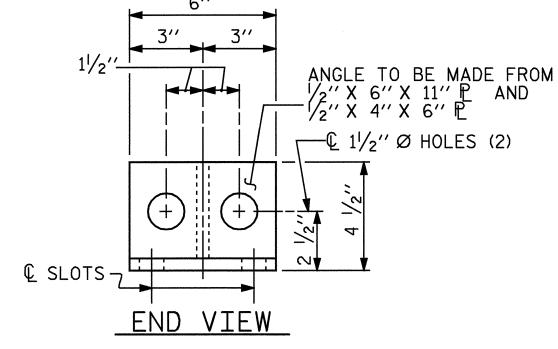
PLAN











DETAILS FOR ATTACHMENT BRACKET (BOTTOM RAIL ONLY)



SHEET 3 OF 4 STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD

ELEVATION

STRUCTURAL CONCRETE

\* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO.

STATION: \_

CLOSED-END FERRULE

B-3685

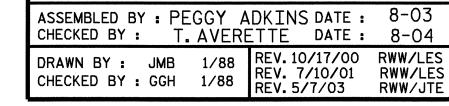
17+47.50 -L-

COUNTY

3 BAR METAL RAIL

FEBRUARY						1988
REVISIONS						SHEET NO.
0.	BY:	DATE:	NO.	BY:	DATE:	S-10
			3			TOTAL SHEETS
2			4			27

--- ... -...



└─ ₡ <sup>13</sup>/<sub>16</sub>" X 1" SLOTS

ELEVATION · € <sup>13</sup>/<sub>16</sub>" X 1" SLOTS € 11/2" Ø HOLE7 <u>1/2" P</u> 5 1/8′′ <u>PLAN</u>

♠ RAIL POST —

ATTACHMENT BRACKET-

 $\mathbb{Q} \frac{1}{2}$  Ø [ 13 THREAD] X  $\frac{1}{4}$ 

1/16" THICK WASHER

RAIL SECTION-

10 1/2"

STANDARD

CLAMP BAR

PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" ₱ NOT SHOWN FOR CLARITY )

SECTION H-H

(FOR TOP & MIDDLE RAIL )

© 11/2" Ø HOLE →

STAINLESS STEEL HEX HEAD CAP

SCREWS &  $1\frac{1}{16}$ " O.D.,  $1\frac{7}{32}$ " I.D.,

RAIL SECTION-

STANDARD

BAR CLAMP

€ SLOTS ¬ END VIEW (FIX. AND EXP.)

EA.SIDE

\_3¼''ØX 15%'' BOLT AND 2'' O.D.WASHER

ROADWAY FACE

- @ ½″∅[13 THREAD]X 1¼″

ANGLE TO BE MADE FROM

1/2" X 4" X 11" P AND

1/2" X 4" X 4" P

STAINLESS STEEL HEX

HEAD CAP SCREWS &

1/<sub>16</sub>" O.D., 17/<sub>32</sub>" I.D. 1/<sub>16</sub>" THICK WASHER

— Ç ¾′′ STRUCTURAL CONCRETE INSERT

-7 1/2"

DETAILS FOR ATTACHMENT BRACKET (TOP & MIDDLE RAIL ONLY)