The metal rail to end post connection shall consist of the following components:

1. Ф 7\(\text{s} \times 11\text{"}" structural concrete insert shall consist of a Ф 7\(\text{s} \times 11\text{"}" bolt with a Ф 7\(\text{s} \times 11\text{"}" washer. The bolt shall engage a Ф 3\(\text{s} \times 6\text{"}" bolt with a Ф 3\(\text{s} \times 6\text{"}" washer."

2. Cap screws for rail attachment to structural concrete shall conform to the requirements of ASTM A307. The cap screws shall be centered in slots at 60°. The washers shall be made from alloy 304 stainless steel."

3. Standard clamp bars (STD. NO. BMR7) shall be included in the unit contract price for linear feet of 3 bar metal rail.

4. The Ф 7\(\text{s} \times 11\text{"}" structural concrete insert with bolt shall be assembled in the shop."

The structural concrete insert assembly shall consist of the following components:

- FERRULES SHALL ENGAGE A Ф 3\(\text{s} \times 6\text{"}" BOLT WITH WASHER. BOLT SHALL HAVE N. C. THREADS.
- 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°. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- STANDARD CLAMP BARS (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 UNIT CONTRACT PRICE FOR LINEAR FEET OF 3 BAR METAL RAIL.
- THE Ф 7\(\text{s} \times 11\text{"}" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE Ф 7\(\text{s} \times 11\text{"}" STRUCTURAL CONCRETE INSERT ASSEMBLY AND THE Ф 7\(\text{s} \times 11\text{"}" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- 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 NOT REQUIRED.

The cost of the Ф 7\(\text{s} \times 11\text{"}" structural concrete insert with bolt shall be included in the unit contract price for linear feet of 3 bar metal rail. The Ф 7\(\text{s} \times 11\text{"}" structural concrete insert with bolt shall be assembled in the shop. The Ф 7\(\text{s} \times 11\text{"}" structural concrete insert assembly and the Ф 7\(\text{s} \times 11\text{"}" plates complete in place shall be included in the various pay items.

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 NOT REQUIRED.

The structural concrete insert assembly shall consist of the following components:

- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
- Ф 3\(\text{s} \times 6\text{"}" BOLT WITH WASHER SHALL ENGAGE A Ф 3\(\text{s} \times 6\text{"}" BOLT WITH WASHER. BOLT SHALL HAVE N. C. THREADS.

The use of this alternate shall be approved by the engineer. 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. An option Ф 3\(\text{s} \times 6\text{"}" wire strut with a minimum tensile strength of 150,000 psi is acceptable.

THE COST OF THE Ф 7\(\text{s} \times 11\text{"}" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR LINEAR FEET OF 3 BAR METAL RAIL. THE Ф 7\(\text{s} \times 11\text{"}" STRUCTURAL CONCRETE INSERT SHALL MEET THE REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

- FERRULES SHALL ENGAGE A Ф 3\(\text{s} \times 6\text{"}" BOLT WITH WASHER. BOLT SHALL HAVE N. C. THREADS.
- 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°. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- STANDARD CLAMP BARS (STD. NO. BMR6).