

ITEM 450

CONCRETE AND STEEL RAILING

- 450.1 Description. This Item shall govern for the construction of concrete or steel railing, or a combination of these materials on bridges, culverts, walls, or incidental structures as shown on the plans.

In general, railing shall include that portion of the structure erected on and above the roadway or along the edges of walks, curbs and/or slabs for the protection of traffic and pedestrians and shall include any tie-in anchorage to approach railing or guard fence.

Railing, including the necessary anchorage, shall be in accordance with these specifications and the details shown on the plans.

- 450.2 Materials. All materials shall conform to the requirements of the items, "Concrete Structures", "Reinforcing Steel", "Metal for Structures", "Steel Structures" and "Concrete".

- 450.3 Quality Assurance. Bridge railings shall meet the requirements of the Texas Department of Transportation's, "Standard Specifications for Construction of Highways, Streets and Bridges", 1993 edition and as hereinafter amended.

- 450.4 Submittals. Contractor shall submit fabrication drawings for metal railing, showing construction and materials.

- 450.5 Steel Railing. Fabrication and erection of railing shall conform to the pertinent provisions of the Item "Steel Structures" and to the requirements of these specifications.

Splicing of members will be permitted only as provided by the plans. All splice locations and details shall be shown on the shop or erection drawings. For metal railings, shop or erection drawings shall be prepared and forwarded for approval in accordance with the requirements of the Item "Steel Structures".

Shop welding shall be in accordance with the Item "Steel Structures" while field welding, when required, shall be in accordance with the Item "Structural Welding".

Pipe rail and posts, shop fabricated into panels shall be mounted in a jig clamped in their true relative position, accurately spaced with respect to each other and while assembled shall be completely welded or bolted, as the case may be. When required by the plans, as each rail section is completely assembled and connected, the adjacent section shall be set in its proper relative position with the ends engaged and remain in this position until completely connected. Each pair of sections shall be

matchmarked so they may be erected in the same order in which they were fabricated.

The fabricated elements for deep beam railing shall conform to the dimensions and cross-section shown on the plans. The rail shall be straight and free from warp. The maximum deviation for straightness of either edge of a full length section shall be one-half of an inch. Rail elements shall be jointed and connected to the rail posts as shown on the plans. Lapped elements shall have the lap in the direction of traffic in the adjacent lane.

- 450.6 Concrete Railing. The concrete portions of railing shall conform to the provisions of the Item "Concrete Structures", and to the requirements of this specification. Provisions shall be made in constructing forms to provide for checking and correction of railing lines and grades after concrete has been placed, but before initial set. The finish floating of the railing tops shall not disturb the form alignment after the final check. Particular care shall be exercised in other construction operations to avoid disturbing or vibrating the span with the newly placed railing.

Reinforcing steel for concrete railing shall conform to the pertinent provisions of the Item, "Reinforcing Steel".

Concrete railing may be constructed with slip-forms with equipment approved by the Engineer. Sensor control for both line and grade must be provided.

Whether slip-formed, cast in place or precast, the concrete must be cured with membrane curing compound.

- 450.7 Protective Coating. Unless otherwise noted on the plans, all portions of steel railing shall be galvanized.

Galvanized railing shall be hot dipped galvanized after fabrication, in accordance with ASTM A123 and A153.

After erection, any damaged galvanizing on steel posts and rail elements shall be thoroughly cleaned and painted with two coats of zinc dust-zinc oxide paint conforming to the requirements of Federal Specification TT-P-641b or repaired by the application of repair compounds meeting Federal Specification 0-G-93.

When fabrication is done after galvanizing and when specifically required by the plans, the cut edges and bolt holes shall be cleaned by brushing and the cleaned area shall be treated as specified above.

- 450.8 Measurement. Railing, of the type designated, shall be measured by the linear foot, in accordance with the dimensions and details shown on the plans. Measurement will be made upon the face of the rail in place.

450.9 Payment. Payment will be made at the contract unit price bid per linear foot for railing of the type indicated on the plans, complete in place, measured as provided herein, which price shall be full compensation for furnishing, preparing and placing of all concrete, expansion joint material, reinforcing steel, structural steel, pipe, anchor bolts, anchorage devices and all other materials required in the finished railing and for all labor, tools, hardware, equipment, galvanizing and all other incidentals necessary to complete the work in the manner and in accordance with the plans and these specifications.

There are line code(s), description(s), and unit(s) for this item.

END OF ITEM 450