

BRIDGE RAILING, GALVANIZED STEEL TUBING/CONCRETE COMBINATION

**From Chester BRF 025-1(28)/BRF 025-1(37)

- xx. DESCRIPTION. This work shall consist of furnishing and erecting cast-in-place concrete bridge railing with galvanized steel tube rail in accordance with the Plans and as directed by the Engineer.

The work under this Section shall be performed in accordance with these provisions, the Plans, and Sections 501 and 525 of the Standard Specifications.

- xx. MATERIALS. Materials shall meet the following requirements:

- (a) Concrete. Concrete shall meet the requirements of SELF-CONSOLIDATING CONCRETE of Section 900.

Coarse aggregate for concrete shall meet the requirements of Subsection 704.02, Table 704.02A.

- (b) Reinforcing Steel. Reinforcing steel shall meet the requirements of Section 507 for Epoxy Coated Reinforcing Steel.

- (c) Steel Tubing. Steel tubing shall meet the requirements of Subsection 732.03.

- (d) Connection Plate. Connection plate for anchoring approach railing terminal connector shall meet the requirements of Subsection 714.02.

- xx. FABRICATION. Fabrication tolerances for all cast-in-place concrete barrier, regardless of the method of construction, shall conform to the following finished tolerances:

Bar Reinforcement Cover	-0, + $\frac{1}{2}$ inch
Width (Top)	-0, + $\frac{1}{4}$ inch
Width (Bottom)	-0, + $\frac{1}{2}$ inch
Surface Straightness (Deviation from theoretical centerline)	$\frac{1}{2}$ inch in 20 feet
Vertical Alignment (Deviation from a line parallel to the theoretical grade line)	$\frac{1}{2}$ inch in 20 feet

- xx. CONSTRUCTION REQUIREMENTS. The barrier shape detailed on the Plans shall not be altered. Slip forming of barrier is not allowed.

- xx. FORMS. Forms shall conform to the railing design shown on the Plans and the forming requirements of Section 501. Forms shall be constructed to allow for checking and correcting the railing alignment and grade after the concrete has been placed and prior to initial set. The forms shall be reinforced in such a manner that finishing of the railing tops will not disturb the final adjusted alignment.

- xx. CONCRETE FINISHING. Concrete bridge railing shall have a dressed finish. In addition, the following work shall be performed:

- (a) Repairs/Patching. Areas that contain minor defects shall be repaired. Minor defects are defined as holes, honeycombing, or

spalls which are 6 inches or less in diameter and do not penetrate deeper than 1 inch into the concrete. Surface voids, or "bugholes", that are less than 1/4 inch in diameter and less than 1/8 inch deep need not be repaired. Repairs shall be made using an overhead and vertical concrete repair material satisfactory to the Engineer. The repair material shall be cured as specified by the manufacturer. Repairs shall be approved by the Engineer.

(b) Cracking. Cracks less than 0.01 inch in width shall be sealed by a method approved by the Engineer. Cracks in excess of 0.01 inch may be cause for rejection. At the Engineer's discretion, cracks shall be repaired or the bridge railing replaced at the Contractor's expense.

xx. CURING CONCRETE. Curing compound shall not be used in curing railing concrete.

The Contractor and all other project personnel shall take particular care when performing any construction or other operations during the railing curing period in order that the bridge deck is not struck, shaken, or vibrated. After the curing period is completed, all parties shall take care to avoid damaging the railing during the remainder of project construction.

xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Bridge Railing, Galvanized Steel Tubing/Concrete Combination) to be measured for payment will be the number of meters (linear feet) of railing constructed in the complete and accepted work. Measurement will be made along the face of the railing between the pay limits specified.

xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Bridge Railing, Galvanized Steel Tubing/Concrete Combination) will be paid for at the Contract unit price per meter (linear foot). Payment shall be full compensation for detailing, furnishing, handling, and placing the materials specified and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work, including the furnishing of all forms, reinforcing steel, joint filler, admixtures, trial batches, connection plates for approach railing terminal connectors, and satisfactory completion of any necessary repairs, surface finishing, and curing.

Water Repellent, Silane used within the pay limits of Bridge Railing, Galvanized Steel Tubing/Concrete Combination will be paid for separately under Contract item 514.10.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.640 Special Provision (Bridge Railing, Galvanized Steel Tubing/Concrete Combination)	Meter (Linear Foot)