ITEM 11568.75 M - EXISTING FASCIA BRIDGE RAILING UPGRADE - DOUBLE BOX BEAM RAIL

DESCRIPTION:

This work shall consist of furnishing and erecting a double box beam railing upgrade onto the existing steel fascia railing system and the appropriate treatment at barriers, parapets, fixed objects, objects requiring access and end conditions. The upgrade shall be as shown on the Contract plans, in accordance with the Specifications, and/or as directed by the Engineer. The work shall be installed at the locations shown, or as directed by the Engineer. The upgrade work shall also include the strengthening of the existing railing posts, that support the new double box beam railing upgrade, by furnishing and installing reinforcing angles at the post base as detailed.

MATERIALS:

Materials used in this work shall be galvanized, unless otherwise indicated, and shall conform to the following requirements:

Galvanized Steel Bridge Railing	710-23
Concrete Grouting Material	701-05
Anchor Studs (Bolts) - ASTM A449	723-60
Shapes, Plates, Bars, Shims - ASTM A36M	715-01
Galvanizing and Repair Methods	710-23

CONSTRUCTION DETAILS:

A. **Fabricator Notification.** Within fourteen (14) calendar days from the award of Contract, the Contractor shall notify the D.C.E.S. of the name and address of the Fabricator of the bridge railing upgrade material. This notification shall list the specific shop or shops in which the railing upgrade material shall be fabricated.

B. **Contractor Verification of Existing Conditions and Measurement Taking.** The existing fascia railing system shall be inspected by the Contractor to determine the actual railing configuration, construction and extent of the existing railing system at the upgrade locations. Measurements shall be taken by the Contractor of all features, that are related to or have an impact on the upgrade work, in order to locate/dimension: railings; fasteners; post spacings; curvatures; attachments; and anchorages. Additionally, the Contractor shall locate all existing obstructions including mechanical, electrical, camera/communication systems contained within, in front of or behind the existing railing that will interfere with the installation of the new railing upgrade system. Existing access doors/panels and splicing chamber/boxes along the fascia curbline that will be obstructed by the new upgrade shall be accurately located. The Engineer shall be notified of all obstructions. Existing items attached to the existing railing for support that will require relocation, temporary disconnection and/or re-attachment to the existing railing shall be identified, located and brought to the Engineer's attention. Relocation work shall be performed by Others or under another Contract pay item. Field verification and measurement work shall be performed prior to submitting shop drawings and fabrication.

C. **Modifications and Adjustments.** Modifications or adjustments to the proposed work, as a result of field conditions, will be considered part of the work.

D. **Erection of Bridge Railing Upgrade.** All the requirements of Subsections 568-3.01 A, B, C, E, F, L, M, N will apply, except as modified in this Specification.

The double box beam rails shall be connected to the existing multiple flat plate type posts of the existing fascia railing by installing wide flange spacers or tee brackets clamped, or bolted to the posts, as shown on the plans. The holes in the rails at the supporting angles may be shop or field drilled at the Contractor's option. If shop drilled holes are selected, then the Contractor shall take accurate measurements of the existing post spacings to assure the proper fit of the proposed railing upgrade. Due regard shall be taken of the ambient temperatures during measurement taking and fabrication, with appropriate compensation made as required. The bridge railing upgrade shall terminate with end or corner treatments that are capped, fastened to existing steel or concrete curbing, anchored to existing concrete barriers, walls or parapets and extended using closure plates, as shown on the plans.

Reinforcing angles (or bent plates) shall be installed at the base of existing posts which support the new railing upgrade, by bolting or field welding to the existing post and field welding to the existing steel curbing, as shown on the plans. All welding shall be in accordance with the New York State Steel Construction Manual (NYSSCM). Reinforcing angles are not required at posts supported by concrete curbing or walls. Reinforcing angles shall be shipped to the field uncoated and shall be field cleaned and painted under a separate pay item.

Removable sections of rails shall be installed as detailed to allow access to the existing mechanical/electrical system behind or below the new double box beam rails. Splices shall be installed to allow rail removal. Welded splices of the box beams shall not be permitted.

The Contractor shall furnish and install all modifications and/or adjustments to the proposed railing upgrade as a result of field conditions or field measurements obtained during the field verification process.

E. **Shop Curving the Box Beam Rails.** The new rails shall be shop curved to the radius that the rails will be installed on. The shop curving shall be required where the radius is equal to or less than 200 meters. The radius of curvature shall be stamped into the base metal of the rail. The stamp shall be on the vertical faces, at or near both ends of the rail section, and in a location where it will be visible to the worker after erection.

F. **Temporary End Treatments.** The Contractor shall install temporary end treatments so as to minimize any hazard that would be caused by leaving an exposed rail end resulting from a temporary stoppage of work. The temporary end treatment shall be temporarily connected to the new rails as shown on the plans and shall be removed and stored to permit continuation of the work during the following work period. The temporary bolts shall be discarded and not reused.

G. **Concrete Anchorages.** Where anchor studs (bolts) are required the anchors shall be fully threaded and shall be inserted into drilled and grouted hole of diameter as recommended by the grout manufacturer, to a depth as shown on the plans.

H. **Shop Drawings.** Shop drawings shall be submitted in accordance with Subsection 710-23

"Fabrication.1 Shop Drawings" except:

1. Shop drawings shall present the fabricated assemblies and components in general terms by using typical details, tables, Bill of Materials to define the fabrication. Shop drawings shall be based on field measurements and existing conditions.

2. Shop drawings for rail sections shall be presented in table form and shall include shop drilled holes and Bill of Materials.

METHOD OF MEASUREMENT:

This work will be measured as the number of meters of the double box beam rails installed, as measured in the field along the centerline of the railing between the extreme outer limits, including the end or corner treatments and assemblies, unless indicated otherwise on the plans.

BASIS OF PAYMENT:

The unit price bid shall include the cost of field verification of existing conditions and the furnishing of all labor, materials, equipment and shop drawings necessary to complete the work including, but not limited to, the costs for: any repairs to the new railing upgrade due to damage in the shop or field; bending any rail element to the required curvature; shop and field drilled holes in steel; field drilled and grouted holes in concrete; reamed holes; rail splices; shims; anchorages; hardware; anchor studs (bolts); end or corner components as indicated; temporary end assemblies; closure plates; post reinforcing angles; removable rail sections at mechanical/electrical equipment's access doors and covers; field or shop welds; fasteners including nuts, bolts, washers, lock washers; and any shop or field modifications or adjustments due to field conditions, as ordered by the Engineer.