ITEM 11568.70 M – STAINLESS STEEL RAILING

DESCRIPTION

This work shall consist of furnishing and installing stainless steel pedestrian railing as shown on the contract plans and in accordance with these specifications. The railing is to be anchored to existing concrete wall which is to be clad with stone precast wall panels and granite coping (under Item 11560.3110 M).

MATERIALS

A. MATERIAL REQUIREMENTS:

1. Stainless steel round pipe railing shall meet the requirements of ASTM A312/A312 M, Type 316.

2. Stainless steel bars and plates shall meet the requirements of ASTM A666, Type 316.

3. Set screws, anchor bolts, brackets, flanges and other fasteners to be fabricated from Type 316 stainless steel.

4. Postinstalled Anchors: Chemical anchors, fabricated from stainless steel with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by test data per ASTM E 488.

CONSTRUCTION DETAILS

A. SUBMITTALS

1. Product data: For each component, submit product data indicating they meet ASTM standards referred under “materials” above.

2. Shop Drawings: Shop drawings shall be submitted to the Engineer for review and approval. Show fabrication and installation of railings. Include plans, elevations, sections, component details, and attachments to other Work.

3. Calculations: Structural analysis data signed and sealed by a qualified Professional Engineer licensed in the state of New York, indicating that the railing installation complies with design loads.

4. Sample: Assembled sample of railing system, made from full-size components, including top rail, post, and midrails. Show method of finishing members at intersections. Sample need not be full height.

B. PERFORMANCE REQUIREMENTS

1. Engineer stainless steel railings to withstand structural loads indicated, and determine allowable design working stresses of railing materials based on ASCE 8, "Specification for the Design of Cold-Formed Stainless Steel Structural Members."

2. Structural Performance: Provide railings conforming to ASHTO 2.7.3 Pedestrian Railings.

3. Thermal Movements: Provide railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

   Temperature Change (Range): 67 deg C, ambient; 100 deg C, material surfaces.

4. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

C. FABRICATION:

The railing shall be fabricated to the dimensions and configurations shown on the contract plans and in compliance with these specifications.

1. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly.

2. Fabrication and welding to comply with NYSDOT Steel Construction Manual.

3. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces

4. Fabricate anchorage devices capable of withstanding loads imposed by railings.

5. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges. Ease exposed edges to a radius of approximately 1mm, unless otherwise indicated.

6. Provide weep holes or another means to drain entrapped water in hollow sections of railing members that are exposed to exterior or to moisture from condensation or other sources.

7. Fabricate joints in watertight manner.

D. FINISHING

1. Grind and polish surfaces to produce uniform, directionally textured polished No.4 finish free of cross scratches. Run grain with long dimension of each piece.

2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

E. ERECTION OF METAL RAILING.

1. Inspection of railing: Immediately prior to erection, the railing shall be inspected for damage. Significant bend or kinks in the railing not specifically called for in the contract plans and documents shall constitute sufficient cause of rejection. Straightening of such bends or kinks shall not be allowed.

2. Erection: all railing shall be erected in accordance with approved shop drawings prepared and submitted as specified in the New York State Steel Construction Manual.

3. Positioning posts. Posts shall be set vertical.

    a. Set posts plumb within a tolerance of 2mm in 1m.

4. Positioning railing: Railing shall be erected so that rails are parallel to each other and to the top of the wall.

    a. Do not weld, cut or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

    b. Align rails so variations from level for horizontal or from parallel with wall slope do not exceed 5mm in 3m.

    c. Adjust railings before anchoring to ensure matching alignment at abutting joints. Space posts at intervals indicated, but not less than that required by structural loads.

5. Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

6. Welded construction: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections listed under the

above article "fabrication" whether welding is performed in the shop or in the field.

7. Expansion joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 50 mm beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 150mm of post.

METHOD OF MEASUREMENT

The quantity to be measured for payment under this item shall be the number of linear meters of railing, measured along the centerline of railing anchorage, between the extreme outer limits shown on the contract plans, installed in accordance with the plans and these specifications.

BASIS OF PAYMENT

The unit price bid per linear meter of railing shall include the cost of furnishing all labor, materials and equipment necessary to compute this work.

No payment shall be made for those railing pieces, which are replacement for those railing pieces that have been rejected.