Item 11607.7201M - Galvanized Powder Coated Steel Grille Fence 2.44M High
Item 11607.7202M - Galvanized Powder Coated Single Steel Grille Gate 2.44M High 1.22M Opening
Item 11607.7203M - Galvanized Powder Coated Double Steel Grille Gate 2.44M High 2.44M Opening

DESCRIPTION: This work shall consist of furnishing and erecting GALVANIZED POWDER COATED STEEL FENCES and GATES of the types and sizes shown in the Contract Documents and directions of the Engineer.

MATERIALS: Fences and Gates shall be constructed of flat galvanized steel bars, round rods and posts of the sizes shown on the plans. All materials shall conform to Specifications C1015 of the A.I.S.I.

LOCK BOLTS: Shall be a drop rod bar arranged to engage the gate stop. A Locking device shall be constructed so that the drop rod cannot be raised when the gate is locked. The locking bolt and bolt catch hardware shall be constructed as shown on the detail drawings. The locking device shall have provisions for a padlock. All necessary fittings and gate holders to lock gates in both open and closed positions shall be furnished.

GATE LATCH: Shall be a lockable stirrup type. The Latch shall be constructed of steel bars and blocks with a stainless steel pin as shown on the drawings. The ends of stirrups shall be treated with a heavy-duty flexible, rubberized coating.

PADLOCK: The Contractor shall furnish one padlock for each single gate and each leaf of double gates. All padlocks shall be keyed alike with a master key, with 50mm wide by 19mm thick brass body, maximum security, five (5) pin tumblers with hardened alloy steel chrome plated shackle no less than 9.5mm diameter and 50mm clearance (elongated shackle). A galvanized steel chain, 228mm long shall be fastened to the gate and body of the lock. The chain shall be 8mm by 35mm.

CONSTRUCTION DETAILS:

FABRICATION: Fences and Gates shall be fabricated in strict accordance with the plans and approved shop drawings. Posts, flat bars and round rods shall be formed into panels of the shapes shown on the plans and joints completely welded with welds of proper size and shape; all welds ground smooth to a neat finish. Connection shall be proved as indicated on the plans. Welding shall conform to the requirements of the D1.1 Structural Steel Welding Code of the American Welding Society (AWS).

1. Posts and flat bars shall, in all cases, be truly vertical. Rods shall be parallel to grade as shown on the plans.
2. Do not install bent, bowed, or otherwise damaged panels. Damaged panels and/or components shall be removed and replaced at no expense to the State.
3. Touch-up damaged finish with paint supplied by approved manufacturer and match original coating.

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GALVANIZATION AND POWDER COATING: Steel fence panels and posts shall be hot-dip galvanized to 0.38 kilograms per square meter minimum zinc coating in accordance with ASTM A123 with the following, additional critiera:
•Hot-dipped galvanized components shall not receive a water quench or chromate quench.
•All drainage spikes and surface defects shall be removed.

Galvanized components shall not be left outside, shall not be allowed to get wet, and shall not be transported uncovered - diesel fumes will contaminate the surface. If surface contamination has occurred or is suspected, the galvanizing shall be cleaned with a proprietary solvent/detergent designed for pre-cleaning prior to powdercoating and rinsed with clean fresh water. Powder coating shall occur within 24 hours of galvanizing.

All galvanized surfaces will be given thermo-setting polyester powder finish using DEGASSING GRADE POLYESTER POWDER ONLY for extra protection and added aesthetic appeal. Large gate panels shall be coated with 2-part polyurethane coating. The coating shall be lead free and without solvents. The final color shall be as approved by the Engineer.

The Powder Coating Process

The Powder coating process shall consist of the following steps unless directed otherwise by the Engineer:

- The material shall be suspended on Transport Beams
- The material shall be alkaline cleaned and then rinsed
- The material shall be pickled in a bath with inhibited phosphoric acid and then rinsed.
- An active anti-corrosive layer of zinc phosphate shall be applied and rinsed
- The material shall be rinsed with e-ionized water to remove any remaining salts which can cause osmosis.
- All material shall be preheated in an oven to assist bringing heavier components up to temperature to assist in avoidance of pinholing during powder cure.
- The powder shall be charged to 80000 volts and then sprayed onto the grounded steel
- The material shall then be heated to a temperature between 180°-200° C and held for a sufficient amount of time, in accordance with the powder manufacturer's specifications, to ensure that sufficient stoving time is allowed to meet the curing specifications of the powder.
- The final product shall be inspected and tested by NYSDOT designated inspectors.
- Check for correct cure by solvent testing.
- Adjust pre-heating and line speed to ensure full cure.

The approved product shall be carefully packed to prevent damages during shipping and unapproved product shall be removed at the Contractor's expense.

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POLYSTER POWDER COATING:

A. Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate.

1. Minimum hardness measured in accordance with ASTM D3363: 2H.
2. Direct impact resistance tested in accordance with ASTM D2794: withstand 18 Meter-Newton.
3. Salt spray resistance tested in accordance with ASTM B117: no undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 35 degrees C and 95 percent relative humidity, and after 1000 hours less than 5 mm undercutting.
4. Weatherability tested in accordance with ASTM D822.

B. Polyurethane coating: 1.0 mil dry film thickness of coating of steel test panel cured 30 minutes at 82 degree C and aged 14 days shall resist the following test conditions without failure:

1. 5 percent salt spray for 500 hours.
2. 100 percent relative humidity for 1000 hours.
3. Water immersion for 100 hours.
4. 20 double rubs with cloth saturated with either lacquer thinner, acetone, MEK, gasoline, xylene.
5. Exposure to lubricating oils, hydraulic fluids, and cutting oils.
6. 16 cycles of 24 hours at 100 percent humidity, 24 hours at -12 degrees C, and 24 hours at 25 degrees C.
7. Hardness: H to 2H.
8. Flexibility: 3 mm conical mandrel.

The final product shall be inspected and tested by NYSDOT designated inspectors.

The approved product shall be carefully packed to prevent damages during shipping and unapproved product shall be removed at no expense to the State.

ERECTION: The fences shall be erected in holes which shall have been formed in the concrete to receive them. After the posts have been set in place and properly supported to hold them to line and grade, the annular space shall be filled to the depth shown on the plans with grout composed of one (1) part Portland Cement to two (2) Parts sand. After the grout has hardened, the remaining space shall be filled with an epoxy sealer filler as approved by the Engineer.

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Sealer shall be applied in strict accordance with the manufacturer's instructions, and shall be tooled in to fill and seal hole and form a 6mm wash away from the post. Any Fences and gates not set plumb and true to line and grade shall be removed and replaced at no expense to the State. The Contractor shall maintain the fences and gates during the life of the contract and shall repair and replace all members that are disturbed, damaged, or destroyed at no expense to the State.

SUBMITTALS: All submittals shall be in accordance with the requirements of the General Conditions, Section C, Special Requirements Article 11. Shop Drawings are required. The Contractor shall submit for the approval of the Engineer finished sample parts of the fences. The workmanship and finish of the final product shall be equal to the approval samples.

METHOD OF MEASUREMENT: The work will be measured for payment as the number of linear meters of 2.44 M HIGH GALVANIZED POWDER COATED STEEL GRILLE FENCE satisfactory installed.

The work will be measured for payment as the number of GALVANIZED POWDER COATED STEEL GRILLE GATES of each size satisfactorily furnished and installed.

BASIS OF PAYMENT: The unit price bid for GALVANIZED POWDER COATED STEEL GRILLE FENCE and GATES shall include the cost of all labor, material, and equipment necessary to satisfactory perform the work.

Concrete and excavation shall be paid for separately under the respective Items.