

STATEMENT OF WORK

ORNAMENTAL METAL SECURITY FENCES AND GATES

PART 1 – GENERAL

1.1 SUMMARY

- A. The extent and locations of ornamental metal security fences (OMSF) and gates are shown on the Contract Drawings, and include devices for anchorage of fence units to substrates.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Detail, fabricate, and install metal fencing as shown on the attached drawings and in a manner that will produce maximum resistance to penetration of the enclosed property by intruders, including resistance to scaling or climbing without the use of ladders. Fabricate for maximum strength against the use of ordinary hand tools to bend pickets in a manner that would enlarge openings sufficiently to allow passage of intruders through the fence.
- B. Security Performance: Fence shall be a minimum of 2.5 meters high and of anti-climb design (no hand or footholds). Within a horizontal distance of 2.75 meters from its connection to the compound perimeter wall, the fence shall be the same height as the perimeter wall and shall have no hand or footholds located within a vertical distance of 2.75 meters below the top of the perimeter wall.

1.3 SUBMITTALS

- A. Product data, for each type and grade of metal used in fabricating units, and for bolts and accessory items used in assembly and installation. Include manufacturer's product data for materials to be used in finishing or painting fence units.
- B. Shop drawings for each type and size of metal fence unit. Show layout at same scale as site plan; typical plan, elevation, and section of units, including bracing, at 1:20 scale; and joint/anchorage details at 1:5 scale. Include details of fence posts, corners, and terminations. Include structural analysis calculations outlining resistance to gravity, wind, and seismic loading, signed and sealed by the professional structural engineer responsible for the analysis.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver prefabricated security fence units and support bracing/anchorage units to project site, completely assembled and prefinished, with finish fully protected during handling, shipping, storage, and delivery/installation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Manufacturer/fabricator of ornamental metal security fence units include, but are not limited to, the following experienced producers of custom ornamental metal work:

1. Ameristar Fence Products; Tulsa, OK
2. Am. Hardware & Orn. Iron Co.; Tulsa, OK.
3. Anchor Fence, Inc.; Baltimore, MD.
4. Builders Fence Co., Inc.; Sun Valley, CA.
5. Cassidy Bros. Forge, Inc.; Rowley, MA.
6. Construction Services, Inc.; Decatur, IL.
7. Cyclone Fence Div., USX Corp.; Chicago, IL.
8. Humane Equipment Co.; Baraboo, WI.
9. Lawler Machine & Foundry Co., Inc.; Birmingham, AL.
10. LMC Corp.; Paterson, NJ.
11. Poma Corp.; West Palm Beach, FL.

2.2 MATERIALS, GENERAL

- A. Steel Shapes, Plates, and Bars: ASTM A 36.
- B. Steel Structural Tubing: ASTM A 618; welded or seamless, high-strength, low-alloy, structural tubing; Grade Ib.
- C. Steel Structural Tubing: ASTM A 501; hot-formed, welded or seamless structural tubing.
- D. Welding Rods and Bare Electrodes: Provide as required by AWS specifications, for the metal and alloy to be welded.
- E. Bolts and Fasteners: ASTM A 320, AISI Type 300-series, stainless steel bolts and nuts. Where within reach from attack-face of fence, provide non-removable bolt/nut units (not removable by use of commonly available tools). Provide stainless steel washers.
- F. Concrete Inserts: Furnish anchorage units to be placed in concrete substrate; of hot-dip galvanized cast-iron/malleable-iron body, design as indicated: ASTM A 153 zinc coating, ASTM A 47 castings.
- G. Setting/Anchoring Cement: Nonshrinking, nonstaining, hydraulic-controlled expansion cementitious compound; factory prepackaged for mixing with water at project site for a pourable and trowellable mix; recommended by manufacturer for exterior exposure without protective coating, sealer, or waterproofing. Provide product equivalent to "Super Por-Rock" by Minwax Const. Products Div.
- H. Expansion Shims: To allow for thermal expansion of fence units, provide fluorocarbon resin (or similar) plastic washers, pads, and slip sheets in bolted connections between units, and between fence components and anchorages.

- I. Shop Primer Paint - Normal Exposure: Fabricator's baked-on, lead-free, modified alkyd base, ferrous-metal primer, which is compatible with finish system specified in "Painting" or "Special Coatings" section of these specifications, and which will provide long-term resistance to corrosion from exterior exposure, and firm undercoat for field-applied topcoats, after prolonged construction-period exposures. Comply with performance requirements of FS TT-P-645, and with paint manufacturer's instruction for baked-on primer coat application.
- J. Shop Primer Paint – Severe Exposure: Organic zinc-rich coating, with zinc-dust content not less than 80 percent by weight of non-volatile content; with vehicle base selected for compatibility with specified finish coating system. Comply with paint manufacturer's instructions for method of application and surface pretreatment.

2.3 FABRICATION

2.3.1 SECURITY FENCE.

- A. General: Cut and form/shape members to sizes and shapes required, for assembly of fence units of sizes indicated. Weld joints of assembly with welds all around, to produce joints of fullmember- strength, with no possible moisture penetration. Grind welds reasonably smooth, but not necessarily flush. Prefabricate units in plant by welding, to the greatest extent possible. Provide bolted connections for bracing elements and similar parts, but only to the extent units must be disassembled for delivery to project and for installation by method indicated.
 - 1. Drill anchor bolt holes accurately spaced as shown, oversized by 6 mm (1/4 inch) above bolt size, for installation tolerance.
 - 2. Provide for thermal movement of units, amounting to plus-or-minus 1 mm in 1 m (1/8 in. in 10 ft.) of fence length.
 - 3. Close ends of hollow members (pipes/tubes) which are not butt welded tight against another member in the assembly. Close with 6 mm (1/4 inch) thick steel plate, slightly recessed and welded all around for tight seal, except as otherwise shown.
 - 4. Avoid the use of bolts and screws exposed to and accessible from the threat side of fence. Where unavoidable, provide nonremovable type fasteners in the assembly.
 - 5. Ease exposed metal edges of fabricated units, to approximately 0.8 mm (1/32 inch) radius, prior to finishing.
- B. Shop-applied Finish, General: Comply with applicable provisions/recommendations of NAAMM Metal Finishes Manual and the following:
 - 1. Prepare ferrous metal surfaces by cleaning in compliance with SSPC-SP6, "Commercial Blast Cleaning."
 - 2. Apply shop primer paint coat in accordance with paint manufacturer's recommendations for application and baking.
 - 3. PVC Special Coating: Provide Fabricator's standard 10 mil (0.254 mm) dry film thickness, of polyvinyl chloride coating, thermally fused on preheated, prime-coated steel surfaces; of color indicated.
 - 4. Polyurethane Special Coating: Provide Fabricator's standard 2.5- to 3.0-mil (0.0635 to 0.0762 mm) dry film thickness, of powdered polyurethane, applied electrostatically and thermally fused to form smooth coating on prime-coated steel surfaces; of color indicated.

5. Polyester Special Coating: Provide Fabricator's standard 2.0 to 2.5 mil (0.0508 to 0.0635 mm) dry film thickness, of powdered polyester resin, applied electrostatically and thermally fused to form smooth coating on prime-coated steel surfaces; of color indicated.

2.3.2 FACILITY GATES

- A. General: Fabricate perimeter gate facilities at the location to the greatest extent possible, including interfacing, supporting, and anchorage provisions as required for installation. Fabricate to comply with indicated performance requirements. Disassemble only to the extent required for handling, delivery, and installation.
 1. Fabricate units with member sizes, shapes, and spacing's as shown, and with overall dimensions of each unit as shown.
 2. Ease exposed edges of fabricated metal elements to approximately 0.8 mm (1/32-inch) radius, prior to finishing.
 3. Avoid the use of bolts and screws exposed and accessible from the exterior (attack side) of fabricated units. Where unavoidable, provide nonremovable (with ordinary hand tools) type fasteners in the assembly.
 4. Provide fabricated hardware and devices for assembly and installation of each gate facility, as indicated and required for performances.
 5. Provide matching padlock eyes for each (closed) gate, located on inside (safe side) of fence except where indicated as exterior.

PART 3 – EXECUTION

3.1 PREPARATION

3.1.1 SECURITY FENCE

- A. Coordinate fence installation with work of other sections of these specifications. Deliver concrete inserts to Installer of concrete substrates that will support fence units, prior to time scheduled for placement of concrete. Furnish templates and complete instructions for placing inserts.
- B. Check concrete substrate and anchorage inserts, for compliances and tolerances required to facilitate installation of fence units. Coordinate beginning of installation with curing of concrete substrate, and with other work at project site; for both temporary security utilization of fence enclosure, and for preservation of metal work and finish.

3.1.2 FACILITY GATES

EXAMINATION, COORDINATION, PREPARATION

- A. General: Examine substrate work, being prepared as work of other sections, for the anchorage and support of perimeter gate facilities of this section. Deliver anchorage inserts, sleeves, and other elements to be cast in concrete work, prior to time scheduled for placement of concrete. Furnish instructions, setting diagrams, templates, and/or other information for elements to be installed as work of other sections. Set posts, frames and similar elements plumb, level and true to line and location; and support adequately during placement of concrete.

B. Examine prefabricated units, and preparations made and to be made as work of other sections, and confirm that interfaces and support of work of this section will achieve performances and align within installation tolerances.

3.2 INSTALLATION

3.2.1 SECURITY FENCE

- A. Install fence units as indicated. Set plumb and level, and true to line-of-slope as indicated; accurately located with respect to adjacent units, property lines, and adjoining work. Comply with Fabricator's instructions on unpacking, handling, preservation/removal of protective covering, and assembly of fabricated elements. Set base/support plates of units in confined bed of setting/anchoring cement, without voids. Trim away excess bedding material and tool exposed joint faces for neat, water-resistant exposure.
- C. Anchor fence units to substrate with bolts and expansion shims as indicated; and fasten units together with bolts/screws and expansion shims. Achieve nonremovable status of fasteners, except where otherwise indicated.
- D. Avoid unnecessary cutting, drilling, and welding of prefinished fence units. Where necessary to cut, drill, or weld, repair shop coat(s) of finish (primer and finish coat, if any) in manner recommended by paint manufacturer, and in manner which will provide corrosion protection equivalent to shop-applied coat(s) in-so-far as this is possible.
- E. Complete the installation of corner posts, special bracing, gates, special security features, and other elements of the work indicated as work of this section.
- F. Clean exposed surfaces of fence work, and touch up abraded finishes to restore appearance and corrosion resistance.

3.2.2 FACILITY GATES

- A. Comply with fabricator's instructions for the handling, protection, assembly, installation, anchorage, and other required interface connections of gate facilities with other work. Set level and plumb, true to line and location. Anchor to develop full-strength resistances against attacks and forced-entry attempts.
- B. Install exposed gate hardware, track, and devices with nonremovable fasteners, where exposed to attack side.
 - 1. After concrete foundations have been completed, fill bollard pipes with concrete grout, providing a uniform shaped hemispheroid cap at the top of each bollard pipe, uniformly trowelled to a smooth finish, and projecting 76.2 mm (3 in.) above end of pipe.