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SECTION 32 31 00

ORNAMENTAL STEEL FENCING

******* MFR Manufacturing Corp, Inc. manufactures several types of ornamental metal fencing. This guide specification section can be used to specify ornamental steel fencing fabricated from galvanized flat bars and rods welded into several open grille designs. Other types of MFR fencing can be specified with SECTION 32 31 20 – ORNAMENTAL STEEL FENCING, SECTION 32 31 21 - ALUMINUM LOUVER FENCING, SECTION 32 31 22 - STAINLESS STEEL LOUVER FENCING, and SECTION 32 31 17 - ORNAMENTAL WELDED WIRE FENCING. MFR also manufactures a railing system which can be specified in SECTION 05 73 10 - OPEN GRILL STEEL RAILING SYSTEM.**

The specifier will need to edit this product specification for a specific project to reflect the options and applications being used. The guide section has been written so that most editing can be accomplished by deleting unnecessary requirements. Options are indicated by [ ]. Notes to assist the specifier in selecting options and editing the specification guide are printed in bold and indicated with ***. For final editing, all brackets and notes will need to be deleted from the guide.**

****

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Ornamental welded steel fencing panels fabricated with galvanized flat bars and round rods welded into, modular, open grille fencing panels including steel fence posts and gates.

B. Related sections:

******* List other specification sections dealing with work directly related to this section such as the following. *******

1. Section 03300 - Cast-in-Place Concrete: Concrete footings for support of fence posts.

2. Section 02829 - Gate Operator: Electric operator for ornamental steel gates.

1.2 REFERENCES

****** List by number and full title reference standards referred to in remainder of specification section. Delete non-applicable references. *******

A. American Society for Testing and Materials (ASTM) Publications:

1. ASTM A36 - Structural Steel.

2. ASTM A121 - Zinc-Coated (Galvanized) Steel Barbed Wire.

3. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

4. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

5. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.

6. ASTM D822 - Tests on Paint and Related Coatings Using Filtered Open-Flame Carbon-Arc Exposure Apparatus.

7. ASTM D1794 - Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

8. ASTM D3363 - Test Method for Film Hardness by Pencil Test.

1.3 SUBMITTALS

A. Provide in accordance with Section 01330 - Submittal Procedures:

1. Product data for components and accessories.

2. Shop drawings showing layout, dimensions, spacing of components, [interface with electric gate operator,] and anchorage and installation details.

3. Sample: [8 by 10 inches] [203 by 254 mm] minimum size sample of fence panel illustrating design, fabrication workmanship, and selected color coating.

4. Copy of warranty specified in Paragraph 1.4 for review by Architect.

1.4 WARRANTY

A. Provide in accordance with Section 01770 - Closeout Procedures:

1. The galvanized and/or polyester coated metal is guaranteed not to rust for the time periods stated below. Accidental damages, defects resulting from improper installation and damage from vandalism or abuse are not included. Fence & Railing materials installed within 0 to 1 miles from salt water coast line 1 year; Fence & Railing materials installed within 1 to 5 miles from salt water coast line 3 years; Fence & Railing materials installed within 1 to 10 miles from salt water coast line 5 years; Fence & Railing materials installed over 20 miles from salt water coast line 20 years. Warranty is limited to a prorated value of the coating, not to exceed the original value of the coating.

2. Components treated with Plascoat PP571 finish are guaranteed not to rust rust for the time periods stated below. Accidental damages, defects resulting from improper installation and damage from vandalism or abuse are not included. Fence & Railing materials installed within 0 to 1 miles from salt water coast line 5 years; Fence & Railing materials installed within 1 to 5 miles from salt water coast line 10 years; Fence & Railing materials installed within 1 to 10 miles from salt water coast line 15 years; Fence & Railing materials installed over 20 miles from salt water coast line 25 years. Warranty is limited to a prorated value of the coating, not to exceed the original value of the coating.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. MFR Manufacturing Corp, Inc., 1065 Sill Ave., Aurora, IL 60506; Tel 815-552-3333.

B. Manufacturers of equivalent products submitted and approved in accordance with Section 01630 - Product Substitution Procedures.

2.2 MATERIALS

A. Steel bar stock: ASTM A36.

B. Steel tubing: ASTM A500, Grade B.

C. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, and water reducing and plasticizing additives.

2.3 FENCE SYSTEM

A. Type: Ornamental steel fencing system consisting of modular open grille fencing panels fabricated by welding flat steel bars and rods, supported by steel posts and gates and gate hardware; GRIGLIATO Fence System as manufactured by MFR Manufacturing Corp, Inc..

******* MFR Manufacturing Corp, Inc. provides 13 open grille fence panels. Refer to MFR product literature for illustrations of various patterns.**

B. Fence panels: Fabricated from galvanized steel rods and flat bars welded to form an open grille pattern; Grigliato® type [“A”] [“B”] [“C”] [“D”] [“E”] [“F”] [“G”] [“H”] [“J”] [“K”] [“L”] as manufactured by MFR Manufacturing Corp, Inc..

******* Fence panels are provided in standard heights and widths. Available sizes vary with fence pattern. Refer to MFR product literature for available sizes. Custom sizes can also be obtained as a special order. *******

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******* Include the following paragraph for GRIGLIATO® type "A" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [2-3/8 inches] [60 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [5-3/16 inches] [132 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [[64-21/32] [78-7/16] inches.] [[1642] [1992 mm.]

******* Include the following paragraph for GRIGLIATO® type "B" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [2-3/8 inches] [60 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [2-5/8 inches] [66 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [[64-21/32] [78-7/16] inches.] [[1642] [1992 mm.]

******* Include the following paragraph for GRIGLIATO® type "C" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [4-1/16 inches] [103 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [4 inches] [100 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [[64-21/32] [78-7/16] inches.] [[1642] [1992 mm.]

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******* Include the following paragraph for GRIGLIATO® type "D" fence panel. *******

1. Vertical main bars: [1-1/4 by 3/16 inch] [30 by 5 mm] flat bars spaced at [2-3/8 inches] [60 mm].

2. Horizontal cross rods: [1/4 inch] [6 mm] diameter rods spaced at [5-3/16 inches] [132 mm.]

3. Top and bottom perimeter bars: [1-1/4 by 3/16 inch] [30 by 5 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [[64-21/32] [78-7/16] inches.] [[1642] [1992 mm.]

******* Include the following paragraph for GRIGLIATO® type "E" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [1-3/16 inches] [30 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [5-3/16 inches] [132 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [[64-21/32] [78-7/16] inches.] [[1642] [1992 mm.]

******* Include the following paragraph for GRIGLIATO® type "F" fence panel. *******

1. Vertical main bars: [1 by 5/64 inch] [25 by 2 mm] flat bars spaced at [1-3/16 inches] [30 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [1 inch] [25 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [[64-21/32] [78-7/16] inches.] [[1642] [1992 mm.]

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******* Include the following paragraph for GRIGLIATO® type "G" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [2-3/8 inches] [60 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [4 inches] [100 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [[64-21/32] [78-7/16] inches.] [[1642] [1992 mm.]

******* Include the following paragraph for GRIGLIATO® type "H" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [2-3/8 inches] [60 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [2 inches] [50 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [[64-21/32] [78-7/16] inches.] [[1642] [1992 mm.]

******* Include the following paragraph for GRIGLIATO® type "J" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [4-3/4 inches] [120 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [5-3/16 inches] [132 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] inches.] [[889] [1219] [1524] mm.]

5. Panel width: [78-7/16 inches.] [1992 mm.]

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******* Include the following paragraph for GRIGLIATO® type "K" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [1-5/8 inches] [42 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [5-3/16 inches] [132 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [62-5/16 inches.] [1583 mm.]

******* Include the following paragraph for GRIGLIATO® type "L" fence panel. *******

1. Vertical main bars: [1 by 1/8 inch] [25 by 3 mm] flat bars spaced at [1-5/8 inches] [42 mm].

2. Horizontal cross rods: [3/16 inch] [5 mm] diameter rods spaced at [2 inches] [50 mm.]

3. Top and bottom perimeter bars: [1 by 1/8 inch] [25 by 3 mm] flat bars.

4. Panel height: [[36] [48] [60] [72] [96] inches.] [[889] [1219] [1524] [1829] [2438] mm.]

5. Panel width: [48 inches.] [1219 mm.]

******* Include the following paragraph for Grigliato "SC" fixed louver pattern fence panel. These panels can be installed with the louvers in either a vertical or a horizontal position. Louvers can be formed to allow either 80 or 100 percent direct vision screening. *******

1. [Vertical] [Horizontal] fixed louver bars: Formed louver shaped bars, [1-31/32 by 1/16 inch] [50 by 2 mm], spaced at [1-13/16 inch] [46 mm]. Extend louver flange to allow [80] [100] percent direct visual screening.

2. Cross rods: [5/32 inch] [4 mm] diameter rods welded perpendicular to back side of louver bars and spaced at [5-7/32 inches] [133 mm.]

3. Perimeter side support bars: [2 by 1/4 inch] [51 by 6 mm] flat bars.

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4. Panel height: [[36] [48] [60] [62-3/8] inches.] [[889] [1219] [1524] [1584] mm.]

5. Panel width: [64-21/32 inches.] [1642 mm.]

******* Fence posts for MFR Fence System can be either flat steel bars, square or rectangular steel tubing. Refer to MFR product literature for required sizes for heights, widths, and types of fence panel. *******

C. Posts: Galvanized [flat steel bars] [square steel tubes].

1. Size: [[2-1/2 by 5/16] [3-1/2 by 5/16] [2-3/8x1-5/8] [3 x 1-5/8] [2 by 2] [4 by 4] inches] [[64 by 8] [89 by 8] [60x40] [80x40] [50 by 50] [100 by 100] mm] [_____].

2. Length: [_____].

3. Weld flat steel bar top caps to tubular posts.

2.4 GATES

A. Provide gates of type and size indicated on Drawings. Equip gates with manufacturer's standard hardware as required for complete functional operation.

******* MFR Manufacturing Corp, Inc. provides single and double hinged swinging gates, V-wheeled rolling gates, and cantilevered horizontal sliding gates for ornamental steel fences. Gates can be operated with various types of electric operators specified in other sections. Refer to MFR product literature for available sizes and types of gates. *******

******* Include the following paragraphs if hinged swinging gates are required. *******

B. Type: Hinged swinging [single] [double] gate.

******* Size of steel tubing used to fabricate swinging gate frames will depend on gate size. Refer to MFR product literature for recommended sizes. *******

1. Construction: Welded frame fabricated from [_____] by [_____] [inches] [mm] steel tubing with open grille steel panels to match fencing material.

2. Nominal size: [_____] wide by [_____] high.

3. Hardware:

a. Hinges: Size and type as determined by manufacturer. Provide 2 hinges for each leaf up to [6 feet] [1829 mm] high and 1 additional hinge for each additional [24 inches] [610 mm] in height or fraction thereof.

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b. Latch: [3/4 inch] [19 mm] diameter slide bolt to accommodate padlock.

c. For double gates provide padlockable, [5/8 inch] [16 mm] diameter center cane bolt assembly and strike.

******* Include the following paragraphs if hinged V-wheeled rolling gates are required. Refer to MFR product literature for recommended steel tubing sizes used to fabricate gate frame and wheel diameters to accommodate different gate weights and sizes. *******

C. Type: V-wheeled rolling gates.

1. Construction: Welded frame fabricated from [_____] by [_____] [inches] [mm] steel tubing with open grille steel panels to match fencing material. Frame configuration shall be as indicated on Drawings and approved shop drawings.

2. Nominal size:

a. Gate opening: [_____].

b. Gate: [_____] wide by [_____] high.

c. Gate travel distance: [_____].

3. Support posts: Pair of [_____] diameter tubular steel posts with solid cap.

4. Rolling mechanism: Steel wheels with V-shaped edge groove and [[4] [6] inches] [[102] [152] mm] diameter, mounted to gate frame and riding on ground set V-track. Assembly braced at top by adjustable guide wheels mounted with brackets to support posts.

******* Include the following paragraphs if cantilevered horizontal sliding gates are required. *******

D. Type: Cantilevered horizontal sliding gate.

******* Size of steel tubing used to fabricate cantilevered gate frame will depend on gate size. Refer to MFR product literature for recommended sizes. *******

1. Construction: Welded frame fabricated from [_____] by [_____] [inches] [mm] steel tubing with open grille steel panels to match fencing material. Frame configuration shall be as indicated on Drawings and approved shop drawings.

2. Nominal size:

a. Gate opening: [_____] wide by [_____] high.

b. Gate: [_____] wide by [_____] high.

c. Overhang distance: [_____].

3. Support posts: Pair of [_____] diameter tubular steel posts with solid cap.

4. Cantilever mechanism: Aluminum top track and wheeled carriers and bottom roller guides supported by brackets attached to support posts.

******* Include the following paragraph if gates are to be operated with electric gate operator. *******

E. Coordinate provision of gate with electric operator specified in Section 02829 - Gate Operator to ensure size, weight, and design of gate is compatible with operator.

2.5 ACCESSORIES

******* Grigliato fences can be fabricated with top, bottom, or top and bottom pickets. If pickets are required, include the following paragraph. *******

A. Fence pickets: Equip fence panels with [top] [and] [bottom] pickets by providing steel tube welded to back of vertical main bars in lieu of flat perimeter bars. Extend pickets [_____] [inches] [mm] above tube.

******* As an anti-intruder device, ornamental steel fences can be provided with extension arm posts to carry 3 strands of barbed wire or electrified wires. Include the following paragraph if extension arms are required. *******

B. Extension arm posts: Provide posts with steel flat bar extensions, [11-3/4 by 2-3/8 by 5/16 inches] [298 by 60 by 8 mm], projecting 45 degrees, with 3 holes for attachment of barbed or electrified wires.

C. Barbed wire: Two twisted strands of ASTM A121 galvanized 12.5 gage wire with 14 gage four point round barbs at 5 inches.

******* Another anti-intruder device is a steel fence panel extending at an angle from top of fence and bolted to vertical fence panel. Include the following paragraph if canted fence panel extensions are required.**

D. Canted fence panel extension: Provide [_____] high fence panels bolted to vertical fence panels and extending at 45 degrees angle. Panels shall match open grille design of adjacent fence panels.

E. Fasteners: Stainless steel bolts of type, size, and spacing as recommended by fence manufacturer for specific condition.

******* Include the following paragraph if fencing is erected in high-security area and anti-intruder bolts are required. *******

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F. For exposed locations, provide anti-intruder bolts consisting of cup head bolt and nut with clamping hexagon such that tightening shears hexagon and render bolt impossible to release.

2.6 FACTORY FINISH

A. Steel fence panels and posts shall be hot-dip galvanized to 1.25 ounces per square foot minimum zinc coating in accordance with ASTM A123 and/or components shall receive polyester powder coating. Large gate panels shall be coated with 2-part polyurethane coating.

Due to do the nature of hot-dip galvanizing, the galvanized coating and powder coat can leave impurities on the treated surface, i.e., flashing, drips, drops, unevenness, roughness, pinholes etc. These do not impair the coating in terms of corrosion resistance and have no impact on the warranty. If a perfectly smooth surface is desired, non-galvanized powder coated only finish shall be specified.

[If materials are used in tropical or coastal areas specify per paragraph D]

B. Polyester powder coating: 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 160 inch-pounds.

3. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than [3/16 inch] [5 mm] undercutting.

4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.

C. Polyurethane coating: 1.0 mil dry film thickness of coating of steel test panel cured 30 minutes at 180 degree F 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.

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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 10 degrees F, and 24 hours at 77 degrees F.

7. Hardness: H to 2H.

8. Flexibility: [1/8 inch] [3 mm] conical mandrel.

D. Installations in tropical or coastal areas: Apply zinc-phosphate pre-treatment to mill Steel components. Electro statically spray apply PLASCOAT PPA571. The PLASCOAT PPA571 shall comply with the following without failure:

1. Salt spray testing to ASTM B117 has exceeded 20,000 hours with no blistering, cracking, corrosion or flaking.

2. Under-film corrosion from a scribe tested to ASTM B117 for 1,000 hours on pre-treated steel is 0 and 0.5 mm

3. After 2,000 hours QUV ASTM G145-06 (which supercedes ASTM G53), Xenon arc (ASTM G26) or five years in Florida at 45 degrees to the sun by the sea, there is no significant change in color, gloss or mechanical properties

******* MFR provides 8 standard colors. 180 special colors are available. Custom matched colors are available. Contact MFR for information on custom colors. *******

D. Color: [[Red 3000] [Black 9005] [Blue 5010] [Brown 8014] [Gray 7030] [Yellow 1021] [White 9010] [Green 6005] as manufactured by MFR [Selected by Architect from manufacturer's standard range.] [Custom color as selected by Architect.]

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to fabrication, field verify required dimensions.

******* Include the following paragraph if electric gate operators are required, *******

B. Coordinate fence and gate installation with provision of gate operator specified in Section 02829 - Gate Operator to ensure proper power supply and that conduit and wiring are concealed.

******* Size of concrete fence footings will depend on fence height, post spacing, and other project conditions. Footing dimensions may be indicated on Drawings or in this section but not both locations in order to eliminate potential conflicts. Edit the following paragraphs to reflect specific project conditions. *******

C. Cast concrete footings in accordance with Section 03300 - Cast-in-Place Concrete as detailed on Drawings and approved shop drawings.

1. Minimum footing diameter:

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a. Terminal and gate posts: [12 inches.] [305 mm.]

b. Intermediate line posts: [10 inches.] [254 mm.]

2. Allow [8 inches] [203 mm] [_____] minimum embedment of posts.

3. Allow [6 inches] [152 mm] [_____] minimum concrete beneath post bottom.

D. [Provide setting holes for embedment of fence posts.] [Core drill existing concrete footings for embedment of fence posts.] Hole shall be [2 inches] [51 mm] minimum greater than post width.

3.2 INSTALLATION

A. Install fencing in accordance with manufacturer's installation instructions and approved shop drawings.

B. Install fence posts plumb and level [by setting post in hole [cast] [drilled] in concrete and grouting solid.] [by embedding post directly in concrete footing.] Temporarily brace fence posts with 2 by 4 wood supports until [concrete] [grout] is set.

C. Do not installed bent, bowed, or otherwise damaged panels. Remove damaged components from site and replace.

D. Secure fence panels with [standard stainless steel bolts] [stainless steel anti-intruder bolts] to fence posts [prior to setting posts in footings.] [after posts have been set in footings.]

******* Include the following paragraph if extension arm posts are installed. *******

E. Extension arm posts: Erect arms sloped [inward] [outward] and attach 3 strands of barbed wire. Tension wire and secure to arms.

******* Include the following paragraph if canted fence panel extensions are required. *******

F. Canted fence panel extension: Slope panels [inward] [outward] at 45 degrees angle and rigidly bolt to vertical fence panels.

G. Gates:

1. Install gates and adjust hardware for smooth operation.

2. [Provide concrete center foundation depth and drop rod retainers at center of double swinging gate openings.]

3. [Provide concrete surface for length of operation of V-wheeled rolling gate.

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Anchor track to concrete with countersunk fasteners.]

4. After installation, test gate [and operator]. Open and close a minimum of five times. Correct deficiencies and adjust.

H. Touch-up damaged finish with paint supplied by manufacturer and matching original coating.

END OF SECTION