

SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Chain-link fences.
2. Swing gates.
3. Privacy slats.

B. Related Sections

1. Section 031000 – Concrete Forming and Accessories.
2. Section 032000 – Concrete Reinforcing.
3. Section 033000 – Cast-in-Place Concrete.

C. Industry Standards

1. The following industry standards shall be applicable to this Section:
 - ASCE/SEI (American Society of Civil Engineers/Structural Engineering Institute)
 - ASTM (American Society for Testing and Materials)
 - CLFMI WLG (Chain Link Fence Manufacturers Institute Wind Load Guide)

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of fence and gate assembly.
 1. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Product test reports.
- C. Sample warranty.

1.5 WARRANTY

- A. Special Warranty: [**Manufacturer agrees**] [**Installer agrees**] to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to [**ASCE/SEI 7**] <Insert requirement>:
1. Design Wind Load: [**As indicated on Drawings**] <Insert loads>.
 - a. Minimum Post Size: Determine according to ASTM F1043 for post spacing not to exceed 10 feet for Material [**Group IA, ASTM F1043, Schedule 40 steel pipe**] [**Group IC, electric-resistance-welded round steel pipe**] <Insert material group>.
 - b. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

2.2 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:
1. Fabric Height: <Insert dimension> [**As indicated on Drawings**].
 2. Steel Wire for Fabric: Wire diameter of [**0.192 inch**] [**0.148 inch**] [**0.120 inch**] [**0.113 inch**] <Insert dimension>.
 - a. Mesh Size: [**2-1/8 inches**] [**2 inches**] [**1-3/4 inches**] [**1 inch**].
 - b. Aluminum-Coated Fabric: ASTM A491, Type I, [**0.40 oz./sq. ft.**] [**0.35 oz./sq. ft.**] [**0.30 oz./sq. ft.**].
 - c. Zinc-Coated Fabric: ASTM A392, Type II, [**Class 1, 1.2 oz./sq. ft.**] [**Class 2, 2.0 oz./sq. ft.**] with zinc coating applied [**before**] [**after**] weaving.
 - d. Zn-5-Al-MM Aluminum-Mischmetal-Coated Fabric: ASTM F1345, Type III, [**Class 1, 0.60 oz./sq. ft.**] [**Class 2, 1.0 oz./sq. ft.**].
 - e. Polymer-Coated Fabric: ASTM F668, [**Class 1**] [**Class 2a**] [**Class 2b**] over [**aluminum**] [**zinc**] [**Zn-5-Al-MM-alloy**]-coated steel wire.

- 1) Color: **[Dark green] [Olive green] [Brown] [Black] [As selected by Design-Professional-of-Record from manufacturer's full range]**, according to ASTM F934.
- f. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.
3. Aluminum Wire Fabric: ASTM F1183, with **[mill] [caustic-cleaned or etched]** finish, and wire diameter of **[0.148 inch] [0.192 inch]**.
 - a. Mesh Size: **[2 inches] [1 inch]**.
4. Selvage: **[Knuckled at both selvages] [Twisted top and knuckled bottom]**.

2.3 FENCE FRAMEWORK

- A. Posts and Rails: ASTM F1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F1043 or ASTM F1083 based on the following:
 1. Fence Height: **[72 inches] [96 inches] [As indicated on Drawings] <Insert dimension>**.
 2. Light-Industrial-Strength Material: **[Group IC-L, round steel pipe, electric-resistance-welded pipe] [Group II-L, roll-formed-steel C-section shapes] [Group III-L, hot-rolled H-beam shapes] [Group IV, Alternative Design]**.
 - a. Line Post: **[1.9 inches in diameter] [2.375 inches in diameter] [2.875 inches in diameter] [2.25 by 1.7 inches]**.
 - b. End, Corner, and Pull Posts: **[2.375 inches] [2.875 inches] [4.0 inches] [2.25 by 1.7 inches]**.
 3. Heavy-Industrial-Strength Material: **[Group IA, round steel pipe, Schedule 40] [Group IC, round steel pipe, electric-resistance-welded pipe] [Group II, roll-formed-steel C-section shapes] [Group III, hot-rolled H-beam shapes] [Group IV, Alternative Design]**.
 - a. Line Post: **[1.9 inches in diameter] [2.375 inches in diameter] [2.875 inches in diameter] [4.0 inches in diameter] [6.625 inches in diameter] [1.875 by 1.63 inches] [2.25 by 1.70 inches] [3.25 by 2.50 inches]**.
 - b. End, Corner, and Pull Posts: **[2.375 inches in diameter] [2.875 inches in diameter] [4.0 inches in diameter] [6.625 inches in diameter] [2.25 by 1.70 inches] [3.25 by 2.50 inches]**.
 4. Horizontal Framework Members: **[Intermediate] [top] [and] [bottom]** rails according to ASTM F1043.
 5. Brace Rails: ASTM F1043.
 6. Metallic Coating for Steel Framework:

- a. Type A zinc coating.
 - b. Type B zinc with organic overcoat.
 - c. External, Type B zinc with organic overcoat and internal, Type D zinc-pigmented coating.
 - d. Type C, Zn-5-Al-MM alloy coating.
 - e. Coatings: Any coating above.
7. Polymer coating over metallic coating.
- a. Color: **[Match chain-link fabric] [Dark green] [Olive green] [Brown] [Black] [As selected by Design-Professional-of-Record from manufacturer's full range]**, according to ASTM F934.

2.4 TENSION WIRE

- A. Metallic-Coated Steel Wire: 0.177-inch-diameter, marcelled tension wire according to ASTM A817 or ASTM A824, with the following metallic coating:
1. Type I: Aluminum coated (aluminized).
 2. Type II: Zinc coated (galvanized) with minimum coating weight matching chain-link fabric coating weight.
 3. Type III: Zn-5-Al-MM alloy with the following minimum coating weight matching chain-link fabric coating weight.
- B. Polymer-Coated Steel Wire: **[0.177-inch-] [0.148-inch-]** diameter, tension wire according to ASTM F1664, **[Class 1] [Class 2a] [Class 2b]** over **[aluminum] [zinc] [Zn-5-Al-MM-alloy]-**coated steel wire.
1. Color: **[Match chain-link fabric] [Dark green] [Olive green] [Brown] [Black] [As selected by Architect from manufacturer's full range]**, according to ASTM F934.

2.5 SWING GATES

- A. General: ASTM F900 for gate posts and **[single] [double]** swing gate types.
1. Gate Leaf Width: **[36 inches] [As indicated]**.
 2. Framework Member Sizes and Strength: Based on gate fabric height **[of 72 inches or less] [of more than 72 inches] [As indicated]**.
- B. Pipe and Tubing:
1. Zinc-Coated Steel: ASTM F1043 and ASTM F1083; **[protective coating and finish to match fence framework] [manufacturer's standard protective coating and finish]**.
 2. Aluminum: ASTM B429; **[mill] [manufacturer's standard] <Insert finish>** finish.
 3. Gate Posts: **[Round tubular steel] [Rectangular tubular steel] [Round tubular aluminum] [Rectangular tubular aluminum]**.

4. Gate Frames and Bracing: [**Round tubular steel**] [**Rectangular tubular steel**] [**Round tubular aluminum**] [**Rectangular tubular aluminum**].

C. Frame Corner Construction: [**Welded**] [**or**] [**assembled with corner fittings**].

D. Extended Gate Posts and Frame Members: Fabricate gate posts and frame end members to extend [**12 inches**] [**as indicated**] above top of chain-link fabric at both ends of gate frame to attach barbed wire assemblies.

2.6 HARDWARE

A. Hardware:

1. Hinges: [**180-degree inward**] [**180-degree outward**] [**360-degree inward and outward**] swing.
2. Latch: Permitting operation from both sides of gate [**with provision for padlocking accessible from both sides of gate**].
3. Lock: [**Manufacturer's standard**] <Insert requirement> internal device.
4. Padlock and Chain: <Insert requirements>.
5. Closer: [**Manufacturer's standard**] <Insert requirement>.
6. <Insert hardware items and accessories>.

2.7 FITTINGS

A. Provide fittings according to ASTM F626.

B. Barbed Wire Arms: [**Pressed steel or cast iron**] [**Aluminum**], with clips, slots, or other means for attaching strands of barbed wire[, **and means for attaching to posts**] [, **integral with post cap**], for each post unless otherwise indicated, and as follows:

1. Provide line posts with arms that accommodate top rail or tension wire.
2. Provide corner arms at fence corner posts unless extended posts are indicated.
3. Single-Arm Type: [**Type I, slanted arm**] [**Type II, vertical arm**].
4. Double-Arm Type: [**Type III, V-shaped arm**] [**Type IV, A-shaped arm**].

C. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.
 - a. Polymer coating over metallic coating.
2. Aluminum: Mill finish.

2.8 PRIVACY SLATS

A. Fiber-Glass-Reinforced Plastic Slats: UV-light-stabilized fiber-glass-reinforced plastic, not less than 0.06 inch thick, sized to fit mesh specified for direction indicated[, **with vandal-resistant fasteners and lock strips**].

- B. Tubular Polyethylene Slats: Minimum 0.023-inch-thick tubular polyethylene, manufactured for chain-link fences from virgin polyethylene with UV inhibitor, sized to fit mesh specified for direction indicated, with **[vandal-resistant fasteners and lock strips] [fins for increased privacy factor]**.
- C. Hedge-Type Slats: UV-light-stabilized[, **flame-resistant**], PVC "needles" woven into braided, galvanized wire core, sized to fit mesh specified for direction indicated.
- D. Color: **[As indicated by manufacturer's designations] [Match Architect's samples] [As selected by Architect from manufacturer's full range] [As indicated on Drawings] <Insert color>**.

2.9 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F567 and more stringent requirements specified.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts **[in concrete] [with mechanical anchors] [by mechanically driving into soil]** at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
 - b. Concealed Concrete: Place top of concrete 2 inches below grade to allow covering with surface material.
 - c. Posts Set into Sleeves in Concrete: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.
 - d. Posts Set into Holes in Concrete: Form or core drill holes not less than 5 inches deep and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.
 3. Mechanically Driven Posts: Drive into soil to depth of **[30 inches]** **[36 inches]** **<Insert dimension>**. Protect post top to prevent distortion.
- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment of **[15 degrees or more]** **[30 degrees or more]** **[as indicated on Drawings]** **<Insert requirement>**. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.
- E. Line Posts: Space line posts uniformly at **[96 inches]** **[10 feet]** **<Insert dimension>** o.c.
- F. Tension Wire: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:
1. Extended along **[top]** **[and]** **[bottom]** of fence fabric.
 2. **[As indicated on Drawings]** **<Insert requirements>**.
- G. Chain-Link Fabric: Apply fabric to **[outside]** **[inside]** of enclosing framework. Leave **[1-inch]** **[2-inch]** bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- H. Privacy Slats: Install slats in direction indicated, securely locked in place.
1. **[Vertically]** **[Horizontally]**, **[for privacy factor of 70 to 75]** **<Insert privacy factor range>**.
 2. Diagonally **[for privacy factor of 80 to 85]** **<Insert privacy factor range>**.
 3. Direction **[and privacy factor]** as indicated on Drawings.

3.4 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

END OF SECTION 323113