

FOR CLIENT REVIEW May 20, 2009

SECTION 323113 - CHAIN-LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Chain-link fences in place of existing fences and in new locations.
 - 2. Swing gates.
 - 3. Handrails.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Fence and gate posts, rails, and fittings.
 - 2. Chain-link fabric, reinforcements, and attachments.
 - 3. Gates and hardware.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Five years from date of Substantial Completion.

1.5 QUALITY ASSURANCE

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- A. Materials and workmanship shall conform to the New York Department of Transportation Standard Specifications as well as the following general specifications:
 - 1. American Society for Testing and Materials (ASTM).
 - 2. American Association of State Highway and Transportation Officials (AASHTO).

PART 2 - PRODUCTS

2.1 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. Comply with CLFMI Product Manual and with requirements indicated below:
 - 1. Fabric Height: Match existing.
 - 2. Steel Wire Fabric:
 - a. Wire Size: 9 gage minimum.
 - b. Mesh Size: 2 inches.
 - c. Zinc-Coated Fabric: ASTM A 392, Type II, Class 2, 2.0 oz./sq. ft. with zinc coating applied after weaving.
 - 3. Selvage: Knuckled at bottom selvages, twisted at top selvages.

2.2 FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 and with requirements indicated below for framing, including rails, braces, and line; terminal; and corner posts.
 - 1. Fence Height: Match existing.
 - 2. Light Industrial Strength: Material Group IC-L, round steel pipe,. Match existing materials being replaced, repaired or extended.
 - a. Line Post: 2.375 inches in diameter.
 - b. End, Corner, Gate and Pull Post: 2.875 inches.
 - 3. Horizontal Framework Members: Intermediate, brace rails and top rails complying with ASTM F 1043.
 - a. Top Rail: 1.66 inches in diameter.
 - b. Intermediate or Brace Rail: 1.66 inches in diameter.
 - 4. Metallic Coating for Steel Framing:
 - a. Type A, consisting of not less than minimum 2.0-oz./sq. ft. average zinc coating per ASTM A 123/A 123M or 4.0-oz./sq. ft. zinc coating per ASTM A 653/A 653M.

2.3 SWING GATES

- A. General: Comply with ASTM F 900 for gate posts and swing gate types.
 - 1. Gate Leaf Width: 36”.
 - 2. Gate Fabric Height: Match existing fence.
 - 3. Framework Members: Comply with ASTM F 1043, .1.66 inches in diameter.
- B. Hardware:
 - 1. Hinges: Minimum 90-degree outward swing.
 - 2. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.

2.4 HANDRAILS

- A. Posts: Comply with ASTM F 1043 and with requirements indicated below for framing, including rails and posts.
 - 1. Handrail Height: 30”.
 - 2. Posts: Schedule 40 galvanized, round steel pipe, 4” in diameter.
 - 3. Rails: Schedule 40 galvanized, round steel pipe, 2” in diameter.
 - 4. Metallic Coating: Type A, consisting of not less than minimum 2.0-oz./sq. ft. average zinc coating per ASTM A 123/A 123M or 4.0-oz./sq. ft. zinc coating per ASTM A 653/A 653M.

2.5 FITTINGS

- A. General: Comply with ASTM F 626.
- B. Post Caps: Provide for each fence, gate and handrail post.
 - 1. Provide line post caps with loop to receive tension wire or top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
 - 1. Top Rail Sleeves: Pressed-steel or round-steel tubing or Aluminum Alloy 6063 not less than 6 inches long.
 - 2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails in the fence line-to-line posts and for connecting handrail posts and rails.
- E. Tension and Brace Bands: Pressed steel or Aluminum Alloy 6063.
- F. Tension Bars: Steel or Aluminum, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

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- G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading or Mill-finished aluminum rod and turnbuckle or other means of adjustment.
- H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.
 - 1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
 - a. Hot-Dip Galvanized Steel: Minimum 9-gage wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.
 - b. Aluminum: ASTM B 211; Alloy 1350-H19; minimum 9-gage, mill-finished wire.
- I. Finish
 - 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 2.0 oz. /sq. ft. zinc.

2.6 CONCRETE

- A. Comply with ACI 301 requirements for concrete mixtures.
- B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:
 - 1. Minimum Compressive Strength: 3000 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 - 3. Slump Limit: 5 inches, plus or minus 1 inch.
 - 4. Air Content: Maintain within range permitted by ACI 301.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567.

3.2 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete 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.
 - 3. Mechanically Driven Posts: Drive into soil to depth of 32 inches. Protect post top to prevent distortion.

- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- D. Line Posts: Space line posts uniformly at 10 feet o.c.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 1. Locate horizontal braces at midheight of fabric 72 inches or higher on fences with top rail and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
 - 2. Extended along top and bottom of fence fabric. Install top tension wire through post cap loops. Install bottom tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- F. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- G. Intermediate Rails: Install and secure to posts with fittings.
- H. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches 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.
- I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.
- J. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.
- K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.3 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.

3.4 HANDRAIL INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete 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.
- C. Posts: Space posts uniformly at 6 feet o.c.
- D. Post Bracing: Install and brace posts according to ASTM F 567, maintaining plumb position and alignment.
- E. Rail: Install according to ASTM F 567, maintaining plumb position and alignment of posts.

END OF SECTION 323113