

SECTION 323113 – CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Fence framework, fabric, and accessories.
 2. Excavation for post bases.
 3. Concrete foundation for posts.
 4. Manual gates and related hardware.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. See Section 012000 – Price and Payment Procedures.

1.3 REFERENCES

- A. ASTM International:
1. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire.
 2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 3. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 4. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
 5. ASTM A491 - Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric.
 6. ASTM A817 - Standard Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric and Marcellled Tension Wire.
 7. A1011/A1011M-07 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
 8. ASTM B429/B429M - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
 9. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 10. ASTM F552 - Standard Terminology relating to Chain Link Fencing.
 11. ASTM F567 - Standard Practice for Installation of Chain-Link Fence.
 12. ASTM F626 - Standard Specification for Fence Fittings.
 13. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric.
 14. ASTM F900 - Standard Specification for Industrial and Commercial Swing Gates.
 15. ASTM F934 - Standard Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials.

16. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
17. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
18. ASTM F1183 - Standard Specification for Aluminum Alloy Chain Link Fence Fabric.
19. ASTM F1184 - Standard Specification for Industrial and Commercial Horizontal Slide Gates.
20. ASTM F1345 - Standard Specification for Zinc - 5% Aluminum - Mischmetal Alloy-Coated Steel Chain-Link Fence Fabric.

- B. Chain Link Fence Manufacturers Institute:
1. CLFMI - Product Manual.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
- C. Product Data: Submit data on fabric, posts, gates, accessories, fittings and hardware.
- D. Manufacturer's Installation Instructions: Submit installation requirements, including standard details of fence and gate installation.

1.5 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines.
- C. Operation and Maintenance Data: Procedures for submittals.

1.6 QUALITY ASSURANCE

- A. Perform installation according to ASTM F567.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum of three years' experience.

- B. Installer: Company specializing in performing work of this section with minimum of two years documented experience.
- C. Examine conditions under which fence is to be installed. Notify the Engineer, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.
- C. Identify each package with manufacturer's name.
- D. Store fence fabric and accessories in secure and dry place.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide aluminized fencing complete with all erection accessories, fittings and fastenings, chain link fabric and gates as shown on the drawings and as manufactured by American Fence Corp., Anchor Fence, Inc. or equivalent.
- B. Steel Framework – Manufactured by roll forming hot-dip aluminized steel strip into tubular form and electric resistance welding. The outside surface of the weld is metallized with pure aluminum to a thickness sufficient to provide resistance to corrosion equal to that of the pure aluminum coating on the base metal. The minimum weight of aluminum coating is 0.75 oz./sq. ft. triple spot test, 0.70 oz./sq. ft. single spot test, both sides combined, as measured in accordance with ASTM A428. A minimum yield strength of 50,000 psi, or compliance with the strength requirements of ASTM F669.
- C. Chain Link Fabric – Aluminum coated steel, in accordance with ASTM A491. Thoroughly degrease, rinse and coat fabric with clear acrylic lacquer by the complete immersion process before taking up into rolls for shipment. Minimum weight of aluminum coating is 0.40 oz./sq. ft. for 6 and 9 gauge, and 0.35 oz./sq. ft. for 11 gauge, as measured in accordance with ASTM A428. Fabric woven to form square openings of size depicted on Drawings. The wire shall be 9 gauge unless otherwise noted on the Drawings. Top and bottom selvage knuckled, in accordance with ASTM A491.
- D. Tension Wire – 7-gauge aluminum coated spring wire, metal and finish to match fabric.
- E. Fittings - In basic compliance with ASTM F626 but of solid aluminum alloy or aluminum-coated steel wherever practical.

- F. Gates – ASTM F900 with welded frames of same material as fence framework, all welds thoroughly cleaned and coated with a suitable rust preventative paint. Gate frames to have interior horizontal and/or vertical bracing wherever the height or width of the gate frame exceeds five feet (5') and additional diagonal bracing for gate frames over twelve feet (12') wide. Submit manufacturer's design for approval before fabrication. Factory assemble gates. Gate frames to be filled with chain link fabric to match that used in the fence.
- G. Fence Top Guard – UV-resistant polyethylene construction with color to be yellow unless otherwise directed by the owner to a different available color. Predrilled holes and ties shall be included. Product shall be Saf-Top Fence Guard by BSN Sports, or equal.

2.2 CONCRETE MIX

- A. Concrete - ASTM C94 Portland cement, 3,000 psi at 28 days, 1-inch maximum aggregate size, maximum 3-inch slump, and 2% to 4% entrained air.

2.3 COMPONENTS

A. Tennis Courts

1. Line Posts - 2.375 inch outside diameter x .154 inch wall thickness tubular section.
2. Swing Gate Posts - 2.875 inch outside diameter x .203 inch wall thickness tubular section.
3. Corner and Terminal Posts – 2.875 inch outside diameter x 0.203 inch wall thickness.
4. Top and Brace Rail – 1.66 inch outside diameter x 0.140 inch wall thickness.
Manufacturer's longest lengths with expansion type couplings for each joint. Provide means for attaching rail securely to each gate, corner, pull and end post.
5. Middle and Bottom Rail – Same materials as top rail.
6. Chain Link Fabric – 2-inch mesh woven from vinyl coated 9 gauge aluminized steel wire.

B. Basketball Courts

1. Line Posts - 2.375 inch outside diameter x .154 inch wall thickness tubular section.
2. Corner and Terminal Posts – 2.875 inch outside diameter x 0.203 inch wall thickness.
3. Top and Brace Rail – 1.66 inch outside diameter x 0.140 inch wall thickness.
Manufacturer's longest lengths with expansion type couplings for each joint. Provide means for attaching rail securely to each gate, corner, pull and end post.
4. Middle and Bottom Rail – Same materials as top rail.
5. Chain Link Fabric – 2-inch mesh woven from vinyl coated 9 gauge aluminized steel wire.

C. Baseball Backstop

1. Line Posts - 2.375 inch outside diameter x .154 inch wall thickness tubular section.
2. Corner and Terminal Posts – 2.875 inch outside diameter x 0.203 inch wall thickness.
3. Top and Brace Rail – 1.66 inch outside diameter x 0.140 inch wall thickness.
Manufacturer's longest lengths with expansion type couplings for each joint. Provide means for attaching rail securely to each gate, corner, pull and end post.
4. Middle and Bottom Rail – Same materials as top rail.

5. Truss Rod – Aluminum coated steel.
 6. Chain Link Fabric – 2-inch mesh woven from 9 gauge aluminized steel wire.
- D. Line and Terminal Post Bands and Tension Bars – Flat aluminum alloy wire post bands and tension bars, bands preformed to the configuration of the post and the wire picket, and with provision for self-locking the ends into a double loop.
 - E. Wire Ties – 9-gauge aluminized steel wire to match fabric material for securing chain link fabric to horizontal rails and line posts at 24” intervals.
 - F. Stretcher Bars – One-piece lengths equal to full height of fabric, with minimum cross section of 3/16” x 3/4”. Provide one stretcher for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into post.
 - G. Post Brace Assembly – Manufacturer’s standard adjustable brace at end and gate posts and at both sides of corner and pull posts, with horizontal brace located at mid-height of fabric. Use same materials as top rail for brace, and truss to line posts with 3/8 inch diameter rod and adjustable tightener. Provide manufacturer’s standard aluminum cap for each end.
 - H. Post Tops: Provide weather-tight aluminum closure cap with loop to receive tension wire or top rail, one cap per post.
 - I. Fence Top Guard – Install on all chain link fencing 8’ and less in height.

2.4 GATES

- A. Gate types, opening widths and direction of operation shall be as indicated on the Drawings.
- B. Gate Frame - 1.66 inch outside diameter for perimeter of frame with interior bracing of 1.66 inch outside diameter tubing. Install diagonal cross-bracing consisting of 3/8 inch diameter adjustable length truss rods to ensure frame rigidity without sag or twist. Space frame members a maximum of 8 feet apart unless otherwise indicated.
- C. Gate Fabric – Provide same fabric as for fence unless otherwise indicated. Install fabric with tension bars and bands at vertical edges and at top and bottom edges.
- D. Gate Hardware - Hinges, latches and all other moving parts of gates to be of certified malleable cast iron, with all components hot-dip galvanized per ASTM A153.
 1. Hinges to be of a size and material to suit gate size, non-lift type, with offset arms to permit a full 180 degree swing from the closed to the open position. Provide 1-1/2 pair of hinges for each leaf over 6 foot nominal height. Provide spring-loaded hinges set to close the gate automatically upon release.
 2. Latches to be double-fork type to permit closure as the gate swings back automatically and permit operation from either side of gate, with pad lock eye as integral part of latch. Padlocks and keys by Owner.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Do not begin installation and erection before final grading is completed, unless otherwise permitted.
- B. Install framework, fabric, accessories and gates according to ASTM F567. Use manufacturer's standard fittings, fasteners and hardware.
- C. Set terminal posts and corner posts at each termination and at each horizontal or vertical change in direction of 30 degrees or more. They shall be with tops properly aligned.
- D. Set line posts in a straight alignment between terminal and/or corner posts with tops properly aligned. Maximum of 10' spacing between line posts.
- E. Set all posts plumb and true to line and grade. Where grade changes gradually from post to post, grade the posts to provide a "rolling" effect and to avoid abrupt changes in the top of the fence line. If abrupt changes in grade are encountered, accomplish them with the use of a corner or pull post, with the chain link fabric cut on a bias where necessary to provide tension over the entire height.
- F. Excavate holes for posts to diameter and spacing indicated on the Drawings in firm, undisturbed or compacted soil, without disturbing underlying materials.
 - 1. If not indicated on the Drawings, excavate holes for each post to a minimum diameter recommended by the fence manufacturer, but not less than 4 times the post outside diameter, and a minimum of 12 inches.
 - 2. If not indicated on the Drawings, excavate hole depths approximately 3 inches lower than the post bottom, with bottom of posts set not less than 42 inches below the ground surface.
- G. Set all posts in center of holes 3 inches above the bottom of the excavation. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations. Unless otherwise indicated on the Drawings, terminate concrete footings 2 inches below grade and trowel to a crown to shed water.
- H. Allow footings to cure a minimum of 7 days before installing fabric and other materials attached to the posts.
- I. Top rail shall run continuously through line post caps, bending to radius if curved. Terminate at end rail cup attached to terminal or corner post. Provide expansion couplings as recommended by fencing manufacturer.
- J. Intermediate and bottom rails shall be one continuous piece running between line, terminal, and/or corner posts and shall terminate at end rail cup attached to the vertical post.
- K. Fabric shall be installed on the outside of posts. Position bottom of fabric two inches (2") above finished grade. Use stretcher bars and pull chain link fabric taut between terminal or corner posts

and attach fabric to these posts using tension bars and tension bar clips spaced using one less band than the height of the fabric in feet, or approximately fourteen inches (14") on-center.

- L. Tie wires of proper length shall be used to secure chain link fabric firmly to the post and rails with ends twisted at least 2 full turns. Bend ends of wire to minimize hazard to persons or clothing. Tie fabric to line posts 12 inches on-center and to rails and braces 24 inches on-center.
- M. Install brace rail between all end, corner and gate posts and first line post.
- N. Attach fabric to horizontal rails with tie wires and to tension wire with hog rings, five (5) tie wires or hog rings per 10-foot bay or approximately 24 inches on center.
- O. Install gates and adjust true to fence line and grade. On double gates, set center stop in concrete. Install appropriate hold-open devices.

END OF SECTION 32 31 13