

**SECTION 02870
FENCES**

1.0 GENERAL

A. Description

This work shall include, but not necessarily be limited to, the construction of fence and gates in accordance with, and in reasonably close conformance to, the lines and grades shown on the Contract Documents.

B. Related Work Included Elsewhere

1. Clearing and Grubbing: Section 02110

C. Quality Assurance

The Commission will inspect all materials before, during and after installation to ensure compliance with the Contract Documents.

2.0 MATERIALS

A. Materials Furnished by the Commission

The Commission will not furnish any materials for fence installation.

B. Contractor's Options

None.

C. Detailed Material Requirements

1. If required by the Chief Engineer, fencing shall consist of chain link fabric topped with three strands of barbed wire mounted on extension arms projecting outward at 45°.
2. Barbed Wire

The barbed wire shall consist of three lines of aluminum coated steel barbed wire which is to be of the four point pattern composed of two strands of 12-1/2 gage line wires with 14 gage aluminum barbs spaced on approximately 5 inch centers. Minimum weights of aluminum coating shall be 0.30 ounces per square foot of wire surface.
3. Chain Link Fabric
 - a. Fabric shall be aluminum coated steel chain link, No. 9 gage wire woven in a 2 inch mesh. Top and bottom selvages shall be barbed. The fabric shall conform to ASTM Designation A491-74 in its entirety.
 - b. The aluminum coating shall be a minimum of 0.4 ounces per square foot of wire surface for #6 and #9 gage fabric and 0.35 ounces per square foot for #11 gage. The weight of coating shall be determined by the strip test as defined in ASTM Specifications A428-68.

4. Fabric Connections

The chain link fabric shall be securely fastened to all terminal posts using 3/16" x 3/4" stretcher bars and heavy 11 gage tension bands. The fabric shall be fastened to all intermediate posts and top rails with #11 gage tie wires.
 5. Tension Wire

The top and bottom tension wire shall be No. 7 gage aluminum coated spring coil or crimped wire. Minimum weight of aluminum coating shall be 0.40 ounce per square foot of wire surface.
 6. Framework
 - a. All posts and framework (including gates) shall be hot dipped zinc coated with a minimum of 1.8 ounces per square foot of surface and shall conform to ASTM A120-78.
 - b. Terminal and corner posts shall be nominal 3-inches outside diameter, nominal weight 5.79 pounds per linear foot.
 - c. Line posts shall be nominal 2 1/2-inches outside diameter, nominal weight 3.65 pounds per linear foot.
 - d. The top rail and brace pipes shall be nominal 1-5/8-inches outside diameter standard weight pipe, wt. 2.27 pounds per linear foot.
 7. Gates
 - a. Posts for swing gates shall be 4-inch O.D. standard weight pipe, wt. 9.1 pounds per linear foot.
 - b. Gate posts shall be equipped with top cap so designed to prevent moisture from entering the post.
 - c. Gate frames shall be nominal 2-inches outside diameter standard weight pipe, wt. 2.72 pounds per linear foot. Gates may be fabricated using welded construction or heavy pressed steel or malleable corner fittings securely riveted. Hinges shall be of sufficient strength and design to permit easy and trouble-free operation. Gates shall have center plunger rod to positively hold gates in open or closed positions. Gates shall have barbed wire. All gates shall be equipped with a positive type latching device with a means for padlocking. An approved padlock with three keys shall be provided for each gate. Locks shall be keyed to the Metropolitan Commission.
 8. Portland Cement Concrete

Portland cement concrete for fence post encasement shall be Mix No. 1 as specified in Section 03300.
- D. Material Storage Note: Materials shall be stored in order to insure the preservation of their quantity, quality and fitness for Work. The Contractor shall place materials on wooden platforms, or other hard, clean surfaces, not on the ground, and the materials shall be placed under cover when directed by the Owner. Stored materials shall be

located in order to facilitate prompt inspection by the Owner. Lawns, grass plots, or other private or public property shall not be used for storage purposes without written permission of the owner or lessee. Unless directed or noted otherwise in the Contract documents, there will be no payment for stored materials.

3.0 EXECUTION

A. General

1. The fence shall be erected at locations shown on the Plans to grades conforming to existing ground contours by experienced fence erectors. The bottom of the fabric shall be placed a normal distance of 1-inch above the finished grade, however, over irregular ground, a minimum clearance of 1-inch and a maximum clearance of 6-inches will be permitted for a horizontal distance not to exceed 8 feet.
2. Any excavation or backfill required in order to comply with these provisions shall be made as approved by the Commission. The fence shall be true to line, taut, and shall comply with the best practice for chain link fence construction. For site fencing projects, the fence fabric shall be placed on the outside of the posts.
3. All posts shall be plumbed and placed at the specified spacing shown on the Contract Documents. Spacing of posts shall be as uniform as practicable under local conditions. The distance between line posts shall not exceed 10 feet.
4. Terminal posts shall be installed at all ends, abrupt changes in grade, and at changes in the horizontal alignment greater than 10 degrees. In no case shall the distance between terminal posts exceed 500 feet.
5. Post lengths shall be adequate in all cases to accommodate the fabricated width of the fence fabric without stretching or compressing the fabric and to obtain, as a minimum, the distance required below the bottom of the fabric.
6. Horizontal brace rails shall be installed at all gate, pull, and corner posts. Horizontal brace rails with diagonal truss rods and turn buckle shall be installed at all terminal posts. Sufficient braces shall be supplied to allow complete bracing from each terminal post to all adjacent line posts. Braces shall be securely fastened to posts by heavy pressed steel and malleable fittings.
7. Fabric shall be tied to brace and top rails at 2-foot intervals maximum. Stretcher bars shall be attached to terminal posts by connectors equally spaced at 12-inch centers maximum. The fabric shall be fastened to all intermediate post at a spacing not to exceed 14-inches.
8. Tension wire shall be stretched taut and run continuously between terminal post near the top and bottom of the fabric and securely fastened to each intermediate post.
9. Gates shall be installed so as to be easily opened and closed by one person and shall be capable of being swung back parallel with the fence unless otherwise noted. Gates shall be properly braced to eliminate any possible sagging condition.
10. Areas contained within and adjacent to the security fence shall be smoothed, level and compacted after which two (2) layers of 6 mil black plastic and three

inches (3") of crushed gravel shall be added. This graveled area shall extend in all directions a minimum of two feet (2') beyond the security fence. Bank run gravel is not acceptable.

B. Concrete

1. Concrete footings shall be constructed in accordance with dimensions shown on the Standard Details. Posts shall be centered in cylindrical concrete footings. The concrete shall be thoroughly compacted around the post by tamping or vibrating. The finish top surface shall be a smooth finish, slightly above the ground line, and uniformly sloped to drain away from the post. The post shall not be disturbed in any manner within 72 hours after the individual post footing is completed.
2. Hand mixed concrete shall not be used without written permission of the Commission. If permitted, the hand mixed batch shall not exceed $\frac{1}{2}$ cubic yard.

4.0 METHOD OF MEASUREMENT

A. Chain Link Fence

Measurement for chain link fence will be made of the length of fence of various sizes installed complete and accepted. Measurement will be made to the centers of end posts.

B. Terminal Posts

No measurement of terminal posts will be made.

C. Line Posts

No measurement of line posts will be made.

D. Gates

No measurement of gates will be made.

5.0 BASIS OF PAYMENT

A. General

1. Payment will be made at the unit prices bid. The prices bid shall include and cover furnishing all labor, tools, equipment, and materials necessary to complete the work as shown and specified, in strict accordance with the Contract Documents.
2. Payment will be made for contingent items when approved by the Commission.

B. Chain Link Fence

Payment for chain link fence will be made at the price bid per linear foot for fence of the size and type specified and shall include traffic control and the furnishing and installation of all terminal posts, line posts, gates, chain line fabric, bracing, fittings, locks, and incidental items to complete the fence installation.

C. Terminal Posts

Payment for furnishing and installing terminal posts will not be made, for it will be incidental to chain link fence installation.

D. Line Posts

Payment for furnishing and installing line posts will not be made, for it will be incidental to chain link fence installation.

E. Gates

Payment for furnishing and installing gates will not be made, for it will be incidental to chain link fence installation.

****END OF SECTION 02870****