Subsection 10.03
Fence

I. Scope

This item includes chain link and barbed wire fencing. The Contractor shall furnish all material, labor, superintendence, tools, equipment, shop drawings, and incidentals necessary to complete this construction in accordance with the drawings and these specifications.

II. Materials

A. Chain Link Fence:

1. Wire Fabric: The chain link fabric shall be Type I, zinc coated steel fabric. Zinc coating shall have a minimum weight of 0.5 ounces per square foot of uncoated wire surface. The fabric shall be 72 inches high and shall be No. 11 gauge with 2 -3/8 inch mesh. The fabric shall be knuckled at bottom selvage and twisted and bared at top selvage.

2. P.I., Cross Member & End Posts: Points of intersections, cross member and end posts shall be 3 inch O.D. pipe, 10 feet total length, with a 0.16 inch wall thickness, weighing 4.64 pounds per linear foot. Posts shall be hot-dip galvanized.

3. Gate Posts: Gate posts shall be 4 inch O.D. pipe, 10 feet total length, with a 0.16 inch wall thickness, weighing 6.56 pounds per linear foot. Posts shall be hot-dip galvanized.

4. Line Posts: Line posts shall be 2 3/8 inch O.D. pipe weighing 3.12 pounds per linear foot with a wall thickness of 0.13 inches. Line posts shall be a minimum length of 9 feet and shall be hot-dip galvanized.

5. Top and Bottom Rails: All top and bottom rails shall be 1 5/8 inch O.D. pipe weighing 1.84 pounds per linear foot with a wall thickness of 0.11 inches. Top and bottom rails shall be hot-dip galvanized and shall be provided with approved couplings and connections. The fabric shall be tied to the rail with No. 11 gauge tie wires on a maximum spacing of 12 inches.

6. Guy Wire: All guy wires shall be appropriate tensile strength cable, coated as specified for the wire fabric, and shall be installed at all cross members, end posts, and P.I. posts. All guy wires shall be installed to the top of posts and anchored to the ground at a distance of 6 feet from the fence using a standard mobile home anchoring system. End posts shall be anchored in line

with the fence. Cross members shall be anchored at a 90° angle to the fence toward the center. P.I. posts shall be anchored at a 90° angle to the fences away from the center.

7. Fittings: All fittings shall be steel of adequate size as approved.

8. Gates: Gates shall be installed as shown on the plans. The fabric covering shall be the same as the fence. All gates shall be furnished complete with the fittings. Gate frames shall be 1-5/8 inch O.D., hot-dip galvanized pipe weighing 1.84 pounds per linear foot with a wall thickness of 0.13 inches.

9. Man Gates: Man gates shall be installed as shown on the plans and per manufacturer's recommendation.

10. Cross Members: At a maximum spacing of 500 feet intervals, cross members shall be installed. The cross members shall be constructed from 3 inches O.D. pipe weighing 4.64 pounds per linear foot with a wall thickness of 0.16 inches. Spacing between posts for cross members shall be 6 feet. Cross members shall be constructed in accordance with these specifications and the detailed drawing on the plans. A guy wire shall be installed at each cross member as specified.

11. Extension Arms: The 16 inch extension arms shall be steel with provisions for 5 wires, and shall extend at a 45° angle west or south from the line posts.

12. Wire: Each wire shall be of a smooth pattern with two strands of No. 12-1/2 gauge. Each strand shall be coated as specified for the fabric. A total of 5 wires shall be installed along the entire length of the fence.

13. Barbed Wire: Barbed wire on the top of the fence to be 3 strands high and have 4-point barbs.

14. Concrete: Shall conform to Subsection 4.07 “Concrete”, and shall have a minimum 28 day compressive strength of 3000 pounds.

B. Barbed Wire Fence

1. Metal Posts and Braces: Steep pipe used for posts and braces shall conform to the specifications of ASTM A 120. Steel sections used for posts and braces shall be a good commercial quality weldable steel. All material shall be new and no used, rerolled or open seam material will be acceptable. All posts and braces shall meet the weight and length requirements shown on the plans. Galvanized steel sections shall conform to ASTM A 123. All posts and braces, except galvanized products, shall be painted with an approved anti-corrosive paint and after installation all areas where the paint coat has been damaged shall be spot-coated with paint of the same color as the shop coat. No other painting

will be required. All fittings required for posts and braces shall be pressed or rolled steel, forged steel, malleable iron or wrought iron of good commercial quality and shall conform to the details shown on the plans.

a) Metal Line Posts, Pull Posts and Braces for Pull Posts: Metal posts and braces shall be "H" column, tubular or any other approved shape and shall be properly adapted to provide means for attaching the fencing to the posts in a manner that will not damage the posts nor fencing material. Metal line posts, pull posts and braces for pull posts shall each be of the weight and dimensions shown on the plans. Line posts shall be provided with tapered anchor plates securely attached thereto. The anchor plates shall be of the area, size and weight shown on the plans. The anchor plate may be omitted provided the post is set in a concrete footing as shown on the plans.

b) Metal Corner, End and Gate Posts: Metal corner, end and gate posts and braces shall be any one of the shapes specified for line posts. Metal posts shall each be of the weight and dimensions shown on the plans**.**

2. Untreated Wood Posts and Braces: Untreated wood posts and braces shall be pine, cedar or mesquite of the length and size shown on the plans and shall be cut from sound timber. Posts shall have a minimum diameter as indicated on the plans and shall be approximately round, shall be trimmed of all knots and knobs and shall be straight and relatively smooth. The posts shall be free from defects such as injurious ring shakes, unsound or loose knots, splits or other defects that might impair their strength and durability. Sound knots will be permitted provided they are not in clusters and do not exceed 1/3 of the small diameter or least dimension of the posts. A line drawn from the center of each end of the post shall not fall outside the center of the post at any point more than 2 inches.

3. Treated Wood Posts and Braces: Treated wood posts and braces shall be pine or fir timber of the size and dimensions shown on the plans. The timber shall be sound and free from all decay, shakes, splits or any other defects which would weaken the posts or braces or otherwise make them structurally unsuitable for the purposes intended**.**

The posts and braces shall be round, square or sawed rectangular shape. The slope of grain in sawed, square or rectangular posts for the full length shall not exceed one in ten and knots shall be sound, tight, well spaced and shall not exceed one-third of the small diameter or least dimension of the post. A line drawn from the center of each end of the post shall not fall outside the center of the post at any point more than 2 inches. All braces shall have a creosote, pentachlorophenol, ACA or CCA treatment. Posts shall be inspected at time of treatment. Round posts and braces shall be peeled to remove all outer bark and all inner cambium bark, except that occasional strips of bark may remain if

not over 1/2 inch wide or over 3 inches long. All knots shall be trimmed flush with the sides, spurs and splinters removed and the ends cut square. The allowable taper from end to end of round posts and braces shall not exceed 1 1/2 inches.

4. Gates and Gate Posts: Gates and gate posts shall be of the materials and to the dimensions detailed on the plans.

5. Barbed wire: Barbed wire shall conform to ASTM A 121, Class 1. The barbed wire shall consist of two strands of 12-1/2-gauge wire, twisted with two-point 14-gauge barbs spaced not more than 5 inches apart, or may be as specified on the plans for high tensile wire.

6. Wire Mesh: Wire mesh fabric shall conform to ASTM A 116, Class 1. The wire mesh shall be of the height and design shown on the plans. The top and bottom wires shall be 10-gauge minimum and the intermediate wires and vertical stays shall be 12-1/2-gauge minimum**.**

7. Miscellaneous: Galvanized bolts and nuts for attaching braces and straps to metal posts and suitable galvanized devices for holding barbed wire and wire mesh firmly in position shall be of good commercial quality and design.

Staples used to secure barbed wire and wire mesh fabric to wood posts shall be not less than 1 1/2 inches long and the wire from which they are made shall be galvanized.

III. Equipment: The Contractor shall use proper equipment to install the proposed fence.

IV. Construction Methods

A. Chain Link Fence: Line posts shall be spaced a maximum of 10 feet apart. Gate posts shall be spaced to fit the gates furnished. All line, gate and P.I. posts shall be set at least 36 inches deep. All line posts shall be set in holes not less than 9 inches in diameter, and all gate, end and P.I. posts shall be set in holes not less than 12 inches in diameter, and filled with concrete. Concrete shall extend one 1 inch above finished grade and be sloped away from the post in all directions such that water shall not pond around the post. Fabric shall be stretched taut and securely attached to the line posts with clips spaced 12 inches apart. Suitable stretcher bars and bands shall be used at all end posts, P.I. posts, and gate posts. The guy wires shall be tightly stretched and securely attached to the top of cross member posts. The fence shall be installed in accordance with the manufacturer's instructions, in a neat and workmanship like manner.

B. Barbed Wire Fence: Fence posts shall be spaced at the intervals and set to the depth shown on the plans. Posts shall be set in a vertical position. Corner and pull posts shall be braced in two directions. End and gate posts shall be braced in one

direction. Where alignment changes 30° or more, a corner post shall be installed. At alignment angles varying from 15° to less than 30°, the angle post shall be braced to adjacent line posts by diagonal tension wires. Where steel posts are specified, a pull post assembly shall be installed at approximately 500 foot intervals and where wood posts are specified the spacing of pull post assemblies shall be approximately 1000 feet, unless otherwise shown on the plans. Metal line posts may be driven in place providing such driving does not damage the posts. Metal corner, end, pull posts and braces shall be set in Portland cement concrete footings crowned at the top to shed water. All posts shall be placed the minimum depth below ground as shown on the plans or as directed by the Engineer. Posts shall be set plumb and firm to the line and grade shown on the plans. Backfilling shall be thoroughly tamped in 4 inch layers. The timber post braces shall be notched as shown on plans.

The corner, end or angle post assembly shall be installed before stretching the wire between line posts. At all grade depressions where stresses tend to pull the posts out of the ground, the fencing shall be snubbed or guyed at the critical point by means of a double 9-gauge galvanized wire connected to each horizontal line of barbed wire or to the top and bottom wire or wire mesh fabric, and to a deadman weighing not less than 100 pounds, buried in the ground as shown on plans. The fencing shall be stretched before being snubbed and guyed. Existing cross-fences shall be connected to the new fences and corner posts with braces which shall be connected to the new fences and corner posts with braces which shall be placed at junctions with existing fences. The barbed wire and wire fabric shall be drawn taut and fastened to posts with galvanized ties or staples as specified on the plans.

V. Measurement: The fence as constructed shall be measured as shown on the project plans and detailed in the project proposal.

VI. Payment: The cost of furnishing and installing the fence complete as specified shall be included in the price bid per lineal foot for the fence installation.

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