

SECTION 02835 - CHAIN LINK FENCING

1.0 GENERAL

1.1 Furnish and install chain link fencing complete in place with gates and accessories as specified herein and as shown on the Contract Drawings.

1.2 Reference Specifications are referred to by abbreviation as follows.

A. American Society for Testing and Materials..... ASTM

B. Chain Link Fence Manufacturer's Institute CLFMI

1.3 Submittals

A. Shop Drawings: Submit complete layout and details of fence and gate construction, fence height, post spacing, dimensions and unit weights of framework and concrete footing details.

2.0 PRODUCTS

2.1 Materials

A. End, Corner and Gate Posts:

(1) Type I tubular members shall be Schedule 40 welded or seamless steel pipe with 1.8 oz. zinc coating per sq. ft. of surface area conforming to ASTM F1083.

(2) Type II tubular members shall be pipe manufactured from steel conforming to ASTM A569, cold-formed, high frequency or induction welded and having a minimum yield strength of 50,000 psi. External surface triple coated per ASTM F1043, Type B & Type D with a minimum of 0.9 oz of zinc per sq. ft., a minimum of 15 micrograms of chromate per sq. in. and high performance polymer top coating with a zinc-rich exterior thickness of not less than 0.3 mil. Posts shall demonstrate the ability to resist 1,000 hours of exposure to salt spray with a maximum of 5% red rust in a test conducted in accordance with ASTM B117. Internal surface coat, after welding, with a zinc-rich based organic coating having a 91% zinc powder loading capable of providing the ability to withstand 650 hours of exposure to salt fog with a maximum of 5% red rust, when conducted in accordance with ASTM B117.

(3) All coatings shall be applied inside and out after welding.

- (4) Pipe shall be straight, true to section and conform to the following weights:

| <u>Pipe Size Outside Diameter</u> | <u>Type I Weight lbs./ft.</u> | <u>Type II Weight lbs./ft.</u> |
|---------------------------------------|-----------------------------------|------------------------------------|
| 1 5/8" | 2.27 | 1.84 |
| 2" | 2.72 | 2.28 |
| 2½" | 3.65 | 3.12 |
| 3' | 5.79 | 4.64 |
| 3½" | 7.58 | 5.71 |
| 4" | 9.11 | 6.56 |
| 6 5/8" | 18.97 | -- |

- B. Fabric: Zinc-coated fabric shall be hot-dipped galvanized after weaving with a minimum of 1.2 oz. of zinc per sq. ft. of surface area and shall conform to ASTM A392, Class I. Fabric shall be 9 gauge wire woven in a 2" diamond mesh. Top selvage shall be twisted and barbed, bottom selvage shall be knuckled.

2.2 Concrete Mix: Mix shall consist of Portland cement concrete ASTM C94 with a maximum 3/4" aggregate and having a minimum compressive strength of 3,000 psi at 28 days.

2.3 Components

- A. Fence Posts

| <u>Fabric Height</u> | <u>Line Post O.D.</u> | <u>Terminal Post O.D.</u> |
|----------------------|-----------------------|---------------------------|
| Under 6' | 2" | 2½" |
| 6' to 9' | 2½" | 3" |
| 9' to 12' | 3" | 4" |

- B. Gate Posts

| <u>Single Gate Width</u> | <u>Double Gate Width</u> | <u>Post O.D. Type I/II</u> |
|--------------------------|--------------------------|----------------------------|
| Up to 6' | Up to 12' | 3" |
| 7' to 12' | 13' to 25' | 4" |

- C. Top Rails and Braces: 1 5/8" O.D.

- D. Gates: Frame assembly of 2" O.D. pipe Type I or II with welded joints. Weld areas repaired with zinc-rich coating applied per manufacturer's directions. Fabric

to match fence. Gate accessories, hinges, latches, center stops, keepers and necessary hardware of quality required for industrial and commercial application. Latches shall permit padlocking.

E. Fittings

- (1) Post Caps: Pressed steel, malleable iron or cast iron designed to fit snugly over posts to exclude moisture. Supply cone type caps for terminal posts and loop type for line posts. All fittings to conform to ASTM F626.
- (2) Rail and Brace Ends: Pressed steel, malleable iron or cast iron, cup-shaped to receive rail and brace ends.
- (3) Top Rail Sleeves: Tubular steel, 0.051" thickness x 7" long, expansion type.
- (4) Tension Bars: Steel strip, 5/8" wide x 3/16" thick.
- (5) Tension Bands: Pressed steel, 14 gauge thickness x 3/4" wide.
- (6) Brace Bands: Pressed steel, 12 gauge thickness x 3/4" wide.
- (7) Truss Rods: Steel rod, 3/8" diameter merchant quality with turnbuckle.
- (8) Barbed Wire Arms: Pressed steel, malleable iron or cast iron fitted with clips or slots for attaching three strands of barbed wire. Arms shall be set outward on a 45° angle and be capable of supporting a 250 pound load at outer barbed wire connecting point without causing permanent deflection.

F. Tension Wire: Marcellled 7 gauge steel wire with minimum coating of 0.80 oz. of zinc per square foot of wire surface and conforming to ASTM A824.

G. Hog Rings: Steel wire, 11 gauge, alloy 1100-H4 or equal.

H. Barb Wire: Commercial quality steel, 12-1/2 gauge, two strand twisted line wire with 4 point barbs at 5" spacing. Coating shall consist of a minimum of 0.80 oz. of zinc per sq. ft. of wire surface conforming to ASTM A121.

I. Cantilever slide gates shall meet requirements of CLFMI specifications.

J. Locks: Each gate shall be furnished with a Master Lock Company, Model No. 2, brass case padlock with two keys per lock and all locks master keyed to Owner's system.

K. Grounding clamps shall be 3/8 in. cadmium-plated plus gold chromated steel U-bolt

and nuts with cast bronze, plain-finish clamp. Ground wire shall be #4 AWG copper wire. Ground rod shall be 5/8" x 8 feet with a 6" projection and shall have a resistance to ground of 25 ohms or less.

3.0 EXECUTION

3.1 Installation

- A. General: Installation shall conform to ASTM F567.
- B. Height: Fence shall be _____ in height unless otherwise indicated on Contract Drawings.
- C. Post Spacing: Space line posts at intervals not exceeding ten (10) feet.
- D. Post Setting: Set terminal, gate and line posts plumb in concrete footings. Top of footing shall be 2" above grade and sloped to direct water away from posts. Bottom of footing shall be 3'-4" below grade and shall have the following diameters:

line posts - 10"
end and corner posts - 12"
gate posts - 14"

Post shall be set to a depth of 3' below grade.

- E. Bracing: Brace gate and terminal posts back to adjacent line posts with horizontal brace rails and diagonal truss rods.
- F. Top Rail: Install through line post loop caps connecting sections with sleeves to form a continuous rail between terminal posts.
- G. Bottom Tension Wire: Stretch between terminal posts 6" above grade and fasten to outside of line posts with tie wires.
- H. Fabric: Pull fabric taut with bottom selvage 2" above grade. Fasten to terminal posts with tension bars threaded through mesh and secured with tension bands at maximum 15" intervals. Tie to line posts and top rails with tie wires spaced at maximum 12" on posts and 24" on rails. Attach to bottom tension wire with top rings at maximum 24" intervals.
- I. Barbed Wire: Anchor to terminal extension arms, pull taut and firmly install in slots of line post extension arms.
- J. Gates: Install gates plumb, level and secure for full opening without interference.

Mushroom center cap and duckbill latches.

Anchor center stops and keepers in concrete.

Drawing to depict what is needed.

- K. Fasteners: Install nuts for fittings, bands and hardware bolts on inside of fence.
- L. Fence shading shall be required at water, wastewater facilities or as deemed necessary by the County.

3.2 Grounding

- A. Ground fence enclosures at diagonally opposite corners and at intervals not exceeding 500 feet.
- B. Where an electric utility line rated 65 KV or greater passes over the fence, fence shall be grounded at points 50 feet, measured horizontally, beyond where the outside conductors pass over the fence.
- C. Where an electric utility line rated 65 KV or greater runs parallel to and within 40 feet of the fence, measured horizontally, fence shall be grounded at 50 ft. maximum intervals along the parallel section of fence.
- D. Fence post grounding shall consist of three grounding clamps, installed at the top, middle and bottom of the post, connected to the ground wire.
- E. Fence grounding shall consist of conductors secured to the fence with compression connectors.
- F. Provide ground rod at each grounding point located on post side of fence as close as possible to post and fence.
- G. Grounding conductors shall be cad welded to the ground rod as specified in Division 16.
- H. Provide flexible copper bonding jumper between fixed fencing and moveable elements such as gates.

3.3 Completion: Leave area of installation free of debris caused by installation of the fence.

END OF SECTION