

SECTION 32 31 13

CHAIN LINK FENCING AND GATES

ART 1 GENERAL

01 SECTION INCLUDES

- A. Chain link fence framework, fabric, and accessories for extension of existing fencing.
- B. Excavation for post bases; concrete foundation for posts.

02 RELATED SECTIONS

- A. Division 3 - Concrete

03 REFERENCES

- A. ASTM C94 – Ready-Mixed Concrete.
- B. ASTM F567 – Installation of Chain-Link Fence.
- C. ASTM F669 – Strength Requirements of Metal Posts and Rails for Industrial Chain Link Fence.

04 PERFORMANCE AND DESIGN REQUIREMENTS

- A. Line Post Spacing: at intervals not exceeding 10 feet for chain link fence.
- B. Chain link fence post and rail strength: Conform to ASTM F669 light industrial fence quality.

05 SUBMITTALS

- A. Submit under Division 1 requirements.
- B. Product Data: Provide data on posts, rails, tension wire, barbed wire, planking, chain link fabric, grounding materials, accessories, fitting hardware, and agricultural swing gate.

06 QUALITY ASSURANCE

- A. Perform work in accordance with ASTM F567.

ART 2 PRODUCTS

01 MATERIALS

- A. Steel and malleable iron: Galvanized.
- B. Aluminum: Prohibited.
- C. Fabric:
 - 1. 2 inch mesh pattern.
 - 2. General fencing shall be nine (9) gauge, chemically cleaned, galvanized.
 - 3. Backstop fabric shall be six (6) gauge, chemically cleaned, galvanized.
 - 4. Knuckled top and bottom.
 - 5. If sharp metal or galvanizing burrs protrude through vinyl coating on fabric, the fabric shall be removed and replaced with acceptable fabric.
- D. Posts:
 - 1. End, corner and pull posts.
 - a) Schedule 40, 2.875 inch O.D. minimum for up to 8-foot height.
 - b) Schedule 40, 3.5 inch O.D. minimum for posts to 10-foot height.
 - 2. Line posts: Schedule 40, 2.375 inch O.D. minimum.
 - 3. Gate Posts.
 - a) Single gates: Schedule 40, 2.875 inch O.D. minimum.

- b) Double gates: Schedule 40, 3.5 inch O.D. minimum.
4. Post caps.
 - a) Line posts: Weather tight closure caps with opening for top rails.
 - b) Terminal posts: Weather tight closure caps.
 5. Provide escutcheon or slope grout to provide positive drainage away from pipe.
- E. Rails:
1. Minimum 1.66 inch O.D., Schedule 40.
 2. Expansion sleeves are prohibited unless approved by DPS.
 3. Provide bottom rail at backstops and on backstop wings.
 4. Intermediate rails are required for fences over 4 feet in height.
- F. Gates:
1. ECE gates with panic bars need to have bulldog hinges. The latch for panic bars to be bolted to post and the latch will not stick out more than one inch.
 2. No removable posts.
 3. Perimeter frame: 1.90 inch O.D. minimum, Schedule 40.
 4. Weld corners of frames and touch-up weld spots with galvanized paint.
 5. Hardware.
 - a) Commercial grade.
 - b) Hinges (Weld to post).
 - i) Non-lift off.
 - ii) Bulldog hinges on all gates (no residential hinges)
 - iii) One pair (minimum) up to and including 6-foot height.
 - iv) One and one-half pair (minimum) on gates over six feet 6-foot height.
 - v) Weld in place. Bolt or screw attachment of hinges is prohibited.
 - c) Latches (Weld all hinges)
 - i) Padlock eye.
 - ii) Operation either side.
 - iii) Single gate: Fork type.
 - iv) Double gate: Cane bolt/drop pin assembly mounted to gate, vertical frame, designed to engage strike/ground sleeve that is embedded 18 inch minimum in concrete (inactive leaf) Pipe is preferred in lieu of rods for cam bolts.
 - d) Rolling gates.
 - i) Allowed at service entries only.
 - ii) Minimum two 1-½ inch tracks.
 - iii) Two pressed steel track rollers.
 - iv) One double-wheel ground roller minimum.
 - e) Cantilever gates.
 - i) Solid track wheels, cast iron.
 - ii) 2-3/8 inch Minimum O.D. Rail / Frame, Schedule 40.
 - iii) 4 inch minimum support posts.
 - iv) If gate is in a play area, provide a protective shield over the rollers.
- G. Backstops shall be fabricated with welded joints. Welded joints will be toughed up per manufacturer's recommendations.

H. Accessories:

1. Truss rods: 3/8 inch diameter with turnbuckle and post anchors.
2. Tension bar: Full height, 1/4 inch by 3/4 inch (minimum).
3. Tension clamps: 14 gauge by 1 inch (minimum).
4. Tension wire: 9 gauge (minimum).
5. Tie wires: 12 gauge (minimum).

I. Concrete:

1. Refer to Section 32 13 13, Concrete.
2. Portland cement, ASTM C150; aggregates, ASTM C33; and clean water.
3. Mix materials to obtain concrete with a minimum 28-day compressive strength of 3000 psi.
4. Mix shall use at least five (5) sacks of cement per cubic yard and 1 inch maximum size aggregate.
5. Mix shall have a maximum slump of three inches (3 inches) and between 2% and 4% entrained air.

J. Wind screen:

1. Windscreen shall have reinforcing tape hog ringed to chain link.
2. Every grommet has a hog ring (9 gauge minimum).
3. Zip Ties Prohibited.
4. Douglas Polypro+ or equivalent.
5. Double stitched sewn reinforcement.
6. Air vents with locations specified.

K. Aluminum chain link fencing accessories are prohibited. (Tie wires, hog rings, tensions wires, etc.).

L. Wood components used in combination with chain link fencing are prohibited.

M. Tension wires must be hog ringed to the fabric and not woven through the fabric.

N. Display of the fence manufacturer or installer's name on completed chain link fencing is prohibited.

O. Hardware will have smooth headed screws or be flush mounted to avoid sharp edges and protrusion of bolts and screws.

ART 3 EXECUTION

01 INSTALLATION

A. Post spacing:

1. General: 10 feet on center (maximum).
2. At rolling gates: 5 feet on center (maximum).

B. Post foundations:

1. Concrete shall be used for post foundations. The depths listed below are minimum embedment depth of the fence post in concrete for fences without wind screens. The foundation depth shall provide an additional 6 inches of concrete below the embedment depth.
 - a) 4-foot and 6-foot Fence Heights: Minimum 12 inches diameter by 36 inches deep.
 - b) 12-foot Fence Heights: Minimum 18 inches diameter by 42 inches deep.
 - c) 18-foot Fence Heights: Minimum 24 inches diameter by 4 feet deep.
 - d) 24-foot Fence Heights: Minimum 24 inches diameter by 6 feet deep.

C. Gates and other access locations:

1. Single Gate: maximum clear opening is 5 feet
2. Double Gate: 5 feet minimum to 10 feet maximum.
3. Provide clear opening 2/3-1/3 split for gates intended for vehicular and pedestrian access.

- D. Truss rods: Provide at all terminations and changes in direction, from top of nearest line post to bottom of terminal or corner post.
- E. Tension bar clamps: maximum 15 inches on center.
- F. Tension wires:
 - 1. All fencing fabric: Continuous length (no splices permitted), woven through fabric at 2nd diamond, 4inches from bottom.
 - 2. Fencing over 4' feet in height: Additional tension wire, continuous length, woven through fabric at 2 feet above bottom of fabric.
 - 3. Backstops: Continuous length, woven through fabric at bottom, 18inches and 36inches above bottom.
 - 4. Continuous welded pipe rail may be used in lieu of tension wire.
- G. Tie wires:
 - 1. Line posts: 12inches on center (maximum).
 - 2. Rails: 24inches on center (maximum).
- H. Remove sharp edges and protrusions.
- I. Warranty:
 - 1. During the period of twenty-four (24) months after the final payment of work, make all necessary repairs or replacements, due to defective workmanship or materials. Any corrections required to meet this specification shall be at the Contractor's expense.

WIND SCREEN INSTALLATION

- A. Fasteners: Galvanized steel hog rings, minimum 9 gauge.
- B. Every grommet shall have a fastener.
- C. Reinforcing tape.
- D. Sewn reinforcement air vents.
- E. Zip ties prohibited.

END OF SECTION 32 31 13