

CHAIN LINK FENCES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide chain link fence system where shown on the Drawings, as specified herein and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division I of these Specifications.

1.2 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
 - 3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage and interface of the work of this Section with the work of adjacent trades;
 - 4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01620.

PART 2 PRODUCTS

2.1 DIMENSIONAL DATA

- A. General:
 - 1. Pipe sizes indicated are commercial pipe sizes.
 - 2. Tube sizes indicated are nominal outside dimensions.
 - 3. H-section sizes indicated are normal flange dimensions.
 - 4. Roll-formed section sizes indicated are the nominal outside dimensions.

2.2 GALVANIZING

- A. On steel framework and appurtenances, provide galvanized finish with not less than the following weight of zinc per sq ft.
 - 1. Pipe: 1.8 oz, complying with ASTM A120.
 - 2. H-sections and square tubing: 2.0 oz, complying with ASTM A123.

3. Hardware and accessories: Comply with Table I of ASTM A153.
4. Fabric: 2.0 oz, complying with class II of ASTM A121.

2.3 FABRIC

- A. Provide number 9 gauge or 0.148" wires in 2" mesh, with top and bottom selvages twisted and barbed.
- B. Provide fabric in one-piece widths.

2.4 POSTS, RAILS AND ASSOCIATED ITEMS

- A. End, corner, slope and pull posts: Provide at least the following minimum sizes and weights:

Material and dimensions:	Lbs per linear ft:
Pipe, 2.875" O.D.	5.79
Tubing, 2-1/2" square:	5.70
Roll-formed section, 3-1/2" x 3-1/2":	5.14
- B. Line posts: Provide minimum sizes and weights as follow:

Material and dimensions:	Lbs per linear ft:
Pipe, 2.375" O.D.	3.65
H-section, 2.25" x 1.95 x 0.143	1.95
- C. Gate posts: Provide gateposts for supporting single gate leaf or one leaf of a double gate installation, for nominal gate widths as follows:

Materials and dimension:	Lbs per linear ft:
Pipe, 4" outside dimension:	9.10
Tubing, 3" square:	9.10
H-section, 4":	14.00

 1. Over 13 feet wide, and up to 18 feet wide: Use 6.625" outside diameter pipe weight in 14.0 lbs per linear ft.
 2. Over 18 feet wide: Use 8.625" outside diameter pipe weighting 24.70 lbs per linear ft.
- D. Top rails:
 1. Use 1.660" outside diameter pipe weighing 1.80 lbs per linear ft; or
 2. Use 1.625" x 1.25" roll-formed sections weighing 1.35 lbs per linear ft.
 3. Provide in manufacturer's longest lengths, with expansion type couplings approximately 6" long for each joint.
 4. Provide means for attaching top rail securely to each gate, corner, pull, slope and end post.
- E. Post brace assemblies:
 1. Provide at end and gate posts, and at both sides of corner, slope and pull posts, with the horizontal brace located at mid-height of the fabric.
 2. Use 1.660" outside diameter pipe weighing 1.80 lbs per linear ft for horizontal brace.
 3. Use 3/8" diameter rod with turnbuckle for diagonal truss.
- F. Tension wire:
 1. Provide number 7 gauge galvanized coiled spring wire at bottom of fabric.
- G. Post tops:
 1. Provide steel, wrought iron or malleable iron, designed as weather tight closure cap.
 2. Provide one cap for each post.
 3. Provide caps with openings to permit through passage of top rail.

- H. Stretcher bars:
1. Provide one-piece lengths equal to full height of fabric, with a minimum cross-section of 3/16" x 3/4".
 2. Provide one stretcher bar for each gate and end post and two for each corner, slope and pull post, except where fabric is woven integrally into the post.
- I. Stretcher bar bands:
1. Provide steel, wrought iron, or malleable iron, spaced not over 15" on centers, to secure stretcher bars to end, corner, pull, slope and gate posts.
 2. Bands may be used also with special fittings for securing rails to end, corner, pull, slope and gate posts.

2.5 GATES

- A. General:
1. Fabricate gate perimeter frames of tubular members.
 2. Provide additional horizontal and vertical members to assure proper operation of the gate, and for attachment of fabric, hardware and accessories.
 3. Space so frame members are not more than 8 feet apart.
 4. Fabricate gate frames from:

Material and dimensions:	Lbs per linear ft:
Pipe 1.90" outside diameter:	2.72
Tubing, 2" square:	2.60
- B. Fabrication:
1. Assemble gate frames by welding with special malleable or pressed steel fittings and rivets for rigid connections.
 2. Use same fabric as used in the fence.
 3. Install fabric with stretcher bars at vertical edges as a minimum.
 4. Attach hardware with rivets or by other means that will provide security against removal and breakage.
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- C. Gates:
1. Swing Gates: Swing gates shall comply with the requirements of ASTM F 900. Provide the following for one 5' gate:
 - a. Hinges:
 - (1). Pressed or forged steel, or malleable iron, to suit the gate size: non-lift-off type, offset to permit 180 degree opening.
 - (2). Provide 1-1/2 pr of hinges for each leaf over 6 feet in nominal height.
 - b. Latches:
 - (1). Provide forked type or plunger-bar type to permit operation from either side of the gate.
 - (2). Provide padlock eye as integral part of latch.
 - c. Keeper:
 - (1). Provide keeper for vehicle gates, which automatically engages the gate leaf and holds it in the open position until manually released.
 2. Sliding Gates: Sliding gates shall conform to the requirements of ASTM F 1184.
 - a. Cantilever Slide Gates: Provide manufacturer's standard top rail incorporating track for top roller guideposts to keep gate on rollers. External rollers shall have ungreased fittings; internal rollers shall have sealed lubricant ball bearings. Gates shall be manufactured to prevent sagging. Fabric shall be the same size and finish as the fence and shall be applied to the entire gate. Provide a lockable positive latch and other hardware and accessories as required. Provide 16' gate.

2.6 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Wire ties:
 - 1. For tying fabric to line posts, use number 9-gauge wire ties spaced 12" on centers.
 - 2. For tying fabric to rails and braces, use number 9-gauge wire ties spaced 24" on centers.
 - 3. For tying fabric to tension wire, use number 11 gage hog rings spaced 24" on centers.
 - 4. Manufacturer's standard wire ties will be acceptable if of equal strength and durability.
- B. Concrete: Comply with provisions of Section 03300 for 2500 psi concrete.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. General:
 - 1. Install posts at a maximum spacing of 10 feet on centers.
 - 2. Install corner or slope posts where changes in line or grade exceed a 30-degree deflection.
- B. Excavating:
 - 1. Drill holes for post footings in firm, undisturbed or compacted soil, strictly adhering to the dimensions and spacing shown.
 - 2. Post hole dimensions:
 - a. Provide 30" deep by 8" diameter foundations for line posts for 5-foot fabric height and less.
 - b. Provide 36" deep by 8" diameter foundations for line posts for fabric heights exceeding 5 feet.
 - c. Provide 36" deep by 12" diameter foundations for all other posts.
 - 3. Spread soil from excavations uniformly adjacent to the fence line or on adjacent areas of the site if so directed.
 - 4. When solid rock is encountered near the surface, drill into rock at least 12" for line posts and at least 18" for end, pull, gate and corner posts. Drill hole at least 1" greater diameter than the largest dimension of the post to be placed.
 - 5. If solid rock is below soil overburden, drill to full depth required, except penetration into rock need not exceed minimum depths specified above.
- C. Setting posts:
 - 1. Remove loose and foreign materials from sides and bottoms of holes and moisten soil prior to placing concrete.
 - 2. Center and align posts in holes.
 - 3. Place concrete around posts in a continuous pour and vibrate or tamp for consolidation.
 - 4. Check each post for vertical and top alignment and hold in position during placement and finishing operations.
 - 5. Trowel tops of footings, and slope or dome to direct water away from posts.
 - 6. Extend footings for gateposts to the underside of bottom hinge.
 - 7. Set keeps, stops, sleeves and other accessories into concrete as required.
 - 8. Keep exposed concrete surfaces moist for at least seven days after placement, or cure with membrane curing material or other curing method approved by the Architect.
 - 9. Gout-in those posts that are set into sleeved holes, concrete constructions or rock excavations, using non-shrink Portland cement grout or other grouting material approved by the Architect.

- D. Concrete strength:
1. Allow concrete to attain at least 75% of its minimum 28-day strength before rails, tension wires and/or fabric is installed.
 2. Do not, in any case, install such items in less than seven days after placement of concrete.
 3. Do not stretch and tension fabric and wire and do not hang gates, until concrete has attained its full design strength.
- E. Rails and bracing:
1. Install fence with a top rail and bottom tension wire.
 2. Install top rails continuously through post caps or extension arms, bending to radius for curved runs.
 3. Provide expansion couplings as recommended by the fencing manufacturer.
 4. Provide bracing to the midpoint of the nearest line post or posts at all end, corner, slope, pull and gate posts.
 5. Install tension wires parallel to the line of fabric by weaving through the fabric and tying to each post with not less than number 6 gage galvanized wire or by securing the wire to the fabric.
- F. Installing fabric:
1. Leave approximately 2" between finish grade and bottom selvage.
 2. Excavate high points in the ground to clear the bottom of the fence.
 3. Place and compact fill to within 1" of the bottom of the fabric in depressions.
 4. Pull fabric taut and tie to posts, rails, and tension wires.
 5. Install fabric on outward side facing side of fence, and anchor to framework so that the fabric remains in tension after pulling force is removed.
 6. Install stretcher bars by threading through or clamping to fabric on 4" centers and secure to posts with metal bands spaced 15" on centers.
- G. Installing gates:
1. Install gates plumb, level and secure for full opening without interference.
 2. Install ground-set items in concrete for anchorage in accordance with the fence Manufacturer's recommendations as approved by the Architect.
 3. Lubricate and adjust the hardware for smooth operation.
- H. Miscellaneous:
1. Use U-shaped tie wires, conforming to diameter of pipe to which attached, clamping pipe and fabric firmly with ends twisted at least two full turns.
 2. Bend ends of wire to minimize hazards to persons and clothing.
 3. Fasteners:
 - a. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
 - b. Peen the ends of bolts to prevent removal of nuts.
 1. Repair coatings damaged in the shop or field erection, using a hot-applied repair compound applied in accordance with its manufacturer's recommendations as approved by the Architect.

END OF SECTION