Plans and Specifications
For
Jogging Trail Fence

At

Don Derr Park

January, 2009

Approved by: _____

_____

_____

Riverside County Flood Control

Approved by: _____

Robert L. Johnson, Principal Park Planner
City of Riverside
Parks Recreation & Community Services

Don Derr Park Site

Jogging Trail Fence Improvements

SECTION 02444 - CHAIN LINK FENCING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Standard Specifications: The provisions of the "Standard Specifications for Public Works Construction" shall apply except as modified herein.

B. Reference Standards:

ASTM A 153	-	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
ASTM A 392	-	Zinc-Coated Steel Chain Link Fence Fabric.
ASTM A 817	-	Metallic-Coated Steel Wire for Chain Link Fence Fabric.
ASTM A 824	-	Metallic-Coated Steel Marcelled Tension Wire for Use with Chain Link Fence.
ASTM F 669	-	Strength Requirements of Metal Posts and Rails for Industrial Chain Link Fence.
ASTM F 1083	-	Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized), Welded, for Fence Structures.
ASTM F 1234	-	Protective Coatings on Steel Framework for Fences.
CLFMI Stds.	-	Chain Link Fence Manufacturers Institute Voluntary Standard for Chain Link Fence Installation.

1.02 SCOPE: The Work of this Section shall consist of furnishing all labor, materials, equipment, appliances and services necessary for the execution and completion of all **Chain Link Fencing Work** as shown on the Plans and as described in the Specifications including, but not necessarily limited to, the following:

- Installation of approximately 680 linear feet of 6’ high chain link fence complete with fabric, posts, tension wire top & bottom, braces and other appurtenances;
- Excavation for foundations;
- Concrete foundations for posts;
- Installation of to lock open posts at two existing gates and related hardware and foundations;
- Obtain permit from Riverside County Flood Control;
- Obtain Public Landscape permit from City of Riverside Parks, Recreation & Community Services Department;
- Clean-up; and,
- Replacements, Repairs, Guarantees and Warranty Work.

1.03 SUBMITTALS: All submittals are to be submitted to the Park Projects Inspector at the pre-construction conference. The following submittals are required for this Section (six copies each except where specified otherwise):

A. Shop Drawings: Prepare fence plan that clearly indicates layout in both plan and elevation views showing spacing of components, accessories, fitments, foundation sizes, gate locations and sizes, direction of swing, line and end posts, light poles being incorporated into the fencing, all tensioning devices, and braces, and obtain approval of both Riverside County Flood Control and City of Riverside PR&CS Department prior to ordering materials.

B. Materials List: Itemize all chain link fencing components.

D. Product Data Sheets: Submit data sheets for all materials of this Section for which substitutions are proposed. Proposed substitution submittals are to be in accordance with Special Provisions Section **4-1.6.1 Proposed Substitutions**.

1.04 MATERIALS CERTIFICATION: Prior to Final Acceptance of the Project, a Manufacturer's written certification of compliance for chain link fabric, posts and rails shall be turned over to the Park Projects Inspector.

PART 2 - MATERIALS

2.01 GENERAL: All materials for chain link fencing shall conform with Section **206-6 CHAIN LINK FENCE** of the Standard Specifications except as modified herein. No advertising signage, impression, stamp, or mark of any description will be permitted on the fence.

2.02 FENCE COMPONENTS:

A. Braces, Gate Frames, Posts and Rails: All tubular members shall comply with provision of ASTM-A120 for weight and coating. All structural shapes shall comply with provisions of ASTM-A123 for galvanized coating.

1. Materials: Pipe for posts, rails braces and gate frames shall comply with one of the following Classes, and shall meet the Type I weight requirements of Table 1 below:
   a) Class I: Schedule-40 pipe conforming to ASTM F 1083.
   b) Class II: 50,000 psi yield per ASTM F 669; exterior coatings per ASTM F 1234, Type B, 0.9 ounces of zinc per square foot, a 15 microgram per square inch chromate conversion coating and 3 mils of acrylic; interior coating per ASTM F 1234, Type B, 0.9 ounces of zinc per square foot.

TABLE 1
MATERIALS FOR POSTS, RAILS, BRACES AND GATE FRAMES

NOMINAL SIZE INCHES	ACTUAL O.D. INCHES	WEIGHT PER FOOT POUNDS CLASS I	CLASS II
1 1/4	1.660 inch	2.27 #/FT	1.82 #/FT
1 1/2	1.900 inch	2.72 #/FT	2.28 #/FT
2	2.375 inch	3.65 #/FT	3.12 #/FT
2 1/2	2.875 inch	5.79 #/FT	4.64 #/FT
3	3.500 inch	7.58 #/FT	5.71 #/FT
3 1/2	4.000 inch	9.11 #/FT	6.56 #/FT

2. Mid-rails: Are not required, but may be used as horizontal brace in lieu of diagonal tension bracing at end and corner posts.
3. Sizes: Pipe sizes shall conform to the following:

Fence Height	Line Posts	All Other Posts	Brace Rail
> 6', ≤ 10'	2.375 inch O.D.	2.875 inch O.D.	1.660 inch O.D.

Gate Lock-Open Post Size: shall be 3.5” O.D., with welded loop to accept lock chain. Post height shall be minimum 4’ above grade with minimum 30” bury into concrete foundation.

B. Caps: Shall be non-pass thru type, cast, pressed steel or malleable iron, and shall be hot dip galvanized, sized to post dimension, set screw or rivet retained; press-fit caps are **not** acceptable.

C. Concrete: Shall conform to Class 470-B-2000 in accordance with the Standard Specifications.

D. Fabric: Shall be interwoven, 9 gauge steel, knuckled selvage top and bottom, diamond mesh sized to match existing fence. Heavy galvanized finish - 2.0 ounces zinc per square foot complying with ASTM A-392, Class 2.

E. Fabric Ties: Shall be 9 gauge galvanized steel post and rail ties and 11 gauge hog ring tension wire ties per ASTM A 817. Aluminum ties are **not** approved.

F. Fittings and Hardware: Sleeves, bands, clips, rail ends, caps, tension bars, truss rods, fasteners, fittings and other fence hardware and accessories shall be galvanized per ASTM A 153.

G. Stretcher Bars. Shall be galvanized high carbon steel bars not smaller than 3/16 inch x ¾ inch. Stretcher bar bands (tension bands) shall be minimum 14 gauge x ¾ inch, galvanized, pressed steel or malleable iron, spaced no more than 15 inches O.C.

H. Tension wire: Shall be 7 gauge steel, galvanized coil spring wire with metallic coating to match fabric per ASTM A 824, Type II, Class 3, 2.0 ounces of zinc per square foot.

I. Truss Rods: Shall be 3/8 inch diameter galvanized steel rod with adjustable tightener, to serve as a diagonal brace.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. General: Install all posts, all rails, and fabric to provide a rigid structure per City of Riverside Standards and the Standard Specifications. Use manufacturer's standard length (minimum 10') rails. Use standard industrial fittings, fasteners, and hardware. The fence shall be a minimum of 6'-0" high, unless otherwise shown on the Plans.

B. Posts:

1. General: Install posts plumb, and with correct vertical and linear alignment, set in concrete footings per City of Riverside, Public Works Standard Detail 380. Omit barb wire and three wire arm at top of posts shown on standard detail. Post footings shall be minimum 12” diameter by 36: deep.

2. Pull Posts: Intermediate "pull posts" matching the size of end and corner posts shall be installed at maximum 500 foot intervals in all straight sections of the fence. Pull posts shall be braced and trussed from both directions. Fabric, rails and/or tension wire shall be terminated at pull posts.

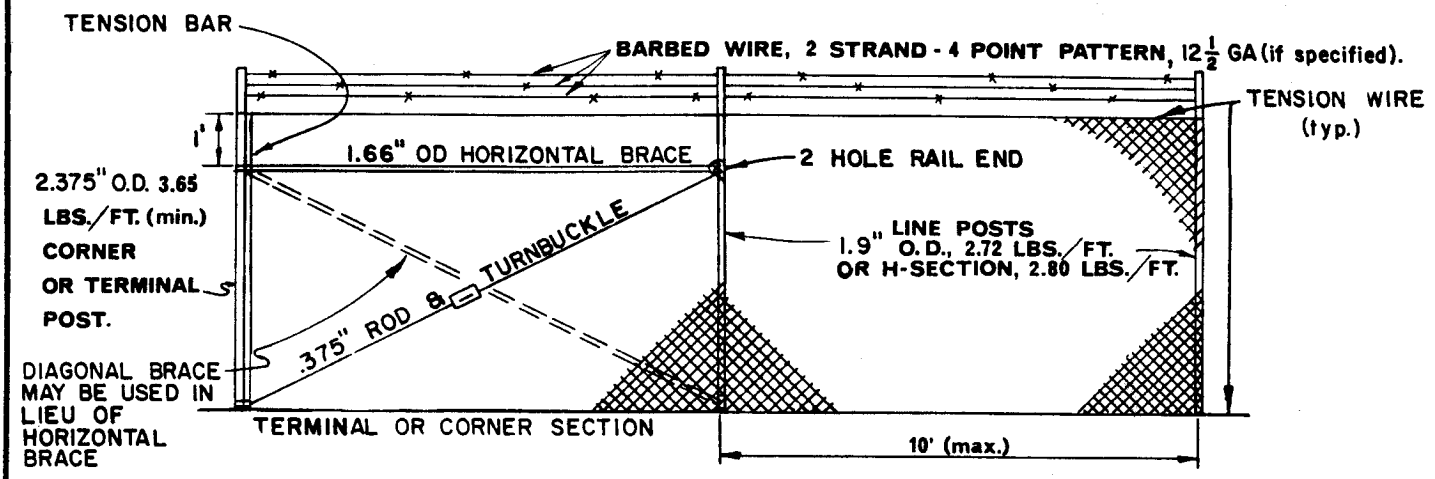
C. Tension Wire: Provide tension wire at top and bottom of fence.

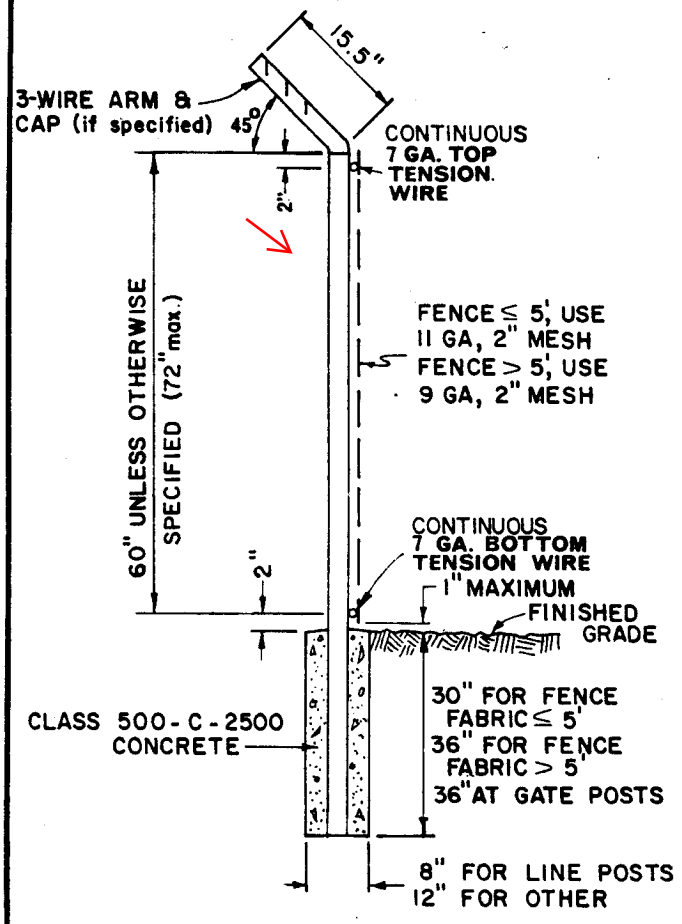
D. Fabric: Stretch fabric taut between posts using specified stretcher bars. With fabric kept taut, fasten fabric to rails, line posts and braces with ties maximum 12 inches on center, and fasten fabric to tension wire with hog rings at maximum 12 inches on center. Attach fabric to end, corner, gate, and pull posts and gate frame ends with stretcher bars and stretcher bar bands.

E. Lock Open Posts: Install lock open posts at both existing gates. Coordinate with RCFC to have these two gates locked open once concrete foundations for lock posts have fully cured.

3.02 CLEAN-UP: Upon completion of the Work of this Section, Contractor shall remove all equipment, excess material, and waste products from the site.

END OF SECTION





POST DETAIL

NOTES

1. All parts of the fence to be galvanized per Std Specifications for Public Works Construction.
2. Corner posts, 1.625" braces, and .375" rods and turnbuckle to be installed at corners of 30° deflection or greater.
3. Line posts to be double braced and turnbuckled every 500' in straight sections of fence. (See sheet 2 of 2)
4. Braces to be 1.25" pipe, 2.27 lbs/ft. - extending from corner, gate, or terminal posts to first adjacent line post, and securely fastened to posts with pressed steel connections, then trussed with .375" diameter round rod and turnbuckled.
5. Top and bottom tension wires to be securely fastened to all posts and tied to fabric at 24" spaces
6. The ground surface shall be filled and compacted to within 1" of bottom of fabric
7. Mesh fabric to be tied per Std Specifications for Public Works Construction.
8. Line posts to have 45° arm and cap carrying 3 strands of galvanized barbed wire of 4 point pattern, each composed of 2 strands of 12½ GA wire if required
9. For repair of damaged zinc coatings, see Std. Specifications for Public Works Construction.
10. When constructing a double gate, use horozontal braces on each side of the gates.
11. Top and bottom tension wires shall be fastened securely and terminated to line posts at each 500' bracing interval.

APPROVED Robert C. Wales DATE 7/1/78
PUBLIC WORKS DIRECTOR - R.C.E. 18793

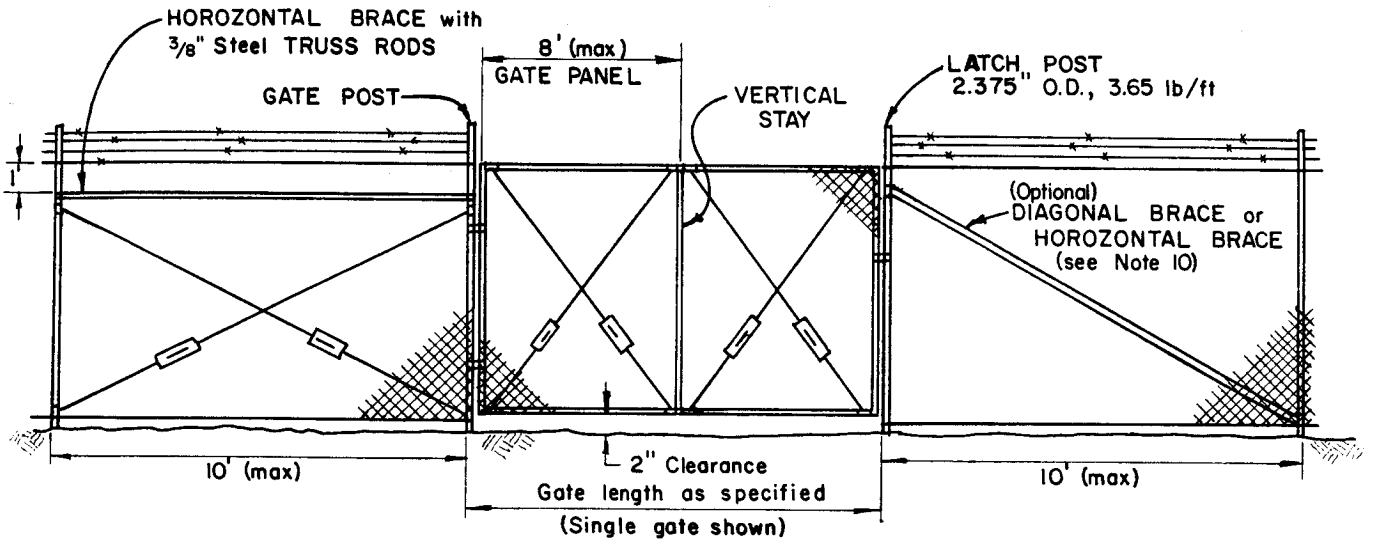
MARK	REVISIONS	APPR.	DATE
1	REVISED PER 1982 GREEN BOOK	RW	12/1/82
2	REVISED BRACING; ADDED SHT 2 OF 2	RW	7/1/84

CITY OF RIVERSIDE
PUBLIC WORKS DEPT. - ENGINEERING DIV.

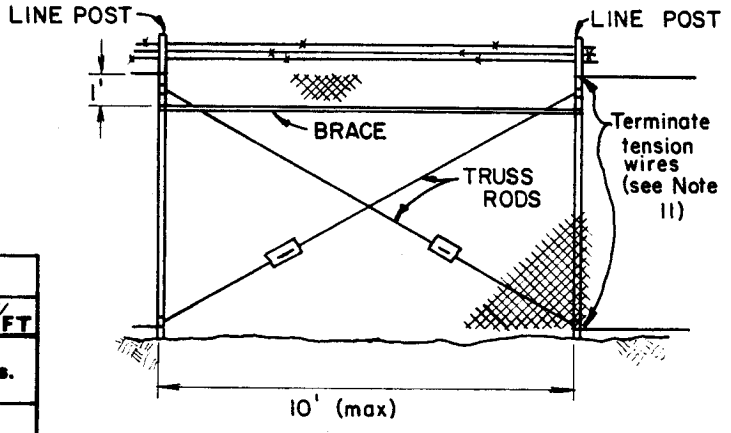
CHAIN LINK FENCE
(FOR FENCES UP TO 72" HIGH)

STANDARD DRAWING NO. 380

Sheet 1 of 2



GATE DETAIL



Line posts at 500' maximum intervals, braced and trussed in both directions. See Note 11 for tension wire termination.

LINE POST BRACING DETAIL

GATES			
FRAME	OPENING	POST O.D.	POST WT/FT
1.9" O.D.	SINGLE TO 6' OR DBL. TO 12' INCL.	2.375"	3.65 lbs.
1.9" O.D.	SGL., OVER 6' TO 13' OR DOUBLE, OVER 12' TO 26' INCL.	4.000"	9.11 lbs.
1.9" O.D.	SINGLE, OVER 13' TO 18' OR DBL., OVER 26' TO 36' INCL.	6.625"	18.97 lbs.
1.9" O.D.	SGL., OVER 18' OR DOUBLE, OVER 36'	8.625"	24.70 lbs.

NOTE: Above dimensions and weights are minimum. Larger sizes may be used on approval of engineer.

BLD

APPROVED Robert C. Cubbon DATE 12/27/84
PUBLIC WORKS DIRECTOR - R.C.E. 18793

MARK	REVISIONS	APPR.	DATE

CITY OF RIVERSIDE
PUBLIC WORKS DEPT. - ENGINEERING DIV.

CHAIN LINK FENCE
(FOR FENCES UP TO 7'" HIGH)

STANDARD DRAWING NO. 380

Sheet 2 of 2