NOTE TO CONSULTANTS: Edit with Track Changes turned on, any text in this section that appears in bold and italics then turn off the bold and italics for the final approved version. Use SPR Standard Specification Section 32 31 13.19 for Tennis Courts (either Galvanized or Color-coated versions) and edit that section accordingly. (Remove this Note).

PART 1 - GENERAL

1.01 Description: Furnish all labor, materials, and equipment required to construct Fencing and Gate(s) System(s) as indicated on the drawings or specified herein. Said work shall include any incidentals required to provide a finished job.

1.02 Existing Conditions: The Contractor/Installer shall examine the site to determine existing conditions, extent of work and clearing operations required. Failure of the Contractor/Installer to visit the site and familiarize themselves with the existing conditions shall in no way relieve them from obligations with respect to their bid or contract.

1.03 Related Sections:

Section 01 25 00 - Substitution & Product Option
Section 01 33 10 - Submittals
Section 03 30 00 - Cast in Place Concrete
Section 31 00 00 - Earthwork

1.04 Quality Assurance:

A. The Contractor/Installer must be experienced in color-coated chain link fencing installations. The Contractor shall provide three representative local fencing projects that have been completed by them within the last three years for the Engineer's review.

B. Contractor shall provide a warranty stating that the fencing is secure and stable, tight, corrosion-free, in proper alignment, complete in detail and finish, and free of hazardous conditions. Any defects that develop within one year from the date of Physical Completion shall be replaced at the expense of the Contractor.

C. Standard Specifications: All work shall conform to all applicable requirements of the following Standard Specifications, whether specifically referred to or not, except as specifically modified herein.

1. Comply with the requirements of the American Society for Testing and Materials (ASTM) especially the ASTM Committee F-14 Standards on Fences (latest edition).
2. Perform all shop and field welding in accordance with the pertinent recommendations of the American Welding Society.
3. Pipe ASTM A-53.
4. ASTM A 392.
5. ASTM F 668-88, Class 2a.

5. ASTM F626-89a.

1.05 Submittals:

A. The Contractor shall make all product submittals and submit Shop Drawings, for approval, prior to manufacturing, describing and detailing typical line post, terminal post, gate, fabric, materials, hardware assemblies, and all proposed fence/gate alignment sections in accordance with Section 01 33 10 - Submittals.

B. The Contractor shall provide certified letters from manufacturers indicating conformance with specifications, manufacturing date and lot number for all materials used on the site.

1.06 Substitutions and Product Options: (Note: Comply with this paragraph, unless specified otherwise in Division I of the Project Manual.)

A. During bidding, all bidders shall bid on the specified products.

B. Refer to Section 01 25 00 - Substitution & Product Option for information about substitutions.

1.07 Product Handling: All materials are to be new and delivered to the site in an undamaged condition. Store materials off the ground and protect from damage. In the event of damage, immediately make repairs and/or replace as necessary to the approval of the Engineer and at no additional cost to the Owner.

PART 2 - MATERIALS

2.01 General:

A. All piping for fence and gates shall be Schedule 40 hot-dipped galvanized steel or approved equal for size, finish, material composition, strength, appearance, performance and ease of maintainability.

B. Galvanizing shall be in accordance with ASTM F 668-88. All fence fittings shall comply with ASTM F626-89a.

C. All materials except nuts and bolts shall have the PVC coating extruded and adhered to the galvanized steel core wire per ASTM F 668-88, Class 2a. Color shall be as selected by the Engineer. Fabric shall have .015 to .025 inch PVC coating extruded and adhered to the core. All other materials shall be 10 to 15 mils PVC coating.

2.02 Chain Link Fence Fabric:

A. Color coated chain link fence fabric shall conform to ASTM F668-88 Class 2a material.

B. Fabric shall be W&M Steel Core Wire, or approved equal, galvanized with not less than .30 oz. per square foot of actual surface, with a .015 - .025 inch PVC bonded or powder coating, extruded and adhering to the galvanized wire. Fabric shall be woven in a continuous 2" mesh (1-3/4 inch for tennis courts). Steel core wire shall have a minimum breaking strength 1290 lbs. Finished size, including PVC bonded or powder coating, shall be 8-gauge (finished) with 9-gauge core wire, 6-guage (finished) with 9-gauge core for backstops and wing fencing (up to 10' height), or as specified on plans and details. Lower edge of fabric shall be no greater than one and one-half (1-1/2) inches above concrete mow strip or infield finished grade as specified on plans and details.

C. Fabric shall have a knuckled top and bottom selvage.

D. Height of the fabric measured from the ends of the knuckled selvage shall be as specified on plans and details, plus or minus 1 inch per 8 lineal feet.

2.03 Fencing Framework: All posts, rails, and framework shall have 10-15 mils of vinyl or powder coating. No hand painting is allowed, except for minor touching up. All posts, rails, rods shall be steel pipe. Sizes shall be as specified in the following table for perimeter fencing and backstop and wing fencing.

For Color Coated Fencing & Gates:

Type	4' High	6' High	8' High	10' High	20' High
Terminal / Corner Posts	2-3/8" OD	2-7/8" OD	2-7/8" OD	2-7/8" OD	4" OD
Line Posts	1-7/8" OD	2-3/8" OD	2-3/8" OD	2-3/8" OD	2-7/8" OD
Top Rails	1-5/8" OD	1-5/8" OD	1-5/8" OD	1-5/8" OD	1-5/8" OD
Intermediate Rails	N/A*	N/A*	1-5/8" OD	1-5/8" OD	1-5/8" OD
Bottom Rails	N/A*	N/A*	1-5/8" OD	1-5/8" OD	1-5/8" OD
Post Footing Size for Terminal/Corner Posts	12" W 30" D	12" W 36" D	12" W 36" D	18" W 36" D	24" W 48" D
Post Footing Size for Line Posts	12" W 24" D	12"W 36"D	12" W 36" D	18" W 36" D	24" W 36" D
Fabric Mesh Size	2"	2"	2"	2"	2"
Fabric Finished Size	8-gauge**	8-gauge**	8-gauge**	8-gauge**	8-gauge**

*Intermediate and bottom rails are not required for these sizes of fencing unless it is specified and detailed on a project by project basis.
**8-gauge (finished) with 9-gauge core wire (typical)

2.04 Gates and Gate Posts:

A. General: Gate posts, frames, and hardware shall be hot-dipped galvanized as noted for framework. All fittings shall be hot-dipped galvanized and vinyl or powder coated as specified in Section 2.02. Gate frames shall be galvanized or vinyl or

powder coated after welding or painted with approved zinc enriched (for galvanized fencing) or flat alkyd enamel (for vinyl or powder coated fencing) paint. Gate fabric shall match fencing fabric. Gates shall maintain no gaps greater than two (2) inches between gateposts and frames or one and one-half (1-1/2) inches above the ground.

B. Gates:

1. Gate Posts: Posts shall be 2-7/8 O.D. schedule 40 steel pipe (or larger, depending upon the size of the gate opening).
2. Gate Frames: 1-7/8 inch O.D. steel pipe with joints notched and welded to form a rigid frame. Welds shall be coated with cold galvanized coating. Frames shall be filled with same fabric as fence and fastened in the frame by means of tension bars and fasteners at 1 foot OC.
3. Diagonal Cross-Bracing: 3/8 inch O.D. vinyl coated adjustable truss rods to ensure frame rigidity without sag or twist.
4. Hinges: Pressed steel to suit gate size, non-lift-off type, offset to permit 180-degree gate opening. Provide 2 hinges for each leaf. Drill, tap, and set screw or weld to frame and post to prevent rotation. Hinges are to be Bulldog Industrial hinge, or approved equal.
5. Single Gate Latch: Provide heavy-duty gate fork latch of correct size malleable iron to permit operation from either side of gate, with padlock eye as integral part of latch.
6. Double Gate Latch: Provide 1-3/8 inch O.D. powder coated steel plunger pipe, locking device, and box as integral part of plunger pipe. Weld and paint fastener to secure plunger and locking device to gate framework to insure latch will not turn. Provide 1-7/8 inch O.D. galvanized steel pipe sleeve, raised ½ inch above finished grade and set in 12-inch diameter by 12-inch deep concrete footing. Plunger shall be the same height as the gate in the closed position.
7. On the ten foot (10') high backstop wing fences, all dugout gates shall be seven feet (7') high with a three foot high panel of fence (transom) above it.

2.05 Fittings: Fittings shall be hot-dipped galvanized pressed steel in accordance with ASTM F 626-89a. All fittings shall be industrial quality. All fittings except nuts and bolts shall be vinyl or powder coated after galvanizing, with 10-15 mils of thermally bonded PVC. After installation, spray all nuts and bolts with two coats of flat alkyd enamel paint (color to match fence) suitable for metal.

2.06 Accessories:

A. Post tops shall be pressed steel and designed as a weather tight closure cap for tubular posts, and shall be vinyl or powder coated.

B. Tension bars shall be of one piece lengths equal to full height of fabric with a minimum cross section of 3/16” x 3/4”. Provide two tension bars (vinyl or powder coated) for each gate, end post, corner and pull posts

C. Tension bar bands (vinyl or powder coated), shall be pressed steel per ASTM F 626-89a spaced not over 12 inches OC to secure tension bars to end, corner, pull, and gate posts.

D. Tension Wire: Contractor shall provide a No. 7 W & M gauge galvanized high carbon coiled, tension wire (vinyl or powder coated), stretched along the bottom of fabric and fastened to the fabric at intervals of not more than 18 inches, using steel hog rings. Tension wire shall be attached with brace band, and nut and bolt. Tension wire shall be terminated around the bolt to itself with a minimum of three complete wraps.

E. Wire Ties: Contractor shall provide wire ties as follows: 8-guage vinyl or powder coated aluminum wire ties (with 9-gauge core wire) on all fencing with 8-guage fabric (with 9-gauge core wire), spaced at **12 inches O.C.** (typ.). Tie fabric to tension wire with 9 gauge hog rings at **18 inches O.C.** (typ.).

2.07 Miscellaneous Materials and Accessories:

A. Concrete Footings: Refer to Section 2.03 above for dimensions of all concrete post footings. Concrete for post footings shall conform to the City of Seattle Standard Specifications for Road, Bridge, and Municipal Construction (most recent edition), and shall be Class "C" concrete. Concrete footings shall be neatly and evenly crowned slightly above finished grades and all concrete shall be cleaned from all posts.

PART 3 - EXECUTION

3.01 Site Preparation:

A. On-Site Conference: Do not work until a site meeting with the Engineer and appropriate Parks Department maintenance staff is held.

B. The Contractor is responsible providing temporary barricades and enclosures, and protection of adjacent property and existing work. Barricades are to be in place before construction operations are started. Coordinate this work with other on-site work and trades. Complete clearing and site preparation work is required prior to excavation.

C. The Contractor shall not allow vinyl or powder coated materials to become scratched, gouged or damaged in any way during the storing or construction of the fence.

3.02 Fence Construction:

A. Posts:

1. Auger holes for post footings in firm, undisturbed or compacted soil. Holes for new line post footings shall be sized as shown on plans and standard details. Holes for terminal and gateposts shall be sized as shown on plans and standard details.
2. Over-excavate footing hole depths to 6 inches deeper than post bottoms.
3. Place concrete around posts in a continuous placement, tamp for consolidation, checking each post for vertical and top alignment. Support posts plumb until concrete has cured. Set and secure keepers, stops, sleeves, and other accessories into concrete as required.
4. Tops of post footings shall be flush with finished grade, trowled and sloped outward to drain. Top of footing shall appear true and circular in shape with post at center of circle.
5. Posts shall be 10 feet O.C. maximum.

B. Sleeved Posts:

1. Insert posts into sleeves provided in concrete footing for tops of walls and hoop-style backstops as specified on plans and details. Check each post for vertical (plumb) and top alignment.
2. Posts shall be 10' O.C. maximum.

C. Rails:

1. Top rail shall be securely fastened to terminal posts and pass through tops of line post fittings, forming a continuous rail for the full length of fence. Top rail shall be furnished in lengths approximately 21 feet long with standard hot dip galvanized, vinyl or powder coated steel expansion couplings not less than 6" in length. Lengths less than 10 feet shall not be used adjacent to terminal posts. Place top rail and coupling to allow for slip expansion and contraction.
2. Intermediate and bottom (when specified) rails shall conform to the same specifications as the top rail and be joined at line posts with double-end socket clamps or brace bands and rail ends, with one inverted to maintain smooth line.

D. Brace Assemblies: All corner, terminal, and gate posts shall be furnished with complete brace assembly, including brace of same material and finish as top rail, and adjustable tightener for 3/8 inch truss rod. Corner and terminal posts shall have two brace assemblies, one in each direction. The diagonal 3/8 inch adjustable truss rod shall be attached to the first ensuing line post. Install braces so that posts are plumb and true when diagonal rod is under proper tension. No truss rod is required if the intermediate rail is continuous.

E. Fabric: Pull fabric taut and securely tie to posts and rails. Install fabric on interior or playing side of fence except as specified on plans and details, and anchored to framework so that the fabric remains in tension after pulling force is released. Lower edge of fabric shall be level with finished grades at one and one-half (1-1/2) inches above grade (typ.).

F. Wire Ties: Tie fabric to line post, rails, and braces with wire ties (sizes above), spaced 12 inches O.C. (typ.). Tie fabric to tension wire, if no bottom rail is required, with hog rings (sizes above) at 18 inches O.C. (typ.).

G. Tension Bars: Fabric shall be attached to the terminal posts by means of single piece tension bars. Thread through fabric and secure to posts with metal bands spaced not over 12" O.C. (typ.).

H. Welding: All field welds shall be fully filled, ground flush and smooth, and cold galvanized by brushing on black colored paint to match color-coated fencing (two coats required).

3.03 Gates:

A. Install gates as shown on the plans and details. No openings between frame or gate members shall exceed 3 inches. The gap between the bottom rail and finish grade shall not exceed one and one-half (1-1/2) inches.

B. Install gates plumb, level, and secure for full opening without interference. Adjust hardware for smooth operation and lubricate where necessary. After the Engineer's approval of operation, drill, tap, and setscrew or spot-weld and paint all hinges and latch hardware to prevent rotation.

C. Install the gateposts the same as terminal posts.

3.04 Cleanup: Job site shall be cleared of all excess materials (concrete, wire, rails, pipe, etc.). All areas impacted by construction shall be leveled with infield soil on the inside and paving or topsoil on the outside for ballfield backstop projects and graded flush with concrete mow strip, be free of all debris and rocks, and restored to as good as or better than the original condition, as approved by the Engineer.

END OF SECTION