SECTION 32 31 00
FENCING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section specifies providing chain-link fencing, gates and fan guards.

B. Related Work Specified Elsewhere:
   1. Cast-in-place Structural Concrete: Section 03 30 0.

1.02 SUBMITTALS:

Submit the following for approval in accordance with the General Requirements and with the additional requirements as specified for each:

A. Shop Drawings:
   1. Manufacturer's product data and installation instructions for fence, posts, fabric, gates, hardware and accessories.
   2. Site plan with fence showing locations of bracing, fan guards, gates, ground rods, depression closures and other special fence construction.
   3. Details of gates, depression closures and other special construction showing fabrication and installation.
   4. Details for installation of accessories.

B. Samples:
   1. Chain link fabric: One of each width and type, each 24 inches long.
   2. Posts, railing, braces, gate frames: One of each size and type, each 24 inches long.
   3. Truss rod and turnbuckle: One each.
   4. Tension wire: One, 24 inches long.
   5. Barbed wire: One, 24 inches long.
   6. Tension bar: One, 24 inches long.
   7. Gate corner assembly: One.
   8. Fabric ties: Four each.
   9. Rail and brace ends and post caps: Two each.
   10. Barbed wire extension arms: One each.
   11. Other materials and accessories: One each.

C. Certification.

1.03 QUALITY ASSURANCE:

A. Codes, Regulations, Reference Standards and Specifications:
   1. Comply with codes and regulations of the jurisdictional authorities.
   2. AWS: D1.1.
   3. MS: MIL-P-21035.

4. FS: FF-T-791, RR-F-191/2D, RR-F-191/3D, RR-F-191/4D.
5. ASTM: A121, A392, A413, C1107, F668.

1.04 JOB CONDITIONS:

A. Warranty - Fencing shall have a 10 year warranty and the vehicular gates shall have a 5 year warranty against defects in materials and/or workmanship. Defective materials shall be replaced with new materials furnished by the Manufacturer, at no cost to the Owner.

B. Right of Access to Adjacent Private Property: As shown.

C. Do not install fencing fabric under tree canopy. If for any reason the Contractor believes that the fabric encroaches under a tree canopy line, notify the Design-Build Contractor immediately for a remedial solution.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Fabric- Anti Climb Wire Mesh:
   1. Steel, Conform to ASTM A 853 Grade AISI1 006, having a minimum tensile strength of 70,000 psi. After welding, the fabric is hot-dipped galvanized with minimum 1.2 oz. zinc per sq. ft. followed by a minimum 10 mil black PVC coaling. The welded wire pattern shall be Y," X 3" 10.5 gauge welded wire.
      a. The PVC coaling shall be thermally fused and adhered to a primer which is thermally cured onto a galvanized steel core wire.
      b. PVC coating shall be applied in a continuous process.
   2. Framework: ASTM F 1 043; Grade A pipe hot dipped galvanized Schedule 40 conforming to ASTM F 1043 Group 1A capable of withstanding 70 mph minimum wind load; 1 5/8" diameter rails located at top and bottom of fence secured with 9 gauge tie wires.
   3. Fittings and Accessories:
      a. Post Tops: Prestressed steel or malleable iron designed as a weather light enclosure and topped with a Y section capable of supporting 6 strands of barbed wire (3 on each side of the Y).
      b. Preformed Power Twisted Ties: 9 gauge spaced at top and bottom rails not exceeding 24 inches.
   4. Perimeter Fencing Height: Six feet

B. Fabric Two Inch Mesh
   1. Steel, hot-dip galvanized after weaving, ASTM A392; Class 2 coating, two-inch mesh, No.9 gauge wire, height shown, both top and bottom selvage twisted and barbed unless otherwise indicated on Contract Drawings.
   2. PVC (vinyl) -coated steel: ASTM F668 Class 2b; two-inch mesh, 0.148-inch diameter zinc-coated steel core wire, height as shown, black color PVC; top and bottom selvages twisted and barbed, unless otherwise shown on Contract Drawings.
   3. Trash Container Area Height: Six feet with redwood slats.
   4. Posts, Top Rails and Braces: FS RR-F-191/3D, with the following additional requirements:
      a. Posts: Class 1, Grade.
      b. Top rails: Class 1, Grade A; Size SP1.

c. Bracing: Class 1, Grade A; Size SP1.

d. Color coating: Where PVC-coated fabric is specified, provide matching PVC color ASTM F668 Class 2b coating.

e. Accessories: FS RR-F-191/4D, with the following additional requirements:

1) Hot-dip galvanized, unless otherwise specified.

2) Wire ties:

a) Fabric: No. 9-gauge steel.

b) Tension wire: No. 11-gauge steel.

3) Tension wire: No. 7-gauge Steel.

4) Color coating: Where PVC-coated fabric is specified, provide matching PVC color ASTM F668 Class 2b coating.

2.02 SWING-TYPE GATES:

A. Provide swing-type gates, size as indicated on the Contract Drawings, complete with latches, stops (if required by the manufacturer), keepers, hinges and three strands of above the fabric (if shown on the Contract Drawings).

1. Conform to Federal Specifications RR-F-191/2D, Single Swing Type I, Double Swing Type II, and as follows:

a. Hot-dipped galvanized.

b. Fabrication:

c. Fabricate gate perimeter frame from Class 1, Size SP2 pipe per Federal Standard RR-F-191/3D.

d. Fabric: Same fabric as used on the fence. Attach fabric securely to the gate frame at intervals not exceeding 15 inches.

e. Barbed wire: As specified in 2.1. D above.

f. Fan Guard: Materials and fabrication as specified for fencing.

2. Hardware:

a. Hinges: Two or more galvanized steel or malleable iron, to suit the gate size: non-lift type, offset to permit 180 degrees opening.

b. Latch: Galvanized steel or malleable iron, combination type with provision for padlock.

c. Gate stops and center rest: Manufacturers' standard.

2.03 CANTILEVERED SLIDE GATE:

A. Conform to Federal Specification RR-F-192/2D, Type III.

PART 3 - EXECUTION

3.01 FENCE INSTALLATION:

A. Perform necessary clearing, grubbing, excavation and filling to provide clear line-of-fence runs.

B. Set posts in concrete footings three feet below grade, sized as shown. Provide post hole diameters large enough to provide a 3 inch gap between the centered, vertical post. Dome concrete ½ - inch higher in the center of footing. Pour edge of concrete footing ½ - inch higher

than existing ground tooled edge. Install posts plumb. Scatter excavated material uniformly about the hole and dispose of any material greater than 3-inches diameter off site.

C. Extend concrete to two inches above ground line at posts and slope to drain away from posts. Form top 12 inches of footing, with remainder poured against excavated hole.

D. Space posts at 10 feet maximum and eight feet minimum on centers. Place additional posts at each abrupt change in grade.

E. Where rock is encountered, drill holes two inches deeper than depth shown and two inches greater than outside diameter of post. After post is placed as shown and specified, and supported, fill remaining void with one-to-three grout mixture of cement and sand.

F. Where fence is located on concrete structure, weld post to base plate, thickness and size as shown on Contract Drawings. Erect fence post truly vertical, where necessary using shims of approved alloy. Secure to structure with anchor bolts; number, diameter and length as shown on Contract Drawings. Fill void under base plate with non-shrink grout. Bolts, base plate and weld to be hot-dipped galvanized.

G. Space pull posts at approximately 500-foot intervals for straight runs and at each vertical angle point. Install corner posts at each horizontal angle point. Provide corner, end and pull posts with horizontal braces and tie rods on each side of posts extending to and connecting to adjacent line posts.

H. After posts are installed and grout has set, install top rail or tension wire and securely anchor at ends and to line posts before hanging fabric.

I. Secure ends of fabric by tension bars threaded through loops in fabric and secured to posts by bands with bolts and nuts or other approved devices.

J. Attach fabric outside framing system, away from Authority property. Stretch fabric by securing one end and applying sufficient tension by mechanical fence stretchers. Fasten fabric to line posts, tension wire and top railing with tie wires at spacing shown.

K. Hold bottom of fabric as uniformly as possible to, but in no case to exceed, two inches above finished grade.

L. Provide barbed wire where shown. Install support arms at 45 degrees upward and outward from Authority property; extend corner, gate and end posts as shown. Stretch barbed wire to remove kinks and sags and secure to bracket arms, using tension bands for attachment to posts.

M. Install gates, gate stops and fan guards as shown.

N. Set gate stops in concrete accurately so that plunger can be fully engaged.

O. Furnish one chain with one padlock for each gate.

P. Grounding per WMATA requirements.

Q. Install fencing per manufacture's written recommendation. No welding is allowed on during construction.

R. Install a 12 inch maintenance mow strip under all fence fabric in vegetated areas per detail indicated on Drawings.

S. Install Anti Climb Security Fence per manufacturer's written instructions.

3.02 GATE INSTALLATION

A. Install gates plumb, level and secure for full opening without interference. Install ground-set items in concrete for anchorage, as detailed on the Contract Drawings. Adjust the hardware for smooth operation and lubricate where necessary.

B. Attach barbed wire as shown on the Contract Drawings.

3.03 DEFECTIVE WORK:

A. Remove and replace fencing which is improperly located and is not true to line and grade, and posts which are not plumb.

B. Repair damaged galvanizing by thoroughly wire brushing damaged area to remove loose and cracked zinc coating, and paint with two coats of high zinc-dust content paint. Allow first coat to dry thoroughly before applying second coat.

END OF SECTION