SECTION 02820
FENCING AND GATES

PART 1 - GENERAL

1.1 SCOPE

A. This section includes the furnishing and installation of chain link fencing and accessories at locations indicated on the drawings. This work shall include the furnishing and installation of fences and gates, where indicated on plans.

1.2 QUALITY ASSURANCE

A. Provide chain link fences and gates as complete units controlled by a single source including necessary erection accessories, fittings, and fastenings.

PART 2 - PRODUCTS

2.1 GENERAL

A. Dimensions shown for pipe are fence industry nominal or actual outside dimensions. Nominal dimensions are fractional, actual dimensions are given in decimals.

B. Available manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include the following:

1. Allied Tube and Conduit Corp.
2. Anchor Fence, Inc.
3. Armorlink Corporation
4. Colorguard Corp.
5. Davis Walker Corp.
6. Dominion Fence and Wire Prod.
7. United States Steel

2.2 STEEL FENCING

A. Fabric: Fabric for fence shall be No. 9-ga (0.148”) and fabric for backstops up to ten (10) feet above ground, 6-ga. (0.192”) finished size steel wires, 2” mesh, with top and bottom selvages knuckled.

B. Furnish one-piece fabric widths for fencing up to twelve feet (12’) high.

C. Fabric finish: Provide minimum 7-mil polyvinyl chloride (PVC) plastic basin finish over galvanized steel wire, color green. Size of wire as noted above, before vinyl coating is applied.

D. Framework: Galvanized steel, ASTM A-120 or A-123, with not less than 1.8 oz., zinc per sq. ft. of surface.

E. Hardware and Accessories: Galvanized, ASTM A-153, with not less than 1.8 oz. zinc per sq. ft. of surface.

2.3 FRAMING AND ACCESSORIES

A. End, Corner and Pull Posts: Minimize sizes and weights as follows:

Schedule 40 Galvanized	SS-40 Tube Pipe
3 inch O.D. (5.79 lbs/foot)	3 inch O.D. (4.640 lbs/foot)

B. Line Posts: Space 10' O.C. maximum, unless otherwise indicated, of following minimum sizes and weights:

Schedule 40 Galvanized	SS-40 Tube Pipe
2-1/2 inch O.D. (3.65 lbs/foot)	2-1/2 inch O.D. (3.117 lbs/foot)

C. Gate Posts: Furnish posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:

Up to 6' leaf:

Schedule 40 Galvanized
3 inch O.D. (5.79 lbs/foot)

10' leaf:

Schedule 40 Galvanized
4 inch OD (9.1 lbs/foot)

20' leaf:

Schedule 40 galvanized
6-5/8 inch OD (18.97 lbs/foot)

D. Top, middle, and bottom rail manufacturer's longest lengths with expansion type couplings, approximately 6" long, for each joint. Provide means for attaching top rail securely to each gate corner, pull and end post.

Schedule 40 Galvanized
1-5/8 inch O.D. (2.27 lbs/foot)

E. Tension Wire: 6-gage, vinyl coated coil spring wire. Install at bottom of fence, post to post.

F. Post Brace Assembly: Manufacturer's standard adjustable brace at end and gate posts and at both sides of corner and pull posts, with horizontal brace located at mid-height of fabric. Use 1.66" OD pipe, 2.27 lb. per ft. for brace, and truss to line posts with 0.375" diameter rod and adjustable tightener.

G. Post Tops: Weathertight closure cap (for tubular Posts), one cap for each post.

H. Furnish caps with openings to permit passage of top rail.

I. Stretcher Bars: One-piece lengths equal to full height of fabric, with minimum cross-section of 3/16" x 3/4". Provide one stretcher bar for each gate and end post, and 2 for each corner and pull post, except where fabric is integrally woven into post.

J. Stretcher Bar Bands: Space not over 15" O.C., to secure stretcher bars to end, corner, pull, and gateposts.

K. Gates: Fabricate swing gate perimeter frames of 2" OD pipe. Gate shall have 1-5/8 inch OD pipe diagonal brace, welded. Metal and finish to match framework. Provide horizontal and vertical members to ensure proper gate operation and for attachment of fabric, hardware, and accessories. Space so that frame members are not more than eight feet (8') apart.

L. Assemble gate frames by welding for rigid connections. Grind welds and paint with two (2) coats of zinc rich paint. No substitutions. Use same fabric as for fence, unless otherwise indicated. Install fabric with stretcher bars at vertical edges. Bars may also be used at top and bottom edges. Attach stretchers to gate frame at not more than 15" O.C. Attach hardware to provide security against removal or breakage. Install diagonal cross bracing consisting of 3/8" diameter adjustable length truss rods on gates to ensure frame rigidity without sag or twist, if required.

M. Gate Hardware: Furnish the following hardware and accessories for each gate.

1. Hinges: Size and material to suit gate size, non-lift-off type, offset to 180° gate opening. Provide 1-1/2 pair of hinges for each leaf over 6' nominal height.
2. Latch: Forked type or plunger-bar type to permit operation from either side of gate, with padlock eye as integral part of latch.
3. Wire Ties: For tying fabric to line posts, use 6 ga., vinyl-coated, galvanized wire ties spaced 12" O.C. For tying fabric to rails and braces, use wire ties spaced 24" O.C. For tying fabric to tension wire, use 6 ga., vinyl-coated, galvanized hog rings spaced 24" O.C.
4. Manufacturer's standard procedure will be accepted if of equal strength and durability.

N. Corner frames (each panel) shall have 1-5/8 inch OD top rail, 1-5/8 inch OD mid-rail/brace pipe, and 3/8-inch truss rod and tightened from middle of line post to base of end post.

O. Concrete: Provide concrete consisting of Portland cement, ASTM C-150, aggregates ASTM C-33, and clean water. Mix materials to obtain concrete with a minimum 28-day compressive strength of 2500 psi using at least four (4) sacks of cement per cu. yd., 1" maximum size aggregate, maximum 3" slump, and 2% to 4% entrained air. Prepare to conform to ASTM C-941.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Do not begin installation and erection before final grading is completed, unless otherwise permitted.

B. Excavation: Drill holes for posts of diameters and spacings shown, in firm, undisturbed or compacted soil. Unless otherwise indicated, excavate hole depths approximately 3" lower than post bottom, with bottom of posts set not less than 36" below finish grade surface, unless otherwise noted.

C. Setting Posts: Center and align posts in holes 3" above bottom of excavation.

D. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.

E. Top Rails: Run rail continuously through post caps, bending to radius for curved runs. Provide expansion couplings as recommended by fencing manufacturer.

F. Center Rails: Provide center rails at all fence with fabric height more than 8.0 foot and also where shown. Install in one piece between posts and flush with post on fabric side, using special offset fittings where necessary. Install center rails at mid-height unless otherwise indicated differently.

G. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.

H. Tension Wire: Install tension wires before stretching fabric and tie to each post.

I. Fabric: Leave approximately 2" between finish grade and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, and anchor to framework so that fabric remains in tension after pulling force is released.

J. Stretcher Bars: Thread through or clamp to fabric 4" O.C., and secure to posts with metal bands spaced 15" O.C.

END OF SECTION 02820