SECTION 63 – CHAIN-LINK FENCES (FAA F-162)

63-1 GENERAL

This specification covers the furnishing and installation of chain link fencing and gates, both permanent and temporary, at the locations shown on the plans. The Contractor shall perform all work in accordance with the Standard Specifications, except as specified otherwise in the FAA Specifications, Item F-162, included herein, and as modified herein and as shown on the plans.

ITEM F-162 CHAIN-LINK FENCES

DESCRIPTION

162-1.1 This item shall consist of furnishing and erecting a chain-link fence in accordance with these specifications and the details shown on the plans and in conformity with the lines and grades shown on the plans or established by the Engineer.

MATERIALS

***162-2.1 FABRIC**. The fabric shall be vinyl-coated chain link fabric conforming to ASTM F668 and SSPWC 206-6.3 meeting the following requirements:*

1. *One piece width, 1 in. mesh, 6 gage min. finish (9 gage core).*
2. *Knuckled edge at both selvage.*
3. *PVC coated fabric shall be in conformance with SSPWC Sect. 206-6.3, Class 1.*

***162-2.2 BARBED WIRE.** Barbed wire shall be vinyl-coated barbed wired, conforming to ASTM F 1665, Class 2b, Type II, 11 gage wire, with 4 point aluminum alloy barbs spaced at 3 inches on center.*

162-2.3 POSTS, RAILS AND BRACES.

1. *Tubular members: ASTM F 1043, Schedule 40, galvanized with a zinc coating of not less than 1.8 oz./sq. ft. minimum.*
   a) *Class 1 steel pipe in accordance with ASTM F1083 (Reference SSPWC Sect. 210-3).*

2. *Poly(Vinyl Chloride) (PVC) coating: ASTM F668.*

3. *Vinyl coated accessories: ASTM F 626 accessories, except for tie wires shall comply with ASTM A 1664, Class 2b.*
   - *a) Tension wire: 6 gage high strength steel wire.*
   - *b) Tension rod: As indicated on Drawings.*
   - *c) Stretcher bars: One piece length equal to full height of fabric. Provide one stretcher bar for each end post, and 2 for each corner and pull post.*
   - *d) Stretcher bar bands: Heavy pressed steel to secure stretcher bars to intermediate, corner posts.*
   - *e) Post tops: Steel or malleable iron designed as a weathertight closure cap. Design caps with opening to permit passage of the top rail, when rail is provided.*
   - *f) Wire ties: For tying fabric to line posts, use 6 gage steel wire clips spaced 12 in. o.c. For tying fabric to tension wire use 9 gage hog rings spaced at 24 in. o.c.*
   - *g) Steel bands: 11 gage, 7/8 in. bands at 12 in on center for barrier.*
   - *h) Barbed wire supporting arms: Galvanized steel assembly complete with provision for anchorage to posts and provision for attachment of 3 rows of barbed wire to each arm. Supporting arm may be either attached to posts or integral with post top weather cap. Provide Vee type with 2 arms at 45 deg. to vertical.*

162-2.4 GATES. *Gates frames, fabric and accessories shall conform to the material requirements in paragraphs 162-2.1 – 162-2.3 and shall be of the type and sizes shown on the plans..*

162-2.5 WIRE TIES AND TENSION WIRES*. Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type. Tension wire shall be 7-gauge marcelled steel wire with the same coating as the fabric type and shall conform to ASTM A 824.*

All material shall conform to Fed. Spec. RR-F-191/4.

162-6 MISCELLANEOUS FITTINGS AND HARDWARE. *Miscellaneous steel fittings and hardware for use with steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A 153. Barbed wire support arms shall withstand a load of 250 pounds applied vertically to the outermost end of the arm.*

162-2.7 CONCRETE*. Concrete shall be of a commercial grade with a minimum 28-day compressive strength of 2500 psi conforming to Section 54 of these Specifications.*

162-2.8 MARKING. *Each roll of fabric shall carry a tag showing the kind of base metal (steel, aluminum, or aluminum alloy number), kind of coating, the gauge of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal (steel, aluminum, or aluminum alloy number), and kind of coating.*

CONSTRUCTION METHODS

162-3.1 CLEARING FENCE LINE. *All trees, brush, stumps, logs, and other debris which would interfere with the proper construction of the fence in the required location shall be removed a minimum width of 2 feet on each side of the fence centerline before starting fencing operations. The cost of removing and disposing of the material shall not constitute a pay item and shall be considered incidental to fence construction.*

162-3.2 INSTALLING POSTS. *All posts shall be set in concrete at the required dimension and depth and at the spacing shown on the plans.*

Posts should be spaced not more than 10 feet apart and should be set a minimum of 36 inches in concrete footings. The posts holes shall be in proper alignment so that there is a minimum of 3 inches concrete on all sides of the posts.

The concrete shall be thoroughly compacted around the posts by tamping or vibrating and shall have a smooth finish slightly higher than the ground and sloped to drain away from the posts. All posts shall be set plumb and to the required grade and alignment. No materials shall be installed on the posts, nor shall the posts be disturbed in any manner within 7 days after the individual post footing is completed.

Should rock be encountered at a depth less than the planned footing depth, a hole 2 inches larger than the greatest dimension of the posts shall be drilled to a depth of 12 inches. After the posts are set, the remainder of the drilled hole shall be filled with grout, composed of one part Portland cement and two parts mortar sand. Any remaining space above the rock shall be filled with concrete in the manner described above.

In lieu of drilling, the rock may be excavated to the required footing depth. No extra compensation shall be made for rock excavation.

162-3.3 INSTALLING TOP RAILS. *The top rail shall be continuous and shall pass through the post tops. The coupling used to join the top rail lengths shall allow for expansion.*

***162-3.4 INSTALLING BRACES**. Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed at all terminal posts.*

***162-3.5 INSTALLING FABRIC.** The wire fabric shall be firmly attached to the posts and braced in the manner shown on the plans. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric no less than 1 inch or more than 4 inches from the ground surface. Grading shall be performed where necessary to provide a neat appearance.*

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts may be used and multiple strands of barbed wire stretched thereon to span the opening below the fence. The vertical clearance between strands of barbed wire shall be 6 inches or less.

***162-3.6 ELECTRICAL GROUNDS**. Electrical grounds shall be constructed at 500-foot intervals. The ground shall be accomplished with a copperclad rod 8 feet long and a minimum of 5/8 inch in diameter driven vertically until the top is 6 inches below the ground surface. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded. Installation of ground rods shall not constitute a pay item and shall be considered incidental to the fence construction.*

METHOD OF MEASUREMENT

See Section 63-2.

BASIS OF PAYMENT

See Section 63-3.

MATERIAL REQUIREMENTS

ASTM A 121	*Zinc-Coated (Galvanized) Steel Barbed Wire*
ASTM A 123	*Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products*
ASTM A 153	*Zinc Coating (Hot-Dip) on Iron and Steel Hardware*
ASTM A 392	*Zinc-Coated Steel Chain-Link Fence Fabric*
ASTM A 491	*Aluminum-Coated Steel Chain-Link Fence Fabric*

ASTM A 572	*High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Steel Quality*
ASTM A 653	*Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process*
ASTM A 824	*Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link Fence*
ASTM A 1011	*Steel Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability*
ASTM B 117	*Standard Practice for Operating Salt Spray (Fog) Apparatus*
ASTM B 221	*Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire Shapes and Tubes*
ASTM B 429	*Aluminum-Alloy Extruded Structural Pipe and Tube*
ASTM F 668	*Poly(vinyl Chloride)(PVC) and other Organic Polymer-Coated Steel Chain-Link Fence Fabric*
ASTM F 1043	*Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework*
ASTM F 1083	*Pipe, Steel, Hot-Dipped Zinc-coated (galvanized) Welded, for Fence Structures*
ASTM F 1183	*Aluminum Alloy Chain Link Fence Fabric*
ASTM F 1345	*Zinc-5% Aluminum-Mischmetal Alloy-Coated Steel Chain Link Fence Fabric*
ASTM G 152	*Operating Open Flame (Carbon-Arc) Light Apparatus for Exposure of Nonmetallic Materials*
ASTM G 153	*Operating Enclosed Carbon-Arc Light Apparatus for Exposure of Nonmetallic Materials*
ASTM G 154	*Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials*

ASTM G 155	*Operating (Xenon- Arc) Light Apparatus for Exposure of Nonmetallic Materials*
FED SPEC	*Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces) RR-F-191/3*
FED SPEC	*Fencing, Wire and Post, Metal (Chain-Link Fence Accessories) RR-F-191/4*

END OF ITEM F-162

63-2 METHOD OF MEASUREMENT

Permanent Chain-link Fencing required for this project will be measured for payment by the linear foot of completed and accepted fencing.

Temporary Chain-link Fencing required for this project will be measured for payment by the linear foot of completed and accepted fencing, including removal and restoration of the site to its original condition, including backfill and compaction of post holes.

Gates will not be measured separately but will be measured and paid in the linear footage of associated fencing.

63-3 BASIS OF PAYMENT

Fencing will be paid at the contract unit price per linear foot of the type indicated, which price shall be full compensation for all layout for furnishing all materials, labor, equipment, tools, and incidentals necessary to install and complete the item. For temporary fencing, the removal of the fence, including restoration of the site, is considered an incidental cost and no separate payment will be made.

Gates will be not be paid separately but will be included in the bid price for the associated fencing.

Payment will be made under:

Item 63.1 Chain-link Fence.....per linear foot

[Item 63.2 Temporary Chain-link Fence .....per linear foot]

END OF SECTION 63

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