

SECTION 02831

CHAIN-LINK FENCES AND GATES

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. Fence framework, fabric and accessories.
- B. Gates and related hardware.
- C. Installation

1.02 SCOPE OF WORK

- A. *Summary:* This section covers the work necessary to complete the chain link fence and gate installation.
- B. *General:* Like items of materials provided hereafter shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance and replacement. Major components including but not limited to Fence Framework and Chain-link Fabric shall be manufactured in the U.S.A.
- C. *Delivery, Storage and Handling:* Deliver material to the site in an undamaged condition. Carefully store material off the ground to provide proper protection against oxidation caused by ground moisture.

1.03 SUBMITTALS AND MILL CERTIFICATION

- A. *Shop Drawings:* Include complete details of fence and gate construction, fence height, post spacing, dimensions and unit weights of framework and concrete footing details.
- B. *Product Data:* Provide manufacturer's catalog cuts with printed specifications. Manufacturer shall provide certification of compliance with material specifications. Actual samples of the material may be requested.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. *Acceptable Manufacturers*
 - 1. Allied Tube & Conduit
16100 South Lathrop Avenue
Harvey, Illinois 60426
708-339-1610

- B. **Framework:** Steel pipe conforming to Standard Specification ASTM F1043 Group IA (Schedule 40); external coatings per F1043 Type A; internal coatings Type A, or high strength steel pipe triple coated per Standard Specification ASTM F1043 Group IC (SS40 as manufactured by Allied Tube & Conduit or approved equal); external coatings per F1043 Type B; internal coatings per F1043 Type D.

All coatings to be applied after welding.

Pipe shall be straight, true to section and conform to the following weights:

<u>Pipe Size</u> <u>Outside Diameter</u>	<u>Group IA</u> <u>Weight Lbs./Ft.</u>	<u>Group IC</u> <u>Weight Lbs./Ft.</u>
1-5/8"	2.27	1.84
1-7/8"	2.72	2.28
2-3/8"	3.65	3.12
2-7/8"	5.79	4.64
3-1/2"	7.58	5.71
4"	9.11	6.56
6-5/8"	18.97	--
8-5/8"	24.70	--

- C. **Fabric:** Aluminized fabric shall be manufactured in accordance with ASTM A491 and coated before weaving with a minimum of 0.4 ounces of aluminum per square foot of surface area. The steel wire and coating shall conform to ASTM A817. Fabric to be 9 gauge woven in a 2" diamond mesh. Top selvage to be twisted and barbed. Bottom selvage to be knuckled unless otherwise specified.

Zinc-coated fabric shall be galvanized after weaving with a minimum 1.2 ounces of zinc per square foot of surface area and conform to ASTM A392, Class 1. Fabric to be 9 gauge wire woven in a 2" diamond mesh. Top selvage to be twisted and barbed, bottom selvage to be knuckled unless otherwise specified.

2.02 CONCRETE MIX

- A. Concrete conforming to ASTM C 94, having a minimum compressive strength of 3,000 PSI at 28 days.

2.03 COMPONENTS

A. Fence Posts:

Fabric Height	Group IA or IC	
	Line Post	Terminal Post
	O.D.	O.D.
Under 6'	1-7/8"	2-3/8"
6' to 9'	2-3/8"	2-7/8"
9' to 12'	2-7/8"	4"

B. Swing Gate Posts:

Single Gate Width	Double Gate Width	Post O.D. Group IA or IC
Up to 6'	Up to 12'	2-7/8"
7' to 12'	13' to 24'	4"
13' to 18'	25' to 36'	6-5/8" Group IA
Over 18'	Over 36'	8-5/8" Group IA

C. Rails and Braces: 1-5/8" O.D. Group IA or IC.

D. Gates: Frame assembly of 1-7/8" O.D. pipe Group IA or IC with welded joints. Weld areas repaired with zinc-rich coating applied per manufacturer's directions. Fabric to match fence. Gate accessories, hinges, latches, center stops, keepers and necessary hardware of quality required for industrial and commercial application. Latches shall permit padlocking.

E. Fittings:

Post Caps – Pressed steel, cast iron or cast aluminum alloy designed to fit snugly over posts to exclude moisture. Supply dome style caps for terminal posts and loop type for line posts. All fittings to conform to ASTM F626.

Rail and Brace Ends – Pressed steel, cast iron or cast aluminum alloy, cup-shaped to receive rail and brace ends.

Top Rail Sleeves – Tubular steel, 0.051 thickness x 7" long, expansion type.

Tension Bars – Steel strip, 5/8" wide x 3/16" thick.

Tension Bands – Pressed steel, 14 gauge thickness x 3/4" wide.

Brace Bands – Pressed steel, 12 gauge thickness x 3/4" wide.

Truss Rods – Steel rod, 3/8" diameter merchant quality with turnbuckle (take up).

Barbed Wire Arms – Pressed steel, cast iron or cast aluminum alloy fitted with clips or slots for attaching three strands of barbed wire. Arms shall be set outward on a 45 degree angle and be capable of supporting a 250 pound load at outer barbed wire connecting point without causing permanent deflection.

- F. **Tension Wire:** Marcellled 7 gauge steel wire with minimum coating of 0.80 ounces of zinc or 0.40 ounces of aluminum per square foot of wire surface and conforming to ASTM A824.
- G. **Tie Wires:** Aluminum, 9 gauge, alloy 1100-H4 or equal.
- H. **Hog Rings:** Steel wire, 11 gauge, with a minimum zinc coating of 0.80 ounces per square foot of wire surface.
- I. **Barbed Wire:** If required, commercial quality steel, 12-1/2 gauge, two strand twisted line wire with 4 point barbs at 5 inch spacing. Coating shall consist of a minimum of 0.80 ounces of zinc per square foot of wire surface conforming to ASTM A121 or a minimum of 0.30 ounces of aluminum per square foot of wire surface conforming to ASTM A585.
- J. **Barbed Tape:** If required, options are available in ASTM F1910 Table 1 and 2.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. **General:** Installation to conform to ASTM F567.
- B. **Height:** Provide height as indicated on contract drawings.
- C. **Post Spacing:** Space line posts at intervals not exceeding ten feet.
- D. **Post Setting:** Set terminal, gate and line posts plumb in concrete footings. Top of footing to be 2" above grade and sloped to direct water away from posts.
- E. **Bracing:** Brace Gate and terminal posts back to adjacent line posts with horizontal brace rails and diagonal truss rods.
- F. **Top Rail:** Install through line loop caps connecting sections with sleeves to form a continuous rail between terminal posts.
- G. **Top Tension Wire:** When top rail is omitted, stretch tension wire through loop caps and fasten to terminal posts.

- H. ***Bottom Tension Wire:*** Stretch between terminal posts 6" above grade and fasten to outside of line posts with tie wires.
- I. ***Fabric:*** Pull fabric taut with bottom selvage 2" above grade. Fasten to terminal posts with tension bars threaded through mesh and secured with tension bands at maximum 15" intervals. Tie to line posts and top rails with tie wires spaced at maximum 12" on posts and 24" on rails. Attach to bottom tension wire with top rings at maximum 24" intervals.
- J. ***Barbed Wire:*** Anchor to terminal extension arms, pull taut and firmly install in slots of line post extension arms.
- K. ***Gates:*** Install gates plumb, level and secure for full opening without interference. Anchor center stops and keepers in concrete.
- L. ***Fasteners:*** Install nuts for fittings, bands and hardware bolts on inside of fence.

3.02 **COMPLETION**

- A. The area of installation shall be left free of debris caused by the installation of the fence

End of Section