

ITEM 555

CHAIN LINK FENCING

555.1 Description. This Item shall govern for furnishing and installing the quantities of chain link fencing and gates as shown on the plans, including all posts, bracing and accessories as called for herein and the installation of all items, complete in every respect at the locations shown on the plans.

555.2 Materials. Wire fabric for fencing shall be 9 gauge steel with a minimum tensile strength of 80,000 psi. Mesh size shall be 2 inch + 1/16 inch between parallel wires. Top edge of fabric shall be twisted and barbed on 5 and 6 foot height fencing and shall be knuckled selvage on 4 foot fencing. Bottom edge of all fencing shall be twisted and barbed.

Fabric ties of the same material as fabric shall be furnished in sufficient quantity to fasten fabric to top tension wire or to top rail at 18 inch intervals. Ties shall be furnished to fasten the fabric to bottom tension wire at 18 inch intervals. The fabric shall be tied to the line posts at 15 inch intervals.

Line posts shall be furnished in sufficient quantity to provide a maximum spacing between posts of 10 feet.

TABLE 1

LINE POST REQUIREMENTS

Fabric Height	Pipe Section		H-Beam Section	Embedment Length
	Size	Wt./Ft.	Wt./Ft.	
4 feet	1.90" O.D.	2.72 lbs.	2.70 lbs.	24"
5 feet	2.375" O.D.	3.65 lbs.	4.10 lbs.	24"
6 feet	2.375" O.D.	3.65 lbs.	4.10 lbs.	24"

TABLE 2

CORNER POST, PULL POST AND ENDPOST REQUIREMENTS

Fabric Height	Pipe Section		Embedment Length
	Size	Wt./Ft.	
4 feet	2.375" O.D.	3.65 lbs.	30"
5 feet	2.875" O.D.	5.79 lbs.	36"
6 feet	2.875" O.D.	5.79 lbs.	36"

TABLE 3
GATE POSTS

Gate Leaf	Pipe Section		Embedment Length
	Size	Wt./Ft.	
to 6 ft.	2.875" O.D.	5.79 lbs.	36"
6 to 13 ft.	4.00" O.D.	9.10 lbs.	36"
13 to 18 ft.	6.625" O.D.	18.79 lbs.	42"

Post caps for pipe sections shall be designed to exclude all moisture. Where barbed wire is specified, extension arms shall be integral with post caps. Where top rail is specified, post caps shall have an opening for top rail. All post caps shall have a 2 inch skirt for rigidity.

Top rail, where called for, shall be 1.625 inch O.D. steel pipe weighing 2.27 lbs./ft. Top rail shall be furnished in random lengths not less than 18-feet per section and shall be joined with outside sleeve, steel couplings not less than 6 inches long and having a wall thickness of not less than 0.07 inch. Couplings shall be designed to allow for expansion movement of the top rail.

Tension wire shall be 7 gauge galvanized carbon steel wire with a minimum breaking strength of 1,950 lb. Tension wire shall be furnished for the bottom edge of all fence fabric, and for the top edge when a top rail is not specified.

Trussed bracing shall be furnished for each panel adjacent to a terminal, pull, corner or gate post. Compression member shall be 1.625 inch O.D. pipe, as specified for top rail material. Tension members shall be 3/8 inch diameter galvanized steel rods with turnbuckles.

For 5 and 6 foot fences with top tension wire, braced panels shall consist of horizontal pipe brace, located approximately 4 inches below top of fabric, a diagonal pipe brace, attached at the midpoint of the terminal post and at the bottom of the adjacent line post, and a truss rod, attached to the top of the adjacent line post, extending diagonally to the bottom of the terminal post.

For 5 and 6 foot fences with top rail, braced panels shall consist of a horizontal pipe brace, midway between top and bottom of fence fabric, with a truss rod extending from the mid point of the line post diagonally to the bottom of the terminal post.

For 4 foot fences with top rail shall be braced with a truss rod connected to the bottom of the terminal post and extending to the top of adjacent line posts.

For 4 foot fences without top rail shall have a horizontal brace pipe at the top of the fabric and a diagonal truss rod installed as described above.

Pedestrian and vehicular gates shall be fabricated from 1.90 inch O.D. pipe weighing 2.72 lbs./ft. The fabric on the gates shall be the same as that specified for fencing. The following accessories shall be furnished for each gate:

- Corner and tee fittings of malleable iron or pressed steel having means for attaching diagonal members. Hinges of malleable iron providing for full 180 degree swing with bottom hinges to be ball and socket type.
- Diagonal braces consisting of 3/8 inch diameter truss rods with turn-buckles, two for each gate frame. Vehicular gates shall have vertical 1.90 inch O.D. pipe brace at center of each gate leaf.
- Latches for single gates shall have a single fork latch with padlock eye; double leaf gates shall have two fork latches mounted on center plunger rod with padlock eye.
- Hold backs shall be provided for each leaf of vehicular gates, employing a semi-automatic hold back catch to be anchored at least 12 inches into a 12 inch diameter by 24 inch deep concrete footing.
- A malleable iron center rest, designed to receive the plunger rod, to be anchored at least 12 inches into a 12 inch diameter by 24 inch deep concrete footing, shall be provided for all double leaf gates.

The top of all gate frames shall align with the fencing top rail. Vehicular gates shall be 4 inches greater in overall height than the adjacent fencing so as to extend to within 2 inches of pavement between 6 inch curbs, if curbs are designated on the plans.

Rolling gates shall be fabricated from 1.90 inch O.D. vertical pipe weighing 2.72 lbs./ft. and 2.375 inch horizontal pipe weighing 3.65 lbs./ft. The fabric on the gates shall be the same as that specified for fencing. The following accessories shall be furnished for each rolling gate:

- Diagonal braces consisting of 1.625 inch O.D. pipes, one for each gate bay(s) and two for counterbalance bay(s).
- Single rolling gate application shall have one 4 inch post latch and one 2 inch cantilever latch with padlock; double rolling gate application shall have one 2 inch cantilever latch on each gate with padlock.
- Single rolling gate application shall have 5 galvanized 4 inch cantilever gate roller assemblies; double rolling gates application shall have 10 galvanized 4 inch cantilever gate roller assemblies.

Barbed wire support arms shall be at an angle of 45 degrees from vertical and shall have clips for attaching three strands of barbed wire. Each support arm shall be of sufficient strength to support a 200 lb. weight applied at the outer strand of barbed wire.

Barbed wire, where specified, shall be twisted 12-1/2 gauge wire, with 14 gauge 2 point barbs spaced approximately 5 inches apart conforming to ASTM A121. Three strands of barbed wire will be required where barbed wire top is specified.

Stretcher bars shall be not less than 3/16 inch by 3/4 inch flat steel and not more than 2 inches shorter than the fabric height. One stretcher bar shall be provided for each gate and end post. Two stretcher bars shall be provided for each corner and pull post. Stretcher bars shall be attached to terminal posts with 1 inch by 1/8 inch flat steel bands, with 3/8 inch carriage bolts at intervals not exceeding 15 inches. Steel band diameter shall match the adjoining post.

Miscellaneous fittings and fasteners shall be furnished in sufficient quantities to erect all fencing materials in a proper manner.

All fencing materials shall be approved by the Engineer to be in accordance with this Item before they are erected. When requested by the Engineer, samples of any fencing component shall be furnished by the Contractor for testing.

555.3 Galvanizing. All material used in chain link fencing shall be hot dip zinc coated as specified by the following:

All Posts and Pipe: ASTM A53 "Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless" (1.8 oz/sf)

All H-Beam Sections: ASTM A123 "Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products" (2.0 oz/sf)

Fence Fabric: ASTM A392 "Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric" Class I (1.2 oz/sf)

Tension Wire, Barbed Wire: ASTM A121 "Standard Specification for Metallic-Coated Carbon Steel Barbed Wire", Class III (0.80 oz/sf)

Post Caps, stretcher Bars and Miscellaneous Fittings, ASTM A153 "Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware".

The weight of zinc coating for all items shall be determined in accordance with ASTM A90 "Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings."

555.4 Construction Methods. The Contractor shall perform all clearing of brush and debris, which may be necessary for the installation of this fencing.

The fencing panels between corner and terminal posts shall generally follow the finished ground elevations. However, the Contractor shall grade off minor irregularities in the path of the fencing as necessary to limit the variation of grade under the bottom edge of fence fabric to a distance of not more than 6 inches and not less than 2 inches to the ground.

The maximum spacing for line posts shall be 10 feet. Pull posts shall not be located more than 500 feet apart and at each change in direction exceeding 20 degrees, both horizontally and vertically. Runs of fencing over 500 feet but less than 1,000 feet shall have a pull post in the center of the run.

Holes for concrete footings, for all posts, shall be drilled to the dimensions listed in the following tables.

TABLE 4
HOLES FOR LINE AND END POSTS

Type Post	Fabric Height	Min. Hole Diameter	Min. Hole Depth	Post Embedment
Line	4'	9"	30"	24"
Line	5', 6'	9"	30"	24"
End	4'	12"	36"	30'
End	5', 6'	12"	42"	36"

TABLE 5
HOLES FOR GATE POSTS

Gate Post Size	Min. Hole Diameter	Min. Hole Depth	Post Embedment
2.875" O.D. x 5.79 lbs.	12"	42"	36"
4" O.D. x 9.10 lbs.	18"	42"	36"
6.625" O.D. x 18.97 lbs.	18"	48"	42"

Concrete for footings shall be Class B and shall be in accordance with the Item 421 "Structural Concrete". All concrete footings shall be cast up to finish grade and crowned one inch to shed water. Excess concrete not used in the footings, and any other construction debris shall be removed from the site.

The fence fabric shall be erected by securing one end and applying sufficient tension to the other end to remove all slack before making attachments. The fabric shall be cut and each span shall be attached independently at all corner posts and pull posts.

Fastening to end, pull, corner and gate posts shall be with stretcher bars which shall be secured to the posts with stretcher bar bands at intervals not exceeding 15 inches.

Fence fabric shall generally follow the finished contour of the site with the bottom edge of the fabric located 2 inches above the grade.

555.5 Submittal Required. The Contractor shall submit manufacturer's certification that materials meet the requirements of this Item.

555.6 Measurement. Chain link fencing of the height specified, will be measured by the linear foot of fence measured at the bottom of the fabric along the centerline of fence from center to center of end posts, excluding gates. Gates will be measured as each gate, complete in place.

555.7 Payment. The work performed and the material furnished as prescribed by this Item, measured as provided under measurement, will be paid for at the unit price bid for "Chain Link Fencing", of the height specified, which price shall be full compensation for furnishing and installing all fencing materials, except gates, including all miscellaneous fittings, braces, all post caps, line wires, connection clips or wires; digging all post holes; furnishing and placing concrete for setting all posts; all hauling; and for all manipulations, labor, tools, equipment and incidentals necessary to complete the work, including excavation, backfilling and disposal of surplus material.

Gates measured as provided under measurement will be paid for at the unit price bid for "Pedestrian Gate", "Vehicular Gate" or "Rolling Gate", of the type, height and opening specified, which price shall be full compensation for furnishing and installing all materials; fabricating, preparation, hauling and erecting all miscellaneous fittings, braces, latches, gate hinges, stops and center anchorages; and for all manipulations, labor, tools, equipment and incidentals necessary for a complete installation.

There are line code(s), description(s), and unit(s) for this Item.

NOTE: This Item requires Standard Civil Drawings that shall be incorporated into the contract documents.

NOTE: This Item requires other Standard Specifications

Item 421 "Structural Concrete"
Item 550 "Existing Fencing and Gates"

END OF ITEM 555