

SECTION 02831

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SUMMARY

- A. Alternate Material for Fence Post and Framing Material: Where schedule 40 galvanized steel is specified, the following will be accepted:

- 1. Cold-rolled steel complying with ASTM A569/A, hot-dipped galvanized with a minimum of 1.0 oz/sq.ft. of ASTM B6 high grade and special grade zinc, a chromate conversion coating weighing a minimum of 30 micrograms/sq.in. and a clear organic coating 0.5 mills thick.

1.02 REFERENCES

- A. Florida Department of Education, Office of Educational Facilities - State Requirements for Educational Facilities - 1997 (SREF).

- B. American Society for Testing and Materials (ASTM) Publications:

- 1. A121-92a Specification for Zinc-coated (Galvanized) Barbed Wire.
- 2. A123-89a Specification for Zinc (Hot Dipped Galvanized Coatings on Iron and Steel Products.
- 3. A392-96 Specification for Zinc-coated Steel Chain Link Fence Fabric.
- 4. A569/A Specification for Steel, Carbon, Hot Rolled Sheet and Strip Commercial Quality.
- 5. B6-95a Specification for Zinc.
- 6. F1083-96 Specification for Pipe, Steel, Hot-dipped Zinc-coated Welded, for Fence Structures.

1.03 QUALITY ASSURANCE

- A. Products made of aluminum, aluminized, or otherwise treated with aluminum to any significant extent shall not be used.

1.04 SUBMITTALS

- A. Submit complete shop drawings for each rolling gate for approval before fabrication.

1.05 SITE CONDITIONS

A. Security:

1. At the beginning and before the end of the work day, project site shall have all safety hazards removed or isolated by mesh type barricades creating a continuous fence perimeter.
2. At the Board's discretion, when a continuous perimeter fence cannot be maintained, Contractor shall provide a properly licensed security guard until a continuous fence perimeter is restored.

1.06 WARRANTY

- A. Warrant for 1 year after substantial completion. Apply warranty to materials, quality of work, and hardware. Work, material, and hardware shall be free from defects and structurally sound during the warranty period. Defective material, improper work, and other substandard conditions documented by the Board within the warranty period shall be corrected at no cost to the Board.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Chain Link Fences and Gates:

1. Allied Tube & Conduit, Fence Division.
2. Cyclone Fence Division of USX Corp.
3. Reeves Southeastern Corp.

B. Gate Hardware:

1. Hinges:
 - a. Semmerling Manufacturing, No.'s 1746, 1747, and 1748.
 - b. Southeastern Wire, No.'s 422405, 422406, and 422407.

2.02 MATERIALS

- A. Fence Posts: Type 1 ASTM F1083 steel, schedule 40 pipe, hot dipped galvanized after forming according to ASTM A123 with galvanized coating weighing 1.8 oz. per sq.ft. minimum. Size posts according to the following line, corner, end,

and pull post table:

<u>POSTS</u>	<u>LINE</u>	<u>CORNER</u>	<u>END</u>	<u>PULL</u>
Height	4'	6', 8', 10', 12'	4'	6', 8', 10', 12'
Pipe Size	2" OD	2.5" OD	3" OD	4" OD
Wall thickness	0.145"	0.154"	0.203"	0.226"
Spacing O.C.	10'	10'	na	na
Footing Depth	2'-0"	2'-6"	3'-0"	3'-0"

- B. Tops: Provide posts with tops to exclude moisture.
1. Loop Top: Provide on line posts.
 2. Dome Top: Provide on corner, end, pull, and gate posts.
- C. Bracing: Install horizontal bracing at every end, corner, gate, and pull post. Bracing shall be 1-5/8" outside diameter, approximately 2.27 lb. per foot, hot dipped galvanized steel pipe complete with hot dip galvanized truss rods, turnbuckles, bolts, washers, and nuts. Braces shall be Type 1, ASTM F1083 steel schedule 40 pipe, hot dipped galvanized after forming according to ASTM A123 with galvanized coating weighing 1.8 oz. per sq.ft. minimum.
- D. Top and Bottom Rail: Install to run continuously between line, corner, gate, pull, and end posts. Railing shall be 1-5/8" outside diameter 2.27 lb. per foot (minimum wt.) hot dip galvanized steel pipe on all fences. Top and bottom rail shall be Type 1 ASTM F1083 steel schedule 40 pipe, is hot dipped galvanized after forming according to ASTM A123 with galvanized coating weighing 1.8 oz. per sq.ft. minimum.
- E. Mid Rail:
1. Install to run continuously between line, corner, gate, pull, and end posts. Railing shall be 1-5/8" outside diameter 2.27 lb. per foot (approx. wt.) hot dip galvanized steel pipe. Mid rail shall be Type 1 ASTM F1083 steel schedule 40 pipe, hot dipped galvanized after forming according to ASTM A123 with galvanized coating weighing 1.8 oz. per sq.ft. minimum.
 2. Install mid-rail on all fences 8 feet high or greater. Install mid-rail at the 1/2 way point on the fence and be level and consistent the entire length of the fence.

F. Fabric and Fastenings:

1. Fabric: Chain linked, No.9 gage, steel wire, hot dip galvanized after weaving, complying with ASTM A392, Class 2, woven in 2 inch mesh with top and bottom selvage knuckled for 4 foot and 6 foot fabric. 8 foot, 10 foot, and 12 foot fabric shall have the bottom selvages knuckled and barbed top selvages.
2. Fabric Tie Wire: No.9 gage, steel alloy wire ties, galvanized, for attachment to line posts.
 - a. Tie at centers not exceeding 14 inches on line posts, and 24 inches on horizontal rails.
3. Stretcher Bars:
 - a. 3/16" x 3/4" minimum OD hot dip galvanized steel, two inches shorter than full height of fabric.
 - b. Provide one stretcher bar for each gate post and end post and two bars for each corner or pull post.
4. Bands, Ties, and Clips:
 - a. At Line Posts:
 - 1) No.9 gage, steel alloy, galvanized, tie wire.
 - 2) Tie fabric to line posts at top, bottom, and intermediately at 14 inch centers.
 - b. At End, Corner, Pull, and Gate Posts:
 - 1) Galvanized steel bands attaching fabric and stretcher bars to posts.
 - 2) Locate bands at top, bottom, and intermediately at 14 inch centers.
 - c. At Top Rails:
 - 1) No.9 gage, steel alloy, galvanized, tie wire.
 - 2) Tie fabric to top rails at 24 inch centers.

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NOTE TO SPECIFIER: In the following paragraph choose either inside or outside location.

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- G. Barbed Wire Extension Arms: Pressed steel hot dip galvanized after fabrication and holding 3 runs of barbed wire at a 45-degree angle to 12 inches above and [inside/outside] of the top of the fence.

H. Barbed Wire: ASTM A121 double strand No.12.5 gage twisted line wire with No.14 gage, four point barbs at 5 inches O.C. hot dip galvanized after weaving class 3.

I. Gates, All Heights:

SINGLE GATE

Width	0' to 6'	6' to 12'	13' to 18'
Pipe Size	3" OD	4" OD	6" OD
Hinges	2 Heavy Duty Industrial	3 Heavy Duty Industrial	4 Heavy Duty Industrial
Sch 40	0.203"	0.226"	6-5/8" OD

DOUBLE GATES

Width	6' to 12'	12' to 26'	26' to 36'
Pipe Size	4" OD	4" OD	6" OD
Hinges	2 Heavy Duty Industrial	3 Heavy Duty Industrial	4 Heavy Duty Industrial
Sch 40	0.203"	0.226"	6-5/8" OD

GATE FRAMEWORK

4', 6', 8', 10', and 12' HIGH FENCE

Pipe Size	2" OD
Wall Thickness	0.145"

1. Gate frames shall be 2 inches OD type 1, ASTM F1083 steel schedule 40 pipe, hot dipped galvanized after forming according to ASTM A123, with galvanized coating weighing 1.8 oz. per. sq.ft. minimum.
2. Assemble by welding.
3. Coat all welds with a suitable cold galvanizing compound.
4. Gate heights shall match adjacent fencing, unless specified otherwise.
5. Provide hinges, latches, stops, and keepers.
6. Gates over 4 feet wide must be sufficiently trussed and braced to prevent sagging.

J. Gate Hardware:

1. Hinges: Malleable iron and hot dip galvanized according to ASTM A123. Hinges shall be ball and socket, offset type to allow gates to swing back parallel with the fence line.
2. Latches, all heights:
 - a. Malleable iron, hot dip galvanized, readily lockable with padlock(s). Padlocks with chains will be provided by the Board.
 - b. Latches for single gates, up to 15 feet wide, shall

be single gate latch assembly.

NOTE TO SPECIFIER: Where keepers present a tripping hazard, the Board's Representative may allow a chained snap hook as the keeper.

- 3. Latches for double gates in openings 18 feet to 30 feet wide shall be heavy duty, galvanized, malleable iron gate stops with steel pipe sleeves anchored in concrete and arranged to engage plunger of latch at the center(s) of the opening(s). Latch and plunger shall not be removable without tools.
- 4. Keepers: Construct keeper of rust proof material and which automatically engage the gate leaf and hold it in the open position until manually released.
- 5. Stops: Hot dip galvanized, set in concrete.
- 6. Handicapped Accessibility: Provide heavy-duty lever type gate hardware or weatherproof push bar in place of latches.
- 7. Miscellaneous Fittings: Malleable iron or pressed steel. Ferrous materials shall be hot dipped galvanized.

K. Bollards: Type 1 ASTM F1083 steel schedule 40 pipe, hot dipped galvanized after forming according to ASTM A123, with galvanized coating weighing 1.8 oz. per sq.ft. minimum. Construct bollards of galvanized steel, fill with concrete, and place on the traffic side of the fabric unless otherwise specified. Post dimensions for bollards shall be twice the diameter of the end post on the adjacent fence. Likewise, the footer dimensions shall be double the dimensions specified for end posts.

PART 3 EXECUTION

3.01 PREPARATION

A. Underground Clearances: Before starting, obtain underground clearances from utility companies, A/E, and site staff to minimize damage to underground piping, cables, or structures.

3.02 INSTALLATION

A. Alignment:

- 1. Install fencing and gates plumb, level, and aligned with all abutting fencing according to the

- manufacturer's instructions and approved shop drawings.
2. Top of fabric line shall be straight and level, with the bottom 2 inches above grade \pm 3 inches. When tolerances of \pm 3 inches cannot be maintained, the top of the fence line shall contour to the ground with all variances spread over the greatest possible fence length. If these tolerances cannot be maintained, Contractor shall contact the Board immediately by before proceeding.
- B. Footings: Provide a stable base for the post, mechanically fixed to the post, and stabilized in the surrounding earth to adequately support the post, fence fabric, and gates.
- C. Bracing:
1. Pull post bracing is to be provided every 200 lineal feet of straight fencing to construct the pull post array for proper fabric stretching.
 2. Install bracing in both directions from corner and pull posts.
- D. Fabric and Fasteners:
1. Hog rings are allowed only as specified by the Board and be No.12 gage galvanized steel.
 2. Attach all stretcher bars by bands and be 2 inches shorter than the fabric and spaced so that there are no protruding ends that can be bent.
 3. If these tolerances can not be maintained, Contractor shall contact the Board immediately by before proceeding.
- E. Pointed Surfaces:
1. Barbed or purposely sharpened edges are not allowed from the highest grade level up to 6'-0" (minimum) of fence height.
 2. Complete minimum height from the highest grade elevation next to the fence line.
 3. All fabric and tie wire terminal ends shall be knuckled and turned away from the traffic side of fences.
 4. Assemble all galvanized drip points, bolts, truss rods, posts, and hardware so that they have their sharp edges directed away from the traffic side of the fence.
 5. All hardware including, but not limited to, brace bands, tension bands, and stretcher turnbuckles shall have rounded edges.
 6. Remove hardware with sharp or pointed surfaces or edges and replace at no cost to the Board.

F. Gates:

1. All gates next to the building shall open in the direction of building egress and be able to be secured in their open and closed positions.
2. No gate may reduce or restrict a building egress dimension in its open position.
3. Gates shall be installed complete with hinges, latches, keepers, and stops and be level and plumb in their closed position and locked with a M-DCPS provided lock.
4. Perimeter fence gates opening on a public sidewalk shall open inward to avoid disrupting the public right of way.

G. Fence Posts:

1. Install initially above the finished fence height and then cut level throughout the fence line between the corner posts.
2. Install post caps when the footings have been set to prevent the accumulation of moisture in the post.
3. All posts shall be installed level and plumb.

H. Footings:

1. Set posts in 3,000 psi concrete consisting of not less than six bags of cement per cubic yard of sand. Rod or vibrate concrete in earth compacted or water saturated and allowed to settle.
2. Footing diameters shall be not less than four times the diameter of the post. Slope the top of the footing a minimum of 1 inch to the surrounding grade to shed water.
3. When posts are installed in asphalt, pour concrete to 2 inches below grade, slope, and back fill with well-tamped Type I asphaltic concrete to match existing surface.
4. Posts should be set in concrete in its entire underground length from grade level to the recommended depth then raised 6 inches until the concrete has fully cured.
5. Install footings on all posts except for temporary fencing.

I. Fence Removal:

1. Includes the unearthing, disassembly, collection, and disposal of all existing fence posts, fabric, hardware, footers, keepers, stops, and debris accumulated along the fence line.

2. Holes and surface irregularities created by the fence removal shall be filled to prevent tripping hazards.

J. Temporary Fencing:

1. 6'-0" No.11 gage or greater fabric tied to 2 inches or greater driven in posts with No.11 gage steel alloy ties.
2. Gates and gateposts shall be constructed and installed according to the specifications for permanent fencing, except for top, bottom, and mid-rails.

K. Baffles:

1. Double baffles shall be constructed of 2 end posts, 3 line posts, and a fabric panel.
2. Set end posts in the fence line 6 feet apart.
 - a. One line post shall be set at the mid point between those end posts as a divider.
 - b. The 2 remaining line posts hold the baffle fabric.
 - c. They are set 2 feet inside the fence line 10 feet apart and are connected by top rail.
 - d. End posts and line posts shall match those specified for the fence line.
3. Construct single baffles of 2 end posts, 2 line posts, and a fabric panel. Set end posts in the fence line 3 feet apart. The 2 line posts hold the baffle fabric. They are set 2 feet inside the fence line 7 feet apart and connected by top rail.
 - a. End posts and line posts shall match those specified for the fence line.

3.03 ADJUSTING AND CLEANING

- A. Clean Up: At the completion of each day's work, remove from the site and premises, all debris, surplus materials, and salvaged fencing not wanted by the Board.

END OF SECTION