

SECTION 323113 – CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

- A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.
- B. This section includes chain link fences and gates.
- C. Related section includes Section 312300 Earthwork for filling and for grading work.

1.3 REFERENCES

- A. Reference to “PVC/vinyl coated fence” or “galvanized fence” refers only to the final appearance. Both shall be constructed of galvanized steel. However, the cantilever gates may be constructed of aluminum as specified in this document.
- B. Product Standard: Chain Link Fence Manufacturers Institute (CLFMI) Product Manual, dated 1992 or later.
- C. Installation Standard: ASTM F567, unless specified otherwise.
- D. ASTM Chain Link Fence Standards is required and when no reference is given.
- E. Should specifications provide insufficient detail, the Owner shall be consulted.

1.4 SYSTEM DESCRIPTION

Specify Length, Height and Type of fence (PVC coated or galvanized) where indicated.

- A. Approximately (contractor to field measure prior to bidding) [Specify Length and Height] lineal feet of [Specify either galvanized or PVC coating over galvanized steel] including posts, rails(if specified), tension wire and required hardware.
- B. [Specify Quantity and Width] wide swing gate opening consisting of [one or two] [Specify Width] gate leaves and [Specify Quantity and Length] cantilever sliding gate

1.5 SUBMITTALS

- A. Shop Drawings:
 - 1. Locations of fence, each gate, posts, rails, and tension wires and details of extended posts, extension arms, gate swing, cantilever gate or other operation, hardware and accessories.

2. Indicate materials, dimensions, sizes, weights and finishes of components.
3. Include plans, elevations, sections, gate swing and other required installation and operational clearances, and details of post anchorage and attachments and bracing.

B. Product Data:

1. Fence and gate posts, rails and fittings.
2. Chain-link fabric, reinforcements and attachments.
3. Gates and hardware.
4. Material certification and test documentation as specified in Part 3, prior to final payment request.

C. Samples: For the following products, showing the full range of color, texture and pattern variations expected. Prepare Samples from the same material to be used for the Work.

1. Provide a 1SF piece of steel wire (for fabric)
2. Provide a 1LF piece of.
3. One sample each: latches and locking assemblies.
4. One sample each: stops, drop rod assemblies and keepers.

D. Waiver of Lien/Wage Statement, as specified in the General Conditions, prior to final payment request.

1.6 QUALITY ASSURANCE

- A. Provide dated written certification and test documentation from each manufacturer that the material they provided for this Project meets or exceeds the Specifications of this Contract. The documentation shall provide product requirements; the name, address and phone number of the manufacturer(s); and the name of a contact person.

1.7 WARRANTY

- A. Contractor agrees that by acceptance of this work and in consideration thereof, binds self and Subcontractors the guarantees and warranties herein. Contractor guarantees materials to be free from defects in materials and installation for 5 years after the date of final acceptance.
- B. If within warranty period, it is found that the warranted materials need to be replaced because of the use of materials which are inferior, defective, not properly installed or not in accordance with the terms of the Contract Documents, Contractor, upon notification, shall promptly and without additional expense to MSU replace such materials immediately.
- C. Should Contractor fail to proceed promptly in accordance with the warranty, the Owner may have such replacements made at the expense of the Contractor and sureties.

- D. Contractor shall execute and deliver to the Owner, before final settlement, a written warranty and submittals subject to and stipulating the provisions above.

PART 2 - PRODUCTS

2.1 FABRIC

Select either PVC or galvanized fence system

- A. 2" mesh, 9 gauge (for standard use or 6 gauge for heavy use) steel core wire, before PVC coating (if PVC fence is specified). (9 gauge core shall have an 8 gauge final size with PVC coating or 6 gauge shall have a 5 gauge final size with the PVC coating)
- B. PVC- coated, ASTM F 668, Class 2b (fused and adhered) over zinc-coated steel wire.
- C. If fence shall be zinc coated, coating shall be hot dipped after fabrication with a **minimum** of 1.2 oz of zinc per square foot of fabric.
- D. Selvage shall be twisted top and bottom, for fences 6 feet and taller. Fences 4 feet and under twisted bottom and knuckled top. Coat selvage ends of fabric in the same manner and color as the fabric.

2.2 LINE POSTS

Select either Standard Duty or Heavy Duty line posts.

- A. SS40 Pipe - Choose Option
1. Standard Duty is 2 1/2" dia.
 2. Heavy duty is 3" dia.
- B. Line post length shall be in accordance with that which is required under Section 2.4.

2.3 TERMINAL, CORNER AND PULL POSTS

Select size based upon fence height for A and B. below.

- A. Type 1 Round Pipe, Schedule 40, Nominal Size:
1. 6 ft. or shorter: 3 " dia. O.D.
 2. Over 6 ft: 3" dia. O.D.;
- B. Length: A minimum of 3'-6" longer than the specified height of fence.

2.4 LINE POST FOOTINGS

- A. Shall be driven posts with a total length below grade according to the following:
1. 4' fence height - 4' below grade
 2. 6' fence height - 4.5' below grade
 3. 8' fence height - 6' below grade
 4. 10' fence height - 6' below grade

2.5 CORNER, GATE AND TERMINAL POST FOOTINGS

- A. In accordance with ASTM F567 except:
1. Concrete footings shall be 12-inch diameter x a minimum of 42-inch deep.
 2. Concrete shall be 3,500 psi.
 3. Footing hole shall have a uniform vertical surface to the bottom of the footing.

2.6 PULL POST FOOTINGS

- A. In accordance with ASTM F567, except concrete shall be 10-inch diameter x a minimum of 42-inch deep with a uniform and plumb vertical surface. Footings shall be approved by the Project Representative prior to post installation.

2.7 SWING GATES

- A. Include the entire assembly to make an [Specify foot height] high gate system to match fence height and either galvanized or PVC coating. Unless otherwise specified, PVC and galvanized coatings shall be identical to fabric. Refer to Article 2.1.

1. Frames:
 - a. Conform to ASTM F 900 Type 2, Class 2.
 - b. 2" dia. SS20 steel pipe
 - c. [REVISE THE FOLLOWING TO MEET PROJECT REQUIREMENTS] PVC coated galvanized steel gates shall have separate steel gate corner sections mechanically (multiple screws) secured to the frame pipe. Galvanized steel gates shall have welded corners. After fabrication the welded areas will be brush coated with ZRC Cold Galvanizing Compound (no exceptions or substitutes permitted) according to the manufactures specifications. Contractor will provide purchase receipts for ZRC and notify the Project Representative to inspect the fabrication and application fo the ZRC Cold Galvanizing Compound.

Delete following paragraph if gate height is not over 8 feet tall.

2. Fabric: Identical to that used on the fence assembly. Stretcher and tension bars, wires, rings and clips shall be identical to the fence fabric.
3. Hinges, Stops, Center Drop Rod and Keepers: Items shall be of structural steel and shall be of appropriate size and quality to accomplish hinges from not twisting and turning, plus holding the gate even with the rest of the fence. Latches shall keep the gates even with each other and/or the rest of the fence. Stops, center drop rod and keepers shall prevent the fence from going in undesired areas and/or directions for the purpose intended. All appurtenances shall match color of fence fabric..

Select type of latches and post per project; delete all other sizes.

4. Latches:
 - a. Double Gate Latch: Commercial galvanized steel as manufactured by DAC Industries, Inc., 615 Eleventh Street, NW, Grand Rapids, MI 49504; 800-888-9768.
 - b. Walk Gate Latch: Heavy duty galvanized as manufactured by DAC Industries, Inc., 615 Eleventh Street, NW, Grand Rapids, MI 49504; 800-888-9768.
5. Single Swing Gate Posts: Shall meet the following minimum size.

Select sizes per project; delete all other sizes.

- a. For less than 13ft. opening shall be 4" O.D. (at 9.11 lb/lf
- b. 13ft. to 18ft. gate opening shall be 6 5/8" O.D. at 18.97 lb/ft.
- c. 19ft. to 20ft. gate opening shall be 8.5/8" O.D. (minimum) at 28.55 lb/ft.

6. Double Swing Gate Posts: Shall meet the following minimum size.

Select sizes per project; delete all other sizes.

- a. 3ft. to 13ft. gate leaf shall be 4" O.D.(minimum) at 9.11 lb/ft
- b. 14ft. to 17-ft. gate leaf shall be 6 5/8" O.D.(minimum) at 18.97 lb/ft
- c. 18ft to 20ft gate leaf shall be 8 5/8" O.D. at 28.55lbs/lf.

Delete following paragraph if double gates are not used in the design.

7. Double Gates: Provide and install the following.
 - a. Drop rod to hold gate closed. To hold gate closed and secured drop rod to pavement, there shall be a galvanized 12" long "U" channel securely positioned in the pavement, directly below the drop rod in the closed position, that is parallel to the closed gate, and flush with the pavement Gate stop to engage gate when in open position Locking latch as previous specified requiring 1 padlock for locking both gate leaves. Padlock provided by owner.

2.8 CANTILEVER SLIDE GATE

A. Frame Assembly

1. Gate Manufacturer - Furnish Fortress Heavy Duty Cantilever Slide Gate by Tymental Corporation, Greenwich, NY 800-328-4283. If an alternate is to be submitted, approval, prior to bidding will be required.
2. Gate Size – Furnish gate to accommodate width of clear opening as shown on drawings and desired height. [SELECT APPROPRIATE GATE(S) THAT FOLLOW] 1) Fortress Heavy Duty Gate opening to 30' opening, 2) Fortress Structural Gate opening to 40' opening, and 3) Fortress Box Frame to 60' opening. Wider openings for unique situations will require two gates.
- 3.

4.

B. Power Opener System

1. For all Tymetal gates that require a power opener system, use [Select appropriate item for gate size)
 - a. Tymetal TYM -2000 Chain Driver Operator for gates to 45'
 - b. Tymetal TYM-VS2 Chain Drive Operator for larger gates./
2. For gate operator, [Select one or more of the following for each gate depending on the situation] 1. Key pad, 2) Card reader or 3) Remote 3 button operator.
- 3.

C. Chain link fence fabric in gate shall match fence.

2.9 POST CAPS AND BRACE ENDS

- A. Formed steel, cast malleable iron, or aluminum alloy, weather tight closure, cap for tubular posts, connection of braces to terminal posts [DELETE FOLLOWING IF NO TOP RAIL] and top rail. "C" shape posts shall not have cap. PVC coated to match fabric.

2.10 HOT DIP GALVANIZED ZINC COATING

- A. Coat steel with a galvanized coating 0.30 oz/sf, in accordance with ASTM.

2.11 PVC COATING

- A. Black (color to be approved); ASTM F668, Class 2b fused and adhered coating for specified parts. Unit ends shall be coated.

2.12 TENSION WIRE

- A. [DELETE OR EDIT, IF TOP AND/OR BOTTOM RAIL IS SPECIFIED] 6 gauge core spring coil wire with 1) Class 2b PVC coating or 2) specified zinc coating, to match fabric

2.13 POST BRACE ASSEMBLY

- A. 1-5/8" O.D. galvanized steel tubing at 1.35 lbs/lf and a 5/16-inch diameter truss rod and turnbuckle to be attached between end, pull or gate post and adjacent line post. [EDIT] Parts shall be PVC coated or zinc coating, to match fabric

2.14 TENSION (STRETCHER) BARS

- A. One piece lengths equal to 2-inches less than full length of fabric with a minimum cross section of 3/16-inch x 3/4-inch or equivalent fiberglass rod. Provide tension (stretcher) bars where chain fabric meets terminal posts. Coating (if steel) to match fabric.

2.15 TENSION AND BRACE BANDS

- A. Galvanized steel 12 gauge, 3/4-inch for 4-inch O.D. or less posts and 7/8-inch for larger posts. Parts shall be PVC coated.

2.16 TIE WIRES AND HOG RINGS FOR FABRIC ATTACHMENT

- A. Rings shall be 6 gauge galvanized steel. Tie wires shall be 6 gauge galvanized steel. Parts shall be PVC coated.

2.17 TRUSS RODS AND TURN BUCKLE

- A. PVC coated galvanized or galvanized coated steel rods with a minimum diameter of 5/16" to match fence fabric

2.18 TOP and or Bottom RAIL ASSEMBLY

- A. [EDIT LINE] PVC coated galvanized or galvanized coated pipe to match fabric. Delete or edit if top and/or bottom rail assembly is not used.

PART 3 - EXECUTION

3.1 GENERAL

- A. Conform to ASTM 567 with the exceptions noted herein.

3.2 FENCE INSTALLATION

- A. Line Post Spacing: Set first corner, gate and pull posts first. Space line fence posts equally not exceeding 10-foot on center.
- B. Corner, Gate, Terminal and Pull Post Footing: Only concrete footings shall be used and shall be 12-inch diameter x a minimum of 42-inch deep, shall be flush with the grade sloped to drain moisture away from the post. 2 inches of concrete shall be placed below the bottom of the post. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations. Pull post footings shall be 10-inch diameter x a minimum 42-inch deep. Owners Representative will be notified sufficiently in advance so that an inspection of the concrete footing holes can be inspected
- C. Line Post Footings: Shall be driven to the proper depth depending on the height of the fence in accordance with these specifications.
- D. Fabric: Install fabric on security side and attach so that fabric remains in tension after pulling force is released. Leave approximately 4 inches between finish grade and bottom selvage. Fasten fabric to line post at 6 equally-spaced intervals. Fasten fabric to each tension wire at intervals not exceeding 18 inches. If new fabric abuts existing fabric, the new fabric shall be woven in the existing fabric at both ends of the 2 sections.

- E. Tension (Stretcher) Bars: Pull fabric taut, thread tension bar through fabric and attach to terminal post with bands. One tension bar for each terminal and 2 for each corner or pull post.
- F. Tension Wire: [DELETE IF TENSION WIRE IS NOT USED] Attach directly to the fabric not less than 3 inches or more than 6 inches from the top of the fabric and 6 inches from the bottom of the fabric with appropriate steel clips to match the fabric.
- G. Tension Bands: Six per terminal and pull post and 12 per corner post.
- H. Top Rail: [DELETE IF TOP RAIL IS NOT USED] Shall be attached to the line, corner and pull posts by means of appropriate post caps securely fastened to the posts and fitted to the top rail. Fabric shall be attached to the top rail with tie wires at equal spacing not to exceed 1 ft.

3.3 [EDIT TITLE] SWING AND CANTILEVER SLIDE GATE

- A. Install gate posts in accordance with manufacturer's instructions as well as specified in Article 3.2 B. Set keepers, stops, sleeves and other accessories into concrete and position out of the way of normal traffic but located to provide reliable performance.
- B. Install gate plumb, level and secure for full operation without interference.
- C. Attach hardware by means which will prevent unauthorized removal.
- D. Adjust hardware for smooth operation and lubricate where necessary. Confirm that latches and locks engage accurately and securely without forcing or binding.

3.4 ADJUSTING

- A. Fence and accessories shall be installed in strict accordance with the Drawings and Specifications in a workmanlike manner. Finished fence shall be in proper alignment with posts plumb, and fabric, tension and barb wires taut.

3.5 CLEANING

- A. Fence installation will not be considered complete until excess excavated materials, cut wires, spilled concrete, and other debris, including the existing fence to be removed, resulting from the fence construction, is removed and legally disposed of off the Owner's property.

END OF SECTION 323113