

SECTION 32 31 13
CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. PVC over zinc-coated chain link fence, gates and accessories.

1.2 MANUFACTURER'S QUALIFICATIONS

Fence, gates, and accessories shall be products of manufacturers' regularly engaged in manufacturing items of type specified.

1.3 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. ASTM International (ASTM):

1. A121-13 - Metallic Coated Carbon Steel Barbed Wire.
2. A392-11a - Zinc-Coated Steel Chain-Link Fence Fabric.
3. A817-12 - Metal-Coated Steel Wire for Chain-Link Fence Fabric and Marcellled Tension Wire.
4. F567-14a - Installation of Chain-Link Fence.
5. F626-14 - Fence Fittings.
6. F668-11 - Polyvinyl Chloride (PVC) and other Organic Polymer-Coated Steel Chain-Link Fence Fabric.
7. F900-11 - Industrial and Commercial Swing Gates.
8. F934-96 (R2013) - Standard Colors for Polymer-Coated Chain Link Fence Materials.
9. F1083-16 - Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
10. F1184-16 - Industrial and Commercial Horizontal Slide Gates. Federal Specifications (Fed. Spec.):

C. American Welding Society (AWS):

1. D1.2/D1.2M-14 - Structural Welding Code - Aluminum.

1.4 SUBMITTALS

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. Shop Drawings for Chain Link Fence and all components of functional fence system:

1. Layout of fences and gates with dimensions, elevations, details, and finishes of components, accessories, and post foundations. Include

all details of fencing and attachments to any walls or buildings around the enclosed area.

C. Manufacturer's Literature and Data:

1. Description of each product indicating materials compliance and specified options.
2. Installation instructions.
3. Warranty.

D. Certificates: Certify products comply with specifications.

1. Certification by a licensed surveyor that fence alignment meets requirements of contract documents.
2. Zinc-coating.

E. Qualifications: Substantiate qualifications comply with specifications.

1. Manufacturer.
2. Installer with project experience list.

F. Operation and Maintenance Manuals.

1. Care instructions for each exposed finish product.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Regularly manufactures specified products.
2. Manufactured specified products with satisfactory service on five similar installations for minimum five years.

B. Installer Qualifications:

1. Regularly installs specified products.
2. Installed specified products with satisfactory service on five similar installations for minimum five years.
 - a. Project Experience List: Provide contact names and addresses for completed projects.

C. Surveyor Qualifications:

1. Trained and experienced to provide services typically provided by a surveyor as defined by state law in the project location.
2. Registered professional qualified to perform survey services in the project location.

D. Welders and Welding Procedures Qualifications: AWS D1.2/D1.2M.

1.6 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

- B. Manufacturer's Warranty: Warrant against material and manufacturing defects.

- 1. Warranty Period: Fifteen years.

PART 2 - PRODUCTS

2.1 PRODUCTS - GENERAL

- A. Basis of Design: Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Provide fences and gates from one manufacturer.
- C. Materials shall conform to ASTM F1083 and ASTM A392 ferrous metals, zinc coated; and detailed specifications forming the various parts thereto; and other requirements specified herein. PVC coated over zinc coat metal members (including fabric, gates, posts, rails, hardware and other ferrous metal items) after fabrication shall be reasonably free of excessive roughness, blisters and sal-ammoniac spots.

2.2 CHAIN-LINK FENCE

- A. Materials: ASTM F1083 and ASTM A392 ferrous metals, zinc-coated.
 - 1. ASTM A934 PVC coating system of color indicated.
- B. Chain-Link Fabric: ASTM A392 9 gage PVC-coated wire woven in 50 mm (2 inch) mesh. Knuckle top and bottom selvage. Zinc-coating weight 570 grams/sq. m (2.0 ounces per square foot).
- C. Post: ASTM F1083, Grade SK-40A, round, PVC-coated zinc-coated steel. PVC color coating, minimum thickness, .25mm (.10 inch). Size and type as indicated on Drawings. Provide post braces and truss rods for each gate, corner, pull or end post. Provide truss rods with turnbuckles or other equivalent provisions for adjustment.
- D. Top Rail and Bottom Rail: ASTM F1083, Grade SK-40A, round, PVC-coated zinc-coated steel.
- E. Top and Bottom Tension Wires: ASTM A817 and ASTM F626, zinc-coated, with minimum coating same as fence fabric.
- F. Barbed Wire Support Arms: ASTM F626, single arm type, PVC-coated steel or malleable iron.
- G. Barbed Wire: ASTM A121, PVC-coated zinc-coated steel wire and barbs; standard size and construction, 2.51 mm (0.099 inch) diameter line wire with 2.03 cm (0.080 inch) diameter, 2-point barbs.

2.3 GATES

- A. Swing Gates: ASTM F900, type as indicated on Drawings. PVC-coated zinc-coating weight same as fabric.

1. Gates less than 2400 mm (8 feet) wide, provide truss rods or intermediate braces.
 2. Attach fabric to frame according to manufacturer's instructions, except welding is not be permitted. Arrange latches for padlocking with padlock accessible from both sides regardless of latching arrangement. Extend gate frame end member above top member or provide three strands of barbed wire in horizontal alignment.
- B. Chain Link Cantilever Slide Gate: ASTM F 1184, Type II, Class 2.
1. Frames: ASTM B 221, aluminum, alloy and temper 6063-T6, 50 mm (2 inch) square, 1.4 Kgs/M (0.94 lb./ft.) in weight. Weld members together forming rigid one-piece frame integral with top track. Provide 2 truck assemblies each gate leaf.
 2. Gate Fabric Assembly: Attach fabric to frame with hook bolts and tension bars at 4 sides, maximum 375 mm (15 inches) on center.
 - a. Bracing: 9 mm (3/8") galvanized steel diagonal adjustable length truss rods, each panel.
 - b. Top Track and Rail: Extruded aluminum, enclosed combination one-piece track and rail, 6 mm (3.72 lb./ft.) in weight. Track to withstand reaction load of 900 kg (2,000 lbs.).
 - c. Truck assembly: Swivel type, zinc die cast, with 4 sealed lubricant ball bearing rollers, 50 mm (2 inches) in diameter by 14 mm (9/16") in width, and 2 side rolling wheels. Mount trucks on post brackets with 22 mm (7/8") diameter ball bolts and 13 mm (1/2") shank. Truck assembly to withstand same reaction load as track.
 - d. Gate Hangers, Latches, Brackets, Guide Assemblies, and Stops: Malleable iron or steel, galvanized after fabrication. Provide positive latch with provisions for padlocking.
 - e. Bottom Guide Wheel Assemblies: 75 mm (3") diameter rubber wheels, and straddling bottom horizontal gate rail, allowing adjustment to maintain gate frame plumb and in proper alignment. Attach one assembly to each guidepost.
 - f. Gates Posts: ASTM F 1083 galvanized steel, 100 mm (4") OD Schedule 40 pipe, 14 Kgs/M (9.1 lb./ft.) in weight. Provide 1 latch post and 2 support posts for single slide gate.

- g. Gate Finish: PVC Vinyl Coated (except track/bottom guide wheel assemblies) 250 to 375 microns (10 to 15 mils) thick thermally fused, ASTM Class-2b, black color.

2.4 HARDWARE

- A. General: Manufacturer's standard products, installed complete.
- B. Hinges: 180 degree gate hinges per leaf.
- C. Stop and Keepers: Arrange latches with plunger-bar for locking to engage center stop. Provide keepers with mechanical device to secure free end of gate when in full open position.

2.5 CONCRETE

- A. Concrete: As specified in Section 03 30 00, Cast-in-Place Concrete.

2.6 ACCESSORIES

- A. General: ASTM F626, caps, rail and brace ends, wire ties or clips, braces and tension bands, tension bars, truss rods, and miscellaneous accessories.
- B. Primers:
- C. Barrier Coating: ASTM D1187/D1187M.
- D. Welding Materials: AWS D1.2/D1.2M, type to suit application.
- E. Galvanizing Repair Paint: MPI No. 18.
- F. Touch-Up Paint: Match shop finish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.
- C. Remove existing fence and gate to permit new installation.
 - 1. Dispose of removed materials.
- D. Correct substrate deficiencies.
 - 1. Fill.
 - 2. Grind.
 - 3. Level.
- E. Apply barrier coating to aluminum surfaces in contact with dissimilar metals and cementitious materials to minimum 0.7 mm (30 mils) dry film thickness.

3.2 INSTALLATION

- A. General: Comply with ASTM F567. Install products according to manufacturer's instructions and approved submittal drawings.
 - 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for COR consideration.
- B. Registered Professional Land Surveyor or Registered Civil Engineer will stake out and certify fence alignment meeting requirements as indicated on Drawings.
- C. Excavation: Excavate concrete-embedded items of dimensions indicated on Drawings, except in bedrock. When bedrock is encountered before reaching required depth, continue excavation to depth indicated or 450 mm (18 inches) into bedrock, whichever is less, and provide minimum 50 mm (2 inches) larger diameter than outside diameter of post. Clear loose material from post holes. Grade area around finished concrete footings as shown and dispose of excess earth as directed by the COR.
- D. Post Setting: Install posts plumb and in alignment. Set post in concrete footings of dimensions indicated on Drawings, except in bedrock. Compact concrete free of voids and finish in slope or dome. Install posts in bedrock with non-shrink grout minimum 25 mm (one inch) around each post, free of voids and finish in slope or dome. Cure concrete and grout minimum 72 hours.
- E. Post Caps: Snugly fit exposed ends of post with caps. Install caps to accommodate top rail. Install post caps according to manufacturer's instructions and as indicated on Drawings.
- F. Supporting Arms: Install supporting arms according to manufacturer's instructions and as indicated on Drawings.
- G. Top Rails and Bottom Rails: Install rails before installing chain link fabric. Provide suitable means for securing rail ends to terminal and intermediate post.
- H. Top Tension Wire: Install and pull taut tension wire before installing chain-link fabric.
- I. Accessories: Install accessories (posts braces, tension bands, tension bars, truss rods, and miscellaneous accessories), as required and recommended by the manufacturer, for complete fence installation, with fabric taut and attached to posts, rails, and tension wire.
- J. Touch up damaged factory finishes.
 - 1. Repair galvanized surfaces with galvanized repair paint.

3.3 FABRIC

- A. Pull fabric taut and secure with wire ties or clips to top rail, bottom rail, and tension wire close to both sides of each post and at intervals maximum 600 mm (24 inches) on centers. Secure fabric to posts using stretcher bars and ties or clips.
- B. Install barbed wire on supporting arms above fence posts. Extend gate frame end member above top member to carry three strands of barbed wire in horizontal alignment with barbed wire strands on fence. Pull each strand taut and securely fasten to each supporting arm and extended member.

3.4 GATES

- A. Install gates plumb, level, and secure for full opening without interference. Set keepers, stops and other accessories into concrete as indicated on Drawings and according to manufacturer's instructions. Adjust hardware for smooth operation and lubricate when necessary.

3.5 REPAIR OF GALVANIZED SURFACES

- A. Use galvanized repair compound, stick form, or other method, where galvanized surfaces need field or shop repair. Repair surfaces according to manufacturer's directions.

3.6 CLEANING

- A. Remove debris, rubbish and excess material from site.

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