

**SECTION 32 31 13
CHAIN LINK FENCES AND GATES**

SPEC WRITER NOTES: Use this section only
for NCA projects. Delete text between
// _____ // not applicable to project.
Edit remaining text to suit project.

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

SPEC WRITER NOTE: This paragraph
describes the typical chain link fencing
for Cemetery projects. Adjust as required
when fencing is placed other than as
security of the
Administration/Maintenance complex for
the Cemetery. As an example, when a total
perimeter fence is installed around the
Cemetery.

1. Zinc-coated chain link fence, gates and accessories.

1.2 RELATED REQUIREMENTS

SPEC WRITER NOTE: Update and retain
references only when specified elsewhere
in this section.

- A. Temporary Construction Fence: Section 01 00 00, GENERAL REQUIREMENTS.
- B. Concrete Footings: Section 03 30 00, CAST-IN-PLACE CONCRETE.
- C. Gate Hardware: Section 08 71 00, DOOR HARDWARE.
- D. Fence Color: Section 09 06 00, SCHEDULE FOR FINISHES.
- E. Grounding: Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.
- F. Finish Grading: // Section 31 20 00, EARTH MOVING //, and Section 32 90 00, PLANTING //.

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.
- D. Federal Specifications (Fed. Spec.):
1. // FF-P-110H - Padlock, Changeable Combination //.

1.4 SUBMITTALS

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

SPEC WRITER NOTE: Include shop drawings requirement for sliding gates.

- B. Submittal Drawings:
1. Show size, configuration, and fabrication and installation details.
 2. // Coordinate with wall manufacturer for appropriate wall and fence construction details to withstand applicable horizontal and vertical loadings //.
- C. Manufacturer's Literature and Data:
1. Description of each product.
 2. Installation instructions.
 3. Warranty.
- D. Samples:
1. // Polymer Coated Product: 150 mm (5 inch) // long // square //, each type and color //.
 - a. // Submit quantity required to show full color // and texture // range //.
 2. Accessories: Full sized, complete assembly.
 3. Approved samples may be incorporated into work.

SPEC WRITER NOTE: Alignment Certification requirement is for property line fencing or similar purpose requiring accurate alignment.

- E. Certificates: Certify // each product complies // products comply // with specifications.
 - 1. Fence alignment.
 - 2. Zinc-coating.
- F. Qualifications: Substantiate qualifications comply with specifications.
 - 1. Manufacturer // with project experience list //.
 - 2. Installer // with project experience list //.
- G. Operation and Maintenance Data.
 - 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.
 - a. // Project Experience List: Provide contact names and addresses for completed projects. //
- 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 // Licensed // professional qualified to perform survey services in the project location.
- D. Welders and Welding Procedures Qualifications: // AWS D1.1/D1.1M. // AWS D1.3/D1.3M. //

1.6 DELIVERY

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, // color, // production run number, and manufacture date.

- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Protect products from damage during handling and construction operations.

1.8 WARRANTY

SPEC WRITER NOTE: Always retain construction warranty. FAR includes Contractor's one year labor and material warranty.

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

SPEC WRITER NOTE: Specify extended manufacturer's warranties for materials only.

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

SPEC WRITER NOTE: Specify customarily available warranty period for specified products.

- 1. Warranty Period: Five years.

SPEC WRITER NOTE: Update Product requirements to comply with applicable requirements (Types, Grades, Class, Tables, etc.) as determined based upon design determination, following the applicable portions of NCA Facilities Design Guide.

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.

SPEC WRITER NOTES:
1. Comply with NCA Facilities Design Guide for sizing and spacing of materials indicated in Part 2. Provide information in specifications or on Drawings

indicating sizes and properties of products used for fencing system.
 2. Follow NCA Facilities Design Guide requirement for chain link fencing system manufactured as galvanized steel, with PVC coating, color as selected during submittal process from manufacturer's standard colors.

2.2 CHAIN-LINK FENCE

A. Materials: ASTM F1083 and ASTM A392 ferrous metals, zinc-coated.

// ASTM F668 //.

1. // ASTM A934 PVC coating system of color indicated //.

SPEC WRITER NOTE: In dry climates of Southwest States specify 340 g/m² (1.2 oz./sq. ft.) coating in Paragraph 2.2 Elsewhere specify 570 g/m² (2 oz./sq. ft.). Specify heavier coating or other material for use in salt-laden or corrosive industrial atmospheres.

B. Chain-Link Fabric: ASTM A392 9 gage wire woven in 50 mm (2 inch) mesh. Knuckle top and bottom selvage. Zinc-coating weight // 340 // 570 // grams/sq. m (// 1.2 // 2.0 // ounces per square foot).

C. Post: ASTM F1083, Grade SK-40A, round, zinc-coated steel. 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.

SPEC WRITER NOTE: Except for conditions where matching existing, omit top rails for main fence, follow NCA Facilities Design Guide for details. Generally provide tension wire for top of fence and bottom rail, secured to posts with wire ties and not pipe caps intended for carrying top rails.

D. Top Rail and Bottom Rail: ASTM F1083, Grade SK-40A, round, zinc-coated steel.

E. Top and Bottom Tension Wires: ASTM A817 and ASTM F626, zinc-coated, with minimum coating same as fence fabric.

SPEC WRITER NOTE: Include Paragraphs F and G when barbed wire is required. See NCA Facilities Design Guide for information regarding barbed wire.

- F. // Barbed Wire Support Arms: ASTM F626, single arm type, steel or malleable iron //.
- G. // Barbed Wire: ASTM A121, 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. Zinc-coating weight same as fabric.
 - 1. // Gate leaves more than 2400 mm (8 feet) wide, provide intermediate members and diagonal truss rods or tubular members, free from sag or twist //.
 - 2. // Gates less than 2400 mm (8 feet) wide, provide truss rods or intermediate braces //.
 - 3. 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 //.

SPEC WRITER NOTE: For double gates, use subparagraph A.

- 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.

SPEC WRITER NOTE: retain stop and keepers
for double gates over 8 feet in width.

- 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 //.

SPEC WRITER NOTE: When job specification
does not have Section 08 71 00, DOOR
HARDWARE, omit Subparagraph D below and
substitute with Subparagraph E.

- D. Padlocks: As specified under Section 08 71 00, DOOR HARDWARE. Provide padlock chains, securely attached to gate or gate post.
- E. // Equip gate openings with padlock. Comply with Fed. Spec. FF-P-110H, Type EPC, size 50 mm (2 inch). Securely attached padlock with chain to gate or gate post. Key padlock as directed by Contracting Officer's Representative (COR) //.

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:

SPEC WRITER NOTE: Retain barrier coating to separate dissimilar metals and to separate metals from cementitious materials.

- 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.

SPEC WRITER NOTE: Retain existing fence and gate paragraph below when required.

- B. Protect existing construction and completed work from damage.
- C. Remove existing fence and gate to permit new installation.
 - 1. Retain existing fence and gate for reuse.
 - 2. Dispose of // other // 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 - // GENERAL // CHAIN LINK FENCES AND GATES //

- 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.

SPEC WRITER NOTE: Use Subparagraph B for Property Line Fencing or similar purpose requiring accurate fence alignment.

- B. Registered Professional Land Surveyor or Registered Civil Engineer specified in Section 01 00 00, GENERAL REQUIREMENTS, will stake out and certify fence alignment meeting requirements as indicated on Drawings.

SPEC WRITER NOTE: Use Paragraph C and D for fence set in individual concrete footings.

- 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. // Straight runs between braced posts maximum 150 m (500 feet) //. 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.

SPEC WRITER NOTE:

1. Do not use following paragraph for perimeter and other fencing. See NCA Facilities Design Guide for clarification.
2. Use Paragraph below for fence set in concrete slabs, walls, curbs, or similar structure.

- E. Post Setting In Structures: Install post in retaining walls, curbs, concrete slabs, or similar construction with galvanized pipe sleeves set into concrete or built into masonry as indicated on Drawings. Set sleeves plumb and 13 mm (1/2 inch) above finished structure. Fill space

solidly between sleeve and post with non-shrinking grout, molten lead, or sulphur, and finish.

- F. 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.
- G. Supporting Arms: Install supporting arms according to manufacturer's instructions and as indicated on Drawings.

SPEC WRITER NOTE: Modify Paragraph H according to NCA Facilities Design Guide for placement of top rails and bottom rails.

- H. Top Rails and Bottom Rails: Install rails before installing chain link fabric. // Pass top rails through intermediate post supporting arms or caps as indicated on Drawings // Install expansion couplings (rail sleeves) spaced according to manufacturer's instructions. Install expansion couplings over expansion joints in wall when fence is on top of wall.

SPEC WRITER NOTE: Modify following paragraph to indicate method of attachment for top tension wire, and exclude use of top rail caps.

- I. // Top // and Bottom // Tension Wire //: Install and pull taut tension wire before installing chain-link fabric.
- J. 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.
- K. 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, when required, 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.

- - - E N D - - -