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SECTION 32 31 20

DECORATIVE METAL FENCES AND GATES

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**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes: Provide decorative steel fence system including gates, manual and automatically operated, framing, and accessories as required for complete fence installation as indicated.
  - 1. Excavate for post bases and provide concrete anchorage for freestanding posts, provide sleeves and grout posts embedded in concrete construction.
- B. Related Sections:
  - 1. Section 01 50 00: Temporary construction fence.
  - 2. Section 05 50 00: Miscellaneous metal fabrications.

1.2 REFERENCES

- A. American Welding Society (AWS): D1.1, Structural Welding Code.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Design/Build: Provide special engineering to ensure compliance with applicable codes and Contract Documents.

1.4 SUBMITTALS

- A. Product Data: Submit product literature for gates and operators, gate hardware, grout, and manufactured items.
- B. Shop Drawings: Indicate fence and gate layout, spacing of components, connections, fabrication details, accessories, and anchorage.
  - 1. Indicate profiles, sizes, connections, and anchorage.
  - 2. Provide templates as required for anchor installation by others.
- C. Samples: Submit samples fence section with welds and finish.
- D. Design/Build Certificates: Submit certification signed by California licensed structural engineer indicating compliance with Contract Documents and code requirements.

1.5 QUALITY ASSURANCE

- A. Sustainability Requirements: Comply with CALGreen requirements including those relative to finish material pollution control for paints and coatings.
- B. Fabricator: Firm with minimum five years successful experience fabricating custom steel fences and gates similar to those required for Project.
  - 1. Provide fence and gates by same fabricator.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. System Description: Provide decorative steel fence system including gates, manual and automatically operated, framing, and accessories.
- B. Regulatory Requirements: Design fence and gates to support loads as required by California Building Standards Code.
- C. Performance Criteria: In addition to applicable code requirements, design to support minimum lateral force of 50 lbs./lin. ft. uniform load and 200 lbs. at any single point without permanent set or damage; ASTM E935.
- D. Steel Shapes, Plates and Bars: ASTM A36; shapes and sizes as indicated on Drawings; provide weights suitable for specified loads; galvanized.
- E. Structural Steel Sheet: Hot rolled, ASTM A1011; or cold rolled, ASTM A1008, Class 1; of grade required for design loading; galvanized.
- F. Steel Tubing: Cold formed ASTM A500; or hot rolled, ASTM A501; minimum Grade B; seamless where exposed; galvanized.
- G. Grout: Non-shrink meeting ASTM C1107 non-metallic, pre-mixed, factory-packaged, non-staining, non-corrosive; type specifically recommended by manufacturer as applicable to job condition.
- H. Fasteners and Rough Hardware: Type required for specific usage; provide zinc-coated fasteners.
- I. Welding Materials: AWS D1.1, type required for materials being welded.
- J. Primer: Provide primers as recommended by paint manufacturers for substrates and paints specified in Section 09 90 00 – Painting and Coating.
  - 1. Galvanizing Repair Paint: High zinc-dust content paint for regalvanizing welds in galvanized steel.
- K. Concrete: ASTM C94, normal Portland cement, 2,500 psi at 28 days, 2" to 3" slump, 2 to 4 percent entrained air.

### **2.2 FABRICATION**

- A. Framework: Design and fabricate fence to withstand anticipated loads, including loads from people climbing on fence.
  - 1. Configurations: As indicated, welded construction unless otherwise indicated.
  - 2. Fittings: Provide fittings and accessories as required for complete installation.

- B. Gates: Fabricate gates as indicated, welded construction.
  - 1. Swing Gates: Provide complete with hardware.
    - a. Pivots: Lift-off type, extra heavy-duty ball bearing pivots, sized for anticipated gate loads plus additional live loads of up to 500 lbs per gate leaf, without damage to system.
      - 1) Provide full surface offset pivots to permit 180-degree opening, minimum 1-1/2 pair per gate leaf.
      - 2) Provide set screws to prevent accidental gate removal due to seismic activities or vehicular impact.
      - 3) Weld pivot to gates and frames.
    - b. Cane Bolts: Custom fabrications as indicated.
    - c. Accessories: Keepers, stops, and accessories as required for complete, secure manually operated fence gate installation.
- C. Fabricate items with joints neatly fitted and properly secured.
- D. Grind exposed welds continuous, smooth and flush with adjacent finished surfaces, and ease exposed edges to approximate 1/32" uniform radius.
- E. Exposed Mechanical Fastenings (Slide Gate Hardware Only): Flush countersunk fasteners unobtrusively located, consistent with design of structure.
- F. Fit and shop assemble in largest practical sections for delivery.
- G. Make exposed joints flush butt type, hairline joints where mechanically fastened.
  - 1. Fabricate joints exposed to weather in manner to exclude water or provide weep holes where water could accumulate.
- H. Supply components required for proper anchorage of custom steel fence; fabricate anchorage and related components of same material and finish as custom steel fence.
- I. Finishing: Galvanize and prime paint custom steel fencing; comply with requirements of Section 09 90 00 – Painting and Coating for preparation and priming.
  - 1. Preparation: Thoroughly clean surfaces of rust, scale, grease and foreign matter prior to applying finishes.
  - 2. Galvanizing: Provide minimum ASTM A123 or A924 and A653 G90 coating; iron and steel hardware galvanized conforming to ASTM A153.
  - 3. Priming: Comply with requirements in Section 09 90 00 – Painting and Coating; do not shop prime surface areas requiring field welding; shop prime in one coat.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication.

**3.2 INSTALLATION**

- A. Install fence, gates, and accessories to provide rigid structure for configurations indicated as specified and in accordance with applicable code requirements.
- B. Install line, corner, and terminal posts plumb in locations indicated on Drawings.
  - 1. Coordinate embedded post sleeves with concrete work.
  - 2. Grout posts solid where indicated on Drawings.
- C. Install gates for free, easy operation.
- D. Obtain Architect's review prior to site cutting or making adjustments that are not part of scheduled work.
- E. Install components square and level, accurately fitted and free from distortion or defects detrimental to appearance or performance.
  - 1. Supply items required to be cast into or embedded in other materials to appropriate trades.
  - 2. Ensure alignment with adjacent construction; coordinate with related work to ensure no interruption in installation.
- F. Make provision for erection stresses by temporary bracing; keep work in alignment.
- G. Field bolt and weld to match standard of shop bolting and welding; hide bolts and screws whenever possible, where not hidden, use flush countersunk fastenings.
  - 1. Perform field welding in accordance with AWS D1.1.
  - 2. Bolting permitted for slide fence hardware only.
- H. After installation, touch-up field welds and scratched and damaged surfaces; use same primer as used for shop coat.
- I. Replace items damaged in course of installation and construction.

**END OF SECTION**