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## SPECIFICATION SECTION 05515: LADDERS O’Keeffe’s Aluminum Ladders

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Aluminum access ladders.
- B. Aluminum ship’s ladders.
- C. Aluminum cage ladders.

#### **1.2 RELATED SECTIONS**

- A. Section 05500 – Metal Fabrications: Fasteners and installation requirements used to attach ladders to structure.
- B. Section 14200 – Elevators: For pit ladders.
- C. Section 15050 – Basic Electrical Materials and Methods: For electrical grounding of ladders.

#### **1.3 REFERENCES**

- A. AA – Aluminum Association.
- B. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- D. OSHA 1910.27 – Fixed Ladders.

#### **1.4 SUBMITTALS**

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer’s data sheets on each product.

C. Shop Drawings:

1. Detail fabrication and erection of each ladder indicated. Include plans, elevations, sections, and details of metal fabrications and their connections.
2. Provide templates for anchors and bolts specified for installation under other Sections.
3. Provide reaction loads for each hanger and bracket.

D. Qualification Data:

1. Refer to Quality Assurance provisions for submittal requirements evidencing experience, certifications and resources.

E. Selection Samples: For each finish specified, two complete sets of color chips representing manufacturer's full range of available colors.

F. Verification Samples: For each finish specified, two samples, minimum size 6 inches (150 mm) square, represent actual product color.

## **1.5 QUALITY ASSURANCE**

A. Manufacturer Qualifications: A firm experienced in producing aluminum metal ladders similar to those indicated for this Project.

1. Record of successful in-service performance.
2. Sufficient production capacity to produce required units.
3. Professional engineering competent in design and structural analysis to fabricate ladders in compliance with industry standards and local codes.

B. Installer Qualifications: Competent and experienced firm capable of selecting fasteners and installing ladders to attain designed operational and structural performance.

C. Product Qualification: Product design shall comply with OSHA 1910.27 minimum standards for ladders.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Install ladder in area designated by Architect.
2. Do not proceed with remaining work until workmanship and installation are approved by Architect.

3. Rework mock-up as required to produce acceptable work.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.

#### **1.7 PROJECT CONDITIONS**

- A. Field Measurements: Verify dimensions by field measurement before fabrication.
  1. Established Dimensions: Where field measurements cannot be made without delaying the Work, indicate established dimensions on shop drawing submittal and proceed with fabrication.

#### **1.8 WARRANTY**

- A. A. Manufacturer has responsibility for an extended Corrective Period for work of this Section for a period of 5 years commencing on the shipment date of the product against all the conditions indicated below, and when notified in writing from Owner, manufacturer shall promptly and without inconvenience and cost to Owner correct said deficiencies.
  1. Defects in materials and workmanship.
  2. Deterioration of material and surface performance below minimum OSHA standards as certified by independent third party testing laboratory. Ordinary wear and tear, unusual abuse or neglect excepted.
  3. Within the warranty period, the manufacturer shall, at its option, repair, replace, or refund the purchase price of defective ladder.
- B. Manufacturer shall be notified immediately of defective products, and be given a reasonable opportunity to inspect the goods prior to return. Manufacturer will not assume responsibility, or compensation, for unauthorized repairs or labor. Manufacturer makes no other warranty, expressed or implied, to the merchantability, fitness for a particular purpose, design, sale, installation, or use, of the ladder; and shall not be liable for incidental or consequential damages, losses of or expenses, resulting from the use of ladder products.

#### **1.9 EXTRA MATERIALS**

- A. Furnish touchup kit for each type and color of paint finish provided.

#### **PART 2 PRODUCTS**

## 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: O’Keeffe’s, Inc.; 100 N Hill Drive, Suite 12, Brisbane, CA 94005. Toll Free Tel: (888) 653-3333. Tel: (415) 824-4900. Fax: (415) 824-5900. Email: info@okeeffes.com. Web: <http://www.okeeffes.com>.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

## 2.2 APPLICATIONS/SCOPE

- A. Fixed and Cage Ladder Design:
  - 1. Safety cages are required on ladders over 20 feet (6096 mm)
  - 2. Safety cages are required on all ladders in high or hazardous areas.
  - 3. Landing platforms are required at 30 feet (9144 mm) above the bottom of the ladder.
  - 4. Rail and harness fall arrest system as alternate to safety cage and landing platforms shall be a permissible manufacturer’s option.
    - a. Fixed Ladder Bottom Bracket:
    - b. Bottom floor supported bracket.
    - c. Bottom wall supported bracket.
    - d. Bracket as drawn.
- B. Fixed Access Ladder:
  - 1. Standard Duty Channel Rail.
    - a. Model 500 as manufactured by O’Keeffe’s Inc.
  - 2. Heavy Duty Tubular Rail.
    - a. Model 501 as manufactured by O’Keeffe’s Inc.
  - 3. Tubular Rail Low Parapet Access Ladder with Roofover Rail Extension.
    - a. Model 502 as manufactured by O’Keeffe’s Inc.

4. Tubular Rail Low Parapet Access Ladder with Platform and Return.
  - a. Model 503 as manufactured by O’Keeffe’s Inc.
5. Tubular Rail Low Parapet Access Ladder with Platform.
  - a. Model 503A as manufactured by O’Keeffe’s Inc.
6. Tubular Rail Low Parapet Access Ladder with Walk-through Rail Extension.
  - a. Model 504 as manufactured by O’Keeffe’s Inc.

C. Cage Ladder:

1. Cage Ladder with Roof Hatch Rail Extension.
  - a. Model 531 as manufactured by O’Keeffe’s Inc.
2. Cage Ladder with Roofover Rail Extension.
  - a. Model 532 as manufactured by O’Keeffe’s Inc.
3. Cage Ladder with High Parapet Access, Platform and Return.
  - a. Model 533 as manufactured by O’Keeffe’s Inc.
4. Cage Ladder with High Parapet Access, Platform and No Return.
  - a. Model 533A as manufactured by O’Keeffe’s Inc.
5. Tubular Rail Low Parapet Cage Ladder with Walk-through Extension.
  - a. Model 534 as manufactured by O’Keeffe’s Inc.

D. Ship Ladder:

1. Ships Ladder.
  - a. Model 520 as manufactured by O’Keeffe’s Inc.
2. Ship Ladder with Platform.
  - a. Model 521 as manufactured by O’Keeffe’s Inc.
3. Ship Ladder with Platform and Return.
  - a. Model 522 as manufactured by O’Keeffe’s Inc.
4. Ship Ladder with Access to Roof Hatch.

- a. Model 523 as manufactured by O’Keeffe’s Inc.
5. Incline:
- a. 60 degree.
  - b. 75 degree.
  - c. As drawn.

### **2.3 FINISHES**

- A. Mill finish. As extruded.
- B. Clear Anodic Finish: AA-M10C22A41 Mechanical finish as fabricated. Architectural Class I, clear coating 0.018 mm or thicker.
- C. Paint. Urethane over chemically pretreated substrate.
  - 1. Fire Red (RAL 2002).
  - 2. Alert Orange (RAL 2003).
  - 3. Warning Blue (RAL 5005).
  - 4. Caution Yellow (RAL 1018).
  - 5. Safety Green (RAL 6001).
  - 6. As scheduled on drawings.

### **2.4 MATERIALS**

- A. Aluminum Sheet: Alloy 5005-H34 to comply with ASTM B209.
- B. Aluminum Extrusions: Alloy 6063-T6 to comply with ASTM B221.

### **2.5 FABRICATION**

- A. Rungs: Not less than 1-1/4 inches (32 mm) in section and 18-3/8 inches (467mm) long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.
  - 1. Rungs shall withstand a 1,500 pound (454 kg) load without deformation or failure.
- B. Channel Side Rails: Not less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide.
- C. Heavy Duty Tubular Side Rails: Assembled from two interlocking aluminum extrusions no less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide. Construction shall be

self-locking stainless steel fasteners, full penetration TIG welds and clean, smooth and burr-free surfaces.

- D. Ship Ladders: Not less than 1-1/4 inches (32mm) high, 4-1/8 inch (105 mm) deep and 2 feet (610 mm) wide; tread spacing shall be 1 foot (305 mm) on center. Handrails shall be aluminum pipe, not less than 1-1/2 inches (38 mm) in diameter with hemispheric end caps.
- E. Walk-Through Rail and Roof Rail Extension: Not less than 3 feet 6 inches (1067 mm) above the landing and shall be fitted with deeply serrated, square, tubular grab rails.
- F. Landing Platform: 1-1/2 inches (38 mm) or greater diameter, tubular aluminum guardrails and decks of serrated aluminum treads.
- G. Security Doors: Formed 1/8 inch (3 mm) thick aluminum sheet. Security panels shall extend on both sides, perpendicular to the door face, to within 2 inches (51 mm) of the wall. Security door shall be furnished with continuous aluminum piano hinge and heavy duty forged steel locking hasps.
- H. Ship Ladder Seismic Bottom Support: Manufacturer's standard; two isolation bearings per stringer.
- I. Ladder Safety Post: Retractable hand hold and tie off.
- J. Rail and Harness Fall Arrest System: Supplied where specified as alternate to safety cage and landing platforms, in accordance with OSHA regulation 1910.27; permanently mounted to ladder rungs and complete with necessary components.
- K. Safety Cages:
  - 1. Fabricate ladder safety cages to comply with authority having jurisdiction. Assemble by welding. Spacing of primary hoops, secondary hoops and vertical bars shall not exceed that required by code.
  - 2. Safety cage hoops and vertical bars: 3/16 inch (5 mm) by 2 inches (51 mm) aluminum bar.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Coordinate anchorages. Furnish setting drawings, templates, and anchorage structural loads for fastener resistance.
- B. Do not begin installation until supporting structure is complete and ladder installation will not interfere with supporting structure work.

- C. If supporting structure is the responsibility of another installer, notify Architect of unsatisfactory supporting work before proceeding.

### **3.2 INSTALLATION**

- A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.

### **3.3 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

### **END OF SECTION**

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