

SPECIAL SPECIFICATION

SECTION 14211S

ELECTRIC ELEVATORS - FREIGHT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Electric freight elevator system.
- B. Freight cab with doors and frames; hoistway entrance doors and frames.
- C. Machines, controllers, hoistway equipment, and accessories.
- D. Related Sections
 - 1. Section 13085 – Seismic Protection.

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Section 05120S-Structural Steel: Placement of special guide rail brackets and inserts for installation.

1.03 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION:

- A. Section 08710S-Finish Hardware: Supply of key cylinders for placement by this section.

1.04 REFERENCES

- A. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
- B. ANSI/ASME A17.1 - Safety Code for Elevators and Escalators.
- C. ANSI/ASME A17.2 - Inspector's Manual For Elevators and Escalators.
- D. ASTM A36 - Structural Steel.
- E. ASTM A366 - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.

- F. ANSI/AWS D1.1 - Structural Welding Code, Steel.
- G. ANSI/NFPA 70 - National Electrical Code.
- H. ANSI/NFPA 80 - Fire Doors and Windows.
- I. ANSI/UL 10B - Fire Tests of Door Assemblies.
- J. APA - American Plywood Association.
- K. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- L. ASTM A446 - Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
- M. NEMA MG1 - Motors and Generators
- N. Steel Structures Painting Council (SSPC) - Steel Structures Painting Manual.
- O. IBC Chapter 30**

1.05 SYSTEM DESCRIPTION

- A. Electric Freight Elevator System: One unit; geared type; traction machine overhead.
- B. Characteristics of [each] elevator are as follows
 - 1. MicroFab
 - a. Rated Net Capacity: 6,000 pounds.
 - b. Loading Class: C2.
 - c. Rated Speed: 200 feet per minute.
 - d. Nominal Platform Size: 100 inches by 120 inches.
 - e. Clear Net Platform Size: 96 inches by 116 inches.
 - f. Cab Height: 108 inches.
 - g. Hoistway and Cab Entrance Frame Opening Sizes: 130 inches by 130 inches.
 - h. Door Type: Power, 96 inches by 108 inches, biparting.
 - i. Operation: Power.

- j. Number of Stops: 3.
- k. Number of Openings: 1 Front 1 Rear.
- 2. MicroLab and WIF
 - a. Rated Net Capacity: 10,000 pounds.
 - b. Loading Class: C2.
 - c. Rated Speed: 200 feet per minute.
 - d. Nominal Platform Size: 100 inches by 144 inches.
 - e. Clear Net Platform Size: 96 inches by 138 inches.
 - f. Cab Height: 108 inches.
 - g. Hoistway and Cab Entrance Frame Opening Sizes: 132 inches by 152 inches.
 - h. Door Type: Power, 96 inches by 108 inches, biparting.
 - i. Operation: Power.
 - j. Number of Stops: 5.
 - k. Number of Openings: 1 Front.
- C. Door Control Features
 - 1. Program control to open door automatically when car arrives at floor.
 - 2. If door is prevented from closing for approximately 10 seconds because of an obstruction, automatically disconnect reopening devices, close door more slowly until obstruction is cleared. Sound buzzer.
 - 3. Door Safety Devices: Moveable, retractable safety edges, equip with photo-electric light rays.
- D. Interconnect elevator control system with building fire alarm and smoke alarm system.
- E. Temporary Elevator Use: Enclose elevator for transport of construction materials and personnel.
 - 1. Enclose cab with protective plywood on floor, walls, and ceiling.
 - 2. Provide temporary lighting.
 - 3. Provide control panel with manual and emergency operation with key operation for attendant operator.
- F. Seismic Design: In accordance with applicable code.

1.06 SINGLE AUTOMATIC OPERATION

- A. Set system operating device to give operator or freight handler in car, uninterrupted use of elevator until car has reached desired destination and car door has been opened and closed.
- B. On momentary pressure of any hall button, dispatch car to that landing.
- C. After car stops at landing in response to landing call, render car inoperative from other hall calls for programmable interval, to allow person boarding time to register a call in the car.
- D. Hall stations to include "IN USE" light.

1.07 SUBMITTALS

- A. Shop Drawings: Indicate the following information:
 - 1. Driving machine, controller, selector, governor and other component locations.
 - 2. Car, counterweight, sheaves, machine and sheave beams, guide rails, buffers, ropes, and other components in hoistway.
 - 3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
 - 4. Individual weight of principal components; load reaction at points of support.
 - 5. Loads on hoisting beams and location of trolley beams.
 - 6. Clearances and over travel of car and counterweight.
 - 7. Location of components in machine room.
 - 8. Locations in hoistway and machine room of traveling cables and connections for car light.
 - 9. Location and sizes of access doors, doors, and frames; structural requirements for door frames.
 - 10. Expected heat dissipation of elevator equipment in machine room.
 - 11. Applicable seismic design data; certified by a Registered Professional Structural Engineer.
 - 12. Interface with building security system.
 - 13. Electrical characteristics and connection requirements.
 - 14. Show arrangement of equipment in machine room so rotating elements, sheaves, and other equipment can be removed for repairs or replaced without disturbing other components. Arrange equipment for clear passage through access door.

- B. Product Data: Provide data on the following items:
 - 1. Signal and operating fixtures, operating panels, indicators.
 - 2. Cab dimensions, layout, and components.
 - 3. Cab and hoistway door and frame details.
 - 4. Electrical characteristics and connection requirements.
- C. Operation and Maintenance Manuals:
 - 1. Include a parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
 - 2. Provide technical information for servicing operating equipment.
 - 3. Include legible schematic wiring diagrams of installed electrical equipment, and changes made in the Work. List symbols corresponding to identity or markings on machine room and hoistway apparatus.
 - 4. Provide one copy of master schematic and one copy of lubrication chart, each framed with clear plastic; mount on machine room wall.

1.08 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSI/ASME A17.1, ANSI/AWS D1.1, ANSI/NFPA 70, AISC, and as supplemented in this section.
- B. Fabricate and install door and frame assemblies in accordance with ANSI/NFPA 80 and ANSI/UL 10B.
- C. Maintain one copy of each document on site.
- D. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years [documented] experience.
- E. Installer Qualifications: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.

1.09 REGULATORY REQUIREMENTS

- A. Conform to applicable code for manufacture and installation of elevator system.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.10 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this section, under provisions of Section 01300.
- B. Require attendance of persons directly involved with the work of this section.
- C. Review schedule of installation, installation procedures and conditions, and coordination with related work.

1.11 FIELD MEASUREMENTS

- A. Verify that field measurements are as instructed by the manufacturer.

1.12 SCHEDULING

- A. Schedule work to permit early use of Freight Elevator for construction purposes.

1.13 WARRANTY

- A. Provide one-year manufacturer's warranty under provisions of Section 01700.
- B. Include coverage for elevator operating equipment and devices.

1.14 MAINTENANCE SERVICE

- A. Furnish service and maintenance of elevator system and components during warranty period.
- B. Examine system components every three (3) months. Clean, adjust, and lubricate equipment.
- C. Include systematic examination, adjustment, and lubrication of elevator equipment. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original equipment. Replace wire ropes when necessary to maintain the required factor of safety.
- D. Perform work without removing cars during peak use periods.
- E. Provide emergency call back service at all hours for this maintenance period.
- F. Maintain locally, near the Place of the Work, an adequate stock of parts for replacement or emergency purposes. Have personnel available to ensure the fulfillment of this maintenance service, without unreasonable loss of time.

- G. Perform maintenance work using competent and qualified personnel, under the supervision of the elevator manufacturer or original installer.
- H. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Kone, Traction Freight Elevator .

2.02 MATERIALS

- A. Rolled Steel Sections, Shapes, Rods: ASTM A36.
- B. Sheet Steel: ASTM A108 Class 1, with matte finish.

2.03 FINISH MATERIALS

- A. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.
- B. Finish Paint (for Metal Surfaces): Alkyd enamel, semi-gloss, color as selected.

2.04 EQUIPMENT

- A. Motors, Controller, Controls, Buttons, Wiring and Devices, Indicators: Required by ANSI/NFPA 70.
- B. Elevator Controls and Motion Controls must be non-proprietary; operation software and diagnostic tools are to be made in the USA and selected by the SDR.**
- C. Geared Machine: Worm geared traction machine, brake, gearing and driving sheave; quiet operation.
- D. Guide Rails, Ropes, Cables, Counterweights, Sheaves, Spring Buffers, Attachment Brackets and Anchors: Purpose designed, sized according to code with safety factors.

2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Electrical Characteristics:
 - 1. MicroFab
 - a. 480 volts, three phase, 60 hertz.
 - b. 8.5 percent minimum power factor at rated load.
 - 2. MicroLab and WIF
 - a. 480 volts, three phase, 60 hertz.
 - b. 8.5 percent minimum power factor at rated load.
- B. Motor: Refer to Section 15170S.
- C. Disconnect Switch: Factory mount disconnect switch [in control panel] [on equipment under provisions of Section 16180].

2.06 ELECTRICAL COMPONENTS

- A. Boxes, Conduit, Wiring, and Devices: Required by ANSI/NFPA 70.
- B. Fittings: Steel compression type for electrical metallic tubing. Fittings with set screws are acceptable only when a separate grounding conductor is also installed across the joint.
- C. Spare Conductors: Include 10 percent extra conductors and two pairs of shielded audio cables in traveling cables. Do not parallel conductors to increase electric current capacity unless individually fused.
- D. Do not use armored flexible metal conduit as a grounding conductor.
- E. Include wiring and connections to elevator devices remote from hoistway and between elevator machine rooms. Provide additional components and wiring to suit machine room layout.

2.07 LUBRICATION

- A. Grease Fittings: For lubricating bearings requiring periodic lubrication.
- B. Grease Cups: Automatic feed type.
- C. Lubrication Points: Visible and easily accessible.

2.08 CAR FABRICATION

- A. Frame: Rigid and braced, rolled or formed steel sections.
- B. Platform: Steel frame, ready to receive floor finish.

2.09 CAB FABRICATION

- A. Flooring: Checker plate stainless steel plate.
- B. Walls: Stainless steel.
- C. Base: Stainless steel perimeter bumper guards.
- D. Ceiling: Stainless steel plate.
- E. Light Fixtures: Fluorescent, recessed downlights.
- F. Control and Indicator Panel and Face Plate: Stainless steel with illuminating call buttons.
- G. Bumper Rail: Stainless steel wrapped over wood, spaced from wall 3 inches; placed 36 inches above floor, placed at rear wall and side walls.
- H. Certificate Frame and Glazing: Metal frame, clear plastic attached with tamper proof screws.

2.10 CAB ENTRANCES

- A. Cab Door, Power Operation: Baked enamel on steel; 16 gage thick metal, rolled profiles, rigid construction.
- B. Cab Door Frame: Baked enamel on steel; 16 inch thick metal, welded corner design with smooth invisible joints.
- C. Cab Threshold: Steel plate type, frame width.

2.11 HOISTWAY ENTRANCES

- A. Hoistway Doors, Power Operation: Baked enamel on steel; 16 gage thick metal, of flush sandwich panel construction, rolled profiles, rigid construction. Top edge of lower bi-parting panel to be load weighted same as elevator car. Bottom edge of upper panel to have structural edge, non-crushing.

- B. Hoistway Door Frames: Rolled steel channel; 16 gage thick metal, of rolled profiles, welded corner joints.
- C. Door and Frame Construction: UL 1-1/2 hour fire rating.
- D. Thresholds: Steel channel type, entrance frame width.

2.12 FINISHES

- A. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- B. Machine Room Components: Clean and degrease; prime one coat, finish with one coat of enamel.
- C. Galvanized Surfaces: Clean with neutralizing solvent; prime one coat.
- D. Wood Surfaces not Exposed to Public View: One coat primer; one coat enamel.
- E. Baked Enamel on Steel: Clean and degrease metal surface apply one coat of primer sprayed and baked; two coats of enamel sprayed and baked; color as selected.
- F. Stainless Steel: No. 4 brushed.

2.13 CAR OPERATING PANEL

- A. Provide one flush mounted operating panel per car containing illuminated call buttons corresponding to floors served, emergency alarm button, service demand buzzer, and DOOR OPEN, DOOR CLOSE, and DOOR STOP buttons.
- B. Provide protective steel perimeter edging protruding 1/2-inch beyond buttons or other control feature.
- C. Position alarm button where it is unlikely to be accidentally actuated.
- D. Include the following:
 - 1. Inspection switch.
 - 2. Light switch.
 - 3. Additional operating switches for the special features specified.
- E. Car Position Indicators: **Use manufacturer's standard.**

2.14 LANDING CONTROLS

- A. Landing Buttons: Stainless steel Illuminating type, one for originating UP and one for originating DOWN calls, one button only at terminating landings.
- B. Provide illuminated call buttons corresponding to direction requested, and DOOR OPEN, DOOR CLOSE, and DOOR STOP buttons.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that hoistway, pit, and machine room are ready for work of this section.
- B. Verify hoistway shaft and openings are of correct size and within tolerance.
- C. Verify location and size of machine foundation and position of machine foundation bolts.
- D. Verify that electrical power is available and of the correct characteristics.

3.02 PREPARATION

- A. Arrange for temporary electrical power for installation work and testing of elevator components.

3.03 INSTALLATION

- A. Install in accordance with ANSI/ASME A17.1.
- B. Install system components. Connect equipment to building utilities.
- C. Provide conduit, boxes, wiring, and accessories.
- D. Mount machine on vibration and acoustic isolators, on bed plate and concrete pad. Place machine on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.
- E. Accommodate equipment in space indicated.
- F. Install guide rails using threaded bolts with metal shims and lock washers under nuts. Compensate for expansion and contraction movement of guide rails.

- G. Accurately machine and align guide rails. Form smooth joints with machined splice plates.
- H. Bolt or weld brackets directly to structural steel hoistway framing.
- I. Field Welds: Chip and clean away oxidation and residue, wire brush; spot prime with two coats.
- J. Coordinate installation of hoistway wall construction.
- K. Install hoistway door sills, frames, and headers in hoistway walls. Grout sills in place. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.
- L. Adjust equipment for smooth and quiet operation.

3.04 TOLERANCES

- A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ANSI/ASME A17.1 and ANSI/ASME A17.2.
- B. Cab Movement on Aligned Guide Rails: Smooth movement, with no objectionable lateral or oscillating movement or vibration.

3.05 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed.
- B. Perform tests required by ANSI/ASME A17.2.
- C. Provide two weeks written notice of date and time of tests.
- D. Supply instruments and execute specific tests.

3.06 TESTS BY REGULATORY AGENCIES

- A. Testing by regulatory agencies will be performed at their discretion; documented by the Contractor under provisions of Section 01400.
- B. Obtain required permits to perform tests. Perform tests required by regulatory agencies.
- C. Schedule tests with agencies, Owner, and Contractor present.
- D. Furnish test and approval certificates issued by jurisdictional authorities.

3.07 ADJUSTING

- A. Adjust for smooth acceleration and deceleration of car.
- B. Adjust automatic floor levelling feature at each floor to achieve 1/4-inch from flush.

3.08 CLEANING

- A. Remove protective coverings from finished surfaces.
- B. Clean surfaces and components ready for inspection.

3.09 PROTECTION OF FINISHED WORK

- A. Do not permit construction traffic within cab after cleaning.

3.10 SCHEDULES

- A. Elevator No. 2 (Service Area): Geared type, machine placed under and to the side of the hoistway, 200 feet per minute, 3,000-pound capacity, 3 stops, 3 front opening doors.

END OF SECTION