

SECTION 142100

ELECTRIC TRACTION ELEVATORS

(Part of Work of Section 140001 - ELEVATORS, Filed Sub-Bid Required)

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Machine-room-less electric traction passenger elevators.
- B. Sustainable Design Intent: Refer to Section 018113 - SUSTAINABLE DESIGN REQUIREMENTS for certification level and certification requirements.
- C. Items To Be Furnished Only: Furnish the following items for installation by the designated Sections
 - 1. Section 033000 - CAST-IN-PLACE CONCRETE:
 - a. Lintels, sleeves, anchors, inserts, plates and similar items for elevators.
- D. Related Work: The following items are not included in this Section and are specified under the designated Sections:
 - 1. Section 033000 - CAST-IN-PLACE CONCRETE for lintels, sleeves, anchors, inserts, plates and similar items for elevators.
 - 2. Section 051200 - STRUCTURAL STEEL FRAMING for the hoist beams, attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
 - 3. Section 055000 - METAL FABRICATIONS for miscellaneous framing and supports for hoisting machines, and for elevator door sills, cants in hoistways made from sheet steel, and elevator pit ladders.
 - 4. Division 09 - FINISHES for floor finish requirements.
 - 5. Division 26 - ELECTRICAL for telephone service to elevators.
 - 6. Division 26 - ELECTRICAL for electrical service for elevators to and including disconnect switches at machine room door and telephone wiring to elevator.
 - 7. Division 28 - SECURITY COMMUNICATIONS SYSTEMS for card readers.

1.3 DEFINITIONS

- A. Definitions in ASME A17.1 apply to work of this Section.

- B. Defective Elevator Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for the following:
 - 2. Car enclosures and hoistway entrances.
 - 3. Operation, control, and signal systems.
- B. LEED Submittals:
 - 1. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD):
 - a. Option 1: For elevators, submit product-specific Type III EPDs.
- C. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, equipment layout, coordination with building structure, relationships with other construction, and locations of equipment and signals. Include large-scale layout of car control station and standby power operation control panel. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.
- D. Samples for Verification: For exposed finishes of cars, hoistway doors and frames, and signal equipment; 3-inch-square Samples of sheet materials; and 4-inch lengths of running trim members.
- E. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.
- F. Qualification Data: For Installer.
- G. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
- H. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- I. Warranty: Special warranty specified in this Section.
- J. Continuing Maintenance Proposal: Service agreement specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain elevators through one source from a single manufacturer.
 - 1. Provide major elevator components, including driving machines, controllers, signal fixtures, door operators, car frames, cabs, and entrances, manufactured by a single manufacturer.
- C. Regulatory Requirements: Comply with ASME A17.1 and Massachusetts Elevator Code.
- D. Accessibility Requirements: Comply with Section 4.10 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG) and the Massachusetts Architectural Access Board.
- E. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging.
- B. Store materials, components, and equipment off of ground, under cover, and in a dry location. Handle according to manufacturer's written recommendations to prevent damage, deterioration, or soiling.

1.7 COORDINATION

- A. Coordinate installation of sleeves, block outs, and items that are embedded in concrete or masonry for elevator equipment. Furnish templates and installation instructions and deliver to Project site in time for installation.
- B. Coordinate sequence of elevator installation with other work to avoid delaying the Work.
- C. Coordinate locations and dimensions of other work relating to traction elevators including pit ladders, sumps, and floor drains in pits; entrance subsills; and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

1.8 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective elevator work within specified warranty period.
 - 1. Warranty Period: One year from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide one year's full maintenance service by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and

adjusting as required for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

1. Include 24-hour-per-day, 7-day-per-week emergency callback service.
- B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard one-year maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering electric traction elevators that may be incorporated into the Work include, but are not limited to, the following:
1. KONE Inc.; EcoSpace Elevator.
 2. Otis Elevator Co.; Gen3.
 3. ThyssenKrupp Elevator; Endura MRL Elevator.
- B. Basis of Design: Otis Gen 3 traction elevators.
1. Building Product Disclosure and Optimization, Environmental Product Declarations (EPD): Type III EPD.

2.2 PASSENGER ELEVATORS

- A. Elevators:
1. Type: Machine-room-less (MRL), gearless traction.
 2. Rated Load: 2500 lb.
 3. Rated Speed: 150 fpm.
 4. Stops: Two.
 5. Stretcher Capacity.
 6. Cab Finishes: Stainless steel walls and ceiling with resilient flooring.
 7. Door Panels: Stainless steel.
 8. Hoistway Entrances: Stainless steel.
 9. Finishes: Stainless steel, AISI No. 4 satin finish.
 10. Auxiliary Operations and Controls:
 - a. Key controlled car light switch and fan switch.
 - b. Alarm/emergency stop button.
 - c. Audible signals.
 - d. Automatic 2 way leveling.
 - e. Liner blanket hooks and blankets.
 - f. Emergency power operation.
 11. Car Enclosures: As follows:
 - a. Inside Width: As indicated on the Drawings.
 - b. Inside Depth: As indicated on the Drawings.

- c. Inside Height: As indicated on the Drawings.
 - d. Front Walls: Satin stainless steel with integral car door frames.
 - e. Car Fixtures: Satin stainless steel.
 - f. Side and Rear Wall Panels: Satin stainless steel.
 - g. Reveals: Satin stainless steel.
 - h. Door Faces (Interior): Satin stainless steel.
 - i. Door Sills: Aluminum.
 - j. Ceiling: Satin stainless steel, with LED downlights.
 - k. Handrails: Satin stainless steel, at side and rear walls.
 - l. Floor prepared to receive resilient flooring specified in Section 096510 - RESILIENT FLOORING AND ACCESSORIES.
12. Hoistway Entrances: As follows:
- a. Width: As indicated on the Drawings
 - b. Height: As indicated on the Drawings.
 - c. Type: As indicated on the Drawings.
 - d. Frames: Satin stainless steel.
 - e. Doors: Satin stainless steel.
 - f. Sills: Aluminum.
13. Hall Fixtures: Satin stainless steel.
14. Additional Requirements: As follows:
- a. Provide inspection certificate in each car, mounted under acrylic cover with satin stainless-steel frame.
 - b. Provide protective blanket hooks in all cars and two complete sets of full-height blankets.

2.3 SYSTEMS AND COMPONENTS

- A. General: Provide manufacturer's standard elevator systems. Where components are not otherwise indicated, provide standard components published by manufacturer as included in standard pre-engineered elevator systems and as required for complete system.
- B. Elevator Machines: Provide variable-voltage, variable-frequency, ac-type or variable-voltage, dc-type hoisting machines. Provide solid-state power converters.
 - 1. Provide regenerative or nonregenerative system.
 - 2. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
 - 3. Provide means for absorbing regenerated power when elevator system is operating on standby power.
 - 4. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system.
- C. Fluid for Oil Buffers: If oil buffers are used, use only fire-resistant hydraulic fluid containing antioxidant, anticorrosive, antifoaming, and metal-passivating additives.
 - 1. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to, "Hydro Safe (FR)" by Hydro Safe Oil Division, Inc.
- D. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work where installation of devices is specified in another Section.

- E. Machine Beams: Provide framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Division 05 Section "Metal Fabrications" for materials and fabrication.
- F. Car Frame and Platform: Welded steel units.
- G. Guides: Provide roller guides or polymer-coated, nonlubricated sliding guides at top and bottom of car and counterweight frames.

2.4 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system for each elevator as required to provide type of operation system indicated.
- B. Single-Car Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:
 - 1. Standby Power Operation: On activation of standby power, car is returned to a designated floor and parked with doors open. Car can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at main lobby. Manual operation causes automatic operation to cease.
 - 2. Nuisance Call Cancel: When car calls exceed a preset number while car load is less than a predetermined weight, all car calls are canceled. Preset number of calls and predetermined weight can be adjusted.
- C. Security Features: Provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.
 - 1. Card-Reader Operation: System uses card readers at car control stations to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers. Provide stripe-swipe card reader integral with each car control station.
 - 2. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitches at car control stations. Key is removable only in deactivated position.
 - 3. Car-to-Lobby Feature: Feature, activated by keyswitch at main lobby, that causes car to return immediately to lobby and open doors for inspection. On deactivation by keyswitch, calls registered before keyswitch activation are completed and normal operation is resumed.

2.5 DOOR REOPENING DEVICES

- A. Infrared Array: Provide door reopening devices with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more of the light beams shall cause doors to stop and reopen.

2.6 FINISH MATERIALS

- A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.

- C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.
- D. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, satin (No. 4) finish.
- E. Stainless-Steel Tubing: ASTM A 554, Grade MT 304, satin (No. 4) finish.
- F. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.
- G. Nickel Silver Extrusions: ASTM B 151/B 151M, Alloy UNS No. C74500 or No. C77600.

2.7 CAR ENCLOSURES

- A. General: Provide enameled-steel car enclosures to receive removable wall panels, with removable car roof, access doors, power door operators, and ventilation.
 - 1. Provide standard railings complying with ASME A17.1 on car tops where required by ASME A17.1.
 - 2. Provide finished car including materials and finishes specified below.
- B. Materials and Finishes: Provide manufacturer's standards, but not less than the following:
 - 1. Subfloor: Underlayment grade, exterior plywood, 5/8-inch nominal thickness.
 - 2. Fabricate car with recesses and cutouts for signal equipment.
 - 3. Fabricate car door frame integrally with front wall of car.
 - 4. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
 - 5. Sight Guards: Provide sight guards on car doors.
 - 6. Sills: Extruded nickel silver, with grooved surface, 1/4 inch thick.
 - 7. Handrails: Manufacturer's standard handrails meeting code requirements, of shape, metal, and finish indicated.

2.8 HOISTWAY ENTRANCES

- A. General: Provide manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Provide frame size and profile to coordinate with hoistway wall construction.
 - 1. Where gypsum board wall construction is indicated, provide self-supporting frames with reinforced head sections.
- B. Materials and Fabrication: Provide manufacturer's standards, but not less than the following:
 - 1. Stainless-Steel Frames: Formed from stainless-steel sheet.
 - 2. Sight Guards: Provide sight guards on doors matching door edges.
 - 3. Sills: Extruded metal, with grooved surface, 1/4 inch thick.
 - 4. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

2.9 SIGNAL EQUIPMENT

- A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with long-life incandescent lamps and acrylic or other permanent, nonyellowing translucent plastic diffusers or LEDs.

- B. Car Control Stations: Provide manufacturer's standard recessed car control stations. Mount in return panel adjacent to car door, unless otherwise indicated.
- C. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
- D. Firefighters' Two-Way Telephone Communication Service: Provide flush-mounted cabinet in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Division 26 - ELECTRICAL.
- E. Car Position Indicator: Provide illuminated, digital-type car position indicator, located above car door or above car control station. Also provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served.
 - 1. Include travel direction arrows if not provided in car control station.
- F. Hall Push-Button Stations: Provide one hall push-button station at each landing for each single elevator.
- G. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide the following:
 - 1. Manufacturer's standard wall-mounted units, for mounting above entrance frames.
- H. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
 - 1. At manufacturer's option, audible signals may be placed on each car.
- I. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Examine hoistways, hoistway openings, pits, and machine rooms as constructed; verify critical dimensions; and examine supporting structure and other conditions under which elevator work is to be installed.
 - 1. For the record, prepare a written report, endorsed by Installer, listing dimensional discrepancies and conditions detrimental to performance or indicating that dimensions and conditions were found to be satisfactory.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions.
- B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.
- C. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to minimize transmission of vibrations to structure and thereby minimize structure-borne noise from elevator system.
- D. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.
- E. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- F. Leveling Tolerance: 1/8 inch, up or down, regardless of load and direction of travel.
- G. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.
- H. Locate hall signal equipment for elevators as follows, unless otherwise indicated:
 - 1. Place hall lanterns either above or beside each hoistway entrance.
 - 2. Mount hall lanterns at a minimum of 72 inches above finished floor.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent) of elevators, perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.
- B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on elevators.

3.4 PROTECTION

- A. Temporary Use: Limit temporary use for construction purposes to one elevator. Comply with the following requirements for each elevator used for construction purposes:
 - 1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
 - 2. Provide strippable protective film on entrance and car doors and frames.
 - 3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
 - 4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
 - 5. Do not load elevators beyond their rated weight capacity.
 - 6. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as necessary for proper elevator operation at rated speed and capacity.

Provide parts and supplies same as those used in the manufacture and installation of original equipment.

7. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate elevator.
- B. Check operation of each elevator with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

END OF SECTION