
SECTION 14 21 00

ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide electric gearless traction type elevator system that requires no equipment room, including equipment and accessories as required for complete operational installation.
- B. Related Sections:
 - 1. Section 05 50 00: Metal fabrications such as elevator pit ladders, pit gratings, sill angle supports, elevator shaft screens, and metal fabrications sized on Architectural Drawings.
 - 2. Section 09 30 00: Tile for elevator cab floors.
 - 3. Division 22: Pit drainage.
 - 4. Division 26: Electrical power including main switch, breaker and lighting.

1.2 REFERENCES

- A. American National Standards Institute, ANSI A17.1: Safety Code for Elevators, Dumbwaiters and Escalators, and Moving Walks.
- B. ANSI C1/NFPA 70: National Electrical Code.
- C. ANSI A17.2: Practice for the Inspection of Elevators, Escalators and Moving Walks.
- D. American Welding Society, AWS D1.1: Structural Welding Code.
- E. California Code of Regulations Title 24, Part 7, Elevator Safety Regulations and Part 2 regulations for elevators accessible to persons with disabilities and ambulance gurney access.
- F. Americans with Disabilities Act (ADA) Standards.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Design/Build: Provide special elevator design and engineering to ensure compliance with applicable codes and Contract Documents.
- B. Coordination: Coordinate elevator work with other work to ensure full compliance with applicable codes and Contract Documents by work performed by others.
 - 1. Review construction documents to assure spaces and materials necessary for legal elevator service are being provided under other sections.

2. Ensure proper fused disconnect switches, hoistway, pits, lighting, communications, ventilation, and services are being provided under other sections.
 3. Inform Architect of discrepancies and omissions during bid period.
 4. Work of the section shall include furnishing items necessary for a complete operational elevator system and not provided elsewhere.
- C. Pre-Installation Meeting: Convene not less than one week prior to commencing work of this Section. Require attendance of those directly affecting work of this Section.
1. Review installation procedures and coordination required with related work.

1.4 SUBMITTALS

- A. Product Data: Submit descriptive brochures or detail drawings of landing buttons, hall fixtures, car position indicators, car operating panels, car interior and hoistway doors and frames for review.
1. Wiring Diagrams: Provide complete diagrams for elevator system.
- B. Shop Drawings: Indicate space requirements, general arrangement of elevator equipment, and material being supplied.
1. Show connections, attachments, reinforcing, anchorage and location of exposed fastenings, and location and loads and reactions to be carried on the building structure.
- C. Samples: Submit samples of finishes, operating and signal system fixtures, samples of each type of sign or graphics provided, and finish of hoistway entrances and doors.
- D. Design/Build Certificates: Submit certification signed by manufacturer indicating design/build compliance with Contract Documents and code requirements.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or firm approved by elevator manufacturer in writing and with minimum five years successful experience installing elevators similar to those required for Project.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver items and materials to site only after area in which they are to be installed is ready to receive them in their place of final installation.
- B. Store materials in storage area allotted.
- C. Fully protect movable and operating equipment from weather.

1.7 WARRANTY

- A. Component Warranties: Provide coincidental product warranties, where available, for major components of elevator work.

PART 2 - PRODUCTS

2.1 SYSTEMS MANUFACTURERS

- A. Otis Elevator Co./Gen 2.
- B. KONE Inc./MonoSpace System.
- C. ThyssenKrupp Elevators/Synergy System.
- D. Substitutions: Refer to Section 01 25 00.

2.2 MATERIALS

- A. System Description: Provide electric gearless traction type elevator system that requires no equipment room, including guide rails and brackets, hoisting cables and counterweights; pit buffers; and required hardware and fittings.
 - 1. Provide motors, controls, and wiring to main switch.
 - 2. Provide hoistway doors, frames, and sills.
 - 3. Provide passenger cars and car doors.
- B. Regulatory Requirements, General: Comply with applicable codes and regulations for elevator work and including to ANSI A17.1 Safety Code for Elevators, Dumbwaiters and Escalators, and Moving Walks.
 - 1. Earthquake Requirements: Provide as required by local and state regulations, but not less than following.
 - a. Guide rail assembly to withstand acceleration of 0.5 G.
 - b. Machine and generator restraints.
 - c. Snag guards on brackets.
 - d. Restraints top and bottom of counterweight frame.
 - e. Governor tension frame restraint.
 - f. Rope guards all sheaves.
 - g. 5-pin key switch on top exit, inside car.
 - h. Derailment device for each counterweight.
 - 2. Fire Emergency Service: Comply with requirements of applicable codes; provide required control circuits to meet code requirements.
 - 3. Medical Emergency Operation: Comply with California Building Code for providing medical emergency operation.
 - 4. Emergency Power Operation: Provide automatic switch to building emergency power system in case of standard power failure; type easily reset by building maintenance.
 - 5. Emergency Battery Power Operation: Provide as required by California Building Standards Code.

- C. Regulatory Requirements, Accessibility: Provide for assuring access for persons with disabilities in accordance with state and federal regulations.
 - 1. California Regulations: Comply with California Building Standards Code.
 - 2. Federal Regulations: Comply with Americans with Disabilities Act (ADA) Standards.
- D. Design Criteria:
 - 1. Elevator Characteristics: Special electric gearless traction elevator that does not require machine room for gearless traction device.
 - a. Net Capacity: 3500 lbs. each.
 - b. Speed: 200 fpm.
 - c. Stops: Openings in line
 - d. Entrance Opening Size: 3'-6" wide by 7'-0" high.
 - e. Door Operation: Single speed side opening, front and back of cab.
 - 2. Operation: Computerized duplex selective collective control with independent service as approved by Architect and designed for minimal waiting time for persons using elevators; provide complete acoustic isolation materials.
 - a. Machine: Gearless traction machine located in shaft.
 - b. Sound Isolation: For machine and generator or SCR.
 - c. Door Operation: High-speed direct current master operators.
 - d. Home Landing: Ground floor.
 - 3. Signal Equipment:
 - a. Car control station and in-car position indicator.
 - b. Hall push-button stations.
 - c. Lanterns and gongs.
 - d. Hall position indicator.
 - 4. Special Features:
 - a. Access for persons with disabilities.
 - b. Fire emergency service.
 - c. Medical emergency service.
 - d. Earthquake requirements.
 - e. Emergency power operation.
 - f. Elevator keyed security operation.
- E. Rolled Steel Sections, Shapes, and Rods: ANSI A17.1; ASTM A924 and A653, G90 galvanized coating.
- F. Sheet Steel: ASTM A653, G90 coating designation, stretcher leveled, commercial grade.
- G. Stainless Steel: ASTM A666, Type 304.

- H. Aluminum: ASTM B221; enameling or anodizing quality as applicable.
- I. Plywood: PS 1, fire retardant treated.
- J. Sills: Extruded aluminum.
- K. Plastic Laminate: NEMA LD-3, General Purpose type; color, texture, and pattern conforming to approved samples.

2.3 FABRICATION

- A. Machines and Equipment: Types specifically designed for traction elevator service without machine room, with equipment designed for minimal noise generation; with acoustical mounting for noise generating equipment.
- B. Guide Shoes: Roller guides for cars and counterweights.
- C. Elevator Car: Sheet steel enclosure with structural steel frame and bracing; 3/4" fire retardant treated plywood floor and wall cladding fastened with hidden mechanical fasteners.
- D. Doors: Power operated stainless steel hollow metal doors with track, rollers and frame; two-point suspension, nonmetallic sheaves; minimum 3" diameter for car doors, 2-1/2" diameter for hoistway doors.
 - 1. Finish: Stainless steel.
- E. Hoistway Entrances: Provide formed metal entrances with struts, hanger headers, fascia plates, toe guards, and Underwriters' Laboratory labels.
 - 1. Finish: Match doors.
 - 2. Floor Graphics: Provide 2" high (exact) raised characters, with Contracted Grade 2 Braille immediately left of numeral, on each side of each door frame; center at 60" above floor. Characters to be white on black background.
 - a. Provide medical emergency symbol at medical emergency elevator.
 - b. Provide star symbol at grade level in accordance with applicable codes.
 - c. Star symbol shall be raised, 2" diameter with points equal length.
 - 3. Entrance Protection: Provide infrared door detectors complying with applicable codes and regulations, including requirements for access for persons with disabilities.
- F. Car Finishes: Finishes as indicated.
 - 1. Front Wall Panels: Stainless steel with inset buttons, swing return panels.
 - 2. Side and Back Wall Panels: Removable plastic laminate panels with stainless steel trim, base, and reveals.
 - a. Color: As indicated, as directed by Architect not limited to manufacturer's standard plastic laminate finishes where not indicated; nonmetallic.

3. Flooring: Tile provided under Section 09 30 00 – Tiling.
 4. Ceiling: Removable stainless steel LED downlight type.
 5. Railings: Stainless steel tubular rail, both sides.
 6. Pads: Provide wall attachment buttons and protective pads.
- G. Operating Fixtures and Signals: Comply with requirements for providing access for persons with disabilities; comply with applicable codes and regulations; stainless steel face panels unless otherwise indicated.
1. Car Control Station: Provide two car stations, one adjacent to each entrance, with illuminated mechanical buttons, with hands free emergency communication not requiring voice communication, and service cabinet.
 - a. Provide door hold open buttons.
 2. Hall Call Station: Provide one hall station risers with illuminated mechanical hall buttons at each elevator lobby.
 3. In-Car Position Indicator: Provide car position indicator; provide indicator above elevator hoistway entrance or above control panel, as approved by Architect.
 4. Lobby Car Position Indicator: Provide car position indicator above elevator hoistway entrance at Main Floor lobby, as approved by Architect.
 5. Jamb Lanterns: Provide jamb-mounted lanterns with audible signal, one for up travel, two for down travel.
 6. Signs in Lobbies: 1/2" letters to read "IN CASE OF FIRE USE STAIRWAY FOR EXIT - DO NOT USE ELEVATOR"; sign to be approved by Architect and applicable authorities; stainless steel.
 - a. Provide elevator lobby graphics conforming to applicable code requirements.
- H. Miscellaneous Items: Provide as required by applicable codes and as follows.
1. Battery operated emergency car lighting.
 2. Two-speed fan.
 3. Convenience outlet in service cabinet.
- I. Special Features:
1. Elevator Keyed (Fob) Security Operation: Provide keyed buttons in car control stations allowing each floor to be individually locked out to prevent passenger from access to floor.

2.4 FINISHES**A. Nonexposed-to-View Surfaces:**

1. Structural and Nonexposed Ferrous Metal Surfaces: Clean surfaces of rust, oil or grease and prime with structural steel primer.
2. Field Welds: Remove oxidation, flux or residue, wire brush clean and apply two coats of primer.
3. Wood: One coat primer and two coats semi-gloss acrylic enamel.

B. Exposed-to-View Surfaces in Car and Hoistway Entrances:

1. Stainless Steel: Number 4 finish (satin directional polish).
2. Baked Enamel: Clean, degrease zinc-coated metal surface; one coat zinc oxide primer sprayed and baked; two coats semi-gloss enamel sprayed and baked; color as approved.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Examine work of other trades on which elevator work depends; report defects to Architect in writing which may affect elevator work or equipment operation.
- B. Ensure shafts and openings for moving equipment are plumb, level and in line, and that pit is to proper depth, waterproofed and drained, with necessary access doors, ladder and guards.
- C. Before fabrication, take necessary job site measurements and verify where work is governed by other trades; check measurement of space for equipment and means of access for installation and operation.
 1. Obtain dimensions from site for preparation of shop drawings.
- D. Ensure preparatory work has been properly completed to receive elevator work, such as the following.
 1. Electrical feeder wires to fused disconnect switches.
 2. Provisions of hoistway outlets and power are provided for car light and for light in pit.
 3. Furnishing of electric power for testing and adjusting equipment.
 4. Provision of hoistway outlet for telephone.
 5. Supply of power for emergency operation.
- E. Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports and bracing, including setting templates and diagrams for placement.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, applicable codes, and standards to provide a quiet, smoothly operating installation, free from sidesway, oscillation or vibration.
 - 1. Work shall be by mechanics skilled in this work and under direct control and supervision of elevator manufacturer's experienced supervisor.
- B. Set hoistway entrances in alignment with car openings and true with plumb sill lines.
- C. Mount machine in accordance with approved shop drawings; isolate and dampen machine vibration with properly sized sound-reducing anti-vibration pads.
- D. Erect hoistway sills, headers and frames prior to erection of rough walls and doors; erect fascias and toe guards after rough walls are finished.
- E. Grout sills and hoistway entrance frames.
- F. Make necessary adjustments of equipment to ensure elevator operates smoothly and accurately.
- G. Locate and protect or lock movable equipment and controls in such a way that they can be operated only by authorized persons.

3.3 FIELD QUALITY CONTROL

- A. Inspections and Permits: Obtain and pay for necessary inspections and permits and make such tests as are required by regulations and authorities.
 - 1. Final inspection shall be after elevator installation and hoisting enclosure are complete.
 - 2. Inspect installation in accordance with ANSI A17.2.
 - 3. Deliver test certificates and permits to Architect.

3.4 MAINTENANCE

- A. Elevator Maintenance Period: Maintain entire elevator installation 12 months after date of Substantial Completion of Work.
 - 1. Include systematic examination, adjustment and lubrication of elevator equipment.
 - a. Repair or replace worn electrical and mechanical parts of elevator equipment, using parts produced by manufacturer of equipment.
 - 2. Perform work without removing cars during peak traffic periods.
 - 3. Provide 24-hour emergency call-back service during maintenance period.

4. Ensure competent personnel handle maintenance service; maintain locally an adequate stock of parts for replacement or emergency purposes.
 - a. Have qualified personnel available at such places to ensure fulfillment of this service without unreasonable loss of time.
- B. Extended Maintenance Proposal: Submit proposal for maintenance of installed elevator work for a period of three years after termination of regular maintenance required at end of this section.
 1. Proposal shall include stipulated sum for time period stated, with premiums due annually.
 2. Extended maintenance proposal shall include requirements specified at end of section for first year maintenance agreement.

END OF SECTION