

SECTION 142100 - ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes electric traction passenger and service elevators consisting of one of the following two types:
 - 1. Machine Room Less (MRL) Elevators.
 - 2. Hole-less Hydraulic Elevators
- B. Related Sections include the following:
 - 1. Division 03 Section "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
 - 2. Division 04 Section "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
 - 3. Division 05 Section "Metal Fabrications" for the following:
 - a. Attachment plates and angle brackets for supporting guide-rail brackets.
 - a. Divider beams.
 - b. Hoist beams.
 - c. Structural-steel shapes for subsills.
 - d. Pit ladders.
 - e. Cants in hoistways made from steel sheet.
 - 4. Division 16 Section "Telephone and Data Raceway Systems" for telephone service for elevators.
 - 5. Division 16 Section "Fire Alarm and Detection System" for smoke detectors in elevator lobbies to initiate emergency recall operation and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation and for connection to elevator controllers.

1.3 DEFINITIONS

- A. Definitions in ASME A17.1-Safety Code for Elevators and Escalators-apply to work of this Section.

- B. Defective Elevator Work: Operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
- C. Passenger Elevator: An elevator that is to be used only for passenger transport and that conforms to Class A design requirements for "general freight loading."
- D. Service Elevator: A passenger elevator that is also used to carry freight that conforms to Class C3 design requirements.

1.4 SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for the following:
 - 1. Car enclosures and hoistway entrances.
 - 2. Operation, control, and signal systems.
- B. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, machine room 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.
- C. Samples for Verification: For exposed finishes of cars, hoistway doors and frames, and signal equipment; 3-inch- (75-mm-) square Samples of sheet materials; and 4-inch (100-mm) lengths of running trim members.
- D. 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.
- E. Qualification Data: For Installer.
- F. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in Division 01 Section "Demonstration and Training," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.
- G. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- H. Warranty: Special warranty specified in this Section.

- I. 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 as well elevator design requirements for earthquake loads in ASCE 7 per requirements of the IBC.
 - 1. Effective peak velocity acceleration (A_v) for Project's location is less than 0.10 (seismic risk zones 0 and 1).
 - 2. Provide earthquake equipment required by ASME A17.1.
 - 3. Project's seismic design category is 'II'.
 - 4. Elevator importance factor is 1.25.
- D. Machine-Room Less (MRL) Elevator Requirements: Comply with ASME A17.1S-2005 Supplement containing all pertinent safety elements related to issues involved with MRLs.
- E. Precaution to Limit Overloading: All elevators with capacities and load carrying requirements greater than Class A general freight loading shall be provided with a load weighing device which prevents overloading of the elevator.
- F. Accessibility Requirements: Comply with the stricter of either 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)" or 407 in ICC A117.1.
- G. 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, UBC Standard 7-2, or UL 10B.

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, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, 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 electric traction elevators including pit ladders, sumps, and floor drains in pits; entrance subsills; machine beams; and electrical service, electrical outlets, lights, and switches in pits and hoistways.

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. Perform maintenance, including emergency callback service, during normal working hours.
 - 2. Include 24-hour-per-day, 7-day-per-week emergency callback service.
 - a. Response Time: Two hours or less.
- B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard maintenance agreement offering options for one-year, two-year, or five-year service periods, 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Fujitec America, Inc.
 2. KONE Inc.
 3. Otis Elevator Co.
 4. Schindler Elevator Corp.
 5. ThyssenKrupp Elevator.
 6. Local or Regional Manufacturer offering Products of Equivalent Quality and Performance.

2.2 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 preengineered elevator systems and as required for complete system.
- B. Elevator Hoist Machines: Provide permanent-magnet, synchronous motors combined with variable-voltage, variable-frequency drives. Provide solid-state power converters.
1. Provide only regenerative variable speed drive 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. Car Frame and Platform: Welded steel units.
- F. Guides: Provide roller guides or polymer-coated, nonlubricated sliding guides at top and bottom of car and counterweight frames.

2.3 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system for each group of elevators as required to provide type of operation system indicated.
- B. Group Automatic Operation with Demand-Based Dispatching: Provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching program designed to minimize passenger waiting time. System automatically adjusts to changes in demand for different traffic conditions including heavy, heavy two-way, heavy outgoing, and light off-hours as variation of normal two-way traffic.
- C. Group Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators and elevator groups where indicated:
 - 1. Standby Power Operation: On activation of standby power, cars are returned, one at a time, to a designated floor and parked with doors open. If a car cannot be returned, it is removed from the system. When all cars have been returned or removed from the system, one car can be put in service on standby power by a selector switch in control panel located at main lobby. Coordinate with Division 16.
 - 2. Battery-Powered Lowering: If power fails, cars that are at a floor remain at that floor, open their doors, and shut down. Cars that are between floors are lowered one at a time to the next floor below, open their doors, and shut down. System includes rechargeable battery and automatic recharging system.
 - 3. Automatic Dispatching of Loaded Car: When car load exceeds 80 percent of rated capacity, doors will begin closing.
 - 4. Nuisance Call Cancel: When car calls exceed a preset number while the car load is less than a predetermined weight, all car calls are canceled. Preset number of calls and predetermined weight can be adjusted.
 - 5. Independent Service: Keyswitch in car control station removes car from group operation and allows it to respond only to car calls. Key cannot be removed from keyswitch when car is in independent service. When in independent service, doors close only in response to door close button.
 - 6. Loaded-Car Bypass: When car load exceeds 80 percent of rated capacity, car will respond only to car calls, not to hall calls.
 - 7. Distributed Parking: When cars are not required for response to calls, they are parked with doors closed, distributed in predetermined zones throughout the building. One zone shall include the main floor and adjacent floors; remaining floors shall be divided into approximately equal zones.

2.4 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.
- B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.5 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.
 - 1. Textured Stainless-Steel Sheet: Product with texture rolled into exposed surface.
 - a. Metal surface is satin polished after rolling.
- E. Stainless-Steel Bars: ASTM A 276, Type 304.
- F. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.
- G. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.
- H. Nickel Silver Extrusions: ASTM B 151/B 151M, Alloy UNS No. C74500 or No. C77600.
- I. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGS for flat applications and Type BKV for panel backing.

2.6 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 (16-mm) nominal thickness.
 - 2. Floor Finish: Level-loop nylon carpet; style, pattern, and color to be selected by Architect.
 - 3. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch (13-mm) fire-retardant-treated particleboard with plastic-laminate panel backing and manufacturer's standard protective edge trim. Panels have a flame-spread index of 25 or less, when tested according to ASTM E 84. Plastic-laminate color, texture, and pattern as selected by Architect.
 - 4. Fabricate car with recesses and cutouts for signal equipment.
 - 5. Fabricate car door frame integrally with front wall of car.

6. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
7. Sight Guards: Provide sight guards on car doors.
8. Sills: Extruded metal, with grooved surface, 1/4 inch (6.4 mm) thick.
9. Metal Ceiling: Flush panel, demarcated into nine equal panels, with fluorescent downlights in the center of each panel.
10. Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.

2.7 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.
- B. Materials and Fabrication: Provide manufacturer's standards, but not less than the following:
 1. Stainless-Steel Frames: Formed from stainless-steel sheet.
 2. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
 3. Sight Guards: Provide sight guards on doors matching door edges.
 4. Sills: Extruded nickel silver, with grooved surface, 1/4 inch (6.4 mm) thick.
 5. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

2.8 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 or semirecessed car control stations. Mount in return panel adjacent to car door, unless otherwise indicated.
- C. Swing-Return Car Control Stations: Provide car control stations mounted on rear of hinged return panel adjacent to car door and with buttons, switches, controls, and indicator lights projecting through return panel but substantially flush with face of return panel.
 1. Mark buttons and switches with standard identification for required use or function that complies with ASME A17.1. Use both tactile symbols and Braille.
 2. Provide "No Smoking" sign matching car control station, either integral with car control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.
- D. 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.

- E. 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 28 Section "Fire Detection and Alarm."
- F. 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.
- G. Hall Push-Button Stations: Provide hall push-button stations at each landing as indicated.
 - 1. Provide manufacturer's standard wall-mounted units.
 - 2. Provide units with flat faceplate for mounting with body of unit recessed in wall.
 - 3. Equip units with buttons for calling elevator and for indicating desired direction of travel.
- H. 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.
- I. 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.
- J. Standby Power Elevator Selector Switches: Provide switches, as required by ASME A17.1, where indicated. Adjacent to switches, provide illuminated signal that indicates when normal power supply has failed.
- K. 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.

2.9 ELEVATORS

A. Elevator Description:

1. Elevator Numbers: One and Two as shown on Drawings.
2. Passenger Elevator Number: Cab number One as shown on Drawings.
3. Service Elevator Number: Cab number Two as shown on Drawings.
4. Type: One of the following types of electric, geared traction elevators:
 - a. Machine-room Less (MRL).
 - b. Hole-less Hydraulic.
5. Number of Landings: Two.
6. Maximum Travel Distance: 14 feet 8 inches.
7. Machine Location:
 - a. MRL: Machines in Hoistway; closet for controllers to be configured out of adjacent mechanical equipment room indicated on plans.
 - b. Hole-less Hydraulic: Adjacent machine room indicated on plans.
8. Rated Load: 2500 lb (1135 kg) for Passenger Elevator Cab Number One; 4000 lb (1816 kg) for Passenger/Service Elevator Cab Number Two.
9. Freight Loading Class for Service Elevator(s): Class 3C.
10. Rated Speed: 125 fpm (0.64 m/s) to maximum of 150 fpm (0.76 m/s).
11. Operation System: Duplex automatic operation.
12. Auxiliary Operations:
 - a. Standby power operation.
 - b. Standby powered lowering.
 - c. Battery-powered lowering.
 - d. Automatic dispatching of loaded car.
 - e. Nuisance call cancel.
 - f. Independent service for service elevator.
 - g. Loaded-car bypass.
 - h. Distributed parking.
13. Car Enclosures:
 - a. Inside Dimensions: Manufacturer's standard for Class A passenger and Class 3C service elevator cabs.
 - b. Front Walls (Return Panels): Satin stainless steel, No. 4 finish.
 - c. Car Fixtures: Satin stainless steel, No. 4 finish.
 - d. Side and Rear Wall Panels: Plastic laminate.
 - e. Reveals: Satin stainless steel, No. 4 finish, horizontal subdividing side and rear wall panels into four sections.
 - f. Door Faces (Interior): Satin stainless steel, No. 4 finish.
 - g. Door Sills: Stainless Steel, satin finish.
 - h. Ceiling: Satin stainless steel, No. 4 finish.

- i. Handrails: 1-1/2 inches (38 mm) round, satin stainless steel, No. 4 finish at sides and rear of car.
 - j. Floor: Manufacturer's standard carpet.
 - k. Floor prepared to receive carpet (specified in Division 09 Section "Sheet Carpeting").
14. Hoistway Entrances: As follows:
- a. Width: 48 inches (1219 mm).
 - b. Height: 96 inches (2438 mm).
 - c. Type: Single-speed center opening.
 - d. Fire-Protection Rating: 1-1/2 hours with 30-minute temperature rise of 450 deg F (250 deg C).
 - e. Frames: Satin stainless steel, No. 4 finish.
 - f. Doors: Satin stainless steel, No. 4 finish.
 - g. Sills: Nickel-silver finish.
15. Hall Fixtures: Satin stainless steel, No. 4 finish.
16. Additional Requirements:
- a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.
 - b. Provide blanket hooks in car number Two complete with set of full-height protective blankets.

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 (3 mm), 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. For groups of elevators, locate hall push-button stations between two elevators at center of group or at location most convenient for approaching passengers.
 - 2. Place hall lanterns either above or beside each hoistway entrance.
 - 3. Mount hall lanterns at a minimum of 72 inches (1829 mm) 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. Operating Test: Load each elevator to rated capacity and operate continuously for 30 minutes over full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of elevator machine during 30-minute test period. Record failure to perform as required.
- C. 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 elevator number Two. Comply with the following requirements for 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, adjust, and maintain elevator(s). Refer to Division 01 Section "Demonstration and Training."
- 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.
- C. Check operation of each elevator with Owner's personnel present not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

END OF SECTION 142100