

SECTION 14240 - HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes hydraulic passenger and service elevators.
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork" for disposition of excavated material from cylinder well hole.
 - 2. Division 3 Section "Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
 - 3. Division 4 Section "Unit Masonry Assemblies" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
 - 4. Division 5 Section "Metal Fabrications" for the following:
 - a. Attachment plates and angle brackets for supporting guide-rail brackets.
 - b. Divider beams.
 - c. Hoist beams.
 - d. Structural-steel shapes for subsills.
 - e. Pit ladders.
 - 5. Division 5 Section "Ornamental Metal" for combination units that contain hall push-button stations.
 - 6. Division 9 Section "Carpet" for finish flooring in elevator cars.
 - 7. Division 9 painting Sections for field painting of hoistway entrance doors and frames.
 - 8. Division 13 Section "Fire Alarm" 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.
 - 9. Division 16 Sections for electrical service for elevators to and including fused disconnect switches at machine room door and standby power source, transfer switch, and connection from auxiliary contacts in transfer switch to controller.
 - 10. Division 16 Section "Voice and Data Communication Cabling" for telephone service to elevators.
- C. Cost for all rock or earth excavation for hydraulic elevators to be included in Base bid price.

1.3 DEFINITIONS

- A. Definitions in ASME A17.1 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. Service Elevator: A passenger elevator that is also used to carry freight.

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 Initial Selection: For finishes involving color selection.
- D. 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.
- 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 pump-and-tank units, plunger-cylinder assemblies, controllers, signal fixtures, door operators, car frames, cabs, and entrances, manufactured by a single manufacturer.

C. Regulatory Requirements: Comply with ASME A17.1.

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 407 in ICC A117.1.

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 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, 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. Furnish well casing and coordinate delivery with related excavation work.

C. Coordinate sequence of elevator installation with other work to avoid delaying the Work.

D. Coordinate locations and dimensions of other work relating to hydraulic 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. 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 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 products that may be incorporated into the Work include, but are not limited to, the following:
1. Fujitec America, Inc.
 2. KONE Inc.
 3. Otis Elevator Co.
 4. Schundler Elevator Corp.
 5. ThyssenKrupp Elevator.
- B. Basis of Design: Subject to compliance with requirements a product that may be incorporated into the work includes, but is not limited to:
1. Passenger Elevator: ThyssenKrupp - Seville 30, 3,000 lb capacity, 200 FPM.
 2. Service Elevator: Thyssen Krupp Continental 50, 5,000 lb capacity, 150 FPM.

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. Pump Units: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations. Provide either of the following:
1. Pump, with fan-cooled squirrel-cage induction motor, mounted on oil tank with vibration isolation mounts. Enclose pump in prime-painted steel enclosure lined with 1-inch- (25-mm-) thick, glass-fiber insulation board.
 2. Submersible pump, with submersible squirrel-cage induction motor, suspended inside oil tank from vibration isolation mounts.
 3. Provide motor with solid-state starting.
 4. Provide variable-voltage variable-frequency motor control.
- C. Hydraulic Silencers: Provide hydraulic silencer containing pulsation-absorbing material in a blowout-proof housing at pump unit.

- D. Piping: Provide size, type, and weight piping recommended by manufacturer, and provide flexible connectors to minimize sound and vibration transmissions from power unit.
 - 1. Provide dielectric couplings at cylinder units.
 - 2. Casing for Underground Piping: PVC pipe complying with ASTM D 1785, joined with PVC fittings complying with ASTM D 2466 and solvent cement complying with ASTM D 2564.
- E. Hydraulic Fluid: Manufacturer's standard hydraulic fluid.
- F. 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.
- G. Protective Cylinder Casing: PVC or HDPE pipe casing complying with ASME A17.1, of sufficient size to provide not less than 1-inch (25-mm) clearance from cylinder and extending above pit floor. Provide means to monitor casing effectiveness to comply with ASME A17.1.
- H. Car Frame and Platform: Welded steel units.
- I. Guides: Provide either roller guides or sliding guides at top and bottom of car and counterweight frames. If sliding guides are used, provide guide-rail lubricators or polymer-coated, nonlubricated guides.

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. Single-Car Service Elevator Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:
 - 1. Standby-Powered Lowering: Battery-Powered Lowering: If power fails and car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it is lowered to a preselected floor, opens its doors, and shuts down. If car is below the preselected floor, it is lowered to the next lower floor, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
 - 2. Battery-Powered Lowering: When power fails, car is lowered to the lowest floor, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
- 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-Powered Lowering: On activation of standby power, cars are lowered to the lowest floor, open their doors, and shut down.
 - 2. 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.

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 coined or embossed texture rolled into exposed surface.
 - a. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to:
 - 1) Service Elevator: Thysson Krup Continental 150; 5,000 lb capacity.
 - 2) Passenger Elevators: Thysson Krup Seville 30; 3,000 lb capacity.
- 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 or ASTM B 221M, Alloy 6063.

2.6 CAR ENCLOSURES

- A. General: Provide enameled steel to receive removable wall panels with nonremovable 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: Specified in a Division 9 Section.
 - 3. Stainless-Steel Wall Panels: Flush, hollow-metal construction; fabricated from stainless-steel sheet at passenger elevator. Flat stainless walls at service elevator.
 - 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 thick.
9. Metal Ceiling: Flush panels, with incandescent downlights in the center of each panel at passenger elevator. Metal with fluorescent strip at service elevator. Align ceiling panel joints with joints between wall panels.
10. Handrails: Brushed stainless steel 1-1/2" diameter at passenger elevator.

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.
 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. Stainless-Steel Doors and Transoms: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
 3. Sight Guards: Provide sight guards on doors matching door edges.
 4. Sills: Extruded metal, with grooved surface, 1/4 inch 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 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.
- 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. Hall Push-Button Stations: Provide one hall push-button station at each landing for each single elevator or group of elevators.
- F. Hall Push-Button Stations: Provide hall push-button stations at each landing-as indicated.
 - 1. Provide rectangular brushed stainless steel with black engraved letters reading "Use stair in case of fire" in font and style determined by Architect.
 - 2. Provide units with flat faceplate for mounting with body of unit recessed in wall.
 - 3. Include a LED read out at each hall call plate showing current floor location of elevator.
- G. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide the following:
 - 1. 4" diameter acrylic 3/4" thick with no face plate.
- 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. Hall position indicators: In each hall call button plate recessed in wall, provide digital display type cab position indicators that indicate which floor the elevator is on.

2.9 PASSENGER ELEVATORS

A. Passenger Elevator Description:

- 1. Type: Under-the-car single cylinder.
- 2. Rated Load: 3000 lb for passenger.
- 3. Rated Speed: 200 fpm.
- 4. Operation System: Single automatic or selective collective **automatic** operation.
- 5. Auxiliary Operations:
 - a. Standby-powered lowering.
 - b. Nuisance call cancel.
 - c. Independent service for service elevator or all cars in group.
 - d. Loaded-car bypass.
- 6. Car Enclosures:
 - a. Inside Width: 6'-8" from side wall to side wall.
 - b. Inside Depth: 4'-9" from back wall to front wall (return panels).
 - c. Inside Height: 96" to underside of ceiling and 108" to underside of cab.
 - d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish with integral car door frames.
 - e. Car Fixtures: Satin stainless steel, No. 4 finish.
 - f. Side and Rear Wall Panels: Rigidized Metals pattern 4 LB panels with stainless trim at sides and lapping face 1/2". Panels, horizontal applied, in manufacturer's standard configuration.
 - g. Reveals: Satin stainless steel, No. 4 finish.
 - h. Door Faces (Interior): Satin stainless steel, No. 4 finish.
 - i. Door Sills: Aluminum, mill finish.
 - j. Ceiling: 6 halogen downlights in stainless steel ceiling. Thyssen Krupp OPG or equal.

- k. Handrails: 1-1/2 inches round brush stainless steel.
 - l. Floor prepared to receive carpet (specified in Division 9 Section "Carpet").
7. Hoistway Entrances:
- a. Width: 42 inches.
 - b. Height: 96 inches.
 - c. Type: Two-speed center opening.
 - d. Fire-Protection Rating: 2 hour.
 - e. Frames: Satin stainless steel, No. 4 finish.
 - f. Frames at Other Floors: Satin stainless steel, No. 4 finish.
 - g. Doors and Transoms: Satin stainless steel, No. 4 finish.
 - h. Doors and Transoms at Other Floors: Satin stainless steel, No. 4 finish.
 - i. Sills: Aluminum, mill finish.
 - j. Sills at Other Floors: Aluminum, mill finish.
8. Hall Fixtures at all Floors: Satin stainless steel, No. 4 finish with plate engraved with lettering "In Case of Fire - Use Stair" and a LED read out of which floor cab is located on.
9. Additional Requirements:
- a. Provide blanket hooks in all cars and one complete set(s) of full-height protective blankets for each elevator.

2.10 SERVICE ELEVATORS

A. Service Elevator Description:

- 1. Type: Under-the-car single cylinder.
 - 2. Rated Load: 5,000 lb.
 - 3. Rated Speed: 150 fpm.
 - 4. Operation System: Single automatic operation.
 - 5. Auxiliary Operations:
 - a. Battery-powered lowering.
 - b. Nuisance call cancel.
 - c. Independent service for service elevator or all cars in group.
 - d. Loaded-car bypass.
6. Inside Width: 5'-8" from side wall to side wall.
- e. Inside Width: 6'-8" from side wall to side wall.
 - f. Inside Depth: 4'-9" from back wall to front wall (return panels).
 - g. Inside Height: 96" to underside of ceiling and 108" to underside of cab.
 - h. Front Walls (Return Panels): Satin stainless steel, No. 4 flat steel walls with integral car door frames.
 - i. Car Fixtures: Satin stainless steel, No. 4 finish.
 - j. Side and Rear Wall Panels: Flat brushed stainless steel walls (D5).
 - k. Reveals: Satin stainless steel, No. 4 finish.
 - l. Door Faces (Interior): Satin stainless steel, No. 4 finish.
 - m. Door Sills: Aluminum, mill finish.
 - n. Ceiling: Manufacturer's standard cove lights, brushed stainless.
 - o. Handrails: 6" x 1/4" stainless bar on three sides.
 - p. Floor: Brushed aluminum checker plate.

6. Hoistway Entrances:
 - a. Width: 48 inches.
 - b. Height: 96 inches.
 - c. Type: Two-speed side opening.
 - d. Fire-Protection Rating: 2 hour.
 - e. Frames: Satin stainless steel, No. 4 finish.
 - f. Frames at Other Floors: Satin stainless steel, No. 4 finish.
 - g. Doors and Transoms: Satin stainless steel, No. 4 finish.
 - h. Doors and Transoms at Other Floors: Satin stainless steel, No. 4 finish.
 - i. Sills: Aluminum, mill finish.
 - j. Sills at Other Floors: Aluminum, mill finish.
7. Hall Call Button Fixtures at all Floors: Satin stainless steel, No. 4 finish with a plate engraved with words "In Case of Fire – Use Stair" and a LED readout of floor location for cab.
8. Additional Requirements:
 - a. Provide blanket hooks in all cars and one complete set(s) of full-height protective blankets for each elevator.

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. 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. Excavation for Cylinder: Drill well hole in each elevator pit to accommodate installation of cylinder; comply with applicable requirements in Division 2 Section "Earthwork."
- B. Provide waterproof well casing as necessary to retain walls of well hole.
- C. Install cylinder in protective casing within well hole. Before installing protective casing, remove water and debris from well hole and provide permanent waterproof seal at bottom of well casing.
 1. Fill void space between protective casing and cylinder with corrosion protective filler.
 2. Align cylinders and fill space around protective casing with fine sand.
- D. Install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor. Seal between well protective casing and pit floor with 4 inches (100 mm) of nonshrink, nonmetallic grout.

- E. Install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor and braced at intervals as needed to maintain alignment. Anchor cylinder guides at spacing needed to maintain alignment and avoid overstressing guides.
- F. 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.
- G. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to effectively prevent transmission of vibrations to structure and thereby eliminate sources of structure-borne noise from elevator system.
- H. Install piping above the floor, where possible. Where not possible, install underground piping in Schedule 40 PVC pipe casing assembled with solvent-cemented fittings.
- I. Install piping above the floor, where possible. Where not possible, cover underground piping with permanent protective wrapping before backfilling.
- J. Lubricate operating parts of systems as recommended by manufacturers.
- K. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay installation of sills and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- L. Leveling Tolerance: 1/4 inch (6 mm), up or down, regardless of load and direction of travel.
- M. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.
- N. 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. 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 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 1 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 14240