

SECTION 142400

HYDRAULIC 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 one hydraulic passenger elevator.
- B. Related Sections include the following:
 - 1. Division 04 Section "Unit Masonry" for setting sleeves, inserts and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
 - 2. Division 5 Section "Metal Fabrications" for attachment plates and angle brackets for supporting guide-rail brackets, structural-steel shapes for sub-sills and pit ladders.
 - 3. Division 09 Section "Resilient Tile Flooring" for finish flooring in elevator cars.
 - 4. Division 26 Sections for electrical service for elevators to and including fused disconnect switches at machine room doors.
 - 5. Division 26 Section 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 and the RI Elevator Safety Code 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. Make Submittals in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for the car enclosures, hoistway entrances, operation, control and signal systems.
- C. Shop Drawings: Show plan, elevations, sections and large-scale details indicating service at each landing, devices, machine room layout, relationships with other construction and locations of equipment and signals. Include large-scale layout of car control station. 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-inches square. Samples of sheet materials and running trim; 4-inches long.
- E. Qualification Data: For Installer.
- F. 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.
- G. Operation and Maintenance Data: For elevator to include in emergency, operation and maintenance manuals.
 - 1. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and installer's maintenance personnel.
- 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 elevator 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 applicable provisions in ASME A17.1, ASME/ANSI A17.3 Safety Code for Elevators and Escalators, the State of Rhode Island Elevator Safety Code and the Rhode Island State Building Code, as amended.
 - 1. Seismic Risk Zone: Project is located in Zone 2 or greater.
- D. Accessibility Requirements: Comply with ADAAG regulations when in conflict with ICC/ANSI A117.1 and ANSI17.1. Where conflict exists between codes and standards, ADA shall take precedence.
- 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 mfg'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 hydraulic elevator including pit ladders, sump in the pit; entrance sub-sills; and electrical service, electrical outlets, lights and switches in pit and machine rooms.

1.8 WARRANTY

- A. Special Manufacturer's Warranty: Standard form in which manufacturer agrees to repair, restore and/or replace defective elevator work within 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. Response time shall be two hours or less.
- B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard five-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. Basis-of-Design Product: Model LVM2500T Telescopic Holeless Hydraulic Elevator by Otis Elevator Co. or a comparable product of one of the following:
 - 1. KONE Inc.
 - 2. Schindler Elevator Corp.

3. ThyssenKrupp Elevator

2.2 SYSTEMS AND COMPONENTS

- A. 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. Pump Units: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations. Provide the following:
 - 1. Submersible pump, with submersible squirrel-cage induction motor, suspended inside oil tank from vibration isolation mounts.
 - 2. Provide motor with solid-state starting.
- 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, with flexible connectors to minimize sound and vibration transmissions from power unit.
 - 1. 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: Elevator manufacturer's standard fluid with additives as needed to prevent oxidation of fluid, corrosion of cylinder and other components, and other adverse effects.
- 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 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, non-lubricated guides.

2.3 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system 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 the elevator:
 - 1. 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 pre-selected floor, opens its doors, and shuts down. If car is below the pre-selected floor, it is lowered

to the next lower floor, opens its doors and shuts down. System includes rechargeable battery and automatic recharging system.

- C. Security Features: Provide the following security features only on the first floor. Security features shall not affect emergency firefighters' service.
1. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitch at car control station. Key is removable only in deactivated position. Controls will automatically reset to the deactivated position after a set amount of time.
 2. Card-Reader Operation: System uses proximity card readers at hall push-button 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 proximity type card reader integral with each car control station.
 - a. Security access system equipment is specified in Division 28 Section "Access Control."

2.4 FIRE FIGHTER SERVICE

- A. Elevator shall be arranged to be recalled by a key switch in accordance with Rhode Island State Fire and Elevator Safety Codes.

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. 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.
- E. Stainless-Steel Bars: ASTM A 276, Type 304.
- F. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.
- G. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGS for flat applications and Type BKV for panel backing.

2.7 CAR ENCLOSURES

- A. Provide enameled-steel car enclosures to receive removable wall panels, with 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. Floor Finish: Specified in a Division 09 Section.
 - 3. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to manufacturer's standard honeycomb core with plastic-laminate panel backing and manufacturer's standard protective edge trim. Panels have a flame-spread index of 75 or less, when tested according to ASTM E 84. Plastic-laminate color, texture, and pattern as selected by Architect from plastic-laminate manufacturer's full range.
 - 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. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.
 - 10. Handrails: Manufacturer's standard handrails, of shape, metal and finish indicated.

2.8 HOISTWAY ENTRANCES

- A. Provide manufacturer's center opening, 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 with No. 4 Finish.
 - 2. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet or by laminating stainless-steel sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning.
 - 3. Sight Guards: Provide sight guards on doors matching door edges.
 - 4. Sills: Extruded metal, with grooved surface, 1/4 inch thick.
 - 5. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107.

2.9 SIGNAL EQUIPMENT

- A. 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, non-yellowing 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.

1. Mark buttons and switches with standard identification for required use or function that complies with the Rhode Island State Elevator Safety Code and ASME 17.1, as amended. 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.
- C. Emergency Communication System: Provide system that complies with the Rhode Island State Elevator Safety Code & ASME 17.1, as amended and ANSI 117.1, as amended. 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. 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.
- E. Hall Push-Button Stations: Provide hall push-button stations at each landing.
1. Provide units with flat faceplate for mounting with body of unit recessed in wall.
 2. Equip units with buttons for calling elevator and for indicating desired direction of travel.
 3. Product: Otis; Classic Hall Fixtures.
- F. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide the following:
1. Units with flat faceplate for mounting with body of unit recessed in wall and with illuminated elements projecting from faceplate for ease of angular viewing.
 2. Product: Otis; Classic Hall Fixtures.
- G. 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 car.
- H. Hall Position Indicators: Provide illuminated, digital-display-type position indicators, located above hoistway entrance at first floor. Provide units with flat faceplate for mounting and with body of unit recessed in wall.
1. Integrate ground-floor hall lanterns with hall position indicators.
- I. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations, with text and graphics as required by the RI State Elevator Code, as amended, authorities having jurisdiction, indicating that in case of fire elevator are out of service and exits should be used instead. Provide one sign at each hall push-button station, unless otherwise indicated.
- J. Proximity Card Readers: Provide one adjacent to each hoistway entrance door.

2.10 ELEVATOR

A. Elevator Description:

1. Type: Holeless, beside-the-car, hydraulic dual cylinder.
2. Rated Load: 2,500 lbs.
3. Rated Speed: 125 fpm.
4. Landings served: 3
5. Rise: +/- 18'-9" (Verify in field).
6. Operation System: Single automatic operation.
7. Auxiliary Operations: Battery-powered lowering; fire department key switch operation; proximity card reader and independent service.
8. Car Enclosure:
 - a. Inside Width: 80 inches from side wall to side wall.
 - b. Inside Depth: 51 inches from back wall to front wall (return panels).
 - c. Inside Height: 96 inches to underside of cab.
 - d. Front and Rear 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: Plastic laminate.
 - g. Reveals: Satin stainless steel, No. 4 Finish.
 - h. Door Faces (Interior): Satin stainless steel, No. 4 finish.
 - i. Door Sills: Extruded Aluminum.
 - j. Ceiling: Luminous ceiling.
 - k. Handrails: 1/2 by 2 inches rectangular satin stainless steel, No. 4 finish, at sides and rear of car.
 - l. Floor prepared to receive VCT specified in Division 09 Section.
9. Hoistway Entrances:
 - a. Size: 42 inches wide by 84 inches high.
 - b. Type: Two speed side opening.
 - c. Fire-Protection Rating: 1-1/2 hours with 30-minute temperature rise of 450 deg F.
 - d. Doors and Frames: Stainless Steel, No. 4 finish.
 - e. Sills: Extruded Aluminum.
10. Hall Fixtures: Satin stainless steel, No. 4 finish.
11. 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 and one complete 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. Verify critical dimensions and examine supporting structure and other conditions under which elevator work is to be installed.

- B. For the record, prepare a written report, endorsed by Installer, listing any discrepancies and conditions detrimental to performance or indicating that conditions were found to be satisfactory.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. 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.
- 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 effectively prevent transmission of vibrations to structure and thereby eliminate sources of structure-borne noise from elevator system.
- D. Install piping above the floor, where possible. Where not possible, install underground piping in Schedule 40 PVC pipe casing assembled with solvent-cemented fittings.
- E. Lubricate operating parts of systems as recommended by manufacturers.
- F. 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.
- G. Leveling Tolerance: 1/4 inch, up or down, regardless of load and direction of travel.
- H. Set sills flush with finished floor surface at landing. Fill space under sill solidly with non-shrink, non-metallic grout.
- I. Locate hall signal equipment for elevator as indicated on drawings or as directed by Architect.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent) of elevator, 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 elevator.

3.4 PROTECTION

- A. Temporary Use: 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 new finishes from damage.
 2. Provide other protective coverings, barriers, devices, signs and procedures as needed to protect elevator and elevator equipment.
 - a) Provide strippable protective film on entrance, car doors and frames.
 - b) Provide padded wood bumpers on entrance door frames which cover jambs and frame faces.
 3. Do not load elevator beyond their rated weight capacity.
 4. 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.
 5. 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.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate, adjust, and maintain elevator. Refer to Division 01 Section "Demonstration and Training."
- B. Check operation of 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 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 142400