

SECTION 14240
HYDRAULIC ELEVATOR

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

- A. The general provisions of the Contract, including General and Supplementary General Conditions, and Division 1 General Requirements, apply to work specified in this Section.

1.02 SUMMARY

- A. This Section includes furnishing and installing one standard pre-engineered hydraulic passenger elevator system. This Work is an Alternate; refer to Section 01230 for additional information.
- B. Pre existing conditions:
 - 1. The elevator pit and three floors of elevator hoistway are pre-existing.
 - 2. The jack hole and earth casing are pre-existing in the pit floor.
- C. Alternates: Work of this Section is an Alternate. Refer to Section 01230 for description of Alternates and administrative requirements applicable to Alternates.
- D. Related Work Specified in Other Sections:
 - 1. Section 05500, "Metal Fabrications" for the following:
 - a. Attachment plates and angle brackets for supporting guide-rail brackets.
 - b. Structural-steel shapes for subsills.
 - c. Elevator pit ladder.
 - 2. Porcelain tile flooring in elevator cab: Section 09310.
 - 3. Contacts at the elevator controller to initiate emergency recall operation and power shut down upon operation of the smoke and/or heat detectors in the elevator lobbies, elevator pit, top of shaft and machine room: Section 13850, "Existing Fire Alarm System Modifications."
 - 4. Telephone service to elevators: Division 16 Section.
 - 5. Electrical service for elevators to and including fused disconnect switches at machine room door: Division 16 Sections.

1.03 SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information.
- 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. 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 of exposed finishes of cars and doors, submit 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. Certification of Non-Restrictive Maintenance: Submit a letter signed by the elevator installer, certifying that no proprietary equipment or software which would be restrictive to maintenance firms will be incorporated into the elevator system, and that maintenance supplies will be made available to any maintenance firm engaged by the Owner in accordance with provisions of the Maintenance Service article in this section.
- F. Closeout Submittals:
 - 1. Maintenance Manuals: Include operation and maintenance instructions, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information. Include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel. Submit for Owner's information at Project closeout as specified in Division 1.
 - 2. As built wiring diagram: Submit 3 copies. In addition, furnish one framed copy of wiring schematic diagram, mounted in plastic glazed metal frame, for mounting on machine room wall.
 - 3. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
 - 4. Record of instruction of Owner's personnel.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or an experienced installer approved by elevator manufacturer who has completed elevator installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Regulatory Requirements: Comply with applicable provisions in ASME A17.1, "Safety Code for Elevators and Escalators," regulations of the State of Maine, and with other local governing regulations. Seismic Velocity Coefficient of Acceleration = 0.1
- C. Fire-Resistance Requirements: Comply with NFPA No. 80 for fire resistance of hoistway entrances. Provide entrance units identical to those tested by UL or other independent testing agency acceptable to the authorities having jurisdiction and bearing testing agency label.
- D. Accessibility Requirements: In addition to local governing regulations, comply with Section 4.10 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)."

1.05 COORDINATION

- A. Coordinate points of support of elevator guide rails with locations of existing and new building structure, and intermediate supports, as shown on the Architectural and Structural Drawings.
- B. Coordinate elevator work with locations and dimensions of other existing and proposed construction in hoistway, including pit ladders; sumps and floor drains in pits; entrance subsills; and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

1.06 WARRANTY

- A. Special Manufacturer's Warranty: Written warranty, signed by manufacturer agreeing to repair, restore, or replace defective elevator work within specified warranty period.
 - 1. Warranty Period: 12 months from the date of Substantial Completion of the entire Project, or from the date of certification by the state elevator inspector, whichever is later.
- B. The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

1.07 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance service by skilled employees of the 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 as used in the manufacture and installation of original equipment.
 - 1. Perform maintenance, including emergency callback service, during normal working hours, with response time of 2 hours or less.
 - 2. Submit monthly report describing inspection findings and maintenance services performed.
 - 3. Closeout: At completion of the 12 month initial maintenance period, perform a final inspection jointly with the Owner and the Owner's designated service representative.
- B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.
- C. Maintenance Supplies: Whether or not the Owner accepts the Elevator Contractor's proposal for continuing maintenance service, the Elevator Contractor shall make available for purchase by the Owner's elevator maintenance contractor, spare parts and tools which are available only through the contractor's organization or are not readily available through recognized suppliers, within a reasonable time and at a reasonable cost. A "reasonable time" shall mean five days for component parts and time frame prevailing in the industry for major components.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide hydraulic elevators by one of the following:
1. KONE Inc.
 2. Schindler Elevator Corp.
 3. Thyssen Elevator Group North America.
 4. Otis Elevator Co.
 5. Canton Elevator, Inc., Massillon, OH.

2.02 ELEVATOR SUMMARY

- A. Provide Elevator system which complies with the following service requirements:
1. Rated Load: 4500 lbs (2044 kg); plus additional load of tile flooring in car, 25 pounds per square foot.
 2. Rated Speed: 100 fpm (0.51 m/s).
 3. Total Rise: 66'-1"
 4. Total stops: 6 (front).
 5. Operating System: Selective collective automatic operation.
 6. Voltage Rating: 480 volt 3 phase, 3 wire.
 7. Existing Hoistway Dimension: 7'-7" wide by 9'-8" deep (verify in field).
 8. Existing Jack Hole: Extends 71'-0" below pit floor with steel earth casing, 19" diameter, plumbs out at 16" diameter.
 9. Car Dimensions:
 - a. Clear Inside Width: 5'-8"
 - b. Clear Inside Depth: 7'-11"
 - c. Clear Inside Height: 8'-0"
 10. Hoistway Entrances:
 - a. Width: 48 inches
 - b. Height: 84 inches
 - c. Type: Two-speed side sliding.

2.03 MATERIALS 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 a 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. Pump with fan-cooled squirrel-cage induction motor mounted on top of the oil tank with vibration isolation mounts. Enclose pump in painted steel enclosure lined with 1-inch thick glass-fiber insulation board.
 2. Provide motor with solid-state starting.
 3. Provide motor sized for proper performance, and not less than 50 HP.
- 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.
- E. 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 Specification Section.
- F. Cylinder: Provide cylinder fabricated with double-bottom safety bulkhead as required by the Elevator Code.
- G. Protective Cylinder Casings: PVC pipe casings 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.
- H. Guide Rails and Guide Shoes: Steel T-bar rails with channel-shaped roller type shoes; O (omega) shaped rails are not acceptable.
1. The elevator shaft will be steel stud/shaftwall construction, and will not be designed to support loads applied by the elevator system. Engineer and install guide rails to span from floor to floor without intermediate supports, and to transfer loads to building structure only at the perimeter edge angle on each level, as indicated on the Structural drawings.
- I. Car Frame and Platform: Welded steel units. Design and fabricate car frame and platform to accommodate weight and thickness of mortar-setting bed and tile, 2-inches overall thickness and weighing 25 pounds per square foot.
- J. Finish Materials: For exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated, provide stainless steel conforming to ASTM A 666, Type 304, with No. 4, directional satin finish.

2.04 OPERATING SYSTEMS

- A. Provide manufacturer's standard microprocessor operation system for "selective collective automatic operation" as defined in ASME A17.1. Provide control system which is non-proprietary and permits testing, trouble-shooting and adjustment without the use of external programming tools; provide built-in diagnostics with LED screen which indicates equipment status.

- B. Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated.
1. Battery-Powered Lowering: Provide a rechargeable battery and automatic recharging system which will provide power to the elevator if the power fails. If power fails, the car is lowered to the First Floor, opens its doors, and shuts down.
 2. Loaded-Car Bypass: When car load exceeds a predetermined weight, car will respond only to car calls, not to hall calls. Predetermined weight can be adjusted.
 3. Automatic Dispatching of Loaded Car: When car load exceeds a predetermined weight, doors will begin closing.
 4. Firefighter's Service, as required by the Elevator Code, including main floor keyed switch controlling Phase I, Emergency Recall Operation, and keyed switch inside each car controlling Phase II, Emergency In-Car Operation. Provide #3502 key cylinder as required by the State of Maine.
- C. Secured Landing Feature: Allow each landing above the lowest to be secured or cleared by a keyswitch. If landing is secured, car buttons for that landing do not register a call. This feature shall not affect emergency firefighter's service.

2.05 SIGNAL EQUIPMENT

- A. General: Provide signal equipment with hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled.
1. Fabricate face plates from stainless steel plate with satin finish.
 2. Fabricate lighted elements of acrylic or other permanent, non-yellowing translucent plastic.
- B. Car Control Stations: Provide fully recessed car control stations with applied metal faceplates. Mount in return panel adjacent to car door, if not otherwise indicated.
1. Include call buttons for each landing served and other buttons, switches, and controls required for specified car operation.
 2. Mark buttons and switches with manufacturer's standard identification for required use or function that complies with ASME A17.1.
 3. Mount controls at heights complying with the referenced accessibility requirements.
- C. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.

- D. Fire Department Communication System: Provide telephone jack in each car and required conductors in traveling cable for fire department communication system specified in Division 16 Sections.
- E. Car Position Indicator: Provide illuminated-signal type, digital-display type, or segmented type, located above car door or above car control station. Also provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served.
 - 1. Include travel direction arrows if not provided in car control station.
- F. Hall Push-Button Stations: Provide one hall push-button station at each landing.
 - 1. Provide units with flat faceplate for mounting with body of unit recessed in wall.
 - 2. Provide units with direction-indicating buttons; two buttons at intermediate landings; one button at terminal landings.
- G. Hall Lanterns: Provide units with illuminated arrows, but provide single arrow at terminal landings. With each lantern, provide audible signals indicating car arrival and direction of travel; signals sound once for up and twice for down.
 - 1. Place lanterns above each hoistway entrance. Mount at a minimum of 72 inches above finished floor.
- H. Hall Position Indicators: Provide illuminated-signal type or digital-display type, located above hoistway entrance at First Floor. Provide units with flat faceplate for mounting with body of unit recessed in wall.
 - 1. Integrate first floor hall lanterns with hall position indicators.
- I. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations with text and graphics according to ASME A17.1, Appendix H. Required signs include, but are not limited to, the following:
 - 1. Fire Emergency Sign re: Use of Stairways: Locate on wall over every hall button station.
 - 2. No Smoking Sign in elevator cab.

2.06 DOOR REOPENING DEVICES

- A. Infrared Array: Provide door reopening devices with a 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.
 - 1. Nudging Feature: After car doors are prevented from closing for a predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.07 PASSENGER ELEVATOR CAR ENCLOSURES

- A. General: Provide enameled-steel car enclosures with removable wall panels, suspended ceiling, trim, accessories, access doors, doors, power door operators, sills (thresholds), lighting, and ventilation.
1. Side and Back Walls: Vertical applied wood-core plastic laminate wall panels, three of equal size per wall. Laminate shall be simulated wood grain white maple. Reveals between panels, between panels and ceiling, and between panels and floor shall be of #4 brushed stainless steel. Bottom reveal shall be 4" minimum height to serve as toe-kick.
 2. Cab front: Full width wrap-around swing return extending to side wall without filler panel, in #4 brushed stainless steel.
 3. Fabricate car with recesses and cutouts for signal equipment.
 4. Fabricate car door frame integrally with front wall of car.
 5. Car Doors: Two-speed, side opening, fabricated from #4 brushed stainless steel; flush, hollow-metal construction.
 6. Sills: Extruded aluminum, with grooved surface, 1/4 inch (6.4 mm) thick.
 7. Ceiling and Lighting: Baked enamel car top with #4 brushed stainless steel light covers mounted on both sides to conceal fluorescent cove lights.
 8. Handrails: Manufacturer's standard 1-1/2" diameter ADA compliant handrails, of brushed or satin stainless steel
 9. Subfloor: Manufacturer's standard water-resistant plywood subfloor; to receive porcelain tile flooring specified in Section 09310. Tile flooring will be 2-inches in overall thickness (setting bed and tile); see "Elevator Summary" for weight.
 10. Signage: All signage inside cab shall be engraved directly onto the cab front.
 11. Miscellaneous Accessories:
 - a. Provide protection pads and stainless steel pad buttons for all sides.
 - b. Provide inspection certificate in each car, mounted under acrylic cover with satin stainless steel frame.

2.08 PASSENGER HOISTWAY ENTRANCES

- A. General: Provide 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. Provide self-supporting frames with reinforced head sections for gypsum board wall construction.
- B. Materials and Fabrication: Provide manufacturer's standards but not less than the following:

1. Frames: Formed #4 brushed stainless-steel sheet.
2. Doors: Flush, hollow-metal construction, fabricated from #4 brushed stainless steel.
3. Sills: Extruded aluminum, with grooved surface, 1/4 inch (6.4 mm) thick.
4. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

PART 3 - EXECUTION

3.01 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. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Existing Jack Hole: Existing well (earth) casing extends 2' -6" above pit floor and is filled with ground water. Remove water and cut off earth casing flush with concrete floor. Confirm existence and integrity of water collar between pit floor and casing.
- B. Install cylinders in protective casings within well casing. Before installing protective casing, remove water and debris from well casing and provide permanent waterproof seal at bottom of well casing.
 1. Align cylinders and leave space between well casing and protective casing empty as required by local authorities. Install required monitoring equipment.
 2. Install water collar between existing well casing and protective casing.
- C. Install cylinders plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor.
- D. 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.
- E. 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.
- F. Install piping above the floor; underground piping will not be acceptable.
- G. Lubricate operating parts of systems as recommended by manufacturers.
- H. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay installation of sills

and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.

- I. Leveling Tolerance: 1/4 inch (6 mm), up or down, regardless of load and direction of travel.
- J. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

3.03 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.

3.04 DEMONSTRATION

- A. Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of operational failure and other building emergencies. Train Owner's personnel in procedures to follow in identifying sources of operational failures or malfunctions. Confer with Owner on requirements for a complete elevator maintenance program.
- B. Make a final check of each elevator operation with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

3.05 PROTECTION

- A. Temporary Use: Do not use elevators for construction purposes unless cars are provided with temporary enclosures, either within finished cars or in place of finished cars, to protect finishes from damage.
 - 1. Provide full maintenance service by skilled, competent employees of elevator Installer for elevators used for construction purposes. Include 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. Use same parts and supplies as used in the manufacture and installation of original equipment.
 - 2. Provide protective coverings, barriers, devices, signs, and other procedures to protect elevators. If, despite such protection, elevators become damaged, engage elevator installer to restore damaged work so that no evidence remains of correction work. 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.

END OF SECTION 14240