

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 elevators.
- B. Related Sections include the following:
 - 1. Division 3 Section "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
 - 2. Division 4 Section "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry hoistway.
 - 3. Division 5 Section "Metal Fabrications" for the following:
 - a. Attachment plates and angle brackets for supporting guide-rail brackets.
 - b. Overhead hoisting beam.
 - c. Structural-steel shapes for subsills and entrance frames.
 - d. Pit ladders.
 - 4. Division 9 Section "Resilient tile" for finish flooring in elevator cars.
 - 5. 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.
 - 6. Division 16 Section "Premises Telephone Wiring" for telephone service to elevators.
 - 7. 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.

1.3 DEFINITIONS

- A. Defective Elevator Work: Operation or control system failures; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; the need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.4 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 exposed finishes of cars, hoistway doors and frames, and signal equipment; 3-inch-square samples of sheet materials; and 4-inch 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, including emergency generator, as shown and specified, are adequate for elevator system being provided.

- E. 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.
- F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

1.5 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: In addition to local governing regulations, comply with applicable provisions in ASME A17.1, "Safety Code for Elevators and Escalators."
 - 1. Seismic Risk Zone: Project is located in Zone 0 or 1.
- C. 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. Elevator car shall be capable of physically receiving a standard stretcher/gurney for emergency medical transport.
- D. Single Source for Primary Components: Elevator shall be supplied as a complete and coordinated package of components and parts, fabricated and supplied from a single source to the greatest extent possible. Primary components obtained from multiple sources is unacceptable.

1.6 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 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.

1.7 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 date of Substantial Completion.

1.8 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 new parts and supplies when required, as used in the manufacture and installation of original equipment. Exclusion of repair or replacement only due to misuse, abuse, accidents or neglect caused by persons other than Installer's personnel will be acceptable.
 - 1. Perform maintenance during normal working hours.

2. Emergency callback service shall be provided 24 hours-per-day, 7 days-per-week, with a maximum response time of 6 hours from time of service call for any emergency callback .
- 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering hydraulic elevators that may be incorporated into the Work include, but are not limited to, the following:
 1. ThyssenKrupp Elevator Systems.
 2. Montgomery KONE Inc.
 3. Otis Elevator Co.
 4. Canton Elevator Company.

2.2 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. Submersible pump, with submersible squirrel-cage induction motor, suspended inside tank from vibration isolation mounts.
- 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. Car Frame and Platform: Welded steel units.
- G. Ventilation Fan: Provide elevator car ventilation in form of manufacturer's standard, ceiling mounted, two-speed exhaust fan.
- H. Finish Materials: Provide the following materials and finishes for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated:
 1. Satin Stainless Steel: ASTM A666, Type 304, with No. 4, directional satin finish.
 2. Enameled-Steel Sheet: Cold-rolled steel sheet complying with ASTM A366/A366M, matte finish, stretcher-leveled standard of flatness; hot-rolled steel sheet complying with ASTM A569/A569M may be used for door frames. Provide with factory-applied enamel finish; colors as selected by Designer.
 3. Plastic Laminate: High-pressure type complying with NEMALD3, Type HGP for postformed applications and Type HGS for flat applications; color, texture, and

pattern as selected by Designer from plastic-laminate manufacturer's full range of products.

- I. Certificate Frame: Standard stainless steel frame mounted to front wall of car with concealed fasteners.
- J. Protective Pads: Provide complete set of standard quilted fabric wall protection pads for interior of car and necessary stainless steel pad support buttons mounted to car walls.

2.3 OPERATION SYSTEMS

- A. Passenger Elevators: Provide manufacturer's standard microprocessor operation system for elevator to provide type of operation system indicated.
 - 1. Single Elevator: Provide "selective collective automatic operation" as defined in ASMEA17.1. Controller for elevator shall be non-proprietary with respect to maintenance, adjustment and repair requirements of service provider.
- B. Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated.
 - 1. Battery-Powered Lowering: When power fails, cars are lowered to the lowest floor, open their doors, and shut down. System includes rechargeable battery and automatic recharging system.
- C. Security Features: In addition to above operational features, provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.
 - 1. Keyswitch Feature: Car and hall push buttons are activated and deactivated by security keyswitches. Key is removable only in deactivated position.

2.4 SIGNAL EQUIPMENT

- A. General: Provide signal equipment for each elevator or group of elevators with hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements of acrylic or other permanent, nonyellowing 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.
- C. Emergency Communication System: Provide system that complies with ASMEA17.1 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: For passenger elevator cars, 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 hall push-button stations at each landing for each elevator or group of elevators as indicated.

1. 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.
 1. Place lanterns either above or beside each hoistway entrance, unless otherwise indicated. Mount at a minimum of 72 inches above finished floor.
 2. With each lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
 - a. At manufacturer's option, audible signals may be placed on each car.
 - H. Hall Position Indicators: Provide illuminated-signal type or digital-display type, located above each hoistway entrance at ground floor. Provide units with flat faceplate for mounting with body of unit recessed in wall.
 1. Integrate ground-floor hall lanterns with hall position indicators.
- 2.5 DOOR REOPENING DEVICES
- A. Door Edge Device: Provide retractable edge shoes on elevator entrance doors that cause doors to stop and reopen upon contacting an obstruction. Include photoelectric device full height of door with timed cutout that projects a light beam across car entrance; the beam, when interrupted, causes 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.
- 2.6 PASSENGER ELEVATOR CAR ENCLOSURES
- A. General: Provide manufacturer's standard enameled-steel car enclosures with removable wall panels suspended ceiling, trim, accessories, access doors, doors, power door operators, sills (thresholds), lighting, and ventilation.
 1. Floor finish is specified in Division 9 Section "Resilient Tile Flooring".
 2. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch fire-retardant-treated particleboard with plastic-laminate panel backing complying with NEMALD3, TypeBKV and manufacturer's standard protective edge trim. Panels have a flame-spread rating of 25 or less, when tested according to ASTM E84.
 3. Fabricate car with recesses and cutouts for signal equipment.
 4. Fabricate car door frame integrally with front wall of car.
 5. Plastic-Laminate Doors: Flush, hollow-metal construction.
 6. Sills: Extruded metal, with grooved surface, 1/4 inch thick. Provide mill polished finish.
 7. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic complying with flammability requirements.
 8. Handrails: Manufacturer's standard cylindrical or tubular handrails, of metal indicated.
- 2.7 PASSENGER ELEVATORS
- A. Elevator (single):
 1. Type: Under-the-car single cylinder.
 2. Rated Load: 2500 lb.
 3. Rated Speed: 125 fpm with capacity load.
 4. Operation System: Selective collective automatic operation.
 5. Auxiliary Operations:

- a. Battery-powered lowering.
6. Security Features: Keyswitch feature.
7. Car Enclosures: As follows:
 - a. Inside Width: 80 inches minimum.
 - b. Inside Depth: 51 inches minimum.
 - c. Inside Height: 94 inches or as standard for manufacturer.
 - d. Front Walls: Enameled steel with integral car door frames.
 - e. Car Fixtures: Satin stainless steel.
 - f. Side and Rear Wall Panels: Plastic laminate.
 - g. Reveals: Enameled steel.
 - h. Door Faces (Interior): Satin stainless steel.
 - i. Door Sills: Mill finish extruded aluminum.
 - j. Ceiling: Luminous ceiling.
 - k. Handrails: Satin stainless steel, at rear walls only.
 - l. Floor prepared to receive resilient tile (specified in Division 9 Section "Resilient Tile Flooring").
8. Hoistway Entrances: As follows:
 - a. Width: 42 inches clear.
 - b. Height: 84 inches.
 - c. Type: Single-speed side sliding.
 - d. Frames : Satin stainless steel.
 - e. Sills: Mill finish extruded aluminum.
9. Hall Fixtures: Satin stainless steel.
10. Travel: Approximately 22'-0".
11. Openings and Stops: All front openings, 3 stops.

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. Proceed with installation only after unsatisfactory conditions have been corrected.
 1. For the record, prepare a written report, endorsed by Installer, listing dimensional discrepancies and conditions detrimental to performance.

3.2 INSTALLATION

- A. Excavation for and Installation of Jack: Drill jack cylinder hole to accommodate installation of plunger-cylinder unit in elevator pit, or if drilled prior to construction of pit, in precisely laid out and located position as indicated on approved shop drawings. Comply with Division 2 - Excavation Sections.
 1. Install casing containing cylinders, with waterproof high-pressure seals at pit floor, plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor.
 2. Fill bond-out between well casing and pit floor with 4 inch thick slab of nonshrink, nonmetallic grout or material as recommended by elevator manufacturer.
- 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-cement 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 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.
 - 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 nonshrink, nonmetallic grout.
- 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, Designer, and authorities having jurisdiction in advance of dates and times tests are to be performed on elevators.
- 3.4 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.
- 3.5 PROTECTION
- A. Temporary Use: Do not use elevator for construction purposes unless car is provided with temporary enclosures, either within finished car or in place of finished car, 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