

DIVISION 14

Conveying Systems



SECTION 14245 - HYDRAULIC PASSENGER ELEVATORS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract from the front of the Specification book, including General Conditions and Supplementary General Conditions, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Elevator and related equipment.
 - 2. As part of elevator work include 16 hours of elevator operation time to accommodate work of other trades related to the elevator and its hoistway.
- B. Elevator machinery.
 - 1. Elevator machinery.
 - 2. Control system and signal equipment.
 - 3. Elevator car finishes.
 - 4. Hoistway entrances.
 - 5. Guides and safety equipment.
 - 6. Testing and inspection of elevator systems.
 - 7. Maintenance service.
 - 8. Pit ladders.
- C. Related Sections:
 - 1. Concrete work, including setting of inserts: Division 3.
 - 2. Grout solid hoistway door frames in masonry walls: Division 4.
 - 3. Rough sills at hoistway entrances: Division 5.
 - 4. Fully fill hoistway door frames with drywall in framed walls: Division 9.
 - 5. Heating, ventilating, and cooling of machine rooms: Division 15.
 - 6. Electrical power to machine room: Division 16.
 - 7. Telephone service or intercom connection to hoistway for each car: Division 16.
 - 8. Fire alarm system: Division 16.

1.3 REFERENCES

- A. ANSI A117.1-1986 -- American National Standard for Buildings and Facilities - Providing Accessibility and Usability for Physically Handicapped People; 1986.
- B. ASME A17.1b-2000 -- Safety Code for Elevators and Escalators; The American Society of Mechanical Engineers.
- C. ASTM A 366/A 366M-91 -- Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality; 1991.
- D. NEMA LD 3-1991 -- High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 1991.
- E. NFPA 70 -- National Electrical Code; National Fire Protection Association; 1993.
- F. NFPA 80 -- Standard for Fire Doors and Windows; National Fire Protection Association; 1992 (with Errata dated October 6, 1992).

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's published data for each principal component or product, including but not limited to the following:
 - 1. Signal and operating fixtures, panels, and indicators.
 - 2. Car construction and finishes.
 - 3. Doors and frames.
 - 4. Control equipment.
- B. Shop Drawings: Incorporate the information necessary for proper fabrication and installation of the elevator system, including but not limited to the following:
 - 1. Location of machines and control components; include required clearances for access and service.
 - 2. Location, size, and required clearances for hoistway components including car, guide rails, traveling cables, and buffers.
 - 3. Rail bracket spacing, and maximum loads on guide rails.
 - 4. Reactions at points of support.
 - 5. Location of electrical and communication service connections, with indication of limits of elevator installer's work.
 - 6. Description of controls and operational features.
 - 7. Average and peak hourly heat dissipation requirements for elevator equipment in machine room.

- C. Samples:
 - 1. Car finishes: 6- to 8-inch-square samples of sheet materials and 10- to 12-inch-long samples of linear materials to be exposed in finished car.
 - 2. Hoistway doors and frames: 6- to 8-inch-square samples of exposed materials.
 - 3. Car doors: 6- to 8-inch-square samples of exposed materials.
 - 4. Signal fixtures: Samples of exposed materials or actual fixtures.
 - a. Approved sample fixtures may be incorporated into the work.
- D. Maintenance Manuals: Include operating instructions, maintenance data, list of parts, recommended parts inventory, purchase sources for parts, emergency procedures, and similar data.
- E. Permits and Certificates: Secure and deliver to owner those permits and certificates required by governing authorities to allow normal operation of each elevator.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Safety code: Comply with requirements of ASME A17.1, and with any more stringent requirements of governing authorities.
 - 2. NFPA: Comply with all applicable NFPA codes and standards.
 - 3. Handicapped accessibility: Comply with the requirements of ANSI A117.1.
 - 4. Fire resistance: Comply with provisions of NFPA 80 for hoistway entrances. Provide doors and frames bearing labels of agency acceptable to governing authority, and including 30-minute temperature rise rating.
 - 5. Americans with Disabilities Act or Code for the disabled of the state that the project is located.
 - 6. Elevator Code of the state that the project is located.
- B. Manufacturer Qualifications: Minimum of 10 years' successful experience in the design, fabrication, and installation of elevator systems comparable in size and nature to that required for this project.
- C. Installer: The elevator manufacturer or an installer approved by the manufacturer who has not less than 5 years' experience in the installation of comparable elevator systems.

1.6 WARRANTY

- A. Elevator System Warranty: Submit a written warranty, signed by the contractor and the installer, guaranteeing to correct failures in elevator system which occur within warranty period, without reducing or otherwise limiting any other rights to correction which the owner may have under the contract documents.
 - 1. Failures are defined to include faulty workmanship, excessive wear, operation system or control system failures, sub-standard performance, excessive noise or vibration, and similar unsafe or unsatisfactory conditions.
 - 2. Damage or failures due to abuse, misuse, vandalism, accidents, or neglect caused by persons other than the installer's personnel may be excluded from the warranty.
 - 3. Warranty period is 12 months from date of substantial completion of the project or written acceptance of the completed elevator..

1.7 MAINTENANCE

- A. Full Maintenance Service: Provide complete maintenance service by installer, including standard monthly preventive maintenance. Repair or replace worn equipment, and include normal lubrication, cleaning, and adjustment as recommended by manufacturer of elevator system components.
 - 1. Include complete emergency service, on an around-the-clock basis every day.
 - 2. Initial maintenance period is 12 months, starting on date of substantial completion or written acceptance of the completed elevator.
- B. Maintenance Service Proposal: Submit proposal to provide continuing service for each elevator as specified above for a period of 24 months following expiration of initial maintenance period. This quote to be presented to the Owner along with the total project costs.

PART 2 - PRODUCTS

2.1 ELEVATOR SCHEDULE

- A. Elevator Type. See drawings for number and locations. Items below apply to each elevator shown:
 - 1. Type: Passenger, In Ground Direct Plunger.
 - 2. Rated capacity: 3500 pounds.
 - 3. Rated speed: 125 feet per minute.

4. Travel distances: See Drawings.
5. Landings served: See Drawings.
6. Machine: Hydraulic.
7. Operation control system: Selective collective.
8. Signal equipment:
 - a. Number of hall call stations: One at each floor.
 - b. Hall position indicators: Provide digital display type at main floor.
 - c. Style of hall call stations: Manufacturer's standard with stainless steel faceplates.
 - d. Hall lanterns: Manufacturer's standard design.
 - e. Car control panels:
 - (1) Provide one per car.
 - (2) Style: Manufacturer's standard.
 - f. Car position indicator: Digital display, mounted in each car control panel.
9. Car enclosure:
 - a. Wall finishes: Plastic Laminate.
 - b. Floor finishes: VCT from common areas
 - c. Ventilating fan: Single speed.
10. Car doors: Hollow metal.
 - a. Finish: No. 4 brushed stainless steel.
11. Hoistway entrances:
 - a. Type: Side opening, single speed.
 - b. Size: Manufacturer's standard.
 - c. Finish - typical all floors: Baked enamel.
12. Accessories:
 - a. Provide pad hooks in each car.
 - b. Provide protective pads.
 - c. Provide inspection certificate frame.
 - d. Provide telephone handset cabinet.
 - e. Provide auto dialer telephone, coordinate with fire department requirements.
 - f. If the project is located in Massachusetts the Massachusetts Medical Emergency Provisions shall be provided.
 - g. Seismic Zone (2) Requirements shall be provided.
 - h. Provide Battery operated emergency power lowering device.
 - i. Provide independent service.
 - j. Provide elevator pit ladder.
 - k. Provide water tight plunger collar.
 - l. If building is located in a flood plane provide flood resistant material and components up to the flood plane level.
 - m. If building is located in a flood plane provide a flood control device, at the bottom level, that in the event of flooding it will return the elevator cab to floor level above flood plane.

- n. Provide additional requirements as may be required by the state in which the project is located.
13. Provide non proprietary components so that 3 or more elevator maintenance contractors will be able to maintain the elevator.

2.2 MANUFACTURER

- A. Elevator Systems:
 1. Manufacturer - elevator system: Provide products complying with requirements of the contract documents and made by one of the following:
 - a. ThyssenKrupp Elevator.
 - b. Otis Elevator Company.
 2. Manufacturer - passenger elevator cars: Provide products complying with requirements of the contract documents and made by one of the following:
 - a. Manufacturer of elevator system.

2.3 ELEVATOR MACHINES AND EQUIPMENT

- A. Hydraulic Machines:
 1. Pump: Positive displacement; 10 percent maximum allowable output variation between no load and full load output volume.
 2. Motor/pump coupling: Direct; submersible pump unit.
 3. Motor: Single speed ac.
 - a. Motor starting: Solid State.
 4. Provide acoustical spring isolators between pump and motor unit and building structure.
 5. Oil control unit: Mount the following items to provide access for adjustment without disconnecting oil lines:
 - a. Relief valve.
 - b. Up start and stop valve.
 - c. Check valve.
 - d. Lowering valve.
 - e. Leveling valve.
- B. Provide rails, brackets, and anchorage devices sized to resist loads and safety factors stipulated by the elevator code.
- C. Buffers: Provide buffers designed to accommodate elevators of speed and capacity indicated.

2.4 HOISTWAY ENTRANCES

- A. Hollow Steel Doors: Flush-welded, hollow-metal construction, fabricated from ASTM A 366 cold-rolled, commercial quality, stretcher-leveled steel sheet.
 - 1. Baked enamel finish: Factory-applied, baked synthetic enamel over rust-inhibiting primer.
 - 2. Color: Selected by the architect from manufacturer's standard selection.
- B. Door Frames: Bolted hollow metal; finish to match doors.
- C. Threshold: Extruded aluminum; mill finish.

2.5 ELEVATOR CARS

- A. Frame: Fabricated from structural steel shapes, braced, and mounted with resilient isolators.
- B. Doors: Flush-welded hollow-metal construction, fabricated from ASTM A 366 cold-rolled, commercial quality, stretcher-leveled steel sheet.
 - 1. No. 4 brushed stainless steel finish.
- C. Door Operating Equipment:
 - 1. Operator: Heavy duty dc motor.
 - 2. Door guides and track: Polyurethane wheels with ball-bearing or roller-bearing hubs in adjustable formed steel track.
 - 3. Door edge protection: Leading edge equipped with retractable rubber bumper which causes door to reopen upon contact with obstruction.
 - 4. Door protective and reopening device: Comply with the requirements of ANSI A117.1.
 - a. Type: Photocell.
- D. Door Frames: Manufacturer's standard design; finish to match car doors.
- E. Threshold: Match typical floor hoistway entrance threshold.
- F. Lighting: Fluorescent.
- G. Ceiling:
 - 1. Translucent polycarbonate panels mounted in a black metal frame.

- H. Walls:
 - 1. Finish:
 - a. Flush Wood Core Walls faced in Plastic laminate.
- I. Floor:
 - 1. Rough floor: Provide 1 layers of 5/8-inch-thick, fire-retardant treated plywood underlayment, recessed below top of threshold to accommodate indicated floor finish.
 - 2. Floor finish: Resilient tile flooring.
 - a. Flooring type: As specified in Division 9.
- J. Base: Stainless steel, No. 4 brushed finish, surface applied.
- K. Handrail: Cylindrical stainless steel on rear wall at front opening elevators and each side wall at front and rear opening elevators.

2.6 OPERATION CONTROL SYSTEMS

- A. General: Provide operation control system with features of operation as defined by the elevator code and as specified.
- B. Selective Collective Operation: Solid state control unit, functions in accordance with ASME A17.1. Relay or vacuum tube systems not acceptable.

2.7 ELECTRICAL COMPONENTS

- A. General:
 - 1. Comply with the requirements of NFPA 70 (National Electrical Code).
 - 2. Provide units with Underwriters Laboratories labels of electrical safety for components which are accessible to persons other than elevator maintenance personnel.

2.8 LUBRICATION

- A. Grease Fittings:
 - 1. Provide at all bearings requiring periodic lubrication.
 - 2. Grease cups: Automatic feed compression type.
 - 3. Lubrication points: Visible and easily accessible.

2.9 SIGNAL EQUIPMENT

- A. Hall Call Stations: Provide illuminated buttons.

- B. Hall Lanterns:
 - 1. Provide two-tone gong; single tone indicates up car, two tones indicates down car.
- C. Hall Position Indicators: Provide display that shows car's position (nearest landing). Locate at the main floor.
 - 1. Digital display type: Manufacturer's Standard.
 - 2. Faceplate: Stainless steel; brushed finish.
 - 3. Combine hall lantern with the position indicator.
- D. Car Control Stations: Manufacturer's standard swing type with the following minimum features:
 - 1. Illuminated call button for each landing served.
 - 2. Door open button.
 - 3. Door close button.
 - 4. Emergency stop switch.
 - 5. Alarm button.
 - 6. Manufacturer's Standard car position indicator.
 - 7. Telephone: Integral with the car station or return panel.
 - 8. Mount the following devices in the car operating panel above the push buttons:
 - a. Fan switch.
 - b. Light switch.
 - c. Independent service switch.
 - 9. Provide audible tone as car passes each landing.
- E. Car Position Indicators: Display to show present or next landing.
 - 1. Manufacturer's Standard Design.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that the following are of proper size and type to receive elevator system:
 - 1. Hoistway; including pit, overrun, shaft enclosure, and hoistway openings.
 - 2. Machine room; including machine supports, ventilation, and access.
 - 3. Electrical work; including communication wiring, electrical power, and circuit protection.
- B. Report conditions detrimental to proper and timely completion of elevator work in writing.

3.2 PREPARATION

- A. Furnish anchors, inserts, and similar materials which are to be installed as work of other sections to the entities performing the work. Include setting drawings or templates as required to ensure accurate placement.

3.3 INSTALLATION

- A. General: Except where exceeded by other requirements, comply with manufacturer's installation instructions and recommendations.
- B. Coordination: Carefully schedule work of this section with respect to other work under the contract documents, to avoid delays in construction.
- C. Plunger-Cylinder: Install unit properly centered under car, anchor securely in place, and make all necessary connections.
 - 1. Install water tight collar.
- D. Lay out and install work to facilitate access for maintenance, lubrication, and repair.
 - 1. Arrange equipment having rotating shafts, armatures, or sheaves in a manner to allow removal of moving components for repair without dismantling or removing other equipment components.
- E. Install rotating and vibrating elevator equipment and components on vibration-attenuating mounts.
- F. Install guide rail brackets and guide rails to allow accurate alignment, expansion, and realignment of guide rails after completion of installation.
- G. Install hoistway entrance components in hoistway walls.
 - 1. Set entrances in vertical alignment with car openings and in correct relationship to guide rails.
 - 2. Set hoistway door sills in correct relationship to finish floor.
- H. Welding:
 - 1. Use welders and welding processes qualified for type of weld and type of equipment required.
 - 2. Clean welds and adjacent metal, removing slag, oxidation, and other residues by wire brushing or other acceptable means. Apply 2 coats of rust-inhibitive primer.
- I. Adjust equipment for smooth and quiet operation.

3.4 TOLERANCES

- A. Guide Rail Alignment: Plumb and parallel within 1/8 inch in 12 feet, not to exceed 1/4 inch overall.
- B. Automatic Leveling at Landing: Plus or minus 1/4 inch within 3 seconds after initial stop; but not more than 1.5 seconds after door is fully open, regardless of load and direction of travel.

3.5 FIELD QUALITY CONTROL

- A. Notice Requirements: Provide 2 weeks' written notice of date and time of tests.
- B. Acceptance Testing: Perform tests required by ASME A17.1 and governing authorities before placing elevator in service.
 - 1. Deliver certificates and permits to the owner.

3.6 PROTECTION AND CLEANING

- A. Protect exposed finished surfaces from time of installation until acceptance of elevator system by the owner.
- B. Upon acceptance by the owner, or when directed by the architect, remove protection and clean exposed finished surfaces.
 - 1. Repair or replace damaged surfaces and components.

3.7 DEMONSTRATION

- A. Instruction of owner's Personnel:
 - 1. Provide instruction of designated personnel in proper use, operation, and daily maintenance of elevators.
 - 2. Review emergency provisions, including the following:
 - a. Emergency access in event of operation failure.
 - b. Restoration of normal service after emergency operation.
- B. Demonstration: Make a final check of each elevator operation, with the owner's personnel present, just prior to date of acceptance. Determine that control systems and operating devices are functioning properly.

END OF SECTION 14245

