

**ARCHITECTURE**

**SECTION 14240**

**HYDRAULIC ELEVATORS**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. This Section includes hydraulic passenger elevator.
- B. Division 2 Section "Earthwork" for disposition of excavated material from cylinder well hole.
- C. See Division 9 Section "09310 Ceramic Tile" for finish flooring in elevator cars.
- D. Unit Prices: Rock excavation for cylinder well holes will be paid for under the unit price indicated in the Contract and as specified in Division 1 Section "Unit Prices."

1.2 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.
- 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. Operation and maintenance data.
- F. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with ASME A17.1 and elevator design requirements for earthquake loads in ASCE 7.
  - 1. Effective peak velocity acceleration ( $A_v$ ) for Project's location is greater than or equal to 0.10, but less than 0.20 (seismic risk zone 2).
  - 2. Design earthquake spectral response acceleration, short period ( $S_d$ s) for Project is .525.
  - 3. Project's seismic design category is D.
  - 4. Elevator importance factor is 1.0.
  - 5. Refer to Structural Notes on Sheet S0.1 for additional design criteria.
- B. Accessibility Requirements: Comply with Section 407 in ICC A117.1.

1.4 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.

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### 1.5 MAINTENANCE SERVICE

- A. Operational Use of Elevator During Construction: Subcontractor to provide certified elevator operator for the duration of two weeks prior to elevator acceptance and certification, for use in moving materials and furniture by Contractor and Tenants.
- B. 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.

## 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. Canton
  - 2. Fujitec America, Inc.
  - 3. KONE Inc.
  - 4. Otis Elevator Co.
  - 5. Schindler Elevator Corp.
  - 6. ThyssenKrupp Elevator.
  - 7. Architect approved equal.

### 2.2 SYSTEMS AND COMPONENTS

- A. General: Provide manufacturer's standard elevator systems, including 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 either of the following:
  - 1. Pump 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, suspended inside oil tank from vibration isolation mounts.
  - 3. 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. Hydraulic Fluid: Nontoxic, readily biodegradable, fire-resistant fluid made from vegetable oil with antioxidant, anticorrosive, antifoaming, and metal-passivating additives. Hydraulic fluid is approved by elevator manufacturer for use with elevator equipment.
  - 1. Product: Subject to compliance with requirements, provide "Hydro Safe" by Hydro Safe Oil Division, Inc.
- E. 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.
- F. 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.

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### 2.3 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation system for each elevator as required to provide type of operation system indicated.
- B. Single-Car Auxiliary Operations:
  - 1. Battery-Powered Lowering: When power fails, car is lowered to the main lobby floor, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
- C. Security Feature: Security feature shall not affect emergency firefighters' service.
  - 1. Card-Reader Operation: System uses card readers at car control stations to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Allow space as indicated for card reader in car.
    - a. Security access system equipment is to be provided by Owner. Coordination between elevator and security subcontractors is required.
    - b. Security access system equipment is not in the Contract.

### 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.

### 2.5 FINISH MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.
- C. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.
- D. Stainless-Steel Bars: ASTM A 276, Type 304.
- E. Stainless-Steel Tubing: ASTM A 554, Grade MT 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 or HGL.

### 2.6 CAR ENCLOSURES

- A. General: Provide steel-framed car enclosures with nonremovable 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. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to manufacturer's standard core with manufacturer's standard protective edge trim. Plastic-laminate color, texture, and pattern as selected by Architect from elevator manufacturer's full range.
  - 3. Enameled-Steel Doors: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
  - 4. Sills: Extruded aluminum, with grooved surface, **1/4 inch (6.4 mm)** thick.
  - 5. Metallic-Finish, Plastic-Laminate Ceiling: Flush panels, with fluorescent downlights in the center of each panel. Align ceiling panel joints with joints between wall panels.

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### 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.
  - 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. Enameled-Steel Frames: Formed from cold-rolled or hot-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
  - 2. Stainless-Steel Frames (At first floor lobby only): Formed from stainless-steel sheet.
  - 3. Enameled-Steel Doors: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
  - 4. Stainless-Steel Doors: (At first floor lobby only) Flush, hollow-metal construction.
  - 5. Sills: Extruded aluminum, with grooved surface, 1/4 inch (6.4 mm) thick.
  - 6. 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 LEDs.
- B. Car Control Stations: Provide manufacturer's standard car control stations. Mount in return panel adjacent to car door, unless otherwise indicated.
- 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 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.
- D. Firefighters' Two-Way Telephone Communication Service: Provide telephone jack in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Division 13 Section "Fire Alarm."
- E. 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.
- F. Hall Push-Button Stations: Provide hall push-button stations at each landing as indicated.
- G. Hall Lanterns: Units with illuminated arrows.
  - 1. Manufacturer's standard wall-mounted units, for mounting above entrance frames.
- 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.

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### 2.9 ELEVATORS

#### A. Elevator Description:

1. Elevator Number(s): 1.
2. Type: Under-the-car single cylinder.
3. Rated Load: **3000 lb (1362 kg)**.
4. Rated Speed: **125 fpm (0.64 m/s) to 150 fpm (0.76 m/s)**.
5. Operation System: Selective collective automatic operation.
6. Auxiliary Operations:
  - a. Battery-powered lowering.
7. Car Enclosures:
  - a. Inside Width: **80 inches (2032 mm)** from side wall to side wall.
  - b. Inside Depth: **57 inches (1448 mm)** from back wall to front wall (return panels).
  - c. Inside Height: **94 inches (2388 mm)** to underside of ceiling.
  - 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: Plastic laminate.
  - g. Door Faces (Interior): Enameled steel.
  - h. Handrails: **1/2 by 2 inches (13 by 50 mm)** rectangular satin stainless steel, No. 4 finish, at sides and rear of car.
  - i. Floor prepared to receive ceramic Tile (specified in Division 9 Section "Ceramic Tile").
8. Hoistway Entrances:
  - a. Width: **42 inches (1067 mm)**.
  - b. Height: **84 inches (2134 mm)**.
  - c. Type: Two-speed side sliding.
  - d. Fire-Protection Rating: 1-1/2 hours.
  - e. Frames and doors at First Floor (at main lobby): Satin stainless steel, No. 4 finish.
  - f. Frames and doors at Other Floors: Enameled steel.
9. Hall Fixtures: Satin stainless steel, No. 4 finish.
10. 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(s) of full-height protective blankets.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Excavation for Cylinder: Drill well hole in 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. Align cylinders and fill space around protective casing with fine sand.

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- D. Install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor. Seal between protective casing and pit floor with **4 inches (100 mm)** of nonshrink, nonmetallic grout.
- E. Leveling Tolerance: **1/4 inch (6 mm)**, up or down, regardless of load and direction of travel.
- F. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

### 3.2 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.

### 3.3 PROTECTION

- A. Temporary Use: Comply with the following requirements for elevator used for construction purposes:
  - 1. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
  - 2. Engage elevator Installer to provide full maintenance service.

### 3.4 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."

**END OF SECTION 14240**