SECTION 142123 - MACHINE-ROOM-LESS ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

0.1 SUMMARY

A. Section Includes:

1. Machine-room-less electric traction passenger and service elevators.
2. Special provisions and requirements for mitigating flood damage of elevator systems and components for elevators located in flood hazards areas.

0.2 DEFINITIONS

A. BFE: Base Flood Elevation.

B. RFE: Regulatory Flood Elevation; the BFE or estimated flood height as determined using simplified methods, plus a freeboard safety factor of 1-1/2 feet.

C. FEMA: Federal Emergency Management Agency.

0.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include Product Data for car enclosures, hoistway entrances, and operation, control, and signal systems.

B. Shop Drawings:

1. Include plans, elevations, sections, and large-scale details indicating service at each landing, coordination with building structure, relationships with other construction, and locations of equipment.
2. Indicate maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.

C. Samples: For each type of exposed finish involving color selection.

0.4 INFORMATIONAL SUBMITTALS

A. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway and pit layout and dimensions, as indicated on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.

0.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.

1. Submit manufacturer's or Installer's standard operation and maintenance manual, according to ASME A17.1/CSA B44.

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

0.6 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.

1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 - PRODUCTS

0.1 MANUFACTURERS

A. Basis-of-Design Products: Subject to compliance with requirements, provide the following models by Schindler Elevator Corp.:

1. Passenger Elevator: Schindler 3300 MRL.
2. Service Elevator: Schindler 3300 XL.

B. Comparable Products: Subject to compliance with requirements, provide the basis-of-design products or comparable product by one of the following:

1. Otis Elevator Co.
2. ThyssenKrupp Elevator.

0.2 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1/CSA B44.

B. Accessibility Requirements: Comply with requirements for accessible elevators in the United States Access Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

C. Flood Protection Requirements: Comply with applicable requirements in FEMA Technical Bulletin 4 (November 2010) Elevator Installation for Buildings Located in Special Flood Hazard Areas, including the following:

1. Equip elevator cars that provide access to areas below the RFE with controls that will prevent the car from descending into floodwaters.
2. Locate designated fire recall floor above the BFE.
3. Grout in door frames and sills located below the BFE.
4. Locate limit switches above the BFE.
5. Use stainless-steel selector tape.
6. Use encapsulated chain system instead of compensation cables.
7. Locate controls and equipment above the BFE whenever possible. For electrical equipment located below the BFE, provide NEMA-4 rated enclosures, galvanized conduits and watertight conduits and fittings.
8. Provide galvanized sill angles and hardware at floors with elevation below the BFE.
9. Paint of coat buffers and steel hardware located in elevator pits with galvanic or rust-preventive paints.

D. Seismic Performance: Elevator system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and shall comply with elevator seismic requirements in ASME A17.1/CSA B44 and as indicated on Drawings.

1. Provide earthquake equipment required by ASME A17.1/CSA B44.

0.3 ELEVATORS

A. Elevator System, General: Manufacturer's standard elevator systems. Unless otherwise indicated, manufacturer's standard components shall be used, as included in standard elevator systems and as required for complete system.

1. Machine Location: Top of hoistway.

B. Passenger Elevator Description:

1. Rated Load: 3500 lb (1589 kg).
2. Rated Speed: 150 fpm (0.75 m/s).
3. Operation System: Single car automatic operation.
4. Auxiliary Operations:

a. Battery-powered automatic evacuation.
b. Automatic operation of lights and ventilation fans.
c. Independent service for service elevator.

5. Car Enclosures:

a. Inside Width: Not less than 81-3/8 inches from side wall to side wall.
b. Inside Depth: Not less than 66-7/8 inches from back wall to front wall (return panels).
c. Inside Height: Not less than 93 inches to underside of ceiling.
d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish.
e. Car Fixtures: Satin stainless steel, No. 4 finish.
f. Side and Rear Wall Panels: To be determined.
g. Door Faces (Interior): Satin stainless steel, No. 4 finish.
h. Door Sills: Aluminum.
i. Ceiling: To be determined.
j. Handrails: To be determined.
k. Floor prepared to receive finish flooring to be determined.

6. Hoistway Entrances:

a. Width: 42 inches (1067 mm).
b. Height: 84 inches (2134 mm).
c. Type: Two-speed side sliding.
d. Frames: To be determined.
e. Doors: To be determined.
f. Sills: Aluminum.

7. Hall Fixtures: To be determined.
8. Additional Requirements:

a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.

C. Service Elevator Description:

1. Rated Load: 4500 lb (2043 kg).
2. Rated Speed: 150 fpm (0.75 m/s).
3. Operation System: Single car automatic operation.
4. Auxiliary Operations:

a. Battery-powered automatic evacuation.
b. Automatic operation of lights and ventilation fans.
c. Independent service for service elevator.

5. Car Enclosures:

a. Inside Width: Not less than 64-1/4 inches from side wall to side wall.
b. Inside Depth: Not less than 98-1/2 inches from back wall to front wall (return panels).
c. Inside Height: Not less than 96 inches to underside of ceiling.
d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish.
e. Car Fixtures: Satin stainless steel, No. 4 finish.
f. Side and Rear Wall Panels: Satin stainless steel, No. 4 finish.
g. Door Faces (Interior): Satin stainless steel, No. 4 finish.
h. Door Sills: Aluminum.
i. Ceiling: Stainless-steel with LED downlights.
j. Handrails: 1-3/8 inches round profile, of painted aluminum, at sides and rear of car.
k. Floor prepared to receive resilient flooring (specified in Section 096519 “Resilient Tile Flooring.”)

6. Hoistway Entrances:

a. Width: 42 inches (1067 mm).
b. Height: 84 inches (2134 mm).
c. Type: Two-speed side sliding.
d. Frames: Satin stainless steel, No. 4 finish.
e. Doors: Satin stainless steel, No. 4 finish.
f. Sills: Aluminum.

7. Hall Fixtures: Satin stainless steel, No. 4 finish.
8. 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 hooks for protective pads in service car and one complete set of full-height protective pads.

0.4 TRACTION SYSTEMS

A. Elevator Machines: Permanent magnet, variable-voltage, variable-frequency, ac-type hoisting machines and solid-state power converters.

1. Provide regenerative system.
2. Provide regenerative system that complies with the IgCC.
3. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
4. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system.

B. Fluid for Hydraulic Buffers: Fire-resistant fluid.

C. Machine Beams: Provide steel framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Section 055000 "Metal Fabrications" for materials and fabrication.

D. Guides: Roller guides or polymer-coated, nonlubricated sliding guides. Provide guides at top and bottom of car and counterweight frames.

0.5 OPERATION SYSTEMS

A. General: Provide manufacturer's standard microprocessor operation systems as required to provide type of operation indicated. Include the following:

1. Built-in remote diagnostic module to relay constant status of elevators and control system to central monitoring facility operating 24 hours 7 days per week.
2. Remote monitoring device to transmit information on current status of elevators including malfunctions, system errors, and shutdown.

B. Auxiliary Operations:

1. Single-Car Battery-Powered Automatic Evacuation: 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 moves to the next floor above or below, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
2. Automatic Operation of Lights and Fan: When elevator is stopped and unoccupied with doors closed, lighting, ventilation fan, and cab displays are de-energized after five minutes and are re-energized before car doors open.
3. Independent Service: Keyswitch in car-control station removes car from group operation and allows it to respond only to car calls. Key cannot be removed from keyswitch when car is in independent service. When in independent service, doors close only in response to door close button.

0.6 DOOR REOPENING DEVICES

A. Infrared Array: Provide door reopening device with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.

0.7 CAR ENCLOSURES

A. General: Provide steel car enclosures with wall panels, car roof, access doors, power door operators, and ventilation.

1. Provide standard railings complying with ASME A17.1/CSA B44 on car tops where required by ASME A17.1/CSA B44.

B. Materials and Finishes for Service Elevator: Manufacturer's standards, but not less than the following:

1. Stainless-Steel Wall Panels: Flush, formed-metal construction; fabricated from stainless-steel sheet.
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 or powder-coated steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning.
3. Sight Guards: Provide sight guards on car doors.
4. Sills: Extruded or machined metal, with grooved surface, 1/4 inch (6.4 mm) thick.
5. Light Fixture Efficiency: Not less than 35 lumens/W.
6. Ventilation Fan Efficiency: Not less than 3.0 cfm/W (1.4 L/s per W).

0.8 HOISTWAY ENTRANCES

A. Hoistway Entrance Assemblies: Manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Frame size and profile shall accommodate hoistway wall construction.

1. Where gypsum board wall construction is indicated, frames shall be self-supporting with reinforced head sections.

B. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies shall comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction based on testing at as close-to-neutral pressure as possible according to NFPA 252 or UL 10B.

1. Fire-Protection Rating: 1-1/2 hours with 30-minute temperature rise of 450 deg F (250 deg C).

C. Materials and Fabrication: Manufacturer's standards, but not less than the following:

1. Stainless-Steel Frames: Formed from stainless-steel sheet.
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 or powder-coated 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 or machined metal, with grooved surface, 1/4 inch (6.4 mm) thick.
5. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.

0.9 SIGNAL EQUIPMENT

A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Provide buttons and lighted elements illuminated with LEDs.

B. Car-Control Stations: Provide manufacturer's standard car-control stations. Mount in return panel adjacent to car door unless otherwise indicated.

1. 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: Two-way voice communication system, with visible signal, which dials preprogrammed number of monitoring station and does not require handset use. 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 flush-mounted cabinet in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Division 28 Sections.

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. 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.

G. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide manufacturer's standard wall-mounted units for mounting above entrance frames, unless otherwise indicated.

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.

I. Emergency Pictorial Signs: Fabricate from materials matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire, elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station unless otherwise indicated.

0.10 FINISH MATERIALS

A. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.

B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.

PART 3 - EXECUTION

0.1 INSTALLATION

A. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise due to elevator system.

B. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.

C. Leveling Tolerance: 1/8 inch (3 mm), up or down, regardless of load and travel direction.

D. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

E. Locate hall signal equipment for elevators as follows unless otherwise indicated:

1. Place hall lanterns either above or beside each hoistway entrance.
2. Mount hall lanterns at a minimum of 72 inches (1829 mm) above finished floor.

0.2 FIELD QUALITY CONTROL

A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.

0.3 PROTECTION

A. Temporary Use: Limit temporary use for construction purposes to one elevator. 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 finishes from damage.
2. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
3. Engage elevator Installer to provide full maintenance service.

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.

0.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate, adjust, and maintain elevators.

0.5 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance 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.

END OF SECTION