SECTION 14 20 00 - HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

1.2.1 Section includes hydraulic [**passenger**] [**and**] [**service**] elevators.

1.2.2 Related Requirements:

1.2.2.1 Section 01 50 00 "Temporary Facilities and Controls" for temporary use of elevators for construction purposes. [OFPC Design Guidelines and Construction Standards]

1.2.2.2 Section 03 30 00 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete. [OFPC Design Guidelines and Construction Standards]

1.2.2.3 Section 04 20 00 "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls. [OFPC Design Guidelines and Construction Standards]

1.2.2.4 Section 05 12 00 "Structural Steel Framing" for the following: [OFPC Design Guidelines and Construction Standards]

1.2.2.4.1 Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.

1.2.2.4.2 Divider beams.

1.2.2.4.3 Hoist beams.

1.2.2.4.4 Structural-steel shapes for sub sills that are part of steel frame.

1.2.2.5 Section 05 50 00 "Metal Fabrications" for the following:

1.2.2.5.1 Attachment plates and angle brackets for supporting guide-rail brackets.

1.2.2.5.2 Divider beams.

1.2.2.5.3 Hoist beams.

1.2.2.5.4 Structural-steel shapes for sub sills.

1.2.2.5.5 Pit ladders.

1.2.2.5.6 Cants in hoist ways made from steel sheet.

1.2.2.6 Section 05 52 13 "Pipe and Tube Railings" for railings between adjacent elevator pits. [OFPC Design Guidelines and Construction Standards]

1.2.2.7 Section 05 70 00 "Decorative Metal" for combination hall push-button stations. [OFPC Design Guidelines and Construction Standards]

1.2.2.8 <**Insert Section number**>-<**Insert Section title**> for finish flooring in elevator cars.

1.2.2.9 Section 09 90 00 "Painting & Coating" for field painting of hoist way entrance doors and frames. [OFPC Design Guidelines and Construction Standards]

1.2.2.10 Section 10 22 13 "Wire Mesh Partitions" for guards between adjacent elevators pits. [OFPC Design Guidelines and Construction Standards]

1.2.2.11 Section 22 14 29 "Sump Pumps" for sump pumps, sumps, and sump covers in elevator pits. [OFPC Design Guidelines and Construction Standards]

1.2.2.12 Section 27 15 00 "Communications Horizontal Cabling" for telephone service for elevators. [OFPC Design Guidelines and Construction Standards]

1.2.2.13 [**Section 28 31 11 "Digital, Addressable Fire-Alarm System"**] [**Section 28 31 12 "Zoned (DC Loop) Fire-Alarm System"**] 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. [OFPC Design Guidelines and Construction Standards]

1.2.2.14 Section 31 00 00 "Earthwork" for excavating well hole to accommodate cylinder assembly. [OFPC Design Guidelines and Construction Standards]

1.3 UNIT PRICES

1.3.1 Unit Prices: Rock excavation for cylinder well holes is paid for under the unit price indicated in the Contract and as specified in Section 01 22 00 "Unit Prices." [OFPC Design Guidelines and Construction Standards]

1.4 DEFINITIONS

1.4.1 Definitions in ASME A17.1/CSA B44 apply to work of this Section.

1.4.2 Service Elevator: A passenger elevator that is also used to carry freight.

1.5 ACTION SUBMITTALS

1.5.1 Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for car enclosures, hoist way entrances, and operation, control, and signal systems.

1.5.2 Shop Drawings:

1.5.2.1 Include 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.

1.5.2.2 Include large-scale layout of car-control station [**and standby power operation control panel**].

1.5.2.3 Indicate maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.

1.5.3 Samples for Initial Selection: For finishes involving color selection.

1.5.4 Samples for Verification: For exposed car, hoist way door and frame, and signal equipment finishes; 3” (75-mm-) square Samples of sheet materials; and 4” (100-mm) lengths of running trim members.

1.6 INFORMATIONAL SUBMITTALS

1.6.1 Qualification Data: For Installer.

1.6.2 Seismic Qualification Certificates: For elevator equipment, accessories, and components, from manufacturer.

1.6.2.1 Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

1.6.2.2 Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

1.6.2.3 Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

1.6.3 Manufacturer Certificates: Signed by elevator manufacturer certifying that hoist way, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service [**including standby power generator**], as shown and specified, are adequate for elevator system being provided.

1.6.4 Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

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

1.7.1.1 In addition to items specified in Section 01 77 00 "Project Closeout Procedures," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

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

1.7.3 Continuing Maintenance Proposal: Submit a continuing maintenance proposal from Installer to Owner, in the form of a standard **one-year** maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

1.7.4 Continuing Maintenance Proposal: Submit a continuing maintenance proposal from Installer to Owner with terms, conditions, and obligations as set forth in, and in same form as, "Draft of Elevator Maintenance Agreement" at end of this Section, starting on date initial maintenance service is concluded.

1.8 QUALITY ASSURANCE

1.8.1 Installer Qualifications: Elevator manufacturer [**or an authorized representative who is trained and approved by manufacturer**].

1.9 DELIVERY, STORAGE, AND HANDLING

1.9.1 Deliver, store, and handle materials, components and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

1.10 COORDINATION

1.10.1 Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

1.10.2 Furnish well casing and coordinate delivery with related excavation work.

1.10.3 Coordinate locations and dimensions of other work relating to hydraulic elevators including pit ladders; sumps and floor drains in pits; entrance sub sills; electrical service; and electrical outlets, lights, and switches in hoist ways, pits, and machine rooms.

1.11 WARRANTY

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

1.11.1.1 Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.11.1.2 Warranty Period: 1 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

2.1.1 Manufacturers: Basis of Design: ThyssenKrupp, Seville 35.

2.1.2 Source Limitations: Obtain elevators from single manufacturer.

2.1.2.1 Major elevator components, including pump-and-tank units, plunger-cylinder assemblies, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured by single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

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

2.2.2 Accessibility Requirements: Comply with all applicable Federal and State accessibility regulations.

2.2.3 Seismic Performance: Elevator system shall withstand the effects of earthquake motions determined according to [**ASCE/SEI 7**] <**Insert requirement**> and shall comply with elevator safety requirements for seismic risk Zone 2 or greater in ASME A17.1/CSA B44.

2.2.3.1 The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified [**and the system will be fully operational after the seismic event**]."

2.2.3.2 Affected peak velocity acceleration (Av) for Project's location is [**less than 0.10 (seismic risk Zones 0 and 1)**] [**greater than or equal to 0.10, but less than 0.20 (seismic risk Zone 2)**] [**greater than or equal to 0.20 (seismic risk Zones 3 and 4)**].

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

2.2.3.4 Provide seismic switch required by ASCE/SEI 7.

2.2.3.5 Design earthquake spectral response acceleration short period (Sds) for Project is <**Insert value**>.

2.2.3.6 Project's Seismic Design Category: [**A**] [**B**] [**C**] [**D**] [**E**] [**F**].

2.2.3.7 Elevator Component Importance Factor: [**1.5**] [**1.0**].

2.3 ELEVATORS

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

2.3.2 Elevator Description:

2.3.2.1 Group Number: <**Insert a different number for each group of elevators that share a group operation system**>.

2.3.2.2 Elevator Number(s) : <**Insert elevator number(s) as shown on Drawings**>.

2.3.2.3 Emergency Elevator Number(s) : <**Insert elevator number(s) as shown on Drawings**>.

2.3.2.4 Service Elevator Number(s) : <**Insert elevator number(s) as shown on Drawings**>.

2.3.2.5 Type: Under-the-car single cylinder.

2.3.2.6 Rated Load: [**3500 lb. (1589 kg)**] [**4000 lb. (1816 kg)**] [**4500 lb. (2043 kg)**] [**5000 lb. (2270 kg)**] <**Insert value**>.

2.3.2.7 Freight Loading Class for Service Elevators: Class A.

2.3.2.8 Rated Speed: [**75 or 80 fpm (0.38 or 0.41 m/s)**] [**100 fpm (0.51 m/s)**] [**125 fpm (0.64 m/s)**] [**150 fpm (0.76 m/s)**] [**175 fpm (0.89 m/s)**] [**200 fpm (1.0 m/s)**] <**Insert value**>.

2.3.2.9 Operation System: [**Single automatic**] [**Selective-collective automatic**] [**Group automatic**].

2.3.2.10 Auxiliary Operations:

2.3.2.10.1 Battery-powered lowering.
2.3.2.10.2 Independent service for [**service elevator**] [**one car in group**] [**all cars in group**].

2.3.2.11 Security Features: [**Card-reader operation**] [**Key switch operation**] [**Car-to-lobby feature**].

2.3.2.12 Dual Car-Control Stations: Provide two car-control stations [**in each elevator**]; equip only one with required key switches, if any.

2.3.2.13 Car Enclosures:

2.3.2.13.1 Inside Width: [**64” (1626 mm)**] [**68” (1727 mm)**] [**80” (2032 mm)**] [**92” (2337 mm)**] <**Insert dimension**> from side wall to side wall.
2.3.2.13.2 Inside Depth: [**51” (1295 mm)**] [**53” (1346 mm)**] [**57” (1448 mm)**] [**65” (1651 mm)**] [**87½” (2222 mm)**] [**90” (2286 mm)**] [**93” (2362 mm)**] [**93½” (2375 mm)**] [**96” (2438 mm)**] [**101” (2565 mm)**] [**102” (2591 mm)**] <**Insert dimension**> from back wall to front wall (return panels).

2.3.2.13.3 Inside Height: [**88" (2235 mm)**] [**92" (2337 mm)**] [**94" (2388 mm)**] [**100" (2540 mm)**] [**104" (2642 mm)**] [**108" (2743 mm)**] [**112" (2845 mm)**] <**Insert dimension**> to underside of ceiling.

2.3.2.13.4 Front Walls (Return Panels): [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] with integral car door frames.

2.3.2.13.5 Car Fixtures: [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].

2.3.2.13.6 Side and Rear Wall Panels: [**Enameled steel**] [**Plastic laminate**] [**Satin stainless steel, No.4 finish**] [**Textured stainless steel**] [**Satin bronze, lacquered**].

2.3.2.13.7 Reveals: [**Enameled steel**] [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].

2.3.2.13.8 Door Faces (Interior): [**Enameled steel**] [**Primed steel**] [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Textured stainless steel**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Plastic laminate**].

2.3.2.13.9 Door Sills: [**Aluminum, mill finish**] [**Bronze, polished**] [**Nickel silver, polished**].

2.3.2.13.10 Ceiling: [**Luminous ceiling**] [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Polished bronze, lacquered**] [**Reflective metallic-finish, plastic-laminate, stainless steel**] [**Reflective metallic-finish, plastic-laminate, bronze**].

2.3.2.13.11 Handrails: [**1½" (38 mm) round**] [**½ by 2" (13 by 50 mm) rectangular**] <**Insert dimension(s)**> [**mirror-polished stainless steel, No. 8 finish**] [**satin stainless steel, No.4 finish**] [**mirror-polished bronze, lacquered**] [**satin bronze, lacquered**], at [**sides**] [**and**] [**rear**] of car.

2.3.2.13.12 Floor: Manufacturer's standard carpet.

2.3.2.13.13 Floor prepared to receive carpet (specified in Section 09 68 16 "Sheet Carpeting").

2.3.2.13.14 Floor prepared to receive resilient flooring (specified in Section 09 65 00 "Resilient Flooring").

2.3.2.13.15 Floor Thickness, Including Setting Materials: <**Insert thickness**> above plywood subfloor.

2.3.2.14 Hoistway Entrances:

2.3.2.14.1 Width: [**36" (914 mm)**] [**42" (1067 mm)**] [**48" (1219 mm)**] [**54" (1372 mm)**] <**Insert dimension**>.

2.3.2.14.2 Height: [**84" (2134 mm)**] [**96" (2438 mm)**] <**Insert dimension**>.

2.3.2.14.3 Type: [**Single-speed side sliding**] [**Two-speed side sliding**] [**Single-speed center opening**] [**Two-speed center opening**].

2.3.2.14.4 Frames [**at First Floor**] [**at Basement Floors**]: [**Enameled steel**] [**Primed steel**] [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].

2.3.2.14.5 Frames at Other Floors: [**Enameled steel**] [**Primed steel**] [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].

2.3.2.14.6 Doors [**and Transoms**] [**at First Floor**] [**at Basement Floors**]: [**Enameled steel**] [**Primed steel**] [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Textured stainless steel**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Plastic laminate**].

2.3.2.14.7 Doors [**and Transoms**] at Other Floors: [**Enameled steel**] [**Primed steel**] [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Textured stainless steel**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Plastic laminate**].

2.3.2.14.8 Sills [**at First Floor**] [**at Basement Floors**]: [**Aluminum, mill finish**] [**Bronze, polished**] [**Nickel silver, polished**].

2.3.2.14.9 Sills at Other Floors: [**Aluminum, mill finish**] [**Bronze, polished**] [**Nickel silver, polished**].

2.3.2.15 Hall Fixtures [**at First Floor**] [**at Basement Floors**]: [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Recessed type with no exposed-metal surfaces**].

2.3.2.16 Hall Fixtures at Other Floors: [**Polished stainless steel, No.8 finish**] [**Satin stainless steel, No.4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Recessed type with no exposed-metal surfaces**].

2.3.2.17 Additional Requirements:

2.3.2.17.1 Provide inspection certificate in each car, mounted under acrylic cover with frame made from [**polished stainless steel, No.8 finish**] [**satin stainless steel, No.4 finish**] [**polished bronze, lacquered**] [**satin bronze, lacquered**].

2.3.2.17.2 Provide hooks for protective pads **in all cars** and **one** (1) complete set of full-height protective pads for each car.

2.4 SYSTEMS AND COMPONENTS

2.4.1 Pump Units: Positive-displacement type with a maximum of 10% variation between no load and full load and with minimum pulsations.

2.4.1.1 Pump shall be **submersible type with submersible squirrel-cage induction motor, and shall be suspended inside oil tank from vibration isolation mounts.**

2.4.1.2 Motor shall have **solid-state** starting.

2.4.1.3 Motor shall have variable-voltage, variable-frequency control.

2.4.1.4 Motor shall have oil cooling unit.

2.4.1.5 Motor shall have viscosity control.

2.4.2 Hydraulic Silencers: System shall have hydraulic silencer containing pulsation-absorbing material in blowout-proof housing at pump unit.

2.4.3 Piping: Size, type, and weight of piping as recommended by elevator manufacturer, with flexible connectors to minimize sound and vibration transmissions from power unit.

2.4.3.1 Cylinder units shall be connected with dielectric couplings.

2.4.3.2 Casing for Underground Piping: Schedule 40 PVC pipe complying with ASTM D 1785, joined with PVC fittings complying with ASTM D 2466 and solvent cement complying with ASTM D 2564.

2.4.4 Hydraulic Fluid: Elevator manufacturer's standard [**fire-resistant**] fluid with additives as needed to prevent oxidation of fluid, corrosion of cylinder and other components, and other adverse effects.

2.4.5 Hydraulic Fluid: Nontoxic, biodegradable [**fire-resistant**] fluid made from vegetable oil with antioxidant, anticorrosive, antifoaming, and metal-passivating additives and approved by elevator manufacturer for use with elevator equipment.

2.4.5.1 Product: Subject to compliance with requirements, provide "Hydro Safe" by Hydro Safe Oil Division, Inc.

2.4.6 Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified in another Section.

2.4.7 Protective Cylinder Casing: PVC or HDPE pipe casing complying with ASME A17.1/CSA B44, of sufficient size to provide not less than 1" (25-mm) clearance from cylinder and extending above pit floor. Casing shall have means of monitoring effectiveness to comply with ASME A17.1/CSA B44.

2.4.8 Corrosion-Protective Filler: A nontoxic, petroleum-based gel formulated for filling the space between hydraulic cylinder and protective casing. Filler shall be electrically nonconductive, displace or absorb water, and gel or solidify at temperatures below 60°F (16 C).

2.4.8.1 Products: Subject to compliance with requirements, [**provide the following**]:

2.4.8.1.1 Citgo A/W Hydraulic Oil NZ 32.

2.4.9 Car Frame and Platform: Welded steel units.

2.4.10 Guides: Roller guides; polymer-coated, non-lubricated sliding guides; or sliding guides with guide-rail lubricators. Provide guides at top and bottom of car and counterweight frames.

2.4.11 Elevator shall be equipped with mechanical door restrictors.

2.5 OPERATION SYSTEMS

2.5.1 General: Provide ThyssenKrupp TAC-20 or TAC-32 digital controller system with Vista as required to provide type of operation indicated.

2.5.2 Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:

2.5.2.1 Single-Car Battery-Powered Lowering: When power fails, car is lowered to the lowest floor, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.

2.5.2.2 Group Battery-Powered Lowering: If power fails, cars that are at a floor remain at that floor, open their doors, and shut down. Cars that are between floors are lowered to a preselected floor, open their doors, and shut down. Cars that are below the preselected floor are lowered to the next lower floor, open their doors, and shut down. System includes rechargeable battery and automatic recharging system.

2.5.2.3 Independent Service: Key switch in car-control station removes car from group operation and allows it to respond only to car calls. Key cannot be removed from key switch when car is in independent service. When in independent service, doors close only in response to door close button.

2.5.3 Security Features: Provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.

2.5.3.1 Key switch Operation: Push buttons are activated and deactivated by security key switches at [**car-control stations**] [**and**] [**hall push-button stations**]. Key is removable [**only in deactivated position**] [**in either position**].

2.5.3.2 Car-to-Lobby Feature: Feature, activated by key switch at main lobby, which causes [**car**] [**all cars in a group**] to return immediately to lobby and open doors for inspection. On deactivation by key switch, calls registered before key switch activation is completed and normal operation is resumed.

2.6 DOOR REOPENING DEVICES

2.6.1 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.

2.6.2 Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.7 CAR ENCLOSURES

2.7.1 General: Provide [**enameled-steel car enclosures to receive removable**] [**steel-framed car enclosures with non-removable**] wall panels, with [**removable**] car roof, access doors, power door operators, and ventilation.

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

2.7.1.2 See "Allowances" Paragraph in "Summary" Article for items to be provided under the Elevator Car Allowance. Provide items not included in the Elevator Car Allowance as needed for finished car [**including materials and finishes specified below**].

2.7.2 Materials and Finishes: Manufacturer's standards, but not less than the following:

2.7.2.1 Subfloor: Exterior, underlayment grade plywood, not less than ⅝**”** (15.9-mm) nominal thickness.

2.7.2.2 Subfloor: Exterior, C-C Plugged grade plywood, not less than 7/8**”** (22.2-mm) nominal thickness.

2.7.2.3 Floor Finish: [**Specified in <Insert Section number>-<Insert Section title>**] [**Elevator manufacturer's standard level-loop nylon carpet; color as selected by Architect from manufacturer's full range**].

2.7.2.4 Enameled-Steel Wall Panels: 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.

2.7.2.5 Stainless-Steel Wall Panels: Flush hollow-metal construction; fabricated from stainless-steel sheet.

2.7.2.6 Bronze Wall Panels: Flush hollow-metal construction; fabricated from bronze sheet.

2.7.2.7 Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to [**½” (13-mm) fire-retardant-treated particleboard**] [**manufacturer's standard honeycomb core**] with [**plastic-laminate panel backing and**] manufacturer's standard protective edge trim. Panels have a flame-spread index of [**25**] [**75**] or less, when tested according to ASTM E 84. Plastic-laminate color, texture, and pattern as selected by Architect from [**plastic-laminate**] [**elevator**] manufacturer's full range.

2.7.2.8 Fabricate car with recesses and cutouts for signal equipment.

2.7.2.9 Fabricate car door frame integrally with front wall of car.

2.7.2.10 Stainless-Steel Doors: Flush hollow-metal construction; fabricated [**from stainless-steel sheet.**

2.7.2.11 Sight Guards: Provide sight guards on car doors.

2.7.2.12 Sills: Extruded metal, with grooved surface, ¼**”** (6.4 mm) thick.

2.7.2.13 Luminous Ceiling: LED Econolight System

2.7.2.14 Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.

2.8 HOISTWAY ENTRANCES

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

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

2.8.2 Fire-Rated Hoist way 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**].

2.8.2.1 Fire-Protection Rating: [**1 hour**] [**1½ hours**] <**Insert rating**> [**with 30-minute temperature rise of 450 F (250 C)**].

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

2.8.3.1 Enameled-Steel Frames: Formed from cold- or hot-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.

2.8.3.2 Primed-Steel Frames: Formed from cold- or hot-rolled steel sheet. Provide with factory-applied, rust-resistant primer for field painting.

2.8.3.3 Steel Sub frames: Formed from cold- or hot-rolled steel sheet, with factory-applied enamel finish or rust-resistant primer. Fabricate to receive applied finish as indicated.

2.8.3.4 Stainless-Steel Frames: Formed from stainless-steel sheet.

2.8.3.5 Bronze Frames: Formed from cold- or hot-rolled steel sheet, with enamel finish, and with formed-bronze sheet laminated to steel frames using adhesive that fully bonds metal to metal without telegraphing or oil-canning.

2.8.3.6 Star of Life Symbol: Identify emergency elevators with star of life symbol, not less than 3**”** (76 mm) high, on both inside surfaces of hoist way door frames.

2.8.3.7 Stainless-Steel Doors [**and Transoms**]: flush hollow-metal construction; fabricated **from stainless-steel sheet.**

2.8.3.8 Sight Guards: Provide sight guards on doors matching door edges.

2.8.3.9 Sills: Extruded metal, with grooved surface, ¼**”** (6.4 mm) thick.

2.8.3.10 Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.

2.9 SIGNAL EQUIPMENT

2.9.1 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**.

2.9.2 Car-Control Stations: Provide manufacturer’s standard [recessed] [or] [semi-recessed] car-control stations. Mount in return panel adjacent to car door unless otherwise indicated.

2.9.2.1 Mark buttons and switches for required use or function. Use both tactile symbols and Braille.

2.9.2.2 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.

2.9.3 Swing-Return Car-Control Stations: Provide car-control stations mounted on rear of hinged return panel adjacent to car door and with buttons, switches, controls, and indicator lights projecting through return panel but substantially flush with face of return panel.

2.9.3.1 Mark buttons and switches for function. Use both tactile symbols and Braille.

2.9.3.2 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.

2.9.4 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.

2.9.5 Firefighters' Two-Way Telephone Communication Service: Provide [**flush-mounted cabinet**] [**telephone jack**] in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in [**Section 28 31 11 "Digital, Addressable Fire-Alarm System"**] [**Section 28 31 12 "Zoned (DC Loop) Fire-Alarm System."**]

2.9.6 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.

2.9.7 Hall Push-Button Stations: [**Provide one hall push-button station at each landing**] [**Provide one hall push-button station at each landing for each single elevator or group of elevators, but not less than one station for each four elevators in a group**] [**Provide hall push-button station at each landing as indicated**].

2.9.7.1 Provide [**manufacturer's standard wall-mounted units**] [**units with flat faceplate for mounting with body of unit recessed in wall**].

2.9.7.2 Equip units with buttons for calling elevator and for indicating applicable direction of travel.

2.9.7.3 Provide telephone jack in each unit for firefighters' two-way telephone communication service specified in [**Section 28 31 11 "Digital, Addressable Fire-Alarm System"**] [**Section 28 31 12 "Zoned (DC Loop) Fire-Alarm System."**]Possibly insert a provision for either an "In Use" signal or a digital display of car position for single elevators.

2.9.8 Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide [**one of**] the following:

2.9.8.1 Manufacturer's standard wall-mounted units, for mounting above entrance frames.

2.9.8.2 Units with flat faceplate for mounting with body of unit recessed in wall and with illuminated elements projecting from faceplate for ease of angular viewing.

2.9.8.3 Units mounted in both jambs of entrance frame [**for each elevator**].

2.9.8.4 Units mounted in both car door jambs [**may be used only for single elevators or for two-car groups**].

2.9.9 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.

2.9.9.1 At manufacturer's option, audible signals may be placed on cars.

2.9.10 Hall Position Indicators: Provide [**illuminated**] digital-display-type position indicators, located above [**each**] hoist way entrance at ground floor. Provide units with flat faceplate for mounting and with body of unit recessed in wall.

2.9.10.1 Integrate ground-floor hall lanterns with hall position indicators.

2.9.11 Standby Power Elevator Selector Switches: Provide switches, as required by ASME A17.1/CSA B44, where indicated. Adjacent to switches, provide illuminated signal that indicates when normal power supply has failed. [**For each elevator, provide illuminated signals that indicate when they are operational and when they are at the designated emergency return level with doors open.**]

2.9.12 Fire-Command-Center Annunciator Panel: Provide panel containing illuminated position indicators for each elevator, clearly labeled with elevator designation; include illuminated signal that indicates when elevator is operational and when it is at the designated emergency return level with doors open. Provide standby power elevator selector switch(es), as required by ASME A17.1/CSA B44, adjacent to position indicators. Provide illuminated signal that indicates when normal power supply has failed.

2.9.13 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.

2.10 FINISH MATERIALS

2.10.1 General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoist way entrance doors and frames, and signal equipment as indicated.

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

2.10.3 Textured Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304 with embossed texture rolled into exposed surface.

2.10.3.1 Product: Subject to compliance with requirements, provide "<**Insert product name**>" by <**Insert manufacturer's name**>.

2.10.3.2 Metal surface is [**satin polished**] [**satin relieved**] [**titanium nitride colored**] [**oxide colored**] [**satin polished and titanium nitride colored**] [**satin relieved and titanium nitride colored**] [**satin polished and oxide colored**] [**satin relieved and oxide colored**] [**color coated and satin relieved**] [**color coated and bright relieved**] after texturing.

2.10.4 Stainless-Steel Bars: ASTM A 276, Type 304.

2.10.5 Stainless-Steel Tubing: ASTM A 554, Grade MT 304.

PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Verify critical dimensions and examine supporting structure and other conditions under which elevator work is to be installed.

3.1.2 Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.2 INSTALLATION

3.2.1 Excavation for Cylinder: Drill well hole in [**each**] elevator pit to accommodate installation of cylinder; comply with applicable requirements in Section 31 00 00 "Earthwork." [OFPC Design Guidelines and Construction Stanards]

3.2.2 Provide [**waterproof**] well casing [**as necessary**] to retain well-hole walls.

3.2.3 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**].

3.2.3.1 Fill void space between protective casing and cylinder with corrosion-protective filler.

3.2.3.2 Align cylinders and fill space around protective casing with fine sand.

3.2.4 Install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor. Seal between [**well**] [**protective**] casing and pit floor with 4**”** (100 mm) of non-shrink, nonmetallic grout.

3.2.5 Install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor and braced at intervals as needed to maintain alignment. Anchor cylinder guides at spacing needed to maintain alignment and avoid overstressing guides.

3.2.6 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 workmanship and welding operator qualification standards.

3.2.7 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.

3.2.8 Install piping above the floor, where possible. Install underground piping in casing.

3.2.9 Lubricate operating parts of systems as recommended by manufacturers.

3.2.10 Alignment: Coordinate installation of hoist way entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay installation of sills and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.

3.2.11 Leveling Tolerance: ¼**”** (6 mm), up or down, regardless of load and travel direction.

3.2.12 Set sills flush with finished floor surface at landing. Fill space under sill solidly with non-shrink, nonmetallic grout.

3.2.13 Locate hall signal equipment for elevators as follows, unless otherwise indicated:

3.2.13.1 For groups of elevators, locate hall push-button stations between two elevators at center of group or at location most convenient for approaching passengers.

3.2.13.2 Place hall lanterns either above or beside each hoist way entrance.

3.2.13.3 Mount hall lanterns at a minimum of 72**”** (1829 mm) above finished floor.

3.3 FIELD QUALITY CONTROL

3.3.1 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.

3.3.2 Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.

3.4 PROTECTION

3.4.1 Temporary Use: [**Limit temporary use for construction purposes to one elevator**]. Comply with the following requirements for [**each**] elevator used for construction purposes:

3.4.1.1 Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.

3.4.1.2 Provide strippable protective film on entrance and car doors and frames.

3.4.1.3 Provide padded wood bumpers on entrance door frames covering jambs and frame faces.

3.4.1.4 Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.

3.4.1.5 Do not load elevators beyond their rated weight capacity.

3.4.1.6 Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

3.4.1.7 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.

3.5 DEMONSTRATION

3.5.1 Engage a factory-authorized service representative to train Owner's maintenance personnel to operate [**adjust, and maintain**] elevator(s).

3.5.2 Check operation of [**each**] elevator with Owner's personnel present before date of Substantial Completion [**and again not more than one month before end of warranty period**]. Determine that operation systems and devices are functioning properly.

3.6 MAINTENANCE

3.6.1 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. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

3.6.1.1 Perform maintenance during normal working hours.

3.6.1.2 Perform emergency callback service during normal working hours with response time of [**2** hours or less.

3.6.1.3 Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of 2 hours or less.

END OF SECTION 14 24 00