SECTION 142400 - HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes hydraulic passenger elevators.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for temporary use of elevators for construction purposes.
2. Section 042000 "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
3. Section 051200 "Structural Steel Framing" for the following:

    a. Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
    b. Hoist beams.
    c. Structural-steel shapes for subsills that are part of steel frame.

4. Section 055000 "Metal Fabrications" for the following:

    a. Attachment plates and angle brackets for supporting guide-rail brackets.
    b. Divider beams.
    c. Structural-steel shapes for subsills.
    d. Pit ladders.
5. Section 096519 "Resilient Tile Flooring" for elevator cab flooring.
6. Section 099123 "Interior Painting" for field painting of hoistway walls.
7. Section 221429 "Sump Pumps" for sump pumps, sumps, and sump covers in elevator pits.
8. Section 271500 "Communications Horizontal Cabling" for telephone service for elevators.
9. Section 283111 "Digital, Addressable Fire-Alarm System" for smoke detectors in elevator lobbies to initiate emergency recall operation and for connection to elevator controllers.

1.3 DEFINITIONS

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

B. 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 ACTION SUBMITTALS

A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. 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, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment.
2. Include large-scale layout of car-control station.
3. Indicate maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.

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

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

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

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

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. 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.

D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

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

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

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

C. 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 QUALITY ASSURANCE

A. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. 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.

1.9 COORDINATION

A. 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.

B. Coordinate locations and dimensions of other work relating to hydraulic elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.

1.10 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. 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.
2. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Delaware Elevator.
2. Dover Elevator Systems.
3. KONE Inc.
4. Otis Elevator Co.
5. Schindler Elevator Corp.
6. ThyssenKrupp Elevator.

2.2 PERFORMANCE REQUIREMENTS

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

B. Accessibility Requirements: Comply with Section 407 in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

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

1. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified."
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)**].
3. Provide earthquake equipment required by ASME A17.1/CSA B44.
4. Provide seismic switch required by ASCE/SEI 7.
5. Design earthquake spectral response acceleration short period (Sds) for Project is <**Insert value**>.
6. Project's Seismic Design Category: [**A**] [**B**] [**C**] [**D**] [**E**] [**F**].
7. Elevator Component Importance Factor: [**1.5**] [**1.0**].

2.3 ELEVATORS

A. 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.

B. Elevator Description:
1. Elevator Number(s): One.
2. Type: Holeless, beside-the-car, single-acting, dual cylinder.
3. Rated Load: 3500 lb (1589 kg).
4. Freight Loading Class for Service Elevators: Class A.
5. Rated Speed: 100 fpm (0.51 m/s).
6. Operation System: Single automatic.
7. Auxiliary Operations:
   a. Standby power operation.
   b. Nuisance call cancel.
8. Security Features: [**Card-reader operation**] [**Keyswitch operation**] [**Keypad operation**] [**Car-to-lobby feature**].
9. Car Enclosures:
   a. Inside Height: 94 inches (2388 mm) to underside of ceiling.
   b. Front Walls (Return Panels): Satin stainless steel, No. 4 finish with integral car door frames.
   c. Car Fixtures: Satin stainless steel, No. 4 finish.
   d. Side and Rear Wall Panels: Plastic laminate.
   e. Reveals: Satin stainless steel, No. 4 finish.
   f. Door Faces (Interior): Satin stainless steel, No. 4 finish.
   g. Door Sills: Aluminum, mill finish.
   h. Ceiling: Satin stainless steel, No. 4 finish.
   i. Handrails: 1/2 by 2 inches (13 by 50 mm) rectangular satin stainless steel, No. 4 finish, at sides and rear of car.

j. Floor prepared to receive rubber flooring (specified in Section 096519 "Resilient Tile Flooring").

10. Hoistway Entrances:

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

11. Hall Fixtures: Satin stainless steel, No. 4 finish.
12. 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 and one complete set(s) of full-height protective pads.

2.4 SYSTEMS AND COMPONENTS

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

1. Pump shall be submersible type with submersible squirrel-cage induction motor, and shall be suspended inside oil tank from vibration isolation mounts or shall be tank-top-mounted type with fan-cooled, squirrel-cage induction motor, and shall be mounted on oil tank with vibration isolation mounts and enclosed in prime-painted steel enclosure lined with 1-inch- (25-mm-) thick, glass-fiber insulation board.
2. Motor shall have wye-delta or solid-state starting.
3. Motor shall have variable-voltage, variable-frequency control.

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

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

1. Cylinder units shall be connected with dielectric couplings.
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.

D. 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.

E. 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.

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

F. 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.

G. Car Frame and Platform: Welded steel units.

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

2.5 OPERATION SYSTEMS

A. General: Provide manufacturer's standard microprocessor operation system as required to provide type of operation indicated.

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

1. Single-Car Standby Power Operation: On activation of standby power, car is returned to a designated floor and parked with doors open. Car can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at fire command station. Manual operation causes automatic operation to cease.
2. Nuisance Call Cancel: When car calls exceed a preset number while car load is less than a predetermined weight, all car calls are canceled. Preset number of calls and predetermined weight can be adjusted.

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

1. Card-Reader Operation: System uses card readers at [**car-control stations**] [**and**] [**hall push-button stations**] to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers. [**Allow space as indicated for card reader in car**] [**Provide stripe-swipe card reader integral with each car-control station**].

   a. Security access system equipment is [**specified in Section 281300 "Access Control."**] [**not in the Contract.**]

2. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitches at [**car-control stations**] [**and**] [**hall push-button stations**]. Key is removable [**only in deactivated position**] [**in either position**].
3. Keypad Operation: Allows each landing to be restricted or unrestricted. When a restricted landing button is pressed, a "Restricted Floor" lamp lights and remains lit until landing access code has been entered into a keypad or predetermined time period has elapsed. Car calls for restricted landings do not register until landing access code is entered into keypad within predetermined time period after landing button is pressed.

   a. Access codes are programmed at each car operating panel using a security keyswitch. Keypad operation can be activated and deactivated by security keyswitch at main landing.

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

2.6 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.

B. 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

A. General: Provide [**enameled-steel car enclosures to receive removable**] [**steel-framed car enclosures with nonremovable**] wall panels, with [**removable**]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: Manufacturer's standards, but not less than the following:

1. Subfloor: Exterior, underlayment grade plywood, not less than 5/8-inch (15.9-mm) nominal thickness.
2. Floor Finish: Specified in 096519-Resilient Tile Flooring.
3. Stainless-Steel Wall Panels: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
4. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch (13-mm) fire-retardant-treated particleboard with manufacturer's standard protective edge trim. Panels have a flame-spread index of 25 or less, when tested according to ASTM E 84. Plastic-laminate color, texture, and pattern as selected by Architect from plastic-laminate manufacturer's full range.
5. Fabricate car with recesses and cutouts for signal equipment.
6. Fabricate car door frame integrally with front wall of car.
7. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
8. Sight Guards: Provide sight guards on car doors.
9. Sills: Extruded metal, with grooved surface, 1/4 inch (6.4 mm) thick.
10. Metal Ceiling: Flush panels, with low-voltage downlights in the center of each panel. Align ceiling panel joints with joints between wall panels.
11. Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.

2.8 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.

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 hour**] [**1-1/2 hours**] <**Insert rating**>[**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. Star of Life Symbol: Identify emergency elevators with star of life symbol, not less than 3 inches (76 mm) high, on both inside surfaces of hoistway door frames.
3. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
4. Sight Guards: Provide sight guards on doors matching door edges.
5. Sills: Extruded metal, 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/C 1107M.

2.9 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 recessed car-control stations. Mount in return panel adjacent to car door unless otherwise indicated.

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

C. 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.

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

D. 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.

E. 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 Section 283111 "Digital, Addressable Fire-Alarm System"

F. 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.

G. Hall Push-Button Stations: Provide one hall push-button station at each landing.

1. Provideunits with flat faceplate for mounting with body of unit recessed in wall.
2. Equip units with buttons for calling elevator and for indicating applicable direction of travel.

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

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

I. 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.

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

J. Hall Position Indicators: Provide illuminated, digital-display-type position indicators, located above hoistway entrance at ground floor. Provide units with flat faceplate for mounting and with body of unit recessed in wall.

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

K. 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.**]

L. 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.

M. 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

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

B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.

C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.

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

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

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

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

H. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGS for flat applications.

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 of the Work. Verify critical dimensions and examine supporting structure and other conditions under which elevator work is to be installed.

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

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

3.2 INSTALLATION

A. 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.

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 workmanship and welding operator qualification standards.

C. 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.

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

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 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.

G. Leveling Tolerance: 1/4 inch (6 mm), up or down, regardless of load and travel direction.

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

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

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

3.3 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.

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

3.4 PROTECTION

A. Temporary Use: 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 strippable protective film on entrance and car doors and frames.
3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
5. Do not load elevators beyond their rated weight capacity.
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.
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

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate elevator(s).

B. Check operation of 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

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 24 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.

1. Perform maintenance during normal working hours.
2. Perform emergency callback service during normal working hours with response time of two hours or less.

END OF SECTION 142400