SECTION 142123 - TRACTION ELEVATORS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Electric Traction Elevators for subject project. **Reference attached document at end of section for additional Otis Elevator requirements.**

B. Products Supplied But Not Installed Under this Section:
   1. Hoist Beam

C. Work Supplied Under Other Sections:
   1. Temporary lighting, including temporary lighting in hoistway for machine space with switch located in hoistway on the strike jamb side of top landing door.
   2. Hoistway ventilation shall be in accordance with local and national building code requirements.
   3. Guide Rail Support shall be structurally adequate to extend from pit floor to top of hoistway, with spans in accordance with requirements of authority having jurisdiction and final layouts.
   4. Removable barricades at all hoistway openings, in compliance with OSHA 29 CFR 1926.502 in addition to any local code requirements.
   5. Lifeline attachments capable of withstanding 5000 lb load in accordance with OSHA 29 CFR 1926.502. Provide a minimum of 2 at the top, front of each hoistway.
   6. Pit lighting: Fixture with switch and guards. Provide illumination level equal to or greater than that required by ASME A17.1/CSA B44 2000, or applicable version.
   7. Control space lighting with switch. Coordinate switch with lighting for machine space as allowable by code.
   8. Access Doors: As required for access to governor. Access door shall be self-closing, self-locking if necessary and operable from the inside without a key.

D. Related sections:
   1. Section - Temporary Facilities and Controls
   2. Section - Cast-in-Place Concrete:
   3. Section - Unit Masonry
   4. Section - Metal Fabrications
   5. Section - Crystalline Waterproofing
   6. Section - Heating, Ventilating, and Air Conditioning
   7. Section - Electrical
   8. Section - Fire Detection and Alarm
   9. Section - Earthwork

E. Industry and government standards:
   1. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
   2. ADAAG - Accessibility Guidelines for Buildings and Facilities
   3. ANSI/NFPA 70, National Electrical Code

4. ANSI/NFPA 80, Standard for Fire Doors and Fire Windows
5. ASME/ANSI A17.1, Safety Code for Elevators and Escalators.

1.02 DESCRIPTION OF ELEVATORS

A. Elevator #1
Passenger / Service

Elevator Type	Machine roomless (Otis "Gen2" or sim) front & rear opening
Quantity	1
Capacity / Speed	3500 lbs @ 350 fpm
Stops / Openings	14 Stops - 13 Front w/ 1 Rear

B. Elevator #2
Passenger / Service

Elevator Type	Machine roomless (Otis "Gen2"or sim) front & rear opening
Quantity	1
Capacity / Speed	4000 lbs @ 350 fpm
Stops / Openings	14 Stops - 12 Front w/ 3 Rear

C. Elevator #3
Passenger / Service

Elevator Type	Machine roomless (Otis "Gen2" or sim) front & rear opening
Quantity	1
Capacity / Speed	3500 lbs @ 350 fpm
Stops / Openings	14 Stops – 13 Front w/ 2 Rear (Level 12 front & rear)

D. Main Power Supply: 480 Volts + 10% of normal, 3 Phase, with a separate equipment grounding conductor.
E. Operation: Simplex
F. Machine Location: Inside the hoistway mounted on car guide rail
G. Control Space Location: Adjacent to hoistway.
H. Maintenance Service Period: 12 Months

1.03 PERFORMANCE REQUIREMENTS

A. Car Performance
1. Car Speed ± 5% of contract speed under any loading condition or direction of travel.
2. Car Capacity: Safely lower, stop and hold (per code) up to 125% of rated load.

B. System Performance
1. Vertical Vibration (maximum): 15-17 mg
2. Horizontal Vibration (maximum): 10-12 mg
3. Jerk Rate (maximum): 3.3 - 5.25 ft/sec^3
4. Acceleration (maximum) 1.6 - 2.6ft/sec^2
5. In Car Noise: = 55 dB(A)
6. Leveling Accuracy: ± 3 mm
7. Starts per hour (maximum): 240

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's product literature for each proposed system.
   1. Cab design, dimension and layout.
   2. Finishes, accessories and available options.
   3. Controls, signals and operating system.
   4. Color selection charts for cab and entrances

B. Shop Drawings:
   1. Clearances and travel of car.
   2. Clear inside hoistway and pit dimensions.
   3. Location and layout of equipment and signals
   4. Car, guide rails, buffers and other components in hoistway.
   5. Maximum rail bracket spacing.
   6. Maximum loads imposed on building structure.
   7. Hoist beam requirements
   8. Location and sizes of access doors
   9. Location and details of hoistway door and frames
   10. Electrical characteristics and connection requirements

C. Closeout Submittals:
   1. Manufacturer's operation and maintenance manuals.
   2. Inspection Certificates and Permits.
   3. Manufacturer Warranty

1.05 QUALITY ASSURANCE

A. Manufacturer: Shall have a minimum of 10 years experience in the fabrication, installation and service of elevators. Manufacturer shall and have a documented quality assurance program

B. Installer: The elevator equipment manufacturer shall install the elevator.

C. Inspection and Testing: In accordance with requirements of local jurisdiction, obtain required permits, inspections and tests.

1.06 DELIVERY, STORAGE AND HANDLING

A. If the construction site is not prepared to receive the elevator equipment at the agreed upon ship date, the General Contractor shall be responsible to provide a safe, dry and easily accessible storage area on or off the premises. Additional labor costs for double handling will be the responsibility of the general contractor.

B. Delivered elevator materials shall be stored in a protected environment in accordance with manufacturer recommendations including. Minimum storage area of 10 feet by 20 feet per elevator is required adjacent to hoistway.

1.07 WARRANTY

A. Provide Manufacturer warranty for a period of one year. Warranty period to begin upon elevator final acceptance. Warranty covers defects in materials and workmanship. Damage due to ordinary use, vandalism, improper or insufficient maintenance, misuse, or neglect do not constitute defective material or workmanship.

1.8 MAINTENANCE SERVICE

A. The elevator manufacturer shall provide maintenance service consisting of examinations and adjustments of the elevator equipment for a period of 12 Months after date of elevator final acceptance. Replacement parts shall be produced by the original equipment manufacturer.

B. Maintenance service be performed during regular working hours of regular working days and shall include regular time call back service.

C. Maintenance service shall not include adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents.

D. Temporary Use: Temporary use for the elevator if required shall be in accordance with terms and conditions of the elevator contractors temporary use agreement.

PART 2 – PRODUCTS

2.01 MANUFACTURER

A. Provide AC gearless machine room-less elevator systems subject to compliance with the design and performance requirements of this specification. Elevator manufacturers may include but are not limited to one of the following:

1. Basis of Design: Otis Elevator Co. – Gen2 TM Product

2.02 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

A. Controller:

1. Provide microprocessor-based control system with AC Drive to perform the functions of safe elevator motion. Included shall be all of the hardware required to connect, transfer and interrupt power, and to protect the motor against overloading. The system shall also perform car and duplex operational control.

2. Each controller cabinet containing memory equipment shall be properly shielded from line pollution. The microcomputer system shall be designed to accept reprogramming with minimum system down time.

3. All high voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.

B. Auto-transformer: Provide auto-transformer to adjust the main-line supply to the 400V required by the controller and drive

C. Drive: Provide Variable Voltage Variable Frequency drive system to develop high starting torque with low staring current.

D. Controller Location: Adjacent to hoistway.

2.03 EQUIPMENT: HOISTWAY COMPONENTS

A. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical disc brakes and integral traction drive sheave, mounted to the car guide rail at the top of the hoistway.

B. Governor: Friction type over-speed governor rated for the duty of the elevator specified.

C. Buffers: Car and Counterweight

D. Hoistway Operating Devices:
   1. Emergency stop switch in the pit
   2. Terminal stopping switches
   3. Emergency stop switch on the machine

E. Positioning System: System consisting of magnets and proximity switches
F. Guide Rails and Attachments: Steel rails with brackets and fasteners.

2.04 EQUIPMENT: HOISTWAY ENTRANCES

A. Hoistway Entrances
   1. Frames: 16 gage sheet steel, bolted construction.
   2. Typical Sill Entrance Finish Aluminum.
   3. Lobby Sill Finish Aluminum.
   4. Doors: Hollow metal construction with vertical internal channel reinforcements.
   5. Fire Rating: Entrance and doors shall be UL fire-rated for 1-1/2 hour.
   6. Typical Entrance Finish: Brushed Stainless Steel.
   7. Lobby Finish: Brushed Stainless Steel.
   8. Entrance Markings Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors.
   9. Plate mounting: Refer to manufacturer drawings.

2.05 EQUIPMENT CAR COMPONENTS

A. Car Frame: Provide care frame with adequate bracing to support the platform and car enclosure.
B. Car Safties: Device will be provided and mounted under the car platform, securely bolted to the Car Frame. The safety will be actuated by a centrifugal governor mounted at the top of the hoistway. The Safety is designed to operate in case the car attains excessive descending speed.
C. Platform, Heavy Loading Type: The car platform shall be arranged to accommodate one-piece loads weighing up to 25% of the rated capacity.
D. Car Guides shall be provided and mounted to the top and bottom of both the car and counterweight frame. Each roller guide assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with seismic design requirements
E. Canopy: Reinforced 16-gauge milled steel. White baked enamel finish standard.
F. Cab: 14 Gauge, Black.
   1. Panels: Manufacturer’s standard plastic laminated panels.
   2. Base Board: As selected by Owner from manufacturer’s standard handrails.
   3. Ceiling and Lighting:
      a. Manufacturer’s standard six-panel, brushed stainless steel ceiling with one recessed light in each panel.
   4. Handrail
      a. As selected by Owner from manufacturer’s standard handrails.
   5. Flooring: By others Total thickness of flooring, including substrate, shall not exceed ½ inch depth, and finished flooring weight may not exceed 2 lbs per sq ft .
   6. Threshold: Aluminum

7. Provide electrical contact on the car-top exit.

G. Emergency Car Signals
1. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.
2. Emergency Car Lighting: Provide emergency power unit employing a 12-volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of building power failure.

H. Ventilation: Fan.

2.06 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

A. Car Operating Panel: Provide car operating panel with all push buttons, key switches, and message indicators for elevator operation. Fixture finish to be: Brushed Stainless Steel
1. Integral car operating panel shall contain a bank of round, mechanical, illuminated buttons marked to correspond to landings served, emergency call button, door open button, door close button, and key switches for lights, inspection, and exhaust fan. Buttons have amber illumination (halo) and shall be {flat flush / ¼ inch projecting targets}. All buttons to have raised text and Braille marking on left hand side. The car operating display panel shall be amber DOT-matrix. All texts, when illuminated, shall be amber. The car operating panel shall have a brushed stainless steel finish.
2. Additional features of car operating panel shall include:
a. Car Position Indicator within operating panel (amber).
b. Elevator Data Plate marked with elevator capacity and car number on car top.
c. Help button markings with raised markings.
d. In car stop switch per local code.
e. Firefighter"s hat.
f. Firefighter"s Phase II Key-switch.
g. Call Cancel Button.
h. Emergency Two Way Communication Device.
i. Independant Serivce.
j. Firefighter"s Phase II emergency in-car operating instructions.

B. Hall Fixtures: Wall mounted hall fixtures shall be provided with nescessary push buttons and key switches for elevator operation.
1. Hall fixtures shall feature round, mechanical, illuminated buttons in raised fixture housings. Hall fixtures shall correspond to options available from that landing.

C. Emergency Two Way Communication Device: A Emergency Two Way Communication device shall be furnished in the car-operating panel. Necessary wires for the device shall be included and connected to the car traveling cable.
   1. Provide ADA compliant communication device. Communications equipment and connections to the building service system shall be furnished and installed by others.}

D. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound. The chime will sound once for up and twice for down.

E. Hall Position Indicator located at Lobby.

2.07 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER:

A. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

B. Car Operating Features
   1. Fan/Light Switch
   2. Car-Stall Protection
   3. Firefighters' Service Phase I and Phase II (US only) Special Emergency Service Phase I and II - Emergency Recall OR Special Emergency Service Phase I and II - Emergency Recall and In-Car Emergency Operation.
   4. Ascending Car uncontrolled Movement Protection.
   5. Access key-switch at top floor in entrance jamb.
   6. Access key-switch at lowest floor in entrance jamb.
   7. Top of Car Inspection Station
   8. Center Doors Operation
   9. Load Weight Bypass
   10. Independent Service
   11. Provisions for Card Reader in Car (reader provided and installed by others)
   12. Emergency Backup Generator Operation

C. Elevator Control System for Inspections and Emergency
   1. Provide devices within controller to run the elevator in inspection operation.
   2. Provide devices on car top to run the elevator in inspection operation.
   3. Provide within controller an emergency stop switch to disconnect power from the brake and prevents motor from running.
   4. Provide the means from the controller to mechanically lift and control the elevator brake to safely bring car to nearest available landing when power is interrupted.
   5. Provide the means from the controller to reset the governor over speed switch and also trip the governor.
   6. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.

2.08 EQUIPMENT: DOOR OPERATOR EQUIPMENT

A. Door Operator: A closed loop permanent magnet PWM high-performance door operator shall be provided to open and close the car and hoistway doors simultaneously. Door movement shall be cushioned at both limits of travel. Electro-mechanical interlock shall be provided at each hoistway entrance to prevent operation of the elevator unless all doors are closed and locked. An electric contact shall be provided on the car at each car entrance to prevent the operation of the elevator unless the car door is closed.

B. The door operator shall be arranged so that, in case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Emergency devices and keys for opening doors from the landing shall be provided as required by the local code.

C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. A door open button shall be provided in the car. Momentary pressing of this button shall reopen the doors and reset the time interval.

D. Door hangers and tracks shall be provided for each car and hoistway door. Tracks shall be contoured to match the hanger sheaves. The hangers shall be designed for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed-for-life bearings.

E. Electronic Door Safety Device. The elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door opening.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Field measure and examine substrates, supports, and other conditions under which elevator work is to be performed.

B. Do not proceed with work until unsatisfactory conditions are corrected

C. Prior to start of Work, verify hoistway is in accordance with shop drawings. Dimensional tolerance of hoistway from shop drawings: -0 inches +2 inches. Do not begin work of this section until dimensions are within tolerances.

D. Prior to start of Work, verify projections greater then 2 inches (4 inches if ASME A17.1/CSA B44 2000 applies) must be beveled not less then 75 degrees from horizontal.

E. Prior to start of Work, verify landings have been prepared for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.

F. Prior to start of Work, verify elevator pit has been constructed in accordance with requirements, is dry and reinforced to sustain vertical forces, as indicated in approved submittal.

1. Verify that sumps or sump pumps located within pit will not interfere with installed elevator equipment.

G. Prior to start of Work, verify control space has been constructed in accordance with requirements, with access coordinated with elevator shop drawings, including:
   1. Sleeves and penetrations

H. Verify installation of GFCI protected 15-amp in pit and adjacent to each signal control cabinet in control space.

3.02 PREPARATION

A. Coordinate installation of anchors, bearing plates, brackets and other related accessories

3.03 INSTALLATION

A. Install equipment, guides, controls, car and accessories in accordance with manufacturer installation methods and recommended practices.
B. Properly locate guide rails and related supports at locations in accordance with manufacturer's recommendations and approved shop drawings. Anchor to building structure using isolation system to minimize transmission of vibration to structure.
C. All hoistway frames shall be securely fastened to fixing angles mounted in the hoistway. Coordinate installation of sills and frames with other trades.
D. Lubricate operating system components in accordance with manufacturer recommendations.
E. Perform final adjustments, and necessary service prior to substantial completion

3.04 CONSTRUCTION

A. Interface with Other Work:
   1. Guide rail brackets attached to steel shall be installed prior to application of fireproofing.
   2. Coordinate construction of entrance walls with installation of door frames and sills. Maintain front wall opening until elevator equipment has been installed.
      a. Ensure adequate support for entrance attachment points at all landings.
   3. Coordinate wall openings for hall push buttons, signal fixtures and sleeves. Each elevator requires sleeves within the hoistway wall.
   4. Coordinate emergency power transfer switch and power change pending signals as required for termination at the primary elevator signal control cabinet in each group.
   5. Coordinate interface of elevators and fire alarm system.
   6. Coordinate interface of dedicated telephone line.

3.05 TESTING AND INSPECTIONS

A. Perform recommended and required testing in accordance with authority having jurisdiction.
B. Obtain required permits and provide originals to Owner's Representative.

3.06 DEMONSTRATION

A. Prior to substantial completion, instruct Owner's Representative on the proper function and required daily maintenance of elevators. Instruct personnel on emergency procedures

END OF SECTION

Scope of: Elevator #1 - Unit 1 -F7N21682

Code Compliance
All applicable local, state and national codes ANSI A17.1, Houston local code and A.D.A.
Seismic Zone 0

Maintenance
12 months after acceptance of elevator by owner
including emergency callback service during normal working hours.

Scope of: Elevator #2 - Unit 1 -F7N21682

Code Compliance
All applicable local, state and national codes ANSI A17.1, Houston local code and A.D.A.
Seismic Zone 0

Maintenance
12 months after acceptance of elevator by owner
including emergency callback service during normal working hours.

Scope of: Elevator #3 - Unit 1 -F7N21682

Code Compliance
All applicable local, state and national codes ANSI A17.1, Houston local code and A.D.A.
Seismic Zone 0

Maintenance
12 months after acceptance of elevator by owner
including emergency callback service during normal working hours.