SECTION 142100 - ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Electric Traction Elevators.

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

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: Install access door provided by elevator contractor.
9. Install hoist and safety beams provided by elevator contractor.

D. 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.

E. DESCRIPTION OF ELEVATOR
1. Quantity of Elevators: 1
2. Landings: 3
3. Openings: 3 Front Openings, 0 Back Openings
4. Travel: 23'-4"
5. Rated Capacity: 4000 lbs Service shape
6. Rated Speed: 150 fpm
7. Clear Inside Dimensions (W x D): 5'-6 13/16" x 7'-7 7/16"
8. Cab Height: 8'-0"
9. Clear height under suspended ceiling: 7'-7"
10. Entrance Width & Type: 4'-0" & Right Opening
11. Entrance Height: 7'-0"
12. Main Power Supply: 480 Volts + 5%, three-phase
13. Operation: Simplex
14. Machine Location: Inside the hoistway mounted on car guide rail
15. Control Space Location: Remote Closet
16. Elevator Equipment shall conform to the requirements of seismic zone: Non-Seismic
17. Maintenance Service Period: 12 Months

1.2 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): 25 mg
2. Horizontal Vibration (maximum): 25 mg
3. Jerk Rate (maximum): 1.3 ft/sec3
4. Acceleration (maximum) 1.3 ft/sec2
5. In Car Noise: = 55 dB(A)
6. Leveling Accuracy: ±0.2 inches
7. Starts per hour (maximum): 120

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product literature for each proposed system.
1. Cab design, dimensions and layout.
2. Layout, finishes, and 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. Operation and maintenance data: Provide manufacturer's standard maintenance and operation manual.

1.4 QUALITY ASSURANCE

A. Manufacturer: Minimum of ten years experience in the fabrication, installation and service of elevators of the type and performance of the specified. The manufacturer shall have a documented quality assurance program.

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

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

D. The elevator equipment must be non proprietary and have total on board diagnostics. Any special tools, computers or trouble shooting equipment required to properly service, repair, change parameters on the elevator must be provided and left as part of the elevator installation.

1.5 DELIVERY, STORAGE AND HANDLING

A. If the construction site is not prepared to receive the elevator equipment at the agreed ship date, the General Contractor shall be responsible to provide a safe, dry, and easily accessible storage area on or off the premises. Additional lablor 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. A minimum storage area of 10 feet by 20 feet is required adjacent to the hoistway.

1.6 WARRANTY

A. Provide manufacturer warranty for a period of one year. The warranty period is to begin upon Substantial Completion of the Contract. 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.

1.7 MAINTENANCE SERVICE

A. The elevator manufacturer shall provide maintenance service consisting of regular examinations and adjustments of the elevator equipment for a period of 12 Months after date of substantial completion. 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.

PART 2 - PRODUCTS

2.1 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: EcoSpace™ traction elevators by KONE, Inc. (www.kone.com).
   2. ThyssenKrupp, Synergy
   3. Otis Elevator, Gen2

1.2 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

A. Controller: Provide microcomputer based control system to perform all of the functions.
   1. 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.
   2. Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed and physically segregated from the rest of the controller.
   3. Provide a serial cardrack and main CPU board containing a non-erasable EPROM and operating system firmware.
   4. Variable field parameters and adjustments shall be contained in a non-volatile memory module.

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

C. Controller Location: Within 100'-0" (30.48m) Controller(s) shall be located in a remote cabinet or room within 140"-0" (42.6 m) wire feet of the elevator machine.

1.3 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: Polyurethane buffer.

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.

G. Provide access door, access ladders, work platforms, hoist and safety beams.

1.4 EQUIPMENT: HOISTWAY ENTRANCES

A. Sills: extruded.

B. Doors: Hollow metal construction with vertical internal channel reinforcements.

C. Fire Rating: Entrance and doors shall be UL fire-rated for 1-1/2 hour.

D. Entrance Finish: Painted Finish, per manufacturers standard selection.

E. Entrance Markings Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Plate Mounting: Refer to manufacturer drawings.

1.5 EQUIPMENT: CAR COMPONENTS

A. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.

B. Platform: Platform shall be per manufacturers standard.

C. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide-shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.

D. Load weighing device shall be strain gauge type mounted to dead-end hitch attached atop the hoistway guide-rail.

E. Steel Cab

1. Panels: Non-removable vertical panels, plastic laminate selected from standard manufacturer's catalog of choices.
2. Car Front Finish: Brushed stainless steel.
3. Car Door Finish: Brushed stainless steel.
4. Ceiling: Standard Translucent Panels - LF-1: Polygal Translucent three panel suspended ceiling with T-5 Fluorescent lighting and Brushed Aluminum frame.
5. Handrail: Round tube brushed aluminum - 1.5 in. Rails to be located on Back Wall and Side Walls - Front opening only of car enclosure.
6. Flooring: By others. (Not to exceed 1/2" finished depth.)
7. Threshold: Aluminum

F. 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.
3. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.

G. Ventilation: Fan.

1.6 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.
1. Full height 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). All buttons to have raised text and Braille marking on left hand side. The car operating display panel shall be amber 7 Segment. All texts, when illuminated, shall be amber. The full height car operating panel shall have a polycarbonate face plate that is shatterproof and impact resistant in a color and pattern per manufacturers standard selection.
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 buttons 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. Pre-programmed integrated ADA phone (complete description of krms features included as standard)
   i. Help Button/Communicator. Activation of help button will initiate two-way communication between car and a location inside the building, switching over to alternate location if call is unanswered, where personnel are available to take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
   j. Firefighter's Phase II emergency in-car operating instructions.
   k. Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.

B. Hall Fixtures: Wall mounted hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Wall mounted hall fixtures shall have a polycarbonate face plate that is shatterproof and impact resistant in a color per manufacturers standard selection.
   1. Hall fixtures shall feature round, mechanical, illuminated buttons in raised fixture housings. Hall fixtures shall correspond to options available from that landing. Buttons shall be flat flush in vertically mounted fixture. Hall fixtures should not be jamb-mounted. Hall lanterns shall feature amber illumination.

C. 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.

1.7 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER

A. Elevator Operation
   1. 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.
   2. Zoned Car Parking.
   3. Relative System Response Dispatching.

B. Standard Operating Features to include:
   1. Full Collective Operation
   2. Fan and Light Control.
   3. Load Weighing Bypass.
   4. Ascending Car Uncontrolled Movement Protection
   5. Top of Car Inspection Station.

C. Additional Operating Features to include:
   1. Independent Service.
   2. Hoistway Access Top Landing

D. 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.
   7. Provide the means for the control to reset elevator earthquake operation.

1.8 EQUIPMENT: DOOR OPERATOR AND CONTROL

A. Door Operator: A closed loop permanent magnet VVVF 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 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

3.1 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. 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 Sleeves and penetrations.

H. Verify installation of GFCI protected 20-amp in pit and adjacent to each signal control cabinet in control space.

3.2 PREPARATION

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

3.3 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.

3.4 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.
      b. Coordinate wall openings for hall push buttons, signal fixtures and sleeves. Each elevator requires sleeves within the hoistway wall.
      c. Coordinate emergency power transfer switch and power change pending signals as required for termination at the primary elevator signal control cabinet in each group.
      d. Coordinate interface of elevators and fire alarm system.
      e. Coordinate interface of dedicated telephone line.

3.5 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.

3.6 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 142133

SECTION 142400 - HYDRAULIC ELEVATOR REPAIR

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Shop Drawings.
   1. Submit operation and maintenance data to include in emergency, operation, and maintenance manuals.

B. Regulatory Requirements: Comply with ASME A17.1.

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

D. Fire-Rated Hoistway Entrance Assemblies: Labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, based on testing at neutral pressure per NFPA 252.

E. Maintenance: Beginning at Substantial Completion, provide one year's full maintenance service. Include monthly preventive maintenance, repair, or replacement of worn or defective components, lubrication, cleaning, and adjusting.

1.2 SCOPE OF WORK

A. Provide the following equipment to Modernize the existing West Wing Elevator (2000#).
   1. New microprocessor controller, with new elevator positioning system
   2. New hoistway limit switches and leveling devices
   3. New car top inspection station & pit switch
   4. New machine room & hoistway wiring, traveling cable & duct
   5. New ADA car and hall push button stations, car lantern, car position indicator, fire service features and ADA telephone
   6. New submersible power unit, oil, piping and required accessories
   7. New double bottom hydraulic jack cylinder with PVC protection liner
   8. New pit channels and spring buffers
   9. New car top handrail as required
   10. New power door operator, gate switch, clutch with restrictor, interlocks, closers, and door drives
   11. New car door hangers and tracks
   12. New stainless steel car door panel
   13. New electronic door edge (Curtain of Light)
   14. Locate the new machine and controller in the new machine room location at the side of the hoistway on the bottom floor
   15. Provide new hoistway door hanger rollers as required
   16. Provide new rollers for the existing car roller guides
   17. Cover the existing car operating panel and hall button stations with stainless steel plates
   18. Retain the existing cab, carframe and platform
   19. Provide new ADA Braille tags for all hoistway entrance frames
   20. Provide a new layout drawing for the new elevator machine room which will be required for the permit to be provided by the elevator contractor
   21. Perform all required acceptance and safety tests required by the State of Ohio

22. During replacement of the existing hydraulic cylinder if the hole caves in or has to be made deeper or wider or the cylinder is incased in concrete, that work will be performed on a time and material basis.
23. All new elevator equipment to comply with the current ANSI A.17 Code
24. Retain existing capacity 2000#, speed 125 fpm and travel.

B. All work shall be between the hours of 7:30 am to 4:30 pm Monday-Friday.

C. Provide 12 months new installation service during regular working hours from date of final acceptance.

D. Work Supplied Under Other Sections.
1. Clean and paint the elevator pit walls and floor, clean all rust from steel components in the pit and paint with a rust inhibitor paint.
2. Proper lighting in the pit and new machine room.
3. A code compliant pit ladder extending 42" above the bottom floor.
4. A steel cover over the existing sump pump hole.
5. A dedicated non-GFI outlet for the sump pump.
6. Proper access and floor space adjacent to the elevator hoistway for storage of material.
7. Dumpster for placing all removed elevator material and packaging.
8. Code compliant barricades at each hoistway entrance at all floors.
9. Proper smoke detectors.
10. Code compliant machine room.
11. New cab flooring and lights if required.
12. Protection and refinishing of existing elevator hoistway doors and frames at all three floors.

E. Prohibited use: Elevator shall not be used for temporary service or contractors use during the construction period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Replacement products & parts capable of working with the existing elevator installation from the following manufacturers:
1. KONE, Inc.
2. ThyssenKrupp.
3. Otis Elevator.
4. Or Approved Equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install new microprocessor controller, with new elevator positioning system in new elevator machine room.

B. Install new hoistway limit switches and leveling devices.

C. Install new car top inspection station & pit switch.

D. Install hoistway wiring, traveling cable & duct

E. Install new ADA car and hall push button stations, car lantern, car position indicator, fire service features and ADA telephone.

F. Install new submersible power unit, oil, piping and required accessories.

G. Block up elevator cab to gain access to pit. Remove existing hydraulic jack cylinder.

H. Delete option in first paragraph below if authorities having jurisdiction require a well casing with annular space left empty.

I. Install new cylinder in PVC protection liner within well holes or casings after removing water and debris. Align cylinder and fill void space with fine sand.

J. Install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor. Seal between protective casing and pit floor with 4 inches of nonshrink, nonmetallic grout.

K. Install new pit channels and spring buffers.

L. Install new car top handrail as required.

M. Install new power door operator, gate switch, clutch with restrictor, interlocks, closers, and door drives.

N. Install new car door hangers and tracks.

O. Install new stainless steel car door panel.

P. Install new electronic door edge (Curtain of Light).

Q. Install new hoistway door hanger rollers as required.

R. Install new rollers for the existing car roller guides.

S. Cover the existing car operating panel and hall button stations with stainless steel plates.

T. Install new ADA Braille tags for all hoistway entrance frames

U. Retain first paragraph below if using aboveground cylinders.

V. Install piping above the floor, where possible. Where not possible, install underground piping in Schedule 40 PVC pipe casing assembled with solvent-cemented fittings.

W. Adjust elevators for 1/4-inch leveling tolerance.

X. On completion of elevator installation and before permitting use (either temporary or permanent) of elevators, perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.

END OF SECTION 142400