

SECTION 14 21 200
ELECTRIC TRACTION ELEVATORS – PASSENGER

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Electric traction passenger elevator system
 - 1. Commercial standard electric traction passenger elevators.
 - 2. Elevator car enclosures, signal equipment, hoist-way entrances including doors and frames.
 - 3. Operation and control systems.
 - 4. Accessibility provisions for physically disabled persons.
 - 5. Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated speed and capacity.
 - 6. Materials and accessories as required for a complete working elevator installation to meet this specification and all applicable Codes.

1.2 RELATED SECTIONS

- A. 01 50 00 Temporary Construction Facilities: Temporary enclosures or other protection from open hoist ways during the elevator(s) installation.
- B. 03 30 00 Cast-in-Place Concrete: Elevator pit, motor, pump, equipment supports and foundations.
- C. 04 20 00 Masonry Unit: Hoist way enclosure, building-in and grouting hoist way doorframes, and grouting thresholds.
- D. 05 50 00 Metal Fabrications: Hoist beams, pit ladders, steel framing, auxiliary support steel, divider beams for supporting guide-rail brackets, steel angle sill supports, and miscellaneous steel required for proper installation of elevator.
- E. 07 14 00 Fluid Applied Waterproofing: Waterproof pit and hoist way as required.
- F. 09 65 00 Resilient Flooring: Finishing floor covering for elevator cab.
- G. 09 90 00 Painting:
- H. 23 00 00 Heating, Ventilation, and Air Conditioning
- I. 26 00 00 Electrical
- J. 26 30 00 Electrical Power Generating and Storing Equipment
 - 1. Provide electrical service for elevator, hoist way, and equipment.
 - a. Provide dry and isolated contact set and wiring between elevator controller and disconnect, Auxiliary contact closed when disconnect switch is in ON position and open when in OFF position.
 - b. Provide wiring and power to controller for cab lighting and ventilation.
 - 2. Provide wiring for interconnection of elevator control system to fire alarm and security system, emergency communication to elevator controller, and heat and smoke sensing devices per ASME A17.1.
 - 3. On all elevator pits:
 - a. Provide pump, float switch in the elevator sump pit connected to the Energy Management System (EMS).
 - i) Connect the pump to an oil separator and discharge water indirectly to the sanitary system.
 - ii) The EMS shall monitor the pump, if the pump fails send an alarm to the EMS monitoring station to notify operator of the pump failure.
 - b. General contractor shall coordinate the installation of the float switch raceway system.
 - c. General contractor shall coordinate with the elevator inspector.

- K. 27 30 00 Voice Communications
- L. 28 31 00 Fire Detection and Alarm
- M. 31 00 00 Earthwork

1.3 REFERENCES

- A. ASME A17.1 - Safety Code for Elevators and Escalators
- B. FBC - Florida Building Code
- C. FFPC – Florida Fire Prevention Code
- D. FFPC - Florida Fire Protection Code
- E. NEC - National Electrical Code (NFPA 70)
- F. NFPA 80 – Standard for Fire Doors and Fire Windows
- G. UL Underwriters Laboratories 10B Fire Test of Door Assemblies

1.4 QUALITY ASSURANCE

- A. Manufacturer: minimum of fifteen years of experience in the fabrication, installation and service of the elevator(s) of the type and performance specified. The manufacture 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.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver elevator materials, components, and equipment in manufacturer's original packaging.
- B. Protect and store materials and equipment in accordance with the manufacturer's requirements.

1.6 SUBMITTALS

- A. Product data: When requested, submit product data for the following:
 - 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. Locations and size of access door(s).
 - 9. Location and details of hoistway door and frames.
 - 10. Electrical characteristics and connection requirements.
- C. Color selection: Submit color charts of exposed finishes and materials for color selection.
 - 1. When requested, submit samples of exposed finishes and materials selected for the elevator system materials and components.
- D. Certificates: Inspection and acceptance certificates of elevator system installation.
- E. Operation and maintenance data. Include the following:
 - 1. Provide manufacturer's standard maintenance and operation manual.
 - 2. Parts list, with recommended parts inventory.
- F. Provide two copies of "as-built" plans, to have same detail as the shop drawings.

1. One placed in secure location in the elevator equipment room, other to Building Department.
- G. Diagnostic Tools
1. Prior to seeking final acceptance for the completed project as specified in the Contract Documents, the Elevator Contractor shall deliver to the Owner any specialized tool(s) that may be required to perform diagnostic evaluations, adjustments, and/or parametric software changes and /or test and inspections on any piece of control or monitoring equipment installed.
 2. This shall include any specialized tool(s) required for monitoring, inspection and /or maintenance where the means of suspension other than conventional wire ropes are furnished and installed by the Elevator Contractor. Any and all such tool(s) shall become property of the Owner. Any diagnostic tool provided to the Owner by the Elevator Contractor shall be configured to perform all levels of diagnostics, systems adjustments and parametric software changes which are available to the Elevator Contractor.
 3. In those cases where diagnostic tools provided to the Owner require periodic recalibration/or re-initiation, the Elevator Contractor shall perform such tasks at no additional cost to the Owner for a period equal to the term of maintenance agreement from the date of final acceptance of the completed project. During those intervals in which the Owner might find it necessary to surrender a diagnostic tool for re-calibration, re-initiation, or repair, the Elevator Contractor shall provide a temporary replacement for the tool at no additional cost to the Owner.
 4. The Elevator Contractor shall deliver to the Owner, printed instructions for the proper use of any tool that may be necessary to perform diagnostic evaluations, system adjustment, and /or parametric software changes on any unit of microprocessor-based elevator control equipment and means of suspension other than standard elevator steel cables furnished and installed by the Elevator Contractor. Accompanying the printed instructions shall be any and all access codes, password(s), or other proprietary information that is necessary to interface with the microprocessor-control equipment.

1.7 MAINTENANCE

- A. The elevator contractor shall furnish maintenance and call back service for a period of 12 months on each elevator after final acceptance.
 1. This service consists of periodic examinations of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevator in proper operations, as required by the manufacturer's specifications.
 2. Trained employees of the elevator contractor shall do all work during regular working hours of the trade.
- B. Include parts catalog and show evidence of local parts inventory with complete list of recommended spare parts.
 1. Use parts produced by manufacturer of original equipment.
- C. Show evidence of bidder's insurance coverage, certificate of insurance outlining limits of liability.
- D. 24-hour minor emergency repair call back service shall be included.

1.8 WARRANTY

- A. The elevator manufacturer warrant shall cover the equipment installed under these specifications against defects in materials and workmanship and any defects not due to ordinary wear or tear or improper use or care for 5-years from the date of Substantial Completion.
- B. Substantial Completion includes the elevator (s) passing an inspection by the State of Florida, and placed in operation.

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 the following;
 - 1. Basis of Design: MonoSpace (trademark) 300 traction elevators by KONE, Inc. (www.kone.com).
 - 2. Other acceptable machine room-less products: manufacturer with a minimum of 15 years of experience in the manufacturing, installation, and servicing elevators of the type required for the project.

2.2 ELEVATOR DESCRIPTION

- A. Elevator Minimum Requirements:
 - 1. Quantity: As shown on the plans.
 - 2. Landings: As shown on the plans
 - 3. Rated capacity: 3,500 lbs
 - 4. Elevator equipment: MonoSpace (registered trademark) 300 gearless traction elevator
 - 5. Equipment control: KCM831
 - 6. Drive: Non - regenerative
 - 7. Clear inside dimensions: (WxH) 6'-5 11/16" x 5'-6 11/16"
 - 8. Cab height: 7'-6"
 - 9. Entrance Size:
 - a. Height: 7'-0"
 - b. Width: 3'-6"
 - 10. Speed: 100 fpm.
 - 11. Net Elevator Travel: As per plans.
 - 12. Openings:
 - a. Front: As per plans.
 - b. Rear: As per plans.
 - 13. Door Type: As per plans.
 - 14. Main power supply: 480 V Volts +5%, 3-PHASE
 - 15. Operation: Simplex
 - 16. Machine location: Inside the hoistway mounted on car guide rail
 - 17. Control space location: integrated control
- B. Special Features:
 - 1. Baked Enamel: Electrostatically applied, oven baked to match selected color.
 - 2. Paint: Except as otherwise specified, properly paint all metal work fabricated by the elevator contractor with the manufacturer's standard paint.
 - 3. Floor finish as scheduled.

2.3 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

- A. Controller: provide microcomputer-based control system to perform all 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 separated 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.

Aluminum

1. Sheet and plate shall comply with ASTM B209, alloy 6063-T52.
 2. Extrusions shall comply with ASTM B221, alloy 6063-T52.
- C. Controller location: locate controller(s) in the front wall integrated with the top landing entrance frame, machine side of the elevator. Provide non-fused three phase permanent power in hoistway at the top landing. A separate control space shall not be necessary.

2.4 EQUIPMENT: HOISTWAY COMPONENTS

2.5 EQUIPMENT: HOISTWAY ENTRANCES

- A. Hoistway Entrance(s)
1. Sill(s): extruded aluminum
 2. Door(s): hollow metal construction with vertical internal channel reinforcements.
 3. Fire rating: entrance and door(s) shall be UL fire-resistance rated for 1 ½ hours.
 4. Entrance finish: brushed stainless steel
 5. Entrance markings jamb plates: provide standard entrance jamb tactile markings on both jambs, and at all floors. Plate mounting: refer to manufacturer drawings.

2.6 EQUIPMENT: CAR COMPONENTS

- A. Car Frame: provide car frame with adequate bracing to support the platform and car enclosure.
- B. Car Safeties: 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 designed to operate in case the car attains excessive descending speed.
- C. Platform: platform shall be all steel construction.
- D. Car Guides: provide guide-shoes mounted to top and bottom of both the car and counterweight frame. Each guide-shoe assembly shall be arranged to maintain constant contact on the rail surfaces. .
- E. Car wall finish:
1. Side walls: 304 brushed stainless steel (4SS)
 2. Rear wall: 441 brushed stainless steel (4SS)
 3. Car front door and skirting: brushed stainless steel
 4. Ceiling, round, LED spotlights
 5. Handrails: brushed stainless steel
 - a. Rails to be located on car enclosure
 6. Sills: extruded aluminum
- F. Flooring: by others (not to exceed 3lb/sqft and ½" finished depth)
- a. The casing shall have a dished end cap and safety bulkhead as required by ASME A17.1 code.
 - b. The plunger shall have a high-pressure sealing system which will not allow for seal movement or displacement during the course of operation.
 - c. The jack system will be supplied with schedule 40 PVC or an HDPE protection system complying with ASME A17.1 code requirements to prevent in ground corrosion of the casing.
 - d. The jack casing shall have a bleeder valve to discharge any air trapped in the jack.

G. Emergency Car Signals

1. Emergency siren: siren mounted on top of cab, activated when the alarm button in car operating panel is engaged. Siren shall have rated sound pressure level of 80 dBA at a distance of three feet from the 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. Totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of a power failure.
3. Emergency exit contact: an electrical contact shall be provided on the car-top enclosure.

H. Ventilation: manufacturer's standard cab fan.

2.6 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. Fixture finish to be brushed stainless steel.

1. Main flush mounted car operation panel shall contain a bank of round, mechanical, illuminate buttons, marked to correspond to the landing served, emergency call button, door open button, door close button, and key switches for lights, inspection and exhaust fan. Buttons have amber dot matrix illumination (halo). All buttons to have raised text and Braille marking on left hand side. The car operation display panel shall be amber dot matrix. All texts, when illuminated shall be amber dot matrix. The car operating panel shall have brushed stainless steel finish.
2. Additional features of car operating panel shall include:
 - a. Car position indicator within operating panel.
 - 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
 - e. Call cancel button

B. Hall fixtures: hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Hall fixtures shall have a brushed stainless steel finish.

1. Hall fixtures feature round, mechanical, buttons in applied mount face frame. Hall fixtures shall correspond to options available for that landing. Buttons shall be in a vertically mounted fixture.

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 direction and twice for a down direction. The car riding lantern face plate shall have a brushed stainless steel finish.

1. motor.

2.7 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER

A. Elevator Operation

1. Simplex Collective Operation: Using a microprocessor-based controller, operations 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. Elevator Control System for Inspections and Emergency
 1. Provide devices within controller to run the elevator in the inspection operation mode.
 2. Provide devices on car top to run the elevator in the inspection operation mode.
 3. Provide within the controller an emergency stop switch to disconnect power from the brake and prevent motor from running.
 4. Provide the means from the controller to mechanically lift and control the elevator brake to safely bring car to the 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.

2.8 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 the case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable codes. Emergency devices and keys for opening doors from the landing shall be provided as required by applicable codes.
- 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 have 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 passed through the door opening.

2.9 CAR OPERATING STATION

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 elevator related work until unsatisfactory conditions have been corrected.
- C. Prior to start of any elevator related work, verify hoistway is in accordance with approved shop drawings. Dimensional tolerance of hoistway from approved shop drawings, shall be 0" plus 2".
- D. Prior to start of elevator related work, very projections greater than 2" must be beveled not less than 75 degrees from horizontal.
- E. Prior to start of any elevator related work, verify landing have been prepared for entrance installation. Traditional sill or concrete sill angle shall not be required.
- F. Prior to start of elevator work, verify elevator pit has been constructed in accordance with requirements, is dry and reinforced to sustain vertical dynamic forces. Verify that sumps or sump pump(s) located within the pit will not interfere with the installation of elevator equipment.
- G. Prior to start of any related elevator work, verify control space has been constructed in accordance with requirements, with access coordinated with approved elevator shop drawings, including sleeves and penetrations.
- H. Verify installation of GFCI protected 20-amp receptacle in pit and adjacent to teach signal control cabinet within the control space. ar If storage on site is not available at time of delivery, Purchaser will provide suitable storage, assume all costs incurred, and make the payments due for the equipment.

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's installation methods and recommendations.
- 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 vibrations to structure.
- C. All hoistway frames shall be securely fastened to fixing angles mounted in the hoistway. Coordinate the installation of sills and frames with other trades.
- D. Lubricate operating system components in accordance with manufacturer's recommendations.
- E. Perform final adjustments and necessary service prior to final acceptance.

3.4 CONSTRUCTION

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

3.5 TESTING AND INSPECTIONS

- A. Perform recommended and required testing and inspections in accordance with the authority having jurisdiction.
- B. Obtain required permits prior to the commencement of any elevator related work.

3.6 DEMONSTRATION & OWNER'S INFORMATION

The School District of Palm Beach County

Project Name

SDPBC Project No.

- A. Once Owner accepts the elevators, elevator contractor shall supply the Owner with two Owner's Manual containing parts list, general maintenance instructions, lubrication instructions, and other data relating to the installation.
- B. Prior to final acceptance, instruct Owner's representative on the proper operation and required maintenance of the elevator. This shall include emergency operation of the elevator.

END OF SECTION