

## SECTION 142100 - ELECTRIC TRACTION ELEVATORS

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Work Included: The Work of this Section includes:

1. Pre-engineered, machine-room-less elevators.
2. Custom car enclosures.
3. Car light fixtures.
4. Handrails.
5. Installation accessories.
6. Filing of Elevator Applications, Permits, Inspections and Sign-off required for placement of elevators in-service.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information.
- B. Shop Drawings: Show 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 and signals. Indicate variations from specified requirements, maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.
- C. Samples: For exposed finishes of cars, hoistway doors and frames, and signal equipment; 3-inch-square samples of sheet materials; and 4-inch lengths of running trim members.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. 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.
- B. Maintenance Manuals: Include operation and maintenance instructions, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information. Include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel. Submit for Owner's information at Project closeout as specified in Division 01 Sections.
- C. Certificates and Permits: Furnish Owner's Representative with copies of construction permits, inspection/acceptance certificates and operating permits as required to allow normal, unrestricted use of elevators.
1. Furnish certificates before final acceptance.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or an experienced installer approved by elevator manufacturer who has completed elevator installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

- B. Regulatory Requirements: In addition to the Building Code, comply with the following as applicable to project:
  - 1. Elevator Code: Except for more stringent governing regulations, comply with applicable requirements of ANSI/ASME A17.1, Safety Code for Elevators, and Escalators (hereinafter referred to as the "Code").
  - 2. NFPA Code: Comply with applicable NFPA codes, and specifically with sections relating to electrical work and elevators.
  - 3. Fire Resistance of Entrances: Comply with NFPA No. 80, and provide units bearing UL labels with 30-min. temperature rise.
  - 4. Seismic Risk Zone: As per Project location.
- C. Accessibility Requirements: In addition to local governing regulations, comply with Section 4.10 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)", Fair Housing and UFAS.
  - 1. One elevator in each building shall accommodate a 24" x 84" stretch.

#### 1.5 COORDINATION

- A. Coordinate installation of sleeves, block outs, and items that are embedded in concrete or masonry for elevator equipment. Furnish templates 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; and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

#### 1.6 MAINTENANCE

- A. Maintenance Service: Provide full maintenance service by the elevator Installer for twelve (12) months from date of Substantial Completion. In addition, provide maintenance of any elevators which are use prior to Substantial Completion.
  - 1. Include monthly preventive maintenance, during normal working hours. Include repair/replacement of worn or defective parts and lubrication, cleaning and adjusting as required for proper elevator operation.
  - 2. Include 24 hour/day, 7 days/week emergency callback service. Exclude only repair/replacement due to misuse, abuse, accidents or neglect by persons other than Installer's personnel.

#### 1.7 PERMITS AND INSPECTIONS

- A. Apply, obtain and pay for required construction filing and approvals, inspections and permits for elevators.
- B. Have tests made called for by the regulations of these authorities.
- C. Tests shall be made in the presence of the authorized representatives of such authorities.

## 1.8 OPERATING INSTRUCTIONS

- A. Upon completion and acceptance of all work, furnish to the Board four complete sets of instructions and lubricating charts describing the operation and proper maintenance procedure of the elevator equipment. Complete wiring diagrams shall be included with one set mounted within each machine room, as directed.
- B. Provide at no cost to Owner, a competent instructor or instructors for a period of not less than one seven-hour day, at a time to be established by the Owner to fully and adequately instruct the personnel appointed by the Owner in the proper maintenance and operation of the elevator equipment.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis- of- Design, Product: Subject to compliance with requirements, provide the following:
  - 1. MonoSpace 500 machine- room- less elevators as supplied Kone or approved equal.
  - 2. Description- Elevator Cab: STANDARD 42005 – Copy as supplied Kone.
    - a. Wall Panel Orientation: Horizontal
    - b. Car Layout: Front Opening.
    - c. Rear Wall: Kensington Maple (L419) Wood Laminate, Raised Panels.
    - d. Side Walls: Brushed Stainless Steel (4SS) Brushed Stainless Steel, Raised Panels.
    - e. Reveal Strips: Brushed Stainless Steel (4SS).
    - f. Front Wall: Brushed Stainless Steel (4ss) Brushed Stainless Steel.
    - g. Ceiling: Rectangular, LED Light Panel (CL94).
    - h. Signalization: KCS 570 Flush Brushed Stainless Steel (4SS)
    - i. Handrails: Round, Straight Ends (Hr61) Brushed Stainless Steel (4SS).
    - j. Skirting: Brushed Stainless Steel (4SS).
- B. Other Manufacturers:
  - 1. Global Tardif.
  - 2. Otis.
  - 3. Thyssen Elevator Group North America.
  - 4. Or approved equal.

### 2.2 MATERIALS AND COMPONENTS

- A. General: Provide manufacturer's standard elevator systems. Where components are not otherwise indicated, provide standard components, published by manufacturer as included in standard pre-engineered elevator systems and as required for a complete system.
- B. Elevator Machines: Gearless type,
- C. Power Control: Except as otherwise indicated, where variable voltage is required, provide solid-state power converters for use with motors on elevator machines (ac).
  - 1. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system from solid-state converters.

- D. Power Supply: ~~480208~~ V, 60 Hz, 3 phase.
- E. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work where installation of devices is specified in another Specification Section.
- F. Controller: Provide microcomputer based control system to perform all the functions.
  - 1. 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 and Control side. High voltage motor power conductors shall be routed and physically segregated from rest of the controller.
  - 3. Variable field parameters and adjustments shall be contained in a non-volatile memory module.
- G. Controller Location: Locate controllers in closet adjacent to the shaft at the top landing.
- H. Car Frame and Platform: Manufacturer's standard welded steel units, unless otherwise indicated.
- I. Finish Materials: Provide the following materials and finishes for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated:
  - 1. Satin Stainless Steel: ASTM A 666, Type 304, with No. 4, directional satin finish, unless otherwise indicated.
  - 2. Enameled-Steel Sheet: Cold-rolled steel sheet complying with ASTM A 366, matte finish, stretcher-leveled standard of flatness; hot-rolled steel sheet complying with ASTM A 569 may be used for door frames. Provide with factory-applied enamel finish; colors as selected by Architect.

### 2.3 PASSENGER ELEVATORS

- A. Electric Traction Machines:
  - 1. Type: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical brakes and integral traction drive sheave, mounted to the car guide rail at the top of hoistway.
  - 2. Rated Speed: 350 FPM.
  - 3. Rated Loads:
    - a. Passenger: Elevator 1 – 3,500 lbs.
    - b. Service (Freight): Elevator 2 – 5,000 lbs.
  - 4. Provide inspection certificate in each car, mounted under acrylic cover with frame indicated.
  - 5. Provide protective blanket hooks for cars indicated and two complete sets of full height blankets.
- B. Passenger Hoistway Entrances: Unless otherwise shown, provide stainless steel sliding door and frame hoistway entrances; complete with track systems, hardware, safeties, sills and accessories. Match car enclosure door for size, and door panel movement. Coordinate frame size and profile with hoistway wall construction:

1. Aluminum Sills: Cast or extruded aluminum, with grooved surface, 1/ 4-inch thickness; mill or finish.
2. Floor designators.
3. Hoistway Entry Door height: 96 inches
4. Clear Cab Height: 9'- 9" (117 inches).
5. Floor Stops, each elevator: 4.
6. Openings: Front.

## 2.4 OPERATION SYSTEMS

- A. Passenger Elevators: Provide manufacturer's standard microprocessor operation system for each elevator or group of elevators as required to provide type of operation system indicated.
  1. Elevator Control: Provide solid-state "Duplex Selective Collective Automatic Operation", as defined in ANSI A17.1.
- B. Auxiliary Operations/Controls: In addition to primary control system features, provide the following features for passenger elevators.
  1. Automatic 2-way leveling.
  2. Automatic dispatching of loaded car.
  3. Handicapped signal and control features.
  4. Additional Functionality: When stopped and unoccupied with doors closed for more than 15 minutes, cab interior lights and ventilation will be de- energized until cab resumes operation.

## 2.5 SIGNAL EQUIPMENT

- A. General: Provide signal equipment for each elevator or group of elevators with hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements of acrylic or other permanent, non- yellowing translucent plastic.
- B. Signal Equipment: Provide manufacturer's standard signal equipment Model #KSS 500 or equal as approved by the Architect. Provide car control station and car position indicator in car, and hall push-button station on each landing. Provide acrylic buttons and signal which light-up when activated and remain lighted until call or other function has been fulfilled. Except for buttons and illuminated signal elements, fabricate signal equipment with exposed surfaces of stainless steel with manufacturer's standard brushed finish.
  1. Car Control Stations: Provide flush-mounted metal faceplates, with call button for each landing served, and with other buttons, switches and controls required for operation and control. Mount in return panel adjacent to car door. Provide operating device symbols as required by Code. Mark other buttons and switches with manufacturer's standard identification for required function.
  2. Car Position Indicator: Provide illuminated-signal type or digital-display type, located near top of car. Include direction-of-next travel signal if not provided in car control station.
    - a. In addition to visual indicator, provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served.
  3. Hall Push-Button Station: Provide type with flat face plate for surface mounting on wall finish (body of unit recessed). Provide 1-button station where only one direction of travel is available and indicate which direction that is, provide 2-button stations at other locations. Call buttons shall be stainless steel Series 2 with LED buttons, centered 42" above finished floor.

4. Car Lanterns: Provide a lantern with visual and audible signal in the edge of the cab return post. On each floor use tamperproof screws and mount stainless steel faceplate flush with hairline joint. Car lantern shall indicate the direction of car when doors are 3/4 open. The unit shall sound once for the "up" direction and twice for the "down" direction. (The fixtures shall be mounted with the centerline at a minimum of 72" above the car sill with visual elements at least 2-1/2" in the smallest dimension)
  5. Hall Position Indicator: Provide illuminated-signal type or digital-display type signal, located above each hoistway entrance at all floors. Match materials, finishes and mounting method with hall push-button stations.
    - a. At manufacturer's option, first floor hall lantern signals may be integrated with hall position indicators.
  6. Alarm Systems: Provide emergency alarm bell properly located within building and audible outside hoistways, equipped to sound automatically in response to emergency stops and in response to "Alarm" button at each car control station.
- C. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded. System is contained in flush intercom, with identification, instructions for use, and battery backup power supply.
- D. Door Reopening Devices:
1. Door Edge Device: Provide retractable edge shoe on leading edges of elevator entrance doors which, upon contacting an obstruction in entrance, causes doors to stop and reopen.

## 2.6 DOOR SAFETY DEVICES

- A. Door Edge Device: Provide retractable edge shoes on elevator entrance doors that cause doors to stop and reopen upon contacting an obstruction.
- B. Photo-Eye Device: Provide electronic photo-eye device with timed cutout, projecting dual-light beams across car entrance at 5-inch and 29-inch heights, that when interrupted cause doors to stop and reopen. Provide keyswitch in car operating panel for disconnecting photo-eye protective device.
  1. Nudging Feature: After car doors are prevented from closing for a predetermined adjustable time, through activating detection device or door edge device, a loud buzzer shall sound and doors shall begin to close at reduced rate of speed.

## 2.7 CUSTOM ELEVATOR CAR ENCLOSURES

- A. General: Provide car enclosure of the selections specified, unless otherwise indicated. Include ventilation, lighting, access doors, doors, power door operators, sills (thresholds), trim, accessories, and wall and ceiling finishes. Provide manufacturer's standard flush-panel horizontal-sliding doors of type indicated. Provide manufacturer's standard protective edge trim system for door and wall panels, except as otherwise indicated.

- B. Materials and Fabrication: Provide selections indicated for each car enclosure surface; provide manufacturer's standards, but not less than the following:
1. Rigidized, Stainless- Steel Wall Panels, Doors, Base, Reveals and Car Station: Flush, hollow-metal construction, fabricated from rigidized stainless steel.
    - a. Finish: As selected by the architect.
  2. Enameled- Steel Doors (Lobby Side): Flush, hollow-metal construction, fabricated from enameled-steel specified.
    - a. Baked- Enameled Finish: As selected by Architect from manufacturer's full range of baked enamel colors.
  3. Fabricate car door frame integrally with front wall of car.
  4. Fabricate car with recesses and cutouts for signal equipment.
  5. Aluminum Sills: Extruded aluminum, with grooved surface, 1/4-inch thickness, mill finish.
  6. Floor Finish: Provide 'LVT' cab floor finish as specified in Division 09 Section - "Resilient Tile Flooring."
  7. Ceiling System: Provide manufacturer's polished metal ceiling system with stainless steel flush panels with downlighting as indicated.
    - a. Product: Subject to compliance with requirements, provide ceiling system LF 88 satin stainless steel panels with circular apertures for downlighting, minimum 35 lumens per watt, as supplied by Kone or equal as approved by the Architect.
  8. Handrails: Provide manufacturer's standard stainless steel handrails on rear wall, unless otherwise indicated.
  9. Emergency Car Lighting: Provide emergency power unit that will illuminate elevator car and provide current to the alarm bell, in the event of power failure.
  10. Fan: Manufacturer's standard design fan with stainless steel frame. Provide key switch in car operating panel for operation of the fan.
  11. Certificate Frame and No Smoking Framed Signs: Stock Designs formed of stainless steel.
  12. Coordinate location and installation of security camera in each cab. See electrical drawings and specifications.
  13. Protective Pads and Pad Hooks: Provide pad hooks at locations as directed by the Architect.
    - a. Protective pads shall cover the front return panels, and the side and rear walls.
    - b. Provide cutouts in pads for access to the cab operating and signaling devices.
    - c. Pads shall be fire-resistant canvas with two (2) layers of cotton batting padding.
  14. Security Camera, each cab: OFCI, Owner Furnished, Contractor Installed.

## 2.8 ELECTRICAL WIRING

- A. Furnish and install complete, necessary insulated wiring to connect all parts of the equipment.
- B. Provide wiring on car with light sockets or receptacles under the car platform and on top of car for inspection purposes.
- C. Insulated wiring shall have a flame-retarding and moisture resisting outer cover and shall be run in metal conduit, metallic tubing or wire ducts.

- D. Raveling cables between car and hoistway shall have flame retarding and moisture-resisting outer cover. They shall be flexible and shall be suitably suspended to relieve strains in the individual conductors.
  - 1. Provide coaxial cable to each elevator cab in raveling cables for camera. Coordinate requirements with Owner.
- E. Insulated conductors and conduit, or tubing, as well as fittings, including metal boxes, troughs and ducts, shall comply with the requirements of the local governing authorities.
- F. Refer to Division 26 - Electrical, for additional requirements.

### **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. Verify critical dimensions, and examine supporting structure and other conditions under which elevator work is to be installed.
- B. For the record, prepare a written report, endorsed by Installer, listing dimensional discrepancies and conditions detrimental to performance.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Coordination: Coordinate elevator work with work of other trades, to avoid delays. Use benchmarks, lines and levels designated by Owner's Representative.
- B. Coordinate delivery of security cameras for installation and connection.

#### **3.3 ELEVATOR SYSTEMS INSTALLATION**

- A. Install in accordance with with elevator manufacturer's instructions and approved Shop Drawings.
  - 1. Provide temporary hoist beams and bracing in accordance with elevator manufacturer's requirements.
  - 2. Install, connect and test security cameras.
- B. Welded Construction: Provide welded connections where bolted connections are not required for removal or for normal operation, adjustment, inspection and maintenance. Comply with AWS standards for workmanship and for welding operators.
- C. Sound Isolation: Mount rotating and vibrating elevator equipment and components on vibration-absorption mounts, to prevent transmission of vibrations to structure.
- D. Lubricate operating parts of systems, as recommended by manufacturer.
- E. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails, for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable. Reduce clearances to minimum, safe, workable dimension at each landing.

- F. Leveling Tolerance: 1/ 2-inch maximum, up or down, regardless of load or direction of travel.
- G. Grout sills with non-staining, non-shrink grout. Set units accurately aligned with or slightly above finished floor.

### 3.4 FIELD QUALITY CONTROL

- A. Acceptance Testing: Upon nominal completion of elevator installation and before permitting use of elevator (either temporary or permanent), perform acceptance tests as required by the Code and by governing regulations or agencies. Provide permits required for operation of each elevator.
  - 1. Perform tests in presence of Owner's Representative.
- B. Operating Tests: Load elevator to its rated capacity and operate continuously for 30 minutes over its full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of pump motor during 30-minute test period. Record failures of elevator to perform as required and notify Owner's Representative.
- C. Advise Inspector(s) and Owner's Representative in advance of dates and times tests are to be performed on elevators.

### 3.5 PROTECTION

- A. At time of Substantial Completion of elevator work (or portion thereof), provide suitable protective coverings, barriers, devices, signs, or such other methods or procedures to protect elevator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.
- B. Provide similar protective measures for elevator units that will be placed in temporary service, including inspection and maintenance service during period of temporary service.

### 3.6 DEMONSTRATION

- A. Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions. Confer with Owner on requirements for a complete elevator maintenance program.
- B. Make a final check of each elevator operation with Owner's personnel present and just prior to date of Substantial Completion. Determine that control systems and operating devices are functioning properly.

END OF SECTION 142100