PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Complete elevator systems.
   B. Elevator maintenance.

1.02 RELATED REQUIREMENTS
   A. Section 01.50.00 - Temporary Facilities and Controls: Temporary power supply.
   B. Section 03.30.00 - Cast-in-Place Concrete: Includes elevator machine foundation.
   C. Section 04.20.00 - Unit Masonry: Masonry hoistway enclosure; building-in and grouting hoistway door frames.
   D. Section 05.12.00 - Structural Steel Framing: Includes hoistway framing.
   E. Section 05.50.00 - Metal Fabrications: Includes pit ladder, sill supports, divider beams, and overhead hoist beams.
   F. Section 07.81.00 - Applied Fireproofing: Fireproofing of guide rail brackets where attached to building structural members.
   G. Section 08.31.00 - Access Doors and Panels: Fire rated access doors into hoistway.
   H. Section 09.21.16 - Gypsum Board Assemblies: Gypsum shaft walls.
   I. Section 10.44.00 - Fire Protection Specialties: Fire extinguisher in elevator machine room.
   J. Section 21.13.00 - Fire Suppression Sprinklers: Sprinkler heads in hoistway.
   K. Section 22.30.00 - Plumbing Equipment: Pit drain.
   L. Section 26.05.34 - Conduit:
      1. Empty conduit to elevator equipment devices remote from elevator machine room or hoistway.
      2. Empty conduit from controller cabinet in machine room to remote group supervisory panel in lobby.
   M. Section 26.27.17 - Equipment Wiring:
      1. Electrical characteristics and wiring connections.
      2. Electrical service to main disconnect in elevator machine room.
      3. Emergency power transfer cabinet.
      4. Electrical power for elevator installation and testing.
      5. Electrical disconnecting device to elevator equipment prior to activation of sprinkler system.
      6. Electrical service for machine room.
      7. Lighting in elevator pit.
      8. Empty conduit for telephone service to machine room.
   N. Section 28.31.00 - Fire Detection and Alarm:
      1. Fire and smoke detectors and interconnecting devices.
      2. Fire alarm signal lines to elevator controller cabinet.

1.03 REFERENCE STANDARDS

D. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2011 w/Errata.

E. NFPA 70 - National Electrical Code; National fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.


1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a meeting one week prior to starting work.
   1. Review schedule of installation, installation procedures and conditions, and coordination with related work.
   2. Review use of elevator for construction purposes, hours of use, scheduling of its use, cleanliness of cab, employment of operator, maintenance of system.

B. Construction Use of Elevator: Elevator may be used for transport of construction personnel and materials.
   1. Enclose cab with protective plywood on floor, walls, and ceiling.
   2. Provide temporary lighting.
   3. Provide control panel with manual and emergency operation with key operation for attendant operator.

1.05 SUBMITTALS

A. See Section 01.30.00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on the following items:
   1. Signal and operating fixtures, operating panels, indicators.
   2. Cab design, dimensions, layout, and components.
   3. Cab and hoistway door and frame details.
   4. Electrical characteristics and connection requirements.

C. Shop Drawings: Indicate the following information:
   1. Locations of Machine Room Equipment: Driving machines, controllers, governors and other components.
   2. Hoistway Components: Car, counterweight, sheaves, machine and sheave beams, guide rails, buffers, ropes, and other components.
   3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
   4. Individual weight of principal components; load reaction at points of support.
   5. Loads on hoisting beams and location of trolley beams.
   6. Clearances and over-travel of car and counterweight.
   7. Locations in hoistway and machine room of traveling cables and connections for car light.
   8. Location and sizes of access doors, doors, and frames.
   9. Expected heat dissipation of elevator equipment in machine room.
   10. Applicable seismic design data; certified by a licensed Professional Structural Engineer.
   11. Interface with building security system.
   12. Electrical characteristics and connection requirements.

D. Maintenance Contract.

E. Maintenance Data: Include:
1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
2. Technical information for servicing operating equipment.
3. Legible schematic of hydraulic piping and wiring diagrams of installed electrical equipment and changes made in the Work. List symbols corresponding to identity or markings on machine room and hoistway apparatus.

1.06 QUALITY ASSURANCE
A. Perform Work in accordance with applicable code and as supplemented in this section.
B. Designer Qualifications: Design guide rails, brackets, anchors, and machine anchors under direct supervision of a Professional Structural Engineer experienced in design of work of this type and licensed in Tennessee.
C. Perform structural steel design, fabrication, and installation in accordance with AISC 360, Specification for Structural Steel Buildings. Perform seismic design in accordance with applicable code.
D. Perform welding of steel in accordance with AWS D1.1/D1.1M.
E. Fabricate and install door and frame assemblies in accordance with NFPA 80.
F. Perform electrical work in accordance with NFPA 70.
G. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
H. Installer Qualifications: Employees and supervisor on payroll of elevator equipment manufacturer.
I. Products Requiring Fire Resistance Rating: Listed and classified by UL.
J. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.07 WARRANTY
A. See Section 01.78.00 - Closeout Submittals, for additional warranty requirements.
B. Provide one year manufacturer warranty for elevator operating equipment and devices.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Kone.
B. Other Acceptable Manufacturers:
   4. Substitutions: See Section 01.60.00 - Product Requirements.
C. All components to be manufactured by same entity, unless otherwise indicated.

2.02 ELEVATORS
A. Elevators No. 1 & No. 2: Passenger, gearless electric.
   1. KONE, Ecospace System elevators ______ ________.
   2. Operation and Controls: Automatic group.
   3. Additional Service Controls: In addition, provide:
      a. Independent service.
      b. Freight service, with separate riser.
      c. Independent riser service.
5. Cab Height: 96 inches.
6. Hoistway and Cab Entrance Frame Opening Size: 42 x 84 inches.
7. Door Type: Double leaf.
9. Rated Net Capacity: 1 @ 3000 and 1 @ 5000 lbs.
10. Rated Speed: 150 ft/min.
11. Travel Distance: As indicated on drawings.
12. Number of Stops: 3.
13. Number of Openings: 3 Front.

2.03 CONTROLS

A. Elevator Controls: Provide landing buttons, hall lanterns, and lobby panel.
B. Door Controls:
   1. Program door control to open doors automatically when car arrives at floor.
   2. Render "Door Close" button inoperative when car is standing at dispatching terminal with doors open.
   3. If doors are prevented from closing for approximately ten seconds because of an obstruction, automatically disconnect door reopening devices, close doors more slowly until obstruction is cleared. Sound buzzer.
   4. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equip with photo-electric light rays.
C. Landing Buttons: Stainless steel type, one for originating UP and one for originating DOWN calls, one button only at terminating landings; marked with arrows.
D. Landing Position Indicators: Illuminating white.
E. Car Direction Indicators: Illuminating white.
F. Interconnect elevator control system with building fire alarm systems.
G. Provide "Firefighter's Operation" in accordance with applicable code. Designated Landing: G.

2.04 EMERGENCY POWER

A. Arrange elevator operation to operate under emergency power when normal power supply fails.
B. Emergency Power Supply: Building emergency power; provide for emergency power characteristics and phase rotation same as for normal power. Provide transfer switches and auxiliary contacts in accordance with Section 26.05.01. Install connections to power feeders.
C. Provide operational control circuitry for adapting the change from normal to emergency power.
D. Upon transfer to emergency power, advance one elevator at a time to a pre-selected landing, stop car, open doors, disable operating circuits, and hold in standby condition.
E. After the above operation has completed one complete cycle, operate one pre-selected elevator in normal operation from the emergency power supply. If the pre-selected car fails to operate, automatically select another car to operate.
F. Provide manual switch to override the automatic selection procedure.

2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Electrical Characteristics:
   1. 460 volts, three phase, 60 Hz.
   2. Refer to Section 26.27.17 for additional requirements.
2.06 MACHINE ROOM FITTINGS
   A. Wall-Mounted Frames: Glazed with clear plastic; sized as required. Provide one for master electric and hydraulic schematic and one for lubrication chart. Install charts.
   B. Key Cabinet: Wall-mounted, lockable, keyed to building keying system, for control/operating panel keys.
      1. Provide two extra key cabinet keys.
      2. Provide two extra control/operating panel keys.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify that hoistway, pit, and machine room are ready for work of this section.
   C. Verify hoistway shaft and openings are of correct size and within tolerance.
   D. Verify location and size of machine foundation and position of machine foundation bolts.
   E. Verify that electrical power is available and of the correct characteristics.

3.02 PREPARATION
   A. Arrange for temporary electrical power for installation work and testing of elevator components.

3.03 INSTALLATION
   A. Install system components. Connect equipment to building utilities.
   B. Provide conduit, boxes, wiring, and accessories.
   C. Mount machines on vibration and acoustic isolators, on bed plate and concrete pad. Place on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.
   D. Accommodate equipment in space indicated.
   E. Install guide rails using threaded bolts with metal shims and lock washers under nuts. Compensate for expansion and contraction movement of guide rails.
   F. Accurately machine and align guide rails. Form smooth joints with machined splice plates.
   G. Bolt or weld brackets directly to structural steel hoistway framing.
   H. Field Welds: Chip and clean away oxidation and residue, wire brush; spot prime with two coats.
   I. Coordinate installation of hoistway wall construction.
   J. Install hoistway door sills, frames, and headers in hoistway walls. Grout sills in place. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.
   K. Fill hoistway door frames solid with grout in accordance with Section 04.20.00.
   L. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
   M. Machine Room Components: Clean and degrease; prime one coat, finish with one coat of enamel.
   N. Adjust equipment for smooth and quiet operation.

3.04 ERECTION TOLERANCES
   A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1.
   B. Cab Movement on Aligned Guide Rails: Smooth movement, with no objectionable lateral or oscillating movement or vibration.
3.05 FIELD QUALITY CONTROL

A. Testing and inspection by regulatory agencies will be performed at their discretion.
1. Schedule tests with agencies and notify Owner and Architect.
2. Obtain permits required to perform tests.
3. Document regulatory agency tests and inspections in accordance with the requirements of Section 01.40.00.
4. Perform tests required by regulatory agencies.
5. Furnish test and approval certificates issued by authorities having jurisdiction.

B. Perform testing and inspection in accordance with requirements of Section 01.40.00.
1. Perform tests as required by ASME A17.2.
2. Provide two weeks written notice of date and time of tests.
3. Supply instruments and execute specific tests.

C. Perform operational tests in the presence of Owner and Architect.

D. Operational Tests:
1. Test single elevator system by transporting at least 5 persons up from main floor during a five minute period.
2. Test multiple elevator system by transporting at least 5 persons up from main floor during a five minute period with maximum average time interval of 60 seconds between cars, with 1 cars leaving main floor during same five minute period.
3. At an agreed time during the contract warranty period, and with the building normally occupied using normal building traffic, conduct tests to verify performance. Furnish event recording of all hall call registrations, time initiated, and response time throughout entire normal working day.
4. Time elevator travel between typical floors at not more than 45 seconds. Measure time from moment doors start to close until car has stopped level at next floor and doors are opening.

3.06 ADJUSTING

A. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort.

B. Adjust automatic floor leveling feature at each floor to achieve 1/4 inch from flush.

3.07 CLEANING

A. Remove protective coverings from finished surfaces.

B. Clean surfaces and components ready for inspection.

3.08 PROTECTION

A. Do not permit construction traffic within cab after cleaning.

B. Protect installed products until project completion.

C. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

3.09 MAINTENANCE

A. See Section 01.70.00 - Execution Requirements, for additional requirements relating to maintenance service.

B. Provide a separate maintenance contract for specified maintenance service.

C. Perform maintenance work using competent and qualified personnel under the supervision and in the direct employ of the elevator manufacturer or original installer.

D. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of Owner.
E. Provide service and maintenance of elevator system and components for one year from Date of Substantial Completion.

F. Examine system components monthly. Clean, adjust, and lubricate equipment.

G. Include systematic examination, adjustment, and lubrication of elevator equipment. Maintain hydraulic fluid levels. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original equipment. Replace wire ropes when necessary to maintain the required factor of safety.

H. Perform work without removing cars during peak traffic periods.

I. Provide emergency call back service at all hours for this maintenance period.

J. Maintain an adequate stock of parts for replacement or emergency purposes locally, near the place of the Work. Have personnel available to ensure the fulfillment of this maintenance service, without unreasonable loss of time.

END OF SECTION