SPECIAL SPECIFICATION

SECTION 14212S

ELECTRIC ELEVATORS - PASSENGER

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Elevator systems, geared and/or gearless traction.

B. Simplex selective collective automatic operation and Duplex selective collective automatic push button operation. Automatic group supervisory control Firefighter's operation. Restricted service.

C. Passenger cabs with doors and frames.

D. Machines, controllers, hoistway, equipment, and accessories.

E. Remote master group supervisory panel.

F. Related Sections

1. Section 1308S – Seismic Protection.

1.02 PRODUCTS FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish hoisting beams to Section 05120S for installation.

B. Furnish elevator machine anchors to Section 03300S for placement in concrete.

C. Furnish special guide rail support brackets and anchors to Section 05500S for placement.

D. Furnish control panel cabinets for remote group supervisory control console to Section 06400S for installation.

1.03 REFERENCES

A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

B. ANSI/ASME A17.1 - Safety Code for Elevators and Escalators.

C. ANSI/ASTM A366 - Steel Sheet, Carbon, Cold-Rolled, Commercial Quality.

D. ANSI/ASTM A446 - Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

E. ANSI/ASTM B221 - Aluminum and Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.

F. ANSI/AWS D1.1 - Structural Welding Code, Steel.

G. ANSI/IEEE C2 - National Electrical Safety Code.

H. ANSI/NFPA 80 - Fire Doors and Windows.

I. ANSI/UL 10B - Fire Tests of Door Assemblies.

J. APA - American Plywood Association.

K. ASTM A 36 - Structural Steel.

L. ASTM A 167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

M. FS TT-P-641 - Primer Coating, Zinc Dust / Zinc Oxide (for Galvanized Surfaces).

N. FS TT-P-645 - Primer, Paint, Zinc Chromate, Alkyd Type.

O. NEMA LD-3 - High Pressure Decorative Laminates.

P. IBC 3002.4, 3002.5, 3003.2, 3004.1.

1.04 SUBMITTALS

A. Shop Drawings: Indicate the following information:

1. Driving machine, controller, selector, governor and other component locations.

2. Car, counterweight, sheaves, machine and sheave beams, guide rails, buffers, ropes, and other components in hoistway.

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. Location of components in machine room.

8. Locations in hoistway and machine room of traveling cables and connections for car light.

9. Location and sizes of access doors, doors, and frames; structural requirements for door frames.

10. Expected heat dissipation of elevator equipment in machine room.

11. Interface with building security system.

12. Electrical characteristics and connection requirements.

13. Show arrangement of equipment in machine room so rotating elements, sheaves, and other equipment can be removed for repairs or replaced without disturbing other components. Arrange equipment for clear passage through access door.

B. Product Data: Provide data on the following items:

1. Signal and operating fixtures, operating panels, indicators.

2. Cab dimensions, layout, and components.

3. Cab and hoistway door and frame details.

4. Electrical characteristics and connection requirements.

1.05 SYSTEM DESCRIPTION

A. This Section includes one and two elevator systems; geared and/or gearless type; traction machine at bottom and adjacent to hoistway.

B. Characteristics of each elevator are scheduled as follows:

1. MicroLab Building

a. Rated Net Capacity: 2,500 pounds.

b. Rated Speed: 200 feet per minute.

c. Travel Distance (nominal): 38 and 51 feet.

d. Number of Stops: 3 and 4.

e. Number of Openings: 1 front.

f. Nominal Platform Size: 84 inches by 60 inches.

g. Hoistway and Cab Entrance Frame Opening Sizes: 42 inches by 84 inches.

h. Door Type: Double leaf.

i. Door Operation: Center opening single speed.

2. WIF-U Building

a. Rated Net Capacity: 2,500 pounds.

b. Rated Speed: 200 feet per minute.

c. Travel Distance (nominal): 15 feet.

d. Number of Stops: 2.

e. Number of Openings: 1 front.

f. Nominal Platform Size: 84 inches by 60 inches.

g. Hoistway and Cab Entrance Frame Opening Sizes: 42 inches by 84 inches.

h. Door Type: Double leaf.

i. Door Operation: Center opening single speed

3. WIF-C Building

a. Rated Net Capacity: 2,500 pounds.

b. Rated Speed: 200 feet per minute.

c. Travel Distance (nominal): 38 feet.

d. Number of Stops: 3.

e. Number of Openings: 1 front.

f. Nominal Platform Size: 84 inches by 60 inches.

g. Hoistway and Cab Entrance Frame Opening Sizes: 42 inches by 84 inches.

h. Door Type: Double leaf.

i. Door Operation: Center opening single speed

C. Program doors to open automatically when car arrives at floor.

D. Include door protective devices consisting of movable, retractable safety edges, noiseless in operation and two photo-electric light rays which operate within invisible infrared light range.

E. Program door operating sequence to minimize car and hall door open and close times. Provide independently adjustable door open times.

F. Program controls to minimize delays and the return of car to service, should doors be prevented from closing for a predetermined time.

G. If doors are prevented from closing for approximately ten seconds because of an activated obstruction safety device, automatically disconnect door control device, allow doors to close more slowly, and recycle until obstruction is cleared. Sound alarm.

H. Render "Door Close" signal inoperative when car is standing at dispatching terminal with doors open unless that elevator is operating on independent service.

I. Special Operational Features:

1. Independent operation; with key operated fire-Fighter's operation.

2. Interconnect with building fire and smoke alarm and building automation system.

3. Seismic Design: In accordance with Section 13085 – Seismic Protection. Include seismic acceleration sensors. Interconnect with elevator equipment controller.

J. Temporary Use: Enclose freight elevator early for transport of construction personnel. Enclose cab with plywood floor, walls and ceiling. Provide temporary lighting, control panel with manual and emergency operation, key operation for attendant operator.

1.06 SIMPLEX SELECTIVE COLLECTIVE AUTOMATIC OPERATION

A. Start car upon momentary pressure of one or more car or landing buttons, other than those for landing at which car is standing. Cause car to stop at first landing for which car or landing button is pressed, corresponding to direction in which car is travelling.

B. Stop car at landings for which calls are registered. Make stops in order in which landings are reached, regardless of sequence in which buttons are pressed, provided button for given landing is pressed sufficiently in advance of arrival of car at that landing to permit stop to be made.

C. If no car buttons are pressed and car starts up in response to several down calls, proceed first to highest down call and reverse to collect other down calls. Collect up calls similarly when car starts down in response to such calls.

D. If car stops for landing call and car button is pressed within predetermined interval after stop for landing corresponding to direction car was travelling, proceed in same direction regardless of other landing calls registered.

E. If down landing buttons are pressed while car is travelling up, do not stop car at these landings, but allow calls to remain registered.

F. After highest car and landing calls have been answered, reverse car automatically and respond to down car and landing calls.

G. When travelling down, do not permit car to respond to up landing calls, but allow these calls to remain registered to be answered on next up trip.

H. At each stop in response to either car or corridor call, hold car at landing for adjustable time interval to permit passengers to enter or exit. Cancel interval upon registration of car call or pressure on DOOR CLOSE button.

1.08 FIREFIGHTER'S OPERATION

A. Provide automatic firefighter's operation in accordance with ANSI A17.1 initiated by building fire and smoke alarm devices.

B. Locate three-position keyed switch, with pilot light, illuminated when this operation is in effect, marked MANUAL/AUTOMATIC/RESET with key removable in AUTOMATIC position only, marked FIREFIGHTER'S OPERATION - ELEVATORS, Elevators, at street level of building in designated location.

C. Do not permit sensing devices to restore normal service.

D. Furnish two position keyed switch with key removable in OFF position only, marked FIREFIGHTER'S OPERATION in each car, located in or adjacent to operating panel marked ON and OFF/CANCEL calls.

E. Arrange multi-compartment elevators to conform to the following requirements:

1. Locate key operated switch in main floor lobby served by upper compartment.

2. Locate means for placing lower compartment out of service adjacent to lower entrance and in view of each elevator entrance.

3. Locate key operated switch in upper compartment of elevator.

F. Number cars at main floor using minimum 6 inches high, readily distinguished numbers.

G. Include automatic emergency power selection.

H. Arrange emergency power to operator position indicators in cars at central control room.

I. Coordinate keys with Owner's master keying system and deliver to Owner's representative and/or Security Office.

1.09 RESTRICTED SERVICE

A. Program down travelling cars to automatically proceed to a designated landing after first stopping at the first floor landing factor of safety.

B. Perform work without removing cars from service during peak traffic periods.

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

D. Maintain locally, near the place of the work, an adequate stock of parts for replacement or emergency purposes, and have qualified installation personnel available to ensure the fulfillment of this maintenance service without unreasonable loss of time.

E. Perform maintenance work using competent personnel, under the supervision and in the direct employ of the elevator manufacturer.

F. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Kone System, Model MonoSpace.

2.02 MATERIALS

A. Rolled Steel Sections, Shapes, Rods: ASTM A36.

B. Sheet Steel: ANSI/ASTM A366; Class 1; with matte finish ANSI/ASTM A446; Grade B; zinc coated to G90.

C. Stainless Steel: ASTM A167; Type 304; No. 4 satin finish.

D. Plywood: APA rated sheathing, span rating 32/16, Exposure 1, sanded.

E. Primer for Galvanized Surfaces: FS TT-P-641.

F. Primer for Plain Steel Surfaces: FS TT-P-645.

G. Finish Paint (for Metal Surfaces): Alkyd enamel, semi-gloss; color to be selected.

2.03 EQUIPMENT

A. Motors, Controller, Controls, Buttons, Wiring and Devices, Indicators: UL approved.

B. **Elevator Controls and Motion Controls must be non-proprietary; operation software and diagnostic tools are to be made in the USA and selected by the SDR.**

C. Gearless Traction Machine: Direct current motor drive, double wrapped traction driving sheave, direct current electromagnetic brake.

D. Guide Rails, Ropes, Cables, Counterweights, Sheaves, Spring Oil Buffers, Attachment Brackets, and Anchors: Purpose designed, sized according to code with safety factors.

2.04 ELECTRICAL COMPONENTS

A. Fittings: Steel compression type for electrical metallic tubing. Fittings with set screws are acceptable only when a separate grounding conductor is also installed across the joint.

B. Spare Conductors: Include 10 percent extra conductors and two pairs of shielded audio cables in travelling cables.

C. Do not parallel conductors to increase current carrying capacity unless individually fused.

D. Do not use armoured flexible metal conduit as grounding conductor.

E. Provide additional disconnect switches and wiring to suit machine room layout.

F. Include wiring and connections to elevator devices remote from hoistway and between elevator machine rooms.

2.05 LUBRICATION

A. Grease Fittings: For lubricating bearings requiring periodic lubrication.

B. Grease Cups: Automatic feed compression type.

C. Lubrication Points: Visible and easily accessible.

2.06 CAR FABRICATION

A. Frame: Rigid rolled steel sections, braced; mounted on resilient isolators.

B. Enclosure: Sheet steel panels attached to steel frame; sheet plywood inner liner.

2.07 CAB FINISHES

A. Floor, Walls and Ceiling: 3/4-inch sheathing, as specified in Section 06100S – Rough Carpentry, with fire retardant treated surfaces and edges. Attach with flush mechanical fasteners.

B. Flooring: Product: Interface, "Pop Plaid-3292 Rock n' Roll".

C. Walls: Fixed decorative plastic laminate on sheating specified in 06400S, basis of design: Kone, "MCD-S."

1. Basis of Design for laminate: Formica, "1150-43 Vosges Pear, Artisan Finish"

D. Base: Baked enamel on steel, mounted flush to wall, color: black.

E. Ceiling: Basis of Design: Kone, "MCD-S"; drop ceiling comprised of stainless steel.

F. Light Fixtures; compact fluorescent downlights in ceiling, per Section 01600 – Electrical Work.

G. Ventialation Fan: Single speed exhaust fan and venting (per IBC 2000 Building Code) in canopy top and at bottom of side and rear walls.

H. Control Panel and Face Plate: Stainless steel with illuminating call buttons.

I. Indicator Panel: Above control panel with illuminating position indicators.

J. License Frame and Glass: Attached with tamper proof screws.

K. Cab Doors: Basis of design: Kone, "MCD-S"; Stainless Steel, 16 gage thick metal, of hollow sandwich panel construction, flush design, rolled profiles, rigid construction. Facia panels constructed same as doors.

L. Cab Door Frames: Basis of design: Kone "MCD-S"; Stainless Steel, 16 gage thick metal, of rolled profiles, welded corner design, smooth invisible joints.

M. Thresholds: Extruded stainless steel type.

2.08 HOISTWAY ENTRANCES

A. Hoistway Doors (Main Floor): Stainless steel; 16 gage thick metal, of hollow sandwich panel construction, flush design, rolled profiles, rigid construction. Facia panels constructed same as doors.

B. Hoistway Door Frames (Main Floor): Stainless steel; 16 gage thick metal, of rolled profiles, welded corner design, smooth invisible joints.

C. Hoistway Doors (Other Floors): Stainless steel; 16 gage thick metal, of hollow sandwich panel construction, flush design, rolled profiles, rigid construction. Facia panels constructed same as doors.

D. Hoistway Door Frames (Other Floors): Stainless steel; 16 gage thick metal, of rolled profiles, welded corner design, smooth invisible joints.

E. Door and Frame Construction: UL rated, with applicable fire rating; insulated sandwich panel construction, 1-1/4 inch thick minimum.

F. Weatherstrip hoistway door and frames to minimize audible noise caused by car movement imposed air pressure differential between hoistway and landing floors.

2.09 FINISHES

A. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.

B. Machine Room Components: Clean and degrease; one coat primer; and, one coat enamel.

C. Galvanized Surfaces: Clean with neutralizing solvent; prime one coat.

D. Wood Surfaces Not Exposed to Public View: One coat primer; and, one coat enamel.

E. Baked Enamel on Steel: Clean and degrease metal surface; apply one coat of zinc oxide primer sprayed and baked; two coats of semi-gloss enamel sprayed and baked.

2.10 MACHINE ROOM MONITORING PANEL

A. Provide one multiple terminal block in a controller relay panel or selector, in location indicated on shop drawings, for connection of monitoring devices for:

1. Hall car registration circuits.

2. Motor generator running circuits.

3. Load weighing circuits.

4. Up and down peak programming circuits.

5. Independent service switches.

B. Label terminals and design for use with alligator test clips.

C. Label interfacing circuitry to switch to and from 48 volts dc to building service by activation of above circuits.

D. Isolate and protect associated electrical components.

2.11 CAR OPERATING PANEL

A. Provide one flush mounted operating panel per car; faceplate integral with front return panels containing illuminated call buttons corresponding to floors served, emergency stop switch, alarm button and DOOR OPEN buttons; key operated light switch.

B. Position emergency stop switch and alarm button where they are unlikely to be accidentally actuated and not more than 55 inches above car floor.

C. Include matching service cabinet integral with front return panel with hinged door and lock in each car containing:

1. Independent service switch.

2. Inspection switch.

3. Fan or blower switch.

4. Light switch.

5. Necessary additional operating switches.

2.12 HALL CONTROLS

A. Comply with requirements in Section 13085 – Seismic Protection.

B. Hall Buttons: Stainless steel Illuminating type, one for originating up and one for originating down calls; one button only at terminating landings; marked with arrows, and Braille indications.

C. Hall Position Indicators: Illuminating white up and green down arrows.

2.13 REMOTE MONITORING PANEL FOR GROUP SUPERVISORY CONTROL

A. Locate indicator and control panel for each individual elevator and the group of elevators, in Central Control Room.

B. Mount in console provided under Section 06400S.

C. Coordinate size and style of panel with console manufacturer.

D. Engrave faceplate markings in panel, and fill with luminous paint.

E. Display waiting passenger indicator showing corridor up and down calls registered at all floors.

F. Display position and motion indicators which indicate position and direction of travel of each elevator. Use vertical rows of lights which illuminate sequentially. Continuously indicate position of cars.

G. Display non-stop indicators which illuminate when car is passing hall calls.

H. Display service indicators which indicate whether car is "in" or "out" of group operation.

I. Display "Elevator Held" signal which indicates car has been held up at any point in hoistway for unscheduled length of time. Indicate by flashing position indicator and audible buzzer.

J. Display emergency call lights and alarms for each elevator which indicate alarm button on that car has been pressed. Sound buzzer simultaneously.

K. Include a "Remove From Service" switch for each elevator, which will call car to ground floor and cause car to park with doors open.

L. Include switches and signal lamps for motor generator sets.

M. Include emergency power selector switch for each group of elevators which override automatic emergency power selection.

N. Include "Firefighter's Operation" switch which manually recalls all elevators to main floor.

O. Display indicator lights for up peak, down peak, two way, and intermittent modes of operation.

2.14 SEISMIC CRITERIA

A. Comply with requirements in Section 1308S – Seismic Protection. Prevent compensating ropes and traveling cables from snagging on brackets and other protusions in hoistway.

B. Secure compensating sheaves and restrain movement of governor tension sheave.

C. Prevent ropes being dislodged from sheave grooves.

D. Arrange elevator to stop should either car or counterweight disengage guide rails.

E. Include adjustable seismic trigger switches to operate elevators whenever predetermined level of seismic acceleration is detected

1. Prevent idle elevators from starting.

2. Stop elevators at next available stop.

F. Provide restraints of 1/4-inch thick steel plate under guide shoes; clear rails by 1/8 inch. Span rail tongue full depth of finished section.

2.15 DESIGN FOR HANDICAPPED

A. Comply with ANSI A117.1.

B. Locate uppermost button in elevator cab control panel and center-line of telephone handset, not more than 54 inches above floor level.

C. Include 3 inch diameter, stainless steel handrails on three sides of car, with ends returned.

D. Sound audible soft-tone signal in car when car is stopping or stopped at a floor.

E. Where hall indicators with gongs are provided, sound gongs once for up stops and twice for down stops.

F. In each cab provide Arabic numerals 5/8-inch in height raised 0.03-inch and Braille numerals immediately to left of floor buttons to identify floor.

G. At each floor landing provide 2-inch floor numerals raised 0.03-inch on and adjacent to hall call buttons.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that hoistway, pit, and machine room are ready for work of this Section.

B. Verify shaft and openings are of correct size and within tolerances.

C. Verify location and size of machine foundation and position of machine foundation bolts.

D. Confirm electrical power is available and of correct characteristics.

E. Report defects or deficiencies in writing.

F. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Arrange for temporary electrical power to be available for installation work and testing of elevator components.

3.03 INSTALLATION

A. Install in accordance with ANSI/ASME A17.1.

B. Install hoistway and machine room components. Connect equipment to building utilities.

C. Provide conduit, boxes, wiring, and accessories within machine room, hoistway, and signal outlets.

D. Mount machine on vibration and acoustic isolators, on bed plate and concrete pad. Place machine on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.

E. Arrange equipment in machine room so rotating elements, sheaves, and other equipment can be removed for repairs or replaced without dismantling or removing other equipment components. Arrange equipment for clear passage to access door. Accommodate equipment in space indicated.

F. Install guide rails using threaded bolts with metal shims and lockwashers under nuts. Compensate for expansion and contraction movement of guide rails.

G. Accurately machine and align guide rails. Form smooth joints with machined splice plates.

H. Bolt or weld brackets directly to structural steel hoistway framing.

I. Field Welds: Chip and clean away oxidation and residue; wire brush weld; prime two coats.

J. Coordinate installation of hoistway wall construction.

K. 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.

L. Adjust equipment for smooth and quiet operation.

3.04 TOLERANCES

A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ANSI/ASME A17.1.

B. Cab Movement on Aligned Guide Rails: Smooth movement, with no perceptable lateral or oscillating movement or vibration.

3.05 FIELD QUALITY CONTROL

A. Perform and meet tests required by ANSI/ASME A17.1.

B. Supply instruments and execute specific tests.

C. Furnish test and approval certificates issued by jurisdictional authorities.

D. Provide two weeks written notice of date and time of tests.

E. Perform tests in the presence of the Owner or Owner's Representative prior to turning each elevator over for use. The Elevator Contractor shall determine that control systems and operating devices are functioning properly. Perform test required by ANSI/ASME A17.2. Provide two weeks written notice of date and time of tests.

F. At an agreed time during warranty period, and with 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.

3.06 CLEANING

A. Remove protective coverings from finished surfaces.

B. Clean surfaces and components ready for inspection.

3.07 ADJUSTING

A. Adjust for smooth acceleration and deceleration of car to provide passenger comfort.

B. Adjust doors to open only at the landing where the car is at rest. The opening sequence may begin only when the car is at rest. The car must be at rest before the hoistway door is fully open.

C. Adjust automatic floor leveling feature at each floor to achieve an alignment of cab floor and landing floor within 1/4-inch from flush.

END OF SECTION