

**SECTION 14210 - ELECTRIC TRACTION ELEVATORS**

**PART 1 GENERAL**

1.1 WORK INCLUDED

- A. Five (5) traction elevators as follows:
  - 1. Four (4) Geared Passenger Elevators. Car No. 1-4.
  - 2. One (1) Geared Service Elevator. Car No. 5.
- B. All engineering, equipment, labor and permits required to satisfactorily complete elevator installation as required by contract documents.
- C. Applicable conditions of General and Supplemental Conditions, and Division 1.
- D. Preventive maintenance as described herein.
- E. Equipment furnished by others, installed under this section:
  - 1. Building announcement speakers
  - 2. Firefighters' telephone jack
  - 3. Card reader
  - 4. CCTV

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Legal Hoistway and Pit:
  - 1. Clear, plumb, substantially flush hoistway with variations not to exceed 1" at any point.
  - 2. Bevel cants not less than 75E with the horizontal on any rear or side wall ledges and beams that project or recess 2" or more into the hoistway. Not required on hoistway divider beams.
  - 3. Divider beams between adjacent elevators at each floor, pit, and overhead. Supports at each floor for car guide rail fastening and intermediate support when heights exceed 14'-0" or as designated on LBA drawings. Counterweight intermediate guide rail supports where floor heights exceed 16'-0". Building supports not to deflect in excess of 1/8" A17.1 under normal conditions.
  - 4. Installation of guide rail bracket supports in concrete. Inserts or imbeds, if used shall be provided under this Section.
  - 5. Wall blockouts and fire rated backing for control and signal fixture boxes which penetrate walls.
  - 6. Cutting and patching walls and floors.
  - 7. Wall pockets and/or structural beams for support of machine, sheave, and dead-end hitch beams. Support beam deflection shall not exceed 1/1666 of span under static load. Machine hold down means for hoist machines mounted beside or below hoistway.
  - 8. Erect from elevator hoistway wall after elevator entrances installed.
  - 9. Grout around hoistway entrances and sills.
  - 10. Pit access ladder for each elevator.
  - 11. Structural support for car and counterweight buffer impact loads, guide rail loads.
  - 12. Waterproof pit, sump with flush grate.
  - 13. Hoistway venting or pressurization to prevent accumulation of smoke and gas as required by Local Building Code.
  - 14. Partition between machine room and hoistway where hoist machine mounted beside hoistway.
- B. Legal Machine Room:
  - 1. Access ladder or stair with guard railing to overhead machinery space.
  - 2. Enclosure with self-closing and locking access door.
  - 3. Ventilation and heating. Maintain minimum temperature of 55degrees F, maximum 85 degrees F. Maintain maximum 80 percent relative humidity, non-condensing.
  - 4. Class ABC fire extinguisher.
  - 5. Fire sprinklers where required.

- C. Electrical Service, Conductors and Devices:
1. Lighting and GFCI convenience outlets in pit, machine room, and overhead machinery space.
  2. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters' control room. Coordinate size, number, and location of conduits with Elevator Contractor.
  3. Three-phase mainline copper power feeder to terminals of each elevator controller in the machine room with protected, lockable "off", disconnect switch.
  4. Single-phase copper power feeder to each elevator controller for lighting and exhaust blower with individual protected, lockable "off", disconnect switch located in machine room.
  5. Emergency public telephone service with dedicated line to each individual elevator control panel in elevator machine room.
  6. Products-of-combustion sensor (NFPA No. 72, Chapter 5-3) in each elevator lobby, for each group of elevators or single elevator and machine room to initiate firefighters' return feature. Detector at top of hoistway if sprinklered. Provide means for service access from outside the hoistway. Provide sensor signal wiring from hoistway or machine room connection point to elevator controller terminals.
  7. Firefighters' telephone jack and announcement speaker in car with connection to individual elevator control panels in each elevator machine room.
  8. Means to manually and automatically disconnect power to affected elevator drive unit and controller prior to activation of machine room overhead fire sprinkler system, and/or hoistway overhead fire sprinkler system. Manual shut-off means shall be located outside bounds of machine room.
  9. When sprinklers are provided in the hoistway all electrical equipment, except seismic protective devices, located less than 4'-0" above the pit floor shall be identified for use in wet locations (ANSI/NFPA70).
  10. Power feeders to firefighters' monitor.
  11. Single-phase power feeders to machine room elevator group control monitor with single-phase, protected, lockable "off", disconnect switch.
- D. Standby Power Provision:
1. Standby power of the same voltage characteristics via normal electrical feeder to run one elevator at a time in each elevator group and/or single elevator unit at full-rated car speed and capacity.
  2. Conductor from auxiliary form "C" dry contacts, located in the standby power transfer switch to a single designated elevator control panel in each elevator bank and/or single elevator unit. Provide time delay of approximately 30-45 seconds for pre-transfer signal in either direction.
  3. Standby single-phase power to group controller, and each elevator controller for lighting, exhaust blower, emergency call bell, and hoist machine cooling fan.
  4. Means for absorbing regenerated power during an overhauling load condition, per NEC 620-101. Elevator will employ SCR drive, presenting a non-linear active load.
  5. UBC Rule 3005.1 requires elevator machine room ventilation or air conditioning to function under a standby power condition.

### 1.3 DEFINITIONS

- A. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.
- B. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

### 1.4 QUALITY ASSURANCE

- A. Compliance with Regulatory Agency: Comply with most stringent applicable provisions of following Code and/or Authority, including revisions and changes in effect on date of this specification:
1. Safety Code for Elevators and Escalators ASME A17.1-2000
  2. Inspectors' Manual, ASME A17.2.1
  3. Elevator and Escalator Electrical Equipment, ASME A17.5
  4. National Electrical Code, NFPA 70
  5. Americans with Disabilities Act (ADA)
  6. Local fire jurisdiction
  7. Requirements of IBC 2000 and all other Codes, Ordinance and Laws applicable within the governing jurisdiction
  8. Life Safety Code, NFPA 101.
  9. Uniform Federal Accessibility Standard (UFAS)

10. Texas Elevator Safety Code
11. Texas Accessibility Code.

B. Warranty:

1. Material and workmanship of the installation shall comply in every respect with contract documents. Correct defective material or workmanship which develops within one year from date of final acceptance of work to the satisfaction of the Architect, Owner, and Architect's consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Owner.
2. Defective is defined to include, but not limited to; operation or control system failures, performance below required minimum, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or vibration, and similar unsatisfactory conditions.
3. Make modifications, adjustments and improvements to meet performance requirements in Parts 2 and 3.

1.5 DOCUMENT VERIFICATION

- A. In order to discover and resolve conflicts or lack of definition which might create problems, Contractor shall review contract documents for compatibility with its product prior to bidding. Review structural, architectural, electrical and mechanical documents and elevator specification. Compliance with all provisions of contract documents is assumed and required. Owner will not pay for changes to structural, mechanical, electrical or other systems required to accommodate Provider's equipment.

1.6 SUBMITTALS

- A. Submit shop drawings and required material for review as outlined in Division 1.
1. Scaled or Fully Dimensioned Layout: Plan of pit, hoistway and machine room indicating equipment arrangement, elevation section of hoistway, details of car enclosures, hoistway entrances, and car/hall signal fixtures.
  2. Design Information: Indicate equipment lists, reactions and design information on layouts.
  3. Power Confirmation Sheets: Include motor horsepower, code letter, starting current, full-load running current, and demand factor for applicable motors.
  4. Fixtures: Cuts, samples or shop drawings.
  5. Finish Material: Submit 3" x 4" samples of actual finished material for review of color, pattern and texture by Architect. Compliance with other requirements is the exclusive responsibility of the Provider. Include, if requested, signal fixtures, lights, graphics, Braille plates, and mounting provisions.
- B. Acknowledge and/or respond to submittal comments within 15 days of return; promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Revision response time is not justification for equipment delivery or installation delay.
- C. Contract Close Out Submittals: Provide 3 sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 60 days prior to the date scheduled for Substantial completion. Include the following as minimums:
1. Straight-line wiring diagram of "as-installed" elevator circuits, with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain machine room set with addition of all subsequent changes. These diagrams are Purchaser's property.
  2. Lubricating instructions, including recommended grade of lubricants.
  3. Parts catalogs for all replaceable parts including ordering forms and instructions.
  4. Four sets of neatly tagged keys for all switches and control features properly tagged and marked.
  5. Diagnostic equipment complete with access codes, adjusters manuals and set-up manuals for adjustment, diagnosis and troubleshooting of elevator system, and performance of routine safety tests.

1.7 PERMIT, TEST AND INSPECTION

- A. Obtain and pay for permit, license, and inspection fee necessary to complete the installation.
- B. Perform test required by Owner in accordance with procedure described in ASME A17.2.1 Inspectors' Manual for Elevators and Escalators in the presence of Owner and Architect.
- C. Supply personnel and equipment for test and final review required by Consultant, as indicated in Part 3.

1.8 MAINTENANCE

- A. Interim:
  - 1. When 1 or more elevators are near completion and ready for service, Owner may accept elevators for interim use and place in service before entire installation of all elevators has been completed and accepted.
  - 2. During this period, Owner may pay a mutually agreed upon amount per elevator for preventive maintenance. Indicate amount per unit per month with bid.
  - 3. Temporary acceptance form must be acceptable to Owner and signed prior to use.
  - 4. Contractor shall provide temporary hoistway and car enclosures; protect installed equipment and finishes; and pay for all cleaning, repairs, and replacement of materials necessary to restore elevator to "as-new" condition prior to final acceptance by Owner.
- B. Warranty Maintenance:
  - 1. Provide preventive maintenance and 24-hour emergency callback service for one year commencing on date of Substantial Completion. Systematically examine, adjust, clean and lubricate all equipment. Repair or replace defective parts using parts produced by the manufacturer of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.
  - 2. Use competent personnel, acceptable to the Owner, supervised and employed by the Provider.
  - 3. The warranty maintenance period specified in Subparagraph 1.8 B.1. above shall be extended one month for each three month period in which equipment related failures average more than .25 per unit per month.
  - 4. Owner retains the option to delete cost of warranty maintenance from new equipment contract and remit 12 equal installments directly to Provider during period in which work is being accomplished.

**PART 2 PRODUCTS**

2.1 MANUFACTURERS

- A. Geared Elevators:
  - 1. Base Bid: Subject to compliance with requirements, provide low energy usage products by the following:
    - a. Kone, Inc.
    - b. Otis Elevator Company
  - 2. Alternate No. 21: Subject to compliance with requirements, provide standard products by the following:
    - a. Kone, Inc.
    - b. Otis Elevator Company,
    - c. Schindler Elevator Corporation.
    - d. Thyssen Dove Elevator.
- B. Car Enclosure: Subject to compliance with requirements, provide low energy usage products by the following:
  - 1. Brice-Southern.
  - 2. Hauenstein & Burmeister,
  - 3. Kone, Inc.
  - 4. Otis Elevator Company.
  - 5. Schindler Elevator Corporation.
  - 6. Thyssen Dover Elevator.
  - 7. Tyler.

- C. Hoistway Entrances:
1. Brice-Southern.
  2. Hauenstein & Burmeister,
  3. Kone, Inc.
  4. Otis Elevator Company.
  5. Schindler Elevator Corporation.
  6. Thyssen Dover Elevator.
  7. Tyler.

2.2 SUMMARY

A. Passenger Elevators:

Number:	Car Nos. 1-4
Capacity:	3500 Pounds Class A loading
Speed:	350 feet per minute
Roping:	2:1
Supervisory Control:	Group automatic microprocessor based system
Motor Control:	Ac variable voltage variable frequency Microprocessor based with digital closed-loop feedback and automatic stopping
Power Characteristics:	480 volts, 3 phase, 60 hertz
Stops:	8
Openings:	8, in line
Floors Served:	1-8
Travel:	102'-0" plus or minus
Platform Size:	7'-0" wide by 6'-2" deep
Minimum Clear Inside Car:	6'-8" wide by 5'-5" deep
Entrance Size:	3'-6" wide by 8'-0" high with offset transom to 10'-0" high
Entrance Type:	Single speed, center opening
Door Operation:	High-speed, heavy-duty, master door operator, Minimum opening speed 2-1/2 feet per second
Door Protection:	Infrared, full screen device, with differential timing and nudging and interrupted beam time
Machine:	Geared
Machine Location:	Overhead
Safety:	Flexible guide clamp-Type B, Car
Guide Rails:	Planed steel tees

Buffers:	Oil
Car Enclosure:	As specified Car canopy height 8'-2" plus or minus
Signals:	Manufacturers' standard
Registration Lights:	Dual hall pushbutton risers Dual car operating panels
Position Indicator:	Car - dual digital with direction arrows  Firefighters' control panel
Hall Lanterns:	At all floors with volume adjustable electronic chime or tone. Sound twice for down direction
Communication System:	Self-dialing, vandal resistant, push-to-call, two-way communication system with recall, tracking and voiceless communication
Fixture Submittal:	Submit brochure depicting manufacturer's proposed designs with Bid
<b>B. Service Elevator:</b>	
Number:	Car No. 5
Capacity:	4500 pounds Class C3 Loading
Speed:	350 feet per minute
Roping:	1:1
Operational Control:	Selective collective, microprocessor based system
Motor Control	AC variable voltage variable frequency Microprocessor based with digital closed-loop feedback and automatic stopping
Power Characteristics:	480 volts, 3 phase, 60 hertz
Stops:	8
Openings:	8, in line
Floors Served:	1-8
Travel:	102'-0" plus or minus
Platform Size:	6'-0" wide by 6'-2" deep
Minimum Clear Inside Car:	5'-8" wide by 5'-5" deep
Entrance Size:	4'-0" wide by 8'-0" high
Entrance Type:	Two speed, side opening
Door Operation:	High-speed, heavy-duty, master door operator, minimum opening speed 2-1/2 feet per second

Door Protection:	Three-dimensional infrared, full screen device, with differential timing and nudging and interrupted beam time
Machine:	Geared
Machine Location:	Offset at 8th floor
Safety:	Flexible guide clamp-Type B, car
Guide Rails:	Planed steel tees
Buffers:	Oil
Car Enclosure:	Ss specified Car canopy height 10'-0"
Signals:	Manufacturers' standard vandal resistant
Registration lights:	Single hall pushbutton riser Single car operating panel Vandal resistant car and hall pushbuttons
Position Indicator:	Car: Digital with direction arrows  Firefighters' control panel
In Car Lanterns:	Both car entrance columns with volume adjustable electronic chime or tone, sound twice for down direction; vandal resistant
Communication System:	Self-dialing, vandal resistant, push to call, two-way communication system with recall, tracking and voiceless communication
Fixture Submittal:	Submit brochure depicting manufacturer's proposed designs with bid
Additional Features: (Car Nos. 1-5):	Car and counterweight roller guides  Car top inspection station  Firefighters' service, including alternate floor return feature  Standby power transfer (automatic to main floor) with manual override in control panel  ADA access and signage  Hinged car return panel(s) arranged for integral car operating panel(s)  Hoistway access switches top and bottom floors  Hoistway door unlocking device all floors  Independent service feature  Platform isolation

Load-weighing device

Firefighters' control panel and remote wiring

Tamper resistant fasteners for signal fixture faceplates

Sill support angles

1 year warranty maintenance with 24-hour callback service

Firefighters' telephone jack

Machine, power conversion unit, and controller sound isolation

Card reader provisions all cars

CCTV provisions all cars

Battery pack emergency car lighting. Provide separate constant pressure test button in car service compartment illuminate portion of normal car lighting

Signage engraving filled with black paint or approved etching process

No visible company name or logo

Wiring diagrams, operating instructions, and parts ordering information.

System diagnostic means and instructions

## 2.2 MATERIALS

### A. Steel:

1. Sheet steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.
2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568 and A569.
3. Structural Steel Shapes and Plates: ASTM A7 and ASTM A36.

### B. Stainless Steel: Type 302 or 304 complying with ASTM A167, with standard tempers and hardness required for fabrication, strength and durability. Apply mechanical finish on fabricated work in the locations shown or specified, (Federal Standard and NAAMM nomenclature), with texture and reflectivity required to match Architect's sample. Protect with adhesive paper covering.

1. No. 4: Directional polish (satin finish). Graining directions as shown or, if not shown, in longest dimension.

### C. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

### D. Paint: Clean exposed metal of oil, grease, scale and other foreign matter and factory paint one shop coat of Manufacturer's standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

### E. Prime Finish: Clean all surfaces receiving a baked enamel finish of oil, grease and scale. Apply one coat of rust-resistant mineral paint followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of mineral paint.

- F. Baked Enamel: Prime per above. Apply and bake three additional coats of enamel in the selected solid color.
- G. Stone: Refer to Section 09385 – Dimensional Stone Tile.

### 2.3 CAR AND GROUP PERFORMANCE

- A. Speed: Plus or minus 3 percent of contract speed under any loading condition.
- B. Capacity: Safely lower, stop and hold up to 125 percent of rated load.
- C. Car Stopping Accuracy: Plus or minus 1/4 inch under any loading condition.
- D. Door Opening Time: Seconds from start of opening to fully open:
  - 1. Cars No. 1-4: 1.6 seconds.
  - 2. Car No. 5: 2.8 seconds.
- E. Door Closing Time: Seconds from start of closing to fully closed:
  - 1. Cars No. 1-4: 2.5 seconds.
  - 2. Car No5: 4.9 seconds.
- F. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open (1/2 open for side opening doors) and car level and stopped at next successive floor under any loading condition or travel direction (14'-0" typical floor height):
  - 1. Cars No. 1-4: 9.8 seconds.
  - 2. Car No. 5: 12.8 seconds.
- G. Car Ride Quality:
  - 1. Horizontal acceleration within car during all riding and door operating conditions: Not more than 15mg peak to peak in the 1-10 Hz range.
  - 2. Acceleration and Deceleration: Smooth constant and not more than 5 feet/second/second with an initial ramp between 0.5 and 0.75 second.
  - 3. Sustained Jerk: Not more than 8 feet/second/second squared.
- H. Airborne Noise: Measured noise level of elevator equipment and its operation shall not exceed 50 dBA in elevator lobbies and 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.

### 2.4 OPERATION

- A. Selective Collective Microprocessor Based (Car No. 5): Operate car without attendant from pushbuttons in car and located at each floor. When car is available, automatically start car and dispatch it to floor corresponding to registered car or hall call. Once car starts, respond to registered calls in direction of travel in the order floors are reached.
  - 1. Do not reverse car direction until all car calls have been answered or until all hall calls ahead of car and corresponding to direction of car travel have been answered.
  - 2. Slow car and stop automatically at floors corresponding to registered calls in the order in which they are approached in each direction of travel. As slow down is initiated for a hall call, automatically cancel hall call. Cancel car calls in same manner. Hold car at arrival floor an adjustable time interval to allow passenger transfer.
  - 3. Answer calls corresponding to travel direction of car unless call in the opposite direction is highest or lowest call registered.
  - 4. Illuminate appropriate pushbutton to indicate call registration. Extinguish light when call is answered.
- B. Group Automatic (Cars No. 1 through 4):
  - 1. Approved microprocessor based, group dispatch, car and motion control systems as follows including, as a minimum, the features described hereafter:
    - a. Kone, Inc.: Resolve 100.
    - b. MCE: IMC System 12/M3.
    - c. Otis Elevator Company: Elevonic 311.
    - d. Schindler elevator Corporation: Miconic TX.

- e. Swift: Futura.
  - f. Thompson: Microflite Ultra.
  - g. Thyssen Dover elevator: TAC 50.
  - 2. Operate cars as a group, capable of balancing service and providing continuity of group operation with one or more cars removed from the system.
  - 3. Register service calls on cars from pushbuttons located at each floor and in each car. Slow down and automatically stop cars at landings corresponding to registered calls. Make Stops at successive floors for each direction of travel irrespective of order in which calls are registered except when bypassing hall calls to balance and improve overall service; stop only one car in response to particular hall call. Assign hall calls to specific cars and continually review and modify these assignments to improve service. Simultaneous to initiation of slow down of a car for a hall call, cancel that call. Render hall pushbutton ineffective until car doors begin to close after passenger transfer. Cancel car calls in the same manner. Give priority to coincidental car and hall calls in car assignment.
  - 4. Operate system to meet changing traffic conditions on a service demand basis. Include provisions for handling traffic which may be heavier in either direction, intermittent or very light. As traffic demands change, automatically and continually modify group and individual car response to provide the most-effective means to handling traffic conditions. Assign hall calls to individual cars, continually review and update assignments; provide means to sense long-wait hall calls and preferentially serve them; give priority to coincidental car and hall calls in hall call assignment and accomplish direction reversal without closing and reopening doors.
  - 5. Use easily re-programmable system software. Design basic algorithm to optimize service based on equalizing system's response to registered hall calls and equalizing passenger trip time at shortest possible time.
  - 6. Serve floors below main floor in a manner which logically minimizes delay in passing or stopping at main floor in both directions of travel. Provide manual means to force a stop at the main floor when passing to or from lower levels.
  - 7. Required Failure Features:
    - a. Dispatch Protection: Backup dispatching shall function in the same manner as the primary dispatching.
    - b. Delayed Car Removal: Automatically remove delayed car from group operation.
    - c. Position Sensing: Reset car position when passing or stopping at each landing.
    - d. Hall Pushbutton Failure: Multiple power sources for pushbutton risers.
    - e. Duplicate communication link; all group and individual car computers.
- C. Other Items:
- 1. Load Weighing: Provide means for weighing car passenger load. Design control system to provide dispatching at main floor in advance of normal intervals when car fills to capacity. Provide hall call by-pass when the car is filled to preset percentage of rated capacity and traveling in down direction. (Field adjustment range: 10 to 100 percent.)
  - 2. Anti-Nuisance Feature: If car loading relative to weight is not commensurate with registered car calls, cancel car calls. Systems employing either load weighing or door protective device for activation of this feature are acceptable.
  - 3. Independent Service: Provide controls for operation of each car from its pushbuttons only. Close doors by constant pressure on desired destination floor button or door close button. Open doors automatically upon arrival at selected floor.
  - 4. Car-To-Lobby Feature: Provide the means for automatic return to the first floor. Return car nonstop after answering pre-registered car calls, and park with doors open until car is returned to normal operation.
- D. Firefighters' Service: Provide equipment and operation in accordance with Code requirements.
- E. Automatic Stopping Zone: Stop car within ¼" above or below the landing sill. Avoid overtravel/undertravel, and maintain stopping accuracy regardless of load in car, direction of travel, or distance between landings, rope slippage or stretch.
- F. Motion Control: Microprocessor based AC, variable voltage, variable frequency with digitally encoded closed-loop velocity feedback suitable for operation specified and capable of providing smooth, comfortable car acceleration, retardation and dynamic braking. Limit the difference in car speed between full load and no load to not more than +/- 3% of the contract speed.

- G. Door Operation: Automatically open door when car arrives at main floor whether car call has been registered or not. When another car is at main floor loading for departure, close doors of arriving car. Reopen doors when car is designated for loading.
- H. Standby Lighting and Alarm: Car mounted, battery unit with solid-state charger to operate alarm bell and car emergency light fixture. Battery to be rechargeable with minimum 5-year life expectancy. Coordinate location of light fixture with Architect. Provide constant-pressure test button in service compartment of car operating panel. Provide lighting integral with portion of normal car lighting system. Include required transformer.
- I. Standby Power Transfer: Upon normal power, adequate standby power will be supplied via the normal electrical feeders to simultaneously start and run one car in each group and single cars at rated speed and load.
  - 1. Automatically return one car at a time, in each group, nonstop to designated floor, open doors for approximately 3.0 seconds, close doors and park out-of-service. During return operation, car and hall call pushbuttons shall be rendered inoperative. As each car parks, system shall immediately select next car until all cars in a group have returned to the designated floor. If a car fails to start or return within 30 seconds, system shall automatically select next car in the group to automatically return. When all cars in a group have returned to the designated floor, one car in each group shall be designated for automatic operation. When a service demand exists for two minutes and the designated car fails to start, the next available car in the group shall be automatically selected for operation.
  - 2. Provide separate key-operated group rotary switch in the firefighters' control panel.
    - a. Switch shall be labeled "STANDBY POWER OVERRIDE" with positions marked "AUTO" and the appropriate car numbers. Key shall be same as utilized for firefighters' Phase I and II switch, key removable in "AUTO" position only.
    - b. Switch shall override automatic return and automatic selection functions, and shall cause the manually selected car to operate. Manual selection shall cause car to start and proceed to the designated floor and open and close its doors before stand-by power is transferred to the next selected car.
    - c. Provide "STANDBY POWER" indicator lights (one per car) in firefighters' control panel. Indicator light illuminates only when corresponding car is selected to automatically or manually operate on standby power.
  - 3. Successive Starting: When normal power is restored or there has been a power interruption, individual cars in each bank shall restart at five second intervals.
- J. Card/Proximity Reader Security System: Provide provisions inside Cars No. 1-5 for reader unit. Unit furnished by Security Subcontractor. Mount reader unit as directed by Architect and cross connect from car pushbuttons to control module in machine room via five pair of shielded wires and two RG-59 type coaxial cables or as required by Security Subcontractor. Reader control module and mounting by Security Subcontractor. All other wiring materials, logic circuits, etc., provided by others

## 2.5 MACHINE ROOM EQUIPMENT

- A. Arrange equipment in spaces shown on drawings.
- B. Geared Traction Hoist Machine:
  - 1. Worm geared traction type with motor, brake, gear, drive shaft, deflector sheave, and gear case mounted in proper alignment on an isolated bedplate. Provide blocking to elevate deflector sheave above machine room floor.
  - 2. Provide hoist machine mounted direct drive, digital, closed-loop velocity encoder.
  - 3. Provide hoist machine drip pans to collect lubricant seepage.
  - 4. Provide machine bedplate mounted deflector sheave A-frame and/or supporting steel beams and fastenings to mount deflector sheaves to building structure. Provide minimum 16-gauge easily removable sheet metal closures in wall opening around machine between the machine room and hoistway.

- C. Solid-State Power Conversion and Regulation Unit:
1. Design unit to limit current, suppress noise, and prevent transient voltage feedback into building power supply. ACV<sup>3</sup>F) Provide internal heat sink cooling fans for the power drive portion of the converter panels. Conform to IEEE standards 446-1987 for line harmonics and switching noise.
  2. Isolate unit to minimize noise and vibration transmission. Provide isolation transformers, filter networks, and choke inductors.
  3. Suppress solid-state converter noises, radio frequency interference, and eliminate regenerative voltage transients induced into the mainline feeders or the building standby power generator.
  4. Supplemental direct-current power for the operation of hoist machine brake, door operator, dispatch processor, signal fixtures, etc., from separate static power supply.
- D. Encoder: Direct drive, solid-state, optical, digital type. Update car position at each floor and automatically restore after power loss.
- E. Controller: UL/CSA labeled.
1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
  2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressers.
  3. Microprocessor Related Hardware:
    - a. Provide built-in noise suppression devices which provide a high level of noise immunity on all solid-state hardware and devices.
    - b. Provide power supplies with noise suppression devices.
    - c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
    - d. Design control circuits so that one side of power supply is grounded.
    - e. Safety circuits shall not be affected by accidental grounding of any part of the system.
    - f. System shall automatically restart when power is restored.
    - g. System memory shall be retained in the event of power failure or disturbance.
    - h. Equipment shall operate properly with a 500 KHZ to 1300 MHZ radio frequency signal, transmitted at a power level of not less than 100 watts Effective Radiated Power (ERP) at a distance of 3 feet.
    - i. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
  4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
  5. Permanently mark components (relays, fuses, PC board, etc.) with symbols shown on wiring diagrams.
  6. Provide controller or machine mounted auxiliary, lockable "off" disconnect if mainline disconnect not in sight of controller and machine.
- F. Sleeves and Guards: 2" steel angle guards around cable or duct slots through floor slabs or grating. Provide rope and smoke guards for sheaves, cables, and cable slots in machine room.
- G. Machine and Equipment Support Beams: Provide structural steel beams required for direct support of elevator hoist machine, deflector sheaves, overhead sheaves, governor, and dead-end hitch assemblies.
1. Provide bearing plates, anchors, shelf angles, blocking, embedments, etc., for support and fastening of machine beams or equipment to the building structure.
  2. Isolate machine and overhead sheave beams to eliminate noise and vibration transmission to building structure.
  3. Provide and set in place hold down bolts for machines located beside the hoistway.
  4. Provide ladders and platforms with handrails and toe boards for overhead sheave access within the bounds of the machine room.
- H. Governor: Centrifugal-type, car driven, with pull-through jaws and bi-directional electrical shutdown switches. Provide required auxiliary supports for attachment to building structure.

- I. Vibration Isolation: All elevator equipment provided under this contract, including power conversion unit, controller and their support, shall be mechanically isolated from the building structure and from electrically induced vibration to minimize the possibility of objectionable noise and vibrations being transmitted to the car, building structure or occupied areas of the building.
- J. Sound Isolation:
  - 1. Noise level relating to elevator equipment and its operation shall not exceed 80 dBA in the machine room.
  - 2. All dBA readings to be taken 3 feet off the floor and 3 feet from the equipment.

## 2.6 HOISTWAY EQUIPMENT

- A. Guide Rails: Planed steel T-sections of suitable size and weight for the application, structural support spacing, car weight, and counterweight, with brackets for attachment to building structure. Provide car rail backing and intermediate counterweight tie brackets to meet Code requirements.
- B. Buffers, Car and Counterweight: Oil type with blocking and support channels.
- C. Sheaves: Machined grooves with sealed bearings. Provide mounting means to machine beams, machine bedplate, car and counterweight structural members, etc.
- D. Counterweight: Steel frame with metal filler weights, guided by 3" roller guide shoes.
- E. Counterweight Guard: Metal guard in pit.
- F. Governor and Encoder Pit-Tensioning Sheave: Mount sheave and frame on pit support member or guide rail. Provide with guides or pivot point to enable free vertical movement and proper tension of cable/tape.
- G. Hoist and Governor Ropes:
  - 1. 8 x 19 or 8 x 25 Seale construction, traction steel type. Fasten with staggered length, adjustable, spring isolated shackles.
  - 2. Governor rope to suit manufacturer's specification.
- H. Terminal Stopping: Provide normal, and final terminal speed limiting devices.
- I. Electrical Wiring and Wiring Connections:
  - 1. Conductors and Connections: Copper throughout with individual wires coded and connections on identified studs or terminal blocks. Use no splices or similar connections in wiring except at terminal blocks, control compartments, junction boxes, or condulets. Provide 10% spare conductors throughout. Run spare wires from car connection points to individual elevator controllers in the machine room. Provide six (6) pairs of spare shielded communication wires in addition to those required to connect specified items. Tag spares in machine room.
  - 2. Conduit: Painted or galvanized steel conduit and duct. Conduit size, 1/2" minimum. Flexible conduit not to exceed 36" in length. Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.
  - 3. Traveling Cables: Type ET flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway. Provide 2 RG-59 coaxial CCTV cables within traveling cable from car controller to car top Provide two (2) pair 14-gauge wire for CCTV power.
  - 4. Auxiliary Wiring: Connect smoke sensors, emergency telephone system, firefighters' phone jack, paging speaker, CCTV, card reader, and announcement and/or background music in each car controller in each machine room.
- J. Entrance Equipment:
  - 1. Door Hangers: Two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.
  - 2. Door Tracks: Bar or formed, cold drawn removable steel tracks with smooth roller contact surface.
  - 3. Door Interlocks: Operable without retiring cam. Paint interlocks flat black.
  - 4. Door Closers: Spring, spirator or jamb/strut mounted counterweight type. Design and adjust to insure the smooth quiet mechanical close of doors.

- K. Floor Numbers: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors at each landing and adjacent to the leading edge of the door.

2.7 HOISTWAY ENTRANCES

- A. Complete entrances bearing UL fire labels.
- B. Frames: Hollow metal at all floors. Bolted and lapped head to jamb connection assemble fabricated from not less than 14 gauge material. Permanently attach rear mounted Arabic floor designation plates, centerline at 60" above finished floor, on both sides of jambs existing. Provide main egress landing plates with "Star" designation. Braille indications shall be below Arabic floor designation.
- C. Door Panels: 16-gauge steel, sandwich construction without binder angles. Provide leading edges of center-opening doors with rubber astragals. Provide a minimum of 2 gibs per panel, one at leading and one at trailing edge with gibs in the sill groove their entire length of travel. Construct doors higher than 7'-0" with interlocking, stiffening ribs. Architectural metal cladding shall wrap around leading and trailing edge of panel and return a minimum of 1/2" on rear side of panel.
- D. Transom Panels: Sheet, offset labeled. Same construction and finish as hoistway door panels at all floors.
- E. Sight Guards: 14-gauge, same material and finish as hoistway entrance door panels. Construct without sharp edges.
- F. Sills: Extruded stainless steel, Cars No. 1-4; Extruded nickel silver, Car No. 5.
- G. Sill Support Angles: Structural or formed steel designed to support door sill, based upon car loading classification. Mount to eliminate need for grout under the sill. 5" x 5" x 1/2" (Service Elevator, Car No. 5) cold-rolled structural steel angle, extend full width of hoistway. Fasten to building structure at maximum 18" O.C.
- H. Fascia, Toe Guards and Hanger Covers: 14 gauge furniture steel with black enamel finish.
- I. Struts and Headers: Provide for vertical support of entrances and related material. Provide door open bumpers on entrances equipped with vertical struts.
- J. Finish of Frames and Doors: Provide information to Painting Subcontractor on Providers prime finish and compatible products for final painting.

CAR(S) NO.	FLOOR	FRAMES	DOOR PANELS
1-4	All	Stainless Steel No. 4 Satin Finish	Stainless Steel No. 4 Satin Finish
5	All	Stainless Steel No. 4 Satin Finish	Stainless Steel No. 4 Satin Finish

2.8 CAR EQUIPMENT

- A. Frame: Welded or bolted, rolled or formed steel channel construction to accommodate load classification requirements.
- B. Safety Device: Type "B", flexible guide clamp.
- C. Platform: Isolated type, constructed of steel, or steel and wood which is fireproofed on the underside. Design and construct to accommodate load classification requirements. Minimum Class "A" construction for all passenger elevators, Cars No. 1-4 and Class C-3 construction for Service Elevator, Car No. 5.
- D. Guide Shoes: Roller type with 3 or more spring-dampened, sound-deadening rollers per shoe. Minimum roller diameter 5".

- E. Finish Floor Covering:
  - 1. Cars No. 1-4 : Stone by Section 09385.
  - 2. Car No. 5: Steel checker plate over 3/4 thick marine plywood sub-floor.
- F. Sills: One piece extrusion with extruded extension between car entrance columns to face of car front return. Extruded extension to match finish of sill. Block up car sill and extension 2" to accommodate installation of granite floor finishes, Cars No. 1-4 only.
  - 1. Cars No1-4: Stainless steel.
  - 2. Car No. 5: Nickel silver.
- G. Toe Guard: Minimum 14-gauge steel, reinforced and braced to car platform, with flat black finish.
- H. Doors: Provide as specified for hoistway entrance doors.
- I. Door Hangers: Two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.
- J. Door Track: Bar or formed, cold drawn removable steel track with smooth roller contact surface.
- K. Door Header: Construct of minimum 12-gauge steel, shape to provide stiffening flanges.
- L. Door Electrical Contact: Prohibit car operation unless car door is closed within tolerance allowed by Code.
- M. Door Clutch: Heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation. Design clutch so car doors can be closed, while hoistway doors remain open.
- N. Restricted Opening Device: Restrict opening of car doors outside the unlocking zone.
- O. Door Operator: High speed, heavy-duty, master door operator capable of opening doors at no less than 2 ½ f.p.s. Accomplish reversal in no more than 2 ½" of door movement. Open doors automatically when car arrives at a floor.
  - 1. Acceptable closed-loop door operators:
    - a. G.A.L.: MOVFR.
    - b. Kone, Inc.: AMD 2.0.
    - c. Otis Elevator Company: i Motion II.
    - d. Schindler Elevator Corporation: QKS 15.
    - e. Thyssen Dover Elevator: HD 91 SmartTech.
- P. Door Control Device:
  - 1. Infrared Reopening Device: Black, fully enclosed device. Full screen infrared matrix or multiple beams extended vertically along edge of each leading door panel to minimum height of 7'-0" above finished floor with extension of detector housing full height of door panel. Device shall prevent doors from closing and reverse doors to normal opening speed if beams are obstructed while doors are closing, except during nudging operation. If device fails, provide for automatic shutdown of car at floor level with doors open.
    - a. Acceptable Infrared Reopening Device, Cars No. 1-4:
      - 1) Gatekeeper 2000 by Adams.
      - 2) Lambda by Otis Elevator Company.
      - 3) Magic Edge by Tri-Tronics.
      - 4) Microlite by Thyssen Krupp.
      - 5) Microscan E by T.L. Jones.
      - 6) Pana194 Plus by Janus.
    - b. Acceptable Infrared 3D Reopening Device, Car No. 5:
      - 1) Lambda 3D by Otis Elevator Company.
      - 2) Microlite 3D by Thyssen Krupp.
      - 3) Pana40 Plus 3D by Janus.
  - 2. Nudging Operation: After beams of door control device are obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), warning signal shall sound and the doors shall attempt to close with a maximum of 2.5 foot pounds kinetic energy. Activation of the door open button shall override the nudging operation and re-open the doors.

3. Interrupted Beam Time: When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0-1.5 seconds after beams are re-established.
4. Differential Door Time: Provide separately adjustable timers to vary time that doors remain open after stopping in response to calls.
  - a. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
  - b. Hall Call: Hold open time adjustable between 5.0 and 8.0 seconds. Use hall call time when car responds to coincidental calls.

Q. Car Operating Panel:

1. Two car operating panels without faceplate(s), Cars No. 1-4 and one car operating panel with faceplate, Car No. 5, consisting of a metal box containing the operating fixtures, mounted behind the car enclosure front return panels. Faceplate(s) shall be hinged and constructed of stainless steel no. 4 satin finish, Car No. 5 only.
2. Suitably identify floor buttons, alarm button, door open button, door close button, emergency push-to-talk button, with SCS, Visionmark or Entrada Cast Tactile symbols recessed flush rear mounted. Provide plates per ADA Standards including Braille. Locate operating controls no higher than 48" (front approach) 54" (side approach) above the car floor; no lower than 35" for emergency push-to-talk button and alarm button.
3. Provide a minimum 3/4" diameter raised or flush floor pushbuttons which illuminates to indicate call registration. Include 5/8" high designation of the floors served on face of pushbutton.
4. Provide alarm button at bottom of car operating panel to ring bell located on car, and sound distress signal. Illuminate button when activated.
5. Provide keyed stop switch with markings to show "run" and "stop". Locate in locked car service compartment. Arrange switch or button to sound main control panel distress signal when actuated. Mark device to indicate "run" and "stop" positions.
6. Provide "door open" button to stop and reopen closing doors or hold doors in open position. Button operable only while car is stopped at floor regardless of special operational features, except firefighters' service.
7. Provide "door close" button to activate door close cycle. Cycle shall not begin until normal door dwell time for a car call has expired, except firefighters' service.
8. Provide firefighters' Phase II key switch with engraved instructions per Code requirement, filled red. Include light jewel, buzzer, and call cancel button.
9. Provide firefighters' telephone jack with bezel matching adjacent controls.
10. Provide lockable service compartment with recessed flush door. Door material and finish to car match return panel or car operating panel faceplate.
11. Include the following controls in lockable service cabinet with function and operating positions identified by engraved letters painted black:
  - a. Inspection switch
  - b. Light switch
  - c. 3-speed exhaust blower switch
  - d. Independent service switch
  - e. Constant pressure test button for battery pack emergency lighting
  - f. 120-volt, AC, GFCI protected electrical convenience outlet
  - g. Car lighting dimmer switch
  - h. Card reader override switch
  - i. Stop switch
12. Provide black paint filled, except as noted, engraved or approved etched signage with size and style approved by Architect as follows:
  - a. Phase II firefighters' operating instructions on main operating panel above corresponding key switch filled red.
  - b. Car(s) No. over main car operating panel.
  - c. "Certificate of Inspection on File in Building Office" on main car operating panel.
  - d. "No Smoking" over auxiliary and main car operating panels.
  - e. Car capacity in pounds on main car operating panel.
  - f. Freight loading classification and description on car operating panel service compartment door.
13. Extended Door Hold Open Button: Provide button to extend normal door hold open period up to 30 seconds. Cancel extended time by registration of destination car call or actuation of door close button. Provide for Car No. 5 only.

R. Car Top Control Station: Per Code. Mount to provide utilization while standing in an upright position.

- S. Work Light and Duplex Plug Receptacle: GFCI protected outlet top and bottom of car. Include on/off switch and lamp guard.
- T. Communication System:
  - 1. "Push to Call", two-way communication instrument in car with automatic dialing, tracking and recall features with shielded wiring to car controller in machine room. Provide dialer with automatic roll over capability with minimum two numbers.
    - a. "Push to Call" button or adjacent light jewel shall illuminate and flash when call is acknowledged. Button shall match floor pushbutton design. Provide uppercase "PUSH TO CALL", "HELP ON THE WAY" engraved signage Sans Serif or simple Serif type.
    - b. Provide "Push to Call" button tactile symbol engraved signage and Braille adjacent to button mounted integral with car front return panel.
  - 2. Firefighters' telephone jack in car and firefighters' panel, with four shielded wires to machine room junction box. Jack bezel shall match adjacent controls.
  - 3. Install remote speaker provided by Life Safety Contractor in car canopy with shielded wiring to machine room junction box.
  - 4. Provide two-way communication between car and machine room per ASME A17.1, Rule 2.11.1 (c).

## 2.9 CAR ENCLOSURE

- A. Passenger Elevator: Provide complete car enclosure as specified herein and as detailed on architectural drawings, cars No. 1-4. Provide the following features:
  - 1. Shell: Reinforced 14-gauge furniture steel with baked enamel interior finish as selected. Apply sound-deadening mastic to exterior.
  - 2. Canopy: Reinforced 12-gauge furniture steel with lockable, hinged emergency exit. Interior finish white, reflective baked enamel.
  - 3. Front Return Panels and Integral Entrance Columns: Reinforced 14-gauge stainless steel no. 4 satin finish. Swing entire unit on substantial pivot points (minimum 3) for service access to car operating panel(s). Locate pivot point to provide full swing of front return panel without interference with side wall finish or handrail. Secure in closed position with concealed 3-point latching. Provide service compartment with recessed flush cover and cutouts for operating switches, etc.
  - 4. Transom: Reinforced 14-gauge stainless steel no. 4 satin finish full width of enclosure.
  - 5. Car Door Panels: Minimum reinforced 16-gauge stainless steel no. 4 satin finish. Same construction as hoistway door panels. Architectural metal cladding to wrap around leading and trailing edge of panel and return a minimum of 1" on rear side of panel.
  - 6. Base: Per Architect's design.
  - 7. Interior Wall Finish: Per Architect's design.
  - 8. Ventilation: Three-speed exhaust blower mounted to car canopy on isolated rubber grommets. Morrison Products, Model AA with diffusor and grille.
  - 9. Lighting: Provide fluorescent fixtures with wiring and hookup. Coordinate with emergency lighting requirements. Provide emergency lighting integral with portion of normal car lighting system. Include required transformer.
  - 10. Suspended Ceiling: As indicated on Architectural Drawings.
  - 11. Handrails: Per Architect's design.
- B. Service Elevator: Provide complete car enclosure as specified herein, Car No. 5. Provide the following features:
  - 1. Shell: Reinforced 14-gauge textured stainless steel as specified in Part 2, Item 2.02 above. Apply sound-deadening mastic to exterior.
  - 2. Top: Reinforced 12-gauge furniture steel with hinged lockable exit. Finish with white reflective baked enamel.
  - 3. Front Return Panels, Integral Entrance Columns, Side Wall, and Rear Wall: Reinforced 14-gauge textured stainless steel as specified in Part 2, Item 2.02 above.
  - 4. Transom: Reinforced 14-gauge, stainless steel no. 4 satin finish.
  - 5. Car Door Panels: Minimum reinforced 16- textured stainless steel as specified in Part 2, Item 2.02 above. Same construction as specified for hoistway door. Metal cladding shall wrap around leading and trailing edge of panel and return a minimum of 1" on rear side of panels.

6. Handrails: Two lines. Top line 1 ½" x 3/8" solid stainless steel bars. Lower line 4" x 3/8" solid stainless steel flatstock bars mounted on both sides and rear of the car. Locate bottom handrail line 8" above car floor and locate top handrail line at 32" above the car floor. Bolt handrails through car walls from back and mount on 1½" deep round stainless steel standoff spacers no more than 18" O.C. Return handrail ends to car walls.
7. Ventilation: Three-speed exhaust blower mounted to car canopy on isolated rubber grommets. Morrison Products, Model OE with diffusor and grille.
8. Lighting: Fluorescent fixtures flush-mounted in ceiling with protective diffusor and steel guard over fixtures on car top.

## 2.10 HALL CONTROL STATIONS

- A. Pushbuttons: Provide two (2) risers, Cars No. 1-4 and one (1) riser, Car No. 5, with flush-mounted faceplates. Include pushbuttons for each direction of travel which illuminate to indicate call registration. Include approved engraved message and pictorial representation prohibiting use of elevators during fire or other emergency situation as part of faceplate. Pushbutton design shall match car operating panel pushbuttons. Provide vandal resistant pushbutton and light assemblies, Car No. 5 only.
- B. Hoistway Door Unlocking Device: Provide unlocking device with escutcheon in door panel at all floors, with finish to match adjacent surface.
- C. Hoistway Access Switches: Mount in wall at top and bottom floors. Provide fixture with faceplate.
- D. Faceplate Material and Finish:
  1. Hall Pushbutton Station: Stainless steel no. 4 satin finish.
  2. Hoistway Access Switch: Stainless steel no. 4 satin finish.

## 2.11 SIGNALS

- A. Hall Lantern: Provide at each entrance to indicate of travel direction of arriving car, Cars No. 1-4. Locate as detailed on architectural drawings. Illuminate up or down lights and sound tone, twice for down direction travel, prior to car arrival at floor. Sound level to be adjustable from 20-80 dBA measured at 5'-0" in front of hall pushbutton and 3'-0" off floor. Illuminate light until the elevator doors start to close. Provide advanced hall lantern notification to comply with ADA hall call notification time. Minimum 2½" in the smallest dimension, arrow lenses without faceplates. Provide vandal resistant lantern and light assemblies consisting of series of dots or lines for maximum visibility.
- B. Car Direction Lantern: Provide flush-mounted car lanterns in both car entrance columns of Car No. 5. Illuminate appropriate direction arrow, minimum 2½" in the smallest dimension, and sound electronic tone to indicate intended car direction as doors open. Sound tone once for up direction, twice for down direction. Sound level shall be adjustable from 0-80 dBA measured at 5'-0" from in front of hall pushbutton. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time. Provide vandal resistant lantern and light assemblies consisting of series of dots or lines for maximum visibility, Car No. 5 only.
- C. Car Position Indicator: Alphanumeric digital indicator type containing floor designations and direction arrows a minimum of ½" high to indicate floor served and the direction of car travel. Locate fixture in car front return panel above each car operating panel. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway. Illuminate proper direction arrow to indicate the direction of travel.
- D. Faceplate Material and Finish:
  1. Hall Lantern: Stainless steel no. 4 satin finish.
  2. Car Direction Lantern: Stainless steel no. 4 satin finish.
- E. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

2.12 GROUP CONTROL AND DISPLAY PANEL

- A. Firefighters' Control Panel: Locate in building fire control room. Fixture faceplate, No. 4 brushed finish stainless steel, including the following features:
  - 1. Car position and direction indicator (digital readout or color SVGA display type). Identify each position indicator by car number.
  - 2. Indicator showing operating status of each car.
  - 3. Wiring to panel. Conduit from closest elevator hoistway of each group or single elevator by others.
  - 4. Manual car standby power selection switch and power status indicator.
  - 5. Firefighters' telephone jack.
- B. Firefighters' Key Box: Flush-mounted box with lockable, hinged cover. Engrave instructions for use on cover per local fire authority requirements.
- C. Machine Room Display Unit: Provide groups of elevators with a machine room color SVGA monitor. As a minimum, SVGA monitor shall display the following functions:
  - 1. On/off means to place car in or out of service. When placed in "off" position, return car nonstop to designated floor and park with doors open.
  - 2. Car operating in normal/standby power
  - 3. Car position and direction of travel
  - 4. Car calls
  - 5. Hall calls
  - 6. Operating mode
  - 7. Door status
  - 8. Delayed car
  - 9. Load weigh and bypass
  - 10. Car to lobby feature
  - 11. Car in/out of service.
  - 12. Secured floor control and code entry.

3.1 SITE CONDITION INSPECTION

- A. Prior to beginning the installation of equipment, examine hoistway and machine room areas. Verify that no irregularities exist which affect execution of work specified.
- B. Do not proceed with installation until work in place conforms to project requirements.

3.2 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver material in manufacturer's original, unopened protective packaging.
- B. Store material in original protective packaging. Prevent soiling, physical damage or moisture damage.
- C. Protect equipment and exposed finishes from damage and stains during transportation, erection and construction.

3.3 INSTALLATION

- A. Install all equipment in accordance with manufacturer's instructions, referenced codes, specification and approved submittal.
- B. Install machine room equipment with clearances in accordance with referenced codes and specification.
- C. Install all equipment so it may be easily removed for maintenance and repair.
- D. Install all equipment for ease of maintenance.
- E. Install all equipment to afford maximum accessibility, safety, and continuity of operation.

- F. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
  - 1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
  - 2. Machine room equipment, hoistway equipment including guide rails, guide rail brackets, and pit equipment.
  - 3. Neatly touch up damaged factory-painted surfaces with original paint and color. Protect machine-finish surfaces against corrosion.

### 3.4 FIELD QUALITY CONTROL

- A. Work at the jobsite will be checked during the course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.
- B. Have Owner and Architect acceptance inspection performed and complete corrective work.

### 3.5 ADJUSTMENTS

- A. Install rails plumb and align vertically with tolerance of 1/16" in 100'-0". Secure joints without gaps and file any irregularities to a smooth surface.
- B. Static balance cars to equalize pressure of guide shoes on guide rails.
- C. Lubricate all equipment in accordance with manufacturer's instructions.
- D. Adjust motors, power conversion unit, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks and safety devices to achieve required performance levels.

### 3.6 CLEANUP

- A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis.
- B. Remove all loose materials and filings resulting from work.
- C. Clean machine room equipment and floor.
- D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

### 3.7 ACCEPTANCE INSPECTION AND TESTS

- A. General: Furnish labor, materials, and equipment necessary for tests. Notify Owner and Architect 5 days in advance when ready for final review of unit or group. Final acceptance of installation will be made only after all field-quality control reviews have been completed, identified deficiencies have been corrected, all operation and maintenance information has been received, and the following items have been completed to satisfaction of Owner and Architect:
  - 1. Workmanship and equipment comply with specification.
  - 2. Contract speed, capacity, floor-to-floor, and door performance comply with specification.
  - 3. Performance of following are satisfactory:
    - a. Starting, accelerating, and running.
    - b. Decelerating, stopping accuracy.
    - c. Door operation and closing force.
    - d. Equipment noise levels.
    - e. Signal fixture utility.
    - f. Overall ride quality.
    - g. Performance of door control devices.
    - h. Operations of special security Operations and floor lock-off provisions.
    - i. Operation of Firefighters' Operation.
    - j. Operation of emergency two-way communication device.

4. Test results:
  - a. In all test conditions, obtain specified speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of Owner and Architect.
  - b. Temperature rise in windings limited to 50 degrees Celsius above ambient. A full-capacity, one-hour running test, stopping at each floor for 10 seconds in up and down directions, may be required.
  
- B. Performance Guarantee: Should tests reveal defects, poor workmanship, variance or noncompliance with requirements of specified Codes and/or ordinances, or variance or noncompliance with the requirements of specifications, complete corrective work to satisfaction of Owner and Architect at no cost:
  1. Replace equipment that does not meet Code or specification requirements.
  2. Perform work and furnish labor, materials and equipment necessary to meet specified operation and performance.
  3. Perform and assume cost for retesting required by Owner and Architect to verify specified operation and/or performance.
  
- C. Field Review Scheduling: Schedule progress and final equipment reviews with Owner and Architect. Reply promptly, in writing, to corrective work indicated on Architect's progress and/or final review reports, indicating status, schedule for completion, and questions. Architect anticipates that scheduled appointments will be met. Contract amount will be reduced to reimburse Architect at normal billing rates for appointments not kept, or for additional follow-up reviews required due to gross non-compliance with previous review requirements.

END OF SECTION 14210

**SECTION 14422 - INCLINE WHEELCHAIR LIFTS**

**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Inclined platform lift.
  - 2. Electrical components, wiring, and connections not indicated on Electrical Drawings.

1.3 SYSTEM DESCRIPTION

- A. Design Requirements:
  - 1. Design platform lift in compliance with ANSI/ASME A17.1 and applicable regulations of the State and locality in which Project is located.
  - 2. Design platform lift at static load of five times specified capacity.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, rated capacities, operating characteristics, furnished specialties, accessories, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details.
  - 1. Include plans, elevations, sections, details, and attachments to other work.
  - 2. Location and characteristics of electrical systems connections.
  - 3. Maximum loads imposed on guide rails requiring load transfer to building structure.
  - 4. Individual weight of principal components, indicating load reactions at points of support from building structure.
- C. Wiring Diagrams: Include complete wiring diagrams indicating all component parts, disconnect switches, conduit, and voltage requirements provided under other Sections, and required to operate assembly.
- D. Color Samples: Two sets of samples of the following.
  - 1. Guide rails finish.
- E. Quality Assurance Submittals:
  - 1. Recycled content certification: Manufacturer's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and post-industrial recycled content by weight for each Product specified under this Section.
  - 2. Local/regional source certification: Manufacturer or fabricator's certificate indicating location, and distance in miles from the Project Site, of each Product's final assembly, extraction, harvesting, or recovery prior to shipment to the Project Site.
- F. Maintenance Data: For to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
1. Maintenance proximity: Not more than 2 hours' normal travel time from Installer's place of business to Project site.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Indicate measurements on Shop Drawings.

**PART 2 - PRODUCTS**

2.1 MANUFACTURED UNITS

- A. Vertical Wheelchair Lifts:
1. Platform manufacturer's standard or custom manufactured vertical wheelchair lift which complies with requirements specified in this Section.
    - a. Where components are not otherwise specified in this Section, provide elevator manufacturer's standard components as required for a complete system.
  2. Capacity: 450 pounds.
  3. Speed: 20 feet per minute.
  4. Platform: ASTM A283/A283M steel plate containing not less than 28 percent recycled steel.
    - a. Size: 30 inches by 48 inches.
    - b. Thickness: Not less than 11 gage.
    - c. Finish: ASTM A123 Grade 90, hot dipped galvanized.
  5. Overall lift dimensions:
    - a. Fold-up position: Not more than 25 inches projection from wall.
    - b. Operational position: Not more than 48 inches from wall.
  6. Motor: 1/2 horsepower, with instant reverse capability and self-locking worm gear.
    - a. Voltage: 120 volts alternating current.
  7. Drive: Twin rack and pinion gear with guide tubes.
  8. Operating controls:
    - a. Landing:
      - 1) On-off keyed switch.
      - 2) Constant pressure call-send buttons.
    - b. Platform:
      - 1) On-off keyed switch.
      - 2) Emergency stop switch.
      - 3) Removable 5 feet long pendant type control switch on coil card with constant pressure directional push buttons.
  9. Travel: As indicated on Drawings.
  10. Power requirements: 110 volts, single phase, 60 cycles alternating current, 20 amperes.
  11. Components: Provide the following.
    - a. Rechargeable battery operation.
    - b. Mechanical brake and electro-mechanical overspeed sensor with electrical drive cut-off protection.
    - c. Upper and lower limit switches.
    - d. Manual safety arms.
    - e. Audio-visual bystander alert.
  12. Guide rails: ASTM A53, Schedule 40 steel pipe containing not less than 28 percent recycled steel.
  13. Access ramps: Automatic dual access ramps with slip-resistant surface.
    - a. Material: ASTM A283/A283M galvanized steel plate containing not less than 28 percent recycled steel.
      - 1) Thickness: Not less than 11 gage.

14. Electrical boxes, conduit, wiring, and devices: Comply with NFPA 70.
15. Products: Subject to compliance with requirements, provide the following:
  - a. Access Industries, Inc.: IL92.
  - b. Other manufacturers offering products that may be incorporated into the Work are the following
    - 1) Concord Elevator, Inc.
    - 2) Graventa (Canada) Ltd.

## 2.2 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Exposed Metal Surface Finish: Manufacturer's standard electrostatically applied baked polyester finish.
  1. Color: as selected by Architect from manufacturer's standard colors.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance Work of this Section.
- B. Examine roughing-in for electrical systems for wheelchair lift to verify actual locations of connections before equipment installation.
- C. Examine walls and floors of pits for suitable conditions where wheelchair lift is to be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Coordinate size and location of wheelchair lift components to be attached to or recessed into concrete or masonry, and furnish anchoring devices with templates, diagrams, and instructions for their installation.

### 3.3 INSTALLATION

- A. Comply with ANSI/ASME A17.1, regulatory requirements specified in PART 1 of this Section, local and State requirements, and manufacturer's instructions.
- B. Install guides, controls, equipment, and accessories to provide quiet and smooth operation, free from sidesway, oscillation, and vibration.
- C. Connect equipment to building utilities at locations indicated on Drawings.

### 3.4 FIELD QUALITY CONTROL

- A. Inspections:
  1. Coordinate with local code authority for review of completed installation and obtaining required permits.
  2. Perform test and inspection in presence of Architect.
- B. Perform test required by applicable regulations.

### 3.5 ADJUSTING AND CLEANING

- A. Adjust wheelchair lift for proper, safe, efficient operation.

- B. Test wheelchair for vertical travel and performance.
- C. Restore marred, abraded surfaces to their original condition.

3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain wheelchair lift.
  - 1. Refer to Division 1 Section "Project Closeout."

END OF SECTION 14422