



**Office of Capital Planning  
and Project Management**

**DIVISION 14**

**CONVEYING  
EQUIPMENT**

This Article on Codes, Regulation and Standards shall apply  
to all Divisions of the Building Standards

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## SECTION 14 10 00 - DUMBWAITERS

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- Refer to applicable codes for rated construction requirements.
- Matot is the preferred manufacturer.

**END OF SECTION 14 10 00**

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## SECTION 14 21 00 - ELECTRIC TRACTION ELEVATORS

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- Scope
  1. General: These standards are intended to cover the installation of (number of elevators) passenger elevators in a first-class manner.
  2. Work: The work shall include, but not be limited to, complete control systems, controller assemblies, machine assemblies, door operation systems, door protection systems, car assemblies and signal systems on Elevators # (elevator numbers).
  3. Location: The work shall be performed at the University of Illinois at Chicago, Building (building number), (building legal address), Chicago, Illinois.
- Work Included:
  1. General: Contractor shall include all work necessary to complete the elevator installation per the Contract Documents.
  2. Code Compliance: Contractor shall provide any additional material or modifications to equipment required to meet applicable Codes, Standards and Laws.
  3. First-class Condition: Contractor shall include servicing, lubrication and painting of equipment to insure all equipment is in first-class condition at the completion of the project.
  4. Multiple Parts: Contractor shall provide the proper number of devices or parts required. In all cases where a device or a part of the equipment is herein referred to in the singular, it is intended to apply to the number of devices or parts required to complete the installation.
- Work Not Included:
  1. General: Contractor shall coordinate the work identified with the other contractors.
  2. Machine Room Requirements:
    - a. Enclosure: Fire-rated walls shall be provided to isolate elevator equipment from other equipment.
    - b. Access: Fire-rated door shall be provided which is self-closing and self-locking. Permanent noncombustible stairs with handrails shall be provided where floor levels for access are different.

- c. Cooling: Air conditioning shall be provided to prevent room from exceeding the maximum equipment operating temperature requirements.
  - d. Heating: Heater shall be provided to prevent room from falling below the minimum equipment operating temperature requirements.
  - e. Painting: Walls in machine rooms shall be painted.
  - f. Fire Extinguisher: An ABC fire extinguisher shall be provided in each machine room area.
3. Hoist-way Requirements:
- a. Enclosure: Fire-rated wall shall be provided. Front wall shall be constructed after entrance frames have been installed.
  - b. Alignment: Hoist-way shall be provided which is plumb within 1 inch.
  - c. Projections: Beveled guards shall be provided where the side or rear wall projects, recedes or is set back more than 2 inches.
  - d. Cutting: Walls shall be cut for fixtures.
  - e. Patching: Walls shall be patched for fixtures. Walls shall be patched for drywall-type entrance assemblies.
  - f. Grouting: Walls shall be grouted for concrete-type entrance assemblies. Floors shall be grouted for sills.
  - g. Painting: Walls around entrances and fixtures shall be painted.
  - h. Venting: Venting shall be provided to prevent accumulation of smoke and gases as required.
  - i. Pit Access: Ladders shall be provided in pits.
4. Electrical Requirements:
- a. Mainline Disconnects: One lockable, fused three-phase mainline disconnect shall be provided for each elevator in the machine room.
  - b. Cab Lighting Disconnect: One fused single-phase service with switch shall be provided for each elevator in the machine room.
  - c. Machine Room Lighting: Adequate lighting (minimum 10 ftc) shall be provided in the machine room. One light switch shall be provided on the lock-jamb side adjacent to each machine room access door. Two duplex outlets shall be provided in the machine room.
  - d. Pit Lighting: Adequate lighting (minimum 5 ftc) shall be provided in the pit area. At least one covered light fixture shall be provided for each elevator. One light switch accessible from the pit entry for each elevator and duplex outlet shall be provided in each pit area.
  - e. Standby Power: Adequate power to operate one elevator in each group shall be provided from the standby generator. Means for absorbing regenerate power shall be provided.

- f. Standby Power Signals: Two signals shall be provided to each elevator operational control system. One signal shall activate when the power has transferred to the standby power source. The other signal shall activate prior to transfer back to normal power. This pre-transfer signal shall be adjustable and initially set at 30 seconds.
        - g. Conduit: Conduit shall be provided from elevator hoist-ways to Fire Control Panel.
- 5. Cab Requirements:
  - a. Flooring: Tile shall be provided for each elevator cab.
- 6. Communication Requirements:
  - a. Telephone Service: Specify the electrical contractor to provide  $\frac{3}{4}$  inch conduit, from the nearest telephone closet (FDF), 4 pair CAT 5 telephone cable and a "D-MARK" junction box near the controller of each elevator for the purpose of providing ADA compliant telephone service in each cab. Final trimming, testing and programming shall be performed by University Telecommunication Department.
  - b. Emergency Telephone Device: Standard University Emergency Telephone Unit (ETU), hands free, ADA compliant, will be provided by the University. Elevator contractor shall make necessary cut out, and provide mounting flanges with 4 tapped holes, so that the unit could be secured flush to either the front return/entrance swing column unless shown otherwise on drawings. The University will loan a prototype of the ETU to the elevator manufacturer contractor for making proper cut outs and mounting reinforcement mechanism.
- Quality Assurance:
  - 1. Qualified Bidders: Contractor shall submit the following certified information with the bid:
    - a. Contractor is currently engaged in the manufacturing and installation of elevator equipment and has been for the previous twenty-five (25) years.
    - b. Contractor shall have technical qualifications of at least ten (10) years installing microprocessor-based elevator equipment. Qualification shall be based on having trained supervisory and installation personnel and the facilities to install the elevator equipment proposed in the Chicago area.
    - c. Contractor shall submit a list of installations totaling 100 elevators where all the elevator equipment proposed for this installation has been completed.
    - d. Contractor shall submit a list of five or more local (in the Chicago area) installations where all the elevator equipment proposed for this installation has been completed by him.

2. Approved Manufacturers: Contractor shall provide material from specified manufacturers.
  3. Other Manufacturers: Contractors may not provide material from other manufacturers.
- Code Compliance:
    1. General: Contractor shall comply with most-stringent applicable provisions of the following Codes, Standards and Laws including revisions and changes in effect on date of these standards.
    2. Elevator:
      - a. ASME A17.1 - Safety Code for Elevators and Escalators.
      - b. ASME A17.2 - Inspectors' Manual.
      - c. ASME A17.3 - Safety Code for Existing Elevators and Escalators.
    3. Electrical
      - a. NFPA 70 - National Electrical Code.
    4. Building:
      - a. City of Chicago Building Code
    5. Life Safety:
      - a. NFPA 101 - Life Safety Code
      - b. City of Chicago fire authority.
    6. Handicapped Accessibility:
      - a. Americans with Disability Act.
      - b. Illinois Environmental Barriers Act.
      - c. ANSI A-117.1
        - i. Specifications for Making Building and Facilities
        - ii. Accessible to, and Usable by, the Physically
        - iii. Handicapped.
    7. Laws: Any other Ordinances and Laws applicable within the governing jurisdiction.
  - Schedule:
    1. General: The contractor shall submit a complete schedule, including material delivery dates, within 14 days of Award of Contract.
    2. Award of Contract: Contractor shall not proceed until the contract is signed by the Owner. Owner may provide written notification to proceed prior to signing contract. Date of notification shall serve as the date of Award of Contract for scheduling purposes.
    3. Installation Period: The contractor shall not begin the installation until all material for the first elevator is delivered.
    4. Final Acceptance: Contractor shall continue to work at the location until the final acceptance of the last elevator is completed.
  - Pre-Installation Submittal:

1. General: Contractor shall assemble complete submittal packages within 30 days of Award of Contractor.
  2. Product Data: Contractor shall submit six (6) copies of the manufacturer's specifications and installation instructions for each product furnished.
  3. Power Data: Contractor shall provide electrical calculations for all three-phase and single-phase feeder requirements.
  4. Test Data: Contractor shall provide certified laboratory test reports on components as specified or required by referenced codes.
  5. Keying: Contractor shall coordinate all keying with the Owner. Key switches shall be Best unless otherwise specified, and shall have construction cores. University at the end of Warranty period will re-key the switches.
  6. Material Samples: Contractor shall provide three (3) samples for each material furnished.
  7. Initial Shop Drawings: Contractor shall submit one (1) mylar and six (6) copies of the layout, cab and fixture drawings for review.
  8. Drawing Review: Drawing review shall not be interpreted as an indication that submittal is correct or that work represented by submittal complies with the Contract Documents.
  9. Submittal Response: One mylar and two copies shall be returned to the Contractor within 14 days. Submittal response is not justification for revision of delivery or installation schedules without prior written notification.
  10. Revised Shop Drawings: Contractor shall incorporate changes and return one copy within 7 days.
- Permits, Inspections and Reviews:
    1. General: Contractor shall coordinate all inspections and reviews.
    2. Permits: Contractor shall obtain and pay for permits, licenses and inspection fees necessary to complete the elevator installation.
    3. Inspections. Contractors shall make all tests required by the referenced codes and/or inspection authorities. Contractor shall notify inspection authorities with sufficient notice and have inspection performed prior to reviews. Inspection delays are not justification for revision of installation schedules without prior written notice.
    4. Reviews. Contractor shall provide the personnel for acceptance reviews and final reviews indicated in the Contract Documents. Contractor shall provide 7 days notice to the Owner for each review.
  - Post-Installation Submittal:
    1. General: Contractor shall assemble complete submittal package within 30 days of final acceptance of the final elevator.

2. Final Shop Drawings: Contractor shall provide six (6) complete sets of "AS INSTALLED" drawings. All changes shall be revised on the manufacturer's drawings. No hand written changes will be accepted.
  3. Electrical Wiring Diagrams: Contractor shall provide six (6) complete sets of "AS INSTALLED" electrical wiring diagrams (EWD's). All changes shall be revised on the manufacturer's drawings. No hand written changes will be accepted.
  4. Maintenance Manuals: Contractor shall provide six (6) copies of neatly bound manuals including instructions explaining all operating features, parts lists, recommended spare parts, lubrication charts and recommended maintenance schedule. Contractor shall also provide three (3) separate copies of the adjustment, system overview, service tool and troubleshooting manuals.
  5. Keys: Contractor shall provide the control key of construction cores and three (3) sets of properly tagged keys to operate all key switches and locks upon completion of the first elevator.
  6. Service Tool: Elevator Contractor shall furnish to the University two (2) laptop PC service tool with necessary software needed for adjusting, trouble shooting and performing safety and operational tests. It must be emphasized that the service tool shall be used exclusively by University elevator mechanics and it shall be used only for the elevator(s) provided under the scope of this project. The service tool shall be delivered to the University elevator foreman on or before the training session described by item 12 of these standards. All necessary updating of this tool will be performed at no cost to the University.
- Warranty:
    1. Period: Contractor shall guarantee that the materials and workmanship of the elevator equipment installed under these standards shall be first-class in every respect. Contractor shall make good all defects, not due to ordinary wear and tear or improper use, which may develop within one year after the final acceptance.
    2. Periodic Examination: During the Warranty period the contractor shall lubricate all parts, examine all components of the elevators for conformance with specified design features such as, the door timings, checking and replacing burnt out bulbs of signals, group operation, speed of elevator, etc. The periodic examination will be conducted at least for one (1) hour every month for each elevator. Prior to performing the examination the contractor shall notify the UIC elevator foreman at least 2 days advance of the scheduled examination date. Failure to provide this examination will result in proportionate extension of warranty period.
    3. Service: Contractor shall provide call back warranty service at no cost to the University, with a response time not to exceed 2 hours, as follows:

- a. Maintenance work, including 24 hour-per-day, 7 day-per-week emergency call back repair service, shall be performed by trained employees of the elevator contractor.
    - b. Contractor will maintain an accurate log of all service calls, including details of the malfunctions and repairs performed.
    - c. At the end of the warranty period the service call log will be turned over to the University Elevator Foreman.
  - 4. End of Warranty Period Review: Contractor shall provide personnel for one warranty review. Owner may schedule this review anytime during the warranty period, contractor shall provide any modifications to the elevator equipment and any adjustment necessary to meet requirements of the Contract Documents identified during the warranty review within 30 days of notification.
- Training:
  - 1. General: Elevator Contractor shall provide training to representatives of the Owner as follows:
    - a. On-Site: Contractor shall provide two (2) 40-hour, uninterrupted adjuster level training sessions to University elevator mechanics on University premise. University Facilities Management will make necessary on-campus/on-site arrangement for this training. Training shall include detailed overview of operational control system, motion control system, door control system, signal system, trouble shooting, servicing and periodic maintenance required.
- General:
  - 1. Outline:
    - a. Quantity: (calculated number of elevators) Passenger Elevators
    - b. Type: Geared Overhead Traction
    - c. Capacity: (calculated capacity) Pounds
    - d. Speed: (calculated speed) FPM
    - e. Stops: (number of stops)
    - f. Openings: (number of openings)
    - g. Floors Served: (nomenclature of floors)
    - h. Travel: (travel of elevators) Feet
    - i. Entrance Size: 3'6" Wide by 7'0" High
    - j. Entrance Type: Center Opening
  - 2. Pre-Engineered Systems: The elevators provided shall be from the following pre-engineered product lines:
    - a. ThyssenKrupp Elevator - TAC 50 VVVF
    - b. KONE Inc. - Miprom 21 VVVF
    - c. Otis - Elevonic 411

3. Design Parameters: The elevator system shall be designed, installed and adjusted to meet the following requirements:
- a. Flight Time: The elevators shall arrive at the next typical floor with the doors open two-thirds within (calculated flight time) seconds from the start of door closing movement. This shall be accomplished regardless of load on the elevator or direction of the elevator.
  - b. Door Motion Times: The elevators shall open its doors within (calculated door open motion time) seconds. The elevators shall close its doors within (calculated door close motion times) seconds or the minimum allowed by Code, whichever is greater. Door times are measured from the start of movement until movement is stopped.
  - c. Floor Accuracy: The elevators shall stop within ¼" of floor regardless of load or direction and re-level to within ¼" during loading/unloading.
  - d. Speed: The elevators shall operate within 3% of the contract speed regardless of load or direction.
  - e. Ride: The elevators shall operate smoothly, with less than 15 mg horizontal acceleration, less than 4.0 feet per second-squared vertical acceleration and less than 8.0 feet per second-cubed vertical jerk.
  - f. Noise: The elevators shall operate quietly, with less than 55 dBa within the cab with the doors closed, 60 dBa with door operation and 65 dBa within the machine room. Noise is measured with a Dranatz Sound Meter on the C scale with the background noise less than 45 dBa.
  - g. Noise: The elevators shall operate quietly, with less than 55 dBa within the cab with the doors closed, 60 dBa with door operation and 65 dBa within the machine room. Noise is measured with a Dranatz Sound Meter on the C scale with the background noise less than 45 dBa.
    - i. Mainline Feeders: The elevator shall have a starting current of less than (calculated starting current) amps and a running current of less than (calculated running current) amps with the three-phase incoming voltage maintained within +/- 10% of 480 Volts AC and with +/- 3% of 60 cycles.
    - ii. Mainline Harmonics: The elevator shall add not more than 5% harmonic distortion and shall meet the requirements of IEEE 519.
    - iii. Lighting Feeders: The elevator shall have a lighting and fan current of less than 20 amps with the single-phase voltage being maintained within +/- 10 of 120 Volts AC.
  - h. Environment:
    - i. Temperature: The elevator shall be capable of operating properly with the temperature being maintained below 90 degrees Fahrenheit in all equipment areas.
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- ii. Humidity: The elevator shall be capable of operating properly with the humidity being maintained below 90% non-condensing in all equipment areas.
  - i. Heat Emissions:
    - i. Machine Room: The elevator shall not produce more than (calculated equipment heat emissions) BTU's in this area.
    - ii. Hoist-way: The elevator shall not produce more than (calculated equipment heat emissions) BTU's in this area.
- Control Systems:
  - 1. Operational Control:
    - a. Group Orientation: Provide group operational control to operate all the elevators in each group automatically in response to car and hall calls. The elevators shall be assigned calls as they are registered. The closest elevator shall be assigned a hall call based on the estimated time of arrival (ETA). Penalties shall be given to long established hall calls and bonuses for coincident calls. The elevator shall stop for hall calls only in the direction of travel. The elevator shall reverse automatically in response to a hall call in the opposite direction of travel. The elevator shall reverse without door cycle after hold open time has expired when there is no further demand in the direction of travel and shall close after the additional hold open time has expired. The elevators shall zone after the last call is answered. There shall be one zone for each elevator in the group. The lobby zone shall be the first zone filled.
    - b. Firefighter's Service Operation: Provide means to operate the elevators during an emergency. Also provide connections for future smoke detector activation of lobby and alternate floor automatic return.
    - c. Inspection Operation: Provide means to operate the elevator at reduced speed from the top of the elevator. Activation of Inspection Operation shall remove the elevator from service.
    - d. Independent Service Operation: Provide means to operate the elevator in response to only car calls. Close doors by holding a car call until doors are completely closed. Activation of Independent Service Operation shall remove the elevator from service. The elevator shall park with the doors open at the last floor served.
    - e. Hoist-way Access Operation: Provide means to operate elevator at the top and bottom terminals at reduced speed with both the hoist-way doors and the car doors open. Terminal access shall be zoned.
    - f. Car-To-Terminal Operation: Provide means to initiate a demand at the terminal when the access key switch is activated. The elevator shall arrive at the terminal without activating the hall lantern or canceling the hall call.

The elevator shall remain at the terminal for 15 to 30 seconds to allow the elevator to be placed on inspection operation. In the event that the elevator not be removed from service during the allotted time, the elevator shall return to group operation.

- g. Load By-pass Operation: Provide means to by-pass hall calls in the event that the elevator is sufficiently loaded. Initial setting of the load sensing device shall be 50% of the capacity of the elevator.
- h. Load Demand Operation: Provide means to initiate a hall call demand when an elevator becomes sufficiently loaded when responding to a hall call. The hall call demand shall be initiated in the direction in which the elevator was traveling and shall be initiated upon activation of the load sensing device (while the doors are open). Initial setting of the load sensing device shall be 40% of the capacity.
- i. Delayed Operation: Provide means to remove an elevator from group operation in the event that it is delayed and cannot respond to demands.
- j. Anti-Nuisance Operation: Provide means to cancel car calls in the event that the elevator makes three (3) consecutive stops without interruption of the door screen.
- k. Programmed Shutdown Operation: Provide means to stop the elevator at the next floor, open the doors and remove the elevator from service. The controller shall prevent the operation of the elevator until the problem is manually reset. This operation shall activate by the governor over-speed device, machine room over-temperature monitor and reduced incoming power monitor.
- l. Hall Button Failure Operation: Provide means to maintain the registration of hall calls in the event all the elevators are removed from service for less than 5 minutes except for firefighter's service feature. After 5 minutes, all hall calls shall be canceled and remain canceled. The timer shall be reset every time one elevator is back in-service.
- m. Standby Power Operation: Provide means to automatically return one elevator at a time to the main floor. After the last elevator has returned to the main floor, one elevator shall continue to operate. Provide means to override automatic return and manually select any elevator in the group.
- n. Advance Lantern Operation: Provide means to indicate direction of elevator travel. Lantern shall light at between 6 to 8 seconds prior to door open movement and shall stay lit until doors begin to close. Audible signal shall sound when the lantern is lit and shall sound once for up travel and twice for down travel.



- ii. Hall Call Timer: The amount of time the doors shall be held open in response to a hall call or coincident call. Timer setting shall be between 4.0 and 8.0 seconds.
  - iii. Interrupted Screen Timer: The amount of time the doors shall be held open after the screen is reestablished. Timer setting shall be between 1.0 and 3.0 seconds. Timer shall be reset with each interruption of the door screen.
  - iv. Door Reversal Timer: The amount of time the door shall be held open after doors are fully reopened. Timer setting shall be between 1.0 and 3.0 seconds.
  - v. Nudging Timer: The amount of time the doors shall be held open before sounding an audible tone. Timer setting shall be between 20 and 30 seconds.
  - vi. Initial Timer Settings: Timers shall be initially set to the minimum allowed by handicapped accessibility standards within the range. Car call and door close buttons shall have no effect on timers.
- g. Door Stall Operation: Provide means to reopen doors in the event that the doors do not close all the way within 30 seconds of closing operation. Provide means to remove the elevator from service after the third unsuccessful attempt.
- Controller Assemblies:
  1. General: Provide material from ThyssenKrupp Elevator, KONE Inc., or Otis.
  2. Microprocessor: Provide a microprocessor-base unit for operational and communication function. Provide ThyssenKrupp - TAC 50 - VVVF model, KONE Inc. Miprom 21 VVVF model, or Otis Elvonic 411 model.
  3. Software: Provide nonproprietary type.
  4. Service Tool: Provide all service tools require for troubleshooting.
  5. Drive: Provide solid-state VVVF control for A.C. hoist motor.
  6. Position Sensing: Provide digital solid-state type with maximum ¼" per pulse. Provide a system that does not utilize a stationary tape in the hoist-way A LED-type position indicator shall be located in the machine room.
  7. Contactors and Relays: Provide solid-state contactor which shall be sized to insure proper conductivity and reliable operation. Contactor shall be Nordic or equal.
  8. Identifications: Provide permanent markings for all components, including size and type of fuses, identical to those symbols found on the Electrical Wiring Diagrams.
  9. Isolation Transformers/Filters: Provide transformers and filters to isolate noise from the electrical system.
  10. Labeling: Provide UL, CSA or ASME A.17.5 label.

- Machine Assemblies:
  1. General: Provide material from ThyssenKrupp Elevator, KONE Inc. or Otis.
  2. Machine: Provide worm-gearred traction type with deflector sheave mounted on an isolated bed-plate.
  3. Motor: Provide A.C. type directly mounted to the machine.
  4. Brake: Provide D.C. type with switch to monitor brake operation.
  5. Vibration Sound Dampeners: Provide rubber type to isolate the machine from the building structure.
- Door Operation Systems:
  1. General: Provide material from ThyssenKrupp Elevator, KONE Inc. or Otis.
  2. Operator: Provide high-speed, heavy-duty DC master type operator with digital velocity and position feedback. Provide a contact on the car door which shall prevent the operation of the elevator when the car door is not closed.
  3. Header: Provide steel type shaped to provide stiff flanges.
  4. Tracks: Provide removable bar or formed steel with contours to match the hangers. Each track shall be reversible.
  5. Hangers: Provide polyurethane-type with pre-lubricated sealed bearings which will allow vertical and lateral adjustment of the hoist-way and car door panels. Each door panel shall have two-point suspension with separate replaceable hangers. Upthrust shall be provided to maintain alignment of the door panels.
  6. Gibs: Provide two nylon-type per door panel. Fire stops shall be properly bent down on hoist-way door panels.
  7. Interlocks: Provide an electromechanical device which shall prevent the operation of the elevator when the hoist-way doors are not closed and locked.
  8. Restrictor: Provide device which restricts the opening of the car doors outside the unlocking zone.
  9. Closer: Provide spirator or sash weight type which shall close the hoist-way doors from any open position.
- Door Protection Systems:
  1. General: Provide material from Janus Elevator Products, Inc.
  2. Door Screen: Provide infrared pulsed type which shall initiate door reopening operation. Provide Panaforty model.
  3. Controller: Provide two-relay type which shall allow reduced speed door closing operation. Provide Panacombi Mark II model.
  4. Labeling: Provide UL or CSA label.
- Car Assemblies, Guide and Balance Systems:
  1. General: Provide material from ThyssenKrupp Elevator, KONE Inc. or Otis.
  2. Car Frames: Provide steel plank, crosshead and stiles. Provide new Car Top Inspection Stations with properly covered work light and 3-wire grounded-type outlet permanently mounted to the crosshead of each elevator. Provide new

Crosshead Data Tags permanently mounted to the crosshead adjacent to the original data tags. Both the stations and the data tags shall be easily accessed from the hoist-way landing.

3. Platforms: Provide steel type isolated from the car frame.
  4. Car Guide Rails: Provide standard T-type steel rails with brackets for attachment to building structure. Provide any backing or intermediate tie brackets.
  5. Car Guide Assemblies: Provide roller-type which allows front-to-back and side-to-side adjustments of each guide. Each arm shall be spring mounted with adjustable stops. Rollers shall operate at less than 250 rpm. Guide assemblies shall be designed maintain guidance with the loss of the roller.
  6. Car Balance: Provide mounting locations and additional weight for balance of the elevator.
  7. Counterweight Guide Rails: Provide standard T-type steel rails with brackets for attachment to building structure. Provide any backing or intermediate tie brackets.
  8. Counterweight Guide Assemblies: Provide roller-type which allows front-to-back and side-to-side adjustment. Each arm shall be spring mounted with adjustable stops. Rollers shall operate at less than 500 rpm. Guide assemblies shall be designed maintain guidance with the loss of rollers.
  9. Counterweight Frame: Provide steel frame with rods for counterweights. Provide sufficient means to hold counterweights and provide quiet operation.
  10. Counterweights: Provide sufficient number and type of weights as required for the motion control system. Weights shall be designed for the counterweight frame and have holes for the rods. Rods shall be secured by cotter pins through the locknuts.
  11. Counterweight Guards: Provide steel guard for counterweight area in pit.
- Safety and Buffer Systems:
    1. General: Provide material from ThyssenKrupp Elevator, Hollister-Whitney Elevator Corp., KONE Inc. or Otis.
    2. Governors: Provide centrifugal-type with bi-direction switches. Provide new test data tags.
    3. Safeties: Provide flexible guide clamp type. Provide new test data tags.
    4. Governor Tension Sheaves: Provide standard sheave with bracket mounted to the guide rails. Provide pivots for free movement and proper tension.
    5. Car Buffers: Provide oil type mounted in the pit with protective covers. Provide switch to prevent operation of the elevator should the buffer not be fully extended. Provide new test data tags.
    6. Counterweight Buffers: Provide oil type mounted in the pit with protective covers. Provide switch to prevent operation of the elevator should the buffer not be fully extended. Provide new test data tags.

- Rope Systems:
  1. General: Provide material from Bethlehem Wire Rope/Williamsport Wirerope Works, Inc. or Macwhyte Company
  2. Hoist: Provide a minimum of four ropes with a minimum diameter of ½". Provide data tag.
  3. Governor: Provide one rope with a minimum diameter 3/8". Provide data tags.
  4. Shackles: Provide wedge-type babbittless type at both ends.
  
- Hoist-way Entrance Assemblies:
  1. General: Provide material from Dover Elevator Company, Hauenstein & Burmeister, Montgomery Elevator Company or Schindler Elevator Company.
  2. Entrance Frames: Provide #4 brushed stainless steel bolted type. Provide UL label on hoist-way side of entrance frame and transom.
  3. Door Panels: Provide #4 stainless steel sandwich type without binder angles. Provide matching or integral sight guards. Provide door panels with rubber astragal to cushion impact. Provide UL label on hoist-way side of door panel. Provide 4" high floor marking on hoist-way side of one door panel.
  4. Sills: Provide extruded aluminum with grooved surface. Provide support angles which require minimal grouting.
  5. Entrance Markings: Provide plates on both sides of the hoist-way entrance centered 60" above the finished floor bolted from the back of the plate through the entrance frame. All floors shall be identified by 2" high raised numbers/letters/symbols and Braille.
  6. Escutcheons: Provide hole in hoist-way door panel to allow special tool for releasing interlock for each elevator at each floor.
  7. Fascia: Provide standard fascia.
  
- Cab Assemblies:
  1. General: Provide material from Dover Elevator Company, Eklund, Hauenstein & Burmeister, G&R, Globe Architectural, Montgomery Elevator Company or Schindler Elevator Company.
  2. Shell: Provide reinforced 14-gage steel with black baked enamel finish. Apply sound deadening to exterior.
  3. Canopy: Provide reinforced 12-gage steel with white baked enamel finish.
  4. Suspended Ceiling: Provide six (6) translucent panels in an aluminum frame and size to match reveals between wall panels.

5. Side and Rear Walls: Provide plastic laminated removable panels. Provide three panels on side walls and two panels on rear wall.
  6. Transom: Provide #4 brushed 14-gage stainless steel.
  7. Front Return/Entrance Columns: Provide #4 brushed 14-gage stainless steel. Entrance columns shall be separate. Entire front return shall swing on concealed hinges. Provide engraving for No Smoking, Capacity, Elevator Number and Emergency Communication. Engrave Firefighter's Service Operation instructions as required.
  8. Door Panels: Provide #4 brushed stainless steel sandwich-type without binder angles.
  9. Sill: Provide extruded silver nickel with grooved surface. Provide support angles which require minimal grouting.
  10. Handrails: Provide one line of #4 brushed 2" by 3/8" stainless steel bars on all three sides with returned ends. Mounting shall be through the car walls from the back and top of handrails shall be 32" above finished door.
  11. Emergency Lighting: Provide battery unit with solid-state charger to operate its alarm bell and a minimum of two cab lights. Lights shall be part of normal lighting system and shall properly illuminate main car station.
  12. Emergency Exit: Provide hinged hatch for evacuation of the elevator through the top of the elevator. Provide contact to prevent operation of the elevator when the hatch is not closed.
  13. Ventilation: Provide Morrison "PE" multi-speed exhaust blower for proper air flow through elevator cab.
- Signal Systems:
    1. General: Provide material from Adams Elevator Equipment Company, ThyssenKrupp Elevator, KONE Inc. or Otis.
    2. Main Car Station
      - a. Car Position Indicator: Provide 1" high digital segmented type with direction indicators representing the floor served and the direction of travel. Provide MH-110 model.
      - b. Pushbuttons: Provide 1-1/8" flush pushbuttons with white LED illumination. Provide standard pushbuttons for each floor served which illuminate to indicate call has been registered. Provide emergency control pushbuttons for alarm, door open, door close, telephone and floor passing signal.
      - c. Pushbutton Markings: All pushbuttons shall be identified by raised numbers/letters/symbols and Braille. Floor pushbuttons and floor passing signal pushbutton shall have a 5/8" high designation in the face of each button. All other pushbuttons shall have 1/8" high designations in the face of each button for identification.

- d. Firefighter's Service Controls: Provide keyed switch, light jewel, audible solid-state signal and call cancel pushbutton.
  - e. Emergency Communication: Mount vandal-resistant telephone unit provided by Owner in car station. Phone shall be programmed to signal Security Department. Phone shall be capable of operating with the remote monitoring system.
  - f. Floor Passing Signal: Provide adjustable audible electronic tone which sounds each time the elevator passes a floor. Pushbutton shall be identified by the letter "S" and shall activate passing tone for entire trip until elevator reverses direction.
  - g. Location: Pushbuttons shall be located between 35" and 48" above the finished cab floor. Emergency control pushbuttons shall be grouped at the bottom. Firefighter's Service controls shall be grouped above the pushbuttons. Emergency communication device shall be behind a round grille with 1/16" holes above the firefighter's service controls.
3. Service Cabinet:
- a. Access: Provide a flush, keyed #4 brushed stainless steel door with window for Certificate of Inspection. Window size shall be identical to local certificate size.
  - b. Controls: Provide switches for Stop, Inspection, Independent Service, Lighting and Fan. Provide test button for Emergency Lighting.
  - c. Location: Cabinet shall be located below the main car station.
4. Hall Lanterns: Provide 2-1/2" high triangular type with #4 brushed stainless steel faceplates located adjacent to each hoist-way entrance. Provide adjustable audible electronic tone.
5. Hall Stations: Provide one #4 brushed stainless steel stations per floor with 1-1/8" standard pushbuttons with white LED illumination. Hall Stations shall be typically flush mounted.
6. Firefighter's Signs: Provide one #4 brushed stainless steel sign above each hall station with wording and symbol as contained in Appendix H.
7. Hoist-way Access Stations: Provide switch with #4 brushed stainless steel faceplates at each terminal located adjacent to the hoist-way entrance.
8. Firefighter's Service Station: Provide at the main firefighter's floor installed per local requirements. Engrave firefighter's service instructions as required in #4 brushed stainless steel faceplate.
9. Fire Control Panel: Provide #4 brushed stainless steel faceplate recess mounted above the main floor hall station with the following:
- a. 1/2" high LED segmented position indicators with direction arrows for each elevator.

- b. Standby power manual override key switches with collars for each elevator.
  - c. Power light for each elevator.
  - d. Firefighter's telephone jack.
- 10. Firefighter's Key Box: Provide surface mounted type with #4 brushed stainless steel door. Provide keys and mount per local requirements.
- 11. Pit Emergency Stop Switch: Provide with red switch.
- Wiring:
  - 1. General: Provide material from Siecor/Republic Wire and Cable.
  - 2. Conductors: Provide new copper wiring throughout, including motor leads. There shall be no splices.
  - 3. Traveling Cables: Provide a minimum of two cables per elevator. The cables shall have a flame retardant and moisture resistant outer cover. Provide pads where necessary to prevent damage to the cables during operation of the elevator.
  - 4. Terminals: Provide permanent identification at all connections.
  - 5. Spares: Provide an additional 10% conductors for future use. Provide four additional twisted shielded pair conductors between the machine room and the main car station. Tag conductors as "SPARES".
- Initial Site Review
  - 1. General: Contractor shall thoroughly review all elevator areas before commencing work.
  - 2. Dimensions: Contractor shall verify proper space has been provided for elevator equipment in the machine room, hoist-way and pit areas. Contractor shall also verify that these areas are ready for the installation of the elevator equipment.
  - 3. Clearances: Contractor shall verify proper clearances for the elevator equipment can be maintained within the space provided.
  - 4. Electrical: Contractor shall verify proper electrical power has been provided. Temporary power of the same characteristics as the permanent power shall be used if available.
  - 5. Environmental: Contractor shall verify proper operating environment has been provided.
  - 6. Variations: Contractor shall provide written notification of any and all conditions which will prevent producing satisfactory work within the schedule.
  - 7. Acceptance: Contractor shall accept conditions prior to commencement of work. Start of work shall be interpreted as acceptance of conditions.
- Transportation and Storage:
  - 1. General: Contractor shall properly protect equipment and architectural finishes during transportation and storage.
  - 2. Transportation: Contractor shall deliver and store materials in original protective packaging.

3. Storage: Contractor shall store equipment in the machine room Any storage outside the machine room shall be coordinated with the Owner.
- Installation:
    1. General: Contractor shall perform all work in a first class work workmanship manner.
    2. Standards: Contractor shall install equipment per Manufacturer's standards and in accordance with referenced codes.
    3. Tolerances: Contractor shall install equipment per Manufacturer's standards and in accordance with referenced codes.
    4. Maintainability: Contractor shall install equipment so components may be easily accessed for removal during maintenance and repair.
    5. Field Welding: Contractor shall utilize certified welders. Oxidation and residue shall be chipped and cleaned away. All welds shall be wire brushed and painted with two coats of primer prior to finished coat.
    6. Unused Equipment: Contractor shall remove all unused equipment.
    7. Lubrication: Contractor shall lubricate all equipment.
    8. Wiring: Contractor shall wire equipment as indicated on the electrical wiring diagrams. Corresponding signals shall both illuminate when either button is registered.
    9. Coordination: Contractor shall coordinate all Work-Not-Included scheduled during the installation period.
    10. Protection: Contractor shall advise Owner of protection procedures to prevent damage or deterioration of work completed during the remainder of the installation period.
  - Adjustments:
    1. General: Contractor shall properly adjust the components provided.
    2. Design Parameters: Contractor shall adjust the elevator to meet the design parameters.
    3. Guide Rails: Contractor shall realign car and counterweight guide rails vertically with tolerance of 1/16". All connections shall be checked and tightened. Joints shall be secured without gaps. Any irregularities on the machined surface shall be filled, sanded and filed to a smooth surface.
    4. Balance: Contractor shall balance elevators front-to-back and side-to-side to equalize pressure of roller car guide rollers on the car guide rails.
    5. Guide Assemblies: Contractor shall adjust car and counterweight guides to maintain roller contact with the guide rails regardless of load or position in hoist-way
  - Testing:
    1. General: Contractor shall test the elevator in accordance with applicable codes.
    2. Brakes: Contractor shall test the brakes with maximum load.

3. Governors: Contractor shall test the governors.
  4. Safeties: Contractor shall test the safeties with full load at full speed.
  5. Buffers: Contractor shall test the buffers with full load at maximum speed.
- Cleanup:
    1. General: Contractor shall keep work areas orderly and free from debris during the installation.
    2. Daily Removal: Contractor shall remove packaging and other materials on a daily basis as equipment is installed.
    3. Daily Cleaning: Contractor shall clean work areas on a daily basis of dirt, oil and grease.
    4. Final Cleaning: Contractor shall clean machine rooms, controllers, hoist-ways, pits, hoist-way equipment, hoist-way entrance assemblies, pit equipment, door operating equipment, cab enclosures and fixtures of dirt, oil, grease and finger marks prior to acceptance review.
  - Painting and Finishes:
    1. General: Contractor shall provide painting and finishing of materials provided.
    2. Equipment: Contractor shall clean and paint all equipment which is provided with one coat of installer's standard enamel unless the equipment has a baked enamel or special architectural finish. Stencil paint 4" high elevator number on the mainline disconnect, car lighting disconnect, each control cabinet, crosshead and car buffer.
    3. Guide Rails: Contractor shall clean and paint the shank and base of the T-Section of the guide rails with one field coat of black Rustoleum
    4. Equipment Areas: Contractor shall paint the machine room and pit floors.
    5. Field Refinishing: Contractor shall finish any metal work provided.
    6. Field Retouch: Contractor shall paint surfaces damaged during installation with the original color and blend-out any variations.
  - Field Quality Control:
    1. General: Contractor shall have the work at the location checked during the course of the installation.
    2. Progress Reviews: Contractor shall provide personnel for review. Corrective work required shall be accomplished as directed.
    3. Inspections: Contractor shall complete all corrective work identified by Code Authority during acceptance inspection prior to Acceptance Review.
    4. Acceptance Reviews: Contractor shall provide personnel for reviews. Contractor shall complete all corrective work identified prior to Final Acceptance Reviews.
    5. Final Acceptance Reviews: Contractor shall provide personnel for reviews to verify completion of punchlist.
    6. Warranty Review: Contractor shall provide personnel for one warranty review.

7. Additional Reviews: Contractor shall compensate Owner for reviews should all corrective work identified not be completed as required.
- Warranty Service:
    1. General: Contractor shall service the elevators from start of the Installation Period through one year from Final Acceptance of last elevator.
    2. Program: Contractor shall provide all service, repair and adjustment. Contractor shall also provide service logs, callback logs and repair logs for the warranty period.
    3. Callbacks: Contractor shall provide emergency callback service 24-hour, 7-day-a-week at no additional cost. Contractor shall have a mechanic at the location within two (2) hours during regular hours and within two (2) hours for all other callbacks after notification to the Contractor.
    4. Vandalism: Owner shall be responsible for service costs due to vandalism.

**END OF SECTION 14 21 00**

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**SECTION 14 24 00 - HYDRAULIC ELEVATORS**

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- Summary:
  1. Specify the scope of work in terms of numbers and groups of elevators and define the applicable components from the following list:
  2. Hoist way entrances, operational and control systems, ADA provisions, power unit assembly, jack unit assemblies, door operation systems, door protection systems, car assemblies, cab assemblies, signal system, furnishing of service/diagnostic laptop computer, providing adjuster level training and providing one year service warranty.
- Machine Room Work Provided by Others:
  1. Enclosure: Fire-rated walls according to the code shall be provided to isolate elevator equipment from other equipment.
  2. Access: Fire-rated door shall be provided which is self-closing and self-locking.
  3. Lighting: Adequate lighting shall be provided in the machine room. One light switch will be provided on the lock-jamb side of the machine room entrance door.
  4. Cooling: Air conditioning shall be provided to prevent room from exceeding the maximum equipment operating temperature requirements.
  5. Heating: Heater shall be provided to prevent room from falling below the minimum equipment operating temperature requirements.
  6. Duplex Outlet: One duplex outlet with dedicated circuit shall be provided in the room.
- Hoist-way Work by Others:

1. Enclosure: Fire-rated wall shall be provided. Front wall shall be constructed after entrance frames have been installed.
  2. Alignment: Hoist-ways shall be provided which is plumb within 1/2 inch.
  3. Painting: Exposed side of hoist-way walls shall be taped and painted.
  4. Projections: Beveled guards shall be provided where the side or rear wall projects, recedes or is set back more than 2 inches.
  5. Pit Access: Ladders shall be provided in pits.
  6. Venting: Venting shall be provided to prevent accumulation of smoke and gases as required.
  7. Sump Pump: Refer to Standards Section 22 14 29 (Sump Pumps).
- Electrical Requirements by Others:
    1. Mainline Disconnects: One lockable, fused three-phase mainline disconnect of specified voltage shall be provided for each elevator in the machine room.
    2. Cab Lighting Disconnect: One fused single-phase service with switch shall be provided for the elevator in the machine room.
  - Cab Flooring:
    1. Flooring: Shall be provided in elevator cabs by general contractor.
  - Cab Communications Requirements:
    1. Telephone Service: Specify the electrical contractor to provide 3/4 inch conduit, from the nearest telephone closet (FDF), 4 pair CAT 5 telephone cable and a "D-MARK" junction box near the controller of each elevator for the purpose of providing ADA compliant telephone service in each cab. Final trimming, testing and programming shall be performed by University Telecommunication Department.
    2. Emergency Telephone Device: Standard University Emergency Telephone Unit (ETU), hands free, ADA compliant, will be provided by the University. Elevator contractor shall make necessary cut out, and provide mounting flanges with 4 tapped holes, so that the unit could be secured flush to either the front return/entrance swing column unless shown otherwise on drawings. The University will loan a prototype of the ETU to the elevator manufacturer contractor for making proper cut outs and mounting reinforcement mechanism.
  - Quality Assurance:
    1. Qualified Bidders: Contractor shall be required to submit the following certified information with pre-qualification documents:
      - a. Contractor is currently engaged in the manufacturing of elevator equipment, installation and repairs of elevators and has been for the previous twenty-five (25) years.
      - b. Contractor shall have technical qualifications of at least ten (10) years installing microprocessor-based elevator equipment. Qualification shall be based on having trained supervisory and installation personnel and

the facilities to install the elevator equipment proposed in the Chicago area.

- c. Contractor shall submit a list of installations totaling 100 completed elevators where the elevator equipment was similar to specified for this installation.
  - d. Contractor shall submit a list of five or more local (in the Chicago area) installations where all the elevator equipment similar to specified herein has been completed.
  - e. Contractor will provide all major components manufactured by his company for unified responsibility.
  - f. Contractor is prepared to furnish to the University the service laptop PC needed to troubleshoot, service and test the controller, door operator and signals and that he is prepared to update the servicing laptop at no cost to the university. Also, that he is prepared to provide adjuster level training to University's elevator mechanics in the use of the service laptop.
- Code Compliance:
    1. General: contractor shall comply with most-stringent applicable provisions of the following Codes, Standards and Laws including revisions and changes in effect on dated of these specifications.
    2. Elevator:
      - a. ASME A17.1 - Safety Code for Elevators and Escalators.
      - b. ASME A17.2 - Inspector's Manual.
      - c. ASME A17.3 - Safety Code for Existing Elevators and Escalators.
    3. Electrical:
      - a. NFPA 70 - National Electrical Code.
    4. Building:
      - a. City of Chicago Building Code
    5. Life Safety:
      - a. NFPA 101 - Life Safety Code
      - b. City of Chicago Fire Prevention.
    6. Handicapped accessibility:
      - a. Americans with Disability Act.
      - b. Illinois Environmental Barriers Act.
      - c. ANSI A-117.1 - Specifications for making Building and Facilities Accessible to, and Usable by, the Physically Handicapped.
    7. Laws: Any other Ordinances and Laws applicable within the governing jurisdiction.
  - Pre-Installation Submittal:

1. General: Require the contractor to assemble complete submittal package within 15 days of Award of Contract.
  2. Product Data: Require the Contractor to submit six (6) copies of the manufacturer's specifications and installation instructions for each product furnished, especially the elevator car enclosure, machine room layout and hoist-way entrances.
  3. Power Data: Require the Contractor to provide electrical calculations for all three-phase and single-phase feeder requirements.
  4. Test Data: Require the Contractor to provide certified laboratory test reports on components as specified or required by referenced codes.
  5. Key Switches and Keying: Require that the elevator shall furnish "BEST" key switches and that the contractor shall furnish cylinders with construction cores. Also, specify the contractor shall furnish to the University the construction core control key. University will key the locks according to UIC Facilities Management procedure.
  6. Material Samples: Require the contractor to furnish three (3) samples of each material furnished.
  7. Initial Shop Drawings: Require contractor to submit one (1) mylar and six (6) copies of the equipment arrangement in the machine room, pit and hoist-way, provide plans, elevations, sections and details of assemblies, erection, anchorage, and equipment location for review and approval by A/E.
  8. Submittal Response: Specify the one Mylar and two copies shall be returned to the Contractor within 10 days. Submittal response is not justification for revision of delivery or installation schedules without prior written notification
  9. Revised Shop Drawings: Specify that contractor shall incorporate changes and return one copy within 7 days.
- Permits, Inspections and Reviews:
    1. General: Specify that contractor shall coordinate all inspections and reviews with University and City of Chicago Bureau of Elevator Inspection.
    2. Permits: Specify that contractor shall obtain and pay for permits, licenses and inspection fees necessary to complete the elevator installation.
    3. Inspections: Contractor shall make all tests required by the referenced codes and/or inspection authorities. Contractor shall notify inspection authorities with sufficient notice and have inspection performed prior to reviews. Inspection delays are not justification for revision of installation schedules without prior written notice.
    4. Reviews: Contractor shall provide the personnel for acceptance reviews and final reviews indicated in the Contract Documents. Contractor shall provide 7 days notice to the Owner for each review.
  - Post-Installation Submittal:

1. General: Contractor shall assemble complete submittal package within 30 days of final acceptance of the final elevator.
  2. Final Shop Drawings: Contractor shall provide four (4) complete sets of "AS INSTALLED" drawings. All changes shall be revised on the manufacturer's drawings. No hand written changes will be accepted.
  3. Electrical Wiring Diagrams: Contractor shall provide six (6) complete sets of "AS INSTALLED" electrical wiring diagrams (EWDs). All changes shall be revised on the manufacturer's drawings. No hand written changes will be accepted.
  4. Maintenance Manuals: Contractors shall provide four (4) copies of neatly bound manuals including instructions explaining all operating features, parts lists, recommended spare parts, lubrication charts and recommended maintenance schedule. Contractor shall also provide three (3) separate copies of the adjustment, system overview, service tool and troubleshooting manuals.
  5. Keys: Contractor shall provide the construction core key and three (3) sets of properly tagged keys to operate all keyed switches and locks upon completion of the first elevator.
  6. Service Tool: Elevator Contractor shall furnish to the University two (2) laptop PC service tool with necessary software needed for adjusting, trouble shooting and performing safety and operational tests. It must be emphasized that the service tool shall be used exclusively by University elevator mechanics and it shall be used only for the elevator(s) provided under the scope of this project. The service tool shall be delivered to the University elevator foreman on or before the training session described by these standards. All necessary updating of this tool will be performed at no cost to University.
- Warranty:
    1. Period: Contractor shall guarantee that the materials and workmanship of the elevator equipment installed under these specifications shall be first-class in every respect. Contractor shall make good all defects, not due to ordinary wear and tear or improper use, which may develop within one year after the final acceptance.
    2. Periodic Examination: During the Warranty period the contractor shall lubricate all parts, examine all components of the elevators for conformance with specified design features such as, the door timings, checking bulbs of signals, group operation, speed of elevator, etc. The periodic examination will be conducted at least for one (1) hour every month for each elevator. Prior to performing the examination the contractor shall notify the UIC elevator foreman at least 2 days advance of the scheduled examination date. Failure to provide this examination will result in proportionate extension of warranty period.
    3. Service: Contractor shall provide call back warranty service at no cost to the University, with a response time not to exceed 2 hours, as follows:

- a. Maintenance work, including 24 hour-per-day, 7 day-per week emergency call back repair service, shall be performed by trained employees of the elevator contractor.
  - b. Contractor will maintain an accurate log of all service calls, including details of the malfunctions and repairs performed.
  - c. At the end of the warranty period the service call log will be turned over to the University Elevator Foreman.
4. End of Warranty period Review: Contractor shall provide personnel for one warranty review. Owner may schedule this review anytime during the warranty period. Contractor shall provide any modifications to the elevator equipment and any adjustment necessary to meet requirements of the Contract Documents identified during the warranty review within 30 days of notification.
- Training:
    1. General: Elevator Contractor shall provide training to representatives of the Owner as follows:
    2. On-Site: Contractor shall provide two (2) adjuster level training sessions of 40 hours each to UIC elevator mechanics on University premises. UIC Facilities Management will make necessary on-campus/on-site arrangement for this training. Training shall include detailed overview of operational control system, motion control system, door control system, signal system, trouble shooting, servicing and periodic maintenance required. This training shall also include the training in the use of the Laptop Service Tool for adjusting, testing, down loading operational history, programming floors, etc.
  - Specify the following for each elevator:
    1. Quantity.
    2. Type.
    3. Capacity.
    4. Speed.
    5. Stops.
    6. Openings and Landings.
    7. Floors Served.
    8. Travel.
    9. Entrance Size.
    10. Entrance Type.
    11. Platform Size.
    12. Cab Height.
    13. Door Type.
    14. Operation System.
    15. Power Characteristics.
    16. Special Features.

- Approved Manufacturers: Specify that elevators shall be (pre-engineered, customized or combination of the two) products from the following manufacturers:
  1. Otis.
  2. ThyssenKrupp.
  3. KONE Inc.
- Design Parameters: The elevator system shall be designed, installed and adjusted to meet the following requirements:
  1. Flight Time: The elevators shall arrive at the next typical floor with the doors open two-thirds within (calculated flight time) seconds from the start of door closing movement. This shall be accomplished regardless of load or direction of the elevator.
  2. Door Motion Times: The elevators shall open its doors within (calculated door open motion time) seconds. The elevators shall close its doors within (calculated door close motion times) seconds or the minimum allowed by Code, whichever is greater. Door times are measured from the start of movement until movement is stopped.
  3. Floor Accuracy: The elevators shall stop within 3/8" of floor regardless of load or direction and re-level to within 3/8" during loading/unloading.
  4. Speed: The elevators shall operate within 10% of the contract speed regardless of load or direction.
  5. Ride: The elevators shall operate smoothly, with less than 15 mg horizontal acceleration, less than 2.0 feet per second-squared vertical acceleration and less than 4.0 feet per second-cubed vertical jerk.
  6. Noise: The elevators shall operate quietly, with less than 55 dBa within the cab with the doors closed, 60 dBa with door operation and 65 dBa within the machine room. Noise is measured with a Dranatz Sound Meter on the C scale with the background noise less than 45 dBa.
  7. Electrical:
    - a. Mainline Feeders: The elevator shall have a starting current of less than (calculated stalling current) amps and a running current of less than (calculated running current) amps with the three-phase incoming voltage being maintained within 6 10% of 480 Volts AC and within 3% of 60 cycles.
    - b. Mainline Harmonics: The elevator shall add not more than 5% harmonic distortion and shall meet the requirements of IEEE 519.
    - c. Lighting Feeders: The elevator shall have a lighting and fan current of less than 20 amps with the single-phase voltage being maintained within 10% of 120 Volts AC.
  8. Environment:

- a. Temperature: The elevators shall be capable of operating properly with the temperature between 55 and 95 degrees Fahrenheit.
  - b. Humidity: The elevator shall be capable of operating properly with the humidity being maintained below 90% non-condensing in equipment room.
- 9. Heat Emissions:
  - a. Machine Room: The elevator shall not produce more than (calculated equipment heat emissions) BTU's total in this area.
  - b. Hoist-way: The elevator shall not produce more than (calculated equipment heat emissions) BTU's total in this area.
- Control Systems:
  - 1. Operational Control:
    - a. Group Operation: Provide group operational control to operate all the elevators in each group automatically in response to car and hall calls. The elevators shall be assigned calls as they are registered. The closest elevator shall be assigned a hall call based on the estimated time of arrival (ETA). Penalties shall be given to long established hall calls and bonuses for coincident calls. The elevator shall stop for hall calls only in the direction of travel. The elevator shall reverse automatically in response to a hall call in the opposite direction of travel. The elevator shall reverse without door cycle after hold open time has expired when there is no further demand in the direction of travel and shall close after the additional hold open time has expired. The elevators shall zone after the last call is answered. There shall be one zone for each elevator in the group. The lobby zone shall be the first zone filled.
    - b. Firefighter's Service Operation: Provide means to operate the elevators during an emergency. Also provide connections for future smoke detector activation of lobby and alternate floor automatic return.
    - c. Inspection Operation: Provide means to operate the elevator at reduced speed from the top of the elevator. Activation of Inspection Operation shall remove the elevator from service.
    - d. Independent Service Operation: Provide means to operate the elevator in response to only car calls. Close doors by holding a car call until doors are completely closed. Activation of Independent Service Operation shall remove the elevator from service. The elevator shall park with the doors open at the last floor served.
    - e. Hoist-way Access Operation: Provide means to operate elevator at the top and bottom terminals at reduced speed with both the hoist-way doors and the car doors open. Terminal access shall be zoned.

- f. Car-To-Terminal Operation: Provide means to initiate a demand at a terminal when the access key switch is activated. The elevator shall arrive at the terminal without activating the hall lantern or canceling the hall call. The elevator shall remain at the terminal for 15 to 30 seconds to allow the elevator to be placed on inspection operation. In the event that the elevator not be removed from service during the allotted time, the elevator shall return to group operation.
  - g. Oil Temperature Control Operation: Provide means to maintain proper operating temperature of hydraulic oil for consistent operation of the elevator. When oil temperature is detected below the proper range and there are no hall calls or car calls, the elevator shall be automatically lowered to the lowest landing and with the doors closed, oil may be bypassed with the pump motor running until the oil is within the proper range. The elevator shall immediately respond to any hall calls or car calls and shall return this feature when all calls have been answered.
  - h. Delayed Operation: Provide means to remove an elevator from group operation in the event that it is delayed and cannot respond to demands.
  - i. Programmed Shutdown Operation: Provide means to stop the elevator at the next floor, open the doors and remove the elevator from service. The controller shall prevent the operation of the elevator until the problem is manually reset. This operation shall activate by the oil over-temperature monitor, machine room over-temperature monitor and reduced incoming power monitor.
  - j. Hall Button Failure Operation: Provide means to maintain the registration of hall calls in the event all the elevators are removed from service for less than 5 minutes except firefighter's service feature. After 5 minutes all hall calls shall be canceled and remain canceled. The timer shall be reset every time one elevator is back in service.
  - k. Power Loss Operation: Provide means to automatically return one elevator to the lowest landing in the event of a power loss. After the elevator has returned to the lowest landing, the elevator shall open and the elevator shall be removed from service until power is restored. The open door button shall remain operational after doors are closed.
  - l. Back-up Operation: Provide means to maintain elevator service in the event that the control system cannot assign hall call demands.
2. Motion Control:
- a. Automatic Operation: Provide motion control which automatically decelerates. Levels and stops the elevator in response to a call.
  - b. Reduce Current Starting Operation: Provide means to start the power unit with reduced current by utilizing a wye-delta configuration for

starting the pump motor or utilizing solid-state starting of the pump motor.

- c. Re-Leveling Operation: Provide means to level the elevator after the elevator has stopped to maintain floor accuracy.
  - d. Low Oil Operation: Provide means to monitor for low oil in the tank. When low oil is detected. The elevator shall be automatically lowered to the bottom terminal. Open the doors and remove the elevator from service until manually reset.
  - e. Over-travel Limiting Operation: Provide means to prevent the operation of the elevator when it travels beyond the leveling zone at a terminal floors. The limits switches shall operate quietly.
3. Door Control:
- a. Automatic Operation: Provide door control which automatically opens and closes.
  - b. Force Limiting Operation: Provide means to open the door pressure while closing to a maximum of 30 pounds (measured from rest) and a maximum of 7.5 foot-pounds kinetic energy.
  - c. Reduced stall Force Operation: Provide means to reduce the force exerted on the doors during a stall condition. Door pressure shall be zero pounds after one second.
  - d. Reduced Speed Closing Operation: Provide means to reduce the speed during closing to a maximum of 2.5 foot-pounds kinetic energy. Doors shall close at reduced speed during Firefighter's Service as required by the code.
  - e. Door Hold Operation: Provide separately adjustable timers to vary the time the doors hold open as follows:
- 4. Car Call Timer: The amount of time the doors shall be held in response to a hall call shall be between 3.0 and 6.0 seconds.
  - 5. Hall Call Timer: the amount of time the door shall be held open in response to a hall call or coincidental car call shall be between 4.0 and 8.0 seconds.
  - 6. Interrupted Screen Timer: The amount of time the door shall be held open after the screen is reestablished shall be between 1.0 and 3.0 seconds. The timer shall be reset with each interruption of the door screen.
  - 7. Door Reversal Timer: The amount of time the door shall be held open after doors are fully reopened. Timer setting shall be between 0 and 3.0 seconds.
  - 8. Nudging Timer: The amount of time the doors shall be held open before sounding an audible tone. Timer setting shall be between 20 and 30 seconds.
  - 9. Initial Timer Settings: Timers shall be initially set to the minimum allowed by handicapped accessibility standards within the range. Car call and door close buttons shall have no effect on timers.

10. Door Stall Operation: Provide means to reopen doors in the event that the doors do not close all the way within 30 seconds of closing operation. Provide means to remove the elevator from service after the third unsuccessful attempt.
11. Controller Assemblies:
- a. General: Provide material from ThyssenKrupp, KONE Inc., or Otis.
  - b. Microprocessor: Provide a microprocessor-base unit for operational and communication functions. Provide ThyssenKrupp TAC 20 model. KONE Inc. Miprom I, Otis Elvonic 211.
  - c. Software: Provide nonproprietary type.
  - d. Service Tool: Provide all service tools require for troubleshooting, adjusting and testing.
  - e. Position Sensing: Provide digital solid-state type. Provide a system that does not utilize a stationary tape in the hoist-way A LED-type position indicator shall be located in the machine room.
  - f. Contactors and Relays: Provide solid-state type which shall be sized to insure proper conductivity and reliable operation. Contactor shall be as manufactured by Nordic or equal.
  - g. Identifications: Provide permanent markings for all components, including size and type of fuses, identical to those symbols found on the Electrical Wiring Diagrams.
  - h. Isolation Transformers/Filters: Provide transformers and filters to isolate noise from the electrical system.
  - i. Labeling: Provide UL, CSA or ASME A.17.5 label.
- Power Unit Assemblies:
    - 1. Valves: Provide a four valve unit which shall be readily accessible for adjustment. Control valves shall be solenoid operated and shall open and close gradually for smooth motion control. Provide test seal for relief valve. Provide EECO Model UV 5A or equal.
    - 2. Pump: Provide a non-submersible constant displacement rotary screw type.
    - 3. Muffler: Provide one muffler in the oil line near the power unit to reduce the pulsations and noise present in the flow of the hydraulic fluid.
    - 4. Vibration Sound Dampeners: Provide rubber type to isolate the power unit from the building structure.
    - 5. Isolation Couplings: Provide a minimum of two in the oil line.
    - 6. Piping/Oil: Provide a direct run from the power unit to the cylinder with a minimum of bends. Provide test data tag. Oil reservoir shall hold 10 gallons in addition to he oil required to operate the elevator.
    - 7. Shutoff Valve: Provide one manual type in machine room near power unit.
  - Jack Assemblies:

1. Plunger: Provide seamless steel type which is accurately ground and polished. The bottom shall be fitted with a heavy steel disc welded in place with an extended edge to prevent the plunger from leaving the cylinder. Provide steel packing gland with bronze guide bearing, wiper ring and packing.
  2. Cylinder: Provide a steel pipe which is machined. The upper end shall have a machine flange and the lower end shall have a heavy steel bulkhead. A double wrap of polyethylene tape bonded with a special corrosion resistant bonding agent shall be provided for protection.
  3. Casing: Provide PVC type filled with Niggard 160.
  4. Jack Hole: Provide excavation for jack. Hole shall be plumb within 1" for every 10 feet or less of depth.
  5. Channel Buffers: Provide two spring type mounted to the pit channels on each side of the cylinder.
  6. Shutoff Valve: Provide one manual type in pit near the cylinder.
- Door Operation System:
    1. General: Provide material from ThyssenKrupp, Moline Accessories Corporation, KONE Inc. or equal product from Otis.
    2. Operator: Provide high-speed, heavy-duty DC master type operator with digital velocity and position feedback. Provide a contact on the car door which shall prevent the operation of the elevator when the car door is not closed. Provide ThyssenKrupp HD-85 model, MAC DHP model or equal product from Otis.
    3. Headers: Provide steel type shaped to provide stiff flanges.
    4. Tracks: Provide removable bar or formed steel with contours to match the hangers. Each track shall be reversible.
    5. Hangers: Provide polyurethane-type with pre-lubricated sealed bearings which will allow vertical and lateral adjustment of the hoist-way and car door panels. Each door panel shall have two-point suspension with separate replaceable hangers. Up-thrust shall be provided to maintain alignment of the door panels.
    6. Gibs: Provide two nylon-type per door panel. Fire stops shall be properly bent down on hoist-way door panels.
    7. Interlocks: Provide an electromechanical device which shall prevent the operation of the elevator when the hoist-way doors are not closed and locked.
    8. Restrictors: Provide device which restricts the opening of the car doors outside the unlocking zone.
    9. Closers: Provide spirator or sash weight type which shall close the hoist-way doors from any open position.
  - Door Protection Systems:
    1. General: Provide material from Janus Elevator Products, Inc.
    2. Door Screen: Provide infrared pulsed type which shall initiate door reopening operation. Provide Panaforty model.

3. Controller: Provide two-relay type which shall allow reduced speed door closing operation. Provide Panacombi Mark II model.
  4. Labeling: Provide UL or CSA label.
- Car Assemblies Guide and Balance Systems:
    1. General: Provide material from ThyssenKrupp, KONE Inc., Hollister-Whitney Elevator Corp., or equal product from Otis.
    2. Car Frame: Provide steel plank, cross head and stiles. Provide new Car Top Inspection Stations with properly covered work light and 3-wire grounded-type outlet permanently mounted to the cross head of each elevator. Provide Crosshead Data Tags permanently mounted to the crosshead. Both the stations and the data tags shall be easily accessed from tile hoist-way landing.
    3. Platform : Provide wood type with paten plate isolation. Fireproof underside of platform. Recess the floor to receive specified flooring material.
    4. Car Guide Rails: Provide standard T-type steel rails with brackets for attachment to building structure. Provide any backing or intermediate tie brackets.
    5. Car Guide Assemblies: Provide roller-type which allows front-to-back and side-to-side adjustment of each guide. Each arm shall be spring mounted with adjustable stops. Rollers shall operate at less than 250 rpm. Guide assemblies shall be designed to maintain guidance with the loss of the rollers.
    6. Car Balance: Provide mounting locations and additional weight for balance of the elevator.
  - Buffer Systems:
    1. General: Provide material from ThyssenKrupp, Hollister-Whitney Elevator Corp., KONE Inc., or equal product from Otis.
    2. Car Buffers: Provide oil type mounted in the pit with protective covers. Provide switch to prevent operation of the elevator should the buffer not be fully extended. Provide new test data tags.
  - Hoist-way Entrance Assemblies:
    1. General: Provide material from ThyssenKrupp, Hauenstein & Burmeister, KONE Inc., Otis.
    2. Entrance Frames: Provide #4 brushed stainless steel bolted type. Provide UL label on hoist-way side of entrance frame and transom.
    3. Door Panels: Provide #4 stainless steel sandwich type without binder angles. Provide matching or integral sight guards. Provide door panels with rubber astragals to cushion impact. Provide UL label on hoist-way side of door panel. Provide 4 " high floor marking on hoist-way side of one door panel.
    4. Sills: Provide extruded silver nickel with grooved surface. Provide support angles which require minimal grouting.
    5. Entrance Markings: Provide plates on both sides of the hoist-way entrance centered 6()" above the finished floor bolted from the back of the plate through

the entrance frame. All floors shall be identified by 2" high raised numbers/letters/symbols and Braille.

6. Escutcheons: Provide hole in hoist-way door panel to allow special tool for releasing interlock for each elevator at each floor.
  7. Fascia: Provide standard fascia.
- Cab Assemblies:
    1. General: Provide material from ThyssenKrupp, Eklund, Hauenstein & Burmeister, G&R, Globe Architectural, KONE Inc. or Otis.
    2. Shell: Provide reinforced 14-gage steel with black baked enamel finish. Apply sound deadening to exterior.
    3. Canopy: Provide reinforced 12-gage steel with white baked enamel finish.
    4. Suspended Ceiling: Provide six (6) translucent panels in an aluminum frame and size to match reveals between wall panels.
    5. Side and Rear Walls: Provide three panels on side walls and two panels on rear wall. A/E shall specify the materials and design of the panels.
    6. Transom: Provide #4 brushed 14-gage stainless steel.
    7. Front Return/Entrance Columns: Provide #4 brushed 14-gage stainless steel. Entrance columns shall be separate. Entire front return shall swing on concealed hinges. Provide engraving for "No Smoking", Capacity in pounds, 5 digit elevator number as specified by UIC.
    8. Door Panels: Provide #4 brushed stainless steel sandwich-type without binder angles.
    9. Sill: Provide extruded Silver Nickel with grooved surface. Setting shall allow for cab flooring material.
    10. Handrails: Provide one line of #4 brushed 2" by 3/8" stainless steel bars on all three sides with returned ends. Mounting shall be through the car walls from the back and top of handrails shall be 32" above finished floor.
    11. Emergency Lighting: Provide battery unit with solid-state charger to operate its alarm bell and a minimum of two cab lights. Lights shall be part of normal lighting system and shall properly illuminate main car.
    12. Emergency Exit: Provide hinged latch for evacuation of the elevator through the top of the elevator. Provide contact to prevent the elevator from operating when the latch is open.
    13. Ventilation: Provide Morrison "OE" multi-speed exhaust blower for proper ventilation through the cab.
  - Signal Systems:
    1. General: Provide material from Adams Elevator Equipment Company Vandal Resistance Series for Dormitories and classroom buildings. Provide ThyssenKrupp fixtures for all other buildings. Typically specify one car station for each elevator. Buildings in excess of 12 stories shall have two (2) car stations.

2. Main Car Station:

- a. Car Position Indicator: Provide 1" high digital segmented type with direction indicators representing the floor served and the direction of travel.
- b. Pushbuttons: Provide 1-1/8" flush pushbuttons with white LED illumination. Typically specify standard pushbuttons for each floor served which illuminate to indicate call has been registered. For classroom occupancy buildings specify vandal resistant buttons. Specify emergency control pushbuttons for alarm, door open, door close, telephone and floor passing signal.
- c. Pushbutton Markings: All pushbuttons shall be identified by raised numbers/letters/symbols and Braille. Floor pushbuttons and floor passing signal pushbutton shall have a 5/8" high designation in the face of each button. All other pushbuttons shall have 1/8" high designations in the face of each button for identification.
- d. Firefighter's Service Controls: Provide keyed switch, light jewel, audible solid-state signal and call cancel pushbutton.
- e. Emergency Communication: Mount vandal-resistant telephone unit provided by Owner in car station. Phone shall be programmed to signal Security Department. Phone shall be capable of operating with the remote monitoring system.
- f. Floor Passing Signal: Provide adjustable audible electronic chime tone which sounds each time the elevator passes a floor. Pushbutton shall be identified by the letter "S" and shall activate passing tone for entire trip until elevator reverses direction.
- g. Location: Pushbuttons shall be located between 35" and 48" above the finished cab floor. Emergency control pushbuttons shall be grouped at the bottom. Firefighter's Service controls shall be grouped above the pushbuttons. Emergency communication device shall be behind a round grille with 1/16" holes above the firefighter's service controls.

3. Service Cabinet:

- a. Access: Provide a flush, keyed #4 brushed stainless steel door with window for Certificate of Inspection. Window size shall be identical to local certificate size.
- b. Controls: Provide switches for Stop, Inspection, Independent Service, Lighting and Fan. Provide test button for Emergency Lighting.
- c. Location: Cabinet shall be located above the car operating station.

4. Hall Lanterns: Provide 2-1/2" high triangular type with #4 brushed stainless steel faceplates located adjacent to each hoist-way entrance. Provide adjustable audible electronic tone.

5. Hall Stations: Provide one #4 brushed stainless steel stations per floor with 1-1/8" standard pushbuttons or vandal resistant with white LED illumination.
  6. Firefighter's Signs: Provide one #4 brushed stainless steel sign above each hall station with wording and symbol as required by applicable code.
  7. Hoist-way Access Stations: Provide switch with #4 brushed stainless steel faceplates at each terminal located adjacent to the hoist-way entrance.
  8. Firefighter's Service Station: Provide at the main firefighter's floor stalled per local requirements. Engrave firefighter's service instructions as required in #4 brushed stainless steel faceplate.
  9. Fire Control Panel: Provide #4 brushed stainless steel faceplate recess mounted in the main floor hall station or at a prominent location with the followings:
    - a. 1/2" high LED segmented position indicators with direction arrows for each elevator.
    - b. Standby power manual override key switches with collars for each elevator.
    - c. Power light for each elevator.
  10. Firefighter's Key Box: Provide surface mounted type with #4 brushed stainless steel door. Provide keys and mount per local requirements.
- Wiring:
    1. General: Provide material from Siecor/Republic Wire and Cable.
    2. Conductors: Provide new copper wiring throughout, including motor leads. There shall be no slices.
    3. Traveling Cables: Provide a minimum of two (2) 50 pair cables per elevator. The cables shall have a flame retardant and moisture resistant outer cover. Provide pads where necessary to prevent damage to the cables during operation of the elevator.
    4. Terminals: Provide permanent identification at all connections.
    5. Spares: Provide an additional 10% conductors for future use. Provide four additional twisted shielded pair conductors between the machine room and the main car station. Tag these conductors as "SPARES".
  - Piping:
    1. General: Provide galvanized steel with removable covers.
  - Initial Site Review:
    1. General: Contractor shall thoroughly review all elevator areas before commencing work.
    2. Dimensions: Contractor shall verify proper space has been provided for elevator equipment in the machine room, hoist-way and pit areas. Contractor shall also verify that these areas are ready for the installation of the elevator equipment.
    3. Clearances: Contractor shall verify proper clearances for the elevator equipment can be maintained within the space provided.

4. Electrical: Contractor shall verify proper electrical power has been provided. Temporary power of the same characteristics as the permanent power shall be used if available.
  5. Environmental: Contractor shall verify proper operating environment has been provided.
  6. Variations: Contractor shall provide written notification of any and all conditions which will prevent producing satisfactory work within the schedule.
  7. Acceptance: Contractor shall accept conditions prior to commencement of work. Start of work shall be interpreted as acceptance of conditions.
- Transportation and Storage:
    1. General: Contractor shall properly protect equipment and architectural finishes during transportation and storage.
    2. Transportation: Contractor shall deliver and store materials in original protective packaging.
    3. Storage: Contractor shall store equipment in the machine room. Any storage outside the machine room shall be coordinated with the Owner.
  - Installation:
    1. General: Contractor shall perform all work in a first class workmanship manner.
    2. Standards: Contractor shall install equipment per Manufacturer's standards and in accordance with referenced codes.
    3. Tolerances: Contractor shall install equipment to maintain proper clearances during the operation of the elevator.
    4. Maintainability: Contractor shall install equipment so components may be easily accessed for removal during maintenance and repair.
    5. Field Welding: Contractor shall utilize certified welders. Oxidation and residue shall be chipped and cleaned away. All welds shall be wire brushed and painted with two coats of primer prior to finished coat.
    6. Unused Equipment: Contractor shall remove all unused equipment.
    7. Lubrication: Contractor shall lubricate all equipment.
    8. Wiring: Contractor shall wire equipment as indicated on the electrical wiring diagrams. Corresponding signals shall both illuminate when either button is registered.
    9. Coordination: Contractor shall coordinate all Work-Not-Included scheduled during the installation period.
    10. Protection: Contractor shall advise Owner of protection procedures to prevent damage or deterioration of work completed during the remainder of the installation period.
  - Adjustments
    1. General: Contractor shall properly adjust the components provided.

2. Design Parameters: Contractor shall adjust the elevator to meet the design parameters.
  3. Guide Rails: Contractor shall realign car guide rails vertically with tolerance of 1/16". All connections shall be checked and tightened. Joints shall be secured without gaps. Any irregularities on the machined surface shall be filled, sanded and filed to a smooth surface.
  4. Balance: Contractor shall balance elevators front-to-back and side-to-side to equalize pressure of roller car guide rollers on the car guide rails.
  5. Guide Assemblies: Contractor shall adjust car guides to maintain roller contact with the guide rails regardless of load or position in hoist-way
- Testing:
    1. General: Contractor shall test the elevator in accordance with applicable codes.
    2. Relief Valve Setting: Contractor shall test the relief valve setting.
    3. Hoses and Fittings: Contractor shall test the hoses and fitting for a minimum of 30 seconds.
    4. Buffers: Contractor shall test the buffers with full load at maximum speed.
  - Painting and Finishes
    1. General: Contractor shall provided painting and finishing of materials provided.
    2. Equipment: Contractor shall clean and paint all equipment which is provided with one coat of installer's standard enamel unless the equipment has a baked enamel or special architectural finish. Stencil paint 4" high elevator number on the mainline disconnect, car lighting disconnect, each control cabinet, crosshead and car buffer.
    3. Guide Rails: Contractor shall clean and paint the shank and base of the T-Section of the guide rails with one field coat of black Rustoleum
    4. Equipment Areas: Contractor shall paint the machine room and pit floors.
    5. Field Refinishing: Contractor shall finish any metal work provided.
    6. Field Retouch: Contractor shall paint surfaces damaged during installation with the original color and blend-out any variations.
  - Cleanup:
    1. General: Contractor shall keep work areas orderly and free from debris during the installation.
    2. Daily Removal: Contractor shall remove packaging and other materials on a daily basis as equipment is installed.
    3. Daily Cleaning: Contractor shall clean work areas on a daily basis of dirt, oil and grease.
    4. Final Cleaning: Contractor shall clean machine rooms, controllers, hoist-ways, pits, hoist-way equipment, hoist-way entrance assemblies, pit equipment, door operating equipment, cab enclosures and fixtures of dirt, oil, grease and finger marks prior to acceptance review.
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- Field Quality Control:
  1. General: Contractor shall have the work at the location checked during the course of the installation.
  2. Progress Reviews: Contractor shall provide personnel for review. Corrective work required shall be accomplished as directed.
  3. Inspections: Contractor shall complete all corrective work identified by the Code Authority during acceptance inspection prior to Acceptance Review.
  4. Acceptance Reviews: Contractor shall provide personnel for reviews. Contractor shall complete all corrective work identified prior to Final Acceptance Reviews.
  5. Final Acceptance Reviews: Contractor shall provide personnel for reviews to verify completion of punch list.
  6. Warranty Review: Contractor shall provide personnel for one warranty review,
  7. Additional Reviews: Contractor shall compensate Owner for reviews should all corrective work identified not be completed as required.
- Warranty Service:
  1. General: Contractor shall service the elevators for one year from Final Acceptance of last elevator of the group.
  2. Program: Contractor shall provide all service, repair and adjustment. Contractor shall also provide service logs, callback logs and repair logs for the warranty period.
  3. Callbacks: Contractor shall provide emergency callback service 24-hours, 7-days-a-week at no additional cost. Contractor shall have a mechanic at the location within two (2) hours during regular hours and within two (2) hours for all other callbacks after notification to the Contractor.
  4. Vandalism: Owner shall be responsible for service costs due to vandalism.

**END OF SECTION 14 24 00**

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**SECTION 14 31 00 - ESCALATORS**

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- Rated Speed: 90 ft./min.
- Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of escalator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper escalator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
  1. Perform maintenance, including emergency callback service, during normal working hours.
  2. Include 24-hour-per-day, 7-day-per-week emergency callback service.
    - a. Response Time: Two hours or less.

- Subject to compliance with requirements, provide escalators by one of the following preferred manufacturers.
  1. Dover Elevator Systems.
  2. Fujitec America, Inc.
  3. Montgomery KONE Inc.
  4. Otis Elevator Co.
  5. Schindler Elevator Corp.
  6. Thyssen Elevator Group North America.
- Optional Features:
  1. Fault Indicator: Provide escalators with a microprocessor unit that monitors safety devices, motor temperature, and escalator speed and records in nonvolatile memory date, time, and device identification if a safety device is activated or escalator malfunctions. Provide built-in unit to display recorded information.
- Instruct Facilities Management maintenance personnel in proper use, operation, and daily maintenance of escalators. Review emergency provisions, including procedures to be followed at time of operational failure and other building emergencies. Train Facilities Management maintenance personnel in procedures to follow in identifying sources of operational failures or malfunctions. Consult Facilities Management on requirements for a complete escalator maintenance program.

**END OF SECTION – 14 31 00**

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**SECTION 14 42 16 - VERTICAL WHEELCHAIR LIFTS**

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- Rise shall be no more than 12 feet.
- Rated load shall not be less than 450 pounds.
- Rated speed shall be no more than 30 feet per minute.
- Enclosures shall be provided to prevent access to underside of lift when the unit is in the up position.
- Matot and Concord are the preferred manufacturers.

**END OF SECTION – 14 42 16**

**This section of the Building Standards establishes minimum requirements only.  
It should not be used as a complete specification**