

SECTION 14 21 23.81 – HYDRAULIC ELEVATOR REHABILITATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes rehabilitation of the existing hydraulic passenger elevator for a complete working system and shall include the furnishing of all labor, materials, tools, equipment, and services required to provide a complete elevator modernization and upgrade. The existing car is intended to be maintained apart from replacing the car controller, flooring, and doors and hoistway entrances.
- B. "Work" as specified herein and as indicated on the Drawings.
- C. Related Requirements:
  - 1. Division 09 Section "Resilient Tile Flooring" for new flooring in elevator car.
  - 2. Electrical Drawings and Division 26, 27, and 28 Sections for telephone service for elevators, for connection to elevator controllers, remote monitoring of elevator, fire alarm requirements, etc.

1.3 DEFINITIONS

- A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.
- B. Defective Elevator Work: Operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.4 STIPULATION

- A. Elevator supplier/installer is responsible for the requirements set forth in this Section, and for coordinating the elevator rehabilitation in a manner that maintains the Project schedule (including the elevator being approved for use by all regulatory authorities having jurisdiction, prior to Substantial Completion of the phase in which this work occurs).

1.5 ACTION SUBMITTALS

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include Product Data for car enclosures, hoistway entrances, and operation, control, and signal systems.
- B. Shop Drawings:

HYDRAULIC ELEVATOR REHABILITATION

1. Provide project specific drawings that indicate all spaces adjacent to elevator, including walls, floors, pit, and roof, showing the actual thickness of materials and relevant details. Include plans, elevations, sections, and large-scale details indicating service at each landing, coordination with building structure, relationships with other construction, and locations of equipment. Drawings shall not be stock details.
  2. Include large-scale layout of car-control station.
  3. Identify requirements associated with the Basis of Design products. Where an acceptable manufacturer's products is provided, identify all deviations from the Basis of Design products in writing and coordinate all revisions required and confirm the same in writing.
  4. Indicate electrical, power, communication, and fire protection requirements.
  5. Car and hoistway doors, operating equipment and all signal and operating equipment.
- C. Samples for Initial Selection: For finishes involving color selection.
- D. Samples for Verification: For hoistway door and frame, and signal equipment finishes; 3-inch-square Samples of sheet materials; and 4-inch lengths of running trim members.
- E. A complete set of approved drawings, signed and sealed by the elevator supplier and installer.
- F. Filing for and obtaining all permits and warranties from regulatory authorities having jurisdiction.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Supplier Certificates: Signed by elevator supplier/installer certifying that hoistway, pit, and machine room layout and dimensions, as indicated on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.
- C. Owner/Operation Manuals: Contractor shall submit operation and maintenance manuals for approval. After Owner approval and prior to the beginning of acceptance testing, approved manuals shall be provided by the Contractor, in accordance with Division 01 requirements. The manuals shall include the following:
1. Equipment and components, descriptive literature.
  2. Performance data and model numbers.
  3. Installation instructions.
  4. Operating instructions.
  5. Maintenance, lubrication and repair instructions.
  6. Troubleshooting techniques.
  7. Spare parts lists and current price lists.
  8. Detailed, record and as-built drawings.
  9. Detailed, as-built, one line, wiring diagrams. Provide one (1) complete set per manual.
  10. Field test reports.
  11. Complete set of contract software.
  12. Six (6) keys for each new key-operated device that is provided.
  13. Diagnostic tools configured to perform at all levels.
  14. The contractor shall provide certification, in writing and signed by an officer of the organization, that the owner of the elevators shall be provided with copies of any and all information, correspondence, bulletins, newsletters, manuals, techniques, procedures, drawings, sketches and any other documents related to maintenance, safety, operations, design changes, modifications, retrofits, etc., which relate to any part, component, equipment, system, subsystem or material and services applicable to the elevators provided.

15. The aforementioned shall be provided as it pertains to the original installation and for a period of ten (10) years after Substantial Completion.
  16. The reference material shall be provided within thirty (30) days of publication or internal distribution by the manufacturer. The material, even if labeled PROPRIETARY, shall be delivered to the Owner without prejudice or delay and at no additional cost.
- D. Machine Room: Provide complete set of "As-Built" field wiring and straight line wiring diagrams showing all electrical circuits in the hoistway as well as the machine room. These diagrams shall be laminated and provided in each elevator machine room as directed.
  - E. Sample Warranty: For special warranty.
  - F. Schedule: Provide milestones required for elevator to be installed and approved in accordance with the project schedule.
  - G. Maintenance Service Agreement conforming to the requirements of this Section.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
  1. Submit manufacturer's or Installer's standard operation and maintenance manual, according to ASME A17.1/CSA B44, including diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- C. Maintenance Service Agreement: Submit a continuing maintenance proposal from Installer to Owner, in the form of a standard one-year (12 months) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.
- D. Diagnostics and Spare Parts: Prior to Substantial Completion, the Contractor shall provide items listed which shall become the Owner's property.
  1. All diagnostics shall be integral with the microprocessor control equipment provided. All levels of diagnostics shall be available, at no additional cost, for the complete maintenance of all aspects of the control and dispatch system. All such systems shall be free from secret codes and decaying circuits that must be periodically reprogrammed by the manufacturer.

#### 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator equipment manufacturer or an authorized representative who is trained and approved by equipment manufacturer who has at least 10 years of successful experience with the installation of similar elevators and is within 40 miles of the Project site. Installer shall guarantee, in writing, a minimum response time for any emergency call of 60 minutes or less. No exceptions.

## 1.9 PRE-INSTALLATION MEETINGS

- A. Initial Coordination Conference: Conduct conference at project site prior to installation of elevator pit foundations.
  - 1. Meet with Owner, Elevator Supplier/Installer, and Contractors.
  - 2. Review approved project specific shop drawings.
  - 3. Review specification requirements.
  - 4. Review Project schedule. Elevator manufacturer shall provide milestones required to meet the schedule and Substantial Completion requirements.
  - 5. Identify all regulatory requirements relevant to the construction of electrical, communications, and life safety systems to be installed as part of the Work.
- B. Pre-Installation Conference: Conduct conference at project site no less than one month prior to scheduled installation date for elevator.
  - 1. Meet with Owner, Elevator Supplier/Installer, and Contractors.
  - 2. Confirm all construction is in compliance with manufacturer's requirements and regulatory requirements. Identify all issues in writing.
  - 3. Confirm initial schedule provided will be maintained. Identify measures to be taken by elevator manufacturer to mitigate time lost (night and weekend work, etc.) if elevator does not ship in accordance with schedule or if elevator contractor delays installation from initial schedule.
  - 4. Review elevator staging and installation requirements. Identify any concerns with installation.

## 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

## 1.11 COORDINATION

- A. Coordinate installation of inserts, sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, inserts, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
- B. Coordinate locations and dimensions of work specified in other Sections that relates to elevators rehabilitation including fire protection, electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.
- C. Coordinate requirements of all regulatory agencies having jurisdiction.

## 1.12 WARRANTY

- A. Warranty: Elevator equipment supplier and manufacturers agree to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

2. Any defective work (labor and material) shall be repaired or replaced at no additional cost to the Owner.
3. Warranty Period: 1 year from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Only products of individuals, firms or corporations regularly engaged in upgrading and/or replacing similar elevators that have been in continuous operation for a period of not less than ten (10) years will be permitted. Contractor shall have an office within forty (40) miles of the Project. There shall be no logos or contractors/manufacture's identification or nameplates within the elevator car or hallways.
- B. Should a conflict exist between the specifications, drawings or field conditions, the Contractor shall submit details of such conflicts at least seven (7) days prior to submitting a bid. No deviations are allowed without prior written approval. Any substitutions to the specified product must be presented prior to the submission of a bid and with the understanding that no substitutions will be allowed after contract award.
- C. Controller Manufacturers:
  1. G.A.L. Galaxy
  2. Motion Control Engineering (MCE)
  3. Virginia Controls
- D. Signal Manufacturers
  1. Elevator Products Corporation (EPCO)
  2. G.A.L. Galaxy
  3. Innovation Industries
  4. MAD Elevator, Inc.
- E. Machine Manufacturers
  1. Hollister-Whitney
- F. Pump Unit
  1. Minnesota Elevator Inc. (MEI)
- G. Door Equipment
  1. G.A.L. Galaxy.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with current ASME A17.1/CSA B44 and governing PA Elevator Code. In the event of any discrepancy between codes, manufacturer shall confirm which requirement governs the installation. Manufacturers shall be prepared to provide for the more stringent requirements.
- B. Accessibility Requirements: Comply with requirements for accessible elevators in the United States Access Board's ADA-ABA Accessibility Guidelines and with current edition of ICC A117.1.

- C. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 and in accordance with the standards set forth in the PA Elevator Code.
- D. Seismic Performance: Elevator system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and shall comply with elevator seismic requirements in ASME A17.1/CSA B44.

## 2.3 ELEVATORS

- A. Elevator System, General: Non-proprietary standard elevator systems. Unless otherwise indicated, standard components shall be used, as included in standard elevator systems and as required for complete system.
- B. Elevator Description:
  - 1. Machine Type: Holed-Hydraulic:
  - 2. Rated Load: Verify existing properties and provide equipment necessary to maintain capacities.
  - 3. Rated Speed: Match existing.
  - 4. Security Features: Keyswitch operation at all call stations.
  - 5. Car Interior:
    - a. Remove existing flooring and provide new resilient tile floor.
  - 6. Hoistway Entrances:
    - a. Width: Existing to remain.
    - b. Height: Existing to remain.
    - c. Type: Single-speed side sliding.
    - d. Sills: Aluminum.
  - 7. Hall Fixtures: Satin stainless steel, No. 4 finish.
  - 8. Power: Verify existing and coordinate with Project power requirements.
  - 9. Additional Requirements:
    - a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.

## 2.4 OPERATION SYSTEMS

- A. General: Provide non-proprietary microprocessor operation systems as required to provide type of operation indicated.
- B. Non-Proprietary Microprocessor Control
  - 1. Activation by keyswitch or hall button shall bring car to corresponding landing. After car stops in response to hall call, a time relay shall render car inoperative from hall controls, for a predetermined interval. Presentation of card-to-card reader or activation by keyswitch at the landing where the car is standing shall cause the door to open.
  - 2. The following features shall be incorporated into the control system:
    - a. Heavy Up Incoming Traffic
    - b. Heavy Down Traffic

- c. Two Way Traffic Conditions
  - d. Delayed Car Feature
  - e. Adjustable Door Dwell Time
  - f. Fire Service Phase I & II
  - g. Anti-Nuisance Operation
  - h. Load Weighing Bypass
  - i. Nudging
  - j. Hoistway access top and bottom
  - k. Security features to include car and hall call lockouts
  - l. Voice Annunciation
- 3. Car and hoistway doors shall open automatically when car stops in response to a car or hall call.
- 4. Doors shall close after a predetermined interval after opening unless closing is interrupted by car door reversal device or door open button in car.
- 5. Fire Service Control shall override any Special Service Operation.
- C. Security features shall not affect emergency firefighters' service.
  - 1. Keyswitch Operation: System uses keyswitches in lieu of hall push-button stations to authorize calls. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers.
    - a. Master keyswitch shall permit operation by hall buttons or by keyswitch only.
- D. Independent Service: Provide controls to remove elevator from normal operation and provide control of the elevator from car buttons only. Car shall travel at contract speed and shall not respond to corridor calls.
- E. Car Top Operation: Provide new inspection and maintenance control station mounted on cartop. Station shall include up and down buttons, inspection operation button, stop switch, GFI duplex outlet, work light and guard along with audible and visual signal to comply with fire service control.
- F. Emergency Recall Operation (Fire Service): Provide equipment and operation per applicable Code requirements. Provide a three-position key switch, marked "RESET-OFF-ON", at the main fire egress lobby. Any additional switches for control panels of alternate recall floors are to be two-position, marked "OFF-ON". All elevators shall be provided with Phase II operation. Contractor shall provide relays, wiring, and terminal strips to receive signals from ionization detectors.
- G. Emergency Car Lighting and Alarm System: Unit shall provide emergency light in car upon failure or interruption of normal car lighting. Emergency lighting unit shall provide a minimum illumination of 0.2 foot-candle at 4 feet above car floor approximately one (1) foot in front of car operating panel for not less than 4 hours. Battery shall be 6-volt minimum, sealed rechargeable lead acid or equal. Battery charger shall be capable of restoring battery to full charge within sixteen (16) hours after resumption of normal power. Provide an external means for testing battery, lamps, and alarm bell.
- H. Door Hold Operation: Provide controls and a button within operating panel, which shall hold the doors open for an adjustable period of 30 to 90 seconds.
  - 1. The following shall resume normal door operation:
    - a. Activation of door close button.
    - b. Activation of any floor button within the elevator.
    - c. Expiration of time period.

## 2.5 OPERATION PERFORMANCE

- A. The control system shall provide smooth acceleration and deceleration with 1/8" leveling accuracy at all landings, from no load to full rated load in the elevator, under normal or unloading conditions. The self-leveling shall, within its zone, be entirely automatic and independent of the operating device and shall correct for overtravel and undertravel. The car shall remain at the landing irrespective of load. Clearance between the car sill and the hoistway landing shall not exceed 1-1/4 inch.
- B. The door open time for elevators is not to be less than 3.0 fps.
- C. The door close time shall be based on the Code requirements with a door delay feature. The door delay is the minimum acceptable time from notification that a car is answering a call (lantern and audible signal) until the doors of the car start to close. Time shall be calculated by the following equation:
  - 1.  $T = D/(1.5\text{ft/s})$
  - 2. T = Total time in seconds.
  - 3. D = Distance from a point in the lobby sixty (60) inches directly in front of the hall station to the centerline of the door opening.
- D. Car Call: The minimum acceptable time for doors to remain fully open shall not be less than 5 seconds.
- E. The speed of the elevator shall not vary +/- 5% under loading conditions.
- F. Elevators shall be statically and dynamically balanced. With empty car, maximum pressure on any roller guide shall not exceed ten (10) pounds, with the elevator located at any point in the hoistway.
- G. Prior to final acceptance and prior to the termination of the maintenance period, the elevators shall be adjusted as required to meet performance requirements.

## 2.6 HOISTWAY EQUIPMENT

- A. Guide Rails: Existing guide rails are to be retained. The rails and brackets are to be examined and re-secured as necessary. The machine surface of the rails is to be thoroughly cleaned. All rail joints shall be filed smooth and the alignment checked and adjusted as necessary to within 1/8" top to bottom and face-to-face. The unmachined portion of the rails are to be cleaned and painted.

## 2.7 DOOR REOPENING DEVICES

- A. Infrared Array: Provide 3D door reopening device as stated below, with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.
- B. Door Operator: New GAL MOVFR II closed loop operator. Door operator shall be adjusted as required to comply with manufacturer's performance requirements. Car header, drive arm, linkage, clutch, gate switch, and all necessary hardware shall be replaced. Heavy-duty master, close loop electric power door operator to automatically open and close the car and hoistway doors shall be provided. The doors shall be capable of smooth and quiet operation without slam or shock.
  - 1. Opening speed shall not be less than 3.0 f.p.s.
  - 2. Hoistway doors shall be automatically closed by an auxiliary closing device if car leaves the landing zone.
  - 3. In case of power interruption, it shall be possible to manually operate car and hoistway doors from inside the cab.

- 4. Door Protection:
    - a. Electronic Detector Screen: Provide 3D electronic door edge device, which projects an infrared curtain of light guarding the door opening. Arrange to reopen doors if one beam of the curtain is penetrated. Unit shall have Transmitters and Receivers spaced at a minimum distance to provide the maximum amount of protection within the height of the doorway. Systems which have the availability to turn Off or On individual zones within the curtain are not permitted.
  - 5. Differential door timing feature: Provide adjustable timers to vary the time that the doors remain open in response to a car or hall call. The doors shall remain open for one second in response to a car call and five to eight seconds for a hall call. This time shall be reduced to 2 seconds if door detection is interrupted. The doors shall remain open as long as passengers are crossing the threshold.
  - 6. Nudging: When doors are prevented from closing for 20 seconds due to failure of the light ray or obstruction, the doors shall close at reduced speed and a buzzer shall sound.
- C. Car Door Contacts: Electrical contacts shall prevent the operation of the elevator by normal operating devices unless car doors are closed or within tolerances allowed by Code.

## 2.8 EXISTING CAR ENCLOSURES

- A. Car Frame: Retain existing. All components shall be checked and secured.
- B. Platform: Retain existing. Secure or replace any loose or missing hardware. Mitigate all areas of rust and paint with rust inhibiting enamel to match treated area.
- C. Toe Guards: Replace with new to meet code. Paint with two (2) coats of black enamel and stencil elevator number six (6) inches in height.
- D. Tracks, Hangers, and Header: New GAL
- E. Floor Covering: Remove existing flooring, thoroughly clean and prepare subfloor. Repair any areas of the subfloor that are damaged. Install new slip and chemical resistant rubber floor tiles with raised circular pattern. Color selected by Owner.
- F. Passenger Elevator Car Enclosure: Reuse existing. Paint car top, crosshead, and any bare steel with two (2) coats of rust inhibiting black enamel. Stencil elevator number on car top and crosshead. Furnish and install new cab fan.
- G. Provide new car door panels with satin stainless steel, No. 4 finish.
- H. Cab Interiors:
  - 1. Wall Panels: Revise existing.
  - 2. Ceilings: Grid Ceiling with stainless steel frame, translucent panels, and new LED lighting.
  - 3. Handrails: Revise existing.
  - 4. Front returns, transom, and columns: Revise existing.

## 2.9 EXISTING HOISTWAY ENTRANCES

- A. Hoistway Entrance Assemblies: Manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Frame size and profile shall accommodate hoistway wall construction.
- B. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies shall comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, based on testing at as close-to-neutral pressure as possible according to NFPA 252 or UL 10B.
  - 1. Fire-Protection Rating: 2 hours.
- C. Fastenings of all entrance equipment shall be inspected and secured.
- D. Sills shall be inspected, cleaned, and polished.
- E. Retain door panels and provided new SEES enforcer gibs. Doors shall be provided with new rubber bumpers.
- F. Existing fascia, dust covers, hanger covers and hoistway toe guards are to be retained. Replace any missing components. All equipment shall be cleaned, inspected and reinforced. Any missing components are to be provided with new compatible products. All equipment required to be painted with black enamel. Six (6) inch high numerals designating the appropriate floor shall be stenciled at six (6) foot intervals.
- G. Provide new stainless steel door assembly and frame wraps at all stops.
- H. Provide new die cast jamb markings on the sides of each entrance frame and mounted sixty (60) inches from the finish floor in compliance with current accessibility standards. Each marking shall be a minimum of two (2) inch high numerals with Braille.
- I. All door tracks, hangers, interlocks, and closers shall be replaced with new GAL equipment. Strut angles and headers may be retained. Clean and mitigate any rust and treat with rust inhibiting paint.
- J. The car and hoistway doors shall be confirmed or corrected so that the doors cannot be opened more than four (4) inches from within the car when the car is outside the unlocking zone in accordance with ANSI A.17.1.
- K. New door stops and rubber bumpers shall be mounted to the top and bottom of each strut angle in order to cushion and limit extreme travel of the door panels.

## 2.10 SIGNAL EQUIPMENT

- A. General: Provide new car-call buttons that light when activated and remain lit until call has been fulfilled. Provide buttons and lighted elements illuminated with LEDs. All devices shall be vandal-resistant.
- B. Car-Control Stations: Provide new recessed car-control stations. Mount in return panel adjacent to car door unless otherwise indicated.
  - 1. Mark buttons and switches for required use or function. Use both tactile symbols and Braille.
  - 2. Provide "No Smoking" sign matching car-control station, either integral with car-control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.
  - 3. Panels shall have illuminating pushbuttons numbered to conform to floors served. Buttons shall light to show registration and extinguish when car stops in response to a call. Buttons shall be raised 1/8 inch above the faceplate. Panel shall include an alarm bell button, DOOR OPEN and

DOOR CLOSE button. All operating controls shall be located no higher than 48" above the car floor and 35" for alarm button. Provide Phase II emergency fire service switch, fire jewel and ADA telephone. Provide oversized panel if necessary due to the size of the existing cutout.

- a. Braille designations shall be die cast and flush with inconspicuous mechanical mounting.
  - b. The plaques shall have numerals and background in a finish selected by the architect/owner.
4. Fire Service Phase I & II requirements using the key acceptable to local authorities having jurisdiction.
5. Provide within panel a service cabinet with a locked flush hinged door and integral certificate frame.
  - a. Certificate Frame shall have durable Plexiglas window and be accessible from backside of locked door. Minimum window size to be 7" wide by 3" high.
  - b. Cabinet shall contain the following key switch type controls:
    - 1) A light switch
    - 2) Two speed fan switch
    - 3) Inspection switch, conforming with the ANSI Code
    - 4) Independent service switch.
    - 5) A duplex 110-volt, A.C. convenience outlet
    - 6) Fire Service keyswitch
    - 7) Two (2) spare switches
    - 8) Hoistway Access Enable
    - 9) Emergency Light Test
6. Engrave the car operating panels with the following:
  - a. No Smoking. Minimum one (1) inch high lettering
  - b. In Case of Fire Do Not Use Elevator
  - c. Elevator Number: Minimum one (1) inch high lettering
  - d. Elevator Capacity: Minimum one (1) inch high lettering
  - e. Firefighters Operating Instructions. Minimum 1/8 inch high lettering.
- C. Provide hoistway access top and bottom. Key switch shall be mounted in the inside of the door frame as approved by the Owner.
- D. Any fixtures not used and not covered by other work included in the scope shall be covered with a stainless steel #4 plate.
- E. Emergency Communication System: Two-way voice communication system, with visible signal, which dials preprogrammed number of monitoring station and does not require handset use. System shall be contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
  1. Telephone System: Provide new ADA compliant hands free telephone integral with the car operating panel.
  2. Provide engraved emergency instructions above the activation button. Instructions in braille shall be provide below the engraved instructions.
  3. Provide a visual indication that consists of a jewel that illuminates once the master station has received a call. Instructions under the visual indicator or within the lighted jewel shall read: "WHEN FLASHING HELP IS ON THE WAY".
  4. Provide two-way communication between the elevator car and the elevator machine room.
  5. Provide wiring from car to telephone terminal box in elevator machine room.

HYDRAULIC ELEVATOR REHABILITATION

- F. Car Position Indicator: Provide illuminated, digital-type car position indicator, located above car door or above car-control station. Also, provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served. Include travel direction arrows if not provided in car-control station.
- G. Hall Call Stations: Card readers and keyswitches as noted elsewhere in this Section.
- H. Hall Position Indicators: Provide new illuminated, digital-display-type position indicator, located above hoistway entrance at first and second floors. Provide units with flat faceplate and with body of unit recessed in wall.
  - 1. Reuse or modify existing back-box for new indicators.
- I. Emergency Pictorial Signs: Fabricate from materials matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire, elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station unless otherwise indicated.

2.11 FINISH MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, commercial steel, Type B, exposed, matte finish.
- B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, commercial steel, Type B, pickled.
- C. Stainless-Steel Sheet: ASTM A240/A240M, Type 304.
- D. Stainless-Steel Bars: ASTM A276, Type 304.
- E. Aluminum Extrusions: ASTM B221, Alloy 6063.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Contractor shall examine elevator areas for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Examine hoistways, hoistway openings, pits, and machine rooms as constructed; verify critical dimensions; and examine supporting structure and other conditions under which elevator work is to be installed.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Contractor shall correct unsatisfactory conditions prior to proceeding with installation.
- D. Contractor shall verify dimensions of supporting structure at the site by accurate field measurements. The work shall be accurately fabricated and fitted to the structure. The contractor shall confirm through review of drawings and field observations that the clearances and the alignments are proper for the installation of this work.
- E. Contractor shall coordinate work with the work of other trades and provide items to be placed during the installation at the proper time to avoid delays in the overall work. Use contractor's benchmarks where necessary.

- F. Contractor shall review the existing electrical system and verify all conditions for proper installation of this work. Contractor shall verify the size of all feeders and related equipment and furnish all equipment for proper operation. The contractor shall be responsible for furnishing any electrical changes or upgrades required.
- G. Contractor shall perform a full load emergency power test as outlined in the A17.1 Safety Code for Elevators. The test shall also include a full load, full speed run in both directions. The test results shall include observations, amperage draws, and any pertinent results, and shall be drafted in a report for review by the Owner. Testing shall be performed prior to the modernization and within 60 days of the Notice to Proceed.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions.
- B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.
- C. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise due to elevator system.
- D. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.
- E. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- F. Leveling Tolerance: 1/8 inch, up or down, regardless of load and travel direction.
- G. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.
- H. Locate hall signal equipment for elevators as follows unless otherwise indicated:
  - 1. Place hall lanterns either above or beside each hoistway entrance.
  - 2. Mount hall lanterns at a minimum of 72 inches above finished floor.

### 3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.
  - 1. Schedule tests and inspections to be performed ahead of substantial completion date for the elevator work.
- B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.
- C. General:

HYDRAULIC ELEVATOR REHABILITATION

1. Perform all tests required by Codes and as required by authorities having jurisdiction.
  2. Provide labor, materials, equipment and connections.
  3. All test results shall be documented and submitted for approval.
  4. Repair or replace defective work as required.
  5. Pay for restoring or replacing damaged work due to tests.
- D. Final Inspection: When all work is completed, and tested to the satisfaction of the Contractor, the Contractor shall notify the Owner in writing that the elevators are ready for final inspection and acceptance test. A testing and inspection date shall be scheduled by the elevator contractor with the appropriate governing authority(s). Proper operation of every part of the elevator system and compliance with contract requirements, including compliance with all requirements of applicable Codes, shall be demonstrated to the Owner. Contractor shall furnish all test instruments, weights, and materials, required at the time of final inspection. The following tests shall be made at the time of final inspection:
1. Test Period: The elevator shall be subjected to a test for a period of one-hour continuous run, with full-specified load in the car. During the test run, the car shall be stopped at all floors in both directions of travel for a standing period of 10 seconds per floor.
  2. Speed Load Tests: The actual speed of the elevator car shall be determined in both directions of travel with full contract load and with no load in the elevator car. Speed shall be determined by a tachometer. The actual measured speed of elevator car with full load shall be within 5% of rated speed. The maximum difference in actual measured speeds obtained under the various conditions outlined between the "UP" and the "DOWN" directions shall be checked.
  3. Floor-to-floor times with no load in the car, balanced load and full carload shall be checked.
  4. Car Leveling Tests: Elevator car leveling devices shall be tested for accuracy of landing at all floors with no load in car, balanced load in car, and with a full load in car, in both directions of travel. Accuracy of floor landing plus or minus 3 inch shall be determined both before and after the full-load run test.
  5. Insulation Resistance Tests: The complete wiring systems of the elevator shall be free from short circuits and grounds, and the insulation resistance shall be determined by use of a "Megger." Conductors shall have an insulation resistance of not less than one megohm between each conductor and ground and between each conductor and all other conductors.
- E. Final Systems Tests for Smoke Detection/Elevator Recall, Power Loss and Security Operation: After work is completed, conduct a final test of entire system.
- F. Reinspection: If any equipment is found to be inoperable, insufficient, damaged, or defective, or if the performance of the elevator does not conform to the requirements of the contract specifications or applicable codes, no approval or acceptance of elevators shall be issued until all defects have been corrected. When the repairs and adjustments have been completed and the discrepancies corrected, the Owner shall be notified and the elevator shall be reinspected. Rejected elevators shall not be used until they have been reinspected and approved. All costs associated with inspection and any reinspections are the responsibility of the Contractor.
- G. The elevator hoistway, pits and equipment rooms shall be thoroughly cleaned. All elevator equipment located with the hoistway and machine room, along with machine room floor shall be painted with two coats of deck enamel after all adjusting is completed. Provide dielectric matting around all controllers.

### 3.4 PERMITS

- A. The Contractor shall be required to secure all permits, including but not limited to PA Labor & Industry's Elevator Division, required for the Project locality and will be required to provide the operating certificate(s) as a condition of Substantial Completion.

### 3.5 MAINTENANCE SERVICE

- A. Full Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
- B. Full Maintenance Service: Preventive maintenance examinations shall be every other week for adjustment, greasing, oiling and parts replacement due to normal elevator usage. Provided a minimum of two (2) mechanic hours (work is on site and does not include travel and office time), per month, exclusively for preventive maintenance tasks. Provide unlimited regular time and twenty-four (24) hour emergency call back service, including travel time, at no additional cost.
- C. All maintenance activities shall be performed in accordance with the procedures set forth in the approved maintenance manual. Each month, the contractor shall submit a written detailed breakdown of all activities occurring in the previous month. In addition the reports are to be provided in an electronic format acceptable to the owner.
- D. Preventive Maintenance Service:
  - 1. No less than monthly, adjust, lubricate, clean and when conditions warrant, repair or replace the following items and all other mechanical or electrical equipment:
    - a. Controller equipment: All components including all relays, solid state components, resistors, condensers, a/c units, transformers, contacts, leads, computer devices, selector switches, mechanical or electrical driving equipment, coils, magnet frames, contact switch assemblies, springs, solenoids, resistance grids, hoistway vanes, magnets and inductors.
    - b. Hoistway door interlocks or locks and contacts, hoistway door hangers, tracks, bottom door gibs, cams, rollers and auxiliary door closing devices for power operated doors.
    - c. Hoistway limit switches, slowdown switches, leveling switches and associated cams, vanes and electronic components.
    - d. Guide shoes assemblies including rollers.
    - e. Automatic power operated door operators, door protective devices, car door hangers, tracks and car door contacts.
    - f. Elevator control wiring in hoistway and machine room.
    - g. Car safety mechanism and load weighing equipment.
    - h. Fixture contacts, pushbuttons, key switches, locks, lamps and sockets or button stations (car and hall), hall lanterns, position indicators (car and hall), direction indicators.
    - i. The guide rails shall be kept dry and free of rust.
    - j. The ADA/emergency telephone.
    - k. Examine all safety devices and governors, and conduct an annual no load test and full speed test of safety mechanism, overhead speed governors, car and counterweight buffers. The car balance shall be checked and governor set. If required, the governor shall be calibrated and sealed for proper tripping speed. All tests shall be performed in accordance with the provisions of the American National Standard, Safety Code for Elevators and Escalators (ANSI/ASME A17.2), current edition.
  - 2. All replacement parts shall be new Original Equipment Manufacturer (OEM) parts specifically designed for the elevators on which they are to be used. All old parts must be returned to the Owner upon completion of repairs if requested by the owner. If OEM parts are not available, an aftermarket replacement to the owner shall be provided. If a part can be repaired, refurbished, manufactured, or rewound by a vendor or company that provides service to the elevator industry, the part is not considered obsolete, and as such, the contractor will not be compensated.

HYDRAULIC ELEVATOR REHABILITATION

3. The Contractor shall furnish and use lubricants as recommended by the original manufacturer of the equipment or a manufacturer-approved equal.
4. The Contractor shall be responsible for keeping the exterior of the elevator machinery and any other parts of the equipment, painted with heat resistant enamel and presentable at all times.
5. The Contractor shall maintain all elevator equipment within enclosures, pits, and machine rooms. Contractor work space shall be kept clean and orderly, free of dirt, dust and debris. Pits and machine spaces shall be kept dry and clean. Contractor shall be responsible for disposal of all waste in accordance with local, state and federal requirements.
6. All work shall be performed during regular working hours, except for emergency callback service. Emergency calls shall be answered at all hours of the day or night and responded to within one (1) hour during normal working hours and within two (2) hours at all other times without any additional cost to the owner.
7. The Contractor shall supply and install any and all control system software upgrades at no additional charge, for the term of the maintenance agreement.
8. Owner may terminate this maintenance coverage for convenience, in whole or in part, by thirty (30) days written notice to the contractor specifying the extent to which performance of services is terminated and the date upon which such termination becomes effective.

E. Maintenance Responsibility:

1. The Contractor shall keep the elevator maintained to operate at the original contract speed, keeping the original performance times, including acceleration and retardation as designed and installed by the manufacturer. The door operation shall be adjusted as required to maintain door opening and door closing times, within legal limits
2. The Owner reserves the right to make inspections and tests as and when deemed advisable. If it is found that the elevator and associated equipment are deficient either electrically or mechanically, the Contractor shall be notified of these deficiencies in writing, and it shall be its responsibility to make corrections within thirty (30) days after receipt of such notice. In the event deficiencies have not been corrected within thirty (30) days, the Owner may terminate the contract and employ a Contractor to make the corrections at the Contractor's expense.

- F. Approximately six (6) months prior to the end of the warranty maintenance period, the Owner shall make a thorough inspection of the elevator. Contractor shall be responsible to assist the owner with field personnel responsible for normal maintenance procedures. At the conclusion of this inspection, the Owner shall give the Contractor written notice of any deficiencies found. The Contractor shall be responsible for correction of these deficiencies within thirty (30) days after receipt of such notice.

3.6 ADJUSTING AND CLEANING

- A. All equipment shall be adjusted prior to final testing and acceptance.
- B. Paint exposed work soiled or damaged during installation. Any part of the building that was damaged, altered, or removed as part of this modernization, must be repaired or replaced to the owner's satisfaction. Repair to match adjoining work prior to final acceptance.

3.7 DEMONSTRATION

- A. The Contractor shall train Owner's maintenance personnel to operate, adjust, and maintain elevator(s).
- B. Check operation of each elevator with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

- C. For bidding purposes, assume up to four (4) hours of on-site demonstration. Any un-needed hours shall be converted to maintenance and service as indicated herein.

END OF SECTION 14 21 23