SECTION 14 21 23

BRINKER BUILDING -- TRACTION ELEVATOR MODERNIZATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Two (2) traction elevator(s) as follows:
   1. Passenger 1 and 2

B. All engineering, equipment, labor, and permits required to satisfactorily complete elevator modernization required by Contract Documents.

C. Cartage and Hoisting: All required staging, hoisting and movement to, on and from the site including new equipment, reused equipment, or dismantling and removal of existing equipment.

D. Unless specifically identified as “Reuse,” “Retain,” or “Refurbish,” provide new equipment.

E. Protective barrier(s) between car(s) in normal operation and adjacent cars in the modernization process. Full depth and height of hoistway.

F. Hoistway, pit and machine room barricades as required.

1.02 RELATED WORK PROVIDED ELEVATOR CONTRACTOR

A. The elevator contractor is responsible for the purchase and installation of the following items and associated work. The pricing of the special requirements work shall be included in the elevator modernization base bid.

B. Provide proper access to the machine room areas, hoistways and pits for all elevators in accordance with the appropriate codes. Currently, there is foreign equipment and piping in machine room.

C. Required electrical power to the elevator system(s) shall be provided by elevator contractor. This shall include the mainline disconnect switch(es) and fuses as required. Contractor must submit, along with their bid, the electrical requirements for the system(s). Reuse existing power conditions.

D. Cutting and patching of walls and floors.

E. Existing grounding, feeding service and distribution in the elevator machine room shall be reviewed and upgraded as per code and equipment requirements.

F. Lighting and GFCI convenience outlet in pit machine room and overhead machine space.

G. Provide Sump Pump, if required by code.

H. Provide new and adequate HVAC units based on Owner’s approval for tonnage required. Provide load calculations for review and approval.
I. Means for absorbing regenerated power during an overhauling load condition per NEC 620.91. Elevator(s) will employ SCR drive, presenting a non-linear active load.

J. Contractor shall provide 120V single phase fused disconnect switch per elevator located in the machine room for elevator car lights and fans.

K. Install new code compliant pit ladders. Retractable if necessary.

1.03 DEFINITIONS
A. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.

B. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

C. Provisions of this specification are applicable to all elevators unless identified otherwise.

1.04 QUALITY ASSURANCE
A. Qualified Providers: Alternate Providers must receive approval of Purchaser and/or Consultant at least 14 days prior to bid date.

B. Approved Providers: Alternate Providers must receive approval of Purchaser and/or Consultant at least 14 calendar days prior to bid date.
   1. Otis
   2. Kone
   3. Schindler
   4. ThyssenKrupp
   5. Oracle
   6. EMR
   7. Bagby Elevator

1.05 APPLICABLE CODES
A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of following Codes, laws, and/or Authorities, including revisions and changes in effect;
   1. Safety Code for Elevators and Escalators, ASME A17.1
   2. Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2
   3. Elevator and Escalator Electrical Equipment, ASME A17.5
   4. National Electrical Code, NFPA 70
   5. Americans with Disabilities Act, ADA
   6. Local Fire Authority
   7. Requirements of UBC, BOCA, SBC, IBC, OSHPD, DSA, and all other Codes, Ordinances and Laws applicable within the governing jurisdiction
   9. Uniform Federal Accessibility Standard, UFAS

B. Warranty:
   1. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one year from date of final
acceptance of all work to satisfaction of Purchaser and Consultant at no additional cost, unless
due to ordinary wear and tear, or improper use or care by Purchaser.

2. Defective is defined to include, but not limited to; operation or control system failures, car
performance below required minimum, excessive wear, unusual deterioration or aging of
materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or
vibration, and similar unsatisfactory conditions.

3. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked,
modified, repaired or replaced, so each component and its parts are in like new operating
condition. Retained equipment must be compatible for integration with new systems. All
retained equipment shall be covered under the warranty provisions, of Article 1.05, B., 1. & 2.
above. No prorations of equipment or parts shall be allowed between the Provider and
Purchaser.

1.06 DOCUMENT AND SITE VERIFICATION

In order to discover and resolve conflicts or lack of definition which might create problems, Provider must
review Contract Documents and site conditions for compatibility with its product prior to submittal of quotation.
Review existing structure, electrical and mechanical provisions for compatibility with Provider's products.
Purchaser will not pay for change to structural, mechanical, electrical, or other systems required to
accommodate Provider’s equipment.

1.07 SUBMITTALS

A. Within 60 calendar days after award of contract and before beginning equipment fabrication, submit
shop drawings and required material samples for review. Allow 30 business days for response to initial
submittal.
    1. Scaled or Fully Dimensioned details of car enclosures, and car/hall signal fixtures.
    2. Power Confirmation Information: Design for existing conditions.
    3. Fixtures: Cuts, samples, or shop drawings.
    4. Finish Material: Submit 3” x 12” samples of actual finished material for review of color, pattern,
and texture. Compliance with other requirements is the exclusive responsibility of the Provider.
Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting
provisions.
    5. Design Information: Provide calculations verifying the following;
       a. Adequacy of existing electrical provisions.
       b. Machine room heat emissions in B.T.U.
       c. Adequacy of existing car platform structure for intended loading.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable, or that the
work represented by submittal complies with the Contract Documents. Compliance with Contract
Documents, Code requirements, dimensions, fit, and interface with other work is Provider’s
responsibility.

C. Acknowledge and/or respond to review comments within 14 calendar days of return. Promptly
incorporate required changes due to inaccurate data or incomplete definition so that delivery and
installation schedules are not affected. Identify and cloud drawing revisions, including Provider elective
revisions on each re-submittal. Provider’s revision response time is not justification for equipment
delivery or installation delay.

1.08 CONSULTANT’S FINAL OBSERVATION AND REVIEW REQUIREMENTS

A. Review procedure shall apply for individual elevators, portions of groups of elevators and completed
groups of elevators accepted on an interim basis or elevators and groups of elevators completed,
accepted, placed in operation.
B. Provider shall perform review and evaluation of all aspects of its work prior to requesting Consultant’s final review. Work shall be considered ready for Consultant’s final contract compliance review when copies of Provider’s test and review sheets are available for Consultant’s review and all elements of work or a designated portion thereof are in place and elevator or group of elevators are deemed ready for service as intended.

C. Furnish labor, materials, and equipment necessary for Consultant’s review. Notify Consultant five (5) working days in advance when ready for final review of elevator or group of elevators.

D. Consultant’s written list of observed deficiencies of materials, equipment and operating systems will be submitted to Provider for corrective action. Consultant’s review shall include as a minimum:
   1. Workmanship and equipment compliance with Contract Documents.
   3. Performance of following is satisfactory:
      a. Starting, accelerating, running
      b. Decelerating, stopping accuracy
      c. Door operation and closing force
      d. Equipment noise levels
      e. Signal fixture quality
      f. Overall ride quality
      g. Performance of door control devices
      h. Operations of emergency two-way communication device
      i. Operations of firefighters’ service
   4. Test Results:
      a. In all test conditions, obtain specified contract speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of Purchaser and Consultant. Tests shall be conducted under both no load and full load condition.

E. Performance Guarantee: Should Consultant’s review identify defects, poor workmanship, variance or noncompliance with requirements of specified Codes and/or ordinances, or variance or noncompliance with the requirements of Contract Documents, Provider shall complete corrective work in an expedient manner to satisfaction of Purchaser and Consultant at no cost as follows;
   1. Replace equipment that does not meet Code or Contract Document requirements.
   2. Perform work and furnish labor, materials and equipment necessary to meet specified operation and performance.

F. A follow-up final contract compliance review shall be performed by Consultant after notification by Provider that all deficiencies have been corrected. Provide Consultant with copies of the initial deficiency report marked to indicate items which Provider considers complete. If additional reviews are required due to Provider’s gross non-compliance with initial and follow-up deficiency reports, consultant shall bill Provider at normal billing rates plus expenses, and Provider acknowledges it will pay for additional compliance reviews.

1.09 PROJECT CLOSEOUT INFORMATION

A. Provide three sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of “as-installed” elevator circuits, with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a
protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser’s property.

2. Lubrication instructions, including recommended grade of lubricants.
3. Parts catalogs for all replaceable parts including ordering forms and instructions.
4. Four sets of keys for all switches and control features properly tagged and marked.
5. Neatly bound instructions explaining all operating features including all apparatus in the car and lobby control panels.
6. Neatly bound maintenance and adjustment instructions explaining areas to be addressed, methods and procedures to be used, and specified tolerances to be maintained for all equipment.
7. Diagnostic equipment complete with access codes, adjusters manuals and set-up manuals for adjustment, diagnosis and troubleshooting of elevator system and performance of routine safety tests.

B. Acceptance of such records by Purchaser/Consultant shall not be a waiver of any Provider deviation from Contract Documents or shop drawings or in any way relieve Provider from his responsibility to perform work in accordance with Contract Documents.

1.10 PERMIT, TEST AND INSPECTION

A. Obtain and pay for permit, license, and inspection fee necessary to complete installation.

B. Perform test required by Governing Authority in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative.

C. Supply personnel and equipment for test and final review by Consultant, as required in Section 1.11.

1.11 MAINTENANCE

A. Warranty Maintenance:
1. Provide preventive maintenance and 24-hour emergency callback service for one year commencing on date of final acceptance by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Provider of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition. Use competent personnel, acceptable to the Purchaser, supervised and employed by Provider.
2. Purchaser retains the option to delete cost of warranty maintenance from new equipment contract and remit twelve (12) equal installments directly to Provider during period in which maintenance is being performed.
PART 2 PRODUCTS

2.01 SUMMARY

A. Two (2) Passenger Elevators

B. Unless specifically identified as “retain existing,” provide new equipment.

<table>
<thead>
<tr>
<th>EXISTING EQUIPMENT</th>
<th>DISPOSITION</th>
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<tbody>
<tr>
<td>NUMBER: CARS 1 - 2</td>
<td>RETAIN EXISTING</td>
</tr>
<tr>
<td>CAPACITY: 3000 lbs.</td>
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<tr>
<td>CLASS LOADING: PASSENGER CLASS A</td>
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<td>CONTRACT SPEED: 350 F.P.M.</td>
<td>350 F.P.M.</td>
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<td>ROPING: 1:1</td>
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<td>MACHINE: GEARED</td>
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<tr>
<td>MACHINE LOCATION: OVERHEAD</td>
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<tr>
<td>SUPERVisory CONTROL: GROUP AUTOMATIC SOLID-STATE BASED SYSTEM</td>
<td>NEW GROUP AUTOMATIC MICROPROCESSOR BASED SYSTEM</td>
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<tr>
<td>OPERATIONAL CONTROL: DUPLEX SELECTIVE COLLECTIVE MICROPROCESSOR BASED SYSTEM</td>
<td>NEW DUPLEX SELECTIVE COLLECTIVE MICROPROCESSOR BASED SYSTEM</td>
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<tr>
<td>MOTOR CONTROL: DC VARIABLE VOLTAGE</td>
<td>NEW AC VARIABLE VOLTAGE VARIABLE FREQUENCY MICROPROCESSOR BASED WITH DIGITAL CLOSED-LOOP FEEDBACK</td>
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<td>POWER CHARACTERISTICS: 480 VOLTS, 3 PHASE, 60 HERTZ</td>
<td>RETAIN EXISTING (Field Verify)</td>
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<td>STOPS: 4 FRONT</td>
<td>RETAIN EXISTING</td>
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## EXISTING EQUIPMENT

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<td>4 FRONT RETAIN EXISTING 0 REAR RETAIN EXISTING</td>
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<th>TRAVEL:</th>
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<th>ENTRANCE SIZE:</th>
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<th>DOOR OPERATION:</th>
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<td>MEDIUM SPEED, HEAVY-DUTY DOOR OPERATOR, MINIMUM OPENING SPEED 1-1/2 F.P.S.</td>
<td>NEW MEDIUM SPEED, HEAVY-DUTY DOOR OPERATOR, CLOSED LOOP, MINIMUM OPENING SPEED 1-1/2 F.P.S.</td>
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<th>GUIDE RAILS:</th>
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<td>PLANED STEEL TEES</td>
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<th>BUFFERS:</th>
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<tr>
<th>CAR ENCLOSURE:</th>
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<tr>
<td>TOP OF CAR HANDRAIL</td>
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| CAR INTERIOR FINISHES PROVIDED UNDER THIS SECTION | TOP OF CAR HANDRAIL |

<p>| BATTERY POWERED EMERGENCY CAR LIGHTING. PROVIDE SEPARATE CONSTANT PRESSURE TEST BUTTON IN CAR SERVICE COMPARTMENT. | TOP OF CAR HANDRAIL |</p>
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<thead>
<tr>
<th>EXISTING EQUIPMENT</th>
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<tr>
<td>SIGNAL FIXTURES:</td>
<td>LED ILLUMINATION</td>
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<td>VANDAL RESISTANT ASSEMBLY</td>
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<tr>
<td>HALL AND CAR PUSHBUTTON STATIONS:</td>
<td>NEW DOUBLE HALL PUSHBUTTON RISER</td>
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<tr>
<td></td>
<td>NEW MAIN &amp; AUX. CAR OPERATING PANELS</td>
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<td></td>
<td>NEW VANDAL RESISTANT CAR AND HALL PUSHBUTTONS</td>
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<tr>
<td>CAR POSITION INDICATORS:</td>
<td>NEW DUAL DIGITAL WITH CAR DIRECTION ARROWS</td>
</tr>
<tr>
<td>HALL LANTERNS:</td>
<td>RETAIN EXISTING AND RETROFIT LED LIGHTING, ELECTRONIC CHIME</td>
</tr>
<tr>
<td>COMMUNICATION SYSTEM:</td>
<td>NEW SELF-DIALING, VANDAL RESISTANT, PUSH TO CALL, TWO-WAY COMMUNICATION SYSTEM WITH RECALL, TRACKING AND VOICELESS COMMUNICATION</td>
</tr>
<tr>
<td>CARS 1 &amp; 2</td>
<td>CAR TOP INSPECTION STATION</td>
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<tr>
<td></td>
<td>FIREFIGHTERS’ SERVICE, PHASE I AND II, INCLUDING ALTERNATE FLOOR RETURN</td>
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<tr>
<td></td>
<td>STATIONARY CAR RETURN PANELS ARRANGED FOR SURFACE APPLIED CAR OPERATING PANELS</td>
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<tr>
<td></td>
<td>HOISTWAY ACCESS SWITCHES TOP AND BOTTOM FLOORS</td>
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<td>HOISTWAY DOOR UNLOCKING DEVICE</td>
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<td>ALL FLOORS</td>
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<td>LOAD-WEIGHING DEVICE</td>
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EXISTING EQUIPMENT | DISPOSITION
--- | ---
ANTI-NUISANCE FEATURE |  
INDEPENDENT SERVICE FEATURE |  
TAMPER RESISTANT FASTENERS FOR ALL FASTENINGS EXPOSED TO THE PUBLIC |  
ONE YEAR WARRANTY MAINTENANCE WITH 24-HOUR CALL-BACK SERVICE |  
SIGNAGE ENGRAVING FILLED WITH BLACK PAINT OR APPROVED ETCHING PROCESS |  
NO VISIBLE COMPANY NAME OR LOGO |  
WIRING DIAGRAMS, OPERATING INSTRUCTIONS, AND PARTS ORDERING INFORMATION |  
SYSTEM DIAGNOSTIC MEANS AND INSTRUCTIONS |  
NON-PropRIETARY CONTROL SYSTEM AND DIAGNOSTICS PROVISIONS |  

2.02 MATERIALS

A. Steel:

B. Bronze: Stretcher-leveled, re-squared sheets composed of 60% copper and 40% zinc similar to Muntz Metal, Alloy Group 2, with standard temper and hardness required for fabrication, strength, and durability. Clean and treat bronze surfaces before mechanical finish. After completion of the final mechanical finish on the fabricated work, use a chemical cleaner to produce finish (Federal Standard and NAAMM nomenclature) matching Architect’s sample;
1. Satin: Directional polish finish. M31-C12-06X, fine-satin, clear-coated (US10) with clear-organic coating recommended by Fabricator. Provide graining direction as shown or, if not shown, in longest dimension.

C. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.
D. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

E. Entrance Field Paint: Clean all surfaces of dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply filler to insure smooth surface, sand and apply one coat of electrostatic enamel in the selected solid color.

F. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove and or check for corrosive activity. Replace components that exhibit severe deterioration. Tighten all fastenings. Repaint exposed surfaces with two coats of rust preventive primer.

2.03 CAR PERFORMANCE

A. Car Speed: ± 3% of contract speed under any loading condition.

B. Car Capacity: Safely lower, stop and hold 125% of rated load.

C. Car Stopping Zone: ±1/4" under any loading condition.

D. Door Opening Time: Seconds from start of opening to fully open:
   1. Cars 1-2: 1.9 seconds.

E. Door Closing Time: Seconds from start of closing to fully closed:
   1. Cars 1–2: 2.4 seconds.

F. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open (1/2 open for side opening doors) and car level and stopped at next successive floor under any loading condition or travel direction (13 foot typical floor height):
   1. Cars 1-2: 5.8 seconds.

G. Car Ride Quality:
   1. Horizontal acceleration within car during all riding and door operating conditions. Not more than 20 mg peak to peak (adjacent peaks) in the 1 - 10 Hz range.
   2. Acceleration and Deceleration: Smooth constant and not less than 3 feet/second² with an initial ramp between 0.5 and 0.75 second.
   3. Sustained Jerk: Not less than 6 feet/second³.

H. Airborne Noise: Measured noise level of elevator equipment during operation shall not exceed 50 dBA in elevator lobbies and 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.

2.04 OPERATION

A. Duplex Selective Collective Microprocessor Based Cars 1 – 2: When cars are available, park one car at main floor (“home” car). Park other car where last used (“free” car).

Respond to car calls and hall calls above main floor using the “free” car. Once a car has started, respond to registered calls in the direction of travel and in the order the floors are reached.

Do not reverse car direction until all car calls have been answered, or until all hall calls ahead of the car and corresponding to the direction of car travel have been answered.
Slow cars and stop automatically at floors corresponding to registered calls in the order in which they are approached in either direction of travel. As slowdown is initiated for a hall call, automatically cancel hall call. Cancel car calls in the same manner. Hold car at arrival floor an adjustable time interval to allow passenger transfer.

Answer calls corresponding to direction in which car is traveling unless call in the opposite direction is the highest (or lowest) call registered.

When the “free” car is clearing calls, start “home” car to respond to:
1. A call registered on “home” car pushbuttons.
2. An up hall call registered below “free” car.
3. An up or a down call registered above “free” car while “free” car is traveling down.
4. A hall call when “free” car is delayed in its normal operation for a predetermined period.

When both cars are clearing calls, stop only one car in response to any registered hall call.

Return the first car to clear its calls to main floor. Should last service required bring both cars to main floor, the first arriving car becomes the “free” car.

Illuminate appropriate pushbutton to indicate call registration. Extinguish light when call is answered.

Answer lower floor calls with the “home” car unless “free” car is parked at floor where the call occurs. If no car is parked at main level, answer calls below main floor using the first car traveling down. Do not stop cars traveling to or from levels below main floor at main floor unless there are calls registered for service at that floor.

B. Group Automatic Cars 1 – 2:
1. Approved microprocessor-based, group dispatch, car and motion control systems as follows:
   a. KONE: ReSolve
   b. Otis: Elevonic R
   c. Schindler: Miconic TX
   d. ThyssenKrupp: TAC 50
   e. Fujitec: Viridian
   f. Smartrise
   g. Elevator Controls Corp: V900 VF-CL
   h. MCE: Motion 4000
2. Include as a minimum, the following features:
   a. Operate cars as a group, capable of balancing service and providing continuity of group operation with one or more cars removed from the system.
   b. Register service calls from pushbuttons located at each floor and in each car. Slow cars and stop automatically at floors corresponding to registered calls. Make stops at successive floors for each direction of travel irrespective of order in which calls are registered except when bypassing hall calls to balance and improve overall service; stop only one car in response to a particular hall call. Assign hall calls to specific cars and continually review and modify those assignments to improve service. Simultaneous to initiation of slow down of a car for a hall call, cancel that call. Render hall pushbutton ineffective until car doors begin to close after passenger transfer. Cancel car calls in the same manner. Give priority to coincidental car and hall calls in car assignment.
   c. Operate system to meet changing traffic conditions on a service demand basis. Include provisions for handling traffic which may be heavier in either direction, intermittent or very light. As traffic demands change, automatically and continually modify group and individual car assignment to provide the most-effective means to handle current traffic conditions. Provide means to sense long-wait hall calls and preferentially serve them.
Give priority to coincidental car and hall calls in hall call assignment. Accomplish car direction reversal without closing and reopening doors.

d. Use easily reprogrammable system software. Design basic algorithm to optimize service based on equalizing system response to registered hall calls and equalizing passenger trip time to shortest possible time.

e. Serve floors below main floor in a manner which logically minimizes delay in passing or stopping at main floor in both directions of travel. Provide manual means to force a stop at the main floor when passing to or from lower levels.

f. Required Features:
   1) Dispatch Protection: Backup dispatching shall function in the same manner as the primary dispatching.
   2) Delayed Car Removal: Automatically remove delayed car from group operation.
   3) Position Sensing: Update car position when passing or stopping at each landing.
   4) Hall Pushbutton Failure: Provide multiple power sources and separate fusing for pushbutton risers.
   5) Communication link: Provide serial or duplicate communication link for all group and individual car computers.

C. Other Items:
   1. Load Weighing: Provide means for weighing car passenger load. Control system to provide dispatching at main floor in advance of normal intervals when car fills to capacity. Provide hall call by-pass when the car is filled to preset percentage of rated capacity and traveling in down direction. Field adjustment range: 10% to 100%.
   2. Anti-Nuisance Feature: If car loading relative to weight in car is not commensurate with number of registered car calls, cancel car calls. Systems employing either load weighing or door protective device for activation of this feature are acceptable.
   3. Independent Service: Provide controls for operation of each car from its pushbuttons only. Close doors by constant pressure on desired destination floor button or door close button. Open doors automatically upon arrival at selected floor.

D. Firefighters’ Service: Provide equipment and operation in accordance with Code requirements.

E. Automatic Car Stopping Zone: Stop car within 1/4" above or below the landing sill. Maintain stopping zone regardless of load in car, direction of travel, distance between landings, hoist rope slippage or stretch.

F. Motion Control: Microprocessor based AC, variable-voltage, variable frequency with digitally encoded closed-loop velocity feedback suitable for operation specified and capable of providing smooth, comfortable car acceleration, retardation, and dynamic braking. Limit the difference in car speed between full load and no load to not more than ±3% of the contract speed.

G. Selective Leveling: Provide means to limit elevator car speed when traveling between adjacent floors.

H. Door Operation: Automatically open doors when car arrives at main floor. At expiration of normal dwell time, close doors. Reopen doors when car is designated for loading. Provide “heavy door/variable air pressure” feature for consistent specified door operation within appropriate speed and inertia limits.

I. Standby Lighting and Alarm: Car mounted battery unit with solid-state charger to operate alarm bell and car emergency lighting. Battery to be rechargeable with minimum 5-year life expectancy. Include required transformer. Provide constant pressure test button in service compartment of car operating panel.
2.05 MACHINE ROOM EQUIPMENT

A. Arrange equipment in existing machine room spaces.

B. Geared Traction Hoist Machine: Retain existing.
   1. Restore, seal oil leaks, clean and paint to function and appear in like new condition.
   2. Drain, flush and provide new gear lubricant.
   3. Replace worn gears and bearings.
   4. Provide supplemental rope and sheave guards as required.
   5. Provide drip pans to collect lubricant seepage.
   6. Other work deemed required to provide specified “like new” operation.
   7. Retrofit new AC V3F induction drive motor to gear case.
   9. Drop and clean brake and lube pivot pins for proper operation.

C. Solid State Power Conversion and Regulation Unit:
   1. Provide solid state, alternating current, variable voltage, variable frequency (ACV3F), I.G.B.T. converter/inverter drives.
   2. Design unit to limit current, suppress noise, and prevent transient voltage feedback into building power supply. Provide internal heat sink cooling fans for the power drive portion of the converter panels. Conform to IEEE standards 519-1992 for line harmonics and switching noise.
   4. Suppress solid-state converter noises, radio frequency interference, and eliminate regenerative transients induced into the mainline feeders or the building standby power generator.
   5. Supplemental direct-current power for the operation of hoist machine brake, door operator, dispatch processor, signal fixtures, etc., from separate static power supply.
   6. ACV3F Drives shall be regenerative and utilize IGBT converter/inverter.

D. Encoder: Direct drive, solid-state, digital type. Update car position at each floor and automatically restore after power loss.

E. Controller: UL/CSA labeled.
   1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
   2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
   3. Microprocessor-Related Hardware:
      a. Provide built-in noise suppression devices which provide a high level of noise immunity on all solid-state hardware and devices.
      b. Provide power supplies with noise suppression devices.
      c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
      d. Design control circuits with one leg of power supply grounded.
      e. Safety circuits shall not be affected by accidental grounding of any part of the system.
      f. System shall automatically restart when power is restored.
      g. System memory shall be retained in the event of power failure or disturbance.
      h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
   4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.

F. Machine and Equipment Support Beams: Retain existing in place.

G. Governor: Centrifugal-type, car machine room mounted with pull-through jaws and bi-directional shutdown switches.

2.06 HOISTWAY EQUIPMENT

A. Guide Rails: Retain main and counterweight guide rails in place.
   1. Clean rails and brackets. Remove rust.
   2. Check all rail and bracket fastenings and tighten.
   3. Realign rails as required to provide smooth car ride.

B. Buffers, Car and Counterweight: Retain existing.
   2. Rebuild as required and paint.
   3. Remove dirt and rust from pit channels and paint per 2.02 D.
   4. Retrofit switch to limit elevator speed if buffer is compressed.

C. Sheaves: Retain existing.
   1. Check all fastenings and tighten.
   2. Replace worn bearings.

D. Counterweight: Retain existing. Replace worn rollers.

E. Counterweight Guard: Metal guard in pit. Retain existing.

F. Governor Pit-tensioning Sheaves: Retain existing. Rebuild as required. As a minimum completely disassemble, clean, replace worn or faulty parts and recalibrate governor.

G. Hoist and Governor Ropes: Retain existing or replace if estimated remaining life is less than five years. No proration is allowed under terms of Warranty Maintenance Agreement.

H. Terminal Stopping: Provide normal and final devices.

I. Electrical Wiring and Wiring Connections:
   1. Conductors and Connections: Copper throughout with individual wires coded and connections on identified studs or terminal blocks. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes. Provide 10% spare conductors throughout. Run spare wires from car connection points to individual elevator controllers in the machine room. Provide four pairs of spare shielded communication wires in addition to those required to connect specified items. Tag spares in machine room.
   2. Conduit: Painted or galvanized steel conduit, EMT or duct. Conduit size, 1/2" (GSA) minimum. Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.
   3. Traveling Cables: Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.

J. Entrance Equipment: Retain existing. Refurbish/replace and adjust assemblies to ensure smooth and quiet mechanical open and close of doors.
   1. Door Hangers and Rollers: Replace as required.
   2. Door Track: Refurbish and/or replace as required.
3. Door Interlocks: Refurbish and/or replace as required.
4. Door Closers: Refurbish and/or replace as required

K. Hoistway Door Unlocking Device: Retain existing.

L. Hoistway Access Switches: Mount in wall at top and bottom floor(s). Provide switch with bronze faceplate.

2.07 HOISTWAY ENTRANCES

A. Frames: Retain existing. Provide Arabic floor designation/Braille plates, centered at 60” above finished floor, on both side jambs of all entrances. Provide plates at main egress landing with “Star” designation

B. Door Panels: Retain existing. Provide new door gibbs with fire tabs at all floors. Minimum two gibbs per panel, one at leading edge, and one at trailing edge of each panel

C. Sight Guards: Retain existing. Replace damaged sight guards.

D. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.

E. Sill Supports: Retain existing. Check and tighten all fastenings.

F. Fascia, Toe Guards and Hanger Covers: Retain existing. Provide as required where damaged or missing. Check and tighten all fastenings

G. Struts and Headers: Retain existing. Check and tighten all fastenings.

2.08 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings.

B. Safety Device: Retain existing. Check and tighten all fastenings.

C. Platform: Retain existing. Reinforce if required. Check and tighten all fastenings.


E. Guides: Retain existing. Check and tighten all fastenings. Replace worn rollers.

F. Finish Floor Covering:
   1. Retain existing.

G. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.

H. Doors: Retain existing. Retrofit dual gibbs, one at trailing edge and one at leading edge of each panel.

I. Door Hangers: New roller or complete hanger assembly as required.

J. Door Track: Retain existing. Clean and sand for smooth, quiet operation. Check and tighten all fastenings.
K. Door Header: Retain existing. Check and tighten all fastenings.

L. Door Electrical Contact: Prohibit car operation unless car door is closed.

M. Door Clutch: Heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation. Design clutch so car doors can be closed, while hoistway doors remain open.

N. Door Operator: Medium speed, heavy-duty door operator capable of opening doors at no less than 1-1/2 f.p.s. Accomplish reversal in no more than 2-1/2" of door movement. Provide solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current. Maintain consistent, smooth and quiet door operation at all floors, regardless of door weight or varying air pressure.

Acceptable closed-loop door operators:
1. KONE Renova 1.5
2. Otis i Motion II
3. Schindler 14 Medium Duty
4. ThyssenKrupp HD91 StarTrac
5. G.A.L. MOVFR
6. Fujitec APEX

O. Door Control Device:
1. Infrared Reopening Device: Black, fully enclosed device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor. Device shall prevent doors from closing and reverse doors at normal opening speed if beams are obstructed while doors are closing, except during nudging operation. In event of device failure, provide for automatic shutdown of car at floor level with doors open
2. Nudging Operation: After beams of door control device are obstructed for a predetermined time interval (minimum 20.0 - 25.0 seconds), warning signal shall sound and doors shall attempt to close with a maximum of 2.5 foot pounds kinetic energy. Activation of the door open button shall override nudging operation and reopen doors.
3. Interrupted Beam Time: When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0 - 1.5 seconds after beams are reestablished.
4. Differential Door Time: Provide separately adjustable timers to vary time that doors remain open after stopping in response to calls.
   a. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   b. Hall Call: Hold open time adjustable between 5.0 and 8.0 seconds. Use hall call time when car responds to coincidental calls.

P. Car Operating Panel:
1. Provide two car operating panels with faceplates, consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car stationary front return panels. Faceplates shall be hinged and constructed of bronze, satin finish.
2. Suitably identify floor buttons, alarm button, door open button, door close button and emergency push-to-call button with SCS cast tactile symbols recessed flush mounted. Configure plates per local building code accessibility standards including Braille. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
3. Provide minimum 3/4" diameter raised floor pushbuttons which illuminate to indicate call registration.
4. Provide alarm button to ring bell located on car, and sound distress signal at control panel. Illuminate button when actuated.
5. Provide keyed stop switch at bottom of car operating panel in locked car service compartment. Mark device to indicate "run" and "stop" positions.
6. Provide "door open" button to stop and reopen doors or hold doors in open position.
7. Provide "door close" button to activate door close cycle. Cycle shall not begin until normal door dwell time for a car or hall call has expired, except firefighters’ operation.
8. Provide firefighters’ Phase II cabinet.
9. Provide lockable service compartment with recessed flush door. Door material and finish shall match car return panel or car operating panel faceplate.
10. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
   a. Access switch.
   b. Light switch.
   c. Three-position exhaust blower switch.
   d. Independent service switch.
   e. Constant pressure test button for battery pack emergency lighting.
   f. 120-volt, AC, GFCI protected electrical convenience outlet.
   g. Stop switch.
11. Provide black paint filled (except as noted), engraved or approved etched signage as follows with approved size and font:
    a. "Fire Operation" filled red on locked cabinet door.
    b. Car number on main car operating panel.
    c. "No Smoking" on main car operating panel.
    d. Car capacity in pounds on main car operating panel.

Q. Car Top Control Station: Mount to provide safe access and utilization while standing in an upright position on car top.

R. Work Light and Duplex Plug Receptacle: Work Light and Duplex Plug Receptacle: GFCI protected outlet at top and bottom of car. Include on/off switch and lamp guard.

S. Communication System:
   1. Two-way communication instrument in car with automatic dialing, tracking and recall features with shielded wiring to car controller in machine room. Provide dialer with automatic rollover capability with minimum two numbers. Provide consolidator to allow multiple phones connected to one (1) line.
      a. "HELP" button adjacent light jewel shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase "WHEN FLASHING HELP ON THE WAY" engraved signage adjacent to light jewel.
      b. Provide "HELP" button tactile symbol, engraved signage, and Braille adjacent to button mounted integral with car front return panel.
   2. Install remote speakers behind front return panel with drilled speaker pattern, with shielded wiring to machine room junction box.
   3. Provide two-way communication between car and machine room.

2.09 CAR ENCLOSURE

A. Car Enclosure Passenger Elevators: Provide complete as specified herein. Provide the following features.
   1. Shell: Retain existing. Modify as required for application of new signal and pushbutton fixtures. Check and tighten all fasteners.
   2. Canopy: Retain existing.
3. Front Return Panels: Strip existing protective sealer, regrain if necessary and reseal.
4. Entrance Columns and Transom: Strip existing protective sealer, regrain if necessary and reseal.
5. Car Door Panels: Retain existing. Strip existing protective sealer, regrain if necessary and reseal or clad with new bronze metal.
7. Ventilation: Two-speed exhaust blower mounted to car canopy on isolating rubber grommets. Provide with a diffusor and grille. Exhaust blower shall meet requirements of Item 2.03, H.
9. Handrails: Top handrail line minimum 1-1/4" diameter bronze tubular grab bar. Bolt rails through car walls from back and mount on 1-1/2" deep solid round bronze standoff spacers. Return handrail ends to car walls.

2.10 HALL CONTROL STATIONS

A. Pushbuttons: Provide one (2) risers with flush mounted faceplates. Include pushbuttons for each direction of travel which illuminate to indicate call registration. Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation as part of faceplate. Pushbutton design shall match car operating panel pushbuttons. Provide vandal resistant pushbutton and light assemblies. Provide enlarged faceplate to cover existing wall blockout and facilitate handicapped access requirements. Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation as part of faceplate. Provide any cutting and patching required.

2.11 SIGNALS

A. Hall Lantern: Retain existing at all floors. Retrofit with new LED lighting and electronic chime. Provide advanced hall lantern notification to comply with ADA hall call notification time.

B. Car Position Indicator: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2" high to indicate floor served and direction of car travel. Locate fixture in car front return panel each car operating panel. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway. Illuminate proper direction arrow to indicate direction of travel.

C. Faceplate Material and Finish: Bronze finish all fixtures.

D. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

PART 3 EXECUTION

3.01 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify that no irregularities exist which affect execution of work specified.

B. Do not proceed with installation until work in place conforms to project requirements.

3.02 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver material in Provider’s original, unopened protective packaging.
B. Store material in original protective packaging. Prevent soiling, physical damage, or moisture damage.

C. Protect equipment and exposed finishes from damage and stains during transportation, erection, and construction.

3.03 INSTALLATION

A. Install all equipment in accordance with Provider’s instructions, referenced Codes, specification and approved submittals.

B. Install machine room equipment with clearances in accordance with referenced Codes and specification.

C. Install all equipment so it may be easily removed for maintenance and repair.

D. Install all equipment for ease of maintenance.

E. Install all equipment to afford maximum accessibility, safety, and continuity of operation.

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

3.04 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Have Code Authority acceptance inspection performed and complete corrective work.

3.05 ADJUSTMENTS

A. Install rails plumb and align vertically with tolerance of 1/16” in 100’-0”. Secure joints without gaps and file any irregularities to a smooth surface.

B. Static balance car to equalize pressure of guide shoes on guide rails.

C. Lubricate all equipment in accordance with Provider’s instructions.

D. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.06 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis.

B. Remove all loose materials and filings resulting from work.
C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

END OF SECTION