

IN THE COUNTY LEGISLATURE OF JACKSON COUNTY, MISSOURI

A RESOLUTION awarding a contract for the restoration and modernization of elevators at the downtown Jackson County Courthouse to Schindler Elevator Corporation of Kansas City, MO, under the terms and conditions of Request for Proposals No. 48-19, at an actual cost to the County not to exceed \$6,360,545.00, which includes a ten percent contingency, and authorizing the Director of Public Works to approve line item adjustments at no additional cost to the County.

RESOLUTION NO. 20317, December 2, 2019

INTRODUCED BY Crystal Williams, County Legislator

WHEREAS, the County requires elevator construction services to assist the County with modernization of the elevator system at the downtown courthouse; and,

WHEREAS, the services will include the modernization of the six main downtown courthouse elevators and associated maintenance required during the modernization and delivery period, as described on the attached detailed scope of services; and,

WHEREAS, the modernization entails replacement and/or refurbishment of most system components that include the controlling and mechanical operating devices; and,

WHEREAS, in addition, new cab interiors, a destination dispatch system, in car video displays, and other technological devices will be implemented to ensure that the system is updated, safe, and effective; and,

WHEREAS, although the County advertised and encouraged a number of potential

professional elevator bidders to respond, the County received one response, which was determined to be qualified, the qualified response was discussed by a selection committee, and the following score was tabulated:

<u>BIDDER</u>	<u>SCORE</u>
Schindler Elevator Corporation Kansas City (Clay County), MO	80

and,

WHEREAS, pursuant to section 1054.6 of the Jackson County Code, the Director of Finance and Purchasing recommends the award of a contract for the restoration and modernization of elevators at the downtown Jackson County Courthouse to Schindler Elevator Corporation of Kansas City, MO, under the terms and conditions of Request for Proposals No. 48-19, as the best proposal received, with pricing and alternative bid items selected and negotiated; and,

WHEREAS, the Director of Public Works requests that he be authorized to make adjustments in the contract should unknown conditions be discovered, to the extent that there will be no further funding obligation to the County, to be covered by a ten percent contingency; now therefore,

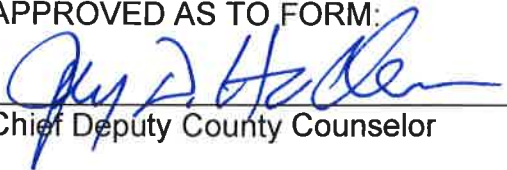
BE IT RESOLVED by the County Legislature of Jackson County, Missouri, that award be made as recommended by the Director of Finance and Purchasing, and that the Director be and hereby is authorized to execute for the County any documents

necessary for the accomplishment of the award; and,

BE IT FURTHER RESOLVED that the Director of Finance and Purchasing is authorized to make all payments, including final payment on the contract.

Effective Date: This Resolution shall be effective immediately upon its passage by a majority of the Legislature.

APPROVED AS TO FORM:



Chief Deputy County Counselor



County Counselor

Certificate of Passage

I hereby certify that the attached resolution, Resolution No. 20317 of December 2, 2019, was duly passed on December 9, 2019 by the Jackson County Legislature. The votes thereon were as follows:

Yeas 9

Nays 0

Abstaining 0

Absent 0

12.9.19

Date



Mary Jo Spino, Clerk of the Legislature

There is a balance otherwise unencumbered to the credit of the appropriation to which the expenditure is chargeable and there is a cash balance otherwise unencumbered in the treasury to the credit of the fund from which payment is to be made each sufficient to provide for the obligation herein authorized.

ACCOUNT NUMBER: 013 5113 58020
ACCOUNT TITLE: County Improvement Fund
Non-Departmental- Cnty Imprvmnt
Buildings & Improvements
NOT TO EXCEED: \$6,360,545.00

11/26/19

Date



Chief Administrative Officer

Scope of Work & Pricing

- Our proposal document includes the following specified work as outlined in the Jackson County Missouri RFP 48 -19. RFP 48 – 19 shall be incorporated into our agreement with our noted clarifications and exceptions.

○ Base Proposal Amount	\$4,588,281	SEC TXR5	Accepted _____
○ Destination Port System	\$530,626	Schindler	Accepted _____
○ Video Display	\$48,407	CE Electronics	Accepted _____
○ Accelerated Schedule All Units	\$420,000	Units #1 - #6	Accepted _____
○ Kiosk Mounted Port Allowance	\$75,000	Levels G & *1	Accepted _____
▪ Total of 1 for each Level			
○ Elevator Sub Floor Allowance	\$120,000	Units #1 - #6	Accepted _____

Kiosk Mounted Port Allowance. Custom Assembly for each respective level shall be provided. Includes the wire path to from each display to the management system located in the elevator machine room, required cutting and patching, the Kiosk Tower Assembly, 19" Directory Display on two sides of the Kiosk with the Port Device Installed directly under the display. Final Kiosk Design and Cost shall be approved by the owner for authorization via a formal Change notice to proceed on a per floor basis, not to exceed the allowance of \$37,500 per floor.

Sub Floor Allowance. Finished Elevator Flooring shall be removed, and the sub floor inspected. Corrective work if identified shall be reviewed and approved by the owner for authorization via formal Change Notice to proceed on a per elevator basis, not to exceed the allowance of \$20,000 per elevator.

Allowance Cost shall be included in the total contract amount. Proceeds not allocated will be returned to the owner via a deductive Change Notice.

4.0 SCOPE OF SERVICES

4.1 Modernization of Elevators

- 4.1.1 Comprehensive modernization of four (4) 3,000 lbs. capacity traction passenger elevators operating at 800 fpm.
- 4.1.2 Comprehensive modernization of two (2) 3,000 lbs. capacity traction passenger elevators operating at 500 fpm.
- 4.1.3 This is a "TURN-KEY" project with the Successful Respondent designated the "PRIME CONTRACTOR" for all related and non-related work specified and required unless specifically excluded or referenced to be done by others.
 - 4.1.3.1 The Successful Respondent is required to retain the services of trade sub-contractors that are experienced in working as subcontractors on elevator modernization projects.
 - 4.1.3.1.1 It is the intent of this Scope of Services that the Successful Respondent include in their base pricing the cost to complete all elevator and related work that will be required to return each of the units to public use with no Code violations or punch-list items identified by the local Authority Having Jurisdiction (AHJ) as remaining to be completed. As such, the items identified in the Scope of Services are intended to be as accurate a listing as can be compiled at the time of preparation of these documents.
 - 4.1.3.1.2 However, should other related building work items be necessary to be completed to meet the requirements of the AHJ for issuance of permanent elevator operating certificates / permits, it will be the responsibility of the Successful Respondent to complete the additional items under the Scope of Services their base pricing amount, with no additional costs to the Owner.
- 4.1.4 Related equipment shall be designed, constructed, installed and adjusted to produce the highest results with respect to smooth, quiet, convenient and efficient operation, durability, economy of maintenance, and the highest standard of safety.
- 4.1.5 It is not the intent of these Scope of Services to detail the construction and design of all parts of the equipment, but it is expected that the type, materials, design, quality of work and construction of each part shall be adequate for the service required, durable, properly coordinated with all other parts, and in accordance with the best commercial standards applicable and of the highest commercial efficiency possible.
- 4.1.6 Electric and magnetic circuits and related parts shall be of proper size, design and material to avoid heating and arcing, and all other objectionable effects which may reduce the efficiency of operation, economy of maintenance and/or net-useful life of the apparatus.
- 4.1.7 Minimum requirements for design, materials, etc., are for certain parts of the equipment. Equivalent requirements approved by the Consultant shall apply to such parts as are of

special design, construction or material and to which the specified requirements are not directly applicable. These minimum requirements as a whole shall be considered as establishing proportionate general minimum standards for all parts of the equipment.

- 4.1.8 The Consultant may permit variations from the requirement of these specifications to permit use of the Successful Respondent's standard equipment, provided such standard equipment is in every way adequate for the intended use and meets the full intent of these Scope of Services. All such variations proposed by the manufacturer shall be called to the attention of the Consultant and shall only be made if approved in writing prior to the award of the Contract/Agreement.
- 4.1.9 General requirements for design, materials and construction are intended primarily to apply to the heavy-duty and important parts of the equipment specifically mentioned and to other parts of similar duty and importance. Less important and light-duty parts may be of the standard design, materials and construction provided that, in the opinion of the Consultant, such standards are in accordance with the best commercial practice and are fully adequate for the purpose of use. All such variations shall be made only on the Consultant's written approval.
- 4.1.10 All equipment and component parts installed, supplied or provided under this Contract/Agreement shall be manufactured and distributed by a third-party, non-installer company servicing the vertical transportation industry.
 - 4.1.10.1 Apparatus shall conform to the design and construction standards referenced herein, and shall be rated the best commercial grade suitable for this application.
 - 4.1.10.2 Equipment and component systems shall not employ any experimental devices or proprietary designs that could hamper and/or otherwise prohibit subsequent maintenance repairs or adjustments by all qualified contractors.
 - 4.1.10.3 Manufacturers of the apparatus shall provide technical support and parts replacements for their equipment and component systems for a minimum of twenty (20) years, and issue such guarantee of support to the Owner with written certification naming the final Owner of their product(s) to ensure the apparatus or systems remain maintainable regardless of who may be selected for future service.
- 4.1.11 All equipment provided shall be factory and field tested with a history of design reliability and net-useful life established.
 - 4.1.11.1 Successful Respondent must be able to demonstrate the apparatus to be installed has been used successfully in a substantially similar manner under comparable conditions.
 - 4.1.11.2 If the apparatus proposed differs substantially in construction, material composition, design, size, capacity, duty or other such rating from the equipment previously used for the same purpose by the manufacturer, the Consultant may reject the apparatus or require the Successful Respondent test and demonstrate the adequacy and suitability for this particular situation. Any necessary tests shall be performed at the sole expense of the Successful Respondent with no prior guarantee of acceptance after the testing procedure.
- 4.1.12 The Successful Respondent shall not use as part of the permanent equipment any experimental devices, proprietary design, components, construction of materials which have not been fully tried out in at least substantially similar or under comparable service, except as may be especially approved by the Consultant. If any important equipment or devices to be used on this installation differ substantially in construction, materials, design, size, capacity or duty from corresponding items previously used for the same purpose by the manufacturer, they shall pass

such tests as the Consultant may require to fully show their adequacy and suitability. These tests shall be in addition to tests herein specified and shall be made at the expense of the Successful Respondent.

- 4.1.13 Certain design limitations, tests, etc., are herein specified as a partial check of the adequacy of design, construction and materials used. These requirements do not cover all features necessary to ensure satisfactory and approved operation, etc., of the equipment.
- 4.1.14 It is understood, the entire system shall be designed, fabricated, modified and/or upgraded in full compliance with applicable local laws and code standards. The absence of a particular item or requirement shall not relieve the Successful Respondent of the full and sole responsibility for such equipment, features and/or procedures.
- 4.1.15 With the exception of only those items specifically identified as being performed by others, the Scope of Services are intended to include all engineering, material, labor, testing, and inspections needed to achieve work specified by this Request for Proposal. Inasmuch as it is understood that any incidental work necessary to complete the project is also covered by the Scope of Services, Respondents are cautioned to familiarize themselves with the existing job site conditions. Additional charges for material or labor shall not be permitted subsequent to execution of the Contract/Agreement.
- 4.1.16 Respondents must report discrepancies or ambiguities occurring in the Scope of Services to the Owner/Consultant for resolution prior to the Response Deadline, otherwise the Scope of Services shall be deemed acceptable in their existing form.
- 4.1.17 Termination of Existing Agreement(s)
 - 4.1.17.1 Respondents understand that the Owner intends to terminate any service contract(s) in effect upon 30-day written notice to the Service Contractor by the Owner.
 - 4.1.17.2 Owner will be responsible for money owed the Service Contractor for services provided and work performed up until the date of cancellation.
- 4.1.18 Abbreviations and Symbols: The following abbreviations, Associations, Institutions, and Societies may appear in the Project Manual or Contract Documents:

AHJ	Authority Having Jurisdiction
AIA	American Institute of Architects
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
IBC	International Building Code
IEEE	Institute of Electrical and Electronics Engineers
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Agency
OSHA	Occupational Safety and Health Act

4.1.19 Codes and Ordinances / Regulatory Agencies:

- 4.1.19.1 Work specified by the Request for Proposal shall be performed in compliance with applicable Federal, State, and municipal codes and ordinances in effect at the time of Contract/Agreement execution. Regulations of the Authority Having

Jurisdiction shall be fulfilled by the Successful Respondent and Subcontractors. The entire installation, when completed, shall conform with all applicable regulations set forth in the latest editions of:

- 4.1.19.1.1 Local and/or State laws applicable for logistical area of project work.
- 4.1.19.1.2 Building Code applicable to the AHJ.
- 4.1.19.1.3 Elevator Code applicable to the AHJ.
- 4.1.19.1.4 Safety Code for Elevators and Escalators, ASME A17.1 and all supplements as modified and adopted by the AHJ.
- 4.1.19.1.5 Safety Code for Elevators and Escalators, A17.1S supplement to A17.1 as modified and adopted by the AHJ for Machine Room Less installations (MRL).
- 4.1.19.1.6 Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2.
- 4.1.19.1.7 Safety Code for Existing Elevators and Escalators, ASME A17.3 as modified and adopted by the AHJ.
- 4.1.19.1.8 Guide for emergency evacuation of passengers from elevators, ASME A17.4.
- 4.1.19.1.9 National Electrical Code (ANSI/NFPA 70).
- 4.1.19.1.10 American with Disabilities Act - Accessibility Guidelines for Building and Facilities and/or A117.1 Accessibility as may be applicable to the AHJ.
- 4.1.19.1.11 ASME A17.5/CSA-B44.1 - Elevator and escalator electrical equipment.

4.1.19.2 The Successful Respondent shall advise the Owner of pending code changes that could be applicable to this project and provide quotations for compliance with related costs.

4.1.20 Definitions

4.1.20.1 Defective 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.

4.1.20.2 Provide: Where used in this Request for Proposal, provide shall mean to install new device, apparatus, system, equipment or feature as specified in this document.

4.1.20.3 Definitions in ASME A17.1 as amended or modified by the AHJ apply to work of this Request for Proposal

4.1.21. Permits and Submittals

4.1.21.1 Permits

4.1.21.1.1 Successful Respondent shall comply with the requirements of this Request for Proposal.

- 4.1.21.1.2 Prior to commencing work specified by this Request for Proposal, the Successful Respondent shall, at its own expense, obtain all permits or variances as may be required by the AHJ and provide satisfactory evidence of having obtained said permits and variances to both the Owner's and Consultant.
- 4.1.21.1.3 Successful Respondent shall file necessary drawings for approval of all Authorities Having Jurisdiction.
- 4.1.21.1.4 The Successful Respondent shall undertake the necessary review and search procedure to identify open applications and/or outstanding violations for the Owner; and, close-out such applications and/or expunge such violations relative to the project scope as required for final acceptance by the AHJ.
- 4.1.21.1.5 Outstanding applications and violations must be indicated on the request for permit filing for this procedure to ensure such applications and/or violations are dismissed accordingly.
- 4.1.21.1.6 All relative costs shall be included in the proposal with the understanding that corrective actions are covered under this Request for Proposal.

4.1.21.2 Submittals

- 4.1.21.2.1 Prior to beginning the work, the Successful Respondent shall submit and have approved copies of layout drawings, shop drawings and standard cuts. These items shall include:
 - 4.1.21.2.1.1 A plan view of the hoistway and machine room. Plans shall include a 1/4" = 1'-0" scaled drawing showing room layout including locations of the machine, governor, controller, resistor pack disconnect, utilization equipment, HVAC equipment, etc.
 - 4.1.21.2.1.2 Plans need to show clearance dimensions and machine control room door swing direction. Plans shall include a 1/4" = 1'-0" scaled elevation drawing of elevator equipment.
 - 4.1.21.2.1.3 Include a 1/8" = 1'-0" owner plan showing the location of the elevator machine control space and the hoist way. Plan shall show room names and corridors.
 - 4.1.21.2.1.4 Equipment clearances will need to comply with ASME A17. 1 S-2005, Section 2.7 and 2011 National Electrical Code, Article 110 and Article 620.
 - 4.1.21.2.1.5 Elevation of the pit
 - 4.1.21.2.1.6 All accessories.
- 4.1.21.2.2 The Consultant and the Owner shall pass on the submittals with reasonable promptness and the Successful Respondent shall be responsible to ensure that there will be no delay in their work or that of any other trade involved
- 4.1.21.2.3 Approved filing and submittal requirements must be completed before equipment and related materials are ordered.
- 4.1.21.2.4 Copies of Department of Buildings' permits and/or governing authority's documents will be posted at the job site with copies issued to the Owner and Consultant.
- 4.1.21.2.5 Samples of wood, metal, plastic, paint or other architectural finish material applicable to this project shall be submitted for approval by the Owner.

- 4.1.21.2.6 It shall be understood that approval of the drawings and cuts by Owner and Consultant shall be for general arrangement only and does not include measurements which are the Successful Respondent's responsibility or approval of variations from the contract documents required by the AHJ.
- 4.1.21.2.7 The Successful Respondent shall prepare a record log and maintain all submittals, shop drawings, catalog cuts and samples.
- 4.1.21.2.8 All layout and shop drawings shall first be reviewed, stamped and initialed by the Successful Respondent prior to issuance to the Owner and Consultant for final review. Any fees incurred by the Owner for additional review of shop drawings by the Consultant shall be deducted from the contract total price.
- 4.1.21.2.9 Successful Respondent shall pay particular attention to the reuse of basic cab enclosures with new front swing return car operating panels.
- 4.1.21.2.10 If a rope gripper is being utilized to comply with Ascending Car Protection requirements of the Elevator Code, a submittal drawing showing location of the rope gripper and related pumping unit is required to be submitted for approval by Owner. Preferred location for both units is in the machine room; alternate locations will only be approved if absolutely necessary.
- 4.1.21.2.11 All documentation submittals required for utility rebates will be performed by the Successful Respondent.

4.1.22 Measurements and Drawings

- 4.1.22.1 Drawings or measurements included with the proposal response shall be for the convenience of the respondents only and full responsibility for detailed dimensions lies with the Successful Respondent.
- 4.1.22.2 In the execution of the work on the job, the Successful Respondent shall verify all dimensions with the actual conditions.
- 4.1.22.3 Where the work of the Successful Respondent is to join other trades, the shop drawings shall show the actual dimensions and the method of joining the work of the various trades.
- 4.1.22.4 The Successful Respondent will submit the stamped structural engineering data for approval to the Owner and Consultant, prior to any work being performed on any building structural material.

4.1.23 Substitutions

- 4.1.23.1 Requests for substitutions will be considered under the following time limitations and situations:
 - 4.1.23.1.1 Not less than ten (10) calendar days before bids are due.
 - 4.1.23.1.2 Work or equipment specified becomes unavailable through unforeseen events such as strikes, loss of manufacturer's plant through fire, flood or bankruptcy.
- 4.1.23.2 Requested substitutions will be reviewed and adjudged. Failure of the Consultant to raise objection shall not constitute a waiver of any of the requirements of this Request for Proposal.

4.1.23.3 Request for substitutions shall include complete data with drawings and samples as required, including the following:

4.1.23.3.1 Quality Comparison - Proposed substitution versus the specified product.

4.1.23.3.2 Changes required in other work because of the substitution.

4.1.23.3.3 Effect on the construction schedule.

4.1.23.3.4 Cost Data - Resulting from the proposed substitution versus the specified product. The Successful Respondent shall certify that the cost data presented is complete and includes all related costs under this Contract/Agreement.

4.1.23.4 When proposing a substitution, the Successful Respondent represents that:

4.1.23.4.1 Successful Respondent has investigated the proposed substitution and has determined that it is equal to or better than the product specified.

4.1.23.4.2 Successful Respondent will guarantee the substitution in the same manner as the product specified.

4.1.23.4.3 Successful Respondent will coordinate and make other changes as required in the work as a result of the substitution.

4.1.23.4.4 Successful Respondent will waive all claims for additional costs as a result of the substitution, with the exception of those identified above under "cost data".

4.1.23.5 The Consultant will be sole judge of the acceptability of the proposed substitution.

4.1.23.6 The Consultant will have authority to approve or reject substitutions or to change the specified standards of quality. However, neither this authority to act under this provision nor any decision made in good faith, either to exercise or not to exercise this authority, shall give rise to any duty or responsibility of the Consultant to the Successful Respondent, any Subcontractor, any Sub-Subcontractor, any of their agents or employees or any other persons performing the work or offering to perform the work.

4.1.24 Changes in Scope and Extra Work

4.1.24.1 The Owner may at any time make changes in the scope of services, plans and drawings, omit work, and require additional work to be performed by the Successful Respondent.

4.1.24.1.1 Each such addition or deletion to the Contract/Agreement shall require the Owner and the Successful Respondent to negotiate a mutually acceptable adjustment in the pricing, and, for the Successful Respondent to issue a change order describing the nature of the change and the amount of price adjustment.

4.1.24.1.2 The Successful Respondent shall make no additions, changes, alterations or omissions or perform extra work except on written authorization of the Owner.

4.1.24.1.3 Each change order shall be executed by the Successful Respondent, Owner, and the Consultant.

4.1.25 Keys

4.1.25.1 Upon the initial acceptance of work specified by the Contract Documents on each unit, the Successful Respondent shall deliver to the Owner, six (6) keys for each general key-operated device that is provided under these Scope of Services in accordance with ASME A17.1, Part 8 standards as may be adopted and modified by the AHJ.

4.1.25.2 All other keying of access or operation of equipment shall be provided in accordance with ASME A17.1 Part 8 as may be adopted and modified by the AHJ.

4.1.26 Diagnostic Tools

4.1.26.1 Prior to seeking final acceptance of the project, the Successful Respondent shall deliver to the Owner any specialized tools required to perform diagnostic evaluations, adjustments, and/or programming changes on any microprocessor-based control equipment installed by the Successful Respondent. All such tools shall become the property of the Owner

4.1.26.1.1 Owner's diagnostic tools shall be configured to perform all levels of diagnostics, systems adjustment and software program changes which are available to the Successful Respondent.

4.1.26.1.2 Owner's diagnostic tools that require periodic re-calibration and/or re-initiation shall be performed by the Successful Respondent at no additional cost to the Owner for a period equal to the term of the maintenance agreement from the date of final acceptance of the project.

4.1.26.1.3 The Successful Respondent shall provide a temporary replacement, at no additional cost to the Owner, during those intervals in which the Owner might find it necessary to surrender a diagnostic tool for re-calibration, re-initiation or repair.

4.1.26.2 Successful Respondent shall deliver to the Owner, printed instructions, access codes, passwords or other proprietary information necessary to interface with the microprocessor-control equipment.

4.1.27 Service Support Requirements / Spare Parts

4.1.27.1 Printed Circuit Boards, Software Programs and Spare Parts

4.1.27.1.1 Prior to seeking final acceptance of the project as specified by the Contract/Agreement, the Successful Respondent shall deliver to the Owner a spare replacement for each printed circuit board that is needed to fully operate any one (1) of the following:

4.1.27.1.1.1 Elevator and the group dispatch/supervisory controller where applicable:

- 4.1.27.1.1.1.1 Circuit boards shall be exact duplicates of those in use and shall be provided with “as installed” software programs.
- 4.1.27.1.1.1.2 Circuit boards shall be “run in” on the job site to demonstrate its ability to function in a normal manner.
- 4.1.27.1.1.1.3 All spare printed circuit boards shall become property of the Owner.

4.1.27.2 Software / Firmware Updates

- 4.1.27.2.1 During the life of the equipment and subject to the term of the maintenance agreement, where revisions to firmware and/or software are issued by the control manufacturer or manufacturer of solid state and microprocessor based subsystems subsequent to the beneficial use of the equipment, updates shall be provided so that the installation and spare circuit boards are current with respect to software and firmware versions.

4.1.28 Wiring Diagrams, Operating Manuals and Maintenance Data

- 4.1.28.1 Comply with the requirements of scope of services.
- 4.1.28.2 Deliver to the Owner, four (4) identical volumes of printed information organized into neatly bound manuals prior to seeking final acceptance of the project.
- 4.1.28.3 The manuals shall also be submitted in electronic format on non-volatile media, incorporating raw ‘CAD’ and/or Acrobat ‘PDF’ file formats.
- 4.1.28.4 Manuals, as well as electronic copies, shall contain the following:
 - 4.1.28.4.1 Step-by-step adjusting, programming and troubleshooting procedures that pertain to the solid-state microprocessor-control and motor drive equipment.
 - 4.1.28.4.2 Passwords or identification codes required to gain access to each software program in order to perform diagnostics or program changes.
 - 4.1.28.4.3 A composite listing of the individual settings chosen for variable software parameters stored in the software programs of both the motion and dispatch controllers.
 - 4.1.28.4.4 Method of control and operation.
- 4.1.28.5 Provide four (4) sets of “AS INSTALLED” straight-line wiring diagrams in both hard and electronic format in accordance with the following requirements:
 - 4.1.28.5.1 Displaying name and symbol of each relay, switch or other electrical component utilized including identification of each wiring terminal.
 - 4.1.28.5.2 Electrical circuits depicted shall include all those which are hard wired in both the machine room and hoistway.

- 4.1.28.5.3 Supplemental wiring changes performed in the field shall be incorporated into the diagrams in order to accurately replicate the completed installation.
- 4.1.28.6 Furnish four (4) bound instructions and recommendations for maintenance, with special reference to lubrication and lubricants.
- 4.1.28.7 Manuals or photographs showing controller repair parts with part numbers listed.
- 4.1.29 Training
 - 4.1.29.1 Prior to seeking final acceptance of the project, the Successful Respondent shall conduct an eight-hour training program on-site with County personnel selected by the Owner.
 - 4.1.29.2 The focus of the session shall include:
 - 4.1.29.2.1 Instructions on proper safety procedures to utilize in assisting passengers that may become entrapped inside an elevator car.
 - 4.1.29.2.2 Explain each control feature and its correct sequence of operation.
 - 4.1.29.3 Control features covered shall include but, not be limited to:
 - 4.1.29.3.1 Independent Service Operation.
 - 4.1.29.3.2 Emergency Fire Recall Operation - Phase I
 - 4.1.29.3.3 Emergency In-car Operation - Phase II.
 - 4.1.29.3.4 Emergency Power Operation.
 - 4.1.29.3.5 Emergency Communications Equipment.
 - 4.1.29.3.6 Security Operating Features.
 - 4.1.29.3.7 Interactive Systems Management.
 - 4.1.29.3.8 Remote Monitoring/Controls.
 - 4.1.29.3.9 Special Security Operation/Prisoner Operation
- 4.1.30 Patents
 - 4.1.30.1 Patent licenses which may be required to perform work specified by the Contract/Agreement shall be obtained by the Successful Respondent at its own expense.
 - 4.1.30.2 The Successful Respondent agrees to defend and save harmless the Owner, Consultant and owners employees thereof from any liability resulting from the manufacture or use of any patented invention, process or article of appliance in performing work specified in the Contract/Agreement.
- 4.1.31 Advertising
 - 4.1.31.1 Advertising privileges shall be retained by the Owner.
 - 4.1.31.2 It shall be the responsibility of the Successful Respondent to keep the job site free of posters, signs, and/or decorations.
 - 4.1.31.3 Successful Respondent's logo shall not appear on faceplates or entrance sills without the approval of the Owner.

4.1.32 Quality Assurance

4.1.32.1 Materials and Quality of Work

4.1.32.1.1 All materials are to be new and of the best quality of the kind specified.

4.1.32.1.2 Installation of such materials shall be accomplished in a neat manner and be of the highest quality.

4.1.32.1.2.1 Should the Successful Respondent receive written notification from the Owner stating the presence of inferior, improper, or unsound materials or quality of installation, the Successful Respondent shall, within twenty-four (24) hours, remove such work or materials and make good all other work or materials damaged.

4.1.32.1.2.2 Should the Owner permit said work or materials to remain, the Owner shall be allowed the difference in value or shall, at its election, have the right to have said work or materials repaired or replaced as well as the damage caused thereby, at the expense of the Successful Respondent, at any time within one (1) year after the completion of the work; and neither payment made to the successful Respondent, nor any other acts of the Owner shall be construed as evidence of acceptance and waiver.

4.1.32.2 Mechanical Design Requirements (General)

4.1.32.2.1 The following typical requirements shall apply to all parts of the work where applicable and are supplementary to other requirements noted under the respective headings.

4.1.32.2.1.1 All bearings, pivots, guides, guide shoes, gearing, door hanger sheaves, door hanger tracks and similar elements subject to friction or rolling wear in the entire elevator installation shall be accurately and smoothly finished and shall be arranged and equipped for adequate and convenient lubrication. Means shall be provided for flushing and draining the larger bearings and gear case. All oiling holes shall have dustproof, self-cleaning caps.

4.1.32.2.1.2 Bearings of governor and governor sheaves and important supporting bearings of other parts in motion when the elevator is traveling shall, unless otherwise specified or approved, be of ball or roller bearing type.

4.1.32.2.1.3 Bearings for brake levers and similar uses where the amount of movement under load is light and the wear negligible may be unlined.

4.1.32.2.1.4 All plain bearings shall be liberally sized in accordance with the best commercial elevator usages which have proved entirely satisfactory on heavy-duty installations.

4.1.32.2.1.5 Bearings of motors shall be arranged and equipped for adequate automatic lubrication. Ring or chain oilers, spring-fed grease cups and equivalent devices properly used in accordance with the best commercial elevator practice will be acceptable. Approved means shall be provided for visibly

checking the amount of lubricant contained and for flushing and draining. Means shall also be provided for preventing leakage of lubricant when the reservoirs or grease cups are filled to proper levels.

- 4.1.32.2.1.6 Ball and roller bearings shall be of liberal size and of a type and make which have been extensively and successfully used on other similar, heavy-duty elevator installations. They shall be fully enclosed. Loading, lubrication, support and all other conditions of use shall be in accordance with the recommendations of the bearing manufacturer based on previous extensive and satisfactory elevator usage.
- 4.1.32.2.1.7 All armature spiders and similar items intended to rotate with their shafts shall be keyed and/or firm press or shrunk fit on the shafts. Set screw fastening will be permitted only for minor items not subject to hoisting loads and where means for field adjustment is required.
- 4.1.32.2.1.8 All bolts used to connect moving parts, bolts carrying hoisting stresses and all other bolts, except guide rail bolts, subject to vibration or shock shall be fitted with adequate means to prevent loosening of the nuts and bolts. Bolts transmitting important shearing stresses between machine parts shall have tight body fit in drilling holes.
- 4.1.32.2.1.9 All machine work, assembling and installing shall be done by skilled and experienced mechanics using first-class, modern equipment and tools. All work shall be thoroughly high grade in every respect. All parts will be manufactured to high precision standards so that wearing parts will be readily interchangeable with stock repair parts with a minimum of field fitting.
- 4.1.32.2.1.10 All bearing and sliding surfaces of shafts, pins, bearings, bushings, guides, etc., shall be smoothly and accurately finished. They shall be assembled and installed in accurate alignment and with working clearance most suitable for the load, speed, lubrication and other conditions of use.
- 4.1.32.2.1.11 Structural steel used for supporting and securing equipment and for the construction of car slings, etc., shall conform to the A.S.T.M. specification for Structural Steel for Buildings. Design stresses shall not exceed those specified in the local Building Code.
- 4.1.32.2.1.12 Castings of motor frames, sheaves, gear casings, etc., shall be of the best quality metallurgically controlled, hard, close grained gray machinery cast iron, free from blow holes, sand holes, or shrinkage cracks, ground to remove overruns, sanded and machined so as to leave a finish suitable for its particular application. Surfaces of sheaves and brake drums shall be entirely free from defects and shall show a hardness of not less than 220 Brinell

4.1.33 Electrical Design Requirements (General)

4.1.33.1 The following typical requirements shall apply to all parts of the work and are supplementary to other requirements noted under the respective headings.

4.1.33.1.1 The design and construction of the motors shall conform to the requirements of these scope of services and to the ASME Standards for Rotating Electrical Machinery with revisions issued to the first day when the work of this Request for Proposal was advertised.

4.1.33.1.1.1 Motors shall operate successfully under all loads and speeds and during acceleration and deceleration.

4.1.33.1.1.2 Motors shall be designed for quiet operation without excessive heat.

4.1.33.1.1.3 Insulation on motor coils and windings and on all insulated switch, relay, brake and other coils shall conform to the requirements for Class "H" insulation, as defined in ASME Standards for Rotating Electrical Machinery. All motors shall be impregnated twice.

4.1.33.1.1.4 Switches, relays, etc., on controller, starter and signal panels and similar items on other parts of the equipment shall be the latest improved type for the condition of use. They shall function properly in full accordance with the requirements of the machines controlled and with the specified operating requirements of the elevator. Any of these parts showing wear or other injurious effects during the guarantee period to the extent that abnormal maintenance is required or indicated shall be replaced with proper and adequate parts by the Successful Respondent.

4.1.33.1.1.5 Contacts in elevator motor circuits which are intended to be opened by governors or other safety devices shall be copper to carbon or other approved non-fusing type.

4.1.33.1.1.6 Where required, controllers and other component parts of the installation shall be labeled in accordance with the latest codes and standards as adopted and/or otherwise modified by the AHJ.

4.1.33.1.1.7 Electrical equipment, motors, controllers, etc., installed under this contract shall have necessary CSA/US or UL/US listing as may be required by the AHJ. Equipment shall be labeled or tagged accordingly.

4.1.34 Materials, Painting and Finishes

4.1.34.1 Two (2) coats of rust inhibiting machinery enamel shall be applied to exposed ferrous metal surfaces in the pit that do not have a galvanized, anodized, baked enamel, or special architectural finishes.

4.1.34.2 Two (2) coats of rust inhibiting enamel paint to the machinery located within the machine room and secondary level (where applicable) as well as to the machine room floors.

4.1.34.3 Architectural metal surfaces of bronze or similar non-ferrous materials which are specified to be refinished, reclad and/or provided new, shall be

- sufficiently clear coated so as to resist tarnishing during normal usage for a period of not less than twelve (12) months after final acceptance by the Owner.
- 4.1.34.4 Identify all equipment including buffers, crosshead, safety plank, machine, controller, drive, governor, disconnect switch, etc., by 4" high numerals which shall contrast with the background to which it is applied. The identification shall be either decalcomania or stencil type.
- 4.1.34.5 Paint or provide decal-type floor designation not less than six (6) inches high on hoistway doors (hoistway side), fascias and/or walls as required by Code at intervals not exceeding 7'-0". The color of paint used shall contrast with the color of the surface to which it is applied.
- 4.1.35 General
- 4.1.35.1 Cold-rolled Sheet Steel Sections: ASTM A1008, commercial steel, Type "B".
- 4.1.35.1.1 Shop Prime: Factory-applied baked on coat of mineral filler and primer.
- 4.1.35.1.2 Finish Paint: Two (2) coats of low sheen baked enamel, color as selected by the Owner.
- 4.1.35.1.2 Steel Equipment: Two (2) coats of manufacturer's standard rust-inhibiting paint.
- 4.1.35.2 Steel Supports and Reinforcement: ASTM A36
- 4.1.35.3 Stainless Steel Bars and Shapes: ASTM A276
- 4.1.35.4 Stainless Steel Tubes: ASTM A269
- 4.1.35.5 Aluminum Extrusions: ASTM B221
- 4.1.35.6 Structural Tubing: ASTM A500
- 4.1.35.7 Bolts, Nuts and Washers: ASTM A325 and A490.
- 4.1.35.8 Clear Tempered Glass: ASTM C1048
- 4.1.36 Accessibility Requirements (ADAAG)
- 4.1.36.1 Locate the alarm button and emergency stop switch at 35", and floor and control buttons not more than 48" above the finished floor. The alarm button shall illuminate when pressed for visual acknowledgement to user.
- 4.1.36.2 Provide raised markings in the panel to the left of the car call and other control buttons. Letters and numbers shall be a minimum of 5/8" and raised .03" and shall be in contrasting color to the call buttons and cover plate.
- 4.1.36.3 The centerline of new hall push button shall be 42" above the finished floor.

- 4.1.36.4 The hall arrival lanterns or cab direction lantern provided shall sound once for the “up” direction and twice for the “down” direction. Design and locate fixtures per Federal standards.
- 4.1.36.5 Provide floor designations at each entrance on both sides of jamb at a height of 60” above the floor.
 - 4.1.36.5.1 Use cast metal plates and polished numbers secured with tamper-proof hardware.
 - 4.1.36.5.2 Designations shall be 2” high, raised .03” on a contrasting color background as selected by the Owner.
- 4.1.36.6 For Destination Oriented elevators, provide car designations at each entrance on both sides of jamb located directly below the floor designation.
 - 4.1.36.6.1 Use cast metal plates and polished numbers secured with tamper-proof hardware.
 - 4.1.36.6.2 Designations shall be 2” high, raised .03” on a contrasting color background as selected by the Owner. For DD cars add car identifiers under the floor indicator Braille plate.
- 4.1.36.7 Provide an audible signal within the elevator to tell passenger that the car is stopping or passing a floor served by the elevator.
- 4.1.36.8 Where elevators operate at a speed greater than 200 fpm, provide a verbal annunciator to announce the floor at which the elevator is stopping where required by the AHJ.
- 4.1.36.9 Provide signal control timing for passenger entry/exit transitions per Federal and/or Local standards.
- 4.1.36.10 Ensure sill-to-sill running clearances do not exceed 1-1/4” at all landings served.
- 4.1.36.11 Provide visual call acknowledgment signal for car emergency intercommunication device.

4.1.37 Delivery/Storage/Handling/Coordination

- 4.1.37.1 Delivery and Storage of Material and Tools
 - 4.1.37.1.1 Comply with the requirements of this Request for Proposal.
 - 4.1.37.1.2 Delivery, Storage and Handling:
 - 4.1.37.1.2.1 Deliver materials to the site ready for use in the accepted manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Delivered materials shall be identical to accepted samples.
 - 4.1.37.1.2.2 Store materials under cover in a dry and clean location, off the ground.

- 4.1.37.1.2.3 Remove delivered materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.
 - 4.1.37.2 The Owner shall bear no responsibility for the materials, equipment or tools of the Successful Respondent and shall not be liable for any loss thereof or damage thereto.
 - 4.1.37.3 The Successful Respondent shall confine storage of materials on the job site to the limits and locations designated by the Owner and shall not unnecessarily encumber the premises or overload any portion with materials to a greater extent than the structural design load of the Facility.
 - 4.1.37.4 The transportation of material from the storage site to the project will be the responsibility of the elevator contractor.
- 4.1.38 Work with Other Trades / Coordination
- 4.1.38.1 Coordinate installation of sleeves, block outs, equipment with integral anchors, and other items that are embedded in concrete or masonry for the applicable equipment. Furnish templates, sleeves, equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
 - 4.1.38.2 Coordinate sequence of installation with other work to avoid delaying the Work.
 - 4.1.38.3 Coordinate locations and dimensions of other work relating to the equipment scheduled for installation including pit ladders, sumps, and floor drains in pits; entrance subsills; machine beams; and electrical service, electrical outlets, lights, and switches in pits and machine rooms, secondary levels, overhead sheave rooms and hoistways as it relates to the specific equipment.
 - 4.1.38.4 Coordinate sequence of installation for group features including dispatching, emergency power, Firemen's service operation, testing, and inspections with the Owner.
 - 4.1.38.5 Coordination of all fixture locations, once final location is determined by Owner.
 - 4.1.38.6 Coordination of security interface requirements for card readers, fixtures, machine room interconnections, wire routing, and integration time between the elevator contractor and the card reader contractor for full installation capabilities.

4.1.39 Removal of Rubbish and Existing Equipment

- 4.1.39.1 On a scheduled basis, the Successful Respondent shall remove all rubbish generated in performing work specified in the Contract Documents from the job site.
- 4.1.39.2 Any component of the existing elevator plant that is not reused under the scope of services in this Request for Proposal shall become property of the Successful Respondent and, as such, shall be removed from the premises at the Successful Respondent's sole expense.
- 4.1.39.3 The Successful Respondent agrees to dispose of the aforementioned equipment and rubbish in accordance with any and all applicable Federal, State, and municipal environmental regulations, and further accepts all liability that may result from handling and/or disposing of said material.

4.1.40 Protection of Work and Property

- 4.1.40.1 The Successful Respondent shall continuously maintain adequate protection of all their work from damage and shall protect the Owner's property from injury or loss arising out of this Contract/Agreement.
- 4.1.40.2 The Successful Respondent shall make good any such damages, injury or loss, except such as may be directly caused by agents or employees of the Owner.
- 4.1.40.3 The Successful Respondents shall provide all barricades required to protect open hoistways or shafts per OSHA regulations. Such protection shall include any necessary guards or other barricades for employee protections during and after the modernization procedure.

4.1.41 Related Work

- 4.1.41.1 Work by Successful Respondent Included in the Base Bid. (Turn-key Project)
 - 4.1.41.1.1 The following requirements shall be applicable based on prevailing conditions at the site of work and/or mandated modifications for code compliance.
 - 4.1.41.1.1.1 Provide new code compliant machine room enclosure to limit access to the elevator equipment to authorized personnel only.
 - 4.1.41.1.1.2 Provide each machine room, secondary space and pit with a self-closing, self-locking access door. Locking means shall be spring-type arranged to permit the doors to be opened from the inside without a key.
 - 4.1.41.1.1.3 Reuse and modify the existing power supplies. Install locking provisions for circuit breakers as per code If existing disconnects are not capable of being locked in the open (OFF) position, or in line of sight of the hoist machine new main line

and/or auxiliary disconnect switches shall be provided.

- 4.1.41.1.1.4 Provide remote/auxiliary disconnects where new or existing disconnect switches are not in line-of-sight of the controller.
- 4.1.41.1.1.5 Installation of new electrical conduit and power feeders between the load side of existing and new main line disconnect switches and new elevator control equipment
- 4.1.41.1.1.6 Installation of auxiliary power feed with related distribution panel(s) and disconnect(s) designed and located per local law requirements
 - 4.1.41.1.1.6.1 Voltage shall be 110 VAC with one 15 Amp circuit breaker or fuse for lighting of each individual elevator car enclosure.
 - 4.1.41.1.1.6.2 Circuit breakers and/or fused disconnects shall be lockable the "OFF" position in accordance with applicable code.
- 4.1.41.1.1.7 The top surface of any setback or projection in the hoistway that measures 2" or more in width shall be beveled at an angle of not less than 75 degrees from horizontal, constructed from prime painted 14-gauge cold-rolled steel and installed so as to conform with ASME A17.1 elevator safety code as modified by, and/or in addition to codes and standards accepted by the AHJ.
- 4.1.41.1.1.8 Installation of new permanent lighting fixtures with protective guards and 110-volt duplex GFI receptacles inside the machine room. Illumination shall be no less than 30 foot-candles at floor level. A light control switch shall be provided immediately adjacent to the machine room entrance door. Provide necessary receptacles as required by Successful Respondent to supply power to auxiliary elevator equipment and/or remotely located monitors.
- 4.1.41.1.1.9 Provide machinery spaces of the secondary level directly below the machine room with permanent lighting fixtures having protective guards and a duplex GFI receptacle. Illumination shall be no less than 19 foot-candles at floor level. A light control switch shall be provided immediately adjacent to the secondary level entrance door/ladder in accordance with code.
- 4.1.41.1.1.10 Provide hoist rope guards at the car and counterweight drop side of the hoisting machine sheave to prevent accidental contact with the hoisting ropes. The guard shall extend from the

point where the hoisting ropes penetrate the machine room floor slab to a point beyond where the ropes contact the traction and deflector sheaves. The guards shall be constructed so as to conceal pinch-points between ropes and sheave grooves.

- 4.1.41.1.1.11 Provide each elevator pit with a 110-volt GFI duplex receptacle and a permanent lighting fixture equipped with protective guard. Illumination shall be no less than 10 foot-candles at pit floor level. A light control switch shall be provided and so positioned as to be readily accessible from the pit entrance door or ladder.
- 4.1.41.1.1.12 Installation of hoistway, secondary, overhead, and machine room smoke relief provisions in accordance with local laws.
- 4.1.41.1.1.13 All smoke ventilation provisions, including duct work, dampers, fans, fire control interfaces, hoistway vents, and key switches in accordance with local codes, shall be reviewed for proper operation and restored, or new provisions provided as required. Any other existing vents of unknown purpose shall be modified/deleted as per the AHJ.
- 4.1.41.1.1.14 Installation of fire emergency control interface provisions for automatic recall of the elevator(s) through operation of the fire detection system. Provisions shall be made for primary, alternate and third-zone (fire-hat) designated fire recall landing with connection contingent on Codes recognized by the local governing authority. The interfacing contacts shall be wired to an electrical junction box located inside each elevator machine room for connection to the elevator control systems by the Successful Respondent. Each wire shall be clearly labeled with its control function. Coordinate the type of interface required for the specific elevator control apparatus with the Consultant and/or Owner.
- 4.1.41.1.1.15 Where sprinkler fire protective systems are provided inside any elevator hoistway, machine room or associated machinery space, provisions shall be made for the disconnecting of the main line power supply from the affected elevator prior to activation. This means of disconnect shall be manually reset in accordance with code.
- 4.1.41.1.1.16 Installation of emergency power control interface provisions to signal the elevator control apparatus of a transfer from normal (utility) power to the building emergency (generator) power supply. Also, provide additional control interface to give advanced notification to the elevator control apparatus that the power source will transfer from emergency (generator) power to normal (utility) power. Interfacing contacts shall be wired to an electrical junction box located inside each machine room for connection to the elevator control equipment by the

Successful Respondent. Coordinate the type of interface required for the specific elevator control apparatus with the Consultant and/or Owner.

- 4.1.41.1.1.16.1 On the line side of each main line disconnect switch, provide some means to absorb power that may be regenerated by the elevator hoist motor during emergency power operation.
- 4.1.41.1.1.16.2 Normal Power/Emergency Power Control Signals consisting of two (2) dry contacts provided by others to function as follows:
 - 4.1.41.1.1.16.2.1 One (1) dry contact normally open to make when Normal Power is available. (Logic state of dry contact is to be confirmed by the Manufacturer of the Elevator Control Equipment).
 - 4.1.41.1.1.16.2.2 One (1) dry contact normally open to make when emergency power is available. (Logic state of dry contact is to be confirmed by the Manufacturer of the Elevator Control Equipment).
- 4.1.41.1.1.17 Installation of HVAC provisions inside the machine room so as to maintain ambient temperature and humidity levels that are within the range specified by the microprocessor-control equipment manufacturers.
- 4.1.41.1.1.18 Provide a class "ABC" fire extinguisher in electrical machinery and control spaces. Locate the extinguisher in close proximity to the access door.
- 4.1.41.1.1.19 Provide necessary telephone wiring with connection to local telephone service for remote elevator monitoring and/or two-way voice emergency communications systems.
 - 4.1.41.1.1.19.1 Terminate the telephone wiring in junction boxes or standard phone jack terminals in the machine room.
 - 4.1.41.1.1.19.2 Coordinate the quantity and termination method of individual phone connections with the Consultant and/or Owner.
 - 4.1.41.1.1.19.3 Identify each phone line for connection to the appropriate elevator device(s).

- 4.1.41.1.1.19.4 Telephone wiring, where required by applicable codes, shall be installed in conduit.
- 4.1.41.1.1.20 Sumps in pits where provided, shall be covered and in good working order to maintain dry conditions. The cover shall be level with the pit floor so as not to produce a tripping hazard.
- 4.1.41.1.1.21 Where the pit extends more than 3 feet below the sill of the pit access door, provide a permanent fixed metal ladder. Elevators 3, 4 and 5.
 - 4.1.41.1.1.21.1 Ladder shall extend no less than 48" above the sill of the access door. Handgrips shall extend from the ladder to a point no less than 48" above the sill of the access door where the ladder does not comply.
 - 4.1.41.1.1.21.2 The rungs shall be a minimum of 12" wide. Where prevailing conditions prevent a 12" wide rung, the rung may be reduced to no less than 9".
 - 4.1.41.1.1.21.3 The rungs shall be spaced 12" on center.
 - 4.1.41.1.1.21.4 A clear distance of no less than 4 ½" from the centerline of the rungs and handgrips to the nearest permanent object in back of the ladder shall be provided.
- 4.1.41.1.1.22 Provide the following signage, plates and tags:
 - 4.1.41.1.1.22.1 Provide each walk-in pit entrance door with a sign reading "Danger Elevator Pit" or the equivalent thereof. Letters shall be not less than 2" high.
 - 4.1.41.1.1.22.2 In addition to (1) above, walk-in pits with pit door stop switches shall be provided with a sign that reads "WARNING – Opening the Pit Door Will Stop the Elevator".
 - 4.1.41.1.1.22.3 Provide access doors to each electrical control room, secondary or machinery space with signs that read "ELEVATOR MACHINE ROOM". Letters shall be not less than 2" high.
 - 4.1.41.1.1.22.4 Provide all required manufacturer data plates and installation-specific tags and signs of the types and styles containing information as required by applicable Codes and Standards as adopted and/or modified by the AHJ.
- 4.1.41.1.1.23 Provide a standard railing conforming to Code on the outside perimeter of the car top on all sides where the perpendicular distance between the edges of the car top and the adjacent hoistway enclosure exceeds 300 mm (12 in.) horizontal clearance or as otherwise required by the Authority Having Jurisdiction.
- 4.1.41.1.1.24 Provide necessary patching, repairing and installation of masonry and/or dry wall for smooth and legal elevator hoistways.
- 4.1.41.1.1.25 Provide any required repair of smoke holes with subway grating covers in the machine rooms and/or secondary levels where applicable. All smoke ventilation provisions, including duct work, dampers, fans, fire control interfaces, in accordance with local codes, shall be reviewed for proper operation.
- 4.1.41.1.1.26 Provide a smoke detector and/or smoke detector alarm system meeting the requirements of A17.1 and/or the Local Governing Authority as may be further specified.

- 4.1.41.1.1.27 Subsequent to the Contract/Agreement execution, the Successful Respondent shall perform the following procedures and engineering tasks relative to balance loading of system and cab work included under base scope of services requirements and alternative/optional upgrades:
 - 4.1.41.1.1.27.1 Perform balance load testing to determine existing conditions and requirements applicable to new/modified equipment.
 - 4.1.41.1.1.27.2 Provide data for Purchaser and/or their agents to evaluate any limitations that may be placed on design/finish options due to prevailing conditions or total suspended loading.
- 4.1.41.1.1.28 Provide all wiring, piping, access panels, and labor as required for the installation of the Destination Based Control system (as applicable), including all fixtures, network switches, lobby interfaces, security desk, fire command room, remote panels, and EMS systems, including conventional applications. The wiring can include Cat 5 and/or fiber optic, as required.
- 4.1.41.1.1.29 Subsequent to the Contract/Agreement execution, the Successful Respondent shall perform a Violation search and review of all open Applications in conjunction with the filing procedure. Subsequently, any and all outstanding Violations and/or open Applications shall be indicated on the Request for Permit; and such outstanding Violations shall be expunged and open Applications closed out as part of this filing procedure.
 - 4.1.41.1.1.29.1 If requirements and/or work necessary to satisfy outstanding Violation or Applications are not included in the contracted scope of work, the Successful Respondent shall prepare an itemized listing with relative extra costs to cure the condition(s) and expunge and/or close out the Violation or Application for the Owners' and Consultants' review/approval prior to executing such work procedures.

4.1.42 Warranty and Maintenance Services

4.1.42.1 Contract Close-Out, Guarantee and Warranties

- 4.1.42.1.1 The Successful Respondent agrees to certify that work performed in accordance with this Request for Proposal shall remain free of defects in materials and quality of work for a period of one (1) year after final acceptance of the completed project, or acceptance thereof by beneficial use on a unit by unit basis, whichever occurs first.
- 4.1.42.1.2 The sole duty of the Successful Respondent under this warranty is to correct any non-conformance or defect and all damages caused by such defect without any additional cost to the Owner and within fifteen (15) days of notification.
- 4.1.42.1.3 The express warranty contained herein is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.
- 4.1.42.1.4 In the event the Successful Respondent fails to fulfill its obligations defined herein, the Owner shall have the express right to perform the Successful Respondent's obligations and to charge the Successful Respondent the cost of such performance or deduct an equal amount from any monies due the Successful Respondent.

4.1.42.2 Maintenance Coverage

4.1.42.2.1 The following maintenance coverage shall apply:

4.1.42.2.1.1 Interim Maintenance

4.1.42.2.1.1.1 Provide full protective maintenance services and equipment coverage for beginning at time Contract/Agreement is awarded prior to the commencement of work, and during the work implementation procedure, until final acceptance of the finished project.

4.1.42.2.1.1.2 Interim full comprehensive maintenance services shall be provided in accordance with this Request for Proposal issued with Contract/Agreement.

4.1.42.2.1.1.3 Costs related to interim maintenance shall not be included in the base bid quotation indicated on the Quotation Form provided with a deduction for unit(s) out of service for upgrading.

4.1.42.2.1.2 Guarantee Maintenance

4.1.42.2.1.2.1 Provide full comprehensive preventative maintenance services for a period of twelve (12) months after the final completion and acceptance of the project.

4.1.42.2.1.2.2 Guarantee maintenance and related services shall be provided in accordance with this Request for Proposal issued with Contract/Agreement.

4.1.42.2.1.2.3 Costs related to guarantee maintenance shall be included in the base bid quotation and indicate the value on the Quotation Form in the space provided.

4.1.42.2.1.3 Long-Term Maintenance

4.1.42.2.1.3.1 Long-term full comprehensive maintenance and related services shall be provided in accordance with this Request for Proposal issued with Contract/Agreement.

4.1.42.2.1.3.2 Costs related to long-term maintenance shall be indicated on the Quotation Form in the space provided

4.1.43 Auxiliary Systems/Testing Procedures

4.1.43.1 Smoke Detector System

4.1.43.1.1 The Successful Respondent shall provide a complete smoke detector system for elevator recall complying with the governing authority's requirements and ASME A17.1 as approved or modified under local law.

4.1.43.1.1.1 Smoke detectors shall be installed, in the elevator lobby at each floor, top of hoistway, in pit areas, and associated elevator machine room in accordance with NFPA and/or other applicable

codes and standards of the authority having jurisdiction.

- 4.1.43.1.1.2 The activation of a smoke detector in any elevator lobby or associated elevator machine room other than the designated level (1st Floor) shall cause all cars in all groups that serve that lobby to return non-stop to the designated level (1st Floor).
- 4.1.43.1.1.3 The activation of a smoke detector at the designated level (1st Floor) shall cause the cars to return to an alternate level as required and/or allowed by applicable code unless the Phase 1 key-operated switch is in the “firemen service” position.
- 4.1.43.1.1.4 Smoke detectors and/or smoke detector system shall not be self-resetting.
- 4.1.43.1.1.5 Elevator Recall System shall incorporate a minimum number of zones as follows:
 - 4.1.43.1.1.5.1 Zone 1, First Floor
 - 4.1.43.1.1.5.2 Zone 2, Alternate Floor
 - 4.1.43.1.1.5.3 Zone 3 Machine Room
 - 4.1.43.1.1.5.4 Zone 4, Top of Shaftway
 - 4.1.43.1.1.5.5 Zone 5, Pit
 - 4.1.43.1.1.5.6 Zone 6, Spare
 - 4.1.43.1.1.5.7 Zone 7 to All Typical Landings serviced.
- 4.1.43.1.1.6 The system shall be independent of the existing building systems and shall contain the following:
 - 4.1.43.1.1.6.1 Modular LED control panel/annunciator, located at the 1st Floor Lobby in a specially designed tamperproof station, shall be custom designed for each individual system and location.
 - 4.1.43.1.1.6.2 Smoke detectors shall be photoelectric type or approved equal.
 - 4.1.43.1.1.6.3 Primary power supply shall be provided by Successful Respondent.
 - 4.1.43.1.1.6.4 Minimum 24-hour emergency power failure battery back-up with automatic recharging apparatus and signal status indicators.
- 4.1.43.1.1.7 Successful Respondent shall provide all wiring, conduit and make final connections. Conduit may run in elevator hoistway as part of elevator control signal systems provided such circuitry is installed per local code requirements.

4.1.43.2 Emergency Power Selector Panel Operation and Testing (EPO Sequencer)

4.1.43.2.1 Visual signals and operating devices noted in the following testing procedure are included in the “Emergency Power Selector Panel” section.

4.1.43.2.1.1 Automatic Mode: If an elevator is requested to return to the main floor, the selector panel lamp will pulse on and off. When this elevator has accepted the request to return, the lamp will illuminate continuously. When the elevator has returned to the main floor, the lamp will extinguish.

4.1.43.2.1.2 Manual Mode: If an elevator has been selected for service, the selector panel lamp will illuminate continuously. If it is desired to deselect this elevator, push the pushbutton or rotate the selector to deselect. The lamp will pulse on and off until the elevator has returned to the main floor. When the elevator has returned the lamp will extinguish.

4.1.43.3 Emergency Power Operation Automatic/Manual Modes

4.1.43.3.1 Automatic Mode:

4.1.43.3.1.1 If an elevator is requested to return to the main floor, the selector panel lamp will pulse on and off. When this elevator has accepted the request to return, the lamp will illuminate continuously. Means shall be provided adjacent to the selector switch(s) to indicate that the elevator is at the designated level with the doors in the normally open position.

4.1.43.3.1.2 The auto/manual keyed switch must be in the “AUTO” position when on Normal Power. When emergency power is initiated, the EPS (Emergency Power Sequencer) will attempt to sequentially return all elevators to the main floor. The number of elevators that can recall simultaneously is contingent on the amount of emergency power available. Coordinate power availability with Owner’s Representative.

4.1.43.3.1.3 The order in which the elevators are returned can be predefined. If after a predetermined time (45 seconds) a selected elevator does not respond to the request to return, another elevator will be selected. When an elevator returns to the main floor, the elevator will open the doors to allow passengers to exit and then close its doors. If there are any elevators that are not at the main floor, the EPS will repeatedly attempt to return these elevators, while in Automatic Mode, a maximum of three (3) times.

4.1.43.3.2 Manual Mode:

4.1.43.3.2.1 The auto/manual keyed switch can be turned at any time to the “MANUAL” position. At the time, the auto/manual keyed switch is turned to the “MANUAL” position, the elevator that was selected while in the Automatic Mode,

will automatically return to the lobby floor, open the doors to allow passengers to exit the elevator, and be removed from service. The newly selected elevator will then begin operation and respond normally to hall and car calls.

4.1.43.3.3 Emergency Power Sequence Elevator Controller Interlocking Operation

4.1.43.3.3.1 Automatic Mode EPS (Emergency Power Sequencer):

- 4.1.43.3.3.1.1 With the loss of Normal Power, the stop signal input will be active to inhibit movement of all the elevators.
- 4.1.43.3.3.1.2 When the signal from the emergency generator signals that the power is stable, the EPS will attempt to return all elevators to the main floor. Selection of an elevator is based upon a stop signal output being active to the controller input for all of the elevators that have not been selected to return. The run signal will then be activated to request the selected elevator to return.
- 4.1.43.3.3.1.3 If the request to return is accepted, the elevator will activate a run signal output to the EPS. If after a predetermined time the request to return is not accepted, the request will be withdrawn and another elevator will be selected for return operation.
- 4.1.43.3.3.1.4 When the selected elevator has returned to the main floor, the doors will open to allow passengers to exit and then close its doors. The run signal output will be deactivated and the stop signal output will be activated.
- 4.1.43.3.3.1.5 If while returning an elevator to the main floor or during a manual selection operating mode, the Normal Power becomes available, an input signal (Normal Power Returning) will be activated to force the elevator to slow down and stop at the nearest floor.
- 4.1.43.3.3.1.6 After a predetermined time, the primary elevator controls will be designed to restart elevators one at a time under Normal Power.

4.1.43.3.3.2 Manual Mode EPS (Emergency Power Sequencer)

- 4.1.43.3.3.2.1 For an elevator to run in normal service while on emergency power, the run signal input will be released with the selector or push button positioned accordingly.
- 4.1.43.3.3.2.2 To inhibit an elevator from running while on emergency power, the stop signal input will be activated with the selector or push button positioned accordingly.
- 4.1.43.3.3.2.3 If an elevator is running and Normal Power becomes available, a control signal input (Normal Power Returning) will be activated to force the elevator to slow down and stop at the nearest floor automatically and open the doors.

4.1.43.3.3.2.4 After Normal Power is restored, all elevators will be restarted on a sequential basis one (1) at a time.

4.1.44 Required Alternates and Value Engineering:

4.1.44.1 The following alternatives are elective upgrades which constitute changes to the base scope of services. Pricing for each alternate upgrade is requested from the Respondent with costs indicated in the appropriate space in the Request for Proposal Quotation Sheet. Respondent shall take into consideration, as part of the alternative pricing, alternate work that is required either in lieu of, or in addition to, work specified in the base scope and shall not duplicate costs.

4.1.44.1.1 Alternate No. 1 – Recondition and reuse existing gearless hoisting machine assemblies.

4.1.44.1.1.1 Respondents are required to submit a separate price quotation to test and refurbish the existing gearless hoist machines as specified later in this document. Price shall include all modifications required to retain the DC Machines.

4.1.44.1.2 Alternate No. 2 – Destination Dispatching (Passenger Elevators 1 – 6)

4.1.44.1.2.1 Respondents are required to submit a separate price quotation to include Destination Dispatch control systems including all related fixtures and present a traffic study comparing the Respondents two button system to their proposed DD system.

4.1.44.1.3 Alternate No. 3 – In-Car Video Displays – Two (2) per car (Passenger Elevators 1- 6)

4.1.44.1.3.1 Provisions shall be made for the installation of a video display panel of a type and size as selected by the Owner.

4.1.44.1.3.1.1 Display shall be flush mounted in new swing returns.

4.1.44.1.3.1.2 Successful Respondent shall coordinate the installation of the panel with the manufacturer and Owner as part of the base scope of work.

4.1.44.1.4 Alternate No. 4: Respondents are required to submit a separate price quotation to perform all work described for cars 3, 4 and 5 on an expedited schedule. A MS Project or similar chart showing the improved installation time must be submitted with the proposal.

4.1.44.1.5 Alternate No. 5 – Duplex Operation (Passenger Elevators 5 – 6)

4.1.44.1.5.1 Respondents shall provide a separate price to upgrade the operation of cars 5 and 6 to duplex operation while retaining both hall button risers as specified below.

4.1.44.1.6 Alternate No. 6 – Accelerated Schedule (Passenger Elevators 3,4,5)

4.1.44.1.6.1 Provide pricing and schedule showing improved installation time to perform work on cars 3, 4 and 5 on an accelerated schedule designed to minimize the project. Price should include all premium labor rates and inefficiency's associated with overtime or shift work. These elevators shall be modernized simultaneously during normal business hours under the base contract.

4.1.44.2 Contractor's Value Engineering Options – Alternate No. 7

4.1.44.2.1 This alternative is provided for individual respondents to propose optional equipment or otherwise offer cost saving suggestions that will provide the same desired results or further enhance the safety, durability or performance of the elevator systems.

4.1.44.2.2 Each suggestion must be fully detailed on the Respondent's own letterhead with the associated price change.

4.1.45 Allowances

4.1.45.1 Carry the following allowances for Elevators:

4.1.45.1.1 Cab: \$25,000 per cab

4.1.45.2 The above allowances are exclusive of any handling charge, applicable sales and/or use taxes. Include three days of labor per elevator in the base quotation for demo and installation of new cab interior. Wiring, installation and coordination of allowance items shall be included in the base quotation.

4.1.46 Products

4.1.46.1 Elevators

4.1.46.1.1 Public Elevators - 1, 2, 3, 4

4.1.46.1.1.1	Quantity	Four (4)/Retain
4.1.46.1.1.2	Type	Passenger/Retain
4.1.46.1.1.3	Capacity (lbs)	3000/Retain
4.1.46.1.1.4	Speed (fpm)	800/Retain
4.1.46.1.1.5	Travel in Feet	Field Verify
4.1.46.1.1.6	Roping/Ropes	
a.	Hoisting	Replace Base Bid – Conditional Reuse Alternate 1
b.	Governor	New
c.	Compensating	New All

4.1.46.1.1.7	Compensation Sheave	Retain Elevators 1, 2 Replace Elevators 3, 4
4.1.46.1.1.8	Number of Landings	Cars 1 & 2 – 13 @ G, 1*, 2,3,4,5,6,7,7M, 8, 9, 10, 11 Cars 3 & 4 – 14 @ B,G, 1*, 2,3,4,5,6,7, 7M,8, 9, 10, 11
4.1.46.1.1.9	Number of Openings	Cars 1 & 2 – Thirteen (13) Cars 3 & 4 – Fourteen (14)
4.1.46.1.1.10	Front Openings	All
4.1.46.1.1.11	Rear Openings	N/A
4.1.46.1.1.12	Operation	GroupAutomatic – Conventional/Base Destination Dispatch – Alternate 2 (six (6) cars)
4.1.46.1.1.13	Control	New Microprocessor
4.1.46.1.1.14	Fireman’s Service	New, as specified
4.1.46.1.1.15	Machine Room, Secondary, Pit Lighting and GFI	Provide New
4.1.46.1.1.16	Machine Type	New Gearless AC Machines
4.1.46.1.1.17	Power Drive	New VVVF AC Drive with Rengenerative Module Alternate – SCR Static Motor Drive – New/Regenerative
4.1.46.1.1.18	Machine Location	Above
4.1.46.1.1.19	Governor	New
4.1.46.1.1.20	Car Platform/Sling/Safety	Retain Existing/modify as required
4.1.46.1.1.21	Counterweight	Retain Existing/modify as required
4.1.46.1.1.22	Counterweight Safety	N/A
4.1.46.1.1.23	Guide Rails	Retain Existing
4.1.46.1.1.24	Guides	Retain Existing

4.1.46.1.1.25	Buffers	New Cars 3,4,5 Retain/Refurbish Cars 1,2,6
4.1.46.1.1.26	Buffer Ladder/Platform	New, as required/Cars 3, 4
4.1.46.1.1.27	Car Door Size/Type	42" x 7'0"/Center Opening/Field Verify
4.1.46.1.1.28	Hoistway Door Size/Type	Retain Existing
4.1.46.1.1.29	Master Door Opener	New
4.1.46.1.1.30	Entrance Sills	Retain
4.1.46.1.1.31	Tracks/Hangers	Retain
4.1.46.1.1.32	Interlocks/Closers	New
4.1.46.1.1.33	Top Emergency Exit	Retain Existing/Modify as required
4.1.46.1.1.34	Keyed Access	New
4.1.46.1.1.35	Power Supply	Retain/Modify as required
4.1.46.1.1.36	Wiring and Traveling Cables	New
4.1.46.1.1.37	CCTV	Provisions for future installation
4.1.46.1.1.38	Security/Key/Card Reader	Provisions for future installation
4.1.46.1.1.39	Number of Push Button Risers	Two (2)
4.1.46.1.1.40	Hall Opening Fixtures	New
4.1.46.1.1.41	Car Operating Fixtures	New
4.1.46.1.1.42	Communication	New
4.1.46.1.1.43	Door Protective Device	New
4.1.46.1.1.44	Emergency Cab Lighting	New
4.1.46.1.1.45	Car Ventilation	New, means approved by Owner
4.1.46.1.1.46	Car Enclosure	\$25,000 allowance per cab
4.1.46.1.1.47	Car Doors	New
4.1.46.1.1.48	Car Flooring	New
4.1.46.1.1.49	Car Sill	New

4.1.46.1.1.50	Lobby Panel	New/Fire Command Room & Lobby Security
4.1.46.1.1.51	Elevator Monitoring System	New All Groups

4.1.46.1.2 Service/Prisoner Elevators 5 & 6

4.1.46.1.2.1	Quantity	Two (2) Retain
4.1.46.1.2.2	Type	Service/Prisoner/Retain
4.1.46.1.2.3	Capacity (lbs)	3000/Retain
4.1.46.1.2.4	Speed (fpm)	500/Retain
4.1.46.1.2.5	Travel in Feet	Field Verify
4.1.46.1.2.6	Roping/Ropes	
a.	Hoisting	Replace Base Bid
		Conditional Reuse – Alternate 1
b.	Governor	New All
c.	Compensating	New All
4.1.46.1.2.7	Compensation Sheave	Retain Car 6 Replace Car 5
4.1.46.1.2.8	Number of Landings	Car: 5 – 16 @ B,G*, 1,2,3,3M,4,4M, 5,6, 7, 7M, 8,9,10, 11 Car: 6 – 15 @ G*, 1,2,3,3M,4,4M,5,6,7, 7M, 8, 9, 10, 11
4.1.46.1.2.9	Number of Openings	Car 5 – 16; Car 6 15
4.1.46.1.2.10	Front Openings	All
4.1.46.1.2.11	Rear Openings	N/A
4.1.46.1.2.12	Operation	Simplex – Conventional/Base Bid Destination Dispatch/Alternate 2 (Six {6} Cars)

		Duplex – Conventional/Alternate 5
4.1.46.1.2.13	Control	New Microprocessor
4.1.46.1.2.14	Fireman’s Service	New, as specified
4.1.46.1.2.15	Machine Room, Secondary, Pit, Lighting and GFI	Provide New
4.1.46.1.2.16	Machine Type	New Gearless AC Machines/Base Bid Retain and Refurbish Existing DC Gearless Machines/Alternate 1
4.1.46.1.2.17	Power Drive	New VVVF AC Drive with Regenerative Module/Base Bid New Regenerative SCR Static Motor Drive/Alternate 1
4.1.46.1.2.18	Machine Location	Above
4.1.46.1.2.19	Governor	New
4.1.46.1.2.20	Car Platform/Sling/Safety	Retain Existing/Modify as required
4.1.46.1.2.21	Counterweight	Retain Existing/Modify as required
4.1.46.1.2.22	Counterweight Safety	N/A
4.1.46.1.2.23	Guide Rails	Retain Existing
4.1.46.1.2.24	Guides	Retain Existing
4.1.46.1.2.25	Buffers	New Car 5 Retain/Refurbish Car 6
4.1.46.1.2.26	Buffer Ladder/Platform	New, as required Car 5
4.1.46.1.2.27	Car Door Size/Type	42” x 7’ 0”/Center Opening/Field Verify
4.1.46.1.2.28	Hoistway Door Size/Type	Retain Existing
4.1.46.1.2.29	Master Door Operator	New
4.1.46.1.2.30	Entrance Sills	Retain
4.1.46.1.2.31	Tracks/Hangers	Retain
4.1.46.1.2.32	Interlocks/Closers	Retain

4.1.46.1.2.33	Top Emergency Exit	Retain Existing/Modify as required
4.1.46.1.2.34	Keyed Access	New
4.1.46.1.2.35	Power Supply	Retain/Modify as required
4.1.46.1.2.36	Wiring and Traveling Cables	New
4.1.46.1.2.37	CCTV	Provisions for future installation
4.1.46.1.2.38	Security/Key/Card Reader	New, both cars
4.1.46.1.2.39	Number of Push Button Risers	Two (2)
4.1.46.1.2.40	Hall Operating Fixtures	New
4.1.46.1.2.41	Car Operating Fixtures	New
4.1.46.1.2.42	Communication	New
4.1.46.1.2.43	Door Protective Device	New
4.1.46.1.2.44	Emergency Cab Lighting	New
4.1.46.1.2.45	Car Ventilation	New, means approved by Owner
4.1.46.1.2.46	Car Enclosure	\$25,000.00 Allowance per cab
4.1.46.1.2.47	Car Doors	New
4.1.46.1.2.48	Car Flooring	New
4.1.46.1.2.49	Car Sill	New
4.1.46.1.2.50	Lobby Panel	New/Fire Command Room & Lobby Security
4.1.46.1.2.51	Elevator Monitoring System	New, All Groups
4.1.46.1.2.52	Prisoner Operation	Car 6 – as further specified

4.1.46.2 Manufactures

4.1.46.2.1 Pre-Approved Equipment Manufacturers

- 4.1.46.2.1.1 The following manufacturers' equipment and materials have been pre-approved for use on this Request for Proposal.
- 4.1.46.2.1.2 Other equipment not specifically mentioned shall be considered for approval on an individual basis.

- 4.1.46.2.1.3 Certain Original Equipment Manufacturers equipment is acceptable unless otherwise specified.
 - 4.1.46.2.1.3.1 Controller - GAL (GALaxy), Motion Control Engineering, Elevator Controls Corporation, Elevator Systems, Inc.
 - 4.1.46.2.1.3.2 Tracks, Hangers, Interlocks and Door Operators - G.A.L., ECI, MAC.
 - 4.1.46.2.1.3.3 Fixtures - G.A.L., Adams, EPCO, Monitor, E-Motive USA, C.E. Electronics, Innovation, PTL.
 - 4.1.46.2.1.3.4 Door Protective Device - Janus, Adams, G.A.L., T.L. Jones, Tri-Tronics.
 - 4.1.46.2.1.3.5 Cabs and Entrances/Entrance Door Panels - Accurate Elevator Door Corp, EDI/ECI, National Cab & Door, Tyler, Velis, Gunderlin, Premier, Prestige, Regency, Columbia Elevator Products.
 - 4.1.46.2.1.3.6 Machines - Hollister-Whitney, Titan, Imperial, Torin.
 - 4.1.46.2.1.3.7 SCR Power Drives - MagneTek DSD 412, MagneTek 'Quattro', MCE System 12, KEB.
 - 4.1.46.2.1.3.8 VVVF Power Drives - Mitsubishi, MagneTek, Yaskawa, TorqMax.
 - 4.1.46.2.1.3.9 Electrical Traveling Cables - Draka, James Monroe.
 - 4.1.46.2.1.3.10 Guide Shoes/Rollers – ELSCO, G.A.L. MAC.
 - 4.1.46.2.1.3.11 Wire Ropes - Paulsen, Bethlehem, Wayland, Draka.
 - 4.1.46.2.1.3.12 Intercommunications/Telephones - Webb Electronics, K-Tec, Ring, Wurtec, Janus, approved equal.
- 4.1.46.2.1.4 Original Equipment Manufacturers may substitute their own branded equipment subject to the following:
 - 4.1.46.2.1.4.1 All requirements of the Scope of Services are met regarding performance, appearance, serviceability and support.
 - 4.1.46.2.1.4.2 A full stock of all regular and critical replacement parts required for this project are maintained at a facility within fifty (50) miles of the project site.
 - 4.1.46.2.1.4.2.1 Any parts not stocked at the above referenced facility shall be identified with the location of the nearest source and shall be available for next-day delivery upon demand.
 - 4.1.46.2.1.4.3 All parts and software shall be made available for purchase to a qualified elevator maintenance firm with one-business day delivery without direct Owner involvement.
 - 4.1.46.2.1.4.3.1 Provide details of parts supply facility and a list of current parts pricing for all major components required for the installation.

4.1.46.2.1.4.4 All specialized tools, equipment, software, and passwords, required to maintain, repair, adjust the operation, and perform code mandated inspections are provided to the Owner as part of the base bid.

4.1.46.2.1.4.4.1 Updates to these items shall be available via the parts supply facility referenced above.

4.1.46.2.1.4.5 Technical support of the product(s) shall be available to the Owner's elevator service provider.

4.1.46.3 Control Features/Operation

4.1.46.3.1 Automatic Group Operation / Conventional Dispatch (Cars 1, 2, 3, 4)

4.1.46.3.1.1 Provide a microprocessor based group supervisory control system for the operation of the elevators.

4.1.46.3.1.2 Elevators shall be arranged to operate with or without attendants as an automatic group.

4.1.46.3.1.2.1 The group shall remain capable of sustaining balanced service and continuing operation with one or more cars removed from the system

4.1.46.3.1.2.2 Elevators shall operate from pushbutton panels located inside each car and from a riser of corridor pushbutton fixtures located on each landing served.

4.1.46.3.1.3 Elevators shall automatically travel to landings for which a call demand exists.

4.1.46.3.1.3.1 Stops in response to calls that are registered at either the car or hall push button stations shall occur in the natural order of progression in which the floors are encountered, depending on the direction of car travel, and irrespective of the order in which calls are registered.

4.1.46.3.1.4 Call acknowledgment lights provided in both the car and hall push button fixtures shall become extinguished as the car responding to a particular call begins its slowdown approach to the corresponding landing.

4.1.46.3.1.5 In the event no demand for elevator service exists, the first car to satisfy its assigned calls shall be dispatched to park at the main landing.

4.1.46.3.1.5.1 In the event additional cars should also complete their call assignments, those cars shall be individually dispatched to previously designated parking floors.

4.1.46.3.1.5.2 Parking assignments shall be accomplished without door operation.

4.1.46.3.1.5.3 Should the elevator parked at the main landing receive a call assignment, another free car in the group shall immediately assume that parking assignment.

4.1.46.3.1.5.4 The number of elevators assigned to park at any particular landing shall be programmable.

- 4.1.46.3.1.6 The group supervisory controller shall, through a dispatching algorithm along with artificial intelligence parameters, continuously scan the system in order to determine the load each car is transporting and to monitor the number of corridor calls registered, the duration of each call, and the intended direction of travel, the number of loaded lifts, etc.
 - 4.1.46.3.1.6.1 Based upon that data, the supervisory system shall automatically devise a strategy for call assignment with preference given to calls registered in the following order:
 - 4.1.46.3.1.6.1.1 Lobby demand
 - 4.1.46.3.1.6.1.2 Long waiting times – down
 - 4.1.46.3.1.6.1.3 Long waiting times – up
 - 4.1.46.3.1.6.1.4 Up calls
 - 4.1.46.3.1.6.2 Long wait calls shall be considered those which have remained unanswered for at least forty (40) seconds. The long wait call threshold time shall be programmable.
- 4.1.46.3.1.7 If a car with no car calls arrives at a landing where both up and down hall calls are registered, it will answer the call in the direction of travel.
 - 4.1.46.3.1.7.1 If no car call is registered, the car shall be assigned to respond to the call registered for opposite direction.
 - 4.1.46.3.1.7.2 The doors shall close and immediately re-open when responding to this call.
 - 4.1.46.3.1.7.3 Hall lantern operation shall always correspond to direction of service.
- 4.1.46.3.1.8 In the event that any car is delayed for more than a predetermined time interval after it received a start signal, the system shall automatically permit the remaining cars in the group to respond to signals and be dispatched in the specified manner.
- 4.1.46.3.1.9 In the event the group dispatching or supervisory system should malfunction so that elevators are not assigned to calls within a predetermined interval and in accordance with the conditions of the operating strategy in effect, the system shall automatically assume a back-up mode of operation whereby the elevators shall be arranged to provide continuous service to each landing in a predetermined pattern without regard to actual corridor demand.
 - 4.1.46.3.1.9.1 Failure of the automatic dispatching system will be indicated by an illuminated signal in the Lobby Elevator Control Panel or Elevator Information and Management System where applicable.
- 4.1.46.3.1.10 In the event of failure of the landing call button circuit, provide a means to enable the elevators to service each floor without registration of a call within the elevators.
 - 4.1.46.3.1.10.1 When emergency operation is in effect, provide an illuminated signal in the Lobby Elevator Control Panel or

Elevator Information and Management System where applicable.

- 4.1.46.3.1.11 When a car arrives at its last stop and reverses direction of travel, all previously registered car calls shall be automatically cancelled.
- 4.1.46.3.1.12 When a car has responded to the highest or lowest call, and hall calls are registered for the opposite direction, the car shall reverse direction automatically and respond to those registered calls.
- 4.1.46.3.1.13 When an empty car reverses direction at a landing with no hall calls, doors shall not open and the hall lantern shall not operate.
- 4.1.46.3.1.14 Main Lobby Operation:
 - 4.1.46.3.1.14.1 Only the "Next" designated car shall have its hall lantern illuminated and its doors open.
 - 4.1.46.3.1.14.2 When a "down" traveling car, which is not designated "Next", arrives at the main lobby with a lobby car call registered, it will open its door to discharge the passengers, close the doors, and shall not illuminate its lantern.
 - 4.1.46.3.1.14.3 When a "down" traveling car with no car calls arrives at the main lobby and is not designated "Next", it shall park without opening its doors.
- 4.1.46.3.1.15 Coincident Calls:
 - 4.1.46.3.1.15.1 The dispatching system shall be designed with a 20 second parameter whereby an elevator with a car call will receive priority to answer a corresponding corridor call if it can do so within 20 seconds.
 - 4.1.46.3.1.15.2 If the elevator cannot answer the call within the prescribed time, the first available car shall be assigned.
 - 4.1.46.3.1.15.3 A continuous reassessment of calls shall be made.
- 4.1.46.3.2 Simplex Selective Collective Operation (Elevators 5 & 6)
 - 4.1.46.3.2.1 Provide simplex selective collective operation from a riser of hall push button stations.
 - 4.1.46.3.2.2 The registration of one or more car calls shall dispatch the car to the designated floors. The car shall also respond to registered hall calls in the same direction of travel. Car and hall calls shall be canceled when answered.
 - 4.1.46.3.2.3 Stops in response to calls that are registered in either the car or corridor pushbutton stations shall occur in the natural order of progression in which the floors are encountered, depending on the direction of car travel, and irrespective of the order in which calls are registered.
 - 4.1.46.3.2.4 When the car has responded to the highest or lowest call, and calls are registered for the opposite direction, the car shall reverse direction automatically and respond to those registered calls.

- 4.1.46.3.2.5 When the car arrives at its last stop and reverses direction of travel, all previously registered car calls shall be automatically cancelled.
- 4.1.46.3.2.6 When the car has responded to the highest or lowest call, and hall calls are registered for the opposite direction, the car shall reverse direction automatically and respond to those registered calls.
- 4.1.46.3.2.7 When the car arrives at a landing where both up and down hall calls are registered, it will answer the call in the direction of travel.
 - 4.1.46.3.2.7.1 After a pre-determined delay, if no car call is registered, the car shall be assigned to respond to calls registered for the opposite direction. Car doors shall close immediately, re-open and respond to the call for the opposite direction.
 - 4.1.46.3.2.7.2 Hall lantern operation shall always correspond to direction of service.
- 4.1.46.3.2.8 When an empty car reverses direction at a landing with no hall calls, the doors shall not open and the hall lantern shall not operate.
- 4.1.46.3.2.9 If the car has no car calls registered and arrives at a floor where both up and down hall calls have been registered, the car shall respond to the hall call corresponding to the direction of car travel. If, after making its stop, a car call is not registered and no other hall calls exist ahead of the car corresponding to its original direction of travel, the doors shall close and immediately reopen in response to the hall call for the opposite direction.
- 4.1.46.3.2.10 The car shall maintain its original direction at each stop until the doors are fully closed to permit a passenger to register a car call before the car reverses its direction of travel.
- 4.1.46.3.3 Automatic Group Duplex / Selective Collective Operation (Cars 5 and 6) / Alternate 5
 - 4.1.46.3.3.1 Provide duplex selective collective operation with the two cars arranged to operate from a single riser of hall push buttons.
 - 4.1.46.3.3.2 When there is no demand for elevator service, park one car at the Lobby Floor and the other shall be a "free car", parking at the floor last served.
 - 4.1.46.3.3.2.1 Park both cars with doors closed.
 - 4.1.46.3.3.2.2 The "free car" shall normally respond to any registered hall call except:
 - 4.1.46.3.3.2.2.1 A hall call registered at the Lobby Floor shall be answered by the car parked at the Lobby Floor.
 - 4.1.46.3.3.2.2.2 A hall call registered below the Lobby Floor shall be answered by the car parked at the Lobby Floor.

- 4.1.46.3.3.3 When the car parked at the Lobby Floor responds to a registered call for a floor above the Lobby Floor, the "free car" shall be dispatched automatically to the Lobby Floor, and shall become the assigned Lobby Floor parking car.
- 4.1.46.3.3.4 When the "free car" is responding to registered calls, the Lobby Floor parking car shall automatically dispatch from the Lobby Floor under any of the following conditions:
 - 4.1.46.3.3.4.1 Registration of hall call below the "free car" while it is traveling in the up direction.
 - 4.1.46.3.3.4.2 Registration of hall call above the "free car" while it is traveling in the down direction.
 - 4.1.46.3.3.4.3 Inability of the "free car" to move in response to a registered hall call within a predetermined time.
- 4.1.46.3.3.5 When both cars are responding to registered car and hall calls, the first car to complete its calls shall become the assigned Lobby Floor parking car and shall be dispatched automatically to the Lobby Floor.
- 4.1.46.3.3.6 If either car is removed from service, the other car shall respond to all registered hall calls and its own car calls.
- 4.1.46.3.3.7 When a car arrives at its last stop and reverses direction of travel, all previously registered car calls shall be automatically cancelled.
- 4.1.46.3.3.8 When a car has responded to the highest or lowest call, and hall calls are registered for the opposite direction, the car shall reverse direction automatically and respond to those registered calls.
- 4.1.46.3.3.9 When a car arrives at a landing where both up and down hall calls are registered, it will answer the call in the direction of travel.
 - 4.1.46.3.3.9.1 If no car call is registered, the car shall be assigned to respond to call registered for the opposite direction. The car doors shall immediately close and re-open to respond to the call in the opposite direction.
 - 4.1.46.3.3.9.2 Hall lantern operation shall always correspond to direction of service.
- 4.1.46.3.3.10 When an empty car reverses direction at a landing with no hall calls, the doors shall not open and the hall lantern shall not operate.
- 4.1.46.3.3.11 If a car has no car calls registered and arrives at a floor where both up and down hall calls have been registered, the car shall respond to the hall call corresponding to the direction of car travel.
- 4.1.46.3.3.12 If, after making its stop, a car call is not registered and no other hall calls exist ahead of the car corresponding to its original direction of travel, the doors shall close and immediately reopen in response to the hall call for the opposite direction.

- 4.1.46.3.3.13 The car shall maintain its original direction at each stop until the doors are fully closed to permit a passenger to register a car call before the car reverses its direction of travel.
 - 4.1.46.3.3.14 In the event that any car is delayed for more than a predetermined time interval after it received a start signal, the system shall automatically permit the remaining car in the two-car group to respond to signals and be dispatched in the specified manner.
 - 4.1.46.3.3.15 Coincident calls: The dispatching system shall be designed with a 20 second parameter whereby an elevator with a car call will receive priority to answer a corresponding corridor call if it can do so within 20 seconds. If it cannot answer the call within the prescribed time, the first available car shall be assigned. A continuous reassessment of calls shall be made, with the processor having the capability of reassessing five (5) times per second.
 - 4.1.46.3.3.16 In the event the supervisory control system should malfunction so that neither elevator is assigned calls within a predetermined interval and in accordance with the conditions of the operating strategy in effect, the system shall automatically assume a back-up mode of operation whereby the elevators shall be arranged to provide continuous service to each landing in a predetermined pattern without regard to actual corridor call demands.
- 4.1.46.3.4 Automatic Group Operation / Destination Dispatch (Alternate 2 / Elevators 1, 2, 3, 4, 5 & 6)
- 4.1.46.3.4.1 Elevators shall be arranged to operate with or without attendants as an automatic group.
 - 4.1.46.3.4.1.1 The group shall remain capable of sustaining balanced service and continuing operation with one or more cars removed from the system.
 - 4.1.46.3.4.1.2 Elevators shall operate from keypad or touch-screen panels located in the corridors of each landing served.
 - 4.1.46.3.4.1.3 An independent PC with the Advanced ETD (Estimated Time to Destination) algorithm will be supplied along with all necessary equipment for networked communications to the floor terminals and car controllers.
 - 4.1.46.3.4.1.4 Elevators shall be equipped with locked access cabinets located in the car front returns, main panel side (where main and auxiliary returns exist).
 - 4.1.46.3.4.1.5 Locked panels shall contain mechanical push buttons for registration of car calls when operating on Independent, Attendant, Fire Emergency Service or Hospital Emergency Service as required by applicable code.
 - 4.1.46.3.4.2 Upon registration of a destination demand call from the hall stations, passengers shall be directed to the appropriate elevator by one or more of the following methods:

- 4.1.46.3.4.2.1 Text notification from the station through which the call was registered via Digital or LCD display indicating the car designation as either a letter or letter/number combination as approved by the AHJ.
- 4.1.46.3.4.2.2 ADA compliance shall be provided by verbal notification of the elevator number or letter and audible repeating tone to direct the visually impaired to the elevator.
- 4.1.46.3.4.3 Call acknowledgment through LED or LCD panels shall be provided in the car front return post(s) that indicates the floors at which the elevator is scheduled to stop.
- 4.1.46.3.4.4 In case the group dispatching or supervisory system should malfunction so that elevators are not assigned to calls in accordance with the conditions of the dispatching strategy in effect, the system shall automatically assume a back-up mode of operation whereby the elevators shall be arranged to provide continuous service to each landing in a predetermined pattern without regard to actual demand.
- 4.1.46.3.5 Motion Control
 - 4.1.46.3.5.1 Smooth stepless acceleration and deceleration of the elevator car shall be provided in either direction of travel during both single and multiple floor runs.
 - 4.1.46.3.5.2 Use digital logic to calculate optimum acceleration and deceleration patterns during each run.
 - 4.1.46.3.5.2.1 The amplitude of acceleration and deceleration shall not exceed 2.6 - 2.8 ft./sec² for geared and MRL traction, and 3.5 - 4 ft./sec² for gearless traction elevator
 - 4.1.46.3.5.2.2 The maximum jerk rate shall be 1.5 to 2.0 times the acceleration and deceleration.
 - 4.1.46.3.5.2.3 The maximum velocity which the elevator achieves in either direction of travel while operating under load conditions that vary between empty car and full rated load shall be within $\pm 3\%$ of the rated speed.
 - 4.1.46.3.5.3 Floor leveling accuracy of $\pm 1/4$ " as measured between the car entrance threshold and the landing sill on any given floor shall be provided.
 - 4.1.46.3.5.3.1 This accuracy standard shall be maintained under varying load conditions and without need for releveling corrections caused by overshooting or stopping short of the floor.
 - 4.1.46.3.5.4 Elapsed flight time during a typical elevator one floor run shall not exceed values as further specified.
 - 4.1.46.3.5.4.1 Timing, as measured between the moment door closing operations begin and when the doors are 3/4 open at the next adjacent floor, shall remain consistent under varying load conditions in either direction of travel.

4.1.46.3.6 Independent Service Operation

4.1.46.3.6.1 The car operating station shall be equipped with a key-operated switch labeled "IND SER".

4.1.46.3.6.2 Locate the switch with other switches on the surface of the car operating panel.

4.1.46.3.6.3 When placed in the "on" position the following shall occur:

4.1.46.3.6.3.1 Group elevator - the elevator shall bypass corridor calls and travel directly to any floor chosen by registration of a car call. Hall calls shall remain registered for service by another elevator in the group.

4.1.46.3.6.3.2 Simplex elevator - existing hall call registrations shall extinguish and hall buttons shall remain inoperative as an indication to passengers that there is no elevator service.

4.1.46.3.6.4 During Independent Service Operation, the elevator doors shall remain open at any landing until the door close or a car call push button is pressed and maintained until the doors are fully closed.

4.1.46.3.6.5 If more than one (1) car call is registered, all registered car calls shall extinguish when the elevator stops in response to the first call.

4.1.46.3.6.6 Fire Emergency Recall shall automatically override Independent Service Operation and engage Phase I - Fire Emergency Recall Operation following a period of approximately forty-five (45) seconds.

4.1.46.3.7 Inspection Service Operation

4.1.46.3.7.1 Provide a key operated switch in the main car operating panel that, when turned to the 'ON' position, shall cause the elevator to be removed from service and placed in Inspection Service Operation.

4.1.46.3.7.2 Limited operation of the car shall be provided through pressing the Attendant Service up and down push buttons (if provided) or the highest or lowest car call push buttons (if up and down buttons are not provided) in the main car operating panel only.

4.1.46.3.7.3 The car shall move at a speed not to exceed 150 feet per minute (0.75 meters per second) as per code with both the hall and car door panels in the closed and locked position.

4.1.46.3.7.4 The Inspection Service switch shall be keyed differently than other typical keys used in the operation of the elevator. Keying shall be in accordance with Security Group Classifications as required by applicable code.

4.1.46.3.7.5 The top of the elevator car shall be equipped with a control for limited operation of the car during repairs, maintenance and inspection conducted in the hoistway. The transfer of control to the top of car operating

device shall cause that device to be the sole means of control for the elevator.

4.1.46.3.7.5.1 Visual and audible indication shall be provided on the top of the car when Firefighters' Emergency Operation is initiated.

4.1.46.3.7.6 Power door operating equipment shall be rendered inoperative while the car is being operated in the Inspection Service mode with the exception of power closing of the door. The control system shall maintain closing power on the door while the elevator is moving under Inspection Service Operation.

4.1.46.3.7.7 The in-car Inspection Service switch shall be rendered ineffective when the top of car inspection control is activated.

4.1.46.3.7.8 Machine Room Inspection Operation and Inspection Operation with open door circuits shall be provided in accordance with A17.1 Safety Code, as modified and adopted, where required or allowed by the AHJ.

4.1.46.3.8 Hoistway Access Operation

4.1.46.3.8.1 Provisions shall be made to allow access to the hoistway through the use of hoistway access switches.

4.1.46.3.8.2 Operating the access switch shall permit the car to move at a speed not to exceed 150 feet per minute (0.75 meters per second) as per code with the hall and car doors in the open position to obtain access to the top of the car or climb-in pit.

4.1.46.3.8.3 The car shall automatically stop motion when the car top is level with the hoistway door sill for access to top of car.

4.1.46.3.8.4 The access key switch(es) shall be keyed differently than other typical keys used in the operation of the elevator. Keying shall be in accordance with Security Group Classifications as required by applicable code.

4.1.46.3.8.5 Access operation shall be disabled when top of car inspection operation is in effect.

4.1.46.3.9 Load Weighing Operation

4.1.46.3.9.1 A positive means shall be provided to continuously monitor the amount of load being transported by the elevator car.

4.1.46.3.9.2 The system shall be used to:

4.1.46.3.9.2.1 Preload static motor drives

4.1.46.3.9.2.2 Activate control features that include:

4.1.46.3.9.2.2.1 anti-nuisance operation

4.1.46.3.9.2.2.2 load dispatch operation

4.1.46.3.9.2.2.3 load dependent non-stop operation where applicable.

- 4.1.46.3.9.3 The anti-nuisance feature shall operate at loads not exceeding 200 lbs., whereas load dispatch and load non-stop shall be set to function at 65% of the rated loading capacity for the initial set up and adjustment procedure.

4.1.46.3.10 Anti-Nuisance Operation

- 4.1.46.3.10.1 In the event car loading is not commensurate with the number of car calls registered, all car calls shall be canceled.
 - 4.1.46.3.10.1.1 The system shall monitor the door protection device to determine if passenger transfer has occurred.
 - 4.1.46.3.10.1.2 If after the third stop a passenger transfer has not occurred, the system shall cancel all remaining registered car calls and respond to assigned hall call demand.
 - 4.1.46.3.10.1.3 The number of calls registered with no passenger transfer that will trigger anti-nuisance shall be adjustable and initially set to 3 calls.

4.1.46.3.11 Firefighters' Emergency Operation

- 4.1.46.3.11.1 Firefighters Service Operation and devices shall meet applicable code requirements of the AHJ.
- 4.1.46.3.11.2 Successful Respondent shall be responsible for compliance in all aspects of Firefighters Service including, but not limited to the mode of operation, initiation of operation, operating control and signaling devices as well as fixture engraving including operating instructions applicable to and where required by the AHJ.

4.1.46.3.12 Emergency Power Operation / Duplicate Existing

- 4.1.46.3.12.1 Existing provisions shall be duplicated and upgraded for automatic sequential operation.
- 4.1.46.3.12.2 Provisions shall be included in the new elevator control system whereby, immediately after transferring to the building emergency power system, all affected elevators shall automatically return the fire recall designated landing in progressive numerical sequence at normal operating speed.
 - 4.1.46.3.12.2.1 Car and corridor calls shall become inoperative and all previously registered calls shall be canceled.
 - 4.1.46.3.12.2.2 As each car arrives at the designated landing, it shall park out of service with its door in the open position.
- 4.1.46.3.12.3 An illuminated signal marked "ELEVATOR EMERGENCY POWER" shall be provided in the elevator lobby at the designated landing to indicate that the normal power supply has failed and the emergency power is in effect.
- 4.1.46.3.12.4 In the event an elevator fails to respond to a recall command within forty-five (45) seconds under Emergency Power Operation, that car shall be bypassed and the next car in the sequence shall be recalled.
- 4.1.46.3.12.5 Upon completion of the recall process, one or more elevators shall be automatically selected to run on the emergency power source (duty car(s)).

- 4.1.46.3.12.6 Interlock all elevators to allow to operate the maximum number of elevators at a time.
- 4.1.46.3.12.7 An emergency power control panel shall be provided where indicated by the Owner containing an indicator light per elevator that becomes illuminated whenever a transfer to emergency power takes place.
 - 4.1.46.3.12.7.1 Provide a key-operated override switch and a manual selector switch with a position indicator for each elevator.
 - 4.1.46.3.12.7.2 Activating the key-operated override switch while on emergency power shall cancel the automatic recall sequence and allow positioning of the manual selector switch to select a car for operation.
 - 4.1.46.3.12.7.3 Means shall be provided on or adjacent to the control panel to indicate that the elevator is at the designated level with the doors in the open position.
- 4.1.46.3.13 Elevator Safety Requirements for Seismic Zone (2)
 - 4.1.46.3.13.1 Guarding of equipment, machine supports, guide rail systems, the design of counterweight car frame and platform, safeties and signaling devices shall meet the requirements of ASME A17.1 as may be modified by the AHJ.
 - 4.1.46.3.13.2 Guide rails, guide rail supports and their fastenings shall meet requirements for the seismic zone.
- 4.1.46.3.14 Floor Lockout Feature / EMIS / Floor-by-Floor / Car-by-Car
 - 4.1.46.3.14.1 Provide the control system with the ability to secure car and hall calls on a car-by-car and floor-by-floor basis.
 - 4.1.46.3.14.1.1 The security settings shall be able to be modified via the Elevator Management and Information System provided as further specified.
 - 4.1.46.3.14.2 Firefighters' Service Operation shall override the Floor Lockout Feature.
- 4.1.46.3.15 Card Reader Capabilities and Interface (Destination Dispatch) Alternate 2
 - 4.1.46.3.15.1 Provide card readers in each hall lobby input device.
 - 4.1.46.3.15.1.1 Arrange the system so that security cards presented at the lobby destination in-pu-t device shall automatically register the default destination specifically assigned to the user.
 - 4.1.46.3.15.1.2 Interface the Destination Dispatching system with the building security system and provide the necessary high-speed data communication lines so that security interface does not slow registration entry and car assignment display.
 - 4.1.46.3.15.1.3 The Successful Respondent shall be responsible for all the coordination with the building security contractor.
 - 4.1.46.3.15.1.4 The Successful Respondent to provide all conduit and wiring from the card reader controls to the security contractor's controls.

4.1.46.3.16 Car-to-Lobby Operation (New)

4.1.46.3.16.1 Provide a key-operated Car-to-Lobby feature.

4.1.46.3.16.1.1 Provide a 3-position key-operated switch for each elevator in the lobby control panel or at a location as directed by the Architect/Owner to activate the Car-to-Lobby operating feature. Car to Lobby Operation (New)

4.1.46.3.16.2 When engaged, this feature shall:

4.1.46.3.16.2.1 Cause the affected elevator to return non-stop to the lobby after it has discharged all registered car calls.

4.1.46.3.16.2.2 Open the door upon arriving at the lobby for approximately ten (10) seconds, after which the elevator shall park out of service with the door closed.

4.1.46.3.16.2.3 Maintain door open button function during the interval in which the car is out of service.

4.1.46.3.16.3 Returning the key-operated switch in the lobby panel to the “on” position shall restore the car to normal operation.

4.1.46.3.16.4 Override the Priority Service feature with Firefighters’ Service in accordance with code and local law.

4.1.46.3.17 Elevator Security Interface Requirements / CCTV

4.1.46.3.17.1 Card Reader Control of Selected Elevators/ Base Bid, Conventional Dispatching

4.1.46.3.17.1.1 Elevators No. 5 and No. 6 shall be card reader-controlled by the security system.

4.1.46.3.17.1.2 Control shall be on an individual floor programmable basis allowing the user to access only those floors for which their access card is programmed.

4.1.46.3.17.1.2.1 The ground or other designated egress floor shall always be available without the need of an access card.

4.1.46.3.17.1.3 The security system shall provide for control of the elevator on a time programmable basis allowing access to certain floors/doors via card reader while allowing free access to other floors/doors at the same time.

4.1.46.3.17.1.4 When an elevator is in the card reader control mode of operation, the elevator user shall be required to hold their access card up to a card reader mounted on the elevator return panel and push the desired floor/door select button, even while in non-automatic modes of operation.

4.1.46.3.17.1.4.1 The elevator control system shall light the selected button from the time of authorized floor/door selection until the elevator reaches the selected floor.

4.1.46.3.17.1.5 To place the elevator in the card reader controlled mode of operation, a maintained contact closure (provide by the security

system) shall be established across a pair of elevator controller terminals (provided by the Successful Respondent).

4.1.46.3.17.1.6 To provide for card reader control of elevators, the application of a dry contact open and/or closed (provided by the security system) across a pair of terminals per floor or door per elevator (provided by the Successful Respondent) shall enable the selection of the authorized floor/door select buttons in the elevator.

4.1.46.3.17.1.6.1 When the elevator is in the card reader controlled mode, the contacts provided by the security system shall be open and shall close for five seconds upon reading a valid card to allow the floor to be selected and the call for that floor registered.

4.1.46.3.17.1.6.2 When the elevator is in the non-reader controlled mode, the contacts shall be closed, allowing the floor to be selected without a card reader.

4.1.46.3.17.2 Bypass Key Switch Override

4.1.46.3.17.2.1 Provide a key switch for each reader controlled elevator in the main elevator control panel to bypass the reader controlled elevator function and return the elevator to normal operation.

4.1.46.3.17.3 Firefighters' Emergency Operation

4.1.46.3.17.3.1 Firefighters' Emergency Operation and other automatic recall functions shall bypass all security elevator control functions.

4.1.46.3.17.4 System Interface

4.1.46.3.17.4.1 Provide a terminal cabinet in each elevator machine room for elevator / security system interface. The terminal cabinet shall contain all terminals required to interface the elevators located in the machine room to the security system.

4.1.46.3.17.5 Submittals

4.1.46.3.17.5.1 Submit product specifications, fabrication shop drawings, and wiring diagrams of the following:

- 4.1.46.3.17.5.1.1 Elevator / Security interface terminal cabinet.
- 4.1.46.3.17.5.1.2 Card reader installation
- 4.1.46.3.17.5.1.3 CCTV camera installation.
- 4.1.46.3.17.5.1.4 Key switch installation.
- 4.1.46.3.17.5.1.5 Traveling Cables.

4.1.46.3.17.6 Interface Terminal Cabinet

4.1.46.3.17.6.1 The interface terminal cabinet shall be a lockable continuous hinge cover NEMA Type 1 enclosure.

4.1.46.3.17.6.2 The cover of the enclosure shall be labeled to identify its function.

4.1.46.3.17.6.3

Dual screw barrier type terminal strips shall be provided within the interface terminal cabinet.

4.1.46.3.17.6.3.1

Terminals shall be provided for each interface point.

4.1.46.3.17.6.3.2

All terminals shall be labeled to identify their function.

4.1.46.3.17.7 Traveling Cable

4.1.46.3.17.7.1 The card reader interface traveling cable shall be one (1), 12-conductor, 20-gauge stranded, low voltage cable with an overall braided shield and drain wire.

4.1.46.3.17.7.2 The CCTV camera interface traveling cable shall be two (2) RG-59U stranded center conductor coax cables and one (1), 2-conductor, 20-gauge stranded, low voltage cable with an overall braided shield and drain wire.

4.1.46.3.17.7.3 All security interface traveling cables shall be located in the elevator control traveling cable and shall be isolated from other traveling cables used to carry high voltage alternating current circuits.

4.1.46.3.17.8 Bypass Key Switch

4.1.46.3.17.8.1 The bypass key switch shall be a maintained contact type key switch with the key removable in either the bypass or normal position. All bypass key switches shall be keyed alike.

4.1.46.3.17.8.2 Each bypass key switch shall be labeled to identify its function, the secure position, and the bypass position.

4.1.46.3.17.9 Interface Terminal Cabinet Installation

4.1.46.3.17.9.1 Install the interface terminal cabinet within the elevator machine room in a readily accessible location no more than 6'-0" AFF.

4.1.46.3.17.9.2 Provide any control logic and relays that will be required to interface the elevator control system to the dry contact closures (rated for 1 AMP at 24 VDC) provided by the security system.

4.1.46.3.17.9.3 Provide interconnect wiring from the elevator control system to the interface terminal cabinet.

4.1.46.3.17.9.4 The security contractor shall wire from the security system to the interface terminal cabinet.

4.1.46.3.17.10 Card Reader and CCTV Camera Installation

4.1.46.3.17.10.1 The card reader and CCTV camera shall be provided by the security contractor and installed by the Successful Respondent.

4.1.46.3.17.10.1.1 The Consultant/Owner shall provide supervision, wiring details and installation diagrams to the Successful Respondent.

4.1.46.3.17.10.2 The exact card reader and CCTV camera locations shall be specified by the Consultant/Owner.

4.1.46.3.17.11 Traveling Cable Installation

- 4.1.46.3.17.11.1 Traveling cables for card reader interface shall extend from the elevator / security interface terminal cabinet in the elevator machine room to behind the elevator return panel.
- 4.1.46.3.17.11.2 Terminate the cables including the drain wire to dual screw barrier terminal strips in the interface cabinet and provide 6 feet of excess cable behind the elevator return panel.
- 4.1.46.3.17.11.3 The Elevator Contractor shall be responsible for connecting the cable behind the return panel to the card reader under the direct supervision of the security contractor.
- 4.1.46.3.17.11.4 Traveling cables for the CCTV camera shall extend from the elevator / security interface terminal cabinet in the elevator machine room to the top of the elevator cab. Provide an excess loop of 10 feet of cable at each end.

4.1.46.3.17.12 Conduit, Power and Wiring

- 4.1.46.3.17.12.1 Provide all conduit, power and wiring required for the installation of the terminal cabinet, traveling cables and interfacing to the elevator control system.
- 4.1.46.3.17.12.2 Provide one (1) 120V duplex unswitched outlet dedicated to security on top of each elevator equipped with CCTV camera.
- 4.1.46.3.17.12.3 The security contractor shall provide all wiring from the interface terminal cabinet to the security system.

4.1.46.3.17.13 Automatic Bypass of Card Reader Control of Elevators

- 4.1.46.3.17.13.1 The card reader control of elevators shall be automatically bypassed by the security system upon a fire alarm condition.
- 4.1.46.3.17.13.2 To provide for automatic bypass, the fire alarm contractor shall provide a normally closed dry output contact from the fire alarm system.
 - 4.1.46.3.17.13.2.1 Upon a fire alarm condition, the contact shall open the elevator system shall bypass the card reader control of elevators.
 - 4.1.46.3.17.13.2.2 The contact shall remain open until the fire alarm system is manually reset.

4.1.46.3.17.14 System Interface

- 4.1.46.3.17.14.1 To provide for interfacing the dry contact output from the fire alarm system to the elevator system. The fire alarm contractor shall provide an interface to the elevator system for card reader-controlled Elevators.

4.1.46.3.18 Special Security Operation / Prisoner Service (New base bid)

4.1.46.3.18.1 Provide "Prisoner Service" Key Switch Operation on (Elevator No. 6 only)

- 4.1.46.3.18.1.1 Provide "Prisoner Service" operation based on "Code Blue" Medical Emergency.
- 4.1.46.3.18.1.2 Provide a two-position key switch in the car-operating panel and each hall call station.
- 4.1.46.3.18.1.3 Activation of a hall call station key switch shall place the elevator under "Prisoner Service".
 - 4.1.46.3.18.1.3.1 An audible and visual signal shall be activated in the nearest car.
 - 4.1.46.3.18.1.3.2 All car and hall calls to the elevator shall be cancelled, and the elevator shall proceed to the landing which initiated the call and open its doors.
- 4.1.46.3.18.1.4 Upon arrival at the floor which initiated the call, the elevator shall wait with its doors open for a minimum of 60 seconds.
 - 4.1.46.3.18.1.4.1 During this period, the authorized person may insert a key into the key switch located in the car operating panel and take control of the car.
 - 4.1.46.3.18.1.4.2 Once the key switch is activated, the audible signal shall turn off and the visible signal shall remain active.
 - 4.1.46.3.18.1.4.3 The elevator shall only register one car call at a time.
 - 4.1.46.3.18.1.4.4 Registration of more than one car call shall cancel all prior car calls.
 - 4.1.46.3.18.1.4.5 The elevator shall ignore hall calls
 - 4.1.46.3.18.1.4.6 The emergency stop switch shall be deactivated.
- 4.1.46.3.18.1.5 Return of the car operating panel key switch to the normal position shall allow the car to resume normal operation.

4.1.46.3.19 Door Operation

- 4.1.46.3.19.1 Car and hoistway doors shall be arranged to operate in unison without excessive noise or slamming in either direction of travel.
 - 4.1.46.3.19.1.1 Door opening speeds of two (2) feet per second shall be provided in conjunction with closing speeds of 1.0 feet per second in accordance with governing code.
 - 4.1.46.3.19.1.2 Door operation shall be arranged to commence as the car enters its final leveling approach to a landing. In no case shall the door opening cycle conclude before the car comes to a complete stop at floor level.

- 4.1.46.3.19.2 Where the hoistway door and the car door are mechanically coupled, the kinetic energy of the closing door system shall be based upon the sum of the hoistway and the car door weights, as well as all parts rigidly connected thereto, including the rotational inertia effects of the door operator and the connecting transmission to the door panels.
- 4.1.46.3.19.3 The force necessary to prevent closing of the car and hoistway door from rest shall not exceed 30 lbf. This force shall be measured on the leading edge of the door with the door at any point between one third and two thirds of its travel.
- 4.1.46.3.19.4 Door open and door close time shall be measured between the moment car door operation in either direction begins and the instant at which that cycle is completed.
- 4.1.46.3.19.5 When responding to either a car or corridor call, the amount of time that the elevator door remains stationary in the open position shall be adjustable up to sixty (60) seconds.
 - 4.1.46.3.19.5.1 Door open dwell time for a corridor call shall be separate of that for a car call, and in both cases, dwell time shall be canceled whenever the car door protection device is momentarily interrupted by passenger transfers, followed by a reduced door open dwell time of approximately one (1) second (adjustable) after the door protection device is cleared of obstructions.
- 4.1.46.3.19.6 The operation of the door protective device by physical contact (mechanical safety-edge) or the interruption of one or more infrared light beams (dual or multi-beam non-contact) during the close cycle shall cause the immediate reversing of the doors to the full open position.
- 4.1.46.3.19.7 The door closing cycle shall be arranged so that, in the event the door protective devices become continually obstructed after the normal door open dwell time has expired, and following a time interval of approximately thirty (30) seconds (adjustable), a warning tone shall sound and the door closing cycle shall commence at reduced speed and torque per applicable Code requirements.
- 4.1.46.3.19.8 Each car operating station shall be provided with a “door open” and “door close” push button.
 - 4.1.46.3.19.8.1 Pressure on the “door open” button shall cause doors in the full open position to remain so and doors engaged in the close cycle to reverse direction and assume the full open position so long as pressure remains applied to the button.
 - 4.1.46.3.19.8.2 The “door open” buttons shall also control the open cycle during Phase II - Emergency In-car Operation.
 - 4.1.46.3.19.8.3 The “door close” push button shall function on Independent Service, Attendant Service and Phase II - Emergency In-car Operation as well as during normal automatic operations.

- 4.1.46.3.19.9 Repeated attempts by the power door operator to open or close the door at any landing shall be monitored by the control system.
 - 4.1.46.3.19.9.1 In the event the door fails to cycle properly after a preset (adjustable) number of attempts, the car shall either travel to the next stop or remove itself from service, depending upon whether the malfunction is in the open or close cycle.
- 4.1.46.3.19.10 Each hoistway door shall be provided with an automatic self-closing mechanism arranged so that the door shall close and lock if the car should leave the landing while the hoistway door is unlocked.
- 4.1.46.3.19.11 Car doors shall be arranged to prevent their being manually opened from inside the car unless the elevator is positioned within a floor landing zone.

4.1.46.4 Machine Room/Secondary Equipment

- 4.1.46.4.1 Controller / Dispatcher (New)
 - 4.1.46.4.1.1 The elevators shall have generic microprocessor-based controller/dispatchers.
 - 4.1.46.4.1.2 Digital logic shall calculate optimum acceleration, deceleration and velocity patterns for the car to follow during each run.
 - 4.1.46.4.1.3 Closed-loop distance and velocity feedback shall monitor the actual performance of the elevator car with the desired speed profile.
 - 4.1.46.4.1.4 System operating software shall be stored in non-volatile memory.
 - 4.1.46.4.1.5 Elevator control relays, contactors, switches, capacitors, resistors, fuses, circuit breakers, overload relays, power supplies, electronic circuit boards, microprocessors, static motor drive units, wiring terminal blocks and related components shall be totally enclosed inside a free-standing metal cabinet with hinged access doors.
 - 4.1.46.4.1.5.1 Provide natural or mechanical ventilation for the controller cabinets.
 - 4.1.46.4.1.5.2 Equip the vent openings and exhaust fans with filters.
 - 4.1.46.4.1.6 Mount equipment to moisture-resistant, noncombustible panels supported from the steel frame.
 - 4.1.46.4.1.7 Provide "noise filter" between hoistway wiring and controller/dispatchers to eliminate interference.
 - 4.1.46.4.1.8 Optically isolate communication cables between components.
 - 4.1.46.4.1.9 Wiring: Wiring on the units, whether factory or field wiring, shall be done in neat order, and all connections shall be made to studs and/or terminals by means of grommets, solderless lugs or similar connections. All wiring shall be copper.

- 4.1.46.4.1.10 Terminal Blocks: Provide terminal blocks with identifying studs on units for connection of board wiring and external wiring.
- 4.1.46.4.1.11 Marking: Identifying symbols or letters shall be permanently marked on or adjacent to each device on the unit, and the marking shall be identical with marking used on the wiring diagrams. In addition to the identifying marks, the ampere rating shall be marked adjacent to all fuse holders.
- 4.1.46.4.1.12 A 23" flat-panel LCD monitor shall be provided inside the elevator machine room for diagnostic purposes. The monitor shall be permanently mounted in a cabinet, on a shelf immediately adjacent or attached to or in a control cabinet of at least one car of a group. By means of graphic depiction, information available on the screen shall include:
 - 4.1.46.4.1.12.1 An overview of car and corridor calls currently existing within the system.
 - 4.1.46.4.1.12.2 Elevator operating status.
 - 4.1.46.4.1.12.3 Elevator position, direction of travel and velocity.
 - 4.1.46.4.1.12.4 The open/close status of elevator door.
 - 4.1.46.4.1.12.5 The current operational status of each CPU input and output.
 - 4.1.46.4.1.12.6 A sequential history of faults detected within the control system over the previous thirty (30) days.
- 4.1.46.4.13 Where the "LCD" is not an integral part of the controller and troubleshooting/reprogramming requires the use of a separate tool, the tool shall be maintained in the machine room and accessible to service personnel. This tool, along with all technical documentation for the correct use of the tool, shall remain the property of the Owner.
 - 4.1.46.4.13.1 Password protection of critical programming features is required to prevent accidental changes to life-safety and other non-typical control settings.
 - 4.1.46.4.13.2 Where a separate dispatch or group control panel is provided, a separate "LCD" display shall be provided to view group functions.
- 4.1.46.4.14 In the event diagnostics and monitoring is accomplished via Field Service Tools, provide the required Field Service Tools with related control system appurtenances for diagnostic evaluations, system monitoring and field adjustments.
 - 4.1.46.4.14.1 Provide instructions for proper use of such diagnostic tools and/or equipment with all coding and other operational requirements.
 - 4.1.46.4.14.2 Maintain and calibrate the diagnostic tools, and update the associated instructions and other related documents under the service agreement.
 - 4.1.46.4.14.2.1 Should the agreement be cancelled for any reason by either party, maintenance and updating of diagnostic tools shall be provided to the Owner at the Successful Respondent's cost without the need to purchase or lease additional diagnostic

devices, special tools or instructions from the original equipment provider.

4.1.46.4.14.2.2 The Owner may request field and technical instructions be provided by the original installation Successful Respondent or manufacturer for proper servicing by other qualified elevator company personnel.

4.1.46.4.14.2.3 The established cost-plus profit, as previously specified, shall be applicable for the life of the system.

4.1.46.4.14.2.3.1 If the equipment for fault diagnosis is not completely self-contained within the controllers but requires a separate detachable device, that device shall be furnished to the Owner as part of this installation.

4.1.46.4.14.2.3.2 Such device shall be in possession of and become property of the Owner.

4.1.46.4.15 Microprocessor Documentation

4.1.46.4.15.1 Provide and/or obtain complete information on systems' design, component parts, installation and/or modification procedures, adjusting procedures and associated computer conceptual logic circuitry and field connection.

4.1.46.4.15.2 Provide microprocessor upgrading and/or modifications to programs that have been assigned to enhance the operation of the equipment for a period of 10 years after project approval.

4.1.46.4.2 Machine Beams (Existing)

4.1.46.4.2.1 Provide additional support beams, angles, plates, bearing plates, blocking steel members, etc., to support new machine, governors, dead end hitches, deflector and overhead sheaves from existing machine beams where applicable.

4.1.46.4.2.2 Successful Respondent shall verify adequacy of all existing supports scheduled to be reused and report any potential issues to the Owner.

4.1.46.4.3 Gearless Elevator Hoisting Machine (New) – Base Bid

4.1.46.4.3.1 Provide an alternating current (AC) gearless traction machine, specially designed and manufactured for elevator service. The machine shall have high starting torque and low starting current, rated for 50^o C (90^o F) continuous operation, and a minimum of 240 starts per hour.

4.1.46.4.3.1.1 The traction driving sheave and brake drum shall be cast integral and bolted securely to the main armature shaft.

4.1.46.4.3.1.2 Securely mount the machine frame, including motor fields, bearing stands and brake on a heavy steel bedplate.

4.1.46.4.3.1.3 The armature shaft shall be supported in ball or roller type bearings.

4.1.46.4.3.1.4 The driving sheave shall be cast from the best grade of metal with a Brinell hardness of 215 to 230 and shall be machined with grooves, providing maximum traction with a minimum of rope and sheave wear.

4.1.46.4.3.1.4.1 Roping requirements and type of steel rope used as suspension means shall be engineered by the contractor and manufacturer of the equipment for maximum life of ropes and sheave.

4.1.46.4.3.1.5 Ensure that adequate ventilation of internal stator windings and rotating element is provided to prevent overheating with thermal overload protection. (Constant velocity fan for constant cooling.)

4.1.46.4.3.1.6 Equip housing with eyebolt(s) for lifting.

4.1.46.4.3.1.7 Provide a spring applied and electrically released electro-mechanical brake.

4.1.46.4.3.1.8 Swivel type brake shoes shall be applied to the braking surface simultaneously and with equal pressure by means of helical compression springs.

4.1.46.4.3.1.9 Design the brake for quick release to provide smooth and gradual application of the brake shoes.

4.1.46.4.3.1.9.1 An emergency brake shall be an integral part of the machine design.

4.1.46.4.3.10 Provide 14-gauge hoist cable guards at the car-drop and counterweight-drop side of the machine sheave.

4.1.46.4.3.10.1 Guards shall cover cables from the point of slab penetration to the point where the hoist cables contact the sheave.

4.1.46.4.3.10.2 Guards shall prevent access to cables at pinch points.

- 4.1.46.4.3.10.3 Guards shall have no sharp edges.
- 4.1.46.4.3.10.4 Guards shall be properly mounted to prevent vibration.
- 4.1.46.4.3.11 Where a secondary level exists, span the distance between the car and counterweight with an accurately grooved deflector sheave mounted in the secondary level.
- 4.1.46.4.3.12 Provide a sheave guard to prevent hoisting rope from jumping off grooves and to prevent possible entrapment on both sides of the floor penetrations.
- 4.1.46.4.3.13 Design and construct the hoisting machine based on passenger elevator cab enclosure weight as specified and as shown on the architectural drawings.
- 4.1.46.4.4 Gearless Hoisting Machine / Sheaves / Brake (Reuse/Refurbish - DC) – Alternate No. 1
 - 4.1.46.4.4.1 The existing gearless traction hoist machine shall be reconditioned and reused.
 - 4.1.46.4.4.1.1 Brush rigging, motor armature windings, field coils and interpoles shall be cleaned with compressed air or through use of inert, high pressure, non-flammable, moisture free gas (i.e. NitroCleantm process) to remove accumulated carbon dust.
 - 4.1.46.4.4.1.2 Resistance readings between armature windings / field coils / interpoles and ground shall be recorded on an individual basis. Any component measuring less than 5 megohms to ground at 250 volts DC shall undergo further examination to determine the cause for the low reading.
 - 4.1.46.4.4.1.2.1 The Successful Respondent shall perform any repairs necessary to restore minimum acceptable resistance levels.
 - 4.1.46.4.4.1.3 Missing, damaged or loose armature banding shall be replaced.
 - 4.1.46.4.4.1.4 Solder connections between a commutator segment and motor armature winding shall be renewed where necessary.
 - 4.1.46.4.4.1.5 Mica insulation between commutator segments shall be undercut and the commutator resurfaced to provide a smooth concentric brush contact surface.
 - 4.1.46.4.4.1.6 Brush rigging shall be dismantled for cleaning and to examine the condition of insulators. Replace damaged or defective rigging as required.
 - 4.1.46.4.4.1.7 New brushes of proper size and composition shall be installed, seated, quartered and reset to an electrical neutral position.
 - 4.1.46.4.4.1.8 Hoist motor bearing reservoirs shall be drained of existing lubricant and flushed to remove any sediment.
 - 4.1.46.4.4.1.8.1 Where applicable, open-link type chain shall be provided within each bearing for the purpose of distributing lubrication.

- 4.1.46.4.4.1.8.2 Each bearing shall be refilled with the proper amount of fresh lubricant as recommended by the O.E.M.
- 4.1.46.4.4.1.9 Field coils with split or unraveling outer wrapping shall be removed from the hoist machine and rewrapped with an approved insulating material.
- 4.1.46.4.4.1.10 Distance between each hoist motor armature winding and each lower field pole shall be measured to determine bearing wear.
 - 4.1.46.4.4.1.10.1 Where contact between the armature banding and field pole is deemed imminent, bearings on both ends of the hoist machine shall be replaced.
- 4.1.46.4.4.1.11 Motor bearings producing excessive heat, noise, vibration or any other unfavorable characteristics during operation, shall be replaced.
- 4.1.46.4.4.1.12 Oil retention seals that display evidence of leakage shall be renewed.
- 4.1.46.4.4.1.13 The existing drive sheave shall undergo Brinell testing to determine its prospects for re-grooving.
 - 4.1.46.4.4.1.13.1 A new sheave shall be provided should Brinell hardness readings of less than 215 be obtained.
- 4.1.46.4.4.1.14 Upon completing of all machine work, the Successful Respondent shall commission third party vibration testing as approved by the Consultant, with results made available to the Owner.
- 4.1.46.4.4.1.15 Provide hoist cable guards at the car and counterweight-drop side of the machine sheave. Guards shall cover cables from the point of slab penetration to the point where the hoist cables contact the sheave preventing access to cables at pinch points.
- 4.1.46.4.4.2 The existing secondary/deflector sheave assembly shall be refurbished and reused.
 - 4.1.46.4.4.2.1 The sheave assembly shall be washed clean of accumulated oil and grease and examined for any indication of bearing failure or leakage.
 - 4.1.46.4.4.2.2 Bearings which are worn or found to emit unusual noises, excessive heat or other unfavorable characteristics shall be renewed or reabbitted per OEM standards.
 - 4.1.46.4.4.2.3 Replace oil seals.
 - 4.1.46.4.4.2.4 Bearing oil reservoirs shall be drained of existing lubricants and flushed to remove any sediment.

- 4.1.46.4.4.2.5 Chains utilized within each bearing to carry lubrication shall be of an open link type.
 - 4.1.46.4.4.2.6 Glass sight gauges shall be replaced with stand pipes.
 - 4.1.46.4.4.2.7 Each bearing shall be filled with the proper amount of fresh lubricant as recommended by OEM.
 - 4.1.46.4.4.2.8 Overhead fastenings between the secondary/deflector sheave assembly and machine beams shall be inspected to verify the structural integrity of the attachment.
 - 4.1.46.4.4.2.9 Secondary/deflector sheave alignment with the hoist machine and the counterweight guide rails shall be checked and reset as necessary.
 - 4.1.46.4.4.2.10 The secondary sheave shall be provided with means to guard the hoist ropes so they do not jump out of their respective grooves during a slack rope condition.
- 4.1.46.4.4.3 Reuse existing brake and overhaul for new.
- 4.1.46.4.4.3.1 Replace linings and resurface scored drum pulley.
 - 4.1.46.4.4.3.2 Renew worn plunger sleeves, clean core surfaces, replace spacers and reset air gap.
 - 4.1.46.4.4.3.3 Reinsulate, rewind and replace leads of the brake coil as required.
 - 4.1.46.4.4.3.4 Inspect all pivot pins and related housing bores for wear.
 - 4.1.46.4.4.3.4.1 Rebore worn castings and provide oversized pin shafts where required.
 - 4.1.46.4.4.3.4.2 Provide new cotter pins and associated hardware with lubrication devices for each pivot point.
 - 4.1.46.4.4.3.5 Replace worn tension springs and hardware where necessary.
 - 4.1.46.4.4.3.6 Adjust brake assembly for proper lift and set action in accordance with O.E.M. specifications.
 - 4.1.46.4.4.3.6.1 Brakes shall be adjusted to safely hold 125% of rated full load capacity in accordance with applicable code.
- 4.1.46.4.5 VVVF AC Drive (New) – Base Bid
- 4.1.46.4.5.1 Provide a solid-state, variable voltage, variable frequency (VVVF), 3-phase AC hoist motor drive system as part of the microprocessor-based equipment.
 - 4.1.46.4.5.1.1 VVVF drive system shall be a low-noise, flux-vector inverter device.
 - 4.1.46.4.5.1.2 Include a digital LED readout and touch-key pad to facilitate software parameter adjustments, monitor system operation and display fault codes.
 - 4.1.46.4.5.2 The drive shall utilize a 3-phase, full wave rectifier and capacitor bank to provide direct current power for solid-state inversion.

- 4.1.46.4.5.3 The inverter shall utilize IGBT power semiconductors and duty cycle modulation fundamental frequency of not less than one kilohertz to synthesize 3-phase, variable voltage variable frequency output.
- 4.1.46.4.5.4 The system shall be designed and configured with the following countermeasures for noise generated by the pulse-width modulated (PWM) inverters.
 - 4.1.46.4.5.4.1 Control of radiated noise via inverter and/or motor cables.
 - 4.1.46.4.5.4.2 Conducted noise through power lines.
 - 4.1.46.4.5.4.3 Induction noise and ground noise.
- 4.1.46.4.5.5 Inverter shall be encased in metal and independently grounded.
- 4.1.46.4.5.6 A noise filter for the input power line shall be provided to prevent penetration into radios, wireless equipment and smoke detectors.
- 4.1.46.4.5.7 A 3% three-phase line reactor shall be provided on the power system rated at the utility voltage input to the drive and sized for the rated drive current.
- 4.1.46.4.5.8 The drive shall:
 - 4.1.46.4.5.8.1 Be configured as a complete digital drive system.
 - 4.1.46.4.5.8.2 Be totally software configurable.
 - 4.1.46.4.5.8.3 Interface with external equipment/signals via either discrete local I/O connections or high speed Local Area Network (LAN).
 - 4.1.46.4.5.8.4 Be located within the limits of the control cabinet (where system size allows) or separately mounted in an appropriate chassis with hinged swing-out doors with clearances equal to the cabinet width dimensions.
 - 4.1.46.4.5.8.5 Provide programmable linear or S-curve acceleration.
 - 4.1.46.4.5.8.6 Provide free run or programmable linear or S-curve deceleration.
 - 4.1.46.4.5.8.7 Have controlled reversing.
- 4.1.46.4.5.9 Operating and Environmental Conditions:
 - 4.1.46.4.5.9.1 Have a service factor of 1.0.
 - 4.1.46.4.5.9.2 Rated for continuous duty.
 - 4.1.46.4.5.9.3 Humidity - 90% rated humidity non-condensing.
 - 4.1.46.4.5.9.4 Cooling - forced air when required.
 - 4.1.46.4.5.9.5 Digital display for:
 - 4.1.46.4.5.9.5.1 Running - output frequency, motor RPM, output current, voltage.
 - 4.1.46.4.5.9.5.2 Setting - Parameters values for setup and review.
 - 4.1.46.4.5.9.5.3 Trip - separate message for each trip, last 30 trips to be retained in memory.

4.1.46.4.5.10 Protective Features:

- 4.1.46.4.5.10.1 Motor overspeed.
- 4.1.46.4.5.10.2 Adjustable current limit.
- 4.1.46.4.5.10.3 Isolated control circuitry.
- 4.1.46.4.5.10.4 Digital display for fault conditions.
- 4.1.46.4.5.10.5 Selectable automatic restart at momentary power loss.
- 4.1.46.4.5.10.6 Manual restart.
- 4.1.46.4.5.10.7 Over/Under Voltage.
- 4.1.46.4.5.10.8 Line to line and line to ground faults.
- 4.1.46.4.5.10.9 Over-temperature.

4.1.46.4.6 VVVF AC Drive - Regenerative Module (New) – Base Bid

- 4.1.46.4.6.1 The system shall provide full regenerative capabilities to control overhauling motor speed and reduce hoist motor deceleration time by allowing overhaul power to be discharged back into the power lines.
 - 4.1.46.4.6.1.1 The regenerative section may be an integral part of the drive or a stand-alone unit mounted in a separate cabinet with proper ventilation as required by the manufacturer.

4.1.46.4.7 SCR - DC Static Motor Drive – (Alternate 1)

- 4.1.46.4.7.1 Provide a microprocessor controlled solid-state motor drive system designed for use with the traction hoisting machine and power supply.
 - 4.1.46.4.7.1.1 Provide a full wave, four-quadrant, solid-state hoist motor drive unit as an integral part of the microprocessor based elevator control system to produce and regulate DC current to the hoist motor armature and fields.
 - 4.1.46.4.7.1.2 Provide the following additional equipment necessary for a complete installation:
 - 4.1.46.4.7.1.2.1 Isolation transformer on the incoming 3-phase AC power supply.
 - 4.1.46.4.7.1.2.2 Noise reduction chokes / ripple filters on the DC motor loop.
 - 4.1.46.4.7.1.2.3 Successful Respondent to disconnect the hoist motor armature from the SCR drive unit whenever the elevator is stopped in accordance with code.
- 4.1.46.4.7.2 All components of the SCR drive system shall be located inside the elevator controller cabinet or in a separate ventilated cabinet with hinged door.
- 4.1.46.4.7.3 Distortion (notching) introduced into the 3-phase power supply by the SCR drive unit shall not exceed the recommended limits established under ANSI/IEEE Standard 519-1981 (1).
- 4.1.46.4.7.4 Combined noise output from all components of the elevator drive system, including the hoist motor, SCR drive unit, choke and filter, as measured anywhere within the machine room during operation shall not exceed 70 dBa.

- 4.1.46.4.7.5 The drive shall operate at $\pm 10\%$ of normal feeder voltage and $\pm 3\%$ of normal feeder frequency without component damage or interruption of elevator service.
- 4.1.46.4.7.6 Operating and Environmental Conditions:
 - 4.1.46.4.7.6.1 Rated for continuous duty.
 - 4.1.46.4.7.6.2 Humidity - 90% rated humidity non-condensing.
 - 4.1.46.4.7.6.3 Cooling - forced air when required.
 - 4.1.46.4.7.6.4 Digital display for:
 - 4.1.46.4.7.6.4.1 Running - motor RPM, output current, voltage selectable).
 - 4.1.46.4.7.6.4.2 Setting - Parameters values for setup and review.
 - 4.1.46.4.7.6.4.3 Trip - separate message for each trip, last 30 trips to be retained in memory.
- 4.1.46.4.7.7 Protective Features:
 - 4.1.46.4.7.7.1 Motor overspeed.
 - 4.1.46.4.7.7.2 Adjustable current limit.
 - 4.1.46.4.7.7.3 Digital display for fault conditions.
 - 4.1.46.4.7.7.4 Selectable automatic restart at momentary power loss.
 - 4.1.46.4.7.7.5 Manual restart.
 - 4.1.46.4.7.7.6 Over/Under Voltage.
 - 4.1.46.4.7.7.7 Line to line and line to ground faults.
 - 4.1.46.4.7.7.8 Over-temperature.
- 4.1.46.4.8 Overspeed Governor (New)
 - 4.1.46.4.8.1 Provide a speed governor, located overhead, to operate the car safety.
 - 4.1.46.4.8.1.1 Maintain the proper tension in the governor rope with a weighted tension sheave located in the pit.
 - 4.1.46.4.8.1.1.1 Springs used to develop the tension are not acceptable.
 - 4.1.46.4.8.1.2 Provide rope grip jaws, designed to clamp the governor rope to actuate the car safety upon a predetermined overspeed downward.
 - 4.1.46.4.8.1.2.1 The centrifugal type governor shall trip and set rope jaws within 60 degrees of governor sheave rotation after reaching rated tripping speed.
 - 4.1.46.4.8.1.3 Design the governor rope tripping device so that no appreciable damage to or deformation of the governor rope shall result from the stopping action of the device in operating the car safety.
 - 4.1.46.4.8.1.4 Provide an electrical governor overspeed protective device which shall remove power from the driving machine motor and brake before or at the application of the safety.
 - 4.1.46.4.8.1.4.1 The setting for the overspeed switch shall be as prescribed in the ASME A17.1 Safety Code.
 - 4.1.46.4.8.1.4.2 Locate and enclose the switch to ensure that excess lubrication will not enter the switch enclosure.

- 4.1.46.4.8.1.4.3 Overspeed switch shall operate in both direction of travel on systems employing a static power drive unit.
- 4.1.46.4.8.1.5 Seal and tag the governor with the running speed, tripping speed and date last tested.
- 4.1.46.4.8.1.6 Design the governor to prevent false tripping due to conditions caused by rope dynamics.
- 4.1.46.4.9 Equipment Isolation (New)
 - 4.1.46.4.9.1 Provide sound reducing vibration isolation elements at all support points of elevator controller, solid-state motor drives, isolation transformers, reactance units, hoisting motors and machines.
 - 4.1.46.4.9.2 The elements for controllers, solid-state motor drives and isolation transformers shall be similar to double deflection neoprene-in-shear mounts, as manufactured by Mason Industries, Type ND, with 0.35" static deflection under design load ratings.
 - 4.1.46.4.9.3 Elements between the hoisting machine unitized base and machine support beams shall be similar to triple layer ribbed neoprene pads, separated by appropriate steel shims as manufactured by Mason Industries, Type W pads, at 50 durometers, loaded for 40 psi or approved equal.
 - 4.1.46.4.9.4 All bolts through isolation elements, where necessary, are to incorporate resilient washers and bushings.
 - 4.1.46.4.9.5 Isolation of existing hoisting machine and motor is contingent on the OEM design of the apparatus.
 - 4.1.46.4.9.5.1 Existing isolation pads shall be replaced with new.
- 4.1.46.4.10 Ascending Car Overspeed Protection Device (New)
 - 4.1.46.4.10.1 Provide a device designed to prevent an ascending elevator from striking the hoistway overhead structure.
 - 4.1.46.4.10.2 The device shall decelerate the car with any load up to the rated capacity by applying an emergency brake.
 - 4.1.46.4.10.2.1 The device shall detect an ascending car overspeed condition of not greater than 10% higher than the speed that the car governor is set to trip.
 - 4.1.46.4.10.2.2 The device, when activated, shall prevent operation of the car until the device is manually reset.
 - 4.1.46.4.10.2.3 The device shall meet the requirements of the ASME A17.1 Safety Code as may be modified by the AHJ.

4.1.46.4.11 Unintended Car Movement Protection Device (New)

4.1.46.4.11.1 Provide a device to prevent unintended car movement away from the landing when the car and hoistway doors are not closed and locked.

4.1.46.4.11.1.1 The device shall prevent such movement in the event of failure of:

4.1.46.4.11.1.1.1 The electric driving machine motor.

4.1.46.4.11.1.1.2 The brake.

4.1.46.4.11.1.1.3 The machine shaft or shaft coupling.

4.1.46.4.11.1.1.4 Machine gearing.

4.1.46.4.11.1.1.5 Control system.

4.1.46.4.11.1.1.6 Any component upon which the speed of the car depends.

4.1.46.4.11.1.2 Suspension ropes and the drive sheave of the traction machine are excluded.

4.1.46.4.11.1.3 The device shall prevent operation of the car until the device is manually reset.

4.1.46.4.11.1.4 The device shall meet the requirements of the ASME A17.1 Safety Code as may be modified by the AHJ.

4.1.46.4.11.1.5 Any requirements for lifting the machine / motor to meet the height requirements for the equipment will be included.

4.1.46.4.11.1.6 If a rope gripper is being utilized to comply with unintended car movement protection requirements of the Elevator Code, the preferred mounting location for both units is in the machine room; alternate locations will only be approved if absolutely necessary. See submittal requirements.

4.1.46.5 Hoistway Equipment

4.1.46.5.1 Guide Rails / Inserts / Brackets (Reuse)

4.1.46.5.1.1 Car and counterweight guide rails, fish plates, rail brackets, backing support and related attachments shall be inspected to determine if unfavorable conditions exist that diminish the structural integrity of any component.

4.1.46.5.1.1.1 In the event substandard conditions are disclosed by means of this inspection, the Successful Respondent shall immediately inform the Consultant as to the exact nature of said problems and then undertake whatever repairs and/or replacements the Consultant may deem appropriate to remedy the situation.

4.1.46.5.1.2 Each stack of guide rails shall be individually examined to determine if excessive compression has occurred from building settlement.

4.1.46.5.1.2.1 In the event such conditions are found to exist, each affected stack shall be cut off enough to relieve pressure.

4.1.46.5.1.2.2 Jacking bolts shall be provided underneath each stack of both car and counterweight guide rails.

4.1.46.5.1.3 Each stack of guide rails shall be realigned so that total deviation from plumb in any direction does not exceed 1/8" over the entire length of the hoistway and that DBG measurements never vary more than .030".

4.1.46.5.1.4 As required, car guide rails joints shall be individually filled, filed and sanded in order to eliminate minor variations in adjoining machined surfaces.

4.1.46.5.2 Counterweight Assembly (Reuse)

4.1.46.5.2.1 The existing counterweight assembly shall be refurbished to as new condition and reused.

4.1.46.5.2.2 Individual counterweight frame members shall be inspected for any indication of damage and to determine if the overall assembly is twisted, racked, or otherwise distorted.

4.1.46.5.2.2.1 All fastenings between counterweight frame members shall be individually examined, tightened and if necessary renewed.

4.1.46.5.2.2.2 In case any of these conditions are found to exist, the Successful Respondent shall immediately inform the Consultant about the exact nature of the problem and undertake whatever corrective action the Consultant may deem appropriate to remedy the situation.

4.1.46.5.2.3 The amount of filler weight placed within the counterweight frame shall be adjusted so the weight of the entire counterweight assembly is equal to that of the renovated elevator car, plus 40-42% of its rated loading capacity unless otherwise required by a manufacturer where new hoisting machinery is employed.

4.1.46.5.2.3.1 Filler weights shall be held securely in place at all times with tie rods passing through holes in both the weights and the counterweight frame with tie rods secured on each end with double lock nut and a cotter pin arrangement.

4.1.46.5.3 Roller Guides (New)

4.1.46.5.3.1 Provide roller guide shoes with adjustable mounting base, rigidly bolted to the top and bottom of each side of the car and counterweight frame.

4.1.46.5.3.1.1 Roller guides shall consist of a set of sound reducing neoprene/polyurethane wheels in precision bearings held in contact with the three finished rail surfaces by adjustable stabilizing springs.

4.1.46.5.3.1.2 The bearings shall be sealed or provided with grease fittings for lubrication.

4.1.46.5.3.1.3 Equip roller guides with adjustable stops to control postwise float.

4.1.46.5.3.1.4 Fit the top car roller guards with galvanized, painted or powder coated steel guards.

4.1.46.5.3.2 Approved Applications and manufacturers:

4.1.46.5.3.2.1 ELSCO Express 3 for car roller guides and ELSCO Model C for counterweight guides or approved equal.

4.1.46.5.3.2.2 Static and dynamic balancing of cards is required as specified elsewhere in this Request for Proposal.

4.1.46.5.4 Hoist Ropes (New) / Base Bid

4.1.46.5.4.1 Pre-formed traction steel wire rope, specifically constructed for elevator applications, shall be provided for suspension of the elevator car and counterweight assembly.

4.1.46.5.4.1.1 Fastenings shall be accomplished by use of individual tapered rope sockets with adjustable shackles.

4.1.46.5.4.1.2 General design requirements for rope shackles and the method of securing wire rope shall conform with ASME A17.1 elevator safety code as modified by, and/or in addition to codes and standards accepted by the AHJ.

4.1.46.5.4.2 New ropes shall be identical in number and construction to those which are currently in use.

4.1.46.5.4.3 Broken rope shackle springs shall be replaced

4.1.46.5.4.4 Provide anti-spinout as required by applicable code at all shackles where applicable.

4.1.46.5.5 Hoist Ropes (Conditional Reuse) / (Alternate 1)

4.1.46.5.5.1 Existing wire hoisting ropes shall be examined and evaluated for replacement.

4.1.46.5.5.2 All ropes demonstrating significant wear, dry lubrication cores or any deterioration, reducing the projected life to less than five (5) years, shall be renewed in conjunction with the modernization procedure.

4.1.46.5.5.2.1 Necessary new pre-formed traction steel wire rope specifically constructed for elevator applications shall be provided for suspension of the elevator car and counterweight assembly.

4.1.46.5.5.2.2 New ropes shall be identical in number and construction to those which are currently in use.

4.1.46.5.5.3 Fastenings shall be accomplished by use of individual tapered rope sockets with adjustable shackles.

4.1.46.5.5.3.1 General design requirements for rope shackles and the method of securing wire rope shall conform with ASME A17.1 Safety Code as adopted and/or otherwise modified by the AHJ.

4.1.46.5.5.4 Broken hoist rope shackle springs shall be replaced on an as needed basis.

4.1.46.5.5.5 Provide anti-spinout as required by applicable code at all shackles.

NOTE: Renewal of traction drive sheaves, including secondary sheaves, mandates rope replacements. All ropes will be replaced with the acceptance of new AC gearless machines.

4.1.46.5.6 Governor Rope (New)

4.1.46.5.6.1 Pre-formed wire rope specifically constructed for elevator applications, shall be provided for governor ropes.

4.1.46.5.6.1.1 Rope shall be traction steel or iron in accordance with OEM design requirements.

4.1.46.5.6.1.1.2 Rope diameter and method of fastening shall be in accordance with ASME A17.1 Safety Code as adopted and/or otherwise modified by the AHJ.

4.1.46.5.7 Compensating Ropes (New)

4.1.46.5.7.1 Existing wire compensation ropes shall be examined and evaluated for replacement.

4.1.46.5.7.1.1 All ropes demonstrating significant wear, dry lubrication cores or any deterioration, reducing the projected life to less than five (5) years, shall be renewed in conjunction with the modernization procedure.

4.1.46.5.7.1.1.1 Necessary new pre-formed traction steel wire ropes, specifically constructed for elevator applications, shall be provided for compensating ropes.

4.1.46.5.7.1.1.2 Ropes shall be of sufficient diameter and number so as to offset the unbalanced weight of hoist ropes and traveling ropes.

4.1.46.5.7.2 Fastenings shall be accomplished by use of individual tapered rope sockets with adjustable shackles.

4.1.46.5.7.2.1 Where O.E.M. method of fastening does not employ shackles, duplicate the original design method.

4.1.46.5.7.2.2 Where shackles are required, general design requirements for rope shackles and the method of securing wire rope shall conform with ASME A17.1 Safety Code as adopted and/or otherwise modified by the AHJ.

4.1.46.5.7.2.3 Provide anti-spinout as required by applicable code at all shackles.

4.1.46.5.8 Electrical Conduit / Wiring / Traveling Cable (New)

4.1.46.5.8.1 Electrical wiring shall be provided.

4.1.46.5.8.1.1 All wiring shall be stranded copper conductors, manufactured in compliance with ANSI/ASTM B174-71 and UL 62 requirements, and polyvinyl chloride insulation complying with ETT requirements of UL 62 and Article 400 of the National Electric Code.

4.1.46.5.8.1.2 Electrical wiring provided for hoistway interlock shall be of a flame retardant type, capable of withstanding temperatures of at least 392 degrees Fahrenheit. Conductors shall be Type SF or equivalent.

4.1.46.5.8.1.3 Each run of electrical conduit or duct shall contain no less than 10% spare wires and, in any case, no fewer than two (2) spare wires.

4.1.46.5.8.1.4 Crimp-on type wire terminals shall be used where possible.

4.1.46.5.8.2 Traveling cable shall be provided. (New)

- 4.1.46.5.8.2.1 Each traveling cable shall be provided with a flame and water resistant polyvinyl chloride jacket.
- 4.1.46.5.8.2.2 Electrical wiring shall consist of stranded copper conductors, manufactured in compliance with ANSI/ASTM B174-71 and UL 62 requirements, and polyvinyl chloride insulation complying with ETT requirements of UL 62 and Article 400 of the National Electric Code.
- 4.1.46.5.8.2.3 Each traveling cable shall contain no less than 10% spare wires.
- 4.1.46.5.8.2.4 Traveling cable exceeding 100' in length shall be provided with a steel wire rope support strand from which the cable shall be suspended.
- 4.1.46.5.8.2.5 Traveling cable must be contained within an approved electrical conduit to within 6' of the final suspension point in the hoistway.
- 4.1.46.5.8.2.6 Each traveling cable shall be arranged to provide no fewer than six (6) individually shielded pairs of 20-gauge wire and arranged to contain no less than one (1) coaxial cable for CCTV remote monitoring.
- 4.1.46.5.8.2.7 Traveling cable conductors that terminate at a hoistway center box shall be connected to stud blocks provided for that purpose.
 - 4.1.46.5.8.2.7.1 Each wiring terminal shall be clearly identified by its nomenclature as shown on the "as built" wiring diagrams and solderless, crimp-on type wire terminals shall be used where possible.
- 4.1.46.5.8.2.8 The attachment of a traveling cable to the underside of the elevator car shall be performed so that a minimum loop diameter of 30x the cable diameter is provided.
- 4.1.46.5.8.2.9 Pre-hang the cables for at least 24 hours with ends suitably weighted to eliminate twisting during operation.

4.1.46.5.8.3 Rigidly supported EMT conduit, flexible metal conduit and galvanized steel trough shall be utilized throughout the hoistway.

- 4.1.46.5.8.3.1 Both EMT and flexible conduit shall be connected on either end by use of compression fittings and secured in place with metal clamps sized in accordance with the diameter of conduit utilized.
 - 4.1.46.5.8.3.1.1 Wire or plastic wire ty-raps shall not constitute an acceptable means of fastening.
- 4.1.46.5.8.3.2 The use of flexible metal conduit shall be limited to runs not greater than 3' in length.
- 4.1.46.5.8.3.3 All abandoned or unused electrical conduit shall be removed from the hoistway.
- 4.1.46.5.8.3.4 Existing conduit and wiring duct may be reused if suitable for the application.
 - 4.1.46.5.8.3.4.1 Reuse of existing conduit/duct shall be at the discretion of the Consultant.

4.1.46.5.9 Normal and Final Terminal Stopping Devices (New)

- 4.1.46.5.9.1 Provide normal terminal stopping devices to stop the car automatically from any speed obtained under normal operation within the top and bottom overtravel, independent of the operating devices, final terminal stopping device and the buffers.
- 4.1.46.5.9.2 Provide final terminal stopping devices to stop the car and counterweight automatically from the speed specified within the top clearance and bottom overtravel.
- 4.1.46.5.9.3 The terminal stopping devices shall have rollers with rubber or other approved composition tread to provide silent operation when actuated by the cam fixed to the top of the car.
 - 4.1.46.5.9.3.1 Terminal stopping devices that are not mechanically operated (i.e.: magnetic proximity) shall be provided by the manufacturer of the control equipment, intended for use as a terminal limit, and designed for reliable operation in the hoistway environment.
- 4.1.46.5.9.4 Final terminal limits shall be pinned so as to prevent movement after final adjustment where required by the AHJ.

4.1.46.5.10 Emergency Terminal Speed Limiting Device (New)

- 4.1.46.5.10.1 Provide necessary emergency terminal speed limiting devices where reduced stroke buffers are used.
 - 4.1.46.5.10.1.1 Operation of the device shall be independent of the operation of the normal terminal stopping device.
 - 4.1.46.5.10.1.2 Arrange the device to automatically reduce the car and counterweight speed by removing power from the driving machine motor and brake so that the rated striking speed of the buffer is not exceeded at the time of impact.
 - 4.1.46.5.10.1.3 The sensing device shall be independent of the normal speed control system.
 - 4.1.46.5.10.1.4 Short circuits caused by grounds or other conditions shall not prevent the operation of the device.

4.1.46.5.11 Emergency Terminal Stopping Device (New)

- 4.1.46.5.11.1 Provide necessary emergency terminal stopping devices where static motor control is used at speeds over 200 feet per minute.
 - 4.1.46.5.11.1.1 Operation of the device shall be independent of the operation of the normal terminal stopping device.
 - 4.1.46.5.11.1.2 Arrange the device to remove power from the driving machine motor and brake should the normal terminal stopping device fail to cause the car to slow down at the terminal as intended.

4.1.46.6 Pit Equipment

4.1.46.6.1 Car and Counterweight Buffers (New cars 3, 4, and 5)

- 4.1.46.6.1.1 Provide buffer with necessary blocking and horizontal steel braces under the car and counterweight.
- 4.1.46.6.1.2 Provide spring type buffers for elevators with operating speeds of up to and including 200 fpm.

- 4.1.46.6.1.3 Use oil buffers for elevators with operating speeds over 200 fpm.
 - 4.1.46.6.1.4 Oil buffer shall bring the car and counterweight to rest from governor tripping speed at an average rate of retardation not exceeding gravity (32 ft/s²).
 - 4.1.46.6.1.5 Oil buffer shall be of the spring return type and shall have means of checking oil supply level.
 - 4.1.46.6.1.6 Use reduced stroke buffer with associated terminal slowdown devices where runby is restrictive.
 - 4.1.46.6.1.6.1 Buffer and emergency terminal slowdown device shall operate in accordance with applicable codes.
 - 4.1.46.6.1.7 The buffer shall be tested and approved by a qualified testing laboratory.
 - 4.1.46.6.1.8 Provide a permanent buffer marking plate which indicates the manufacturer's name, identification number, rated impact speed and stroke.
 - 4.1.46.6.1.9 Provide a permanent data plate in the vicinity of the counterweight buffer indicating the maximum designed counterweight runby.
 - 4.1.46.6.1.10 Support buffers from the pit floor level with all required blocking and bracing steel members.
 - 4.1.46.6.1.11 Coordinate the installation of the buffer inspection platform and ladder with the Architect and Construction Manager.
- 4.1.46.6.2 Car and Counterweight Buffer (Reuse cars 1, 2, 6)
- 4.1.46.6.2.1 Existing car and counterweight buffers shall be reused.
 - 4.1.46.6.2.1.1 Pit channels, related supports and fastenings shall be inspected for damage and to determine if the structural integrity of any component is diminished by the effects of rust or other unfavorable conditions.
 - 4.1.46.6.2.1.1.1 In the event defects are found, the Successful Respondent shall immediately inform the Consultant and undertake whatever repair and/or replacement the Consultant may deem appropriate.

- 4.1.46.6.2.1.2 Surface rust shall be removed from all reused components.
 - 4.1.46.6.2.1.3 Where hydraulic buffers are used:
 - 4.1.46.6.2.1.3.1 Buffer plunger shall be honed free of all surface rust and blemishes and provided with a protective coating of machinist bluing.
 - 4.1.46.6.2.1.3.2 The hydraulic fluid reservoir on each buffer shall be drained, flushed and refilled with fresh oil. The grade and amount of fluid added to each buffer shall conform to O.E.M. specification.
 - 4.1.46.6.2.1.4 Provide a permanent buffer marking plate which indicates the manufacturer's name, identification number, rated impact speed and stroke.
 - 4.1.46.6.2.1.5 Provide a permanent data plate in the vicinity of the counterweight buffer indicating the maximum designed counterweight runby in accordance with ASME A17.1 as may be modified by, and/or in addition to codes and standards accepted by the AHJ.
 - 4.1.46.6.2.1.6 The buffer shall undergo testing in accordance with ASME A17.1 Code as modified by, and/or in addition to codes and standards accepted by the AHJ.
- 4.1.46.6.3 Inspection Platforms, Ladders, Guard Rails, Screens and Guards (New cars 3, 4, 5)
- 4.1.46.6.3.1 Provide the following secondary metal work in the pit, hoistway and in elevator machine room in accordance with bid documents.
 - 4.1.46.6.3.1.1 Wire mesh separator screen between two adjacent elevator pits located at different elevations.
 - 4.1.46.6.3.1.2 Counterweight shall be guarded by means of a fixed screen from the pit floor to a position of at least 2450 mm (96") above pit floor.
 - 4.1.46.6.3.1.3 Pit access ladders.
 - 4.1.46.6.3.1.4 Buffer inspection platforms and ladders.
 - 4.1.46.6.3.1.5 Guard rails and 60 degree ships ladders in machine room.
 - 4.1.46.6.3.1.6 Guard around machine, ropes and rope holed.
 - 4.1.46.6.3.1.7 Hoisting machine inspection and service platforms with handrails.
 - 4.1.46.6.3.2 Submit detailed shop drawings of all miscellaneous metal items for Consultant's approval.
 - 4.1.46.6.3.3 Provide painted sheet steel covers for all dead-end hitches.
 - 4.1.46.6.3.4 The pit ladder shall have continuous steel flat bar side rails 12 mm (1/2") x 75 mm (3"), with eased edges, spaced a minimum of 400 mm (16") apart. Rungs shall be steel bars 18 mm (3/4") in diameter, spaced 300 mm (12") apart with top to have a non-slip surface. Rungs shall be located along centerline of side rails, located not less than 180 mm (7") from the nearest permanent object or structure. Plug weld and grind smooth on outer rails faces. Support each ladder at top and bottom and at intermediate points spaced not more than 1500 mm (60"). Extend side rails 1200 mm (48") above top rung.

- 4.1.46.6.3.5 Prime paint and apply two (2) coats of rust inhibiting machinery enamel to metal work specified above as approved by the Consultant.
- 4.1.46.6.4 Roped Compensation and Compensating Sheave (New cars 3, 4, & 5)
 - 4.1.46.6.4.1 Provide compensation to offset the weight of the hoist ropes and unbalanced portion of the traveling cables.
 - 4.1.46.6.4.1.1 Compensation shall consist of iron or steel wire ropes attached to the underside of the car and counterweight passing under a weighted guide sheave in the pit.
 - 4.1.46.6.4.1.2 Provisions shall be made for equalizing tension in the compensating ropes.
 - 4.1.46.6.4.2 The guide sheave shall be provided with bearings of anti-friction bearing metal, ball, or roller type similar to those specified for hoisting machine.
 - 4.1.46.6.4.2.1 The guide sheave shall operate in guides, and the guide structure shall be securely fastened in place.
 - 4.1.46.6.4.2.2 Provide metal guards to prevent ropes jumping off of the sheave, prevent foreign objects from falling between ropes and sheave grooves and to protect workmen.
 - 4.1.46.6.4.2.3 Provide upper and lower limit of travel safety switches on the compensation guide sheave that shall stop the elevator when actuated.
 - 4.1.46.6.4.3 Provide lock down compensators and beams for all cars operating over 700 fpm.
- 4.1.46.6.5 Compensating Sheave Assembly (Reuse cars 1, 2, 6)
 - 4.1.46.6.5.1 The compensating sheave assembly shall be washed clean of accumulated grease and oil, then examined for any indication of bearing or bearing seal failure.
 - 4.1.46.6.5.2 Bearings which are found to emit unusual noises, appreciable vibration, excessive heat, or other unfavorable characteristics during operation shall be replaced.
 - 4.1.46.6.5.3 Defective grease retention seals shall be replaced as part of this scope of work.
 - 4.1.46.6.5.4 Compensating sheave guide rails, supports and fastenings shall be inspected for damage and to determine if the structural integrity of any component is diminished by the effects of rust or other unfavorable conditions.
 - 4.1.46.6.5.4.1 Where necessary, the Successful Respondent shall undertake whatever repairs and/or replacements are necessary to remedy the situation.
 - 4.1.46.6.5.5 Surface rust shall be removed from all reused components of the compensating sheave assembly prior to repainting.

- 4.1.46.6.5.6 The compensating sheave assembly shall be provided with manually reset electrical safety switches to trip prior to the sheave reaching the normal limit of its travel in either vertical direction.
 - 4.1.46.6.5.6.1 When in the tripped position, the electrical safety switch shall remove power from the hoist motor and machine brake.
 - 4.1.46.6.5.6.2 An existing electrical safety switch that meets the requirement set forth herein may be refurbished to as new condition and reused.
 - 4.1.46.6.5.7 Where applicable, the existing compensating sheave tie-down shall be dismantled and inspected for any indication of damage or other unfavorable conditions that might interfere with their proper operation.
 - 4.1.46.6.5.7.1 Where necessary, the Successful Respondent shall undertake repairs and/or replacements to remedy the situation.
 - 4.1.46.6.5.8 Tie-down shall be lubricated as necessary and set to O.E.M. specifications upon completion of repairs.
- 4.1.46.6.6 Governor Rope Tension Assembly (New cars 3, 4, 5)
 - 4.1.46.6.6.1 Provide a governor rope tension assembly.
 - 4.1.46.6.6.1.1 Maintain the proper tension in the governor rope with a weighted tension sheave located in the pit.
 - 4.1.46.6.6.1.1.1 Springs used to develop the tension are not acceptable.
 - 4.1.46.6.6.2 The sheave shall be of proper diameter and set directly plumb with the governor rope drop to prevent the rope from pulling off of the sheave at an angle.
 - 4.1.46.6.6.3 Lubrication fittings shall be provided on the assembly.
 - 4.1.46.6.6.4 The assembly shall have necessary rope guards to prevent accidental contact of the rope/sheave by service personnel and to prevent the governor rope from jumping off of the sheave.
- 4.1.46.6.7 Governor Rope Tension Assembly (Reuse cars 1, 2, and 6)
 - 4.1.46.6.7.1 The tension sheave assembly shall be washed clean of accumulated grease and oil and inspected for any indication of defective bearings.
 - 4.1.46.6.7.1.1 Sheave bearings or oilite bushings which are found to emit unusual noises, appreciable vibration, heat, or which allow the sheave to wobble during operation shall be replaced.
 - 4.1.46.6.7.1.2 Surface rust shall be removed from all components.
 - 4.1.46.6.7.2 At the Successful Respondent's option, the governor rope tension sheave assembly may be replaced with new in lieu of rebuilding as specified.
- 4.1.46.6.8 Pit Stop Switch (New)
 - 4.1.46.6.8.1 Where pit depth does not exceed 67", each elevator pit shall be provided with a push/pull or toggle switch that is conspicuously designated "EMERGENCY STOP" and located so as to be readily accessible from

the hoistway entrance on the lowest landing served at a height of approximately 18" above the floor.

4.1.46.6.8.1.1 This switch shall be arranged to prevent the application of power to the hoist motor and machine brake when placed in the "OFF" position.

4.1.46.6.8.1.2 Where climb-in pit depth exceeds 67", each pit shall be provided with two (2) push/pull or toggle switches conspicuously designated "EMERGENCY STOP".

4.1.46.6.8.1.2.1 Both of these stop switches, shall be located immediately adjacent to the pit access ladder.

4.1.46.6.8.1.2.1.1 Place one (1) stop switch approximately 47" above the pit floor.

4.1.46.6.8.1.2.1.2 Place the second stop switch 18" above the hoistway entrance sill on the lowest landing served.

4.1.46.6.8.1.2.1.3 These switches shall be arranged so as to prevent the application of power to the hoist motor or machine brake when either one is placed in the "OFF" position.

4.1.46.6.8.1.3 Where a walk-in pit exists, each elevator shall be provided with a push/pull or toggle switch that is conspicuously numbered and designated "EMERGENCY STOP".

4.1.46.6.8.1.3.1 The location of this stop switch shall be approximately 47" above the pit floor at the nearest point of pit entry from the access door.

4.1.46.6.8.1.3.2 This switch shall be arranged so as to prevent the application of power to the hoist motor and machine brake when placed in the "OFF" position.

4.1.46.6.8.1.4 Provide an electric contact safety switch for the pit access door if any equipment attached to the car extends within the space of the hoistway pit when the car is level at the bottom terminal landing.

4.1.46.6.8.1.4.1 Opening the pit access door shall cause the electric contact switch stop the elevator by interrupting electric power to the driving machine and brake.

4.1.46.6.8.1.4.2 Provide a sign on the pit door "**WARNING – OPENING OF PIT DOOR WILL STOP ELEVATOR**" using lettering a minimum of 2 inches high.

4.1.46.6.8.1.5 Existing stop and/or pit door switch conforming to the requirements set forth herein may be refurbished to as new condition and reused subject to approval of the Consultant.

4.1.46.7 Hoistway Entrances

4.1.46.7.1 Hoistway Entrances (Reuse)

4.1.46.7.1.1 Hoistway entrance sills, sill supports, entrance frames, headers and header supports shall be reused and refurbished.

- 4.1.46.7.1.1.1 Hoistway entrances that have become distorted or bent shall be straightened, plumbed, reset to the proper width dimension and reinforced as necessary.
- 4.1.46.7.1.1.2 Provide 14-gauge steel fascia plates that extend at least the full width of the door and be secured at hanger support and sill with oval head machine screws.
 - 4.1.46.7.1.1.2.1 Reinforce fascia to allow not more than ½” of deflection.
 - 4.1.46.7.1.1.2.2 Provide fascia plates where the clearance between the edge of the loading side of the platform and the inside face of the hoistway enclosure exceeds the code allowed clearance.
- 4.1.46.7.1.1.3 Provide 14-gauge steel toe guards that extend 12” below any sill not protected by fascia.
 - 4.1.46.7.1.1.3.1 The toe guards shall extend the full width of the door and shall return to the hoistway wall at a 15-degree angle and be firmly fastened.
 - 4.1.46.7.1.1.3.2 Remove oil, dirt and impurities on new and existing apparatus and give a factory coat of rust inhibitive paint to all exposed surfaces of struts, hanger supports, covers, fascias, toe guards, dust covers and other ferrous metal.
- 4.1.46.7.2 Slide Type Hoistway Door / New in Existing Frame at B
 - 4.1.46.7.2.1 Provide a new elevator hoistway entrance door reusing existing entrance frame.
 - 4.1.46.7.2.2 Each new door shall be as follows:
 - 4.1.46.7.2.2.1 Hollow metal construction
 - 4.1.46.7.2.2.2 1-1/2-hour fire-rated test approved with required label
 - 4.1.46.7.2.2.3 Manufactured of cold rolled furniture steel
 - 4.1.46.7.2.2.4 Flush design both sides
 - 4.1.46.7.2.2.5 Rigidly reinforced
 - 4.1.46.7.2.2.6 Sound deadened
 - 4.1.46.7.2.3 Where conditions warrant, and where otherwise required by code, equip all hoistway landing doors with one-piece full height non-vision wings of material and finish to match hall side of door panels.
 - 4.1.46.7.2.4 Provide each door panel with two removable laminated plastic composition guides, arranged to run in existing sill grooves with a minimum clearance.
 - 4.1.46.7.2.4.1 The guide mounting shall permit their replacement without removing the door from the hangers.
 - 4.1.46.7.2.4.2 A steel fire stop shall be enclosed in each guide.
 - 4.1.46.7.2.5 Provide the meeting edge of center opening doors with necessary new continuous rubber astragal bumper strips.
 - 4.1.46.7.2.5.1 Astragal shall be relatively inconspicuous when the doors are closed.

- 4.1.46.7.2.5.2 Provide rubber bumpers at the top and bottom of each section of door to stop them at their limit of travel in the opening direction.
- 4.1.46.7.2.6 In multi-speed door arrangements, provisions shall be made to interlock the individual panels so all panels close should the normal door panel relating means fail.
- 4.1.46.7.2.7 Provide a special key so that an authorized person can open any landing door when the car is elsewhere.
 - 4.1.46.7.2.7.1 The key hole shall be not less than 3/8" in diameter and shall be fitted with a stainless steel or bronze ferrule to match related equipment.
- 4.1.46.7.2.8 Finish all door panels to match elevator entrances
- 4.1.46.7.2.9 Where conditions require, provide necessary new masonry around existing entrance frames to maintain fire rating. Painting or other wall surface decorating will be by Owner.
- 4.1.46.7.3 Slide Type Hoistway Entrance Door Panels (Reuse at all floors except B)
 - 4.1.46.7.3.1 Hoistway entrance door panels shall be reused and refurbished.
 - 4.1.46.7.3.1.1 Provide each door panel with two removable laminated plastic composition guides, arranged to run in existing sill grooves with a minimum clearance.
 - 4.1.46.7.3.1.1.1 The guide mounting shall permit their replacement without removing the door from the hangers.
 - 4.1.46.7.3.1.1.2 A steel wear indicator shall be enclosed in each guide.
 - 4.1.46.7.3.1.2 Provide the meeting edge of center opening doors with necessary new continuous rubber astragal bumper strips.
 - 4.1.46.7.3.1.2.1 Astragal shall be relatively inconspicuous when the doors are closed.
 - 4.1.46.7.3.1.2.2 Provide rubber bumpers at the top and bottom of each section of door to stop them at their limit of travel in the opening direction.
 - 4.1.46.7.3.2 In multi-speed door arrangements, provisions shall be made to interlock the individual panels so all panels close should the normal door panel relating means fail.
 - 4.1.46.7.3.3 Provide a special key so that an authorized person can open any landing door when the car is elsewhere.
 - 4.1.46.7.3.3.1 The key hole shall be not less than 3/8" in diameter and shall be fitted with a stainless steel or bronze ferrule to match related equipment.
 - 4.1.46.7.3.3.2 Where applicable, plug the abandoned hoistway door access hole in each door panel, secured from the hoistway side of the door,

finished to match existing or as otherwise directed by the Owner.

4.1.46.7.3.3 Where conditions warrant, or where otherwise required by code, equip all hoistway landing doors with one-piece full height non-vision wings of material and finish to match hall side of door panels.

4.1.46.7.4 Tracks / Hangers / Closers / Interlocks (Reuse)

4.1.46.7.4.1 The existing hoistway door hangers, tracks and interlocks shall be reused and rehabilitated.

4.1.46.7.4.2 Roller/hanger assemblies, consisting of the roller and eccentric, shall be cleaned, degreased and adjusted for proper operation.

4.1.46.7.4.3 Up-thrust shall be minimized through adjustment of the eccentric roller.

4.1.46.7.4.4 Worn rollers and eccentrics shall be replaced where needed.

4.1.46.7.4.5 Thoroughly clean the track of all dirt and grease accumulations to provide a smooth surface.

4.1.46.7.4.6 The interlock shall be dissembled and checked for contact wear.

4.1.46.7.4.6.1 Worn contacts shall be replaced as required.

4.1.46.7.4.6.2 The interlock wiring shall be replaced with new.

4.1.46.7.4.6.3 The entire assembly shall be adjusted and checked for proper operation.

4.1.46.7.4.7 Closers at each entrance shall be cleaned and pivot pins lubricated. Worn and/or defective sill closers as well as noisy spirators shall be replaced as required to maintain self-closing of the hoistway doors should the elevator leave the floor for any reason with the car door open.

4.1.46.7.4.8 Where applicable, each hoistway door interlock assembly shall be provided with an emergency release mechanism utilizing manufacturers' standard type access key at all landings served.

4.1.46.7.4.8.1 Drill each hoistway door to accommodate manufacturers standard lock release key and install escutcheon.

4.1.46.7.4.8.2 Where new access holes are drilled and escutcheons installed, the old unused access hole shall be sealed and finished flush with the surface of the door panel.

4.1.46.7.4.8.2.1 Escutcheon shall be brushed stainless steel or bronze, to match door panels where required.

4.1.46.7.4.9 Where multi-speed side slide door panels exist, provide a secondary interlocking device that will prevent separation of the panels should the sill closer or relating cable(s) fail.

4.1.46.7.5 Hoistway Door Bottom Guides / Safety Retainers (New)

- 4.1.46.7.5.1 The bottom of each side sliding type hoistway door panel shall be equipped with a minimum of two (2) guiding members.
 - 4.1.46.7.5.1.1 Metal mounting angles shall be secured to the integral panel frame structure; and when conditions warrant, additional external metal support plates or angles shall be installed to ensure the integrity of the panel frame is not compromised.
 - 4.1.46.7.5.1.2 Guides shall be manufactured of low friction non-metal material with sufficient strength to withstand forces placed on door panels per ASME A17.1 Standards.
 - 4.1.46.7.5.1.3 Each guide assembly shall incorporate a steel wear indicator and be so designed to permit sliding member replacements without removal of door panel(s) from top hanger devices.
 - 4.1.46.7.5.1.4 Panels shall be hung with a maximum vertical clearance of 3/8 inch between top of sill and bottom of panel and the guide shall engage the sill groove by not less than 1/4 inch.

- 4.1.46.7.5.2 The bottom of each side sliding type hoistway door panel shall be equipped with a guiding member safety retainer to prevent displacement in the event of primary guide means failure.
 - 4.1.46.7.5.2.1 A metal reinforcement (12 gauge stainless or galvanized steel) shall be installed between the two (2) primary guiding members (a.k.a. "Z" bracket).
 - 4.1.46.7.5.2.2 The reinforcement shall be designed with a minimum length of 8 inches or the maximum possible length that will fit between the primary members and a minimum overall height of 2.5 inches secured on the internal face of the door panel. (Hoistway side)
 - 4.1.46.7.5.2.3 The retainer shall be set with the supplemental safety angle 3/8 inch into the corresponding sill groove; and be capable of preventing displacement of the panel no more than 3/4 inch with an applied force of 1125 lbf at right angles over an area 12 inches x 12 inches at the approximate center of the door panel.

4.1.46.8 Car Equipment/Frame

4.1.46.8.1 Car Frame (Reuse)

- 4.1.46.8.1.1 The existing car frame assembly shall be refurbished to as new condition and reused.
- 4.1.46.8.1.2 Individual car frame members, platform isolation framework, door operator support structure, related bracing and hardware shall be inspected for any indication of damage or distortion.
 - 4.1.46.8.1.2.1 Where damage is detected, the Successful Respondent shall immediately inform the Consultant and then undertake corrective action deemed appropriate by the Consultant to remedy the condition.
- 4.1.46.8.1.3 Provide new elastomer isolation pads for all existing platforms where pads are presently installed.
- 4.1.46.8.1.4 The car frame, door operator support, and related bracing shall be modified or reconfigured as necessary in order to accommodate new cab enclosure and/or master door operating equipment specified herein.
- 4.1.46.8.1.5 The elevator car shall undergo static balancing upon substantial completion of all work described in the project specifications and subsequent to any car interior refinishing or cab replacement work performed in conjunction with the project.
- 4.1.46.8.1.6 The 2:1 rope sheave shall be refurbished:
 - 4.1.46.8.1.6.1 The sheave shall be washed clean of accumulated grease and oil.
 - 4.1.46.8.1.6.2 Bearings which are found worn or to emit unusual noises, appreciable vibration, excessive heat, or other unfavorable characteristics shall be replaced.
 - 4.1.46.8.1.6.3 Defective grease retention seals shall be replaced as needed.
 - 4.1.46.8.1.6.4 Provide means to ensure that hoist ropes cannot jump out of their respective grooves in case of a slack rope condition.

4.1.46.8.2 Car Platform (Reuse)

- 4.1.46.8.2.1 The existing platform shall be modified to accommodate the new apparatus specified herein.
 - 4.1.46.8.2.1.1 Where necessary, the underside of platform shall be refurbished and treated with fire-rated material.
 - 4.1.46.8.2.1.2 Top of platform shall be refurbished with a marine grade plywood set to receive new finished floor covering as selected by Owner.
 - 4.1.46.8.2.1.3 Where necessary, provide a new safety access hole ring and cover assembly to match selected cab finishes.
 - 4.1.46.8.2.1.4 At Successful Respondent's option or when conditions warrant, provide a totally new platform in lieu of repairs, modifications and upgraded specified above.

4.1.46.8.3 Car Safety (Reuse)

- 4.1.46.8.3.1 The existing governor actuated car safety device shall be retained, overhauled and upgraded for current code compliance.
- 4.1.46.8.3.2 Readjust safety for proper operation in accordance with current ASME A17.1 design standards.
- 4.1.46.8.3.3 Check the existing safety operated switch (plank-switch) for proper adjustment and operation.
 - 4.1.46.8.3.3.1 Provide a new plank-switch where none currently exists.
- 4.1.46.8.3.4 A new safety shall be provided where the existing is not suitable for reuse due to overall condition or in conjunction with an increase in the elevator speed or full load capacity.

4.1.46.8.4 Automatic Leveling / Releveling / Positioning Device (New)

- 4.1.46.8.4.1 Equip the elevator with a floor leveling device which shall automatically bring the car to a stop within 1/4" of any floor for which a stop has been initiated regardless of load or direction of travel.
- 4.1.46.8.4.2 This device shall also provide for releveling which shall be arranged to automatically return the elevator to the floor in the event the elevator should move below or above floor level in excess of 1/4".
- 4.1.46.8.4.3 This device shall be operative at all floors served and whether the hoistway or car door is open or closed provided there is no interruption of power to the elevator.
- 4.1.46.8.4.4 A positioning device shall be part of the controller microprocessor systems.
 - 4.1.46.8.4.4.1 Position determination in the hoistway may be through fixed tape in the hoistway or by sensors fitted on each driving machine to encode and store car movement.
 - 4.1.46.8.4.4.2 Design the mechanical features and electrical circuits to permit accurate control and rapid acceleration and retardation without discomfort.

4.1.46.8.5 Top-of-Car Inspection Operating Station (New)

- 4.1.46.8.5.1 An inspection operating station shall be provided on top of the elevator car.
- 4.1.46.8.5.2 This station shall be installed so that the controls are plainly visible and readily accessible from the hoistway entrance without stepping on the car.
- 4.1.46.8.5.3 When the station is operational, all operating devices in the car shall be inoperative.
- 4.1.46.8.5.4 Provide the following control devices and features:

- 4.1.46.8.5.4.1 A push/pull switch designated "EMERGENCY STOP" shall be arranged so as to prevent the application of power to the hoist motor or machine brake when in the "off" position.
 - 4.1.46.8.5.4.2 A toggle switch designated "INSPECTION" and "NORMAL" to activate the top of car Inspection Service Operation.
 - 4.1.46.8.5.4.3 Push button designated "Up", "Down" and "Enable" to operate the elevator on Inspection Service (the "Enable" button shall be arranged to operate in conjunction with either the "Up" or "Down" button).
 - 4.1.46.8.5.4.4 An indicator light and warning buzzer that are subject to activation under Phase I - Fire Emergency Recall Operation.
- 4.1.46.8.5.5 The unit may contain the following additional devices:
- 4.1.46.8.5.5.1 Approved car top lighting fixture with service guard and local control switch.
 - 4.1.46.8.5.5.2 Approved 120 Volt grounded convenience receptacle.

4.1.46.8.6 Load Weighing Device (New)

- 4.1.46.8.6.1 Provide means to measure the load in the car within an accuracy of $\pm 4\%$ of the elevator capacity.
- 4.1.46.8.6.2 Provide one of the following types of devices:
 - 4.1.46.8.6.2.1 A device consisting of four strain gauge load cells located at each corner of the car platform and supporting a free-floating car platform and cab with summing circuits to calculate the actual load under varying conditions of eccentric loading.
 - 4.1.46.8.6.2.2 A device consisting of four strain gauge load cells, supporting the weight of the elevator machine with summing circuits to calculate the actual load under varying conditions of load.
 - 4.1.46.8.6.2.3 A device to measure the tension in the elevator hoist ropes and thus determine the load in the car.
- 4.1.46.8.6.3 Arrange that the output signal from the load weighing device be connected as an input to the signal and motor control systems to pre-torque of the hoisting machine motors where applicable.
- 4.1.46.8.6.4 Provide audible and visual signals in connection with the load weighing device when used as an "overload" device.

4.1.46.8.7 Automatic Leveling / Releveling / Positioning Device – All Elevators

- 4.1.46.8.7.1 Equip the elevator with a floor leveling device which shall automatically bring the car to a stop within 1/4" of any floor for which a stop has been initiated regardless of load or direction of travel.

- 4.1.46.8.7.2 This device shall also provide for releveling which shall be arranged to automatically return the elevator to the floor in the event the elevator should move below or above floor level in excess of 1/4".
- 4.1.46.8.7.3 This device shall be operative at all floors served and whether the hoistway or car door is open or closed provided there is no interruption of power to the elevator.
- 4.1.46.8.7.4 A positioning device shall be part of the controller microprocessor systems.
 - 4.1.46.8.7.4.1 Position determination in the hoistway may be through fixed tape in the hoistway or by sensors fitted on each driving machine to encode and store car movement.
 - 4.1.46.8.7.4.2 Design the mechanical features and electrical circuits to permit accurate control and rapid acceleration and retardation without discomfort.
- 4.1.46.8.8 Car Enclosure Work Light / Receptacle (New)
 - 4.1.46.8.8.1 The top and bottom of each car shall be provided with a permanent lighting fixture and 110 volt GFI receptacle.
 - 4.1.46.8.8.2 Light control switches shall be located for easy accessibility from the hoistway entrance.
 - 4.1.46.8.8.3 Where sufficient overhead clearance exists, the car top lighting fixture shall be extended no less than 24" above the crosshead member of the car frame.
 - 4.1.46.8.8.4 Light bulbs shall be guarded so as to prevent breakage or accidental contact.
- 4.1.46.8.9 Emergency Exits / Top
 - 4.1.46.8.9.1 Ensure they operate as per code and have proper electrical contacts and mechanical locks on the exterior of the cab enclosure.
 - 4.1.46.8.9.2 Ensure emergency car-top exit is aligned with ceiling cab assembly, to ensure proper code compliant clearances as required by the AHJ. Modify car top emergency exit as needed to obtain alignment.

4.1.46.8.10 Master Door Power Operator System – VVVF/AC (New)

- 4.1.46.8.10.1 Provide a heavy-duty master door operator on top of the elevator car enclosure for power opening and closing of the cab and hoistway entrance door panels.
- 4.1.46.8.10.2 Operator shall utilize an alternating current motor, controlled by a variable voltage, variable frequency (VVVF) drive and a closed-loop control with programmable operating parameters.
 - 4.1.46.8.10.2.1 System may incorporate an encoder feedback to monitor positions with a separate speed sensing device or an encoderless closed-loop VVVF-AC control to monitor motor parameters and vary power applied to compensate for load changes.
- 4.1.46.8.10.3 The type of system shall be designated as a high-speed operator, designed for door panel opening at an average speed of 2.0 feet per second and closing at approximately 1.0 foot per second.
 - 4.1.46.8.10.3.1 Reduce the closing speed as required to limit kinetic energy of closing doors to within values permitted by ASME A17.1 as may be adopted and/or modified by the AHJ.
- 4.1.46.8.10.4 The door shall operate smoothly without a slam or abrupt motion in both the opening and closing cycle directions.
 - 4.1.46.8.10.4.1 Provide controls to automatically compensate for load changes such as:
 - 4.1.46.8.10.4.1.1 Wind conditions (stack effect)
 - 4.1.46.8.10.4.1.2 Use of different weight door panels on multiple landings
 - 4.1.46.8.10.4.1.3 Other unique prevailing conditions that could cause variations in operational speeds.
 - 4.1.46.8.10.4.2 Provide nudging to limit speed and torque in conjunction with door close signaling/closing and timing devices as permitted by ASME A17.1 as may be adopted and/or modified by the AHJ. Nudging shall be initiated by the signal control system and not from the door protective device.
- 4.1.46.8.10.5 In case of interruption or failure of electric power from any cause, the door operating mechanism shall be so designed that it shall permit emergency manual operation of both the car and corridor doors only when the elevator is located in the floor landing unlocking zone.
 - 4.1.46.8.10.5.1 The hoistway door shall continue to be self-locking and self-closing during emergency operation.
 - 4.1.46.8.10.5.2 The door operator and/or car door panel shall be equipped with safety switches and electrical controls to prevent operation of the elevator with the door in the open position as per ASME A17.1 Code Standards.
 - 4.1.46.8.10.5.3 Provide zone-lock devices as required by ASME A17.1 as may be adopted and/or otherwise modified by the AHJ.

- 4.1.46.8.10.6 Construct all door operating levers of heavy steel or reinforced extruded aluminum members, designed for stress and forces imposed on the related parts, linkages and fixed components during normal and emergency operation functions.
 - 4.1.46.8.10.6.1 All pivot points shall have either ball or roller-type bearings, oilite bronze bushings or other non-metallic bushings of ample size.
- 4.1.46.8.10.7 Provide operating data / data tag permanently attached to the operator as required by applicable code and standards.
- 4.1.46.8.11 Car Door Gate Switch (New)
 - 4.1.46.8.11.1 Provide a car door electrical safety (gate) switch that connects directly to the car door track.
 - 4.1.46.8.11.1.1 The gate switch shall prevent movement of the elevator until such time as it signals the control equipment that the car door has physically closed.
- 4.1.46.8.12 Car Door Panel(s) (New)
 - 4.1.46.8.12.1 Provide standard 1" thick, 14-gauge hollow metal flush construction panel(s), reinforced for power operation and insulated for sound deadening.
 - 4.1.46.8.12.2 Paint the hoistway side of each panel black and face the cab side with 16-gauge sheet steel matching the new swing returns or in selected material and finish as otherwise directed by Owner/Architect.
 - 4.1.46.8.12.3 The panels shall have no binder angles and welds shall be continuous, ground smooth and invisible.
 - 4.1.46.8.12.4 Drill and reinforce panels for installation of door operator hardware, door protective device, door gibs, etc.
 - 4.1.46.8.12.4.1 Provide each door panel with two removable laminated plastic composition guides, arranged to run in the sill grooves with minimum clearance.
 - 4.1.46.8.12.4.2 The guide mounting shall permit their replacement without removing the door from the hangers.
 - 4.1.46.8.12.5 Provide the meeting edge of center opening doors with necessary continuous rubber astragal bumper strips.
 - 4.1.46.8.12.5.1 These strips shall be relatively inconspicuous when the doors are closed.
- 4.1.46.8.13 Door Reopening Device / "3D" (New)
 - 4.1.46.8.13.1 Provide a combination infrared curtain and 3D door protection system.
 - 4.1.46.8.13.2 The door shall be prevented from closing and will reopen when closing if any one of the curtain light rays is interrupted or should an object enter the 3D detection zone.

- 4.1.46.8.13.3 The door shall start to close when the protection system is free of any obstruction.
- 4.1.46.8.13.4 The infrared curtain and 3D zone protective system shall provide:
 - 4.1.46.8.13.4.1 Protective curtain field not less than 71” above the sill.
 - 4.1.46.8.13.4.2 D protective zone field not less than 61” above the sill.
 - 4.1.46.8.13.4.3 Accurately positioned infrared lights to conform to the requirements of the applicable handicapped code.
 - 4.1.46.8.13.4.4 Modular design to permit on board test operation and replacement of all circuit boards without removing the complete unit.
 - 4.1.46.8.13.4.5 Self-contained, selectable 3D zone timeout feature to allow for closing at nudging speed with audible signal.
 - 4.1.46.8.13.4.6 Automatic turning-off of the 3D zone in the event of three (3) consecutive 3D triggers.
 - 4.1.46.8.13.4.6.1 Light curtain shall continue to operate after 3D system timeout.
 - 4.1.46.8.13.4.7 Selectable control of the 3D zone operation on an “always-on” or “as doors close” basis.
 - 4.1.46.8.13.4.8 Controls to shut down the elevator when the unit fails to operate properly.

4.1.46.9 Finish/Materials/Signage

4.1.46.9.1 Material, Finishes and Painting

4.1.46.9.1.1 General

- 4.1.46.9.1.1.1 Cold-rolled Sheet Steel Sections: ASTM A366, commercial steel, Type B
- 4.1.46.9.1.1.2 Rolled Steel Floor Plate: ASTM A786
- 4.1.46.9.1.1.3 Steel Supports and Reinforcement: ASTM A36
- 4.1.46.9.1.1.4 Aluminum-alloy Rolled Tread Plate: ASTM B632
- 4.1.46.9.1.1.5 Aluminum Plate: ASTM B209
- 4.1.46.9.1.1.6 Stainless Steel: ASTM A167 Type 302, 304 or 316
- 4.1.46.9.1.1.7 Stainless Steel Bars and Shapes: ASTM A276
- 4.1.46.9.1.1.8 Stainless Steel Tubes: ASTM A269
- 4.1.46.9.1.1.9 Aluminum Extrusions: ASTM B221
- 4.1.46.9.1.1.10 Nickel Silver Extrusions: ASTM B155
- 4.1.46.9.1.1.11 Bronze Sheet: ASTM B36(36M) alloy UNS No. C2800 (Muntz Metal)
- 4.1.46.9.1.1.12 Structural Tubing: ASTM A500
- 4.1.46.9.1.1.13 Bolts, Nuts and Washers: ASTM A325 and A490
- 4.1.46.9.1.1.14 Laminated / Safety Tempered Glass: ANSI Z97.1

4.1.46.9.1.2 Finishes

- 4.1.46.9.1.2.1 Bronzed – Satin finish lacquer.

4.1.46.9.1.3 Sheet Steel:

- 4.1.46.9.1.3.1 Shop Prime: Factory-applied baked on coat of mineral filler and primer.
- 4.1.46.9.1.3.2 Finish Paint: Two (2) coats of low sheen baked enamel, color as selected by the Owner.
- 4.1.46.9.1.3.3 Steel Equipment: Two (2) coats of manufacturer's standard rust-inhibiting paint to exposed ferrous metal surfaces in both the hoistway and pit that do not have galvanized, anodized, baked enamel, or special architectural finishes.

4.1.46.9.1.4 Painting

- 4.1.46.9.1.4.1 Apply two (2) coats of paint to the machine room floor.
- 4.1.46.9.1.4.2 Apply two (2) coats of clear lacquer to bronze or similar non-ferrous materials to prevent tarnishing during a period of not less than twelve (12) months after initial acceptance by the Owner.
- 4.1.46.9.1.4.3 Identify all equipment including buffers, crosshead, safety plank, machine, controller, drive, governor, disconnect switch, etc., by 4" high numerals which shall contrast with the background to which it is applied. The identification shall be either decalcomania or stencil type.
- 4.1.46.9.1.4.4 Paint or provide decal-type floor designation not less than six (6) inches high on hoistway doors (hoistway side), fascias and/or walls as required by A17.1 as may be adopted and/or modified by the AHJ. The color of paint used shall contrast with the color of the surface to which it is applied.

4.1.46.9.2 Car Interior Finishes

- 4.1.46.9.2.1 Car interior finishes shall be as selected by Owner and/or Architect.
- 4.1.46.9.2.2 Contractor shall provide samples of finishes as required for approval prior to fabrication.
- 4.1.46.9.2.3 Refer to specifications for other design requirements where provided.
- 4.1.46.9.2.4 Special attention shall be given to flooring materials and suitability for intended duty.

4.1.46.9.3 Designation and Data Plates, Labeling and Signage. (New)

- 4.1.46.9.3.1 Provide an elevator identification plate on or adjacent to each entrance frame where required by the AHJ.
- 4.1.46.9.3.2 Provide an elevator identification plate on or adjacent to each entrance frame at the designated landing only as required by code.
- 4.1.46.9.3.3 Elevators shall be identified by "number" only. Where a "letter" is used to identify the elevator, the letter shall indicate the bank the elevator is in.
 - 4.1.46.9.3.3.1 The designation numeral shall be a minimum of 3" in height.

- 4.1.46.9.3.4 Provide floor designation plates at each elevator entrance, on both sides of the jamb at a height of 60 inches to center line of plate.
 - 4.1.46.9.3.4.1 Floor number designations and Braille shall be 2" high, 0.03" raised and stud mounted.
- 4.1.46.9.3.5 For Destination Based Dispatch systems, provide an elevator designation plate immediately below the floor designation plate in accordance with applicable handicapped accessibility requirements and codes.
 - 4.1.46.9.3.5.1 Elevator number designations and Braille shall be 2" high, 0.03" raised and stud mounted.
- 4.1.46.9.3.6 Identify the designated medical emergency services elevator with 3" high international symbol at each elevator entrance on both sides of the jamb.
- 4.1.46.9.3.7 Provide raised designations and Braille markings to the left of the car call and control buttons of the car operating panel(s).
 - 4.1.46.9.3.7.1 Designations shall be a minimum of 5/8" high, 0.03" raised and stud mounted.
- 4.1.46.9.3.8 Provide elevators with data and marking plates, labels, signage and refuge space markings complying with A17.1 Elevator Safety Code as may be adopted and/or otherwise modified by the AHJ.
- 4.1.46.9.3.9 Owner shall select the designation and data plates from manufacturer's premium line of plates.

4.1.46.10 Fixtures/Signal Equipment

4.1.46.10.1 General - Design and Finish

- 4.1.46.10.1.1 The design and location of the hall and car operating and signaling fixtures shall comply with the ADAAG.
- 4.1.46.10.1.2 The operating fixtures shall be selected from the manufacturer's premium line of fixtures.
- 4.1.46.10.1.3 A sample fixture or the hall and car shall be provided for owner review and approval.
- 4.1.46.10.1.4 Custom designed operating and signaling fixtures shall be as shown on the drawings or as approved by the Owner.
- 4.1.46.10.1.5 The layout of the fixtures including all associated signage and engraving shall be as approved by the Owner.
- 4.1.46.10.1.6 Where no special design is shown on the drawings, the buttons shall be as follows:
 - 4.1.46.10.1.6.1 Bronze convex type as selected by the Owner from the manufacturer's premium line of push buttons.
 - 4.1.46.10.1.6.2 The button shall have a collar with LED call registered light.
- 4.1.46.10.1.7 Where no special design is shown on the drawings, the faceplates shall be as follows:

4.1.46.10.1.7.1 Passenger and Service Elevators

4.1.46.10.1.7.1.1 Ground Floor: Custom designed bronze faceplate.

4.1.46.10.1.7.1.2 Typical Floors: 1/8" thick bronze faceplate.

4.1.46.10.1.8 Mount passenger elevator fixtures with concealed fasteners and service and garage elevator fixtures with tamperproof screws. The screw and key switch cylinder finishes shall match faceplate finish.

4.1.46.10.1.9 Where key-operated switch and or key operated cylinder locks are furnished in conjunction with any component of the installation, four keys for each individual switch or lock shall be furnished, stamped or permanently tagged to indicate function.

4.1.46.10.1.10 All caution signs, pictographs, code mandated instructions and directives shall be engraved and filled with epoxy.

4.1.46.10.2 Main Car Operating Panel - Base Bid Conventional dispatching (New)

4.1.46.10.2.1 Car operating panel shall be incorporated in the swing-front return of the elevator cab.

4.1.46.10.2.1.1 Coordination with car front manufacturer shall be the responsibility of the Successful Respondent.

4.1.46.10.2.2 The push buttons shall become individually illuminated as they are pressed and shall extinguish as the calls are answered.

4.1.46.10.2.3 The operating panel shall include:

4.1.46.10.2.3.1 A call button for each floor served, located not more than 48" above the cab floor.

4.1.46.10.2.3.2 "Door open" / "Door close".

4.1.46.10.2.3.3 "Alarm" button, interfaced with emergency alarm. The alarm button shall illuminate when pressed.

4.1.46.10.2.3.4 "Emergency Stop" switch per local law located at 35" above the cab floor.

4.1.46.10.2.3.5 Self-dialing, hands-free telephone with call acknowledging feature and A.D.A. design provisions.

4.1.46.10.2.3.6 Three-position firefighter key-operated switch, call cancel button and illuminated visual/audible signal system with mandated signage engraved per ASME A 17.1 Standards as modified by the AHJ.

4.1.46.10.2.4 Locked Firemens' Service cabinet, keyed in accordance with local Code, containing required devices and signals in accordance with ASME A17.1 Standards.

4.1.46.10.2.4.1 Automatic opening of the locked cabinet door may be provided with signals initiated by the fire detection and alarm system where approved by the Authority Having Jurisdiction.

4.1.46.10.2.5 Provide a locked service cabinet flush mounted and containing the key switches required to operate and maintain the elevator, including, but not limited to:

- I 4.1.46.10.2.5.1 Independent operation service switch
- 4.1.46.10.2.5.2 Light switch.
- 4.1.46.10.2.5.3 Three Position Fan switch.
- 4.1.46.10.2.5.4 G. F. I. duplex receptacle.
- 4.1.46.10.2.5.5 Emergency light test button and indicator.
- 4.1.46.10.2.5.6 Inspection Service Operation key switch.
- 4.1.46.10.2.5.7 Port for hand-held service tool where applicable.
- 4.1.46.10.2.5.8 Dimmer for cab interior lighting.

4.1.46.10.2.6 Car operating panel shall incorporate:

- 4.1.46.10.2.6.1 An integral (no separate faceplate) digital L.E.D. floor position indicator.
- 4.1.46.10.2.6.2 Emergency light fixture (without a separate faceplate) and black-filled engraved unit (unless new ceiling is provided with at least two ceiling lights on battery backup meeting the requirements of ANSI 17.1 then omit from car operating panel.)
- 4.1.46.10.2.6.3 ID number or other nomenclature, as approved by Owner.
- 4.1.46.10.2.6.4 A "No Smoking" advisory and the rated passenger load capacity.

4.1.46.10.2.7 Equip the car operating panel proximity card reader to disconnect the corresponding floor push button. (Cars 5 and 6 only)

- 4.1.46.10.2.7.1 Security system shall be overridden by Phase II Firefighter's Emergency Operations in accordance with code.

4.1.46.10.2.8 Where posting of an advisory is permitted by the Governing Authority in lieu of the inspection certificate, engrave the following advisory on the hinged cover of the service cabinet, or where otherwise directed by the Owner.

- 4.1.46.10.2.8.1 Elevator Certificate is On File in Building Management Office.

4.1.46.10.3 Auxiliary Car Operating Panel - Base Bid Conventional dispatching (New)

4.1.46.10.3.1 Provide an auxiliary car operating panel that contains the following:

- 4.1.46.10.3.1.1 Car call registration buttons.
- 4.1.46.10.3.1.2 Door open and close buttons.
- 4.1.46.10.3.1.3 Illuminated alarm button.

4.1.46.10.3.2 Operating devices shall be of the same design, material and finish as the main operating panel.

4.1.46.10.3.3 Design this station so as to duplicate the layout of the main operating panel.

4.1.46.10.3.4 Provide a digital position indicator, ID engraving to match the main car operating panel.

4.1.46.10.4 Main Car Operating Panel / Destination Dispatch (Alternate 2): Passenger Elevators 1 - 6

- 4.1.46.10.4.1 Provide a concealed car operating push button panel in the front return panel of the car in a swing-front configuration.
- 4.1.46.10.4.2 The push buttons shall be located behind a locked service cabinet door for use only when the elevator is operating on modes other than Destination Dispatch.
 - 4.1.46.10.4.2.1 Buttons shall become individually illuminated as they are pressed and shall extinguish as the calls are answered.
 - 4.1.46.10.4.2.2 Provide LED call registration lights.
 - 4.1.46.10.4.2.3 The locked push button cabinet door shall open automatically upon initiation of Fire Service Phase 1.
- 4.1.46.10.4.3 The exposed devices in the operating panel shall include:
 - 4.1.46.10.4.3.1 "Door open" / "Door close" / "Door Hold" buttons.
 - 4.1.46.10.4.3.2 "Alarm" button (Interfaced with emergency alarm).
 - 4.1.46.10.4.3.3 "Emergency Stop" switch per local law.
 - 4.1.46.10.4.3.4 Full speech voice annunciator capabilities.
 - 4.1.46.10.4.3.5 Self-dialing, hands-free telephone and/or intercom with call acknowledging feature and A.D.A. design provisions. (See individual unit clarifications).
 - 4.1.46.10.4.3.6 Three (3) position firefighter key operated switch, call cancel button and illuminated visual/audible signal system with mandated signage engraved per ASME A17.1 Standards as modified by the AHJ.
- 4.1.46.10.4.4 Provide a locked Firemen's Service cabinet, keyed in accordance with local Code, containing required devices and signals in accordance with ASME A17.1 Standards.
 - 4.1.46.10.4.4.1 Automatic opening of the locked cabinet door may be provided with signals initiated by the fire detection and alarm system where approved by the Authority Having Jurisdiction.
- 4.1.46.10.4.5 Provide a locked service cabinet flush mounted and containing the key switches required to operate and maintain the elevator, including, but not limited to:
 - 4.1.46.10.4.5.1 Independent service switch with associated operating buttons and signal indicators.
 - 4.1.46.10.4.5.2 Light switch.
 - 4.1.46.10.4.5.3 Fan switch.
 - 4.1.46.10.4.5.4 G. F. I. duplex receptacle.
 - 4.1.46.10.4.5.5 Emergency light test button and indicator.
 - 4.1.46.10.4.5.6 Inspection Service Operation key switch.
- 4.1.46.10.4.6 Concealed car operating panel shall be incorporated in the swing-front return of the elevator cab.
 - 4.1.46.10.4.6.1 Mount all key switches that are required to operate and maintain the elevators exposed on the car station except those specified

- within a locked service cabinet or Fire Service control cabinet where applicable.
- 4.1.46.10.4.6.2 Coordination with car front manufacturer shall be the responsibility of the Successful Respondent.
- 4.1.46.10.4.7 Each car operating panel shall incorporate a digital L.E.D. floor position indicator, and black-filled engraved unit ID number or other nomenclature, as approved by Owner, and the rated passenger load capacity.
- 4.1.46.10.4.8 Provide a dedicated space within the car operating panel for a proximity card reader device to disconnect the corresponding floor push button.
- 4.1.46.10.4.8.1 System shall be overridden by Phase II Firefighter's Emergency Operations in accordance with code.
- 4.1.46.10.4.9 Where posting of an advisory is permitted by the Governing Authority in lieu of the inspection certificate, engrave the following advisory on the hinged cover of the service cabinet, or where otherwise directed by the Owner.
- 4.1.46.10.4.9.1 Elevator Certificate is On File in Building Management Office.
- 4.1.46.10.4.10 Auxiliary panels shall be provided as follows: (Destination dispatch – Alternate 2)
- 4.1.46.10.4.10.1 Provide auxiliary car operating panels that to match existing conditions that contains those buttons normally used by a passenger, i.e., floor pushbuttons, door open and close button, alarm button, and shall be of the same design, construction, material and finish as the main operating panel.
- 4.1.46.10.4.10.2 Auxiliary car operating panels shall incorporate a digital LED floor position indicator, and black-filled engraved unit ID number or other nomenclature, as approved by Owner, and the rated passenger load capacity. Final design to be approved by the Owner or Consultant.
- 4.1.46.10.4.10.3 Acceptance of Alternate 2 will allow the required cutouts for the new Car Video Display, mounting, and associated wiring.
- 4.1.46.10.5 In-Car Destination Display / Destination Dispatch (Alternate 2): Passenger Elevators 1 - 6
- 4.1.46.10.5.1 Provide a digital display to notify entering passengers of the location of scheduled stops for the individual elevator.
- 4.1.46.10.5.2 The display shall be sized to fit within the width of the car entrance return post(s).
- 4.1.46.10.5.3 The display shall clearly indicate the scheduled stops for that particular elevator based on assigned call demand. The characters displayed could be either Alpha or Numeric characters.
- 4.1.46.10.5.4 Locate the display so that it is easily viewed by passengers entering the elevator.
- 4.1.46.10.5.4.1 Where necessary, or as directed by the Owner, one display shall be installed in each of the entrance return posts.

4.1.46.10.5.5 Floor indications shall extinguish as the elevator stops at the respective floor.

4.1.46.10.6 In-Car Video Display (Alternate 3)

4.1.46.10.6.1 Provisions shall be made for the installation of a video display panel of a type and size as selected by the Owner.

4.1.46.10.6.1.1 Display shall be flush mounted.

4.1.46.10.6.1.2 Successful Respondent shall coordinate the installation of the panel with the manufacturer and Owner as part of the base scope of work.

4.1.46.10.7 Car Position Indicator (New)

4.1.46.10.7.1 The position of the car in the hoistway shall be indicated by the illumination of the position indicator numeral corresponding to the floor t which the car has stopped or is passing.

4.1.46.10.7.1.1 Provide 2" high, 10-segment LED type position indicator with direction arrows, integral with each car operating panel.

4.1.46.10.7.1.2 Provide Lexan cover lens with hidden support frame behind fixture plate to protect the indicator readout.

4.1.46.10.7.1.3 Provide audible floor passing signal per ADA standards where not provided by the elevator signal control.

4.1.46.10.7.1.4 Flush mount fixture with cover to match selected car front or car operating panel finish as directed by the Owner.

4.1.46.10.8 Voice Annunciator (New)

4.1.46.10.8.1 Provide a voice annunciator in each elevator.

4.1.46.10.8.2 The device features shall comply with the requirements of ADAAG and A117.1 where applicable.

4.1.46.10.8.3 Coordinate size, shape and design with Designer and other trades.

4.1.46.10.8.4 The system shall include, but not limited to:

4.1.46.10.8.4.1 Solid state digital speech annunciator

4.1.46.10.8.4.2 A recording feature for customized messages

4.1.46.10.8.4.3 Playback option

4.1.46.10.8.4.4 Built-in voice amplifier

4.1.46.10.8.4.5 Master volume control

4.1.46.10.8.4.6 Audible indication for selected floor, floor status or position, direction of travel, floor stop and nudging.

4.1.46.10.8.5 Locate all associated equipment in a single, clearly labeled enclosure located either in the machine room and/or on car top.

4.1.46.10.9 Corridor Push Button Stations / Reuse Back Boxes

4.1.46.10.9.1 Push button signal fixtures shall be provided on each landing.

4.1.46.10.9.2 Each signal fixture shall consist of:

- 4.1.46.10.9.2.1 A flush-mounted faceplate. (Not surface mount)
- 4.1.46.10.9.2.2 Up and down illuminating push buttons measuring 3/4" at their smallest dimension as selected by the Owner.
- 4.1.46.10.9.2.3 A recessed mounting box, electrical conduit and wiring.
- 4.1.46.10.9.3 Intermediate landings shall be provided with fixtures containing two (2) push buttons while terminal landings shall be provided with fixtures containing a single push button.
- 4.1.46.10.9.4 Include firefighter key switch in the main lobby level station or other designated recall landing.
- 4.1.46.10.9.5 Where existing fixtures are located greater than 48" above the floor:
 - 4.1.46.10.9.5.1 The existing back boxes shall be retained and used to attach the oversized fixture faceplate to locate the new buttons with a centerline of 42" above the finished floor.
 - 4.1.46.10.9.5.1.1 The Successful Respondent has the option of providing a single oversized back box in lieu of retaining existing for faceplate attachment.
 - 4.1.46.10.9.5.2 Standardize the new centerline distance on all floors.
- 4.1.46.10.9.6 All cutting, patching, grouting and/or plastering of masonry walls resulting from the removal or installation of corridor fixtures shall be performed by the Successful Respondent so as to maintain the fire rating of the hoistway.
 - 4.1.46.10.9.6.1 Finished painting or decorating of wall surfaces shall be by Others.
- 4.1.46.10.9.7 All faceplates shall be engraved with fire logo and "In Case of Fire Use Stairs" to help fill the void created by the use of oversized covers.
- 4.1.46.10.10 Destination Entry Hall Stations (Main Lobby Only) Destination Dispatch (Alternate 2): Passenger Elevators 1 – 6
 - 4.1.46.10.10.1 Provide Main Lobby destination entry stations as required for system operation in a location as directed by the Owner. Successful Respondent to provide calculation backup for the proposed number of Lobby stations based on current population.
 - 4.1.46.10.10.2 Stations shall utilize system specific mechanical keypad or touch-screen technology to register destination demand.
 - 4.1.46.10.10.3 Fixtures shall be located in accordance with applicable handicapped accessibility requirements. Mounting and design of the fixtures shall be approved by the Owner.
 - 4.1.46.10.10.3.1 Main Lobby floor will have mechanical keypad input devices with a (separate price add/deduct for touch screen input terminals) at or near the entrance to the Elevator Lobby. The mechanical keypad/touch screen input devices will graphically depict floor designations. The mechanical keypad/touch screen devices and associated hardware may be housed in a free standing kiosk or

wall mounted cabinet as selected by Owner based on Successful Respondent's calculation sheet of the proper number of units to handle 15% of the building's population during a five (5) minute morning up-peak on a per-bank basis.

- 4.1.46.10.10.3.2 Where existing fixtures are being replaced with new and the original back-box is not fully covered, the new fixture shall incorporate an oversized plate to fully cover the original opening in the wall.
- 4.1.46.10.10.3.3 Where new wall mount fixtures are provided at locations other than where existing fixtures are located, provide blank cover plates at existing cutouts of a finish as directed by the Owner.
- 4.1.46.10.10.3.4 Where new fixtures are not wall mounted, provide blank cover plates at existing cutouts of a finish as directed by the Owner.

4.1.46.10.10.4 Fixtures shall incorporate a visual and audible indication of the elevator to which the passenger entering the demand has been assigned.

4.1.46.10.10.4.1 The display shall be alpha-numeric "LED" or "LED" flat panel touch display as dictated by the specific system.

4.1.46.10.10.4.1.1 Include Firefighter key switch in the main lobby level station or other designated recall landing.

4.1.46.10.10.4.1.2 One (1) spare Main Floor Hall Station Terminal and one (1) spare floor Keypad Input device Terminal (serves all floors other than the main lobby) will be on site at all times.

4.1.46.10.10.4.1.3 Fixtures shall be of a finish as selected by the Owner.

4.1.46.10.10.4.2 Fixture mounting stands will be provided by the contractor. Final design as approved by the Owner. Any attachments related to structural or marble will require review by the Owner.

4.1.46.10.11 Floor Position Indicator

4.1.46.10.11.1 Remove all existing floor position indicators and replace with new digital LED type unit.

4.1.46.10.11.2 New face plate shall completely cover the present cutout and provide 2" numerals located on center.

4.1.46.10.11.3 Provide integral direction arrows that will indicate the direction in which the elevator is traveling.

4.1.46.10.12 Hall Direction Lanterns (reuse/refinish and retrofit)

4.1.46.10.12.1 The existing hall lanterns shall be reused and retrofitted with new LED illumination and audible signals as required by the ADAAG.

4.1.46.10.12.1.1 Design the lantern with up and down indication at intermediate landings and a single indication at terminal landings.

4.1.46.10.12.1.2 Lanterns shall sound once for the up direction and twice for the down direction.

- 4.1.46.10.12.1.2.1 Provide an electronic chime with adjustable sound volume.
- 4.1.46.10.12.1.3 Provide adjustable signal time (3 to 10 seconds, with 1 second increments) to notify passengers which car shall answer the hall call and preset, per ADAAG distance standards.
- 4.1.46.10.12.2 Main Lobby fixture shall incorporate a 2" high LED floor position indicator in the hall lantern fixture with direction arrows located on both sides of the indicator.
- 4.1.46.10.12.3 Locate the lantern above the corridor entrance in its current location.
- 4.1.46.10.13 Car Designation Indicator / Destination Dispatching – Alternate 2
 - 4.1.46.10.13.1 A unique car designation indicator (flag) shall be provided for all elevators at each entrance frame on all floors served.
 - 4.1.46.10.13.2 Provide an illuminated car designation indicator at the lobby or main dispatching floor above each hoistway entrance frame or as otherwise directed by the Owner.
 - 4.1.46.10.13.2.1 The indicator shall be marked with an appropriate identifying designation as may be applicable to the specific elevator as developed in the destination dispatch configuration.
 - 4.1.46.10.13.2.2 The per elevator fixture allowance in the main lobby is \$500.
 - 4.1.46.10.13.3 Where illuminated car designation indicators are used, they shall be made permanently illuminated using the existing hall lantern box and wiring.
 - 4.1.46.10.13.3.1 The car designation indicator shall be designed with an oversized cover plate to fully cover the existing hall lantern box.
 - 4.1.46.10.13.4 At each of the typical floors, the car designation indicator shall be non-illuminated with an allowance of \$250 per indicator, per elevator, per floor.
- 4.1.46.10.14 Hoistway Access Switch (New)
 - 4.1.46.10.14.1 Install a cylindrical type keyed switch at top terminal in order to permit the car to be moved at slow speed with the doors open to allow authorized persons to obtain access to the top of the car.
 - 4.1.46.10.14.2 Where there is no separate pit access door, a similar switch shall be installed at the lowest landing in order to permit the car to be moved away from the landing with the doors open in order to gain access to the pit.
 - 4.1.46.10.14.3 Locate the switch in a separate fixture with a flush cover plate at a height of between 48" and 72" above the finished floor. Cover plate shall be of a design and style as approved by the Owner.

4.1.46.10.14.4 This switch is to be of the continuous pressure spring-return type and shall be operated by a cylinder type lock having not less than a five (5) pin or five (5) disc combination with the key removable only in the "OFF" position.

4.1.46.10.14.4.1 The lock shall not be operable by any key which operates locks or devices used for other purposes in the building and shall be available to and used only by inspectors, maintenance men and repairmen in accordance with A17.1 applicable Security Group.

4.1.46.10.15 Lobby Control Panel/Remote Lobby Security System

4.1.46.10.15.1 Provide a Lobby Control Panel, including a Remote Lobby Security System for the elevator in the main lobby as directed by the Owner.

4.1.46.10.15.2 Provide stainless steel / bronze finish faceplate with tamperproof screws.

4.1.46.10.15.3 Coordinate panel location with the Owner.

4.1.46.10.15.4 The panel shall include:

- 4.1.46.10.15.4.1 2" high LED position and direction indicators.
- 4.1.46.10.15.4.2 Car On / Car to Lobby /Car Off three-position keyed switch with pilot light.
- 4.1.46.10.15.4.3 Security On / Off keyed switch.

4.1.46.10.16 Emergency Power Control Panel

4.1.46.10.16.1 Provide the lobby console or other designated location with a control panel for emergency power operation as further specified.

4.1.46.10.16.1.1 An emergency power control panel provided at the designated location.

4.1.46.10.16.1.2 The panel shall contain:

4.1.46.10.16.1.2.1 An indicator light that illuminates when a transfer to emergency power takes place.

4.1.46.10.16.1.2.2 Indication that the elevators have arrived at the designated landing and have parked with the doors maintained in the open position.

4.1.46.10.16.1.2.3 Key-operated override switch(es) and a manual selector switch(es) identified with positions for each elevator.

4.1.46.10.16.2 The control panel shall be engraved so as to identify the function of each control feature and device provided.

4.1.46.10.16.3 The Successful Respondent shall provide all necessary electrical conduit and wiring between the elevator machine room(s), and the Emergency Power Control Panel.

4.1.46.10.17 Lift-Net Elevator Management Information System (Base Bid) / (Use manufacturers standard system for Destination Dispatch – Alternate 2)

4.1.46.10.17.1 The data collection, data storage and real-time monitoring portion of the system shall be based on Microsoft Windows, and able to run on Windows 7 or later operating systems.

4.1.46.10.17.2 The system shall:

- 4.1.46.10.17.2.1 Be network-based and be capable of interfacing with all makes and types of elevator control systems.
- 4.1.46.10.17.2.2 Collect data for monitoring.
- 4.1.46.10.17.2.3 Be capable of operating on any TCP/IP based network system.
- 4.1.46.10.17.2.4 Allow the addition of unlimited monitoring terminals on the network.

4.1.46.10.17.3 Monitoring terminals shall operate "peer to peer" without a single server, and the failure of a single network device shall not affect the operation of the rest of the system.

4.1.46.10.17.4 The system shall provide multiple banks, including multiple buildings, on a single monitoring terminal screen.

4.1.46.10.17.5 All monitored banks shall be visible from any monitoring terminal on the network.

4.1.46.10.17.6 Entry into the network shall be multi-level password protected.

- 4.1.46.10.17.6.1 The system shall be capable of real time display of all monitored status points on all monitored equipment.
- 4.1.46.10.17.6.2 Fault and event notification screens and audible alarms shall be immediately displayed on selected monitoring stations.
- 4.1.46.10.17.6.3 Different fault and event tables shall be defined on a per-bank basis.
- 4.1.46.10.17.6.4 The system shall collect and store all status, fault and event information for later reporting and analysis.
- 4.1.46.10.17.6.5 The system shall provide statistical analysis of hall call response times, traffic patterns, fault conditions, service logs and security usage in graphical and tabular format.
- 4.1.46.10.17.6.6 The system shall maintain a record of every status point change occurring on the monitored equipment and provide the ability to replay these events in a simulation at a later time in real time, slow speed, single step, reverse, or fast forward.
 - 4.1.46.10.17.6.6.1 This information shall be retained for a period of at least twenty-six weeks, and a mechanism shall be provided whereby this information may be archived.

4.1.46.10.17.6.7 The system shall store traffic, fault and statistical data for a period of at least three (3) years.

- 4.1.46.10.17.6.7.1 The system shall log error type, car number, floor position and major system status points whenever a fault or logged event occurs.
- 4.1.46.10.17.6.8 The system shall provide interactive control of certain features provided in the elevator control system which may be revised as of the building change.
- 4.1.46.10.17.6.9 Interactive controls shall include but are not limited to:
 - 4.1.46.10.17.6.9.1 Security floor lockouts
 - 4.1.46.10.17.6.9.2 Entering car and hall calls
 - 4.1.46.10.17.6.9.3 Firefighter's return service
 - 4.1.46.10.17.6.9.4 Lobby recall
 - 4.1.46.10.17.6.9.5 VIP service
 - 4.1.46.10.17.6.9.6 Suspicious person / security return
 - 4.1.46.10.17.6.9.7 Up/Down peak
 - 4.1.46.10.17.6.9.8 Hospital Code Blue service (per local codes).
Local codes may affect the availability or operation of these features.
- 4.1.46.10.17.6.10 In the case of a power failure the system shall be capable of connecting to an emergency power back-up unit without the loss of any stored data.
- 4.1.46.10.17.7 The system will automatically re-boot the program and continue to operate after a power loss or other system malfunction.
- 4.1.46.10.17.8 The Elevator Monitoring Equipment shall have the following minimum characteristics:
 - 4.1.46.10.17.8.1 Machine Room Hardware
 - 4.1.46.10.17.8.1.1 Controller interface panels with high quality printed circuit boards
 - 4.1.46.10.17.8.1.2 Input voltage range - 5 - 250V AC/DC
 - 4.1.46.10.17.8.1.3 Compatible with all types and makes of controller.
 - 4.1.46.10.17.8.1.4 Operating temperature range - 45 - 112 degrees Fahrenheit
 - 4.1.46.10.17.8.1.5 Humidity range - 10% - 85% non-condensing
 - 4.1.46.10.17.8.1.6 Modular design - capable of future expansion.
 - 4.1.46.10.17.8.1.7 Power requirements - 90 - 230 VAC 50 - 60Hz @ 3A
- 4.1.46.10.17.9 The system shall display and record the following information for each monitored unit: (The following is intended as a guideline - connections to each status point mentioned on every control system may be impractical. Serial data links may include many more points.)
 - 4.1.46.10.17.9.1 Group operational mode
 - 4.1.46.10.17.9.2 Multiple groups or buildings on the same screen
 - 4.1.46.10.17.9.3 In/out of service
 - 4.1.46.10.17.9.4 In/out of group service
 - 4.1.46.10.17.9.5 Emergency power

- 4.1.46.10.17.9.6 Supervisory failure
- 4.1.46.10.17.9.7 Location and direction of hall calls
- 4.1.46.10.17.9.8 Individual car status - expandable menus
- 4.1.46.10.17.9.9 Direction of travel
- 4.1.46.10.17.9.10 Independent service
- 4.1.46.10.17.9.11 Inspection service
- 4.1.46.10.17.9.12 Fire service
- 4.1.46.10.17.9.13 Position of elevator
- 4.1.46.10.17.9.14 Door status (open, opening, closing, closed)
- 4.1.46.10.17.9.15 Door dwell time
- 4.1.46.10.17.9.16 Load by-pass
- 4.1.46.10.17.9.17 Emergency power
- 4.1.46.10.17.9.18 Power on/off
- 4.1.46.10.17.9.19 Door detector
- 4.1.46.10.17.9.20 Safety circuit
- 4.1.46.10.17.9.21 Door zone
- 4.1.46.10.17.9.22 Stop switch
- 4.1.46.10.17.9.23 Alarm button
- 4.1.46.10.17.9.24 Registered Car Calls

4.1.46.10.17.10 Keyboard, Mouse and time clock control capabilities

- 4.1.46.10.17.10.1 Floor lockouts (car or hall)
- 4.1.46.10.17.10.2 Lobby recall
- 4.1.46.10.17.10.3 VIP service
- 4.1.46.10.17.10.4 Firefighter's service
- 4.1.46.10.17.10.5 Up/Down Peak
- 4.1.46.10.17.10.6 User defined parameters (minimum eight [8] inputs)

4.1.46.10.17.11 Faults monitored with visual and audible alarm, triggered by combinations of any of the above status points

- 4.1.46.10.17.11.1 Safety circuit
- 4.1.46.10.17.11.2 Alarm bell
- 4.1.46.10.17.11.3 Door reversal devise
- 4.1.46.10.17.11.4 Earthquake
- 4.1.46.10.17.11.5 At least six user selectable faults or events

4.1.46.11 Car Enclosures

4.1.46.11.1 Elevator Car Enclosure(s) and the Five Percent (5%) Rule:

4.1.46.11.1.1 In accordance with A17.1, Section 8.7, entitled "Alterations", where a new or remodeled elevator car enclosure is included in the base scope of work, the Successful Respondent shall, within thirty (30) days after execution of the Contract/Agreement, weigh the elevator, or one elevator of each group of elevators included in the base scope of services, to determine the present deadweight of the platform/sling/cab assembly.

4.1.46.11.1.2 The Successful Respondent shall make every effort to provide accurate weight measurements while taking into consideration all weights that may

present themselves at the time the measurement is taken such as compensation, compensating sheave, hoist ropes and traveling cables that may affect the measurement of the assembly itself.

- 4.1.46.11.1.3 The Successful Respondent shall evaluate the actual counterbalance percentage for each sample elevator to identify prevailing conditions.
- 4.1.46.11.1.4 Measurements of actual cab weight shall be compared to the original deadweight of the car as stamped on the crosshead data tag.
- 4.1.46.11.1.5 Where no data tag exists, the Successful Respondent shall make every effort to determine the original weight of the platform/sling/cab through calculations based on the current weight of the counterweight assembly and the verified percent of full load counterbalance.
- 4.1.46.11.1.6 The amount of weight that may be added to the car, so as to remain within the limits of the "5% Rule", shall be calculated based on the following:
 - 4.1.46.11.1.6.1 $(\text{Original Deadweight} + \text{Capacity}) \times (0.05) = \text{Maximum Additional Weight Allowed}$
- 4.1.46.11.1.7 The Successful Respondent shall document and notify the Owner and Consultant of the results of the measurements taken and what weight, if any, can be added or needs to be removed from the cab in order to maintain compliance with the 5% Rule.
- 4.1.46.11.1.8 The Successful Respondent shall work diligently with the Owner and/or Consultant as well as the manufacturer of the car enclosure to minimize additional weights of the new or remodeled car enclosure so as to maintain compliance with the 5% Rule.
- 4.1.46.11.1.9 Successful Respondent shall be responsible for proper adjustment of the counterbalance of the system, including the static balance of the platform/sling/car enclosure, upon completion of the car interior work.
- 4.1.46.11.1.10 Costs associated with this work shall be included in the base modernization price.
- 4.1.46.11.2 Elevator Cab Remodel Allowance \$25,000, per elevator
 - 4.1.46.11.2.1 It is understood that if the selected manufacturer of the cab is not the same as the Elevator Supplier, all cab material will be constructed in a manner to accommodate the elevator manufacturer's associated equipment, such as operator, hangers, interlocks, etc., as purchased by the Owner or Consultant.
 - 4.1.46.11.2.2 The net allowance for the elevator cabs are to be exclusive of:
 - 4.1.46.11.2.2.1 Handling charges.
 - 4.1.46.11.2.2.2 Applicable sales and/or use taxes.
 - 4.1.46.11.2.2.3 Car door hangers, interlocks, exit contact locks.
 - 4.1.46.11.2.2.4 Platform, flooring, car door sill.
 - 4.1.46.11.2.2.5 Cab shell

- 4.1.46.11.2.2.6 Fan
- 4.1.46.11.2.2.7 Car installation, operating equipment, and such items are to be included by the Successful Respondent in the base price.
- 4.1.46.11.3 The net allowance covering the elevator cars of a design and material as selected shall include:
 - 4.1.46.11.3.1 Ventilation and lighting.
 - 4.1.46.11.3.2 Doors.
 - 4.1.46.11.3.3 Base wainscoting.
 - 4.1.46.11.3.4 Handrails.
 - 4.1.46.11.3.5 Entrance columns.
 - 4.1.46.11.3.6 Transoms as required.
 - 4.1.46.11.3.7 Necessary cutouts.
 - 4.1.46.11.3.8 All necessary cutouts and cab associated appurtenances that may be designed or required.
- 4.1.46.11.4 The Owner or Consultant reserves the right to deduct the net allowances from the Contract/Agreement and to purchase the elevator cabs separately.
- 4.1.46.11.5 The Owner retains the right to assign this purchase to the Elevator Supplier for coordination and receive the necessary credits or make the installation by an authorized representative of the Owner.
- 4.1.46.11.6 Successful Respondent shall include all costs associated with coordination of cab related work in the base modernization bid including static and dynamic balance of the system.
- 4.1.46.11.7 Entrance Sill:
 - 4.1.46.11.7.1 Provide car door entrance saddle using a Bronze sill.
- 4.1.46.11.8 Lighting:
 - 4.1.46.11.8.1 Provide low voltage high efficiency recessed down lighting with finished reflector, trim and cover shields.
- 4.1.46.11.9 Flooring:
 - 4.1.46.11.9.1 Provide finish floor covering using a vinyl composition tile as selected by Owner.
- 4.1.46.11.10 Handrail:
 - 4.1.46.11.10.1 Provide standard 1/2" x 2" polish bronze flat-stock handrail on rear wall with top of rail located 32 inches above the finished floor.
 - 4.1.46.11.10.2 Use three (3) points of attachment designed for interior access servicing with exterior support plates.
- 4.1.46.11.11 Protection Pads: Elevators 5 & 6
 - 4.1.46.11.11.1 Provide floor-to-ceiling vinyl pads for all wall surfaces with associated hanging hardware.
 - 4.1.46.11.11.2 Include embroidered storage bag for each set of pads.
- 4.1.46.12 Elevator Cab Enclosure Fan

4.1.46.12.1 Provide an exhaust type two-speed fan unit with cover grill, Morrison OE or equivalent, mounting accessories and necessary cab enclosure modifications.

4.1.46.12.1.1 Fan unit shall include self-lubricating motor with housing rubber mounted for sound vibration isolation.

4.1.46.12.2 Provide a key switch in the elevator cab enclosure for control of fan unit.

4.1.46.12.3 Provide necessary wiring and approved conduit to properly connect fan unit with power source and control key switch.

4.1.46.13 Emergency Lighting/Communications/Signaling

4.1.46.13.1 Battery Back-Up Emergency Lighting Fixture and Alarm

4.1.46.13.1.1 Provide a self-powered emergency light unit.

4.1.46.13.1.1.1 Arrange two (2) of the cab light fixtures to operate as the emergency light system.

4.1.46.13.1.2 Provide a car-mounted battery unit including solid-state charger and testing means enclosed in common metal container.

4.1.46.13.1.2.1 The battery shall be rechargeable nickel cadmium with a 10-year minimum life expectancy. Mount the power pack on the top of the car.

4.1.46.13.1.2.2 Provide a 6" diameter alarm bell mounted directly to the battery/charger unit and connected to sound when any alarm push button or stop switch in the car enclosure is operated.

4.1.46.13.1.2.3 The bell shall be configured to operate from power supplied by the building emergency power generator. The bell shall produce a sound output of between 80-90 dBa (measured from a distance of 10') mounted on top of the elevator car.

4.1.46.13.1.2.3.1 Activation of this bell shall be controlled by the stop switch and alarm button in the car operating station

4.1.46.13.1.2.3.2 The alarm button shall illuminate when pressed.

4.1.46.13.1.2.4 Where required by Code for the specific application, the unit shall provide mechanical ventilation for at least one (1) hour.

4.1.46.13.1.2.5 The operation shall be completely automatic upon failure of normal power supply.

4.1.46.13.1.2.6 Unit shall be connected to normal power supply for car lights and arranged to be energized at all times, so it automatically recharges battery after use.

4.1.46.13.2 Common Alarm Bell

4.1.46.13.2.1 Provide a common alarm bell located in the elevator pit.

4.1.46.13.2.1.1 The bell shall be configured to operate when the alarm or stop switch of any elevator is activated, during both normal and battery back-up power conditions.

4.1.46.13.3 Central Exchange Communication System / Intercom

4.1.46.13.3.1 Provide an ADA compatible, hands-free intercommunication system for all elevators for two-way, multi-path communication between the elevator car stations and master stations using a central exchange design system.

4.1.46.13.3.2 The communication system shall include:

4.1.46.13.3.2.1 A car station in each elevator.

4.1.46.13.3.2.2 A master station in each machine room to communicate with the central and satellite monitor panels, and with each car within its group.

4.1.46.13.3.2.3 A master station in the Engineers Room to communicate with all stations in the system.

4.1.46.13.3.2.4 A master station at the employee security station.

4.1.46.13.3.2.5 A master station where selected by the Owner.

4.1.46.13.3.3 The car station shall have a loudspeaker and a microphone to provide hands-free communication. The station shall be installed behind the car operating panel.

4.1.46.13.3.4 Master stations shall include:

4.1.46.13.3.4.1 Selector push buttons

4.1.46.13.3.4.2 Annunciator lights for each connected station

4.1.46.13.3.4.3 Speaker/microphone

4.1.46.13.3.4.4 Volume control and function buttons

4.1.46.13.3.5 Install one master station in the remote monitoring panel with other master stations being the desk-mount type.

4.1.46.13.3.6 The master stations shall communicate with other master stations and any elevator in that group.

4.1.46.13.3.7 A call shall be placed from the elevator car station by pressing the emergency call or alarm button.

4.1.46.13.3.7.1 This action shall cause the lamp in the corresponding button of all the designated master stations to flash and an intermittent tone to be heard.

4.1.46.13.3.7.2 When the incoming call is answered, the flashing light shall go to a steady condition.

4.1.46.13.3.7.3 Disconnection of a call is simply done by depressing the designated car button once.

4.1.46.13.3.7.4 If a call request is placed during a conversation, it shall be indicated by a flashing light and short tone of every designated master station.

- 4.1.46.13.3.7.5 When the original conversation is completed, the normal intermittent tone shall resume.
- 4.1.46.13.3.8 A master station shall be connected to any of its designated car stations by depressing the corresponding call button.
 - 4.1.46.13.3.8.1 The lamp in the button shall be illuminated while the button is depressed.
 - 4.1.46.13.3.8.2 In the car station, an audible tone shall be emitted and immediate communication is established.
 - 4.1.46.13.3.8.3 The call shall be ended by depressing the button a second time, disconnecting the circuit.
 - 4.1.46.13.3.8.4 The master stations shall call any other master station by depressing the corresponding call button.
 - 4.1.46.13.3.8.5 The button shall lock in its down position and the lamp shall be lit with a steady light.
 - 4.1.46.13.3.8.6 At the called master station, a short tone shall be sent out and the lamp in the button corresponding to the "calling" party shall be lit.
 - 4.1.46.13.3.8.7 After the tone, immediate communication is established.
- 4.1.46.13.3.9 On all non-called master stations, the lamps corresponding to the calling and called stations shall be illuminated as an indication that those stations are busy.
- 4.1.46.13.3.10 Provide all power supplies, wire, conduit, fittings, etc., for both systems.
- 4.1.46.13.3.11 Location of the stations, in the specified rooms or areas, shall be directed by the Owner.
- 4.1.46.13.3.12 The intercom system shall include the following features:
 - 4.1.46.13.3.12.1 Test button to verify audio circuit path.
 - 4.1.46.13.3.12.2 All call buttons to initiate a call to all cars in the systems.
 - 4.1.46.13.3.12.3 Priority button in the remote monitoring panel stations.
 - 4.1.46.13.3.12.4 Visual acknowledgment for the hearing impaired.
- 4.1.46.13.3.13 Provide a battery backup power supply for the intercom capable of providing sufficient power to operate the complete system for a minimum of four (4) hours.
- 4.1.46.13.4 Firefighters' Two-Way Telephone Communications System
 - 4.1.46.13.4.1 Provide a complete two-way telephone communications system for point-to-point communications between authorized personnel.
 - 4.1.46.13.4.2 Provide firefighter telephone jack in the car operating panel in accordance with the requirements of the local authorities. The box shall be fitted with a flush mounted door having hairline joints.
 - 4.1.46.13.4.3 Connection devices (jacks) and all associated wiring shall be provided by the elevator Contractor as part of the base bid.

4.1.46.13.4.4 The handsets shall be self-powered and not require an external power source for operation.

4.1.46.13.4.4.1 The firefighter phone shall be furnished by others.

4.1.47 Execution

4.1.47.1 Examination

4.1.47.1.1 Inspection

4.1.47.1.1.1 Study the Contract/Agreement with regard to the work as specified and required so as to ensure its completeness.

4.1.47.1.1.2 Examine surface and conditions to which this work is to be attached or applied and notify the Owner in writing if conditions or surfaces are detrimental to the proper and expeditious installation of the work. Starting the work shall imply acceptance of the surfaces and conditions to perform the work as specified.

4.1.47.1.1.3 Verify, by measurements at the job site, dimensions affecting the work. Bring field dimensions which are at variance with those on the accepted shop drawings to the attention of the Owner. Obtain the decision regarding corrective measures before the start of fabrication of items affected.

4.1.47.1.1.4 Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.

4.1.47.2 Installation/Project Phasing

4.1.47.2.1 Installation

- 4.1.47.2.1.1 Modernize the elevators, using skilled personnel in strict accordance with the final accepted shop drawings and other submittals.
- 4.1.47.2.1.2 Comply with the code, manufacturers' instructions and recommendations.
- 4.1.47.2.1.3 Coordinate work with the work of other building functions for proper time and sequence to avoid delays and to ensure right-of-way of system. Use lines and levels to ensure dimensional coordination of the work.
- 4.1.47.2.1.4 Accurately and rigidly secure supporting elements within the shaftways to the encountered construction within the tolerance established.
- 4.1.47.2.1.5 Provide and install motor, switch, control, safety and maintenance and operating devices in strict accordance with the submitted wiring diagrams and applicable codes and regulations having jurisdiction.
- 4.1.47.2.1.6 Ensure sill-to-sill running clearances do not exceed 1 ¼" at all landings served.
- 4.1.47.2.1.7 Arrange door tracks and sheaves so that no metal-to-metal contact exists.
- 4.1.47.2.1.8 Reinforce hoistway fascias to allow not more than 1/2" of deflection.
- 4.1.47.2.1.9 Install elevator cab enclosure on platform plumb and align cab entrance with hoistway entrances.
- 4.1.47.2.1.10 Sound isolate cab enclosure from car structure. Allow no direct rigid connections between enclosure and car structure and between platform and car structure.
- 4.1.47.2.1.11 Isolate cab fan from canopy to minimize vibration and noise.
- 4.1.47.2.1.12 Remove oil, dirt and impurities and give a factory coat of rust inhibitive paint to all exposed surfaces of struts, hanger supports, covers, fascias, toe guards, dust covers and other ferrous metal.
- 4.1.47.2.1.13 Prehang traveling cables for at least 24 hours with ends suitably weighted to eliminate twisting after installation.

4.1.47.2.2 Project Phasing

- 4.1.47.2.2.1 Phase I - Final design development and Successful Respondents' preliminary work procedures to be completed within four (4) weeks from date of contract award.
 - 4.1.47.2.2.1.1 Prevailing conditions review and layout.
 - 4.1.47.2.2.1.2 Selection meeting for aesthetic design and finishes with Owner.

- 4.1.47.2.2.1.3 Filing for required permits or other governing authorities work procedure requirements.
- 4.1.47.2.3 Phase II - Submittal approvals and confirmations shall be completed within eight (8) weeks from date of contract award.
 - 4.1.47.2.3.1 Selection confirmations.
 - 4.1.47.2.3.2 Manufacturer's shop drawings applicable, i.e., fixtures, cab, machine room layouts, doors, etc.
 - 4.1.47.2.3.3 Engineering data acknowledgment applicable, i.e., power, heat, structural loads.
 - 4.1.47.2.3.4 Delivery dates for major component suppliers, i.e., controls, machinery, fixtures, cabs, etc.
 - 4.1.47.2.3.5 Posting of permits or other governing agency authorizations to proceed.
 - 4.1.47.2.3.6 Proposed work implementation schedule based on the aforementioned procedures/confirmations.
- 4.1.47.2.4 Phase III - Mobilization of Final Design Approvals
 - 4.1.47.2.4.1 Revision confirmations. (Equipment, etc.)
 - 4.1.47.2.4.2 Preliminary work procedures
 - 4.1.47.2.4.3 Schedule confirmations
- 4.1.47.2.5 Phase IV – Preferred but not mandatory installation
 - 4.1.47.2.5.1 Modernize cars 3,4 and 5 simultaneously under the base bid/ Alternate 6 pricing for an accelerated schedule
 - 4.1.47.2.5.2 Modernize car 1/ Standard work schedule
 - 4.1.47.2.5.3 Modernize car 2 and 6 / Standard work schedule
 - 4.1.47.2.5.4 Should Respondents not be able to meet this request, please supply an alternate schedule in Section 9.0 Quotations.
- 4.1.47.2.3 Removal of Elevators
 - 4.1.47.2.3.1 If extenuating circumstances (i.e. separating controller interconnections, inspection, testing, etc.), require that multiple cars of a single elevator group be removed from service simultaneously, the work shall be performed outside of the normal business hours at a time mutually agreed to by the Owner and Successful Respondent.
 - 4.1.47.2.3.2 A minimum of five (5) days advance written notice shall be given to the Owner and Consultant by the Successful Respondent detailing the reasons for the simultaneous removal of the elevators from service along with the estimated out-of-service time.
 - 4.1.47.2.3.3 The request shall be subject to review by the Successful Respondent and approved by the Owner prior to the commencement of the work.
 - 4.1.47.2.3.4 Costs for this work in addition to associated expenses shall be included as part of the base bid pricing.
- 4.1.47.2.4 Transfer of Hall Button Risers

4.1.47.2.4.1 Transfer of the hall button riser(s) to the new signal control systems shall be performed on a not-to-interfere basis and shall not interrupt building operations or inconvenience building occupants.

4.1.47.2.4.2 Costs for this work in addition to associated expenses shall be included as part of the base bid.

4.1.47.3 Field Quality Control

4.1.47.3.1 Inspection and Testing

4.1.47.3.1.1 Upon completion of each work phase or individual elevator specified herein, the Successful Respondent shall, at its own expense, arrange and assist with inspection and testing as may be required by the A.H.J. in order to secure a Certificate of Operation.

4.1.47.3.2 Substantial Completion

4.1.47.3.2.1 The work shall be deemed "Substantially Complete" for an individual unit or group of units when, in the opinion of the Consultant, the unit is complete, such that there are no material and substantial variations from the Contract/Agreement, and the unit is fit for its intended purpose.

4.1.47.3.2.2 Governing authority testing shall be completed and approved in conjunction with inspection for operation of the unit; a certificate of operation or other required documentation issued; and remaining items mandated for final acceptance completion are limited to minor punch list work not incorporating any life safety deficiencies.

4.1.47.3.2.3 The issuance of a substantial completion notification shall not relieve the Successful Respondent from its obligations hereunder to complete the work.

4.1.47.3.2.4 Final completion cannot be achieved until all deliverables, including but not limited to training, spare parts, manuals, and other documentation requirements, have been completed.

4.1.47.3.3 Successful Respondent's Superintendent

4.1.47.3.3.1 The Successful Respondent shall assign a competent project superintendent during the work progress and any necessary assistant, all satisfactory to the Owner. The superintendent shall represent the Successful Respondent and all instructions given to him shall be as binding as if given to the Successful Respondent.

4.1.47.4 Protection/Cleaning

4.1.47.4.1 Protection and Cleaning

- 4.1.47.4.1.1 Adequately protect surfaces against accumulation of paint, mortar, mastic and disfiguration or discoloration and damage during shipment and installation.
- 4.1.47.4.1.2 Upon completion, remove protection from finished surfaces and thoroughly clean and polish surfaces with due regard to the type of material. Work shall be free from discoloration, scratches, dents and other surface defects.
- 4.1.47.4.1.3 The finished installation shall be free of defects.
- 4.1.47.4.1.4 Before final completion and acceptance, repair and/or replace defective work, to the satisfaction of the Owner, at no additional cost.
- 4.1.47.4.1.5 Remove tools, equipment and surplus materials from the site.

4.1.47.4.2 Barricades and Hoistway Screening

4.1.47.4.2.1 Protection of Work and Property

- 4.1.47.4.2.1.1 The Successful Respondent shall continuously maintain adequate protection of all their work from damage and shall protect Owner's property from injury or loss arising out of the Contract/Agreement.
- 4.1.47.4.2.1.2 The Successful Respondent shall make good any such damages, injury or loss, except such as may be directly caused by agents or employees of the Owner.
- 4.1.47.4.2.1.3 The Successful Respondent shall provide an Owner approved, full height, lockable barricade(s) required to protect open hoistways or shafts per OSHA regulations. Such protection shall include any necessary guards or other barricades for employee protections during and after the modernization procedure. The barricade will be provided with a wrapped design fully enclosing the work area at floors B, 1 and 2 as needed to separate the work from the public spaces. It shall include a ceiling to reduce noise transmissions and the exterior shall be painted or otherwise covered to provide a finished appearance. It shall allow enough space for code required public passage. The cost of the barricade(s) and design will be included in the base lump sum pricing.

- 4.1.47.4.2.2 As required, the Successful Respondent shall provide temporary wire mesh screening in the hoistway and of any elevator undergoing work specified in the Contract/Agreement. This screening shall be installed in such a manner as to completely segregate the hoistway from that of adjacent elevators. Screening shall be constructed from .041" diameter wire in a pattern that rejects passage of a 1" diameter ball.

4.1.47.5 Demonstration

4.1.47.5.1 Performance and Operating Requirements

- 4.1.47.5.1.1 Passenger elevators shall be adjusted to meet the following performance requirements:

- 4.1.47.5.1.1.1 Speed: within 3% of rated speed under any loading condition
- 4.1.47.5.1.1.2 Leveling: within 1/4" under any loading condition.
- 4.1.47.5.1.1.3 Typical Floor-to-Floor Time: (Recorded from the doors start to close on one floor until they are 3/4 open at the next floor.)
 Group Passenger Elevators 9.0 - 10.0 seconds. (12' floor to floor)

4.1.47.5.1.1.4 Door Operating Times:

Door Type	Opening	Closing
Center Opening	1.5 - 2.0 sec	2.5 - 3.0 sec

- 4.1.47.5.1.1.5 Door dwell time for hall calls:4.0 sec with Advance lantern signals
- 4.1.47.5.1.1.6 Door dwell time for hall calls:5.0 sec without Advance lantern signals
- 4.1.47.5.1.1.7 Door dwell time for car calls:3.0 sec
- 4.1.47.5.1.1.8 Reduced non-interference dwell time: 1.0 sec

4.1.47.5.1.2 Maintain the following ride quality requirements for the passenger elevators:

- 4.1.47.5.1.2.1 Where pit permits, extend bottom roller guides by not less than one half the distance from the centerline of the upper roller guides to the platform.
- 4.1.47.5.1.2.2 Noise levels inside the car shall not exceed the following:
 - 4.1.47.5.1.2.2.1 Car at rest with doors closed and fan off - 40 dba.
 - 4.1.47.5.1.2.2.2 Car at rest with doors closed, fan running - 55 dba.
 - 4.1.47.5.1.2.2.3 Car running at high speed, fan off - 50 dba.
 - 4.1.47.5.1.2.2.4 Door in operation - 60 dba.
- 4.1.47.5.1.2.3 Vertical horizontal accelerations shall not exceed 14 milli-g and horizontal accelerations shall not exceed 20 milli-g.
 - 4.1.47.5.1.2.3.1 The accelerometer used for this testing shall be capable of measuring and recording acceleration to nearest 0.01 m/s² (1 milli-g) in the range of 0-2 m/s² over a frequency range from 0-80 Hz with ISO 8041 filter weights applied. Accelerometer should provide contact with the floor similar to foot pressure, 60 kPA (8.7psi).
- 4.1.47.5.1.2.4 Amplitude of acceleration and deceleration shall not exceed 4.0 ft/sec².
- 4.1.47.5.1.2.5 A sustained jerk shall not be more than twice the acceleration.
- 4.1.47.5.1.2.6 The rate of change in the acceleration/deceleration rate shall not be greater than 8.0 ft/sec³

4.1.47.5.2 Acceptance Testing

- 4.1.47.5.2.1 Comply with the requirements of this Request for Proposal.
- 4.1.47.5.2.2 The Successful Respondent shall provide at least five (5) days prior written notice to the Owner and Consultant regarding the exact date on which

work specified in the Contract/Agreement will reach completion on any single unit of vertical transportation equipment.

- 4.1.47.5.2.3 In addition to conducting whatever testing procedures may be required by local inspecting authorities in order to gain approval of the completed work, and before seeking approval of said work by the Owner, the Successful Respondent shall perform certain other tests in the presence of the Consultant.
- 4.1.47.5.2.4 The Successful Respondent shall provide test instruments, test weights, and qualified field labor as required to safely operate the unit under load conditions that vary from empty to full rated load and, in so doing, to successfully demonstrate compliance with applicable performance standards set forth in the Scope of Services with regard to:
 - 4.1.47.5.2.4.1 Operation of safety devices.
 - 4.1.47.5.2.4.2 Sustained high-speed velocity of the elevator in either direction of travel.
 - 4.1.47.5.2.4.3 Brake-to-brake running time and floor-to-floor time between adjacent floors.
 - 4.1.47.5.2.4.4 Floor leveling accuracy.
 - 4.1.47.5.2.4.5 Door opening/closing and dwell times.
 - 4.1.47.5.2.4.6 Ride quality inside the elevator car.
 - 4.1.47.5.2.4.7 Communication system.
 - 4.1.47.5.2.4.8 Load settings at which anti-nuisance, load dispatch, and load non-stop features are activated.
- 4.1.47.5.2.5 Upon completion of work specified in the Contract/Agreement on the last car in any group of elevators, and in conjunction with the aforementioned testing procedures, the Successful Respondent shall carry out additional testing of group dispatch/supervisory control features in the presence of the Consultant.
- 4.1.47.5.2.6 The Successful Respondent shall provide test instruments and qualified field labor as required to successfully demonstrate:
 - 4.1.47.5.2.6.1 The back-up operating mode for group dispatch failure
 - 4.1.47.5.2.6.2 Simulated and actual emergency power operation
 - 4.1.47.5.2.6.3 Firefighter, attendant and independent service operations
 - 4.1.47.5.2.6.4 Restricted access security features and card reader controls
 - 4.1.47.5.2.6.5 Zoning operations and floor parking assignments
 - 4.1.47.5.2.6.6 Up/down peak operation
- 4.1.47.5.2.7 Ride Quality Analysis
 - 4.1.47.5.2.7.1 A ride quality measurement and vibration analysis report shall be provided prior to final acceptance for all elevators. This report shall include, as a minimum, Executive Summary and Overview Comparison for: acceleration, deceleration, speed, jerk and vibration and sound measurements. Such reports shall be provided, both in printed format and electronic data copies, to Owner after completion of such tests. Owner shall have the right to witness such tests. Should the finalized results be objectionable

for any reason by the Owner's, the Successful Respondent shall immediately correct the problem and re-run the analysis.

- 4.1.47.5.2.8 After hour tests of systems such as emergency generators, fire service, and security systems shall be conducted at no extra cost to the Owner.

4.1.48 Mandatory Alternates

- 4.1.48.1 All Elevator Shaft Sound Dampening: Due to excess noise in various areas of the Downtown Courthouse, it is expected that each Respondent provide ample sound proofing to new and existing equipment, as specified in the Request for Proposal. In addition to the equipment specified in the Request for Proposal, it is the expectation of the County that necessary precautions be taken to include noise reduction in the adjacent spaces, notably the various courtrooms. Please address this concern with a proposed solution. Should one not exist in excess of what is specified in the Request for Proposal, please respond with "No solutions applicable".

4.2 Maintenance of Seven (7) Elevators through Award until Warranty Expiration

- 4.2.1 **Contract Intent: It is Jackson County's preferred intent that the Successful Respondent maintain the existing 7 elevators during the modernization implementation. Should any Respondent have an alternative proposal to ongoing maintenance, the County is willing to entertain such a proposal. Should the Respondent provide an alternative maintenance solution, the quotation in Section 9.0 should reflect the proposal monetarily. This maintenance proposal would be subject to negotiation with the selected vendor.**

- 4.2.1.1 The purpose of this Contract/Agreement is to state and define the terms and conditions under which the Successful Respondent shall provide full comprehensive maintenance and repair services for elevators identified and the terms and conditions under which the owner shall compensate the Successful Respondent for such services rendered.
- 4.2.1.2 It is the intent of this Contract/Agreement to ensure all requirements, procedures, tests, inspections, service practices, component repairs, equipment renewals, system adjustments, filing procedures and recording documentation as referenced, mandated or otherwise implied herein are all inclusive, and to guarantee the Owner the absences of a particular item of work, service or procedure shall not alleviate the Successful Respondent of the sole responsibility to provide such labor, expertise, materials, equipment, services or other procedures applicable to the Contract/Agreement and practical requirements unless same is specifically excluded, prorated or deleted herein.
- 4.2.1.3 Minimum standards and requirements for services to be rendered shall be performed in accordance with the specifications and relative time periods. When there is no specific requirement for a preventative maintain procedure, the original equipment manufacturer (O.E.M.) standard shall be employed unless there is no relative documentation available. The absence of both a contract requirement herein and the O.E.M. design standard shall cause the Successful Respondent to engage the services of a qualified engineer to formulate the relative standards and incorporate same as an addendum to this Contract/Agreement with the Professionals' Seal and Stamp.

4.2.2 Abbreviations and Symbols:

4.2.2.1 Abbreviations for associations, institutions, societies, reference documents and/or governing agencies, which may appear in the Request for Proposal, shall mean the following:

AIA	American Institute of Architects
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
BOCA	Building Officials and Code Administrators International (Basic National Building Code)
AHJ	Authority Having Jurisdiction
GA	Governing Agency
NEC	National Electrical Code
OHSA	Occupational Safety and Health Administration

4.2.2.2 It is mutually agreed that the Successful Respondent shall not be under any obligation hereunder to make any repairs or replacements except those incidental to the normal operation of the machinery, and that the Successful Respondent is not required under this Contract/Agreement to make repairs or replacements necessitated by reason of malicious damage, fire, including non-elevator component electrical fire, which are the result of causes beyond the Successful Respondent’s control. All repairs, if necessitated by this paragraph will be performed at a fee not to exceed the standard rate in effect at the time the service is performed.

4.2.2.2.1 It is mutually agreed that the Successful Respondent shall make any and all repairs or replacements damaged by Successful Respondent’s improper repair, negligence or willful acts or omissions.

4.2.3 Compensation:

4.2.3.1 Payment for services rendered shall be made on a monthly basis, within thirty (30) days of the end of each billing period.

4.2.3.1.1 Payment for Emergency Call-back services shall be invoiced on a monthly basis for all call-back services with an itemized statement for each service rendered using the hourly rates specified in “Attachment A” and adjusted on an annual basis in accordance with terms and specified herein.

4.2.4 Subsequent Equipment Modernizations/Alterations/Upgrades:

4.2.4.1 Full comprehensive service and repair coverage shall be included under the terms of this agreement when equipment and/or component systems represented herein are modified or upgraded.

4.2.4.2 Such changes in equipment necessitating continuing full maintenance coverage may be initiated by the Owner under a separate voluntary extra cost upgrading agreement with or without the Successful Respondent’s permission or direct authorization and involvement before the work is performed.

4.2.4.3 All **non-elective** changes or modifications necessitated due to obsolescence, parts unavailability or the Successful Respondent’s inability to maintain these systems in accordance with this Request for Proposal shall be fully covered

under this Contract/Agreement regardless of application, method or cost assignment for the life of the Contract/Agreement.

4.2.4.4 Modernized or otherwise upgraded systems and parts thereof shall automatically be included under the terms of this full comprehensive Contract/Agreement whether such components are specifically identified or not without extra cost to the Owner.

4.2.5 Notice by Authority or Company to Repair or Replace:

4.2.5.1 The Successful Respondent shall comply with all written recommendations of the governing authority or independent inspectors, consultants and insurance carriers employed by the Owner. However, the Successful Respondent is not required under this Contract/Agreement to install new attachments or parts other and different from those now constituting the equipment, as recommended or directed by insurance companies, Government Authorities, or otherwise.

4.2.6 Record Keeping:

4.2.6.1 A complete permanent record of inspections, maintenance, lubrication and call-back service shall be kept in the machine room or other designated location at the site of work. These records are to be available to the Owner's Designee at all times. The records shall indicate the reason the mechanic was in the building, arrival and departure time, the work performed, etc. and these records will be the property of the Owner. Record keeping requirements shall include Successful Respondent's assigned maintenance personnel and scheduled preventative maintenance procedures, inspections, tests and third party assisted examinations.

4.2.7 Record Drawings:

4.2.7.1 Successful Respondent shall provide and maintain two (2) complete sets of updated electrical wiring diagrams and control schematic drawings on file with the building and they are to become the property of the Owner for each group and/or individual system.

4.2.8 Reports by Successful Respondent:

4.2.8.1 The Successful Respondent shall, at any time during the term of this Contract/Agreement, upon written request of the Owner, render a report of inspections, repairs or replacements made by the Successful Respondent at the premises herein, itemized as to parts installed and or services performed and supply samples of lubricants, compounds, or other materials employed.

4.2.8.1.1 Successful Respondent shall prepare and issue all required forms and/or reports relative to examinations, tests and inspections as specified herein.

4.2.9 Price Adjustments:

4.2.9.1 Labor Rates – State of Missouri Wage Rates shall prevail. The County's Annual Wage Order from the State of Missouri is included as part of this Request for Proposal.

4.2.9.1.1 The Successful Respondent may request increase in Hourly Wage Rates quoted during the term of this Contract/Agreement only when the increase is equal to or less than the increase in the State of Missouri's Prevailing Hourly Rate of Wages for

Workmen in that occupational title category. Hourly increases will only take effect when the Successful Respondent has provided evidence in writing of such increases to the reasonable satisfaction of the Owner and the Owner has given its approval in writing.

4.2.9.2 Materials Portion of the Contract/Agreement: the current materials portion of the Contract/Agreement shall be adjusted based on the established monthly difference in the "Producer Commodity Prices for Wholesale Metals and Metal Products Index" as published by the United States Department of Labor, Bureau of Labor Statistics during the month within such adjustment occurs for comparison.

4.2.9.2.1 Using _____ 20__ as the base month, the material factor is _____.

4.2.9.3 Annual adjustments shall be effective the first day of the new Contract/Agreement and shall remain unchanged for the next twelve (12) months.

4.2.9.4 Notwithstanding anything to the contrary, the maximum annual increase shall not be more than three (3%) of the total contracted payment for the preceding contract year.

4.2.10 Insurance Coverage: See Exhibit A, Page 150 of 171 herein.

4.2.11 Cancellation:

4.2.11.1 The Owner shall have the right to cancel this Contract/Agreement upon at least thirty (30) days prior written notice to the Successful Respondent of its election to do so without penalty for the following:

- 4.2.11.1.1 Elective upgrading of apparatus awarded to another vendor;
- 4.2.11.1.2 Substandard services and/or maintenance practices as confirmed by the Consultant or other qualified professional;
- 4.2.11.1.3 Failure to comply with governing authority directives and/or citations;
- 4.2.11.1.4 Cost analysis completed prior to expiration date.

4.2.11.2 In addition to the rights provided in Item 4.2.11.1 above, the Owner shall have the right to cancel this Contract/Agreement immediately, upon the occurrence of any of the following contingencies: bankruptcy of the Owner or Successful Respondent; mortgage foreclosure; condemnation, destruction, or transfer or conveyance of Title to the premises in which the subject equipment is located or the premises in which the subject equipment is located is rendered unusable in the opinion of the Owner.

4.2.11.3 Cancellation of this Contract/Agreement prior to the expiration date

shall entitle the Successful Respondent to payment for services rendered up to and including the date of cancellation; and the Owner shall not be responsible for any expenses or subsequent costs that may be incurred by the Successful Respondent as a result of an early cancellation or standard Contract/Agreement expiration.

4.2.12 Non-Payment:

4.2.12.1 The Owner may have the Successful Respondent's work and systems performance operations checked monthly to ensure the Successful Respondent is performing in accordance with this Contract/Agreement. If the work requirements are not maintained, the Owner will retain the monthly payment to the Successful Respondent until the Consultant verifies that the work and/or operating performance is back to standard. If three (3) consecutive months of substandard maintenance is noted, the Owner has the right to immediately cancel the Contract/Agreement without notice to the Successful Respondent.

4.2.12.2 The Consultant or Owner may withhold approval for payment on any request to such extent as may be necessary to protect the Owner from loss on account of:

4.2.12.2.1 Negligence on the part of the Successful Respondent to execute the work properly or failure to perform any provisions of the Contract/Agreement. The Owner, after three (3) days written notice to the Successful Respondent, may, without prejudice to any other remedy, make good such deficiencies and may deduct the cost from the payment.

4.2.12.2.2 Claims filed or reasonable evidence indicating probable filing of claims due to Successful Respondent's failure to perform.

4.2.12.2.3 Failure of Successful Respondent to make payments properly to subcontractors for material and labor used to fulfill Contract/Agreement requirements.

4.2.12.2.4 Damage to the Owners building as a result of work performed by Successful Respondent and/or Successful Respondent's subcontractor failure to perform.

4.2.13 Force Majeure: Neither party shall be liable by reason of any failure or delay in the performance of its obligations due to strikes, riots, fires, explosions, acts of Gods, war, governmental action or any other cause which is beyond the reasonable control of such parties. The performance of such party shall be excused for such reasonable time as may be required to resume performance following cessation of such cause.

4.2.14 Contractor's License: If required by law, the Successful Respondent certified that it is licensed in the state, municipality and/or local jurisdiction where the property is located to perform the elevator maintenance services pursuant to this Contract/Agreement, and the license will be maintained current and valid for the term of this Contract/Agreement.

4.2.15 Waiver: A waiver by either party of any term or condition of this Contract/Agreement in any instance shall not be deemed or construed as a waiver of such term or condition for

the future, or of any subsequent breach thereof. All remedies and rights of the parties contained in this Contract/Agreement shall be cumulative.

4.2.15: Attorney's Fees: In the event litigation be commenced by either party hereto against the other in connection with the enforcement of any provision of the Contract/Agreement, the losing party shall pay all court costs and shall pay to the prevailing party all expenses incurred by the prevailing party in litigation, including attorney's fees in a reasonable amount to be determined by the Court. The amount so allowed as attorney's fees shall be taxed to the losing party as costs of the suit, unless prohibited by law.

4.2.16 Limitation of Liability: It is expressly understood and agreed by the Parties that the Owner, its parent, subsidiaries and/or affiliates shall not be liable or responsible in any way for any loss of or damage or injury to any equipment as referred to in this Contract/Agreement or other personal property belonging to the Successful Respondent or any personnel of Successful Respondent while in any area of the Owner's building; nor shall Owner, its parent, subsidiaries and/or affiliates be liable for any injury suffered by any personnel of Successful Respondent while on or in the Owner's property. Personnel of Successful Respondent shall make all necessary arrangement for the safety and security.

4.2.17 Products and Services:

4.2.17.1 Scheduled Preventative Maintenance Labor: Successful Respondent shall provide scheduled systematic examinations, adjustments, cleaning and lubrication of all machinery, machinery spaces, hoistways and pits. The Successful Respondent shall include minimum hours per month per unit as quoted in Attachment C that is to be dedicated to routine preventative maintenance.

4.2.18 Cleaning: The Successful Respondent shall during the course of all examinations remove and discard immediately all accumulated dirt and debris from the car top (s) and pit area(s). Prior to each annual anniversary date of this Contract/Agreement, Successful Respondent shall thoroughly clean down the entire hoistway of all accumulated dirt, grease, dust and debris each year.

4.2.19 Painting: The Successful Respondent shall keep the exterior of the machinery and any other parts of the equipment subject to rust, properly painted, identified and presentable at all times. Motor windings and controller coils shall be periodically treated with proper insulating compound. The machine room floor and all storage areas shall be painted annually with a good quality deck enamel.

4.2.20 Inspections/Tests:

4.2.20.1 The Successful Respondent shall conduct Safety, Efficiency and Maintained Conditions surveys, inspections and tests as follows:

4.2.20.1.1 Semi-Annual quality control evaluations by a qualified supervisor to ensure and confirm the services and procedures as specified herein are properly executed relative to maintenance and performance standards for the systems serviced.

4.2.20.1.2 Mandated inspections and testing in accordance with the latest ASME A17.1 standards applicable per local law.

4.2.20.1.3 Payment of all relative fees per the AIJ shall be by the Owner.

- 4.2.20.1.4 As required, the Successful Respondent shall correct noted deficiencies in addition to preparation and filing of appropriate Affirmation of Correction(s) within the stipulated timeframe as required by the AHJ. Applicable fees associated with this filing shall be covered under the terms of this Contract/Agreement.
 - 4.2.20.1.5 Where required work necessary to resolve aforementioned deficiencies is not covered under the terms of this Contract/Agreement, Successful Respondent shall submit proposals in a timely fashion in an effort to meet applicable correction deadlines.
 - 4.2.20.1.5.1 Proposals shall indicate the material and labor costs in addition to anticipated time of completion from approval of proposal(s) by Owner.
 - 4.2.20.1.6 If applicable, independent testing of Fire Emergency Operating Systems and/or Emergency Power System test in accordance with local law requirements and ASME standards.
 - 4.2.20.1.7 The Owner retains the right to have these tests performed on a not-to-interfere basis at any hour of the day and any day of the week; and the costs for overtime work shall be included in the base monthly maintenance price. Successful Respondent shall maintain ASME code-required safety tests, fireman's service tests, telephone/intercom tests and emergency power tests on site.
 - 4.2.20.1.8 Successful Respondent shall maintain monthly oil consumption records on site in accordance with ASME A17.1 Safety Code (hydraulic elevators only).
- 4.2.20.2 The Successful Respondent shall conduct testing procedures in accordance with the applicable ASME A17.1 standards at intervals specified and/or local code requirements in place at commencement of Contract/Agreement, complete and execute all governing authority filing procedures including payment of all associated fees or other charges where mandated by local authorities, and forward confirmation of all authority required filings to the Owner within ten (10) business days of the date the test procedure was completed. Any fines incurred for failure on complete required testing or for filing irregularities will be paid by the Successful Respondent.
- 4.2.20.2.1 Annual Electric Traction Elevator Safety Test: Successful Respondent shall perform an Annual Electric Traction Elevator Safety Test conforming to the requirements contained in ASME A17.1 Category 1, Inspection and Test Requirements on all Traction Elevators covered by this Contract/Agreement, and/or as required by the AHJ.
 - 4.2.20.2.2 Five Year Full Load Safety Test: Successful Respondent shall perform a Five-Year Safety Test conforming to the requirements contained in ASME A17.1 Category 5, Inspection and Test Requirements on all Traction Elevators covered by this Contract/Agreement.
 - 4.2.20.2.3 Annual Hydraulic Elevator Safety Test: Successful Respondent shall perform an Annual Hydraulic Elevator Safety Test

- conforming to the requirements contained in ASME A17.1 Category 1, Inspection and Test Requirements on all Hydraulic Elevators covered by this Contract/Agreement, and/or as required by the AHJ.
- 4.2.20.2.4 Three Year Hydraulic Safety Test: Successful Respondent shall perform a Three Year Safety Test conforming to the requirements contained in ASME A17.1 Category 3, Inspection and Test Requirements on all Hydraulic Elevators covered by this Contract/Agreement.
- 4.2.20.2.5 Five Year Hydraulic Safety Test: The Successful Respondent shall perform a Five Year Safety Test conforming to the requirements contained in ASME A17.1 Category 5, Inspection and Test Requirements on all Hydraulic Elevators covered by this Contract/Agreement.
- 4.2.20.3 The Owner may engage the services of a third-party qualified and certified agency for the sole purpose of mandated inspections of the equipment per local code authority requirements. The Successful Respondent shall conform to the third-party agency schedule and provide qualified labor to assist in these inspections (including assistance in gaining access to hoistways, pits and machine rooms) at no additional charge to Owner.
- 4.2.21 Emergency Call-Back Service (24 Hours, 7 Days Per Week):
- 4.2.21.1 Provide emergency call-back service which consists of promptly dispatching qualified employees in response to request from Owner by telephone or otherwise, for emergency adjustment or minor repairs on any day of the week, at any hour, day or night. If repairs cannot be made immediately, the Successful Respondent shall notify Owner as to the reason why and provide supplemental information regarding the restoration of services.
- 4.2.21.1.1 Call-back service in response to passenger entrapments shall be provided within one-half (1/2) hour during regular working hours and within one (1) hour during overtime periods.
- 4.2.21.1.2 Call-back services for out-of-service units that have been secured by Owner shall be provided within one (1) hour during regular working hours and within two (2) hours between 6:00 AM and 8:00 AM and 4:30 PM and 6:30 PM Monday through Friday, except holidays.
- 4.2.21.1.3 Call-back services for out-of-service units that have been secured by the Owner shall be provided within three (3) hours at all other times not specified above in 4.2.21.1.1 and 4.2.21.1.2.
- 4.2.21.1.4 Call-back services for non-essential system malfunctions that do not constitute an operational or other safety condition shall be provided during normal working hours of regular work days within four (4) hours of the request for service.

4.2.22 Repairs, Renewals and Replacements:

- 4.2.22.1 Repairs, renewals and replacements shall be made by the Successful

Respondent as soon as scheduled or other examinations reveal the necessity of the same, or when the Owner so advises the Successful Respondent under the terms of this Contract/Agreement. It is understood and agreed that repairs, renewals, and replacements shall be made in accordance with high standards of preventative maintenance and replacements shall be made in accordance with high standards of preventative maintenance practice and that the repair and renewals of parts made shall be equal in design, workmanship, quality, finish, fit, adjustment, operation and appearance to the original installation and that replacements shall be new and genuine parts equal to those parts supplied by the manufacturer of the original equipment or its successor, and shall apply to the repair, renewal, or replacement of all mechanical, electronic, and electrical parts, including, but not limited to the following:

- 4.2.22.1.1 Automatic door systems, power operated door systems and manual door/gate systems complete.
 - 4.2.22.1.1.1 Power operator and engagement linkages
 - 4.2.22.1.1.2 Car door top track and hanger roller assemblies
 - 4.2.22.1.1.3 Car door track liners, eccentrics, stops, bumpers and related operating mechanisms for multiple speed or multiple panel doors.
 - 4.2.22.1.1.4 Car gates, bottom guides, retainers, fire stops, gibs, entrance sills and threshold plates, gate handles and protection guards.
 - 4.2.22.1.1.5 Electrical safety switches and activation mechanisms, door protective and/or retracting devices, and power door operators.
 - 4.2.22.1.1.6 Electromechanical safety interlock assemblies, related operating mechanisms, clutch or other master system engaging devices, linkages, zoned locking devices and self-closing devices.
- 4.2.22.1.2 Car Frame, platform and car safety devices complete,
 - 4.2.22.1.2.1 Crosshead, stiles, hitch plates, tie rods, supports and related structures.
 - 4.2.22.1.2.2 Car guides, shoes, stands, spindles, gibs, rollers and tensioning devices.
 - 4.2.22.1.2.3 Sub-platform, under car platform fireproofing, car sills with support cradles, load weighing devices, top/side exit access operating/safety hardware and electrical switches.
 - 4.2.22.1.2.4 Car fans, blowers and cab ventilation systems.
- 4.2.22.1.3 Hoisting machinery, and rotating power drives with mounting supports and beams, raised platforms and weighted foundations and structures complete.
 - 4.2.22.1.3.1 Geared traction and winding drum units, gearless traction and related systems complete.
 - 4.2.22.1.3.2 Worms, gears, shafts, couplings, drive sheaves, deflector sheaves, 2:1 sheaves, bearings, support/mounting apparatus, brake assembly, rotating elements and all associated castings, guards, retainers and hardware.

- 4.2.22.1.3.3 Integral and free standing brake units, drums, discs, pulleys, shoes, linings, pads, pins, sleeves, plungers, coils, caps, adjustment devices and hardware complete.
- 4.2.22.1.3.4 AC and DC motors, motor generators, rotating regulators and exciters; armatures, field coils, pole pieces, interpoles, commutators, brush riggings, brush holders, carbon brushes, stator windings, fan or other ventilation mechanisms, bearings, bushings, shafts, caps, packings, seals, junction boxes, leads, connectors and related wiring.
- 4.2.22.1.4 Controls, selectors, power drives, encoding devices with related wiring, conduit and circuitry complete.
 - 4.2.22.1.4.1 Relays, contactors, switches, capacitors, resistors, fuses, circuit breakers, overloads, power supplies, regulators, tach generators, arc shields, shunts, holders and hardware.
 - 4.2.22.1.4.2 Circuit boards, transmitters, encoders, transformers, rectifiers, transistors, solid state switching devices, insulators, timing devices, suppressors, and computer apparatus.
 - 4.2.22.1.4.3 Filters, fans, blowers, wiring, studs, terminal blocks, plug connectors, CRTs or other diagnostic devices, keyboards and printers.
 - 4.2.22.1.4.4 Cabinets, isolation transformers, chokes, diagnostic tools, status indicators, solid state and hard wire circuitry.
- 4.2.22.1.5 Car and counterweight safety systems.
 - 4.2.22.1.5.1 Overspeed governors and electromechanical safety devices, wire ropes and tensioning devices with related hitch and connection apparatus complete.
 - 4.2.22.1.5.2 Car and counterweight safety devices, drums, rods, linkages, clamps and hardware.
- 4.2.22.1.6 Hoistway and pit equipment.
 - 4.2.22.1.6.1 Guide rails, fishplates, brackets, inserts and related hardware to include jack bolts or other special mechanisms for monitoring and alignment.
 - 4.2.22.1.6.2 Wire ropes, chains and cables used for suspension, compensation, safety and selector encoding with related hitch and connection hardware complete.
 - 4.2.22.1.6.3 Corridor entrance top track and hanger rollers, toe guards, fascias, dust covers, sills, stops, bumpers, eccentrics, retainers, and bottom guides.
 - 4.2.22.1.6.4 Overhead machine room, secondary, and 2:1 wire rope sheaves, shafts, bearings, bushing, seals, mounting supports, lubrication devices, guards and hardware complete.
 - 4.2.22.1.6.5 Electrical wiring and conduit, electrical traveling cables, electrical limits, slow-downs, activating cams, switches,

- vaners, inductors, tapes, readers, leveling and encoding systems complete with all related hardware and wiring.
- 4.2.22.1.6.6 Compensation sheaves, shafts, frame, guides, switches, rollers, cams, guards, "S" hooks, guidance systems and all related hardware.
- 4.2.22.1.6.7 Counterweight assemblies, guides, rollers, stands, strike plates, safeties and hitch devices.
- 4.2.22.1.6.8 Car and counterweight buffers, stands, strikes, blocking, platforms, extension devices, mounting hardware and appurtenances.
- 4.2.22.1.6.9 Pit safety switches, cable tensioning devices, access ladders, light switches, lighting assemblies, bulbs and guards.
- 4.2.22.1.7 Operating and signal fixtures with electrical wiring.
 - 4.2.22.1.7.1 Car operating panels, push buttons, stop switches, audible signals, keyed or other control switches, visual signals, jewels and indicators with electrical wiring.
 - 4.2.22.1.7.2 Car position indicators, riding lanterns, signal annunciators, visual and audible signals complete.
 - 4.2.22.1.7.3 Corridor push button stations, hall lanterns, hall position indicators, keyed switches, access controls, electrical wiring and traveling cables complete.
 - 4.2.22.1.7.4 Emergency lighting systems, emergency communication devices, and signal systems complete.
 - 4.2.22.1.7.5 Corridor and lobby fixtures with remote controls and operational monitoring devices, starter panels, emergency power selectors, telltale panels, location indicators, security controls and monitors.
- 4.2.22.1.8 Hydraulic system components, including but not limited to, tanks, valves, pump, cylinder head, above ground piping, hoses, fittings, gauges, seals, O-Rings, filters, screens, packings, belts, recovery devices overflow devices, rescuator or other emergency operating and signal systems, above grade cylinder and plunger assemblies complete, mufflers, heaters and shut-off valves.
- 4.2.22.1.9 Escalator systems' components, including but not limited to driving machines, steps, rollers, tracks, lubricators, handrails, guides, starting mechanisms, stop and safety switches, comb plates, hand guards, brush guards, skirt boards, step/handrail driving mechanisms complete, lubricating devices, chains, sprockets, demarcation lighting and/or safety strips or other markings.
- 4.2.22.1.10 The following items of equipment are excluded: Main line power switches and fuses, car enclosure, car doors, hoistway enclosures, hoistway doors and door frames, escalator truss assembly, escalator floor plates, escalator balustrades, buried hydraulic piping, cylinder and conventional below grade plunger assembly.
- 4.2.22.1.11 Prorations, exclusions or other component coverage modifications shall be approved by the Owner prior to the execution of and/or Contract/Agreement

renewal or such changes shall be null and void without conflict or alteration of other contractual conditions, including price and maintenance contingencies.

4.2.23 Obsolescence

- 4.2.23.1 Component Obsolescence shall be defined as the inability to purchase and/or otherwise repair parts of the system no longer produced by the original equipment manufacturer or a third-party after-market supplier. Claims of component obsolescence shall not be allowed when replacement parts, components or assemblies of equivalent design and functionality are available in the market.
- 4.2.23.2 In the event of component obsolescence as defined in 4.2.23.1 above, the condition shall be reported to the Owner with the following information:
 - 4.2.23.2.1 Alternative equipment or component parts renewal options for restoration of the system due to obsolescence.
 - 4.2.23.2.2 Procurement and installation time for restoration of system service.
 - 4.2.23.2.3 Any safety code requirements that will be triggered by the alternative equipment or component renewal (i.e., including filing, tests and approvals).
 - 4.2.23.2.4 Certification by the manufacturer of the replacement parts that the parts meet or exceed the original equipment design intent including, but not limited to, durability, reliability, maintainability, longevity and safety.
- 4.2.23.3 Payment for obsolescence work shall be based on the extra cost to the Successful Respondent only.
 - 4.2.23.3.1 Labor costs over and above the time necessary for standard equipment and component renewal or repair procedures.
 - 4.2.23.3.1.1 Labor costs over and above the time necessary for standard equipment and component renewal or repair procedures.
 - 4.2.23.3.1.1.1 Contractual hourly rate schedule as provided under Attachment D shall be used to compute the extraordinary labor charge if applicable.
 - 4.2.23.3.1.1.2 Actual material extra cost to the Successful Respondent minus the value of the standard component replacement cost plus a maximum of five percent (5%) mark-up on the cost variance only.
 - 4.2.23.3.1.1.3 At Owner's option, a lump sum extra cost price may be employed in lieu of time and material as indicated above.
 - 4.2.23.3.2 Subsequent to the Owner's authorization to proceed with an

alternative obsolescence repair and approval of the relative extra cost, if any, the Successful Respondent shall immediately perform such work and restore operating services.

4.2.23.3.3 The Owner shall retain the right to competitively bid obsolescence repairs and replacements; and, such work as performed by another qualified contractor shall not diminish or otherwise alter the coverage provided under this Contract/Agreement subject to the following;

4.2.23.3.3.1 The Successful Respondent has the right to inspect work performed by others; and when conditions warrant, reject obsolescence procedures that increase their contractual liability. The Successful Respondent shall provide written notification of acceptance or rejection.

4.2.23.3.3.2 Should the Successful Respondent reject an obsolescence repair made by others, the Owner may have a qualified third party professional engineer evaluate the work and render a decision regarding the acceptability of the prevailing conditions or the Owner may terminate the Contract/Agreement and award the maintenance work to another Contractor at the Owner's sole discretion.

4.2.24 Scheduled Service Procedures

4.2.24.1 Maintenance requirements, in addition to scheduled and emergency repairs, renewals and testing, shall include but are not limited to:

4.2.24.1.1 Examination of wire ropes to maintain proper tensioning and legal bottom clearances on a monthly basis for shortening and adjusting ropes as required and performance of all reshackling procedures per ASME A17.1 standards and local laws in conjunction with maintenance of related slack cable devices, machine limits or other safety equipment.

4.2.24.1.2 Examination, repair and replacement of all electrical wiring, traveling cables, conduits, connections and related apparatus extending from the main line power supply switch in the machine or other power supplies in hoistways.

4.2.24.1.3 Maintenance of pit, hoistway and machine room lighting to include relamping, wiring and switch controls.

4.2.24.1.4 Mandated inspections and relative labor requirements for third party examinations and/or test procedures as approved by the Owner.

4.2.25 Execution and Supplemental Requirements

4.2.25.1 Performance Times, Leveling and Contract Speed

4.2.25.1.1 The control system shall be maintained to provide smooth acceleration and retardation. Successful Respondent must maintain elevators in accordance with the original equipment manufacturer (O.E.M.) design performance specifications

(including floor-to-floor times, door timing, rated speed, group supervisory system, etc.). The door close pressure must never exceed 30 pounds. The following performance schedule shall be adhered to:

- 4.2.25.1.1.1 Contract Speed: The contract speed shall be provided for up direction travel with full-capacity load in the elevator car. The speed in either direction under any loading condition shall not vary more than five percent (5%) of the contract speed.
- 4.2.25.1.1.2 In accordance with the ASME A17.1 Code, the elevators shall be maintained and adjusted to safety lower, stop and hold the car with a load of one hundred twenty-five percent (125%) of the rated capacity.
- 4.2.25.1.1.3 Leveling Accuracy: The elevator shall be adjusted to provide accurate leveling within $\frac{1}{4}$ " \pm of the floor level without releveling regardless of load.
- 4.2.25.1.1.4 Door Opening Times:

Door Type	Opening	Close
42 x 84" center opening	1.5 – 2.0 seconds	2.5 – 3.0 seconds
42 x 84" side opening	3.0 – 3.5 seconds	4.4 – 5.0 seconds

- Door dwell time for hall calls: 4.0 second with Advance lantern signals
- Door dwell time for hall calls: 5.0 seconds without Advance lantern signals
- Door dwell time for car calls: 3.0 seconds
- Reduced non-interference dwell time: 1.0 seconds

- 4.2.25.1.2 Floor to Floor Time (Flight Time) gearless: 9 seconds to 10 seconds.
- 4.2.25.1.3 Floor to Floor Time (Flight Time) geared: 13 seconds to 14 seconds.

- 4.2.25.2 Maintain the following ride quality requirements for the passenger elevators:
 - 4.2.25.2.1 Vertical and horizontal accelerations shall not exceed 14 milli-g and horizontal accelerations shall not exceed 20 milli-g.
 - 4.2.25.2.1.1 The accelerometer used for this testing shall be capable of measuring and recording acceleration to nearest 0.01 m/s² (1 milli-g) in the range of 0-2 m/s² over a frequency range from 0-80 Hz with ISO 8041 filter weights applied. Accelerometer should provide contact with the floor similar to foot pressure, 60 kPA (8.7psi).
 - 4.2.25.2.2 Amplitude of acceleration and deceleration shall not exceed 4.0 ft/sec².
 - 4.2.25.2.3 A sustained jerk shall not be more than twice the acceleration.
 - 4.2.25.2.4 The rate of change in the acceleration/deceleration rate shall not be greater than 8.0 ft/sec³.

4.2.26 Parts Inventory and Wiring Diagrams

- 4.2.26.1 The Successful Respondent shall maintain an inventory of spare parts at the site of the work for scheduled preventative maintenance procedures and common emergency call-back service repairs. Such parts shall include but are not limited

to contacts, coils, solid-state boards, relays, resistors, timing devices, computer devices, interlock safety switch and linkage parts, bottom guides, door closers, fuses, bulbs, car guides and an assortment of hardware.

- 4.2.26.2 The Successful Respondent shall maintain and continually update wiring diagrams and control schematics to ensure “as built” documents remain on site and the property of the Owner per the Contract/Agreement.

4.2.27 Materials and Workmanship

- 4.2.27.1 All materials and parts are to be new and of the best quality of the kind specified. Installation of such materials shall be accomplished in a neat workmanlike manner. In case the Successful Respondent should receive written notification from the Owner stating the presence of inferior, improper, or unsound materials or workmanship, the Successful Respondent shall, within twenty-four (24) hours proceed to remove such work or materials and make good all other work or materials damaged thereby. If the Owner permits said work or materials to remain, the Owner shall be allowed the difference in value or shall, at its election, have the right to have said work or materials repaired or replaced as well as the damage caused thereby, at the expense of the Successful Respondent, at any time during the Contract/Agreement term; and neither payments made to the Successful Respondent, nor any other acts of the Owner shall be construed as evidence of acceptance and waiver.

4.2.28 Protection of Work and Property

- 4.2.28.1 The Successful Respondent shall continuously maintain adequate protection of all work from damage and shall protect the Owner’s property from injury or loss arising out of this Contract/Agreement. The Successful Respondent shall make good any such damages, injury or loss, except such as may be directly caused by agents or employees of the Owner. The Successful Respondent shall provide all barricades required to protect open hoistways or shafts per OSHA Regulations. Such protection shall include any necessary guards or other barricades for employee protections during and after the maintenance procedures.

4.2.29 Representation

- 4.2.29.1 Successful Respondent represents that it will:
- 4.2.29.1.1 Perform elevator maintenance services under this Contract/Agreement in accordance with acceptable industry professional and ethical standards;
 - 4.2.29.1.2 Will not proceed with performance of various aspects of the services, unless pre-authorized (“pre-approved services”) by the Owner;
 - 4.2.29.1.3 Conduct any handling of the Owner’s confidential information in accordance with acceptable industry professional and ethical standards;
 - 4.2.29.1.4 Will not represent to any third party that it has the authority to sign, endorse or represent a contractual relationship with or in Owner’s name, or enter into any agreement on behalf of Owner in connection herewith (unless pre-authorized in writing by

- Owner);
- 4.2.29.1.5 Safeguard the physical security of Owner's confidential information if it has access to or possession of such information;
 - 4.2.29.1.6 Ensure that only Authorized Representatives of this Contract/Agreement, will have access to any of Owner's confidential information while rendering the services, and that it will not be copied, or disseminated to anyone other than the Authorized Representative; and
 - 4.2.29.1.7 Ensure that all of its employees, representatives, agents or assigns will not solicit any of Owner's employees for any purpose.

4.2.30 Guarantees/Supplemental Requirements/Execution

4.2.30.1 Contractual Requirement Guarantee

- 4.2.30.1.1 The Owner may have the Successful Respondent's work and system performance checked by the Owner's Consultant to ensure the Successful Respondent is performing in accordance with this Contract/Agreement. If the Owner's Consultant determines that the contractual requirements are not being maintained, the Owner's Consultant may retain the monthly payment to the Successful Respondent until the Owner's Consultant verified that the work performance is back to standard. The Successful Respondent shall pay re-inspection costs incurred by the Owner's Consultant by deduction from the monthly maintenance fees. If two (2) consecutive inspections by the Owner's Consultant (two consecutive inspections within one (1) year but more than sixty (60) days apart) indicate that the contractual requirements are not being maintained, the Owner's Consultant has the right to immediately terminate the Contract/Agreement or to pursue any other available remedy.

4.2.30.2 Minimum Hour Guarantee

- 4.2.30.2.1 The Successful Respondent's failure to provide the Minimum Hours quoted in Attachment B for routine preventative maintenance on a quarterly basis shall result in the Successful Respondent paying liquidated damages by issuing a refund to the Owner for the unexpended hours at the "Straight Time Rate Hourly Selling Price" or overtime rate, if appropriate, for Maintenance Mechanics listed in the Schedule of Initial Base Hourly Rates. The amount of the liquidated damages shall be deducted from the monthly maintenance fee in the month(s) following the semi-annual anniversary date of the Contract/Agreement or refunded by check at the option of the Owner. The amount shall be determined as part of the annual review of required reports.
- 4.2.30.2.2 If the Successful Respondent fails to provide the required Monthly Minimum Hours for routine preventative maintenance for three (3) consecutive quarters, the Owner has the right to

immediately terminate the Contract/Agreement or to pursue any other available remedy.

4.2.31 Callback Guarantee

4.2.31.1 Callback Rate

4.2.31.1.1 Callbacks shall be monitored and reported quarterly on an annualized basis. For measurement purposes callbacks shall be grouped and averaged on an annualized basis by common control group. Callbacks for items not covered by the Contract/Agreement (i.e., vandalism, water or fire damage callbacks that have been billed to the Owner and paid by mutual agreement) will not be included in the calculation.

4.2.31.1.2 Once a year in the month following the anniversary date of the Contract/Agreement, the Successful Respondent and Owner will review the callback data submitted with the annual Inspection and Evaluation Report. If the average annualized callback rate for the building exceeds the rate(s) provided in this Contract/Agreement by more than twenty-five (25%) percent, the monthly fee for each unit in that grouping will be reduced, as liquidated damages, during the next twelve (12) months (until the next annual calculation) by ten (10%) percent. The reduction will be cumulative by group and year, that is, if a reduction is warranted for multiple years, the monthly fee for each ensuing year will be reduced from the previous year's amount by an additional ten (10%) percent per year. If reductions in monthly pricing due to excessive callbacks occur for two (2) consecutive years, the Owner has the right to immediately cancel the Contract/Agreement or to pursue any other available remedy.

4.2.31.2 Entrapment Callback Response Time Guarantee: Successful Respondent's failure to comply with the callback entrapment response times contained in this Contract/Agreement will result in the Successful Respondent paying liquidated damages for the applicable callback(s) time, including travel time, at the billing rates listed in the Quotation, price adjusted as appropriate.

4.2.32 Reliability Guarantees

4.2.32.1 The Successful Respondent shall endeavor to correct any system or individual malfunction that requires the removal of a unit from normal operating service within seventy-two (72) hours of the initial failure. Seventy-two (72) hours in this paragraph means within three (3) full Regular Working Days in the elevator trade.

4.2.32.1.1 If the unit is not returned to service within the specified time allotment, the Successful Respondent shall reduce the subsequent monthly fee for the unit by the amount equal to fifty (50%) percent of the total monthly unit price for each twenty-four (24) hour period the unit is out of service from the

date of the system malfunction. Any overtime required beyond the required timeline established here shall be performed at no cost to the Owner.

4.2.32.1.2 However, the Successful Respondent shall not be penalized for pre-approved and scheduled maintenance repairs, tests or other conditions necessitating unscheduled major work procedures, resulting from a cause excluded by any other provision of this Contract/Agreement, or repairs to items not covered by this Contract/Agreement.

4.2.32.2 Only one (1) elevator is allowed to be out-of-service for routine maintenance at any time in any bank of units. If an elevator is out-of-service for routine maintenance and another elevator malfunctions, the elevator that is out for routine service shall be restored to normal operation, as long as the other unit remains out of service, at no additional cost to the Owner.

4.2.33 Data Guarantee: The Successful Respondent warrants that all data supplied as a response to this Request for Proposal will remain valid over the duration of the Contract/Agreement. If any changes occur relative to the information provided in response to this Request for Proposal, the Owner has the right to immediately cancel the Contract/Agreement or to pursue any other available remedy.

4.2.34 Reporting Guarantee

4.2.34.1 Successful Respondent's failure to provide quarterly written reports within the time frame specified herein will result in an automatic reduction of the Contract/Agreement prices of ten (10%) percent for a three (3) month period as liquidated damages. Liquidated damages will be cumulative quarter to quarter. If the quarterly reporting requirements are missed for two consecutive periods, the Owner has the option to immediately cancel the Contract/Agreement or to pursue any other available remedy.

4.2.34.2 Failure to provide Efficiency and Maintenance Survey Inspection Reports within the time frame specified herein will result in an automatic reduction of the Contract/Agreement pricing of ten (10%) percent for a one (1) year period as liquidated damages. Liquidated damages will be cumulative year to year. If the yearly reporting requirements are missed for two consecutive periods, the Owner has the option to immediately cancel the Contract/Agreement or to use any other available remedy.

4.2.34.3 Failure to provide and maintain a Code Compliant Maintenance Control and Recordkeeping system as specified herein will result in an automatic reduction of the Contract/Agreement price of ten (10%) percent for a one (1) year as liquidated damages. Liquidated damages will be cumulative year to year. If the yearly recordkeeping requirements are missed for two (2) consecutive periods, the Owner has the option to immediately cancel the Contract/Agreement or to pursue any other available remedy.

4.2.35 Testing Guarantee

4.2.35.1 Traction Elevators: Failure to complete the code required annual no-load

and/or five year full load safety test(s) within thirty (30) calendar days of the appropriate anniversary date or code compliance date will result in an automatic reduction of the monthly Contract/Agreement price for that elevator of fifty (50%) percent for each thirty (30) day period the test(s) are overdue as liquidated damages if requested by the Owner. If the test(s) become overdue, the thirty (30) day grace period is eliminated and any liquidated damages will be applied from the due day. (Example: test(s) are forty-five [45] days overdue; liquidated damages will be fifty (50%) percent of two (2) months billing.)

4.2.35.2 Hydraulic Elevators: Failure to complete the code required annual no-load pressure test(s) within thirty (30) calendar days of the appropriate anniversary date or code compliance date will result in an automatic reduction of the monthly Contract/Agreement price for that elevator of fifty (50%) percent for each thirty (30) day period the test(s) are overdue as liquidated damages if requested by Owner. If the test(s) become overdue the thirty (30) day grace period is eliminated and any liquidated damages will be applied from the due date. (Example: test(s) are forty-five [45] days overdue; liquidated damages will be fifty (50%) percent of two [2] months billing.)

4.2.36 Restricted Door Opening Guarantee: If an elevator is furnished with a restricted door opening device and said device is inoperable in a manner or pattern that indicates its ability to function as intended was other than by random failure the monthly Contract/Agreement price for that elevator will be reduced by fifty (50%) percent for each full and/or partial thirty (30) day period the device is inoperative after Successful Respondent has been notified as liquidated damages if requested by Owner. (Example No. 1: the device is inoperative [as defined above] for forty-five [45] days; liquidated damages will be fifty [50%] of two [2] months billing; Example No. 2: the device is inoperative [as defined above] for one [1] day; liquidated damages will be fifty [50%] of one [1] months billing). Final determination for why a restricted door opening device is inoperable will be made by the Owner.

4.2.37 Audits/Liquidated Damages

4.2.37.1 The Owner's Consultant will audit each unit on an annual basis and assign a numerical score as a result of that audit. Ninety-five (95%) percent of all units must be scored at a seventy (70) or higher or a ten (10%) percent reduction in the monthly Contract/Agreement pricing will be assessed as liquidated damages for all units that audit below a seventy (70). Failure to correct any code related deficiencies identified in these audit reports within thirty (30) days will result in a fifty (50%) percent reduction in the monthly Contract/Agreement billing rate as liquidated damages until the identified items are completed. Minimum liquidated damage assessment period under this provision is two (2) months Contract/Agreement billing.

4.2.37.2 Audit Bonus: At each anniversary date of the Contract/Agreement the audit scores for all inspection groups will be reviewed. A bonus will be awarded to the Successful Respondent as follows:

4.2.27.2.1 Audit Score of seventy (70) or above on one (1%) percent of the annual Contract/Agreement billing.