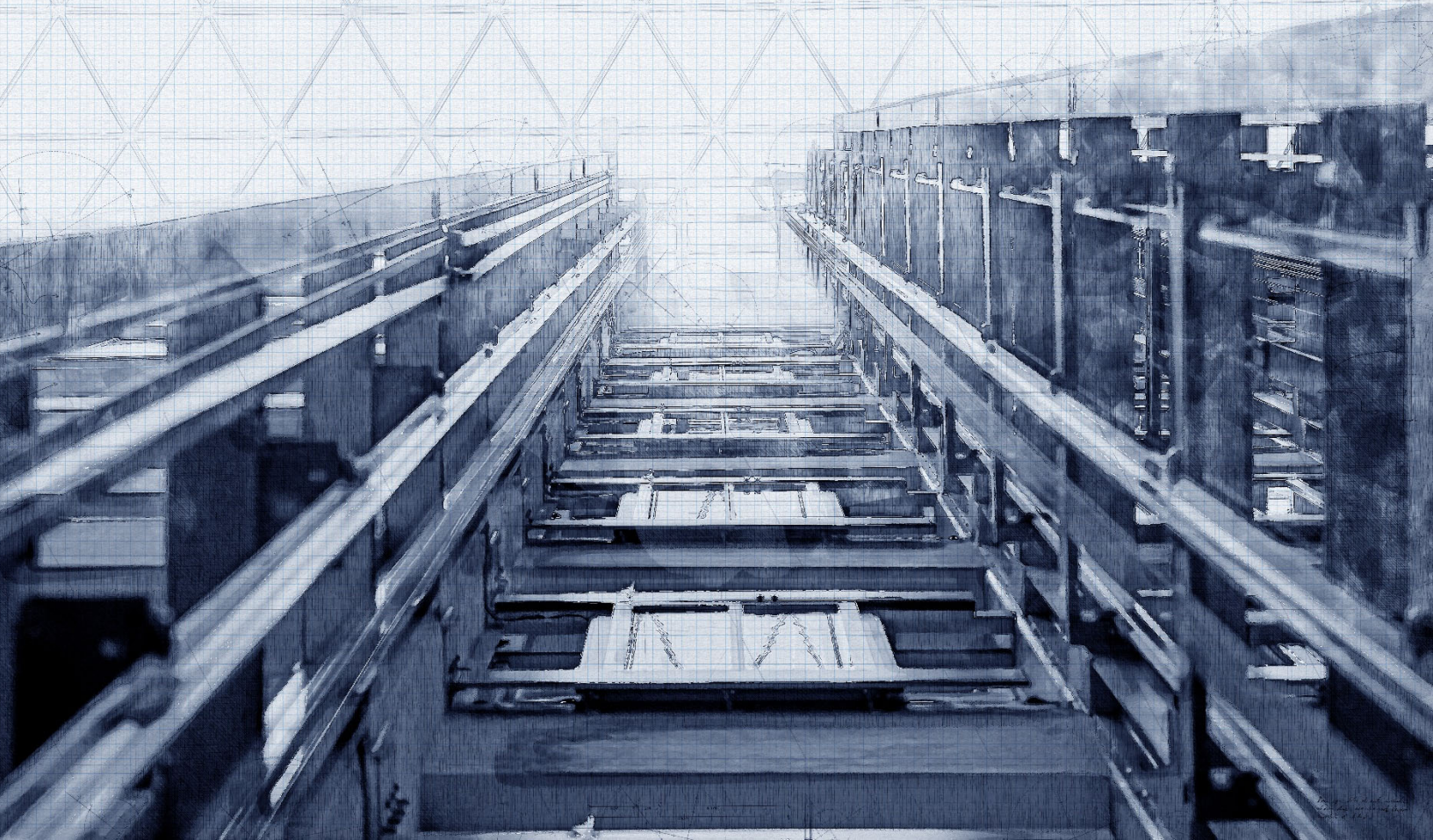




Specifications for Elevator & Escalator Modernization

Williams Center Towers 1 & 2
1 West 3rd Street & 2 West 2nd Street
Tulsa, OK 74103

Prepared By:
Consultant: Landon deVille
Phone: 725-347-045
Email: Ldeville@atis.com



ATIS.com

Email: Ldeville@atis.com

CONTENTS

INVITATION FOR BIDS	5
SUMMARY OF WORK:	5
BID SHEETS FOR SOLICITATION	7
GENERAL PROVISIONS.....	12
ACKNOWLEDGMENT OF AMENDMENTS	12
ADDITIONAL INFORMATION.....	12
ALTERNATIVE BIDS.....	12
APPLICABLE LAW	12
ASSIGNMENT	12
AWARD	12
BID ACCEPTANCE PERIOD	12
BID CLARIFICATIONS.....	12
BIDDER CERTIFICATION.....	13
BIDDER INVESTIGATIONS.....	13
BID RECEIPT AND OPENING	13
CHANGES OR MODIFICATIONS.....	14
DEFINITIONS.....	14
EXCEPTIONS	14
FORCE MAJEURE	14
LIMITATION OF COST.....	14
ORAL STATEMENTS.....	14
PAYMENT TERMS AND DISCOUNTS.....	15
TERMINATION OR DEFAULT	15
QUALIFICATIONS OF BIDDERS	15
QUALITY OF GOODS.....	16
UNSATISFACTORY WORK.....	16
END OF GENERAL PROVISIONS	16
SPECIAL PROVISIONS	17
INSURANCE REQUIREMENTS.....	17
TRANSPORTATION AND PACKING	17
LEGAL COUNSEL REVIEW.....	17
TIME OF COMMENCEMENT AND COMPLETION	17

PROJECT SCHEDULE.....	18
END OF SPECIAL PROVISIONS.....	20

**BID ITEM 001A SPECIFICATION FOR MODERNIZATION OF HIGH RISE
ELEVATORS 21**

1	GENERAL.....	21
1.1	SUMMARY	21
1.2	DEFINITIONS.....	22
1.3	CODE AND STANDARD REFERENCES	23
1.4	RELATED WORK BY OTHERS.....	24
1.5	PAINTING.....	32
1.6	ELEVATOR SYSTEM DESCRIPTION	33
1.7	SUBMITTALS.....	35
1.8	QUALITY ASSURANCE	36
1.9	DELIVERY, STORAGE AND HANDLING.....	38
1.10	PROJECT CONDITIONS.....	39
1.11	WARRANTY	39
1.12	CONTRACT PREVENTIVE MAINTENANCE	40
2	PRODUCTS	41
2.1	ACCEPTABLE MANUFACTURER.....	41
2.2	MATERIALS, GENERAL	42
2.3	EQUIPMENT: MACHINE ROOM/SPACE COMPONENTS.....	42
2.4	EQUIPMENT: HOISTWAY	53
2.5	DOOR OPERATION	58
2.6	CAR COMPONENTS.....	61
2.7	FIRE COMMAND CENTER ELEVATOR PANEL.....	68
2.8	HALL FIXTURES.....	70

**BID ITEM 001B SPECIFICATION FOR MODERNIZATION OF HIGH RISE
ELEVATORS 75**

1	GENERAL.....	75
1.1	SUMMARY	75
1.2	DEFINITIONS.....	76
1.3	CODE AND STANDARD REFERENCES	77
1.4	RELATED WORK BY OTHERS.....	78
1.5	PAINTING.....	86
1.6	ELEVATOR SYSTEM DESCRIPTION	87
1.7	SUBMITTALS.....	89

1.8	QUALITY ASSURANCE	90
1.9	DELIVERY, STORAGE AND HANDLING.....	92
1.10	PROJECT CONDITIONS.....	93
1.11	WARRANTY	93
1.12	CONTRACT PREVENTIVE MAINTENANCE	94
2	PRODUCTS	95
2.1	ACCEPTABLE MANUFACTURER.....	95
2.2	MATERIALS, GENERAL	96
2.3	EQUIPMENT: MACHINE ROOM/SPACE COMPONENTS.....	96
2.4	EQUIPMENT: HOISTWAY	107
2.5	DOOR OPERATION	112
2.6	CAR COMPONENTS.....	115
2.7	FIRE COMMAND CENTER ELEVATOR PANEL.....	122
2.8	HALL FIXTURES.....	124
BID ITEM 001C SPECIFICATION FOR MODERNIZATION OF LOW RISE ELEVATORS 129		
1	GENERAL.....	129
1.1	SUMMARY	129
1.2	DEFINITIONS.....	130
1.3	CODE AND STANDARD REFERENCES	131
1.4	RELATED WORK BY OTHERS.....	132
1.5	PAINTING.....	140
1.6	ELEVATOR SYSTEM DESCRIPTION	141
1.7	SUBMITTALS.....	143
1.8	QUALITY ASSURANCE	144
1.9	DELIVERY, STORAGE AND HANDLING.....	146
1.10	PROJECT CONDITIONS.....	147
1.11	WARRANTY	148
1.12	CONTRACT PREVENTIVE MAINTENANCE	148
2	PRODUCTS	150
2.1	ACCEPTABLE MANUFACTURER.....	150
2.2	MATERIALS, GENERAL	150
2.3	EQUIPMENT: MACHINE ROOM/SPACE COMPONENTS.....	150
2.4	EQUIPMENT: HOISTWAY	161
2.5	DOOR OPERATION	167
2.6	CAR COMPONENTS.....	169

2.7	FIRE COMMAND CENTER ELEVATOR PANEL.....	177
2.8	HALL FIXTURES.....	178

**BID ITEM 002 SPECIFICATION FOR MODERNIZATION OF HYDRAULIC
ELEVATORS 183**

Passenger Elevator Nos. 9 & 10 Entrance Summary.....	207
A. Site Inspection: Prior to commencing elevator renovation inspect hoistway, hoistway openings, pit, and machine room as constructed. Contractor is responsible for all dimensions as field measured by the Contractor for proper installation and performance of elevator work.....	209
B. Demolition: All boards and/or components that are not readily available through direct replacement from the OEM, or secondary market, may be retained by the Contractor for use as spares for the second hydraulic elevator until modernized. The removal of all elevator equipment, which is not to be retained in the renovation, shall be completed by the contractor. The old elevator equipment removed becomes the property of the Contractor and it is their responsibility to remove this equipment from the project site. Include all work necessary to protect the public, residents, building employees, and building property during removal of demolished materials.	209

BID ITEM 003 SPECIFICATION FOR MODERNIZATION OF ESCALATORS 215

3	EXECUTION	254
3.1	CONTRACTOR RESPONSIBILITY	254
3.2	TERMS of PAYMENT	258
END OF MODERNIZATION SECTION		262

**Williams Center Towers 1 & 2
1 West 3rd Street & 2 West 2nd Street
Tulsa, OK 74103**

INVITATION FOR BIDS

**FOR THE MODERNIZATION OF TRACTION
PASSENGER ELEVATOR**

SUMMARY OF WORK:

Cherokee Nation Businesses("Owner"), requires a trade Elevator Contractor to provide the necessary services to modernize thirteen (13) Traction Passenger Elevators: eight (8) high rise units (in a 23-story building), and five (5) low rise units (in a 17-story building), Two (2) Hydraulic Passenger Elevators, and Two (2) Escalators, located at Williams Center Towers 1 & 2, 1 West 3rd Street & 2 West 2nd Street, Tulsa, OK 74103 (the "Project").The technical consultant for the Project is Landon deVille, Senior Consultant for ATIS Elevator Consultants at (725) 277-9533. All project questions during the Request for Proposal ("RFP") period shall be submitted to the Purchasing Agent identified within this RFP.

Mandatory Pre-Bid meeting is scheduled for August 27, 2026 at 9AM.

Interested bidders are requested to submit one (1) original bid by e-mail as indicated on the bid sheet not later than 5:00 PM, Tuesday September 29, 2026. Bids received after this time will not be accepted.

All bid packages shall include the following:

Modernization Specification:

1. Completed Bid Sheets
2. Completed Project Schedule
3. Modernization Contract Signature Sheet

Maintenance Specification:

1. Present Billing Rates
2. Maintenance Contract Execution Sheet

Additional Information:

1. Any additional clarifications and/or exceptions to specification.
2. 5 References that are of similar size and scope.
3. Familiarity and resources on existing equipment both escalators and elevators.

4. Depth of resources as far as manpower within a 50-mile radius of property for Service and Repair needs.
5. Depth of resources as far as spare parts for existing equipment models both escalators and elevators.
6. Plan for oversight and project management of project.
7. GANTT chart schedule (see Special Provisions section – Project Schedule for preferred sequencing of project).

Having reviewed the RFP, site conditions, applicable codes and statutes and all conditions affecting and governing the work, the Undersigned Contractor hereby offers to provide all engineering, labor, materials, transportation, services and equipment necessary and incidental to properly execute required work of the Contract Documents as follows. This will acknowledge acceptance of all requirements on all pages of this package.

The submission of a bid response without identifying exceptions expressly acknowledges and formally evidences the Elevator Contractor's acceptance of all terms and conditions of the contract. Any and all exceptions must be submitted in writing in the contractor's bid response.

The Owner reserves the right in its sole and absolute discretion to deem any Elevator Contractor non-responsive if the Elevator Contractor submits an exception, which alters the Owner's risk, liability, exposure in, or the intent of this procurement.

All Elevator Contractors further understand and agree that CHEROKEE NATION BUSINESSES will accept no vendor exceptions or requests for "Or Equal" substitutions to the contract at any time after submission of the bid response. Any request for substitution must be approved, in writing, by Owner 96-hours ahead of the bid due date.

**PROSPECTIVE BIDDERS CAN CALL BETWEEN 9:00 AM AND 4:00 PM
918-230-9150, TO MAKE ARRANGEMENTS FOR NECESSARY SITE VISITS/
INSPECTIONS AFTER THE MANDATORY PRE-BID MEETING. AN ASSIGNED
FACILITY ENGINEER WILL CONDUCT THE SITE VISIT.**

Insurance coverage is required for this project; please refer to the Special Provisions Section of the Specification.

This cover letter is intended to invite prospective vendors to submit a Bid as detailed on the attached bid sheet. For complete details, please refer to the attached bid/proposal package.

**Williams Center Towers 1 & 2
1 West 3rd Street & 2 West 2nd Street
Tulsa, OK 74103
BID SHEETS FOR SOLICITATION**

Prices for **BID ITEMS, DUE Tuesday, September 29, 2026**, as indicated in the following schedule:

Bid Item	Description	Item Total Cost
001A	ELEVATOR MODERNIZATION: Total price for labor, equipment, transportation, supervision, tools, administrative costs, materials, permits and taxes including any incidental cost necessary to perform all work specified in BID ITEM 001 - ELEVATOR MODERNIZATION SPECIFICATION section of this specification for Four (4) High Rise Traction Elevators in Williams Center Tower I.	Total Cost \$ _____
001B	ELEVATOR MODERNIZATION: Total price for labor, equipment, transportation, supervision, tools, administrative costs, materials, permits and taxes including any incidental cost necessary to perform all work specified in BID ITEM 001 - ELEVATOR MODERNIZATION SPECIFICATION section of this specification for Four (4) High Rise Traction Elevators in Williams Center Tower II.	Total Cost \$ _____
001C	ELEVATOR MODERNIZATION: Total price for labor, equipment, transportation, supervision, tools, administrative costs, materials, permits and taxes including any incidental cost necessary to perform all work specified in BID ITEM 001 - ELEVATOR MODERNIZATION SPECIFICATION section of this specification for Five (5) Low Rise Traction Elevators in Williams Center Tower II.	Total Cost \$ _____
002	ELEVATOR MODERNIZATION: Total price for labor, equipment, transportation, supervision, tools, administrative costs, materials, permits and taxes including any incidental cost necessary to perform all work specified in BID ITEM 002 - ELEVATOR MODERNIZATION SPECIFICATION section of this specification for Two (2) Hydraulic Elevators in Williams Center Tower Parking Garage.	Total Cost \$ _____

003	ESCALATOR MODERNIZATION: Total price for labor, equipment, transportation, supervision, tools, administrative costs, materials, permits and taxes including any incidental cost necessary to perform all work specified in BID ITEM 003 - ESCALATOR MODERNIZATION SPECIFICATION section of this specification for Two (2) Escalators (1 pair) in Williams Center Tower II.	Total Cost \$ _____
004	CONTINUING ELEVATOR MAINTENANCE: Total Monthly price for labor, equipment, transportation, supervision, tools, administrative costs, materials and any incidental cost necessary to perform all work specified in Clients Standard ELEVATOR MAINTENANCE CONTRACT section of this solicitation for the Eighteen (18) Traction Elevators, Two (2) Hydraulic Elevators, and Two (2) Escalators. Based on 36 months of maintenance service.	Cost for Twenty (20) Elevators and Two (2) Escalators \$ _____
004A	12 MONTH WARRANTY ELEVATOR MAINTENANCE: Total Monthly price for labor, equipment, transportation, supervision, tools, administrative costs, materials and any incidental cost necessary to perform all work specified in the ELEVATOR MAINTENANCE CONTRACT section of this solicitation.	Cost for Twenty (20) Elevators and Two (2) Escalators \$ _____
004B	INTERIM ELEVATOR & ESCALATOR MAINTENANCE: Total Monthly price for labor, equipment, transportation, supervision, tools, administrative costs, materials and any incidental cost necessary to perform all work specified in Clients Standard ELEVATOR MAINTENANCE CONTRACT section of this solicitation for the Eighteen (18) Traction Elevators, Two (2) Hydraulic Elevators, and Two (2) Escalators. To start when contractor begins modernization and ends when all elevators & escalators have been substantially completed and turned over for owner beneficial use.	Cost for Twenty (20) Elevators and Two (2) Escalators \$ _____
005	Related Work Items for Passenger Elevator: Total price for labor, equipment, transportation, supervision, tools, administrative costs, materials, permits and taxes including any incidental cost necessary to perform all related work specified in ELEVATOR MODERNIZATION section of this specification for Thirteen (13) Traction Elevators, Two (2) Hydraulic Elevators, and Two (2) Escalators.	Related Work Costs Elevator & Escalator Modernization \$ _____
001 A-C, 002,	Provide total lump sum price for base bid package including interim maintenance, 12-month warranty maintenance and work by others costs.	Total Cost \$ _____

003, 004, 004A, and 005		
ALT A	Tower I Highrise Elevators – Retain and Refurbish Gearless machines.	Total Savings \$ _____
ALT B	OPTION FOR INCONSPICUOUS RISER SYSTEM – Tower I Highrise Bank (Elevator 5)	Total Cost \$ _____
ALT C	Geared Machine Replacement or complete rebuild – Tower I Elevators #1, #2, #3, #4, and Tower II Highrise Freight Elevator 10.	Total Cost \$ _____
ALT D	New Controllers - Tower I Elevators #1, #2, #3, #4, and Tower II Highrise Freight Elevator 10.	Total Cost \$ _____
ALT E	Tower I Elevators #1, #2, #3, and #4 Cab Interior Allowance \$30,000.00/per elevator	Total Cost \$ _____
ALT F	Deduct for deletion of Auxiliary Car Operating Panels – Tower on all elevators (excluding Tower I Lowrise and Tower II Highrise Freight Elevator 10).	Total Savings \$ _____
ALT G	Replacement of Elevator Signal Fixtures for Tower I Elevators #1, #2, #3, #4 and Tower II Highrise Freight Elevator 10.	Total Cost \$ _____
ALT H	Elevator Cab Video Display System – all Tower Elevators (excepting freight and hydraulic)	Total Cost \$ _____
ALT H-1	Elevator Cab Video Display System – all Tower Elevators (w-Centrally controlled computer for content)	Total Cost \$ _____
ALT I	Audio/Video Emergency Communication System	Total Cost \$ _____
ALT I (Maint)	If Applicable – Monthly cost per elevator for Audio/Video Emergency Communication System	Mthly Cost Maint \$ _____
ALT J	Replace Plaza/Main Lobby Level Hoistway Doors	Total Cost \$ _____
ALT K	OEM Equipment by Elevator Contractor (Details Attached):	Total Cost \$ _____

	Option to include Original Equipment Manufacturers (OEM) manufactured controller and/or other specific and listed components manufactured directly by installation contractor. Note: hall and car fixtures are not optional changes. At the time of bid submission, this shall be identified as such on the bid identifying all equipment that is offered as OEM equipment. Any equipment that is provided for installation which would require any specialized tool, devices, manuals, source codes, access codes, objects, passwords and/or software to input parameters, make adjustments, troubleshoot, perform diagnostics, perform testing functions or required for any other type of maintenance or repair function shall be included with the modernization cost of this contract and will become the property of the building owner. Price must include any required specialized diagnostic tools and other equipment, manuals, codes, passwords and/or software for future trouble shooting or adjusting by any licensed elevator maintenance contractor of all equipment installed including controller(s) as detailed in the Quality Assurance, section of the modernization specifications.	Total Cost \$ _____
Bonds	Cost or Rate of Payment & Performance Bond Cost or Rate of Maintenance Performance Bond	\$ _____ \$ _____

ONLY BIDS SENT BY E-MAIL WILL BE ACCEPTED. BIDS MUST BE IDENTIFIED BY HAVING THE PROJECT, Williams Center Towers I & II, Elevator Modernization, CLEARLY MARKED IN THE SUBJECT LINE.

PLEASE SEND YOUR BID BY E-MAIL TO THE FOLLOWING:

William.bfy3pn6w3bfzfn2u@u.box.com

REFER TO REQUEST FOR PROPOSAL FOR BIDDING INSTRUCTIONS.

Having reviewed documents prepared by ATIS and having reviewed site conditions, applicable codes and statutes and all conditions affecting and governing the work, the Undersigned Contractor hereby offers to provide all engineering, labor, materials, transportation, services and equipment necessary and incidental to properly execute required work of the Contract Documents herein.

Elevator Contractor

Signature _____

Date _____

IMPORTANT!—PLEASE READ CAREFULLY BEFORE MAKING BID

GENERAL PROVISIONS

These general terms and conditions of the bid quotation and acceptance apply in like force to this inquiry and to any subsequent contract resulting there from.

ACKNOWLEDGMENT OF AMENDMENTS

Bidders shall acknowledge receipt of any amendment to the solicitation by email to the Purchasing Agent and acknowledging each amendment or bid addendum on its bid submission. Failure to acknowledge an issued amendment may result in bid rejection and disqualification.

ADDITIONAL INFORMATION

Questions concerning the technical portions of the bid document must be submitted to the Cherokee Nation Businesses Purchasing Agent . Bidders are cautioned that any statements made by individuals other than as indicated above shall not be relied upon unless subsequently ratified by a formal written amendment to the bid document. No contractual or technical questions will be accepted after ten (10) days prior to the bid date as above.

ALTERNATIVE BIDS

Bidders **WILL NOT** be allowed to submit more than one (1) bid for this project.

APPLICABLE LAW

The contract shall be governed in all respects by the laws of the State of Oklahoma, and any litigation with respect thereto shall be brought in the courts of Tulsa County, Oklahoma. The contractor shall comply with all applicable Federal, State, and local laws and regulations. Lack of knowledge by the bidder will in no way be a cause for relief from responsibility.

ASSIGNMENT

The contractor shall not assign, transfer, convey, sublet, or otherwise dispose of any award or any or all of its rights, title, or interest therein, or delegate the duties hereunder without the express written consent of the Owner.

AWARD

The contract shall be awarded to the bidder submitting the most favorable proposal based on cost and value as determined through the evaluation procedures established for this procurement. Cost will be a factor in the award decision, although the award may not necessarily be made to the bidder submitting the lowest total price. Owner reserves the right to award a contract to that responsive, responsible bidder whose bid, conforming to this specification, is the most advantageous to the Owner, all factors considered.

BID ACCEPTANCE PERIOD

Any bid submitted as a result of the solicitation shall be binding on the bidder for a minimum of ninety (90) calendar days following the bid opening date. Any bid for which the bidder specifies a shorter acceptance period may not be submitted.

BID CLARIFICATIONS

If any party contemplating the submission of a bid on this invitation is in doubt as to the true meaning of any part of the plans, specifications, or other documents, he should immediately submit a written request for an interpretation thereof to any of the above-named individuals at the above address. The bidder's concerns, regarding clarification of specifications and/or discrepancies and/or omissions and/or changes to the attached specifications shall only be made via email and sent to the Purchasing Agent at least five (5) calendar days prior to the bid closing date. The email from the bidder shall state clearly, and in detail, the basis for such concern(s) or request(s) and shall be sent to the Purchasing Agent address, marked "PREBID QUESTION" in the email subject line. The Purchasing Agent will respond in writing. If necessary, an interpretation of the bid invitation document will be made only by addendum duly issued to each party receiving a bid invitation. All such addenda shall become part of the contract documents. The Owner shall not be responsible for explanations or interpretations of bid invitation documents except as issued in accordance herewith. No oral interpretations will be made as to the meaning of specifications or any other contract documents. Failure to comply with this provision will result in the bidder waiving their right to dispute the bid specification.

BIDDER CERTIFICATION

The bidder agrees that submission of a signed bid form is certification that the bidder will accept an award made to it as a result of the submission.

BIDDER INVESTIGATIONS

Before submitting a bid, each bidder shall make all investigations and examinations necessary to ascertain all site conditions and requirements affecting the full performance of the contract and to verify any representations made the Owner upon which the bidder will rely. On site examination of the existing elevators and their components can be scheduled by calling between 9:00 AM AND 4:00 PM after the mandatory pre-bid meeting. An assigned facility engineer will conduct the site visit. If the bidder receives an award as a result of its bid submission, failure to have made a thorough and complete investigation and examination of the site, will in no way relieve the bidder from its obligation to comply in every detail with all provisions and requirements of the contract documents and specifications, nor will a plea of ignorance of such conditions and requirements be accepted as a basis for any claim whatsoever by the contractor for additional compensation.

BID RECEIPT AND OPENING

The Owner will receive bid proposals until date and time indicated. Bids must be delivered, by e-mail.

Once received, the bids will be held where they will be opened after the bid closing date of 5:00 PM, Tuesday, September 29, 2026. It is the responsibility of the bidder to ensure that bids arrive on time. FAXED BIDS WILL NOT BE ACCEPTED AND SHALL NOT BE CONSIDERED FOR EVALUATION OR AWARD.

CHANGES OR MODIFICATIONS

All changes or modifications shall be agreed upon in writing, including contract prices and schedule adjustment, prior to the commencement of work covered by changes or modifications.

DEFINITIONS

The definitions are detailed in the specification document and shall be used throughout all general conditions, special conditions, specifications, and contract documents except where superseded in those documents.

EXCEPTIONS

Bidders taking exception to any part or section of the solicitation shall indicate such exceptions on the bid form or appendix. Failure to indicate any exception will be interpreted as the bidder's intent to comply fully with the requirements as written. Conditional or qualified bids, unless specifically allowed, shall be subject to rejection in whole or in part.

FORCE MAJEURE

The contractor shall not be held responsible for failure to perform the duties and responsibilities imposed by the contract due to legal strikes, fires, riots, rebellions, and acts of God beyond the control of the contractor, unless otherwise specified in the contract.

BID BOND

The contractor will not be required to provide a bid bond.

PAYMENT & PERFORMANCE BOND

The contractor will be required to provide a payment and performance bond.

MAINTENANCE PERFORMANCE BOND

The contractor will be required to provide a maintenance performance bond.

TERO FEES

This procurement is subject to Cherokee Nation Tribal Employment Rights Office ("TERO") regulations that include a fee of ½ of 1% of total contract award and, if applicable, the completion of a TERO Labor Agreement and payment of associated fees. The successful bidder's award will be published on the Cherokee Nation's procurement website and their performance will also be measured, recorded, and reported to the Cherokee Nation. The complete Act is available by contacting the TERO OFFICE at Tahlequah 918-453-5000. TERO bidders are required to provide a copy, front and back, of their TERO certificate with return bid(s) and failure to do so will result in such bidders not receiving the TERO preferences afforded TERO bidders under the CNB procurement and contracting policies and procedures.

LIMITATION OF COST

The contractor agrees to perform the work specified and complete all obligations under the contract within the stated amounts of their quotation.

ORAL STATEMENTS

No oral statement of any person shall modify or otherwise affect the terms, conditions or any of the specifications as stated in this contract. All modifications to the contract will be

made in writing by the Owner and subject to the approval of the contractor before being implemented.

PAYMENT TERMS AND DISCOUNTS

Upon successful award of the contract, the Owner will make payments in accordance with the terms detailed in section titled Terms of Payment in the Elevator Modernization Specification.

TERMINATION OR DEFAULT

If the Contractor defaults in the performance of its duties, the Owner, after seven days' written notice to the Contractor, and after a reasonable opportunity for Contractor to cure, the Owner may terminate the Contract, and shall be entitled to exercise all remedies available to it under laws of the State of Oklahoma with any litigation with respect thereto to be brought in the courts of Tulsa County.

No waiver of any breach of the Contract Documents shall be held to be a waiver of any other or subsequent breach. All remedies afforded in the Contract Documents shall be taken and construed as cumulative, that is, in addition to every other remedy provided therein or by law. Contractor retains all rights and remedies granted to it by operation of law, or in equity; and has not waived, conditioned, or limited such, or assumed any obligation(s) unless expressly stated in any Amendment.

Notwithstanding anything contained in the Contract Documents to the contrary, if any term or condition of the Contract Documents to be performed by any party hereto is rendered impossible due to any cause beyond such party's control, including, without limitation, an act of God, war, civil disturbance, fire or casualty, labor dispute or governmental rule, such party, for so long as such condition exists, shall be excused from such performance or observance, provided such party takes all reasonable steps as soon as reasonably practicable upon the termination of such condition to recommence performance, and provided that after thirty (30) days from the onset of such cause or a reasonable period of time, if the party is still unable to perform its obligations hereunder, the other party, may, at its option, terminate the Contract Documents by giving written notice to the other party to that effect not less than thirty (30) days prior to the proposed termination date. Contractor shall automatically receive an extension of time commensurate with any delay not solely caused by Contractor; and shall not be liable for consequential damages. In the event of termination as set forth in this paragraph, Owner agrees to: (i) pay Contractor the proportional contract value of work performed including contract value of materials in process of fabrication, in transit, stored at jobsite, or in Contractor's possession; and (ii) limit possession to work and materials previously paid for by Owner to Contractor.

Notwithstanding any other provision of the Contract, neither party shall be entitled to recover consequential damages.

In the event it becomes necessary for any party to seek legal means to enforce the terms of the Contract, the non-prevailing party will be liable for all reasonable attorneys' fees and expenses incurred by the prevailing party in connection with this action.

QUALIFICATIONS OF BIDDERS

The bidder may be required before the award of any contract to show to the complete satisfaction of the Owner that it has the necessary facilities, ability, and financial

resources to provide the service specified therein in a satisfactory manner. The bidder is required to give a past history and references in order to satisfy the Owner in regard to the bidder's qualifications. The Owner may make reasonable investigations deemed necessary and proper to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all information for this purpose that may be requested. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, the bidder fails to satisfy the Owner that the bidder is properly qualified to carry out the obligations of the contract and to complete the work described therein. Evaluation of the bidder's qualifications shall include:

1. The ability, capacity, skill, and financial resources to perform the work or provide the service required.
2. The ability of the bidder to perform the work or provide the service promptly or within the time specified, without delay or interference.
3. The character, integrity, reputation, judgment, experience, and efficiency of the bidder.
4. The quality of performance of previous contracts or services.
5. The ability of the contractor to initiate and execute the modernization work in an expedient manner.

QUALITY OF GOODS

All goods installed shall be new, in first class condition, and of the manufacturer's latest proven design.

UNSATISFACTORY WORK

If, at any time during the contract term, the service performed or work done by the contractor is considered by the Owner to create a condition that threatens the health, safety, or welfare of the community, the contractor shall, on being notified by the Owner, immediately correct such deficient service or work. In the event the contractor fails, after notice, to correct the deficient service or work immediately, the Owner shall have the right to order the correction of the deficiency by separate contract or with its own resources at the expense of the contractor.

END OF GENERAL PROVISIONS

SPECIAL PROVISIONS

In addition to the General Provisions of this solicitation, these Special Provisions, along with the specifications that follow, will apply in like force to this solicitation and to any subsequent contract resulting there from.

INSURANCE REQUIREMENTS

Prior to the time the contractor is entitled to commence any part of the project, work under this contract, the contractor shall procure, pay for, and maintain the insurance coverage and limits as detailed in Section 9 Elevator Maintenance Section of this procurement. The Elevator Contractor shall submit certificate of confirmation naming indemnified parties as additional insured prior to commencing any work. The insurance requirements shall remain in effect throughout the term of this contract.

Contractor shall maintain workers' liability insurance and shall file such insurance with the Owner prior to the commencement of the Work.

The Contractor shall indemnify and hold the Owner harmless from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from the performance of the Work, to the extent caused by intentional or negligent acts or omissions of the Contractor.

The Owner is to be defended and indemnified for claims arising from third parties resulting from Elevator Contractor's acts, actions, omissions, or neglects; but is not defended or indemnified for its own acts, actions, omissions, or neglects. Elevator Contractor will provide a satisfactory insurance endorsement for the Owner.

Cancellation notice shall contain the standard Acord Form 25 cancellation language, but same is understood to provide 30 days' notice. The aggregate shall not be per project. Products and completed operations coverage shall be maintained for one (1) year after Owner acceptance of the totality of the work hereunder; and shall be included as part of the general aggregate and not evidenced separately.

TRANSPORTATION AND PACKING

Prices quoted shall be net, including transportation and delivery charges and fully prepaid by the seller, f.o.b. the site. No additional charges will be allowed for packing, packages, or partial delivery costs.

LEGAL COUNSEL REVIEW.

Contractor is to submit final Contract within 20 days of award to Owner. That Contract will then be presented to Legal Counsel for review & approval. Contractor will agree with, and/or negotiate any reasonable revisions requested by Counsel at conclusion of review by Legal Counsel.

TIME OF COMMENCEMENT AND COMPLETION

The work to be performed under this Contract shall commence on the date this Contract is executed by the parties hereto and, subject to authorized adjustment, shall be

completed no later than the time periods detailed in the project schedule below. Contractor agrees to commence and complete the work with continued diligence as a continuous operation from start through completion in accordance with project schedule below.

Contractor's ability to maintain scheduled job progress is conditioned on Contractor being allowed additional time for delays beyond its control as well as the timely furnishing of all necessary approvals.

Under no circumstances shall either party be liable for any loss, damage or delay due to any cause beyond either parties reasonable control, including but not limited to acts of government, strikes, lockouts, labor disputes, fire, explosion, theft, weather damage, flood, earthquake, riot, civil commotion, war mischief or act of God.

PROJECT SCHEDULE

Contractor shall provide a schedule for execution of modernization work with time periods necessary to indicate the milestones as listed below. It is anticipated that this contract will be awarded within thirty (30 days) of bid submission with the work start date to be as detailed in the Project Schedule identified below.

The start of on-site modernization must initiate on the date provided by the Elevator Contractor and approved by the Owner with completion finished in accordance with the schedule submitted by the Elevator Contractor and approved by the Owner for the elevator modernization. All open time periods are to be calculated after a date of award for this contract. The schedule below, when completed, will constitute the final schedule for this project.

Elevator modernization preferred sequencing is shown below. It is the intent of the Owner to have a bank of elevators always available for use. At no time (unless Owner has expressly agreed to in writing two weeks in advance) will all elevators of a similar style (i.e. traction or hydraulic) in a tower be offline. If the contractor is going to deviate from this schedule please clarify and explain benefit of proposed schedule:

Group 1:

- a. Williams Tower 1 – 2 Hydraulic Elevators (Garage) Units, performed one at a time. In advance of material delivery and modernization for the Traction Elevators, and Escalators.

Group 2

- b. Williams Tower 2 – 2 Elevators in the High Rise Bank
c. Williams Tower 2 – 2 Elevators in the Low Rise Bank

Group 3

- d. Williams Tower 2 – 2 Elevators in the High Rise Bank
e. Williams Tower 2 – 2 Elevators in the Low Rise Bank

Group 4

- f. Williams Tower 2 – 1 Elevator in the Low Rise Bank
g. Williams Tower 1 – 1 Elevators in the High Rise Bank

Group 5

- h. Williams Tower 1 – 2 Elevators in the High Rise Bank
i. Williams Tower 2 – 1 Escalator (Down Escalator)

Group 6

- j. Williams Tower 1 – 1 Elevator in the High Rise Bank
k. Williams Tower 2 – 1 Escalator (Up Escalator)

All time periods are to be calculated after a date of award for this contract with the actual start date as listed below. **Once the elevator is turned over to the Elevator Contractor for modernization, the Elevator Contractor shall provide all material and labor to ensure that the approved schedule is achieved to complete all modernization work on the elevators.**

PROJECT SCHEDULE

Elevator	Elevator	Mobilization / Start Date (Calendar Dates)	Completion/ Turn Over Date (Calendar Dates)	Duration (Days / Weeks)
Award & Contract Signing (November 15th 2026)	All			
Product Submittal Date	All			
Submittal Review Period	All			
Submittal Approval Date	All			
Manufacturing Shipping	All			
Installation	Hyd 1			
Installation	Hyd 2			
Installation	Esc Up			
Installation	Esc Dwn			
Installation	WT1 5			
Installation	WT1 6			
Installation	WT1 7			
Installation	WT1 8			
Installation	WT2 6			
Installation	WT2 7			

Installation	WT2 8			
Installation	WT2 9			
Installation	WT2 1			
Installation	WT2 2			
Installation	WT2 3			
Installation	WT2 4			
Installation	WT2 5			
Substantial Completion	All			
Final Completion	All			
Total Duration	All			

END OF SPECIAL PROVISIONS

BID ITEM 001A SPECIFICATION FOR MODERNIZATION OF HIGH RISE ELEVATORS

Williams Center Tower I 1 West 3rd St, Tulsa, OK 74103

FOUR (4) HIGH RISE TRACTION PASSENGER ELEVATORS (Elevators 5-8)

1 GENERAL

1.1 SUMMARY

- A) This section specifies required work to complete the modernization of Four (4) Traction Elevators.
- B) Elevator work includes:
 - 1) Commercial, standard electric traction elevators.
 - 2) Elevator car and hoistway signal equipment.
 - 3) Operation and control systems.
 - 4) Patching, painting etc. as indicated.
 - 5) Accessibility provisions for physically disabled persons.
- C) Engineering, equipment, labor, machines, control systems, devices and accessories as required for safely operating the specified elevators at rated speed with rated capacities.
- D) Delivery, staging, and hoisting of new equipment. Hoisting, dismantling, removal and disposal of existing equipment. Repair, cleaning, and painting of reusable equipment.
- E) Materials and accessories as required for completing the elevator modernization.
- F) Hoistway, pit and machine room barricades for safety as required.
- G) Required hoisting, hoisting permits and traffic coordination and/or permits with local jurisdictions and the State of Oklahoma as required.
- H) Required permits and coordination and/or permits with local jurisdictions, Bureau of Elevator Safety and the State of Oklahoma as required.

1.2 **DEFINITIONS**

- A) The following definitions shall be used throughout all general conditions, specifications and contract documents except where superseded in those documents.
- 1) "Owner": Cherokee Nation Businesses.
 - 2) "Consultant": ATIS.
 - 3) "Contractor": The Elevator Contractor unless stated differently.
 - 4) "Contract": The Contract for the elevator modernization and other related work shall be deemed to be the Elevator Specifications provided to Contractor prior to execution.
 - 5) "Contract Documents": The Contract for the elevator modernization and other related work to the elevator of the building, the Elevator Specifications (the "Specifications") and any Addendum shall comprise the Contract Documents. Additional Contract Documents may be created and incorporated upon written agreement by Owner and Contractor. Notwithstanding, any documents not furnished hereunder shall not be binding upon Contractor until such time Contractor is furnished with same and specifically accepts in writing.
 - 6) "Contract Sum": The amount set forth in the Contract as priced by the "Contractor" for Bid Items, for Contractor's performance of the Work.
 - 7) "Direct Labor Costs": Wages or salaries, which can be properly identified with and charged to one specific product or service. Direct labor cost shall include all direct labor employee benefit costs and burdens. Employee benefits shall include the employer's cost contributions for health and welfare, injury compensation, Federal and State Unemployment and Social Security taxes. It shall also include a burden factor to recover the cost of paid absence due to Federal Holidays, vacation, and election days required by the Department of Labor Wage Determinations. Other benefit costs including retirement contributions and paid sick leave may be included where identifiable and payable by the Contractor.
 - 8) "Direct Labor Hours": Those hours actually expended in the accomplishment of direct labor costed work.
 - 9) "Direct Materials Cost": The actual vendor invoice charges for materials used for performance of work under this contract. Direct material costs shall include transportation charges when such charges are included on the invoice by the vendor, as well as any discounts allowed for prompt payment and discounts or rebates for core value of salvage value that accrue to the Contractor. When questions arise concerning the cost of materials, material costs will be based on the lowest of quotes provided by the Contractor from at least three different commercial vendors.

- 10)“Code”: All applicable laws and codes, including but not limited to the electrical, fire, building, and Safety Codes for Elevators and Escalators codes designated by any authority having jurisdiction as detailed in the codes and standards reference section of this specification.
- 11)“Jurisdictional Authority”: The authority having jurisdiction, the organization, office, or individual responsible for enforcement of the associated Elevator Code(s). Where compliance with these Codes has been mandated by legislation or regulation, the “Jurisdictional Authority” is the regulatory authority.
- 12)“Component” or “Component Part”: Any part of any item or system that is detachable or removable from the main body or main assembly of the item or system.
- 13)Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that reference is made to this specification and the drawings accompanying this specification unless stated otherwise.
- 14)Where “as directed”, “as required”, “as permitted”, “approval”, “acceptance”, or other words of similar import are used, it shall be understood that direction, requirement, permission, approval, or acceptance of the Owner is intended unless stated otherwise.
- 15)“Work”: The services to be completed by Contractor are as specified in the Contract Documents. This Work includes all Services necessary; material and labor required to provide and install and/or repair equipment as specified under this specification. Schedules and completion dates shall be agreed to in writing by both parties before becoming effective.
- 16)“Provide”: Provide all materials and labor required to furnish and install and or repair.
- 17) “Services”: Services shall include, but shall not necessarily be limited to, all labor, transportation, supplies, materials, parts, tools, scaffolding, machinery, hoists, employee safety equipment, equipment, lubricants; supervision, applicable taxes, and all other work and materials expressly required under this Contract or reasonably inferred whether or not expressly stated herein necessary to maintain all equipment covered under this specification.
- 18)“Fire Alarm Contractor”: Contractor approved to work on the Fire Alarm System installed in Williams Center Tower I, 1 W 3rd St, Tulsa, OK 74103.
- 19)“Subcontractor”: A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work and Services at the site. All Subcontractors must be licensed and insured and must provide proof of adequate insurance in the amounts specified herein prior to the commencement of any portion of the Work.

1.3 CODE AND STANDARD REFERENCES

- A) All codes and standards referenced in this specification will be to the edition of the references as detailed in this section. All materials and Work and Services to be performed under these specifications shall be in compliance with the Codes listed in this section or as determined by the authority having jurisdiction.
- B) Comply with applicable PROPERTY STATE Regulatory Requirements, Building Codes and Elevator Codes at the project site, including but not limited to the following:
 - 1) ASME A17.1-2004 Safety Code for Elevators and Escalators
 - 2) ASME A17.3-2004 Safety Code for Existing Elevators and Escalators
 - 3) ASME A17.2-2004 Guide for Inspection of Elevators and Escalators
 - 4) ADAAG, Americans with Disabilities Act Accessibility Guidelines
 - 5) ASCE 24 Flood Resistant Design and Construction
 - 6) NFPA 13-2019 Standard for the Installation of Sprinkler Systems
 - 7) NFPA 70-2020 National Electrical Code
 - 8) National Electric Code (NEC)
 - 9) NFPA 80, Fire Doors and Windows
 - 10) ANSI/UL 10B, Fire Tests of Door Assemblies
 - 11) NFPA 72-2019 National Fire Alarm Code
 - 12) NFPA 101 Life Safety Code
 - 13) O.S.H.A. Requirements for construction and repairs of existing buildings
 - 14) Elevator Industry Field Employees' Safety Handbook 2020
 - 15) Americans with Disabilities Act (ADA)
 - 16) Any and all onsite workmen and receiving of products to site are required to follow security and safety procedures as per policies due to facility regulations

1.4 RELATED WORK BY OTHERS

- A) This project will be a “turn-key” project with all work requirements included under the Related Work by Others section to be provided by the Elevator Contractor unless specifically stated. All work necessary for a complete and useable elevator system, shall be the responsibility of the Elevator Contractor. Specifically, to include non-traditional Contractor work detailed in Part 1.4 in addition to traditional Contractor work as detailed in all other sections of this specification. All materials and work to be performed under these specifications shall be in compliance with the codes listed in Part 1.3 CODE AND STANDARD REFERENCES or as determined by the authority having jurisdiction. As work progresses, Contractor shall consult with their Subcontractors, examine the Work installed by Subcontractors, and resolve all conflicts without expense to Owner and/or Consultant.

- B) **Machine Room HVAC:** Machine room HVAC is required, to maintain temperature and humidity to between 55 deg F and 90 deg F with relative humidity of not more than 85% non-condensing. The Elevator Contractor shall provide actual calculations for total anticipated heat loads generated by all elevator machine room equipment.
- 1) Machine room HVAC must be positioned as approved by the Elevator Contractor and consultant. There shall be no drain lines or condensation allowing water in the machine room.
 - 2) Dedicated HVAC system for machine room is required to have an electrical disconnect lockable in the off position with proper labels identifying source of power and purpose.
 - 3) HVAC Contractor shall provide HVAC receptacle or disconnect switch as required for the installation of HVAC system by HVAC Contractor.
 - 4) HVAC Contractor is responsible for providing electrical power and code compliant disconnect switch for installation of HVAC equipment.
 - 5) Remote systems shall have a proper thermostat inside the machine room.
 - 6) Any existing vents in the machine room will be properly covered and protected.
- C) **Fire Alarm:** Fire alarm including heat and smoke sensing devices as per NFPA 70 National Electrical Code and NFPA 72 National Fire Alarm.
- 1) Verify that proper connections exist for fire recall devices to the elevator controllers. If required, provide connection from new or existing fire recall devices to the elevator controllers in machine room. For each elevator within the building, a minimum of three separate elevator control circuits shall be terminated at the designated elevator controller within each elevator machine room in accordance with NFPA 72, section 21.3. Operation of the elevator shall be in accordance with Section 2.27 of ASME A17.1 Safety Code for Elevators and Escalators. The smoke detectors or other automatic fire detection as permitted by NFPA 72, shall actuate the elevator control circuits as detailed in NFPA 72.
 - 2) Fire alarm contractor shall demonstrate at time of elevator inspection, compliance and testing of all alarm initiating devices as required by ASME A17.1 Safety Code for Elevators and Escalators, ASME A17.2 and NFPA 72 National Fire Alarm Code.
 - 3) Installation of alarm system and devices shall conform to ASME A17.1 Safety Code for Elevators and Escalators, and NFPA 72 including NFPA 70 NEC.
 - 4) All conduit and wiring requirements for Fire Alarm System work is the responsibility of the Fire Alarm Contractor.
- D) **Emergency Generator:** These elevators are provided with emergency generator power. Emergency generator personnel shall demonstrate system and tests at completion of each elevator for inspection as required by the applicable Building Code, Jurisdictional Statutes, Rules & requirements and ASME A17.1 Safety Code for Elevators and Escalators.

- 1) Emergency power in the building is capable for providing only power to one (1) of four (4) elevator cars in this bank at the same time.
- 2) Verify the existence of code compliant emergency power supply transfer switch. If existing transfer switch is not code compliant, provide and install emergency power supply transfer switch, wiring and auxiliary contacts as required by applicable Building Code and NFPA 70 National Electrical Code.
- 3) Emergency generator configuration, installation, wiring including conduit to elevator controller; repair, transfer switches including elevator selector options, connections or testing with or standby or emergency power systems shall be coordinated and completed by emergency generator service contractor. Emergency generator personnel shall demonstrate system and tests at completion of each elevator for inspection as required by applicable Building Code, Jurisdictional Statutes, Rules & requirements, and ASME A17.1 Safety Code for Elevators and Escalators
- 4) An illuminated signal marked "ELEVATOR EMERGENCY POWER" shall be provided in the elevator lobby at the designated level to indicate that the normal power supply has failed and the emergency or standby power is in effect for the elevator. This will be provided with the elevator hall station fixtures for the designated landing.
- 5) Generator contractor (under contract to the elevator contractor) shall provide signal in transfer switch to elevator controller that the building is on emergency standby power.
- 6) The operation of elevator cars on emergency power shall be determined through a selector switch capable of automatic or manual selection of the car to be operated by emergency power.
- 7) Elevator Contractor will provide new elevator controllers capable of required emergency power operations as detailed in this section, including sequencing operation for both elevators and conformance with the requirement detailed from the Building Code.
- 8) Current Building Code Chapter 30, Section 3003, Emergency Operations requires the following:
 - a) 3003.1 Standby Power. In buildings and structures where standby power is required or furnished to operate an elevator, the operation shall be in accordance with Sections 3003.1.1 through 3003.1.4.
 - b) 3003.1.1 Manual Transfer. Standby power shall be manually transferable to all elevators in each bank.
 - c) 3003.1.3 Two or More Elevators. Where two or more elevators are controlled by a common operating system, all elevators shall automatically transfer to standby power within 60 seconds after failure of normal power where the standby power source is of sufficient capacity to operate all elevators at the same time.

- d) 3003.1.4 Venting. Where standby power is connected to elevators, the machine room ventilation or air conditioning shall be connected to the standby power source.
- e) Emergency Power has been verified to be capable of operating only one elevator at a time in the building and other building loads concurrently. Key operated sequencing will be required.
- f) Contractor, or Generator Subcontractor, shall provide signal in transfer switch to elevator controllers that the building is on emergency standby power.

E) Sprinklers: Currently there are no sprinklers located in the machine room.

- 1) If sprinklers are required by local Fire Officials a code compliant shunt trip breaker would need to be installed and located for disconnecting power to the elevator in conformance with applicable codes.
- 2) Where elevator equipment is located or its enclosure is configured such that application of water from sprinklers could cause unsafe elevator operation, means shall be provided to automatically disconnect the main line power supply to the affected elevator and any other power supplies used to move the elevator upon or prior to the application of water.
- 3) When sprinklers are installed not more than 600 mm (24 in.) above the pit floor, the following shall apply to elevator electrical equipment and wiring in the hoistway located less than 1,200 mm (48 in.) above the pit floor, except earthquake protective devices conforming as required to ASME A17.1 Part 8.4); and on the exterior of the car at the point where the car platform sill and the lowest landing hoistway door sill are in vertical alignment.
 - a) Elevator electrical equipment shall be weatherproof (Type 4 as specified in NEMA 250).
 - b) Elevator wiring, except traveling cables, shall be identified for use in wet locations in accordance with the requirements in NFPA 70
- 4) If sprinkler head(s) are located in the machine room or hoistway, it will be required to install a heat detector within 24" of each sprinkler in order to automatically disconnect the main line power supply to the affected elevator(s) upon or prior to the application of water, in accordance with ASME A17 Safety Code for Elevators and Escalators, and NFPA 72 National Fire Alarm Code.

F) Building General Construction: Building general construction conditions will include, work detailed in this section, including cleaning and painting of miscellaneous surfaces. The Elevator Contractor shall not be responsible for all work as detailed in this section. All construction, cleaning and painting other than equipment directly supplied by the Elevator Contractor shall be performed by Work by Others.

- 1) Verify proper installation of 1 ½ hour "B-Label" door to machine room to include self-closing and self-locking requirements.

- 2) Verify proper Class ABC Fire Extinguisher in machine room permanently mounted and conveniently located to the access door as required by ASME A17.1 Safety Code for Elevators and Escalators.
 - 3) Verify that all non-elevator related pipes, wiring, conduit have been removed and openings in machine rooms and hoistways to include a 2-hour fire rating. All foreign pipes, wiring or conduit not in use or directly related to the elevator system shall be removed from machine rooms and hoistways.
 - 4) All sills must be substantially level to all adjacent finished flooring surfaces.
 - 5) Machine room warning sign "Danger Authorized Personnel Only" shall be provided on the machine room door as required by NFPA 70 NEC.
- G) Each contractor will be required to provide any cutting, patching including painting to match existing finishes of building.
- H) All above work and materials to be performed to meet compliance with applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code, NFPA 13 National Sprinkler Code and NFPA 72 Fire Alarm Code or as determined by the authority having jurisdiction.
- I) Failure by above associated contractors to perform required testing at time of scheduled elevator acceptance testing and inspection will require full advance payment by contractor at fault for all expenses relating to re-inspection, permit and scheduling fees to building management.
- J) **Telephone Lines:** Provide a **cellular** non-proprietary line for the elevators.
- 1) Telephone lines and wiring to elevator controllers for telephone system including all wiring in machine room to be installed inside conduit as per NFPA 70 NEC.
 - 2) All emergency telephone devices shall include a minimum of 4 hours emergency backup power including power from emergency generator if supplied.
- K) **Electrical Requirements:** Electrical work required for elevator modernization shall be the responsibility of the Elevator Contractor. Electrical requirements shall include the following:
- 1) All Electrical work must be coordinated and scheduled with, at least 7 days' notice, with the building owner. Elevators shall be removed from service while electrical trades are working.
 - 2) Electrical requirements for hoistway and machine room HVAC, GFCI receptacles and disconnects, as required by NFPA 70, NEC and ASME A17.1 Safety Code for Elevators and Escalators. Additionally, Electrical Contractor shall provide and install conduits and wiring required for communication devices as detailed in this section.
 - 3) **Main Line Disconnect:** Main line disconnect is to be verified by Elevator Contractor as appropriate size and type for power requirements of new elevator equipment prior to installation. Main line disconnect for elevators shall not be used for other conductors to pass thru disconnect switch boxes.

- a) If existing disconnect is not satisfactory, Electrical Contractor shall provide new disconnect for elevator main line power in accordance with NFPA 70, NEC. The disconnecting means shall be an enclosed externally operable fused motor circuit switch capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.
- 4) **Cab Lighting Disconnect:** Cab Lighting disconnect is to be verified by Electrical Contractor as appropriate size and type for power requirements. Cab Lighting disconnect for elevators shall not be used for other conductors to pass thru disconnect switch boxes. Electrical Contractor shall provide new disconnect(s) for elevator cab lighting in accordance with NFPA 70, NEC.
 - a) The disconnecting means shall be an enclosed externally operable fused motor circuit switch capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.
 - b) Cab Light Source: A separate branch circuit shall supply the cab lights, receptacle(s), accessory equipment (alarm devices, alarm bells, monitoring devices not part of the control system), auxiliary lighting power source, and ventilation on each elevator car. The overcurrent device protecting the branch circuit shall be located in the elevator machine room or control room/machinery space or control space. Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.
- 5) **Machine Room Lighting and Receptacles:**
 - a) A separate branch circuit shall supply the machine room or control room/machinery space or control space lighting and receptacle(s).
 - b) Minimum lighting in machine room shall be 19 foot candles ("fc").
 - c) Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.
- 6) **Pit Lighting and Receptacle(s):**
 - a) Verify that current pit lighting meets minimum 10 fc. at all locations in the pit. If pit lighting is below 10 fc requirement, provide additional lighting as detailed in this specification.
 - b) Verify that a separate branch circuit is installed to supply the hoistway pit lighting and receptacle(s).

- c) Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.
 - d) The lighting switch shall be so located as to be readily accessible from the pit access door.
 - e) Duplex Receptacle. At least one 120-volt, single phase, 20-ampere duplex receptacle shall be provided in the hoistway pit.
- 7) **Pit Receptacles:** Pit receptacles, with GFCI protection shall be installed in NEMA 4 devices where placed within 4'-0" of pit floor. Care must be taken not to place equipment in line with elevator equipment.
- 8) Each 120-volt, single-phase, 20 ampere receptacle installed in pits, in hoistways and on elevator car tops shall be of the ground fault circuit-interrupter type for protection of personnel.
- 9) All disconnects shall be labeled according to NFPA 70 National Electrical Code including source of power, Jurisdictional Identification (Serial Number) and all required warning signs.
- 10) All disconnects shall be installed with proper clearances in accordance to the applicable provisions of NFPA 70 National Electrical Code.
- 11) All conduit and wiring in the hoistway must be checked for proper installation and properly mounted in accordance with applicable provisions of NFPA 70 National Electrical Code.
- 12) Equipment grounding and bonding shall be provided in accordance with the requirements of NFPA 70 National Electrical Code. The equipment grounding conductor will be run with the circuit conductors and shall be a copper conductor. Ground all conductors, supports, controller enclosure, and other non-current conducting metal enclosures for electrical equipment in accordance with NFPA 70 National Electrical Code. The ground wires shall be solid or stranded; insulated, covered, or bare copper, sized as required by NEC, and shall be colored green if #6 AWG or smaller, and have green tape or adhesive marking if #4 AWG or larger.
- 13) Provide new electric wiring from disconnect switches to the terminals of the new elevator controllers in their new locations, inclusive of a minimum 120 VAC, 15 AMP supply at each controller, or as required.
- 14) Provide new pit lighting and machine room lighting as per NFPA 70 National Electrical Code with enclosed and protected lamps.
- 15) All existing and new lighting fixtures in machine rooms, elevator cars and on top of car are to be suitably guarded in accordance with ASME A17.1 Safety Code for Elevators and Escalators clearance requirements and NFPA 70 National Electrical Code requirements for guarding.
- 16) Pit lighting switches and emergency stop switches shall be installed approximately 18" above first floor landing adjacent to opening and operable from side of pit access where pit ladder is installed.

17) Telephone lines and wiring to elevator controllers for telephone system including all wiring in machine room to be installed inside conduit as per NFPA 70 NEC. Conduit to be installed under Electrical Requirements.

L) **Patching:** Patching of all masonry openings and drywall surfaces as required by elevator installation work as detailed below will be the responsibility of the Elevator Contractor and shall be completed with fire rating of hoistway or machine room equal or greater than 2 hours in accordance with Oklahoma Building Code.

- 1) All openings left from the removal of any surface mounted devices will be patched appropriately and surface restoration performed by the Elevator Contractor. Included in this will be the removal of old position indicators and directional indicators.
- 2) Patching of all surfaces at elevator landings will be the responsibility of the Elevator Contractor. Masonry, drywall, patching, and finishes including painting for repair of all openings as required by elevator installation work and shall be completed with fire rating of hoistway or machine room equal or greater than 2 hours in accordance with applicable Building Code and shall match or exceed the existing level of finish.
- 3) Patching of all masonry openings and drywall surfaces as required by elevator installation work inside the hoistway and machine room will be the responsibility of the Elevator Contractor. All patching shall be of a finish level equal to or exceeding the existing wall surface.

M) **Coordination of Work:**

- 1) Elevator Contractor shall coordinate as required with other contractors to ensure that schedules are met and all work being performed in association with the elevator modernization project is acceptable.
- 2) Before proceeding with any Work, the Contractor shall carefully check and verify all pertinent dimensions and sizes, and assume full responsibility for fitting the equipment and materials to the structure. Where the apparatus and equipment have been indicated on the drawings, the dimensions have been taken from typical equipment of the type specified in these specifications. The Contractor shall carefully check the drawings to verify that the equipment that will be actually provided will fit into the spaces available. Should the equipment not fit the specific structure shown on the drawings, all additional sub-framing members required to accommodate the equipment installation shall be provided and paid for by Contractor as part of the Work of this section. The Contractor shall submit all structural shop drawings and engineering calculations for the Consultant's review and written approval.
- 3) Contractor shall familiarize himself with the specifications, drawings, installation procedures and construction schedules for those phases of Work performed by his subcontractors. The Contractor shall also familiarize himself with the Owner's security and safety requirements and shall abide by and conform to such established regulations at all times. If the Contractor's Work or the Work of any of his subcontractors depends upon the execution of the Work of another subcontractor or

upon his own Work, he shall so coordinate all phases of Work so as to avoid conflicts in installation procedures and construction schedules.

- 4) As work progresses, Contractor shall consult with his subcontractors, examine the Work installed by them, and resolve all conflicts without expense to Owner and/or Consultant.
- 5) Progress meetings shall be held at the job site, as and when requested by Owner or Consultant. The Contractor shall be represented at these meetings by persons familiar with the details of the scope of Work and authorized to conclude matters relative to Work progress, as may be necessary to expedite completion of Work.
- 6) All above work and materials to be performed to meet compliance with applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code, NFPA 13 National Sprinkler Code and NFPA 72 Fire Alarm Code or as determined by the authority having jurisdiction.
- 7) Failure by above associated contractors to perform required testing at time of scheduled elevator acceptance testing and inspection will require full advance payment by contractor at fault for all expenses relating to re-inspection, permit, and scheduling fees to building management.

1.5 PAINTING

- A) **Cleaning and Painting of Miscellaneous Surfaces:** The Contractor shall be responsible for all miscellaneous painting as detailed in this specification. The procedures proposed for the accomplishment of the work shall provide for safe conduct of the work, careful removal and disposition of materials specified to be salvaged, protection of property, which is to remain undisturbed, and coordination with other work in progress. The work plan shall include a Safety and Health Plan describing procedures for handling monitoring, and disposition of Volatile Organic Compounds "VOCs" and other hazardous and toxic materials. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations.
- B) **Painting Provisions:** For all painting performed, the following provisions shall apply:
- 1) Provide all ferrous metals installed in the hoistway shop primed with a rust inhibitive primer.
 - 2) All cleaning or painting work that produces any vapors or fumes shall not be performed during normal business work hours. All cleaning or painting work that produces any vapors or fumes shall be performed with sufficient ventilation to prevent the vapors or fumes from permeating into the building. Work of this nature must be scheduled and coordinated with the Owner three (3) days prior to execution of work.
 - a) The procedures proposed for the accomplishment of the Work shall provide for safe conduct of the Work, careful removal and disposition of materials specified to be salvaged, protection of property, which is to remain undisturbed, and

coordination with other work in progress. The Work Plan shall include a Safety and Health plan describing procedures for handling monitoring, and disposition of Volatile Organic Compounds "VOCs" and other hazardous and toxic materials. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations.

- b) All paint products and application method must be pre-approved prior to application by Owner or Owner's agent. Paint products and application methods are to be equal or better than existing product applicable with matching color as approved by Owner.
 - c) All products of paint, thinners or cleaning agents must be pre-approved prior to use for VOC's or any additional health concerns.
- 3) Interior work zones having a volume of 1,000 cubic feet or less shall be ventilated at a minimum of 2 air exchanges per hour. Ventilation in larger work zones shall be maintained by means of mechanical exhaust. Solvent vapors shall be exhausted outdoors, away from air intakes, building occupants and workers. Building air conditioning return air inlets in the work zone shall be temporarily sealed before start of work until the prepared surfaces have dried and are free of odor. Operators and personnel in the vicinity of paint removal processes involving chemicals or mechanical action (sanding or blasting) shall wear respirators.

1.6 ELEVATOR SYSTEM DESCRIPTION

A) Elevator Arrangement: Quantity – Four (4) with Elevator(s) numbered as follows:

- 1) Elevator # 5 (State ID # 35104)
- 2) Elevator # 6 (State ID # 35105)
- 3) Elevator # 7 (State ID # 35106)
- 4) Elevator # 8 (State ID # 35107)
- 5) Specific requirements for the specific elevator or component shall be designated as such. It shall be the bidding Contractor's responsibility to review and verify as required for proper installation. Specifications for elevators include minimum requirements of elevators and it shall be the responsibility of the bidder to complete all work to code compliance.

B) Type:

- 1) Elevator # 5 (State ID # 35104) – Passenger – High Rise Traction
- 2) Elevator # 6 (State ID # 35105) – Passenger – High Rise Traction
- 3) Elevator # 7 (State ID # 35106) – Passenger – High Rise Traction
- 4) Elevator # 8 (State ID # 35107) – Passenger – High Rise Traction

C) Number of Stops & Openings:

- 1) Elevator # 5 (State ID # 35104): 9 front (labeled B, *P, 11 - 17) / No Rear Openings

- 2) Elevator # 6 (State ID # 35105): 8 front (labeled *P, 11 - 17) / No Rear Openings
- 3) Elevator # 7 (State ID # 35106): 8 front (labeled *P, 11 - 17) / No Rear Openings
- 4) Elevator # 8 (State ID # 35107): 8 front (labeled *P, 11 - 17) / No Rear Openings

D) **Rise:** All existing conditions

E) **Rated Capacity/Speed:** Maintain existing conditions

- 1) Elevator # 5 (State ID # 35104)
 - a) Capacity rated at 3500 lbs.
 - b) Speed rated at 500 fpm
- 2) Elevator # 6 (State ID # 35105)
 - a) Capacity rated at 3500 lbs.
 - b) Speed rated at 500 fpm
- 3) Elevator # 7 (State ID # 35106)
 - a) Capacity rated at 3500 lbs.
 - b) Speed rated at 500 fpm
- 4) Elevator # 8 (State ID # 35107)
 - a) Capacity rated at 3500 lbs.
 - b) Speed rated at 500 fpm

F) **Minimum Car Inside:** Maintain existing dimensions

G) **Inside Cab Height:** Maintain existing clear headroom dimensions inside car.

H) **Entrance Width & Type:**

- 1) Elevator # 5 (State ID # 35104):
 - a) Front Openings: Single Speed Center Opening 48" x 84"
 - b) Rear Openings: N/A
- 2) Elevator # 6 (State ID # 35105):
 - a) Front Openings: Single Speed Center Opening 48" x 84"
 - b) Rear Openings: N/A
- 3) Elevator # 7 (State ID # 35106):
 - a) Front Openings: Single Speed Center Opening 48" x 84"
 - b) Rear Openings: N/A
- 4) Elevator # 8 (State ID # 35107):
 - a) Front Openings: Single Speed Center Opening 48" x 84"
 - b) Rear Openings: N/A

I) **Main Power Supply:**

- 1) Elevator # 5 (State ID # 35104) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.

- 2) Elevator # 6 (State ID # 35105) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.
 - 3) Elevator # 7 (State ID # 35106) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.
 - 4) Elevator # 8 (State ID # 35107) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor
- J) **Lighting Power Supply:** 120 Volts, 1 Phase, 15 Amp, 60 Hz.
- K) **Stopping Accuracy:** $\pm 1/4"$ under any loading condition or direction of travel.
- L) **Door Operating Equipment:** Door operating equipment shall be labeled with maximum door speed and Kinetic Energy shall not exceed 7.37 ft-lb. as required by ASME A17.1 Safety Code for Elevators and Escalators.
- M) **Car Operation:**
- 1) Using a Group Operation for elevators microprocessor-based controller, the operation shall be automatic by means of the car and hall buttons.
 - 2) Provide microprocessor-based Group Operation automatic operation control system, which utilizes on-board diagnostics for servicing, troubleshooting, and adjusting without requiring the use of an outside service tool.

1.7 **SUBMITTALS**

- A) **Product data:** Submit product data for the following:
- 1) Elevator car and hoistway fixtures.
 - 2) Operation, control, and signal systems.
 - 3) Motor & traction driving machine, speed governor and all major components of system including layout for machine room if equipment layout is changed all major components of system.
 - 4) Elevator cab interior materials and finishes.
- B) **Shop drawings:** Provide the following if equipment existing layout is changed.
- 1) Show equipment arrangement in the machine room, pit and hoistway plans, elevations, sections and details of assembly, erection, anchorage, and equipment location as required.
 - 2) Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
 - 3) Show floors served, existing travel distances, maximum loads imposed on the building structure at points of support and all similar considerations of the elevator work.
 - 4) Indicate electrical power requirements and branch circuit protection device recommendations and locations.

C) **Certificates:** Inspection and acceptance certificates of elevator system installation.

D) **Submittals at Project Close-Out:**

1) **Operation and Maintenance Data:** Include the following:

- a) Product User Manuals and maintenance guides.
- b) Parts list, with recommended parts inventory.
- a) Furnish two (2) copies of bound Product User Manuals and maintenance guides for elevators. Furnish one (1) electronic copy of all project close-out submittals to Owner.

2) **Wiring Diagrams:** Provide complete as built wiring diagrams with all electrical connections of elevator systems.

- a) Provide one set of as built wiring diagrams in the elevator machine room.
- b) Provide one (1) additional hard copy and 1 electronic copy on separate USB Flash Drive, in PDF format to Elevator Consultant for review and delivery to Owner.
- c) Provide legible schematic wiring diagrams of installed electrical equipment, including control equipment, and any changes and/or in field modifications.
- d) Provide legible copy of field pull sheets and wiring notes. Pull sheets to include wire numbers and colors. List symbols corresponding to identity or markings on machine room and hoistway apparatus.
- e) Coded diagrams are not acceptable unless fully identified.

1.8 **QUALITY ASSURANCE**

A) **Contractor Qualifications:** Elevator Contractor shall provide pre-engineered elevator system components by manufacturer(s) regularly engaged in the manufacture of elevator systems and that complies with ASME A17.1 Safety Code for Elevators and Escalators in its entirety, Jurisdictional Statutes, Rules & requirements, all applicable sections of the applicable Building Code as referenced above in its entirety, and additional requirements specified herein.

B) **Quality Assurance Program:** The Contractor shall have a documented, on-going quality assurance program.

C) **Installer Qualifications:** The Elevator Contractor must have not less than ten years of satisfactory experience installing elevators equal in character and performance to the project elevator. All mechanics employed to work onsite must be certified and/or licensed by appropriate federal and/or state regulatory agencies to meet federal and/or local certification requirements in maintenance, repair, alteration, and construction of elevators. There shall not be allowed onsite more than one helper or assistant unlicensed per onsite licensed mechanic.

D) **Permits and Inspections:** The Contractor shall be responsible to obtain all permits, licenses and other fees that are necessary for proper completion and execution of the

Work, which are specifically included in the Contract Sum, but not limited to required Jurisdictional Authority permits as required by Jurisdictional Statutes, Rules & requirements for Alteration Permits, and local jurisdiction permits. Elevator Contractor is responsible for proper posting of all required licenses, permits and safety documentation.

- E) **Inspection and testing:** Elevator Installer shall obtain and pay for all required tests, permits and fees for elevator installation as required by the State of Oklahoma.
- 1) Owner has designated ATIS as their consultant on this project. ATIS, in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Inspection and Test Requirements, may be present for and review all acceptance inspections for this elevator. Elevator Installer in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Inspection and Test Requirements will schedule and coordinate all acceptance tests and arrange for inspection for this elevator. Elevator Contractor must notify building owner and elevator consultant 5 days prior to inspection advising of the date and time of all inspections and tests. Elevator consultant must qualify and approve any inspector prior to inspection other than inspectors employed by the Authority Having Jurisdiction (AHJ).
 - 2) Elevator Contractor shall be solely responsible for the application, securing, maintaining, completion and posting of existing elevator permits as per Jurisdictional Statutes, Rules & requirements, and delivery to the Owner upon completion and acceptance of elevator work, the certificate of operation.
 - 3) Failures by Contractor to successfully perform required testing and pass alteration acceptance inspection, at time of scheduled elevator acceptance testing, will require a re-inspection. All costs for re-inspection required due to Contractor fault will be paid by Contractor.
- F) **Signage:** All signage as required by the applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code and NFPA 72 Fire Alarm Code to be posted in elevator lobbies, fire alarm panels, disconnects, machine rooms and machine room doors.
- G) **Non-Proprietary Controls:** Letter of guarantee that any and all equipment installed shall be completely non-proprietary and shall not require the need for specialized testing or programming tools currently or in the future. Future information for trouble shooting or adjusting shall be available to any licensed elevator maintenance contractor by the supplier of the control system at a reasonable cost comparable to cost of competitive parts within marketplace. Contractor shall provide complete schematics and wiring diagrams for control systems including information for change of program, on board diagnostics or mnemonics, or other on board switches or settings.
- 1) Any equipment that is provided for installation which would require any specialized tool, laptop computer, devices, manuals, source codes, access codes, objects, passwords and/or software to input parameters, make adjustments, troubleshoot, perform diagnostics, perform testing functions or required for any other type of maintenance or repair function shall be included with the modernization cost of this

contract and will become the property of the Owner. At the time of bid submission, this shall be identified as such on the bid.

- 2) Any controller by a manufacturer other than specified must be pre-approved prior to bid. Letter stating agreement to the above compliance shall be signed by an officer of Contractor and shall be notarized.

H) **Contractor's Safety and Health Plan:** The contractor shall have in place a safety and health plan that, at a minimum, addresses OSHA requirements. The safety and health plan shall comply with the requirements of the Elevator Industry Field Employees' Safety Handbook. The program shall include job site cleanliness, hard hats, safety glasses, safety shoes, hearing protection, fall protection, proper use of ladders, barriers around hazards and proper scaffolding.

I) **Protection of Spaces:** Contractor is responsible for all protection both inside and outside of hoistway to all personnel inside or outside of hoistway areas. This includes providing and maintaining of protective barricades at hall entrances, screening of each hoistway during work and protection from trip hazards due to storage or use of materials or drop cords.

- 1) Contractor is to provide due care to protect building flooring, walls and other surfaces from excessive debris, dirt or damage due to workmen onsite.

1.9 DELIVERY, STORAGE AND HANDLING

- A) Deliver elevator materials, components, and equipment in manufacturer's protective packaging.
- B) Elevator equipment disassembled for replacement shall be neatly stored prior to removal from site and disposal, which is responsibility of Elevator Contractor.
- C) Store materials in a dry protected area if designated by owner. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling, or deterioration.
- D) Elevator Contractor shall be responsible for the material handling of all elevator equipment to site storage area. Elevator Contractor will be responsible for keeping all stored materials inside storage area with lock and key.
- E) Elevator Contractor's sole responsibility and liability shall be limited to the extent Elevator Contractor is at fault; and shall not be responsible for material once material arrives at jobsite.
- F) Elevator Contractor shall be responsible for the removal the existing equipment from the machine rooms and placement of the new equipment in the machine rooms.
- G) Owner shall afford the Contractor and separate contractors' reasonable opportunity for storage of materials and performance of their activities on the property and shall cooperate in coordinating operations with such other activities.
- H) Locked and protected storage for Elevator Contractor's tools or materials at site is contractor's responsibility. Key will be provided for elevator machine room, which is

located on roof level of building, and can be utilized for storage or securing of tools and equipment. Additional storage may be available and will require coordination with property for identification and requirements for use.

- I) If the Elevator Contractor needs additional storage beyond what is available on site than the property will provide a single location for either a storage trailer or POD. The cost of the storage container/trailer is the responsibility of the Elevator Contractor.
- J) Authorized elevator personnel only are responsible for temporary installed barrier panels as may be required during construction to protect the openings at elevator at each floor. Panels may be removed only while the authorized elevator personnel are to perform work in the immediate area of the unprotected opening. Authorized elevator personnel shall re-install all barriers as required to maintain the original solid and safe protection to the opening prior to leaving immediate work area of the opening.

1.10 PROJECT CONDITIONS

A) **Prohibited Use:** Elevator that is turned over to the Contractor for modernization work shall not be used for any purpose during the construction period before Substantial Completion. The elevator will only be turned over to the Owner upon completion of all modernization work, including successful completion of all required inspections and tests including acceptance by Owner and Consultant.

B) Painting:

- 1) Only paint metal work provided by Contractor or impacted by Work performed under this specification by Contractor unless specifically required in other sections of this specification.
- 2) For all painting performed the requirements of Part 1.6 Painting shall be complied with as required.
- 3) Pit floor should be painted at the end of the modernization.
- 4) Machine room floor should be painted at the end of the modernization.
- 5) Top of car should be painted at the end of the modernization.

1.11 WARRANTY

A) **Warranty:** The Contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship.

- 1) The guarantee period shall extend to one (1) year from the date of completion or acceptance thereof by beneficial use; whichever is earlier, of each elevator.
- 2) The guarantee excludes ordinary wear and tear or improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the Contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

- 3) Any defective condition or workmanship not mutually agreeable as satisfactory to building Owner and Contractor shall be determined by the independent elevator Consultant as final for the replacement, repair or continued use or product or part in question.
 - 4) In addition to Contractor's above-mentioned warranties, Contractor shall, for the benefit of the Owner, obtain and assign to Owner if necessary, warranties from the manufacturers, producers and suppliers whose products are incorporated into or used in the work performed hereunder. All work and materials provided pursuant to the warranties hereunder shall be performed at no charge to the Owner.
- B) **Warranty Response Time:** Contractor shall respond to warranty calls within one hour and be on site within 2 hours.

1.12 CONTRACT PREVENTIVE MAINTENANCE

- A) **Existing Elevator Maintenance Agreement:** In the event that a bidder is currently the provider of preventive maintenance services on the elevators and escalators that are the subject of this modernization specification, this bidder acknowledges and fully agrees that their present agreement shall terminate upon submission of a bid from their company and Award of Contract to their company, or to another Elevator Contractor bidder, for the work called for in this specification for modernization.
- 1) The existing maintenance agreement for all elevator(s) and escalators will terminate on the date that the elevator modernization contractor commences on-site work.
 - 2) The elevator modernization contractor will assume maintenance on all elevator(s) and escalators that are the subject of this modernization specification once on-site modernization work commences on the first elevator or escalator. Monthly maintenance pricing will be the pricing submitted under BID ITEM 004B – INTERIM ELEVATOR & ESCALATOR MAINTENANCE.
 - 3) Elevators and escalators taken out of service for modernization will not be billed for maintenance during any time the elevator or escalator is under modernization.
 - 4) Once all elevators and escalators are turned over for substantial use of the owner after modernization, no additional maintenance charges will be due until after the maintenance period detailed in Contract Preventive Maintenance section herein subpart C), Modernization Maintenance Period as detailed below has ended.
- B) **Follow on Maintenance Contract:** All bidders shall quote monthly cost for Preventive Maintenance Agreement for all elevators and escalators that are the subject of this modernization commencing upon completion of the warranty period specified at the end of the modernization specification but a part of this document. Submit quote based upon terms and conditions of BID ITEM 002 - ELEVATOR MAINTENANCE, as detailed in the Elevator Maintenance Specification section of this solicitation.
- C) **Modernization Warranty Maintenance Period:** Maintenance service consisting of a minimum of monthly examinations, adjustments and lubrication of the elevator and

escalator equipment shall be provided by the Elevator Contractor for a period of twelve (12) months after the elevators and escalators have been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the Elevator Contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour callback service at no additional charge. This service shall not cover adjustments, repairs, or replacement of parts due to negligence, misuse, abuse, or accidents caused by persons other than the Elevator Contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

- 1) Elevator Contractor shall provide a service manual for each elevator and escalator describing monthly, quarterly, and annual maintenance tasks. Each task shall include an area for signature by a Certified Elevator Technician upon completion of task. Service manual shall also include page/s for documenting all required inspections and tests. Service manual shall contain a section to record all related maintenance, repair, and replacement information in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Part 8.6 and remain on site.
- 2) Elevator Contractor shall provide documentation and shall perform monthly testing of fire service recall operation as per ASME A17.1 Safety Code for Elevators and Escalators and ASME A17.2.
- 3) Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Manufacturer of original equipment shall produce parts.
- 4) Elevator Contractor shall have a service office and full-time service personnel within 50-mile radius of the project site.
- 5) Maintenance service shall include all required tests for inspection services as required by Jurisdictional Authority and ASME A17.1 Safety Code for Elevators and Escalators.
- 6) Elevators and escalators taken out of service for modernization will not be billed for maintenance during any time the elevator is under modernization. Maintenance charges will be equally divided by the number of elevators and number of weeks of each month for an equivalent percentage deduction of the number of elevators removed from service. Time not under maintenance charges is from the time of the elevator being removed from service until the time of certificate for public use.

2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A) Only products and components produced or provided by manufacturer(s) regularly engaged in the manufacture of elevator products, and that complies with ASME A17.1 Safety Code for Elevators and Escalators in its entirety, ASME A17.2,

Jurisdictional Statutes, Rules & requirements, all applicable sections of the applicable Building Code in its entirety, and additional requirements specified herein are acceptable. Only Bidders deemed qualified shall be notified by Request for Bid.

2.2 MATERIALS, GENERAL

A) **Colors, Patterns, and Finishes:** As selected by the Owner or Owner's Representative from manufacturer's full range of standard colors, patterns, and finishes.

1) Steel:

a) Shapes and bars: ASTM A 36.

b) Sheet: ASTM A 366, cold-rolled steel sheet, commercial quality, Class 1, matte finish, stretcher leveled.

c) Finish: Factory-applied baked or powder coated enamel.

2) Stainless Steel:

a) Shapes and bars: ASTM A 276, Type 300 (18-8).

b) Tubing: ASTM A 269, Type 300 (18-8).

2.3 EQUIPMENT: MACHINE ROOM/SPACE COMPONENTS

A) **Gearless Drive Machine:** Tower I, Elevators #5, #6, #7 & #8 shall have the drive machines replaced with new gearless drive machines.

1) **Gearless Traction Drive Machine Assembly:** Install new Motion Control Engineering (MCE), Torin PM TMGL or equal, Gearless Traction Machine, Motor, Brake and Drive.

2) **Machine:** The hoisting machine shall be a gearless traction type, consisting of permanent magnet AC motor, brake and driving sheave mounted on a rigid bedplate. A large diameter, forged shaft shall serve as a support for the motor armature and for the removable drive sheave and brake drum/disc; it shall be supported by roller bearings.

a) Steel deflector sheaves of adequate diameter and strength shall be provided as necessary and mounted in the machine room.

3) **Drive System:** The drive system shall be of the non-regenerative Variable Voltage Variable Frequency (VVVF) type.

a) The system shall be a vector controlled pulse-width modulated AC drive. The variable voltage variable frequency drive shall convert the AC power supply using a two step process to a variable voltage variable frequency power supply for use by the hoist motor.

b) The speed control shall be by means of vector control providing independent excitation and torque current. A digital absolute velocity encoder shall be provided giving feedback to the controller on armature position and motor speed.

- 4) **Motor:** The motor shall be AC, with class "F" insulation. The motor armature shall be dynamically balanced and supported by roller bearings of ample capacity. The armature and driving sheave shall be properly balanced for smooth, high-speed elevator performance.
 - 5) **Brake:** The brake and emergency brake will be a dual system shall be a spring applied electric brake; held open by an electro-magnet actuated by a digital brake controller and designed to work as an integral part of the motor controller to provide smooth positive stops. The Brake shall be designed to automatically apply in the event of interruption of power supply from any cause. Operation and control of the brake shall be all digital. The setting and lifting of the brake shall be software based and all electronic. All adjustments and setup of the brake shall be made using a PC interface. No contactors or resistors shall be used in the actuation of the brake.
 - 6) **Emergency Brake:** The emergency brake shall be a component of the dual braking system to satisfy ASME A17.1 requirements for emergency brake without the installation of a rope brake assembly.
- B) **Counterweight:** With existing counterweights, counterbalance each elevator for smooth and economical operation by cast iron or steel plate weights contained in a structural steel frame. Counterweight shall equal a complete elevator car and approximately 40 percent of the specified load. If additional weights are required, Contractor shall provide and adjust for proper balance as a part of this specification and contract.
- C) **Sheaves and Cable Guards:** Existing primary and secondary drive sheaves shall be retained and reutilized. New cable guards shall be provided as required by ASME A17.1.
- D) **Suspension Ropes:**
- 1) **Elevator # 5-8:** Suspension ropes shall be replaced with new suspension ropes as detailed below:
 - a) Replace suspension ropes with traction steel hoist ropes of size and number to ensure proper wearing qualities, consisting of at least six strands wound around a hemp core center. Suspension ropes shall be provided in conformance with rope data on elevator car crosshead data plate.
 - b) All suspension means shall be adjusted and installed with alternating shackle rod length so that shackles do not make contact and include anti-rotation devices.
 - c) Load-carrying rope must be vertically in line with shackle rod.
 - d) All required labels shall be affixed after installation.
 - e) All ropes are to be tensioned equally.
 - 2) **Lubrication of Suspension Ropes:** Suspension ropes shall be lubricated as detailed below:
 - a) Automatic rope lubricators shall be installed.

- b) Lubricators shall be provided with lubricant compatible with the strand and core lubricants and have good rope penetrating properties as determined by the rope manufacturer.
 - c) Lubricant meeting these requirements is a light viscosity Spindle oil. It should have a Saybolt Seconds Universal (SSU) viscosity of 34 to 38 seconds at 210° F. Spindle oil lubricates and will also assist in keeping the hoist ropes clean. Spindle oil is best applied with a felt pad, wick-type lubricator.
 - d) After installing rope lubricators, the level of lubrication shall be monitored to ensure correct amount of lubrication is applied. To verify correct amount of lubrication, check for a film of lubricant in the drive sheave grooves. With the machine out of service, carefully wipe the groove. If the groove is dry, field lubrication is required.
 - e) The frequency of additional rope cleaning and lubrication shall be determined by the Elevator Maintenance Contractor.
- 3) **Rope Tensioning:** All ropes are to be tensioned equally.
- a) Suspension members are considered to be equally tensioned when the smallest tension measured is within 10% of the highest tension measured. Equal tension shall be maintained between individual suspension members in each set.
 - b) Written results of the measurement of the tension of all suspension members for traction elevator shall be provided and maintained in the elevator machine room as permanent records that are considered the property of the Owner.
- E) **Load Weighing Devices:** Draka Micelect Model # LMC Wire Rope Sensor with the LM3D Control Unit or approved EMCO equal load weighing device for 2:1 roping shall be installed to provide signals to the controller for various load monitoring and dispatching operations.
- F) **Centrifugal Speed Governor:** The centrifugal speed governor shall be replaced as required to cut off power to the motor and apply the brake whenever the governor indicates the car has excessive speed. Governor as manufactured by Hollister Whitney or equal. Provide new governor tail sheave as well.
- G) **Governor Tail Sheave:** Provide a complete new governor tail sheave assembly, including new sheave, bearings, shaft, tensioning components, guards, mounting hardware, and all related components required for a complete installation. Properly align, tension, and adjust the assembly for smooth, quiet, and reliable operation.
- H) **Governor Ropes:** Provide and install new governor rope as follows:
- a) Replace governor ropes with traction steel ropes of size and number to ensure proper wearing qualities, consisting of at least six strands wound around a hemp core center.
 - b) All required labels shall be affixed after installation.

- l) **Elevator Controller:** The Elevator control system shall be Motion Control Engineering Controller Model Motion 4000, GAL Galaxy, Smartrise SRA AC, Elevator Controls Model V900 AC or preapproved equal. Provide above manufacturer's standard microprocessor operation system for each elevator as required to provide type of operation system indicated. The elevator controller shall use a microprocessor-based logic system and shall be ASME A17.1 compliant including all applicable elevator and electrical safety codes to include the following:
- 1) All power feed lines to the brake shall be opened by an electro-mechanical switch. A single ground, short circuit or solid-state control failure shall not prevent application of the brake.
 - 2) The automatic leveling zone shall not extend more than 6 inches (152.4 mm) above or below the landing level, nor shall the doors begin to open until the car is within 6 inches (152.4 mm) of the landing. In addition, the inner leveling zone shall not extend more than 3 inches (76.2 mm) above or below the landing. The car shall not move if it stops outside the inner leveling zone unless the doors are fully closed and locked.
 - 3) The system shall use an automatic two-way leveling device to control the leveling of the car to within 0.25 inches (6.35 mm) or better above or below the landing sill. Overtravel, undertravel or rope stretch must be compensated for and the car brought level to the landing sill.
 - 4) The closed loop feedback power control shall be arranged to continuously monitor the actual elevator speed signal from the velocity transducer and compare it with the intended speed signal to verify proper and safe operation of the elevator.
 - 5) During operation of the elevator with an overhauling load (empty car up or loaded car down), precision speed control shall be obtained by the regulation system used in the power control. The power control shall have the capability to maintain regulation under varying loads.
 - 6) The controller shall provide stepless acceleration and deceleration and smooth operation at all speeds. The system shall provide the required electrical operation of the elevator control system including automatic application of the brake, which shall bring the car to rest in the event of a power failure.
 - 7) The controller shall include absolute floor encoding which, upon power up, shall move the car to the closest floor to identify the position of the elevator. With absolute floor encoding it is not necessary to travel to a terminal to establish floor position.
 - 8) The controller shall use a variable voltage, variable frequency drive to control three-phase AC induction and Permanent Magnet AC motors.
 - 9) The drive shall use a three-phase, full-wave bridge rectifier and capacitor bank to provide a DC voltage bus for the solid-state inverter.
 - 10) The drive shall use power semiconductor devices and pulse width modulation with a carrier frequency of not less than 8 kHz to synthesize the three-phase, variable voltage, variable frequency output to operate the hoist motor in an essentially

synchronous mode.

- 11) The drive shall have the capability of being adjusted or programmed to achieve the required motor voltage, current and frequency to properly match the characteristics of the AC elevator hoist motor.
- 12) The drive shall not create excessive audible noise in the elevator motor.
- 13) The drive shall be a heavy-duty type, capable of delivering sufficient current to accelerate the elevator to contract speed with rated load. The drive shall provide speed regulation appropriate to the motor type.
- 14) A means shall be provided for removing regenerated power from the drive DC power supply during dynamic braking. This power shall be dissipated in a resistor bank which is an integral part of the controller. Failure of the system to remove the regenerated power shall cause drive output to be removed from the hoist motor.
- 15) A contactor shall be used to disconnect the hoist motor from the output of the drive unit each time the elevator stops. This contactor shall be monitored. The elevator shall not start again if the contactor has not returned to the de-energized position when the elevator stops.
- 16) All power feed lines to the brake shall be opened by an electro-mechanical switch. A single ground, short circuit or solid-state control failure shall not prevent application of the brake.
- 17) The controller shall provide stepless acceleration and deceleration and smooth operation at all speeds.
- 18) The controls shall be arranged to continuously monitor the performance of the elevator so that, if car speed exceeds 150 fpm during access, inspection, or leveling, the car shall shut down immediately, requiring a reset operation.
- 19) The controller shall include absolute floor encoding which, upon power up, shall move the car to the closest floor to identify the position of the elevator. With absolute floor encoding it is not necessary to travel to a terminal to establish floor position.
- 20) The controller shall have an RFI Filter to reduce EMI and RFI noise.
- 21) Failure of the brake to lift as detected by a mechanical switch (if provided) shall cause the control system to take the elevator out of service at the next stop where it shall remain out of service until the condition is corrected.
- 22) Hoistway Equipment Minimization:
 - a) The control system shall allow slowdown, emergency terminal, and hoistway access limit switches to be eliminated. These switches shall exist as virtual switches in system software.
 - b) The control system shall allow leveling magnets and/or vanes to be eliminated.
- 23) Programmable Logic:

- a) All available programming options or parameters shall be field programmable, without need for any external device or knowledge of any programming languages. Programmable options and parameters shall be stored in nonvolatile memory. At a minimum, there shall be a 32-character alphanumeric display used for programming and diagnostics. Programmable parameters and options shall include, but are not limited to, the following:
- (1) Number of Stops/Openings Served (Each Car)
 - (2) Selective Collective
 - (3) Programmable Fire Code Options/Fire Floors (Main, Alternates)
 - (4) Floor Encoding (Absolute PI)
 - (5) Digital Position Indicators/Single Wire Position Indicators
 - (6) Programmable CE Microcom floor labels
 - (7) Programmable Door Times
 - (8) Programmable Motor Limit Timer
 - (9) Programmable Car Fan and Light Timer
 - (10) Door Nudging, Automatic and Fire Operation
 - (11) Emergency Power
 - (12) Parking Floor
 - (13) Lobby Floor
 - (14) Hall or Car Gong Selection
 - (15) Standard Security
 - (16) Anti-nuisance - Light Load Weighing and Photo Eye
 - (17) Load Weighing for Light, Heavy and Overload Car
 - (18) High Speed Inspection Enable
 - (19) Door behavior selections
 - (20) Door type selection
 - (21) Fault Bypass – Inspection Operation
 - (22) Fault Bypass – Automatic Operation

24) ADA Requirements:

- a) The elevator shall comply with ICC/ANSI A117.1, the American National Standard for Accessible and Usable Buildings and Facilities and the applicable Building Code, Chapter 11.
- b) Leveling Accuracy: The controller shall have a self-leveling feature that shall automatically bring the car to floor landings within a tolerance of 0.25 inches (6.35 mm) or better under all loading conditions up to the rated load.

- c) Hall Lanterns: The controller shall have outputs to drive the visible and audible signals that are required at each hoistway entrance to indicate which elevator car is answering a call. Audible signals shall sound once for up, twice for down. (In-car lanterns located in cars, visible from the vicinity of hall call buttons, and conforming to the above requirements, shall be acceptable.
- d) Car Position Indicators: The controller shall have a position indicator output to drive the required position indicator capable of indicating the corresponding floor numbers as the car passes or stops at a floor.
- e) The controller shall have an output capable of indicating car direction and floor number.

25) Environmental Considerations:

- a) The elevator control shall be capable of operating within the following environmental conditions:
 - (1) Ambient temperature: 32°F to 104°F (0°C degrees to 40°C degrees).
 - (2) Humidity: Non-condensing up to 95%
 - (3) Altitude: Up to 7,500 feet (2286 m)

26) Building and System Configuration:

- a) The elevator controller shall be microprocessor based and designed specifically for elevator applications. Elevator and drive logic shall be implemented independently of safety functions.
- b) Elevator logic shall be implemented to facilitate tight coordination between subsystems and enhance reliability. The implementation shall utilize a real-time, multi-tasking operating system to allow the processors to simultaneously execute elevator control logic, drive control logic, operator interface logic, and communication support.
- c) The elevator controller shall have an independent safety system in order to implement safety features required by ASME A17.1 code. The safety system shall incorporate redundant, multi-processor, multi-path, solid-state, ASME compliant implementation that meets CSA and CE standards.
- d) The elevator controller shall be configured and packaged in such a way that external “jumpers” cannot be used (intentionally or unintentionally) while the elevator is running in any passenger mode of operation. Non-passenger modes of operation shall be provided, along with means to bypass safety functionality, to allow inspection testing and other setup and/or troubleshooting operations.
- e) The elevator control logic configuration shall be fully field programmable. Changes in number of floors, I/O configuration, starter setup, eligibility etc. shall not require the replacement/reprogramming of EEPROMs or other storage devices. Further, changes in the controller configuration shall be user adjustable in the field.

27)Diagnostics:

- a) The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes. It shall have permanent indicators for important elevator status conditions as an integral part of the controller.
- b) The microprocessor boards shall be equipped with on-board diagnostics for ease of troubleshooting and field programmability of specific control variables. Field changes shall be stored permanently, using nonvolatile memory. The microprocessor board shall provide the features listed below:
 - (1) On-board diagnostic switches and an alphanumeric display to provide user friendly interaction between the mechanic and the controller.
 - (2) An on-board event log shall store and display time-stamped events for diagnostic purposes. (Viewable only with monitoring software.)
 - (3) An on-board real-time clock shall display the time and date and be adjustable by means of on-board switches.
 - (4) Field programmability of specific timer values (i.e., door times, etc.) may be viewed and/or altered through on-board switches and pushbuttons.
 - (5) The elevator controller shall have extensive diagnostic capability. A built-in LCD display or equivalent shall allow access to major user functions and diagnostic features. The display shall be a multi-character, multi-line type with associated keypad to allow users to enter information. The display shall show data and menus in readily understood character format. No numeric, hexadecimal, or binary codes are acceptable.
 - (6) Dedicated indicators shall be provided in a conspicuous location on the elevator controller to indicate important system statuses, such as when the safety string is made, when the door locks are made, when the elevator is on Inspection/Access, etc. In addition, other special or error conditions detected by the main processor or safety subsystem shall be displayed.

28)Universal I/O:

- a) Field I/O boards shall be universal in that 24V to 120V AC or DC connections shall be accepted without requirement for unique circuit boards for each. I/O boards shall provide built-in current limiting protection.

29)Intended Operation of Critical Components:

- a) Failure of any single magnetically operated switch, contactor, or relay to release in the intended manner; the failure of any static control device, speed measuring circuit, or speed pattern generating circuit to operate as intended; the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contactor or relay to release in the

intended manner, failure of any static control device to operate as intended or the occurrence of a single accidental ground, shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

30) Status Indicators:

- a) Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is made, when the door locks are made, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on Inspection or Access, when the elevator is on fire service, when the elevator out of service timer has elapsed, and when the elevator has failed to successfully complete its intended movement. A means shall be provided to display other special, or error conditions detected by the microprocessor.
- b) Every field connection input or output shall have a dedicated LED such that no voltmeter or other test equipment is required to see when an input or output is active.

31) Parking Floor Function:

- a) Parking Floor: Elevator car shall be capable of parking on a designated floor after a predetermined time period. Any landing may be the parking floor. The car will go to the parking floor when it is free of call demand. A Parking Delay Timer will cause a free car to wait for a short time before parking. The timer shall be adjustable, with a value between 0.0 minutes (no delay) and 6.0 minutes.

32) Out of Service Timer

- a) An out of service timer (T. O. S.) shall be provided to take the car out of service if the car is delayed in leaving the landing while calls exist in the system.

33) Programmable Car Fan and Light Timer:

- a) Controls shall be provided that will de-energize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.

34) High or Low Speed Inspection

- a) A selection shall be provided on the controller to select high or low speed during access or inspection operation as long as contract speed does not exceed 150 feet per minute.

35) Door Operation

- a) Door protection timers shall be provided for both opening and closing directions to protect the door motor and help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time if the doors are prevented from reaching the open position. In the event that the door closing attempt fails to make up the door locks after a predetermined time, the door close protection timer shall

reopen the doors for a short time. If, after a predetermined number of attempts, the doors cannot successfully be closed, the doors shall be opened, and the car removed from service.

- b) A minimum of four different door standing open times shall be provided. A car call time value shall predominate when only a car call is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of a door reopen caused by the safety edge, photo eye, etc., a separate short door time value shall predominate. A separate door standing open time shall be available for lobby return.
- c) If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at slow speed in the closed direction. A buzzer shall sound during nudging operation.

36)Door Pre-opening

- a) When selected, this option shall start to open the doors when the car is in final leveling, 3" (76.2 mm) from the floor. If pre-opening is not selected, the doors shall remain closed until the car is at the floor, at which time the doors shall commence opening.

37)Car and Hall Call Registration

- a) Car and hall call registration and lamp acknowledgment shall be by means of a single wire per call, in addition to the ground and the power bus. Systems that register the call with one wire and light the call acknowledgment lamp with a separate wire can be accommodated.
- b) The user shall be able to register car calls via the on-board LCD display and keypad.

38)Emergency Power Operation

- a) Emergency power in the building is sized to power one car at a time. Key operated sequencing operation will be required by ASME A17.1, Part 2.27.2 with full functionality of the code requirements for sequencing operation.

39)Fire Service Operation

- a) Fire Phase I emergency recall operation, alternate level Phase I emergency recall operation and Phase II emergency in-car operation shall be provided according to latest applicable edition of ASME A17.1 and current Jurisdictional Statutes, Rules & requirements.

40)Independent Service

- a) Independent service operation shall be provided in such a way that actuation of a key switch in the car operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls. Car and hoistway doors will only close with constant pressure on a car call pushbutton or door close button. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns shall be inoperative.

41) Group Operation

- a) For group configurations, each elevator shall have its own computer and dispatching algorithm. Should one computer lose power or become inoperative, the next shall be capable of accepting and answering all hall calls. When all computers are in operation, only one shall assume the role of dispatching hall calls to both elevators.

42) Leveling

- a) The car shall be equipped with two-way leveling to automatically bring the car level at any landing, within the required range of leveling accuracy, with any load up to full load.

43) Test Switch

- a) A controller test switch shall be provided. In the test position, this switch shall allow independent operation of the elevator with the door open function deactivated for purposes of adjusting or testing the elevator. The elevator shall not respond to hall calls and shall not interfere with any other car in a duplex or group installation.

44) Inspection

- a) To enhance safety, an inspection switch, enable switch, and an up/down toggle switch shall be provided in the controller and on the car top to place the elevator on inspection operation and allow the user to move the car. Activation of the car top inspection switch shall render the controller inspection switch inoperative.

45) Uncanceled Call Bypass

- a) A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call, including stuck pushbuttons. Call demand at another floor shall cause the car, after a predetermined time, to ignore the defective call and continue to provide service in the building.

46) Anti-nuisance (Photo Eye)

- a) The controller shall cancel all remaining car calls, if a user-determined number of car calls are answered without the computer detecting a change in the photo eye input (indicating that no one is passing through the car door).

47) Load Weighers

- a) Load weighing devices shall be installed to provide signals to the controller for various load monitoring and dispatching operations.
- b) By identifying the load (light, heavy or overload), the system can activate anti-nuisance car call cancellation, loaded car hall call bypass, or overload.

48) Absolute Floor Encoding

- a) The controller shall include absolute floor encoding, which upon power up, shall move the car to the closest floor to identify the position of the elevator.

49) Landing/Positioning System Information

- a) The landing/positioning system shall use a Gray code, magnetically permanent encoded tape and two, independent sensor heads in a single housing for absolute position control under all powered conditions. The tape shall provide a unique code for every 1mm of travel. A third, independent system shall provide speed feedback directly from the hoist motor. The system shall continuously compare inputs from the three independent systems to assure accuracy and safety.

50) Service Enhancements

- a) The manufacturer shall make software updates for controller and/or group control available via Internet download, email attachment, or physical EEPROM shipment. Internet downloads and email attachment deliveries require an optional, hand-held user interface to facilitate software transfer from the user's PC to the elevator or group.

2.4 **EQUIPMENT: HOISTWAY**

A) **Platform:** Existing frame shall be retained. Underside of the platform shall be verified and maintained structurally sound and fireproof by the Contractor.

- 1) Existing platform guard shall be verified to be not less than 21 inches. If less than 21 inches, the platform guard shall be replaced with a new platform guard no less than 525 mm (21 in.) with the lower portion of the guard bent back at an angle of not less than 60 degrees nor more than 75 degrees from the horizontal.
- 2) Existing guard is required to be properly braced in accordance with ASME A17.1 which requires the guards to be securely braced and fastened in place to withstand a constant force of not less than 650 N (145 lbf) applied at right angles to and at any position on its face without deflecting more than 6 mm (0.25 in.), and without permanent deformation.

B) **Sling:** Existing steel stiles affixed to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure shall be retained.

C) **Guide Rails:** Retain and reutilize with no alterations. Existing car guide rails shall be verified as properly fastened to the building with steel brackets verified in alignment, secure to wall and brackets with surface planed smooth. Existing car guide rails shall be cleaned and aligned as necessary for the proper performance of the elevators.

D) **Roller Type Guides:**

- 1) **Elevator Car:** Existing guides on top and bottom of cars shall be replaced with new roller guide complete assemblies which shall have a minimum of three tires each, shall be mounted on top and bottom of the car and counterweight frame and be held in contact with the guide rail by adjustable devices. Car roller guides shall be ELSCO Model B, or equal. Properly adjusted for smooth operation.
- 2) **Counterweight Assembly:** Existing guides on top and bottom of counterweight assembly shall be replaced with new roller guide complete assemblies which shall have a minimum of three tires each, shall be mounted on top and bottom of the

counterweight frame and be held in contact with the guide rail by adjustable devices. Counterweight roller guides shall be ELSCO Model D, or equal. Properly adjusted for smooth operation.

- E) **Car Top Guard Railing:** A standard railing conforming to ASME A17.1 shall be provided on the outside perimeter of the car enclosure top on all sides where a 300 mm (12 in.) ball can pass between the edges of the car enclosure top and the adjacent hoistway enclosure and on sides where there is no hoistway enclosure.
- 1) If clearances require the standard railing to be located more than 100 mm (4 in.) from the edge of the outside perimeter of the car enclosure top, the top of the car enclosure outside of the railing shall be clearly marked.
 - 2) The marking shall consist of alternating 100 mm (4 in.) diagonal red and white stripes. The forces specified in ASME A17.1 shall not deflect the railing beyond the perimeter of the car top.
 - 3) There shall be a minimum of 100 mm (4 in.) horizontal clearance between the top rail and intermediate rail of the standard railing and fixed equipment passed or approached by the standard railing as the car moves throughout the hoistway to ensure protection from shearing hazards.
- F) **Buffers:** Retain existing buffers. Buffer data plates shall be maintained or replaced for compliance with ASME A17.1 Safety Code for Elevators and Escalators. All buffers shall be cleaned and painted. Verify the spring buffer(s) comply with the stroke and load requirements of the ASME A17.1 Safety Code for Elevators and Escalators. Buffer data plates shall be maintained or replaced for compliance with ASME A17.1 Safety Code for Elevators and Escalators.
- 1) Prepare all surfaces to be painted by removing dirt, grease, oil, loose paint, rust, scale, and other contaminants by cleaning, scraping, sanding, wire brushing, or grinding as required. Treat remaining corrosion and apply a compatible rust-inhibiting primer to all exposed or prepared metal surfaces. Apply not less than two finish coats of durable industrial-grade enamel or approved equivalent to provide a uniform, complete, and professional finish. Color shall be selected by the Owner or Consultant. Protect adjacent equipment and surfaces from overspray and paint damage.
- G) **Automatic Terminal Limits:** Replace Automatic slow down and final limit switches. Place electric limit switches in the hoistway near the terminal landings. Limit switches shall be designed to cut off the electric current, slow down and stop the car if it runs beyond either terminal landing.
- H) **Automatic Self-Leveling:** Provide elevator car with a self-leveling feature to automatically bring the car to the floor landings and correct for over-travel or under-travel. Self-leveling shall, within its zone, be automatic and independent of the operating device. The car shall be maintained level to less than $\frac{1}{4}$ inch with the landing irrespective of its load.
- I) **Traveling Cable:** Existing traveling cable shall be removed and replaced with new traveling cable.

- 1) Traveling cable shall terminate at numbered terminal blocks in car and machine room.
 - 2) Traveling cable shall be provided with a separate shielded circuit for communication system and hang to obtain proper size of loop. Traveling cable outer covering will be of fire resistant and meet UL standard testing.
 - 3) Traveling cable will be hung free of all contact from hoistway or car equipment and shall be provided with 10 percent spare conductors for each car. Provide additional wiring for card readers and cameras in each elevator. Type and wire count to be coordinated during submittal phase with security sub contractor.
 - 4) In addition to all code required cables to support code required devices and infrastructure, the traveling cable(s) shall include four (4) additional pair of shielded, 18/2 AWG twisted pair for Owner's use plus four (4) CAT 6 POE traveling cables with a minimum 22 AWG sizing, and two (2) coax cables.
- J) **Hoistway & Machine Room Wiring:** Provide all new wiring throughout the elevator machine room and hoistway, adequately sized and constructed for the proper operation of the equipment.
- 1) Multi-conductor type wiring for light and signal circuits shall be used in the elevator hoistway. All conductors will be copper and the minimum size of conductors, excluding those which form an integral part of control devices, shall be No. 14 for lighting circuits and No. 18 for operating, control, and signal circuits. All wiring will be installed in accordance with applicable NEC and latest applicable edition of ASME A17.1 codes. Hoistway door interlock wiring will be replaced with new SF-2 high heat resistance wiring and shall include a grounding conductor. All other new wiring will have flame retarding and moisture resistant outer covering.
 - 2) Equipment grounding shall be provided. The equipment grounding conductor shall be run with the circuit conductors and shall be a copper conductor. Ground all conductors, supports, controller enclosure, and other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be solid or stranded; insulated, covered, or bare copper, sized as required by NEC, and shall be colored green if #6 AWG or smaller, and have green tape or adhesive marking if #4 AWG or larger.
 - 3) Retain and reutilize to the maximum extent possible all ducts and conduit in machine room and hoistway. Install new ducts and conduit as required.
 - 4) Hoistway travel cable and associated wiring shall be coordinated with controller manufacture for wiring configuration requirements to match all controller wiring color coded and numbered diagrams for installation.
- K) **Pit Stop Switch:** Provide new pit stop switch as required by latest applicable edition of ASME A17.1 code.
- 1) Stop switch(es) shall be of the manually opened and closed type, have red operating buttons of the push-to-stop configuration, be conspicuously and permanently marked "STOP," and shall indicate the "STOP" and "RUN" positions.

- L) **Pit Light:** Pit lighting to be verified by Electrical Contractor as meeting minimum 10 ft-c requirement or additional pit lighting will be installed by electrical contractor as detailed in the Electrical Requirements section of this specification.
- M) **Pit & Hoistway Cleanup:** The hoistway surfaces and pit area shall be thoroughly cleaned to remove all excessive dust and debris from hoistway surfaces and pit area with proper disposal from property of all waste products from work under this specification.
- N) **Pit Ladder:** Verify that pit ladder is compliant with current edition of ASME A17.1 Safety Code for Elevators and Escalators. If compliant, retain and reutilize existing pit ladder. If pit ladder is not in compliance with current ASME A17.1 code, provide new pit ladder as required by latest applicable edition of ASME A17.1 code.
- 1) Pit ladder shall be positioned so that means to unlock the access door from inside the pit shall be located not more than 1 825 mm (72 in.) vertically above a rung, cleat, or step. The minimum distance from the top rung, cleat, or step to the top of the pit ladder or handhold shall not be less than 1 200 mm (48 in.). With the door in the closed position, in a plane not more than 1 000 mm (39 in.) horizontally from a rung, cleat, or step of the pit ladder.
- O) **Hoistway Door Equipment:**
- 1) **Hoistway Entrances:** Existing hoistway entrance assembly consisting of the elevator entrance frame, head jamb & strike jamb and door sills shall be retained and reutilized. Verify and adjust as required to maintain all door gaps less than 3/8 inch in accordance with latest applicable edition of ASME A17.1 code.
 - 2) **Hoistway Doors:** Existing hoistway shall be retained and reutilized.
 - a) Refurbish as required and replace all parts necessary to deliver doors in as new condition. Verify and adjust as required to maintain all door gaps less than 3/8 inch in accordance with latest applicable edition of ASME A17.1 code.
 - b) Hoistway doors that cannot be adjusted to maintain the door gaps to less than 3/8 inch shall be replaced with new door panels. Bidders are cautioned to verify the capability of all hoistway doors to be properly adjusted to maintain code required clearances and gaps as no request for any change order will be approved for this purpose. It is the Elevator Contractors responsibility to verify this prior to submission of a bid on this project.
 - 3) **Door Header Assembly:** Existing hoistway door header assemblies shall be retained and reutilized.
 - 4) **Hoistway Door Sill and Sill Support:** Existing hoistway door sills and supports shall be retained and reutilized.
 - a) **Sealing at Door Sills:** Hoistway Door Sills at all landings will have joint area between floor surfaces and existing sills properly sealed to prevent the intrusion of water into the joint.
 - 5) **Interlocks:** All existing interlocks shall be replaced with new interlocks.

- a) Equip each hoistway entrance with an approved type interlock (GAL or pre-approved equal) tested as required by code including SF-2 wiring and grounding. Interlock to be GAL Interlock, or pre-approved equal.
 - b) Interlock shall be designed to prevent operation of the car away from the landing until the doors are locked in the closed position as defined by code and shall prevent opening the doors at any landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing.
- 6) **Hoistway Door Components:** Existing door hangers, and door tracks shall be retained and refurbished. Door hangers are to be adjusted for proper clearances and smooth operation for the door panels. Door tracks shall be thoroughly cleaned for smooth operation.
- a) Existing Hoistway door sheaves and door gibs shall be replaced with new components for all landings specifically designed for existing tracks and sills as specified below.
 - b) Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
 - c) Replace all door gibs specifically designed for existing hoistway sills.
 - d) All missing secondary retainers installed at the bottom of each hoistway door shall be provided with direct OEM secondary retainers in conformance with applicable requirements of ASME A17.1.
 - e) Door Bumpers: Provide and install new rubber door bumpers on new side opening car doors. Bumpers shall be installed at top and bottom of door jambs.
 - f) All hoistway door closers shall be replaced with new spirator type.
 - g) All hoistway interlocks and pickup rollers shall be replaced with new to work with new clutch and interface with existing door configuration.
 - h) All hoistway door eccentrics are to be replaced with new.
 - i) All hoistway door astragals shall be replaced with new.
- 7) **Entrance Markings:** Replace all hoistway entrance markings and door jamb plates at each floor.
- a) Jamb Braille: All elevator hoistway entrances shall have raised and Braille floor designations provided on both jambs. The centerline of the characters shall be 60 in (1525 mm) above finish floor. Entrance jambs shall be marked with new 4" x 4" stainless steel plates having raised floor markings with Braille adjacent. Such characters shall be 2 in (50 mm) high and shall comply with ICC/ANSI A117.1.
 - b) Main Entry Level: A raised star shall be provided on both jambs at the main entry level.
 - c) **Car Identification:** In conformance with ASME A17.1 Part 2.29, in buildings with more than one elevator, each elevator in the building shall be assigned a unique alphabetical or numerical identification. The elevator identification

alphanumeric designation shall be a minimum of 75 mm (3 in.) in height, painted on, engraved, or securely attached to the to or on every elevator entrance at the designated level.

- P) **Hoistway Floor Numbers:** After painting has been completed, the hoistways shall have floor numbers, not less than 100 mm (4 in.) in height, painted on the hoistway side of the enclosure or hoistway doors.
- Q) **Floor Designations:** Floor designations shall be as listed in Elevator System Description, Number of Stops and Openings section of this specification.
- R) **Sight Guards:** Sight guards, if required, to reduce the opening between the leading edge of the hoistway door and the car door to maintain code required clearances, will be finished to match door panels. All existing sight guards will be inspected to ensure structural integrity, proper contour, and secure attachment to the hoistway door panels.
- S) **Escutcheon Tubes:** Hoistway doors that do not have escutcheon tubes installed shall have escutcheon holes fitted with new escutcheon tubes to match existing OEM escutcheon tubes.
- T) **Door Bumpers:** Provide and install new rubber door bumpers on all hoistway door jambs and on car door jamb. Bumpers shall be installed at top and bottom of door jambs.
- U) **Painting Inside Hoistway:** All painting on this project must be performed in conformance with Part 1.6 of this specification.
 - 1) After removal of all old hardware and components for the hoistway as detailed above all existing components shall have all rust thoroughly removed and treated as detailed below.
 - 2) Remove rust, clean, degrease and paint any existing parts or components for a like new condition, including but not limited to the door panel surfaces, door track assemblies and door frame surfaces inside the hoistway.
 - 3) After painting has been completed, the hoistways shall have floor numbers, not less than 100 mm (4 inch) in height, painted on the hoistway side of the enclosure or hoistway doors.

2.5 DOOR OPERATION

- A) **New Door Operator:** Provide each elevator with a new complete door operator assembly. Door operator to be a closed loop motor driven heavy-duty operator GAL MOVFR or pre-approved equal.
 - 1) Door operator shall be a closed loop, microprocessor-based system. The door operator will facilitate smooth operation under varying environmental influences such as, temperature, wind, friction, and component variation. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile the command will be automatically

- corrected. The Closed Loop Door Operator control system shall not require machine room door control equipment.
- 2) Door operation to comply with ASME A17.1 requirements for Restricted Opening of Hoistway or Car doors of passenger elevator.
 - 3) Door Operator shall be provided with adjustable parameters, at a minimum, for the following:
 - a) Adjustable Parameters in the closing cycle for high speed, final speed, nudging speed, acceleration, deceleration, and slow speed torque.
 - b) Adjustable parameter for stall reversal – automatic reversal if the door meets an obstruction.
 - c) Adjustable parameter for door reversal – to accomplish a quick but smooth reversal.
 - 4) Door noise not to exceed 58 dBA.
 - 5) Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
 - 6) Install door operator data plate as per ASME A17.1 Safety Code for Elevators and Escalators and provide all door closing speed times to ensure code conformance to Kinetic Energy limitations of latest applicable edition of ASME A17.1 code.
 - 7) Door operator must be mounted so completely isolated from the car top. Mounting to car stiles by brackets as configured by GAL will be accepted for isolation.
- B) Door Zone Lock:** Install new door zone lock system with door operation to comply with the latest applicable edition of ASME A17.1 requirements for restricted opening of car doors of passenger elevator.
- 1) Door zone lock system shall be GAL LWZ-2 clutch and combination zone locking system, OEM or pre-approved equal.
 - 2) When the car is outside the unlocking zone, the car doors shall be so arranged that when in the closed position they shall be restricted from opening more than 100 mm (4 inch) from inside the car.
 - 3) Car doors shall be openable from outside the car without the use of a special tool(s).
 - 4) Car doors shall be openable from within the car when the car is within the unlocking zone.
- C) New Door Protection Device:** A new door protection shall be a combination 2D & 3D detection means system. The elevator door protection system shall consist of a Light Curtain, an Approaching Object Detection Means and a Controller. The system shall be designed to detect persons and objects that are in the path of the elevator cab doors or approaching the elevator cab door entrance in accordance with ASME A17.1. The system shall also be designed to ignore stationary persons or objects that are not entering the elevator. The beams shall project across the car opening detecting the presence of a passenger or object. If door movement is obstructed or objects are

detected in the approach zone, the doors shall immediately reopen. A mechanical reopening device shall not be acceptable.

- 1) **Acceptable Manufacturers:** Acceptable pre-approved door edge protection systems are as follows:
 - a) Non-Weatherproof Systems shall be Formula Systems Vision Plus, Janus Smart 3D combined with Panachrome+ 2D (including red/green color indicators to highlight door movement, and CEDES CabSafe™ system, consisting of a Controller, a 2D light curtain and a 3D TOF sensor.
- 2) If an object has been detected in accordance with ASME A17.1 Detection of Approaching Objects or Detection of Objects in the Door Path when the doors are fully open, the hoistway door and car door shall not close or, when the doors are closing, the car door and hoistway door at the landing shall initiate a reversal without intentional delay beyond system response time, and shall fully reopen or reopen a minimum of 915 mm (36 in.). If the doors fail to fully close within 10 seconds in addition to the door close data plate value, the doors shall fully reopen.
- 3) The reopening device(s) shall be permitted to be rendered inoperative when the closing kinetic energy is reduced in conformance with ASME A17.1 requirements for detection of approaching objects within 450 mm (18 in.) of the point at which the leading edge of the leading door panel contacts the door jamb or opposing door panel. Additionally, when 20 seconds have transpired after the detection means of approaching objects first detects an object when an object is detected in the path of the doors, the 20 seconds duration shall reset. When objects are detected within 20 mm (0.75 in.) of the point at which the leading edge of the leading door panel contacts the door jamb or opposing door panel the reopening device(s) are permitted to be rendered inoperative.
- 4) When the reopening device(s) has been rendered inoperative as detailed above, a continuously sounding audible signal shall be provided with a sound level of 10 dBA minimum above ambient and shall not exceed 80 dBA. The sound level shall be measured 1 m (40 in.) above the landing floor, 500 mm (20 in.) from the door face, along the centerline of the entrance opening, with the doors open. The signal shall sound during door closing until the doors are fully closed. In no case shall the sound level exceed 85 dBA inside the cab and within 300 mm (12 in.) from the centerline of the entrance and 1 m (40 in.) above the floor.
- 5) Detection of Approaching Objects: The reopening device(s) shall be designed to detect a cylindrical target(s) approaching the entrance opening of the landing-side doors as required ASME A17.1. The approaching object detection means shall be effective until the leading edge of the doors is within 450 mm (18 in.) of the fully closed position and shall be permitted to be effective up to the fully closed position.
- 6) Detection of Objects in the Door Path. The reopening device(s) shall be designed to detect rectangular prisms positioned as required by ASME A17.1. The device(s) shall be designed to detect prisms positioned anywhere within the opening width of the entrance on the floor and oriented with the 80 mm (3.15 in.) dimension parallel to the floor, the 150 mm (6 in.) dimension perpendicular to the door, and the 50 mm

(2 in.) dimension perpendicular to the floor either wholly located between the vertical planes established by the landing-side face of the hoistway door and the car-side face of the car door or centered between the two planes if the distance between the two planes is less than 150 mm (6 in.).

- 7) **Self-Monitoring of Detection Means.** The system shall be designed to be self-monitoring. After the door has reached its fully opened position and before door closing is initiated, the detection means shall be self-checked to verify the detection means is operational. If the self-check outcome is unsuccessful, power closing of the door(s) shall be at reduced kinetic energy conforming to ASME A17.1.
- D) **Nudging Operation:** The doors shall remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door movement is obstructed for a field programmable time, a buzzer will sound, and the doors will close at reduced speed. If the infra-red door protection system detects a person or object while closing, the doors will stop and resume closing after the obstruction has been removed.

2.6 **CAR COMPONENTS**

- A) **Cab Interior:** Existing elevator cab shell shall be retained. The interior cab wall panels and drop ceiling shall be replaced. Elevator contractor to include a \$30,000.00 cab allowance per elevator. Allowance is for material only. Labor shall be included in Contractor's estimate. Owner will install finished flooring.
 - 1) All refurbishment identified in this section is the responsibility of the Elevator Contractor to coordinate and complete.
 - 2) Elevator modernization contractor shall coordinate cab interior renovations. If interior renovations are going to be subcontracted then elevator contractor needs to identify subcontractor for owner approval.
 - 3) Elevator modernization contractor is responsible to provide schedule that allows for coordination of the cab interior refurbishment. This schedule will have all cab interior work performed prior to elevator modernization contractor making final acceptance inspection and testing of this elevator.
 - 4) Elevator modernization contractor is responsible for all required door adjustments required for cab modernization work; no additional charges will be allowed for any door adjustments.
- B) **Car Entrances:**
 - 1) **Cab Doors:** Replace & hang new cab door panels.
 - a) Provide new fire rated cab door panels mounted on existing car door hangers with new rubber door astragals.
 - b) New car door close contact switch shall be installed.
 - c) Finish for car door shall be ASTM A 167, Type 300 Stainless Steel Number 4 finish. Door shall be manufactured to include all mounting hardware

requirements of the GAL door operating equipment. Door shall be manufactured by Gunderlin LTD or pre-approved equal by Owner and consultant.

- d) Refurbish associated components as detailed below and replace all parts necessary to deliver doors in as new condition. Verify and adjust as required to maintain all door gaps in accordance with latest applicable edition of ASME A17.1 code.
- 2) **Car Door Hangers, Sheaves, and Tracks:** Existing door hangers, sheaves, tracks, door gibs including all required retainers shall be replaced with new components as detailed below:
- a) Provide sheave type two-point galvanized suspension hangers and galvanized track for car sliding door, product GAL, or preapproved equal.
 - b) New components for all components shall be GAL or preapproved equal.
 - c) Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
 - d) Hangers: Provide an adjustable slide to accommodate the up thrust of the doors.
 - e) Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.
 - f) Car Door Guides: New car door slide guides shall be installed with tabs installed per manufacture's design. Bottom slide guides as manufactured by GAL replacement or preapproved equal. Car door guides shall be matched to existing car door sill.
- C) **Cab Shell Enclosure:** The existing cab shell enclosure shall be retained and reutilized.
- D) **Car Steady Plates:** Existing car steady plates shall be rebuilt and adjusted to like new condition. All rubber spacers that are deteriorated will be replaced with new rubber components to hold the car steady and plumb.
- E) **Car Top Exit Switch:** Car top escape panels shall have switch assemblies including all wiring to install proper safety circuit as required by ASME A17.1. The top emergency exit cover shall open outward and shall be hinged or securely attached with a chain when in both the open and closed positions. If a chain is used, it shall be not more than 300 mm (12 inch) in length. The exit cover shall only open from the top of the car, where it shall open without the use of special tools.
- F) **Car Top Lighting:** The elevator shall be provided with lighting and a duplex receptacle fixture on the car top. The lighting shall consist of two (2) separate light sources. The lighting sources shall be permanently connected, fixed, or portable, or a combination thereof, to provide an illumination level of not less than 100 lx (10 fc) measured at the point of any elevator part or equipment, where maintenance or inspection is to be performed from the car top. All lighting shall be equipped with guards. The light switch shall be accessible from the landing when accessing the car top.

G) Car Top Inspection Station: Provide a new car top inspection station with an "emergency stop" switch and constant pressure "up-down" direction buttons to make the normal operating devices inoperative and give the inspector complete control of the elevator. Car top Inspection unit manufactured by Vator Accessories, Inc., (630) 876-8370, Nylube Products Company, LLC. (248) 852-6500, Monitor Controls, or equal. Mount the car top inspection station as required by ASME A17.1 Safety Code for Elevators and Escalators.

- 1) When the elevator is on inspection operation or when the hoistway access switch has been enabled, a continuous audible signal, audible at the location where the operation is activated shall sound when the "FIRE RECALL" switch is in the "ON" position or when the fire alarm initiating device is activated to alert the operator of an emergency.
- 2) Car Top Inspection Station must be approved by Owner and Consultant prior to Contractor ordering fixtures.

H) Cab Fan:

- 1) Provide and install new 2 speed quiet run fan manufactured by Nylube securely mounted in ceiling. Fan shall be protected from access through cab ceiling.
- 2) Ventilation fans in elevators that do not have their own air-conditioning system shall not consume more than 0.33 watts/cfm at the maximum speed of the fan.
- 3) Controls shall be provided that will de-energize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.

I) Car Operating Panel: Provide new car operating stations (Main & Auxiliary) as follows:

- 1) **Car Operating Station:** The car control station shall contain the devices required for specific operation mounted directly to an aluminum backing plate with a Stainless Steel # 4 brush finish applied faceplate. The panel shall consist of a series of modules, key switches or approved buttons for optimum viewing and accessibility. All engraving shall be on flush mounted hairline faceplates securely mounted to the aluminum backing plate.
 - a) The lowest section shall contain the "DOOR OPEN," "DOOR CLOSE," and car emergency signaling devices.
 - b) Intermediate section shall contain floor buttons, which illuminate when a call is registered and remain illuminated until the call is answered. Raised floor indications and handicap symbols shall be located immediately adjacent to the floor buttons.
 - c) Layout of floor buttons will have the floor buttons centered with two columns of floor buttons stacked vertically.
 - d) Provide a lockable service compartment with recessed flush door. Door material and finish to match car station face plate or car return panel. Inside surface of door shall contain an integral flush window for displaying the elevator operating permit. Service cabinet shall contain all required and accessory key switches

- including independent service, fan switch, key stop switch, hoistway access and an emergency light test button in service cabinet.
- e) The top section shall contain fire service features inside a locked cabinet in accordance with currently adopted edition of ASME A17.1, including operating instructions.
 - f) Plug connection for Fire Department Communications System shall be provided in the car operating panel which shall provide communications for Fire Department personnel from the Lobby Panel into each elevator car.
 - g) Swing of panel shall match car door configuration. Car operating panels shall swing open with the hinged side closest to the sidewall. Panel shall swing to open only to the open car side.
 - h) All car and hall fixtures by Innovation Industries, or equal. All pushbuttons to be tamper resistant, Innovation Industries PB 39, Flush Button with Illuminated Halo and Center Jewel or pre-approved equal. Halo to be Blue LED light source.
 - i) Car operating panels by Innovation Industries "Prestige Series" Stainless Steel # 4 brushed finish, or pre-approved equal. No adhesive type applied plates will be accepted at either car or hall stations. All fixtures shall have a Blue LED lighting source.
 - j) Car stations shall be pre-wired by the car station manufacture with terminal strip connection to control wiring.
 - k) All hall and car push button lamps shall include long life LED type lamps.
- 2) **Position Indicators:** Each car operating panel to include a 2-inch electronic segmented digital position indicator mounted in the control panel for optimum viewing. As the car travels, its position in the hoistway shall be indicated by the illumination of the alpha/numeric character corresponding to the landing which the elevator is stopped or passing. On one side of digital numeric indicator in the car panel will also be a matching indicator with direction of travel. Position Indicator shall have a Blue LED lighting source.
- 3) **Emergency Light:** Emergency lighting shall be incorporated into the car operating panel. Emergency light shall illuminate automatically upon loss of the building's normal power supply as required by latest edition of ASME A17.1.
- 4) **Emergency In-Car Signaling Devices:** Provide a Kings III, RATH® Two-Way Elevator Communication System, or approved equal, emergency communications device mounted in the car station panel. Emergency communications device shall comply with Americans with Disabilities Act (ADA) and with the currently adopted edition of ASME A17.1 Safety Code for Elevators and Escalators requirements. Emergency In-Car Signaling Devices for two-way communications shall, at a minimum, conform to the following:
- a) A push button to actuate the communications means shall be provided in or adjacent to a car operating panel. The push button shall be visible and permanently identified with the phone symbol in conformance with ASME A17.1.

The identification shall be on or adjacent to the phone push button. The communications means shall be initiated when the push button is actuated.

- b) On the same panel as the phone push button, a message shall be displayed that is activated by authorized personnel to acknowledge that communications are established. The message shall be permitted to be extinguished where necessary to display a new message or when the communications are terminated.
- c) On the same panel as the phone push button, messages shall be displayed that permit authorized personnel to communicate with and obtain responses from a trapped passenger(s), including a passenger(s) who cannot verbally communicate or hear.
- d) On the same panel as the phone push button, a message shall be displayed that is activated by the authorized personnel to indicate when help is on the way. The message shall continue to be displayed until a new message is displayed or the communications are terminated.
- e) The communications means shall provide on demand to authorized personnel information that identifies the building location and elevator number.
- f) The communications, once established, shall be disconnected only when authorized personnel terminate the call or a timed termination occurs. A timed termination by the communications means in the elevator, with the ability to extend the call by authorized personnel, is permitted if voice notification is sent by the communications means to authorized personnel a minimum of 3 min after communication has been established. Upon notification, authorized personnel shall have the ability to extend the call; automatic disconnection shall be permitted if the means to extend are not enacted within 20 s of the voice notification.
- g) The communications means shall not use a handset in the car.
- h) The communications shall not be transmitted to an automated answering system. The call shall be answered by authorized personnel.
- i) Operating instructions shall be incorporated with or adjacent to the phone push button.
- j) Controlled Access Operation – Card Reader: The car operating panel shall also incorporate space and lens for a card reader to be mounted behind the COP faceplate. The card reader shall be located at ADA/accessibility height requirements. Style of car reader installation shall be confirmed during the fixture review and approval process. Provide a card reader override switch behind the locked service panel. Elevator contractor to provide assistance on installation as well as provide wiring to the card reader and coordinate installation with security contractor.
- k) A security camera shall be provided and installed by others in the rear corner of the elevator cab. Elevator contractor to provide assistance on installation as

well as provide wiring to the ceiling area and coordinate installation with security contractor.

5) Special Accessories in Car Station Panel:

- a) Located in Service Compartment Subpanel w/ Clear Certificate Window, sized 6" x 9":
 - (1) Light key switch.
 - (2) Fan 2 speed key switch.
 - (3) Independent Operation Key Switch.
 - (4) Access Key Switch.
 - (5) Emergency Light Test Button.
 - (6) Keyed stop switch.
- b) No applied plates.
- c) Braille and engraving to include:
 - (1) Engraved Capacity and Identification Number of elevator.
 - (2) No Smoking sign shall be engraved on flush mounted hairline faceplate.
- d) All push buttons and key switches as required for fire service operation.

6) Fire Service Features: Fire Fighters Service Key switch as required by the IBC including operations required by the currently adopted edition of ASME A17.1 Safety Code for Elevators and Escalators shall be engraved on a flush mounted hairline faceplate.

- a) The "FIRE OPERATION" switch, the "CALL CANCEL" button, the "STOP" switch, the door open button(s), the door close button(s), the additional visual signal, and the operating instructions shall be grouped together at the top of the main car operating panel behind a locked cover.
- b) The firefighters' operation panel cover shall be openable by the same key that operates the "FIRE OPERATION" switch. The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation and at the recall level. When the key is in the "FIRE OPERATION" switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.
- c) All buttons and switches shall be readily accessible, located not more than (72 inch) above the floor.
- d) The front of the cover shall contain the words "FIREFIGHTERS' OPERATION" in red letters at least 0.4 in. high.
- e) Firemans' Service Key: The fire key shall be of a tubular, 7 pin, style 137 construction and shall have a bitting code of 6143521 starting at the tab sequenced clockwise as viewed from the barrel end of the key. The key shall be coded "FEO-K1".

- 7) All required Braille for buttons and other switches as required by the FBC & ASME A17.1 shall be securely fastened to the aluminum backing plate or directly engraved.
 - 8) Integral Emergency In-Car Signaling Device (telephone), including engraving directly into the car-operating panel all ADA required telephone instructions.
 - 9) There shall be NO ADHESIVE APPLIED PLATES, SIGNS or PANELS affixed to the car-operating panel or other locations inside or outside the elevator cab.
 - 10) Phone Response Location shall be designated by Owner.
- J) **Car Operating Station & Fixture Approval:** Car Operating Station & fixtures must be approved by Owner and consultant prior to contractor ordering fixtures.
- K) **Car Front Cladding:** Car front shall be re-clad as detailed below:
- 1) The existing swing return panels shall be rigidly secured to accept the installation of the new Car Operating Panel (COP).
 - 2) Car Return Panel: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing car box openings in return panel and wrap around car return panel.
 - 3) Car Door Header & Transom Assembly: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing car box openings in car door head jamb & Transom assembly.
 - 4) Car Strike Jamb: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing openings in car door strike jamb assembly.
- L) **Cab Interior Painting:** Elevator Modernization Contractor shall be responsible for the following rust remediation prior to new cab interior finishes being installed:
- 1) The exposed metal surfaces on the inside of the cab interior shall be mechanically cleaned, primed and painted in conformance with the requirements detailed in the Painting subsection of the Project Conditions section of this specification. This will include all metal surfaces but not limited to cove base and ceiling areas of the cab.
- M) **Cab Wall Panels:** To be included in cab allowance.
- N) **Cab Enclosure Vents:** Cab enclosure vents shall be repaired to provide proper cab enclosure ventilation.
- 1) Base of each wall will be provided with a 6" cove base of #4 satin finish stainless steel with punched ventilation to align with the existing cab shell vents.
 - 2) Cove base shall include 18 gauge brushed #4 finish stainless steel base with ventilation slots aligning with existing ventilation openings.
 - 3) Cab enclosure vents shall be repaired as necessary to provide proper cab enclosure ventilation. Openings shall be appropriately sized and be guarded to prevent straight through passage in accordance to the applicable requirements of the current ASME A17.1 safety code.
- O) **Floor Finish:** New flooring will be completed by owner.

P) **LED Car Lighting & Ceiling:** To be included in cab allowance.

Q) **Handrails:** To be included in cab allowance and meet minimum requirements below:

- 1) Support rails must be continuous and a minimum length of 42 inches (1067 mm) overall.
- 2) The inside surface of support rails must be 1½ inches (38 mm) clear of the car wall.
- 3) The distance from the top of the support rail to the finished car floor must be at least 31 inches (787 mm) and not more than 33 inches (838 mm).
- 4) Padded or tufted material or decorative materials such as wallpaper, vinyl, cloth or the like may not be used on support rails.

R) **Cab Interior Pads:** Furnish set of pads and hooks for interior of each elevator.

- 1) One (1) set of pads and hooks per bank shall be provided for the interior. If any elevator in the bank is unique in design that this should be identified an additional (1) set of pads and hooks provided for each unique design.
- 2) Type must be pre-approved by Owner and elevator consultant as manufactured by W.E. Palmer, or equal. Color to be selected from standard color selection provided to Owner by Elevator Contractor.
- 3) Elevator pads shall be turned over to the Building Owner and stored in the machine room of the elevator.

S) All openings left from removal of current car devices, which are not re-clad, shall be covered with stainless steel: ASTM A 167, Type 300 stainless steel covers, No. 4 satin finish. All edges shall be finished in a manner that presents no sharp edges or corners.

2.7 FIRE COMMAND CENTER ELEVATOR PANEL

A) High-rise buildings having floors with human occupancy 75 feet or more above the lowest level for fire emergency vehicle access shall meet the requirements of the applicable Building Code Chapter 9, Fire Protection Systems, which includes a Fire Command Center as detailed in Section 911. The remote Elevator Panel of the Fire Command Center will be installed at a location verified by the Fire Marshal.

- 1) The new Fire Command Center Elevator Panel shall be located in the area around the main desk area on the “L” floor. Field verify existing location. Exact location will be determined as needed. This location may change after review of Fire Alarm System requirements by the Fire Marshal having jurisdiction.

B) The panel will include a Stainless Steel # 4 finished face plate for surface mounting to wall as manufactured by Monitor Controls, Innovation Industries or pre-approved equal. Additional Features and/or Operations for the Fire Command Center Elevator Panel shall include the following:

- 1) The means shall enable emergency personnel within the building to establish two-way communications to each car individually. Two-way communication shall be established without any intentional delay and shall not require intervention by a

person within the car. The means shall override communications to outside of the building and comply with the following requirements:

- a) Two-way communications, once established, shall be disconnected only when emergency personnel outside the car terminates the call.
 - b) Once the two-way communication has been established, the visual indication within the car shall illuminate. The visual indication shall be extinguished when the two-way communication is terminated.
 - c) Once the communications have been established, a message shall be displayed on the same panel as the phone push button, that is activated by emergency personnel to indicate that help is on-site. The message shall be permitted to be extinguished where necessary to display a new message or when the communications are terminated.
 - d) Operating instructions shall be incorporated with or adjacent to the two-way communication outside the car.
 - e) On the same panel as the phone push button, messages shall be displayed that permit emergency personnel to communicate with and obtain responses from a trapped passenger, including a passenger who cannot verbally communicate or hear.
 - f) A means to display video to observe passengers at any location on the car floor, to emergency personnel for entrapment assessment, shall be provided.
 - g) Cutting and patching as may be required at the location of the lobby communication device is by Elevator Contractor.
 - h) Conduit, as required, from the machine room or from inside hoistway junction box(es) at the designated floor to elevator lobby phone panel at designated location as required.
 - i) Elevator contractor is responsible for all elevator related wiring to the lobby phone panel and/or elevator panel of the fire command center.
- 2) Digital Position Indicator with 1-inch display numerals including direction of travel indicator for each elevator.
 - 3) Elevator emergency or standby power selector switch(es), and emergency generator status indicator for elevators including lighted jewel indicating power status with proper labeling in conformance with ASME A17.1 & applicable Building Code.
 - a) A selector switch marked "ELEVATOR EMERGENCY POWER" in red lettering a minimum of 5 mm (0.25 in.) in height that is key-operated shall be provided to permit the selection of the elevator(s) in each bank of elevators to operate on the emergency or standby power system. The key shall be Group 3 Emergency Operation Key as required. The selector switch positions shall be marked to correspond with the elevator identification number and a position marked "AUTO."

- b) An illuminated signal marked “ELEVATOR EMERGENCY POWER” shall be provided in the elevator lobby at the designated level to indicate that the normal power supply has failed, and the emergency or standby power is in effect for one or more of the cars in this group operation.
- c) The transfer between the normal and the emergency or standby power system shall be automatic.
- 4) Fire Service Phase I Key Switch and Fire Service indicator lighted jewel matching main floor hall operating panel. Reset position shall not be incorporated in switch.
- 5) **Fire Department Communications System:** Plug connection for Fire Department Communications System shall be provided in Fire Command Center Elevator Panel which shall provide communications for Fire Department personnel from the Fire Command Center Elevator Panel into each elevator car.
- 6) Engraved labeling for each elevator number and function. No applied plates or labels.
- 7) Car call key switch to lobby/egress floor of each elevator.
- 8) Lobby Park key switch for each elevator.
- C) **Fire Command Center Approval:** Fire Command Center Elevator Panel must be approved by Owner and Consultant prior to Contractor ordering fixtures.

2.8 HALL FIXTURES

- A) **Hall Stations – General:** New Hall Stations shall be flush mounted. Buttons shall illuminate to indicate call has been registered at that floor for the indicated direction. Faceplates shall be # 4 Brushed Stainless-Steel finish. Provide two sets of risers per elevator group.
 - 1) Hall stations shall be of one-piece construction, flush mounted.
 - 2) Designated level hall station (Floor designation “1”) shall be of two (2) piece construction and flush mounted.
 - a) Lower section to have hall station push button(s), in case of fire use stair signs and Phase 1 Firefighter’s Service key switch, with instructions.
 - b) Upper section to have devices for emergency power operation and emergency communications monitoring.
 - 3) All other hall stations shall be of one (1) piece construction and contain all required switches and signage as required by this specification.
 - 4) All switches, fixtures and pushbuttons shall be by Monitor Controls, Innovation Industries or pre-approved equal.
 - 5) All push buttons to be tamper resistant Innovation Industries PB 39, Flush Button with Illuminated Halo and Center Jewel or pre-approved equal.

- 6) All Hall Stations shall be # 4 Brushed Stainless Steel.
- 7) In case of fire use stair signs shall be engraved into the hall station panel with exact signage as per ASME A17.1 Code. No adhesive type applied signage plates will be accepted at this hall station.
- 8) All hall and car push button assemblies shall include long life LED type lamps.
- 9) Each terminal station shall contain one illuminating push button and other applicable accessories, including hoistway access switches as required by this specification.
- 10) Each intermediate station shall consist of two illuminating push buttons, one for the up direction and one for the down position.
- 11) Phase 1 Firefighter's Service key switch, with instructions, shall be incorporated into the hall station at the designated level. Fire Service instructions as per ASME A17.1 Safety Code for Elevators and Escalators shall be engraved in the main floor hall station panel.
- 12) Local Telephone Line Status Monitoring: The telephone system for the elevators shall be compliant with the requirements of the ASME A17.1, Requirement 2.27 and will include a verification means as required by the ASME A17.1 code. If the verification means determines that the telephone line or equivalent means is not functional, an audible and illuminated visual signal shall be activated. A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a "FIRE RECALL" switch.
 - a) A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a "FIRE RECALL" switch.
 - b) Verification of the telephone line operability shall be automatically performed at least on a daily basis and shall not require activation of the two-way communications link(s).
 - c) The visual signal shall be located at the designated landing in the vicinity of the "FIRE RECALL" switch, be visible to elevator user(s), be labeled "ELEVATOR COMMUNICATIONS FAILURE" in red letters a minimum of 5 mm (0.25 inch) high, illuminate intermittently and continue to illuminate intermittently until the telephone line or equivalent means is functional.
 - d) The audible signal shall be 10 dBA minimum above ambient but shall not exceed 80 dBA measured at the designated landing "FIRE RECALL" switch, sound at least once every 30 s with a minimum duration of half a second and continue to sound until silenced by authorized personnel or the telephone line or equivalent means is functional.
 - e) The means to silence the audible signal shall be accessible only to authorized personnel. The signal when silenced shall remain silent unless activated by the next verification.
- 13) **Hoistway Access Switches:** New Hoistway Access Switches shall be provided and installed adjacent to the hoistway landing with which it is associated.

- a) The switch shall be installed a minimum of 1,200 mm (48 in.) and a maximum of 1,825 mm (72 in.) above the floor measured to the centerline of the switch, adjacent to or part of the hoistway entrance at the landing with which it is identified and shall be located on the wall outside of the hoistway within 300 mm (12 in.) of the entrance frame or on the hoistway entrance frame or jamb.
 - b) The switch shall be labeled "ACCESS" and shall be a three-position switch, labeled "UP," "OFF," and "DOWN" (in that order), with the "OFF" position as the center position. The switch shall be rotated clockwise to go from the "UP" to "OFF" to "DOWN" positions.
 - c) The switch shall be of the continuous pressure spring-return type and shall be operated by a cylinder-type lock having not less than a five-pin or five disk combination, with the key removable only when the switch is in the "OFF" position.
 - d) The key shall be Group 1 Security.
- B) Controlled Access Operation - Card Reader:** Car calls from car operating panel may be entered only in conjunction with the access control system which provides the elevator controller with signals to enable/disable car calls. A card reader, provided by others, shall be installed in the car station to provide authorized persons with ability to enter car calls for individual openings as determined by the access control system.
- 1) The contractor shall mount the card reader behind a glass cut out (as provided by other Sections) at the proper ADA/accessibility height on the face of the car control station panel. Wiring from the card reader shall be brought from the elevator car, through the traveling cable, and to the elevator machine room. Reader shall have a controller in the elevator machine room which shall be hard wired into the elevator control system under this section to individually enable/disable each car call button. Coordinate with other Sections and provide wiring between readers and controllers as directed by Access Control Installer.
- C) Elevator Monitoring System:** The contractor shall provide a microprocessor based elevator monitoring system in the Security Desk at the Plaza level. The system shall be capable of monitoring elevator status and security features. The functions shall include the capability to change security car and corridor call lockouts per elevator & floor.
- 1) Communication between the elevator control equipment and the elevator monitoring system in the Security Desk at the Plaza level shall be accomplished through an Ethernet connection in each machine/control room. The contractor shall be responsible for connection from the elevator controller to the Ethernet port in each elevator machine/control room.
- D) Hall Position Indicators:** Provide new hall position indicator as follows:
- 1) New 2-inch electronic segmented digital position indicators shall be provided and the position indicator shall be provided at the Main Lobby Floor landing above the door with a faceplate mounted at a 20-degree angle for viewing. Digital characters

to correspond to the floors as listed in the Elevator System Description, Part 1.7 of this specification. The digital display shall be Blue LED.

- 2) As the car travels, its position in the hoistway shall be indicated by the illumination of the alpha/numeric character corresponding to the landing which the elevator is stopped or passing.
- 3) Position indicator shall have new tamper resistant, arrows thru engraved, clear epoxy filled, car-directional lanterns located on both sides of the position indicator with one for up direction travel and a second for the down direction travel. The up direction indicator will illuminate in green and the down indicator will illuminate in red color. The lantern bars, when illuminated, will indicate the intended direction of travel. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop. The lantern shall remain illuminated until the door(s) begin to close.

E) **Hall Lanterns:** New tamper resistant, arrows thru engraved, clear epoxy filled, hall lanterns shall be installed adjacent to hoistway openings. New hall lanterns shall replace the existing hall lanterns.

- 1) The lantern bars, when illuminated, will indicate the intended direction of travel. The lanterns will illuminate, and a signal will sound when the car arrives at a floor where it will stop. The lanterns shall remain illuminated until the door(s) begin to close.

F) **Lobby Phone:** The elevator travel exceeds sixty feet (60 ft) requiring a two-way voice communication means within the building to be provided.

- 1) The means shall enable emergency personnel within the building to establish two-way voice communications to each car individually. Two-way voice communication shall be established without any intentional delay and shall not require intervention by a person within the car. The means shall override communications to outside of the building and comply with the following requirements:
 - a) Two-way voice communications, once established, shall be disconnected only when emergency personnel outside the car terminates the call.
 - b) Once the two-way voice communication has been established, the visual indication within the car shall illuminate. The visual indication shall be extinguished when the two-way communication is terminated.
 - c) Operating instructions shall be incorporated with or adjacent to the two-way voice communication outside the car.
 - d) Cutting and patching as may be required at the location of the lobby communication device is by Elevator Contractor.
 - e) Conduit, as required, from the machine room or from inside hoistway junction box(es) at the designated floor to elevator lobby phone panel at designated location as required.
 - f) Elevator contractor is responsible for all elevator related wiring to the lobby phone panel and/or elevator panel of the fire command center.

- G) **Signal Fixture Illumination and Design:** All illuminated signal devices including, but not limited to, car operating panel pushbuttons, hall call pushbuttons, hall lanterns, position indicators, direction indicators, and related visual signaling devices shall utilize **blue illumination**. All illumination shall be consistent in color, intensity, and appearance throughout the elevator group. New fixtures should match as closely as possible to the Tower I Lowrise fixtures that are being retained.
- H) **Hall Fixtures Approval:** Hall fixtures listed above must be approved prior to ordering fixtures by Contractor.

BID ITEM 001B SPECIFICATION FOR MODERNIZATION OF HIGH RISE ELEVATORS

**Williams Center Tower II
2 West 2nd Street, Tulsa, OK 74103**

FOUR (4) HIGH RISE TRACTION PASSENGER ELEVATORS (Elevators 6-9)

1 GENERAL

1.1 SUMMARY

- A) This section specifies required work to complete the modernization of Four (4) Traction Elevators.
- B) Elevator work includes:
 - 1) Commercial, standard electric traction elevators.
 - 2) Elevator car and hoistway signal equipment.
 - 3) Operation and control systems.
 - 4) Patching, painting etc. as indicated.
 - 5) Accessibility provisions for physically disabled persons.
- C) Engineering, equipment, labor, machines, control systems, devices and accessories as required for safely operating the specified elevators at rated speed with rated capacities.
- D) Delivery, staging, and hoisting of new equipment. Hoisting, dismantling, removal and disposal of existing equipment. Repair, cleaning, and painting of reusable equipment.
- E) Materials and accessories as required for completing the elevator modernization.
- F) Hoistway, pit and machine room barricades for safety as required.
- G) Required hoisting, hoisting permits and traffic coordination and/or permits with local jurisdictions and the State of Oklahoma as required.
- H) Required permits and coordination and/or permits with local jurisdictions, Bureau of Elevator Safety and the State of Oklahoma as required.

1.2 DEFINITIONS

- A) The following definitions shall be used throughout all general conditions, specifications and contract documents except where superseded in those documents.
- 1) "Owner": Cherokee Nation Businesses.
 - 2) "Consultant": ATIS.
 - 3) "Contractor": The Elevator Contractor unless stated differently.
 - 4) "Contract": The Contract for the elevator modernization and other related work shall be deemed to be the Elevator Specifications provided to Contractor prior to execution.
 - 5) "Contract Documents": The Contract for the elevator modernization and other related work to the elevator of the building, the Elevator Specifications (the "Specifications") and any Addendum shall comprise the Contract Documents. Additional Contract Documents may be created and incorporated upon written agreement by Owner and Contractor. Notwithstanding, any documents not furnished hereunder shall not be binding upon Contractor until such time Contractor is furnished with same and specifically accepts in writing.
 - 6) "Contract Sum": The amount set forth in the Contract as priced by the "Contractor" for Bid Items, for Contractor's performance of the Work.
 - 7) "Direct Labor Costs": Wages or salaries, which can be properly identified with and charged to one specific product or service. Direct labor cost shall include all direct labor employee benefit costs and burdens. Employee benefits shall include the employer's cost contributions for health and welfare, injury compensation, Federal and State Unemployment and Social Security taxes. It shall also include a burden factor to recover the cost of paid absence due to Federal Holidays, vacation, and election days required by the Department of Labor Wage Determinations. Other benefit costs including retirement contributions and paid sick leave may be included where identifiable and payable by the Contractor.
 - 8) "Direct Labor Hours": Those hours actually expended in the accomplishment of direct labor costed work.
 - 9) "Direct Materials Cost": The actual vendor invoice charges for materials used for performance of work under this contract. Direct material costs shall include transportation charges when such charges are included on the invoice by the vendor, as well as any discounts allowed for prompt payment and discounts or rebates for core value of salvage value that accrue to the Contractor. When questions arise concerning the cost of materials, material costs will be based on the lowest of quotes provided by the Contractor from at least three different commercial vendors
 - 10) "Code": All applicable laws and codes, including but not limited to the electrical, fire, building, and Safety Codes for Elevators and Escalators codes designated by

any authority having jurisdiction as detailed in the codes and standards reference section of this specification.

- 11)“Jurisdictional Authority”: The authority having jurisdiction, the organization, office, or individual responsible for enforcement of the associated Elevator Code(s). Where compliance with these Codes has been mandated by legislation or regulation, the “Jurisdictional Authority” is the regulatory authority.
- 12)“Component” or “Component Part”: Any part of any item or system that is detachable or removable from the main body or main assembly of the item or system.
- 13)Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that reference is made to this specification and the drawings accompanying this specification unless stated otherwise.
- 14)Where “as directed”, “as required”, “as permitted”, “approval”, “acceptance”, or other words of similar import are used, it shall be understood that direction, requirement, permission, approval, or acceptance of the Owner is intended unless stated otherwise.
- 15)“Work”: The services to be completed by Contractor are as specified in the Contract Documents. This Work includes all Services necessary; material and labor required to provide and install and/or repair equipment as specified under this specification. Schedules and completion dates shall be agreed to in writing by both parties before becoming effective.
- 16)“Provide”: Provide all materials and labor required to furnish and install and or repair.
- 17) “Services”: Services shall include, but shall not necessarily be limited to, all labor, transportation, supplies, materials, parts, tools, scaffolding, machinery, hoists, employee safety equipment, equipment, lubricants; supervision, applicable taxes, and all other work and materials expressly required under this Contract or reasonably inferred whether or not expressly stated herein necessary to maintain all equipment covered under this specification.
- 18)“Fire Alarm Contractor”: Contractor approved to work on the Fire Alarm System installed in Williams Center Tower II, 2 West 2nd St, Tulsa, OK 74103.
- 19)“Subcontractor”: A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work and Services at the site. All Subcontractors must be licensed and insured and must provide proof of adequate insurance in the amounts specified herein prior to the commencement of any portion of the Work.

1.3 CODE AND STANDARD REFERENCES

- A) All codes and standards referenced in this specification will be to the edition of the references as detailed in this section. All materials and Work and Services to be

performed under these specifications shall be in compliance with the Codes listed in this section or as determined by the authority having jurisdiction.

- B) Comply with applicable PROPERTY STATE Regulatory Requirements, Building Codes and Elevator Codes at the project site, including but not limited to the following:
- 1) ASME A17.1-2004 Safety Code for Elevators and Escalators
 - 2) ASME A17.3-2004 Safety Code for Existing Elevators and Escalators
 - 3) ASME A17.2-2004 Guide for Inspection of Elevators and Escalators
 - 4) ADAAG, Americans with Disabilities Act Accessibility Guidelines
 - 5) ASCE 24 Flood Resistant Design and Construction
 - 6) NFPA 13-2019 Standard for the Installation of Sprinkler Systems
 - 7) NFPA 70-2020 National Electrical Code
 - 8) National Electric Code (NEC)
 - 9) NFPA 80, Fire Doors and Windows
 - 10) ANSI/UL 10B, Fire Tests of Door Assemblies
 - 11) NFPA 72-2019 National Fire Alarm Code
 - 12) NFPA 101 Life Safety Code
 - 13) O.S.H.A. Requirements for construction and repairs of existing buildings
 - 14) Elevator Industry Field Employees' Safety Handbook 2020
 - 15) Americans with Disabilities Act (ADA)
 - 16) Any and all onsite workmen and receiving of products to site are required to follow security and safety procedures as per policies due to facility regulations

1.4 RELATED WORK BY OTHERS

- A) This project will be a “turn-key” project with all work requirements included under the Related Work by Others section to be provided by the Elevator Contractor unless specifically stated. All work necessary for a complete and useable elevator system, shall be the responsibility of the Elevator Contractor. Specifically, to include non-traditional Contractor work detailed in Part 1.4 in addition to traditional Contractor work as detailed in all other sections of this specification. All materials and work to be performed under these specifications shall be in compliance with the codes listed in Part 1.3 CODE AND STANDARD REFERENCES or as determined by the authority having jurisdiction. As work progresses, Contractor shall consult with their Subcontractors, examine the Work installed by Subcontractors, and resolve all conflicts without expense to Owner and/or Consultant.
- B) **Machine Room HVAC:** Machine room HVAC is required, to maintain temperature and humidity to between 55 deg F and 90 deg F with relative humidity of not more than 85%

non-condensing. The Elevator Contractor shall provide actual calculations for total anticipated heat loads generated by all elevator machine room equipment.

- 7) Machine room HVAC must be positioned as approved by the Elevator Contractor and consultant. There shall be no drain lines or condensation allowing water in the machine room.
- 8) Dedicated HVAC system for machine room is required to have an electrical disconnect lockable in the off position with proper labels identifying source of power and purpose.
- 9) HVAC Contractor shall provide HVAC receptacle or disconnect switch as required for the installation of HVAC system by HVAC Contractor.
- 10) HVAC Contractor is responsible for providing electrical power and code compliant disconnect switch for installation of HVAC equipment.
- 11) Remote systems shall have a proper thermostat inside the machine room.
- 12) Any existing vents in the machine room will be properly covered and protected.

C) **Fire Alarm:** Fire alarm including heat and smoke sensing devices as per NFPA 70 National Electrical Code and NFPA 72 National Fire Alarm.

- 5) Verify that proper connections exist for fire recall devices to the elevator controllers. If required, provide connection from new or existing fire recall devices to the elevator controllers in machine room. For each elevator within the building, a minimum of three separate elevator control circuits shall be terminated at the designated elevator controller within each elevator machine room in accordance with NFPA 72, section 21.3. Operation of the elevator shall be in accordance with Section 2.27 of ASME A17.1 Safety Code for Elevators and Escalators. The smoke detectors or other automatic fire detection as permitted by NFPA 72, shall actuate the elevator control circuits as detailed in NFPA 72.
- 6) Fire alarm contractor shall demonstrate at time of elevator inspection, compliance and testing of all alarm initiating devices as required by ASME A17.1 Safety Code for Elevators and Escalators, ASME A17.2 and NFPA 72 National Fire Alarm Code.
- 7) Installation of alarm system and devices shall conform to ASME A17.1 Safety Code for Elevators and Escalators, and NFPA 72 including NFPA 70 NEC.
- 8) All conduit and wiring requirements for Fire Alarm System work is the responsibility of the Fire Alarm Contractor.

D) **Emergency Generator:** These elevators are provided with emergency generator power. Emergency generator personnel shall demonstrate system and tests at completion of each elevator for inspection as required by the applicable Building Code, Jurisdictional Statutes, Rules & requirements and ASME A17.1 Safety Code for Elevators and Escalators.

- 1) Emergency power in the building is capable for providing only power to one (1) of four (4) elevator cars in this bank at the same time.

- 2) Verify the existence of code compliant emergency power supply transfer switch. If existing transfer switch is not code compliant, provide and install emergency power supply transfer switch, wiring and auxiliary contacts as required by applicable Building Code and NFPA 70 National Electrical Code.
- 3) Emergency generator configuration, installation, wiring including conduit to elevator controller; repair, transfer switches including elevator selector options, connections or testing with or standby or emergency power systems shall be coordinated and completed by emergency generator service contractor. Emergency generator personnel shall demonstrate system and tests at completion of each elevator for inspection as required by applicable Building Code, Jurisdictional Statutes, Rules & requirements, and ASME A17.1 Safety Code for Elevators and Escalators
- 4) An illuminated signal marked "ELEVATOR EMERGENCY POWER" shall be provided in the elevator lobby at the designated level to indicate that the normal power supply has failed and the emergency or standby power is in effect for the elevator. This will be provided with the elevator hall station fixtures for the designated landing.
- 5) Generator contractor (under contract to the elevator contractor) shall provide signal in transfer switch to elevator controller that the building is on emergency standby power.
- 6) The operation of elevator cars on emergency power shall be determined through a selector switch capable of automatic or manual selection of the car to be operated by emergency power.
- 7) Elevator Contractor will provide new elevator controllers capable of required emergency power operations as detailed in this section, including sequencing operation for both elevators and conformance with the requirement detailed from the Building Code.
- 8) Current Building Code Chapter 30, Section 3003, Emergency Operations requires the following:
 - a) 3003.1 Standby Power. In buildings and structures where standby power is required or furnished to operate an elevator, the operation shall be in accordance with Sections 3003.1.1 through 3003.1.4.
 - b) 3003.1.1 Manual Transfer. Standby power shall be manually transferable to all elevators in each bank.
 - c) 3003.1.3 Two or More Elevators. Where two or more elevators are controlled by a common operating system, all elevators shall automatically transfer to standby power within 60 seconds after failure of normal power where the standby power source is of sufficient capacity to operate all elevators at the same time.
 - d) 3003.1.4 Venting. Where standby power is connected to elevators, the machine room ventilation or air conditioning shall be connected to the standby power source.

- e) Emergency Power has been verified to be capable of operating only one elevator at a time in the building and other building loads concurrently. Key operated sequencing will be required.
- f) Contractor, or Generator Subcontractor, shall provide signal in transfer switch to elevator controllers that the building is on emergency standby power.

E) Sprinklers: Currently there are sprinklers located in the machine room.

- 1) If sprinklers are required by local Fire Officials a code compliant shunt trip breaker would need to be installed and located for disconnecting power to the elevator in conformance with applicable codes.
- 2) Where elevator equipment is located or its enclosure is configured such that application of water from sprinklers could cause unsafe elevator operation, means shall be provided to automatically disconnect the main line power supply to the affected elevator and any other power supplies used to move the elevator upon or prior to the application of water.
- 3) When sprinklers are installed not more than 600 mm (24 in.) above the pit floor, the following shall apply to elevator electrical equipment and wiring in the hoistway located less than 1,200 mm (48 in.) above the pit floor, except earthquake protective devices conforming as required to ASME A17.1 Part 8.4); and on the exterior of the car at the point where the car platform sill and the lowest landing hoistway door sill are in vertical alignment.
 - a) Elevator electrical equipment shall be weatherproof (Type 4 as specified in NEMA 250).
 - b) Elevator wiring, except traveling cables, shall be identified for use in wet locations in accordance with the requirements in NFPA 70
- 4) If sprinkler head(s) are located in the machine room or hoistway, it will be required to install a heat detector within 24" of each sprinkler in order to automatically disconnect the main line power supply to the affected elevator(s) upon or prior to the application of water, in accordance with ASME A17 Safety Code for Elevators and Escalators, and NFPA 72 National Fire Alarm Code.

F) Building General Construction: Building general construction conditions will include, work detailed in this section, including cleaning and painting of miscellaneous surfaces. The Elevator Contractor shall not be responsible for all work as detailed in this section. All construction, cleaning and painting other than equipment directly supplied by the Elevator Contractor shall be performed by Work by Others.

- 1) Verify proper installation of 1 ½ hour "B-Label" door to machine room to include self-closing and self-locking requirements.
- 2) Verify proper Class ABC Fire Extinguisher in machine room permanently mounted and conveniently located to the access door as required by ASME A17.1 Safety Code for Elevators and Escalators.
- 3) Verify that all non-elevator related pipes, wiring, conduit have been removed and openings in machine rooms and hoistways to include a 2-hour fire rating. All foreign

pipes, wiring or conduit not in use or directly related to the elevator system shall be removed from machine rooms and hoistways.

- 4) All sills must be substantially level to all adjacent finished flooring surfaces.
 - 5) Machine room warning sign "Danger Authorized Personnel Only" shall be provided on the machine room door as required by NFPA 70 NEC.
- G) Each contractor will be required to provide any cutting, patching including painting to match existing finishes of building.
- H) All above work and materials to be performed to meet compliance with applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code, NFPA 13 National Sprinkler Code and NFPA 72 Fire Alarm Code or as determined by the authority having jurisdiction.
- I) Failure by above associated contractors to perform required testing at time of scheduled elevator acceptance testing and inspection will require full advance payment by contractor at fault for all expenses relating to re-inspection, permit and scheduling fees to building management.
- J) **Telephone Lines:** Provide a **cellular** non-proprietary line for the elevators.
- 1) Telephone lines and wiring to elevator controllers for telephone system including all wiring in machine room to be installed inside conduit as per NFPA 70 NEC.
 - 2) All emergency telephone devices shall include a minimum of 4 hours emergency backup power including power from emergency generator if supplied.
- K) **Electrical Requirements:** Electrical work required for elevator modernization shall be the responsibility of the Elevator Contractor. Electrical requirements shall include the following:
- 1) All Electrical work must be coordinated and scheduled with, at least 7 days' notice, with the building owner. Elevators shall be removed from service while electrical trades are working.
 - 2) Electrical requirements for hoistway and machine room HVAC, GFCI receptacles and disconnects, as required by NFPA 70, NEC and ASME A17.1 Safety Code for Elevators and Escalators. Additionally, Electrical Contractor shall provide and install conduits and wiring required for communication devices as detailed in this section.
 - 3) **Main Line Disconnect:** Main line disconnect is to be verified by Elevator Contractor as appropriate size and type for power requirements of new elevator equipment prior to installation. Main line disconnect for elevators shall not be used for other conductors to pass thru disconnect switch boxes.
 - a) If existing disconnect is not satisfactory, Electrical Contractor shall provide new disconnect for elevator main line power in accordance with NFPA 70, NEC. The disconnecting means shall be an enclosed externally operable fused motor circuit switch capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch used as the disconnecting means and shall remain in place with or

without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.

- 4) **Cab Lighting Disconnect:** Cab Lighting disconnect is to be verified by Electrical Contractor as appropriate size and type for power requirements. Cab Lighting disconnect for elevators shall not be used for other conductors to pass thru disconnect switch boxes. Electrical Contractor shall provide new disconnect(s) for elevator cab lighting in accordance with NFPA 70, NEC.

- a) The disconnecting means shall be an enclosed externally operable fused motor circuit switch capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.
- b) Cab Light Source: A separate branch circuit shall supply the cab lights, receptacle(s), accessory equipment (alarm devices, alarm bells, monitoring devices not part of the control system), auxiliary lighting power source, and ventilation on each elevator car. The overcurrent device protecting the branch circuit shall be located in the elevator machine room or control room/machinery space or control space. Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

5) **Machine Room Lighting and Receptacles:**

- a) A separate branch circuit shall supply the machine room or control room/machinery space or control space lighting and receptacle(s).
- b) Minimum lighting in machine room shall be 19 foot candles ("fc").
- c) Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

6) **Pit Lighting and Receptacle(s):**

- a) Verify that current pit lighting meets minimum 10 fc. at all locations in the pit. If pit lighting is below 10 fc requirement, provide additional lighting as detailed in this specification.
- b) Verify that a separate branch circuit is installed to supply the hoistway pit lighting and receptacle(s).
- c) Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.
- d) The lighting switch shall be so located as to be readily accessible from the pit access door.
- e) Duplex Receptacle. At least one 120-volt, single phase, 20-ampere duplex receptacle shall be provided in the hoistway pit.

- 7) **Pit Receptacles:** Pit receptacles, with GFCI protection shall be installed in NEMA 4 devices where placed within 4'-0" of pit floor. Care must be taken not to place equipment in line with elevator equipment.
- 8) Each 120-volt, single-phase, 20 ampere receptacle installed in pits, in hoistways and on elevator car tops shall be of the ground fault circuit-interrupter type for protection of personnel.
- 9) All disconnects shall be labeled according to NFPA 70 National Electrical Code including source of power, Jurisdictional Identification (Serial Number) and all required warning signs.
- 10) All disconnects shall be installed with proper clearances in accordance to the applicable provisions of NFPA 70 National Electrical Code.
- 11) All conduit and wiring in the hoistway must be checked for proper installation and properly mounted in accordance with applicable provisions of NFPA 70 National Electrical Code.
- 12) Equipment grounding and bonding shall be provided in accordance with the requirements of NFPA 70 National Electrical Code. The equipment grounding conductor will be run with the circuit conductors and shall be a copper conductor. Ground all conductors, supports, controller enclosure, and other non-current conducting metal enclosures for electrical equipment in accordance with NFPA 70 National Electrical Code. The ground wires shall be solid or stranded; insulated, covered, or bare copper, sized as required by NEC, and shall be colored green if #6 AWG or smaller, and have green tape or adhesive marking if #4 AWG or larger.
- 13) Provide new electric wiring from disconnect switches to the terminals of the new elevator controllers in their new locations, inclusive of a minimum 120 VAC, 15 AMP supply at each controller, or as required.
- 14) Provide new pit lighting and machine room lighting as per NFPA 70 National Electrical Code with enclosed and protected lamps.
- 15) All existing and new lighting fixtures in machine rooms, elevator cars and on top of car are to be suitably guarded in accordance with ASME A17.1 Safety Code for Elevators and Escalators clearance requirements and NFPA 70 National Electrical Code requirements for guarding.
- 16) Pit lighting switches and emergency stop switches shall be installed approximately 18" above first floor landing adjacent to opening and operable from side of pit access where pit ladder is installed.
- 17) Telephone lines and wiring to elevator controllers for telephone system including all wiring in machine room to be installed inside conduit as per NFPA 70 NEC. Conduit to be installed under Electrical Requirements.
- L) **Patching:** Patching of all masonry openings and drywall surfaces as required by elevator installation work as detailed below will be the responsibility of the Elevator Contractor and shall be completed with fire rating of hoistway or machine room equal or greater than 2 hours in accordance with Oklahoma Building Code.

- 1) All openings left from the removal of any surface mounted devices will be patched appropriately and surface restoration performed by the Elevator Contractor. Included in this will be the removal of old position indicators and directional indicators.
- 2) Patching of all surfaces at elevator landings will be the responsibility of the Elevator Contractor. Masonry, drywall, patching, and finishes including painting for repair of all openings as required by elevator installation work and shall be completed with fire rating of hoistway or machine room equal or greater than 2 hours in accordance with applicable Building Code and shall match or exceed the existing level of finish.
- 3) Patching of all masonry openings and drywall surfaces as required by elevator installation work inside the hoistway and machine room will be the responsibility of the Elevator Contractor. All patching shall be of a finish level equal to or exceeding the existing wall surface.

M) Coordination of Work:

- 1) Elevator Contractor shall coordinate as required with other contractors to ensure that schedules are met and all work being performed in association with the elevator modernization project is acceptable.
- 2) Before proceeding with any Work, the Contractor shall carefully check and verify all pertinent dimensions and sizes, and assume full responsibility for fitting the equipment and materials to the structure. Where the apparatus and equipment have been indicated on the drawings, the dimensions have been taken from typical equipment of the type specified in these specifications. The Contractor shall carefully check the drawings to verify that the equipment that will be actually provided will fit into the spaces available. Should the equipment not fit the specific structure shown on the drawings, all additional sub-framing members required to accommodate the equipment installation shall be provided and paid for by Contractor as part of the Work of this section. The Contractor shall submit all structural shop drawings and engineering calculations for the Consultant's review and written approval.
- 3) Contractor shall familiarize himself with the specifications, drawings, installation procedures and construction schedules for those phases of Work performed by his subcontractors. The Contractor shall also familiarize himself with the Owner's security and safety requirements and shall abide by and conform to such established regulations at all times. If the Contractor's Work or the Work of any of his subcontractors depends upon the execution of the Work of another subcontractor or upon his own Work, he shall so coordinate all phases of Work so as to avoid conflicts in installation procedures and construction schedules.
- 4) As work progresses, Contractor shall consult with his subcontractors, examine the Work installed by them, and resolve all conflicts without expense to Owner and/or Consultant.
- 5) Progress meetings shall be held at the job site, as and when requested by Owner or Consultant. The Contractor shall be represented at these meetings by persons

familiar with the details of the scope of Work and authorized to conclude matters relative to Work progress, as may be necessary to expedite completion of Work.

- 6) All above work and materials to be performed to meet compliance with applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code, NFPA 13 National Sprinkler Code and NFPA 72 Fire Alarm Code or as determined by the authority having jurisdiction.
- 7) Failure by above associated contractors to perform required testing at time of scheduled elevator acceptance testing and inspection will require full advance payment by contractor at fault for all expenses relating to re-inspection, permit, and scheduling fees to building management.

1.5 PAINTING

- A) **Cleaning and Painting of Miscellaneous Surfaces:** The Contractor shall be responsible for all miscellaneous painting as detailed in this specification. The procedures proposed for the accomplishment of the work shall provide for safe conduct of the work, careful removal and disposition of materials specified to be salvaged, protection of property, which is to remain undisturbed, and coordination with other work in progress. The work plan shall include a Safety and Health Plan describing procedures for handling monitoring, and disposition of Volatile Organic Compounds "VOCs" and other hazardous and toxic materials. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations.
- B) **Painting Provisions:** For all painting performed, the following provisions shall apply:
- 1) Provide all ferrous metals installed in the hoistway shop primed with a rust inhibitive primer.
 - 2) All cleaning or painting work that produces any vapors or fumes shall not be performed during normal business work hours. All cleaning or painting work that produces any vapors or fumes shall be performed with sufficient ventilation to prevent the vapors or fumes from permeating into the building. Work of this nature must be scheduled and coordinated with the Owner three (3) days prior to execution of work.
 - a) The procedures proposed for the accomplishment of the Work shall provide for safe conduct of the Work, careful removal and disposition of materials specified to be salvaged, protection of property, which is to remain undisturbed, and coordination with other work in progress. The Work Plan shall include a Safety and Health plan describing procedures for handling monitoring, and disposition of Volatile Organic Compounds "VOCs" and other hazardous and toxic materials. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations.
 - b) All paint products and application method must be pre-approved prior to application by Owner or Owner's agent. Paint products and application methods

are to be equal or better than existing product applicable with matching color as approved by Owner.

- c) All products of paint, thinners or cleaning agents must be pre-approved prior to use for VOC's or any additional health concerns.
- 3) Interior work zones having a volume of 1,000 cubic feet or less shall be ventilated at a minimum of 2 air exchanges per hour. Ventilation in larger work zones shall be maintained by means of mechanical exhaust. Solvent vapors shall be exhausted outdoors, away from air intakes, building occupants and workers. Building air conditioning return air inlets in the work zone shall be temporarily sealed before start of work until the prepared surfaces have dried and are free of odor. Operators and personnel in the vicinity of paint removal processes involving chemicals or mechanical action (sanding or blasting) shall wear respirators.

1.6 ELEVATOR SYSTEM DESCRIPTION

A) **Elevator Arrangement:** Quantity – Four (4) with Elevator(s) numbered as follows:

- 1) Elevator # 6 (State ID # 35115)
- 2) Elevator # 7 (State ID # 35116)
- 3) Elevator # 8 (State ID # 35117)
- 4) Elevator # 9 (State ID # 35118)
- 5) Specific requirements for the specific elevator or component shall be designated as such. It shall be the bidding Contractor's responsibility to review and verify as required for proper installation. Specifications for elevators include minimum requirements of elevators and it shall be the responsibility of the bidder to complete all work to code compliance.

B) **Type:**

- 1) Elevator # 6 (State ID # 35115) – Passenger – High Rise Traction
- 2) Elevator # 7 (State ID # 35116) – Passenger – High Rise Traction
- 3) Elevator # 8 (State ID # 35117) – Passenger – High Rise Traction
- 4) Elevator # 9 (State ID # 35118) – Passenger – High Rise Traction

C) **Number of Stops & Openings:**

- 1) Elevator # 6 (State ID # 35115): 11 front (labeled *P, 14 - 23) / No Rear Openings
- 2) Elevator # 7 (State ID # 35116): 11 front (labeled *P, 14 - 23) / No Rear Openings
- 3) Elevator # 8 (State ID # 35117): 11 front (labeled *P, 14 - 23) / No Rear Openings
- 4) Elevator # 9 (State ID # 35118): 11 front (labeled *P, 14 - 23) / No Rear Openings

D) **Rise:** All existing conditions

E) **Rated Capacity/Speed:** Maintain existing conditions

- 1) Elevator # 6 (State ID # 35115)
 - a) Capacity rated at 3500 lbs.
 - b) Speed rated at 500 fpm
- 2) Elevator # 7 (State ID # 35116)
 - a) Capacity rated at 3500 lbs.
 - b) Speed rated at 500 fpm
- 3) Elevator # 8 (State ID # 35117)
 - a) Capacity rated at 3500 lbs.
 - b) Speed rated at 500 fpm
- 4) Elevator # 9 (State ID # 35118)
 - a) Capacity rated at 3500 lbs.
 - b) Speed rated at 500 fpm

F) **Minimum Car Inside:** Maintain existing dimensions

G) **Inside Cab Height:** Maintain existing clear headroom dimensions inside car.

H) **Entrance Width & Type:**

- 1) Elevator # 6 (State ID # 35115):
 - a) Front Openings: Single Speed Center Opening 48" x 84"
 - b) Rear Openings: N/A
- 2) Elevator # 7 (State ID # 35116):
 - a) Front Openings: Single Speed Center Opening 48" x 84"
 - b) Rear Openings: N/A
- 3) Elevator # 8 (State ID # 35117):
 - a) Front Openings: Single Speed Center Opening 48" x 84"
 - b) Rear Openings: N/A
- 4) Elevator # 9 (State ID # 35118):
 - a) Front Openings: Single Speed Center Opening 48" x 84"
 - b) Rear Openings: N/A

I) **Main Power Supply:**

- 1) Elevator # 6 (State ID # 35115) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.
- 2) Elevator # 7 (State ID # 35116) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.
- 3) Elevator # 8 (State ID # 35117) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.
- 4) Elevator # 9 (State ID # 35108) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor

- J) **Lighting Power Supply:** 120 Volts, 1 Phase, 15 Amp, 60 Hz.
- K) **Stopping Accuracy:** $\pm 1/4"$ under any loading condition or direction of travel.
- L) **Door Operating Equipment:** Door operating equipment shall be labeled with maximum door speed and Kinetic Energy shall not exceed 7.37 ft-lb. as required by ASME A17.1 Safety Code for Elevators and Escalators.
- M) **Car Operation:**
 - 1) Using a Duplex Selective Collective for elevators 1 & 2 microprocessor-based controller, the operation shall be automatic by means of the car and hall buttons.
 - 2) Provide microprocessor-based Duplex Selective Collective automatic operation control system, which utilizes on-board diagnostics for servicing, troubleshooting, and adjusting without requiring the use of an outside service tool.

1.7 **SUBMITTALS**

- A) **Product data:** Submit product data for the following:
 - 1) Elevator car and hoistway fixtures.
 - 2) Operation, control, and signal systems.
 - 3) Motor & traction driving machine, speed governor and all major components of system including layout for machine room if equipment layout is changed all major components of system.
 - 4) Elevator cab interior materials and finishes.
- B) **Shop drawings:** Provide the following if equipment existing layout is changed.
 - 1) Show equipment arrangement in the machine room, pit and hoistway plans, elevations, sections and details of assembly, erection, anchorage, and equipment location as required.
 - 2) Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
 - 3) Show floors served, existing travel distances, maximum loads imposed on the building structure at points of support and all similar considerations of the elevator work.
 - 4) Indicate electrical power requirements and branch circuit protection device recommendations and locations.
- C) **Certificates:** Inspection and acceptance certificates of elevator system installation.
- D) **Submittals at Project Close-Out:**
 - 1) **Operation and Maintenance Data:** Include the following:
 - a) Product User Manuals and maintenance guides.
 - b) Parts list, with recommended parts inventory.

- a) Furnish two (2) copies of bound Product User Manuals and maintenance guides for elevators. Furnish one (1) electronic copy of all project close-out submittals to Owner.
- 2) **Wiring Diagrams:** Provide complete as built wiring diagrams with all electrical connections of elevator systems.
 - a) Provide one set of as built wiring diagrams in the elevator machine room.
 - b) Provide one (1) additional hard copy and 1 electronic copy on separate USB Flash Drive, in PDF format to Elevator Consultant for review and delivery to Owner.
 - c) Provide legible schematic wiring diagrams of installed electrical equipment, including control equipment, and any changes and/or in field modifications.
 - d) Provide legible copy of field pull sheets and wiring notes. Pull sheets to include wire numbers and colors. List symbols corresponding to identity or markings on machine room and hoistway apparatus.
 - e) Coded diagrams are not acceptable unless fully identified.

1.8 **QUALITY ASSURANCE**

- A) **Contractor Qualifications:** Elevator Contractor shall provide pre-engineered elevator system components by manufacturer(s) regularly engaged in the manufacture of elevator systems and that complies with ASME A17.1 Safety Code for Elevators and Escalators in its entirety, Jurisdictional Statutes, Rules & requirements, all applicable sections of the applicable Building Code as referenced above in its entirety, and additional requirements specified herein.
- B) **Quality Assurance Program:** The Contractor shall have a documented, on-going quality assurance program.
- C) **Installer Qualifications:** The Elevator Contractor must have not less than ten years of satisfactory experience installing elevators equal in character and performance to the project elevator. All mechanics employed to work onsite must be certified and/or licensed by appropriate federal and/or state regulatory agencies to meet federal and/or local certification requirements in maintenance, repair, alteration, and construction of elevators. There shall not be allowed onsite more than one helper or assistant unlicensed per onsite licensed mechanic.
- D) **Permits and Inspections:** The Contractor shall be responsible to obtain all permits, licenses and other fees that are necessary for proper completion and execution of the Work, which are specifically included in the Contract Sum, but not limited to required Jurisdictional Authority permits as required by Jurisdictional Statutes, Rules & requirements for Alteration Permits, and local jurisdiction permits. Elevator Contractor is responsible for proper posting of all required licenses, permits and safety documentation.

- E) **Inspection and testing:** Elevator Installer shall obtain and pay for all required tests, permits and fees for elevator installation as required by the State of Oklahoma.
- 1) Owner has designated ATIS as their consultant on this project. ATIS, in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Inspection and Test Requirements, may be present for and review all acceptance inspections for this elevator. Elevator Installer in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Inspection and Test Requirements will schedule and coordinate all acceptance tests and arrange for inspection for this elevator. Elevator Contractor must notify building owner and elevator consultant 5 days prior to inspection advising of the date and time of all inspections and tests. Elevator consultant must qualify and approve any inspector prior to inspection other than inspectors employed by the Authority Having Jurisdiction (AHJ).
 - 2) Elevator Contractor shall be solely responsible for the application, securing, maintaining, completion and posting of existing elevator permits as per Jurisdictional Statutes, Rules & requirements, and delivery to the Owner upon completion and acceptance of elevator work, the certificate of operation.
 - 3) Failures by Contractor to successfully perform required testing and pass alteration acceptance inspection, at time of scheduled elevator acceptance testing, will require a re-inspection. All costs for re-inspection required due to Contractor fault will be paid by Contractor.
- F) **Signage:** All signage as required by the applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code and NFPA 72 Fire Alarm Code to be posted in elevator lobbies, fire alarm panels, disconnects, machine rooms and machine room doors.
- G) **Non-Proprietary Controls:** Letter of guarantee that any and all equipment installed shall be completely non-proprietary and shall not require the need for specialized testing or programming tools currently or in the future. Future information for trouble shooting or adjusting shall be available to any licensed elevator maintenance contractor by the supplier of the control system at a reasonable cost comparable to cost of competitive parts within marketplace. Contractor shall provide complete schematics and wiring diagrams for control systems including information for change of program, on board diagnostics or mnemonics, or other on board switches or settings.
- 1) Any equipment that is provided for installation which would require any specialized tool, laptop computer, devices, manuals, source codes, access codes, objects, passwords and/or software to input parameters, make adjustments, troubleshoot, perform diagnostics, perform testing functions or required for any other type of maintenance or repair function shall be included with the modernization cost of this contract and will become the property of the Owner. At the time of bid submission, this shall be identified as such on the bid.
 - 2) Any controller by a manufacturer other than specified must be pre-approved prior to bid. Letter stating agreement to the above compliance shall be signed by an officer of Contractor and shall be notarized.

- H) **Contractor's Safety and Health Plan:** The contractor shall have in place a safety and health plan that, at a minimum, addresses OSHA requirements. The safety and health plan shall comply with the requirements of the Elevator Industry Field Employees' Safety Handbook. The program shall include job site cleanliness, hard hats, safety glasses, safety shoes, hearing protection, fall protection, proper use of ladders, barriers around hazards and proper scaffolding.
- I) **Protection of Spaces:** Contractor is responsible for all protection both inside and outside of hoistway to all personnel inside or outside of hoistway areas. This includes providing and maintaining of protective barricades at hall entrances, screening of each hoistway during work and protection from trip hazards due to storage or use of materials or drop cords.
- 1) Contractor is to provide due care to protect building flooring, walls and other surfaces from excessive debris, dirt or damage due to workmen onsite.

1.9 DELIVERY, STORAGE AND HANDLING

- A) Deliver elevator materials, components, and equipment in manufacturer's protective packaging.
- B) Elevator equipment disassembled for replacement shall be neatly stored prior to removal from site and disposal, which is responsibility of Elevator Contractor.
- C) Store materials in a dry protected area if designated by owner. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling, or deterioration.
- D) Elevator Contractor shall be responsible for the material handling of all elevator equipment to site storage area. Elevator Contractor will be responsible for keeping all stored materials inside storage area with lock and key.
- E) Elevator Contractor's sole responsibility and liability shall be limited to the extent Elevator Contractor is at fault; and shall not be responsible for material once material arrives at jobsite.
- F) Elevator Contractor shall be responsible for the removal the existing equipment from the machine rooms and placement of the new equipment in the machine rooms.
- G) Owner shall afford the Contractor and separate contractors' reasonable opportunity for storage of materials and performance of their activities on the property and shall cooperate in coordinating operations with such other activities.
- H) Locked and protected storage for Elevator Contractor's tools or materials at site is contractor's responsibility. Key will be provided for elevator machine room, which is located on roof level of building, and can be utilized for storage or securing of tools and equipment. Additional storage may be available and will require coordination with property for identification and requirements for use.

- I) If the Elevator Contractor needs additional storage beyond what is available on site than the property will provide a single location for either a storage trailer or POD. The cost of the storage container/trailer is the responsibility of the Elevator Contractor.
- J) Authorized elevator personnel only are responsible for temporary installed barrier panels as may be required during construction to protect the openings at elevator at each floor. Panels may be removed only while the authorized elevator personnel are to perform work in the immediate area of the unprotected opening. Authorized elevator personnel shall re-install all barriers as required to maintain the original solid and safe protection to the opening prior to leaving immediate work area of the opening.

1.10 PROJECT CONDITIONS

- A) **Prohibited Use:** Elevator that is turned over to the Contractor for modernization work shall not be used for any purpose during the construction period before Substantial Completion. The elevator will only be turned over to the Owner upon completion of all modernization work, including successful completion of all required inspections and tests including acceptance by Owner and Consultant.
- B) **Painting:**
 - 1) Only paint metal work provided by Contractor or impacted by Work performed under this specification by Contractor unless specifically required in other sections of this specification.
 - 2) For all painting performed the requirements of Part 1.6 Painting shall be complied with as required.
 - 3) Pit floor should be painted at the end of the modernization.
 - 4) Machine room floor should be painted at the end of the modernization.
 - 5) Top of car should be painted at the end of the modernization.

1.11 WARRANTY

- A) **Warranty:** The Contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship.
 - 1) The guarantee period shall extend to one (1) year from the date of completion or acceptance thereof by beneficial use; whichever is earlier, of each elevator.
 - 2) The guarantee excludes ordinary wear and tear or improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the Contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.
 - 3) Any defective condition or workmanship not mutually agreeable as satisfactory to building Owner and Contractor shall be determined by the independent elevator Consultant as final for the replacement, repair or continued use or product or part in question.

- 4) In addition to Contractor's above-mentioned warranties, Contractor shall, for the benefit of the Owner, obtain and assign to Owner if necessary, warranties from the manufacturers, producers and suppliers whose products are incorporated into or used in the work performed hereunder. All work and materials provided pursuant to the warranties hereunder shall be performed at no charge to the Owner.
- B) **Warranty Response Time:** Contractor shall respond to warranty calls within one hour and be on site within 2 hours.

1.12 CONTRACT PREVENTIVE MAINTENANCE

- A) **Existing Elevator Maintenance Agreement:** In the event that a bidder is currently the provider of preventive maintenance services on the elevators and escalators that are the subject of this modernization specification, this bidder acknowledges and fully agrees that their present agreement shall terminate upon submission of a bid from their company and Award of Contract to their company, or to another Elevator Contractor bidder, for the work called for in this specification for modernization.
- 1) The existing maintenance agreement for all elevator(s) and escalators will terminate on the date that the elevator modernization contractor commences on-site work.
 - 2) The elevator modernization contractor will assume maintenance on all elevator(s) and escalators that are the subject of this modernization specification once on-site modernization work commences on the first elevator or escalator. Monthly maintenance pricing will be the pricing submitted under BID ITEM 004B – INTERIM ELEVATOR & ESCALATOR MAINTENANCE.
 - 3) Elevators and escalators taken out of service for modernization will not be billed for maintenance during any time the elevator or escalator is under modernization.
 - 4) Once all elevators and escalators are turned over for substantial use of the owner after modernization, no additional maintenance charges will be due until after the maintenance period detailed in Contract Preventive Maintenance section herein subpart C), Modernization Maintenance Period as detailed below has ended.
- B) **Follow on Maintenance Contract:** All bidders shall quote monthly cost for Preventive Maintenance Agreement for all elevators and escalators that are the subject of this modernization commencing upon completion of the warranty period specified at the end of the modernization specification but a part of this document. Submit quote based upon terms and conditions of BID ITEM 002 - ELEVATOR MAINTENANCE, as detailed in the Elevator Maintenance Specification section of this solicitation.
- C) **Modernization Warranty Maintenance Period:** Maintenance service consisting of a minimum of monthly examinations, adjustments and lubrication of the elevator and escalator equipment shall be provided by the Elevator Contractor for a period of twelve (12) months after the elevators and escalators have been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the Elevator Contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour

callback service at no additional charge. This service shall not cover adjustments, repairs, or replacement of parts due to negligence, misuse, abuse, or accidents caused by persons other than the Elevator Contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

- 1) Elevator Contractor shall provide a service manual for each elevator and escalator describing monthly, quarterly, and annual maintenance tasks. Each task shall include an area for signature by a Certified Elevator Technician upon completion of task. Service manual shall also include page/s for documenting all required inspections and tests. Service manual shall contain a section to record all related maintenance, repair, and replacement information in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Part 8.6 and remain on site.
- 2) Elevator Contractor shall provide documentation and shall perform monthly testing of fire service recall operation as per ASME A17.1 Safety Code for Elevators and Escalators and ASME A17.2.
- 3) Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Manufacturer of original equipment shall produce parts.
- 4) Elevator Contractor shall have a service office and full-time service personnel within 50-mile radius of the project site.
- 5) Maintenance service shall include all required tests for inspection services as required by Jurisdictional Authority and ASME A17.1 Safety Code for Elevators and Escalators.
- 6) Elevators and escalators taken out of service for modernization will not be billed for maintenance during any time the elevator is under modernization. Maintenance charges will be equally divided by the number of elevators and number of weeks of each month for an equivalent percentage deduction of the number of elevators removed from service. Time not under maintenance charges is from the time of the elevator being removed from service until the time of certificate for public use.

2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A) Only products and components produced or provided by manufacturer(s) regularly engaged in the manufacture of elevator products, and that complies with ASME A17.1 Safety Code for Elevators and Escalators in its entirety, ASME A17.2, Jurisdictional Statutes, Rules & requirements, all applicable sections of the applicable Building Code in its entirety, and additional requirements specified herein are acceptable. Only Bidders deemed qualified shall be notified by Request for Bid.

2.2 MATERIALS, GENERAL

A) **Colors, Patterns, and Finishes:** As selected by the Owner or Owner's Representative from manufacturer's full range of standard colors, patterns, and finishes.

1) Steel:

a) Shapes and bars: ASTM A 36.

b) Sheet: ASTM A 366, cold-rolled steel sheet, commercial quality, Class 1, matte finish, stretcher leveled.

c) Finish: Factory-applied baked or powder coated enamel.

2) Stainless Steel:

a) Shapes and bars: ASTM A 276, Type 300 (18-8).

b) Tubing: ASTM A 269, Type 300 (18-8).

2.3 EQUIPMENT: MACHINE ROOM/SPACE COMPONENTS

A) **Gearless Drive Machine:** Tower II, Elevators #6, #7, #8, & #9 shall have the drive machines replaced with new gearless drive machines.

1) **Gearless Traction Drive Machine Assembly:** Install new Motion Control Engineering (MCE), Torin PM TMGL or equal, Gearless Traction Machine, Motor, Brake and Drive.

2) **Machine:** The hoisting machine shall be a gearless traction type, consisting of permanent magnet AC motor, brake and driving sheave mounted on a rigid bedplate. A large diameter, forged shaft shall serve as a support for the motor armature and for the removable drive sheave and brake drum/disc; it shall be supported by roller bearings.

a) Steel deflector sheaves of adequate diameter and strength shall be provided as necessary and mounted in the machine room.

3) **Drive System:** The drive system shall be of the non-regenerative Variable Voltage Variable Frequency (VVVF) type.

a) The system shall be a vector controlled pulse-width modulated AC drive. The variable voltage variable frequency drive shall convert the AC power supply using a two step process to a variable voltage variable frequency power supply for use by the hoist motor.

b) The speed control shall be by means of vector control providing independent excitation and torque current. A digital absolute velocity encoder shall be provided giving feedback to the controller on armature position and motor speed.

4) **Motor:** The motor shall be AC, with class "F" insulation. The motor armature shall be dynamically balanced and supported by roller bearings of ample capacity. The armature and driving sheave shall be properly balanced for smooth, high-speed elevator performance.

- 5) **Brake:** The brake and emergency brake will be a dual system shall be a spring applied electric brake; held open by an electro-magnet actuated by a digital brake controller and designed to work as an integral part of the motor controller to provide smooth positive stops. The Brake shall be designed to automatically apply in the event of interruption of power supply from any cause. Operation and control of the brake shall be all digital. The setting and lifting of the brake shall be software based and all electronic. All adjustments and setup of the brake shall be made using a PC interface. No contactors or resistors shall be used in the actuation of the brake.
 - 6) **Emergency Brake:** The emergency brake shall be a component of the dual braking system to satisfy ASME A17.1 requirements for emergency brake without the installation of a rope brake assembly.
- B) **Counterweight:** With existing counterweights, counterbalance each elevator for smooth and economical operation by cast iron or steel plate weights contained in a structural steel frame. Counterweight shall equal a complete elevator car and approximately 40 percent of the specified load. If additional weights are required, Contractor shall provide and adjust for proper balance as a part of this specification and contract.
- C) **Sheaves and Cable Guards:** Existing primary and secondary drive sheaves shall be retained and reutilized. New cable guards shall be provided as required by ASME A17.1.
- D) **Suspension Ropes:**
- 1) **Elevator # 6-9:** Suspension ropes shall be replaced with new suspension ropes as detailed below:
 - a) Replace suspension ropes with traction steel hoist ropes of size and number to ensure proper wearing qualities, consisting of at least six strands wound around a hemp core center. Suspension ropes shall be provided in conformance with rope data on elevator car crosshead data plate.
 - b) All suspension means shall be adjusted and installed with alternating shackle rod length so that shackles do not make contact and include anti-rotation devices.
 - c) Load-carrying rope must be vertically in line with shackle rod.
 - d) All required labels shall be affixed after installation.
 - e) All ropes are to be tensioned equally.
 - 2) **Lubrication of Suspension Ropes:** Suspension ropes shall be lubricated as detailed below:
 - a) Automatic rope lubricators shall be installed.
 - b) Lubricators shall be provided with lubricant compatible with the strand and core lubricants and have good rope penetrating properties as determined by the rope manufacturer.

- c) Lubricant meeting these requirements is a light viscosity Spindle oil. It should have a Saybolt Seconds Universal (SSU) viscosity of 34 to 38 seconds at 210° F. Spindle oil lubricates and will also assist in keeping the hoist ropes clean. Spindle oil is best applied with a felt pad, wick-type lubricator.
 - d) After installing rope lubricators, the level of lubrication shall be monitored to ensure correct amount of lubrication is applied. To verify correct amount of lubrication, check for a film of lubricant in the drive sheave grooves. With the machine out of service, carefully wipe the groove. If the groove is dry, field lubrication is required.
 - e) The frequency of additional rope cleaning and lubrication shall be determined by the Elevator Maintenance Contractor.
- 3) **Rope Tensioning:** All ropes are to be tensioned equally.
- a) Suspension members are considered to be equally tensioned when the smallest tension measured is within 10% of the highest tension measured. Equal tension shall be maintained between individual suspension members in each set.
 - b) Written results of the measurement of the tension of all suspension members for traction elevator shall be provided and maintained in the elevator machine room as permanent records that are considered the property of the Owner.
- E) **Load Weighing Devices:** Draka Micelect Model # LMC Wire Rope Sensor with the LM3D Control Unit or approved EMCO equal load weighing device for 2:1 roping shall be installed to provide signals to the controller for various load monitoring and dispatching operations.
- F) **Centrifugal Speed Governor:** The centrifugal speed governor shall be replaced as required to cut off power to the motor and apply the brake whenever the governor indicates the car has excessive speed. Governor as manufactured by Hollister Whitney or equal.
- G) **Governor Tail Sheave:** Provide a complete new governor tail sheave assembly, including new sheave, bearings, shaft, tensioning components, guards, mounting hardware, and all related components required for a complete installation. Properly align, tension, and adjust the assembly for smooth, quiet, and reliable operation.
- H) **Governor Ropes:** Provide and install new governor rope as follows:
- a) Replace governor ropes with traction steel ropes of size and number to ensure proper wearing qualities, consisting of at least six strands wound around a hemp core center.
 - b) All required labels shall be affixed after installation.
- I) **Elevator Controller:** The Elevator control system shall be Motion Control Engineering Controller Model Motion 4000, GAL Galaxy, Smartrise SRA AC, Elevator Controls Model V900 AC or preapproved equal. Provide above manufacturer's standard microprocessor operation system for each elevator as required to provide type of operation system indicated. The elevator controller shall use a microprocessor-based

logic system and shall be ASME A17.1 compliant including all applicable elevator and electrical safety codes to include the following:

- 1) All power feed lines to the brake shall be opened by an electro-mechanical switch. A single ground, short circuit or solid-state control failure shall not prevent application of the brake.
- 2) The automatic leveling zone shall not extend more than 6 inches (152.4 mm) above or below the landing level, nor shall the doors begin to open until the car is within 6 inches (152.4 mm) of the landing. In addition, the inner leveling zone shall not extend more than 3 inches (76.2 mm) above or below the landing. The car shall not move if it stops outside the inner leveling zone unless the doors are fully closed and locked.
- 3) The system shall use an automatic two-way leveling device to control the leveling of the car to within 0.25 inches (6.35 mm) or better above or below the landing sill. Overtravel, undertravel or rope stretch must be compensated for and the car brought level to the landing sill.
- 4) The closed loop feedback power control shall be arranged to continuously monitor the actual elevator speed signal from the velocity transducer and compare it with the intended speed signal to verify proper and safe operation of the elevator.
- 5) During operation of the elevator with an overhauling load (empty car up or loaded car down), precision speed control shall be obtained by the regulation system used in the power control. The power control shall have the capability to maintain regulation under varying loads.
- 6) The controller shall provide stepless acceleration and deceleration and smooth operation at all speeds. The system shall provide the required electrical operation of the elevator control system including automatic application of the brake, which shall bring the car to rest in the event of a power failure.
- 7) The controller shall include absolute floor encoding which, upon power up, shall move the car to the closest floor to identify the position of the elevator. With absolute floor encoding it is not necessary to travel to a terminal to establish floor position.
- 8) The controller shall use a variable voltage, variable frequency drive to control three-phase AC induction and Permanent Magnet AC motors.
- 9) The drive shall use a three-phase, full-wave bridge rectifier and capacitor bank to provide a DC voltage bus for the solid-state inverter.
- 10) The drive shall use power semiconductor devices and pulse width modulation with a carrier frequency of not less than 8 kHz to synthesize the three-phase, variable voltage, variable frequency output to operate the hoist motor in an essentially synchronous mode.
- 11) The drive shall have the capability of being adjusted or programmed to achieve the required motor voltage, current and frequency to properly match the characteristics of the AC elevator hoist motor.

- 12)The drive shall not create excessive audible noise in the elevator motor.
- 13)The drive shall be a heavy-duty type, capable of delivering sufficient current to accelerate the elevator to contract speed with rated load. The drive shall provide speed regulation appropriate to the motor type.
- 14)A means shall be provided for removing regenerated power from the drive DC power supply during dynamic braking. This power shall be dissipated in a resistor bank which is an integral part of the controller. Failure of the system to remove the regenerated power shall cause drive output to be removed from the hoist motor.
- 15)A contactor shall be used to disconnect the hoist motor from the output of the drive unit each time the elevator stops. This contactor shall be monitored. The elevator shall not start again if the contactor has not returned to the de-energized position when the elevator stops.
- 16)All power feed lines to the brake shall be opened by an electro-mechanical switch. A single ground, short circuit or solid-state control failure shall not prevent application of the brake.
- 17)The controller shall provide stepless acceleration and deceleration and smooth operation at all speeds.
- 18)The controls shall be arranged to continuously monitor the performance of the elevator so that, if car speed exceeds 150 fpm during access, inspection, or leveling, the car shall shut down immediately, requiring a reset operation.
- 19)The controller shall include absolute floor encoding which, upon power up, shall move the car to the closest floor to identify the position of the elevator. With absolute floor encoding it is not necessary to travel to a terminal to establish floor position.
- 20)The controller shall have an RFI Filter to reduce EMI and RFI noise.
- 21)Failure of the brake to lift as detected by a mechanical switch (if provided) shall cause the control system to take the elevator out of service at the next stop where it shall remain out of service until the condition is corrected.
- 22)Hoistway Equipment Minimization:
 - a) The control system shall allow slowdown, emergency terminal, and hoistway access limit switches to be eliminated. These switches shall exist as virtual switches in system software.
 - b) The control system shall allow leveling magnets and/or vanes to be eliminated.
- 23)Programmable Logic:
 - b) All available programming options or parameters shall be field programmable, without need for any external device or knowledge of any programming languages. Programmable options and parameters shall be stored in nonvolatile memory. At a minimum, there shall be a 32-character alphanumeric display used for programming and diagnostics. Programmable parameters and

options shall include, but are not limited to, the following:

- (1) Number of Stops/Openings Served (Each Car)
- (2) Selective Collective
- (3) Programmable Fire Code Options/Fire Floors (Main, Alternates)
- (4) Floor Encoding (Absolute PI)
- (5) Digital Position Indicators/Single Wire Position Indicators
- (6) Programmable CE Microcom floor labels
- (7) Programmable Door Times
- (8) Programmable Motor Limit Timer
- (9) Programmable Car Fan and Light Timer
- (10) Door Nudging, Automatic and Fire Operation
- (11) Emergency Power
- (12) Parking Floor
- (13) Lobby Floor
- (14) Hall or Car Gong Selection
- (15) Standard Security
- (16) Anti-nuisance - Light Load Weighing and Photo Eye
- (17) Load Weighing for Light, Heavy and Overload Car
- (18) High Speed Inspection Enable
- (19) Door behavior selections
- (20) Door type selection
- (21) Fault Bypass – Inspection Operation
- (22) Fault Bypass – Automatic Operation

24) ADA Requirements:

- a) The elevator shall comply with ICC/ANSI A117.1, the American National Standard for Accessible and Usable Buildings and Facilities and the applicable Building Code, Chapter 11.
- b) Leveling Accuracy: The controller shall have a self-leveling feature that shall automatically bring the car to floor landings within a tolerance of 0.25 inches (6.35 mm) or better under all loading conditions up to the rated load.
- c) Hall Lanterns: The controller shall have outputs to drive the visible and audible signals that are required at each hoistway entrance to indicate which elevator car is answering a call. Audible signals shall sound once for up, twice for down. (In-car lanterns located in cars, visible from the vicinity of hall call buttons, and conforming to the above requirements, shall be acceptable.

- d) Car Position Indicators: The controller shall have a position indicator output to drive the required position indicator capable of indicating the corresponding floor numbers as the car passes or stops at a floor.
- e) The controller shall have an output capable of indicating car direction and floor number.

25)Environmental Considerations:

- a) The elevator control shall be capable of operating within the following environmental conditions:
 - (1) Ambient temperature: 32°F to 104°F (0°C degrees to 40°C degrees).
 - (2) Humidity: Non-condensing up to 95%
 - (3) Altitude: Up to 7,500 feet (2286 m)

26)Building and System Configuration:

- a) The elevator controller shall be microprocessor based and designed specifically for elevator applications. Elevator and drive logic shall be implemented independently of safety functions.
- b) Elevator logic shall be implemented to facilitate tight coordination between subsystems and enhance reliability. The implementation shall utilize a real-time, multi-tasking operating system to allow the processors to simultaneously execute elevator control logic, drive control logic, operator interface logic, and communication support.
- c) The elevator controller shall have an independent safety system in order to implement safety features required by ASME A17.1 code. The safety system shall incorporate redundant, multi-processor, multi-path, solid-state, ASME compliant implementation that meets CSA and CE standards.
- d) The elevator controller shall be configured and packaged in such a way that external “jumpers” cannot be used (intentionally or unintentionally) while the elevator is running in any passenger mode of operation. Non-passenger modes of operation shall be provided, along with means to bypass safety functionality, to allow inspection testing and other setup and/or troubleshooting operations.
- e) The elevator control logic configuration shall be fully field programmable. Changes in number of floors, I/O configuration, starter setup, eligibility etc. shall not require the replacement/reprogramming of EEPROMs or other storage devices. Further, changes in the controller configuration shall be user adjustable in the field.

27)Diagnostics:

- a) The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes. It shall have permanent indicators for important elevator status conditions as an integral part of the controller.

- b) The microprocessor boards shall be equipped with on-board diagnostics for ease of troubleshooting and field programmability of specific control variables. Field changes shall be stored permanently, using nonvolatile memory. The microprocessor board shall provide the features listed below:
- (1) On-board diagnostic switches and an alphanumeric display to provide user friendly interaction between the mechanic and the controller.
 - (2) An on-board event log shall store and display time-stamped events for diagnostic purposes. (Viewable only with monitoring software.)
 - (3) An on-board real-time clock shall display the time and date and be adjustable by means of on-board switches.
 - (4) Field programmability of specific timer values (i.e., door times, etc.) may be viewed and/or altered through on-board switches and pushbuttons.
 - (5) The elevator controller shall have extensive diagnostic capability. A built-in LCD display or equivalent shall allow access to major user functions and diagnostic features. The display shall be a multi-character, multi-line type with associated keypad to allow users to enter information. The display shall show data and menus in readily understood character format. No numeric, hexadecimal, or binary codes are acceptable.
 - (6) Dedicated indicators shall be provided in a conspicuous location on the elevator controller to indicate important system statuses, such as when the safety string is made, when the door locks are made, when the elevator is on Inspection/Access, etc. In addition, other special or error conditions detected by the main processor or safety subsystem shall be displayed.

28) Universal I/O:

- a) Field I/O boards shall be universal in that 24V to 120V AC or DC connections shall be accepted without requirement for unique circuit boards for each. I/O boards shall provide built-in current limiting protection.

29) Intended Operation of Critical Components:

- a) Failure of any single magnetically operated switch, contactor, or relay to release in the intended manner; the failure of any static control device, speed measuring circuit, or speed pattern generating circuit to operate as intended; the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contactor or relay to release in the intended manner, failure of any static control device to operate as intended or the occurrence of a single accidental ground, shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

30) Status Indicators:

- a) Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is made, when the door locks are made, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on Inspection or Access, when the elevator is on fire service, when the elevator out of service timer has elapsed, and when the elevator has failed to successfully complete its intended movement. A means shall be provided to display other special, or error conditions detected by the microprocessor.
- b) Every field connection input or output shall have a dedicated LED such that no voltmeter or other test equipment is required to see when an input or output is active.

31) Parking Floor Function:

- a) Parking Floor: Elevator car shall be capable of parking on a designated floor after a predetermined time period. Any landing may be the parking floor. The car will go to the parking floor when it is free of call demand. A Parking Delay Timer will cause a free car to wait for a short time before parking. The timer shall be adjustable, with a value between 0.0 minutes (no delay) and 6.0 minutes.

32) Out of Service Timer

- a) An out of service timer (T. O. S.) shall be provided to take the car out of service if the car is delayed in leaving the landing while calls exist in the system.

33) Programmable Car Fan and Light Timer:

- a) Controls shall be provided that will de-energize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.

34) High or Low Speed Inspection

- a) A selection shall be provided on the controller to select high or low speed during access or inspection operation as long as contract speed does not exceed 150 feet per minute.

35) Door Operation

- a) Door protection timers shall be provided for both opening and closing directions to protect the door motor and help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time if the doors are prevented from reaching the open position. In the event that the door closing attempt fails to make up the door locks after a predetermined time, the door close protection timer shall reopen the doors for a short time. If, after a predetermined number of attempts, the doors cannot successfully be closed, the doors shall be opened, and the car removed from service.
- b) A minimum of four different door standing open times shall be provided. A car call time value shall predominate when only a car call is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of

a door reopen caused by the safety edge, photo eye, etc., a separate short door time value shall predominate. A separate door standing open time shall be available for lobby return.

- c) If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at slow speed in the closed direction. A buzzer shall sound during nudging operation.

36)Door Pre-opening

- a) When selected, this option shall start to open the doors when the car is in final leveling, 3" (76.2 mm) from the floor. If pre-opening is not selected, the doors shall remain closed until the car is at the floor, at which time the doors shall commence opening.

37)Car and Hall Call Registration

- a) Car and hall call registration and lamp acknowledgment shall be by means of a single wire per call, in addition to the ground and the power bus. Systems that register the call with one wire and light the call acknowledgment lamp with a separate wire can be accommodated.
- b) The user shall be able to register car calls via the on-board LCD display and keypad.

38)Emergency Power Operation

- a) Emergency power in the building is sized to power one car at a time. Key operated sequencing operation will be required by ASME A17.1, Part 2.27.2 with full functionality of the code requirements for sequencing operation.

39)Fire Service Operation

- a) Fire Phase I emergency recall operation, alternate level Phase I emergency recall operation and Phase II emergency in-car operation shall be provided according to latest applicable edition of ASME A17.1 and current Jurisdictional Statutes, Rules & requirements.

40)Independent Service

- a) Independent service operation shall be provided in such a way that actuation of a key switch in the car operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls. Car and hoistway doors will only close with constant pressure on a car call pushbutton or door close button. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns shall be inoperative.

41)Group Operation

- a) For group configurations, each elevator shall have its own computer and dispatching algorithm. Should one computer lose power or become inoperative, the next elevator shall be capable of accepting and answering all hall calls. When all computers are in operation, only one shall assume the role of dispatching hall calls to all elevators.

42)Leveling

- a) The car shall be equipped with two-way leveling to automatically bring the car level at any landing, within the required range of leveling accuracy, with any load up to full load.

43)Test Switch

- a) A controller test switch shall be provided. In the test position, this switch shall allow independent operation of the elevator with the door open function deactivated for purposes of adjusting or testing the elevator. The elevator shall not respond to hall calls and shall not interfere with any other car in a duplex or group installation.

44)Inspection

- a) To enhance safety, an inspection switch, enable switch, and an up/down toggle switch shall be provided in the controller and on the car top to place the elevator on inspection operation and allow the user to move the car. Activation of the car top inspection switch shall render the controller inspection switch inoperative.

45)Uncanceled Call Bypass

- a) A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call, including stuck pushbuttons. Call demand at another floor shall cause the car, after a predetermined time, to ignore the defective call and continue to provide service in the building.

46)Anti-nuisance (Photo Eye)

- a) The controller shall cancel all remaining car calls, if a user-determined number of car calls are answered without the computer detecting a change in the photo eye input (indicating that no one is passing through the car door).

47)Load Weighers

- a) Load weighing devices shall be installed to provide signals to the controller for various load monitoring and dispatching operations.
- b) By identifying the load (light, heavy or overload), the system can activate anti-nuisance car call cancellation, loaded car hall call bypass, or overload.

48)Absolute Floor Encoding

- a) The controller shall include absolute floor encoding, which upon power up, shall move the car to the closest floor to identify the position of the elevator.

49)Landing/Positioning System Information

- a) The landing/positioning system shall use a Gray code, magnetically permanent encoded tape and two, independent sensor heads in a single housing for absolute position control under all powered conditions. The tape shall provide a unique code for every 1mm of travel. A third, independent system shall provide speed feedback directly from the hoist motor. The system shall

continuously compare inputs from the three independent systems to assure accuracy and safety.

50) Service Enhancements

- a) The manufacturer shall make software updates for controller and/or group control available via Internet download, email attachment, or physical EEPROM shipment. Internet downloads and email attachment deliveries require an optional, hand-held user interface to facilitate software transfer from the user's PC to the elevator or group.

2.4 **EQUIPMENT: HOISTWAY**

- A) **Platform:** Existing frame shall be retained. Underside of the platform shall be verified and maintained structurally sound and fireproof by the Contractor.
 - 1) Existing platform guard shall be verified to be not less than 21 inches. If less than 21 inches, the platform guard shall be replaced with a new platform guard no less than 525 mm (21 in.) with the lower portion of the guard bent back at an angle of not less than 60 degrees nor more than 75 degrees from the horizontal.
 - 2) Existing guard is required to be properly braced in accordance with ASME A17.1 which requires the guards to be securely braced and fastened in place to withstand a constant force of not less than 650 N (145 lb-ft) applied at right angles to and at any position on its face without deflecting more than 6 mm (0.25 in.), and without permanent deformation.
- B) **Sling:** Existing steel stiles affixed to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure shall be retained.
- C) **Guide Rails:** Retain and reutilize with no alterations. Existing car guide rails shall be verified as properly fastened to the building with steel brackets verified in alignment, secure to wall and brackets with surface planed smooth. Existing car guide rails shall be cleaned and aligned as necessary for the proper performance of the elevators.
- D) **Roller Type Guides:**
 - 1) **Elevator Car:** Existing guides on top and bottom of cars shall be replaced with new roller guide complete assemblies which shall have a minimum of three tires each, shall be mounted on top and bottom of the car and counterweight frame and be held in contact with the guide rail by adjustable devices. Car roller guides shall be ELSCO Model B, or equal. Properly adjusted for smooth operation.
 - 2) **Counterweight Assembly:** Existing guides on top and bottom of counterweight assembly shall be replaced with new roller guide complete assemblies which shall have a minimum of three tires each, shall be mounted on top and bottom of the counterweight frame and be held in contact with the guide rail by adjustable devices. Counterweight roller guides shall be ELSCO Model D, or equal. Properly adjusted for smooth operation.
- E) **Car Top Guard Railing:** A standard railing conforming to ASME A17.1 shall be provided on the outside perimeter of the car enclosure top on all sides where a 300 mm

(12 in.) ball can pass between the edges of the car enclosure top and the adjacent hoistway enclosure and on sides where there is no hoistway enclosure.

- 1) If clearances require the standard railing to be located more than 100 mm (4 in.) from the edge of the outside perimeter of the car enclosure top, the top of the car enclosure outside of the railing shall be clearly marked.
- 2) The marking shall consist of alternating 100 mm (4 in.) diagonal red and white stripes. The forces specified in ASME A17.1 shall not deflect the railing beyond the perimeter of the car top.
- 3) There shall be a minimum of 100 mm (4 in.) horizontal clearance between the top rail and intermediate rail of the standard railing and fixed equipment passed or approached by the standard railing as the car moves throughout the hoistway to ensure protection from shearing hazards.

F) **Buffers:** Retain existing buffers. Buffer data plates shall be maintained or replaced for compliance with ASME A17.1 Safety Code for Elevators and Escalators. All buffers shall be cleaned and painted. Verify the spring buffer(s) comply with the stroke and load requirements of the ASME A17.1 Safety Code for Elevators and Escalators. Buffer data plates shall be maintained or replaced for compliance with ASME A17.1 Safety Code for Elevators and Escalators.

- 1) Prepare all surfaces to be painted by removing dirt, grease, oil, loose paint, rust, scale, and other contaminants by cleaning, scraping, sanding, wire brushing, or grinding as required. Treat remaining corrosion and apply a compatible rust-inhibiting primer to all exposed or prepared metal surfaces. Apply not less than two finish coats of durable industrial-grade enamel or approved equivalent to provide a uniform, complete, and professional finish. Color shall be selected by the Owner or Consultant. Protect adjacent equipment and surfaces from overspray and paint damage.

G) **Automatic Terminal Limits:** Replace Automatic slow down and final limit switches. Place electric limit switches in the hoistway near the terminal landings. Limit switches shall be designed to cut off the electric current, slow down and stop the car if it runs beyond either terminal landing.

H) **Automatic Self-Leveling:** Provide elevator car with a self-leveling feature to automatically bring the car to the floor landings and correct for over-travel or under-travel. Self-leveling shall, within its zone, be automatic and independent of the operating device. The car shall be maintained level to less than ¼ inch with the landing irrespective of its load.

I) **Traveling Cable:** Existing traveling cable shall be removed and replaced with new traveling cable.

- 1) Traveling cable shall terminate at numbered terminal blocks in car and machine room.
- 2) Traveling cable shall be provided with a separate shielded circuit for communication system and hang to obtain proper size of loop. Traveling cable outer covering will be of fire resistant and meet UL standard testing.

- 3) Traveling cable will be hung free of all contact from hoistway or car equipment and shall be provided with 10 percent spare conductors for each car.
 - 4) In addition to all code required cables to support code required devices and infrastructure, the traveling cable(s) shall include four (4) additional pair of shielded, 18/2 AWG twisted pair for Owner's use plus four (4) CAT 6 POE traveling cables with a minimum 22 AWG sizing, and two (2) coax cables.
- J) **Hoistway & Machine Room Wiring:** Provide all new wiring throughout the elevator machine room and hoistway, adequately sized and constructed for the proper operation of the equipment.
- 1) Multi-conductor type wiring for light and signal circuits shall be used in the elevator hoistway. All conductors will be copper and the minimum size of conductors, excluding those which form an integral part of control devices, shall be No. 14 for lighting circuits and No. 18 for operating, control, and signal circuits. All wiring will be installed in accordance with applicable NEC and latest applicable edition of ASME A17.1 codes. Hoistway door interlock wiring will be replaced with new SF-2 high heat resistance wiring and shall include a grounding conductor. All other new wiring will have flame retarding and moisture resistant outer covering.
 - 2) Equipment grounding shall be provided. The equipment grounding conductor shall be run with the circuit conductors and shall be a copper conductor. Ground all conductors, supports, controller enclosure, and other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be solid or stranded; insulated, covered, or bare copper, sized as required by NEC, and shall be colored green if #6 AWG or smaller, and have green tape or adhesive marking if #4 AWG or larger.
 - 3) Retain and reutilize to the maximum extent possible all ducts and conduit in machine room and hoistway. Install new ducts and conduit as required.
 - 4) Hoistway travel cable and associated wiring shall be coordinated with controller manufacture for wiring configuration requirements to match all controller wiring color coded and numbered diagrams for installation.
- K) **Pit Stop Switch:** Provide new pit stop switch as required by latest applicable edition of ASME A17.1 code.
- 1) Stop switch(es) shall be of the manually opened and closed type, have red operating buttons of the push-to-stop configuration, be conspicuously and permanently marked "STOP," and shall indicate the "STOP" and "RUN" positions.
- L) **Pit Light:** Pit lighting to be verified by Electrical Contractor as meeting minimum 10 ft-c requirement or additional pit lighting will be installed by electrical contractor as detailed in the Electrical Requirements section of this specification.
- M) **Pit & Hoistway Cleanup:** The hoistway surfaces and pit area shall be thoroughly cleaned to remove all excessive dust and debris from hoistway surfaces and pit area with proper disposal from property of all waste products from work under this specification.

N) **Pit Ladder:** Verify that pit ladder is compliant with current edition of ASME A17.1 Safety Code for Elevators and Escalators. If compliant, retain and reutilize existing pit ladder. If pit ladder is not in compliance with current ASME A17.1 code, provide new pit ladder as required by latest applicable edition of ASME A17.1 code.

- 1) Pit ladder shall be positioned so that means to unlock the access door from inside the pit shall be located not more than 1 825 mm (72 in.) vertically above a rung, cleat, or step. The minimum distance from the top rung, cleat, or step to the top of the pit ladder or handhold shall not be less than 1 200 mm (48 in.). With the door in the closed position, in a plane not more than 1 000 mm (39 in.) horizontally from a rung, cleat, or step of the pit ladder.

O) **Hoistway Door Equipment:**

- 1) **Hoistway Entrances:** Existing hoistway entrance assembly consisting of the elevator entrance frame, head jamb & strike jamb and door sills shall be retained and reutilized. Verify and adjust as required to maintain all door gaps less than 3/8 inch in accordance with latest applicable edition of ASME A17.1 code.
- 2) **Hoistway Doors:** Existing hoistway shall be retained and reutilized.
 - a) Refurbish as required and replace all parts necessary to deliver doors in as new condition. Verify and adjust as required to maintain all door gaps less than 3/8 inch in accordance with latest applicable edition of ASME A17.1 code.
 - b) Hoistway doors that cannot be adjusted to maintain the door gaps to less than 3/8 inch shall be replaced with new door panels. Bidders are cautioned to verify the capability of all hoistway doors to be properly adjusted to maintain code required clearances and gaps as no request for any change order will be approved for this purpose. It is the Elevator Contractors responsibility to verify this prior to submission of a bid on this project.
- 3) **Door Header Assembly:** Existing hoistway door header assemblies shall be retained and reutilized. Replace existing hoistway door header assemblies with new galvanized steel hoistway door header assemblies. Hanger/track supports to be formed of zinc coated steel, 10-gauge minimum thickness, extending the full travel of the door(s) and securely anchored to the unit frame, adjacent wall, or beam above.
- 4) **Hoistway Door Sill and Sill Support:** Existing hoistway door sills and supports shall be retained and reutilized.
 - a) **Sealing at Door Sills:** Hoistway Door Sills at all landings will have joint area between floor surfaces and existing sills properly sealed to prevent the intrusion of water into the joint.
- 5) **Interlocks:** All existing interlocks shall be replaced with new interlocks.
 - a) Equip each hoistway entrance with an approved type interlock (GAL or pre-approved equal) tested as required by code including SF-2 wiring and grounding. Interlock to be GAL Interlock, or pre-approved equal.

- b) Interlock shall be designed to prevent operation of the car away from the landing until the doors are locked in the closed position as defined by code and shall prevent opening the doors at any landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing.
- 6) **Hoistway Door Components:** Existing door hangers, and door tracks shall be retained and refurbished. Door hangers are to be adjusted for proper clearances and smooth operation for the door panels. Door tracks shall be thoroughly cleaned for smooth operation.
- a) Existing Hoistway door sheaves and door gibs shall be replaced with new components for all landings specifically designed for existing tracks and sills as specified below.
 - b) Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
 - c) Replace all door gibs specifically designed for existing hoistway sills.
 - d) All missing secondary retainers installed at the bottom of each hoistway door shall be provided with direct OEM secondary retainers in conformance with applicable requirements of ASME A17.1.
 - e) Door Bumpers: Provide and install new rubber door bumpers on new side opening car doors. Bumpers shall be installed at top and bottom of door jambs.
 - f) All hoistway door closers shall be replaced with new spirator type.
 - g) All hoistway interlocks and pickup rollers shall be replaced with new to work with new clutch and interface with existing door configuration.
 - h) All hoistway door eccentrics are to be replaced with new.
 - i) All hoistway door astragals shall be replaced with new.
- 7) **Entrance Markings:** Replace all hoistway entrance markings and door jamb plates at each floor.
- a) Jamb Braille: All elevator hoistway entrances shall have raised and Braille floor designations provided on both jambs. The centerline of the characters shall be 60 in (1525 mm) above finish floor. Entrance jambs shall be marked with new 4" x 4" stainless steel plates having raised floor markings with Braille adjacent. Such characters shall be 2 in (50 mm) high and shall comply with ICC/ANSI A117.1.
 - b) Main Entry Level: A raised star shall be provided on both jambs at the main entry level.
 - c) **Car Identification:** In conformance with ASME A17.1 Part 2.29, in buildings with more than one elevator, each elevator in the building shall be assigned a unique alphabetical or numerical identification. The elevator identification alphanumeric designation shall be a minimum of 75 mm (3 in.) in height, painted on, engraved, or securely attached to the to or on every elevator entrance at the designated level.

- P) **Hoistway Floor Numbers:** After painting has been completed, the hoistways shall have floor numbers, not less than 100 mm (4 in.) in height, painted on the hoistway side of the enclosure or hoistway doors.
- Q) **Floor Designations:** Floor designations shall be as listed in Elevator System Description, Number of Stops and Openings section of this specification.
- R) **Sight Guards:** Sight guards, if required, to reduce the opening between the leading edge of the hoistway door and the car door to maintain code required clearances, will be finished to match door panels. All existing sight guards will be inspected to ensure structural integrity, proper contour, and secure attachment to the hoistway door panels.
- S) **Escutcheon Tubes:** Hoistway doors that do not have escutcheon tubes installed shall have escutcheon holes fitted with new escutcheon tubes to match existing OEM escutcheon tubes.
- T) **Door Bumpers:** Provide and install new rubber door bumpers on all hoistway door jambs and on car door jamb. Bumpers shall be installed at top and bottom of door jambs.
- U) **Painting Inside Hoistway:** All painting on this project must be performed in conformance with Part 1.6 of this specification.
- 1) After removal of all old hardware and components for the hoistway as detailed above all existing components shall have all rust thoroughly removed and treated as detailed below.
 - 2) Remove rust, clean, degrease and paint any existing parts or components for a like new condition, including but not limited to the door panel surfaces, door track assemblies and door frame surfaces inside the hoistway.
 - 3) After painting has been completed, the hoistways shall have floor numbers, not less than 100 mm (4 inch) in height, painted on the hoistway side of the enclosure or hoistway doors.

2.5 DOOR OPERATION

- A) **New Door Operator:** Provide each elevator with a new complete door operator assembly. Door operator to be a closed loop motor driven heavy-duty operator GAL MOVFR or pre-approved equal.
- 1) Door operator shall be a closed loop, microprocessor-based system. The door operator will facilitate smooth operation under varying environmental influences such as, temperature, wind, friction, and component variation. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile the command will be automatically corrected. The Closed Loop Door Operator control system shall not require machine room door control equipment.

- 2) Door operation to comply with ASME A17.1 requirements for Restricted Opening of Hoistway or Car doors of passenger elevator.
 - 3) Door Operator shall be provided with adjustable parameters, at a minimum, for the following:
 - a) Adjustable Parameters in the closing cycle for high speed, final speed, nudging speed, acceleration, deceleration, and slow speed torque.
 - b) Adjustable parameter for stall reversal – automatic reversal if the door meets an obstruction.
 - c) Adjustable parameter for door reversal – to accomplish a quick but smooth reversal.
 - 4) Door noise not to exceed 58 dBA.
 - 5) Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
 - 6) Install door operator data plate as per ASME A17.1 Safety Code for Elevators and Escalators and provide all door closing speed times to ensure code conformance to Kinetic Energy limitations of latest applicable edition of ASME A17.1 code.
 - 7) Door operator must be mounted so completely isolated from the car top. Mounting to car stiles by brackets as configured by GAL will be accepted for isolation.
- B) Door Zone Lock:** Install new door zone lock system with door operation to comply with the latest applicable edition of ASME A17.1 requirements for restricted opening of car doors of passenger elevator.
- 1) Door zone lock system shall be GAL LWZ-2 clutch and combination zone locking system, OEM or pre-approved equal.
 - 2) When the car is outside the unlocking zone, the car doors shall be so arranged that when in the closed position they shall be restricted from opening more than 100 mm (4 inch) from inside the car.
 - 3) Car doors shall be openable from outside the car without the use of a special tool(s).
 - 4) Car doors shall be openable from within the car when the car is within the unlocking zone.
- C) New Door Protection Device:** A new door protection shall be a combination 2D & 3D detection means system. The elevator door protection system shall consist of a Light Curtain, an Approaching Object Detection Means and a Controller. The system shall be designed to detect persons and objects that are in the path of the elevator cab doors or approaching the elevator cab door entrance in accordance with ASME A17.1. The system shall also be designed to ignore stationary persons or objects that are not entering the elevator. The beams shall project across the car opening detecting the presence of a passenger or object. If door movement is obstructed or objects are detected in the approach zone, the doors shall immediately reopen. A mechanical reopening device shall not be acceptable.

- 1) **Acceptable Manufacturers:** Acceptable pre-approved door edge protection systems are as follows:
 - a) Non-Weatherproof Systems shall be Formula Systems Vision Plus, Janus Smart 3D combined with Panachrome+ 2D (including red/green color indicators to highlight door movement , and CEDES CabSafe™ system, consisting of a Controller, a 2D light curtain and a 3D TOF sensor.
- 2) If an object has been detected in accordance with ASME A17.1 Detection of Approaching Objects or Detection of Objects in the Door Path when the doors are fully open, the hoistway door and car door shall not close or, when the doors are closing, the car door and hoistway door at the landing shall initiate a reversal without intentional delay beyond system response time, and shall fully reopen or reopen a minimum of 915 mm (36 in.). If the doors fail to fully close within 10 seconds in addition to the door close data plate value, the doors shall fully reopen.
- 3) The reopening device(s) shall be permitted to be rendered inoperative when the closing kinetic energy is reduced in conformance with ASME A17.1 requirements for detection of approaching objects within 450 mm (18 in.) of the point at which the leading edge of the leading door panel contacts the door jamb or opposing door panel. Additionally, when 20 seconds have transpired after the detection means of approaching objects first detects an object when an object is detected in the path of the doors, the 20 seconds duration shall reset. When objects are detected within 20 mm (0.75 in.) of the point at which the leading edge of the leading door panel contacts the door jamb or opposing door panel the reopening device(s) are permitted to be rendered inoperative.
- 4) When the reopening device(s) has been rendered inoperative as detailed above, a continuously sounding audible signal shall be provided with a sound level of 10 dBA minimum above ambient and shall not exceed 80 dBA. The sound level shall be measured 1 m (40 in.) above the landing floor, 500 mm (20 in.) from the door face, along the centerline of the entrance opening, with the doors open. The signal shall sound during door closing until the doors are fully closed. In no case shall the sound level exceed 85 dBA inside the cab and within 300 mm (12 in.) from the centerline of the entrance and 1 m (40 in.) above the floor.
- 5) Detection of Approaching Objects: The reopening device(s) shall be designed to detect a cylindrical target(s) approaching the entrance opening of the landing-side doors as required ASME A17.1. The approaching object detection means shall be effective until the leading edge of the doors is within 450 mm (18 in.) of the fully closed position and shall be permitted to be effective up to the fully closed position.
- 6) Detection of Objects in the Door Path. The reopening device(s) shall be designed to detect rectangular prisms positioned as required by ASME A17.1. The device(s) shall be designed to detect prisms positioned anywhere within the opening width of the entrance on the floor and oriented with the 80 mm (3.15 in.) dimension parallel to the floor, the 150 mm (6 in.) dimension perpendicular to the door, and the 50 mm (2 in.) dimension perpendicular to the floor either wholly located between the vertical planes established by the landing-side face of the hoistway door and the car-side

face of the car door or centered between the two planes if the distance between the two planes is less than 150 mm (6 in.).

- 7) **Self-Monitoring of Detection Means.** The system shall be designed to be self-monitoring. After the door has reached its fully opened position and before door closing is initiated, the detection means shall be self-checked to verify the detection means is operational. If the self-check outcome is unsuccessful, power closing of the door(s) shall be at reduced kinetic energy conforming to ASME A17.1.
- D) **Nudging Operation:** The doors shall remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door movement is obstructed for a field programmable time, a buzzer will sound, and the doors will close at reduced speed. If the infra-red door protection system detects a person or object while closing, the doors will stop and resume closing after the obstruction has been removed.

2.6 CAR COMPONENTS

- A) **Cab Interior:** Existing elevator cab shell shall be retained. The interior cab wall panels and drop ceiling shall be replaced. Elevator contractor to include a \$30,000.00 cab allowance per elevator. Allowance is for material only. Labor shall be included in Contractor's estimate. Owner will install finished flooring.
 - 1) All refurbishment identified in this section is the responsibility of the Elevator Contractor to coordinate and complete.
 - 2) Elevator modernization contractor shall coordinate cab interior renovations. If interior renovations are going to be subcontracted then elevator contractor needs to identify subcontractor for owner approval.
 - 3) Elevator modernization contractor is responsible to provide schedule that allows for coordination of the cab interior refurbishment. This schedule will have all cab interior work performed prior to elevator modernization contractor making final acceptance inspection and testing of this elevator.
 - 4) Elevator modernization contractor is responsible for all required door adjustments required for cab modernization work; no additional charges will be allowed for any door adjustments.
- B) **Car Entrances:**
 - 1) **Cab Doors:** Replace & hang new cab door panels.
 - a) Provide new fire rated cab door panels mounted on existing car door hangers with new rubber door astragals.
 - b) New car door close contact switch shall be installed.
 - c) Finish for car door shall be ASTM A 167, Type 300 Stainless Steel Number 4 finish. Door shall be manufactured to include all mounting hardware requirements of the GAL door operating equipment. Door shall be

manufactured by Gunderlin LTD or pre-approved equal by Owner and consultant.

- d) Refurbish associated components as detailed below and replace all parts necessary to deliver doors in as new condition. Verify and adjust as required to maintain all door gaps in accordance with latest applicable edition of ASME A17.1 code.
- 2) **Car Door Hangers, Sheaves, and Tracks:** Existing door hangers, sheaves, tracks, door gibs including all required retainers shall be replaced with new components as detailed below:
 - a) Provide sheave type two-point galvanized suspension hangers and galvanized track for car sliding door, product GAL, or preapproved equal.
 - b) New components for all components shall be GAL or preapproved equal.
 - c) Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
 - d) Hangers: Provide an adjustable slide to accommodate the up thrust of the doors.
 - e) Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.
 - f) Car Door Guides: New car door slide guides shall be installed with tabs installed per manufacture's design. Bottom slide guides as manufactured by GAL replacement or preapproved equal. Car door guides shall be matched to existing car door sill.
- C) **Cab Shell Enclosure:** The existing cab shell enclosure shall be retained and reutilized.
- D) **Car Steady Plates:** Existing car steady plates shall be rebuilt and adjusted to like new condition. All rubber spacers that are deteriorated will be replaced with new rubber components to hold the car steady and plumb.
- E) **Car Top Exit Switch:** Car top escape panels shall have switch assemblies including all wiring to install proper safety circuit as required by ASME A17.1. The top emergency exit cover shall open outward and shall be hinged or securely attached with a chain when in both the open and closed positions. If a chain is used, it shall be not more than 300 mm (12 inch) in length. The exit cover shall only open from the top of the car, where it shall open without the use of special tools.
- F) **Car Top Lighting:** The elevator shall be provided with lighting and a duplex receptacle fixture on the car top. The lighting shall consist of two (2) separate light sources. The lighting sources shall be permanently connected, fixed, or portable, or a combination thereof, to provide an illumination level of not less than 100 lx (10 fc) measured at the point of any elevator part or equipment, where maintenance or inspection is to be performed from the car top. All lighting shall be equipped with guards. The light switch shall be accessible from the landing when accessing the car top.
- G) **Car Top Inspection Station:** Provide a new car top inspection station with an "emergency stop" switch and constant pressure "up-down" direction buttons to make

the normal operating devices inoperative and give the inspector complete control of the elevator. Car top Inspection unit manufactured by Vator Accessories, Inc., (630) 876-8370, Nylube Products Company, LLC. (248) 852-6500, Monitor Controls, or equal. Mount the car top inspection station as required by ASME A17.1 Safety Code for Elevators and Escalators.

- 1) When the elevator is on inspection operation or when the hoistway access switch has been enabled, a continuous audible signal, audible at the location where the operation is activated shall sound when the "FIRE RECALL" switch is in the "ON" position or when the fire alarm initiating device is activated to alert the operator of an emergency.
- 2) Car Top Inspection Station must be approved by Owner and Consultant prior to Contractor ordering fixtures.

H) Cab Fan:

- 1) Provide and install new 2 speed quiet run fan manufactured by Nylube securely mounted in ceiling. Fan shall be protected from access through cab ceiling.
- 2) Ventilation fans in elevators that do not have their own air-conditioning system shall not consume more than 0.33 watts/cfm at the maximum speed of the fan.
- 3) Controls shall be provided that will de-energize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.

I) Car Operating Panel: Provide new car operating stations (Main & Auxiliary) as follows:

- 1) **Car Operating Station:** The car control station shall contain the devices required for specific operation mounted directly to an aluminum backing plate with a Stainless Steel # 4 brush finish applied faceplate. The panel shall consist of a series of modules, key switches or approved buttons for optimum viewing and accessibility. All engraving shall be on flush mounted hairline faceplates securely mounted to the aluminum backing plate.
 - a) The lowest section shall contain the "DOOR OPEN," "DOOR CLOSE," and car emergency signaling devices.
 - b) Intermediate section shall contain floor buttons, which illuminate when a call is registered and remain illuminated until the call is answered. Raised floor indications and handicap symbols shall be located immediately adjacent to the floor buttons.
 - c) Layout of floor buttons will have the floor buttons centered with two columns of floor buttons stacked vertically.
 - d) Provide a lockable service compartment with recessed flush door. Door material and finish to match car station face plate or car return panel. Inside surface of door shall contain an integral flush window for displaying the elevator operating permit. Service cabinet shall contain all required and accessory key switches including independent service, fan switch, key stop switch, hoistway access and an emergency light test button in service cabinet.

- e) The top section shall contain fire service features inside a locked cabinet in accordance with currently adopted edition of ASME A17.1, including operating instructions.
 - f) Plug connection for Fire Department Communications System shall be provided in the car operating panel which shall provide communications for Fire Department personnel from the Lobby Panel into each elevator car.
 - g) Swing of panel shall match car door configuration. Car operating panels shall swing open with the hinged side closest to the sidewall. Panel shall swing to open only to the open car side.
 - h) All car and hall fixtures by Innovation Industries, or equal. All pushbuttons to be tamper resistant, Innovation Industries PB 39, Flush Button with Illuminated Halo and Center Jewel or pre-approved equal. Halo to be Blue LED light source.
 - i) Car operating panels by Innovation Industries "Prestige Series" Stainless Steel # 4 brushed finish, or pre-approved equal. No adhesive type applied plates will be accepted at either car or hall stations. All fixtures shall have a Blue LED lighting source.
 - j) Car stations shall be pre-wired by the car station manufacture with terminal strip connection to control wiring.
 - k) All hall and car push button lamps shall include long life LED type lamps.
- 2) **Position Indicators:** Each car operating panel to include a 2-inch electronic segmented digital position indicator mounted in the control panel for optimum viewing. As the car travels, its position in the hoistway shall be indicated by the illumination of the alpha/numeric character corresponding to the landing which the elevator is stopped or passing. On one side of digital numeric indicator in the car panel will also be a matching indicator with direction of travel. Position Indicator shall have a Blue LED lighting source.
- 3) **Emergency Light:** Emergency lighting shall be incorporated into the car operating panel. Emergency light shall illuminate automatically upon loss of the building's normal power supply as required by latest edition of ASME A17.1.
- 4) **Emergency In-Car Signaling Devices:** Provide a Kings III, RATH® Two-Way Elevator Communication System, or approved equal, emergency communications device mounted in the car station panel. Emergency communications device shall comply with Americans with Disabilities Act (ADA) and with the currently adopted edition of ASME A17.1 Safety Code for Elevators and Escalators requirements. Emergency In-Car Signaling Devices for two-way communications shall, at a minimum, conform to the following:
- a) A push button to actuate the communications means shall be provided in or adjacent to a car operating panel. The push button shall be visible and permanently identified with the phone symbol in conformance with ASME A17.1. The identification shall be on or adjacent to the phone push button. The communications means shall be initiated when the push button is actuated.

- b) On the same panel as the phone push button, a message shall be displayed that is activated by authorized personnel to acknowledge that communications are established. The message shall be permitted to be extinguished where necessary to display a new message or when the communications are terminated.
- c) On the same panel as the phone push button, messages shall be displayed that permit authorized personnel to communicate with and obtain responses from a trapped passenger(s), including a passenger(s) who cannot verbally communicate or hear.
- d) On the same panel as the phone push button, a message shall be displayed that is activated by the authorized personnel to indicate when help is on the way. The message shall continue to be displayed until a new message is displayed or the communications are terminated.
- e) The communications means shall provide on demand to authorized personnel information that identifies the building location and elevator number.
- f) The communications, once established, shall be disconnected only when authorized personnel terminate the call or a timed termination occurs. A timed termination by the communications means in the elevator, with the ability to extend the call by authorized personnel, is permitted if voice notification is sent by the communications means to authorized personnel a minimum of 3 min after communication has been established. Upon notification, authorized personnel shall have the ability to extend the call; automatic disconnection shall be permitted if the means to extend are not enacted within 20 s of the voice notification.
- g) The communications means shall not use a handset in the car.
- h) The communications shall not be transmitted to an automated answering system. The call shall be answered by authorized personnel.
- i) Operating instructions shall be incorporated with or adjacent to the phone push button.
- j) Controlled Access Operation – Card Reader: The car operating panel shall also incorporate space and lens for a card reader to be mounted behind the COP faceplate. The card reader shall be located at ADA/accessibility height requirements. Style of car reader installation shall be confirmed during the fixture review and approval process. Provide a card reader override switch behind the locked service panel. Elevator contractor to provide assistance on installation as well as provide wiring to the card reader and coordinate installation with security contractor.
- k) A security camera shall be provided and installed by others in the rear corner of the elevator cab. Elevator contractor to provide assistance on installation as well as provide wiring to the ceiling area and coordinate installation with security contractor.

5) Special Accessories in Car Station Panel:

- a) Located in Service Compartment Subpanel w/ Clear Certificate Window, sized 6" x 9":
 - (1) Light key switch.
 - (2) Fan 2 speed key switch.
 - (3) Independent Operation Key Switch.
 - (4) Access Key Switch.
 - (5) Emergency Light Test Button.
 - (6) Keyed stop switch.
- b) No applied plates.
- c) Braille and engraving to include:
 - (1) Engraved Capacity and Identification Number of elevator.
 - (2) No Smoking sign shall be engraved on flush mounted hairline faceplate.
- d) All push buttons and key switches as required for fire service operation.
- 6) **Fire Service Features:** Fire Fighters Service Key switch as required by the IBC including operations required by the currently adopted edition of ASME A17.1 Safety Code for Elevators and Escalators shall be engraved on a flush mounted hairline faceplate.
 - a) The "FIRE OPERATION" switch, the "CALL CANCEL" button, the "STOP" switch, the door open button(s), the door close button(s), the additional visual signal, and the operating instructions shall be grouped together at the top of the main car operating panel behind a locked cover.
 - b) The firefighters' operation panel cover shall be openable by the same key that operates the "FIRE OPERATION" switch. The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation and at the recall level. When the key is in the "FIRE OPERATION" switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.
 - c) All buttons and switches shall be readily accessible, located not more than (72 inch) above the floor.
 - d) The front of the cover shall contain the words "FIREFIGHTERS' OPERATION" in red letters at least 0.4 in. high.
 - e) Firemans' Service Key: The fire key shall be of a tubular, 7 pin, style 137 construction and shall have a bitting code of 6143521 starting at the tab sequenced clockwise as viewed from the barrel end of the key. The key shall be coded "FEO-K1".
- 7) All required Braille for buttons and other switches as required by the FBC & ASME A17.1 shall be securely fastened to the aluminum backing plate or directly engraved.
- 8) Integral Emergency In-Car Signaling Device (telephone), including engraving directly into the car-operating panel all ADA required telephone instructions.

- 9) There shall be NO ADHESIVE APPLIED PLATES, SIGNS or PANELS affixed to the car-operating panel or other locations inside or outside the elevator cab.
- 10) Phone Response Location shall be designated by Owner.
- J) **Car Operating Station & Fixture Approval:** Car Operating Station & fixtures must be approved by Owner and consultant prior to contractor ordering fixtures.
- K) **Car Front Cladding:** Car front shall be re-clad as detailed below:
 - 1) The existing swing return panels shall be rigidly secured to accept the installation of the new Car Operating Panel (COP).
 - 2) Car Return Panel: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing car box openings in return panel and wrap around car return panel.
 - 3) Car Door Header & Transom Assembly: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing car box openings in car door head jamb & Transom assembly.
 - 4) Car Strike Jamb: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing openings in car door strike jamb assembly.
- L) **Cab Interior Painting:** Elevator Modernization Contractor shall be responsible for the following rust remediation prior to new cab interior finishes being installed:
 - 1) The exposed metal surfaces on the inside of the cab interior shall be mechanically cleaned, primed and painted in conformance with the requirements detailed in the Painting subsection of the Project Conditions section of this specification. This will include all metal surfaces but not limited to cove base and ceiling areas of the cab.
- M) **Cab Walls:** To be included in cab allowance.
- N) **Cab Enclosure Vents:** Cab enclosure vents shall be repaired to provide proper cab enclosure ventilation.
 - 1) Base of each wall will be provided with a 6" cove base of #4 satin finish stainless steel with punched ventilation to align with the existing cab shell vents.
 - 2) Cove base shall include 18 gauge brushed #4 finish stainless steel base with ventilation slots aligning with existing ventilation openings.
 - 3) Cab enclosure vents shall be repaired as necessary to provide proper cab enclosure ventilation. Openings shall be appropriately sized and be guarded to prevent straight through passage in accordance to the applicable requirements of the current ASME A17.1 safety code.
- O) **Floor Finish:** New flooring will be completed by owner.
- P) **LED Car Lighting & Ceiling:** To be included in cab allowance.
- Q) **Handrails:** Elevator car interior must have a support rail on back wall.

- 1) Support rails must be continuous and a minimum length of 42 inches (1067 mm) overall.
- 2) The inside surface of support rails must be 1½ inches (38 mm) clear of the car wall.
- 3) The distance from the top of the support rail to the finished car floor must be at least 31 inches (787 mm) and not more than 33 inches (838 mm).
- 4) Padded or tufted material or decorative materials such as wallpaper, vinyl, cloth or the like may not be used on support rails.

R) **Cab Interior Pads:** Furnish set of pads and hooks for interior of each elevator.

- 1) One (1) set of pads and hooks per bank shall be provided for the interior. If any elevator in the bank is unique in design that this should be identified an additional (1) set of pads and hooks provided for each unique design.
- 2) Type must be pre-approved by Owner and elevator consultant as manufactured by W.E. Palmer, or equal. Color to be selected from standard color selection provided to Owner by Elevator Contractor.
- 3) Elevator pads shall be turned over to the Building Owner and stored in the machine room of the elevator.

S) All openings left from removal of current car devices, which are not re-clad, shall be covered with stainless steel: ASTM A 167, Type 300 stainless steel covers, No. 4 satin finish. All edges shall be finished in a manner that presents no sharp edges or corners.

2.7 **FIRE COMMAND CENTER ELEVATOR PANEL**

- A) High-rise buildings having floors with human occupancy 75 feet or more above the lowest level for fire emergency vehicle access shall meet the requirements of the applicable Building Code Chapter 9, Fire Protection Systems, which includes a Fire Command Center as detailed in Section 911. The remote Elevator Panel of the Fire Command Center will be installed at a location verified by the Fire Marshal.
- 1) The new Fire Command Center Elevator Panel shall be located in the area around the main desk area on the “L” floor. Currently all security monitoring systems, emergency generator panels and fire alarm system panels are located at this desk area. Exact location will be determined as needed. This location may change after review of Fire Alarm System requirements by the Fire Marshal having jurisdiction.
- B) The panel will include a Stainless Steel # 4 finished face plate for surface mounting to wall as manufactured by Monitor Controls, Innovation Industries or pre-approved equal. Additional Features and/or Operations for the Fire Command Center Elevator Panel shall include the following:
- 1) The means shall enable emergency personnel within the building to establish two-way communications to each car individually. Two-way communication shall be established without any intentional delay and shall not require intervention by a

person within the car. The means shall override communications to outside of the building and comply with the following requirements:

- a) Two-way communications, once established, shall be disconnected only when emergency personnel outside the car terminates the call.
 - b) Once the two-way communication has been established, the visual indication within the car shall illuminate. The visual indication shall be extinguished when the two-way communication is terminated.
 - c) Once the communications have been established, a message shall be displayed on the same panel as the phone push button, that is activated by emergency personnel to indicate that help is on-site. The message shall be permitted to be extinguished where necessary to display a new message or when the communications are terminated.
 - d) Operating instructions shall be incorporated with or adjacent to the two-way communication outside the car.
 - e) On the same panel as the phone push button, messages shall be displayed that permit emergency personnel to communicate with and obtain responses from a trapped passenger, including a passenger who cannot verbally communicate or hear.
 - f) A means to display video to observe passengers at any location on the car floor, to emergency personnel for entrapment assessment, shall be provided.
 - g) Cutting and patching as may be required at the location of the lobby communication device is by Elevator Contractor.
 - h) Conduit, as required, from the machine room or from inside hoistway junction box(es) at the designated floor to elevator lobby phone panel at designated location as required.
 - i) Elevator contractor is responsible for all elevator related wiring to the lobby phone panel and/or elevator panel of the fire command center.
- 2) Digital Position Indicator with 1-inch display numerals including direction of travel indicator for each elevator.
 - 3) Elevator emergency or standby power selector switch(es), and emergency generator status indicator for elevators including lighted jewel indicating power status with proper labeling in conformance with ASME A17.1 & applicable Building Code.
 - a) A selector switch marked "ELEVATOR EMERGENCY POWER" in red lettering a minimum of 5 mm (0.25 in.) in height that is key-operated shall be provided to permit the selection of the elevator(s) in each bank of elevators to operate on the emergency or standby power system. The key shall be Group 3 Emergency Operation Key as required. The selector switch positions shall be marked to correspond with the elevator identification number and a position marked "AUTO."

- b) An illuminated signal marked “ELEVATOR EMERGENCY POWER” shall be provided in the elevator lobby at the designated level to indicate that the normal power supply has failed, and the emergency or standby power is in effect for one or more of the cars in this group operation.
- c) The transfer between the normal and the emergency or standby power system shall be automatic.
- 4) Fire Service Phase I Key Switch and Fire Service indicator lighted jewel matching main floor hall operating panel. Reset position shall not be incorporated in switch.
- 5) **Fire Department Communications System:** Plug connection for Fire Department Communications System shall be provided in Fire Command Center Elevator Panel which shall provide communications for Fire Department personnel from the Fire Command Center Elevator Panel into each elevator car.
- 6) Engraved labeling for each elevator number and function. No applied plates or labels.
- 7) Car call key switch to lobby/egress floor of each elevator.
- 8) Lobby Park key switch for each elevator.
- C) **Fire Command Center Approval:** Fire Command Center Elevator Panel must be approved by Owner and Consultant prior to Contractor ordering fixtures.

2.8 HALL FIXTURES

- A) **Hall Stations – General:** New Hall Stations shall be flush mounted. Buttons shall illuminate to indicate call has been registered at that floor for the indicated direction. Faceplates shall be # 4 Brushed Stainless-Steel finish. Provide one set of risers per elevator. NOTE: Floors 17-23 have custom magnetic hall stations and this design should be utilized for new fixtures. Provide new plates and new components in lieu of full fixture would be acceptable for these floors. This bank is the only bank with this design.
 - 1) Hall stations shall be of one-piece construction, flush mounted.
 - 2) Designated level hall station (Floor designation “1”) shall be of two (2) piece construction and flush mounted.
 - a) Lower section to have hall station push button(s), in case of fire use stair signs and Phase 1 Firefighter’s Service key switch, with instructions.
 - b) Upper section to have devices for emergency power operation and emergency communications monitoring.
 - 3) All other hall stations shall be of one (1) piece construction and contain all required switches and signage as required by this specification.
 - 4) All switches, fixtures and pushbuttons shall be by Monitor Controls, Innovation Industries or pre-approved equal.

- 5) All push buttons to be tamper resistant Innovation Industries PB 39, Flush Button with Illuminated Halo and Center Jewel or pre-approved equal.
- 6) All Hall Stations shall be # 4 Brushed Stainless Steel.
- 7) In case of fire use stair signs shall be engraved into the hall station panel with exact signage as per ASME A17.1 Code. No adhesive type applied signage plates will be accepted at this hall station.
- 8) All hall and car push button assemblies shall include long life LED type lamps.
- 9) Each terminal station shall contain one illuminating push button and other applicable accessories, including hoistway access switches as required by this specification.
- 10) Each intermediate station shall consist of two illuminating push buttons, one for the up direction and one for the down position.
- 11) Phase 1 Firefighter's Service key switch, with instructions, shall be incorporated into the hall station at the designated level. Fire Service instructions as per ASME A17.1 Safety Code for Elevators and Escalators shall be engraved in the main floor hall station panel.
- 12) Local Telephone Line Status Monitoring: The telephone system for the elevators shall be compliant with the requirements of the ASME A17.1, Requirement 2.27 and will include a verification means as required by the ASME A17.1 code. If the verification means determines that the telephone line or equivalent means is not functional, an audible and illuminated visual signal shall be activated. A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a "FIRE RECALL" switch.
 - a) A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a "FIRE RECALL" switch.
 - b) Verification of the telephone line operability shall be automatically performed at least on a daily basis and shall not require activation of the two-way communications link(s).
 - c) The visual signal shall be located at the designated landing in the vicinity of the "FIRE RECALL" switch, be visible to elevator user(s), be labeled "ELEVATOR COMMUNICATIONS FAILURE" in red letters a minimum of 5 mm (0.25 inch) high, illuminate intermittently and continue to illuminate intermittently until the telephone line or equivalent means is functional.
 - d) The audible signal shall be 10 dBA minimum above ambient but shall not exceed 80 dBA measured at the designated landing "FIRE RECALL" switch, sound at least once every 30 s with a minimum duration of half a second and continue to sound until silenced by authorized personnel or the telephone line or equivalent means is functional.
 - e) The means to silence the audible signal shall be accessible only to authorized personnel. The signal when silenced shall remain silent unless activated by the next verification.

13) Hoistway Access Switches: New Hoistway Access Switches shall be provided and installed adjacent to the hoistway landing with which it is associated.

- a) The switch shall be installed a minimum of 1,200 mm (48 in.) and a maximum of 1,825 mm (72 in.) above the floor measured to the centerline of the switch, adjacent to or part of the hoistway entrance at the landing with which it is identified and shall be located on the wall outside of the hoistway within 300 mm (12 in.) of the entrance frame or on the hoistway entrance frame or jamb.
- b) The switch shall be labeled "ACCESS" and shall be a three-position switch, labeled "UP," "OFF," and "DOWN" (in that order), with the "OFF" position as the center position. The switch shall be rotated clockwise to go from the "UP" to "OFF" to "DOWN" positions.
- c) The switch shall be of the continuous pressure spring-return type and shall be operated by a cylinder-type lock having not less than a five-pin or five disk combination, with the key removable only when the switch is in the "OFF" position.
- d) The key shall be Group 1 Security.

B) Controlled Access Operation - Card Reader: Car calls from car operating panel may be entered only in conjunction with the access control system which provides the elevator controller with signals to enable/disable car calls. A card reader, provided by others, shall be installed in the car station to provide authorized persons with ability to enter car calls for individual openings as determined by the access control system.

- 1) The contractor shall mount the card reader behind a glass cut out (as provided by other Sections) at the proper ADA/accessibility height on the face of the car control station panel. Wiring from the card reader shall be brought from the elevator car, through the traveling cable, and to the elevator machine room. Reader shall have a controller in the elevator machine room which shall be hard wired into the elevator control system under this section to individually enable/disable each car call button. Coordinate with other Sections and provide wiring between readers and controllers as directed by Access Control Installer.

C) Elevator Monitoring System: The contractor shall provide a microprocessor based elevator monitoring system in the Security Desk at the Plaza level. The system shall be capable of monitoring elevator status and security features. The functions shall include the capability to change security car and corridor call lockouts per elevator & floor.

- 1) Communication between the elevator control equipment and the elevator monitoring system in the Security Desk at the Plaza level shall be accomplished through an Ethernet connection in each machine/control room. The contractor shall be responsible for connection from the elevator controller to the Ethernet port in each elevator machine/control room.

D) Hall Position Indicators: Provide new hall position indicator as follows:

- 1) New 2-inch electronic segmented digital position indicators shall be provided and the position indicator shall be provided at the Main Lobby Floor landing above the door with a faceplate mounted at a 20-degree angle for viewing. Digital characters to correspond to the floors as listed in the Elevator System Description, Part 1.7 of this specification. The digital display shall be Blue LED.
 - 2) As the car travels, its position in the hoistway shall be indicated by the illumination of the alpha/numeric character corresponding to the landing which the elevator is stopped or passing.
 - 3) Position indicator shall have new tamper resistant, arrows thru engraved, clear epoxy filled, car-directional lanterns located on both sides of the position indicator with one for up direction travel and a second for the down direction travel. The up direction indicator will illuminate in green and the down indicator will illuminate in red color. The lantern bars, when illuminated, will indicate the intended direction of travel. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop. The lantern shall remain illuminated until the door(s) begin to close.
- E) **Hall Lanterns:** New tamper resistant, arrows thru engraved, clear epoxy filled, hall lanterns shall be installed adjacent to hoistway openings. New hall lanterns shall replace the existing hall lanterns.
- 1) The lantern bars, when illuminated, will indicate the intended direction of travel. The lanterns will illuminate, and a signal will sound when the car arrives at a floor where it will stop. The lanterns shall remain illuminated until the door(s) begin to close.
- F) **Lobby Phone:** The elevator travel exceeds sixty feet (60 ft) requiring a two-way voice communication means within the building to be provided.
- 1) The means shall enable emergency personnel within the building to establish two-way voice communications to each car individually. Two-way voice communication shall be established without any intentional delay and shall not require intervention by a person within the car. The means shall override communications to outside of the building and comply with the following requirements:
 - a) Two-way voice communications, once established, shall be disconnected only when emergency personnel outside the car terminates the call.
 - b) Once the two-way voice communication has been established, the visual indication within the car shall illuminate. The visual indication shall be extinguished when the two-way communication is terminated.
 - c) Operating instructions shall be incorporated with or adjacent to the two-way voice communication outside the car.
 - d) Cutting and patching as may be required at the location of the lobby communication device is by Elevator Contractor.

- e) Conduit, as required, from the machine room or from inside hoistway junction box(es) at the designated floor to elevator lobby phone panel at designated location as required.
- f) Elevator contractor is responsible for all elevator related wiring to the lobby phone panel and/or elevator panel of the fire command center.
- l) **Signal Fixture Illumination and Design:** All illuminated signal devices including, but not limited to, car operating panel pushbuttons, hall call pushbuttons, hall lanterns, position indicators, direction indicators, and related visual signaling devices shall utilize **blue illumination**. All illumination shall be consistent in color, intensity, and appearance throughout the elevator group. New fixtures should match as closely as possible to the Tower I Lowrise fixtures that are being retained.
- G) **Hall Fixtures Approval:** Hall fixtures listed above must be approved prior to ordering fixtures by Contractor.

BID ITEM 001C SPECIFICATION FOR MODERNIZATION OF LOW RISE ELEVATORS

**Williams Center Tower II
2 West 2nd Street, Tulsa, OK 74103**

FIVE (5) LOW RISE TRACTION PASSENGER ELEVATORS (Elevators 1-5)

1 GENERAL

1.1 SUMMARY

- A) This section specifies required work to complete the modernization of Five (5) Traction Elevators.
- B) Elevator work includes:
 - 1) Commercial, standard electric traction elevators.
 - 2) Elevator car and hoistway signal equipment.
 - 3) Operation and control systems.
 - 4) Patching, painting etc. as indicated.
 - 5) Accessibility provisions for physically disabled persons.
- C) Engineering, equipment, labor, machines, control systems, devices and accessories as required for safely operating the specified elevators at rated speed with rated capacities.
- D) Delivery, staging, and hoisting of new equipment. Hoisting, dismantling, removal and disposal of existing equipment. Repair, cleaning, and painting of reusable equipment.
- E) Materials and accessories as required for completing the elevator modernization.
- F) Hoistway, pit and machine room barricades for safety as required.
- G) Required hoisting, hoisting permits and traffic coordination and/or permits with local jurisdictions and the State of Oklahoma as required.
- H) Required permits and coordination and/or permits with local jurisdictions, Bureau of Elevator Safety and the State of Oklahoma as required.

1.2 DEFINITIONS

- B) The following definitions shall be used throughout all general conditions, specifications and contract documents except where superseded in those documents.
- 1) "Owner": Cherokee Nation Businesses.
 - 2) "Consultant": ATIS.
 - 3) "Contractor": The Elevator Contractor unless stated differently.
 - 4) "Contract": The Contract for the elevator modernization and other related work shall be deemed to be the Elevator Specifications provided to Contractor prior to execution.
 - 5) "Contract Documents": The Contract for the elevator modernization and other related work to the elevator of the building, the Elevator Specifications (the "Specifications") and any Addendum shall comprise the Contract Documents. Additional Contract Documents may be created and incorporated upon written agreement by Owner and Contractor. Notwithstanding, any documents not furnished hereunder shall not be binding upon Contractor until such time Contractor is furnished with same and specifically accepts in writing.
 - 6) "Contract Sum": The amount set forth in the Contract as priced by the "Contractor" for Bid Items, for Contractor's performance of the Work.
 - 7) "Direct Labor Costs": Wages or salaries, which can be properly identified with and charged to one specific product or service. Direct labor cost shall include all direct labor employee benefit costs and burdens. Employee benefits shall include the employer's cost contributions for health and welfare, injury compensation, Federal and State Unemployment and Social Security taxes. It shall also include a burden factor to recover the cost of paid absence due to Federal Holidays, vacation, and election days required by the Department of Labor Wage Determinations. Other benefit costs including retirement contributions and paid sick leave may be included where identifiable and payable by the Contractor.
 - 8) "Direct Labor Hours": Those hours actually expended in the accomplishment of direct labor costed work.
 - 9) "Direct Materials Cost": The actual vendor invoice charges for materials used for performance of work under this contract. Direct material costs shall include transportation charges when such charges are included on the invoice by the vendor, as well as any discounts allowed for prompt payment and discounts or rebates for core value of salvage value that accrue to the Contractor. When questions arise concerning the cost of materials, material costs will be based on the lowest of quotes provided by the Contractor from at least three different commercial vendors.
 - 10) "Code": All applicable laws and codes, including but not limited to the electrical, fire, building, and Safety Codes for Elevators and Escalators codes designated by

any authority having jurisdiction as detailed in the codes and standards reference section of this specification.

- 11)“Jurisdictional Authority”: The authority having jurisdiction, the organization, office, or individual responsible for enforcement of the associated Elevator Code(s). Where compliance with these Codes has been mandated by legislation or regulation, the “Jurisdictional Authority” is the regulatory authority.
- 12)“Component” or “Component Part”: Any part of any item or system that is detachable or removable from the main body or main assembly of the item or system.
- 13)Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that reference is made to this specification and the drawings accompanying this specification unless stated otherwise.
- 14)Where “as directed”, “as required”, “as permitted”, “approval”, “acceptance”, or other words of similar import are used, it shall be understood that direction, requirement, permission, approval, or acceptance of the Owner is intended unless stated otherwise.
- 15)“Work”: The services to be completed by Contractor are as specified in the Contract Documents. This Work includes all Services necessary; material and labor required to provide and install and/or repair equipment as specified under this specification. Schedules and completion dates shall be agreed to in writing by both parties before becoming effective.
- 16)“Provide”: Provide all materials and labor required to furnish and install and or repair.
- 17) “Services”: Services shall include, but shall not necessarily be limited to, all labor, transportation, supplies, materials, parts, tools, scaffolding, machinery, hoists, employee safety equipment, equipment, lubricants; supervision, applicable taxes, and all other work and materials expressly required under this Contract or reasonably inferred whether or not expressly stated herein necessary to maintain all equipment covered under this specification.
- 18)“Fire Alarm Contractor”: Contractor approved to work on Fire Alarm System installed in Williams Center Tower II, 2 W 2nd St, Tulsa, OK 74103.
- 19)“Subcontractor”: A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work and Services at the site. All Subcontractors must be licensed and insured and must provide proof of adequate insurance in the amounts specified herein prior to the commencement of any portion of the Work.

1.3 CODE AND STANDARD REFERENCES

- A) All codes and standards referenced in this specification will be to the edition of the references as detailed in this section. All materials and Work and Services to be

performed under these specifications shall be in compliance with the Codes listed in this section or as determined by the authority having jurisdiction.

- B) Comply with applicable PROPERTY STATE Regulatory Requirements, Building Codes and Elevator Codes at the project site, including but not limited to the following:
- 1) ASME A17.1-2004 Safety Code for Elevators and Escalators
 - 2) ASME A17.3-2004 Safety Code for Existing Elevators and Escalators
 - 3) ASME A17.2-2004 Guide for Inspection of Elevators and Escalators
 - 4) ADAAG, Americans with Disabilities Act Accessibility Guidelines
 - 5) ASCE 24 Flood Resistant Design and Construction
 - 6) NFPA 13-2019 Standard for the Installation of Sprinkler Systems
 - 7) NFPA 70-2020 National Electrical Code
 - 8) National Electric Code (NEC)
 - 9) NFPA 80, Fire Doors and Windows
 - 10) ANSI/UL 10B, Fire Tests of Door Assemblies
 - 11) NFPA 72-2019 National Fire Alarm Code
 - 12) NFPA 101 Life Safety Code
 - 13) O.S.H.A. Requirements for construction and repairs of existing buildings
 - 14) Elevator Industry Field Employees' Safety Handbook 2020
 - 15) Americans with Disabilities Act (ADA)
 - 16) Any and all onsite workmen and receiving of products to site are required to follow security and safety procedures as per policies due to facility regulations

1.4 RELATED WORK BY OTHERS

- A) This project will be a “turn-key” project with all work requirements included under the Related Work by Others section to be provided by the Elevator Contractor unless specifically stated. All work necessary for a complete and useable elevator system, shall be the responsibility of the Elevator Contractor. Specifically, to include non-traditional Contractor work detailed in Part 1.4 in addition to traditional Contractor work as detailed in all other sections of this specification. All materials and work to be performed under these specifications shall be in compliance with the codes listed in Part 1.3 CODE AND STANDARD REFERENCES or as determined by the authority having jurisdiction. As work progresses, Contractor shall consult with their Subcontractors, examine the Work installed by Subcontractors, and resolve all conflicts without expense to Owner and/or Consultant.
- B) **Machine Room HVAC:** Machine room HVAC is required, to maintain temperature and humidity to between 55 deg F and 90 deg F with relative humidity of not more than 85%

non-condensing. The Elevator Contractor shall provide actual calculations for total anticipated heat loads generated by all elevator machine room equipment.

- 1) Machine room HVAC must be positioned as approved by the Elevator Contractor and consultant. There shall be no drain lines or condensation allowing water in the machine room.
- 2) Dedicated HVAC system for machine room is required to have an electrical disconnect lockable in the off position with proper labels identifying source of power and purpose.
- 3) HVAC Contractor shall provide HVAC receptacle or disconnect switch as required for the installation of HVAC system by HVAC Contractor.
- 4) HVAC Contractor is responsible for providing electrical power and code compliant disconnect switch for installation of HVAC equipment.
- 5) Remote systems shall have a proper thermostat inside the machine room.
- 6) Any existing vents in the machine room will be properly covered and protected.

C) **Fire Alarm:** Fire alarm including heat and smoke sensing devices as per NFPA 70 National Electrical Code and NFPA 72 National Fire Alarm.

- 1) Verify that proper connections exist for fire recall devices to the elevator controllers. If required, provide connection from new or existing fire recall devices to the elevator controllers in machine room. For each elevator within the building, a minimum of three separate elevator control circuits shall be terminated at the designated elevator controller within each elevator machine room in accordance with NFPA 72, section 21.3. Operation of the elevator shall be in accordance with Section 2.27 of ASME A17.1 Safety Code for Elevators and Escalators. The smoke detectors or other automatic fire detection as permitted by NFPA 72, shall actuate the elevator control circuits as detailed in NFPA 72.
- 2) Fire alarm contractor shall demonstrate at time of elevator inspection, compliance and testing of all alarm initiating devices as required by ASME A17.1 Safety Code for Elevators and Escalators, ASME A17.2 and NFPA 72 National Fire Alarm Code.
- 3) Installation of alarm system and devices shall conform to ASME A17.1 Safety Code for Elevators and Escalators, and NFPA 72 including NFPA 70 NEC.
- 4) All conduit and wiring requirements for Fire Alarm System work is the responsibility of the Fire Alarm Contractor.

D) **Emergency Generator:** These elevators are provided with emergency generator power. Emergency generator personnel shall demonstrate system and tests at completion of each elevator for inspection as required by the applicable Building Code, Jurisdictional Statutes, Rules & requirements and ASME A17.1 Safety Code for Elevators and Escalators.

- 1) Emergency power in the building is capable for providing only power to one (1) of two (2) elevator cars in the building at the same time.

- 2) Verify the existence of code compliant emergency power supply transfer switch. If existing transfer switch is not code compliant, provide and install emergency power supply transfer switch, wiring and auxiliary contacts as required by applicable Building Code and NFPA 70 National Electrical Code.
- 3) Emergency generator configuration, installation, wiring including conduit to elevator controller; repair, transfer switches including elevator selector options, connections or testing with or standby or emergency power systems shall be coordinated and completed by emergency generator service contractor. Emergency generator personnel shall demonstrate system and tests at completion of each elevator for inspection as required by applicable Building Code, Jurisdictional Statutes, Rules & requirements, and ASME A17.1 Safety Code for Elevators and Escalators
- 4) An illuminated signal marked "ELEVATOR EMERGENCY POWER" shall be provided in the elevator lobby at the designated level to indicate that the normal power supply has failed and the emergency or standby power is in effect for the elevator. This will be provided with the elevator hall station fixtures for the designated landing.
- 5) Generator contractor (under contract to the elevator contractor) shall provide signal in transfer switch to elevator controller that the building is on emergency standby power.
- 6) The operation of elevator cars on emergency power shall be determined through a selector switch capable of automatic or manual selection of the car to be operated by emergency power.
- 7) Elevator Contractor will provide new elevator controllers capable of required emergency power operations as detailed in this section, including sequencing operation for both elevators and conformance with the requirement detailed from the Building Code.
- 8) Current Building Code Chapter 30, Section 3003, Emergency Operations requires the following:
 - a) 3003.1 Standby Power. In buildings and structures where standby power is required or furnished to operate an elevator, the operation shall be in accordance with Sections 3003.1.1 through 3003.1.4..
 - b) 3003.1.1 Manual Transfer. Standby power shall be manually transferable to all elevators in each bank.
 - c) 3003.1.3 Two or More Elevators. Where two or more elevators are controlled by a common operating system, all elevators shall automatically transfer to standby power within 60 seconds after failure of normal power where the standby power source is of sufficient capacity to operate all elevators at the same time.
 - d) 3003.1.4 Venting. Where standby power is connected to elevators, the machine room ventilation or air conditioning shall be connected to the standby power source.

- e) Emergency Power has been verified to be capable of operating only one elevator at a time in the building and other building loads concurrently. Key operated sequencing will be required.
- f) Contractor, or Generator Subcontractor, shall provide signal in transfer switch to elevator controllers that the building is on emergency standby power.

E) Sprinklers: Currently there are no sprinklers located in the machine room.

- 1) If sprinklers are required by local Fire Officials a code compliant shunt trip breaker would need to be installed and located for disconnecting power to the elevator in conformance with applicable codes.
- 2) Where elevator equipment is located or its enclosure is configured such that application of water from sprinklers could cause unsafe elevator operation, means shall be provided to automatically disconnect the main line power supply to the affected elevator and any other power supplies used to move the elevator upon or prior to the application of water.
- 3) When sprinklers are installed not more than 600 mm (24 in.) above the pit floor, the following shall apply to elevator electrical equipment and wiring in the hoistway located less than 1,200 mm (48 in.) above the pit floor, except earthquake protective devices conforming as required to ASME A17.1 Part 8.4); and on the exterior of the car at the point where the car platform sill and the lowest landing hoistway door sill are in vertical alignment.
 - a) Elevator electrical equipment shall be weatherproof (Type 4 as specified in NEMA 250).
 - b) Elevator wiring, except traveling cables, shall be identified for use in wet locations in accordance with the requirements in NFPA 70
- 4) If sprinkler head(s) are located in the machine room or hoistway, it will be required to install a heat detector within 24" of each sprinkler in order to automatically disconnect the main line power supply to the affected elevator(s) upon or prior to the application of water, in accordance with ASME A17 Safety Code for Elevators and Escalators, and NFPA 72 National Fire Alarm Code.

F) Building General Construction: Building general construction conditions will include, work detailed in this section, including cleaning and painting of miscellaneous surfaces. The Elevator Contractor shall not be responsible for all work as detailed in this section. All construction, cleaning and painting other than equipment directly supplied by the Elevator Contractor shall be performed by Work by Others.

- 1) Verify proper installation of 1 ½ hour "B-Label" door to machine room to include self-closing and self-locking requirements.
- 2) Verify proper Class ABC Fire Extinguisher in machine room permanently mounted and conveniently located to the access door as required by ASME A17.1 Safety Code for Elevators and Escalators.
- 3) Verify that all non-elevator related pipes, wiring, conduit have been removed and openings in machine rooms and hoistways to include a 2-hour fire rating. All foreign

pipes, wiring or conduit not in use or directly related to the elevator system shall be removed from machine rooms and hoistways.

- 4) All sills must be substantially level to all adjacent finished flooring surfaces.
 - 5) Machine room warning sign "Danger Authorized Personnel Only" shall be provided on the machine room door as required by NFPA 70 NEC.
- G) Each contractor will be required to provide any cutting, patching including painting to match existing finishes of building.
- H) All above work and materials to be performed to meet compliance with applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code, NFPA 13 National Sprinkler Code and NFPA 72 Fire Alarm Code or as determined by the authority having jurisdiction.
- I) Failure by above associated contractors to perform required testing at time of scheduled elevator acceptance testing and inspection will require full advance payment by contractor at fault for all expenses relating to re-inspection, permit and scheduling fees to building management.
- J) **Telephone Lines:** Provide a **cellular** non-proprietary line for the elevators.
- 1) Telephone lines and wiring to elevator controllers for telephone system including all wiring in machine room to be installed inside conduit as per NFPA 70 NEC.
 - 2) All emergency telephone devices shall include a minimum of 4 hours emergency backup power including power from emergency generator if supplied.
- K) **Electrical Requirements:** Electrical work required for elevator modernization shall be the responsibility of the Elevator Contractor. Electrical requirements shall include the following:
- 1) All Electrical work must be coordinated and scheduled with, at least 7 days' notice, with the building owner. Elevators shall be removed from service while electrical trades are working.
 - 2) Electrical requirements for hoistway and machine room HVAC, GFCI receptacles and disconnects, as required by NFPA 70, NEC and ASME A17.1 Safety Code for Elevators and Escalators. Additionally, Electrical Contractor shall provide and install conduits and wiring required for communication devices as detailed in this section.
 - 3) **Main Line Disconnect:** Main line disconnect is to be verified by Elevator Contractor as appropriate size and type for power requirements of new elevator equipment prior to installation. Main line disconnect for elevators shall not be used for other conductors to pass thru disconnect switch boxes.
 - a) If existing disconnect is not satisfactory, Electrical Contractor shall provide new disconnect for elevator main line power in accordance with NFPA 70, NEC. The disconnecting means shall be an enclosed externally operable fused motor circuit switch capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch used as the disconnecting means and shall remain in place with or

without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.

- 4) **Cab Lighting Disconnect:** Cab Lighting disconnect is to be verified by Electrical Contractor as appropriate size and type for power requirements. Cab Lighting disconnect for elevators shall not be used for other conductors to pass thru disconnect switch boxes. Electrical Contractor shall provide new disconnect(s) for elevator cab lighting in accordance with NFPA 70, NEC.

- a) The disconnecting means shall be an enclosed externally operable fused motor circuit switch capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted as the means required to be installed at and remain with the equipment.
- b) Cab Light Source: A separate branch circuit shall supply the cab lights, receptacle(s), accessory equipment (alarm devices, alarm bells, monitoring devices not part of the control system), auxiliary lighting power source, and ventilation on each elevator car. The overcurrent device protecting the branch circuit shall be located in the elevator machine room or control room/machinery space or control space. Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

5) **Machine Room Lighting and Receptacles:**

- a) A separate branch circuit shall supply the machine room or control room/machinery space or control space lighting and receptacle(s).
- b) Minimum lighting in machine room shall be 19 foot candles ("fc").
- c) Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

6) **Pit Lighting and Receptacle(s):**

- a) Verify that current pit lighting meets minimum 10 fc. at all locations in the pit. If pit lighting is below 10 fc requirement, provide additional lighting as detailed in this specification.
- b) Verify that a separate branch circuit is installed to supply the hoistway pit lighting and receptacle(s).
- c) Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.
- d) The lighting switch shall be so located as to be readily accessible from the pit access door.
- e) Duplex Receptacle. At least one 120-volt, single phase, 20-ampere duplex receptacle shall be provided in the hoistway pit.

- 7) **Pit Receptacles:** Pit receptacles, with GFCI protection shall be installed in NEMA 4 devices where placed within 4'-0" of pit floor. Care must be taken not to place equipment in line with elevator equipment.
- 8) Each 120-volt, single-phase, 20 ampere receptacle installed in pits, in hoistways and on elevator car tops shall be of the ground fault circuit-interrupter type for protection of personnel.
- 9) All disconnects shall be labeled according to NFPA 70 National Electrical Code including source of power, Jurisdictional Identification (Serial Number) and all required warning signs.
- 10) All disconnects shall be installed with proper clearances in accordance to the applicable provisions of NFPA 70 National Electrical Code.
- 11) All conduit and wiring in the hoistway must be checked for proper installation and properly mounted in accordance with applicable provisions of NFPA 70 National Electrical Code.
- 12) Equipment grounding and bonding shall be provided in accordance with the requirements of NFPA 70 National Electrical Code. The equipment grounding conductor will be run with the circuit conductors and shall be a copper conductor. Ground all conductors, supports, controller enclosure, and other non-current conducting metal enclosures for electrical equipment in accordance with NFPA 70 National Electrical Code. The ground wires shall be solid or stranded; insulated, covered, or bare copper, sized as required by NEC, and shall be colored green if #6 AWG or smaller, and have green tape or adhesive marking if #4 AWG or larger.
- 13) Provide new electric wiring from disconnect switches to the terminals of the new elevator controllers in their new locations, inclusive of a minimum 120 VAC, 15 AMP supply at each controller, or as required.
- 14) Provide new pit lighting and machine room lighting as per NFPA 70 National Electrical Code with enclosed and protected lamps.
- 15) All existing and new lighting fixtures in machine rooms, elevator cars and on top of car are to be suitably guarded in accordance with ASME A17.1 Safety Code for Elevators and Escalators clearance requirements and NFPA 70 National Electrical Code requirements for guarding.
- 16) Pit lighting switches and emergency stop switches shall be installed approximately 18" above first floor landing adjacent to opening and operable from side of pit access where pit ladder is installed.
- 17) Telephone lines and wiring to elevator controllers for telephone system including all wiring in machine room to be installed inside conduit as per NFPA 70 NEC. Conduit to be installed under Electrical Requirements.
- L) **Patching:** Patching of all masonry openings and drywall surfaces as required by elevator installation work as detailed below will be the responsibility of the Elevator Contractor and shall be completed with fire rating of hoistway or machine room equal or greater than 2 hours in accordance with Oklahoma Building Code.

- 1) All openings left from the removal of any surface mounted devices will be patched appropriately and surface restoration performed by the Elevator Contractor. Included in this will be the removal of old position indicators and directional indicators.
- 2) Patching of all surfaces at elevator landings will be the responsibility of the Elevator Contractor. Masonry, drywall, patching, and finishes including painting for repair of all openings as required by elevator installation work and shall be completed with fire rating of hoistway or machine room equal or greater than 2 hours in accordance with applicable Building Code and shall match or exceed the existing level of finish.
- 3) Patching of all masonry openings and drywall surfaces as required by elevator installation work inside the hoistway and machine room will be the responsibility of the Elevator Contractor. All patching shall be of a finish level equal to or exceeding the existing wall surface.

M) Coordination of Work:

- 1) Elevator Contractor shall coordinate as required with other contractors to ensure that schedules are met and all work being performed in association with the elevator modernization project is acceptable.
- 2) Before proceeding with any Work, the Contractor shall carefully check and verify all pertinent dimensions and sizes, and assume full responsibility for fitting the equipment and materials to the structure. Where the apparatus and equipment have been indicated on the drawings, the dimensions have been taken from typical equipment of the type specified in these specifications. The Contractor shall carefully check the drawings to verify that the equipment that will be actually provided will fit into the spaces available. Should the equipment not fit the specific structure shown on the drawings, all additional sub-framing members required to accommodate the equipment installation shall be provided and paid for by Contractor as part of the Work of this section. The Contractor shall submit all structural shop drawings and engineering calculations for the Consultant's review and written approval.
- 3) Contractor shall familiarize himself with the specifications, drawings, installation procedures and construction schedules for those phases of Work performed by his subcontractors. The Contractor shall also familiarize himself with the Owner's security and safety requirements and shall abide by and conform to such established regulations at all times. If the Contractor's Work or the Work of any of his subcontractors depends upon the execution of the Work of another subcontractor or upon his own Work, he shall so coordinate all phases of Work so as to avoid conflicts in installation procedures and construction schedules.
- 4) As work progresses, Contractor shall consult with his subcontractors, examine the Work installed by them, and resolve all conflicts without expense to Owner and/or Consultant.
- 5) Progress meetings shall be held at the job site, as and when requested by Owner or Consultant. The Contractor shall be represented at these meetings by persons

familiar with the details of the scope of Work and authorized to conclude matters relative to Work progress, as may be necessary to expedite completion of Work.

- 6) All above work and materials to be performed to meet compliance with applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code, NFPA 13 National Sprinkler Code and NFPA 72 Fire Alarm Code or as determined by the authority having jurisdiction.
- 7) Failure by above associated contractors to perform required testing at time of scheduled elevator acceptance testing and inspection will require full advance payment by contractor at fault for all expenses relating to re-inspection, permit, and scheduling fees to building management.

1.5 PAINTING

- A) **Cleaning and Painting of Miscellaneous Surfaces:** The Contractor shall be responsible for all miscellaneous painting as detailed in this specification. The procedures proposed for the accomplishment of the work shall provide for safe conduct of the work, careful removal and disposition of materials specified to be salvaged, protection of property, which is to remain undisturbed, and coordination with other work in progress. The work plan shall include a Safety and Health Plan describing procedures for handling monitoring, and disposition of Volatile Organic Compounds "VOCs" and other hazardous and toxic materials. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations.
- B) **Painting Provisions:** For all painting performed, the following provisions shall apply:
- 1) Provide all ferrous metals installed in the hoistway shop primed with a rust inhibitive primer.
 - 2) All cleaning or painting work that produces any vapors or fumes shall not be performed during normal business work hours. All cleaning or painting work that produces any vapors or fumes shall be performed with sufficient ventilation to prevent the vapors or fumes from permeating into the building. Work of this nature must be scheduled and coordinated with the Owner three (3) days prior to execution of work.
 - a) The procedures proposed for the accomplishment of the Work shall provide for safe conduct of the Work, careful removal and disposition of materials specified to be salvaged, protection of property, which is to remain undisturbed, and coordination with other work in progress. The Work Plan shall include a Safety and Health plan describing procedures for handling monitoring, and disposition of Volatile Organic Compounds "VOCs" and other hazardous and toxic materials. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations.
 - b) All paint products and application method must be pre-approved prior to application by Owner or Owner's agent. Paint products and application methods

are to be equal or better than existing product applicable with matching color as approved by Owner.

- c) All products of paint, thinners or cleaning agents must be pre-approved prior to use for VOC's or any additional health concerns.
- 3) Interior work zones having a volume of 1,000 cubic feet or less shall be ventilated at a minimum of 2 air exchanges per hour. Ventilation in larger work zones shall be maintained by means of mechanical exhaust. Solvent vapors shall be exhausted outdoors, away from air intakes, building occupants and workers. Building air conditioning return air inlets in the work zone shall be temporarily sealed before start of work until the prepared surfaces have dried and are free of odor. Operators and personnel in the vicinity of paint removal processes involving chemicals or mechanical action (sanding or blasting) shall wear respirators.

1.6 ELEVATOR SYSTEM DESCRIPTION

A) **Elevator Arrangement:** Quantity – Five (5) with Elevator(s) numbered as follows:

- 3) Elevator # 1 (State ID # 35110)
- 4) Elevator # 2 (State ID # 35111)
- 5) Elevator # 3 (State ID # 35112)
- 6) Elevator # 4 (State ID # 35113)
- 7) Elevator # 5 (State ID # 35114)
- 8) Specific requirements for the specific elevator or component shall be designated as such. It shall be the bidding Contractor's responsibility to review and verify as required for proper installation. Specifications for elevators include minimum requirements of elevators and it shall be the responsibility of the bidder to complete all work to code compliance.

B) **Type:**

- 1) Elevator # 1 (State ID # 35110) – Passenger – Low Rise Traction
- 2) Elevator # 2 (State ID # 35111) – Passenger – Low Rise Traction
- 3) Elevator # 3 (State ID # 35112) – Passenger – Low Rise Traction
- 4) Elevator # 4 (State ID # 35113) – Passenger – Low Rise Traction
- 5) Elevator # 5 (State ID # 35114) – Passenger – Low Rise Traction

C) **Number of Stops & Openings:**

- 1) Elevator # 1 (State ID # 35110): 14 front (labeled *P, 2 - 14) / No Rear Openings
- 2) Elevator # 2 (State ID # 35111): 14 front (labeled *P, 2 - 14) / No Rear Openings
- 3) Elevator # 3 (State ID # 35112): 14 front (labeled *P, 2 - 14) / No Rear Openings
- 4) Elevator # 4 (State ID # 35113): 14 front (labeled *P, 2 - 14) / No Rear Openings

5) Elevator # 5 (State ID # 35114): 14 front (labeled *P, 2 - 14) / No Rear Openings

D) **Rise:** All existing conditions

E) **Rated Capacity/Speed:** Maintain existing conditions

1) Elevator # 1 (State ID # 35110)

a) Capacity rated at 3500 lbs.

b) Speed rated at 500 fpm

2) Elevator # 2 (State ID # 35111)

a) Capacity rated at 3500 lbs.

b) Speed rated at 500 fpm

3) Elevator # 3 (State ID # 35112)

a) Capacity rated at 3500 lbs.

b) Speed rated at 500 fpm

4) Elevator # 4 (State ID # 35113)

a) Capacity rated at 3500 lbs.

b) Speed rated at 500 fpm

5) Elevator # 5 (State ID # 35114)

a) Capacity rated at 3500 lbs.

b) Speed rated at 500 fpm

F) **Minimum Car Inside:** Maintain existing dimensions

G) **Inside Cab Height:** Maintain existing clear headroom dimensions inside car.

H) **Entrance Width & Type:**

1) Elevator # 1 (State ID # 35110):

a) Front Openings: Single Speed Center Opening 48" x 84"

b) Rear Openings: N/A

2) Elevator # 2 (State ID # 35111):

a) Front Openings: Single Speed Center Opening 48" x 84"

b) Rear Openings: N/A

3) Elevator # 3 (State ID # 35112):

a) Front Openings: Single Speed Center Opening 48" x 84"

b) Rear Openings: N/A

4) Elevator # 4 (State ID # 35113):

a) Front Openings: Single Speed Center Opening 48" x 84"

b) Rear Openings: N/A

5) Elevator # 5 (State ID # 35114):

a) Front Openings: Single Speed Center Opening 48" x 84"

b) Rear Openings: N/A

I) **Main Power Supply:**

- 1) Elevator # 1 (State ID # 35110) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.
- 2) Elevator # 2 (State ID # 35111) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.
- 3) Elevator # 3 (State ID # 35112) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor.
- 4) Elevator # 4 (State ID # 35113) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor
- 5) Elevator # 5 (State ID # 35114) - Existing 480 VAC + or - 5% of normal, 3 Phase, 60 Cycle with a separate equipment grounding conductor

J) **Lighting Power Supply:** 120 Volts, 1 Phase, 15 Amp, 60 Hz.

K) **Stopping Accuracy:** $\pm 1/4"$ under any loading condition or direction of travel.

L) **Door Operating Equipment:** Door operating equipment shall be labeled with maximum door speed and Kinetic Energy shall not exceed 7.37 ft-lb. as required by ASME A17.1 Safety Code for Elevators and Escalators.

M) **Car Operation:**

- 1) Using a Group Operation for the elevators microprocessor-based controller, the operation shall be automatic by means of the car and hall buttons.
- 2) Provide microprocessor-based Group automatic operation control system, which utilizes on-board diagnostics for servicing, troubleshooting, and adjusting without requiring the use of an outside service tool.

1.7 **SUBMITTALS**

A) **Product data:** Submit product data for the following:

- 1) Elevator car and hoistway fixtures.
- 2) Operation, control, and signal systems.
- 3) Motor & traction driving machine, speed governor and all major components of system including layout for machine room if equipment layout is changed all major components of system.
- 4) Elevator cab interior materials and finishes.

B) **Shop drawings:** Provide the following if equipment existing layout is changed.

- 1) Show equipment arrangement in the machine room, pit and hoistway plans, elevations, sections and details of assembly, erection, anchorage, and equipment location as required.

- 2) Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
 - 3) Show floors served, existing travel distances, maximum loads imposed on the building structure at points of support and all similar considerations of the elevator work.
 - 4) Indicate electrical power requirements and branch circuit protection device recommendations and locations.
- C) **Certificates:** Inspection and acceptance certificates of elevator system installation.
- D) **Submittals at Project Close-Out:**
- 1) **Operation and Maintenance Data:** Include the following:
 - a) Product User Manuals and maintenance guides.
 - b) Parts list, with recommended parts inventory.
 - a) Furnish two (2) copies of bound Product User Manuals and maintenance guides for elevators. Furnish one (1) electronic copy of all project close-out submittals to Owner.
 - 2) **Wiring Diagrams:** Provide complete as built wiring diagrams with all electrical connections of elevator systems.
 - a) Provide one set of as built wiring diagrams in the elevator machine room.
 - b) Provide one (1) additional hard copy and 1 electronic copy on separate USB Flash Drive, in PDF format to Elevator Consultant for review and delivery to Owner.
 - c) Provide legible schematic wiring diagrams of installed electrical equipment, including control equipment, and any changes and/or in field modifications.
 - d) Provide legible copy of field pull sheets and wiring notes. Pull sheets to include wire numbers and colors. List symbols corresponding to identity or markings on machine room and hoistway apparatus.
 - e) Coded diagrams are not acceptable unless fully identified.

1.8 **QUALITY ASSURANCE**

- A) **Contractor Qualifications:** Elevator Contractor shall provide pre-engineered elevator system components by manufacturer(s) regularly engaged in the manufacture of elevator systems and that complies with ASME A17.1 Safety Code for Elevators and Escalators in its entirety, Jurisdictional Statutes, Rules & requirements, all applicable sections of the applicable Building Code as referenced above in its entirety, and additional requirements specified herein.
- B) **Quality Assurance Program:** The Contractor shall have a documented, on-going quality assurance program.

- C) **Installer Qualifications:** The Elevator Contractor must have not less than ten years of satisfactory experience installing elevators equal in character and performance to the project elevator. All mechanics employed to work onsite must be certified and/or licensed by appropriate federal and/or state regulatory agencies to meet federal and/or local certification requirements in maintenance, repair, alteration, and construction of elevators. There shall not be allowed onsite more than one helper or assistant unlicensed per onsite licensed mechanic.
- D) **Permits and Inspections:** The Contractor shall be responsible to obtain all permits, licenses and other fees that are necessary for proper completion and execution of the Work, which are specifically included in the Contract Sum, but not limited to required Jurisdictional Authority permits as required by Jurisdictional Statutes, Rules & requirements for Alteration Permits, and local jurisdiction permits. Elevator Contractor is responsible for proper posting of all required licenses, permits and safety documentation.
- E) **Inspection and testing:** Elevator Installer shall obtain and pay for all required tests, permits and fees for elevator installation as required by the State of Oklahoma.
- 1) Owner has designated ATIS as their consultant on this project. ATIS, in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Inspection and Test Requirements, may be present for and review all acceptance inspections for this elevator. Elevator Installer in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Inspection and Test Requirements will schedule and coordinate all acceptance tests and arrange for inspection for this elevator. Elevator Contractor must notify building owner and elevator consultant 5 days prior to inspection advising of the date and time of all inspections and tests. Elevator consultant must qualify and approve any inspector prior to inspection other than inspectors employed by the Authority Having Jurisdiction (AHJ).
 - 2) Elevator Contractor shall be solely responsible for the application, securing, maintaining, completion and posting of existing elevator permits as per Jurisdictional Statutes, Rules & requirements, and delivery to the Owner upon completion and acceptance of elevator work, the certificate of operation.
 - 3) Failures by Contractor to successfully perform required testing and pass alteration acceptance inspection, at time of scheduled elevator acceptance testing, will require a re-inspection. All costs for re-inspection required due to Contractor fault will be paid by Contractor.
- F) **Signage:** All signage as required by the applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code and NFPA 72 Fire Alarm Code to be posted in elevator lobbies, fire alarm panels, disconnects, machine rooms and machine room doors.
- G) **Non-Proprietary Controls:** Letter of guarantee that any and all equipment installed shall be completely non-proprietary and shall not require the need for specialized testing or programming tools currently or in the future. Future information for trouble shooting or adjusting shall be available to any licensed elevator maintenance contractor by the supplier of the control system at a reasonable cost comparable to

cost of competitive parts within marketplace. Contractor shall provide complete schematics and wiring diagrams for control systems including information for change of program, on board diagnostics or mnemonics, or other on board switches or settings.

- 1) Any equipment that is provided for installation which would require any specialized tool, laptop computer, devices, manuals, source codes, access codes, objects, passwords and/or software to input parameters, make adjustments, troubleshoot, perform diagnostics, perform testing functions or required for any other type of maintenance or repair function shall be included with the modernization cost of this contract and will become the property of the Owner. At the time of bid submission, this shall be identified as such on the bid.
 - 2) Any controller by a manufacturer other than specified must be pre-approved prior to bid. Letter stating agreement to the above compliance shall be signed by an officer of Contractor and shall be notarized.
- H) **Contractor's Safety and Health Plan:** The contractor shall have in place a safety and health plan that, at a minimum, addresses OSHA requirements. The safety and health plan shall comply with the requirements of the Elevator Industry Field Employees' Safety Handbook. The program shall include job site cleanliness, hard hats, safety glasses, safety shoes, hearing protection, fall protection, proper use of ladders, barriers around hazards and proper scaffolding.
- I) **Protection of Spaces:** Contractor is responsible for all protection both inside and outside of hoistway to all personnel inside or outside of hoistway areas. This includes providing and maintaining of protective barricades at hall entrances, screening of each hoistway during work and protection from trip hazards due to storage or use of materials or drop cords.
- 1) Contractor is to provide due care to protect building flooring, walls and other surfaces from excessive debris, dirt or damage due to workmen onsite.

1.9 DELIVERY, STORAGE AND HANDLING

- A) Deliver elevator materials, components, and equipment in manufacturer's protective packaging.
- B) Elevator equipment disassembled for replacement shall be neatly stored prior to removal from site and disposal, which is responsibility of Elevator Contractor.
- C) Store materials in a dry protected area if designated by owner. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling, or deterioration.
- D) Elevator Contractor shall be responsible for the material handling of all elevator equipment to site storage area. Elevator Contractor will be responsible for keeping all stored materials inside storage area with lock and key.

- E) Elevator Contractor's sole responsibility and liability shall be limited to the extent Elevator Contractor is at fault; and shall not be responsible for material once material arrives at jobsite.
- F) Elevator Contractor shall be responsible for the removal the existing equipment from the machine rooms and placement of the new equipment in the machine rooms.
- G) Owner shall afford the Contractor and separate contractors' reasonable opportunity for storage of materials and performance of their activities on the property and shall cooperate in coordinating operations with such other activities.
- H) Locked and protected storage for Elevator Contractor's tools or materials at site is contractor's responsibility. Key will be provided for elevator machine room, which is located on roof level of building, and can be utilized for storage or securing of tools and equipment. Additional storage may be available and will require coordination with property for identification and requirements for use.
- I) If the Elevator Contractor needs additional storage beyond what is available on site than the property will provide a single location for either a storage trailer or POD. The cost of the storage container/trailer is the responsibility of the Elevator Contractor.
- J) Authorized elevator personnel only are responsible for temporary installed barrier panels as may be required during construction to protect the openings at elevator at each floor. Panels may be removed only while the authorized elevator personnel are to perform work in the immediate area of the unprotected opening. Authorized elevator personnel shall re-install all barriers as required to maintain the original solid and safe protection to the opening prior to leaving immediate work area of the opening.

1.10 PROJECT CONDITIONS

- A) **Prohibited Use:** Elevator that is turned over to the Contractor for modernization work shall not be used for any purpose during the construction period before Substantial Completion. The elevator will only be turned over to the Owner upon completion of all modernization work, including successful completion of all required inspections and tests including acceptance by Owner and Consultant.
- B) **Painting:**
 - 1) Only paint metal work provided by Contractor or impacted by Work performed under this specification by Contractor unless specifically required in other sections of this specification.
 - 2) For all painting performed the requirements of Part 1.6 Painting shall be complied with as required.
 - 3) Pit floor should be painted at the end of the modernization.
 - 4) Machine room floor should be painted at the end of the modernization.
 - 5) Top of car should be painted at the end of the modernization.

1.11 WARRANTY

- A) **Warranty:** The Contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship.
- 1) The guarantee period shall extend to one (1) year from the date of completion or acceptance thereof by beneficial use; whichever is earlier, of each elevator.
 - 2) The guarantee excludes ordinary wear and tear or improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the Contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.
 - 3) Any defective condition or workmanship not mutually agreeable as satisfactory to building Owner and Contractor shall be determined by the independent elevator Consultant as final for the replacement, repair or continued use or product or part in question.
 - 4) In addition to Contractor's above-mentioned warranties, Contractor shall, for the benefit of the Owner, obtain and assign to Owner if necessary, warranties from the manufacturers, producers and suppliers whose products are incorporated into or used in the work performed hereunder. All work and materials provided pursuant to the warranties hereunder shall be performed at no charge to the Owner.
- B) **Warranty Response Time:** Contractor shall respond to warranty calls within one hour and be on site within 2 hours.

1.12 CONTRACT PREVENTIVE MAINTENANCE

- A) **Existing Elevator Maintenance Agreement:** In the event that a bidder is currently the provider of preventive maintenance services on the elevators and escalators that are the subject of this modernization specification, this bidder acknowledges and fully agrees that their present agreement shall terminate upon submission of a bid from their company and Award of Contract to their company, or to another Elevator Contractor bidder, for the work called for in this specification for modernization.
- 1) The existing maintenance agreement for all elevator(s) and escalators will terminate on the date that the elevator modernization contractor commences on-site work.
 - 2) The elevator modernization contractor will assume maintenance on all elevator(s) and escalators that are the subject of this modernization specification once on-site modernization work commences on the first elevator or escalator. Monthly maintenance pricing will be the pricing submitted under BID ITEM 004B – INTERIM ELEVATOR & ESCALATOR MAINTENANCE.
 - 3) Elevators and escalators taken out of service for modernization will not be billed for maintenance during any time the elevator or escalator is under modernization.
 - 4) Once all elevators and escalators are turned over for substantial use of the owner after modernization, no additional maintenance charges will be due until after the

maintenance period detailed in Contract Preventive Maintenance section herein subpart C), Modernization Maintenance Period as detailed below has ended.

- B) Follow on Maintenance Contract:** All bidders shall quote monthly cost for Preventive Maintenance Agreement for all elevators and escalators that are the subject of this modernization commencing upon completion of the warranty period specified at the end of the modernization specification but a part of this document. Submit quote based upon terms and conditions of BID ITEM 002 - ELEVATOR MAINTENANCE, as detailed in the Elevator Maintenance Specification section of this solicitation.
- C) Modernization Warranty Maintenance Period:** Maintenance service consisting of a minimum of monthly examinations, adjustments and lubrication of the elevator and escalator equipment shall be provided by the Elevator Contractor for a period of twelve (12) months after the elevators and escalators have been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the Elevator Contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour callback service at no additional charge. This service shall not cover adjustments, repairs, or replacement of parts due to negligence, misuse, abuse, or accidents caused by persons other than the Elevator Contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.
- 1) Elevator Contractor shall provide a service manual for each elevator and escalator describing monthly, quarterly, and annual maintenance tasks. Each task shall include an area for signature by a Certified Elevator Technician upon completion of task. Service manual shall also include page/s for documenting all required inspections and tests. Service manual shall contain a section to record all related maintenance, repair, and replacement information in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Part 8.6 and remain on site.
 - 2) Elevator Contractor shall provide documentation and shall perform monthly testing of fire service recall operation as per ASME A17.1 Safety Code for Elevators and Escalators and ASME A17.2.
 - 3) Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Manufacturer of original equipment shall produce parts.
 - 4) Elevator Contractor shall have a service office and full-time service personnel within 50-mile radius of the project site.
 - 5) Maintenance service shall include all required tests for inspection services as required by Jurisdictional Authority and ASME A17.1 Safety Code for Elevators and Escalators.
 - 6) Elevators or escalators taken out of service for modernization will not be billed for maintenance during any time the elevator is under modernization. Maintenance charges will be equally divided by the number of elevators and number of weeks of each month for an equivalent percentage deduction of the number of elevators

removed from service. Time not under maintenance charges is from the time of the elevator being removed from service until the time of certificate for public use.

2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A) Only products and components produced or provided by manufacturer(s) regularly engaged in the manufacture of elevator products, and that complies with ASME A17.1 Safety Code for Elevators and Escalators in its entirety, ASME A17.2, Jurisdictional Statutes, Rules & requirements, all applicable sections of the applicable Building Code in its entirety, and additional requirements specified herein are acceptable. Only Bidders deemed qualified shall be notified by Request for Bid.

2.2 MATERIALS, GENERAL

- B) **Colors, Patterns, and Finishes:** As selected by the Owner or Owner's Representative from manufacturer's full range of standard colors, patterns, and finishes.

1) Steel:

- a) Shapes and bars: ASTM A 36.
- b) Sheet: ASTM A 366, cold-rolled steel sheet, commercial quality, Class 1, matte finish, stretcher leveled.
- c) Finish: Factory-applied baked or powder coated enamel.

2) Stainless Steel:

- a) Shapes and bars: ASTM A 276, Type 300 (18-8).
- b) Tubing: ASTM A 269, Type 300 (18-8).

2.3 EQUIPMENT: MACHINE ROOM/SPACE COMPONENTS

- A) **Gearless Drive Machine:** Tower II, Elevators #1, #2, #3, #4, & #5 shall have the drive machines replaced with new gearless drive machines.

- 1) **Gearless Traction Drive Machine Assembly:** Install new Motion Control Engineering (MCE), Torin PM TMGL or equal, Gearless Traction Machine, Motor, Brake and Drive.
- 2) **Machine:** The hoisting machine shall be a gearless traction type, consisting of permanent magnet AC motor, brake and driving sheave mounted on a rigid bedplate. A large diameter, forged shaft shall serve as a support for the motor armature and for the removable drive sheave and brake drum/disc; it shall be supported by roller bearings.

- a) Steel deflector sheaves of adequate diameter and strength shall be provided as necessary and mounted in the machine room.
- 3) **Drive System:** The drive system shall be of the non-regenerative Variable Voltage Variable Frequency (VVVF) type.
 - a) The system shall be a vector controlled pulse-width modulated AC drive. The variable voltage variable frequency drive shall convert the AC power supply using a two step process to a variable voltage variable frequency power supply for use by the hoist motor.
 - b) The speed control shall be by means of vector control providing independent excitation and torque current. A digital absolute velocity encoder shall be provided giving feedback to the controller on armature position and motor speed.
- 4) **Motor:** The motor shall be AC, with class "F" insulation. The motor armature shall be dynamically balanced and supported by roller bearings of ample capacity. The armature and driving sheave shall be properly balanced for smooth, high-speed elevator performance.
- 5) **Brake:** The brake and emergency brake will be a dual system shall be a spring applied electric brake; held open by an electro-magnet actuated by a digital brake controller and designed to work as an integral part of the motor controller to provide smooth positive stops. The Brake shall be designed to automatically apply in the event of interruption of power supply from any cause. Operation and control of the brake shall be all digital. The setting and lifting of the brake shall be software based and all electronic. All adjustments and setup of the brake shall be made using a PC interface. No contactors or resistors shall be used in the actuation of the brake.
- 6) **Emergency Brake:** The emergency brake shall be a component of the dual braking system to satisfy ASME A17.1 requirements for emergency brake without the installation of a rope brake assembly.
- B) **Counterweight:** With existing counterweights, counterbalance each elevator for smooth and economical operation by cast iron or steel plate weights contained in a structural steel frame. Counterweight shall equal a complete elevator car and approximately 40 percent of the specified load. If additional weights are required, Contractor shall provide and adjust for proper balance as a part of this specification and contract.
- C) **Sheaves and Cable Guards:** Existing primary and secondary drive sheaves shall be retained and reutilized. New cable guards shall be provided as required by ASME A17.1.
- D) **Suspension Ropes:**
 - 1) **Elevator # 1-5:** Suspension ropes shall be replaced with new suspension ropes as detailed below:
 - a) Replace suspension ropes with traction steel hoist ropes of size and number to ensure proper wearing qualities, consisting of at least six strands wound

around a hemp core center. Suspension ropes shall be provided in conformance with rope data on elevator car crosshead data plate.

- b) All suspension means shall be adjusted and installed with alternating shackle rod length so that shackles do not make contact and include anti-rotation devices.
- c) Load-carrying rope must be vertically in line with shackle rod.
- d) All required labels shall be affixed after installation.
- e) All ropes are to be tensioned equally.

2) **Lubrication of Suspension Ropes:** Suspension ropes shall be lubricated as detailed below:

- a) Automatic rope lubricators shall be installed.
- b) Lubricators shall be provided with lubricant compatible with the strand and core lubricants and have good rope penetrating properties as determined by the rope manufacturer.
- c) Lubricant meeting these requirements is a light viscosity Spindle oil. It should have a Saybolt Seconds Universal (SSU) viscosity of 34 to 38 seconds at 210° F. Spindle oil lubricates and will also assist in keeping the hoist ropes clean. Spindle oil is best applied with a felt pad, wick-type lubricator.
- d) After installing rope lubricators, the level of lubrication shall be monitored to ensure correct amount of lubrication is applied. To verify correct amount of lubrication, check for a film of lubricant in the drive sheave grooves. With the machine out of service, carefully wipe the groove. If the groove is dry, field lubrication is required.
- e) The frequency of additional rope cleaning and lubrication shall be determined by the Elevator Maintenance Contractor.

3) **Rope Tensioning:** All ropes are to be tensioned equally.

- a) Suspension members are considered to be equally tensioned when the smallest tension measured is within 10% of the highest tension measured. Equal tension shall be maintained between individual suspension members in each set.
- b) Written results of the measurement of the tension of all suspension members for traction elevator shall be provided and maintained in the elevator machine room as permanent records that are considered the property of the Owner.

E) **Load Weighing Devices:** Draka Micelect Model # LMC Wire Rope Sensor with the LM3D Control Unit or approved EMCO equal load weighing device for 2:1 roping shall be installed to provide signals to the controller for various load monitoring and dispatching operations.

F) **Centrifugal Speed Governor:** The centrifugal speed governor shall be replaced as required to cut off power to the motor and apply the brake whenever the governor

indicates the car has excessive speed. Governor as manufactured by Hollister Whitney or equal.

- G) **Governor Tail Sheave:** Provide a complete new governor tail sheave assembly, including new sheave, bearings, shaft, tensioning components, guards, mounting hardware, and all related components required for a complete installation. Properly align, tension, and adjust the assembly for smooth, quiet, and reliable operation.
- H) **Governor Ropes:** Provide and install new governor rope as follows:
- a) Replace governor ropes with traction steel ropes of size and number to ensure proper wearing qualities, consisting of at least six strands wound around a hemp core center.
 - b) All required labels shall be affixed after installation.
- I) **Elevator Controller:** The Elevator control system shall be Motion Control Engineering Controller Model Motion 4000, GAL Galaxy, Smartrise SRA AC, Elevator Controls Model V900 AC or preapproved equal. Provide above manufacturer's standard microprocessor operation system for each elevator as required to provide type of operation system indicated. The elevator controller shall use a microprocessor-based logic system and shall be ASME A17.1 compliant including all applicable elevator and electrical safety codes to include the following:
- 1) All power feed lines to the brake shall be opened by an electro-mechanical switch. A single ground, short circuit or solid-state control failure shall not prevent application of the brake.
 - 2) The automatic leveling zone shall not extend more than 6 inches (152.4 mm) above or below the landing level, nor shall the doors begin to open until the car is within 6 inches (152.4 mm) of the landing. In addition, the inner leveling zone shall not extend more than 3 inches (76.2 mm) above or below the landing. The car shall not move if it stops outside the inner leveling zone unless the doors are fully closed and locked.
 - 3) The system shall use an automatic two-way leveling device to control the leveling of the car to within 0.25 inches (6.35 mm) or better above or below the landing sill. Overtravel, undertravel or rope stretch must be compensated for and the car brought level to the landing sill.
 - 4) The closed loop feedback power control shall be arranged to continuously monitor the actual elevator speed signal from the velocity transducer and compare it with the intended speed signal to verify proper and safe operation of the elevator.
 - 5) During operation of the elevator with an overhauling load (empty car up or loaded car down), precision speed control shall be obtained by the regulation system used in the power control. The power control shall have the capability to maintain regulation under varying loads.
 - 6) The controller shall provide stepless acceleration and deceleration and smooth operation at all speeds. The system shall provide the required electrical operation of the elevator control system including automatic application of the brake, which

shall bring the car to rest in the event of a power failure.

- 7) The controller shall include absolute floor encoding which, upon power up, shall move the car to the closest floor to identify the position of the elevator. With absolute floor encoding it is not necessary to travel to a terminal to establish floor position.
- 8) The controller shall use a variable voltage, variable frequency drive to control three-phase AC induction and Permanent Magnet AC motors.
- 9) The drive shall use a three-phase, full-wave bridge rectifier and capacitor bank to provide a DC voltage bus for the solid-state inverter.
- 10) The drive shall use power semiconductor devices and pulse width modulation with a carrier frequency of not less than 8 kHz to synthesize the three-phase, variable voltage, variable frequency output to operate the hoist motor in an essentially synchronous mode.
- 11) The drive shall have the capability of being adjusted or programmed to achieve the required motor voltage, current and frequency to properly match the characteristics of the AC elevator hoist motor.
- 12) The drive shall not create excessive audible noise in the elevator motor.
- 13) The drive shall be a heavy-duty type, capable of delivering sufficient current to accelerate the elevator to contract speed with rated load. The drive shall provide speed regulation appropriate to the motor type.
- 14) A means shall be provided for removing regenerated power from the drive DC power supply during dynamic braking. This power shall be dissipated in a resistor bank which is an integral part of the controller. Failure of the system to remove the regenerated power shall cause drive output to be removed from the hoist motor.
- 15) A contactor shall be used to disconnect the hoist motor from the output of the drive unit each time the elevator stops. This contactor shall be monitored. The elevator shall not start again if the contactor has not returned to the de-energized position when the elevator stops.
- 16) All power feed lines to the brake shall be opened by an electro-mechanical switch. A single ground, short circuit or solid-state control failure shall not prevent application of the brake.
- 17) The controller shall provide stepless acceleration and deceleration and smooth operation at all speeds.
- 18) The controls shall be arranged to continuously monitor the performance of the elevator so that, if car speed exceeds 150 fpm during access, inspection, or leveling, the car shall shut down immediately, requiring a reset operation.
- 19) The controller shall include absolute floor encoding which, upon power up, shall move the car to the closest floor to identify the position of the elevator. With absolute floor encoding it is not necessary to travel to a terminal to establish floor

position.

20)The controller shall have an RFI Filter to reduce EMI and RFI noise.

21)Failure of the brake to lift as detected by a mechanical switch (if provided) shall cause the control system to take the elevator out of service at the next stop where it shall remain out of service until the condition is corrected.

22)Hoistway Equipment Minimization:

a) The control system shall allow slowdown, emergency terminal, and hoistway access limit switches to be eliminated. These switches shall exist as virtual switches in system software.

b) The control system shall allow leveling magnets and/or vanes to be eliminated.

23)Programmable Logic:

a) All available programming options or parameters shall be field programmable, without need for any external device or knowledge of any programming languages. Programmable options and parameters shall be stored in nonvolatile memory. At a minimum, there shall be a 32-character alphanumeric display used for programming and diagnostics. Programmable parameters and options shall include, but are not limited to, the following:

(1) Number of Stops/Openings Served (Each Car)

(2) Selective Collective

(3) Programmable Fire Code Options/Fire Floors (Main, Alternates)

(4) Floor Encoding (Absolute PI)

(5) Digital Position Indicators/Single Wire Position Indicators

(6) Programmable CE Microcom floor labels

(7) Programmable Door Times

(8) Programmable Motor Limit Timer

(9) Programmable Car Fan and Light Timer

(10)Door Nudging, Automatic and Fire Operation

(11)Emergency Power

(12)Parking Floor

(13)Lobby Floor

(14)Hall or Car Gong Selection

(15)Standard Security

(16)Anti-nuisance - Light Load Weighing and Photo Eye

(17)Load Weighing for Light, Heavy and Overload Car

(18)High Speed Inspection Enable

- (19) Door behavior selections
- (20) Door type selection
- (21) Fault Bypass – Inspection Operation
- (22) Fault Bypass – Automatic Operation

24) ADA Requirements:

- a) The elevator shall comply with ICC/ANSI A117.1, the American National Standard for Accessible and Usable Buildings and Facilities and the applicable Building Code, Chapter 11.
- b) Leveling Accuracy: The controller shall have a self-leveling feature that shall automatically bring the car to floor landings within a tolerance of 0.25 inches (6.35 mm) or better under all loading conditions up to the rated load.
- c) Hall Lanterns: The controller shall have outputs to drive the visible and audible signals that are required at each hoistway entrance to indicate which elevator car is answering a call. Audible signals shall sound once for up, twice for down. (In-car lanterns located in cars, visible from the vicinity of hall call buttons, and conforming to the above requirements, shall be acceptable.
- d) Car Position Indicators: The controller shall have a position indicator output to drive the required position indicator capable of indicating the corresponding floor numbers as the car passes or stops at a floor.
- e) The controller shall have an output capable of indicating car direction and floor number.

25) Environmental Considerations:

- a) The elevator control shall be capable of operating within the following environmental conditions:
 - (1) Ambient temperature: 32°F to 104°F (0°C degrees to 40°C degrees).
 - (2) Humidity: Non-condensing up to 95%
 - (3) Altitude: Up to 7,500 feet (2286 m)

26) Building and System Configuration:

- a) The elevator controller shall be microprocessor based and designed specifically for elevator applications. Elevator and drive logic shall be implemented independently of safety functions.
- b) Elevator logic shall be implemented to facilitate tight coordination between subsystems and enhance reliability. The implementation shall utilize a real-time, multi-tasking operating system to allow the processors to simultaneously execute elevator control logic, drive control logic, operator interface logic, and communication support.
- c) The elevator controller shall have an independent safety system in order to implement safety features required by ASME A17.1 code. The safety system

shall incorporate check redundant, multi-processor, multi-path, solid-state, ASME compliant implementation that meets CSA and CE standards.

- d) The elevator controller shall be configured and packaged in such a way that external “jumpers” cannot be used (intentionally or unintentionally) while the elevator is running in any passenger mode of operation. Non-passenger modes of operation shall be provided, along with means to bypass safety functionality, to allow inspection testing and other setup and/or troubleshooting operations.
- e) The elevator control logic configuration shall be fully field programmable. Changes in number of floors, I/O configuration, starter setup, eligibility etc. shall not require the replacement/reprogramming of EEPROMs or other storage devices. Further, changes in the controller configuration shall be user adjustable in the field.

27)Diagnostics:

- a) The control system shall provide comprehensive means of accessing the computer memory for elevator diagnostic purposes. It shall have permanent indicators for important elevator status conditions as an integral part of the controller.
- b) The microprocessor boards shall be equipped with on-board diagnostics for ease of troubleshooting and field programmability of specific control variables. Field changes shall be stored permanently, using nonvolatile memory. The microprocessor board shall provide the features listed below:
 - (1) On-board diagnostic switches and an alphanumeric display to provide user friendly interaction between the mechanic and the controller.
 - (2) An on-board event log shall store and display time-stamped events for diagnostic purposes. (Viewable only with monitoring software.)
 - (3) An on-board real-time clock shall display the time and date and be adjustable by means of on-board switches.
 - (4) Field programmability of specific timer values (i.e., door times, etc.) may be viewed and/or altered through on-board switches and pushbuttons.
 - (5) The elevator controller shall have extensive diagnostic capability. A built-in LCD display or equivalent shall allow access to major user functions and diagnostic features. The display shall be a multi-character, multi-line type with associated keypad to allow users to enter information. The display shall show data and menus in readily understood character format. No numeric, hexadecimal, or binary codes are acceptable.
 - (6) Dedicated indicators shall be provided in a conspicuous location on the elevator controller to indicate important system statuses, such as when the safety string is made, when the door locks are made, when the elevator is on Inspection/Access, etc. In addition, other special or error conditions detected by the main processor or safety subsystem shall be displayed.

28) Universal I/O:

- a) Field I/O boards shall be universal in that 24V to 120V AC or DC connections shall be accepted without requirement for unique circuit boards for each. I/O boards shall provide built-in current limiting protection.

29) Intended Operation of Critical Components:

- a) Failure of any single magnetically operated switch, contactor, or relay to release in the intended manner; the failure of any static control device, speed measuring circuit, or speed pattern generating circuit to operate as intended; the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contactor or relay to release in the intended manner, failure of any static control device to operate as intended or the occurrence of a single accidental ground, shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

30) Status Indicators:

- a) Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is made, when the door locks are made, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on Inspection or Access, when the elevator is on fire service, when the elevator out of service timer has elapsed, and when the elevator has failed to successfully complete its intended movement. A means shall be provided to display other special, or error conditions detected by the microprocessor.
- b) Every field connection input or output shall have a dedicated LED such that no voltmeter or other test equipment is required to see when an input or output is active.

31) Parking Floor Function:

- a) Parking Floor: Elevator car shall be capable of parking on a designated floor after a predetermined time period. Any landing may be the parking floor. The car will go to the parking floor when it is free of call demand. A Parking Delay Timer will cause a free car to wait for a short time before parking. The timer shall be adjustable, with a value between 0.0 minutes (no delay) and 6.0 minutes.

32) Out of Service Timer

- a) An out of service timer (T. O. S.) shall be provided to take the car out of service if the car is delayed in leaving the landing while calls exist in the system.

33) Programmable Car Fan and Light Timer:

- a) Controls shall be provided that will de-energize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.

34) High or Low Speed Inspection

- a) A selection shall be provided on the controller to select high or low speed during access or inspection operation as long as contract speed does not exceed 150 feet per minute.

35) Door Operation

- a) Door protection timers shall be provided for both opening and closing directions to protect the door motor and help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time if the doors are prevented from reaching the open position. In the event that the door closing attempt fails to make up the door locks after a predetermined time, the door close protection timer shall reopen the doors for a short time. If, after a predetermined number of attempts, the doors cannot successfully be closed, the doors shall be opened, and the car removed from service.
- b) A minimum of four different door standing open times shall be provided. A car call time value shall predominate when only a car call is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of a door reopen caused by the safety edge, photo eye, etc., a separate short door time value shall predominate. A separate door standing open time shall be available for lobby return.
- c) If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at slow speed in the closed direction. A buzzer shall sound during nudging operation.

36) Door Pre-opening

- a) When selected, this option shall start to open the doors when the car is in final leveling, 3" (76.2 mm) from the floor. If pre-opening is not selected, the doors shall remain closed until the car is at the floor, at which time the doors shall commence opening.

37) Car and Hall Call Registration

- a) Car and hall call registration and lamp acknowledgment shall be by means of a single wire per call, in addition to the ground and the power bus. Systems that register the call with one wire and light the call acknowledgment lamp with a separate wire can be accommodated.
- b) The user shall be able to register car calls via the on-board LCD display and keypad.

38) Emergency Power Operation

- a) Emergency power in the building is sized to power one car at a time. Key

operated sequencing operation will be required by ASME A17.1, Part 2.27.2 with full functionality of the code requirements for sequencing operation.

39) Fire Service Operation

- a) Fire Phase I emergency recall operation, alternate level Phase I emergency recall operation and Phase II emergency in-car operation shall be provided according to latest applicable edition of ASME A17.1 and current Jurisdictional Statutes, Rules & requirements.

40) Independent Service

- a) Independent service operation shall be provided in such a way that actuation of a key switch in the car operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls. Car and hoistway doors will only close with constant pressure on a car call pushbutton or door close button. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns shall be inoperative.

41) Group Operation

- a) For group configurations, each elevator shall have its own computer and dispatching algorithm. Should one computer lose power or become inoperative, the next shall be capable of accepting and answering all hall calls. When all computers are in operation, only one shall assume the role of dispatching hall calls to both elevators.

42) Leveling

- a) The car shall be equipped with two-way leveling to automatically bring the car level at any landing, within the required range of leveling accuracy, with any load up to full load.

43) Test Switch

- a) A controller test switch shall be provided. In the test position, this switch shall allow independent operation of the elevator with the door open function deactivated for purposes of adjusting or testing the elevator. The elevator shall not respond to hall calls and shall not interfere with any other car in a duplex or group installation.

44) Inspection

- a) To enhance safety, an inspection switch, enable switch, and an up/down toggle switch shall be provided in the controller and on the car top to place the elevator on inspection operation and allow the user to move the car. Activation of the car top inspection switch shall render the controller inspection switch inoperative.

45) Uncanceled Call Bypass

- a) A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call, including stuck pushbuttons. Call demand at another floor shall cause the car, after a predetermined time, to ignore the

defective call and continue to provide service in the building.

46)Anti-nuisance (Photo Eye)

- a) The controller shall cancel all remaining car calls, if a user-determined number of car calls are answered without the computer detecting a change in the photo eye input (indicating that no one is passing through the car door).

47)Load Weighers

- a) Load weighing devices shall be installed to provide signals to the controller for various load monitoring and dispatching operations.
- b) By identifying the load (light, heavy or overload), the system can activate anti-nuisance car call cancellation, loaded car hall call bypass, or overload.

48)Absolute Floor Encoding

- a) The controller shall include absolute floor encoding, which upon power up, shall move the car to the closest floor to identify the position of the elevator.

49)Landing/Positioning System Information

- a) The landing/positioning system shall use a Gray code, magnetically permanent encoded tape and two, independent sensor heads in a single housing for absolute position control under all powered conditions. The tape shall provide a unique code for every 1mm of travel. A third, independent system shall provide speed feedback directly from the hoist motor. The system shall continuously compare inputs from the three independent systems to assure accuracy and safety.

50)Service Enhancements

- a) The manufacturer shall make software updates for controller and/or group control available via Internet download, email attachment, or physical EEPROM shipment. Internet downloads and email attachment deliveries require an optional, hand-held user interface to facilitate software transfer from the user's PC to the elevator or group.

2.4 **EQUIPMENT: HOISTWAY**

A) **Platform:** Existing frame shall be retained. Underside of the platform shall be verified and maintained structurally sound and fireproof by the Contractor.

- 1) Existing platform guard shall be verified to be not less than 21 inches. If less than 21 inches, the platform guard shall be replaced with a new platform guard no less than 525 mm (21 in.) with the lower portion of the guard bent back at an angle of not less than 60 degrees nor more than 75 degrees from the horizontal.
- 2) Existing guard is required to be properly braced in accordance with ASME A17.1 which requires the guards to be securely braced and fastened in place to withstand a constant force of not less than 650 N (145 lbf) applied at right angles to and at any position on its face without deflecting more than 6 mm (0.25 in.), and without permanent deformation.

- B) **Sling:** Existing steel stiles affixed to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure shall be retained.
- C) **Guide Rails:** Retain and reutilize with no alterations. Existing car guide rails shall be verified as properly fastened to the building with steel brackets verified in alignment, secure to wall and brackets with surface planed smooth. Existing car guide rails shall be cleaned and aligned as necessary for the proper performance of the elevators.
- D) **Roller Type Guides:**
- 1) **Elevator Car:** Existing guides on top and bottom of cars shall be replaced with new roller guide complete assemblies which shall have a minimum of three tires each, shall be mounted on top and bottom of the car and counterweight frame and be held in contact with the guide rail by adjustable devices. Car roller guides shall be ELSCO Model B, or equal. Properly adjusted for smooth operation.
 - 2) **Counterweight Assembly:** Existing guides on top and bottom of counterweight assembly shall be replaced with new roller guide complete assemblies which shall have a minimum of three tires each, shall be mounted on top and bottom of the counterweight frame and be held in contact with the guide rail by adjustable devices. Counterweight roller guides shall be ELSCO Model D, or equal. Properly adjusted for smooth operation.
- E) **Car Top Guard Railing:** A standard railing conforming to ASME A17.1 shall be provided on the outside perimeter of the car enclosure top on all sides where a 300 mm (12 in.) ball can pass between the edges of the car enclosure top and the adjacent hoistway enclosure and on sides where there is no hoistway enclosure.
- 1) If clearances require the standard railing to be located more than 100 mm (4 in.) from the edge of the outside perimeter of the car enclosure top, the top of the car enclosure outside of the railing shall be clearly marked.
 - 2) The marking shall consist of alternating 100 mm (4 in.) diagonal red and white stripes. The forces specified in ASME A17.1 shall not deflect the railing beyond the perimeter of the car top.
 - 3) There shall be a minimum of 100 mm (4 in.) horizontal clearance between the top rail and intermediate rail of the standard railing and fixed equipment passed or approached by the standard railing as the car moves throughout the hoistway to ensure protection from shearing hazards.
- F) **Buffers:** Retain existing buffers. Buffer data plates shall be maintained or replaced for compliance with ASME A17.1 Safety Code for Elevators and Escalators. All buffers shall be cleaned and painted. Verify the spring buffer(s) comply with the stroke and load requirements of the ASME A17.1 Safety Code for Elevators and Escalators. Buffer data plates shall be maintained or replaced for compliance with ASME A17.1 Safety Code for Elevators and Escalators.
- 1) Prepare all surfaces to be painted by removing dirt, grease, oil, loose paint, rust, scale, and other contaminants by cleaning, scraping, sanding, wire brushing, or grinding as required. Treat remaining corrosion and apply a compatible rust-inhibiting primer to all exposed or prepared metal surfaces. Apply not less than two

finish coats of durable industrial-grade enamel or approved equivalent to provide a uniform, complete, and professional finish. Color shall be selected by the Owner or Consultant. Protect adjacent equipment and surfaces from overspray and paint damage.

- G) **Automatic Terminal Limits:** Replace Automatic slow down and final limit switches. Place electric limit switches in the hoistway near the terminal landings. Limit switches shall be designed to cut off the electric current, slow down and stop the car if it runs beyond either terminal landing.
- H) **Automatic Self-Leveling:** Provide elevator car with a self-leveling feature to automatically bring the car to the floor landings and correct for over-travel or under-travel. Self-leveling shall, within its zone, be automatic and independent of the operating device. The car shall be maintained level to less than $\frac{1}{4}$ inch with the landing irrespective of its load.
- I) **Traveling Cable:** Existing traveling cable shall be removed and replaced with new traveling cable(s).
- 1) Traveling cable shall terminate at numbered terminal blocks in car and machine room.
 - 2) Traveling cable shall be provided with a separate shielded circuit for communication system and hang to obtain proper size of loop. Traveling cable outer covering will be of fire resistant and meet UL standard testing.
 - 3) Traveling cable will be hung free of all contact from hoistway or car equipment and shall be provided with 10 percent spare conductors for each car.
 - 4) In addition to all code required cables to support code required devices and infrastructure, the traveling cable(s) shall include four (4) additional pair of shielded, 18/2 AWG twisted pair for Owner's use plus four (4) CAT 6 POE traveling cables with a minimum 22 AWG sizing, and two (2) coax cables.
- J) **Hoistway & Machine Room Wiring:** Provide all new wiring throughout the elevator machine room and hoistway, adequately sized and constructed for the proper operation of the equipment.
- 1) Multi-conductor type wiring for light and signal circuits shall be used in the elevator hoistway. All conductors will be copper and the minimum size of conductors, excluding those which form an integral part of control devices, shall be No. 14 for lighting circuits and No. 18 for operating, control, and signal circuits. All wiring will be installed in accordance with applicable NEC and latest applicable edition of ASME A17.1 codes. Hoistway door interlock wiring will be replaced with new SF-2 high heat resistance wiring and shall include a grounding conductor. All other new wiring will have flame retarding and moisture resistant outer covering.
 - 2) Equipment grounding shall be provided. The equipment grounding conductor shall be run with the circuit conductors and shall be a copper conductor. Ground all conductors, supports, controller enclosure, and other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be solid or stranded; insulated, covered, or bare copper, sized as

- required by NEC, and shall be colored green if #6 AWG or smaller, and have green tape or adhesive marking if #4 AWG or larger.
- 3) Retain and reutilize to the maximum extent possible all ducts and conduit in machine room and hoistway. Install new ducts and conduit as required.
 - 4) Hoistway travel cable and associated wiring shall be coordinated with controller manufacture for wiring configuration requirements to match all controller wiring color coded and numbered diagrams for installation.
- K) **Pit Stop Switch:** Provide new pit stop switch as required by latest applicable edition of ASME A17.1 code.
- 1) Stop switch(es) shall be of the manually opened and closed type, have red operating buttons of the push-to-stop configuration, be conspicuously and permanently marked "STOP," and shall indicate the "STOP" and "RUN" positions.
- L) **Pit Light:** Pit lighting to be verified by Electrical Contractor as meeting minimum 10 ft-c requirement or additional pit lighting will be installed by electrical contractor as detailed in the Electrical Requirements section of this specification.
- M) **Pit & Hoistway Cleanup:** The hoistway surfaces and pit area shall be thoroughly cleaned to remove all excessive dust and debris from hoistway surfaces and pit area with proper disposal from property of all waste products from work under this specification.
- N) **Pit Ladder:** Verify that pit ladder is compliant with current edition of ASME A17.1 Safety Code for Elevators and Escalators. If compliant, retain and reutilize existing pit ladder. If pit ladder is not in compliance with current ASME A17.1 code, provide new pit ladder as required by latest applicable edition of ASME A17.1 code.
- 1) Pit ladder shall be positioned so that means to unlock the access door from inside the pit shall be located not more than 1 825 mm (72 in.) vertically above a rung, cleat, or step. The minimum distance from the top rung, cleat, or step to the top of the pit ladder or handhold shall not be less than 1 200 mm (48 in.). With the door in the closed position, in a plane not more than 1 000 mm (39 in.) horizontally from a rung, cleat, or step of the pit ladder.
- O) **Hoistway Door Equipment:**
- 1) **Hoistway Entrances:** Existing hoistway entrance assembly consisting of the elevator entrance frame, head jamb & strike jamb and door sills shall be retained and reutilized. Verify and adjust as required to maintain all door gaps less than 3/8 inch in accordance with latest applicable edition of ASME A17.1 code.
 - 2) **Hoistway Doors:** Existing hoistway shall be retained and reutilized.
 - a) Refurbish as required and replace all parts necessary to deliver doors in as new condition. Verify and adjust as required to maintain all door gaps less than 3/8 inch in accordance with latest applicable edition of ASME A17.1 code.
 - b) Hoistway doors that cannot be adjusted to maintain the door gaps to less than 3/8 inch shall be replaced with new door panels. Bidders are cautioned to verify

the capability of all hoistway doors to be properly adjusted to maintain code required clearances and gaps as no request for any change order will be approved for this purpose. It is the Elevator Contractors responsibility to verify this prior to submission of a bid on this project.

- 3) **Door Header Assembly:** Existing hoistway door header assemblies shall be retained and reutilized.
- 4) **Hoistway Door Sill and Sill Support:** Existing hoistway door sills and supports shall be retained and reutilized.
 - a) **Sealing at Door Sills:** Hoistway Door Sills at all landings will have joint area between floor surfaces and existing sills properly sealed to prevent the intrusion of water into the joint.
- 5) **Interlocks:** All existing interlocks shall be replaced with new interlocks.
 - a) Equip each hoistway entrance with an approved type interlock (GAL or pre-approved equal) tested as required by code including SF-2 wiring and grounding. Interlock to be GAL Interlock, or pre-approved equal.
 - b) Interlock shall be designed to prevent operation of the car away from the landing until the doors are locked in the closed position as defined by code and shall prevent opening the doors at any landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing.
- 6) **Hoistway Door Components:** Existing door hangers, and door tracks shall be retained and refurbished. Door hangers are to be adjusted for proper clearances and smooth operation for the door panels. Door tracks shall be thoroughly cleaned for smooth operation.
 - a) Existing Hoistway door sheaves and door gibs shall be replaced with new components for all landings specifically designed for existing tracks and sills as specified below.
 - b) Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
 - c) Replace all door gibs specifically designed for existing hoistway sills.
 - d) All missing secondary retainers installed at the bottom of each hoistway door shall be provided with direct OEM secondary retainers in conformance with applicable requirements of ASME A17.1.
 - e) Door Bumpers: Provide and install new rubber door bumpers on new side opening car doors. Bumpers shall be installed at top and bottom of door jambs.
 - f) All hoistway door closers shall be replaced with new spirator type.
 - g) All hoistway interlocks and pickup rollers shall be replaced with new to work with new clutch and interface with existing door configuration.
 - h) All hoistway door eccentrics are to be replaced with new.
 - i) All hoistway door astragals shall be replaced with new.

- 7) **Entrance Markings:** Replace all hoistway entrance markings and door jamb plates at each floor.
- a) **Jamb Braille:** All elevator hoistway entrances shall have raised and Braille floor designations provided on both jambs. The centerline of the characters shall be 60 in (1525 mm) above finish floor. Entrance jambs shall be marked with new 4" x 4" stainless steel plates having raised floor markings with Braille adjacent. Such characters shall be 2 in (50 mm) high and shall comply with ICC/ANSI A117.1.
 - b) **Main Entry Level:** A raised star shall be provided on both jambs at the main entry level.
 - c) **Car Identification:** In conformance with ASME A17.1 Part 2.29, in buildings with more than one elevator, each elevator in the building shall be assigned a unique alphabetical or numerical identification. The elevator identification alphanumeric designation shall be a minimum of 75 mm (3 in.) in height, painted on, engraved, or securely attached to the to or on every elevator entrance at the designated level.
- P) **Hoistway Floor Numbers:** After painting has been completed, the hoistways shall have floor numbers, not less than 100 mm (4 in.) in height, painted on the hoistway side of the enclosure or hoistway doors.
- Q) **Floor Designations:** Floor designations shall be as listed in Elevator System Description, Number of Stops and Openings section of this specification.
- R) **Sight Guards:** Sight guards, if required, to reduce the opening between the leading edge of the hoistway door and the car door to maintain code required clearances, will be finished to match door panels. All existing sight guards will be inspected to ensure structural integrity, proper contour, and secure attachment to the hoistway door panels.
- S) **Escutcheon Tubes:** Hoistway doors that do not have escutcheon tubes installed shall have escutcheon holes fitted with new escutcheon tubes to match existing OEM escutcheon tubes.
- T) **Door Bumpers:** Provide and install new rubber door bumpers on all hoistway door jambs and on car door jamb. Bumpers shall be installed at top and bottom of door jambs.
- U) **Painting Inside Hoistway:** All painting on this project must be performed in conformance with Part 1.6 of this specification.
- 1) After removal of all old hardware and components for the hoistway as detailed above all existing components shall have all rust thoroughly removed and treated as detailed below.
 - 2) Remove rust, clean, degrease and paint any existing parts or components for a like new condition, including but not limited to the door panel surfaces, door track assemblies and door frame surfaces inside the hoistway.

- 3) After painting has been completed, the hoistways shall have floor numbers, not less than 100 mm (4 inch) in height, painted on the hoistway side of the enclosure or hoistway doors.

2.5 DOOR OPERATION

A) **New Door Operator:** Provide each elevator with a new complete door operator assembly. Door operator to be a closed loop motor driven heavy-duty operator GAL MOVFR or pre-approved equal.

- 1) Door operator shall be a closed loop, microprocessor-based system. The door operator will facilitate smooth operation under varying environmental influences such as, temperature, wind, friction, and component variation. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile the command will be automatically corrected. The Closed Loop Door Operator control system shall not require machine room door control equipment.
- 2) Door operation to comply with ASME A17.1 requirements for Restricted Opening of Hoistway or Car doors of passenger elevator.
- 3) Door Operator shall be provided with adjustable parameters, at a minimum, for the following:
 - a) Adjustable Parameters in the closing cycle for high speed, final speed, nudging speed, acceleration, deceleration, and slow speed torque.
 - b) Adjustable parameter for stall reversal – automatic reversal if the door meets an obstruction.
 - c) Adjustable parameter for door reversal – to accomplish a quick but smooth reversal.
- 4) Door noise not to exceed 58 dBA.
- 5) Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
- 6) Install door operator data plate as per ASME A17.1 Safety Code for Elevators and Escalators and provide all door closing speed times to ensure code conformance to Kinetic Energy limitations of latest applicable edition of ASME A17.1 code.
- 7) Door operator must be mounted so completely isolated from the car top. Mounting to car stiles by brackets as configured by GAL will be accepted for isolation.

B) **Door Zone Lock:** Install new door zone lock system with door operation to comply with the latest applicable edition of ASME A17.1 requirements for restricted opening of car doors of passenger elevator.

- 1) Door zone lock system shall be GAL LWZ-2 clutch and combination zone locking system, OEM or pre-approved equal.

- 2) When the car is outside the unlocking zone, the car doors shall be so arranged that when in the closed position they shall be restricted from opening more than 100 mm (4 inch) from inside the car.
 - 3) Car doors shall be openable from outside the car without the use of a special tool(s).
 - 4) Car doors shall be openable from within the car when the car is within the unlocking zone.
- C) **New Door Protection Device:** A new door protection shall be a combination 2D & 3D detection means system. The elevator door protection system shall consist of a Light Curtain, an Approaching Object Detection Means and a Controller. The system shall be designed to detect persons and objects that are in the path of the elevator cab doors or approaching the elevator cab door entrance in accordance with ASME A17.1. The system shall also be designed to ignore stationary persons or objects that are not entering the elevator. The beams shall project across the car opening detecting the presence of a passenger or object. If door movement is obstructed or objects are detected in the approach zone, the doors shall immediately reopen. A mechanical reopening device shall not be acceptable.
- 1) **Acceptable Manufacturers:** Acceptable pre-approved door edge protection systems are as follows:
 - a) Non-Weatherproof Systems shall be Formula Systems Vision Plus, Janus Smart 3D combined with Panachrome+ 2D (including red/green color indicators to highlight door movement, and CEDES CabSafe™ system, consisting of a Controller, a 2D light curtain and a 3D TOF sensor.
 - 2) If an object has been detected in accordance with ASME A17.1 Detection of Approaching Objects or Detection of Objects in the Door Path when the doors are fully open, the hoistway door and car door shall not close or, when the doors are closing, the car door and hoistway door at the landing shall initiate a reversal without intentional delay beyond system response time, and shall fully reopen or reopen a minimum of 915 mm (36 in.). If the doors fail to fully close within 10 seconds in addition to the door close data plate value, the doors shall fully reopen.
 - 3) The reopening device(s) shall be permitted to be rendered inoperative when the closing kinetic energy is reduced in conformance with ASME A17.1 requirements for detection of approaching objects within 450 mm (18 in.) of the point at which the leading edge of the leading door panel contacts the door jamb or opposing door panel. Additionally, when 20 seconds have transpired after the detection means of approaching objects first detects an object when an object is detected in the path of the doors, the 20 seconds duration shall reset. When objects are detected within 20 mm (0.75 in.) of the point at which the leading edge of the leading door panel contacts the door jamb or opposing door panel the reopening device(s) are permitted to be rendered inoperative.
 - 4) When the reopening device(s) has been rendered inoperative as detailed above, a continuously sounding audible signal shall be provided with a sound level of 10 dBA minimum above ambient and shall not exceed 80 dBA. The sound level shall be

measured 1 m (40 in.) above the landing floor, 500 mm (20 in.) from the door face, along the centerline of the entrance opening, with the doors open. The signal shall sound during door closing until the doors are fully closed. In no case shall the sound level exceed 85 dBA inside the cab and within 300 mm (12 in.) from the centerline of the entrance and 1 m (40 in.) above the floor.

- 5) **Detection of Approaching Objects:** The reopening device(s) shall be designed to detect a cylindrical target(s) approaching the entrance opening of the landing-side doors as required ASME A17.1. The approaching object detection means shall be effective until the leading edge of the doors is within 450 mm (18 in.) of the fully closed position and shall be permitted to be effective up to the fully closed position.
 - 6) **Detection of Objects in the Door Path.** The reopening device(s) shall be designed to detect rectangular prisms positioned as required by ASME A17.1. The device(s) shall be designed to detect prisms positioned anywhere within the opening width of the entrance on the floor and oriented with the 80 mm (3.15 in.) dimension parallel to the floor, the 150 mm (6 in.) dimension perpendicular to the door, and the 50 mm (2 in.) dimension perpendicular to the floor either wholly located between the vertical planes established by the landing-side face of the hoistway door and the car-side face of the car door or centered between the two planes if the distance between the two planes is less than 150 mm (6 in.).
 - 7) **Self-Monitoring of Detection Means.** The system shall be designed to be self-monitoring. After the door has reached its fully opened position and before door closing is initiated, the detection means shall be self-checked to verify the detection means is operational. If the self-check outcome is unsuccessful, power closing of the door(s) shall be at reduced kinetic energy conforming to ASME A17.1.
- D) **Nudging Operation:** The doors shall remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door movement is obstructed for a field programmable time, a buzzer will sound, and the doors will close at reduced speed. If the infra-red door protection system detects a person or object while closing, the doors will stop and resume closing after the obstruction has been removed.

2.6 **CAR COMPONENTS**

- A) **Cab Interior:** Existing elevator cab shell shall be retained. The interior cab wall panels and drop ceiling shall be replaced. Elevator contractor to include a \$30,000.00 cab allowance per elevator. Allowance is for material only. Labor shall be included in Contractor's estimate. Owner will install finished flooring.
- 1) All refurbishment identified in this section is the responsibility of the Elevator Contractor to coordinate and complete.
 - 2) Elevator modernization contractor shall coordinate cab interior renovations. If interior renovations are going to be subcontracted then elevator contractor needs to identify subcontractor for owner approval.

- 3) Elevator modernization contractor is responsible to provide schedule that allows for coordination of the cab interior refurbishment. This schedule will have all cab interior work performed prior to elevator modernization contractor making final acceptance inspection and testing of this elevator.
- 4) Elevator modernization contractor is responsible for all required door adjustments required for cab modernization work; no additional charges will be allowed for any door adjustments.

B) Car Entrances:

- 1) **Cab Doors:** Replace & hang new cab door panels.
 - a) Provide new fire rated cab door panels mounted on existing car door hangers with new rubber door astragals.
 - b) New car door close contact switch shall be installed.
 - c) Finish for car door shall be ASTM A 167, Type 300 Stainless Steel Number 4 finish. Door shall be manufactured to include all mounting hardware requirements of the GAL door operating equipment. Door shall be manufactured by Gunderlin LTD or pre-approved equal by Owner and consultant.
 - d) Refurbish associated components as detailed below and replace all parts necessary to deliver doors in as new condition. Verify and adjust as required to maintain all door gaps in accordance with latest applicable edition of ASME A17.1 code.
- 2) **Car Door Hangers, Sheaves, and Tracks:** Existing door hangers, sheaves, tracks, door gibs including all required retainers shall be replaced with new components as detailed below:
 - a) Provide sheave type two-point galvanized suspension hangers and galvanized track for car sliding door, product GAL, or preapproved equal.
 - b) New components for all components shall be GAL or preapproved equal.
 - c) Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
 - d) Hangers: Provide an adjustable slide to accommodate the up thrust of the doors.
 - e) Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.
 - f) Car Door Guides: New car door slide guides shall be installed with tabs installed per manufacture's design. Bottom slide guides as manufactured by GAL replacement or preapproved equal. Car door guides shall be matched to existing car door sill.

- C) **Cab Shell Enclosure:** The existing cab shell enclosure shall be retained and reutilized.

- D) **Car Steady Plates:** Existing car steady plates shall be rebuilt and adjusted to like new condition. All rubber spacers that are deteriorated will be replaced with new rubber components to hold the car steady and plumb.
- E) **Car Top Exit Switch:** Car top escape panels shall have switch assemblies including all wiring to install proper safety circuit as required by ASME A17.1. The top emergency exit cover shall open outward and shall be hinged or securely attached with a chain when in both the open and closed positions. If a chain is used, it shall be not more than 300 mm (12 inch) in length. The exit cover shall only open from the top of the car, where it shall open without the use of special tools.
- F) **Car Top Lighting:** The elevator shall be provided with lighting and a duplex receptacle fixture on the car top. The lighting shall consist of two (2) separate light sources. The lighting sources shall be permanently connected, fixed, or portable, or a combination thereof, to provide an illumination level of not less than 100 lx (10 fc) measured at the point of any elevator part or equipment, where maintenance or inspection is to be performed from the car top. All lighting shall be equipped with guards. The light switch shall be accessible from the landing when accessing the car top.
- G) **Car Top Inspection Station:** Provide a new car top inspection station with an "emergency stop" switch and constant pressure "up-down" direction buttons to make the normal operating devices inoperative and give the inspector complete control of the elevator. Car top Inspection unit manufactured by Vator Accessories, Inc., (630) 876-8370, Nylube Products Company, LLC. (248) 852-6500, Monitor Controls, or equal. Mount the car top inspection station as required by ASME A17.1 Safety Code for Elevators and Escalators.
- 1) When the elevator is on inspection operation or when the hoistway access switch has been enabled, a continuous audible signal, audible at the location where the operation is activated shall sound when the "FIRE RECALL" switch is in the "ON" position or when the fire alarm initiating device is activated to alert the operator of an emergency.
 - 2) Car Top Inspection Station must be approved by Owner and Consultant prior to Contractor ordering fixtures.
- H) **Cab Fan:**
- 1) Provide and install new 2 speed quiet run fan manufactured by Nylube securely mounted in ceiling. Fan shall be protected from access through cab ceiling.
 - 2) Ventilation fans in elevators that do not have their own air-conditioning system shall not consume more than 0.33 watts/cfm at the maximum speed of the fan.
 - 3) Controls shall be provided that will de-energize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.
- I) **Car Operating Panel:** Provide new car operating stations (Main & Auxiliary) as follows:
- 1) **Car Operating Station:** The car control station shall contain the devices required for specific operation mounted directly to an aluminum backing plate with a Stainless

Steel # 4 brush finish applied faceplate. The panel shall consist of a series of modules, key switches or approved buttons for optimum viewing and accessibility. All engraving shall be on flush mounted hairline faceplates securely mounted to the aluminum backing plate.

- a) The lowest section shall contain the "DOOR OPEN," "DOOR CLOSE," and car emergency signaling devices.
 - b) Intermediate section shall contain floor buttons, which illuminate when a call is registered and remain illuminated until the call is answered. Raised floor indications and handicap symbols shall be located immediately adjacent to the floor buttons.
 - c) Layout of floor buttons will have the floor buttons centered with two columns of floor buttons stacked vertically.
 - d) Provide a lockable service compartment with recessed flush door. Door material and finish to match car station face plate or car return panel. Inside surface of door shall contain an integral flush window for displaying the elevator operating permit. Service cabinet shall contain all required and accessory key switches including independent service, fan switch, key stop switch, hoistway access and an emergency light test button in service cabinet.
 - e) The top section shall contain fire service features inside a locked cabinet in accordance with currently adopted edition of ASME A17.1, including operating instructions.
 - f) Plug connection for Fire Department Communications System shall be provided in the car operating panel which shall provide communications for Fire Department personnel from the Lobby Panel into each elevator car.
 - g) Swing of panel shall match car door configuration. Car operating panels shall swing open with the hinged side closest to the sidewall. Panel shall swing to open only to the open car side.
 - h) All car and hall fixtures by Innovation Industries, or equal. All pushbuttons to be tamper resistant, Innovation Industries PB 39, Flush Button with Illuminated Halo and Center Jewel or pre-approved equal. Halo to be Blue LED light source.
 - i) Car operating panels by Innovation Industries "Prestige Series" Stainless Steel # 4 brushed finish, or pre-approved equal. No adhesive type applied plates will be accepted at either car or hall stations. All fixtures shall have a Blue LED lighting source.
 - j) Car stations shall be pre-wired by the car station manufacture with terminal strip connection to control wiring.
 - k) All hall and car push button lamps shall include long life LED type lamps.
- 2) **Position Indicators:** Each car operating panel to include a 2-inch electronic segmented digital position indicator mounted in the control panel for optimum viewing. As the car travels, its position in the hoistway shall be indicated by the illumination of the alpha/numeric character corresponding to the landing which the

elevator is stopped or passing. On one side of digital numeric indicator in the car panel will also be a matching indicator with direction of travel. Position Indicator shall have a Blue LED lighting source.

- 3) **Emergency Light:** Emergency lighting shall be incorporated into the car operating panel. Emergency light shall illuminate automatically upon loss of the building's normal power supply as required by latest edition of ASME A17.1.
- 4) **Emergency In-Car Signaling Devices:** Provide a Kings III, RATH® Two-Way Elevator Communication System, or approved equal, emergency communications device mounted in the car station panel. Emergency communications device shall comply with Americans with Disabilities Act (ADA) and with the currently adopted edition of ASME A17.1 Safety Code for Elevators and Escalators requirements. Emergency In-Car Signaling Devices for two-way communications shall, at a minimum, conform to the following:
 - a) A push button to actuate the communications means shall be provided in or adjacent to a car operating panel. The push button shall be visible and permanently identified with the phone symbol in conformance with ASME A17.1. The identification shall be on or adjacent to the phone push button. The communications means shall be initiated when the push button is actuated.
 - b) On the same panel as the phone push button, a message shall be displayed that is activated by authorized personnel to acknowledge that communications are established. The message shall be permitted to be extinguished where necessary to display a new message or when the communications are terminated.
 - c) On the same panel as the phone push button, messages shall be displayed that permit authorized personnel to communicate with and obtain responses from a trapped passenger(s), including a passenger(s) who cannot verbally communicate or hear.
 - d) On the same panel as the phone push button, a message shall be displayed that is activated by the authorized personnel to indicate when help is on the way. The message shall continue to be displayed until a new message is displayed or the communications are terminated.
 - e) The communications means shall provide on demand to authorized personnel information that identifies the building location and elevator number.
 - f) The communications, once established, shall be disconnected only when authorized personnel terminate the call or a timed termination occurs. A timed termination by the communications means in the elevator, with the ability to extend the call by authorized personnel, is permitted if voice notification is sent by the communications means to authorized personnel a minimum of 3 min after communication has been established. Upon notification, authorized personnel shall have the ability to extend the call; automatic disconnection shall be permitted if the means to extend are not enacted within 20 s of the voice notification.

- g) The communications means shall not use a handset in the car.
- h) The communications shall not be transmitted to an automated answering system. The call shall be answered by authorized personnel.
- i) Operating instructions shall be incorporated with or adjacent to the phone push button.
- j) Controlled Access Operation – Card Reader: The car operating panel shall also incorporate space and lens for a card reader to be mounted behind the COP faceplate. The card reader shall be located at ADA/accessibility height requirements. Style of car reader installation shall be confirmed during the fixture review and approval process. Provide a card reader override switch behind the locked service panel. Elevator contractor to provide assistance on installation as well as provide wiring to the card reader and coordinate installation with security contractor.
- k) A security camera shall be provided and installed by others in the rear corner of the elevator cab. Elevator contractor to provide assistance on installation as well as provide wiring to the ceiling area and coordinate installation with security contractor.

5) Special Accessories in Car Station Panel:

- a) Located in Service Compartment Subpanel w/ Clear Certificate Window, sized 6" x 9":
 - (1) Light key switch.
 - (2) Fan 2 speed key switch.
 - (3) Independent Operation Key Switch.
 - (4) Access Key Switch.
 - (5) Emergency Light Test Button.
 - (6) Keyed stop switch.
 - b) No applied plates.
 - c) Braille and engraving to include:
 - (1) Engraved Capacity and Identification Number of elevator.
 - (2) No Smoking sign shall be engraved on flush mounted hairline faceplate.
 - d) All push buttons and key switches as required for fire service operation.
- 6) **Fire Service Features:** Fire Fighters Service Key switch as required by the IBC including operations required by the currently adopted edition of ASME A17.1 Safety Code for Elevators and Escalators shall be engraved on a flush mounted hairline faceplate.
- a) The "FIRE OPERATION" switch, the "CALL CANCEL" button, the "STOP" switch, the door open button(s), the door close button(s), the additional visual

- signal, and the operating instructions shall be grouped together at the top of the main car operating panel behind a locked cover.
- b) The firefighters' operation panel cover shall be openable by the same key that operates the "FIRE OPERATION" switch. The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation and at the recall level. When the key is in the "FIRE OPERATION" switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.
 - c) All buttons and switches shall be readily accessible, located not more than (72 inch) above the floor.
 - d) The front of the cover shall contain the words "FIREFIGHTERS' OPERATION" in red letters at least 0.4 in. high.
 - e) Firemans' Service Key: The fire key shall be of a tubular, 7 pin, style 137 construction and shall have a biting code of 6143521 starting at the tab sequenced clockwise as viewed from the barrel end of the key. The key shall be coded "FEO-K1".
- 7) All required Braille for buttons and other switches as required by the FBC & ASME A17.1 shall be securely fastened to the aluminum backing plate or directly engraved.
 - 8) Integral Emergency In-Car Signaling Device (telephone), including engraving directly into the car-operating panel all ADA required telephone instructions.
 - 9) There shall be NO ADHESIVE APPLIED PLATES, SIGNS or PANELS affixed to the car-operating panel or other locations inside or outside the elevator cab.
 - 10) Phone Response Location shall be designated by Owner.
- J) **Car Operating Station & Fixture Approval:** Car Operating Station & fixtures must be approved by Owner and consultant prior to contractor ordering fixtures.
- K) **Car Front Cladding:** Car front shall be re-clad as detailed below:
- 1) The existing swing return panels shall be rigidly secured to accept the installation of the new Car Operating Panel (COP).
 - 2) Car Return Panel: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing car box openings in return panel and wrap around car return panel.
 - 3) Car Door Header & Transom Assembly: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing car box openings in car door head jamb & Transom assembly.
 - 4) Car Strike Jamb: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing openings in car door strike jamb assembly.
- L) **Cab Interior Painting:** Elevator Modernization Contractor shall be responsible for the following rust remediation prior to new cab interior finishes being installed:

- 1) The exposed metal surfaces on the inside of the cab interior shall be mechanically cleaned, primed and painted in conformance with the requirements detailed in the Painting subsection of the Project Conditions section of this specification. This will include all metal surfaces but not limited to cove base and ceiling areas of the cab.

M) **Cab Walls:** To be included in cab allowance.

N) **Cab Enclosure Vents:** Cab enclosure vents shall be repaired to provide proper cab enclosure ventilation.

- 1) Base of each wall will be provided with a 6" cove base of #4 satin finish stainless steel with punched ventilation to align with the existing cab shell vents.
- 2) Cove base shall include 18 gauge brushed #4 finish stainless steel base with ventilation slots aligning with existing ventilation openings.
- 3) Cab enclosure vents shall be repaired as necessary to provide proper cab enclosure ventilation. Openings shall be appropriately sized and be guarded to prevent straight through passage in accordance to the applicable requirements of the current ASME A17.1 safety code.

O) **Floor Finish:** New flooring will be completed by owner.

P) **LED Car Lighting & Ceiling:** To be included in cab allowance.

Q) **Handrails:** Elevator car interior must have a support rail on back wall.

- 1) Support rails must be continuous and a minimum length of 42 inches (1067 mm) overall.
- 2) The inside surface of support rails must be 1½ inches (38 mm) clear of the car wall.
- 3) The distance from the top of the support rail to the finished car floor must be at least 31 inches (787 mm) and not more than 33 inches (838 mm).
- 4) Padded or tufted material or decorative materials such as wallpaper, vinyl, cloth or the like may not be used on support rails.

R) **Cab Interior Pads:** Furnish set of pads and hooks for interior of each elevator.

- 1) One (1) set of pads and hooks per bank shall be provided for the interior. If any elevator in the bank is unique in design that this should be identified an additional (1) set of pads and hooks provided for each unique design.
- 2) Type must be pre-approved by Owner and elevator consultant as manufactured by W.E. Palmer, or equal. Color to be selected from standard color selection provided to Owner by Elevator Contractor.
- 3) Elevator pads shall be turned over to the Building Owner and stored in the machine room of the elevator.

S) All openings left from removal of current car devices, which are not re-clad, shall be covered with stainless steel: ASTM A 167, Type 300 stainless steel covers, No. 4 satin finish. All edges shall be finished in a manner that presents no sharp edges or corners.

2.7 FIRE COMMAND CENTER ELEVATOR PANEL

- A) High-rise buildings having floors with human occupancy 75 feet or more above the lowest level for fire emergency vehicle access shall meet the requirements of the applicable Building Code Chapter 9, Fire Protection Systems, which includes a Fire Command Center as detailed in Section 911. The remote Elevator Panel of the Fire Command Center will be installed at a location verified by the Fire Marshal.
- 1) The new Fire Command Center Elevator Panel shall be located in the area around the main desk area on the “L” floor. Currently all security monitoring systems, emergency generator panels and fire alarm system panels are located at this desk area. Exact location will be determined as needed. This location may change after review of Fire Alarm System requirements by the Fire Marshal having jurisdiction.
- B) The panel will include a Stainless Steel # 4 finished face plate for surface mounting to wall as manufactured by Monitor Controls, Innovation Industries or pre-approved equal. Additional Features and/or Operations for the Fire Command Center Elevator Panel shall include the following:
- 1) The means shall enable emergency personnel within the building to establish two-way communications to each car individually. Two-way communication shall be established without any intentional delay and shall not require intervention by a person within the car. The means shall override communications to outside of the building and comply with the following requirements:
- a) Two-way communications, once established, shall be disconnected only when emergency personnel outside the car terminates the call.
- b) Once the two-way communication has been established, the visual indication within the car shall illuminate. The visual indication shall be extinguished when the two-way communication is terminated.
- c) Once the communications have been established, a message shall be displayed on the same panel as the phone push button, that is activated by emergency personnel to indicate that help is on-site. The message shall be permitted to be extinguished where necessary to display a new message or when the communications are terminated.
- d) Operating instructions shall be incorporated with or adjacent to the two-way communication outside the car.
- e) On the same panel as the phone push button, messages shall be displayed that permit emergency personnel to communicate with and obtain responses from a trapped passenger, including a passenger who cannot verbally communicate or hear.
- f) A means to display video to observe passengers at any location on the car floor, to emergency personnel for entrapment assessment, shall be provided.
- g) Cutting and patching as may be required at the location of the lobby communication device is by Elevator Contractor.

- h) Conduit, as required, from the machine room or from inside hoistway junction box(es) at the designated floor to elevator lobby phone panel at designated location as required.
 - i) Elevator contractor is responsible for all elevator related wiring to the lobby phone panel and/or elevator panel of the fire command center.
 - 2) Digital Position Indicator with 1-inch display numerals including direction of travel indicator for each elevator.
 - 3) Elevator emergency or standby power selector switch(es), and emergency generator status indicator for elevators including lighted jewel indicating power status with proper labeling in conformance with ASME A17.1 & applicable Building Code.
 - a) A selector switch marked "ELEVATOR EMERGENCY POWER" in red lettering a minimum of 5 mm (0.25 in.) in height that is key-operated shall be provided to permit the selection of the elevator(s) in each bank of elevators to operate on the emergency or standby power system. The key shall be Group 3 Emergency Operation Key as required. The selector switch positions shall be marked to correspond with the elevator identification number and a position marked "AUTO."
 - b) An illuminated signal marked "ELEVATOR EMERGENCY POWER" shall be provided in the elevator lobby at the designated level to indicate that the normal power supply has failed, and the emergency or standby power is in effect for one or more of the cars in this group operation.
 - c) The transfer between the normal and the emergency or standby power system shall be automatic.
 - 4) Fire Service Phase I Key Switch and Fire Service indicator lighted jewel matching main floor hall operating panel. Reset position shall not be incorporated in switch.
 - 5) **Fire Department Communications System:** Plug connection for Fire Department Communications System shall be provided in Fire Command Center Elevator Panel which shall provide communications for Fire Department personnel from the Fire Command Center Elevator Panel into each elevator car.
 - 6) Engraved labeling for each elevator number and function. No applied plates or labels.
 - 7) Car call key switch to lobby/egress floor of each elevator.
 - 8) Lobby Park key switch for each elevator.
- C) **Fire Command Center Approval:** Fire Command Center Elevator Panel must be approved by Owner and Consultant prior to Contractor ordering fixtures.

2.8 HALL FIXTURES

A) Hall Stations – General: New Hall Stations shall be flush mounted. Buttons shall illuminate to indicate call has been registered at that floor for the indicated direction. Faceplates shall be # 4 Brushed Stainless-Steel finish. Provide one set of risers per elevator.

- 1) Hall stations shall be of one-piece construction, flush mounted.
- 2) Designated level hall station (Floor designation "1") shall be of two (2) piece construction and flush mounted.
 - a) Lower section to have hall station push button(s), in case of fire use stair signs and Phase 1 Firefighter's Service key switch, with instructions.
 - b) Upper section to have devices for emergency power operation and emergency communications monitoring.
- 3) All other hall stations shall be of one (1) piece construction and contain all required switches and signage as required by this specification.
- 4) All switches, fixtures and pushbuttons shall be by Monitor Controls, Innovation Industries or pre-approved equal.
- 5) All push buttons to be tamper resistant Innovation Industries PB 39, Flush Button with Illuminated Halo and Center Jewel or pre-approved equal.
- 6) All Hall Stations shall be # 4 Brushed Stainless Steel.
- 7) In case of fire use stair signs shall be engraved into the hall station panel with exact signage as per ASME A17.1 Code. No adhesive type applied signage plates will be accepted at this hall station.
- 8) All hall and car push button assemblies shall include long life LED type lamps.
- 9) Each terminal station shall contain one illuminating push button and other applicable accessories, including hoistway access switches as required by this specification.
- 10) Each intermediate station shall consist of two illuminating push buttons, one for the up direction and one for the down position.
- 11) Phase 1 Firefighter's Service key switch, with instructions, shall be incorporated into the hall station at the designated level. Fire Service instructions as per ASME A17.1 Safety Code for Elevators and Escalators shall be engraved in the main floor hall station panel.
- 12) Local Telephone Line Status Monitoring: The telephone system for the elevators shall be compliant with the requirements of the ASME A17.1, Requirement 2.27 and will include a verification means as required by the ASME A17.1 code. If the verification means determines that the telephone line or equivalent means is not functional, an audible and illuminated visual signal shall be activated. A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a "FIRE RECALL" switch.
 - a) A minimum of one visual and one audible signal shall be provided for each group of elevators controlled by a "FIRE RECALL" switch.

- b) Verification of the telephone line operability shall be automatically performed at least on a daily basis and shall not require activation of the two-way communications link(s).
- c) The visual signal shall be located at the designated landing in the vicinity of the "FIRE RECALL" switch, be visible to elevator user(s), be labeled "ELEVATOR COMMUNICATIONS FAILURE" in red letters a minimum of 5 mm (0.25 inch) high, illuminate intermittently and continue to illuminate intermittently until the telephone line or equivalent means is functional.
- d) The audible signal shall be 10 dBA minimum above ambient but shall not exceed 80 dBA measured at the designated landing "FIRE RECALL" switch, sound at least once every 30 s with a minimum duration of half a second and continue to sound until silenced by authorized personnel or the telephone line or equivalent means is functional.
- e) The means to silence the audible signal shall be accessible only to authorized personnel. The signal when silenced shall remain silent unless activated by the next verification.

13) Hoistway Access Switches: New Hoistway Access Switches shall be provided and installed adjacent to the hoistway landing with which it is associated.

- a) The switch shall be installed a minimum of 1,200 mm (48 in.) and a maximum of 1,825 mm (72 in.) above the floor measured to the centerline of the switch, adjacent to or part of the hoistway entrance at the landing with which it is identified and shall be located on the wall outside of the hoistway within 300 mm (12 in.) of the entrance frame or on the hoistway entrance frame or jamb.
- b) The switch shall be labeled "ACCESS" and shall be a three-position switch, labeled "UP," "OFF," and "DOWN" (in that order), with the "OFF" position as the center position. The switch shall be rotated clockwise to go from the "UP" to "OFF" to "DOWN" positions.
- c) The switch shall be of the continuous pressure spring-return type and shall be operated by a cylinder-type lock having not less than a five-pin or five disk combination, with the key removable only when the switch is in the "OFF" position.
- d) The key shall be Group 1 Security.

B) Controlled Access Operation - Card Reader: Car calls from car operating panel may be entered only in conjunction with the access control system which provides the elevator controller with signals to enable/disable car calls. A card reader, provided by others, shall be installed in the car station to provide authorized persons with ability to enter car calls for individual openings as determined by the access control system.

- 1) The contractor shall mount the card reader behind a glass cut out (as provided by other Sections) at the proper ADA/accessibility height on the face of the car control station panel. Wiring from the card reader shall be brought from the elevator car, through the traveling cable, and to the elevator machine room. Reader shall have a controller in the elevator machine room which shall be hard wired into the elevator

control system under this section to individually enable/disable each car call button. Coordinate with other Sections and provide wiring between readers and controllers as directed by Access Control Installer.

C) Elevator Monitoring System: The contractor shall provide a microprocessor based elevator monitoring system in the Security Desk at the Plaza level. The system shall be capable of monitoring elevator status and security features. The functions shall include the capability to change security car and corridor call lockouts per elevator & floor.

- 1) Communication between the elevator control equipment and the elevator monitoring system in the Security Desk at the Plaza level shall be accomplished through an Ethernet connection in each machine/control room. The contractor shall be responsible for connection from the elevator controller to the Ethernet port in each elevator machine/control room.

D) Hall Position Indicators: Provide new hall position indicators as follows:

- 1) New 2-inch electronic segmented digital position indicators shall be provided and the position indicator shall be provided at the Main Lobby Floor landing above the door with a faceplate mounted at a 20-degree angle for viewing. Digital characters to correspond to the floors as listed in the Elevator System Description, Part 1.7 of this specification. The digital display shall be Blue LED.
- 2) As the car travels, its position in the hoistway shall be indicated by the illumination of the alpha/numeric character corresponding to the landing which the elevator is stopped or passing.
- 3) Position indicator shall have new tamper resistant, arrows thru engraved, clear epoxy filled, car-directional lanterns located on both sides of the position indicator with one for up direction travel and a second for the down direction travel. The up direction indicator will illuminate in green and the down indicator will illuminate in red color. The lantern bars, when illuminated, will indicate the intended direction of travel. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop. The lantern shall remain illuminated until the door(s) begin to close.

E) Hall Lanterns: New tamper resistant, arrows thru engraved, clear epoxy filled, hall lanterns shall be installed adjacent to hoistway openings. New hall lanterns shall replace the existing hall lanterns.

- 1) The lantern bars, when illuminated, will indicate the intended direction of travel. The lanterns will illuminate, and a signal will sound when the car arrives at a floor where it will stop. The lanterns shall remain illuminated until the door(s) begin to close.

F) Lobby Phone: The elevator travel exceeds sixty feet (60 ft) requiring a two-way voice communication means within the building to be provided.

- 1) The means shall enable emergency personnel within the building to establish two-way voice communications to each car individually. Two-way voice communication shall be established without any intentional delay and shall not

require intervention by a person within the car. The means shall override communications to outside of the building and comply with the following requirements:

- a) Two-way voice communications, once established, shall be disconnected only when emergency personnel outside the car terminates the call.
 - b) Once the two-way voice communication has been established, the visual indication within the car shall illuminate. The visual indication shall be extinguished when the two-way communication is terminated.
 - c) Operating instructions shall be incorporated with or adjacent to the two-way voice communication outside the car.
 - d) Cutting and patching as may be required at the location of the lobby communication device is by Elevator Contractor.
 - e) Conduit, as required, from the machine room or from inside hoistway junction box(es) at the designated floor to elevator lobby phone panel at designated location as required.
 - f) Elevator contractor is responsible for all elevator related wiring to the lobby phone panel and/or elevator panel of the fire command center.
- J) **Signal Fixture Illumination and Design:** All illuminated signal devices including, but not limited to, car operating panel pushbuttons, hall call pushbuttons, hall lanterns, position indicators, direction indicators, and related visual signaling devices shall utilize **blue illumination**. All illumination shall be consistent in color, intensity, and appearance throughout the elevator group. New fixtures should match as closely as possible to the Tower I Lowrise fixtures that are being retained.
- G) **Hall Fixtures Approval:** Hall fixtures listed above must be approved prior to ordering fixtures by Contractor.

END TRACTION ELEVATOR SECTION

BID ITEM 002

SPECIFICATION FOR MODERNIZATION OF HYDRAULIC ELEVATORS

SECTION 142400 - HYDRAULIC PASSENGER ELEVATOR

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. General Provisions of Contract, including general and supplementary conditions, special conditions and Division I Specification sections, apply to work of this section.
- B. Provide all labor, materials, services, and equipment necessary to complete the renovation of the elevator as specified herein.
- C. Anything not mentioned in these specifications or vice versa, as well as any work which is obviously necessary to complete the Project, within the limits established by the drawings, specifications and codes, although not shown on or described therein, shall be performed by the Contractor as part of their work.

1.2 DESCRIPTION OF WORK

- A. This section includes the substantial modernization of two (2) in-ground (holed) hydraulic passenger elevators Nos. 9 and 10 ("the elevators" or "the elevator") in the Williams Center Tower I, 1 West 3rd Street, Tulsa, Oklahoma as noted in the elevator schedule at the end of this section. The schedule indicates the elevator(s) to be modernized, required performance, control, capacity, features, and finishes for the elevator.
- B. Hydraulic elevator is defined to include a plunger & cylinder unit connected to the elevator platform which will raise and lower the elevator with pumping units using compatible oil as the medium complete with components, controls and devices as indicated and as required for safely operating elevator at rated speed and capacity.
- C. The modernization of the elevators shall be completed one elevator at a time. There shall be no more than one (1) elevator out of service at any one time. The Contractor in this section shall provide a written schedule, detailing specific tasks for the elevator and critical dates for the completion of related work. This schedule shall be acceptable to the Owner. The elevator shall be modernized per this schedule. Once work begins on site, the Elevator Contractor shall keep appropriate manpower onsite continuously until completion.

1.3 SUBMITTALS

- A. Refer to Division 1 for additional information regarding submittals, including submittal requirements, processing procedures, and limitations of review.
- B. Pre-Construction/Modernization Submittals: The following shall be submitted for review, comment, and approval prior to manufacturing or procurement of equipment.
 - 1. Product Data: Submit manufacturer's technical product data and instructions for each principal component or product. List and describe features of control system, performances, and operating characteristics. Submit brochures of all signal and operational fixtures, control and drive equipment, hoistway door equipment, door operator, door protective device, and all ancillary and necessary accessories or equipment to effect a complete modernization per the requirements of this Request For Proposal ("RFP").
 - 2. Shop Drawings: Shop drawings shall be prepared by skilled draftsmen and presented in a clear and thorough manner as follows:
 - a. Job-specific Elevator Layout Drawings: Drawings shall include dimensional layout drawings for the elevator, showing plans, elevations, sections, and large scale details of hoistway and machine room indicating service at each landing, coordination with building structure, and relationships with other construction including, but not limited to, electrical and HVAC equipment. Indicate capacities, speeds, sizes, performances, operations, safety features, controls, finishes, and similar information on the layout drawings.
 - b. Fixture drawings: Submit job-specific, straight line dimensional drawings of all signal and operational fixtures.
 - c. Cab Drawing: Submit job-specific plans, elevations, and details of the new cab interior finishes, including wall panels.
 - d. Approval of shop drawings is for general arrangement only and does not include measurement, which is the contractor's responsibility, or approval of variations from the contract documents. The purpose of the shop drawing submittals by the contractor is to demonstrate to the owner the contractor understands the design concept and demonstrates an understanding of the equipment and materials to be furnished.
 - 3. Samples: Submit samples of exposed finishes of car enclosures, hoistway entrances, and signal equipment.
 - 4. Maintenance Certification: The Contractor shall submit a written certification, signed by the Contractor and the manufacturer of the equipment, making a commitment to provide direct support to the Owner, or the Owner's elevator

maintenance service representative, including availability of parts (for inventory, not on an “exchange only” basis), diagnostic tools, and technical & engineering support. In addition, all parts and support shall be provided at a reasonable cost in line for which the original manufacturer would charge to its own customer base and response shall be in a timely manner. This commitment shall remain in effect for a minimum of twenty-five (25) years after substantial completion of the project.

C. Post Construction Submittals: Prior to completion and acceptance of the project, the following shall be submitted for review and acceptance.

1. Diagnostic Device: Upon completion of work provide diagnostic testing device, or maintenance terminal, suitable for all troubleshooting and testing procedures related to the specific type of microprocessor control. This diagnostic testing device, or maintenance terminal, shall conform to the operating procedures under the testing section of these specifications, and shall remain the property of the Owner. If onboard diagnostics are provided in the controller to meet this requirement, provide Adjustors Manual for proper interpretation of onboard diagnostics (see 1.3.C.2.b below).
2. Maintenance Manuals: Submit job-specific bound manuals for each elevator or group of elevators. Submit the required number in hard copy plus a minimum of one (1) electronic copy in .pdf format.
 - a. Operating and maintenance instructions, lubricating schedule and instructions, parts listing, recommended parts inventory listing for motor and critical components, diagnostic device operations manual, emergency instructions and similar information. Include description of any manufacturer specific safety features that are beyond code requirements.
 - b. The diagnostic device operations manual shall be complete with adjustment settings, sequence of operation, and other diagnostic technical data required for adjustments, tuning, maintenance, and operation of the elevators including performance of all required acceptance and periodic testing required by the Elevator Code. User’s instruction manual shall include access codes required for accessing microprocessor equipment for adjusting or programming.
 - c. Detailed "Maintenance Control Program" - specific to the elevator as required by Elevator Code. The MCP shall be in place to maintain the equipment in compliance with Elevator Code. The MCP shall specify examinations, tests, cleaning, lubrication, and adjustments to applicable components at regular intervals and shall comply with Section 8.6.1 of the Elevator Code. The MCP shall include “On-Site Documentation” and a method for “Maintenance Records” and “On-Site Maintenance Records” as described in Elevator Code. One (1) hard copy of the “Maintenance Control Program,” identical to the MCP provided in the Maintenance Manual, shall be placed for use in the elevator control room.

- d. Wiring Diagrams: Complete electrical circuit diagrams for control and operational features as installed, showing location and wiring for power, signal and control systems. The diagrams shall differentiate clearly between manufacturer-installed wiring and field installed wiring.
3. On-Site Wiring Diagrams: Provide job-specific wiring diagrams located near the elevator controller in the elevator control room. Provide one (1) hard copy sized at 11" x 17" minimum, clear-laminated wiring diagrams.
4. Keys: Provide a total of three (3) sets of keys for each type of key fixture on the elevator equipment. Keys shall be tagged with permanent marking, identifying function and use.
5. Certificate Frame: Provide a certificate frame in the elevator machine room mounted in a conspicuous location. Frame shall be made of a quality metal with a window size to house the operating certificate from the State of Oklahoma, Department of Labor.
6. Certificates and Permits: Provide Owner with copies of all inspection/acceptance certificates and operating permits as required by governing authorities to allow normal, unrestricted use of elevator

1.4 QUALITY ASSURANCE

- A. Installer Qualification: The elevator manufacturer, or a licensee of the manufacturer, who has a record of successful experience with the renovation of similar elevators. The contractors shall have, as a minimum, the following qualifications and documentation verifying these qualifications shall be submitted prior to award:
 1. Minimum of five (5) years successful experience in installing and servicing similar elevator renovations.
 2. Installed at least ten (10) completed and accepted elevator systems of similar size, scope, logic control, and motion control required by this contract.
 3. An existing in-house administrative and technical organization staffed with competent personnel who are experienced in the elevator related work required to install and service the elevator system as specified.
- B. Elevator Code: Except for more stringent requirements as indicated or imposed by governing regulations (which must be complied with), comply with applicable requirements of the ASME A17.1-2016 Safety Code for Elevators and Escalators hereinafter referred to as the "Elevator Code" as required by the local Authority Having Jurisdiction (AHJ) and the 2018 International Building Code, hereinafter

referred to as the "Building Code", or the latest adopted version of the Building Code by the AHJ.

- D. NEC Code: Comply with the NEC Code and specifically with sections relating to electrical work for elevators.
- E. Fire Resistance of Entrances: Comply with NFPA No. 80 and provide units bearing appropriate UL labels or other equivalent testing agency.
- F. Accessibility Standards: Comply with the 2009 ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities. Comply with the 2010 ADA Standards for Accessible Design dated September 15, 2010.
- G. Performance Requirements: Provide an elevator that meets the following performance requirements:
 - 1. Speed: +/- 5% of specified contract speed under a full load condition in either direction.
 - 2. Stopping Accuracy: within 1/4 inch maximum variance under any loading condition.
 - 3. Floor to Floor Performance Time: 17.2 seconds (based on a floor height of 12'-0") from start of doors closing until doors are 3/4 open and car is level and stopped at the next successive floor under any loading condition or travel direction.
 - 4. Door Close Time: 3.0 seconds
 - 5. Door Open Time: 2.0 seconds
 - 6. Door Open Dwell Time: 3.0 seconds car call / 5.0 seconds hall call. Dwell time shall be canceled upon activation of the door protection device or any car call button.
 - 7. Nudging: 60 seconds (adjustable and capable of turning on or off)
 - 8. Smooth acceleration and deceleration for comfort of ride.

1.5 DELIVERY, STORAGE AND HANDLING

- A) Deliver elevator materials, components, and equipment in manufacturer's protective packaging.
- B) Elevator equipment disassembled for replacement shall be neatly stored prior to removal from site and disposal, which is responsibility of Elevator Contractor.
- C) Store materials in a dry protected area if designated by owner. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling, or deterioration.
- D) Elevator Contractor shall be responsible for the material handling of all elevator equipment to site storage area. Elevator Contractor will be responsible for keeping all stored materials inside storage area with lock and key.

- E) Elevator Contractor's sole responsibility and liability shall be limited to the extent Elevator Contractor is at fault; and shall not be responsible for material once material arrives at jobsite.
- F) Elevator Contractor shall be responsible for the removal the existing equipment from the machine rooms and placement of the new equipment in the machine rooms.
- G) Owner shall afford the Contractor and separate contractors' reasonable opportunity for storage of materials and performance of their activities on the property and shall cooperate in coordinating operations with such other activities.
- H) Locked and protected storage for Elevator Contractor's tools or materials at site is contractor's responsibility. Key will be provided for elevator machine room and can be utilized for storage or securing of tools and equipment. This is the only area available on site for storage of any elevator materials, equipment, or tools.
- I) On site storage is limited and would need to be identified and coordinated with the site Facilities. In the event the on site storage is insufficient the Elevator Contractor will be provided a single location for either a storage trailer or POD. The cost of the storage container/trailer is the responsibility of the Elevator Contractor.
- J) Authorized elevator personnel only are responsible for temporary installed barrier panels as may be required during construction to protect the openings at elevator at each floor. Panels may be removed only while the authorized elevator personnel are to perform work in the immediate area of the unprotected opening. Authorized elevator personnel shall re-install all barriers as required to maintain the original solid and safe protection to the opening prior to leaving immediate work area of the opening.

1.6 PROJECT CONDITIONS

- A) **Prohibited Use:** Elevator that is turned over to the Contractor for modernization work shall not be used for any purpose during the construction period before Substantial Completion. The elevator will only be turned over to the Owner upon completion of all modernization work, including successful completion of all required inspections and tests including acceptance by Consultant.
- B) **Painting:**
 - 6) Only paint metal work provided by Contractor or impacted by Work performed under this specification by Contractor unless specifically required in other sections of this specification.
 - 7) For all painting performed the requirements of the General Provisions Painting shall be complied with as required.
 - 8) Pit floor should be painted at the end of the modernization.
 - 9) Machine room floor should be painted at the end of the modernization.
 - 10) Top of car should be painted at the end of the modernization.

1.7 INITIAL MAINTENANCE SERVICE AND WARRANTY

A. Warranty Maintenance Service: Furnish maintenance and callback service on the two (2) hydraulic elevators for a period of twelve (12) months following date of final acceptance of all elevator and escalator work as specified herein and as specified in the related additional sections of the RFP. The maintenance and call back service shall include at a minimum, but not be limited to, the full maintenance requirements as follows:

1. Maintenance service shall be performed by skilled elevator personnel directly employed and supervised by the same company that furnished and installed the elevator equipment specified herein.
2. This service shall include:
 - a. Monthly examination of the hydraulic unit as a minimum.
 - b. Lubricating, adjusting, repairing and replacing of all parts as necessary to keep the equipment, including battery packs, in a first-class condition and proper working order.
 - c. Furnish all lubricants and parts required.
 - d. Assure smooth and consistent operation of automatic hoistway doors and car doors.
 - e. Assure smooth starting and stopping and accurate leveling at all times.
 - f. Provide all periodic annual and maintenance testing in accordance with the Elevator Code.
 - g. The contractor shall keep clean of all dirt and debris guide rails, top of car, bottom of platform, machine room, unit hoistway and pit. All necessary cleaning supplies and equipment shall be furnished by the contractor.
 - h. An annual inspection, as described in the Elevator Code and/or as required by governing authorities, shall be performed by the contractor. The units shall have the State annual inspection performed during the normal anniversary dates of the elevators in the building during the Maintenance Service period identified above. Coordinate exact dates of required annual inspections with Owner's Representative and the Certified Inspector.
3. The maintenance service shall not include the performance of any work required as a result of improper use, accidents or negligence, for which the contractor is not directly responsible.
4. All work shall be completed by trained employees of the elevator contractor and performed during normal working hours. Include 24 hour/day, 7 days/week emergency callback service. Owner is responsible for the difference between straight time cost and overtime cost of said callbacks. Exclude only repair/replacement due to misuse, abuse, accidents, or neglect caused by persons other than installer's personnel. Response to non-emergency service calls shall be within 2 hours of the call and response to

emergency service calls shall be within 1 hour of the call. Emergency callbacks include, but are not limited to, the following:

- a. Incidents resulting in injury.
 - b. Entrapments.
 5. Contractor shall follow the procedure below when responding to any callbacks:
 - a. Upon receiving a call, the service representative shall immediately send emails to the Facilities Manager and the Security desk with an estimated arrival time. Exact email address will be provided to the successful installer.
 - b. Upon arrival at the site, during normal working hours (7:30 am - 5:00 pm Mon.-Fri.), the service representative shall immediately call the Facilities department and check-in at the Security desk and inform them of their arrival.
 - c. After work has been completed, the service representative shall send an email to the Facilities department stating the status of the elevator and repair. The status shall include how long the elevator was or will be shut down and a description of the problem and solution.
 6. During the ninth month of the new installation maintenance service period, a post warranty inspection shall be coordinated by the installing contractor to ensure the elevator is in a good state of maintenance repair and all maintenance manuals, diagnostic tools and Maintenance Control Program documents are in place. The inspection shall include the installing contractor, the Owner's current campus elevator maintenance contractor and the Owner's representative.
 7. The contractor shall maintain a log in the elevator machine room. The log shall list the date and time of routine examinations and all trouble calls. Each trouble call shall be fully described including the nature of the call, necessary corrections performed and or parts replaced.
 8. Maintenance service shall conform to the requirements of Section 8.6 of Elevator Code. This shall include the provision of a written Maintenance Control Program and maintenance record keeping that is consistent with Elevator Code requirements.
- B. General Warranty: The elevator warranty specified in this section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with,

other warranties made by the Contractor under requirements of the Contract Documents.

- C. Warranty: Provide special project warranty, signed by contractor, installer, and Manufacturer, agreeing to replace, repair/restore defective materials and workmanship of elevator work during warranty period. "Defective" is hereby defined to include, but not by way of limitation, operation or control system failures, performances below required minimums, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or vibration, and similar unusual, unexpected and unsatisfactory conditions. The warranty period is twelve (12) months starting on date of final acceptance of the elevators and escalators in this RFP and shall be extended until "defects" as defined in this warranty are corrected. Contractor shall maintain and warrant the elevators and escalators during the period when an elevator or escalator is placed in service through the 12-month warranty period.

PART 2 MATERIALS AND COMPONENTS

2.1 GENERAL

- A. Provide manufacturer's base pre-engineered elevator system with modifications or added features that will comply with the elevator work requirements as specified herein or, at manufacturer's option, provide custom manufactured base elevator system that will comply with the requirements. Where components are not otherwise indicated, provide standard components, published by manufacturer as included in standard pre-engineered elevator systems, and as required for a complete system.

2.2 ELEVATOR MACHINERY AND CONTROL EQUIPMENT

- A. Hydraulic Power Unit: The existing pumping unit shall be removed and replaced with a new pumping unit of an integral design and shall include an electric motor connected to a pump, a hydraulic control system, storage tank, necessary piping connections, and a controller, all compactly designed as a self-contained unit. The new pumping unit shall be located in the elevator machine room and the controller shall be mounted on the end of the machine or mounted on the wall of the machine room to meet NEC working clearance requirements. The hydraulic power unit shall be securely fastened to the machine room floor to prevent the tank from being overturned or displaced. Elevator contractor shall verify location and dimensions in general layout of machine room. Provide proper isolation pads under the feet of the pumping unit to substantially eliminate vibrations from the operating unit to the building structure. The locations of both hydraulic power units shall be on the wall immediately adjacent to the elevator hoistway.

1. The hydraulic control system shall be a compact design suitable for operation under the required pressures and it shall be mounted in the storage tank. The control valve will be a manifold type with up, down and check valve sections. A control section including solenoid valves will direct the main valve and control up and down starting, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. Down speed and up and down leveling shall be controlled at the main valve sections. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. All control systems shall be pre-adjusted at the factory. A manual lowering feature shall be provided to permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
 2. The pump shall be a positive displacement screw type to give smooth operation and shall be specially designed and manufactured for elevator service.
 3. The storage tank shall be constructed of steel and shall be provided with a removable cover and a means to gauge the proper level of the oil. The pump and submersible motor shall be mounted on a special reinforced isolation mount in the bottom of the tank. The control valve shall be mounted in the discharge line above the oil level and easily accessible from the top of the tank. All oil for the entire hydraulic system shall be new. An initial supply of oil sufficient for proper operation shall be provided.
 4. Provide a muffler in the discharge oil line near the pump unit designed to dampen and absorb pulsation and noise in the flow of hydraulic fluid.
 5. Provide a manual shut off valve in the supply line adjacent to the pump unit.
 6. The oil supply line shall be provided new to accept the new hydraulic power unit in the elevator machine room. Any new oil supply line piping shall be installed above ground and be of adequate size and thickness, properly supported, per code requirements.
- B. Cylinder & Plunger (Jack Unit): The cylinder and plunger (Jack units) shall be retained and reused with the renovation. With the renovation, the following tasks shall be performed:
1. The jack packing shall be replaced to eliminate excessive leakage.
 2. Provide a new manual shut off valve in the pit.
- D. Controller:

1. A microprocessor computer-based control system shall be provided to perform all of the functions of safe elevator motion and elevator door control and shall be one of the following control systems or approved equal:
 - a. Motion Control Engineering – Motion 2000 (with onboard diagnostic keyboard and display)
 - b. Vertitron Midwest Inc. - VHC-102
 - c. Smartrise - Hydraulic Controller
 - d. Elevator Controls- Pixel
2. The controller shall be designed with a split cabinet to separate high voltage from low voltage for efficiency and safety of future maintenance and troubleshooting of the unit.
3. The controller shall include all the hardware required to connect, transfer, and interrupt power and protect car operational and group supervisory control. A three-phase overload device shall be provided to protect the motor against overloading.
4. Identify each device, module and fuse (with ampere rating) by name, letter, or standard symbol, in an indelible and legible manner on the device or panel. Coordinate identification markings with identical markings on wiring diagrams. Use light emitting diodes (LED) for visual monitoring of individual modules. Components shall have interlocking circuits to assure fail-safe operation and to prevent unwarranted elevator movement should any component fail to function properly. Modules shall be of the type that plug into pre-wired mounting racks. Field wiring or alteration shall not be necessary in order to replace defective modules.
5. The elevator shall be provided with an automatic leveling device that will bring the car to a stop within 1/4" of the landing level regardless of load or direction of travel. Landing level will be maintained within the leveling zone irrespective of the hoistway doors being open or closed.
6. A protective circuit shall be provided which will stop the motor and the pump and return the car to its lowest landing in the event that the car while traveling up, does not reach its designated landing within a predetermined time interval. This circuit shall permit a normal exit from the car but prevent further operation of the elevator until the trouble has been corrected.
7. Solid state, reduced current starting shall be furnished which shall limit both the initial starting current and peak current drawn by the motor.
8. The control equipment and hydraulic power unit enclosures shall be mechanically fastened to the machine room floor.

9. Design the system so that it will start properly when power is restored in the event of a power failure. Provide system memory so that data is retained in the event of power failure or disturbance.
10. Provide manufacturer's standard pre-engineered microprocessor system, which shall control car movements as a group collective operation. Provide automatic dispatching of the car in response to hall calls with automatic response of system to changes in demand.
11. A car control station shall be furnished for the elevator and shall contain a bank of buttons numbered to correspond to the landing served. At each terminal landing a single push button fixture shall be provided containing the appropriate up or down push button and at each intermediate landing a button fixture shall be provided containing up and down push buttons.
12. When a call is registered by momentary pressure on a car or landing button, that button shall become illuminated and remain illuminated until the call is answered. Illuminated buttons serve as a visual indication that a call has been registered and that the car will stop at that landing.
13. Operation shall be automatic by means of the car and landing buttons. Response to hall calls shall be achieved by computing response time for each registered hall call. The car with the least response time for total system dispatching optimization shall have the call assigned to it. Response computations for each hall call shall be continuously monitored and hall call assignments changed if a more suitable car is found.
 - a. Load weighing transducers shall be furnished on the elevator's car platform or sling to operate at an adjustable fixed percentage of the load in the car (initially set at 60%). The car shall bypass hall calls when this device is actuated. This device shall also be used in determining load for hall call response analysis.
14. A diagnostic testing device, or maintenance terminal, suitable for all troubleshooting and testing procedures related to the specific type of microprocessor control, shall be installed on this project and provided at the final acceptance. This diagnostic testing device, or maintenance terminal, shall conform to the operating procedures under the testing section of these specifications.
 - b. After successful testing of the diagnostic device, in conjunction with the microprocessor control, the testing device shall become the property of the Owner. The diagnostic testing device shall not become inoperative after a period of time requiring factory rehabilitation. The contractor shall provide

written certification that repair and support of the diagnostic tool components is readily available to the Owner in the future.

- c. When repairs or replacement to the testing device become necessary prior to the final acceptance, the repairs, or replacement, shall be provided at no cost to the Owner.

15. Additional special operations shall be included with the elevator control system:

- a. Independent Service: A key switch shall be provided in the car operating station of the elevator which, when actuated, shall disconnect the elevator from the hall buttons and permit operation from the car buttons only. Close doors by constant pressure on desired destination floor button. Open doors automatically upon arrival at selected floor.
- b. Top of Car Inspection Operation: Provide an operating fixture on top of the car containing continuous pressure "Up" and "Down" buttons for operating the elevator, an emergency stop button, a light and duplex GFCI receptacle, and a toggle switch that will make the top of car operating device operative.
- c. Fireman's Emergency Service: Furnish emergency operation to return the elevator to the main fire access Floor P and return to the alternate Floor P1 when emergency is at main fire access floor. Furnish "in car" control of the elevator during emergency operation by means of a key switch in the car. All key switches and keys for this service shall match those utilized for WT1 Low Rise Otis Units, and WT2 High Rise #10, which are FEO-K1.
 - 1) The appropriate signals from the fire alarm control system, as required to work in conjunction with the fireman's phase I recall operation, shall be provided in the machine room by other sections. Coordinate exact signal requirements with fire alarm contractor to ensure proper operation and code compliance.
- d. Emergency Communications System Failure Verification: For each elevator group, provide a means to verify operability of the telephone line, or other means of connection, serving the respective elevator group's emergency two-way communications system. This system shall verify telephone line operability on a daily basis and provide for a visual and audible alarm when the system determines that the telephone line is not functioning. The audible and visual alarm shall be located near the firemen's emergency service phase I key switch. The visual signal shall be an intermittent jewel illumination that shall not extinguish until the telephone line is functional. The audible signal shall be 10 dBA above ambient noise, but shall not exceed 80 dBA, as measured from the phase

I recall key switch location. The audible alarm shall sound until authorized personnel silence it or until the telephone line is made functional. The means to silence the alarm shall be accessible only to authorized personnel. This system shall meet Elevator Code requirements.

- e. Hoistway Access Key Switch Operation: Key operated switches shall be provided in the car and at the top and bottom landings for selecting hoistway access operation. When the inspection switch in the car is turned to the "ON" position, the car is put on inspection operation and can only be run by use of the switch at the terminal landings.
 - 1) The car parks with the doors open and the closing circuit rendered inoperative. The inspector runs the car at low speed with the doors open by constant operation of the switch located in the elevator lobby.
 - 2) The car can be run down from the top floor to gain access to the top of the car or up from the bottom floor to gain access to the elevator pit. The movement of the car initiated and maintained by the upper access switch shall be limited in the down direction to a travel not greater than the height of the car crosshead above the car platform, and limited in the up direction so that the maximum travel is the point where the bottom of the platform guard is even with the hoistway entrance header.
 - 3) The car can be run up from the bottom landing to gain access to the pit. Travel is limited in the up direction by hoistway limit switches so that the maximum travel is the point where the bottom of the platform guard is even with the hoistway entrance header.
- f. Controlled Access Operation - Card Reader: Car calls from car operating panel may be entered only in conjunction with the access control system which provides the elevator controller with signals to enable/disable car calls. A card reader, provided by others and installed under this contract, shall be installed in the car station to provide authorized persons with ability to enter car calls for individual openings as determined by the access control system.
 - 1) The contractor shall mount the card reader behind a glass cut out (as provided by other Sections) at the proper ADA/accessibility height on the face of the car control station panel. Wiring from the card reader shall be brought from the elevator car, through the traveling cable, and to the elevator machine room. Reader shall have a controller in the elevator machine room which shall be hard wired into the elevator control system under this section to individually enable/disable each car call button. Coordinate with other Sections and provide wiring between readers and controllers as directed by Access Control Installer.

- g. Elevator Monitoring System: The contractor shall provide a microprocessor based elevator monitoring system in the Security Desk at the Plaza level. The system shall be capable of monitoring elevator status and security features. The functions shall include the capability to change security car and corridor call lockouts per elevator & floor.
 - 1) Communication between the elevator control equipment and the elevator monitoring system in the Security Desk at the Plaza level shall be accomplished through an Ethernet connection in each machine/control room. The contractor shall be responsible for connection from the elevator controller to the Ethernet port in each elevator machine/control room.
- h. Emergency Power Operation: When the normal power fails an emergency power source, as supplied under other sections, is applied to each elevator disconnect switch for the passenger elevator nos. 9 & 10. A signal shall be provided by other sections from the emergency power transfer switch with wiring brought up to one elevator controller in the machine room to indicate to the elevator control system that emergency power is available for emergency use.
 - 1) When the elevators are on emergency power operation the elevators shall operate such that all car calls and hall calls for all elevators shall be made ineffective and the cars are initially rendered inoperative.
 - 2) One car at a time shall be automatically selected to return to the first floor. A selected car stopped between floors by the disruption of normal power will first run at low speed to the nearest floor and then return at high speed to the return floor. If the selected car does not start running within a predetermined time, the selection proceeds to the next car.
 - 3) When the selected car arrives at the return floor the doors open. After the normal door open time, the doors close, the car is rendered inoperative, except for door reopening, and the selection proceeds to the next car. After all cars have returned to the first floor, one car is automatically selected to run on normal operation under emergency power. This car shall operate at full contract speed. The hall calls shall be made effective and the selected car responds to all hall calls and car calls as a normal operation.
 - 4) An automatic and override selection key switch shall be provided at the first floor hall button to allow manual selection of passenger car nos. 5 & 6 to run on normal operation. When the switch is turned to the automatic position, the automatic selection feature is made effective.

Selection of a particular car to run on normal operation is done by turning the selection switch to the position that represents that car. The switch shall be made such that each position is interlocked from the other position and only one car is allowed to run at a time.

5) When normal power is restored all cars return to normal operation.

- i) Battery Power Operation: When both normal utility and emergency power sources fail, Contractor shall provide an alternate method (battery system) of powering the elevators to the nearest lower landing and opening the doors. Elevators shall resume normal operation automatically upon restoration of either utility power or emergency power.

2.3 CAR STRUCTURE

- A. Platform, Car Frame and Car Sills: The existing platform, car frame, and car sills shall be retained. All components shall be thoroughly cleaned, and if conditions warrant, primed and painted.
- B. Platform Guard: Where present, the existing platform toe guard under the entrances of the car shall be replaced or modified to extend a minimum of 21 inches below the car sill before the bend. Where not present, a toe guard extending a minimum of 21 inches below the car sill before the bend shall be installed. Upon completion, paint the guard with two (2) coats of a rust preventive paint, color to be black.
- C. Roller Guides: The existing slide guides shall be replaced with new, spring loaded ElSCO Swivel Slide guides to match rail size. Adjust the guides with the rails for smooth quality of ride upon completion of the renovation.
- D. Top of Car Handrail: A standard railing, consisting of a top rail, intermediate rail, posts, and toe-board, shall be provided on the top of each elevator car where required by code. The top rail shall have a smooth surface and the upper surface shall be located at a vertical height of 42" from the top of the car. The intermediate rail shall be located approximately half-way between the top rail and the top of the car. Posts shall be located not more than 7'-10" apart. The toe-board shall be securely fastened to the posts and extend from the top of the car to a height not less than 4".
- E. Balance: After all components are assembled on the car structure, the elevator car shall be statically balanced in alignment with the guide rails to equalize pressure on the guides for a smooth ride upon completion of the renovation.

- F. Cleaning: Upon completion of all modifications on top of the car, clean the car structure and top of the new elevator car of all grease, lint, and dirt.

2.4 HOISTWAY COMPONENTS

- A. Guide Rails: The present guide rails shall be retained. Rails shall be cleaned and realigned as required to assure smoothness of ride.
- B. Hoistway Operating Devices: Normal terminal stopping devices shall be provided. When an emergency terminal speed-limiting device is furnished, the controller switches and circuitry shall be arranged in accordance with the requirements of the Elevator Code.
- C. Pit Switch: A new emergency stop switch shall be provided and located in the elevator pit within reach of the pit access door, adjacent to the pit ladder, and 18 inches above the sill. Pit ladder shall meet applicable code requirements, and bolts shall be checked and confirmed to be secure in place.
- D. Top of Car Operating Device: A new top of car operating device shall be provided for each car and made to work with the new control equipment. The device shall have the proper buttons, switches, and stop switch to operate the elevator on top of the car under inspection operation. The device shall be provided with a GFCI duplex receptacle and a guarded light providing 10 foot candles ("fc") of illumination at any maintainable point on the car top.
- E. Wiring: All hoistway and machine room wiring shall be installed new. The wiring and electrical interconnections shall comply with the governing codes. Insulated wiring shall have flame retardant and moisture-proof outer covering, and shall be run in conduit, tubing or electrical wireways. Assure all new wiring and conduits are located against a wall in the machine room or a minimum of 7'-0" above the machine room floor level.
- F. Traveling Cable: A new traveling cable shall be provided and shall be flexible, with a flame and moisture resistant outer cover, and shall be suspended to relieve strain on individual conductors. In addition to all code required cables to support code required devices and infrastructure, the traveling cable(s) shall include four (4) additional pair of shielded, 18/2 AWG twisted pair for Owner's use plus four (4) CAT 6 POE traveling cables with a minimum 22 AWG sizing, and two (2) coax cables. Provide 10% spare wires in traveling cable for elevator usage.
 - 1. Wire meshing, or similar means, shall be provided behind the traveling cable, between the elevator hoistways, to prevent the traveling cable from rubbing, chaffing against hoistway or car items, snagging, or swaying into the adjacent hoistway.

2. Provide necessary conductors for 2-way video emergency phone communications as per code ASME 17.1 2019 2.27.1.1.
- G. Spring Buffers: The existing spring buffers and buffer channels shall be retained in the elevator pit as a means for retarding the movement of the car at the bottom limits of travel.
1. Prepare all surfaces to be painted by removing dirt, grease, oil, loose paint, rust, scale, and other contaminants by cleaning, scraping, sanding, wire brushing, or grinding as required. Treat remaining corrosion and apply a compatible rust-inhibiting primer to all exposed or prepared metal surfaces. Apply not less than two finish coats of durable industrial-grade enamel or approved equivalent to provide a uniform, complete, and professional finish. Color shall be selected by the Owner or Consultant. Protect adjacent equipment and surfaces from overspray and paint damage.
- H. Pit Ladder: Existing pit ladder shall be checked for compliance, and if necessary, remove the existing pit ladder and provide a new, Elevator Code-compliant, steel ladder for access to the pit. The new ladder shall be located on the interlock side of the entrance, be a minimum of 16 inches wide, provided with a 4-1/2 inches of toe kick to the pit wall, and have the handgrips extend 48 inches above the access landing.

2.5 DOOR OPERATING SYSTEM

- A. Door Operator: Doors on the car and at the hoistway entrances shall be power operated by means of a new high speed, heavy duty, closed-loop, master door operator mounted on top of the car with all new associated operating linkages, door clutches, and gate switches. The motor shall have positive control over door movement for smooth operation. New infrared car door safety devices shall be used to cause instant reopening should an obstruction be detected during the closing cycle.
1. Door operation shall be automatic at each landing with door opening being initiated as the car arrives at the landing and closing taking place after expiration of a time interval. A car door electric contact shall prevent starting the elevator away from the landing unless the car door is in the closed position. Door close shall be arranged to start within a time consistent with accessibility requirements.
 2. The time interval for which the elevator doors remain open when a car stops at a landing shall be independently adjustable for response to car calls and response to hall calls.

- B. Interlocks: A new approved positive interlock shall be provided for each hoistway entrance which shall be made to work in conjunction with the new door operators. The interlocks shall prevent operation of the elevator unless all doors for that elevator are closed and shall maintain the doors in their closed position while the elevator is away from the landing.
1. New closers shall be provided. The closers shall be adjusted to automatically close the hoistway doors when the car is away from the landing per ASME A17.1 Elevator Code requirements.
 2. New hoistway door unlocking devices shall be provided at all landings to permit access to the top of the car. All unlocking devices shall be actuated by a special key and access holes in hoistway doors shall be protected by a naturally finished, barrel type escutcheon plate.
- C. Car Door Safety Devices: The existing door safety devices shall be removed and discarded. New infrared, door protection devices shall be installed and made to work in conjunction with the new control equipment. Where code required, Smart 3D infrared door reopening devices shall be utilized. Operation for all devices to be as follows:
1. The doors shall be prevented from closing from their full open position if a person or object comes within the zone of detection. The detection zone shall move with the doors and if a person or object enters the zone as the doors are closing, the doors shall reverse and reopen prior to physical contact. The doors shall reclose after a minimal time interval. After a stop is made, the doors shall remain open for a time interval to permit passenger transfer, after which the doors shall close automatically. This interval shall be less for a car call stop than for a hall call stop or a coincident car/hall call stop.
 2. If the doors are prevented from closing for a fixed time period an audible chime shall sound on the car. When the object is removed from the zone of detection the doors shall close at reduced power and speed to below 2 1/2 ft.-lbs. of kinetic energy. If an object enters the zone of detection while the doors are closing at reduced power and speed the doors shall stall and not reopen. Once the object is removed from the zone of detection the doors will continue to close at reduced power and speed. This operation will continue until the doors are totally closed. Normal operation shall resume at the next landing reached by the car.
- D. Car Door Restrictors: New car door restrictors shall be provided. The door operating mechanism shall be arranged so that the car and hoistway doors cannot be opened by hand more than four inches from within the elevator car when the car is outside the unlocking zone. Design of door restricting mechanism shall permit opening of car doors from outside of the elevator car

without the use of special tools. Only mechanical type door restrictors are permitted.

2.6 OPERATIONAL FIXTURES

A. Car Control Station: A new single car control station panel shall be provided on the front return panel of the elevator car to replace the existing.

1. The car control station panel shall contain a bank of mechanical illuminated buttons and Braille marked to correspond to the landings served and contain an illuminated alarm bell, door open & close buttons, fireman's phase II service key & fixtures, key switches for lights, fan, and other controls required for specified car operation and control. Mount the panel at height to comply with accessibility standards. Floor buttons shall be positioned in as few columns as possible to fit within the code required range. Braille plates shall not be the same shape as the floor call buttons.
2. The car control station panel for each elevator shall incorporate the fireman's phase II key switch and associated fire operation fixtures inside a locked cabinet located at the upper portion of the panel. The fireman's keyswitch shall be of a tubular, 7 pin, style 137 construction and shall have a bitting code of 6143521. The key shall be coded "FEO-K1." The phase II key switch, instructions, call cancel button, fire jewel, door open and door close buttons, and stop switch shall all be located within this locked panel. The front of the cabinet shall be engraved with the label "FIREFIGHTERS' OPERATION". The cover to the cabinet shall be openable with the same key that is used to operate the phase II key switch. This cabinet shall meet Elevator Code requirements.
3. A new digital car position indicator with direction arrows shall be provided in the top of the new car control station panel. The position of the car in the hoistway shall be shown by the illumination of the indication corresponding to the landing at which the car is stopped or passing. Provide an electronic, adjustable, floor bypass tone to indicate to passengers that car is stopping at a particular floor served. When a car stops, an audible annunciation of the floor number shall be provided.
4. The elevator number shall be permanently engraved on the upper portion of the car control station. The car capacity shall be permanently engraved on the lower portion of the car control station panel or engraved on an inset panel at this location. Lettering shall not be less than ½" high and shall be black filled.
5. The car control station panel shall also contain emergency car lights and the emergency power unit employing a sealed rechargeable battery and static circuits, or a portion of the cab ceiling lights shall be made to work on a

- similar emergency power unit. The battery shall be 6-volt minimum, sealed, maintenance free, of either lead acid or gel cell construction, and designed to give a life expectancy of not less than 5 years. Illumination for the elevator car and power for alarm bell shall be provided in the event of power failure.
6. Car control station shall not contain plastic or polycarbonate components, labels or frames.
 7. Controlled Access Operation – Card Reader: The car operating panel shall incorporate space and lens for a card reader to be mounted behind the COP faceplate. The card reader shall be located at ADA/accessibility height requirements. Style of car reader installation shall be confirmed during the fixture review and approval process. Include a card reader override switch behind the locked service panel.
 8. The car control station shall also contain an integral emergency communication system located at ADA/accessibility height requirements. Provide operating switches with manufacturer's standard identification for required use or function. The activation button shall match the car operating panel button fixtures. The speaker shall be mounted behind the car operating panel with vandal resistant perforations drilled through the car operating panel.
 - a. The speakerphone shall be of the automatic dialing type and shall have the capability to automatically identifying its location upon receipt of the call to the party answering the call.
 - b. Provide an activation button, with integral legend, and identification plate adjacent to the button. Illuminate button to indicate call registration. Provide means to indicate when call is answered. Provide engraved legend below indicator light explaining phone instruction. The speakerphone shall meet the requirements of ADA guidelines and shall operate in accordance with Elevator Code OR A17.1 2019.
 - c. Necessary shielded wires shall be provided by the contractor from the speakerphone in the elevator car, through the traveling cables, and shall terminate in a junction box on the elevator controller in the elevator machine room. Connections to the building service system shall be provided by the Contractor.
 - d. On the same panel as the phone activation button, provide a display for messages from authorized personnel that acknowledge when two-way communication has been established and allow for further communication. Additionally, provide means for authorized personnel to obtain responses from entrapped passengers, including those who cannot verbally

communicate or cannot hear. Where required, the design and features shall meet the requirements for two-way visual communications.

- e. Provide all required equipment, including any necessary software, in-car cameras, displays, computers, etc. required for authorized personnel receiving emergency calls from these elevators.
 - 1) Where required by local AHJ, Authorized personnel receiving the call shall be provided with a means to display video of passengers at any location on the car floor.
 - f. The complete two-way communications system shall be non-proprietary and shall not require any ongoing elevator maintenance agreement or elevator emergency call monitoring agreement from the elevator installer or any manufacturer. The building Owner shall have the option of having this system monitored by authorized personnel of their choosing.
 - g. The communications system shall provide for all operations necessary to comply with ASME A17.1 Rule 2.27.1.
- B. Hall Push Button Station: The existing riser of hall button fixtures shall be replaced with new at all floors. At each terminal landing, single type button fixtures shall contain the appropriate "Up" or "Down" buttons, and at each intermediate landing dual button type fixtures shall be provided, containing appropriate "Up" and "Down" buttons. All fixtures shall be installed at proper height to comply with the accessibility standards. The hall button fixture faceplates shall be the flat, applied type that is flush mounted with the wall. The hall buttons shall operate such that when a call is registered by any momentary pressure on the landing button, the button shall become illuminated and remain illuminated until the call is answered. The fixture faceplates shall be large enough to cover access holes remaining from the old fixture so that there is no need for patching.
- 1. The face plate of the Floor P hall button shall additionally contain the fireman's phase I key switch. The fireman's keyswitch shall be of a tubular, 7 pin, style 137 construction and shall have a bitting code of 6143521. The key shall be coded "FEO-K1." The fireman's phase I instructions shall be permanently engraved on the face plate or on an inset plate mechanically fastened flush with the face of the hall button fixture.
 - 2. The faceplate of the Floor P hall button shall additionally contain the audible and visual alarm for the elevator group's "Emergency Communications

- System Failure Verification” in addition to the keyswitch for temporary silence of the alarm.
3. The call buttons in the hall button fixture shall be centered at 42” above the finished floor. The Contractor shall be responsible for cutting any new holes and installing the new hall button fixtures. The face plate of the new fixture shall cover the new and old hall button access holes such that no refinishing of the front wall around the new fixture will be required.
 4. The faceplate of the Floor P hall button shall additionally contain the audible and visual alarm for the elevator group’s “Emergency Communications System Failure Verification” in addition to the keyswitch for temporary silence of the alarm.
 5. The faceplate of all hall button stations shall be engraved with the fire evacuation sign incorporating a pictograph as depicted in Figure 2.27.9 of the Elevator Code.
 6. Assure there is space between the actual hall buttons and any other items on the fixture to avoid any confusion as to which button is the hall call button.
- C. “In-Car” Hall Lantern: New in-car hall lanterns shall be located in the existing car entrance jamb locations at the ADA/accessibility required height. The lanterns shall be the applied type with a flush-mounted faceplate and shall be on both sides of the entrance. The lanterns shall incorporate the appropriate triangular direction arrows for the up and down directions. The operating function of the lantern shall incorporate the appropriate directional tones per accessibility standards. An adjustable, electronic, audible tone shall sound to announce the arrival of the elevator car. The tone shall sound once for the “UP” direction and twice for the “DOWN” direction upon opening of the car doors. The fixture faceplates, if utilized, shall be large enough to cover access holes remaining from the old fixture so that there is no need for patching. Fixtures are to be of a vandal resistant design, and shall be illuminated.
- D. Hoistway Access Key Switches: A new, jamb mounted fixture shall be provided at the top and bottom landings for each car containing the hoistway access key switch replacing the existing fixture with a faceplate large enough to cover access sholes remaining from the old fixture. The key switch shall be a three position, Up-Off-Down, key switch with spring return to the Off position and removable in the Off position only.
- E. Lobby Status Panel: Elevators 9 and 10 shall be integrated to lobby status panel upgraded as part of Elevator WT1 and WT2 elevator modernizations. A new lobby status panel shall be installed to replace existing lobby status panel, integrating all previously modernized elevators, and the elevators under this RFP, within respective tower lobbies.

- F. All signal fixture face plates shall be stainless steel with a brushed finish. Vandal resistant screws shall be provided for mounting all signal and operational fixture face plates.
- G. Signal Fixture Illumination **and Design**: All illuminated signal devices including, but not limited to, car operating panel pushbuttons, hall call pushbuttons, hall lanterns, position indicators, direction indicators, and related visual signaling devices shall utilize **blue illumination**. All illumination shall be consistent in color, intensity, and appearance throughout the elevator group. New fixtures should match as closely as possible Tower I Lowrise fixtures that are being retained.
- H. Fixtures shall be as manufactured by the following or approved equal:

- 1. Innovation – Prestige

2.7 CAR ENCLOSURE

- A. The existing steel car enclosures shall be retained, and the interior finishes shall be replaced and refurbished as follows:
 - 1. Include cab interior allowance of \$30,000 per elevator. Final design and finishes to be coordinated and approved by owner and consultant. The allowance is for the cab interior wall panels and ceiling. Allowance is for material only. Labor shall be included in Contractor's estimate.
 - 2. If new cab is to be included through allowance, Bidders are required to provide examples of available styles included as part of budget.
 - 3. New finished flooring will be provided by owner and is not to be included in the allowance.
 - 4. The front returns, and entrance columns shall be retained and re-cladded. The existing swing return panels shall be rigidly secured to accept the installation of the new Car Operating Panel (COP). Car Return Panel: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing car box openings in return panel and wrap around car return panel. Car Door Header & Transom Assembly: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing car box openings in car door head jamb & Transom assembly. Car Strike Jamb: Install stainless steel: ASTM A 167, Type 300 stainless steel panels, No. 4 satin finish, extend one piece to cover all existing openings in car door strike jamb assembly.
 - 5. The canopy shall be retained.
 - a. The existing top emergency exit panels shall be retained and provided with an electrical device that will prevent operation of the elevator cars if the exit

cover is open more than 2 inches. Devices shall be designed in accordance with Elevator Code requirements.

- b. A new cab exhaust blower fan shall be provided and installed on each car top. Mount with rubber grommets and adjust for smooth, quiet operation. The fans shall be Morrison Model OE or approved equal.
- c. One light fixture shall be connected to the emergency power circuit and shall operate as the emergency power light for inside the cab upon power loss. (Add for SEMO)

A security camera shall be provided and installed by others in the rear corner of the elevator cab. Elevator contractor to provide assistance on installation as well as provide wiring to the ceiling area and coordinate installation with security contractor.

6. A new extruded aluminum car sill shall be installed such that the platform is recessed below the car door sill to accept the car flooring so the flooring is flush with the car door sill upon completion of the installation. The existing car flooring and shall be removed and replaced with new flooring, to be provided and installed by other trades. Exact flooring and subflooring thicknesses to be verified by contractor with flooring manufacturer. The Contractor in this section shall allow for the thickness and weight of the flooring, provide any necessary subflooring, and set the car entrance sills accordingly so as to avoid any tripping hazard.
7. The car enclosures shall comply with the ASME A17.1 Safety Code for Elevators and Escalators. All stainless steel shall be provided with #4 brushed finish.

2.8 HOISTWAY ENTRANCES

Passenger Elevator Nos. 9 & 10 Entrance Summary

Speed	Total Number -	Six (6)
	Type-	Retain Center Opening, Single
Jambs.	Clear Opening	3'-6" W by 7'-0" H
	Door Panels -	Retain Existing
Jambs.	Jambs & Sills -	Retain Side & Head jambs.
	Door & Jamb Finish -	Retain existing on doors. Repaint

A. The existing hoistway entrances shall be retained and modified as follows:

1. Frames: The existing frames shall be retained. Check to make certain all are secure to the building structure; make any necessary repairs to unsecured frames. Jambs and Transoms on floors B and SB should be repainted; Local Site Management Team will provide paint product/code to be used.

2. Sills: The existing hoistway door sills shall be retained. The sills shall be cleaned upon substantial completion of the elevator renovation.
3. Fascia Plates, Toe Guard and Dust Covers: The existing components may be retained. The contractor is responsible for checking the components and providing any additional required fastenings to assure they are totally secured to the hoistway structure. Any missing fascia or hanger covers shall be replaced with new. Upon reconditioning and cleaning, the fascia shall be painted with a low VOC paint by the Contractor in this section, color to be black.
4. Headers and Struts: Headers and struts may be retained. The contractor is responsible for checking these components and providing any new required fastenings to assure they are totally secured to the hoistway structure.
5. Hangers and Tracks: The existing tracks and hangers may be retained. Provide all new hanger rollers and properly adjust all equipment for smooth door operation.
6. Closers: The existing closers shall be replaced with new Smart Tork spirator type closers. All closers shall be adjusted to assure proper automatic closing of the doors when the car is away from the respective floor. Adjust all equipment for smooth operation.
7. Door Panels: The existing door panels shall be retained. The door panels shall be furnished with barrel type escutcheon plates for the door unlocking devices at each landing. If relocated, old unlocking holes shall be plugged and sanded smooth with epoxy or equivalent type material.
 - a. The door panels shall be provided with two (2) removable phenolic guides and one (1) fire retention tab per door panel that run in the sill slots with minimum clearance.
 - b. The sight guards shall be checked. Damaged guards shall be repaired or replaced, and loose guards shall be tightened and secured to the door edge.
 - c. Any missing or damaged astragals or door bumpers in the strike jambs shall be replaced for proper cushioning of the doors when closing.
8. Handicap Jamb Markings: The jamb Braille marking plates shall be retained. Any missing jamb Braille marking plates shall be replaced with plates that match those retained.
9. Elevator Identification Signs: Provide applied elevator identification signs with black raised number markings and a stainless background to identify the

elevator on both jambs of the main and alternate fire recall floor, hoistway entrances. Signs to be mounted at the top of the hoistway entrance jamb, centered vertically in line with handicap jamb markings.

10. All stainless steel shall be provided with #4 brushed finish unless stated otherwise.

PART 3 EXECUTION

3.1 PREPARATIONS

- A. Site Inspection: Prior to commencing elevator renovation inspect hoistway, hoistway openings, pit, and machine room as constructed. Contractor is responsible for all dimensions as field measured by the Contractor for proper installation and performance of elevator work.
 1. Contractor shall be responsible for inspecting and determining extent of work to be performed at the site to complete the work. Contractor must consider all requirements for installation of new work, access, code requirements, and removal or demolition, which additional work shall be performed without cost to the Owner.
- B. Demolition: All boards and/or components that are not readily available through direct replacement from the OEM, or secondary market, may be retained by the Contractor for use as spares for the second hydraulic elevator until modernized. The removal of all elevator equipment, which is not to be retained in the renovation, shall be completed by the contractor. The old elevator equipment removed becomes the property of the Contractor and it is their responsibility to remove this equipment from the project site. Include all work necessary to protect the public, residents, building employees, and building property during removal of demolished materials.
 1. When barricades are required for protection of the hoistway they shall be provided by the Contractor. Do not start demolition of an area until all temporary protection and temporary partitions are in place as furnished by the contractor. Temporary screening between adjacent hoistways shall be provided during the renovation and shall be removed after completion of the elevator work.

3.2 INSTALLATION OF ELEVATOR SYSTEM

- A. General: Comply with manufacturer's instructions and recommendations for work required during installation, referenced codes, and specifications.
- B. Welded Construction: Provide welded connections for installation of elevator work where bolted connections are not required for subsequent removal or for

normal operation, adjustment, inspection, maintenance and replacement of worn parts. Comply with AWS standards for workmanship for qualifications of welding operators. Coordinate any welding or burning with the Owner's Representative.

- C. Coordination: Coordinate elevator work with other sections for proper time and sequence to avoid construction delays. The Contractor shall provide fully operational elevator system as stipulated in the construction schedule. The Contractor shall maintain full crews and continue work once elevator demolition begins until the elevator system is completed and operational and accepted by the Owner. The Contractor shall provide the number of crews required to maintain the schedule and shall provide additional manpower and work such additional hours as are necessary to bring the project back on schedule.
- D. Sound Isolation: Mount any new rotating vibrating elevator equipment and components on vibration absorption mounts, designed to effectively prevent transmission of vibrations to structure, and thereby eliminate sources of structure borne noise from elevator system.
- E. Guide Rails: The existing guide rails are being reused and it is the Contractor's responsibility to see they are adaptable to Contractor's equipment, erected plumb, properly aligned, and anchored securely to the existing structure.
- F. Hoisting: All required hoisting and movement of the elevator equipment shall be the responsibility of the Contractor in this section.
- G. Final Cleaning & Painting: Upon completion of all elevator work, provide total clean down of elevator machine room, hoistway, and pit areas to remove all dirt and construction debris. All newly provided steel components in machine room and hoistway shall be provided with touch up painting to remove all scratches and blemishes incurred during construction.

3.3 ELECTRIC WIRING

- A. Conductors: Copper throughout with individual wires coded and all connections on identified studs or terminal blocks. Use no splices or similar connections on any wiring except at terminal blocks, control cabinets, junction boxes or conduits. Provide 10% spare conductors throughout, plus requested spares for Owner's security and/or telecommunication needs.
- B. Conduit: Painted or galvanized steel or aluminum conduit and duct shall be used. Conduit size shall be 1/2" minimum, except that 3/8" can be used for runs containing only 2 wires. Flexible conduit exceeding 18" in length shall not be used. Flexible heavy-duty service cord, type SO, may be used between fixed car wiring and car door switches for safety edges.

3.4 FIELD QUALITY CONTROL

- A. Acceptance Testing: Upon nominal completion of the elevator work, and before permitting use of elevator (either temporary or permanent), perform acceptance tests as depicted in Rule 8.10.3, "Acceptance Inspection and Tests of Passenger & Freight Hydraulic Elevators", of the Elevator Code. Also perform other tests, if any, as required by governing regulations.
 - 1. Contractor is responsible for coordinating observance of final acceptance inspection with the Owner's representative and a representative of ATIS Elevator Consulting, as they have been retained by the Owner to represent their interests. The Contractor is also responsible for coordinating any additional inspectors as required by local jurisdiction.
 - 2. A code data plate shall be provided on each elevator controller stating the applicable code year for installation/alteration, and any local AHJ required information.
- B. Diagnostic Testing: The diagnostic testing device, or maintenance terminal, provided shall be demonstrated and tested during the final testing of the elevator installation. This diagnostic tool shall have the capability of troubleshooting and field programmability of all control variables providing interaction between the service man and the microprocessor controller including performance of all ongoing safety testing as required by the Elevator Code.
- C. Any special testing procedures necessary for inspection and/or testing of the installed equipment shall be provided on a per unit basis, as required by code, and not on a per site basis. These testing procedures shall remain the property of the owner, and shall be permanently retained on site as part of required MCP documentation.

3.6 INSTRUCTION AND MAINTENANCE

- A. A maximum period of four hours shall be dedicated to instruct Owner's personnel in proper use, operation and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions.
- B. At the time of substantial completion of elevator work (or portion thereof) provide suitable protective covering, barriers, devices, signs, or such other methods or procedures to protect elevator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.

3.7 ELEVATOR SCHEDULE

Renovate	Two (2) direct plunger hydraulic Passenger Elevators Nos. 9 & 10
Type of Machine	Provide new hydraulic pumping unit in the machine room. Retain the existing hydraulic jack unit drive.
Capacity & Speed	Retain 3500 lbs. capacity at 125 fpm.
Operation	Provide new microprocessor controller with group collective operation with: - Fireman's Emergency Service - Independent Service - Hoistway Access Operation - Communication Verification Operation - Controlled Access Card Reader - Security Access - Elevator Monitoring - Emergency Power Operation
Approximate Travel	Retain Existing
Number of Openings	Retain three (3) stops and openings at floors P, B, and SB.
Opening Size	Retain 3'-6" wide by 7'-0" high
Hoistway Entrances	Retain center-opening, single-speed design. Retain frames, door panels, sills, tracks and hangers. Provide new hanger rollers, closers, unlocking devices and interlocks.
Door Operating Equipment	Provide a new heavy-duty, closed loop door operator with new clutch and door restrictor device. Provide a new infrared, non-contact door reversal device.

Guide Rails	Retain and clean existing rails and re-align as necessary.
Car Structure	Retain existing car platform and sling. Retain car door sill. Retain roller guide assemblies and furnish new rollers. Provide new top of car inspection station and top of car exit switch. Provide new top of car handrail system.
Buffers & Pit Equipment	Retain existing spring buffers and pit channels. Provide new pit ladder and stop switch.
Car Enclosure	Retain car enclosure and refurbish as specified.
Signal Fixtures	
Car Control Station	Provide new single car control station with integral car position indicator, speakerphone, and emergency light in the front return panel. Telephone to comply with 2019 EC video and two-way communication requirements, as applicable.
Car Position Indicator	Provide new digital car position indicator in the upper portion of the new car control station panel.
Hall Buttons	Provide new, flush mounted hall button fixtures with Fireman's Phase I key switch, illuminated fire hat jewel, and engraved instructions.
In-car Hall Lantern	Provide new, In-car Hall lanterns with illuminating arrows and adjustable electronic direction tones.

Hoistway Access Key Switches

Provide replacement entrance jamb mounted hoistway access keyswitch fixtures at the top and bottom floors.

Warranty & Service

Provide interim maintenance upon successful completion and turnover of elevator for Owner's use. Provide Twelve (12) months warranty. New installation maintenance service on the elevator for a period of 12 months after completion of work on all units included within the RFP.

END OF SECTION

BID ITEM 003

SPECIFICATION FOR MODERNIZATION OF ESCALATORS

SECTION 14310 – ESCALATORS

PART 1 - GENERAL

1.1 GENERAL NOTES

- A. General Provisions of Contract, including general and supplementary conditions and Division I Specification sections, apply to work of this section.
- B. Provide all labor, materials, services, and equipment necessary to complete the modifications to the escalators as specified herein.
- C. Any work which is obviously necessary to complete the Project, within the limits established by the specifications and codes, although not shown on or described therein, shall be performed by the Contractor as part of their work.
- E. Related building work: Building related work by other trades will be the responsibility of the elevator contractor to complete and project manage. At a minimum the elevator contractor should complete all code required related work, repair/replace all finishes, and provide new GFCI outlets, and 120 v power, 1 & 3 Phase disconnects.

1.2 DESCRIPTION OF WORK

- A. Extent of work in this Section is to provide a major alteration to two (2) electric escalators in the Williams Center Tower II in Tulsa, OK, as noted in the escalator schedule. The schedule indicates escalators to be modified, required performance, control, capacities, features, and finishes for the escalators.
 - 1. The escalator alterations shall consist of replacing all escalator components with the exception of the structural truss and floor plate frames. All existing mechanical, electrical and aesthetic components of the existing escalators shall be removed and replaced with brand new components as specified herein. Components equal to those removed, reconditioned or rebuilt original components shall not be acceptable for this installation. Only the original truss, drip pan, and access floor plate frames shall be retained.
- B. Escalators are hereby defined to include a power driven, inclined, continuous stairway used for raising and lowering passengers.

- C. The escalators shall be renovated per the schedule as indicated in Division 1.

1.3 ESCALATOR SCHEDULE

Quantity	Two (2) electric escalator nos. 1 through 2
Type of Escalator	Cleated step reversible type with 2 flat steps (as allowed by space in existing truss).
Speed	100 feet per minute.
Rise	Retain existing. Escalators 12
Step Width	Escalator Nos. 1-2: Nominal 32 inches (24" step width)
Angle of Inclination	Retain 30 degrees.
Balustrades	Provide new single radius newels and curved decking transitions.
Balustrade Finish	Provide new ½" thick glass balustrades with joints perpendicular to the deck and no mullions between panels.
Drive Machine & Motor	Provide new, planetary-gear or worm gear drive machine and motor and provide new permanent magnet brake. Drive / Motor / Brake / Chain / etc. on all units to be sized for no less than 220 lbs. / step - based upon a 32 inch nominal step width.
Brake	Provide new, closed loop, load sensing permanent magnet ceramic brake on the new motor shaft.
Controller & Wiring	Provide new microprocessor controller and wiring.
Floor Plates	Provide new aluminum floor plates. No manufacturer's logo shall be visible.
Comb Plates	Provide new yellow combplates.
Handrail System	Provide new, V-Groove type handrails with new drive sprockets, and idler sprockets.

Skirts	Provide new 304 type #4 brushed stainless-steel skirting with skirt deflection brush devices on each side of the stairway for each escalator.
Step Chains	Provide new, lube free, step chains and step rollers.
Steps/Step Demarcation	Provide new one-piece die cast aluminum steps. Demarcation shall be renewable color core plastic inserts at the side and rear of each step. Painted step demarcation shall not be acceptable.
Starting Switches	Provide new spring-loaded starting switches at the top and bottom landings with new spring-loaded switches with the properly labeled positions.
Safety Features	Provide all new safety circuit switches to meet escalator code.
Power Supply	Retain 480 volts, 3 phase, 60 hertz.
Maintenance	Provide full maintenance service from substantial completion of the individual escalator unit until a period of twelve (12) months after substantial completion of renovation work on all elevators and escalators.

1.4 QUALITY ASSURANCE

- A. Installer Qualification: The escalator manufacturer, or a licensee of the manufacturer, who has a record of successful experience with the renovation of similar escalators. The Contractor shall have, as a minimum, the following qualifications and documentation verifying these qualifications shall be submitted prior to award:
1. Minimum of five (5) years successful experience in installing and servicing similar escalator installations. Equipment provided for the modernization shall represent manufacturer's latest technology. Refurbished, re-conditioned, or re-built original style components shall NOT be acceptable. Material provided or installed by a third party shall NOT be acceptable.
 2. Modernization experience of escalator systems of similar size, scope, logic control, and motion control required by this contract.
 3. An existing in-house administrative and technical organization staffed with competent personnel who are experienced in escalator-related work required to install and service the escalator systems as specified. Service

shall be provided by the installer and shall not be subcontracted. Installer shall have a local office established within 75 miles of the project site.

- B. Escalator Code: Except for more stringent requirements as indicated or imposed by governing regulations, alteration work shall comply with applicable requirements of the 2019 ASME A17.1a Safety Code for Elevators and Escalators (hereinafter referred to as the "Elevator Code") and the 2018 IBC Building Code.
- C. NFPA Code: Comply with applicable NFPA Codes and specifically with sections relating to electrical work and escalators.
- D. Accessibility Standards: Comply with the Uniform Federal Accessibility Standards and the "Americans with Disability Act" of July 26, 1991.
- E. Performance Requirements: Escalators shall provide smooth operation and operate within 2% of contract speed.

1.5 SUBMITTALS

- A. Refer to Division 1 for additional information regarding submittals, including submittal requirements, processing procedures, and limitations of review. Approval of shop drawings and cuts is for general arrangement only and does not include measurement, which is the contractor's responsibility, or approval of variations from the contract documents.
- B. Product Data: Submit manufacturer's product data, installation instructions, and maintenance recommendations for each material proposed for use.
- C. Layout Drawings: Provide layout drawings of each escalator including maximum loads imposed on the building structure at all support points, dimensions of the existing escalator and electrical characteristics and connection requirements of new equipment.
- D. Barricade / Wall System Graphics: Owner shall provide graphic design for the barricade / wall system. Contractor to coordinate design and provide appropriate submittals of design for review and approval by Owner.
- E. Maintenance Manuals: Submit bound manuals for escalators, with operating and maintenance instructions, lubricating schedule and instructions, parts listing, recommended parts inventory listing for motor and critical components, diagnostic device operations manual, emergency instructions and similar information.
 - 1. The diagnostic device operations manual shall be complete with adjustment settings, sequence of operation, and other diagnostic technical data required

for adjustments, tuning, maintenance, and operation of escalators including performance of all required acceptance and periodic testing required by the ASME A17.1 Safety Code for Elevators and Escalators. Users' instruction manual shall include access codes required for accessing microprocessor equipment for adjusting or programming.

2. Provide one (1) copy of manual bound in standard three-ring, hard binder. Additionally, provide one (1) electronic copy in "PDF" format. Identify each copy with escalator numbers and Owner's name.
- F. Wiring Diagrams: Provide three (3) sets of complete electrical circuit diagrams for control and operational features as installed, showing location and wiring for power and control systems. The diagrams shall differentiate clearly between manufacturer-installed wiring and field installed wiring. One (1) of the three sets shall be an electronic copy in "PDF", or similar standard format for control and operational features as installed, showing location and wiring for power, signal and control systems.
- G. Keys: The Contractor shall provide the Owner with a total of six (6) sets of keys for each type of key switch fixture provided.
- H. Serviceability of Equipment: The Contractor shall submit a written certification, signed by the Contractor and the manufacturer of the control equipment, making a commitment to provide direct support to the Owner, or the Owner's escalator maintenance service representative, including availability of parts (for inventory, not on an "exchange only" basis), diagnostic tools, and technical & engineering support. In addition, all parts and support shall be provided at a reasonable cost in line for which the original manufacturer would charge to it's own customer base and response shall be in a timely manner. Any required service tools / chips / SIM cards etc. required for regular maintenance and troubleshooting activities shall be included and shall become the sole property of the owner.
- I. Certificates and Permits: Provide Owner with copies of all inspection/acceptance certificates and operating permits as required by governing authorities to allow normal, unrestricted use of escalators.
- 1.6 INITIAL MAINTENANCE AND WARRANTY
- A. Maintenance Service: Furnish maintenance and callback service on the escalators from completion of the renovation/modernization work on each individual escalator for a period of twelve (12) months following date of final acceptance of all elevator and escalator work as specified herein. The maintenance and call back service shall include at a minimum, but not be limited to, the full maintenance requirements as follows:

1. Maintenance service shall be performed by skilled escalator personnel directly employed and supervised by the same company that furnished and installed the escalator equipment specified herein.
 2. This service shall include:
 - a. Semi-monthly examination of each escalator unit as a minimum.
 - b. Lubricating, adjusting, repairing, and replacing all parts as necessary to keep the equipment in a first-class condition and proper working order.
 - c. Furnish all lubricants and parts required.
 - d. Equalizing tension of step chains when necessary.
 - e. Assure smooth and consistent operation of escalator.
 - f. Provide all periodic annual and maintenance testing in accordance with the Elevator Code.
 - h. The contractor shall keep the escalator internal wellways, upper control area, and lower pit clean of all dirt and debris. All necessary cleaning supplies and equipment shall be furnished by the contractor.
 3. The maintenance service shall not include the performance of any work required as a result of improper use, accidents, or negligence, for which the contractor is not directly responsible.
 4. All work shall be completed by trained employees of the elevator contractor and performed during normal working hours. Include 24 hour/day, 7-days/week emergency callback service. Owner is responsible for overtime cost of said callbacks. Exclude only repair/replacement due to misuse, abuse, accidents, or neglect caused by persons other than installer's personnel. Emergency callbacks shall be of highest priority.
 5. The contractor shall maintain a log in the upper elevator machine space. The log shall list the date and time of routine examinations and all trouble calls. Each trouble call shall be fully described including the nature of the call, necessary corrections performed and or parts replaced.
- E. Future Maintenance Service: The contractor shall submit an ongoing, full-service, five-year escalator maintenance agreement response to the maintenance specification included in the RFP along with their bid for the project to begin after the expiration of the new installation maintenance service.
- C. General Warranty: The elevator warranty specified in this section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

- D. Warranty: Provide special project warranty, signed by Contractor, Installer, and Manufacturer, agreeing to replace, repair/restore defective materials and workmanship of escalator work during warranty period. "Defective" is hereby defined to include, but not by way of limitation, operation or control system failures, performances below required minimums, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or vibration, and similar unusual, unexpected and unsatisfactory conditions. The warranty period is twelve (12) months starting on date of substantial completion of all escalator work on the individual escalators and shall be extended until "defects" as defined in this warranty are corrected.

PART 2 - MATERIALS AND COMPONENTS

2.1 GENERAL

- A. Provide manufacturer's standard pre-engineered escalator systems that will comply with or fulfill the requirements of escalator schedule sheets or, at manufacturer's option, provide custom manufactured escalator systems that will fulfill requirements. Where components are not otherwise indicated, provide standard components, published by manufacturer as included in standard pre-engineered escalator systems, and as required for a complete system.
1. Direction of travel shall be considered as either direction, and unit shall be up and down reversible.

2.2 ESCALATOR MACHINERY AND CONTROL EQUIPMENT

- A. Drive Machine: A totally enclosed; planetary, or worm geared machine specially designed for this service shall be furnished. It shall include a drive motor and electro-magnetic brake. The machine shall be mounted in the upper end module to truss interface brackets and integrally attached to the track sub-assembly plates and be connected by separate direct drive shafts to both the step drive sprocket and the handrail friction drive sheave. Handrail drive chains shall NOT be provided. The drive machine shall be designed to substantially match speeds of the step band and handrails. Lubrication of the gears and bearings shall be by synthetic based oil bath.
1. Bearings shall be rated for AFBMA L10 life under a fluctuating load. Bearings shall be rated for a minimum of 150,000 hours of service.
 2. For the purpose of driving machine and power transmission calculations, the rated load shall comply with Code.
- B. Motor: The escalator(s) shall be equipped with a motor(s) designed for escalator service. The motor shall be of TEFC design, ball bearing type,

integrally and horizontally mounted to the drive machine. The motor protection class shall be equivalent to IP55 Insulation Group. The motor shall be flange mounted to the main drive gear case and torsionally connected to the gearbox. Driving motor and motor switch gear shall be designed to provide a smooth start, which shall prevent undue strain on drive components. The motor shall be of sufficient size to operate the escalator at a minimum of Code-rated load, ascending without exceeding the rated horsepower. Each escalator shall be provided with a permanent magnet ceramic brake, located on the high-speed shaft which, when activated, shall stop the escalator as required by Code, upon activation of a stop button, safety device, or loss of power.

- C. Permanent Magnet Ceramic Brake: A load compensating brake system shall be installed. The brake shall be capable of automatically stopping the escalator quickly but gradually and shall hold the escalator stationary under full load whenever the power is interrupted. The brake shall be "fail safe" and electrically released. The system shall continually adjust brake torque to maintain a relatively constant deceleration independent of the load. The brake shall not cause the escalator to come to an abrupt stop. It shall be designed to meet ASME A17.1a-2005, and later Code deceleration requirements without adjustment and shall operate in conjunction with a velocity feedback encoder on the new microprocessor controller.
- D. Upper Reversing Station: The Upper Reversing Station and drive shall include a precision-machined step chain sprocket mounted on the machine output shaft and rotating on bearings.
- E. Lower Reversing Station: The Lower Reversing Station shall consist of a machined floating track system designed to maintain proper tension on the step chain by use of springs. It shall be designed to maintain uniform chain tension and shall detect movement of the carriage through the activation of a safety switch.
- F. Incline Modules: Modular multi-purpose stanchion assemblies shall be installed on the incline of the existing truss and shall attach to the EXISTING cross members. These incline support stanchions shall be fabricated of steel. They shall be designed to support all incline track sections and handrail guide components as part of the complete step band. These stanchions shall be pre-assembled and fixtured to set track spacing, as well as step and handrail guidance components, prior to installation into the existing truss.
- G. Step Band
 - 1. Step Guidance: A step guidance system shall be provided to control the movement of the steps both horizontally and vertically. Each step shall be

provided with horizontal guide pads, which shall guide the steps throughout their travel, in combination with a continuous guide profile installed in the area of the escalators open to passengers. Code Step/Skirt Performance Index requirements shall be met without the need for skirt deflector brushes.

2. Step Chain: The step band shall consist of consecutively running steps powered and spaced with a chain designed for long life and quiet operation. The step chain shall properly mesh with the main drive sprockets and lower reversing station castings. The chain shall be an engineering class roller chain, manufactured to close tolerances, from high quality material with heat-treated bushings, pins, and link plates.
 - a. Lubrication-free chain: The escalators shall be designed using Lubrication-free chain. The chain shall be designed to reduce oil use and life cycle costs.
 - b. Step chain and chain pins shall load rated in accordance with Code.
3. Steps: The steps shall be formed from one-piece die cast aluminum with closely spaced tread and riser cleats. Step rollers shall rotate on sealed ball bearings. The step shall be connected to the chain by a pin and bushing. Vertical curved step risers shall be furnished with vertical cleats arranged to pass between the cleats of the tread on the adjacent step to form an inter-meshing unit with minimum clearances.
 - a. The number of level steps at each end of the escalator shall be two wherever possible based upon space available in the existing truss.
 - b. Step demarcation inserts shall be provided on the sides and rear of each step. The inserts shall be fabricated from reinforced structural plastic, shall be easily replaced and shall be approximately 1.5 inches (38mm) wide at the sides and approximately 1.5 inches (38 mm) wide at the rear. Inserts shall be attached to the step without the use of visible fasteners.
 - c. Step assemblies shall be one (1) piece, die cast aluminum, or approved equal. Step treads shall have one eighth (1/8) of an inch wide cleats on three eighths (3/8) of an inch centers, not less than three eighths (3/8) of an inch in depth, and shall be designed to mesh with the combplates.
 - d. Step ends shall be square in order to minimize step to skirt clearances. The entire step assembly shall be treated with not less

- than one (1) coat of zinc chromate primer and one (1) coat of aluminum enamel for corrosion resistance.
- e. Steps and their various attachments shall permit removal of steps without disturbing balustrades.
 - f. The design shall permit the running of the drive without steps for convenience in cleaning and inspection.
 - g. Step rollers shall have polyurethane tires on hubs and sealed roller bearings and a minimum diameter of 3 inches. Step rollers shall not require any additional lubrication and must be rated for severe, heavy-duty service.
 - h. Steps shall be constructed so as to be driven by step linkages to step or step rollers. Step rollers shall rotate on sealed bearings.
 - i. Green step demarcation lights located below the step shall be located at both landings in an area not to exceed 400 mm (16 in.) from the combplate. There shall be a minimum of two LED lamp fixtures at each landing. The lamps shall be activated whenever the escalator is in operation.
 - j. Step color shall be silver, or approved equal.
4. Tracks: New tracks shall be designed and fabricated to support and retain the steps and running gear at the rated load and at the highest speed specified. Tracks shall be assembled and secured together for easy removal and replacement of sections. The system shall be adjustable, with no welding of the track sections at the joints. Tracks shall be properly supported on stanchions to provide correct alignment and smooth transition to return stations. The rolling surface of the incline track shall be a minimum thickness of 3 mm. The transition track shall be a minimum thickness of 10 mm. The guiding surface of the wheels shall be galvanized steel profiles with smooth and even running surfaces. Joints shall be cut diagonally to the running direction. A second, continuous step guiding profile shall be provided above the step chain rollers.
- H. Decks: All existing escalator decking shall be removed, and new escalator decking shall be provided with a minimum of 14 gauge 304 type #4 Stainless Steel brushed finish. The new decking shall be fabricated in such a way so as to interface with the existing escalator cladding / wall finishes, or any required modifications required to match the new decking shall be included in the escalator contractors scope of work.

1. Newel Ends: The new newel ends shall support the handrail around the newel through the use of a new multi-roller bearing system to minimize drag and maximize handrail life.
 2. Handrail Base: New handrail base shall be provided. New handrail guide channels shall also be installed.
 3. Where applicable decking between escalators shall be designed to support a live load of one hundred and seventy-five (175) pounds per square foot, without surface deflection.
 4. Install stainless steel deck between units and anti-slide devices, as required by code; which shall consist of stainless-steel objects fastened to the decks no closer than 4 inches from either handrail nor greater than 12 inches from either handrail. Each device shall be no less than 2 inches and shall contain no sharp corners or edges.
- I. Controller: Provide a new microprocessor controller for each escalator. The new controller shall work in conjunction with the new and retained safety features, new annunciator cabinets, the new permanent magnet brake and the velocity encoder to ensure safe and proper escalator control. The controller shall be supplied by a portable cord so that it can be removed from the pit.
1. The escalator control equipment shall contain diagnostic capabilities as required for the ease of complete maintenance. The diagnostic system shall be an integral part of the controller and provide user-friendly interaction between the service person and the controls. All such systems shall be free of decaying circuits that must be periodically reprogrammed by the manufacturer.
 2. The main control switchgear of an escalator shall contain at least the following devices: Lockable main switch thermal and magnetic motor protection starter for up and down travel, hour counter, auxiliary contactors, phase failure device, phase sequence monitor, and ground fault monitor.
 3. A diagnostic testing device, or maintenance terminal, suitable for all troubleshooting and testing procedures related to the specific type of microprocessor control, shall be installed on this project and provided for the control system at the final acceptance. This diagnostic testing device, or maintenance terminal, shall conform to the operating procedures under the testing section of these specifications.
 - a. The diagnostic tool shall have the capability of being plugged into the main control cabinet, and in the newels at both the top and

bottom terminals so the escalator can be diagnosed without removal of the floor plates.

- b. After successful testing of the diagnostic device, in conjunction with the microprocessor control, the testing device shall become the property of the Owner. The diagnostic testing device shall not become inoperative after a period of time requiring factory rehabilitation. The contractor shall provide written certification that repair, and support of the diagnostic tool components is readily available to the Owner in the future.
 - c. When repairs or replacement to the testing device become necessary prior to the final acceptance, the repairs, or replacement, shall be provided at no cost to the Owner.
- 4. All terminals shall have identification markings and all cables shall be provided with cable markers.
- 5. The controller shall be equipped with an AC induction motor reduced voltage starter; installed in line between the standard type contactor and the drive motor. The starter shall be solid state, capable of starting motors smoothly and gradually, reducing inrush current and mechanical shock upon start up. Adjustable settings for accelerating time and starting torque shall be provided. The starter shall also contain auxiliary contacts and a thermal overload relay for motor protection.
- 6. The escalator control cabinet shall be provided with a fan to provide ventilation to the cabinet.
- J. Wiring: All wiring shall be replaced and installed new. The wiring and electrical interconnections shall comply with the governing codes. Insulated wiring shall have flame retardant and moisture-proof outer covering, and shall be run in conduit, tubing or electrical wireways.
- K. Operating Devices: Provide new stop buttons and key-actuated starting switches for each escalator. A momentary pressure emergency stop button and key-actuated spring-return starting switch that shall start the escalator in either direction. Locate at upper and lower landing newels, at code-required locations. Stop buttons shall be housed under clear, high impact resistant, plastic cover, which shall be self closing by means of spring-loaded hinge at upper edge. Cover shall have clearly printed upon it, the words "emergency stop", in one half (1/2) inch high letters. When the cover is lifted an audible alarm shall sound at, or near, the top and bottom button locations until cover is returned to the closed position.

- L. Handrail System: Escalator handrails shall be of the V-groove type and shall be properly constructed and reinforced. Handrails shall be endless with a smoothly vulcanized splice and shall operate with the moving steps. The handrails shall move on specially formed guides and traction sheaves. These sheaves shall be an integral part of the drive machine. Close-fitting guards shall be provided by the handrail openings in the newel base. The handrail color shall be black. The handrail drive system shall be a direct drive type and shall not utilize a drive chain.
- M. Truss: Retain the existing truss for each escalator. Provide a clean down of each truss to remove any surface rust, oil, grease, lint, dirt and debris that has collected. Inspect and analyze the existing welds, rivets and overall structure. At the upper and lower ends remove the track and support brackets, access cover support plates, selected truss cross members and handrail support return brackets. In the incline remove the top and return track, remove the handrail return brackets and modify the truss cross members as required for the installation of the new equipment. Paint truss with a low VOC type paint.
- N. Balustrade: Glass Balustrades shall be provided between the escalator decks and the handrails. The Balustrades shall be constructed of 1/2-inch tempered glass with joints perpendicular to the deck and shall be installed without mullions between the panels.
- O. Skirt Panels: Provide new skirt panels. The skirts shall be constructed from a heavy gauge material reinforced with steel channels. Skirts shall be fastened to the truss modules with hidden fastenings in the incline and transition areas. Skirt panels shall be installed without overlapping joints or requiring trim pieces to cover where two skirt panels meet. The skirt panels will be finished in Teflon coated 11-gauge 304 type stainless steel with a #4 satin finish.
 - 1. Panel edges shall be sealed against moisture.
 - 2. Panels shall be constructed, when practical, in equal lengths for interchangeability.
 - 3. When framework to which panels are fastened is less than one quarter (1/4) of an inch thick, steel backup plates with a minimum one quarter (1/4) of an inch thickness shall be added which have tapped holes or clearance holes where necessary.
- P. Comb Segments: Provide new sectional comb plates located at upper and lower landings, fabricated in sections to facilitate replacement without the use of special tools. Comb segments to be aluminum.
- Q. Front Plates: Provide 304 type stainless #4 brushed finish steel front plates at upper and lower ends designed to include the handrail inlet device and key

actuated direction starting switch. The handrail inlet device shall be a four piece door/gate assembly. The existing floor plate frames shall be retained, cleaned and provide with any required modifications to accept the new floor plates.

- R. Control Station: At both the upper and lower landings, located near the handrail inlet, a station shall be provided which shall include a key actuated direction starting switch. The escalator will not restart automatically. It must be restarted with the key after it has shut down.
- S. Upper and Lower Annunciator Cabinets: New annunciator printed circuit boards, provided in separate cabinets, shall be provided and located at the upper and lower landings for each escalator. These cabinets shall serve as individual interfaces for the electrical system, to which all of the safety devices will be wired into. Provide inspection switches on the exterior of each cabinet.
- T. Floor Plates: The existing floor plate frames shall be retained in place if possible. New, extruded aluminum floor plates shall be provided and be of such a design to meet Escalator Code>
- U. Labeling Requirements: Every escalator shall be clearly marked with rated load and speed, braking torque and manufacturer serial number.
- V. Protective Devices: Provide the following protective devices as required by Escalator Code and tie them into the escalator system at the new annunciator cabinets:
 - 1. Missing Step Device: This device activates by detection of a missing step and shall cause the escalator to stop before the resulting gap emerges from the comb by removal of electrical power from the drive motor and applying the brake.
 - 2. Handrail Speed Monitoring Device: This device is activated by a deviation between the handrail and step speed of more than 15 percent; upon detection, an alarm shall sound; the brake will be applied if deviation continues for more than two seconds.
 - 3. Step Level Device: This device is activated by any downward displacement of riser end of step of 1/8 inch (3.2 mm) or greater; activation shall stop the escalator prior to the step entering the combplate by removal of electrical power from the drive motor and applying the brake.
 - 4. Handrail Entry Device: This device is activated if an object becomes caught between the handrail and the handrail guard. The device will cause removal of electrical power from the drive motor and application of the brake.

5. Step Upthrust Device at Lower Landing: The device is activated if a step is displaced against the upthrust track at the lower curve in the passenger carrying line of the track system. The device will cause removal of electrical power from the drive motor and application of the brake.
6. Emergency Stop Buttons: Provide buttons to cut electrical power supply to the motor upon activation. Emergency stop buttons shall be located at each landing and in machinery spaces in accordance with Escalator Code.
7. Safety Signs: Provide pictorial sign at upper and lower landings in accordance with Escalator Code.
8. Friction Reversal Device: For an ascending escalator, the friction reversal device shall cause the electric power to be removed from the drive motor and the brake activated in case of reversal of travel while the escalator is operating. Device shall be employed to remove power if the escalator speed varies more than plus or minus twenty (+/- 20%) percent.
9. Left and Right Hand Broken Step Chain Contacts: The broken step chain devices will cause the electric power to the drive machine to be removed and the brake activated in the case that a step chain breaks or excessively sags.
10. Left and Right Hand Step and Skirt Safety Switch: These devices cause the electric power to the drive machine to be removed and the brake activated should an object become wedged between the step and skirt panel as the step approaches the upper or lower combplate.
11. Level Step Device: Device to stop escalator should escalator have misalignment of steps, or linkages. This device, one (1) at top and one (1) at bottom, shall monitor steps before entry into comb as well as on return side and shall be manually reset.
12. Comb-Step Impact Device: A comb-step impact device shall be provided at the upper and lower comb plates. Should an impact occur between the comb segments and the steps, the escalator shall come to a controlled stop.

PART 3 - EXECUTION

3.1 PREPARATIONS

- A. Site Inspection: Prior to commencing escalator modifications, inspect wellways, openings, pits, and machinery areas as constructed. Contractor is responsible

for all dimensions as field measured by the Contractor for proper installation and performance of escalator work.

1. Contractor shall be responsible for inspecting and determining extent of work to be performed at the site to complete the work. Contractor must take into account all requirements for installation of new work, access, code requirements, and removal or demolition, which additional work shall be performed without cost to the Owner.
- B. Demolition: The removal of all escalator equipment that is not to be retained in the renovation shall be completed by the contractor. The old escalator equipment removed becomes the property of the Contractor and it is their responsibility to remove this equipment from the project site. Include all work necessary to protect the public, residents, building employees, and building property during removal of demolished materials.
1. Barricades required for protection of the wellways during the renovation shall be provided by the Contractor. Do not start demolition of an area until all temporary protection and temporary partitions are in place as furnished by the contractor.
 2. Barricades shall be provided.
 - a. Contractor shall include providing Self Adhesive Graphics Overlay for barricade / wall system. Graphic Design to be provided by Owner and coordinated with Contractor. Graphic size shall include Contractor providing +/- 500 square feet of graphics with a 5-color graphic design. Owner shall be responsible for application and removal of graphic overlay with installation and movement of barricades to coincide with escalator schedule.
 3. During work on escalators, anytime there is the possibility of items falling from the respective escalator truss due to the particular work being performed (such as installation of outside skirting), the contractor shall provide all adequate protection / roping off of areas below, to protect the public.
- 3.2 MODIFICATIONS TO ESCALATOR SYSTEM
- A. General: Comply with manufacturer's instructions and recommendations for work required during installation, referenced codes, and specifications.
 - B. Welded Construction: Provide welded connections for installation of escalator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance and replacement of

worn parts. Comply with AWS standards for workmanship for qualifications of welding operators.

1. All welding shall require hot work permits from the facility and shall be performed outside of scheduled event hours.
- C. Coordination: Coordinate escalator work with other trades for proper time and sequence to avoid construction delays. The Contractor shall provide modifications to achieve a fully operational escalator system as stipulated in the construction schedule. The Contractor shall maintain full crews and continue work once escalator demolition begins until the escalator system is completed and operational and accepted by the Owner. The Contractor shall provide the number of crews required to maintain the schedule and shall provide additional manpower and work such additional hours as are necessary to bring the project back on schedule.
1. Contractor shall keep the noise level below 80 dBA during normal building hours. Contractor shall include overtime work (between the hours of 8 PM and 6 AM) cost PER UNIT for noisy and disruptive material movement and installation activities that exceed 80 dBA. The contractor shall advise the building management of needs and times overtime work will be scheduled. Contractor shall anticipate and schedule excessive noise generating activities and include an allowance for each escalator in the base quotation. Provide an estimate of anticipated overtime hours for each escalator. All other labor shall be anticipated to be performed during the regular working hours of the trade.
 2. Contractor shall provide floor protection in barricaded areas consisting of masonite panels or approved equal. Contractor is additionally responsible for floor protection during removal and delivery of equipment to well ways. During transfer of heavy materials, provide temporary masonite panels to protect flooring.
 3. Contractor is to coordinate with related building work trades and provide all the specific requirements for each individual escalator for final turnover of each unit. This includes the following:
 - a. Front plate location, material requirements for interface with front plate and cladding.
 - b. Access cover: Cover frame and flooring requirements around access cover frame for finish material work.
 - c. Ground wire to each disconnect, coordination of electrical requirements for GFCI outlets, illumination levels and switches in pits.
 - d. Sizing of disconnects and new wire if required by each manufacturer.

- D. Sound Isolation: The existing truss isolation pads shall be re-used.
- E. Hoisting: All required hoisting and movement of the escalator equipment shall be the responsibility of the Contractor in this section.
- F. Final Cleaning & Painting: Upon completion of all escalator work, provide total clean down of escalator machinery areas, wellways and pits, including equipment. All steel components in these areas shall be provided with touch up painting to remove all scratches and blemishes incurred during construction.
 - 1. All painting shall be closely coordinated with the facility and shall be performed outside of scheduled event hours.

3.3 ELECTRIC WIRING

- A. As the duty load of this equipment is being increased to a min of 220 lbs. / step, verify if the existing electrical wiring will be sufficient for loads of the new equipment. Provide new electrical feeders / etc. as required to support the higher rated step loading requirements. Conductors: Copper throughout with individual wires coded and all connections on identified studs or terminal blocks. Use no splices or similar connections on any wiring except at terminal blocks, control cabinets, junction boxes or conduits.
- B. Conduit: Painted or galvanized steel or aluminum conduit and duct shall be used. Conduit size shall be 1/2" minimum, except that 3/8" can be used for runs containing only 2 wires. Flexible conduit exceeding 18" in length shall not be used.
- C. Provide new ground wires as required by code if not already present.

3.4 FIELD QUALITY CONTROL

- A. Acceptance Testing: Upon nominal completion of the escalator modifications, and before permitting use of escalator, perform acceptance tests as depicted in Rule 8.10.2.2, "Inspection and Test Requirements for New Installations", of the Escalator Code. Also perform other tests, if any, as required by governing regulations.
 - 1. Advise Owner and Consultant of dates and time the acceptance tests and specification conformance review are to be completed as the Consultant is required to make final check of each escalator operation to determine when the control systems and operating devices are functioning as specified and in compliance with code.

- B. Diagnostic Testing: The diagnostic testing device, or maintenance terminal, provided shall be demonstrated and tested during the final testing of the elevator installation. This diagnostic tool shall have the capability of troubleshooting and field programmability of all control variables providing interaction between the service man and the microprocessor controller including performance of all ongoing safety testing as required by the Escalator Code.

3.5 PROTECTION

- A. At the time of substantial completion of escalator work (or portion thereof) provide suitable protective covering, barriers, devices, signs, or such other methods or procedures to protect escalator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.

3.6 INSTRUCTION AND MAINTENANCE

- A. A maximum period of four (4) hours shall be dedicated to instruct Owner's personnel in proper use, operation and daily maintenance of escalators. Review emergency provisions and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions. Provide instruction on the use and capabilities of the diagnostic testing device (if provided), or maintenance terminal. A complete manual of instruction shall be provided with the diagnostic equipment.

END OF SECTION 14310

ALTERNATES**ALT A:**

Gearless Drive Machine Alternate: Tower I, Elevators #5, #6, #7 & #8, Tower II, Elevators #6, #7, #8, & #9, Tower II, Elevators #1, #2, #3, #4, & #5 shall retain the existing gearless drive machines in lieu of replacement with new gearless machines.

1. Existing Gearless Traction Drive Machine Assembly: Retain the existing gearless traction machines and provide all labor, materials, engineering, testing, adjustments, refurbishment, and modifications required to ensure reliable long-term operation and compatibility with the modernization equipment provided under this specification.
2. Existing Machine Condition:
 - a) Existing gearless machines have previously undergone refurbishment and rebuilding by the current maintenance contractor.
 - b) It is anticipated that only minor refurbishment, adjustments, cleaning, testing, and component replacement will be required to place the machines into acceptable operating condition.
 - c) Any significant deficiencies, repairs, machining, rewinding, bearing replacement, shaft repairs, frame repairs, or other major work identified by the Contractor shall be specifically identified as a clarification or exception in the bid submission.
3. Refurbishment Requirements:
 - a) Thoroughly inspect all machine components including motor windings, bearings, shaft, brake surfaces, brake linkage, sheaves, bearing housings, lubrication systems, mounting hardware, and structural components.
 - b) Clean, adjust, repair, replace, refinish, and refurbish machine components as necessary to provide a reliable service life equivalent to the anticipated life of the modernization.
 - c) Replace all worn, deteriorated, damaged, leaking, or otherwise deficient components required for proper operation.
 - d) Contractor shall provide documentation identifying all refurbishment work completed on each machine.
4. Compatibility:
 - a) Existing gearless machines shall be fully compatible with the new controller, drive equipment, motion control system, and all other modernization components.
 - b) Contractor shall provide all required interfaces, encoders, sensors, wiring, and auxiliary equipment required for proper operation of the retained machines.
5. Brake System:
 - a) Existing machine brake assemblies shall be thoroughly inspected, tested, adjusted, and refurbished as required.
 - b) Replace worn brake linings, springs, hardware, coils, contacts, wiring, and related components as necessary to provide reliable operation.

Williams Center Towers Modernization

- c) Brake performance shall comply with all applicable code requirements and manufacturer recommendations.
- 6. Emergency Brake:
 - a) Provide and install an emergency brake system meeting all applicable requirements of ASME A17.1 Safety Code for Elevators and Escalators.
 - b) Emergency brake system shall be integrated with the retained gearless machine and new control system.
 - c) Emergency brake shall satisfy all code requirements applicable to unintended car movement protection and ascending car overspeed protection.
 - d) Emergency brake shall be a machine-mounted solution integrated with the existing gearless machine and shall not utilize a rope brake assembly unless specifically approved by the Owner and Consultant.
- 7. Testing:
 - a) Perform all testing necessary to verify proper machine performance, brake performance, emergency brake operation, motor operation, bearing condition, vibration levels, and overall system reliability.
 - b) Demonstrate compliance with all applicable code requirements during acceptance testing and final inspection.
- 8. Contractor Responsibility:
 - a) Submission of a bid utilizing retained gearless machines shall constitute acknowledgment by the Contractor that the existing machines are suitable for continued service after completion of the refurbishment work specified herein.
 - b) No additional compensation shall be requested for normal refurbishment work, adjustments, cleaning, testing, or replacement of minor components reasonably required to place the retained machines into satisfactory operating condition.

ALT B:

OPTION FOR INCONSPICUOUS RISER SYSTEM – Tower I Highrise Bank (Elevator 5)

A. SUMMARY

- 1. Provide pricing as a separate alternate for furnishing and installing an Inconspicuous Riser System (IRS) for the four (4) high-rise passenger elevators serving Williams Tower I.
- 2. The purpose of this alternate is to provide building management, security personnel, and emergency responders with real-time elevator position and status information in a discreet location approved by the Owner.
- 3. Pricing for this alternate shall be completely separate from the base modernization bid and shall not be included in the base contract amount.

B. SCOPE OF WORK

Williams Center Towers Modernization

1. Furnish and install a complete Inconspicuous Riser System fully integrated with the new elevator control system.
2. The system shall provide, at a minimum, the following information for each elevator within the group:
 - a. Elevator car position.
 - b. Direction of travel.
 - c. Elevator availability status.
 - d. Independent Service operation.
 - e. Firefighters' Emergency Operation status.
 - f. Out-of-service indication.
 - g. Emergency power operation status.
3. Contractor shall provide all interface boards, software, wiring, conduit, programming, testing, commissioning, and documentation necessary for a complete and operational installation.
4. Contractor shall coordinate final mounting location with Owner and Consultant prior to fabrication and installation.
5. Mounting location shall be discreet and suitable for use by building operations personnel and emergency responders.

C. EQUIPMENT REQUIREMENTS

1. The Inconspicuous Riser shall be fully compatible with the new elevator control system provided under this modernization contract.
2. System shall continuously display real-time elevator information without degrading elevator system performance.
3. Display shall utilize LED, LCD, or approved graphical display technology designed for commercial building applications.
4. All required software licenses, communication interfaces, and programming tools shall be included in the alternate price.
5. Any proprietary hardware, software, passwords, access codes, diagnostic tools, or licensing required to maintain, troubleshoot, repair, or replace the system shall become the property of the Owner and shall be transferred at project completion.

D. SUBMITTALS

1. Provide product data sheets.
2. Provide wiring diagrams.
3. Provide mounting details.

Williams Center Towers Modernization

4. Provide sample screen displays or illustrations of the proposed system.
5. Identify any recurring software subscription, licensing, maintenance, or monitoring costs.

E. TESTING AND ACCEPTANCE

1. Demonstrate proper operation of the Inconspicuous Riser System during final acceptance testing.
2. Verify all elevator positions, status indications, and special operating modes are accurately displayed.

F. ALTERNATE PRICE

Contractor shall provide a lump-sum price for furnishing and installing the Inconspicuous Riser System as specified herein.

The alternate price shall include all labor, materials, supervision, engineering, programming, wiring, conduit, permits, testing, startup, training, and incidental costs necessary for a complete installation.

ALT C:

Geared Drive Machine Alternate for Tower I Low Rise, Elevators #1, #2, #3 #4, and Tower II Highrise Freight Elevator 10

Elevator drive machines shall be replaced with new geared traction machines. As an alternative to furnishing new geared machines, the Contractor may provide a factory-certified complete rebuild of the existing geared machines, provided the rebuilt machines are equivalent to new equipment in performance, reliability, and expected service life.

1. Geared Traction Drive Machine Assembly:
 - a) Provide new geared traction machine assemblies specifically designed for the application, complete with gearing, bearings, shafts, drive sheaves, lubrication system, brake mounting provisions, and all related components.
 - b) As an alternate to new machines, Contractor may provide a consultant verified complete rebuild of the existing geared machines.
 - c) Any rebuilt machine shall be restored to like-new condition and shall include replacement or reconditioning of all major wear components necessary to provide a service life equivalent to a new geared traction machine.
2. Complete Rebuild Requirements:
 - a) Rebuilt machines shall be disassembled, inspected, machined, repaired, and reassembled in accordance with manufacturer recommendations and industry best practices.

Williams Center Towers Modernization

- b) Complete rebuild shall include, at a minimum, inspection and refurbishment or replacement as required of:
 - (1) Worm shaft.
 - (2) Ring gear.
 - (3) Drive sheave.
 - (4) Bearings.
 - (5) Bearing housings.
 - (6) Seals and gaskets.
 - (7) Lubrication system components.
 - (8) Brake mounting surfaces.
 - (9) Machine shafting.
 - (10) All wear components necessary to restore the machine to like-new operating condition.
- 3. Certification:
 - a) Contractor shall provide written documentation certifying that the rebuilt machine has been restored to like-new condition.
 - b) Documentation shall identify all components replaced, repaired, machined, or reconditioned.
 - c) Documentation shall be provided by the rebuilding facility and submitted as part of the project closeout package.
- 4. New Hoisting Motor and Drive:
 - a) Provide new Variable Voltage Variable Frequency (VVVF) AC motor and drive system compatible with the new or rebuilt geared machine.
 - b) New hoisting motor shall be specifically designed and rated for elevator duty with high starting torque and low starting current.
 - c) Existing motor-to-machine coupling and bushings shall be replaced with new components.
- 5. Brake Assembly:
 - a) Existing brake assembly shall be replaced with a new brake assembly where required by the machine manufacturer.
 - b) Where brake components are retained as part of a machine rebuild, the brake shall be completely rebuilt and restored to like-new condition with replacement of all worn components.
- 6. Emergency Brake Assembly:
 - a) Provide and install a Rope Gripper emergency brake assembly, as manufactured by Hollister-Whitney, or approved equal, in accordance with ASME A17.1 requirements.
 - b) Contractor shall provide all structural modifications, supports, mounting hardware, controls, wiring, testing, and certification required for a complete installation.
- 7. Warranty:
 - a) New geared machines or rebuilt geared machines provided under this alternate shall be covered by the same warranty requirements specified elsewhere in this contract for new equipment.
 - b) Rebuilt machines shall not be considered refurbished equipment and shall be warranted as equivalent to new equipment.

Williams Center Towers Modernization

8. Alternate Price:

- a) Contractor shall identify whether the alternate price is based upon a new geared machine or a complete rebuilt geared machine.
- b) Failure to identify the basis of the alternate shall constitute a proposal for a new geared machine.

ALT D:**NEW CONTROL SYSTEMS – TOWER I LOW RISE ELEVATORS #1, #2, #3, #4 and Tower II Highrise Freight Elevator 10****A) General**

1. This Alternate shall include replacement of the existing elevator control systems serving Elevators #1, #2, #3, #4 in the Low Rise Tower I and Tower II Highrise Freight Elevator 10 with new non-proprietary microprocessor-based elevator control systems.
2. The intent of this Alternate is to replace the existing proprietary Otis GCS control equipment with a fully maintainable non-proprietary control system while retaining the maximum amount of existing equipment possible.
3. Contractor shall provide all labor, engineering, materials, software, programming, testing, permits, inspections, and incidental work required for a complete and operational installation.
4. Elevator performance, group dispatching functionality, code compliance, and operating characteristics shall be equal to or better than those existing prior to modernization.

B) Equipment to be Replaced

1. Provide new non-proprietary microprocessor-based controllers for each elevator.
2. Provide new group supervisory control equipment and communication network as required for proper operation of the elevator group.
3. Provide new motion control hardware, power supplies, interface modules, communication devices, relays, contactors, and associated control equipment required for complete operation.
4. Provide all programming, software licenses, diagnostic software, access devices, passwords, manuals, and specialized tools necessary for future adjustment, troubleshooting, maintenance, and repair.
5. Any equipment determined by Contractor to be incompatible with the new control system shall be replaced as part of this Alternate.

C) Equipment to be Retained

1. Existing gearless machines shall be retained.

Williams Center Towers Modernization

2. Existing hoist motors shall be retained.
3. Existing drive equipment may be retained if compatible with the proposed control system and approved by Owner and Consultant. If incompatible, Contractor shall provide all equipment necessary for proper operation.
4. Existing door operators shall be retained where compatible.
5. Existing hall fixtures shall be retained where compatible.
6. Existing car operating panels, lanterns, position indicators, and signal fixtures shall be retained where compatible.
7. Existing traveling cables shall be retained where suitable for continued service.
8. Existing selectors, encoders, and positioning devices shall be retained where compatible with the proposed control system.
9. Retained equipment shall be thoroughly inspected, cleaned, adjusted, repaired as required, and integrated into the new control system.

D) Compatibility Requirements

1. Contractor shall be solely responsible for compatibility between retained equipment and newly installed control equipment.
2. No additional compensation shall be provided for equipment required to achieve compatibility with retained systems.
3. Any retained component that prevents proper operation, reliability, code compliance, or performance shall be replaced by Contractor at no additional cost to Owner.
4. Contractor shall provide all interface devices required to maintain operation of retained equipment.

E) Non-Proprietary Requirements

1. Control systems shall be fully non-proprietary.
2. No component shall require proprietary access codes, passwords, software subscriptions, factory authorization, remote authorization, or manufacturer-exclusive diagnostic equipment to perform normal maintenance, adjustment, troubleshooting, testing, repair, or replacement.
3. All software, passwords, source files, diagnostic programs, manuals, wiring diagrams, and adjustment procedures shall become the property of the Owner upon project completion.
4. Any licensed elevator contractor shall be capable of maintaining the equipment without assistance from the installing contractor or equipment manufacturer.

F) Performance Requirements

1. Existing group dispatching functions shall be maintained.
2. Existing traffic handling capabilities shall be maintained or improved.
3. Contractor shall perform all field adjustments required to optimize dispatching performance after installation.

Williams Center Towers Modernization

4. Final acceptance shall be contingent upon demonstrating reliable operation of all elevators under normal and peak traffic conditions.

G) Testing and Acceptance

1. Perform all testing required by applicable codes and authorities having jurisdiction.
2. Perform a minimum thirty (30) day operational evaluation period following completion.
3. Correct all deficiencies identified during testing and evaluation prior to final acceptance.

H) Alternate Price

1. Contractor shall provide a lump sum price for replacement of control systems on Elevators #1, #2, #3, #4 and Tower II Highrise Freight Elevator 10 as described herein.
2. Alternate price shall include all work required for a complete and operational installation regardless of whether specifically identified in this section.

ALT E:

TOWER I LOW RISE ELEVATORS #1, #2, #3, AND #4 CAB INTERIOR ALLOWANCE

A) General

1. This Alternate shall provide for modernization of the existing elevator cab interiors on Tower I Low Rise Elevators #1, #2, #3, and #4.
2. The intent of this Alternate is to provide cab interiors that match the architectural appearance, finish quality, and aesthetic design of the final design approved Tower Elevator Interior design.
3. Contractor shall provide all labor, engineering, coordination, fabrication, delivery, installation, permits, and incidental work required for complete installation of the new cab interiors.

B) Allowance

1. Include a material allowance of Thirty Thousand Dollars (\$30,000.00) per elevator cab for the purchase, fabrication, and installation of new interior finishes and decorative materials.
2. Total material allowance shall be One Hundred Twenty Thousand Dollars (\$120,000.00) for the four (4) elevators.
3. Include the labor for installation of the interiors (walls, ceiling, and handrails) in the pricing of this alternate above and beyond the allowance cost.

Williams Center Towers Modernization

4. Contractor shall include all labor, supervision, engineering, freight, permits, removal of existing materials, installation, and related work required to complete the cab interior modernization within the Alternate price.
5. Any unused allowance shall be credited back to Owner by Change Order.
6. Any selected finishes exceeding the allowance amount shall be addressed through a Change Order approved by Owner prior to material procurement.

C) Cab Interior Requirements

1. New cab interiors shall be designed to match the appearance and finish standards established in the Tower II Low Rise elevator modernization.
2. Consultant and Owner shall review and approve all finish selections prior to fabrication.
3. Contractor shall provide detailed shop drawings, finish samples, metal finish samples, ceiling samples, flooring samples, and color renderings for review and approval.
4. Cab interiors shall be custom fabricated for the existing elevator cab dimensions.

D) Scope of Work

1. Remove existing wall panels, decorative trim, handrails, ceiling system, lighting fixtures, flooring, and related cab interior components.
2. Provide new wall panel system with decorative reveals and trim.
3. Provide new architectural ceiling system with energy-efficient LED lighting.
4. Provide new handrails.
5. Provide new flooring material coordinated with approved design selections.
6. Refinish or replace transom panels, return panels, front returns, and other exposed interior finishes as required to provide a complete and uniform appearance.
7. Modify existing fixture cutouts and mounting provisions as required for integration with the new cab interior design.

E) Submittals

1. Final design shall not proceed to fabrication until written approval has been received from Owner and Consultant.

F) Alternate Price

1. Contractor shall provide a lump sum price for modernization of cab interiors on Tower I Low Rise Elevators #1, #2, #3, #4, and #5, including the material allowance identified above and all labor required for complete installation.
2. Alternate price shall include all work necessary to provide complete, finished, and operational cab interiors.

ALT F:**DEDUCT FOR DELETION OF AUXILIARY CAR OPERATING PANELS****A) General**

1. This Alternate shall provide a deductive price to eliminate the Auxiliary Car Operating Panels (COPs) specified as part of the elevator modernization work.
2. This Alternate shall apply to all elevators included in the modernization project requiring new car operating panels and cab interior modernization.
3. This Alternate shall not apply to Tower I Low Rise Elevators #1, #2, #3, #4, and Tower II Highrise Freight Elevator 10, as these elevators have previously been modernized and are not included in the Auxiliary COP replacement scope.

B) Scope of Work

1. Omit the Auxiliary Car Operating Panel from each applicable elevator.
2. Retain and provide the primary Car Operating Panel as specified.
3. Provide all modifications required to maintain code compliance and proper elevator operation without the Auxiliary Car Operating Panel.
4. Omit all associated wiring, conduit, communication devices, interface equipment, mounting provisions, and control equipment required solely for operation of the Auxiliary Car Operating Panel.
5. Modify cab wall panels, substrates, trim, reveals, and interior finishes as required to provide a complete and finished appearance where Auxiliary Car Operating Panels have been eliminated.

C) Requirements

1. Elevator operation shall remain fully functional and code compliant following deletion of the Auxiliary Car Operating Panel.
2. Primary Car Operating Panels shall contain all code-required operating devices, indicators, emergency communication equipment, accessibility features, and firefighter service functions.
3. Deletion of the Auxiliary Car Operating Panel shall not reduce elevator performance, reliability, accessibility, emergency operation, or compliance with applicable codes.
4. Contractor shall verify compliance with all applicable requirements of ASME A17.1, ADA, NFPA, and local code authorities.

D) Alternate Price

1. Contractor shall provide a deductive lump sum amount representing the total savings associated with deletion of all Auxiliary Car Operating Panels included in the modernization scope.

Williams Center Towers Modernization

2. Deductive amount shall include all labor, materials, engineering, fabrication, wiring, programming, and modifications required to eliminate the Auxiliary Car Operating Panels and provide a complete finished installation.

ALT G:**TOWER I LOW RISE ELEVATORS #1, #2, #3, #4, and Tower II Highrise Freight Elevator 10 - REPLACEMENT OF ELEVATOR SIGNAL FIXTURES****A) General**

1. This Alternate shall provide for replacement of the existing elevator signal fixtures serving Tower I Low Rise Elevators #1, #2, #3, #4, and Tower II Highrise Freight Elevator 10.
2. The intent of this Alternate is to provide fixture designs, finishes, appearance, functionality, and operating characteristics that match the new fixture package being installed as part of the modernization of the remaining elevator groups within the Williams Tower project.
3. Contractor shall provide all labor, engineering, materials, fabrication, wiring, programming, testing, permits, and incidental work required for complete installation and operation.

B) Car Operating Panels

1. Remove existing primary and auxiliary car operating panels.
2. Provide new car operating panels matching the design, material finish, button style, illumination, engraving, indicators, and operating characteristics utilized throughout the remainder of the modernization project.
3. Provide new code-compliant emergency communication devices integrated into the new fixture design.
4. Provide new digital position indicators integrated within the car operating panels.
5. Provide new emergency lighting, alarm button, firefighter service controls, inspection controls, and all other required code-compliant devices.

C) Hall Fixtures

1. Remove existing hall call stations.
2. Provide new hall call stations matching the fixture package utilized throughout the remainder of the modernization project.

Williams Center Towers Modernization

3. Provide new hall lanterns and position indicators as required to match modernization design standards.
4. Provide all required wiring, interface equipment, programming, and modifications necessary for complete integration with the existing elevator control system.

D) Signal Equipment

1. Replace all car and hall signal fixtures necessary to provide a consistent appearance with the modernized elevator groups.
2. New fixtures shall match approved modernization fixture designs with respect to:
 - a) Faceplate material and finish.
 - b) Button design and illumination.
 - c) Engraving and identification markings.
 - d) Position indicator style.
 - e) Hall lantern style and illumination.
 - f) Accessibility features.
 - g) Firefighter service identification.
3. All fixture finishes and layouts shall be subject to review and approval by Owner and Consultant.

E) Integration Requirements

1. Existing control equipment shall remain operational following fixture replacement.
2. Contractor shall provide all interface equipment, software modifications, communication devices, and wiring required to integrate new fixtures with the existing control system.
3. Contractor shall be solely responsible for compatibility between existing control equipment and newly installed fixtures.

F) Submittals

1. Submit fixture shop drawings, wiring diagrams, finish samples, engraving layouts, and product data for review and approval.
2. Submit fixture designs demonstrating consistency with the modernization fixture package utilized throughout the remainder of the project.

G) Alternate Price

Williams Center Towers Modernization

1. Contractor shall provide a lump sum price for complete replacement of signal fixtures serving Tower I Low Rise Elevators #1, #2, #3, #4, and Tower II Highrise Freight Elevator 10.
2. Alternate price shall include all labor, materials, wiring, engineering, programming, testing, and incidental work necessary to provide a complete and operational installation.

ALT H**ELEVATOR CAB VIDEO DISPLAY SYSTEM****A) General**

1. This Alternate shall provide a digital video display system within each passenger elevator included in the modernization project. All elevators to receive this feature including Low Rise Tower I passenger elevators, except for freight elevators and parking hydraulic elevators.
2. The intent of this Alternate is to provide a modern passenger communication and information display system capable of displaying video content, building information, tenant communications, branding, advertising, emergency messaging, weather information, news feeds, transportation updates, and other approved content.
3. Display systems shall be commercial-grade products specifically designed for elevator applications.
4. All equipment shall be furnished, installed, programmed, tested, and placed into operation by the Elevator Contractor.

B) Display Options

1. Contractor may provide either of the following display configurations:

a) Integrated Position Indicator Display:

- (1) Display incorporated into the elevator position indicator assembly.
- (2) Similar to Elite PI, MAD, Avire, or approved equivalent elevator media display systems.
- (3) Position indication shall remain clearly visible while video content is displayed.

OR**b) Separate Video Display:**

- (1) Dedicated display mounted on cab front return panel, transom panel, or other approved location.
- (2) Location shall be subject to Consultant and Owner approval.
- (3) Installation shall be architecturally integrated into cab design.

Williams Center Towers Modernization

2. Contractor shall identify proposed display location and equipment type within bid submission.

C) Display Requirements

1. Displays shall be commercial-grade LCD, LED, or equivalent technology designed for continuous operation.
2. Minimum display size shall be 10 inches diagonal unless otherwise approved by Owner and Consultant.
3. Displays shall support full-color video playback.
4. Displays shall support continuous loop video content.
5. Displays shall support still images, graphics, text messaging, and multimedia content.
6. Display resolution shall be minimum HD quality.
7. Displays shall automatically resume operation following power interruption.
8. Equipment shall be designed for operation within elevator environments including vibration and continuous daily operation.

D) Stand-Alone System

1. Base Alternate pricing shall include a stand-alone system for each elevator.
2. Each display shall be capable of storing and playing local content without reliance upon a central server.
3. Content updates may be performed by USB, SD card, network connection, or other approved method.
4. Contractor shall provide all software, licenses, and hardware necessary for content management.

E) Centrally Managed Content System (**ALT H-1**)

1. Contractor shall provide a separate price identifying the additional cost to provide a centrally managed content system for all elevators included in the modernization project.
2. Central management system shall permit content updates from a single administrative location.
3. System shall permit simultaneous content updates to multiple elevators.
4. System shall permit scheduling of content by date and time.
5. System shall support emergency messaging and priority announcements.
6. Contractor shall identify all networking, communication, server, software licensing, subscription, and maintenance requirements associated with the centralized system.
7. Contractor shall identify any recurring annual fees associated with operation of the centralized system.

F) Integration Requirements

Williams Center Towers Modernization

1. Display systems shall operate independently of elevator control systems.
2. Failure of display equipment shall not affect elevator operation.
3. Display equipment shall not interfere with elevator controls, communications, life safety systems, or code-required functions.
4. All wiring shall be concealed and professionally installed.

G) Submittals

1. Submit product data, shop drawings, mounting details, display dimensions, power requirements, and content management information.
2. Submit examples of user interface and content management software.
3. Submit renderings illustrating proposed display locations within elevator interiors.
4. Final display locations and appearance shall be subject to Owner and Consultant approval.

H) Alternate Pricing

1. Contractor shall provide a lump sum price for a stand-alone video display system installed in each passenger elevator included in the modernization project.
2. Contractor shall separately identify the additional cost required to upgrade the stand-alone system to a centrally managed content management platform serving all elevators.

ALT I:

AUDIO / VIDEO EMERGENCY COMMUNICATION SYSTEM

A) General

1. This Alternate shall provide a code-compliant Audio/Video Emergency Communication System for passenger elevators included in the modernization project.
2. This Alternate is intended as an Owner-requested enhancement and shall provide emergency communication capabilities generally consistent with the requirements contained within ASME A17.1-2019 for Two-Way Audio/Video Communication.
3. This Alternate shall replace the standard emergency telephone system specified elsewhere within the modernization specification.
4. Contractor shall provide all labor, materials, software, equipment, wiring, programming, testing, training, and incidental work necessary for a complete and operational system.

B) System Requirements

Williams Center Towers Modernization

1. Provide a hands-free two-way communication system capable of voice communication between elevator passengers and an authorized emergency response location.
2. Provide integrated video communication capability permitting remote visual assessment of elevator occupants during emergency situations.
3. System shall be capable of transmitting both audio and video simultaneously.
4. Communication shall automatically initiate upon activation of the emergency communication device.
5. System shall be capable of operating during loss of normal building power utilizing elevator emergency power and battery backup systems as required.
6. System shall provide automatic system monitoring and fault notification.
7. Communication devices shall be specifically designed and listed for elevator applications.

C) Elevator Equipment

1. Provide camera(s), microphone(s), speaker(s), communication devices, interface equipment, and associated hardware required for each elevator.
2. Camera placement shall provide a clear view of elevator occupants.
3. Equipment shall be integrated into the car operating panel, auxiliary panel, transom, ceiling, or other approved location.
4. Equipment locations shall be subject to Owner and Consultant approval.
5. All equipment shall be vandal-resistant and suitable for continuous operation within an elevator environment.

D) Monitoring Station Requirements

1. System shall communicate with a designated monitoring location approved by Owner.
2. Monitoring location may be an on-site security office, management office, third-party monitoring center, or other approved location.
3. Contractor shall identify all infrastructure requirements associated with the proposed monitoring solution.
4. System shall provide notification of communication failures, equipment faults, and loss of connectivity.

E) Non-Proprietary Requirements

1. System shall be non-proprietary.
2. Owner shall have unrestricted ability to utilize the monitoring provider of their choice.
3. System shall not require the use of a single manufacturer-designated monitoring service.
4. All passwords, software, programming tools, licenses, manuals, configuration files, and documentation shall be provided to Owner upon project completion.

Williams Center Towers Modernization

5. Any qualified elevator contractor, communication contractor, or building systems contractor shall be capable of servicing and maintaining the system.
6. Contractor shall identify any recurring monitoring fees, communication fees, cloud-hosting fees, software subscription fees, or licensing fees associated with the proposed system.

F) Communication Network

1. Contractor shall identify communication method utilized by the system including:
 - a) Cellular communication.
 - b) Internet Protocol (IP) communication.
 - c) Building network connection.
 - d) Dedicated communication circuit.
2. Contractor shall identify all Owner-furnished requirements necessary for system operation.
3. Contractor shall identify all monthly recurring costs associated with communication services.

G) Submittals

1. Submit complete product data, equipment specifications, wiring diagrams, communication architecture, monitoring requirements, and installation details.
2. Submit description of communication pathway and emergency response process.
3. Submit sample user interface screens and monitoring station displays.
4. Submit documentation demonstrating compliance with applicable portions of ASME A17.1-2019 relating to two-way audio/video communication.

H) Testing and Training

1. Demonstrate proper operation of audio and video communication functions for each elevator.
2. Demonstrate communication with the designated monitoring location.
3. Provide training for Owner personnel regarding operation, testing, and administration of the system.
4. Provide written operating and troubleshooting manuals.

I) Alternate Pricing

1. Contractor shall provide a lump sum price for furnishing and installing a complete Audio/Video Emergency Communication System in all elevators included in the modernization project.

Williams Center Towers Modernization

2. Contractor shall separately identify all recurring annual costs associated with monitoring, communication services, software subscriptions, cloud services, licensing, maintenance, or other recurring fees.

ALT J:**REPLACE PLAZA / MAIN LOBBY LEVEL HOISTWAY ENTRANCES****A) General**

1. This Alternate shall provide replacement of the existing elevator hoistway entrance assemblies at the Plaza / Main Lobby Level for all elevators included within the Williams Tower modernization project.
2. This Alternate shall include all Tower elevators and Parking Garage elevators.
3. The intent of this Alternate is to provide a consistent, modern architectural appearance throughout the primary public elevator lobbies while improving the condition, appearance, and long-term maintainability of the entrance systems.
4. Contractor shall provide all labor, materials, engineering, fabrication, demolition, delivery, installation, permits, testing, and incidental work necessary for complete replacement of the entrance assemblies.

B) Scope of Work

1. Remove existing hoistway entrance assemblies at the Plaza / Main Lobby Level.
2. Provide new entrance frames, headers, fascia assemblies, struts, sight guards, hardware, and entrance-related structural supports as required.
3. Provide new center-opening or side-opening entrance doors matching existing entrance configuration unless otherwise approved by Owner and Consultant.
4. New entrances shall be compatible with the new door operators, controllers, and door protection systems provided as part of the modernization work.
5. Contractor shall provide all modifications necessary to ensure proper alignment, operation, and code compliance of the new entrance assemblies.

C) Entrance Construction

1. New entrance doors shall be minimum 16-gauge furniture-quality stainless steel construction.
2. Entrance frames shall be minimum 14-gauge stainless steel construction.
3. Finish shall be selected by Owner and Consultant from manufacturer's standard architectural finishes.
4. All entrance components shall be fabricated and installed to provide a premium architectural appearance.
5. Visible fasteners shall not be permitted unless specifically approved by Owner and Consultant.

Williams Center Towers Modernization

D) Architectural Requirements

1. Entrance finishes shall be coordinated with lobby finishes and modernization design intent.
2. Contractor shall submit finish samples for review and approval.
3. Entrance design shall be consistent throughout all elevator groups regardless of elevator type or tower location.
4. All entrances included under this Alternate shall provide a uniform appearance throughout the property.

E) Door Equipment

1. Existing sill supports, struts, headers, and structural supports shall be evaluated and replaced as required.
2. New entrance assemblies shall be designed to withstand anticipated building traffic and usage.
3. Existing lobby sills may be retained if determined to be in acceptable condition by Owner and Consultant.
4. Any damaged flooring, wall finishes, or adjacent construction resulting from entrance replacement shall be repaired and restored by Contractor.

F) Submittals

1. Submit complete shop drawings showing entrance construction, dimensions, materials, finishes, and installation details.
2. Submit finish samples and color selections for Owner and Consultant approval.
3. Submit photographs or manufacturer's literature illustrating proposed entrance design.

G) Alternate Price

1. Contractor shall provide a lump sum price for replacement of all Plaza / Main Lobby Level hoistway entrance assemblies serving all elevators included within the project.
2. Alternate price shall include demolition, disposal, fabrication, installation, wiring modifications, structural modifications, restoration work, and all associated labor and materials necessary for a complete installation.

ALT K:

PROVIDE OEM CONTROLLER AND EQUIPMENT BY ELEVATOR CONTRACTOR

A) OEM Controller and Equipment: Provide an alternate price to furnish and install an Original Equipment Manufacturer (OEM) controller and/or other specifically identified

Williams Center Towers Modernization

components manufactured directly by the installing Elevator Contractor in lieu of the equipment specified in the Base Bid.

1. At the time of bid submission, Bidder shall clearly identify all equipment proposed under this Alternate as OEM or contractor-manufactured equipment, including the manufacturer, model, and specific components being substituted for the Base Bid equipment. Equipment not specifically identified at the time of bid shall be provided in accordance with the Base Bid requirements.
2. This Alternate shall **not** include substitutions or changes to the specified car operating panels, hall fixtures, car fixtures, pushbuttons, position indicators, lanterns, or other specified fixture equipment. All car and hall fixtures shall be provided as specified in the Base Bid.
3. Any OEM or contractor-manufactured equipment requiring specialized tools, devices, manuals, source codes, access codes, passwords, software, interfaces, dongles, licenses, or other means to input parameters, make adjustments, troubleshoot, perform diagnostics, conduct testing, reset faults, or perform any maintenance or repair function shall include all such items as part of the Alternate price.
4. All required specialized diagnostic tools, devices, manuals, codes, passwords, software, interfaces, licenses, and related equipment shall be provided to the Owner at project completion and shall become the property of the Owner. No additional charges, subscriptions, recurring fees, or proprietary service agreements shall be required for the Owner or a qualified third-party elevator service provider to access and use the equipment for future troubleshooting, adjustment, testing, maintenance, and repair.
5. Where software, licenses, or access credentials cannot legally be transferred to the Owner, the Elevator Contractor shall provide the Owner with a fully paid, perpetual right of use sufficient to allow the Owner and any qualified elevator service provider selected by the Owner to perform all required maintenance, adjustment, troubleshooting, diagnostic, testing, and repair functions.
6. The Alternate price shall include all costs associated with the proposed OEM equipment and all required diagnostic and maintenance support equipment identified herein. No additional charges will be accepted after award for items required to fully access, maintain, troubleshoot, adjust, test, or repair the installed equipment.
7. Acceptance of this Alternate shall be at the sole discretion of the Owner and Consultant. The Owner reserves the right to accept or reject the Alternate, in whole or in part, without affecting the Bidder's Base Bid

3 EXECUTION

3.1 CONTRACTOR RESPONSIBILITY

A) **Contractor Responsibility:** The Contractor shall be responsible to the Owner for the acts, omissions and negligence of the Contractor's employees, Subcontractors and their agents or employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors. In no event shall Contractor be liable for consequential damages.

B) **Examinations:**

- 1) Before starting elevator modernization, inspect hoistway, hoistway openings, pits and machine room, as constructed, verify all critical dimensions, and examine supporting structures and all other conditions under which elevator work is to be installed. Do not proceed with elevator modernization until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- 2) Modernization constitutes acceptance of existing conditions and responsibility for satisfactory performance.

C) **Crane Services:** Elevator Contractor shall coordinate crane services, if required, for the removal the existing equipment from the machine rooms and placement of the new equipment in the machine rooms with building owner's representative.

D) **Scheduling:** Only one (1) elevator at a time will be turned over to the elevator contractor for modernization work. The subsequent elevator(s) will only be turned over for modernization work upon completion of all modernization work on the first elevator, including successful completion of all required inspections and tests.

E) **Signage:**

- 1) Cherokee Nation Businesses Representative and the Board, in accordance with the General Materials section of this specification, will approve all signage in order to maintain consistent appearance for entire elevator installation.
- 2) All signage as required by current edition of the applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code and NFPA 72 Fire Alarm Code to be posted in elevator lobbies, fire alarm panels, disconnects, machine rooms and machine room doors.
- 3) All existing signage will be replaced in conformance to the Current edition of the applicable Building Code, ASME A17.1 Safety Code for Elevators and Escalators, NFPA 70 National Electrical Code and NFPA 72 Fire Alarm Code requirements as a part of this specification.

F) **Installation:**

- 1) Install elevator systems components and coordinate repairs of hoistway wall construction.

Williams Center Towers Modernization

- 2) Competent licensed elevator installation personnel in accordance with Jurisdictional Statutes, Rules & requirements and ASME A17.1 Safety Code for Elevators and Escalators, manufacturer's installation instructions and approved shop drawings shall perform work.
 - 3) Comply with the NFPA 70 National Electrical Code for electrical work required during installation.
 - 4) Perform work with competent, skilled workmen under the direct control and supervision of the Elevator Contractor's experienced foreman.
 - 5) Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports, and bracing including all setting templates and diagrams for placement.
 - 6) Welded construction: Provide welded connections for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn Parts. Comply with AWS B2.1 Standard Welding Procedure and Performance Qualification.
 - 7) Coordination: Coordinate elevator work with the work of other trades, for proper time and sequence to avoid construction delays. Use benchmarks, lines, and levels designated by the Contractor, to ensure dimensional coordination of the work.
 - 8) Install machinery, guides, controls, car and all equipment and accessories to provide a quiet, smoothly operating installation, free from side sway, oscillation, or vibration.
 - 9) Sound isolation: Mount rotating and vibrating elevator equipment and components on vibration-absorption mounts, designed to effectively prevent the transmission of vibrations to the structure, and eliminate sources of structure-borne noise from the elevator system.
 - 10) Lubricate operating parts of system, including ropes, as recommended by the manufacturer.
- G) **Data Plates, Tags & Signs:** Elevator Contractor shall be required to install all data plates as required by ASME A17.1 Safety Code for Elevators and Escalators on complete elevator system including alteration and original equipment.
- 1) **All existing alteration code data plates must have the associated information retained with new alteration data plates being provided including the applicable information about the alteration code reference requirements and alteration code edition.**
 - 2) All data plates shall be manufactured and printed with proper data for each elevator by CodeDataPlate.com or approved equal.
 - 3) No ink-based markers shall be used for any data plates, tags, or signs. All data plates, tags & miscellaneous signage shall be of such material and construction

Williams Center Towers Modernization

that the letters and figures stamped, etched, cast, or otherwise applied to the face shall remain permanently and readily legible.

H) **Field Quality Control:** The Elevator Contractor shall perform pre-testing of all required acceptance tests of the elevator system(s) prior to the scheduled Alteration Acceptance Testing and Inspection. The Elevator Contractor shall ensure the installation conforms to all applicable safety codes and contract requirements.

I) **Acceptance Testing & Inspection:**

- 1) **Acceptance Testing:** Upon completion of the elevator modernization perform and satisfactorily complete all acceptance tests as required by the State of Oklahoma, AHJ (Authority Having Jurisdiction) and required by all applicable codes and governing regulations. Perform other tests, if any, as required by governing regulations or agencies.
- 2) Advise Owner, Elevator Consultant, and governing authorities in advance as required of dates and times tests are to be performed on the elevator.
- 3) **Acceptance Inspection:** Cherokee Nation Businesses has designated ATIS, as their consultant on this project.
 - a) The Elevator Contractor shall be responsible, in accordance with ASME A17.1 Safety Code for Elevators and Escalators for all acceptance inspections for this elevator.
 - b) Elevator Installer in accordance with ASME A17.1 Safety Code for Elevators and Escalators, Inspection and Test Requirements will perform all acceptance tests for this elevator.
 - c) Elevator Contractor must notify building owner and elevator consultant 5 days prior to inspection advising of the date and time of all inspections and tests.
 - d) Elevator inspector other than Jurisdictional Authority inspectors must be approved prior to inspection date by Owner and consultant.

J) **Keys for Elevator Key Switches:** Provide a minimum of two (2) keys per cylinder used on all key switches for a single elevator. If there is more than one elevator, two (2) additional keys per cylinder will be required for each additional elevator. Each numbered set of keys shall be identified with their function on a labeled plastic tag with a split ring for each numbered set.

K) **Adjusting:**

- 1) Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.
- 2) The Elevator Contractor shall be required to perform and pass all required testing of all equipment as per ASME A17.1 Safety Code for Elevators and Escalators and ASME A17.2.
- 3) Elevator Contractor is to return at 30 days, 90 days and 180 days after final installation to examine and readjust rope tension and hoist machine as may be required for optimum performance.

L) Cleaning:

- 1) Contractor shall keep the premises and surrounding areas free from accumulation of waste materials or rubbish caused by its operations. Upon completion of the Work, the Contractor shall remove all waste materials and Contractor's equipment and surplus materials. Contractor shall police the work area daily and any common area used by the Contractor each day and shall remove trash and debris from the work area and common area. Any trash that is stored on the common area shall be protected from wind so as to prevent trash being blown around the common area.
- 2) Contractor shall ensure that no hazardous conditions exist as a result of any Work, including the removal of nails in the parking area and walkway.
- 3) Contractor shall store all materials, supplies and equipment in a neat and orderly manner and dispersed to minimize fire hazards. The unloading of materials, supplies, or equipment in the roadways or landscaped areas by vehicles, cranes or forklifts shall be coordinated at least 24 hours in advance with the Owner.
- 4) Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided.
- 5) For duration and/or completion of elevator work, remove tools, equipment, and surplus materials from site daily.
- 6) Clean equipment rooms and hoistway.
- 7) Remove trash and debris daily from premises.

M) Protection:

- 1) During all elevator work, or portion thereof, provide suitable protective coverings, barriers, devices, signs, or other such methods or procedures to protect elevator work from damage or deterioration. Protect all areas of work from public access or dangers including tripping or fall hazards. Maintain protective measures throughout remainder of construction period.

N) Demonstration:

- 1) The Elevator Contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The Elevator Contractor shall demonstrate that control systems and operating devices are functioning properly.
- 2) Instruct Owner's personnel in proper use, operations, and daily care or operation of elevator. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies.
- 3) Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions.

Williams Center Towers Modernization

- 4) Make a final check of each elevator operation, with Owner's personnel present, immediately before date of substantial completion.
- 5) Demonstrate that control systems and operating devices are functioning properly.
- 6) Final Electrical Schematics and Drawings
- 7) Maintenance Requirements.

O) Elevator Consultant's Punch-Out List Items:

- 1) Complete all of the consultant's punch-out list items as may be required. The elevator consultant shall provide a review and written punch list of deficiencies. The elevator consultant shall verify one time that the items from the punch list are completed after notice by the Elevator Contractor. If the work is not complete and the consultant is required to make return visits, the Elevator Contractor shall be charged for consultant at a rate of \$175.00 per hour including travel time for any additional return visits, reviews or work of any type.

P) Fire Service Key Switch Standardization:

- 1) Consultant has identified that the existing Firefighters' Emergency Operation (Phase I and Phase II) key switches throughout the property are not standardized and currently utilize differing keying arrangements between elevator groups.
- 2) Elevator Contractor shall verify existing conditions during the site survey and include all costs necessary to address this condition within the Base Bid.
- 3) Prior to commencement of elevator modernization work, Contractor shall coordinate with Owner, Consultant, local Fire Department, and Authority Having Jurisdiction (AHJ) to determine the required fire service keying standard for the property.
- 4) Contractor shall provide and install all required cylinders, switches, cores, and associated hardware necessary to establish a uniform fire service keying arrangement throughout all elevator groups included in this project.
- 5) Contractor shall complete this work prior to placing the first elevator out of service for modernization.
- 6) Work shall be scheduled and coordinated to minimize disruption to building operations.

3.2 TERMS of PAYMENT**A) Payment Schedule:**

- 1) Based upon applications for payment submitted to OWNER by CONTRACTOR, as accepted and approved by Owner, Owner shall make progress payment on account of the Contract Sum to Contractor based on the Work completed to date. Upon completion of a portion of the Work as described above, Contractor shall submit to Owner's Representative a sworn and certified progress payment affidavit which recites that all laborers, material suppliers and subcontractors dealing with the

Williams Center Towers Modernization

Contractor have been paid in full up through the date of the affidavit and partial releases of lien from Contractor and any lienors serving a notice to the Owner prior to payment and evidence of proof of payment of any indebtedness incurred with a respect to the Work of Contractor, as may be required by the Owner and evidence that all Work has been performed as required pursuant to the Contact Documents up to the time of the request for payment.

- 2) Progress Payments for the modernization work shall be made in accordance to this Paragraph, in the following manner for the elevator that is modernized.
 - a) 20% of contract sum is due upon signed acceptance and upon compliance with the relevant conditions precedent detailed in the Conditions Precedent to Payment paragraph, which shall include, but not be limited to, receipt by Owner of Contractor's Certificate of Insurance and signed contract.
 - b) 20% of the contract sum is due upon the arrival of the materials to the site and approval of the Owner's Representative of the materials.
 - c) 30% of the contract sum is due upon completion of the first elevator, including satisfactory completion of alteration acceptance testing and inspection of elevator.
 - d) 30% of the contract sum is due upon completion of the second elevator, including satisfactory completion of alteration acceptance testing and inspection of elevator.
 - e) A Retainage of Ten Percent (10%) shall be withheld from all payments until completion of all work in accordance with the Owner Representative of this Contract paragraph. Final payment shall be payable within thirty (30) days from completion and upon delivery of Written Warranty(s), releases of all liens from Contractor, all Subcontractors, Laborers and Material Suppliers and Final Contractor's Affidavit
- 3) All progress payments shall be made payable jointly to Contractor and Subcontractors and suppliers or Subcontractors in the event a lien or liens have been filed by a Subcontractor against the Owner.
- 4) Prior to issuance of any payments, the Work shall be inspected by Owner or the Owner's Representative. In addition, as Contractor is fully responsible for meeting the requirements of the manufacturers' warranties, Contractor shall be responsible for obtaining inspections by the manufacturers' representatives, if required, and delivering, along with his application for payment and supporting documentation, signed statements from the manufacturers verifying that the manufacturers will issue written warranties for the Work performed for which payment is being made. If fully satisfied with the documentation submitted, the Owner's Representative shall issue a certificate of authorization of payment to the Owner within fifteen (15) business days of receipt of the application for payment and supporting documentation. Upon receipt of the certificate of authorization of payment, the Owner shall issue payment to Contractor within fifteen (15) business days.

- 5) The Owner's Representative shall have sole reasonable discretion as to approval of work and progress payments. The Owner's Representative shall timely review each application for payment and submit its Certificate of Payment to the Owner authorizing payment for all work performed and accepted by the Owner's Representative and materials on site as of the date of the application, reduced solely by the Representative's estimate of the cost to cure defective work (regarding which the Contractor has received Notice) performed by the Contractor. The Owner's Representative shall have the right to disapprove payment if in his reasonable judgment Work does not conform to the Contract Documents, the quality and progress of the work is not satisfactory, or as further provided in the Conditions Precedent to Payment paragraph hereof.

B) Conditions Precedent to Payment:

- 1) As a condition precedent to receiving payment Contractor shall furnish:
 - a) The Certificates of Insurance described in the Special Provisions, Insurance Requirements section of this contract.
 - b) An Affidavit reciting that all sums for labor, materials and services incurred as of the date of the payment requisition have been paid in full.
 - c) A sworn Release and Waiver of Lien to the extent of all payments requisitioned to date shall be furnished by Contractor and any Subcontractors, Laborers or Material suppliers.
 - d) Satisfactory final inspection by the Owner's Representative and delivery of Final Contractor's Affidavit shall occur prior to final payment.
 - e) Contractor agrees that Owner may pay unpaid Subcontractors, Laborers and Material Suppliers directly after ten (10) days written notice to Contractor if any sum remains unpaid at that time, or in the event of any lien filed in connection with such amounts unpaid, including attorneys' fees and other costs necessary to satisfy such lien unless Contractor advised Owner in writing of a reasonable basis for objection to payment within the ten (10) day period. Such amounts paid will be deducted from the amounts due Contractor.

C) Owner's Representative of This Contract:

- 1) The Owner's Representatives shall be designated by Owner. The Owner's Representatives will provide general administration during performance of the work and until final payment is due.
 - a) The Owner's Representatives shall at all times have access to the work wherever it is in preparation and progress.
 - b) The Owner's Representatives shall have the authority to reject work which does not conform to the contract documents and work specifications.
 - c) Based upon the Owner's Representatives' observations of the work and Contractor's applications for payment, the Owner's Representatives will determine the amounts owing to Contractor as described in Terms of Payment section of this contract.

D) Final Payment:

- 1) The Owner shall make or authorize final payment equal to ten (10%) percent of the Contract Sum to be made within thirty (30) days after completion of the Work, provided the Contract be then fully performed and Contractor has complied with the other requirements set forth in this section.
- 2) Final payment shall not be due until the Contractor has delivered to the Owner a complete release of all liens and releases or waivers of lien from all lienors who have served a notice to owner to Owner arising out of this Contract, a final Contractor's affidavit pursuant to Oklahoma Statutes and a final Certificate of Inspection issued by the appropriate governmental authority(ies). In addition, final payment shall not be due until satisfactory final inspection and Contractor has delivered to Owner fully executed warranties in the Owner's name from all subcontractors and material and equipment manufacturers who have supplied labor, materials or equipment to the property under a contract with Contractor to the extent that such warranties are customarily supplied by any such subcontractors, material and equipment manufacturers.
- 3) Payment shall not become due until Contractor has delivered to the Owner a complete release of all liens arising out of this Contract or receipts in full covering all labor, materials and equipment for which a lien could be filed. Upon receipt of the release of liens from the Contractor, the Owner shall deliver payment to the Contractor.
- 4) Owner may, for reasonable cause, make or authorize to be made all or any portion of any of the Final Payment by check payable jointly to the order of Contractor and any lienor giving timely notice. Payments shall be made directly to lienor by Owner unless Contractor has prior written notice and opportunity to resolve any disputes. If Contractor wishes to bond off or to contest any liens, and does not bond off the liens, Owner will escrow the applicable funds until the dispute is resolved and deduct said payment from the sum due Contractor. In the event there are no claims which exceed the final payment amount, no payment shall be made until Contractor deposits the amount of any such deficiency with Owner.
- 5) The making of Final Payment shall not constitute a waiver of any claims by the Owner.

E) Claims and Disputes:

- 1) The parties shall endeavor to work together to resolve any disputes which may arise out of this Contract, but in the event a resolution cannot be reached, the parties reserve the right to litigate this matter in a court of competent jurisdiction located in the county where the work is to be performed. In no event shall Contractor be liable for consequential damages.

F) Modernization Contract Acceptance:

- 1) This Elevator Modernization Contract contains all the terms and conditions agreed upon by the Owner and Elevator Contractor. This Contract, once signed, will constitute the contract for modernization of electric traction elevators as detailed

Williams Center Towers Modernization

above. No other agreement, oral or otherwise, regarding the subject matter of this Contract shall be deemed to exist or to bind either party hereto, except as noted herein.

EXECUTION

IN WITNESS WHEREOF, the parties have executed this Contract the date noted below.

ELEVATOR CONTRACTOR**WILLIAMS CENTER TOWERS**

BY: _____

BY:

TITLE: _____

TITLE:

DATE: _____

DATE:

END OF MODERNIZATION SECTION