



DIVISION 14

SECTION(S) 14 24 23,

TECHNICAL SPECIFICATIONS FOR

TWO (2) Hydraulic Passenger Elevators

AT

MERIDIAN TOWNSHIP

One (1) Car located at Meridian Township Public Safety
One (1) Car located at Meridian Municipal Building

5151 MARSH ROAD

OKEMOS, MI

DATE: 7/10/2026

VDA No. 82329/PL

DIVISION 14 – CONVEYING SYSTEMS

14 00 00 Conveying Equipment

14 24 23 – Hydraulic Passenger Elevators

PART 1 - GENERAL

1.1 SUMMARY AND DEFINITIONS

A. Related Documents

- 1 Division 01 - Supplementary General Conditions
- 2 14 24 23 - Hydraulic Passenger Elevators
- 3 Request for Proposal

B. Intent

- 1 This section includes:
 - a. Hydraulic passenger Elevator Modernization
- 2 The following outlines the scope of work covered in this Section:
 - a. Complete Modernization of two (2) Hydraulic Passenger Elevators in order to bring both into full code compliance.
- 3 Related equipment shall be designed, constructed, installed and adjusted to produce the highest results with respect to smooth, quiet, convenient and efficient operation, durability, economy of maintenance, and the highest standard of safety.
- 4 It is not the intent of these specifications to detail the construction and design of all parts of the equipment, but it is expected that the type, materials, design, quality of work and construction of each part shall be adequate for the service required, durable, properly coordinated with all other parts, and in accordance with the best commercial standards applicable and of the highest commercial efficiency possible.
- 5 Minimum requirements for design, materials, etc., are for certain parts of the equipment. Equivalent requirements approved by the Owner shall apply to such parts as are of special design, construction or material and to which the specified requirements are not directly applicable. These minimum requirements as a whole shall be considered as establishing proportionate general minimum standards for all parts of the equipment.
- 6 The Owner may permit variations from the requirement of these specifications to permit use of the Contractor's standard equipment, provided such standard equipment is in every way adequate for the intended use and meets the full intent of these specifications. All such variations proposed by the manufacturer shall be called to the attention of the Owner and shall only be made if approved in writing prior to the award of the contract.

- 7 General requirements for design, materials and construction are intended primarily to apply to the parts of the equipment specifically mentioned. Parts may be of the standard design, materials and construction provided that, in the opinion of the Owner, such standards are in accordance with the best commercial practice and are fully adequate for the purpose of use. All such variations shall be made only on the Owner's written approval.
- 8 All equipment and component parts installed, supplied or provided under this contract shall be manufactured and distributed by a company servicing the vertical transportation industry.
 - a. Apparatus shall conform to the design and construction standards referenced herein, and shall be rated the best commercial grade suitable for this application.
 - b. Manufacturers of the apparatus shall provide technical support and parts replacements for their equipment and component systems for a minimum of twenty (20) years, and issue such guarantee of support to the purchaser with written certification naming the final Owner of their product(s) to ensure the apparatus or systems remain maintainable regardless of who may be selected for future service.
- 9 It is understood, the entire system shall be designed, fabricated, modified and/or upgraded in full compliance with applicable local laws and code standards. The absence of a particular item or requirement shall not relieve the Contractor of the full and sole responsibility for such equipment, features and/or procedures.
- 10 With the exception of only those items specifically identified as being performed by others, the Specifications are intended to include all engineering, material, labor, testing, and inspections needed to achieve work specified by the Contract Documents. Inasmuch as it is understood that any incidental work necessary to complete the project is also covered by the Specifications, bidders are cautioned to familiarize themselves with the existing job site conditions. Additional charges for material or labor shall not be permitted subsequent to execution of the Contract.
- 11 Bidders must report discrepancies or ambiguities occurring in the Specifications to the Owner for resolution prior to the bidding deadline, otherwise the Specifications shall be deemed acceptable in their existing form.

C. Termination of Existing Agreements

- 1 By submitting a bid, the existing maintenance provider agrees that any service contracts in effect shall be terminated by the Owner should the project be awarded to another vendor upon thirty (30) day written notice to the Contractor by the Owner.
 - a. The contracts shall be terminated with no penalty to the Owner or Contractor.
 - b. Owner will be responsible for money owed the Contractor for services provided and work performed up until the date of cancellation.

D. Abbreviations and Symbols

- 1 The following abbreviations, Associations, Institutions, and Societies may appear in the Project Manual or Contract Documents:

ADA	Americans with Disabilities Act
AHJ	Authority Having Jurisdiction
AIA	American Institute of Architects

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

E. Codes and Ordinances / Regulatory Agencies

- 1 Work specified by the Contract Documents shall be performed in compliance with applicable Federal, State, and municipal codes and ordinances in effect at the time of Contract execution. Regulations of the Authority Having Jurisdiction shall be fulfilled by the Contractor and Subcontractors. The entire installation, when completed, shall conform with all applicable regulations set forth in the latest editions of:
 - a. Local and/or State laws applicable for logistical area of project work.
 - b. Building Code applicable to the AHJ.
 - c. Elevator Code applicable to the AHJ.
 - d. Safety Code for Elevators and Escalators, ASME A17.1 and all supplements as modified and adopted by the AHJ.
 - e. Safety Code for Elevators and Escalators, A17.1S supplement to A17.1 as modified and adopted by the AHJ for Machine Room Less installations (MRL).
 - f. Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2.
 - g. Safety Code for Existing Elevators and Escalators, ASME A17.3 as modified and adopted by the AHJ.
 - h. Guide for Emergency Evacuation of Passengers from Elevators, ASME A17.4.
 - i. National Electrical Code (ANSI/NFPA 70).
 - j. American with Disabilities Act - Accessibility Guidelines for Buildings and Facilities and/or A117.1 Accessibility as may be applicable to the AHJ.
 - k. ASME A17.5/CSA-B44.1 - Elevator and Escalator Electrical Equipment.
 - l. ECC (Energy Conservation Code) as may be applicable to the AHJ.
- 2 The Contractor shall advise the Owner's Representative of pending code changes that could be applicable to this project and provide quotations for compliance with related costs.

F. Reference Standards

- 1 ASTM D1785 - PVC Pipe.
- 2 ASTM D2466 – PVC Pipe Fittings.
- 3 ASTM D2564 – Cement for PVC Pipe and Fittings.
- 4 ANSI/IEEE - 519-Latest Edition.
- 5 ANSI/IEEE - Guide for Surge Withstand Capability (SWC) Tests.
- 6 ANSI Z97.1 – Laminated/Safety Tempered Glass.

G. Definitions

- 1 Defective Work: Operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
- 2 Provide: Where used in this document, provide shall mean to install new device, apparatus, system, equipment or feature as specified in this document.
- 3 Definitions in ASME A17.1 as amended or modified by the AHJ apply to work of this Section.

1.2 PERMITS AND SUBMITTALS

A. Permits

- 1 Prior to commencing work specified by the Contract Documents, the Contractor shall, at its own expense, obtain all permits or variances as may be required by the AHJ and provide satisfactory evidence of having obtained said permits and variances to both the Owner's Representative and Consultant.
- 2 File necessary drawings for approval of all Authorities Having Jurisdiction.
- 3 The Elevator Contractor shall undertake the necessary review and search procedure to identify open applications and/or outstanding violations for this property; and, close-out such applications and/or expunge such violations relative to the project scope as required for final acceptance by the AHJ.
- 4 Outstanding applications and violations must be indicated on the request for permit filing for this procedure to ensure such applications and/or violations are dismissed accordingly.
- 5 All relative costs shall be included in the base bid proposal with the understanding that corrective actions are covered under the specified scope of work.

B. Submittals

- 1 Prior to beginning the work, the Contractor shall submit and have approved copies of shop drawings and standard cuts. These items shall include:
 - a. Pump unit assembly, controller, door equipment, signal fixtures door panels, car guides, travel cable, and cab enclosures/ interiors.
 - b. All specified additional accessories.
- 2 The Consultant and the Owner's Representative shall pass on the submittals with reasonable promptness and the Contractor shall be responsible to ensure that there will be no delay in their work or that of any other trade involved.
- 3 Approved filing and submittal requirements must be completed before equipment and related materials are ordered.
- 4 Copies of Department of Buildings' permits and/or governing authority's documents will be posted at the job site with copies issued to the Owner's Agent, Owner's Representative and Consultant.
- 5 Samples of wood, metal, plastic, paint or other architectural finish material applicable to this project shall be submitted for approval by the Owner's designee.

- 6 It shall be understood that approval of the drawings and cuts by Owner's designee, Architect and/or Consultant shall be for general arrangement only and does not include measurements which are the Contractor's responsibility or approval of variations from the contract documents required by the AHJ.
- 7 The Contractor shall prepare a record log and maintain all submittals, shop drawings, catalog cuts and samples.

C. Measurements and Drawings

- 1 Drawings or measurements included with the bidding material shall be for the convenience of the bidders only and full responsibility for detailed dimensions lies with the Contractor.
- 2 In the execution of the work on the job, the Contractor shall verify all dimensions with the actual conditions.
- 3 Where the work of the Elevator Contractor is to join other trades, the shop drawings shall show the actual dimensions and the method of joining the work of the various trades.

D. Substitutions

- 1 Requests for substitutions will be considered under the following time limitations and situations:
 - a. Not less than ten (10) calendar days before bids are due.
 - b. Work or equipment specified becomes unavailable through unforeseen events such as strikes, loss of manufacturer's plant through fire, flood or bankruptcy.
- 2 Requested substitutions will be reviewed and adjudged. Failure of the Owner to raise objection shall not constitute a waiver of any of the requirements of the Contract Documents.
- 3 Request for substitutions shall include complete data with drawings and samples as required, including the following:
 - a. Quality Comparison - Proposed substitution versus the specified product.
 - b. Changes required in other work because of the substitution.
 - c. Effect on the construction schedule.
 - d. Cost Data - Resulting from the proposed substitution versus the specified product. The Contractor shall certify that the cost data presented is complete and includes all related costs under this Contract.
 - e. Safety Comparison – Proposed substitution shall provide equivalent or greater safety, with certification data provided where relevant.
- 4 When proposing a substitution, the Contractor represents that:
 - a. They have investigated the proposed substitution and have determined that it is equal to or better than the product specified.
 - b. They will guarantee the substitution in the same manner as the product specified.
 - c. They will coordinate and make other changes as required in the work as a result of the substitution.
 - d. They waive all claims for additional costs as a result of the substitution, with the exception of those identified above under "cost data".

- 5 The Owner will be sole judge of the acceptability of the proposed substitution.
- 6 The Owner and Consultant will have authority to approve or reject substitutions or to change the specified standards of quality. However, neither this authority to act under this provision nor any decision made in good faith, either to exercise or not to exercise this authority, shall give rise to any duty or responsibility of the Owner to the Contractor, any Subcontractor, any Sub-Subcontractor, any of their agents or employees or any other persons performing the work or offering to perform the work.

E. Changes in Scope and Extra Work

- 1 The Owner may at any time make changes in the specifications, plans and drawings, omit work, and require additional work to be performed by the Contractor.
 - a. Each such addition or deletion to the Contract shall require the Owner and the Contractor to negotiate a mutually acceptable adjustment in the contract price, and, for the Contractor to issue a change order describing the nature of the change and the amount of price adjustment.
 - b. The Contractor shall make no additions, changes, alterations, or omissions or perform extra work except on written authorization of the Owner.
 - c. Each change order shall be executed by the Contractor, Owner, and the Consultant.

F. Keys

- 1 Upon the initial acceptance of work specified by the Contract Documents on each unit, the Contractor shall deliver to the Owner, six (6) keys for each general key-operated device that is provided under these specifications in accordance with ASME A17.1, Part 8 standards as may be adopted and modified by the AHJ.
- 2 All other keying of access or operation of equipment shall be provided in accordance with ASME A17.1 Part 8 as may be adopted and modified by the AHJ.

G. Diagnostic Tools

- 1 Prior to seeking final acceptance of the project, the Contractor shall deliver to the Owner any specialized tools required to perform diagnostic evaluations, adjustments, and/or programming changes on any microprocessor-based control equipment installed by the Contractor. All such tools shall become the property of the Owner.
 - a. Owner's diagnostic tools shall be configured to perform all levels of diagnostics, systems adjustment and software program changes which are available to the Contractor.
 - b. Owner's diagnostic tools that require periodic re-calibration and/or re-initiation shall be performed by the Contractor at no additional cost to the Owner for a period equal to the term of the maintenance agreement from the date of final acceptance of the project.
 - c. The Contractor shall provide a temporary replacement, at no additional cost to the Owner, during those intervals in which the Owner might find it necessary to surrender a diagnostic tool for re-calibration, re-initiation or repair.
- 2 Contractor shall deliver to the Owner, printed instructions, access codes, passwords or other proprietary information necessary to interface with the microprocessor-control equipment.

H. Service Support Requirements / Spare Parts

1 Software / Firmware Updates

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

I. Wiring Diagrams, Operating Manuals and Maintenance Data

- 1 Deliver to the Owner, two (2) identical volumes of printed information organized into neatly bound manuals prior to seeking final acceptance of the project.
- 2 The manuals shall also be submitted in Acrobat 'PDF' file formats. Electronic manuals shall be properly indexed, bookmarked, and searchable.
- 3 Manuals, as well as electronic copies, shall contain the following:
 - a. Step-by-step adjusting, programming and troubleshooting procedures that pertain to the solid-state microprocessor-control and motor drive equipment.
 - b. Passwords or identification codes required to gain access to each software program in order to perform diagnostics or program changes.
 - c. A composite listing of the individual settings chosen for variable software parameters stored in the software programs of both the motion and dispatch controllers.
 - d. Method of control and operation.
- 4 Provide two (2) sets of "AS INSTALLED" straight-line wiring diagrams in both hard and electronic format in accordance with the following requirements:
 - a. Displaying name and symbol of each relay, switch or other electrical component utilized including identification of each wiring terminal.
 - b. Electrical circuits depicted shall include all those which are hard-wired in both the machine room and hoistway.
 - c. Supplemental wiring changes performed in the field shall be incorporated into the diagrams in order to accurately replicate the completed installation.
- 5 Furnish two (2) sets of bound instructions and recommendations for maintenance, with special reference to lubrication and lubricants along with the full Maintenance Control Program as required Part 8 of ASME A17.1.
- 6 Manuals or photographs showing controller replacement parts with part numbers listed.

J. Demonstration

- 1 Prior to seeking final acceptance of the project, the Contractor shall conduct a two (2) or four (4) hour program on-site with building personnel selected by the Owner.
- 2 The focus of the session shall include:

- a. Instructions on proper safety procedures and who to contact for the purpose of assisting passengers that may become entrapped inside an elevator car.
- b. Explain each control feature and its correct sequence of operation.

3 Control features covered shall include but, not be limited to:

- a. Emergency Fire Recall Operation - Phase I
- b. Emergency In-car Operation - Phase II
- c. Emergency Communications Equipment
- d. Emergency Hoistway Access and Rescue Features

K. Patents

- 1 Patent licenses which may be required to perform work specified by the Contract Documents shall be obtained by the Contractor at its own expense.
- 2 The Contractor agrees to defend and save harmless the Owner, Consultant and agents, servants, and employees thereof from any liability resulting from the manufacture or use of any patented invention, process or article of appliance in performing work specified in the Contract Documents.

L. Advertising

- 1 Advertising privileges shall be retained by the Owner.
- 2 It shall be the responsibility of the Contractor to keep the job site free of posters, signs, and/or decorations.
- 3 Contractor's logo shall not appear on faceplates or entrance sills without the approval of the Owner.

1.3 QUALITY ASSURANCE

A. Materials and Quality of Work

- 1 All materials are to be new and of the best quality of the kind specified.
- 2 Installation of such materials shall be accomplished in a neat manner and be of the highest quality.
 - a. Should the Contractor receive written notification from the Owner stating the presence of inferior, improper, or unsound materials or quality of installation, the Contractor shall, within twenty-four (24) hours, remove such work or materials and make good all other work or materials damaged.
 - b. Should the Owner permit said work or materials to remain, the Owner shall be allowed the difference in value or shall, at its election, have the right to have said work or materials repaired or replaced as well as the damage caused thereby, at the expense of the Contractor, at any time within one (1) year after the completion of the work; and neither payment made to the Contractor, nor any other acts of the Owner shall be construed as evidence of acceptance and waiver.

B. Electrical Design Requirements (General)

- 1 The following typical requirements shall apply to all parts of the work and are supplementary to other requirements noted under the respective headings.
 - a. The design and construction of the motors shall conform to the requirements of these specifications and to the ASME Standards for Rotating Electrical Machinery with revisions issued to the first day when the work of this Contract was advertised.
 - 1) Motors shall operate successfully under all loads and speeds and during acceleration and deceleration.
 - 2) Motors shall be designed for quiet operation without excessive heat.
 - 3) Insulation on motor coils and windings and on all insulated switch, relay, brake and other coils shall conform to the requirements of minimum Class "F" insulation, as defined in ANSI Standards for Rotating Electrical Machinery. All motors shall be impregnated twice.
 - 4) Switches, relays, etc., on controller, starter and signal panels and similar items on other parts of the equipment shall be the latest improved type for the condition of use. They shall function properly in full accordance with the requirements of the machines controlled and with the specified operating requirements of the elevator. Any of these parts showing wear or other injurious effects during the guarantee period to the extent that abnormal maintenance is required or indicated shall be replaced with proper and adequate parts by the Contractor.
 - 5) Contacts in elevator motor circuits which are intended to be opened by governors or other safety devices shall be copper to carbon or other approved non-fusing type.
 - 6) Where required, controllers and other component parts of the installation shall be labeled in accordance with the latest codes and standards as adopted and/or otherwise modified by the AHJ.
 - 7) Electrical equipment, motors, controllers, etc., installed under this contract shall have necessary CSA/US or UL/US listing as may be required by the AHJ. Equipment shall be labeled or tagged accordingly.

C. Materials, Painting and Finishes

- 1 Two (2) coats of rust inhibiting machinery enamel shall be applied to exposed ferrous metal surfaces in the pit that do not have a galvanized, anodized, baked enamel, or special architectural finishes.
- 2 Two (2) coats of rust inhibiting enamel paint to the machinery located within the machine room and secondary level (where applicable) as well as to the machine room floors.
- 3 Architectural metal surfaces of bronze or similar non-ferrous materials which are specified to be refinished, re clad and/or provided new, shall be sufficiently clear coated so as to resist tarnishing during normal usage for a period of not less than twelve (12) months after final acceptance by the Owner.

- 4 Identify all equipment including buffers, crosshead, safety plank, machine, controller, drive, , disconnect switch, etc., by 4" high numerals which shall contrast with the background to which it is applied. The identification shall be either decalcomania or stencil type.
- 5 Paint or provide decal-type floor designation not less than 6" high on hoistway doors (hoistway side), fascias and/or walls as required by Code at intervals not exceeding 7'-0". The color of paint used shall contrast with the color of the surface to which it is applied.

D. Accessibility Requirements

- 1 Locate the alarm button and emergency stop switch at 35", and floor and control buttons not more than 48" above the finished floor. The alarm button shall illuminate when pressed for visual acknowledgement to user.
- 2 Provide raised markings in the panel to the left of the car call and other control buttons. Letters and numbers shall be a minimum of 5/8" and raised 0.03" and shall be in contrasting color to the call buttons and cover plate.
- 3 The centerline of new hall push button shall be 42" above the finished floor.
- 4 The hall arrival lanterns or cab direction lantern provided shall sound once for the "up" direction and twice for the "down" direction. Design and locate fixtures per Federal standards.
- 5 Provide floor designations at each entrance on both sides of jamb at a height of 60" above the floor to the baseline of the floor designation.
- 6 Provide an audible signal within the elevator to tell passenger that the car is stopping or passing a floor served by the elevator.
- 7 Where elevators operate at a speed greater than 200 fpm, provide a verbal annunciator to announce the floor at which the elevator is stopping where required by the AHJ.
- 8 Provide signal control timing for passenger entry/exit transitions per Federal and/or Local standards.
- 9 Ensure sill-to-sill running clearances do not exceed 1-1/4" at all landings served.
- 10 Provide visual call acknowledgment signal for car emergency intercommunication device.
- 11 Provide emergency communication device with provisions for the deaf and hard of hearing.

E. Qualifications

- 1 The work shall be performed by a company specialized in the business of manufacturing, installing and servicing conveying systems of the type and character required by these specifications with a minimum of ten (10) years of experience.
- 2 Prior written acceptance is required for manufacturers other than those listed, before quoting this project. Requests for acceptance will not be considered unless they are submitted before bid date and are accompanied by the following information:
 - a. List of five (3) similar installations having exact equipment being proposed for this project arranged to show name of project, system description and date of completed installation. The list shall include the names, position and resumes of the construction team and field supervisor of the installations.
 - b. Complete literature, performance and technical data describing the proposed equipment. Include the names, position and resumes of the proposed construction team and field supervisor.
 - c. List of ten (5) service accounts by building name, building manager or owner, including phone numbers.

- d. Location of closest service office from which conveying system will be maintained.
- e. Location of closest parts inventory for this installation.
- f. List of the names, positions and resumes of the construction teams and field supervisor for the installation.

1.4 DELIVERY / STORAGE / HANDLING / COORDINATION

A. Delivery and Storage of Material and Tools

1 Delivery, Storage and Handling:

- a. Deliver materials to the site ready for use in the accepted manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name. Delivered materials shall be identical to accepted samples.
- b. Store materials under cover in a dry and clean location, off the ground.
- c. Remove delivered materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.

2 The Owner shall bear no responsibility for the materials, equipment or tools of the Contractor and shall not be liable for any loss thereof or damage thereto.

3 The Contractor shall confine storage of materials on the job site to the limits and locations designated by the Owner and shall not unnecessarily encumber the premises or overload any portion with materials to a greater extent than the structural design load of the Facility.

B. Work with Other Trades / Coordination

1 Coordinate installation of sleeves, block outs, equipment with integral anchors, and other items that are embedded in concrete or masonry for the applicable equipment. Furnish templates, sleeves, equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

2 Coordinate sequence of installation with other work to avoid delaying the Work.

3 Coordinate locations and dimensions of other work relating to the equipment scheduled for installation including pit ladders, sumps, and floor drains in pits; entrance subsills; machine beams; and electrical service, electrical outlets, lights, and switches in pits and machine rooms, secondary levels, overhead sheave rooms and hoistways as it relates to the specific equipment.

C. Removal of Rubbish and Existing Equipment

1 On a scheduled basis, the Contractor shall remove all rubbish generated in performing work specified in the Contract Documents from the job site.

2 Any component of the existing elevator plant that is not reused under the scope of work specified in the Contract Documents shall become property of the Contractor and, as such, shall be removed from the premises at the Contractor's sole expense.

3 The Contractor agrees to dispose of the aforementioned equipment and rubbish in accordance with any and all applicable Federal, State, and municipal environmental regulations, and further accepts all liability that may result from handling and/or disposing of said material.

D. Protection of Work and Property

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

1.5 RELATED WORK

A. Work by Elevator Contractor Included in the Base Bid

- 1 The following requirements shall be applicable based on prevailing conditions at the site of work and/or mandated modifications for code compliance.
 - a. Reuse and modify the existing power supplies. Install locking provisions for circuit breakers as per code. If existing disconnects are not capable of being locked in the open (OFF) position, new main line and/or auxiliary disconnect switches shall be provided.
 - b. Provide auxiliary power feeds with required distribution load center (circuit breaker panel) for intercommunication, CCTV systems, cab lighting or other specialty devices existing or to be provided by the Elevator Contractor.
 - 1) Voltage shall be 110 VAC with one 15 Amp circuit breaker or fuse for lighting of each individual elevator car enclosure.
 - 2) Circuit breakers and/or fused disconnects shall be lockable in the "OFF" position in accordance with applicable code.
 - c. Installation of new main line power feed with related disconnect switch designed and located per local law requirements. (If Required)
 - d. Installation of new fully enclosed, externally operated, fused (or circuit breaker), main line and/or auxiliary disconnect switch(es), properly located in accordance with local law that can be locked in the open (off) position. (If Required)
 - e. Provide remote/auxiliary disconnects where new (either by the Elevator Contractor or by others) or existing disconnect switches are not in line-of-sight of the controller. (If Required)
 - f. Installation of new electrical conduit and power feeders between the load side of existing and new main line disconnect switches and new elevator control equipment. (If Required)
 - g. The top surface of any setback or projection in the hoistway that measures 2" or more in width shall be beveled at an angle of not less than 75 degrees from horizontal. Each bevel plate shall be constructed from prime painted 14-gauge cold-rolled steel and installed so as to conform with ASME A17.1 elevator safety code as modified by, and/or in addition to codes and standards accepted by the AHJ.
 - h. Provide each machine room, with a self-closing, self-locking access door. Locking means shall be spring type arranged to permit the doors to be opened from the inside without a key.

- i. Installation of new permanent lighting fixtures with protective guards and 110-volt duplex GFI receptacles inside the machine room. Illumination shall be no less than 30 foot-candles at floor level. A light control switch shall be provided immediately adjacent to the machine room entrance door. Provide necessary receptacles as required to supply power to auxiliary elevator equipment and/or remotely located monitors.
- j. Provide each elevator pit with a 110-volt GFI duplex receptacle and a permanent lighting fixture equipped with protective guard. Illumination shall be no less than 10 foot-candles at pit floor level. A light control switch must be provided and so positioned as to be readily accessible from the pit entrance door or ladder.
- k. Provide the following signage, plates, and tags:
 - 1) Provide access doors to each electrical control room, secondary or machinery space with signs that read "ELEVATOR MACHINE ROOM". Letters shall be not less than 2" high.
 - 2) Provide all required manufacturer data plates and installation-specific tags and signs of the types and styles containing information as required by applicable Codes and Standards as adopted and/or modified by the AHJ.
- l. Where the pit extends more than 3' below the sill of the pit access door, provide a permanent fixed metal ladder.
 - 1) Ladder shall extend no less than 48" above the sill of the access door. Handgrips shall extend from the ladder to a point no less than 48" above the sill of the access door where the ladder does not comply.
 - 2) The rungs shall be a minimum of 16" wide. Where prevailing conditions prevent a 16" wide rung, the rung may be reduced to no less than 9".
 - 3) The rungs shall be spaced 12" on center.
 - 4) A clear distance of no less than 4-½" from the centerline of the rungs and handgrips to the nearest permanent object in back of the ladder shall be provided.
 - a) Where prevailing conditions prohibit the installation of the required ladder as specified above, the Elevator Contractor shall coordinate requirements necessary for compliance with the Authority Having Jurisdiction.
- m. Provide a standard railing conforming to Code on the outside perimeter of the car top on all sides where the perpendicular distance between the edges of the car top and the adjacent hoistway enclosure exceeds 300 mm (12".) horizontal clearance or as otherwise required by the Authority Having Jurisdiction.
- n. Provide necessary patching, repairing and installation of masonry and/or dry wall for smooth and legal elevator hoistways.
- o. Provide any required repair of smoke holes with subway grating covers in the machine rooms and/or secondary levels where applicable. All smoke ventilation provisions, including duct work, dampers, fans, fire control interfaces, in accordance with local codes, shall be reviewed for proper operation.
- p. Installation of HVAC provisions inside the machine room so as to maintain ambient temperature and humidity levels that are within the range specified by the microprocessor-control equipment manufacturers.

- q. Subsequent to the contract execution, the Contractor shall perform a Violation search and review of all open Applications in conjunction with the filing procedure. Subsequently, any and all outstanding Violations and/or open Applications shall be indicated on the Request for Permit; and such outstanding Violations shall be expunged and open Applications closed out as part of this filing procedure.
 - 1) If requirements and/or work necessary to satisfy outstanding Violation or Applications are not included in the contracted scope of work, the Elevator Contractor shall prepare an itemized listing with relative extra costs to cure the condition(s) and expunge and/or close out the Violation or Application for the Owners' and Consultants' review/approval prior to executing such work procedures.

Additional Work by Elevator Contractor Included in the Base Bid

- 2 The following requirements shall be applicable based on prevailing conditions at the site of work and/or mandated modifications for code compliance.
 - a. Installation of hoistway and machine room smoke relief provisions in accordance with local laws.
 - b. Provide a smoke detector system meeting the requirements of A17.1 and/or the Local Governing Authority.
 - c. Installation of fire emergency control interface provisions for automatic recall of the elevator(s) through operation of the fire detection system. Provisions shall be made for alternate designated fire recall landing with connection contingent on Codes recognized by the local governing authority. The interfacing contacts shall be wired to an electrical junction box located inside each elevator machine room for connection to the elevator control systems by the Elevator Contractor. Each wire shall be clearly labeled with its control function. Coordinate the type of interface required for the specific elevator control apparatus with the Elevator Contractor.
 - d. Where sprinkler fire protective systems are provided inside any elevator hoistway, machine room or associated machinery space, provisions shall be made for the disconnecting of the main line power supply from the affected elevator prior to activation. This means of disconnect shall be manually reset in accordance with code.
 - e. Installation of emergency power control interface provisions to signal the elevator control apparatus of a transfer from normal (utility) power to the building emergency (generator) power supply. Also, provide additional control interface to give advanced notification to the elevator control apparatus that the power source will transfer from emergency (generator) power to normal (utility) power. Interfacing contacts shall be wired to an electrical junction box located inside each machine room for connection to the elevator control equipment by the Elevator Contractor. Coordinate the type of interface required for the specific elevator control apparatus with the Elevator Contractor.
 - 1) On the line side of each main line disconnect switch, provide some means to absorb power that may be regenerated by the elevator hoist motor during emergency power operation.
 - 2) Normal Power/Emergency Power Control Signals consisting of two (2) dry contacts provided by others to function as follows:

- a) One (1) dry contact normally open to make when Normal Power is available. (Logic state of dry contact is to be confirmed by the Manufacturer of the Elevator Control Equipment).
- b) One (1) dry contact normally open to make when emergency power is available. (Logic state of dry contact is to be confirmed by the Manufacturer of the Elevator Control Equipment).
- f. Provide a class "ABC" fire extinguisher in electrical machinery and control spaces. Locate the extinguisher in close proximity to the access door.
- g. Provide necessary telephone wiring with connection to local telephone service for remote elevator monitoring and/or two-way voice emergency communications systems.
 - 1) Terminate the telephone wiring in junction boxes or standard phone jack terminals in the machine room.
 - 2) Coordinate the quantity and termination method of individual phone connections with the Elevator Contractor.
 - 3) Identify each phone line for connection by the Elevator Contractor to the appropriate elevator device(s).
 - 4) Telephone wiring, where required by applicable codes, shall be installed in conduit.
- h. Sumps in pits where provided, shall be covered. The cover shall be level with the pit floor so as not to produce a tripping hazard.

1.6 WARRANTY / MAINTENANCE SERVICES

A. Contract Close-Out, Guarantee and Warranties

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

B. Maintenance Coverage

- 1 The following maintenance coverage apply:
 - a. Guarantee Maintenance

- 1) Provide full comprehensive preventative maintenance services for a period of twelve (12) months after the final completion and acceptance of the project.
- 2) Guarantee maintenance and related services shall be provided in accordance with the Contractor's Form of Protective Maintenance Services submitted with the bid as further specified.
- 3) Costs related to guarantee maintenance shall be [included in the base bid quotation] [indicated on the bid form in the space provided.]
- 4) Cost shall include all/any monthly subscription and licensing fees for new two-way audio-visual communication monitoring services.

b. Long-Term Maintenance

- 1) Long-term full comprehensive maintenance and related services shall be provided in accordance with the Contractor's Form of Full Protective Maintenance Services submitted with the bidding documents as further specified
- 2) Costs related to long-term maintenance shall be included in the base bid quotation indicated on the bid form in the space provided.
- 3) Cost shall include all/any monthly subscription and licensing fees for new two-way audio-visual communication monitoring services.

1.7 ALTERNATES AND VALUE ENGINEERING:

- A. The following alternatives are elective upgrades which constitute changes to the base scope of work specified. Pricing for each alternate upgrade is requested from the bidder with costs indicated in the appropriate space in the Request for Proposal (RFP). Contractor shall take into consideration, as part of the alternative pricing, alternate work that is required either in lieu of, or in addition to, work specified in the base scope and shall not duplicate costs.
- B. Contractor's Value Engineering Options
- 1 This alternative is provided for individual contractors to propose optional equipment or otherwise offer cost saving suggestions that will provide the same desired results or further enhance the safety, durability or performance of the elevator systems.
 - 2 Each suggestion must be fully detailed on the contractor's own letterhead with the associated price change specified on the form of proposal provided.

1.8 ALTERNATES / ALLOWANCES

- A. Voluntary Alternates are allowed. They will be reviewed by Owner and Consultant for possible inclusion in the project.
- B. Include a Cab allowance of \$30,000 per elevator car for upgraded cab material as described herein.

PART 2 - PRODUCTS

2.1 GENERAL DESCRIPTION

Two (2) hydraulic elevator modernization project at Meridian Township Public Safety, and Township Administration

A. Meridian Township 5151 Marsh Road, Okemos, MI 48864 US - Hydraulic Elevator Meridian Township Public Safety

1.	Quantity	1
2.	Type	Hydraulic Elevator Passenger
3.	Capacity (lbs.)	2500
4.	Speed (fpm)	100
5.	Travel in Feet	12' 8" Elevator Contractor to confirm.
6.	Number of Landings	2
7.	Number of Openings	2
8.	Front Openings	2
9.	Rear Openings	0
10.	Operation	Simplex Selective Collective Operation
11.	Controller	Control Equipment (New)
12.	Firefighter's Service	Replace as part of Modernization
	a. Comments	ASME A17.3
13.	Machine Room, Secondary, Pit Lighting and GFI	
	a. Comments	Per requirement of local AHJ for Modernization.
14.	Machine/Pump Unit Type	Hydraulic
15.	Machine Location	Adjacent
16.	Power Unit	Replace with New
17.	Hydraulic Jack / Cylinder	Jack Unit (Reuse)
18.	Hydraulic Piping	Modify as needed
19.	Scavenger Pump	Not Applicable
20.	Rescuator	Hydraulic Auto Lowering
21.	Car Platform / Frame / Safety	Car Frame (Reuse); Car Platform (Reuse)
22.	Guide Rails	Reuse
23.	Guides	Slide Guides (Refurbish and Reuse)
24.	Buffers	Car Buffers (Reuse)
25.	Car Door Type	
	a. Front Door	Single Speed Center Opening
26.	Car Door Size	
	a. Front Door	42 (inches) wide x 84 (inches) height (Field Confirm)
27.	Hoistway Door Type	Single Speed Center Opening
28.	Hoistway Door Size	42 (inches) wide x 84 (inches) height (Field Confirm)

29.	Master Door Operator	Master Door Power Operator System - VVVF/AC (New)
30.	Hoistway Entrance Sills	Reuse
31.	Hoistway Entrances	Reuse
32.	Tracks / Hangers / Interlocks / Closers	Interlocks / Unlocking Devices (New); Tracks / Hangers / Closers / Related Equipment (New)
33.	Emergency Exits / Top	Reuse. Modify as needed to meet code.
	a. Comments	Top
34.	Pit Ladder	Modify as needed to me code
35.	Power Supply	208V-3-60
36.	Electrical Conduit / Wiring / Traveling Cable	New
37.	Floor Lockout Feature	Not Applicable
38.	Number of Push Button Risers	1
39.	Car Operating Fixtures	New
40.	Emergency Communication	New
41.	Door Reopening Device	Door Reopening Device / "3D" (New)
42.	Emergency Cab Lighting	Reuse
43.	Car Ventilation	New
44.	Cab Allowance	\$ 30,000 allowance/As further specified.
45.	Car Doors	Car Door Panel(s) (New)
46.	Car Flooring	Reuse
47.	Car Sill	Reuse
48.	Platform Size	Existing
49.	Door Operation	Power Car / Slide Hoistway
B. Meridian Township 5151 Marsh Road, Okemos, MI 48864 US - Hydraulic Elevator Meridian Township Administration-Meridian Township Administration		
1.	Quantity	1
2.	Type	Hydraulic Elevator Passenger
3.	Capacity (lbs)	2500
4.	Speed (fpm)	100
5.	Travel in Feet	12' 8" Elevator Contractor to confirm
6.	Number of Landings	2
7.	Number of Openings	2
8.	Front Openings	2
9.	Rear Openings	0
10.	Operation	Simplex Selective Collective Operation
11.	Controller	Control Equipment (New)
12.	Firefighter's Service	General
	a. Comments	ASME A17.3
13.	Machine Room, Secondary, Pit	
	Lighting and GFI	
	a. Comments	Per requirement of local AHJ for Modernization.

14.	Machine/Pump unit Type	Hydraulic
15.	Machine Location	Adjacent
16.	Power Unit	Replace with New
17.	Hydraulic Jack / Cylinder	Jack Unit (Replace if Single Bottom Jack
18.	Hydraulic Piping	Replace as needed)
19.	Scavenger Pump	Not Applicable
20.	Rescuvator	Hydraulic Auto Lowering
21.	Car Platform / Frame / Safety	Car Frame (Reuse); Car Platform (Reuse)
22.	Guide Rails	Reuse
23.	Guides	Slide Guides (Reuse)
24.	Buffers	Car Buffers (Replace with jack replacement)
25.	Car Door Type	
	a. Front Door	SSSO- Single Speed Side Opening
26.	Car Door Size	
	a. Front Door	42 (inches) wide x 84 (inches) height (Field Confirm)
27.	Hoistway Door Type	[Hoistway Door Configuration Other]
28.	Hoistway Door Size	42 (inches) wide x 84 (inches) depth (Field Confirm)
29.	Master Door Operator	Master Door Power Operator System - VVVF/AC (New)
30.	Hoistway Entrance Sills	N
31.	Sill Finish	Reuse
32.	Hoistway Entrances	Reuse
33.	Tracks / Hangers / Interlocks / Closers	Interlocks / Unlocking Devices (New); Tracks / Hangers / Closers / Related Equipment (New)
34.	Emergency Exits / Top and Side	Reuse. Modify as needed to meet code.
	a. Comments	Top
35.	Keyed Access	New
36.	Pit Ladder	Reuse
37.	Power Supply	208V-3-60
38.	Electrical Conduit / Wiring / Traveling Cable (New)	New
39.	Floor Lockout Feature	Not Applicable
40.	Number of Push Button Risers	1
41.	Car Operating Fixtures	New
42.	Emergency Communication	New
43.	Door Reopening Device	Door Reopening Device / "3D" (New)
44.	Emergency Cab Lighting	New
45.	Car Ventilation	New
46.	Elevator Cab Enclosure	Retain
47.	Cab Allowance	\$30,000 allowance/As further specified.
48.	Car Doors / Gate Panels	Car Door Panel(s) (New)
49.	Car Flooring	Reuse
50.	Car Sill	Reuse

- | | | |
|-----|----------------|----------------------------|
| 51. | Platform Size | Existing |
| 52. | Door Operation | Power Car / Slide Hoistway |

2.2 MANUFACTURERS

A. Pre-Approved Equipment Manufacturers

- 1 The following manufacturer's equipment and materials have been pre-approved for use on this project. Other equipment not specifically mentioned shall be considered for approval on an individual basis.
 - a. Controller - GAL (GALaxy), Motion Control Engineering, Elevator Controls Corporation, Elevator Systems, Inc., Smartrise (up to and including 500 fpm high rise / multi-car group).
 - b. Tracks, Hangers, Interlocks and Door Operators - G.A.L., ECI.
 - c. Fixtures - G.A.L., Adams, EPCO, Monitor, E-Motive USA, C.E. Electronics, Innovation, PTL, MAD, National.
 - d. Door Protective Device - Janus, Adams, G.A.L., T.L. Jones, Tri-Tronics.
 - e. Cabs and Entrances/Entrance Door Panels - Accurate Elevator Door Corp, A&D Entrances, CEC Elevator Cab, EDI/ECI, Elite Elevator Cab, H&B Elevators, National Cab & Door, Tyler, Velis, Gunderlin, Peelle, Premier, Prestige, Regency, Columbia Elevator Products, United Cabs.
 - f. Electrical Traveling Cables - Draka, James Monroe.
 - g. Hydraulic Systems/Components - Canton, ECS Corporation, Elevator Equipment Corporation, Mongrain Vertical Transport (MVT), MEI, Schumacher.
 - h. Guide Shoes/Rollers – ELSCO, G.A.L.
 - i. Intercommunications/Telephones - Webb Electronics, K-Tec, Ring, Wurtec, Janus, approved equal.

- 2 Original Equipment Manufacturers may substitute their own branded equipment subject to the following:
 - a. All requirements of the specifications are met regarding performance, appearance, serviceability and support.
 - b. A full stock of all regular and critical replacement parts required for this project are maintained at a facility within fifty (50) miles of the project site.
 - 1) Any parts not stocked at the above referenced facility shall be identified with the location of the nearest source and shall be available for next-day delivery upon demand.
 - c. All parts and software shall be made available for purchase to a qualified elevator maintenance firm with one (1) business day delivery without direct Owner involvement.
 - 1) Provide details of parts supply facility and a list of current parts pricing for all major components required for the installation.

- d. All specialized tools, equipment, software, and passwords, required to maintain, repair, adjust the operation, and perform code mandated inspections are provided to the Owner as part of the base installation.
 - 1) Updates to these items shall be available via the parts supply facility referenced above.
- e. Technical support of the product(s) shall be available to the Owner's elevator service provider.

2.3 CONTROL FEATURES / OPERATION

A. Motion Control

- 1 Smooth stepless acceleration and deceleration of the elevator car shall be provided in either direction of travel during both single and multiple floor runs.
- 2 Use digital logic to calculate optimum acceleration and deceleration patterns during each run.
- 3 Acceleration, deceleration, jerk, maximum velocity, leveling accuracy and elapsed flight time, for a typical elevator one floor run, shall not exceed values as further specified.

B. Simplex Selective Collective Operation

- 1 Provide simplex selective collective operation from a riser of hall push button stations.
- 2 The registration of one or more car calls shall dispatch the car to the selected floors.
 - a. The car shall also respond to registered hall calls in the same direction of travel.
 - b. Car and hall calls shall be canceled when answered.
- 3 Stops in response to calls that are registered in either the car or hall push button stations shall occur in the natural order of progression in which the floors are encountered, depending on the direction of car travel, and irrespective of the order in which calls are registered.
- 4 When the car has responded to the highest or lowest call, and calls are registered for the opposite direction, the car shall reverse direction automatically and respond to those registered calls.
- 5 When the car arrives at its last stop and reverses direction of travel, all previously registered car calls shall be automatically cancelled.
- 6 When the car arrives at a landing where both up and down hall calls are registered, it will answer the call in the direction of travel.
 - a. After a pre-determined delay, if no car call is registered, the car shall respond to calls registered for the opposite direction. Car doors shall close immediately, re-open and respond to the call for the opposite direction.
 - b. Hall lantern operation shall always correspond to direction of service.
- 7 When an empty car reverses direction at a landing with no hall calls, the doors shall not open and the hall lantern shall not operate.

- 8 If the car has no car calls registered and arrives at a floor where both up and down hall calls have been registered, the car shall respond to the hall call corresponding to the last direction of car travel. If, after making its stop, a car call is not registered and no other hall calls exist ahead of the car corresponding to its original direction of travel, the doors shall close and immediately reopen in response to the hall call for the opposite direction.
- 9 The car shall maintain its original direction at each stop until the doors are fully closed to permit a passenger to register a car call before the car reverses its direction of travel.

C. Inspection Service Operation

- 1 Provide a key operated switch in the main car operating panel [that, when turned to the 'ON' position, shall cause the elevator to be removed from service and placed in Inspection Service Operation.
- 2 Limited operation of the car shall be provided through pressing the Attendant Service up and down push buttons (if provided) or the highest or lowest car call push buttons (if up and down buttons are not provided) in the main car operating panel only.
- 3 The car shall move at a speed not to exceed 150 feet per minute (0.75 meters per second) as per code with both the hall and car door panels in the closed and locked position.
- 4 The Inspection Service switch shall be keyed differently than other typical keys used in the operation of the elevator. Keying shall be in accordance with Security Group Classifications as required by applicable code.
- 5 The top of the elevator car shall be equipped with a control for limited operation of the car during repairs, maintenance and inspection conducted in the hoistway. The transfer of control to the top of car operating device shall cause that device to be the sole means of control for the elevator.
 - a. Visual and audible indication shall be provided on the top of the car when Firefighters' Emergency Operation is initiated.
- 6 Power door operating equipment shall be rendered inoperative while the car is being operated in the Inspection Service mode with the exception of power closing of the door. The control system shall maintain closing power on the door while the elevator is moving under Inspection Service Operation.
- 7 The in-car Inspection Service switch shall be rendered ineffective when the top of car inspection control is activated.
- 8 Machine Room Inspection Operation and Inspection Operation with open door circuits shall be provided in accordance with A17.1 Safety Code, as modified and adopted, where required or allowed by the AHJ.

D. Hoistway Access Operation

- 1 Provisions shall be made to allow access to the hoistway through the use of hoistway access switches.
- 2 Operating the access switch shall permit the car to move at a speed not to exceed 150 feet per minute (0.75 meters per second) as per code with the hall and car doors in the open position to obtain access to the top of the car or climb-in pit.
- 3 The car shall automatically stop motion when the car top is level with the hoistway door sill for access to top of car.

- 4 The access key switch(es) shall be keyed differently than other typical keys used in the operation of the elevator. Keying shall be in accordance with Security Group Classifications as required by applicable code.
- 5 Access operation shall be disabled when top of car inspection operation is in effect.

E. Firefighters' Emergency Operation

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

F. Hydraulic Auto Lowering

- 1 Provide automatic battery powered lowering feature for the hydraulic elevator.
 - a. In the case of normal power outage, the elevator shall be automatically lowered to the Main Lobby level.
 - b. The door shall open automatically to discharge passengers.
 - c. The elevator shall remain parked with its door closed and door open button operative until normal power is restored.
- 2 The control panel shall be located in the machine room or be an integral part of the control system.
 - a. It shall include necessary batteries, solid-state controls, charger, monitor lights and a test button.
 - b. It shall be fed by a 120-volt, 20 Ampere branch circuit from the emergency power source, provided by Others under another section of these specifications.
- 3 Provide necessary circuitry within the controller to determine the difference between an "intentional" loss of power and an "actual" loss of power in order to prevent operation of the auto lowering unit when the main line disconnect has been opened for elevator servicing.
- 4 Provide necessary terminals for connection to an auxiliary switch in main line disconnect provided by others.

G. Door Operation

- 1 Car and hoistway doors shall be arranged to operate in unison without excessive noise or slamming in either direction of travel.
 - a. Door opening speeds of 2 feet per second shall be provided in conjunction with closing speeds of 1.0 foot per second in accordance with governing code.
- 2 Where the hoistway door and the car door are mechanically coupled, the kinetic energy of the closing door system shall be based upon the sum of the hoistway and the car door weights, as

- well as all parts rigidly connected thereto, including the rotational inertia effects of the door operator and the connecting transmission to the door panels.
- 3 The force necessary to prevent closing of the car and hoistway door from rest shall not exceed 30 lbf. This force shall be measured on the leading edge of the door with the door at any point between one-third and two-thirds of its travel.
 - 4 Door open and door close time shall be measured between the moment car door operation in either direction begins and the instant at which that cycle is completed.
 - 5 When responding to either a car or corridor call, the amount of time that the elevator door remains stationary in the open position shall be adjustable up to sixty (60) seconds.
 - a. Door open dwell time for a corridor call shall be separate of that for a car call, and in both cases, dwell time shall be canceled whenever the car door protection device is momentarily interrupted by passenger transfers, followed by a reduced door open dwell time of approximately one (1) second (adjustable) after the door protection device is cleared of obstructions.
 - 6 The operation of the door protective device by interruption of one or more infrared light beams (dual or multi-beam non-contact) during the close cycle shall cause the immediate reversing of the doors to the full open position.
 - 7 The door closing cycle shall be arranged so that, in the event the door protective devices become continually obstructed after the normal door open dwell time has expired, and following a time interval of approximately thirty (30) seconds (adjustable), a warning tone shall sound and the door closing cycle shall commence at reduced speed and torque per applicable Code requirements.
 - 8 Each car operating station shall be provided with a “door open” and “door close” push button.
 - a. Pressure on the “door open” button shall cause doors in the full open position to remain so and doors engaged in the close cycle to reverse direction and assume the full open position so long as pressure remains applied to the button.
 - b. The “door open” buttons shall also control the open cycle during Phase II - Emergency In-car Operation.
 - c. The “door close” push button shall function on Independent Service, Attendant Service and Phase II - Emergency In-car Operation as well as during normal automatic operations.
 - 9 Each car operating station shall be provided with a “door hold” push button.
 - a. Pressure on the “door hold” button shall cause doors in the full open position to remain in the open position and doors operating in the close cycle to reverse direction and travel to the full open position for an extended (adjustable) period of time to allow for loading and unloading.
 - b. The “door hold” feature shall be overridden when the elevator is on Fire Emergency Phase I and Phase II.
 - c. The “door hold” feature shall be canceled when the “door close” button is pressed.]
 - 10 Repeated attempts by the power door operator to open or close the door at any landing shall be monitored by the control system.

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

2.4 MACHINE ROOM

A. Control Equipment

- 1 Provide a microprocessor-based elevator control system.
- 2 Digital logic shall calculate optimum acceleration, deceleration and velocity patterns for the car to follow during each run.
- 3 Closed-loop distance and velocity feedback shall monitor the actual performance of the elevator car with the desired speed profile.
- 4 System operating software shall be stored in non-volatile memory.
 - a. Elevator control relays, contactors, switches, capacitors, resistors, fuses, circuit breakers, overload relays, power supplies, circuit boards, static motor drive units, wiring terminal blocks and related components shall be totally enclosed inside a free-standing metal cabinet with hinged access doors.
 - b. The motor drive may be located in its own cabinet where the physical size of the drive prohibits installation within the elevator signal controller cabinet.
 - c. All electrical wiring inside the control equipment cabinet shall be performed in a neat manner with field wiring terminated at stud blocks provided inside the control cabinet.
 - d. Each wiring terminal shall be clearly identified according to the nomenclature used on the "as built" wiring diagrams. No more than two (2) field wires may be connected to any single terminal stud.
 - e. Spare wires shall be tagged according to their point of termination, bundled, and placed at the bottom of the control equipment cabinet.
 - f. Each electrical component within the cabinet shall be permanently identified with symbols, identical to those used on the "as-built" wiring diagrams.
 - g. A data plate that indicates the edition of the Code in effect at the time of installation and/or alteration shall be provided in accordance with applicable code and requirements of ASME A17.1 Code. The data plate shall be in plain view and securely attached on the mainline disconnect or on the controller.
 - h. Control equipment shall comply with requirements of all applicable Sections of the ASME A17.1 Code as approved and adopted by the AHJ.
 - i. The manufacturer's standard on-board "LCD" display shall be incorporated on the main processor board and/or otherwise incorporated in the controller cabinet. The "LCD" shall be capable of providing alpha-numeric characters to view the operational status of the elevator and/or group functions depending on the application. The display shall provide

the user with necessary information for troubleshooting and reprogramming of the basic system parameters.

- 1) Where the “LCD” is not an integral part of the controller and troubleshooting/reprogramming requires the use of a separate tool, the tool shall be maintained in the machine room and accessible to service personnel. This tool, along with all technical documentation for the correct use of the tool, shall remain the property of the Owner.
- 2) Password protection of critical programming features is required to prevent accidental changes to life-safety and other non-typical control settings.
- 3) Where a separate dispatch or group control panel is provided, a separate “LCD” display shall be provided to view group functions.

B. Equipment Isolation

- 1 Provide sound reducing vibration isolation elements at all support points of elevator controller, solid-state motor drives, isolation transformers, reactance units, hoisting motors and machines.
- 2 The elements for controllers, solid-state motor drives and isolation transformers shall be similar to double deflection neoprene-in-shear mounts, as manufactured by Mason Industries, Type ND, with 0.35” static deflection under design load ratings.
- 3 Elements between the pump unitbase and floor shall be isolated as needed to eliminate noise and vibration in line with manufacturers recommendations..
- 4 All bolts through isolation elements, where necessary, are to incorporate resilient washers and bushings.

C. Hydraulic Power Unit / Motor

- 1 Provide a self-contained power unit which includes:
 - a. Structural steel outer base.
 - b. Tank support.
 - c. Oil tight drip pan.
 - d. Floating inner base to prevent metallic contact for mounting the motor pump assembly.
 - e. Sound isolation panels to enclose the unit and reduce airborne noise.
- 2 Provide a reinforced overhead oil reservoir with a tight-fitting tank over the oil control unit which includes:
 - a. An oil fill strainer with air filter.
 - b. An oil level gauge assembly.
 - c. A self-cleaning strainer in the suction line.
- 3 The pump shall be for oil hydraulic elevator service with positive displacement screw type design for steady discharge with minimum vibration.
- 4 The drive shall be by multiple V-Belts and sheaves or directly driven by a submersible pump depending on the HP requirements of the system.
 - a. The use of submersible pumps having more than a 40 HP motor is unacceptable.

- 5 Pump drive motor control shall utilize solid state motor starter circuitry to provide reduced current starting and maximum protection of the motor.
- 6 The oil control unit shall be of the manufacturer's own design but shall include relief, safety check, start and slow down valves.
 - a. Use lowering and leveling valves for drop away speed, lowering speed, leveling speed and stopping speed to ensure smooth down starts and stops.
 - b. Provide a valve for manual lowering of the elevator car in event of power failure and for use in servicing and adjusting the elevator mechanism.
 - c. Design the tank shut-off valve for isolating oil in the power unit tank to ensure servicing and adjusting the elevator mechanism without removing oil from the tank.
 - d. All valves shall be accessible for adjustment without removing the assembly from the oil line.
- 7 Manufacture the unit to operate under 600 psi (for dry units) / 700 psi (for submersible units) working pressure.
- 8 Provide a thermostatically controlled heater in the oil tank to maintain proper operating oil temperature.
- 9 When the oil reservoir thermostat registers 50 degrees F, the car shall "exercise" until the oil temperature reaches 75 degrees F.

D. Hydraulic Piping

- 1 Provide all necessary pipes and fittings to connect the power unit to the jack.
 - a. Use minimum Schedule 80 steel pipe.
 - b. Provide a shut off valve in the machine room for maintenance service.
- 2 For remote machine rooms, run the hydraulic pipe in a trench provided by others.
 - a. The pipe shall be welded and wrapped with a protective tape coat.
 - b. Enclose the pipe in a schedule 40 PVC sleeve which shall run from the machine room to the hoistway.
- 3 The oil pipe and conduit shall be overhead above suspended ceiling.
 - a. Exact location must be coordinated with other trades.
 - b. For pipe hangers use spring hangers Type 30 of Mason Industries, Inc. or approved equal.
 - c. Provide neoprene isolation pads between the pipe and the hangers.
- 4 Adequately support the full run of pipe with isolation type support.

E. Hydraulic Mainline Oil Strainer

- 1 Provide a mainline hydraulic oil strainer of the self-cleaning, compact type, equipped with a 40 mesh element and installed in the oil line.
- 2 Design the strainer for maximum system working pressure.

2.5 HOISTWAY EQUIPMENT

A. Guide Rails / Inserts / Brackets (Reuse)

- 1 Car guide rails, fishplates, rail brackets, backing support and related attachments shall be inspected to determine if unfavorable conditions exist that diminish the structural integrity of any component.
 - a. In the event substandard conditions are disclosed by means of this inspection, the Contractor shall immediately inform the Consultant as to the exact nature of said problems and then undertake whatever repairs and/or replacements the Consultant may deem appropriate to remedy the situation.
- 2 Each stack of guide rails shall be individually examined to determine if excessive compression has occurred from building settlement.
 - a. In the event such conditions are found to exist, each affected stack shall be cut off enough to relieve pressure.
- 3 Each stack of guide rails shall be realigned so that total deviation from plumb in any direction does not exceed 1/8" over the entire length of the hoistway and that DBG measurements never vary more than 0.030".
- 4 As required, car guide rails joints shall be individually filled, filed and sanded in order to eliminate minor variations in adjoining machined surfaces.

B. Slide Guides (Refurbish)

- 1 Existing sliding type guide shoes shall be rebuilt and securely bolted to the carat top and bottom.
- 2 Provide new guide insert and insert retention hardware at all guide assemblies.
- 3 Contractor may provide new guide shoe assemblies, in lieu of rebuilding the existing, as part of the base bid work. Costs associated with new guides shall be included in the base bid cost.

C. Electrical Conduit / Wiring / Traveling Cable

- 1 Electrical wiring shall be provided.
 - a. All wiring shall be stranded copper conductors, manufactured in compliance with ANSI/ASTM B174-71 and UL 62 requirements, and polyvinyl chloride insulation complying with ETT requirements of UL 62 and Article 400 of the National Electric Code.
 - b. Electrical wiring provided for hoistway interlock shall be of a flame-retardant type, capable of withstanding temperatures of at least 392 degrees Fahrenheit. Conductors shall be Type SF or equivalent.
 - c. Each run of electrical conduit or duct shall contain no less than 10% spare wires and, in any case, no fewer than two (2) spare wires.
 - d. Crimp-on type wire terminals shall be used where possible.
- 2 Traveling cable shall be provided.

- a. Each traveling cable shall be provided with a flame- and water-resistant polyvinyl chloride jacket.
 - b. Electrical wiring shall consist of stranded copper conductors, manufactured in compliance with ANSI/ASTM B174-71 and UL 62 requirements, and polyvinyl chloride insulation complying with ETT requirements of UL 62 and Article 400 of the National Electric Code.
 - c. Each traveling cable shall contain no less than 10% spare wires.
 - d. Traveling cable exceeding 100' in length shall be provided with a steel wire rope support strand from which the cable shall be suspended.
 - e. Traveling cable must be contained within an approved electrical conduit to within 6' of the final suspension point in the hoistway.
 - f. Each traveling cable shall be arranged to provide no fewer than six (6) individually shielded pairs of 20-gauge wire and arranged to contain no less than one (1) coaxial cable for CCTV remote monitoring.
 - g. Traveling cable conductors that terminate at a hoistway center box shall be connected to stud blocks provided for that purpose.
 - 1) Each wiring terminal shall be clearly identified by its nomenclature as shown on the "as built" wiring diagrams and solderless, crimp-on type wire terminals shall be used where possible.
 - h. The attachment of a traveling cable to the underside of the elevator car shall be performed so that a minimum loop diameter of thirty times (30x) the cable diameter is provided.
 - i. Pre-hang the cables for at least twenty-four (24) hours with ends suitably weighted to eliminate twisting during operation.
- 3 Rigidly supported EMT conduit, flexible metal conduit and galvanized steel trough shall be utilized throughout the hoistway.
- a. Both EMT and flexible conduit shall be connected on either end by use of compression fittings and secured in place with metal clamps sized in accordance with the diameter of conduit utilized.
 - 1) Wire or plastic wire ty-raps shall not constitute an acceptable means of fastening.
 - b. The use of flexible metal conduit shall be limited to runs not greater than 3' in length.
 - c. All abandoned or unused electrical conduit shall be removed from the hoistway.
 - d. Existing conduit and wiring duct may be reused if suitable for the application.
 - 1) Reuse of existing conduit/duct shall be at the discretion of the Consultant.

D. Normal and Final Terminal Stopping Devices

- 1 Provide normal terminal stopping devices to stop the car automatically from any speed obtained under normal operation within the top and bottom overtravel, independent of the operating devices, final terminal stopping device and the buffers.
- 2 Provide final terminal stopping devices to stop the car automatically from the speed specified within the top clearance and bottom overtravel.

- 3 The terminal stopping devices shall have rollers with rubber or other approved composition tread to provide silent operation when actuated by the cam fixed to the top of the car.
 - a. Terminal stopping devices that are not mechanically operated (i.e.: magnetic proximity) shall be provided by the manufacturer of the control equipment, intended for use as a terminal limit, and designed for reliable operation in the hoistway environment.
- 4 Final terminal limits shall be pinned so as to prevent movement after final adjustment where required by the AHJ.

2.6 PIT EQUIPMENT

- A. Car Buffer (Refurbish and Reuse for Elevator with Jack being reused. Replace with new on car with Hydraulic Jack being replaced).
 - 1 Existing car buffers shall be refurbished and reused. Replaced on car with hydraulic jack replacement.
 - a. Pit channels, related supports and fastenings shall be inspected for damage and to determine if the structural integrity of any component is diminished by the effects of rust or other unfavorable conditions.
 - 1) In the event defects are found, the Contractor shall make required corrections.
 - b. Surface rust shall be removed from all reused components.
 - c. Provide a permanent buffer marking plate which indicates the manufacturer's name, identification number, rated impact speed and stroke.
 - d. The buffer shall undergo testing in accordance with ASME A17.1 Code as modified by, and/or in addition to codes and standards accepted by the AHJ.
- B. Jack Unit (Reuse for Meridian Public Safety Elevator) (Replace for Meridian Administration Building if determined to be a single bottom jack).
 - 1 The existing jack shall be reused.
 - 2 The jack shall undergo the following work:
 - a. Check plunger for smooth surface and eliminate burrs where necessary.
 - b. Verify plunger sections are securely attached with minimum seam.
 - c. Check stop-ring for proper fit.
 - d. Renew internal babbitt-lined, guide bearing, packing or seals where necessary.
 - e. Clean drip ring around cylinder top to provide adequate drainage.
 - f. Check mounting hardware and welds where applicable.
 - g. Check secure attachment of head.
 - h. Remove rust and apply rust inhibiting paint.
 - 3 Perform static load test of the jack unit to determine if there are any failures of the cylinder wall.

C. Pit Stop Switch

- 1 Where pit depth does not exceed 67", each elevator pit shall be provided with a push/pull or toggle switch that is conspicuously designated "EMERGENCY STOP" and located so as to be readily accessible from the hoistway entrance on the lowest landing served at a height of approximately 18" above the floor.
 - a. This switch shall be arranged to prevent the application of power to the hoist motor and machine brake when placed in the "OFF" position.

2.7 HOISTWAY ENTRANCES

A. Hoistway Entrances (Reuse)

- 1 Hoistway entrance sills, sill supports, entrance frames, headers and header supports shall be reused and refurbished.
 - a. Hoistway entrances that have become distorted or bent shall be straightened, plumbed, reset to the proper width dimension and reinforced as necessary.
 - b. Provide 14-gauge steel fascia plates that extend at least the full width of the door and be secured at hanger support and sill with oval head machine screws.
 - 1) Reinforce fascia to allow not more than ½" of deflection.
 - 2) Provide fascia plates where the clearance between the edge of the loading side of the platform and the inside face of the hoistway enclosure exceeds the code allowed clearance.
 - c. Provide 14-gauge steel toe guards that extend 12" below any sill not protected by fascia.
 - 1) The toe guards shall extend the full width of the door and shall return to the hoistway wall at a 15-degree angle and be firmly fastened.
 - d. Remove oil, dirt and impurities on new and existing apparatus and give a factory coat of rust inhibitive paint to all exposed surfaces of struts, hanger supports, covers, fascia, toe guards, dust covers and other ferrous metal.

B. Slide Type Hoistway Entrance Door Panels (Reuse)

- 1 Hoistway entrance door panels shall be reused and refurbished.
 - a. Provide each door panel with two (2) removable laminated plastic composition guides, arranged to run in existing sill grooves with a minimum clearance.
 - 1) The guide mounting shall permit their replacement without removing the door from the hangers.
 - 2) A steel wear indicator shall be enclosed in each guide.

- b. Provide the meeting edge of center opening doors with necessary new continuous rubber astragal bumper strips.
 - 1) Astragal shall be relatively inconspicuous when the doors are closed.
 - 2) Provide rubber bumpers at the top and bottom of each section of door to stop them at their limit of travel in the opening direction.
 - 2 In multi-speed door arrangements, provisions shall be made to interlock the individual panels so all panels close should the normal door panel relating means fail.
 - 3 Provide a special key so that an authorized person can open any landing door when the car is elsewhere.
 - a. The keyhole shall be not less than 3/8" in diameter and shall be fitted with a stainless steel or bronze ferrule to match related equipment.
 - b. Where applicable, plug the abandoned hoistway door access hole in each door panel, secured from the hoistway side of the door, finished to match existing or as otherwise directed by the Owner/Architect.
 - 4 Where conditions warrant, or where otherwise required by code, equip all hoistway landing doors with one-piece full height non-vision wings of material and finish to match hall side of door panels.
- C. Tracks / Hangers / Closers / Related Equipment
- 1 Formed or extruded steel landing door hanger tracks shall be provided.
 - 2 Each landing door panel shall be suspended from a pair of door hanger assemblies that are compatible with the hanger tracks.
 - a. Hanger assemblies shall be directly mounted to the door panel using 3/8" diameter or better hardware.
 - b. Solid steel blocks shall be used where job-site conditions dictate the use of spacers between hanger assemblies and the landing door panel.
 - c. Hanger assemblies shall be adjusted or shimmed so that door panels are suspended in a plumb manner with no more than 3/8" vertical clearance to the cab entrance threshold.
 - d. Upthrust rollers shall be adjusted for minimal operating clearance against the bottom edge of the hanger track.
 - e. Means shall be provided to prevent hangers from jumping the track.
 - f. Blocks shall be provided to prevent rollers from overrunning the end of the track.
 - 3 Each set of center opening landing doors (Public Safety Building) shall be provided with a cable driven relating mechanism which is compatible for use with the door hanger assemblies.
 - a. The relating mechanism shall be properly tensioned and adjusted to equalize the relationship between the door panels and the hoistway entrance.
 - 4 Each set of single speed side slide landing doors (Administration Building) shall be provided with a sill-mounted spring closing mechanism.

- a. Spirator-type spring closers shall be acceptable should prevailing sill depth or runby clearance conditions require their use.
- 5 Where applicable, each hoistway door interlock assembly shall be provided with an emergency release mechanism utilizing manufacturers' standard type access key at all landings served.
- a. Drill each hoistway door to accommodate manufacturers standard lock release key and install escutcheon.
 - 1) Escutcheon shall be brushed stainless steel to match door panels where required.
 - 2) Aluminum shall be provided at all other typical floors.
- 6 Where multi-speed side slide door panels exist, provide a secondary interlocking device that will prevent separation of the panels should the sill closer or relating cable(s) fail.
- D. Interlocks / Unlocking Devices
- 1 Each set of landing doors shall be provided with a complete electromechanical interlock assembly.
- a. Each interlock assembly shall consist of:
 - 1) A switch housing with contacts.
 - 2) Lock keeper.
 - 3) Clutch engagement/release subassembly.
 - 4) Associated linkages.
 - b. Arrange the lock so that individual leading door panels (side slide or center opening) are locked when in the closed position.
- 2 Non-typical mounting arrangements for interlocks and/or related mechanisms must receive prior approval from the Consultant.
- 3 Each hoistway door interlock assembly shall be provided with an emergency release mechanism utilizing a drop-leaf type access key at all landings served.
- a. Each hoistway door shall accommodate manufacturers standard lock release key with escutcheon.
 - 1) The keyhole shall be fitted with a metal ferrule that matches the door finish.
- E. Hoistway Door Bottom Guides / Safety Retainers
- 1 The bottom of each side sliding type hoistway door panel shall be equipped with a minimum of two (2) guiding members.
- a. Metal mounting angles shall be secured to the integral panel frame structure; and when conditions warrant, additional external metal support plates or angles shall be installed to ensure the integrity of the panel frame is not compromised.

- b. Guides shall be manufactured of low friction non-metal material with sufficient strength to withstand forces placed on door panels per ASME A17.1 Standards.
 - c. Each guide assembly shall incorporate a steel wear indicator and be so designed to permit sliding member replacements without removal of door panel(s) from top hanger devices.
 - d. Panels shall be hung with a maximum vertical clearance of 3/8" between top of sill and bottom of panel and the guide shall engage the sill groove by not less than 1/4".
- 2 The bottom of each side sliding type hoistway door panel shall be equipped with a guiding member safety retainer to prevent displacement in the event of primary guide means failure.
- a. A metal reinforcement (12-gauge stainless or galvanized steel) shall be installed between the two (2) primary guiding members (a.k.a. "Z" bracket).
 - b. The reinforcement shall be designed with a minimum length of 8" or the maximum possible length that will fit between the primary members and a minimum overall height of 2-1/2" secured on the internal face of the door panel. (Hoistway side)
 - c. The retainer shall be set with the supplemental safety angle 3/8" into the corresponding sill groove; and be capable of preventing displacement of the panel no more than 3/4" with an applied force of 1125 lbs at right angles over an area 12" x 12" at the approximate center of the door panel.

2.8 CAR EQUIPMENT / FRAME

A. Car Frame (Reuse)

- 1 The existing car frame assembly shall be refurbished to as new condition and reused.
- 2 Individual car frame members, platform isolation framework, door operator support structure, related bracing and hardware shall be inspected for any indication of damage or distortion.
 - a. Where damage is detected, the Contractor shall immediately inform the Consultant and then undertake corrective action deemed appropriate by the Consultant to remedy the condition.
- 3 Provide new elastomer isolation pads for all existing platforms where pads are presently installed.
- 4 The car frame, door operator support and related bracing shall be modified or reconfigured as necessary in order to accommodate new cab enclosure and/or master door operating equipment specified herein.
- 5 The elevator car shall undergo static balancing upon substantial completion of all work described in the project specifications and subsequent to any car interior refinishing or cab replacement work performed in conjunction with the project.

B. Car Platform (Reuse)

- 1 The existing platform shall be modified to accommodate the new apparatus specified herein.
 - a. Where necessary, the underside of platform shall be refurbished and treated with fire-rated material.

- b. Top of platform shall be refurbished with a marine grade plywood set to receive new finished floor covering as selected by Owner.
- c. Where necessary, provide a new safety access hole ring and cover assembly to match selected cab finishes.
- d. At Contractor's option or when conditions warrant, provide a totally new platform in lieu of repairs, modifications and upgrades specified above.

C. Automatic Leveling / Releveling / Positioning Device

- 1 Equip the elevator with a floor leveling device which shall automatically bring the car to a stop within 1/4" of any floor for which a stop has been initiated regardless of load or direction of travel.
- 2 This device shall also provide for releveling which shall be arranged to automatically return the elevator to the floor in the event the elevator should move below or above floor level in excess of 1/4".
- 3 This device shall be operative at all floors served and whether the hoistway or car door is open or closed provided there is no interruption of power to the elevator.
- 4 A positioning device shall be part of the controller microprocessor systems.
 - a. Position determination in the hoistway may be through fixed tape in the hoistway or by sensors fitted on each driving machine to encode and store car movement.
 - b. Design the mechanical features and electrical circuits to permit accurate control and rapid acceleration and retardation without discomfort.
- 5 Where there are consecutive floors/stops that are short stops, the system shall be capable of distinguishing between the two landing zones without error.
- 6 All equipment and logic required for leveling system to properly function with short stops shall be included.

D. Top-of-Car Inspection Operating Station

- 1 An inspection operating station shall be provided on top of the elevator car.
- 2 This station shall be installed so that the controls are plainly visible and readily accessible from the hoistway entrance without stepping on the car.
- 3 When the station is operational, all operating devices in the car shall be inoperative.
- 4 Provide the following control devices and features:
 - a. A push/pull or toggle switch designated "EMERGENCY STOP" shall be arranged so as to prevent the application of power to the hoist motor or machine brake when in the "off" position.
 - b. A toggle switch designated "INSPECTION" and "NORMAL" to activate the top of car Inspection Service Operation.
 - c. Push button designated "Up", "Down" and "Enable" to operate the elevator on Inspection Service (the "Enable" button shall be arranged to operate in conjunction with either the "Up" or "Down" button).
 - d. An indicator light and warning buzzer that are subject to activation under Phase I - Fire Emergency Recall Operation.

E. Car Enclosure Work Light / Receptacle

- 1 The top and bottom of each car shall be provided with a permanent lighting fixture and 110-volt GFI receptacle.
- 2 Light control switches shall be located for easy accessibility from the hoistway entrance.
- 3 Where sufficient overhead clearance exists, the car top lighting fixture shall be extended no less than 24" above the crosshead member of the car frame.
- 4 Light bulbs shall be guarded so as to prevent breakage or accidental contact.

F. Master Door Power Operator System – VVVF/AC

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

- b. The door operator and/or car door panel shall be equipped with safety switches and electrical controls to prevent operation of the elevator with the door in the open position as per ASME A17.1 Code Standards.
 - c. Provide zone-lock devices as required by ASME A17.1 as may be adopted and/or otherwise modified by the AHJ.
- 7 Construct all door operating levers of heavy steel or reinforced extruded aluminum members.
- 8 Belts shall be designed for long life and operate noise free.
- 9 All components shall be designed for stress and forces imposed on the related parts, linkages and fixed components during normal and emergency operation functions.
- a. All pivot points, pulleys and motors shall have either ball or roller-type bearings, oilite bronze bushings or other non-metallic bushings of ample size.
- 10 Provide operating data / data tag permanently attached to the operator as required by applicable code and standards.

G. Car Door Hangers / Tracks / Gate Switch

- 1 Provide sheave type two-point suspension hangers and track for each car door.
- a. Sheaves shall be hardened steel, not less than 3-1/4" in diameter with sealed grease packed precision ball bearings.
 - b. The upthrust shall be taken by a roller mounted on the hanger and arranged to ride on the underside of the track.
- 2 The track shall be of formed cold rolled steel or cold drawn steel and shall be rounded on the track surface to receive the hanger sheaves.
- a. The track shall be removable and shall not be integral with the header.
- 3 Provide a gate switch that mounts directly to the car door track.
- a. The gate switch shall prevent movement of the elevator until such time as it signals the control equipment that the car door has physically closed.

H. Car Door Panel(s) Replace with New

- 1 Provide no less than 1" thick, 14-gauge hollow metal flush construction panel(s), reinforced for power operation and insulated for sound deadening.
- 2 Paint the hoistway side of each panel black and face the cab side with 16-gauge sheet steel matching the existing returns or in selected material and finish as otherwise directed by Owner/Architect.
- 3 The panels shall have no binder angles and welds shall be continuous, ground smooth and invisible.
- 4 Drill and reinforce panels for installation of door operator hardware, door protective device, door gibs, etc.

- a. Provide each door panel with two (2) removable laminated plastic composition guides, arranged to run in the sill grooves with minimum clearance.
 - b. The guide mounting shall permit their replacement without removing the door from the hangers.
- 5 Provide the meeting edge of center opening doors with necessary continuous rubber astragal bumper strips.
 - a. These strips shall be relatively inconspicuous when the doors are closed.

I. Door Reopening Device / "3D"

- 1 Provide a combination infrared curtain and 3D door protection system.
- 2 The door shall be prevented from closing and will reopen when closing if any one of the curtain light rays is interrupted or should an object enter the 3D detection zone.
- 3 The door shall start to close when the protection system is free of any obstruction.
- 4 The infrared curtain and 3D zone protective system shall provide:
 - a. Protective curtain field not less than 71" above the sill.
 - b. 3D protective zone field not less than 61" above the sill.
 - c. Accurately positioned infrared lights to conform to the requirements of the applicable handicapped code.
 - d. Modular design to permit on board test operation and replacement of all circuit boards without removing the complete unit.
 - e. Self-contained, selectable 3D zone timeout feature to allow for closing at nudging speed with audible signal.
 - f. Automatic turning-off of the 3D zone in the event of three (3) consecutive 3D triggers.
 - 1) Light curtain shall continue to operate after 3D system timeout.
 - g. Selectable control of the 3D zone operation on an "always-on" or "as doors close" basis.
 - h. Controls to shut down the elevator when the unit fails to operate properly.
 - i. Provide audible and visual notification of pending door close.
- 5 Existing infrared door protection system, designed in accordance with the criteria specified herein, may be retained and refurbished for new subject to the Consultant's review and approval.

2.9 FINISH / MATERIALS / SIGNAGE

A. Material, Finishes and Painting

- 1 General
 - a. Cold-rolled Sheet Steel Sections: ASTM A366, commercial steel, Type B.
 - b. Rolled Steel Floor Plate: ASTM A786.
 - c. Steel Supports and Reinforcement: ASTM A36.

- d. Aluminum-alloy Rolled Tread Plate: ASTM B632.
- e. Aluminum Plate: ASTM B209.
- f. Stainless Steel: ASTM A167 Type 302, 304 or 316.
- g. Stainless Steel Bars and Shapes: ASTM A276.
- h. Stainless Steel Tubes: ASTM A269.
- i. Aluminum Extrusions: ASTM B221.
- j. Nickel Silver Extrusions: ASTM B155.
- k. Bronze Sheet: ASTM B36(36M) alloy UNS No. C2800 (Muntz Metal).
- l. Structural Tubing: ASTM A500.
- m. Bolts, Nuts and Washers: ASTM A325 and A490.
- n. Laminated / Safety Tempered Glass: ANSI Z97.1.

2 Finishes

a. Stainless Steel

- 1) Satin Finish: No. 4 satin, long grain.
- 2) Mirror Finish: No. 8 non-directional mirror polished.

b. Sheet Steel:

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

3 Painting

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

B. Car Interior Finishes

- 1 Car interior finishes shall be as selected by Owner and/or Architect.
- 2 Contractor shall provide samples of finishes as required for approval prior to fabrication.
- 3 Refer to specifications for other design requirements where provided.

- 4 Special attention shall be given to flooring materials and suitability for intended duty.

C. Designation and Data Plates, Labeling and Signage.

- 1 Provide an elevator identification plate on or adjacent to each entrance frame where required by the AHJ.

2.10 FIXTURES / SIGNAL EQUIPMENT

A. General - Design and Finish

- 1 The design and location of the hall and car operating and signaling fixtures shall comply with the ADAAG and local requirements of the AHJ.
- 2 The operating fixtures shall be selected from the manufacturer's or a third party's premium line of fixtures.
- 3 Custom designed operating and signaling fixtures shall be as shown on the drawings or as approved by the Owner / Architect.
- 4 The layout of the fixtures including all associated signage and engraving shall be as approved by the Owner.
- 5 Where no special design is shown on the drawings, the faceplates shall be as follows:
 - a. Passenger Elevators
 - 1) Ground Floor and typical floors: Stainless steel faceplate with No. 4 stainless steel finish.
- 6 Mount passenger elevator fixtures with tamperproof fasteners and service elevator fixtures with tamperproof screws. The screw/fastener and key switch cylinder finishes shall match faceplate finish.
- 7 Where key-operated switch and or key operated cylinder locks are furnished in conjunction with any component of the installation, six (6) keys for each individual switch or lock shall be furnished, stamped or permanently tagged to indicate function.
- 8 All caution signs, pictographs, code mandated instructions and directives shall be engraved and filled with epoxy in code required colors.

B. Main Car Operating Panel

- 1 Car operating panel shall be flush mounted with swing type, one-piece faceplate with heavy-duty concealed hinges.
 - a. Mount all key switches that are required to operate and maintain the elevators exposed on the car station except those specified within a locked service cabinet.
- 2 The push buttons shall become individually illuminated as they are pressed and shall extinguish as the calls are answered.
- 3 The operating panel shall include:

- a. A call button for each floor served, located not more than 48" above the cab floor.
 - b. "Door open" / "Door close" / buttons.
 - c. "Alarm" button, interfaced with emergency alarm. The alarm button shall illuminate when pressed. Locate 35" above the cab floor.
 - d. "Emergency Stop" switch per local law located at 35" above the cab floor.
 - e. Self-dialing, hands-free emergency communication system actuation button with call acknowledging feature and ASME A17.1/ADA/IBC (CBC) design provisions.
 - f. Three (3) position firefighter key operated switch, call cancel button and illuminated visual/audible signal system with mandated signage engraved per ASME A 17.1 Standards as modified by the AHJ.
- 4 Provide a locked service cabinet with flush mounted door and containing the suitably identified key switches required to operate and maintain the elevator, including, but not limited to:
- a. Light switch
 - b. Fan switch
 - c. G. F. I. duplex receptacle
 - d. Emergency light test button and indicator
 - e. Inspection Service Operation key switch
- 5 Car operating panel shall incorporate:
- a. An integral (no separate faceplate) digital L.E.D. floor position indicator.
 - b. Emergency light fixture (without a separate faceplate)
 - c. Black-filled engraved unit I.D. number or other nomenclature, as approved by Owner.
 - d. Provide engraving as follows:
 - 1) The rated passenger load capacity in pounds.

C. Car Position Indicator

- 1 The position of the car in the hoistway shall be indicated by the illumination of the position indicator numeral corresponding to the floor at which the car has stopped or is passing.
 - a. Provide 2" high, 10-segment LED type position indicator with direction arrows, integral with the car operating panel.
 - b. Provide Lexan cover lens with hidden support frame behind fixture plate to protect the indicator readout.
 - c. Provide audible floor passing signal per ADA standards where not provided by the elevator signal control.
 - d. Flush mount fixture with cover to match selected car front or car operating panel finish as directed by the Owner.

D. Corridor Push Button Stations / Reuse Back Boxes

- 1 Push button signal fixtures shall be provided on each landing.
- 2 Each signal fixture shall consist of:

- a. Up and down illuminating push buttons measuring 3/4" at their smallest dimension as selected by the Owner.
 - b. A recessed mounting box, electrical conduit and wiring.
- 3 Intermediate landings shall be provided with fixtures containing two (2) push buttons while terminal landings shall be provided with fixtures containing a single push button.
- 4 Include firefighter key switch in the main lobby level station or other designated recall landing.
- 5 Where existing fixtures are located greater than 48" above the floor:
 - a. The existing back boxes shall be retained and used to attach the oversized fixture faceplate to locate the new buttons with a centerline of 42" above the finished floor.
 - 1) The Contractor has the option of providing a single oversized back box in lieu of retaining existing for faceplate attachment.
 - b. Standardize the new centerline distance on all floors.
- 6 All cutting, patching, grouting and/or plastering of masonry walls resulting from the removal or installation of corridor fixtures shall be performed by the Contractor so as to maintain the fire rating of the hoistway.
 - a. Finished painting or decorating of wall surfaces shall be by Others.

E. Hall Direction Lanterns

- 1 Provide a visual and audible signal at each entrance to indicate the direction of travel and, where applicable, which car shall stop in response to the hall call.
 - a. Design the lantern with up and down indication at intermediate landings and a single indication at terminal landings.
 - b. Lanterns shall sound once for the up direction and twice for the down direction.
 - 1) Provide an electronic chime with adjustable sound volume.
 - c. Provide adjustable signal time (three [3] to ten [10] seconds, with one [1] second increments) to notify passengers which car shall answer the hall call and preset per ADAAG notification standards.
- 2 Main Lobby fixture shall incorporate a 2" high LED floor position indicator in the hall lantern fixture with direction arrows located on both sides of the indicator.
- 3 Locate the lantern above / adjacent to the corridor entrance.

F. Hoistway Access Switch

- 1 Install a cylindrical type keyed switch at top terminal in order to permit the car to be moved at slow speed with the doors open to allow authorized persons to obtain access to the top of the car.

- 2 Where there is no separate pit access door, a similar switch shall be installed at the lowest landing in order to permit the car to be moved away from the landing with the doors open in order to gain access to the pit.
- 3 Locate the switch in the terminal floor entrance jambs without faceplate at a height of 72" above the finished floor.
- 4 Locate the switch in a separate fixture with a flush cover plate at a height of 72" above the finished floor. Cover plate shall be of a design and style as approved by the Owner, the Owner's representative or Architect.
- 5 Locate the switch in the hall call push button station at the top and bottom terminal landings where required if allowed by the Authority Having Jurisdiction.
- 6 This switch is to be of the continuous pressure spring-return type and shall be operated by a cylinder type lock having not less than a five (5) pin or five (5) disc combination with the key removable only in the "OFF" position.
 - a. The lock shall not be operable by any key which operates locks or devices used for other purposes in the building and shall be available to and used only by inspectors, maintenance men and repairmen in accordance with A17.1 applicable Security Group.
- 7 Existing provisions that meet the aforementioned criteria may be updated with keyed switches to match new apparatus provided for uniformity of systems within the building.

2.11 CAR ENCLOSURES

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

- 1 In accordance with A17.1, Section 8.7, as adopted and/or modified by the AHJ, entitled "Alterations", where a new or remodeled elevator car enclosure is included in the base scope of work, the Contractor shall, within thirty (30) days after execution of the contract, weigh the elevator, or one (1) elevator of each group of elevators included in the base scope of work, to determine the present deadweight of the platform/sling/cab assembly.
- 2 The Contractor shall, when necessary, weigh the interior materials of a single cab to better estimate the total existing weight of existing materials being removed as part of the alteration.
- 3 The Contractor shall make every effort to provide accurate weight measurements while taking into consideration all weights that may present themselves at the time the measurement is taken such as compensation, compensating sheave, hoist ropes and traveling cables that may affect the measurement of the assembly itself.
- 4 The Contractor shall evaluate the actual counterbalance percentage for each sample elevator to identify prevailing conditions.
- 5 Measurements of actual cab weight shall be compared to the original deadweight of the car as stamped on the crosshead data tag.
- 6 The amount of weight that may be added to the car, so as to remain within the limits of the "5% Rule", shall be calculated based on the following:
 - a. $(\text{Original Deadweight} + \text{Capacity}) \times (0.05) = \text{Maximum Additional Weight Allowed}$

- 7 The Contractor shall document and notify the Owner and Consultant of the results of the measurements taken and what weight, if any, can be added or needs to be removed from the cab in order to maintain compliance with the 5% Rule.
- 8 The Contractor shall work diligently with the Owner and/or Owner's Representative and/or Architect as well as the manufacturer of the car enclosure to minimize additional weights of the new or remodeled car enclosure so as to maintain compliance with the 5% Rule.
- 9 Contractor shall be responsible for proper adjustment of the counterbalance of the system, including the static balance of the platform/sling/car enclosure, upon completion of the car interior work.
- 10 Costs associated with this work shall be included in the base modernization price.
- 11 Provide a new data tag on the crosshead of the elevator indicating the new deadweight, the current percent counterbalance and the date of the alteration.

B. Elevator Cab Allowance (\$30,000 per elevator total net allowance for passenger elevators.)

- 1 It is understood that if the selected manufacturer of the cab is not the same as the Elevator Supplier, all cab material will be constructed in a manner to accommodate the elevator manufacturer's associated equipment, such as operator, hangers, interlocks, etc., as purchased by the Owner or Owner's Agent.
- 2 The net allowance for the elevator cabs are to be exclusive of:
 - a. Handling charges.
 - b. Applicable sales and/or use taxes.
 - c. Car door hangers, interlocks, exit contact locks.
 - d. Platform, flooring, car door sill.
 - e. Car installation, operating equipment, and such items are to be included by the Elevator Supplier in the base contract.
- 3 The net allowance covering the elevator cars of a design and material as selected shall include:
 - a. Ventilation and lighting.
 - b. Doors.
 - c. Base wainscoting.
 - d. Handrails.
 - e. Entrance columns.
 - f. Transoms as required.
 - g. Necessary cutouts.
 - h. All necessary cutouts and cab associated appurtenances that may be designed or required.
- 4 The Owner or Owner's authorized representative reserves the right to deduct the net allowances from the Elevator Contract and to purchase the elevator cabs separately.
- 5 The Owner retains the right to assign this purchase to the Elevator Supplier for coordination and receive the necessary credits or make the installation by an authorized representative of the Architect and/or Owner.
- 6 Contractor shall include all costs associated with coordination of cab related work in the base modernization bid including static and dynamic balance of the system.

C. Elevator Cab Enclosure Fan

- 1 Provide an exhaust type two (2) speed fan unit with cover grill, mounting accessories and necessary cab enclosure modifications.
 - a. Fan unit shall include self-lubricating motor with housing rubber mounted for sound vibration isolation.
- 2 Provide a key switch in the elevator cab enclosure for control of fan unit.
- 3 Provide necessary wiring and approved conduit to properly connect fan unit with power source and control key switch.

2.12 EMERGENCY LIGHTING / COMMUNICATIONS / SIGNALING

A. Battery Back Up Emergency Lighting Fixture and Alarm

- 1 Provide a self-powered emergency light unit.
 - a. The light fixture shall contain a minimum of two (2) LED lamps. Flush mount the light fixture in the main car station. The fixture shall have a milk white lens.
- 2 Provide a car-mounted battery unit including solid-state charger and testing means enclosed in common metal container.
 - a. The battery shall be rechargeable nickel cadmium with a ten (10) year minimum life expectancy. Mount the power pack on the top of the car.
 - b. Provide a 6" diameter alarm bell mounted directly to the battery/charger unit and connected to sound when any alarm push button or stop switch in the car enclosure is operated.
 - c. The bell shall be configured to operate from power supplied by the building emergency power generator. The bell shall produce a sound output of between 80-90 dBa (measured from a distance of 10') mounted on top of the elevator car.
 - 1) Activation of this bell shall be controlled by the stop switch and alarm button in the car operating station.
 - 2) The alarm button shall illuminate when pressed.
- 3 Where required by Code for the specific application, the unit shall provide mechanical ventilation for at least one (1) hour.
- 4 The operation shall be completely automatic upon failure of normal power supply.
- 5 Unit shall be connected to normal power supply for car lights and arranged to be energized at all times so it automatically recharges battery after use.

B. Emergency Voice Communication / Telephone

- 1 A hands-free emergency voice communication system shall be furnished in each car mounted as an integral part of the car operating panel.

- a. Necessary wires shall be included in the car traveling cable and shall consist of a minimum of one shielded pair of 20AWG conductors.
 - b. 120-volt power shall be provided to power the hands-free device.
- 2 The telephone shall be equipped with an auto-dialer and illuminating indicator which shall illuminate when a call has been placed and begin to flash when the call has been answered.
 - a. Engraving shall be provided next to the indicator which says, "When lit help is on the way".
- 3 In addition to the standard "Alarm" button, a separate activation button shall be provided on the car operating panel to initiate the emergency telephone and place a call.
 - a. The telephone must not shut off if the activating button is pushed more than once.
 - b. The telephone shall transmit a pre-recorded location message only when requested by the operator and be provided with an adjustable call time which can be extended on demand by the operator.
 - c. Once two-way communication has been established, voice prompts shall be provided which instruct the operator on how to activate these functions as well as alerting the operator when a call is being attempted from another elevator in the building.
- 4 If provisions for cellular communications are required, owner shall provide all media converters as well as hard connections to the elevator machine room.
- 5 The system shall be compatible with ring down equipment and PBX switchboards if applicable.
- 6 The system shall be capable of serving as the audio output for an external voice annunciation system.
 - a. Conversation levels shall measure 60 dbA or higher and measure 10 dbA above ambient noise levels.
 - b. Each device shall be provided with a self-diagnostic capability in order to automatically alert building personnel should an operational problem be detected.
- 7 The phone shall be able to:
 - a. Receive incoming calls from any On-Site Rescue Station (when provided or required).
 - b. Receive incoming calls from other off-site locations via the public telephone system.
 - c. Acknowledge incoming calls and automatically establishing hands-free two way communications.
 - 1) If no On-Site Rescue Station is provided, each hands-free device shall have built in line consolidation which will allow up to six (6) elevators to be called individually from outside the building over a single telephone line and up to eighty (80) elevators if an On-Site Rescue Station is provided.
- 8 The emergency elevator communication system shall require a maximum of one (1) telephone line.

- a. The system must provide line sharing capability to eliminate the need for a dedicated telephone line.
 - b. The line sharing function must ensure that the emergency telephones always receive dialing priority even if the line is in use and that the emergency telephones can be called into from an off-site location.
- 9 The system shall provide its own four (4) hour backup power supply in case of a loss of regular AC power.
- 10 The system must provide capability for building personnel to call into elevators and determine the charge state of any backup batteries provided for the emergency telephones.
- 11 Pushing the activation button in any of the elevator car stations will cause any on-site Rescue Station (where provided or required) or security telephone to ring.
 - a. If the on-site call is not picked up within thirty (30) seconds, the call will be automatically forwarded to a twenty-four (24) hour off-site monitoring service.
 - b. The arrangements and costs of the off-site monitoring and telephone line shall be by others.
- 12 All connections from the junction box to the telephone system shall be done by the Elevator Contractor where existing provisions can be reused.
- 13 New telephone lines, where required, shall be provided and interfaced by others.
- 14 All connections from the junction box to the security room's main telephone system shall be done by others.
- 15 All electrical work shall conform to Division 16 requirements.
- 16 Existing phone systems removed shall be returned to the Owners for installation by others in other areas.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspection

- 1 Study the Contract Documents with regard to the work as specified and required so as to ensure its completeness.
- 2 Examine surface and conditions to which this work is to be attached or applied and notify the Owner in writing if conditions or surfaces are detrimental to the proper and expeditious installation of the work. Starting the work shall imply acceptance of the surfaces and conditions to perform the work as specified.
- 3 Verify, by measurements at the job site, dimensions affecting the work. Bring field dimensions which are at variance with those on the accepted shop drawings to the attention of the Owner. Obtain the decision regarding corrective measures before the start of fabrication of items affected.
- 4 Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.

3.2 INSTALLATION / PROJECT PHASING

A. Installation

- 1 Modernize the elevators, using skilled personnel in strict accordance with the final accepted shop drawings and other submittals.
- 2 Comply with the code, manufacturer's instructions and recommendations.
- 3 Coordinate work with the work of other building functions for proper time and sequence to avoid delays and to ensure right-of-way of system. Use lines and levels to ensure dimensional coordination of the work.
- 4 Accurately and rigidly secure supporting elements within the shaftways to the encountered construction within the tolerance established.
- 5 Provide and install motor, switch, control, safety and maintenance and operating devices in strict accordance with the submitted wiring diagrams and applicable codes and regulations having jurisdiction.
- 6 Ensure sill-to-sill running clearances do not exceed 1 ¼" at all landings served.
- 7 Erect guide rails plumb and parallel with a tolerance of 1/8" (plus or minus 1/16").
- 8 Install rails so joints do not interfere with brackets, attachment points and divider beam.
- 9 Set entrance plumb in hoistway and in alignment with guide rails prior to erection of the front walls.
- 10 Arrange door tracks and sheaves so that no metal-to-metal contact exists.
- 11 Reinforce hoistway fascias to allow not more than 1/2" of deflection.
- 12 Install elevator cab enclosure on platform plumb and align cab entrance with hoistway entrances.
- 13 Sound isolate cab enclosure from car structure. Allow no direct rigid connections between enclosure and car structure and between platform and car structure.
- 14 Isolate cab fan from canopy to minimize vibration and noise.
- 15 Remove oil, dirt and impurities and give a factory coat of rust inhibitive paint to all exposed surfaces of struts, hanger supports, covers, fascias, toe guards, dust covers and other ferrous metal.
- 16 Prehang traveling cables for at least twenty-four (24) hours with ends suitably weighted to eliminate twisting after installation.
- 17 Pack openings around oil line with fire resistant, sound isolating glass or mineral wool.
- 18 Provide isolation pad between platen head and car structure.

B. Project Phasing

- 1 Phase I - Final design development and contractors' preliminary work procedures to be completed within _____ () weeks from date of contract award.
 - a. Prevailing conditions review and layout.
 - b. Selection meeting for aesthetic design and finishes with Owners' designee.
 - c. Filing for required permits or other governing authorities work procedure requirements.
- 2 Phase II - Submittal approvals and confirmations shall be completed within _____ () weeks from date of contract award.
 - a. Selection confirmations.

- b. Manufacturer's shop drawings applicable, i.e., fixtures, cab, machine room layouts, doors, etc.
 - c. Engineering data acknowledgment applicable, i.e., power, heat, structural loads.
 - d. Delivery dates for major component suppliers, i.e., controls, machinery, fixtures, cabs, etc.
 - e. Posting of permits or other governing agency authorizations to proceed.
 - f. Proposed work implementation schedule based on the aforementioned procedures/confirmations.
 - 3 Phase III - Mobilization of Final Design Approvals
 - a. Revision confirmations. (Equipment, etc.)
 - b. Preliminary work procedures.
 - c. Schedule confirmations.
 - 4 Contractor shall provide a project schedule as part of the Bid based on the following:
 - a. Include three (3) days of simulated operation, with or without door operation, while not allowing passenger use.
 - b. Consultant punch list inspection report shall be performed after acceptance testing by the AHJ for each individual elevator.
 - c. Contractor shall complete all punch list items issued by both the AJH and the Consultant prior to turn-over for beneficial use by the Owner and removal of the next elevator for modernization.
 - 5 Accelerated Schedule
 - a. Where extra costs for an accelerated schedule are incurred, it is mutually agreed and understood that such costs are intended as compensation for completion on or by a mutually agreed date, and not simply for the premium-time/overtime hours worked by the Contractor.
 - b. If the mutually agreed schedule is not achieved, the Contractor will not be entitled to full payment of the additional cost for the accelerated schedule. The additional charges will be diminished in direct proportion to the extent of failure to meet the mutually agreed schedule.
- C. Removal of Elevators
- 1 If extenuating circumstances (i.e. separating controller interconnections, inspection, testing, etc.), require that multiple cars of a single elevator group be removed from service simultaneously, the work shall be performed outside of the normal business hours at a time mutually agreed to by the Owner and Contractor.
 - 2 A minimum of five (5) days advance written notice shall be given to the Owner and Elevator Consultant by the Contractor detailing the reasons for the simultaneous removal of the elevators from service along with the estimated out-of-service time.
 - 3 The request shall be subject to review by the Elevator Consultant and approved by the Owner prior to the commencement of the work.

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

D. Transfer of Hall Button Risers

- 1 Transfer of the hall button riser(s) to the new signal control systems shall be performed on a not-to-interfere basis and shall not interrupt building operations or inconvenience building occupants.
- 2 Costs for this work in addition to associated expenses shall be included as part of the base bid pricing.

3.3 FIELD QUALITY CONTROL

A. Inspection and Testing

- 1 Upon completion of each work phase or individual elevator specified herein, the Contractor shall, at its own expense, arrange and assist with inspection and testing as may be required by the A.H.J. in order to secure a permit to operate.

B. Substantial Completion

- 1 The work shall be deemed "Substantially Complete" for an individual unit or group of units when, in the opinion of the Consultant, the unit is complete, such that there are no material and substantial variations from the Contract Documents, and the unit is fit for its intended purpose.
- 2 Governing authority testing shall be completed and approved in conjunction with inspection for operation of the unit; a certificate of operation or other required documentation issued; and remaining items mandated for final acceptance completion are limited to minor punch list work not incorporating any life safety deficiencies.
- 3 The issuance of a substantial completion notification shall not relieve the Contractor from its obligations hereunder to complete the work.
- 4 Final completion cannot be achieved until all deliverables, including but not limited to training, spare parts, manuals, and other documentation requirements, have been completed.

C. Contractor's Superintendent

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

3.4 PROTECTION / CLEANING

A. Protection and Cleaning

- 1 Adequately protect surfaces against accumulation of paint, mortar, mastic and disfiguration or discoloration and damage during shipment and installation.

- 2 Upon completion, remove protection from finished surfaces and thoroughly clean and polish surfaces with due regard to the type of material. Work shall be free from discoloration, scratches, dents and other surface defects.
- 3 The finished installation shall be free of defects.
- 4 Before final completion and acceptance, repair and/or replace defective work, to the satisfaction of the Owner, at no additional cost.
- 5 Remove tools, equipment and surplus materials from the site.

B. Barricades and Hoistway Screening

- 1 The Contractor shall provide barricades where necessary in order to maintain adequate protection of areas in which work specified by the Contract Documents is being performed, including open hoistway entrances. Fabrication and erection as all barricades shall be in compliance with applicable OSHA regulations.

3.5 DEMONSTRATION

A. Performance and Operating Requirements

- 1 Passenger elevators shall be adjusted to meet the following performance requirements:
 - a. Speed within 5% of rated speed in the up direction under any loading condition.
 - b. Leveling: within $\pm 1/4"$ as measured between the car entrance threshold and the landing sill on any given floor under any loading condition.
 - c. Door dwell time for hall calls: 4.0 sec with Advance lantern signals.
 - d. Door dwell time for hall calls: 5.0 sec without Advance lantern signals.
 - e. Door dwell time for car calls: 3.0 seconds.
 - f. Reduced non-interference dwell time: 1.0 seconds.
- 2 Maintain the following ride quality requirements for the passenger elevators:
 - a. Where pit permits, extend bottom roller guides by not less than one half the distance from the centerline of the upper roller guides to the platform.
 - b. Noise levels inside the car shall not exceed the following:
 - 1) Car at rest with doors closed and fan off - 40 dba.
 - 2) Car at rest with doors closed, fan running - 55 dba.
 - 3) Car running at high speed, fan off - 50 dba.
 - 4) Door in operation - 60 dba.
 - c. The maximum jerk rate shall be one and one-half to two time (1.5x-2.0x) the acceleration and deceleration.
 - d. The maximum velocity which the elevator achieves in either direction of travel while operating under load conditions that vary between empty car and full rated load shall be within $\pm 3\%$ of the rated speed.

B. Acceptance Testing

- 1 Comply with the requirements of Division 01.
- 2 The Contractor shall provide at least five (5) days prior written notice to the Owner and Consultant regarding the exact date on which work specified in the Contract Documents will reach completion on any single unit of vertical transportation equipment.
- 3 In addition to conducting whatever testing procedures may be required by local inspecting authorities in order to gain approval of the completed work, and before seeking approval of said work by the Owner, the Contractor shall perform certain other tests in the presence of the Consultant.
- 4 The Contractor shall provide test instruments, test weights, and qualified field labor as required to safely operate the unit under load conditions that vary from empty to full rated load and, in so doing, to successfully demonstrate compliance with applicable performance standards set forth in the project specifications with regard to:
 - a. Operation of safety devices.
 - b. Sustained high-speed velocity of the elevator in either direction of travel.
 - c. Running time and floor-to-floor time between adjacent floors.
 - d. Floor leveling accuracy.
 - e. Door opening/closing and dwell times.
 - f. Ride quality inside the elevator car.
 - g. Communication system.
- 5 Upon completion of work specified in the Contract Documents on the last car in any group of elevators, and in conjunction with the aforementioned testing procedures, the Contractor shall carry out additional testing of group dispatch/supervisory control features in the presence of the Consultant.
- 6 The Contractor shall provide test instruments and qualified field labor as required to successfully demonstrate:
 - a. Simulated and actual emergency power operation.
 - b. Firefighter, attendant and independent service operations.
 - c. Zoning operations and floor parking assignments.
- 7 Upon completion of the modernization of each individual elevator, emergency power testing shall be conducted by the Building Management after normal business hours and/or weekends.
- 8 After hour tests of systems such as emergency generators, fire service, and security systems shall be conducted at no extra cost to the Owner.

END OF SPECIFICATION