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**Automatic Passenger's Elevator
Upgrade and Alteration for**


***Carolina Judicial Center
Administration Elevator***



Prepared by:



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PART 1 – GENERAL

1.1 DESCRIPTION

This specification sets out the minimum requirements for full modernization of one (1) passenger elevator at the **Carolina Judicial Center – Administration Elevator**. The elevator included in the specification are the existing passenger elevator. The intention of this specification is to set out the standards the Building requires for lift installations. This work would encompass the replacement of all the components of the elevator which have become most affected by wear and tear and normal use over an extended period. Major Modernization is a reasonably straight forward exercise in that, except for the car and counterweight guide rails, the counterweight itself, car and hoistway doors and frames, cab and others which are retained. This will provide the Building with one elevator which has a life expectancy of 25 years and is compliant with current ASME 17.1-2010 code.

Equipment to be replaced would be:

1. Main lift controller
2. Traction machine and its engine
3. Suspension Ropes.
4. Travelling cables.
5. Shaft switches.
6. Landing and car doors components.
7. Door operator
8. Landing door locks, rollers, shoes and door closers.
9. Car Operating Panel.
10. Emergency light system for lift car.
11. Fire System Phase I and II
12. All guide shoes.
13. Car top control station.
14. Car/landing hall buttons and car position indicator.
15. Bi - Directional Over speed safety governor.
16. New wiring throughout.
17. Others

This section of the specification is intended to cover the complete furnishing of all labor, materials, supervision, and components on the elevator located in the **Carolina Judicial Center – Administration Elevator**

1.2 SCOPE OF WORK

This proposal includes the furnishing an installation of elevator equipment as hereinafter specified. It is the intention of this proposal to outline broadly the equipment required, **but not** to cover details of design and construction. All equipment not specifically designate herein as "Provide" will be retained and re-used in place without alteration.

Elevators shall retain main and counterweight rails, buffers, counterweights, entrance frames, sills, strut angles, fascia plates and slings.

Controls panel alteration and upgrading to **simplex passenger car**.

Recondition the door tracks in conjunction with the replacement and the upgrade of the doors operating systems.

Fixtures and signals as per current ADA regulations.

Mandated fire emergency service and elevator safety requirements for seismic in comply with the ANSI A17.1 2010.

Component upgrades to existing as further specified.

New traction machine with AC motor

1.3 ELEVATOR SERVICE

1. In order to discover and resolve conflicts or lack of definition which might create problems, Elevator Company must review Contract Documents and site conditions for compatibility with its product prior to submittal of quotation. Review existing structural, electrical, and mechanical provisions for compatibility with Company's products. Purchaser will not pay for change to structural, mechanical, electrical, or other systems required to accommodate Company's equipment.
2. The Elevator Company shall furnish adequate equipment and use great care in the hoisting and handling of materials and equipment so as not to damage adjacent and existing construction. All damage to the existing building, adjacent structures, walks, drives and facilities caused by the Company's work shall be repaired by the Company, at no additional cost to the Owner.

3. Prior to final acceptance, Elevator Company shall complete all pertinent safety tests and inspections. Final inspection and tests shall be given only when all work on the elevator has been completed. Final acceptance shall be given only upon successful completion of final inspection and tests of the elevator. Premises shall be occupied during performance of work, but Elevator Company shall have uninterrupted use of scheduled elevator vacated for completion of work.

1.4 WORK SCHEDULE

Before work is started, submit prepared work schedule for approval and arrange with the owner sequence of procedure, means of access to premises, space for storage, use of approaches, corridors, stairways and elevators, location of temporary partitions, etc. No work may begin on any elevator until all materials for that elevator have been delivered to the site and verified by the Owner Representative. The phasing of work on the elevators shall be coordinated with the Owner and/or the Representative.

1.5 SAFETY PRECAUTIONS

Building will be occupied during execution of work. Work shall be conducted in a manner to afford maximum protection of building, facilities, employees, and the public, and to prevent unreasonable delay or interference with normal functioning of building activities.

The Elevator Company shall provide protection, barricades and coverings required by local ordinances, and shall maintain lights and/or signals as a warning during the work; removing same when completed.

Provide fire extinguishers so that they shall always be readily available.

It shall be the obligation of the Elevator Company to maintain a free and clear passageway in each elevator lobby. Parts, tools, etc. shall be kept within the confines of entrance partitions. Trash and debris shall be removed daily.

1.6 REMOVED MATERIALS AND EQUIPMENT

Materials that are required to be removed and not specified to be reused or retained under contract shall be removed daily from the public traffic area.

Equipment replaced under this specification will become the property of the Elevator Company. The Elevator Company should be responsible to dispose in the correct way the unused equipment from the premises.

1.7 APPLICABLE PUBLICATIONS

The following standards and codes of the issues listed below (including the latest amendments, addenda, and errata) form a part of this specification:

1. A17.1: 2010 American National Standards Institute (ANSI/ASME) Standards: Safety Code for Elevators and Escalators. In text, publication will be referred to as the Code.
2. A17.2: 2010 American National Standards Institute (ANSI) Standards: Practice for the Inspection of Elevators, Escalators and Moving Walks, Inspector's Manual.
3. American Society of Mechanical Engineers (ASME), American National Standards Institute of National Standards, Elevator and Escalator Electrical Equipment, ANSI/ASME A17.5 - 2010
4. American Society for Testing and Materials (ASTM), standards.
5. American with Disabilities Act (ADA) of 1994 Federal Regulations 28 CFR Part 36, Accessibility for Building and Facilities
6. National Electric Code (NEC) NFPA 70 Article 620 Elevators, Dumbwaiters, Escalators, Moving Walks, Wheelchair Lifts, and Stairway Chair Lifts.
7. National Electric Manufacturers Association (NEMA), LD 3-1985
8. National Fire Protection Association (NFPA)
9. Hoistway ventilation is required for elevators penetrating more than three stories. See NCBC Vol. 1, 3004.

1.8 QUALIFICATIONS:

Owner's approval is required for proposed manufacturer, suppliers and installers products or services upon submission by the Elevator's Company, accompany of a certificate stating the following:

- A. The Elevator's Company/Company it's currently and regularly engaged in elevator equipment modifications as one of its principal duties.
- B. The Elevator's Company/Company must be able to demonstrate that Elevator Company has installed and maintained similar elevators to those specified and which have given satisfactory service; has been in successful operation

- for at least five (10) years; maintains locally, an adequate stock of new parts for replacement or emergency purposes; has available qualified persons to do the work.
- C. Elevator Company shall submit a list of five or more prior building installations where all the elevator equipment he proposes to furnish on this project has performed satisfactorily together under conditions of normal use. The list shall include projects that have been in operation for a period of not less than two years preceding the date of these specifications; include the names and addresses of the building and the names of the administrators.
- D. The Company shall cooperate with the Owner, the Owner's representative, the Consultant, and/or other trades, by providing all labor, supervision and materials, as specified, for the successful completion of the work specified herein and any agreed to additional work during the term of the contract.
- E. All employees of the Company shall wear full laundered uniforms that clearly identify the employee as an agent of the Company.
- F. The Owner reserves the right to request removal of any of the Company's employees from the project site at any time for any reason.

1.9 WIRING DIAGRAMS AND MANUALS

- A. Provide three complete sets of field wiring and straight-line wiring diagrams showing all electrical circuits of the controller. Maintain one set in the elevator machine room. In the event field modifications are found necessary during installation, diagrams shall be revised to include all corrections made prior to and-during the final inspection.

The following information relating to the specific type of microprocessor controls installed on this project shall be provided:

- Owner's information manual, containing general data on major components maintenance and adjustment.
- System logic description.
- Complete wiring diagrams needed for field troubleshooting, adjustment, repair and/or replacement of components. Diagrams shall be base diagrams,

containing all changes and additions made to the equipment during the design and construction period.

B. Operation and Maintenance Data: Provide written information necessary for proper maintenance and adjustment of the equipment prior to final acceptance as follows:

- Straight line wiring diagrams of as-installed elevator circuits with index of location and function of all components. Leave one set in machine rooms. Provide two (2) corrected sets for Owner's file 90 days after acceptance.
- Lubricating instructions and recommended lubricant grade.
- Parts catalogs and maintenance manuals.
- Include any special tools, passwords and manuals that are required for maintenance, trouble shooting, adjustments or performance of safety tests for the Owner's use.
- If the Company requires the Owner to sign a lease for a special trouble-shooting tool, a copy of the agreement, with all costs associated with its use, shall be submitted with the bid.

1.10 ADDITIONAL EQUIPMENT

Additional equipment required to operate specified equipment manufactured and contemplated for this installation shall be furnished and installed. The cost of such equipment shall be included in the base bid.

1.10 SAMPLES AND DESCRIPTIVE DATA

- A. Before executing any work, furnish information enough to evidence full compliance with contract requirements on proposed items. Such information shall include, as required: Manufacturer's Name, Trade Names, Model or Catalog Number, Nameplate Data (size, capacity, and rating) and corresponding specification references.
- B. Name of manufacturer, type or style designation and applicable data of the following equipment shall be shown on the elevator layouts:
- a. Controllers: Elevator Controls, Smartrise, Otis, Schindler, ThyssenKrupp or similar

- b. Door Equipment: GAL or similar
- c. Auto dial phone system: Adams or similar
- d. Car roller guides: Otis or similar
- e. Interlocks: Otis, or similar
- f. Car Panel and Hall buttons: Innovation or similar
- g. Door restrictor: Adams or similar
- h. Car doors: Columbia or similar
- i. AC Motor: Imperial or similar
- j. Traction Machine with Emergency Breaker integrated: Torin or similar

No exceptions to these component suppliers shall be accepted without the approval of the Elevator Consultant.

C. Information:

- a. Cuts or drawings and description of power door operator.
- b. Cuts or drawings showing details of all signal and car equipment fixtures.
- c. Furnish certificates as required under paragraph "Qualifications".
- d. Car operating panels
- e. Seismic system

1.11 PERFORMANCE STANDARDS

The elevator shall be capable of meeting the highest standards of the elevator industry and specifically the following:

- A. Contract speed shall mean speed in the up direction with full capacity load in the car. Speed variation under any load condition, regardless of direction, shall be no more than 3 percent.
- B. The controlled rate of change of acceleration and retardation of the car shall not exceed 0.1 g per second and the maximum acceleration and retardation shall not exceed 0.2 g per second.
- C. Starting, stopping and leveling shall be smooth and comfortable without appreciable steps of acceleration and deceleration. Stopping shall be without bumps or jars.

- D. Full speed running shall be quiet and free from vibration and swaying. When cars are standing at the floor with doors open, they shall remain firmly stopped and shall not rock side to side.
- E. Cars shall not move from side to side during the process of opening and closing the doors.

DOOR HOLD

The Door Hold button in the elevator shall be easily adjustable from 20 – 60 seconds.

Door closing force is the force necessary to prevent closing of the hoistway and the car door from rest shall be not more than 30 lbs. (133N). This force shall be measured on the leading edge of the door with the door at any point between 1/3 and 2/3 of its travel. Door closing force shall not exceed the requirements of Rule 112.4 ASME A17.1.

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

Car Leveling Zone: $\pm 1/4$ " under any loading condition.

Door Opening Time: Passenger Elevators: 1.8 seconds.

Door Closing Time: Passenger Elevators: 2.7 seconds.

The door operator shall open the car door and hoistway door simultaneously at 2.5-feet per second and close at 1-foot per second.

1.12 WARRANTY

Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions. **Warranty Period: 1 year from date of Substantial Completion.**

No device will be acceptable that will not give perfect satisfaction without excessive maintenance and attention. If it becomes evident during the guarantee period that the

device is not functioning properly or in accordance with specification requirements, or, if in the opinion of the Owner, excessive maintenance and attention must be employed to keep device operating, device shall be installed as part of work until satisfactory operation of installation is obtained. Period of guarantee shall start anew from date of completion of new installation performed in accordance with foregoing requirements.

1.13 Maintenance services

INTERIM MAINTENANCE

The Elevator Company shall furnish, at no additional cost, "Interim Full Maintenance" service at no additional cost, to the elevator that will be altered during the waiting period for the receipt of the materials and the beginning of the works.

AFTER FINAL ACCEPTANCE

Beginning at Substantial Completion, provide three **(3) months** full maintenance service by skilled employees of Elevator Company. The maintenance service shall comprise regular examinations of the installation by competent and trained mechanics on a monthly basis, and shall include all necessary adjustments, greasing, oiling, cleaning, and supply of parts and accessories necessary to keep the equipment in good operating condition, except such replacement of parts made necessary by misuse, accidents not attributable to failure of equipment or workmanship, and negligence of the Owner. For the period, spare parts shall be available within 24 hours. Maintenance documentation shall be submitted to Owner within one week of completion of prescribed tasks. Emergency Service response time shall be one hour or less, 24 hours a day.

Repair work shall be carried out only by the Elevator Company's personnel using only standard new parts furnished by the Elevator Company and shall not be assigned or transferred to any agent.

Provide to Owner any proprietary tools, manuals, adjuster manuals, parts lists, software / hardware updates including programming software for all microprocessor based equipment, etc. for the life of the equipment at no cost to the Owner. Troubleshooting tool shall have full capabilities for adjusting units.

1.14 ELEVATOR ELECTRICAL REQUIREMENTS – (Part of the Elevator Company responsibilities)

Coordination: All electrical equipment placement and installation shall be coordinated with the elevator Company and shall not be located until elevator equipment is installed or coordination has been arranged with elevator Company's equipment placement.

The following items are part of the Owner responsibilities:

GFI Receptacles: GFI receptacles shall be required in all elevator machine rooms, machinery spaces and elevator pit areas. ASME A17.1 NEC, 620.23(C) & 620.24(C).

Lighting Required in Elevator Machine Rooms: Fluorescent light fixtures shall be provided in elevator machine rooms (and machinery spaces when present). Lighting shall be adequate to work on all equipment without shadowing. ASME A17.1.

Lighting Required in Elevator Pits: Four foot, 2 tubes, guarded fluorescent light fixtures shall be required in all elevator pits. The location shall be determined after coordination with the elevator Company so that the light fixture is located out of the way of all elevator equipment. ASME A17.

Bulls Eye (Simplex) Receptacles: Bulls eye (simplex) receptacle for Sump pumps (not – GFI) on a designated circuit, shall be required in all elevator pits, for the elevator pit sump pump. ¾-inch conduit is required to the sump pump. *(ONLY IF THE PIT HAS SUMP PUMP)*

Main Line Breaker or Disconnect (lockable, fused or breaker, a listed device): Shall be supplied in all elevator machine rooms in sight of elevator motor and controller and adjacent to machine room entry door, one disconnects required for the elevator. A label on the disconnect is required stating location of overcurrent protection device. NEC 620-51.

Car Lighting Disconnect: A separate branch circuit shall supply the car lights, receptacle(s), auxiliary lighting power source, and ventilation on each elevator car. It shall be fused/breaker and lockable and shall be supplied in all elevator machine rooms. One disconnects required for each elevator. A label stating the location of the supply side overcurrent protection device is required on the disconnect. NEC 620.22(A) & 620.51(D).

Light outlet for the elevator, pit and machine room, as indicated by your elevator Company.

Smoke Hole: Is required floor elevators of 5 stops or more if the machine room has air condition.

The door to access to machine room must be fire rated 1 1/2hr labeling.

Lighting, convenience GFCI outlets, cooling and ventilation of machine room. Machine room temperature to be maintained between 55° F and 90° F (13° C and 32° C) or between manufacture specifications. Relative humidity to be maintained at 95% or less non-condensing.

It requires all machine room, ABC type fire extinguisher. This will be accessible from the door that provides access to these rooms.

Elevator Firefighter's Service is required per ASME A17.1 Rule 2.27.3. Elevator Firefighter's Service wiring and interconnections to automatic sprinkler systems or heat and smoke sensing devices furnished by others.

The following will be the Company's responsibilities:

Electrical Component NEC Clearances: Clearances around all electrical equipment in the elevator machine room shall comply with NEC 110-26 electrical clearances requirements. The electrician's work and equipment placement shall be coordinated with the elevator Company's equipment placement. NEC 620.5

Electrical Piping Runs: All electrical piping runs provided by the electrical Company and elevator Company to the elevator equipment shall be run overhead or in a manner which does not restrict access to and around any equipment.

Emergency Phone and Data Line: Conduit shall be provided by electrical Company in all elevator machine rooms to the elevator controller. Electrical Company shall provide electrical conduit for both the emergency elevator phone and required data line to the elevator machine room, to the elevator controller, and terminated on the elevator controller with coordination from the elevator Company.

* It should be connected to the existing phone line.

1.15 SUBSTANTIAL COMPLETION

Elevator Company:

1. Notify the Owner's Representative in writing that the project, or designated portion thereof, is substantially complete.
2. Upon completion of the preliminary Elevator Consultant punch list, the Contractor shall submit the following:
 - a. Operation and maintenance data.
 - b. Guarantees and warranties.
 - c. Interfacing information.

PART 2 – PRODUCTS

2.1 MANUFACTURED PRODUCTS

- A. Materials, devices, and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items. Items not meeting this requirement but meet technical specifications which can be established through reliable test reports or physical examination of representative samples, will be considered.
- B. When two or more devices of the same class of materials or equipment are required, these units shall be products of one manufacturer.
- C. Manufacturers of equipment assemblies which include components made by others shall assume complete responsibility for the final assembled unit.
 1. Individual components of assembled units shall be products of the same manufacturers.
 2. Parts which are alike shall be the product of a single manufacturer.
 3. Components shall be compatible with each other and with the total assembly for the intended service.
- D. Motor nameplates shall state manufacturers' name, rated horsepower, speed, volts, starting and full load amperes, and other characteristics required by NEMA Standards and shall be securely attached to the item of equipment in a conspicuous location.

- E. The elevator equipment, including controllers, door operators, and supervisory system shall be the product of manufacturers of established reputation, provided such items are capably engineered and produced under coordinated specifications to ensure compatibility with the total operating system. Mixing of manufactures related to a single system or group of components shall be identified in the submittals.

- F. Where key operated switches are furnished in conjunction with any component of this elevator installation, furnish four (4) keys for each individual switch or lock. Provide different key tumblers for different switch and lock functions. Each key shall have a tag bearing a stamped or etched legend identifying its purpose. Barrel key switches are not acceptable, except where required by code.

- G. If the elevator equipment, to be installed, is not known to the Owner shall submit drawings in triplicate for approval to the Consultant, and Owner showing all details and demonstrate that the equipment to be installed is in strict accordance with the specifications.

2.2 EXISTING EQUIPMENT

- A. The elevator shall have the capacity to lift and lower the live load, including the weight of the car and cables, at the speed specified in the following existing schedule:

EXISTING CHARACTERISTICS	
Elevator Number	ADMINISTRATION
Controller	Otis
Year	1987
Rated Load – (lb)	2,000 lbs
Contract Speed - (fpm)	200 fpm
Number of Stops	4
Number of Openings	4
Type of Roping	1:1
Entrance Type	Center Opening
Machine	Otis



2.3 POWER SUPPLY

- A. It shall be the Elevator Company's responsibility to supply the labor and materials for the installation of the following:
 - 1. Feeders from the power source.
 - 2. Provide Surge Suppressors to protect the elevator equipment.
- B. Power for auxiliary operation of elevator shall be available from auxiliary power generator, including wiring connection to the elevator control system.

***Connection should be made to the existing power supply.**

2.4 CONDUIT AND WIREWAY

- A. Unless otherwise specified or approved, install electrical conductors, except traveling cable connections to the car, in rigid zinc-coated steel or aluminum conduit, electrical metallic tubing or metal wireways. Rigid conduit smaller than 3/4 inch or electrical metallic tubing smaller than 1/2 inch electrical trade size shall not be used. All raceways completely embedded in concrete slabs, walls, or floor fill shall be rigid steel conduit. Wireway (duct) shall be installed in the hoistway and to the controller and between similar apparatus in the elevator machine room. Fully protect self-supporting connections, where approved, from abrasion or other mechanical injury. Flexible metal conduit not less than 3/8 inch electrical trade size may be used, not exceeding 18 inches in length unsupported, for short connections between risers and limit switches, interlocks, and for other applications permitted by NEC.
- B. All conduits terminating in steel cabinets, junction boxes, wireways, switch boxes, outlet boxes and similar locations shall have approved insulation bushings. Install a steel lock nut under the bushings if they are constructed completely of insulating materials. Protect the conductors at ends of conduits not terminating in steel cabinets or boxes by terminal fittings having an insulated opening for the conductors.
- C. Rigid conduit and EMT fittings using set screws or indentations as a means of attachment shall not be used. All fittings shall be steel or malleable iron.
- D. Connect motor or other items subject to movement, vibration or removal to the conduit or EMT systems with flexible, steel conduits.

2.5 CONDUCTORS

- A. Unless otherwise specified, conductors, excluding the traveling cables, shall be stranded or solid coated annealed copper. Multiple conductor cable shall have color or number coding for each conductor. Conductors for control boards shall be in accordance with NEC. Joints or splices are not permitted in wiring except at outlets. Tap connectors may be used in wire ways provided they meet all UL requirements.
- B. Provide all conduit and wiring between machine room, hoistway and fixtures.
- C. All wiring must test free from short circuits or ground faults. Insulation resistance between individual external conductors and between conductors and ground shall be a minimum of one megaohm.
- D. Where size of conductor is not given, voltage and amperes shall not exceed limits set by NEC.
- E. Provide equipment grounding. Ground the conduits, supports, controller enclosure, motor, platform and car frame, and all other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be copper, green insulated and sized as required by NEC. Bond the grounding wires to all junction boxes, cabinets, and wire raceways.
- F. Terminal connections for all conductors used for external wiring between various items of elevator equipment shall be solderless pressure wire connectors. The Elevator Company may, at his option, make these terminal connections on 10 gauge or smaller conductors with approved terminal eyelets set on the conductor with a special setting tool, or with an approved pressure type terminal block. Terminal blocks using pierce-through serrated washers are not acceptable.

2.6 TRAVELING CABLES – PROVIDE

- A. All conductors to the car shall consist of flexible traveling cables conforming to the requirements of NEC. Traveling cables shall run from the junction box on the car directly to the controller. Junction boxes on the car shall be equipped with terminal blocks. Terminal blocks having pressure wire connectors of the clamp type that meet UL 486A requirements for stranded wire may be used in lieu of terminal eyelet connections. Terminal blocks shall have permanent indelible identifying numbers for each connection. Cables shall be securely anchored to

avoid strain on individual terminal connections. Flame and moisture resistant outer covering must remain intact between junction boxes. Abrupt bending, twisting and distortion of the cables shall not be permitted.

- B. Provide spare conductors equal to 10 percent of the total number of conductors furnished, but not less than 5 spare conductors in each traveling cable.
- C. Provide shielded wires for the auto dial telephone system within the traveling cable.
- D. If traveling cables meet the hoistway or elevator due to sway or change in position, **provide shields or pads** to the elevator and hoistway to prevent damage to the traveling cables.
- E. Hardware cloth wide may be installed from the hoistway suspension point downward to the elevator pit to prevent traveling cables from rubbing or chafing. Hardware cloth shall be securely fastened and tensioned to prevent buckling. Hardware cloth is not required when traveling cable is hung against a flat wall.

2.7 CONTROLLER – PROVIDE

- A. UL/CSA Labeled Controller: The elevator control equipment shall contain diagnostic capabilities as required for the ease of complete maintenance. The diagnostic system shall be an integral part of the controller and provide user-friendly interaction between the service person and the controls. All such systems shall be free from decaying circuits that must be periodically reprogrammed by the manufacture All controller switches and relays shall have contacts of design and material to ensure maximum conductivity, long life and reliable operation without overheating or excessive wear, and shall provide a wiping action to prevent sticking due to fusion. Switches carrying highly inductive currents shall be provided with arc shields or suppressors.
- B. Properly identify each device on all panels by name, letter, or standard symbol which shall be neatly stencil painted or decaled in an indelible and legible manner. Identification markings shall be coordinated with identical markings used on wiring diagrams. The ampere rating shall be marked adjacent to all fuse holders. All spare conductors to controller and supervisory panel shall be neatly formed, laced, and identified.

2.8 OPERATION - SIMPLEX

Simplex Selective Collective

1. Momentary pressure of car or hall button, other than landing at which car is parked, shall automatically start the car and dispatch the car to the corresponding floor for which that call was registered. If a call is registered at the floor when the car is idle, the doors shall automatically open.
2. When the direction of travel has been established, the car shall answer all calls corresponding to the direction of travel and shall not reverse direction until all car and hall calls, in that direction, have been answered.
3. Calls registered for the opposite direction of car travel shall remain registered and shall be answered after car has completed its calls in the direction of travel.
4. If no car buttons are pressed, and car starts up in response to several down calls, the car shall answer highest down call first and then reverse to collect other down calls.
5. The car shall remain at the arrival floor for an adjustable interval to permit passenger transfer. Doors shall close after a predetermined interval after opening unless closing is interrupted by car door reversal device or door open button in car.

2.9 VVVF AC MOTOR CONTROL - PROVIDE

A variable voltage, variable frequency AC drive system shall be provided. Power for the system will be taken from the building 3 phase power supply. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system. The AC voltage will be changed to DC, and a power transistor inverter circuit will change the DC voltage to AC to power the elevator motor. Motor speed and torque will be controlled by varying the frequency and amplitude of the AC. A digital velocity encoder shall be provided on the motor giving feedback to the controller on motor speed and position. Provide line filters, noise spike or notching suppressors to insure other computer-operated equipment in the building will not be affected.

The drive system shall be designed to suppress noise and prevent transient voltage feedback into the building power supply. Isolation transformers and filter networks shall be utilized to ensure that waveform distortion and harmonic content will not adversely affect the operation of standby generator and other equipment.

The power for the system is to be protected for phase loss and phase unbalance protection.

The drive system shall meet or exceed all requirements of IEEE 519 1981 standard for general systems. The position selector shall be part of the microprocessor system. The car position in the hoistway shall be digitized through a primary position encoder. The microprocessor control system shall store the floor position and slowdown points in memory.

The drive control system shall be a dual-loop feedback system based primarily on car position. The velocity profile shall be calculated by the microprocessor control system producing extremely smooth and accurate stops. The velocity encoder shall permit accurate position/velocity feedback and shall permit a fast and accurate control of acceleration and deceleration.

2.10 GEARED TRACTION HOIST MACHINE AND MOTOR; NEW

Provide a new geared traction hoist machine

1. The machine shall be of the geared traction type in accordance with the applicable requirements of the ASME A1.7 Elevator Code. It shall have the motor, double brake and traction drive sheave compactly mounted on a continuous steel bedplate and set on steel beams with sound isolation pads to reduce noise and vibration. The machine and motor shall be factory tested and aligned.
2. Machine Location: Overhead
3. The motor shall have VVVF speed control.
4. The machine brake shall be electrically released, and spring applied and designed to give smooth stops under variable loads.

2.11 HOIST ROPES: NEW

- A. NEW elevators with the required number and size of ropes to ensure adequate traction for the range of loads with a factor of safety not less than that required by ASME A17.1 Section 2.20. Hoisting ropes shall be preformed 8 x 19 or 8 x 25 traction steel
- B. Securely attach a corrosion resistant metal data tag to one hoisting rope fastening on top of the elevator.
- C. NEW wedge type shackles.

2.12 GOVERNOR: NEW

- A. The elevator shall be protected from over-speeding in the down and up direction by a governor in the machine room (as required by the ASME A17.1 Elevator Code) safety devices on the elevator car frame.
- B. Rope Brake: A rope gripper safety device shall be installed as a secondary emergency braking means in addition to the emergency brakes as integrated with the drive machine and as required in the ASME A17.1 Elevator Code. Provide a detection system which detects over-speed in either direction and activate the rope gripper. Provide detection to protect against failures which result in slow speed movement away from the floor with the doors open and apply the rope gripper and stop the elevator within the distances required by the ASME A17.1 Elevator Code.
- C. Provide a new rope and deflection sheave.

2.13 CAR SAFETY DEVICE

- A. Recondition the Safeties on the elevator and test that meet the requirements of ASME A17.1 Section 2.17.
- B. Field testing of car safety and governor shall be as specified in Section 3.7 PRETEST and TEST of this specification.

2.14 ASCENDING CAR OVERSPEED PROTECTION: NEW

- A. NEW a device to prevent ascending over speed and unintended motion away from the landing when the doors are not locked in accordance with ASME A17.1 Section 2.19.

2.15 EMERGENCY BRAKE: NEW

The emergency brake is permitted to consist of one or more devices and shall (a) function to decelerate the car by acting on one or more of the following:

- A. Counterweight.
- B. Car.
- C. Suspension or compensation means system.
- D. Drive sheave of a traction machine.

- E. Brake drum or braking surface of the driving machine brake, NEWd that the driving-machine brake surface is integral (cast or welded) with or directly attached to the driving-machine sheave.
- F. Be independent of the driving-machine brake.

2.16 STANDARD RAILING - NEW

A standard railing shall be NEWd on the outside perimeter of the car enclosure top on all sides where the perpendicular distance between the edges of the car enclosure top and the adjacent hoistway enclosure exceeds 300 mm (12 in.) horizontal clearance and on sides where there is no hoistway enclosure. If clearances require the standard railing to be located more than 100 mm (4 in.) from the edge of the outside perimeter of the car enclosure top, the top of the car enclosure outside of the railing shall be clearly marked. The marking shall consist of alternating 100 mm (4 in.) diagonal red and white stripes.

A standard railing shall be substantially constructed of metal and shall consist of a top rail, intermediate rail or equivalent structural member or solid panel, and toe-board. The top rail shall have a smooth surface, and the upper surface shall be located at a vertical height of 1 070 mm (42 in.) from the working surface. The intermediate rail or equivalent structural member or solid panel shall be located approximately centered between the top rail and the working surface.

2.17 CAR AND COUNTERWEIGHT SPRING BUFFERS

Existing car and counterweight spring buffers shall be re-used. Buffers shall be load tested and tagged after equipment modifications.

The minimum stroke of the buffer shall comply with the Code.

The Buffer Plate Markings:

Maximum & minimum loads

Maximum striking speed

Buffer stroke

2.18 COUNTERWEIGHTS

- A. Elevator shall be counterweighted with the weight of the car plus 40-50 percent of the rated capacity load as required by the controller manufacturer.
- B. Furnish two (2) tie rods with cotter pins and double nuts at top and bottom. Install counterweight retainer plates or other approved means on tie rods to prevent

counterweight sub-weights from jumping and/or rattling. Both ends of tie-rods shall be visible and accessible.

- C. NEW counterweight guards in the pit in accordance with ASME A17.1 Section 2.3. (If apply)
- D. Perform the test balance and add weight if necessary.

2.19 CAR AND COUNTERWEIGHT ROLLER/SLIDE GUIDES: NEW

- A. NEW car and counterweight with adjustable roller guides.
- B. Each guide shall be of an approved type consisting of not less than three (3) wheels, each with a durable, resilient oil-resistant material tire rotating on ball bearings having sealed-in lubrication. Assemble rollers on a substantial metal base and mount to NEW continuous spring pressure contact of all wheels with the corresponding rail surfaces under all conditions of loading and operation. Secure the roller guides at top and bottom on each side of car frame and counterweight frame. All mounting bolts shall be fitted with nuts, flat washers, split lock washers, and if required, beveled washers.

2.20 GUIDE RAILS, SUPPORTS AND FASTENINGS

- A. Guide rails shall conform to ASME A17.1 Section 2.23. Verified their condition.
- B. Guide rails shall be clean and free of any signs of rust, grease, or abrasion before final inspection. Paint the shank and base of the T-section with two field coats of manufacturer's standard enamel.
- C. After completion of car safety testing during final inspection, all marks left on rails by application of car safety shall be filed smooth.

2.21 NORMAL AND FINAL TERMINAL STOPPING DEVICES: NEW

- A. Normal and final terminal stopping devices shall conform to ASME A17.1 Section 2.25.
- B. Mount terminal slowdown switches and direction limit switches on the elevator or in hoistway to reduce speed and bring car to an automatic stop at the terminal landings.

- a. Switches shall function with any load up to and including 125 percent of rated elevator capacity at any speed obtained in normal operation.
 - b. Switches, when opened, shall permit operation of elevator in reverse direction of travel.
- C. Mount final terminal stopping switches in the hoistway.
- a. Switches shall be positively opened should the car travel beyond the terminal direction limit switches.
 - b. Switches shall be independent of other stopping devices.
 - c. Switches, when opened, shall remove power from hoist motor, apply hoist machine brake, and prevent operation of car in either direction.
- D. After final stopping switches have been adjusted, through bolt switches to guide rail.

2.22 CROSSHEAD DATA PLATE AND CODE DATA PLATE: NEW

- A. Permanently attach a non-corrosive metal Data Plate to car crosshead. Data plate shall bear information required by ASME A17.1 Section 2.16.3 and 2.20.2.1.
- B. Permanently attach a Code Data Plate, in plain view, to the controller, ASME A17.1 Section 8.9.

2.23 WORKMAN'S LIGHTS AND OUTLETS: NEW

- A. NEW duplex GFCI protected type receptacles and lamps with guards on top of each elevator car and beneath the platform. The receptacles shall be in accordance with Fed. Spec. W-C-596 for Type D7, 2-pole, 3-wire grounded type, rated for 15 amperes and 125 volts.

2.24 TOP-OF-THE CAR OPERATING DEVICE: NEW

- A. NEW a car top operating device that meets the requirements of ASME A17.1 Section 2.26.
- B. The device shall be activated by a toggle switch mounted in the device. The switch shall be clearly marked "INSPECTION" and "NORMAL" on the faceplate, with 6 mm (1/4 in.) letters.
- C. Movement of the elevator shall be accomplished by the continuous pressure on a direction button and a safety button.
- D. NEW an emergency stop toggle type switch.
- E. NEW permanent identification for the operation of all components in the device.
- F. The device shall be permanently attached to the elevator crosshead on the side of the elevator nearest to the hoistway doors used for accessing the top of the car.

2.25 CAR LEVELING DEVICE: NEW

- A. Car shall be equipped with a two-way leveling device to automatically bring the car to within 3 mm (1/8 in.) of exact level with the landing for which a stop is initiated regardless of load in car or direction.
- B. If the car stops short or travels beyond the floor, the leveling device, within its zone shall automatically correct this condition and maintain the car within 3 mm (1/8 in.) of level with the floor landing regardless of the load carried.
- C. NEW encoded steel tape, steel tape with magnets or steel vanes with magnetic switches. Submit design for approval.

2.26 EMERGENCY STOP SWITCHES: NEW

- A. NEW an emergency stop switch for each top-of-car device, pit, machine spaces, service panel and firefighters' control panel inside the elevator. Mount stop switches in the pit adjacent to pit access door, at top of the pit ladder 1220 mm (48 in.) above the bottom landing sill and 1220 mm (48 in.) above the pit floor adjacent to the pit ladder.

- B. Each stop switch shall be red in color and shall have "STOP" and "RUN" positions legibly and indelibly identified.

2.27 SIGNAL DEVICES AND FIXTURES

- A. General: Provide vandal resistant signal fixtures and control devices. Buttons and signals shall be tampering resistant of the illuminated type that light-up when activated and remain lit until call or other function has been fulfilled.

B. Car Operating Station

1. Provide car operating station with faceplates flush with front returns. Station shall have illuminating pushbuttons numbered to conform to floors served. Buttons shall light to show registration and extinguish when car stops in response to a call. Buttons shall have a minimum dimension of 3/4", be raised 1/8" \pm 1/32" above the surrounding surface, be of square shouldered design, and have a detectable mechanical motion. A minimum clear space of 3/8" of other suitable means of separation shall be provided. Panel shall include an alarm bell button, Door Open and Door Close buttons. Provide an extended Door Hold button in each service elevator. All operating controls shall be located no higher than 48" above the car floor, the keyed in car stop switch and alarm button shall be located no lower than 35" above finished floor height. Provide in main car station a fire emergency service cabinet containing. Phase II emergency fire service switch, fire operating instructions, Stop button, Call Cancel button and Door Open and Door Close buttons. Provide FEO key.
2. Braille/Arabic designations shall be identified by a minimum of 5/8" Arabic numeral, standard alphabet character, or standard symbol immediately to the left of the control button. Braille shall be located immediately below the numeral, character or symbol. Controls and emergency equipment shall be identified by raised symbols, including but not limited to, door open, door close, alarm bell, emergency stop and telephone. The call button for the main entry floor shall be designated by a raised star at the left of the floor designations. Braille and Arabic designations shall be flush with inconspicuous mechanical mounting. The plaques shall have raised white colored numerals on a black background.
3. Provide a lockable service cabinet with concealed hinges.
 - a. Cabinet shall contain the following type controls:
 1. A light switch.
 2. Two speed fan switch.

3. Inspection keyswitch, conforming to the ASME Code.
4. Independent service keyswitch.
5. Emergency light test button.
6. Keyed stop switch.
7. A duplex 120-volt, A.C. G.F.C.I convenience outlet.
4. Provide a flush integral certificate frame for viewing the operating permit.
5. Provide engraved signage as follows with approved size and font.
 - a. Phase II firefighters' operating instructions on rear of locked Phase II compartment door.
 - b. Car number over main car operating panel.
 - c. Car capacity in pounds
 - d. 3/16" "Push for Alarm" and telephone usage instructions.

C. Car Position Indicators: Provide segmented digital readout type with 2" high (minimum) indications. Locate at top of the car operating panel at a height no lower than 6'-6" above the finished floor. Indicator shall provide car position and direction of travel and include an adjustable electronic floor passing chime. As the car passes or stops at a floor served by the elevator, the corresponding designation shall illuminate, and an audible signal will sound. The audible signal shall be no less than 20-decibels with a frequency no higher than 1500.

D. Floor Annunciator: Provide digitized voice annunciator providing female voices in a system capable of up to 5-minutes of speech. Messages shall include the following announcements:

1. Floor number.
2. Notice of doors closing prior to nudging operation.
3. Emergency operation announcements:
 - a. Firefighter's Service, "Elevator returning to lobby."
 - b. Seismic operation, "Elevator proceeding to next floor."
 - c. Car has exceeded it rated load, reduce load to resume operation.
 - d. Standby power activated, "Elevator returning to lobby," upon sequencing.
 - e. Security operation, "Elevator in Secure Operation, Exit Elevator Immediately", upon notification from ACAMS Controller.
 - f. Contractor/Installer to submit messages for Owner approval prior to fabrication.

E. Hall Buttons

1. Provide one riser of vandal resistant hall pushbuttons. Station shall include flush mounted faceplate. Centerline between 35 to 48 inches. Buttons shall have a minimum dimension of 3/4", be raised 1/8" \pm 1/32" above the surrounding

surface, be of square shouldered design, and have a detectable mechanical motion. A minimum clear space of 3/8" or other suitable means of separation shall be provided. Button design shall match those used on the car operating panel. Provide blue and/or green LED illumination. Provide 3-position Code required Phase I key switch and operational instructions engraved minimum 1/8" high on the faceplate, at the main lobby. Incorporate fire service. Faceplate edges shall be relieved. Finish shall be stainless steel No. 4 brushed finish.

G. Hall Lanterns: Provide UP and DOWN lanterns at intermediate landings, single lantern at terminal landings. Electronic chimes for each lantern shall sound once for up and twice for the down direction of travel. The lantern shall illuminate for corresponding direction of car travel and the chime shall sound when the elevator is at a predetermined distance from the scheduled floor stop. The design and location of the hall lanterns shall be in the existing position. Faceplate finish matching hall buttons.

H. Hoistway Access Switches: Provide without faceplate

2.28 AUTO DIAL TELEPHONE SYSTEM: NEW

- A. Furnish and install a complete ADA compliant intercommunication system.
- B. NEW a two-way communication device in the car with automatic dialing, tracking and recall features with shielded wiring to car controller in machine room. NEW dialer with automatic rollover capability with minimum two numbers.
- C. "HELP" button shall illuminate and flash when call is acknowledged. Button shall match floor push button design.
- D. NEW "HELP" button tactile symbol engraved signage and Braille adjacent to button mounted integral with car operating panels.
- E. The auto dial system shall be located in the auxiliary car operating panel. The speaker and unit shall be mounted on the backside of the perforated stainless-steel plate cover.
- F. Each elevator shall have individual phone numbers.
- G. If the operator ends the call, the phone shall be able to redial immediately.

2.29 HOISTWAY ENTRANCES

The hall door system must be restored. This should include the replacement of the door rollers, eccentric, *springs*, track nylon, nylon retainer, NEW security door and double door shoes, etc... Rehabilitate the interior hallway doors removing rust, sanding, and then painting with anticorrosive paint accordingly. Where require, NEW fascia between floors where require.

2.30 ELECTRIC INTERLOCKS: NEW

- A. Equip each hoistway door with an interlock, functioning as hoistway unit system, to prevent operation of car until all hoistway doors are locked in closed position. Hoistway door interlocks shall not be accepted unless they meet the requirements of ASME A17.1 Section 2.12.
- B. Equip car doors with electric contact that prevents operation of car until doors are closed unless car is operating in leveling zone or hoistway access switch is used. Locate door contact to prevent its being tampered with from inside of car. Car door contact shall not be accepted unless it meets the requirements of ASME A17.1 Section 2.12.
- C. Wiring installed from the hoistway riser to each door interlock shall be NEC type SF-2 or equivalent. Type SF-2 cable terminations in the interlock housing shall be sleeved with glass braid fillers or equivalent.
- D. NEW devices, either mechanical or electrical, that shall prevent operation of the elevator in event of damaged or defective door equipment that has permitted an independent car or hoistway door panel to remain in the "unclosed" and "unlocked" position.

2.31 CAR SLING: REUSE EXISTING CAR SLINGS

Present car frame shall be checked for proper alignment and correct it if necessary. All bolt connections shall be checked, tightened or replaced, where necessary.

2.32 CAR PLATFORM

The underside of the platform shall be retaining.

The platform shall consist of a structural steel frame with a wood floor.

This flooring shall be recessed to accept the thickness of the specified flooring.

The platform shall be mounted on rubber pads to create an isolating cushion between the car and the steel car frame.

The platform shall contain a steel toe guard at the leading edge of the car entrance.

THE EXISTING CONDITION OF THE PLATFORM IS NOT KNOWN FOR BEING COVERED WITH THE RUBBER FLOOR.

2.33 CAR ENCLOSURE FOR ELEVATORS - NEW

- A. Car enclosure shall be NEW.
- B. All wall panels, entrance columns, ceiling, entrance head-jamb and transom shall be 14-gauge stainless steel full height of car.
- C. Handrails shall be NEd on all non-access walls. The top of the gripping surfaces of the handrails shall be at a height of 800 mm to 920 mm (31.5 in. to 36.2 in.), with a space of 35 mm to 45 mm (1.4 in. to 1.8 in.) between the handrails and wall.
- D. The level of illumination at the car controls, platform, car threshold, and landing sill shall be 100 lx (10 fc) minimum.
- E. Exhaust Fan: An exhaust fan shall be mounted on the car top. NEW an exhaust-type ventilation system in the elevator cab. Ten maximum noise levels when operating at high speed shall not exceed 44 db as measured at 36" above the floor.

NOTE: The specifications of the cab decoration may vary at the request of the owner

2.34 POWER DOOR OPERATORS: NEW

- A. NEW **GAL's MOVFRW** door operator with encoder-less VVVF drive or approved equal. Closed loop door operator designed to operate car and hoistway doors simultaneously at the speed specified. Door shall open automatically when car

stops at landing to discharge passengers or to answer valid calls and close automatically after predetermined time interval has elapsed. The doors shall be capable of smooth and quiet operation without slam or shock. Door operator to have the following features:

- a. 1/2 hp motor and heavy-duty sprocket, chain, belt, and sheaves.
 - b. Closed loop regulated speed performance.
 - c. Hand-held keypad programming.
 - d. Adjustments can be stored in the keypad and downloaded to another operator.
 - e. Adjustable door obstruction reversal unit.
 - f. Optical cams with LED indicators.
 - g. Test switches for open, close, nudging and speed zone set up.
 - h. Universal inputs for open, close, and nudging.
 - i. Reversing switch to back up the door reversal device.
- B. Hoistway doors and car gates shall be manually operable in an emergency without disconnecting the power door operating equipment unless the car is outside the unlocking zone:
- a. It shall not be possible for the doors to open by power unless the elevator is within the leveling zone.
 - b. Doors shall be NEWd with a door-reopening device that will function to stop and reopen a car door and an adjacent landing door to at least 910 mm (36 in.), in case the car door is obstructed while closing. This reopening device shall also be capable of sensing an object or person in the path of a closing door at a nominal 125 mm \pm 25 mm (5 in. \pm 1 in.) and 735 mm \pm 25 mm (29 in. \pm 1 in.) above the floor without requiring contact for activation, although contact may occur before the door reverses.

- C. Should the doors be prevented from closing for more than a predetermined adjustable interval of 20 to 60 seconds by operation of the curtain unit, the doors shall stay open, the audio voice message and a buzzer located on the car shall sound only on automatic operation:
- a. If an obstruction of the doors should not activate the photo-electric door control device and prevent the doors from closing for more than a predetermined adjustable interval of 15 to 30 seconds, the doors shall reverse to the fully open position and remain open until the "Door Close" button re-establishes the closing cycle.
- D. NEW door "OPEN" and "CLOSE" buttons. When the door "OPEN" button is pressed and held, the doors, if in the open position, shall remain open and if the doors are closing, they shall stop, reverse and re-open. Momentary pressure of the door "CLOSE" button shall initiate the closing of the doors prior to the expiration of the normal door open time.

2.35 FLOOR/CAR DESIGNATIONS: NEW

Raised character and Braille floor designations shall be NEW on both jambs of elevator hoistway entrances and shall be centered at 1 525mm (60 in.) above the floor, measured from the baseline of the characters. A raised star placed immediately to the left of the floor designation shall also be NEW on both jambs at the main entry level. Such characters shall be 50 mm (2 in.) high and shall comply with Clause E-20.2 of the ASME A 17.1-2010.

2.36 CAR TOP EMERGENCY EXIT ELECTRICAL DEVICE.

An electrical device shall be NEW on the car top emergency exit cover.

2.37 FIREFIGHTERS SERVICE

- A. Firefighters' Service as per ASME A17.1 Section 2.27.
- B. Provide the pictogram indicating that the elevator cannot be used in case of fire as established by the code.
- C. Smoke Detectors:

- a. Smoke detection devices that are designated for actuation of Elevator Phase I "FIRE SERVICE" response in each elevator lobby, top of hoistway, and machine room shall be NEW by others.
 - i. Elevator lobby smoke detectors shall activate only the elevators sharing the corresponding or common lobby.
 - ii. Top of hoistway smoke detectors shall activate fire recall and the top of hoistway motorized vent.
 - iii. Elevator or group of elevators serving separate isolated areas of the same floor shall have an independent smoke detection system.
 - iv. Machine room smoke detectors shall activate fire recall for each and every elevator with equipment located in that machine room.

2.38 HOISTWAY VENTING: NEW

Hoistway shall be NEW with means to prevent the accumulation of smoke and hot gases. A smoke venting system is required for the elevator hoistway to comply with rule 2.1.4 of ANSI.1-2010, Elevator Safety Code. Louver size shall be equal to 3% of the floor area of the hoistway with a minimum area of 3 square feet PER ELEVATOR.

2.39 MAIN LINE FUSED DISCONNECTS:

- A. Reuse existing mainline fused disconnects.
- B. NEW wires from disconnect to controller.

2.40 SEISMIC REQUIREMENTS

- A. Meet the requirements of ASME A17.1 Section 8.4, Elevator Safety Requirements for Seismic Risk Zone 2 or greater.
- B. Support and maintain hoisting machines, controllers, supervisory panels, governors and pit sheaves in place to prevent any component from sliding, rotating, overturning, or jumping under conditions imposed by seismic forces.
- C. NEW hoisting machines mounted on vibration isolators with separate isolated seismic restraints.

- D. Controllers and supervisory panel shall be bolted to the floor, and NEWd with sway braces at the top. Secure all electrical components within the panels to the panel frame. Fit cabinet doors with positive locking latches.
- E. NEW two counterweight derailment sensing wires vertically on the car side of the counterweight the entire height of travel. The counterweight frame shall be equipped with four derailment rings. NEW counterweight displacement switch. In the event the switch is activated, the corresponding elevator shall stop immediately and then proceed in the direction away from the counterweight to the next floor at a speed not exceeding 0.76 m/s (150 FPM). Upon arrival at the next floor, the elevator shall shut down with its door open. An indicator pilot light shall illuminate when the counterweight derailment detector is activated. This pilot shall be fully identified and shall be located in the machine room indicator panel, or if no machine room indicator panel is specified, locate pilot light in a conspicuous place on the front of the elevator controller, not obstructed by controller door panels.
- F. NEW seismic switch to activate seismic operation, a minimum of one seismic switch per elevator or group of elevators.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine work of other trades on which the work of this Section depends. Report defects to the Owner Representative in writing that may affect the work of this alteration.
- B. Ensure that machine room is properly illuminated, ventilated, and equipment correctly located complete with floor and access door.
- C. Before fabrication, take necessary job site measurements. Check measurement of space for equipment and means of access for installation and operation.

3.2-INSTALLATION

- A. Perform work with competent Elevator Mechanics and Apprentices skilled in this work and under the direct supervision of the Elevator Company's experienced foreman.

- B. Install machinery, guides, controls, car and all equipment and accessories in accordance with manufacturer's instructions, applicable codes and standards.

3.3 ARRANGEMENT OF EQUIPMENT

Clearance around elevator, mechanical and electrical equipment shall comply with applicable provisions of NEC. Arrange equipment in machine room so that major equipment components can be removed for repair or replacement without dismantling or removing other equipment in the same machine room. Locate controller near and visible to its respective hoisting machine.

3.4 WORKMANSHIP AND PROTECTION

- A. Installations shall be performed by Elevator Mechanics and Apprentices to best possible industry standards. Details of the installation shall be mechanically and electrically correct. Materials and equipment shall be new and without imperfections.
- B. Recesses, cutouts, slots, holes, patching, grouting, refinishing to accommodate installation of equipment shall be included in the Company's work. All new holes in concrete shall be core drilled.
- C. Structural members shall not be cut or altered. Work in place that is damaged or defaced shall be restored equal to original new condition.
- D. Finished work shall be straight, plumb, level, and square with smooth surfaces and lines. All machinery and equipment shall be protected against dirt, water, or mechanical injury. At final completion, all work shall be thoroughly cleaned and delivered in perfect unblemished condition.
- E. Beams, slabs, or other building construction protruding more than four inches into the hoistway, all top surfaces shall be beveled at an angle of at least 75 degrees to the horizontal.
- F. Sleeves for conduit and other small holes shall project 50 mm (2 in.) above concrete slabs.

- G. Hoist cables that are exposed to accidental contact in the machine room and pit shall be completely enclosed with 16-gauge sheet metal or expanded metal or guards.
- H. Exposed gears, sprockets, and sheaves shall be guarded from accidental contact in accordance with ASME A17.1 Section 2.10.

3.5 CLEANING

- A. Keep machine room and equipment clean at all times during construction period
- B. Perform hoistway clean down.
- C. Prior to final acceptance; remove protective coverings from finished or ornamental surfaces. Clean and polish surfaces with regard to type of material.

3.6 PAINTING AND FINISHING

- A. Hoist machine, motor, shall be painted with manufacturer's standard finish and color.
- B. Controller, sheave, car frame and platform, counterweight, beams, rails and buffers, except their machined surfaces, cams, brackets and all other uncoated ferrous metal items shall be painted one factory priming coat or approved equal.
- C. Upon completion of installation and prior to final inspection, all equipment shall be thoroughly cleaned of grease, oil, cement, plaster and other debris.
- D. Field painting of governors shall be in accordance with ASME A17.1 Rule 2.18.3.1.
- E. Stencil or apply decal floor designations not less than 100 mm (4 in.) high on hoistway doors, fascias or walls within door restrictor areas as required by ASME A17.1 Rule 2.29.2. The color of paint used shall contrast with the color of the surfaces to which it is applied.
- F. Elevator hoisting machine, controller, governor, main line shunt trip circuit breaker, safety plank, and cross head of car shall be identified by 100 mm (4 in.) high numerals and letters located as directed. Numerals shall contrast with surrounding color and shall be stenciled or decaled.

G. Hoistway Entrances:

- a. Door panels shall be packetized or given equivalent rust resistant treatment and a factory finish of one coat of baked-on primer and one factory finish coat of baked-on enamel.
- b. Fascia plates, top and bottom shear guards, dust covers, hanger covers, and other metalwork, including built-in or hidden work and structural metal, (except stainless steel entrance frames and surfaces to receive baked enamel finish) shall be given one approved prime coat of paint of approved color.
- c. All surfaces of door frames, door panels, and cab interior surfaces that become damaged or marred shall be restored to original condition before final acceptance of work.

3.7 PRE-TESTS AND TESTS

Pre-test the elevator and related equipment for proper operation before requesting final inspection. Conduct final inspection at other than normal working hours, if required by Owner.

Procedure outlined in the Inspectors Manual for Electric Elevators, ASME A17.2 shall apply.

Final test shall be conducted in the presence of and witnessed by a Certified Elevator Inspector.

Company shall furnish the following test instruments and materials on-site and at the designated time of inspection: properly marked test weights, voltmeter, amp probe, thermometers, direct reading tachometer, megohmmeter, vibration meter, sound meter, light meter, stopwatch, and a means of two-way communication.

Inspect workmanship, equipment furnished, and installation for specification compliance.

Balance Tests: The percent of counterbalance shall be checked by placing test weights in car until the car and counterweight are equal in weight when located at the mid-point

of travel. If the actual percent of counterbalance does not conform to the specification, the amount of counterweight shall be adjusted until conformance is reached.

Full-Load Run Test: Elevators shall be tested for a period of one-hour continuous run with full contract load in the car. The test run shall consist of the elevator stopping at all floors, in either direction of travel, for not less than five or more than ten seconds per floor.

Speed Test: The actual speed of the elevator shall be determined in both directions of travel with full contract load, balanced load and no load in the elevator. Speed shall be determined by applying a certified tachometer to the car hoisting ropes or governor rope. The actual measured speed of the elevator with all loads in either direction shall be within three (3) percent of specified rated speed. Full speed runs shall be quiet and free from vibration and sway.

Car Leveling Test: Elevator car leveling devices shall be tested for accuracy of leveling at all floors with no load in car, balanced load in car, and with contract load in car, in both directions of travel. Accuracy of floor level shall be within plus or minus 3 mm (1/8 in.) of level with any landing floor for which the stop has been initiated regardless of load in car or direction of travel. The car leveling device shall automatically correct over travel as well as under travel and shall maintain the car floor within plus or minus 3 mm (1/8 in.) of level with the landing floor regardless of change in load.

Brake Test: The action of the brake shall be prompt and a smooth stop shall result in the up and down directions of travel with no load and rated load in the elevator. Down stopping shall be tested with 125 percent of rated load in the elevator.

Safety Devices and Governor Tests: The safety devices and governor shall be tested as required by ASME A17.1 Section 8.10.

Overload Devices: Test all overload current protection devices in the system at final inspection.

Limit Stops:

The position of the car when stopped by each of the normal limit stops with no load and with contract load in the car shall be accurately measured.

Final position of the elevator relative to the terminal landings shall be determined when the elevator has been stopped by the final limits. The lower limit stop shall be made with

contract load in the elevator. Elevator shall be operated at inspection speed for both tests. Normal limit stopping devices shall be inoperative for the tests.

Oil Buffer Tests: These tests shall be conducted with operating device and limit stops inoperative and with contract load in the elevator for the car buffer and with no load in the elevator for the counterweight buffer. Preliminary test shall be made at the lowest (leveling) speed. Final tests shall be conducted at contract speed. Buffers shall compress and return to the fully extended position without oil leakage.

Setting of Car Door Contacts: The position of the car door at which the elevator may be started shall be measured. The distance from full closure shall not exceed that required by ASME A17.1. The test shall be made with the hoistway doors closed or the hoistway door contact inoperative.

Setting of Interlocks: The position of the hoistway door at which the elevator may be started shall be measured and shall not exceed ASME A17.1 requirements.

Operating and Signal System: The elevator shall be operated by the operating devices NEW and the operation signals and automatic floor leveling shall function in accordance with requirements specified. Starting, stopping and leveling shall be smooth and comfortable without appreciable steps of acceleration or deceleration.

Evidence of malfunction in any tested system or parts of equipment that occurs during the testing shall be corrected, repaired, or replaced at no additional cost to the Owner and the test repeated.

3.8 MAINTENANCE SERVICE

The modernized elevator system shall be guaranteed for a period of 3 month, beginning with the completion and acceptance by the Owner of the last elevator.

If the company who wins the bid it's not the company that offers ongoing maintenance, the current maintainer will have to remove these two units of the existing contract.

This contract will cover full maintenance, which includes emergency call back service, inspections and preventive maintenance of each of the elevators listed in the Elevator Schedule. The Elevator Company shall be required to perform MONTHLY inspections during the 3 months maintenance period. During the inspections visit, the Elevator Company shall clean, adjust, repair, replace and lubricate the equipment. Determine the

nature and extent of any trouble required to restore the elevators to satisfactory service, and if conditions warrant, furnish and install parts.

A general guide for maintenance is providing:

MONTHLY CHECK ITEMS	
HOISTWAY & CAR TOP	Check lube and lubrication top car and cwt. Rails. Observe bolts, joints and brackets. Checks lube O. H. thieves and bearings. Observe all hoistway switches and vane. Observe shoes, radios and cable hitch. Observe conduit, fittings and fastenings. Check tension and hitch of hoist cables. Check guide shoes, gibes, rollers and tires. Check door operator and retiring cam.
CAR	Check car light, stop switch. and alarm bell. Check operating devices and signal lamps. Check operations of car doors and gates. Check door or gates contact, safety edge and photo electric beams. Observe stop and leveling at all floors.
CORRIDOR	Test operation of all doors and gates. Test operation of interlocks and contacts. Check hall buttons and indicator lamps.
QUARTERLY CHECK ITEMS	
HOISTWAY & CAR TOP	Check and tighten all belts, brackets and fastenings in hoistway. Clean and lube all hoistway door hangers. Clean and check contacts and actuators. Clean and lubricate hoistway door hangers. Clean and adjust door operator contacts, motor brushes, belt, and chain, cords, and clutch and safety edge.
CAR	Check and tighten all bolts on sling. Check fastenings and bolts for cams, safety, cards and compensating chain. Check conduit and electric wiring.
PIT	Test Buffers and pit stop switch.

	Check tail sheaves, bolts, hangers, and bearings.
ANNUAL AND SEMI-ANNUAL CHECK ITEMS	
MISCELANEOUS	Brush and vacuum clean hoistway. Conduct annual safety test. Check bottom gibes of car and hall doors. Test all door hangers for up thrust. Check lubrication of ball and roller bearings.

When and as required, motors, controllers, relay panels, selectors, leveling devices, operating devices, switches, in car and in hoistway, hoistway door and car door or gate operating device, interlock-contacts, guide shoes, guide rails, car door sills, hangers for doors, car doors or gates, signal system, car safety device, governors, tension and sheaves in pit shall be cleaned, lubricated and adjusted.

Furnish all lubricant, cleaning materials and parts required.

Cleaning Services: Guide rails, overhead sheaves and beams, counterweight frames, bottom of platforms and machine room's floors shall be brushed cleaned at least once every four month. Car tops shall be cleaned monthly. All accumulated rubbish shall be removed from the pits monthly. A general cleaning of the entire installation including all machine room equipment and hoistway equipment shall be accomplished quarterly. Necessary cleaning supplies, vacuum cleaner, shall be furnished by the Company.

Adjustment Services: All hoistway ropes shall be examined and the tension shall be adjusted whenever necessary to insure maintenance of adequate safety factors.

Materials to Be Furnished: The Elevator Company shall furnish all lubricants, cleaning supplies and tools necessary to perform the work described above. All lubricants shall be as recommended by the manufacturer of the equipment.

This guarantee service shall not include the performance of any work required as a result of vandalism, accidents due to improper use, like overloading the cabin, or negligence, for which the Company is not directly responsible.

NEW 24 hour emergency call-back service, which shall consist of promptly responding to calls within three (3) hours, for emergency service if a shutdown or emergency difficulty develops between regular examinations. It shall be 1 hour for "trap calls".

Service and emergency personnel shall report to the authorized representative upon arrival at the Building and again upon completion of the required work. A copy of the work ticket containing a complete description of the work performed shall be given to the authorized representative.

3.9 EXECUTION

Due to the type of building, the requested job has its limitations and needs to be performed as follows:

It is necessary to include, in the proposal, an average completion time that will include the possibility to deliver an elevator. The time that the project will last will be 18 months after the order to proceed is issued.

Work must begin as soon as requested by the Owner.

The execution of this item will be discussed at the Pre-Bid meeting.

3.10 BIDDER'S QUALIFICATIONS

Each bidder must submit literature of the equipment it intends to furnish. Bids submitted without the equipment's literature will not be considered.

To qualify each bidder, they must submit a list of clients to whom similar work has been performed in the last ten years. The list must include names, addresses and the contact person telephone number, for each job.

3.11 ELEVATOR COMPANY RESPONSIBILITIES

The Elevator Company should be bound to the Owner by the terms of this Request for Proposal in addition to the Contract Agreement. The Company shall pay for all material, equipment and labor used in, or in connection with the performance of the work. In carrying out the work, the Company shall take necessary precautions to properly protect the other trades finished work, from damages caused by his operations, including existing improvements.

The Elevator Company shall keep the building and premises clean, at all times, of any debris generated during development of this Contract.

The Elevator Company shall take all responsible safety precautions with respect to the Work. The Elevator Company shall comply with all safety measures initiated by the Owner and with all applicable laws, ordinances, rules regulations and orders, of any public authority for the safety of all people and/or property, in accordance with the Contract Agreement requirements.

The Elevator Company warrants that all material and equipment to be furnished and incorporated by him in the Project shall be new unless otherwise specified, and that all work under the Contract shall be of good quality, free from faults and defects and in conformance with the Contracts Documents.

The Elevator Company Shall comply with federal, State and local tax laws, social security acts, unemployment compensation acts and workmen's compensation acts, insofar as applicable to the performance of the work.

Insurance Conditions

Prior to starting work, the Company shall obtain the required insurance from a responsible insurer, and shall furnish satisfactory insurance evidence to the Owner, as required by the Contract Agreement.

Documents to be submitted

The Company shall submit the following documents and comply with the following requirements, in order to qualify with the evaluation of his Proposal:

Proposed Schedule for payments.

Detailed Work Plan and Time Schedule: Include special conditions necessary to meet our target dates.

Letter guaranteeing Quotation Price for 90 days.

Quotation of the Preventive Maintenance of the actual units, during the work been done.

Quotation of Preventive Maintenance after the modernization.

A list of inventory items of the suggested equipment.

A list technician and year of experience.

List of references.

Evidence that the company has a liability insurance of not less than \$ 1 million.

NEW evidence that their technicians are factory trained for installed the proposed equipment.

3.12 SPECIAL CONDITIONS

As the elevator installation is completed, the Owner may accept and use the elevators, shut them down, or accept them under an Interim Service Agreement described below:

ACCEPTANCE

Final acceptance of the installation shall be made only after all field inspections and tests are complete, punch list items are complete, all submittals have been furnished, and the Owner's representative is satisfied and confirms that the installation has been satisfactorily completed.

PRE-BID

The Elevator Company, before delivering the final proposal, will visit the BUILDING for a technical consultation visit for any clarification of the scope for the proposed work.