SECTION 14220

ELECTRIC TRACTION PASSENGER ELEVATOR RENOVATION WORK

PART I – GENERAL

1.01 SECTION INCLUDES

A. Elevator and other renovation work, including all labor, materials, tools, supervision, hoists or cranes, project management, coordination, insurance, engineering, fabrication and related costs or responsibilities necessary to complete all of the work required under this contract. The Dover Elevator brand electric traction passenger elevators involved in this renovation project are identified by State of Florida elevator serial numbers 39350 (elevator no. 1) and 39351 (elevator no. 1). All of the specified requirements, general conditions, project manual sections, special project instructions, notices and other communications listed in Section 14220, as well as all other sections in the Project Manual or Construction Documents, shall apply to this contract. This contract is intended to be a "turn-key" project, wherein the Elevator Contractor is to function as a General Contractor in terms of contract responsibility. In general, the following work is required under this contract:

1. Provide all of the elevator renovation project work required by Section 14220, as hereinafter described. A basic outline of the work includes materials and installation labor for the following:

   a. New permanent magnet type, alternating current design, gearless driving machines to replace the existing geared type machines and related driving machine hardware, all as specified hereinafter. Existing hoist cable deflector sheaves and sheave supports shall be removed and discarded.

   b. New digitally controlled elevator control systems complete, to replace the existing control systems, with new motor drives, group supervisory controls, floor selector equipment and related electronic and mechanical gear and hardware, all as specified hereinafter.

   c. New door operator equipment complete, to replace the existing door operators, including new door operator machines, digitally operated door operator controls, door safety screen devices, door interlocks, door interlock release mechanisms, door track and hanger equipment, door closers, door relating system hardware items, and all other door related equipment, all as specified hereinafter.

   d. New over-speed governor equipment, governor rope tail sheaves, governor ropes and related gear, to replace all existing similar components, as specified hereinafter.

   e. New signal fixtures at all landings and in elevator cabs, to replace all existing fixtures for the elevators, as specified hereinafter. The Elevator Contractor shall be completely responsible for all cutting (including granite, marble, drywall or other surfaces) existing materials which surround the elevator hoist way entrances, column covers or other locations, where signal fixtures are mounted. The Elevator Contractor

shall also remove any unwanted signage, and suitably patch any holes in the stone or drywall materials, with matching colors of materials. All painting and finish color coordination work is required under this contract. Additionally, any required concrete cutting and patching in machine room and hoist way areas shall be the responsibility of the Elevator Contractor.

f. Specified New Cab Equipment, and materials for renovation of the existing elevator cabs, including the following: New swing type front return panels and operating devices, new stationary front return panels, new cab doors, new LED type cab lighting, new signal fixtures, new covering for cab transoms, new car entrance strike columns, new covering for cab bases and reveal areas, recovering of existing cab wall panels, new car top exit panels with new car top exit panel safety switches, and related items, all as specified hereinafter.

g. New hoist ropes, new 2:1 cable sheaves on top of cars and on the counterweights, new sheave mountings and supports, as well as related equipment, as specified hereinafter.

h. Original equipment manufacturer (or successor company) replacement roller guide wheels for elevator cars and counterweights, to replace all existing roller guide wheels, as specified hereinafter.

i. Furnish and install new emergency telephone equipment, and intercommunication equipment between the elevator cabs, elevator machine room area and the firemen's emergency panel/elevator monitoring panel. The equipment shall be a combination system that provides all such functions, as specified hereinafter.

j. New Whisperflex brand cable type hoist rope compensation for elevators, as required hereinafter.

k. Remove all existing door guide shoes on hoist way doors, and replace with new heavy duty type guide shoes and door retainer devices, as specified hereinafter.

l. Furnish and install all new electrical wiring conductors, electrical devices, controls, and other materials, whatsoever, to replace all existing wiring and conductors in the elevator cars, machine rooms and hoist way areas. In addition, the Elevator Contactor shall furnish and install all additional wiring, whatsoever required, to meet all needs for this project, as specified hereinafter (in all sections of the project requirements), or as required by all applicable codes, operations and provisions that must be met under this project. This includes requirements of the Owner relative to security or restrictive operation controls, as follows:

   1) Floor restriction devices.

   2) Connect the security cameras to existing wiring which leads to the building monitoring location, located on the Calhoun Street Level.

   3) Firemen's recall operation.

4) Emergency power signal wiring. Connect to the existing wiring, as required by the Owner.

5) Elevator monitoring lobby and control panels, to be mounted adjacent to the alarm and fire safety panels on the Monroe Street level, to include new control features, and future connections for all elevators in the building. Currently, this work shall include all wiring to the two (2) recently renovated elevators no. 6 & 7, and to elevators no. 1 & 2, which are included in this contract.

6) Any other devices as required for the project.

m. Provide suitably designed safety barricades, at least 7'-0", constructed of painted plywood, hinged doors and safety locks. Barriers shall be installed at all openings when work is being performed. Include all suitable warning signs. Barriers shall meet all requirements of the Owner, Project Engineer and Elevator Consultant.

n. Provide multiple, professionally designed and constructed signage in appropriate locations indicating the elevators are being renovated. Signage must meet Owner and Engineer's approval. Coordinate the signage with Owner and Project Engineer before removing any elevator equipment from service.

o. Remove existing pit ladders and replace with new ladders that extend at least 60" above the lowest land threshold. Two (2) ladders are required. Ladders shall meet all code requirements.

p. Copy of the technical specification requirements listed hereinafter, and all other project specifications shall be provided to the mechanic in charge of this project.

q. Supervision and management of all subcontractors or suppliers providing work on this project. The Owner shall not accept any delays caused by sub-contractors, and the Elevator Contractor shall make the required arrangements to avoid same.

r. Elevator Contractor work shall be performed on the basis of a five (5) day per week schedule, working one (1) shift, except on holidays observed by the Elevator Contractor's work force. Some work will be required during times when the facility is not in normal operations, including overtime and weekend hours. The Elevator Contractor shall anticipate the overtime work and include all such costs in the bid for this work. Work performed by the sub-contractors of the Elevator Contractor shall be accomplished on the same basis.

s. Other work as specified hereinafter.

1.02 OTHER WORK

A. Other Project Requirements:

1. Under this contract, the Elevator Contractor shall be responsible for providing all work required for the entire project, and such work to be included in his or her bid price.

Refer to the Project Drawings/Project Specifications. This includes any required mechanical, electrical, general construction or other types of work or services necessary to complete the entire project, in addition to Section 14220 (Elevator Specifications. This includes:

a. All General construction work as required, including: patching holes in hoist ways; cutting of walls or column covers in locations of new signal fixtures; installation of and electrical power to elevator monitoring panel to be located in building alarm center location; cutting of floor area in machine room area, improvements associated with machine room/hoist way venting system, as required; and all other such work.

b. All Electrical work as required, including: fire alarm system; emergency communication systems; required heat and smoke detectors; connections for emergency power transfer system for elevators; added pit lighting; added machine room lighting; all other electrical work, whatsoever, required for the project.

c. Any required replacements to the Mechanical Systems work, including that which may be required of the machine room air conditioning equipment and related requirements.

d. Any additional work required in the Project Manual or Specifications.

1.03 REFERENCES

A. Regulatory Requirements:

1. Elevator Code, ASME A17.1-2010, including all published addenda.

2. Requirements of the State of Florida, Bureau of Elevator Safety, and Florida Building Code for Existing Buildings. This includes Chapter 399, Statute 61-C5 and all other State of Florida documents pertaining to elevator equipment and elevator installations.

3. ASME A17.1 Safety Code for Elevator Electrical Equipment, latest edition.

4. NFPA 70 National Electrical Code, latest edition approved by State of Florida.

5. Americans with Disabilities Act – Accessibilities Guidelines (ADAAG), latest edition.

6. AWS – American Welding, for all welding methods and certifications related to elevator equipment, and equipment installation.

7. All other State of Florida and Local Codes, and Fire Department Requirements.

B. Fire Rated Hoist way Entrance Interlock Wiring Materials:

1. All new interlock wiring materials and methods shall comply with all requirements of ASME A17.1 and National Electrical Code. Wiring shall be SF-2, as required by the National Electrical Code.

1.04 SUBMITTALS

A. Submittal Documents:

1. The Elevator Contractor shall submit all shop drawings, cut sheets, samples and other forms of submittals in accordance with the requirements herein described, or in accordance with general requirements listed elsewhere in the Project Requirements or Instructions. All submittals shall be promptly delivered to the Project Engineer for distribution and handling. All submittals required for approval shall be submitted in the quantities required, and approved prior to any fabrication on the equipment being provided under the contract. Provide all submittals on the elevator work in one (1) submittal package that includes all such requirements.

B. Product Data and/or Shop Drawings: Provide five (5) copies of each of the following:

1. Car and landing signal fixture and operating device layout drawings. This includes layouts and all details for the elevator emergency monitoring system, with all specified components as described hereinafter.

2. Car door opening restrictor devices that comply with ASME A17.1.

3. Driving machines motors and associated information.

4. General layout drawings of the machine room area, showing equipment layout.

5. Over-speed governors and governor rope tail sheave assemblies, including governor mounted encoders.

6. Cut-sheets on electrical controllers, motor controls and related equipment. Include information and data on the types, designs and manufacturers of the electronic filters systems to be provided to alleviate any undesirable electrical harmonics associated with elevator power feeders and regenerated elevator power system.

7. Roller guide wheels as replacement items. OEM cut sheets for replacement roller guide wheels will be acceptable for submittal.

8. Layouts of cab replacement components and equipment, as specified hereinafter. Include finish information, metal gauges and related information.

9. LED type cab lighting replacement system and devices, and all information on the types and designs of new lighting being furnished.

10. Cab emergency lighting system, utilizing a portion of normal lighting fixtures.

11. All 2:1 roping components, sheaves, hardware, etc. for car suspension.

12. Hoist rope information, including size, design, construction and manufacturer proposed.

13. Emergency telephone and communication system.

14. Elevator door safety screen system.

15. Door operator equipment complete, digital controls, mechanical components, etc.

16. Hoist way door guide shoe assemblies and door retainer devices.

17. Hoist rope compensation devices, including cables, anti-sway devices, safety retainers, etc.

18. Hoist rope lubricator devices.

19. Load weighing system.

20. Voice announcement system for elevator operation.

21. Outline and features of Advanced Information Management System for elevator control systems.

22. Any other elevator components required under this contract.

23. All product data on field applied paint, coatings of all types, etc., which will be field applied.

C. Metal Samples:

1. Provide five (5) samples of all metal to be provided for signal fixtures, cab front materials, cab doors, or other locations.

2. Samples shall be at least 4" by 4" in size, all with no. 4 satin finish.

D. Permits, Inspections, Tests and Other Records:

1. Provide five (5) copies of all such records to Engineer when the records are received from the sources.

E. Operation, Adjustment, Maintenance, Testing, and Trouble-shooting Data Requirements:

1. Elevator Contactor shall provide all of the following materials in three (3) copies, as specified hereinafter.

2. Project and serial number specific installation instructions, adjustment instructions, trouble-shooting instructions, maintenance and service data, test instructions, and related data on all elevator equipment or components which are incorporated into this elevator system. This includes the elevator controller system, motor control system, door operator system, signal fixtures, safety switches, interlocks, door safety screen system, elevator drive motors, governors, roller guides, and other elevator electrical and mechanical components or systems.

3. All wiring diagrams and electrical data (project specific) for elevator controller systems, motor drive systems, hoist way wiring systems, signal fixture systems, job site "pull

sheets" for field wiring, connection diagrams, wiring marker systems, etc. Drawings shall be on 8.5" by 11" size, suitable for inclusion in loose-leaf binder format. Also, include one (1) additional set of all drawings on heavy gauge (24 pound, high rag content black on white paper) drawing paper suitable for reproduction, when needed. Provide the large drawings in a heavy paper or plastic tube with screw on cap. Mark tube with contents and job identification.

4. All controller function details and operation features shall be furnished, including but not limited to the following: system entry codes, SIM cards, legends, passwords, malfunction codes, operation codes, test codes, connections, and all other information or equipment that will allow a competent elevator contractor to perform all necessary tests, operational diagnosis or adjustments to the controller systems without the need for any outside assistance, whatsoever.

5. Provide complete controller, motor control and door operator software for these elevator systems. If the systems require preprogrammed chips, software or devices for entry, these devices shall also be provided during closeout of project.

6. Provide project specific parts lists for all parts utilized on the elevator systems.

7. Provide typed instructions for proper cleaning and maintenance on the architectural surfaces furnished under this contract.

8. All materials shall be furnished in heavy duty three (3) ring binders, with oversized covers and positive locking devices to prevent pages from easily falling out.

9. Provide suitable project identification labels on binders, including the edge of the binders.

F. Special Tools and Equipment:

1. Any special tools, terminals, hand held devices of any type, SIM cards and any similar equipment necessary to access the elevator controllers, motor controllers, door operators or any other components or systems for maintenance, adjustments trouble-shooting, resetting of operational parameters, or any type of testing, shall be provided to Engineer during final acceptance and close-out of this project. Failure to do so will result in withholding of final payment until the devices are turned over for examination by Engineer and Elevator Consultant.

2. Any special tools shall be designed to recognize only the controller and component serial numbers for which the equipment is supplied to operate, and cannot be utilized on other elevators at a different location.

3. In the elevator machine room, install the following, to be used for elevator system evaluation, adjusting, trouble-shooting, testing and other purposes:

a. Small wooden or metal desk and chair.

b. New, high quality, laptop computer terminal, with serialized system protection capabilities, and fully programmed for these elevators. Secure the computer to the desk to prevent easy removal. Provide plastic covers to protect equipment.

c. Ink jet copier, with plastic cover.

d. Ethernet cable connected to elevator controllers.

e. Software program for evaluating all elevator performance, as well as making adjustments or testing of each elevator controller system. This includes advanced Information Management System, capable of accessing and evaluating all elevator electrical components, from multiple locations.

4. Elevator Contractor bidder shall provide a letter of commitment from the Elevator Contractor, signed by an executive of the elevator company, stating that the Elevator Contractor is committed to providing all of the requirements listed in items 1.04, E & F, if awarded the contract for this work. Additionally, this Elevator Contractor shall confirm that the company shall provide, at the standard replacement parts prices, all replacement necessary parts, supplies and equipment to the Owner or Elevator Contractor agent, whom may be maintaining the elevator equipment, after the Warranty and Maintenance period has expired.

1.05 QUALITY ASSURANCE

A. Elevator Equipment Manufacturer and Elevator Contractor Qualifications:

1. In the interest of continuity and highest quality, the Elevator Equipment Manufacturer and Elevator Contractor shall be owned by the same parent firm, and shall have been regularly engaged in design, manufacturing, installation, maintenance, repair, and modernization of high quality commercial elevator equipment for a period of no less than ten (10) years. The experience of the Elevator Manufacturing and Elevator Contracting firm shall have at least ten (10) years experience in the Leon County, performing work at least equal to the type of work to be performed under this contract.

2. For purposes of these project requirements, the elevator manufacturing portion of the firm shall be the manufacturer shall be the manufacturer of at least the following components: elevator electrical controller system, the motor controller system, signal fixtures and elevator monitoring system, door operator machines and door equipment, door equipment control system, as well as the driving machine design and assembly.

3. Only new components are acceptable. No rebuilt or reconditioned parts are permitted to be brought onto the site.

4. The elevator components are required to be products of the highest elevator industry manufacturing standards.

5. The major components shall be manufactured in North America, except that a portion of gearless driving machine can be imported if the component has a solid, verifiable track record of high performance and reliability.

B. The following Elevator Manufacturers – Elevator Contractors are provided with pre-approval, provided the firm fully complies with every aspect and condition of these technical specifications. Any firm named, that does not intend to completely comply with all specified requirements listed herein shall be deemed an unqualified bidder for this project.

1. Otis Elevator Company.

2. Schindler Elevator Corporation

3. ThyssenKrupp Elevator Corporation

C. Bidders shall have a well established local sales and business office located in the City of Tallahassee, Florida, equipped with a local branch manager, secretary in the office to handle day to day business matters, local supervision of maintenance and repair staff, local field mechanics to provide the elevator renovation work, local maintenance mechanics which live within 20 miles of the building site, local parts and tools storage facility and an exceptionally good reputation for servicing their clients in the local community. Companies that have a "store-front" operation only for storage of parts do not meet the requirements of these contract provisions.

D. Any other bidders wishing to submit a bid shall provide all of the necessary evaluation information, including information on the firm, equipment proposed to be used, all design details, and any other materials necessary for consideration, at least 18 calendar days prior to the bid date, for complete evaluation by Owner, Project Engineer and Elevator Consultant. Any firm who do not have an exceptional reputation for performance with this Owner, or whom fails to meet any of the specific requirements listed in "C" above can anticipate not being approved for this project. Additionally, a complete listing of all maintenance contract accounts in the Tallahassee, Florida area, including location, address, contact persons and phone numbers, is required at least 18 days prior to the bid date so that any and all of the accounts can be contacted.

Further, any Elevator Contractor wishing to bid shall provide a complete list of all similar completed projects within the Tallahassee, Florida, market area (extending out 50 miles in each direction, using the Leon County Courthouse, as the center). Provide the names of the projects, size of the projects, locations of the projects, age of the completed work, contact persons and phone numbers.

Any other interested bidders, who obtain approval to bid, shall be approved by addendum.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver elevator materials and equipment in equipment manufacturer's protective packaging. All packing materials shall be disposed of at the sole expense of the Elevator Contractor.

B. Store all materials in a dry, protected area. Protect and handle the materials in accordance with the manufacturer's recommendations. Storage space on the building site is extremely

limited, and delivery of the materials shall be arranged for in advance with the Owner's Representative. The elevator equipment, supplies, tools and materials will require storage off-site, and delivered to the site as the materials are needed for the project. Owner shall not be responsible for any added costs related to storage, cartage and similar costs.

C. Elevator Contactor shall be responsible for removing, from the building site, all of the materials that are not to be reused or retained on the renovation project. The Elevator Contractor shall take title to the scrap materials upon removal from the elevator systems, and lawfully dispose of the materials as his expense. All materials that are being disposed of shall be removed from the site on a daily basis, except for small items that can be temporarily stored in a location acceptable to the Owner. Items temporarily stored at any agreed upon location must be removed from the site at least two (2) times per week. Elevator Contractor shall arrange for and pay for the rental of a "trash container" or "dumpster" of adequate size to hold the materials without overflowing beyond the design capacity. No equipment or debris, which is removed from the elevator systems, or surrounding areas, shall remain on the site after the renovation has been completed. Close coordination with Owner's Representatives shall be paramount throughout the course of this contract.

D. Hoisting of all materials to the elevator machine room shall be at the sole expense and responsibility of the Elevator Contractor, including the use of cranes, hoists, derricks, or similar equipment. Any damage caused by the Elevator Contractor to the existing roofs, roof structures, or to any areas inside or outside the building(s) shall be repaired at the sole expense of the Elevator Contractor. It shall be the responsibility of the Elevator Contractor to suitably coordinate the use of cranes, hoists, derricks or other such equipment during non peak periods to avoid disrupting street traffic or causing a safety hazard to pedestrians. Coordination with Owner's Representatives, and other officials, is a major requirement of this contract.

1.07 PROJECT CONDITIONS

A. Prohibited Use: The elevator equipment shall not be used to handle passengers, or otherwise be put into public use, during the time of renovation or alteration work being performed on either elevator. After completion of the renovation work on each elevator, the completed elevator shall be returned to unlimited passenger service.

B. Each of the two (2) elevators covered under this contract, shall be removed from building service, one (1) at a time, and for the shortest possible time period. The elevator work on this project shall be based on one (1) shift per day, working five (5) days per week, except for no work on holidays. No more than one (1) elevator shall be out of service at one time, except that the Elevator Contractor shall allow sufficient time for work on overtime to arrange switch-over of the elevator systems at times other than during the regular workdays for the building staff and visitors to the complex. At least 24 hours of overtime work shall be necessary during this process, including materials hoisting work on weekends; however, the Elevator Contractor shall provide all necessary overtime needed to accomplish the task, regardless of the hours required.

   This is a "time is of the essence" and "high quality performance" contract.

C. Elevator Contractor shall attend all scheduled coordination meetings.

D. Painting: All of the following elevator equipment shall be field painted during the elevator equipment renovation:

1. Tops of elevator cabs, bottoms and sides of platforms, safety plank assemblies, roller guide assemblies (prior to installation of new rollers), cross-heads and car frames, guide rails and brackets, overhead machine support beams, pit buffers and buffer supports, 2:1 sheaves and sheave support assemblies, counterweight assemblies complete, and all other metal items in the hoist ways. Separator beams and beam supports must be cleaned and painted. Repaint the new governor rope tension sheaves, weight assemblies and swing arm devices.

2. Hoist way door fascia, backs of hoist way doors, headers, toe guards, and dust covers.

3. Driving machines motors, mounting frames & bedplates, sheaves, machine hardware and electrical apparatus. All controller equipment that is not powder coated at the factory, shall be repainted in the field. Electrical cabinets, electrical boxes of all types, electrical dust work, electrical conduit and all other items in the machine room area, shall be repainted in the field, including all galvanized boxes.

4. Coat the machined blades of the guide rails and the polished pistons on the pit buffers with high quality, fast drying type, machinist bluing materials to retard rust and corrosion on the machined surfaces. Use Dykem brand bluing materials, typically used by machinists in connection with machining work, gear alignment, and other such tasks.

5. Paint or install new floor numbers on the rear of all hoist way door panels.

6. Paint the elevator pits with two coats of high quality, water based, gray colored, gloss finish, floor and deck enamel after all work has been completed.

7. Paint the machine room floor with two (2) coats of high quality, water based, gray colored, gloss finish, floor and deck enamel after all work has been completed.

8. Paint the machine room ceiling and walls.

9. Any unnecessary holes in the machine room floor shall be neatly patched prior to painting of the machine room floor area.

1.08 WARRANTY PROVISIONS

A. Submit Elevator Manufacturer's and Elevator Contractor's written project warranty agreeing provide labor, materials and supplies to repair, replace or otherwise restore materials or workmanship on all elevator components or systems, whether or not furnished new under this contract. The warranty does not extend to existing finishes on hoist way doors or cabs, except for materials replaced under this contract.

Warranty period shall be for a period of twelve (12) months, commencing when renovation work on both elevators have been fully completed and accepted by the Owner, Engineer and Elevator Consultant.

1.09 MAINTENANCE PROVISIONS

A. Elevator Contractor shall provide complete elevator maintenance for twelve (12) months after the work on the last elevator has been fully completed and accepted as final by the Owner, Engineer and Elevator Consultant.

B. The Elevator Contractor shall provide complete maintenance on all of the elevator system equipment, commencing one (1) month prior to removing the first elevator from service for renovation work, and for one (1) full year after the second elevator has been fully completed and accepted by Owner, Engineer and Elevator Consultant. The total maintenance period is anticipated to be approximately 17-18 months; however, this is only an estimate. During this time period, the Elevator Contractor shall provide all labor, supplies, parts, components, equipment, repairs, lubricants, cleaning, adjusting, testing, bulbs, supervision, tools, 24-hour call-back service on 24/7 basis, and all other work whatsoever to properly maintain the elevator equipment.

   All routine maintenance on this elevator equipment, when an elevator is out of service for renovation purposes, shall be provided during overtime hours. The regularly scheduled maintenance is not permitted to occur during busy times within the facility, and must be scheduled during a time period agreed upon by the Owner.

C. The Elevator Contractor shall provide response to call-backs within 30 minutes from the time a call is received during regular working hours, and within one (1) hour during overtime hours, including holidays, weekends and other times.

D. The elevators shall be examined at least one (1) per month, during a time period that is convenient to the Owner, for a period of not less than two (2) hours per elevator, on the site, per regular maintenance examination. The total time per month, for both elevators, shall be a minimum of four (4) hours. All work on the elevators shall be provided by a certified mechanic, who holds a Certificate of Competency card issued by State of Florida. Helpers or "Temporary Mechanics" are not permitted to answer call-backs or perform any work on these elevator unless a certified mechanic is on site at the time the work is performed.

E. Near the time of termination of the maintenance included in this contract, the Elevator Contractor shall provide the following work as a requirement of this contract:

   1. Fully clean all of the elevator equipment in the machine room, hoist way, pit area and on the car top.

   2. Fully clean the interiors of the elevator electrical controller panels.

   3. Verify that all telephone and intercommunication equipment is fully functional. Correct any malfunctions that may exist.

   4. Verify that the emergency lighting and alarm bell systems are fully functional. Correct any malfunctions.

   5. Adjust the door operation to comply with the door times and operating conditions shown in these technical specifications.

   6. Verify that all floor leveling is accurate, and in compliance with these specifications.

7. Remove all rattles, squeaks, noises, vibrations, or other conditions that detract from the quality of the elevator installation.

8. Tighten all components of the elevator cab, doors and other such components. Replace all worn door guide shoes.

9. Perform all tests that are to be performed, as a requirement of the State of Florida.

10. Lubricate all equipment that requires such attention on a regular basis.

11. Adjust all roller guides and other items that impact ride comfort. Replace all roller guide wheels that do not provide high quality ride characteristics.

12. Adjust the tension on all hoist ropes to within five (5) pounds of the adjacent ropes.

13. As necessary, adjust the governor ropes to allow the governor rope tail sheave assembly support bracket to be no lower than in a horizontal position.

14. Provide the Owner with written certification that all required work has been performed in accordance with these requirements.

15. Arrange, at least ten (10) calendar days in advance of the end of the maintenance included in this contract, for the Owner and Elevator Consultant to evaluate the work performed by the Elevator Contractor. Any deficiencies found shall be corrected by the Elevator Contractor before being released from the contract requirements.

PART II – PRODUCTS

2.01 MATERIALS, GENERAL

A. The elevator related materials to be utilized in the renovation of two (2) existing Dover Elevator Company brand passenger elevators located in Leon County Courthouse, are as contained in this section of the elevator technical specifications.

B. The new materials to be incorporated into the elevator system are clearly defined in this specifications section.

C. The existing materials to be removed and replaced with new materials are clearly defined in this specification section.

D. The materials that are to be entirely removed from the elevators are clearly identified.

2.02 SCHEDULE OF EQUIPMENT

A. Renovation of two (2) existing Dover Elevator brand electric traction passenger elevators.

B. Machine type: New gearless type, permanent magnet motor, alternating current design; roped 2:1, to match the design of the new gearless machines recently installed on elevators no. 6 & 7 in the same Courthouse complex.

C. Machine location: Overhead, in machine room, above hoist way, on existing machine support beams.

D. Capacity: 3,500 pounds, net lifting capacity.

E. Speed: 450 feet per minute, in both directions, under full load on the elevators.

F. Travel Distance: Existing travel is approximately 98'-0." Elevator Contractor shall verify the actual travel distance.

G. Stops: Nine (9, on each elevator. Elevator Contractor shall verify the stops.

H. Openings: Nine (9), on each elevator, on same side of the hoist way. Elevator Contractor shall verify the opening locations.

I. Operation: Two-car group automatic system, with fully programmable, digitally controlled, microprocessor based control system.

J. Control: Variable frequency, variable voltage, alternating current, with regenerative power saver feature and power filtering systems.

K. Doors: Car and hoist way doors are motorized, center-opening type, side sliding, passenger elevator type doors, 3'-6" wide by 7'-0" high. Elevator Contractor shall verify opening sizes.

L. Cab design: Passenger type, with alterations as specified hereinafter.

M. Power supply: 480 volts, 3 phase, 60 cycles.

N. Warranty and maintenance: Twelve (12) months after completion of second elevator. Comply with complete requirements listed herein.

2.03 HOIST WAY MATERIALS

A. The following materials located in the hoist way area shall be either retained and reused, or completely replaced with new materials, as specifically indicated hereinafter.

1. Guide Rails and Rail Support Brackets: All such materials, including all of the heavy steel mountings for the guide rails for car and counterweight assembly, shall be retained and reused under this contract. All of these materials, including the separator beams between the elevators, shall all be cleaned and painted as required under Painting. Check the mountings for the guide rails and guide rail brackets, and correct any defects found. Bluing material is required on the machined surfaces of all guide rails, as required under Painting.

2. Counterweight Assembly: The entire assembly shall be retained and reused under this contract. The existing roller guide wheels shall be removed and replaced with original equipment manufacturer (available from successor company) replacement roller guide wheels, under this contract. Adjust roller guides for proper rail contact.

   The amount of weight in the counterweight assembly shall be increased or decreased, depending upon the weight required to compensate for changes in cab weight, counterweight ratio and other appurtenances or changes associated with the renovation

of the elevator car, door operator, cab and counterweight assembly. The Elevator Contractor shall pay for any additional weights, and labor to install same, as may be required to properly adjust the overall weight of the complete counterweight assembly. The weight of the counterweight assembly shall be increased to provide 50% counterweight, compared to the net lifting capacity of the elevator system. The complete counterweight systems shall be cleaned and painted.

3. Elevator Car Frame, Platform, Safety Device mounted under the Car, Platform Brace Rods and Related Materials: These items of materials hall be retained and reused under this contract. All of the fasteners shall be checked, and replaced as may be necessary. All of the car equipment shall be cleaned and painted in accordance with the Painting section of the elevator specifications. Safety switch for the under car safety device shall be retained, and checked for proper operation. In the event the safety switch does not operate correctly, replace or repair the switch at the expense of the Elevator Contractor.

   The toe guard or safety apron on the elevator car platform shall be replaced with a new toe guard to comply with the ASME A17.1-2010 Safety Code for Elevators. Paint the toe guard with two (2) coats of gloss black machinery enamel, and install 3M brand 4" wide black and yellow safety marking tape across the full width of the opening, just below the threshold.

   Car safety device and safety switch shall be tested at full load on the car.

4. Car Guide Assemblies: The existing car roller guide assemblies shall be completely cleaned, lubricated and painted, and all roller wheels shall be replaced with new original manufacturer equipment (successor company) roller guide wheels. The tires for the roller guides shall be high quality neoprene type, designed for long life and comfortable ride characteristics. Adjust the roller guides to function according to the manufacturer's installation and adjustment instructions.

5. Hoist Ropes, Rope Shackles & Hardware: The hoist ropes and rope shackles shall be removed and replaced under this contract. Furnish and install proper number, size and construction for the new elevator drive sheave assembly, recommended by the elevator driving machine equipment manufacturer. Rope shackles shall be wedge type design. Condition the rope shackles against rusting and corrosion. Install a new hoist rope tag indicating manufacturer, type of rope construction and date of installation, any other code required information, on a dead end hitch in the machine room area. Hoist ropes shall be equipped with a hoist rope lubricator device, which is to be adjusted to dispense only a small amount of cable lubricant onto the ropes. Lubrication device shall be grounded to the elevator driving machine.

6. Hoist Rope Compounding & Deflector Sheaves in Hoist way: Furnish and install new hoisting rope compounding and deflector sheaves located in the machine room and hoist way area, as part of the driving equipment system, to replace all existing sheaves. All sheaves shall be metallic construction, and shall be thoroughly cleaned and field painted according to Painting requirements. No plastic or non-metallic sheaves are permitted on this project.

   Hoist rope compound sheaves shall be added to top of counterweight assembly and top of elevator car, to modify the existing roping arrangement from 1:1 to 2:1 roping. All necessary hardware, sheaves, guards, reinforcements, and other changes shall be

included in this contract. All materials shall be factory and field painted as required by the Painting requirements.

The existing hoist rope deflector sheaves and sheave mountings shall be removed and discarded, at the expense of the Elevator Contractor.

7. Compensating Cables, Brackets and Other Such Hardware: The Elevator Contractor shall furnish and install new hoist rope compensation equipment on these elevators, equal to the quality and performance to Draka Elevator Products, Whisperflex cable design, with suitable sway elimination equipment, devices and hardware mounted in the pit area. Install and adjust the equipment to provide noiseless operation and long service life. Take all necessary precautions to prevent the cables from rubbing on elevator cars or cabs. All metallic materials and hardware shall be painted as required by Painting specifications.

8. Pit Buffers: The existing oil-type pit buffers, located under the elevator car and counterweight, shall all be retained and reused under this contract. Add additional buffers, or modify the existing buffers, as required, to accommodate the required hoist rope compensation equipment. The buffers and buffer supports shall all be thoroughly cleaned and repainted, as required by the Painting specifications.

   Pit buffers shall be drained, flushed and refilled with new approved buffer oil of the proper characteristics as approved by the original buffer manufacturer. Install a metal tag on each buffer indicating the type and manufacturer of oil that is installed in the buffers. Clean and polish the plungers, and coat each plunger with fast drying machinist bluing material to retard rust and corrosion. Paint the exterior of each buffer when work has been completed. Additionally, each buffer must be tested when the elevator work has been completed.

9. Machinery Support Beams at Top of Hoist way: The existing beams shall remain in place and be reused during the elevator renovation. Add any additional beams or supports as may be required for the new hoisting equipment and 2:1 roping arrangement. Any additional costs incurred by the Elevator Contractor shall be included in the contract for elevator renovation. All of the machinery beams shall be thoroughly cleaned and painted, as required by the Painting specifications.

10. Governor Rope Tension Sheave, Weight Assembly and Swing Arm: The existing governor rope tension sheave, weight and swing arm assembly shall be removed and replaced with all new equipment. The swing arm assembly shall be installed in a manner that it remains near or slightly above the horizontal position after rope stretch. Factory paint and field paint all of this equipment, as specified by Painting specifications.

11. Hoist way Doors and Frames: The hoist way door frames shall be retained and reused during the elevator renovation. The existing doors shall all be retained and reused under this contract. Install new rubber type door astragals on the leading edges of all door panels, at all floors. Install two (2) new heavy duty type guide shoes on each door panel, using renewable door gibs of the proper width and quality to fit the existing threshold grooves.

    Furnish and install new machined, solid steel type, hoist way door tracks, door hangers and rollers, relating cables and accessory hardware.

Furnish and install devices at the bottom of the doors to restrict the doors from becoming disengaged from thresholds during a fire emergency.

New door tracks and hangers shall have a coating that retards rust and corrosion.

12. Hoist way Door Frame Marking Plates: Remove and replace all existing hoist way door frame marking plates, and replace the plates all frame locations with new cast bronze and cast stainless steel (provide cast stainless steel plates on floors without bronze entrance frames) plates equal in quality to Entrada Braille, Minneapolis, MN. Plates shall be model Entrada Braille, model VP4.. Submit samples for approval.

    Plates shall have high quality adhesive backing to properly secure the plates to the frames.

13. Hoist way Entrance Thresholds: All of the existing hoist way entrance thresholds shall be cleaned and polished to improve the appearance. Except for existing major damage to the metal surface, the thresholds shall appear to be new when the work is completed by the Elevator Contractor. The thresholds shall be cleaned inside the hoist way, as well. Any thresholds that appear to be damaged beyond long term serviceability shall be replaced at the expense of the Elevator Contractor.

14. Fascia, Headers, Toe Guards and Dust Covers: Retain and reuse all of these existing materials under this contract, provided they are suitable for long term, continued use. In the event any such materials are damaged, or are missing, furnish and install new components under the contract requirements. All materials in this category shall be cleaned and painted as specified under the Painting specifications.

15. Hoist way Interlock Assemblies: All existing hoist way interlocks, at all openings shall be removed and replaced with new interlock assemblies, complete. All equipment shall be painted as specified under Painting specifications.

16. Hoist way Interlock Release Mechanisms: All existing door interlock release roller/crank mechanisms, hooks, lift rods, roller assemblies and related hardware shall be completely replaced under this elevator renovation contract. All such devices shall be adjusted to function properly to provide safe and reliable operation. All devices shall be protected against rust and corrosion, as required under Painting specifications.

17. Car and Hoist way Door Operator and Door Safety Equipment: All of the existing car and hoist way door operator equipment shall be removed and replaced with new heavy duty door operator equipment, including complete new door operator machines, heavy duty operator motors, digitally operated and programmable door operator controls, car door switches, solid steel machined car door tracks, steel car door hangers, car door opening restrictors, car door clutches, car door electronic type safety edge equipment and miscellaneous door operator hardware. New door operators shall have the following features:

    a. Heavy duty type drive motors, at least ½ horsepower, alternating current design.

    b. Door operator shall be of heavy duty gearless type, with highly effective harmonic motion door drive system. Door system shall be designed to easily handle the weight and size of the door panels in the door equipment.

c. Door operator controls shall be microprocessor based, software oriented design, completely "closed loop" type design, manufactured exclusively for high quality elevator door controls.

d. Operator controls shall be easily adjustable, with adjustable parameters that can be set under field conditions, from the top of the elevator cab. Provide a hand-held programming device or complete on-board diagnostics for programming purposes.

e. A precise digital encoder shall be furnished on door drive operator motor shaft.

f. Provide door position recognition.

g. Provide door velocity recognition.

h. Provide door motor current monitoring and regulation.

i. Provide door closing pressure recognition. Set door closing pressure at 18-20 pounds of pressure. If pre-set door closing pressure occurs during a closing operation, the doors shall immediately stop closing and automatically reopen to full open position.

j. Include high quality retractable type car door clutch on each car door assembly.

k. Include door obstruction warning: If the doors are obstructed from closing for a period of approximately 15-20 seconds (provide an adjustable timer with a range of 10 to 30 seconds), an audible warning shall occur and continue to sound until the doorway is cleared of obstructions; however, the doors shall not attempt to close during this time period. When the doorway has been cleared of obstructions, the doors shall close at the normal rate of speed, continuing to be accompanied by sounding of the audible device that warned of obstructions in the door way. The audible sound shall continue until the door is fully closed, when it has been obstructed. The electronic door safety monitoring device shall remain activated during the door closing cycle.

l. Door close watchdog: If the doors are closing, but do not fully close after a programmable time period, the doors shall be capable of recycling to open position for up to 10 times to attempt to clear the fault in the door system or obstruction in the door threshold, before the elevator is automatically removed from continued service. The recycling program shall be adjustable for up to 20 times, which can be pre-set by elevator technician.

m. Door close assist: When the doors have failed to completely close due to high air differential in the hoist way area, or obstructions in the thresholds, the door operator drive motor shall have an increased torque applied to possibly overcome the mechanical obstruction or a differential air pressure problem, and allow the door to close completely. Door close assist torque shall never exceed 30 pounds of pressure during any closing operation.

n. Door open time saver: If the car is stopping in response to a car call assignment only, the current door open time is changed to a shorter field programmable time when the electronic door safety detection system is activated by a passenger moving through the doorway.

o. Door time variable: When the car stops to respond to hall call only, the door time shall be reduced after the electronic door safety system is activated and the car-call button is pushed.

p. Door operator designs without all of these features are not acceptable under this contract.

q. Door opening time period required, measured from door fully closed position, shall be 1.8 seconds.

r. Door closing time period required, measured from door fully open position, shall be 2.3 seconds.

18. Hoist way and Car Door Up-thrusts or Eccentrics: All door up-thrusts or eccentrics shall be set at .005" running clearance, in all locations.

19. Electronic Car Door Safety Screen: The existing door protection device shall be removed and replaced with completely new door protection device on the cab doors. The new devices shall be equal in design, operation and performance to that manufactured by Janus Elevator Products, Inc. The new safety screen shall have 3-D feature and Panachrome lighting system incorporated into the safety screen. The Panachrome system shall feature green lighting, mounted vertically along the electronic edge, indicating it is safe to enter the doorway, and orange/red lighting in the same area indicating that the doors are ready to close or are closing, and passengers should not enter the doorway during this time. All electrical connections should be located on the car top out of reach of unauthorized persons. Provide a defeat switch on the car top for removal of the 3-D function, if so elected by the Owner.

20. Electrical Switches, Electronic Scanners, Cams & Brackets: The Elevator Contractor shall furnish and install all new hoist way switches, cams and brackets for all suitable switches in the hoist way, including leveling, re-leveling, limit switches, terminal switches, hoist way access switches and similar devices. All cams, brackets, and hardware shall be painted after installation, as required by Painting specifications. Also, include stainless steel, perforated tape system, if selected by Elevator Contractor, for use in car absolute positioning in the hoist way area.

21. Pit Ladders: Elevator Contractor shall furnish and install a high quality, steel ladder in the pit that extends from the pit floor to at least 60" above the lowest landing of the elevator. Ladder construction and mounting shall meet all applicable code requirements. Paint ladder according to Paint specifications.

22. Safety Railing on Car Top: The car top shall be equipped with a safety railing system to meet the current code requirements. Railing shall be mounted securely, and braced to retard deflection as much as possible. Mount auxiliary car top lighting on the rear safety railing. Paint railing according to Painting specifications.

2.04 MACHINE ROOM EQUIPMENT

A. Driving Machine: The existing Dover Elevator brand geared traction driving machines shall be completely removed and replaced with a new permanent magnet type, inverter grade,

alternating current drive, gearless machines, mounted in the machinery room, directly over the hoist way. The new gearless machines shall include the following:

1. Drive Motors: Shall be permanent magnet type rotor design, with totally enclosed motor frame assembly. Motor shall have at least "F" type insulation. New motors shall be exceptionally quiet in operation, and function without vibration or other undesirable conditions.

2. Brake Assemblies: The dual brake assemblies shall be capable of stopping and holding a fully loaded car, including all of the requirements of preventing unintended motion of the elevator car. This braking systems shall be designed to meet all such requirements of ASME A17.1-2010 Safety Code for Elevators and Escalators.

   Brake assembly shall be adjusted and tested as required by ASME A17.1-2010 Safety Code for Elevators and Escalators, using a full load of test weights on the elevator car. The machine brake assemblies shall be smooth in operation, exceptionally quiet and very reliable. One brake assembly on each machine shall be capable of stopping and holding the elevator; however, dual brakes are to provided for additional breaking back-up feature.

   Electrical switches on the brake assemblies shall be adjusted to prevent the machine from operating unless the brake pads have been lifted off the brake rotors.

3. Drive Sheave Assembly: This driving machine shall have a replaceable drive sheave assembly, designed to handle the number of ropes required for the application. The drive sheave shall be metal of the correct degree of hardness for the rope tensile strength. Provide rope guards to prevent the rope from leaving the drive sheave during an emergency stop condition.

4. Bearings and Seals: Machines shall be constructed with replaceable roller or ball bearings that are designed for extra long life service and friction free operation. Bearings shall be designed for a service life of at least 25 years.

5. Isolation Pads For Driving Machines: Rubber insulated pads shall be incorporated into the machine mounting frame assemblies, to alleviate vibrations from being transmitted to the building structure. These pads shall be replaceable, as may be necessary during the life of the driving machines.

6. Design the elevator driving systems to function per elevator code without need for addition of a secondary braking system to prevent unintended upward movement of the elevator car.

7. Field paint all of the driving machinery and machine support equipment, after installation work has been completed, in accordance with the Painting specifications.

B. Over-speed Governors: The existing over-speed governors shall be removed and replaced with a new over-speed assemblies, which includes electrical encoder devices and over-speed cut-off switches. The over-speed governors shall be factory adjusted and tested to trip at the correct tripping speed, and the entire assemblies shall be tested in the field after installation. The governor assemblies shall be repainted in the field after installation, and tested in accordance with all requirements of ASME A17.1 Safety Code.

The over-speed governors shall be operated by a new rope assembly of the proper size and construction, as required for operation of the governor.

Paint all over-speed equipment shall be as required by Painting specifications.

C. Motor Control Assemblies: The existing elevator motor controls shall be removed and replaced with new programmable, digitally operated controls to operate the new alternating current, permanent magnet type, gearless, hoisting machine motors. The new motor controls shall be microprocessor type, software oriented, vector controlled pulse width modulated alternating current drive systems. The variable voltage, variable frequency drive shall convert the alternating current power supply using a two-part process to a variable voltage, variable frequency power supply to the hoist machine drive motor. Speed control shall be by means of vector control providing independent excitation and torque current. Furnish a digital encoder on the driving machine motor, providing feedback to the motor controller on the speed of the motor and the position in the hoist way. Motor control shall provide for exceptionally smooth, efficient, expedient and quiet operation of the elevator. Provide all necessary electrical line isolation filters and other devices as may be necessary to minimize the total harmonic line distortion and noise generated by the elevator equipment. In addition to all other required filtering components, the elevator control systems shall include the following filtering system:
   1. Filter shall be KEB-America, Model Z1, or equal product, of ample capacity and effectiveness.
   2. Low loss, at least 99% efficient, passive design.
   3. Meet IEEE design 519 distortion effectiveness standards.
   4. Low unity power factor.
   5. Targeted <8%THiD at rated load.

   Also, include car position and velocity feed-back control feed-back on the over-speed governor or other suitable means. Elevator motor controller equipment shall be equal to that manufactured by ThyssenKrupp Elevator, Model 10K Drive with Regen Drive, Otis Elevator, Model 411 VVVF- PMAC Regen Drive, or Magnetek Model Series II 900HVP-PMAC-Regen Drive.

   Motor Control System shall include **Regenerative Power Recovery Feature**. The use of resistors to absorb normal regenerative power from hoist motor is not acceptable under this contract.

   The Elevator Contractor shall also furnish and install a high capacity isolation transformer, where required to control the electrical harmonic distortions which would otherwise be introduced into the building power supply system during regenerative power operation and where developed by the electronic type motor drive system.

D. Elevator Controller Systems: The existing electro-mechanical elevator controller system shall be completely removed and replaced with a completely new microprocessor type, software oriented controller system, using up-to-date design architecture. The systems shall operate in real time, continuously analyzing the position and condition of the elevator. Control of the elevator shall be by means of push-buttons located at each elevator landing, with "up-down" buttons at all intermediate floors and single call buttons at each terminal landing. The operation shall be a two-car microprocessor group supervisory type system using the latest state-of-the-art technology especially designed for elevator control systems to maximize the

level of efficiency in serving the varying traffic needs in the building, while minimizing the passenger waiting times and travel times. The system shall electronically calculate and continuously evaluate the service demand, and shall automatically change directions as required. The elevator control system shall be capable of providing serial communications with car and landing signal fixtures.

Elevator control systems shall be equal in design to Otis Elevator, Model Elevonics 411 or ThyssenKrupp Elevator, Model no. TAC 50-04.

There shall be one (1) riser of pushbuttons for the elevators, installed at all floor openings. The elevators are installed in the same hoist way area.

The elevator control system shall be fully capable of resetting automatically in the event of a power failure which does not damage the elevator control equipment or trip an electrical overload on the motor control system.

Additionally, the following features shall be included in the elevator electrical controller system:

1. Meet all requirements of ASME A17.1-2010 Safety Code for Elevators and Escalators, and all published addenda.

2. Main floor coverage when elevators in group remain idle for two (2) minutes.

3. Independent service operation, from key switch in service cabinet in car.

4. Emergency power operation, including operational delays for power transfer, for emergency power use by Owner. Provide selector switch in main landing operating station. Switch shall be marked according to the existing marking for four (4) elevators (namely Auto-1-2-3-5) which are to be controlled by the same switch. Numbering of elevators may be different, if desired by Owner. Verify switch markings with Owner prior to development of the signal fixture shop drawings. Also, emergency power selection switches shall be provided in the elevator monitoring panel

5. Digital position indicator operation in the cars, at all floors, and in the elevator monitoring panel, all with direction arrows indicating direction of car travel.

6. Dual car riding lanterns in each car, with single chime for up direction and double chime for down direction. Volume for chime shall be adjustable.

7. Door operation control interface, for car top mounted, high quality, "closed loop" door operator control systems.

8. Floor passing chime in car operating panels.

9. Digitally operated, combination load weighing and cable tension analysis system shall be provided. Fully adjustable, microprocessor type. Also, system shall be used for anti-nuisance, motor pre-torque, overload conditions, elevator load by-pass, roll-back prevention due to varying loads. A special jewel shall illuminate and a chime shall sound if elevator becomes overloaded. If car becomes overloaded, the elevator doors shall not close until the load is reduced to the acceptable capacity.

10. Door closing interference warning system. (See door operator equipment operation, and voice announcement system)

11. Controller shall have baked enamel (or baked-on power coat) finish and, and equipped with swing doors. Lift-off type doors are not acceptable. Controllers with galvanized finish do not meet these requirements.

12. Controller equipment shall have cooling fans which shut off after a predetermined period of idle time.

13. Controller shall be designed for floor mounting or wall mounting.

14. Hoist way access controls, top and bottom terminals, rendered operable by key operated switch in elevator cab maintenance cabinet.

15. Control for cab lighting system, to shut down the cab lighting and exhaust blower after five (5) minutes (adjustable timer, from 5-20 minutes), provided the car is idle and doors are closed. Arrange wiring and controls so that cab emergency lighting system shall not be activated during this shut-down operation. Contract Electronic Controls, Inc. for design information. Call Walter Barnes @ 888.633.9788.

16. Also, provide a fault out-put if the emergency lighting battery is low or defective. Contract Electronic Controls, Inc. at 888.633.9788, for details on operation of this system.

17. Complete on-board diagnostics of elevator system, with ability to make adjustments on the controls. Also, provide the ability to make adjustments from multiple locations through Enhanced Management Information System features in the control system, including those which allow remote monitoring, system adjustments, etc.

18. Include Advanced Information Management System in the control system, which permits elevator analysis from multiple locations, a variety of security controls from multiple floors, and several other features that are not included with standard elevator control systems. Security controls are an important component of this system, and required by the Owner. Only four (4) landings do not have security control at the present time. Also, this elevator equipment shall be capable of being analyzed from an emergency monitoring control center in the fire alarm control center of the building. The security control and voice announcement system shall be coordinated to announce the proper message related to each of the secure floors.

19. Car top safety operation, for operating car from control station on top of car. Also, provide a key switch in the car operating panel maintenance cabinet.

20. Any other additional features that will enhance operation or benefit Owner.

2.05 SIGNAL FIXTURES

A. Car Top Station: New operating stations shall be mounted on the car tops to control operation during maintenance work, inspections and tests on the equipment. The stations shall meet all elevator code requirements, and include a duplex 115 volts, GFCI protected electrical outlets. Mount stations near the doorway to permit access without stepping onto

car tops. Include lights on the operating stations, controlled by switches that are within easy reach of the landing thresholds.

Additionally, mount industrial grade fluorescent fixtures on the car tops, consisting of two (2) 40 watt fluorescent tubes, with protective lens, to prevent contract with the lamps. As an option, the Elevator Contractor is permitted to install two (2) strips of LED lamps, which are to be approximately 4'-0" long, with milk white covers on the LED lights to better distribute the lighting. Mount the lighting horizontally on the safety railings, in a manner that allows it to illuminate the entire car top. Connect the wiring for the fixtures to the switch that illuminates the lamps on the car top operating stations.

B. Car Operating Panels: The existing car operating panels shall be removed, and replaced with new car operating panels, mounted in no. 4 satin finished bronze swing panels. The new operating panels shall include the following features:

1. Complete car operating panels in each cab, mounted in full swing, full height type, front return panels, with high quality, heavy duty hinges and locking devices. Bronze or Muntz metal (with lacquer finish) materials are required. All locking devices shall be adjustable, to permit proper alignment and to alleviate rattles. Remove and discard the existing car operating panels and entrance columns.

2. Cab operating panels shall contain all of the necessary components to function as required for the building, meet the needs of the Owner, and to meet the required code provisions. Design the panels in a very neat, well arranged fashion.

3. Button design, and other operating station devices, shall be match the buttons recently installed in elevators no. 6 & 7. Call registered lights shall illuminate blue in color.

4. Mount the floor selection buttons two vertical rows. Provide the necessary key switches as required to restrict traffic flow to certain locations, mounted in the locations approved by Owner. Provide all markings for handicapped persons, using type and design as approved by Owner, Project Engineer and Elevator Consultant during approval process.

5. Provide door control buttons mounted below the floor selection buttons. Buttons shall match the buttons in elevators no. 6 & 7.

6. Provide keyed stop switch in each panel, grouped with alarm bell button. Provide an alarm bell button, with a red jewel, which shall illuminate when button is depressed.

7. Provide digital position indicators in the upper portion of the car operating panels, along with direction arrows which alert the direct of car travel. Digital position indicators shall be approximately 1.5 inches in height.

8. Firemen's operation panel shall contain all of the features required by elevator code. Include a tight fitting bronze door to match the finish on the front return panels. Engrave firemen's operation on the panel door. Provide the proper keyed lock for the door, to match the keyed lock in elevators no. 6 & 7. Install operating instructions for firemen's operation on the rear of the compartment door.

9. Operating station service cabinet compartment, mounted below the emergency telephone device, shall contain the following keyed switches, and have a tight fitting, key locked,

bronze swing door. Cabinet shall contain the following features:

a. Keyed independent service switch.

b. Keyed three (3) position exhaust blower switch (off-low-high).

c. Keyed car lights control switch.

d. Keyed car emergency lighting test switch.

e. Keyed hoist way access switch.

f. Keyed car top inspection switch.

g. Any other special requirements, including flush operating certificate holder and Lexan brand cover, as part of the hinged door.

10. Engrave no smoking signs and symbols in swing returns, above the position indicator.

11. Engrave capacity in pounds and number of people, located where space is available.

12. Car capacity overload warning jewel (and audible voice announcement feature).

13. Engrave the appropriate elevator numbers at the top of each swing panel. Include the building elevator numbers and State of Florida serial numbers.

14. Firemen's cap jewel that flashes when smoke or fire is in machine room or in hoist way area.

15. Floor passing chimes. Chimes shall have adjustable volume controls.

16. Flush mounted certificate frame, sized for State of Florida inspection certificate, in the swing door of the service cabinet. Include a flush mounted Lexan brand, scratch resistant cover, approximately 5/16" thickness, for the certificate frame. Size the cabinet door, and certificate holder, to accept a standard sized Florida operating certificate.

17. Emergency telephone device, with all required features to meet elevator code and comply with the requirements of the Owner. Verify that the emergency phone device before manufacturing the operating station. Include punched grillwork for speaker and microphone. Combine phone equipment with the emergency intercommunication equipment system.

18. Provide separate punched grillwork for speaker and microphone associated with elevator intercommunication system.

19. Provide a brown or bronze colored, modern design duplex type GFCI protected electrical outlet in the lower part of the swing panel, flush mounted in horizontal position, approximately 6" above the floor line. Power supply shall be 115 volts, alternating current, fused for 15 amps. Mount from the rear of the panel without any exposed fasteners.

20. Provide any additional features required by Contract, Owner required security system, elevator code or other applicable codes. Verify the security control features prior to the final design and fabrication of the elevator cab control panels, as well as the elevator controllers. Elevator Contractor is responsible for all coordination and work associated with satisfaction of needs of the Owner.

21. Only if required by local fire code, install fire phone receptacle in car operating panel.

22. All lamps shall be high quality LED type.

C. Car Riding Lanterns: Remove the existing car riding lanterns and install two (2) complete new lanterns, per car, designed for installation bronze faceplates. Include the following:

1. All lamps shall be highest quality, high output, LED type.

2. The lantern lenses shall be through a punched and acrylic plastic filled vandal resistant arrow shaped design.

3. Up arrows shall illuminate brilliant white.

4. Down arrows shall illuminate brilliant red.

5. Cover plates shall be rectangular in shape, with edges slightly relieved to remove sharpness. Secure each cover plate with two (2) countersunk, vandal resistant screws with finish to match the surrounding cover plate.

6. No exposed fasteners shall be permitted.

7. Chimes shall be electronic type. Chime shall sound one (1) time for up traveling car, and two (2) times for down traveling car. Chime volume shall be adjustable.

8. Lanterns shall be designed for service and maintenance by removing the face plates.

D. Landing Stations at Each Hoist way Opening: Remove the existing landing control stations and replace them with completely new operating stations that contain the following features:

1. Cover plates constructed of 1/8" thickness bronze or Muntz metal, approximately 8" wide, with final design width as selected by the Owner, Engineer and Elevator Consultant. Plates shall be flush mounted. Attach the covers with a suitable number of matching countersunk fasteners to prevent the covers from warping. Provide cover designs to match those on elevators no. 6 & 7.

2. On floors that do not have bronze hoist way doors and frames, install no. 4 satin finish stainless steel cover plates on the landing stations. Cover plates shall be the same design layout, except for the materials from which they are constructed.

3. Finish on cover plates shall be as approved by the Owner, Project Engineer and Elevator Consultant. Include protective coating on all bronze finished cover plates.

4. Button design shall be round type, matching finish materials, LED lamps, highly durable design. All call registered lights shall be blue in color. Match the button design on elevators no. 6 & 7.

5. Braille and raised direction arrows are to be mounted to left of each button.

6. Warning signage along with red pictograph, to use stairs during fire emergency. Follow ASME A17.1 Code requirements. Pictograph shall be designed for easy replacement if it becomes damaged from abuse.

7. Hoist way access switches at top and bottom floors, in the call stations for the appropriate elevators.

8. Emergency power selector switch in main landing station. Mark switch with 'Auto-1- 2-3 & 5." Final selection of the elevator numbering shall be made at time of approval of drawings. Verify all related work and information. The selecting of elevator to run on emergency power may take place only in the elevator monitoring panel.

9. All cutting and patching of column covers and walls for station installation shall be by Elevator Contractor. This cutting shall include granite, marble, drywall, concrete or other materials that exist in the location where the stations are to be mounted. Elevator Contractor is expected to hire a professional stone cutter firm to perform such work where needed.

10. Install 1.5" high position indicators, with car direction arrows, in each landing station at all floors.

11. There shall be one (1) call station, with associated devices, at each floor.

12. All lamps shall be high quality LED type.

13. Layout of all landing stations shall place the warning signage, operating switches, indicator jewels and other devices, mounted above the car position indicators, and the floor buttons below the position indicators. This is intended to decrease the confusion as to the location of the floor direction buttons. Provide additional space below the car position indicators, for increased separation, to improve positioning of the floor call buttons.

2.06 ELEVATOR CAR ENCLOSURE

A. The Elevator Contractor shall retain the existing cab structures, except for the following cab related items that shall be replaced or renovated:

1. The new cab equipment shall be of the highest quality design and materials, meeting all of the requirements hereinafter described.

2. For each cab, provide new full width, full height, matching design swing return panel and stationary panel; new cab doors; all of which shall be constructed of no. 4 satin finished bronze or Muntz metal, which shall be used to provide replacement equipment for the cab. The transom panels shall also replaced with new materials to create a matching surface for the other new materials on the front of the cab. The metal thickness for the front return and entrance column shall be 14 gauge materials, with adequate reinforcement to prevent warping or oil-canning conditions. Metal for cladding or replacement of the transom shall also be 14 gauge thickness materials.

3. The new car doors shall be sandwich type construction, using 16 gauge thickness furniture steel materials on front and back of the door panels, then faced with bronze or Muntz metal as indicated in no. 2 above. Bronze metal for doors shall be at least 16 gauge, securely applied over the sandwich design car door panels. Provide adequate reinforcement for door operator clutches, to alleviate flexing or bending of the rear side of the door panels.

4. Replace the existing bronze colored reveal covering materials, and cab base materials, with new materials, to permit the cab interior to appear to be all new. Materials for the reveal areas shall be 16 gauge materials. Bronze colored cab base plate, around three (3) sides of each cab, shall be at 12 gauge materials. Base plates shall be relieved on the top edge to alleviate sharpness of metal. Secure all reveal and base area materials to the walls with highest quality industrial grade contact cement.

5. Remove the existing cab applied wall panels and recover them with a new laminate plastic material, in color and design selected by the Owner. Alter the bottoms of the removable cab panels, to permit the cab ventilation to be directed under the panels and through the walls in a manner that is not visible from the cab interior. Drill a series of holes in the walls, behind the removable panels, to allow the cab ventilation to be effective.

6. The cab tops shall be repaired, as may be necessary. New car top exit panels shall be provided, which shall have the required electrical safety switches installed. Paint the cab exit panels, and replacement top panels, with baked enamel on both sides of the material.

7. Cab suspended ceiling shall be retained and reused. Outfit the ceiling with new lighting as shown in no. 6 below. Clean the ceiling after the work has been completed.

8. Existing cab lighting shall be replaced, by using six (6) high quality LED down lights, with bronze colored or black rimmed fixtures, equal in quality to "Cablite" Elite LED system manufactured by Electronic Controls, Inc., Cape Canaveral, Florida 32990, Phone 800.633.9788, Contact Walter Barnes. The cab lighting system shall include one (1) lighting power controller, and an emergency lighting system which will illuminate two (2) of the lighting fixtures positioned across the front of the elevator cab. Additionally, provide the ECI-America brand LiteWizard system to control the lighting (and exhaust blower), and cause automatic shut-down after five (5) minutes of elevator idle time, and the doors are closed. The emergency lighting portion of the cab lighting system shall not be impacted by the automatic shut-down of the lighting system. The lighting level of the LED lighting shall be approximately 3000 Kelvin.

   Power to the cab lighting and exhaust blower shall be restored automatically when a hall call button is depressed on a car assigned to answer the landing call.

9. Furnish and install additional lighting, using LED lighting strips, to project lighting downward between the cab walls and the suspended ceiling perimeter. Lighting shall be provided completely around all four (4) sides of the ceiling, with no apparent areas without lighting. Lighting level shall be sufficient to supplement the new LED type lighting system for the cab, and shall be adjustable in lighting output. Provide milk white covers on the lighting strips to better distribute the lighting and alleviate the appearance of individual LED lights in the strips. The lighting shall be warm white level, equal to

approximately 3000 Kelvin. This additional lighting shall also be turned off, when the other lighting is automatically switched off, due to the elevator being idle for five (5) minutes, or more. Under this contract, provide similar milk white covers on the existing LED lighting strips, around the ceiling perimeter in elevators no. 6 & 7, to provide for similar appearance.

10. Furnish a high quality exhaust blower system, equal in quality to Morrison brand, on the car top. The output of the exhaust blower shall be at least 400 CFM, with quiet operating motor designed for two (2) speed operation. Propeller type fans are not acceptable. The blower control system shall be designed to automatically shut down after five (5) minutes of car idle time and the doors are closed. Provide a grill work on the underside of the ceiling to protect against accidental contact with the exhaust blower system.

11. Threshold for the no. 1 elevator cab shall be replaced with a new extruded bronze threshold, with matching screws. The threshold on elevator no 2 cab shall be completely polished to remove scratches and burrs, and to make the threshold appear to be new.

12. Provide new bronze matching finish handrails on the rear of the cab walls. Handrails shall be 1.5" in diameter, with closed ends returned toward the walls. Provide adequate number of bronze colored supports to support the rails. The rails shall support at least 500 pounds of weight, without noticeable deflection or warping.

13. Provide cutouts in entrance columns for car riding lanterns. Two (2) per car.

14. All cab work shall be professional in appearance and construction. All work is subject to approval by Owner, Engineer and Elevator Consultant.

15. Design the swing type front return panels to work with the existing thickness of car flooring materials, so that it can be properly opened for maintenance purposes.

16. Each cab shall be thoroughly cleaned before final acceptance examination.

2.07 ELEVATOR FLOOR LEVELING EQUIPMENT AND ACCURACY

A. The elevator floor leveling equipment shall all be replaced with completely new equipment, designed to provide extremely reliable and quiet operation. All motion control shall be digitally controlled, for consistent performance in both directions.

B. The floor leveling and re-leveling shall stop the elevator platform within 3/16" of the floor level, consistently, with or without a load on the car. Additionally, the direction of travel shall not impact the leveling accuracy.

2.08 EMERGENCY TELEPHONE AND INTERCOMMUNICATION SYSTEM

A. The system shall be a combination system, including telephone and intercommunication phases, in one (1) electronic type package. The system shall be capable of providing emergency telephone service and intercommunication for eight (8) elevators, including the recently renovated elevators no. 6 & 7, as well as elevators no. 3, 4, 5 and 8 which will be renovated in the future.

B. The master operating station shall be mounted in the elevator machine room or elevators 1 & 2, or in the elevator monitoring panel in the area of the fire alarm and emergency control system, which shall include battery back-up equipment that will function for up to four (4) hours after a power failure. Provide sub-master stations in machine rooms of elevators no. 1 & 2, and elevators no. 6 & 7, if master control is located in the elevator monitoring control panel.

C. The system in the elevator monitoring and control panel shall allow each elevator to be contacted separately, or all elevators to be contacted at the same time. Also, this location shall provide the ability for each of the elevator machine rooms to be contracted separately, or all of the machine rooms to be contracted at the same time. Provide jewels in all locations that indicate that the communication system is active.

D. Provide hand-sets in each machine room area. Provide operation with in elevator monitoring panel that does not require a handset, unless a handset can be provided that does not increase the overall panel depth.

E. Elevator cabs shall have both emergency telephone equipment and hands-free elevator intercommunication devices, both functions working through separately punched grillwork in the front return panels. Provide jewel in elevator cabs that indicates that the passenger intercommunication system is active.

F. Telephone equipment shall work with the Owner's telephone system in the building.

G. The system shall be equal in quality and function to that manufactured by Halma - Janus, EMS5 Call Director, suitable for multiple tasks from multiple locations. The system shall be capable of being expanded in the future, when required to include additional elevators in the complex.

2.09 ELEVATOR MONITORING SYSTEM PANEL

A. On the Monroe Street Level, in the hallway adjacent to elevators no. 1 & 2, a central elevator monitoring panel shall be furnished and installed. This panel shall be approximately 26" wide by 52" high, overall, and similarly match the existing panels which were provided by Simplex. The features included in the panel shall include the following:

1. Eight car position indicators. Four of the position indicators will be used in the future, when elevators 3, 4, 5 & 8 are renovated.

2. Keyed Emergency Power on-off selector switches for all eight (8) elevators. Keyed emergency power switch, with Automatic and Off Positions.

3. Keyed car return to main landing location

4. Car in operation jewels for each elevator car.

5. Car in "failure mode" for each elevator car.

6. Car doors open jewel for each elevator car.

7. Car doors closed jewel for each elevator car.

8. Keyed Phase I Fire Fighter operation for each elevator, or group of elevators.

9. LCD screen, 14" minimum, for viewing elevator systems operations and functions.

10. Keyboard for operation of Advanced Information Management System from this location. Locate behind a locked, swing down panel. Include discretely mounted computer system as part of this panel.

11. Locked key box, with hinged cover, which houses a set of all elevator related keys, including machine room access keys. Engraving on box cover to indicate "Firemen's Use Only - Elevator Keys."

12. Panel cover plate to mount inside the large, glass enclosed panel. Purchase the panel box, with glass cover, from Simplex, if possible. Swing glass door assembly shall have two (2) keyed locks. Panel box cover frame to be painted black to match the existing boxes in the area. Inside panel cover can be power coated steel with black finish, or brushed stainless steel. The indicator panel shall be hinged for access purposes, with support chains or cables to hold he weight.

13. All indicators or devices inside the locked panel shall be clearly marked with engraved and filled nomenclature to designate the purpose of the device.

14. Mounting of the panel shall be similar to the existing panels in the area, which protrudes approximately 2" form the wall.

15. All cutting and patching for the panel installation is by the Elevator Contractor. Do not remove any more of the wall thickness than necessary. Design the depth of the box to be as shallow as possible. Also, Elevator Contractor shall provide the 120 volts power supply for the computer in this panel.

2.09 AUDIBLE ANNOUNCEMENT SYSTEM

A. The Elevator Contractor shall furnish and install an electronic audible announcement system that shall provide information to the passengers regarding the following operations:

1. Announce the floor level at which the elevator is stopping.

2. Announce the direction of travel for the elevator when it leaves the floor at which it is currently stopped.

3. Announce when the door have been blocked from closing beyond a normal time period associated with door closing operation. Announcement shall indicate that the doors should be cleared so they can close.

4. Announce when the elevator has stopped in the event of any emergency operation such as over-speed, fire recall system, power failure or other emergency condition.

5. Announce floors which require security clearance to exit the elevator.

6. Announce any other features that the Owner desires to be included.

7. Capable of being revised at any time, to include additional features or announcements.

8. Contains battery back-up to provide operation during a power failure.

9. Before initial set-up, meet with Owner to decide on the announcements that should be included.

2.11 SPARE EMERGENCY PARTS

A. The Elevator Contractor shall furnish to the Owner, at time of turn-over of the second elevator in the project, the following parts or components, which are to be used during emergency conditions only. These components are to be the property of the Owner, and are not to be consumed by the Elevator Contractor, except during an emergency situation. If the Elevator Contractor consumes any of the parts of components as part of his responsibility to the Owner, replacement of those components shall occur as soon as possible, at no cost to the Owner.

1. Two (2) sets of all car station panel and landing operating buttons and operating devices, including button caps, and control modules.

2. Two (2) sets of all different types of car panel and landing station panel key switches, complete with keys.

3. Two (2) sets of all lenses utilized on all operating devices such as position indicators, etc.

4. One (1) intermediate landing call station cover plate, in both stainless steel and bronze finish.

5. Two (2) sets of all jewels used in car and landing stations.

6. Two (2) complete sets of all markings for handicapped persons on all operating stations.

7. Two (2) replacement lenses for operating certificates.

8. Four (4) LED down light fixtures for cab ceiling.

9. One (1) LED lighting system control module for each type of LED lighting.

10. Twelve (12) bronze material vandal resistant screws for landing cover plates.

11. Four (4) sets of all LED lamps used in the signal fixtures, both car and landing.

2.12 ELEVATOR ELECTRICAL WORK

A. All elevator electrical wiring, including traveling cables, shall be replaced with new materials suitable for the purpose intended. No existing wiring conductors shall be retained and reused during the elevator renovation contract.

Provide all needed wiring, conductors, conduit, junction boxes, electrical duct work and other electrical devices, as may be needed, to complete the work associated with operation of the elevator equipment.

B. The existing metal electrical ductwork is permitted to be retained and reused during this elevator renovation contract provided it meets the following criteria:

1. The electrical duct work is not damaged.

2. The electrical duct work is located in the proper position for future use. In the event the duct work must be relocated or altered, it shall be completely replaced with new materials.

3. The capacity of the electrical duct work is sufficient to meet the needs of the renovation contract requirements.

4. The electrical duct work meets all requirements of ASME A17.1-2010 Safety Code for Elevators and Escalators, and the NEC.

5. All electrical duct work shall be cleaned and painted.

C. Furnish and install the electrical wiring, conduits and associated work from all of the elevator power supply disconnect switches in the machine room area, to the elevator controller panels. All work shall comply with NEC and ASME A7.1 Safety Code requirements. Support all wiring conductors, duct work, wire ways, conduit, as necessary, to meet all code requirements.

D. Remove all existing wiring connected to landing fixtures associated with elevator systems. The fixtures and boxes shall be removed.

E. Furnish and install new elevator emergency communication system, with emergency phones in cars. Also, provide emergency intercommunication systems in each car, with master station mounted in the elevator machine room area, or in a location as selected by the Elevator Contractor. These intercommunication systems shall be combined with the emergency phone systems, equal in design and quality to Halma - Janus, EMS5 Call Director combined systems. Provide battery backup systems for the master station in the machine room. Design the system to allow additional locations to be added in the future.

F. Provide all new elevator traveling cables, which shall run be run from the elevator car top junction boxes to the terminals inside the elevator controller panel, without an intermediate junction boxes.

G. Provide traveling cables with at least the following additional conductors, for each elevator, as well as those necessary to provide proper car control circuits, security systems and other functions, as required by Owner:

1. Two (2) coax cables of latest design, or conductors as required by Owner for use of video, audio and other types of communications. Verify the Owner's requirements before ordering the materials.

2. Four (4) cat. 6 cables of latest design requirements.

3. Twenty-five percent spares of all control wiring required for elevator operation.

4. One-hundred percent spares for car lighting and alarm power supply.

5. Any additional conductors for special elevator control features or requirements of the Owner. Verify Owner's requirements.

H. Work closely with Owner's security department personnel, during the design, installation and set-up of the security system to control the access and operation of the elevator equipment. This includes access to elevator and access to specific floors.

PART III – EXECUTION

3.01 EXAMINATION

A. Before developing any drawings, fabricating and materials or performing any work at the site, the Elevator Contractor shall thoroughly inspect, review, measure and evaluate all site conditions. Verify all dimensions and examine all conditions prior to performing work.

3.02 INSTALLATION

A. Install all of the elevator components and incorporate the equipment in a completely professional and satisfactory manner, while complying with the contract and specification requirements. Unilateral decisions or changes, without prior written approval, are not acceptable.

B. Perform the work with competent, highly skilled elevator workman, other skilled trades, under the direct control and supervision of the Elevator Contractor's superintendent. All mechanics shall show evidence of being fully trained and qualified in the elevator trade, and shall possess a current "Certificate of Competency" issued by the State of Florida.

C. Coordination: Coordinate the elevator work with any other trades on the site, under the control of the Elevator Contractor, to avoid any delays in the completion of the work.

D. Lubricate any points, where required, on the elevator equipment provided under this contract.

E. Painting shall all be as required under the paragraph covering painting in this specification section.

3.03 FIELD QUALITY CONTROL

A. Acceptance Testing: Upon completion of each elevator up-grade, and before acceptance of the work by the Owner, Engineer and Elevator Consultant, the elevator equipment shall be inspected and tests witnessed by an authorized Certified Elevator Inspector, who possesses a current CEI license in the State of Florida, issued by the Department of Professional Regulation, Bureau of Elevators. All work shall be approved by the Bureau of Elevators prior to the elevator equipment being returned to public usage.

B. The CEI licensed elevator inspector shall not be an employee of the Elevator Contractor, and Inspector shall not have any mutual financial relationship, whatsoever, with the Elevator Contractor.

C. Documentation of the safety and acceptance tests shall be provided as part of the turn-over documentation.

3.04 ADJUSTING WORK

A. The door operator equipment, elevator motion controller, elevator supervisory controller, over-speed governor, floor leveling accuracy, hoist ropes, governor rope, and all other features of the elevator equipment, to comply with the requirements of ASME A17.1 Safety Code for Elevators and Escalators, and all of the requirements of these technical elevator specifications. All of the elevator equipment shall operate in first-class condition, and as though it is all completely new.

3.05 CLEANING WORK

A. Before Final Acceptance of each elevator, the elevator equipment and surrounding areas, shall be fully cleaned of all dirt and debris created by the Elevator Contractor, or by others whom may be under the control of the Elevator Contractor. Remove all trash from the site.

B. Clean and polish all architectural surfaces, cabs, thresholds, door safety screens, signal fixtures and related equipment. Remove all protective coverings for examination of the work.

3.06 DEMONSTRATION AND TRAINING

A. Provide at least eight (8) hours of training to representatives of the Owner and Property Maintenance Personnel, on the proper maintenance of the new elevator surfaces and operating fixtures that need to be regularly maintained on a daily basis. Also, communicate information on the proper recognition of and usage of the operating devices, key switches, and other components that are new to the building personnel. Advise the Owner and/or Property Manager of the emergency procedures that should be observed and operated.

B. Personnel providing the training shall be fully qualified and versed in the requirements of these elevators, as well as the system operation with respect to this project.

3.07 TURNOVER OF KEYS AND REQUIRED DOCUMENTS

A. The Elevator Contractor shall turn over the specified copies of all documents listed in another area of these elevator specifications, plus a total of twelve (12) sets of all typical keys for the new elevator equipment. Provide at least twenty (20) sets of any keys used for floor lockout purposes.

B. Only six (6) emergency door release keys are to be provided.

C. The required documents, keys, tools, manuals and spare parts shall be provided to Engineer prior to Final Acceptance and final payment for this contract.

3.08 COMPLETION DATE

A. The elevator renovation work is not considered complete until the elevator work has been finalized, including all adjustments, tests, delivery of documents and required tools, required maintenance and repair support items, delivery of spare parts and all punch-list items have been completed. All required documentation and keys must also be turned over to the Project Engineer prior to establishing an agreed upon final completion date.

END OF SECTION