

SECTION 14 22 00
ELECTRIC TRACTION ELEVATOR MODERNIZATION

PART 1 GENERAL

1.1 DESCRIPTION

- A. This section specifies the engineering, furnishing and installation of complete and ready for operation electric traction elevator systems described herein and as indicated on the contract drawings.
- B. Items listed in the singular apply to each and every elevator in this specification except where noted.
- C. Passenger Elevator No. 209-P1 shall be overhead geared traction type; with Variable Voltage Variable Frequency (VVVF) microprocessor based control system with regenerative drive single car selective collective automatic and power operated two-speed side opening car and hoistway doors. Elevator shall retain a Class "A" loading classification.

1.2 RELATED WORK

- A. General
 - 1. Section 01 33 23 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236 21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL CONDITIONS.
 - 2. Section 07 84 00, FIRESTOPPING: Sealing around penetrations to maintain the integrity of fire-rated construction. Restoration of hoistway to a state of good repair.
 - 3. Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS: Requirements for seismic restraint of non-structural components.
 - 4. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements that are common to more than one section.
 - 5. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low Voltage power and lighting wiring.
 - 6. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
 - 7. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits for cables and wiring.

8. Section 26 05 71, ELECTRICAL SYSTEM PROTECTIVE DEVICE STUDY:
Requirements for installing the over-current protective devices to ensure proper equipment and personnel protection.
 9. Section 26 22 00, LOW-VOLTAGE TRANSFORMERS: Low voltage transformers.
 10. Section 26 24 16, PANELBOARDS: Low voltage panelboards.
 11. VA Barrier Free Design Handbook (H-18-13)
- B. Elevator 209-P1; **BY GENERAL CONTRACTOR**
1. Hoistway and Pit:
 - a. Restore hoistway to a state of good repair. Patch all holes.
 - b. Bevel cants not less than 75° from the horizontal on any rear or side wall ledges and beams that project or recess 4" or more into the hoistway.
 - d. Cutting and patching walls and floors.
 - e. Pit access ladder. Extend to 48" above bottom landing.
 - f. Waterproof pit. Indirect waste drain or sump with flush grate and pump, if required.
 - g. Protect open hoistways and entrances during construction per OSHA Regulations.
 - h. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
 2. Machine Room and Machinery Spaces: **BY GENERAL CONTRACTOR**
 - a. Enclosure with access. Provide wall enclosure to facilitate installation of air conditioning.
 - b. Self-closing and locking access door.
 - c. Ventilation and heating. Maintain minimum temperature of 55° F, maximum 90° F. Maintain maximum 80% relative humidity, non-condensing.
 - d. Paint walls and ceiling.
 - e. Class "ABC" fire extinguisher in each elevator machine room.
 - f. Fire sprinklers where required. Place basket guards on sprinklers.
 3. Electrical Service, Conductors and Devices: **By General Contractor**
 - a. Lighting and GFCI convenience outlets in pit, machine room, hoistway, and overhead machinery spaces (secondary levels). 10 footcandles light level in pit and hoistway and 20 footcandles in machine room.

- b. Three-phase mainline Shunt Trip Circuit Breaker copper power feeder to terminals of each elevator controller in the machine room with protected, lockable "open," disconnecting means. Auxiliary disconnects in multi-level machine room.
 - c. Elevator lobby illumination level shall be maintained at 10 footcandles minimum at elevator entrance.
 - d. Single-phase copper power feeder to elevator controller for car lighting and exhaust blower with individual protected, lockable "open," disconnecting means located in machine room.
 - e. Emergency telephone line to elevator control panel in elevator machine room.
 - f. Fire alarm initiating devices in each elevator lobby, and machine room to initiate firefighters' return feature. Provide alarm initiating signal wiring from hoistway or machine room connection point to elevator controller terminals. Device in machine room and at top of hoistway to provide signal for general alarm and discrete signal for Phase II firefighters' operation.
 - g. Means to automatically disconnect power to affected elevator drive unit and controller prior to activation of machine room fire sprinkler system, and/or hoistway fire sprinkler system. Manual shut-off means shall be located outside bounds of machine room.
4. Standby Power Provision: By **General Contractor**
- a. Standby power of normal voltage characteristics via normal electrical feeders to run elevator at full-rated car speed and capacity.
 - b. Conductor from auxiliary form "C" dry contacts, located in the standby power transfer switch to elevator control panel. Provide a time delay of 30 - 45 seconds for pre-transfer signal in either direction.
 - c. Standby single-phase power to elevator controller for car lighting, exhaust blower, emergency signaling device, intercom amplifier and hoist machine cooling fan.
 - d. Means for absorbing regenerated power during an overhauling load condition per NEC 620.91.
 - e. Standby power to machine room ventilation or air conditioning.

f. Standby power to emergency communications device(s).

1.3 QUALIFICATIONS

- A. Approval by the Contracting Officer is required for products and services of proposed manufacturers, suppliers and installers and shall be contingent upon submission by Contractor of certificates stating the following:
1. Elevator contractor is currently and regularly engaged in the installation of elevator equipment as one of his principal products.
 2. Elevator contractor shall have three years of successful experience, trained supervisory personnel, and facilities to install elevator equipment specified herein.
 3. The installers shall be Certified Elevator Mechanics with technical qualifications of at least five years of successful experience and Apprentices actively pursuing certified mechanic status. Certificates shall be submitted for all workers employed in this capacity.
 4. Elevator contractor shall submit a list of two or more prior hospital installations where all the elevator equipment he proposes to furnish for this project functioned satisfactorily to serve varying hospital traffic and material handling demands. Provide a list of hospitals that have the equipment in operation for two years preceding the date of this specification. Provide the names and addresses of the Medical Centers and the names and telephone numbers of the Medical Center Administrators.
- B. Approval of Elevator Contractor's equipment will be contingent upon their identifying an elevator maintenance service provider that shall render services within two hours of receipt of notification, together with certification that the quantity and quality of replacement parts stock is sufficient to warranty continued operation of the elevator installation.
- C. Approval will not be given to elevator contractors and manufacturers who have established on prior projects, either government, municipal, or commercial, a record for unsatisfactory elevator installations, have failed to complete awarded contracts within the contract period, and do not have the requisite record of satisfactorily performing elevator installations of similar type and magnitude.
- D. The Contractor shall provide and install only those types of safety

devices that have been subjected to tests witnessed and certified by an independent professional testing laboratory that is not a subsidiary of the firm that manufactures supplies or installs the equipment.

- E. Welding at the project site shall be made by welders and welding operators who have previously qualified by test as prescribed in American Welding Society Publications AWS D1.1 to perform the type of work required. Certificates shall be submitted for all workers employed in this capacity. A welding or hot work permit is required for each day and shall be obtained from the COTR of safety department. Request permit one day in advance.
- F. Electrical work shall be performed by Licensed Electricians as requirements by NEC. Certificates shall be submitted for all workers employed in this capacity.

1.4 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification.
Elevator installation shall meet the requirements of the latest editions published and adopted by the United States Department of Veterans Affairs on the date contract is signed.
- B. Federal Specifications (Fed. Spec.):
 - J-C-30B Cable and Wire, Electrical (Power, Fixed Installation)
 - W-C-596F Connector, Plug, Electrical; Connector, Receptacle, Electrical
 - W-F-406E Fittings for Cable, Power, Electrical and Conduit, Metal, Flexible
 - HH-I-558C Insulation, Blankets, Thermal (Mineral Fiber, Industrial Type)
 - W-F-408E Fittings for Conduit, Metal, Rigid (Thick- Wall and Thin-wall (EMT) Type)
 - RR-W-410 Wire Rope and Strand
 - TT-E-489J Enamel, Alkyd, Gloss, Low VOC Content
 - QQ-S-766 Steel, Stainless and Heat Resisting, Alloys, Plate, Sheet and Strip
- C. International Building Code (IBC)
- D. American Society of Mechanical Engineers (ASME):
 - A17.1-2010 Safety Code for Elevators and Escalators
 - A17.2-2010 Inspectors Manual for Electric Elevators and Escalators
- E. National Fire Protection Association:
 - NFPA 13-10 Standard for the Installation of Sprinkler Systems
 - NFPA 70-11 National Electrical Code (NEC), latest edition

NFPA 72-10 National Fire Alarm and Signaling Code

NFPA 101-09 Life Safety Code

NFPA 252-08 Fire Test of Door Assemblies

F. American Society of Testing and Materials (ASTM):

A1008/A1008M-10 Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High Strength Low-Alloy with Improved Formability
E1042-02(R2008) Acoustically Absorptive Materials Applied by Trowel or Spray

G. Society of Automotive Engineers, Inc. (SAE):

J517-10 Hydraulic Hose, Standard

H. Gauges:

For Sheet and Plate: U.S. Standard (USS)

For Wire: American Wire Gauge (AWG)

I. American Welding Society (AWS):

D1.1-10 Structured Welding Code Steel

J. National Electrical Manufacturers Association (NEMA):

LD-3-05 High-Pressure Decorative Laminates

K. Underwriter's Laboratories (UL):

486A-03 Safety Wire Connectors for Copper Conductors

797-07 Safety Electrical Metallic Tubing

L. Institute of Electrical and Electronic Engineers (IEEE) M. Regulatory Standards:

Uniform Federal Accessibility Standards

Americans with Disabilities Act

1.5 SUBMITTALS

A. Submit in accordance with Specification Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.

B. Before execution of work, furnish information to evidence full compliance with contract requirements for proposed items. Such information shall include, as required: Manufacturer's Name, Trade Names, Model or Catalog Number, Nameplate Data (size, capacity, and rating) and corresponding specification reference (Federal or project specification number and paragraph). All submitted drawings and related elevator material shall be forwarded to the Contracting Officer.

C. Shop Drawings:

1. Complete scaled and dimensioned layout in plan and section view showing the arrangement of equipment and all details of each and

every elevator unit specified including:

- a. Hoisting machines, controllers, power conversion devices, governors, and all other components located in machine room.
- b. Brackets, buffers, and other components located in hoistway.
- c. Rail bracket spacing and maximum vertical forces on guide rails in accordance with ASME A17.1 Section 2.23 and Section 8.4.8 for Seismic Risk Zone 2 or greater.
- e. Weights of principal parts.
- f. Top and bottom clearances and over travel of car and counterweight.
- g. Location of shunt trip circuit breaker, switchboard panel, light switch, and feeder extension points in the machine room.
- h. Drawing showing re-skinning of hoistway door jambs.

D. Samples:

1. One each of stainless steel, 75 mm x 125 mm (3 in. x 5 in.).
2. One each of color vinyl floor tile.
3. One each of protection pads, 75 mm x 125 mm (3 in. x 5 in.) if used.
4. One each car and hoistway Braille plate sample.
5. No other samples of materials specified shall be submitted unless specifically requested after submission of manufacturer's name. If additional samples are furnished pursuant to request, adjustment in contract price and time will be made as provided in Section 00 7200, GENERAL CONDITIONS.

E. Name of manufacturer, type or style designation, and applicable data of the following equipment shall be shown on the elevator layouts:

1. Hoisting Machine.
2. Hoisting Machine Motor, HP and RPM ratings, Voltage, Starting and Full Load Ampere, and Number of Phases.
3. Controller
4. Starters and Overload Current Protection Devices.
6. Governor
7. Electric Door Operator; HP and RPM ratings, Voltage and Ampere rating of motor.
8. Hoistway Door Interlocks.
9. Hoist Ropes; ultimate breaking strength, allowable working load, and actual working load.
10. Cab Ventilation Unit; HP rating and CFM rating.

- F. To match elevator in Building 218. Drawings of elevator car enclosure, car lighting, ventilation, ceiling framing, top exits, and location of car equipment.
- G. Complete dimensioned detail of vibration isolating foundations for traction hoisting machines.
- H. Dimensioned drawings showing details of:
 - 1. All signal and operating fixtures.
 - 2. Car and counterweight roller guides.
 - 3. Hoistway door tracks, hangers, and sills.
 - 4. Door operator, infrared curtain units.
- I. Drawings showing details of controllers and supervisory panels.
- J. Furnish certificates as required under: Paragraph "QUALIFICATIONS".

1.6 WIRING DIAGRAMS

- A. Provide three complete sets of field wiring and straight line wiring diagrams showing all electrical circuits in the hoistway, machine room and fixtures. Install one set coated with an approved plastic sealer and mounted in the elevator machine room as directed by the Resident Engineer.
- B. In the event field modifications are necessary during installation, diagrams shall be revised to include all corrections made prior to and during the final inspection. Corrected diagrams shall be delivered to the Resident Engineer within thirty (30) days of final acceptance.
- C. Provide the following information relating to the specific type of microprocessor controls installed:
 - 1. Owner's information manual, containing job specific data on major components, maintenance, and adjustment.
 - 2. System logic description.
 - 3. Complete wiring diagrams needed for field troubleshooting, adjustment, repair and replacement of components. Diagrams shall be base diagrams, containing all changes and additions made to the equipment during the design and construction period.
 - 4. Changes made during the warranty period shall be noted on the drawings in adequate time to have the finalized drawings reproduced for mounting in the machine room no later than six months prior to the expiration of the warranty period.

1.7 ADDITIONAL EQUIPMENT

- A. Additional equipment required to operate the specified equipment retained, manufactured and supplied for this installation shall be furnished and installed by the contractor. The cost of the equipment shall be included in the base bid.
- B. Equipment not required by specification, which would improve the operation, may be installed in conjunction with the specified equipment by the contractor at his option at no additional cost to the Government, provided prior approval is obtained from the Contracting Officer's Technical Representative.
- C. Retained equipment shall be noted on SUBMITTALS. All retained equipment shall be refurbished and placed in like-new condition. Retained equipment shall be included under Section 14 22 00, 1.10 WARRANTY.

1.8 TOOL CABINET

- A. Provide a metal parts/tool cabinet, having two shelves and hinged doors. Cabinet size shall be 1220 mm (48 in.) high, 762 mm (30 in.) wide, and 457 mm (18 in.) deep.

1.9 PERFORMANCE STANDARDS

- A. The elevators shall be capable of meeting the highest standards of the industry and specifically the following:
 - 1. Contract speed is high speed in either direction of travel with rated capacity load in the elevator. Speed variation under all load conditions, regardless of direction of travel, shall not vary more than three (3) percent.
 - 2. The controlled rate of change of acceleration and retardation of the car shall not exceed 0.1G per second and the maximum acceleration and retardation shall not exceed 0.2G per second.
 - 3. Starting, stopping, and leveling shall be smooth and comfortable without appreciable steps of acceleration and deceleration.
- B. The door operator shall open the car door and hoistway door simultaneously at 2.5-feet per second and close at 1-foot per second.
- C. Elevator control system shall be capable of starting the car without noticeable "roll-back" of hoisting machine sheave, regardless of load condition in car, location of car, or direction of travel.
- D. Floor level stopping accuracy shall be within 3 mm (1/8 in.) above or

below the floor, regardless of load condition.

- E. Noise and Vibration Isolation: All elevator equipment including their supports and fastenings to the building, shall be mechanically and electrically isolated from the building structure to minimize objectionable noise and vibration transmission to car, building structure, or adjacent occupied areas of building.
- F. Sound Isolation: Noise level relating to elevator equipment operation in machine room shall not exceed 80 dBA. All dBA readings shall be taken three (3) feet off the floor and three (3) feet from equipment.
- G. Airborne Noise: Measured noise level of elevator equipment during operation shall not exceed 50 dBA in elevator lobbies and 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.

1.10 WARRANTY

- A. Submit all labor and materials furnished in connection with elevator system and installation to terms of "Warranty of Construction" articles of FAR clause 52.246-21. The one year Warranty shall commence after final inspection, completion of performance test, and upon full acceptance of the installation and shall concur with the guarantee period of service.
- B. During warranty period if a device is not functioning properly or in accordance with specification requirements, or if in the opinion of the Contracting Officer's Technical Representative, excessive maintenance and attention must be employed to keep device operational, device shall be removed and a new device meeting all requirements shall be installed as part of work until satisfactory operation of installation is obtained. Period of warranty shall start anew for such parts from date of completion of each new installation performed, in accordance with foregoing requirements.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Where stainless steel is specified, it shall be corrosion resisting steel complying with Federal Specification QQ-S-766, Class 302 or 304, Condition A with Number 4 finish on exposed surfaces. Stainless steel shall have the grain of belting in the direction of the longest dimension and surfaces shall be smooth and without waves. During installation all stainless steel surfaces shall be protected with suitable material.
- B. Where cold rolled steel is specified, it shall be low-carbon steel rolled to stretcher leveled standard flatness, complying with ASTM A109.

2.2 MANUFACTURED PRODUCTS

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

group of components shall be identified in the submittals.

- F. Where key operated switches are furnished in conjunction with any component of this elevator installation, furnish four (4) keys for each individual switch or lock. All new elevator keys to match keys on elevators located in Building 218. Each and every key shall have a tag bearing a stamped or etched legend identifying its purpose. Barrel key switches are not acceptable, except where required by code.
- G. If the elevator equipment to be installed is not known to the Resident Engineer, the Contractor shall submit drawings in triplicate for approval to the Resident Engineer, Contracting Officer, and VA CFM Elevator Engineer showing all details and demonstrate that the equipment to be installed is in strict accordance with the specifications.

2.3 CAPACITY, SIZE, SPEED, AND TRAVEL

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

	EXISTING EQUIPMENT	DISPOSITION
NUMBER:	CAR NO. 209-P1	RETAIN EXISTING
CAPACITY:	3500 #	RETAIN EXISTING
CLASS LOADING:	PASSENGER CLASS A	RETAIN EXISTING
CONTRACT SPEED:	150 F.P.M.	RETAIN EXISTING
ROPING:	1:1	1:1
MACHINE:	GEARED	GEARED AC
MACHINE LOCATION:	OVERHEAD	RETAIN EXISTING
OPERATIONAL CONTROL:	SELECTIVE COLLECTIVE	SELECTIVE COLLECTIVE MICROPROCESSOR BASED SYSTEM
MOTOR CONTROL:	DC VARIABLE VOLTAGE WARD LEONARD	AC VARIABLE VOLTAGE VARIABLE FREQUENCY MICROPROCESSOR BASED WITH DIGITAL CLOSED-LOOP FEEDBACK

	EXISTING EQUIPMENT	DISPOSITION
POWER CHARACTERISTICS:	220 VOLTS, 3 PHASE, 60 HERTZ FIELD VERIFY	480 VOLTS, 3 PHASE, 60 HERTZ
STOPS:	3 FRONT	RETAIN EXISTING
OPENINGS:	3 FRONT	RETAIN EXISTING
FLOORS SERVED:	B, 1, 2 FRONT	RETAIN EXISTING
TRAVEL:	FIELD VERIFY	RETAIN EXISTING
PLATFORM SIZE:	FIELD VERIFY	RETAIN EXISTING
MINIMUM CLEAR INSIDE CAR:	5'-3 1/2" WIDE X 7'-8" DEEP FIELD VERIFY	RETAIN EXISTING
ENTRANCE SIZE:	3'-7" WIDE X 7'-0" HIGH FIELD VERIFY	RETAIN EXISTING
ENTRANCE TYPE:	TWO SPEED, SIDE OPENING	RETAIN, RE-SKIN FRAMES WITH STAINLESS STEEL, NEW STAINLESS STEEL DOORS
DOOR OPERATION:	MEDIUM SPEED, HEAVY-DUTY DOOR OPERATOR, MINIMUM OPENING SPEED 1-1/2 F.P.S.	HIGH SPEED, HEAVY-DUTY, DOOR OPERATOR, MINIMUM OPENING SPEED 2-1/2 F.P.S.
DOOR PROTECTION:	MECHANICAL SAFETY EDGE	INFRARED WITH DIFFERENTIAL TIMING, NUDGING AND INTERRUPTED BEAM TIME
SAFETY:	FLEXIBLE GUIDE CLAMP - TYPE B, CAR	RETAIN EXISTING. SERVICE, FULL LOAD TEST AND TAG
GUIDE RAILS:	PLANED STEEL TEES	RETAIN EXISTING. REINFORCE TO MEET SEISMIC REQUIREMENTS
BUFFERS:	SPRING	RETAIN EXISTING

	EXISTING EQUIPMENT	DISPOSITION
CAR ENCLOSURE:		<ul style="list-style-type: none"> - CAR ENCLOSURE TO MATCH CAR ENCLOSURE IN BUILDING 218. - CAR INTERIOR FINISHES TO MATCH CAR INTERIORS IN BUILDING 218. - 8'-0" CLEAR HEIGHT UNDER CANOPY. - PAD BUTTONS AND VINYL COVERED PADS. - BATTERY POWERED EMERGENCY CAR LIGHTING IN MAIN C.O.P. PROVIDE SEPARATE CONSTANT PRESSURE TEST BUTTON IN CAR SERVICE COMPARTMENT.
SIGNAL FIXTURES:		TO MATCH BUILDING 218.
HALL AND CAR PUSHBUTTON STATIONS:		SINGLE HALL PUSHBUTTON RISER. MAIN AND AUXILIARY CAR OPERATING PANELS TO MATCH BUILDING 218
CAR POSITION INDICATORS:		TO MATCH BUILDING 218
HALL CAR POSITION INDICATOR		TO MATCH BUILDING 218
COMMUNICATION SYSTEM:		SELF-DIALING, VANDAL RESISTANT, PUSH TO CALL, TWO-WAY COMMUNICATION SYSTEM WITH RECALL, TRACKING AND VOICELESS COMMUNICATION
FIXTURE SUBMITTAL:		SUBMIT BROCHURE DEPICTING PROVIDER'S PROPOSED DESIGNS WITH BID

	EXISTING EQUIPMENT	DISPOSITION
ADDITIONAL FEATURES - (CAR NO. 209-P1):		<ul style="list-style-type: none"> - CAR AND COUNTERWEIGHT ROLLER GUIDES. - CAR TOP INSPECTION STATION. - FIREFIGHTERS' SERVICE, PHASE I AND II, INCLUDING ALTERNATE FLOOR RETURN - STANDBY POWER TRANSFER. - HOISTWAY ACCESS SWITCHES TOP AND BOTTOM FLOORS. - HOISTWAY DOOR UNLOCKING DEVICE ALL FLOORS. - PLATFORM ISOLATION. - INDEPENDENT SERVICE FEATURE. - CCTV PROVISIONS. - MACHINE, POWER CONVERSION UNIT, AND CONTROLLER SOUND ISOLATION. - TAMPER RESISTANT FASTENERS FOR ALL FASTENINGS EXPOSED TO THE PUBLIC. - ONE YEAR WARRANTY MAINTENANCE WITH 24-HOUR CALL-BACK SERVICE. - SEISMIC DEVICES AND OPERATION. - SIGNAGE ENGRAVING FILLED WITH BLACK PAINT.

	EXISTING EQUIPMENT	DISPOSITION
ADDITIONAL FEATURES (CONTINUED) - (CAR NO. 209-P1):		- NO VISIBLE COMPANY NAME OR LOGO. - WIRING DIAGRAMS, OPERATING INSTRUCTIONS, AND PARTS ORDERING INFORMATION - NON-PROPRIETARY CONTROL SYSTEM AND DIAGNOSTICS PROVISIONS

2.4 POWER SUPPLY

- A. For power supply in each machine room, see Specification 26 05 21, Electrical specifications, and Electrical drawings.
- B. It shall be the Electrical contractor's responsibility to supply the labor and materials for the installation of the following:
1. Feeders from the power source indicated on the drawings to elevator controller.
 2. Shunt Trip Circuit Breaker for controller shall be located

inside machine room at the strike side of the machine room door and

lockable in the "Off" position.
- C. Power for auxiliary operation of elevator as specified shall be available from auxiliary power generator, including wiring connection to the elevator control system.

2.5 CONDUIT AND WIREWAY

- A. May reuse any existing hoistway duct that meets code. Unless otherwise specified or approved, install electrical conductors, except traveling cable connections to the car, in rigid zinc-coated steel or aluminum conduit, electrical metallic tubing or metal wireways. Rigid conduit smaller than 3/4 inch or electrical metallic tubing smaller than 1/2 inch electrical trade size shall not be used. All raceways completely

embedded in concrete slabs, walls, or floor fill shall be rigid steel conduit. Wireway (duct) shall be installed in the hoistway and to the controller and between similar apparatus in the elevator machine room. Fully protect self-supporting connections, where approved, from abrasion or other mechanical injury. Flexible metal conduit not less than 3/8 inch electrical trade size may be used, not exceeding 18 inches in length unsupported, for short connections between risers and limit switches, interlocks, and for other applications permitted by NEC. Existing conduit and wireway meeting these specifications may be reused, if properly positioned.

- B. All conduits terminating in steel cabinets, junction boxes, wireways, switch boxes, outlet boxes and similar locations shall have approved insulation bushings. Install a steel lock nut under the bushings if they are constructed completely of insulating materials. Protect the conductors at ends of conduits not terminating in steel cabinets or boxes by terminal fittings having an insulated opening for the conductors.
- C. Rigid conduit and EMT fittings using set screws or indentations as a means of attachment shall not be used. All fittings shall be steel or malleable iron.
- D. Connect motor or other items subject to movement, vibration or removal to the conduit or EMT systems with flexible, steel conduits.

2.6 CONDUCTORS

- A. Unless otherwise specified, conductors, excluding the traveling cables, shall be stranded or solid coated annealed copper in accordance with Federal Specification J-C-30B for Type RHW or THW. Where 16 and 18 AWG are permitted by NEC, single conductors or multiple conductor cables in accordance with Federal Specification J-C-580 for Type TF may be used provided the insulation of single conductor cable and outer jacket of multiple conductor cable is flame retardant and moisture resistant. Multiple conductor cable shall have color or number coding for each conductor. Conductors for control boards shall be in accordance with NEC. Joints or splices are not permitted in wiring except at outlets. Tap connectors may be used in wireways provided they meet all UL requirements.
- B. Provide all conduit and wiring between machine room, hoistway and

fixtures.

- C. All wiring must test free from short circuits or ground faults.

Insulation resistance between individual external conductors and between conductors and ground shall be a minimum of one megohm.

- D. Where size of conductor is not given, voltage and amperes shall not exceed limits set by NEC.
- E. Provide equipment grounding. Ground the conduits, supports, controller enclosure, motor, platform and car frame, and all other non-current conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be copper, green insulated and sized as required by NEC. Bond the grounding wires to all junction boxes, cabinets, and wire raceways.
- F. Terminal connections for all conductors used for external wiring between various items of elevator equipment shall be solderless pressure wire connectors in accordance with Federal Specification W-S-610. The Elevator Contractor may, at his option, make these terminal connections on 10 gauge or smaller conductors with approved terminal eyelets set on the conductor with a special setting tool, or with an approved pressure type terminal block. Terminal blocks using pierce-through serrated washers are not acceptable.

2.7 TRAVELING CABLES

- A. All conductors to the car shall consist of flexible traveling cables conforming to the requirements of NEC. Traveling cables shall run from the junction box on the car directly to the controller. Junction boxes on the car shall be equipped with terminal blocks. Terminal blocks having pressure wire connectors of the clamp type that meet UL 486A requirements for stranded wire may be used in lieu of terminal eyelet connections. Terminal blocks shall have permanent indelible identifying numbers for each connection. Cables shall be securely anchored to avoid strain on individual terminal connections. Flame and moisture resistant outer covering must remain intact between junction boxes. Abrupt bending, twisting and distortion of the cables shall not be permitted.
- B. Provide spare conductors equal to 10 percent of the total number of conductors furnished, but not less than 5 spare conductors in each traveling cable.

- C. Provide shielded wires for the auto dial telephone system within the traveling cable. Add 5 pair shielded wires for card reader, 2 RG-6/U coaxial CCTV cables, and 2 pair 14 gauge wires for CCTV power as needed. Provide a minimum of four spare pair of shielded communication wires.
- D. If traveling cables come into contact with the hoistway or elevator due to sway or change in position, provide shields or pads to the elevator and hoistway to prevent damage to the traveling cables.
- E. Hardware cloth may be installed from the hoistway suspension point downward to the elevator pit to prevent traveling cables from rubbing or chafing. Hardware cloth shall be securely fastened and tensioned to prevent buckling. Hardware cloth is not required when traveling cable is hung against a flat wall.

2.8 CONTROLLER

- A. UL/CSA Labeled Controller: Mount all assemblies, power supplies, chassis switches, and relays on a self-supporting steel frame. Completely enclose the equipment and provide a mean to control the temperature. Solid state components shall be designed to operate between 32 to 104 degrees Fahrenheit, humidity non-condensing up to 85 percent.
- B. All controller switches and relays shall have contacts of design and material to ensure maximum conductivity, long life and reliable operation without overheating or excessive wear, and shall provide a wiping action to prevent sticking due to fusion. Switches carrying highly inductive currents shall be provided with arc shields or suppressors.
- C. Where time delay relays are used in the circuits, they shall be of acceptable design, adjustable, reliable, and consistent such as condenser timing or electronic timing circuits.
- D. Properly identify each device on all panels by name, letter, or standard symbol which shall be neatly stencil painted or decaled in an indelible and legible manner. Identification markings shall be coordinated with identical markings used on wiring diagrams. The ampere rating shall be marked adjacent to all fuse holders. All spare conductors to controller and supervisory panel shall be neatly formed, laced, and identified.

2.9 MICROPROCESSOR CONTROL SYSTEM

- A. Provide a microprocessor based system (Motion Control Elevator MCE 4000) with absolute position/speed feedback encoded tape to control the hoisting machine and signal functions in accordance with these specifications. Complete details of the components and printed circuit boards, together with a complete operational description, shall be submitted for approval.
1. Controller shall be non-proprietary.
 2. Proprietary tools shall not be necessary for adjusting, maintenance, repair, and testing of equipment.
 3. Controller manufacturer shall provide engineering and technical support, including all manuals and wiring diagrams to the VA Medical Center's designated Elevator Maintenance Service Provider.
 4. Replacement parts shall be shipped overnight within 24 hours of an order being received.
- B. All controller assemblies shall provide smooth, step-less acceleration and deceleration of the elevator, automatically and irrespective of the load in the car. All control equipment shall be enclosed in metal cabinets with lockable, hinged door(s) and shall be provided with a means of ventilation. All non-conducting metal parts in the machine room shall be grounded in accordance with NEC. Cabinet shall be securely attached to the building structure.
- C. Circuit boards for the control of each and every elevator system; operational control, signals, door operation and special operation shall be installed in a NEMA Type 1 General Purpose Enclosure. Circuit boards shall be moisture resistant, non-corrosive, non-conductive, fabricated of non-combustible material and adequate thickness to support the components mounted thereon. Mounting racks shall be spaced to prevent accidental contact between individual circuit boards and modules.
- D. Modules shall be the type that plug into pre-wired mounting racks. Field wiring or alteration shall not be necessary in order to replace defective modules.
- E. Each device, module and fuse (with voltage and ampere rating) shall be identified by name, letter or standard symbol in an approved indelible and legible manner on the device or panel. Coordinate identification

markings with identical markings on wiring diagrams.

- F. The electrical connections between the printed circuit boards (modules) and the circuit connectors incorporated in the mounting racks shall be made through individual tabs which shall be an integral part of each module. The tabs shall be nickel-gold plated or other approved metal of equal electrical characteristics. Modules shall be keyed or notched to prevent insertion of the modules in the inverted position.
- G. Light emitting diodes (LED) shall be for visual monitoring of individual modules.
- H. Components shall have interlocking circuits to assure fail-safe operation and to prevent elevator movement should a component malfunction.
- I. Method of wire wrapping from point to point with connections on the mounting racks shall be submitted for approval.
- J. Field wiring changes required during construction shall be made only to the mounting rack connection points and not to the individual module circuitry or components. If it is necessary to alter individual modules they shall be returned to the factory where design changes shall be made and module design records changed so correct replacement units will be available.
- K. All logic symbols and circuitry designations shall be in accordance with ASME and NEC Standards.
- L. Solid state components shall be designed to operate within a temperature range of 32 to 104 degrees Fahrenheit, humidity non-condensing up to 85 percent.
- M. Wiring connections for operating circuits and for external control circuits shall be brought to terminal blocks mounted in an accessible location within the controller cabinet. Terminal blocks using pierce through serrated washers shall not be used.
- N. To activate hall push buttons located at floors 1 and 2, you must use the card swipe located next to the hall push buttons. After card swipe is activated, push hall push button floor call to bring the elevator to that floor.

2.10 VVVF AC MOTOR CONTROL WITH REGENERATIVE DRIVE

A. Variable Voltage Variable Frequency Motor Control:

- 1. Elevator control shall be affected by means of a compact solid state

motor control unit for each and every elevator with electrical characteristics to suit the power supply. The system shall consist of the necessary three phase, full-wave bridge rectifiers and be equipped with regenerative drive.

2. Solid state motor control unit shall operate with high efficiency and low power consumption, have the capacity to handle peak currents typical of elevator service and contain a balanced, coordinated fault protection system which shall accomplish the following:
 - a. Protect the complete power circuit and specifically the power semi-conductors from failure under short circuit (bolted fault) conditions.
 - b. Protect against limited faults arising from partial grounds, partial shorts in the motor armature or in the power unit itself.
 - c. Protect the drive motor against sustained overloads. A solid state overload circuit shall be used.
 - d. Protect motor and power unit against instantaneous peak overload.
 - e. Provide semi-conductor transient protection.
 - f. Provide phase sequence protection to ensure incoming line is phased properly.
 - g. Removable printed circuit boards shall be provided for the VVVF control. Design tabs so boards cannot be reversed.

2.11 AUXILIARY POWER OPERATION

- A. The control system for Elevator 209-P1 shall provide for the operation of auxiliary power upon failure of the normal power supply.
- B. Auxiliary power supply, its starting means, transfer switch for transfer of elevator supply from normal to auxiliary power, two pair of conductors in a conduit from an auxiliary contact on the transfer switch (open or close contacts as required by Controller Manufacturer) to terminals in the elevator controller and other related work shall be provided by the Electrical Contractor.
- C. Upon loss of normal power supply there shall be a delay before transferring to auxiliary power of 10 seconds minimum to 45 seconds maximum, the delay shall be accomplished through an adjustable timing device.
- D. Prior to the return of normal power an adjustable timed circuit shall

be activated that will cause car to remain at a floor if already there or stop and remain at the next floor if in flight. Actual transfer of power from auxiliary power to normal building power shall take place after car is stopped at a floor with its doors open.

E. Car lighting circuits shall be connected to the auxiliary power panel.

2.12 SINGLE CAR SELECTIVE COLLECTIVE AUTOMATIC OPERATION

- A. Provide single car selective collective automatic operation for passenger/service Elevator No. 209-P1.
- B. Operate car without attendant from push buttons inside the car and located at each floor adjacent to the elevator entrance. When car is available, automatically start car and dispatch it to the floor corresponding to registered car or hall call. Once car starts it shall respond to registered calls in the direction of travel in the order floors are reached. Do not reverse car directions until all car calls have been answered or until all hall calls ahead of car and corresponding to direction of car travel have been answered. Slow car and stop automatically at floors corresponding to registered calls, in the order in which they are approached in either direction of travel. As slowdown is initiated, automatically cancel the hall call and car call. Hold car at arrival floor an adjustable time interval to allow passenger transfer. Illuminate appropriate push button to indicate call registration. Extinguish light when call is answered.
- C. When all calls in the system have been satisfied, the elevator shall shut down at the last landing served with the car and hoistway doors closed. Registration of a call at the landing where the car is parked shall automatically open the car and hoistway doors. Provide a predetermined time delay to permit passengers entering the parked car to register the call of their choice and establish direction of travel before the system can respond to landing calls registered to the same time above or below the parked car.
- D. Car lights and fan in the elevator shall not shut off when elevator is idle. Arrange circuits so that power to the lights and outlets on top and bottom of car shall not be interrupted.

2.15 FIREFIGHTERS' SERVICE

- A. Provide Firefighters' Service as per ASME A17.1 Section 2.27.
- B. Smoke Detectors:
 - 1. Smoke detection devices that are designated for actuation of Elevator Phase I "FIRE SERVICE" response in each elevator lobby and machine room shall be provided by others.
 - a. Elevator lobby smoke detectors shall activate only the elevator in the common lobby.
 - b. Top of hoistway smoke detectors shall activate fire recall. This sensor shall be provided if hoistway has sprinklers.

2.16 SEISMIC REQUIREMENTS

- A. Meet the requirements of ASME A17.1 Section 8.4, Elevator Safety Requirements for Seismic Risk Zone 2 or greater and VA Seismic Design Manual H-18-8.
- B. Support and maintain hoisting machines, controllers, governors, pit sheaves, car and counterweight rails and brackets, conduit systems, buffers, from sliding, rotating, overturning, or jumping under conditions imposed by seismic forces not less than that required to produce an acceleration of gravity horizontally and 1/2 gravity vertically acting simultaneously. Design the total system to continue operation without interruption under specified seismic acceleration, as outlined in H-18-8.
- C. Support all vertical conduits or duct systems within the hoistway at points above the center of gravity of the riser. Provide lateral guides at regular intervals.
- D. Provide hoisting machines mounted on vibration isolators with separate isolated seismic restraints.
- E. Controllers shall be bolted to the floor, and provided with sway braces at the top. Secure all electrical components within the panels to the panel frame. Fit cabinet doors with positive locking latches.
- F. Car and counterweight guide rail brackets and rail clip bolts shall be guarded against snagging the traveling cables on the side of the rail adjacent to the point of suspension of the traveling cables.
- G. Provide car guide rails with at least one intermediate bracket between brackets located at each floor so that bracket spacing does not exceed 2440 mm (8 ft.). If intermediate brackets cannot be installed because of lack of structural support, reinforce rails with 229 mm (9 in.)

channel or approved equal backing.

- H. Guide rails (Existing) shall not be less than 22.5 kg/m (15 lb/ft), or equal with channel backing.
- I. Provide counterweight guide rails with intermediate brackets in sufficient number so that the counterweight frame shall span no less than two brackets in its full length anywhere in the hoistway. Each pair of intermediate brackets as well as brackets located at each floor line shall have a horizontal tie of sufficient strength to contain the counterweight. Locate the horizontal tie member between the counterweight and the elevator car, and do not attach to the car guide rail or channel backing.
- J. Provide two counterweight derailment sensing wires vertically on the car side of the counterweight the entire height of travel. The counterweight frame shall be equipped with four derailment rings. Provide counterweight displacement switch. In the event the switch is activated, the corresponding elevator shall stop immediately and then proceed in the direction away from the counterweight to the next floor at a speed not exceeding 0.76 m/s (150 FPM). Upon arrival at the next floor, the elevator shall shut down with its door open. An indicator pilot light shall illuminate when the counterweight derailment detector is activated. This pilot shall be fully identified and shall be located in the machine room indicator panel, or if no machine room indicator panel is specified, locate pilot light in a conspicuous place on the front of the elevator controller, not obstructed by controller door panels.
- K. Provide a dual axis seismic switch to activate seismic operation.
- L. Provide an Annunciator in machine room connected to the essential electrical system. Annunciator will indicate if the seismic switch is not operative due to loss of power.
- M. Provide a sensor switch, installed on the governor rope tail sheave, to signal when the governor tail sheave is dislodged. The sensor shall prevent car movement when the governor tail sheave is dislodged from its normal position.
- N. The stresses in parts of structural members made of steel shall not exceed 88 percent of the minimum elastic strength of the material used in the fastenings.
- O. Provide car enclosure ceiling panels and fluorescent tubes with latching devices that shall restrain the panels and fluorescent tubes.

Devices shall be readily removable for cleaning or replacing panels and re-lamping.

- P. Submittals are required for all equipment anchors, supports, restraints and detectors. Submittals shall include weight, dimensions, center of gravity, standard connections, calculations, manufacturer's recommendations, behavior problems (vibration, thermal, expansion, etc.) so that design can be properly reviewed.
- Q. California only: provide an Earthquake Detection device in machine room to activate "GO SLOW ELEVATORS" operation. The following are references:
 - 1. Emergency Service:
 - a. Earthquake emergency operation Section 304(d)
 - b. Title 8, Industrial Relations, Division 01
 - c. Department of Industrial Relations, Chapter 4
 - d. Division of Industrial Safety and Sub Chapter 6, Elevator Safety Order

2.17 ELEVATOR MACHINE BEAMS

- A. Provide verification on SUBMITTALS that existing overhead beams meet the requirements of ASME A17.1 Section 2.9 to support machine and machinery in place to prevent any part from becoming loose or displaced under the conditions imposed in service.

2.18 GEARED TRACTION HOIST MACHINES; NEW ALTERNATING CURRENT (AC) MOTOR

- A. Geared traction machine to meet ASME A17.1 Elevator Code.
- B. Provide new geared machine with new sheave, disc brake, and AC motor.
- C. The geared traction machine shall be of a single worm and gear, single wrap traction type, with motor, brake, worm gear housing and sheave pedestals mounted in rigid bedplate.
- D. Hoisting motor of geared traction machine shall be alternating Current (AC) type. The motor shall be designed to develop the required high starting torque with a low starting current and shall conform to the NEMA Standards for 50 degree C, sixty minute rated elevator hoisting motor.
- E. Drive sheaves shall be free from cracks, sand holes, and other

imperfections that would tend to injure the hoist ropes. Sheave shall be turned smooth and true with rope grooves of proper design to ensure maximum traction and maximum life of the hoist ropes. Traction sheave shall be mechanically coupled to the hoist motor shaft centered in a positive manner.

- F. Hoisting machine brake shall be drum or disc type and shall have the capacity to hold the elevator with 125 percent of rated load. Arrange brake circuits so that no current shall be applied to the brake coil prior to the establishment of the hoistway door interlock circuit, except during leveling, re-leveling, and hoistway access operation.

2.19 SHEAVES

- A. Provide new deflector sheave with a metal basket type guard mounted below the sheave and seismic rope retainers to prevent ropes from jumping out of grooves. Securely fasten guard to sheave beams.

2.20 HOIST ROPES

- A. Provide elevator with the required number and size of ropes to ensure adequate traction for the range of loads with a factor of safety not less than that required by ASME A17.1 Section 2.20. Hoisting ropes shall be preformed 8 x 19 or 8 x 25 traction steel, conforming to Federal Specification RR-W-410 with minimum nominal diameter of 0.50 inch. For machines located overhead, 6 x 19 preformed traction steel hoisting ropes may be used in lieu of 8 x 19 that meet the requirements of the sheave manufacturer, at the elevator contractor's option.
- B. Securely attach a corrosion resistant metal data tag to one hoisting rope fastening on top of the elevator or at dead-end hitch.
- C. Provide wedge type shackles.
- D. Install new hoist ropes to provide minimum car runby required by ASME A17.1 Rule 2.4.2

2.21 GOVERNOR ROPE

- A. Governor Rope shall be 6 x 19 or 8 x 19 wire rope, preformed traction steel, uncoated, fiber core, conforming to Federal Specification RR-W-410 with minimum nominal diameter of 0.375 inch having a minimum safety

factor of 5. Tiller rope construction is not acceptable.

- B. Under normal operation rope shall run free and clear of governor jaws, rope guards, and other stationary parts.
- C. Securely attach governor rope tag to governor rope releasing carrier. Data tag shall be corrosion-resisting metal and bear data as required by ASME A17.1 Section 2.18.

2.22 SPEED GOVERNOR

- A. Provide Centrifugal type car driven governor, in accordance with ASME A17.1 Section 2.18, to operate the car safety device. Governor shall be complete with weighted pit tension sheave, governor release carrier and mounting base with protected cable sleeves.
- B. Furnish overspeed switch and speed reducing switches when required.
- C. The governor rope clamping device shall be designed so that no appreciable damage to or deformation of the governor rope shall result from the stopping action of the device in operating the safety.
- D. Provide anti-friction metal bearings for the governor and pit tension sheaves. Bearing shall be either self-oiling or Zerk fitting type connections. Ball or roller bearings may be used in lieu of sleeve type.
- E. Provide metal guard over top of governor rope and sheaves.
- F. Governor, with the exception of finished surfaces, screw threads, etc., shall be factory painted and shall operate freely. Field painting of governor parts shall be permitted in accordance with ASME A17.1 Rule 2.18.3.1.
- G. Where the elevator travel does not exceed 100 feet, the weight tension sheave may be mounted on a pivoted steel arm in lieu of operating in steel guides.

2.23 CAR SAFETY DEVICES

- A. Retain existing "Type B Safeties" on the elevator that meet the requirements of ASME A17.1 Section 2.17. Service, full load test, and provide corrosion-resisting metal tag indicating test date, type and testing party.
- B. Field testing of car safety and governor shall be as specified in Section 3.7 PRETEST and TEST of this specification.

2.24 ASCENDING CAR OVERSPEED PROTECTION

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

2.25 CAR AND COUNTERWEIGHT BUFFERS

- A. Retain existing spring buffers for car and counterweight. Check and tighten all fastenings. Properly prepare buffers and pit channels for painting, eliminating all rust. Prime and paint with rust inhibiting black enamel paint. Each installed buffer shall have a permanently attached metal plate indicating its stroke and load rating.
- B. Install new hoist ropes to provide minimum car runby required by ASME A17.1 Rule 2.4.2.

2.26 COUNTERWEIGHTS

- A. Retain existing counterweight. Statically balance to the weight of the car plus 40 percent of the rated capacity load as required by the controller manufacturer.
- B. Reuse existing two (2) tie rods with cotter pins and double nuts at top and bottom. Install counterweight retainer plates or other approved means on tie rods to prevent counterweight sub-weights from jumping and/or rattling. Both ends of tie-rods shall be visible and accessible.
- C. Retain existing counterweight guard in the pit in accordance with ASME A17.1 Section 2.3. Stencil car number on guard.

2.27 CAR AND COUNTERWEIGHT ROLLER GUIDES

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

- counterweight frame. All mounting bolts shall be fitted with nuts, flat washers, split lock washers, and if required, beveled washers.
- C. Provide sheet metal guards to protect wheels on top of car and counterweight.
 - D. Minimum diameter of car rollers shall be 150 mm (6 in.) unless the six wheel roller type is used. The entire elevator car shall be properly balanced to equalize pressure on all guide rollers. Cars shall be balanced in post-wise and front-to-back directions. Test for this balanced condition shall be witnessed at time of final inspection.
 - E. Minimum diameter of counterweight rollers shall not be less than 75 mm (3 in.). Properly balance counterweight frame to equalize pressure on all guide rollers. The Contractor shall have the option of furnishing, for counterweight only, mechanically adjusted roller guide in lieu of spring loaded roller guides as specified.
 - F. Equip car and counterweight with an auxiliary guiding device for each guide shoe which shall prevent the car or counterweight from leaving the rails in the event that the normal guides are fractured. These auxiliary guides shall not, during normal operation, touch the guiding surfaces of the rails. Fabricate the auxiliary guides from hot rolled steel plate and mount between the normal guide shoes and the car and counterweight frames. The auxiliary guides may be an extension of the normal guide shoe mounting plate if that plate is fabricated from hot rolled steel. The portion of the auxiliary guide which shall come in contact with the rail guiding surfaces in the event of loss of the normal guides shall be lined with an approved bearing material to minimize damage to the rail guiding surfaces.

2.28 GUIDE RAILS, SUPPORTS AND FASTENINGS

- A. Retain existing guiderails. Arrange guide rails to conform to ASME A17.1 Section 8.4 and the requirements of these Specifications.
- B. Check and tighten all existing fastenings.
- C. Provide necessary car and counterweight rail brackets and counterweight spreader brackets of sufficient size and design to secure substantial rigidity to prevent spreading or distortion of rails under any condition and to meet the requirements of ASME A17.1, Section 8.4 and Section 1.5 herein.
 - 1. Slotted or oversized holes shall be fitted with flat washers and

shall conform to ASME A17.1 Rule 2.23.10.3.

2. Where fastenings are over 4.2 m (14 ft) apart, rails shall be reinforced with 228 mm (9 in.) channel or approved equal backing to secure the rigidity required.
- D. Rail joints and fishplates shall be in accordance with ASME A17.1 Rule 8.4.8.6. Rail joints shall not interfere with clamps and brackets. Design rail alignment shims to remain in place if fastenings become loose.
- E. Guide rails shall be clean and free of any signs of rust, grease, or abrasion before final inspection. Paint the shank and base of the T-section with two field coats of manufacturer's standard enamel.
- F. After completion of car safety testing during final inspection, all marks left on rails by application of car safety shall be filed smooth.

2.29 NORMAL AND FINAL TERMINAL STOPPING DEVICES

- A. Normal and final terminal stopping devices shall conform to ASME A17.1 Section 2.25.
- B. Mount terminal slowdown switches and direction limit switches on the elevator or in hoistway to reduce speed and bring car to an automatic stop at the terminal landings.
 1. Switches shall function with any load up to and including 125 percent of rated elevator capacity at any speed obtained in normal operation.
 2. Switches, when opened, shall permit operation of elevator in reverse direction of travel.
- C. Mount final terminal stopping switches in the hoistway.
 1. Switches shall be positively opened should the car travel beyond the terminal direction limit switches.
 2. Switches shall be independent of other stopping devices.
 3. Switches, when opened, shall remove power from hoist motor, apply hoist machine brake, and prevent operation of car in either direction.
- D. After final stopping switches have been adjusted, through bolt switches to guide rail.

2.30 CROSSHEAD DATA PLATE AND CODE DATA PLATE

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

2.31 WORKMAN'S LIGHTS AND OUTLETS

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

2.32 TOP OF CAR OPERATING DEVICE

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

2.33 CAR LEVELING DEVICE

- A. Car shall be equipped with a two-way leveling device to automatically bring the car to within 3 mm (1/8 in.) of exact level with the landing for which a stop is initiated regardless of load in car or direction of travel.
- B. If the car stops short or travels beyond the floor, the leveling device, within its zone shall automatically correct this condition and

maintain the car within 3 mm (1/8 in.) of level with the floor landing regardless of the load carried.

2.34 EMERGENCY STOP SWITCHES

- A. Provide an emergency stop switch for each top-of-car device, pit, machine spaces, service panel and firefighters' control panel inside the elevator. Service panel stop switch shall be keyed. Mount stop switches in the pit at four feet above the pit floor and at top of the pit ladder 1220 mm (48 in.) above the bottom landing sill.
- B. Each stop switch shall be red in color and shall have "STOP" and "RUN" positions legibly and indelibly identified.

2.35 MAIN CAR OPERATING PANEL; PANEL AND BUTTONS TO MATCH BUILDING 218

- A. Locate the main car operating panel in the car enclosure on the front return panel. The top floor car call push button shall not be more than 1220 mm (48 in.) above the finished floor. Car call push buttons and indicator lights shall be round with a minimum diameter of 25 mm (1 in.), LED white light illuminated.
- B. One piece front faceplate, with edges beveled 15 degrees, shall have the firefighters' service panel recessed into the upper section and the service operation panel recessed into the lower section, fitted with hinged doors. Doors shall have concealed hinges, be in the same front plane as the faceplate and fitted with cylinder type key operated locks. Secure the faceplate with stainless steel tamperproof screws.
- C. All terminology on the main car operating panel shall be raised or engraved. Use 6 mm (1/4 in.) letters to identify all devices in upper section of the main car operating panel. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.
- D. The upper section shall contain the following items in order listed from top to bottom:
 - 1. Engrave elevator number, 25 mm (1 in.) high with black paint for contrast.

2. Engrave capacity plate information with black paint for contrast with number of passengers allowed.
3. Emergency car lighting system consisting of a rechargeable battery, charger and controls. The system shall automatically provide emergency light in the car upon failure or interruption of the normal car lighting service, and function irrespective of the position of the light control switch in the car. The system shall be capable of maintaining a minimum illumination of 1.0 foot-candle when measured 1220 mm (48 in.) above the car floor and approximately 305 mm (12 in.) in front of the car operating panel, for not less than four (4) hours.
4. LED illuminated digital car position indicator with direction arrows. Digital display floor numbers and direction arrows shall be a minimum of 50mm (2 in.) high.
5. Firefighters' Emergency Operation Panel shall conform to the requirements of ASME A17.1 Section 2.27. Firefighters' Panel shall be 1676 mm (66 in.) minimum to 1830 mm (72 in.) maximum to the top of the panel above finished floor.
6. Firefighters' Emergency Indicator Light shall be round with a minimum diameter of 25 mm (1 in.).
7. Key operated Independent Service; see Section 2.37 for detailed description.
9. Complete set of round car call push buttons, minimum diameter of 25 mm (1 in.), and LED white light illuminated, corresponding to the floors served. Car call buttons shall be legibly and indelibly identified by a floor number and/or letter not less than 15.9 mm (5/8 in.) high in the face of the call button. Stack buttons in a single vertical column.
10. Door Open and Door Close buttons shall be located below the car call buttons. They shall have "OPEN" and "CLOSE" legibly and indelibly identified by letters in the face of the respective button. The Door Open button shall be located closest to the door jamb as required by ADA.
11. Red Emergency Alarm button that shall be located below the car operating buttons. Mount the emergency alarm button not lower than 890 mm (35 in.) above the finished floor. It shall be connected to audible signaling devices as required by A17.1 Rule 2.27.1.2.

Provide audible signaling devices including the necessary wiring.

12. Emergency Help push button shall activate two way communications by Auto Dial telephone system as required by ASME A17.1 Rule

2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button "HELP" in the face of the button with 12 mm (1/2 in.) high letters.

13. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 15.9 mm (5/8 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

14. Provide a seismic signaling system per ASME A17.1, Section 8.4.10.1.1.

E. The service operation panel, in the lower section shall contain the following items:

1. Light switch labeled "LIGHTS" for controlling interior car lighting with its two positions (toggle switch) marked "ON" and "OFF".
2. Inspection switch that will disconnect normal operation and activate hoistway access switches at terminal landings. Switch shall be labeled "INSPECTION" with its two positions (toggle switch) marked "ON" and "OFF".
3. Three position toggle switch labeled "FAN" with its positions marked "HIGH", "LOW" and "OFF" for controlling car ventilating blower.
4. Two position, spring return, toggle switch or push button to test the emergency light and alarm device. It shall be labeled "TEST EMERGENCY LIGHT AND ALARM".
5. Two position keyed emergency stop switch, when operated, shall interrupt power supply and stop the elevator independently of regular operating devices. Emergency stop switch shall be marked "STOP" and "RUN".

2.36 AUXILIARY CAR OPERATING PANEL; PANEL TO MATCH BUILDING 218

- A. Provide an auxiliary car operating panel in the side wall of the elevator adjacent to the front entrance column strike jamb opposite the main car operating panel, located between the 2 car handrails. The

auxiliary car operating panel shall contain only those controls essential to passenger (public) operation. The auxiliary car operating panel faceplate shall match the main car operating panel faceplate in material and general design. Secure the faceplate with stainless steel tamperproof screws.

1. Mount door "OPEN" and door "CLOSE" buttons closest to the door jamb and mount the alarm button no lower than 875 mm (35 in.) above the finished floor. The Door Open button shall be located closest to the door as required by ADA.
2. Complete set of round car call push buttons, minimum diameter 25 mm (1 in.), and LED white light illuminated, to match elevator in Building 218, corresponding to the floors served. Car call button shall be legibly and indelibly identified by a floor number and/or letter not less than 15.9 mm (5/8 in.) high in the face of the call button corresponding to the numbers of the main car operating buttons.
3. Cross-connect all buttons in the auxiliary car operating panels to their corresponding buttons in the main car operating panel. Registration of a car call shall cause the corresponding button to illuminate in the main and auxiliary car operating panel.
4. Emergency Help push button shall activate two way communications by Auto Dial telephone system as required by ASME A17.1 Rule 2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button "HELP" in the face of the button with 15.9 mm (5/8 in.) high letters. Install emergency telephone system in the auxiliary car operating panel.
5. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 15.9 mm (5/8 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

2.37 INDEPENDENT SERVICE

- A. Provide a legibly and indelibly labeled "INDEPENDENT SERVICE", two-position key operated switch on the face of the main car operating

panel that shall have its positions marked "ON" and "OFF". When the switch is in the "ON" position, the car shall respond only to calls registered on its car dispatch buttons and shall bypass all calls registered on landing push buttons. The car shall start when a car call is registered, car call button or door close button is pressed, car and hoistway doors are closed, and interlock circuits are made. When switch is returned to "OFF" position, normal service shall be resumed.

2.38 CAR POSITION INDICATOR

- A. Provide an alpha-numeric digital car position indicator in the main car operating panel, consisting of numerals and arrows not less than 50 mm (2 in.) high, to indicate position of car and direction of car travel. Locate position indicator at the top of the main car operating panel, illuminated by light emitting diodes.

2.39 AUDIO VOICE SYSTEM

- A. Provide digitized audio voice system activated by stopping at a floor. Audio voice shall announce floor designations, direction of travel, and special announcements. The voice announcement system shall be a natural sounding human voice that receives messages and shall comply with ADA requirements for audible car position indicators. The voice announcer shall have two separate volume controls, one for the floor designations and direction of travel, and another for special announcements. The voice announcer shall have a full range loud speaker, located on top of the cab. The audio voice unit shall contain the number of ports necessary to accommodate the number of floors, direction messages, and special announcements. Install voice announcer per manufacturer's recommendations and instructions. The voice system shall be the product of a manufacturer of established reputation. Provide manufacturer literature and list of voice messages.
 - 1. Fire Service Message
 - 2. Seismic Operation Message
 - 3. "Please do not block doors"
 - 4. Provide special messages as directed by Resident Engineer.

2.40 AUTO DIAL TELEPHONE SYSTEM

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

2.41 CORRIDOR OPERATING DEVICE FACEPLATES; FACEPLATES TO MATCH BUILDING 218

- A. Fabricate faceplates for elevator operating and signal devices from not less than 3 mm (1/8 in.) thick flat stainless steel with all edges beveled 15 degrees. Install all faceplates flush with surface on which they are mounted.
- B. Corridor push button faceplates shall match the faceplates on elevator in Building 218. The centerline of the landing push buttons shall be 1067 mm (42 in.) above the corridor floor.
- C. Elevator Corridor Call Station Pictograph shall be engraved in the faceplate. Fill in colors mandated by ASME A17.1, Fig. 2.27.9.
- D. Fasten all car and corridor operating device and signal device faceplates with stainless steel tamperproof screws.
- E. Design corridor push button faceplates so that pressure on push buttons shall be independent of pressure on push button contacts.
- F. Engraved legends in faceplates shall have lettering 6 mm (1/4 in.) high filled with black paint.
- G. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 15.9 mm (5/8 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

2.42 CORRIDOR OPERATING DEVICES FOR PASSENGER/SERVICE ELEVATORS

- A. Provide one riser of landing call buttons located as shown on contract drawings.
- B. Fixture for intermediate landing shall contain "UP" and "DOWN" buttons. Fixtures for terminal landings shall contain a single "UP" or "DOWN" button.
- C. Each button shall contain integral registration LED white lights which shall illuminate upon registration of a call and shall extinguish when that call is answered.
- D. The direction of each button shall be legibly and indelibly identified by arrows not less than 12 mm (1/2 in.) high in the face of each button.
- E. Landing push buttons shall not re-open the doors while the car and hoistway doors are closing at that floor, the call shall be registered for the next available elevator. Calls registered shall be canceled if closing doors are re-opened by means of "DOOR OPEN" button or infrared curtain unit.
- F. To activate hall push buttons located at floors 1 and 2, you must use card swipe located next to the hall push buttons. After card swipe is activated, push hall button floor call to bring the elevator to that floor.
- G. Card swipe to be installed by others.

2.43 DIGITAL CORRIDOR POSITION INDICATOR; TO MATCH BUILDING 218

- A. Provide car with combination corridor lantern/position indicator digital display mounted over the hoistway entrances at each and every floor. Provide each terminal landing with "UP" or "DOWN", minimum 64 mm (2 1/2 in.) high digital arrow lanterns and each intermediate landing with "UP" and "DOWN" digital arrow lanterns. Each lens shall be LED illuminated of proper intensity, so shielded to illuminate individual lens only. Lanterns shall signal in advance of car arrival at the landing indicating the direction of travel whether or not corridor button has been operated at that floor. Hall calls shall receive advanced assignment to car and hall lantern shall sound and illuminate. Corridor lanterns shall not be illuminated when a car passes a floor without stopping. Each lantern shall be equipped with a clearly audible

electronic chime which shall sound once for "UPWARD" bound car and twice for "DOWNWARD" bound car. Audible signal shall not sound when a car passes the floor without stopping. Provide adjustable sound level on audible signal. Car riding lanterns are not acceptable.

- B. Provide alpha-numeric digital position indicators directly over hoistway landing entranceways between the arrival lanterns at each and every floor. Indicator faceplate shall be stainless steel. Numerals shall be not less than 50 mm (2 in.) high with direction arrows. Cover plates shall be readily removable for re-lamping. The appropriate direction arrow shall be illuminated during entire travel of car in corresponding direction.
- C. Provide LED illumination in each compartment to indicate the position and direction the car is traveling by illuminating the proper alpha-numeric symbol. When the car is standing at a landing without direction established, arrows shall not be illuminated.

2.44 HOISTWAY ACCESS SWITCHES; KEY SWITCHES TO MATCH BUILDING 218

- A. Provide hoistway access switches for elevator at top terminal landing to permit access to top of car, and at bottom terminal landing to permit access to pit. Mount 6 ft above the corridor floor in the wall next to the strike jamb. Exposed portion of each access switch or its faceplate shall have legible, indelible legends to indicate "UP", "DOWN", and "OFF" positions. Submit design and location of access switches for approval. Each access switch shall be a constant pressure cylinder type lock having not less than five pins or five stainless steel disc combination with key removable only when switch is in the "OFF" position. The key switch shall match the access key switches in Building 218. Lock shall not be operable by any other key which will operate any other lock or device used for any other purpose at the VA Medical Center. Arrange the hoistway switch to initiate and maintain movement of the car. When the elevator is operated in the down direction from the top terminal landing, limit the zone of travel to a distance not greater than the top of the car crosshead level with the top floor.
- B. Provide emergency access for all hoistway entrances, keyways for passenger and service elevators.

2.45 HOISTWAY ENTRANCES: PASSENGER/SERVICE ELEVATORS

- A. Retain existing entrance frames. Re-skin door jambs, 2 sides and header, with new stainless steel covering. Provide new hanger supports, hangers, tracks, door panels, hardware, bumpers, and sight guards, and wall anchors. Retain existing sills, angle struts, unit frames, fascia panels and toe guards.
- B. Check and tighten all sill and sill support fastenings.
- C. Reuse hanger supports.
- D. Ensure that angle struts are securely fastened at maximum 457 mm (18 in.) on center and at each end with two bolts.
- E. Provide jambs with protective covering. After re-skinning, protect jambs and head soffits with wood framing to prevent damage to finish during construction.
- F. Paint existing fascia, toe guards and hanger covers flat black. Stencil floor numbers on fascia as required.
- G. Provide hoistway entrance with flush two speed side slide hoistway doors. Door panels shall be not less than 16-gauge stainless steel, flush type construction, and not less than 32 mm (1 1/4 in.) thick. Wrap stainless steel around the leading and trailing edges of the door panel. Top and bottom of door panels shall have continuous stiffener channels welded in place. Reinforcement of the door panels shall be approximately 1.0 mm (0.04 in.) in thickness and of the hat section type. At bottom of each and every panel, provide two removable laminated phenolic gibs or other approved material guides and a separate fire gib. Reinforce each door panel for hangers, interlock mechanism, drive assembly, and closer. One door panel for each entrance shall bear a BOCA label, Underwriters' label, or in lieu of this, labels from other accredited test laboratories may be furnished provided they are based on fire test reports and factory inspection procedures acceptable to the COTR. Fasten sight guard of 14-gauge stainless steel, extending full height of panel, to leading edge of fast speed panel of two-speed doors.
- H. Provide hangers for hoistway door panels and provide relating devices to transmit motion from one door panel to the other. Fasten the hangers to the door sections. Provide reinforcements at the point of attachment. The hanger shall have provisions for vertical and lateral

adjustments. Hang doors on two-point suspension hangers having sealed ball-bearing sheaves not less than 76 mm (3 in.) in diameter, with rubber or non-metallic sound-reducing tires mounted on a malleable iron or steel bracket. The hanger sheaves shall operate at a relatively low rotational speed, and shall roll on a high-carbon, cold-rolled or drawn steel track shaped to permit free movement of sheaves without regard to vertical adjustment of sheave, bracket or housing. Beneath the track and each hanger sheave, provide a hardened steel up-thrust roller capable of withstanding a vertical thrust equal to the carrying capacity of adjacent upper sheave. The up-thrust shall have fine vertical adjustments, and the face of the roller shaped so as to permit free movement of the hanger sheave. The up-thrust roller shall have ball or roller bearings. Provide the hanger sheaves with steel fire stops to prevent disengagement from tracks.

- I. Do not use hangers that are constructed integrally with the door panels.
- J. Provide raised numerals on cast, plates for all openings. Numerals shall be a minimum of 50 mm (2 in.) high, located on each side of entrance frame, with centerline of 1524 mm (5 ft) above the landing sill. The number plates shall contain Braille. Locate Braille beneath the floor indication. Plates at the designated level shall include a 50 mm (2 in.) star with points of equal length. Floor numbers and star shall be white on a black background.

2.46 ELECTRIC INTERLOCKS

- A. Equip each hoistway door with an interlock, functioning as hoistway unit system, to prevent operation of car until all hoistway doors are locked in closed position. Hoistway door interlocks shall not be accepted unless they meet the requirements of ASME A17.1 Section 2.12.
- B. Equip car doors with electric contact that prevents operation of car until doors are closed unless car is operating in leveling zone or hoistway access switch is used. Locate door contact to prevent its being tampered with from inside of car. Car door contact shall not be accepted unless it meets the requirements of ASME A17.1 Section 2.12.
- C. Wiring installed from the hoistway riser to each door interlock shall be NEC type SF-2 or equivalent.

1. Type SF-2 cable terminations in the interlock housing shall be sleeved with glass braid fillers or equivalent.
- D. Provide devices, either mechanical or electrical, that shall prevent operation of the elevator in event of damaged or defective door equipment that has permitted an independent car or hoistway door panel to remain in the "unclosed" and "unlocked" position.

2.47 CAR FRAME: PASSENGER/SERVICE ELEVATORS

- A. Retain existing car frame. Check and tighten all fastenings. Car frame members shall be adjusted to relieve the car enclosure of all strains. Balance car front to back and side to side. Provide balancing weights and frames, properly located, to achieve the required true balance.

2.48 CAR PLATFORM:

- A. Retain existing car platform and sill. Cover underside and all exposed edges of wood filled platform with sheet metal of not less than 27-gauge, with all exposed joints and edges folded under. Fire resistant paint is not acceptable. Platform shall have new flexible composition flooring not less than 3 mm (1/8 in.) thick. Type and color shall match elevator flooring on elevator located in Building 218. Adhesive material shall be type recommended by manufacturer of flooring. Lay flooring flush with threshold plate and base.
- B. Provide a platform guard (toe guard) that meets the requirements of ASME A17.1 Section 2.15.9, of not less than 12-gauge sheet-steel on the entrance side, extend 76 mm (3 in.) beyond each side of entrance jamb. Securely brace platform guard to car platform, and bevel bottom edge at a 60-75 degree angle from horizontal. Install platform in the hoistway, so that the clearance between front edge and landing threshold shall not exceed 32 mm (1 1/4 in.). Stencil car number on guard.
- C. Isolate the platform from the car frame by approved rubber pads or other equally effective means.
- D. Adjust and tighten existing diagonal brace rods to hold platform firmly within car suspension frame.
- E. Provide a bonding wire between frame and platform.

2.49 CAR ENCLOSURE: TO MATCH BUILDING 218

- A. Retain existing car shell and canopy.
- B. Check and tighten all car enclosure fastenings.
- C. Reuse existing car enclosure base.
- D. Re-clad canopy of not less than 14-gauge steel. Repaint ceiling bright white.
- E. Provide car top railings that meet the requirement of ASME A17.1 Rules 2.14.1.7 and 2.10.2.
- F. Reuse existing front return wall panel, entrance columns, rear corner columns, entrance head-jamb and transom of 14-gauge stainless steel full height of car. Side and rear walls up to 1220 mm (48 in.) above finished floor shall be covered with new stainless steel cladding. Side and rear walls from 1220 (48 in.) to the ceiling shall be covered with high pressured plastic laminate. Apply to ½ inch fire rated plywood/particle board. Stainless steel and plastic laminate to match existing elevator in Building 218.
 - 1. Smooth and flush all joints with no ragged or broken edges.
- G. Reuse existing top emergency exit cover. Exit shall be unobstructed when open and shall have mechanical stops on the cover. Provide a code approved exit switch to prevent operation of the elevator when the emergency exit is open.
- H. Provide duplex, GFCI protected type receptacle in car. Locate flush-mounted receptacle on the centerline of the main car operating panel, 150 mm (6 in.) above the car floor.
- I. Lighting for passenger elevators:
 - 1. Provide aluminum hanging ceiling frame. Construct frame of 1/8 in. x 1 1/2 in. x 1 1/2 in. "T" and "L" sections, divide ceiling into six panels.
 - 2. Provide fluorescent or LED illuminated car light fixtures above the ceiling panels. See Specification 265100, Interior Lighting for fixture and ballast type. Maintain a minimum light level of 50-foot candles at 36 in. above the finished floor. Lighting to match elevator in Building 218.
- J. Provide a type AA blower unit arranged to exhaust through an opening in the canopy. Provide a stainless or chrome plated fan grill around the

- opening. Provide 2-speed blower, capable of rated free delivery air displacement of approximately 380 and 700 cfm at respective speeds. Mount fan on top of car with rubber isolation to prevent transmission of vibration to car structure. Provide screening over intake and exhaust end of blower. Provide a 3-position switch to control the unit in the service panel.
- K. Provide car enclosure with two sets of stainless steel handrails.
1. 75 mm (3 in.) wide x 9 mm (3/8 in.) thick flatstock located with centerlines 750 mm and 1050 mm (30 in. and 42 in.) above the car floor.
 2. Locate handrails 38 mm (1 1/2 in.) from cab wall. Install handrails on two side and rear walls. Curve ends of handrails to walls. Conceal all handrail fastenings. Handrails shall be removable from inside the car enclosure.
- L. Provide car entrance with two-speed side opening horizontal sliding car doors, of same type as hoistway doors. Construct door panels to be flush hollow metal construction, not less than 32 mm (1 1/4 in.) thick, consisting of one continuous piece 16-gauge stainless steel on car side face wrapped around the leading and trailing edges. Separate two plates by a sound-deadening material, and reinforce by steel shapes welded to the plates at frequent intervals. Reinforce panels as required for installation of hangers, power-operating and door-opening devices. Hang doors on two-point suspension hangers having sealed ball-bearing sheaves not less than 76 mm (3 in.) in diameter, with rubber or non-metallic sound-reducing tires. Equip hangers with adjustable ball-bearing rollers to take upward thrust of panels. Upthrust rollers shall be capable of being locked in position after adjustment to a maximum of .38 mm (1/64 in.) clearance. Provide two laminated phenolic gibs on each door panel. Gibs shall be replaceable without removal of door panel. Provide door drive assembly, restrictor, gate switch, header, track, arms, and all related door hardware.
- M. Provide each service elevator one set of protection pads of sufficient length to completely cover two sides, rear walls and front return of cab interior. Pads shall consist of a minimum of 6 mm (1/4 in.) thick glass fiber insulation securely sewn between flame resistant vinyl coated coverings. Insulation shall conform to ASTM E 84, UL 723, CAN/ULCS102.2, or

ASTM C612. Color of the covering shall be approved by the Resident Engineer.

Provide stainless steel pad buttons or hooks, spaced at intervals of not more than 150 mm (18 in.) to adequately support pads.

2.50 POWER DOOR OPERATORS: PASSENGER/SERVICE ELEVATORS

- A. Provide a high-speed heavy duty door operator to automatically open the car and hoistway doors simultaneously when the car is level with the floor, and automatically close the doors simultaneously at the expiration of the door-open time. Provide solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current. Motor shall be of the high-internal resistance type, capable of withstanding high currents resulting from stall without damage to the motor. The door operator shall be capable of opening a car door and hoistway door simultaneously, at a speed of .762 m (2.5 ft) per second. The closing speed of the doors shall be .3 m (1 ft) per second. A reversal of direction of the doors from the closing to opening operation, whether initiated by obstruction of the infrared curtain or the door "OPEN" button, shall be accomplished within 38 mm (1.5 in.) maximum of door movement. Emphasis is placed on obtaining quiet interlock and door operation; smooth, fast, dynamic braking for door reversals, stopping of the door reversal, and stopping of the doors at extremes of travel. Construct all levers and drive arms operating the doors, of heavy steel members, and all pivot points shall have ball or roller bearings. Auxiliary automatic door closers required under ASME A17.1 Section 2.11.3 shall be torsion spring type or spring loaded sill mounted type.
- B. Hoistway doors and car gates shall be manually operable in an emergency without disconnecting the power door operating equipment unless the car is outside the unlocking zone.
1. It shall not be possible for the doors to open by power unless the elevator is within the leveling zone.
 2. Provide infrared curtain unit. The device shall cause the car and hoistway doors to reverse automatically to the fully-open position should the unit be actuated while the doors are closing. Unit shall function at all times when the doors are not closed, irrespective of all other operating features. The leading edge of the unit shall

have an approved black finish. Extend ICU housing the full entrance height.

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

PART 3 EXECUTION

3.1 SPACE CONDITIONS

- A. Attention is called to existing overhead clearance, pit clearances, overall space in machine room, and construction conditions at building site in connection with elevator work. Addition or revision of space requirements, or construction changes that may be required for the complete installation of the elevator must be arranged for and obtained by the Contractor, subject to approval by Resident Engineer. Include cost of changes in bid that become a part of the contract. Provide proper, code legal installation of equipment, including all construction, accessories and devices in connecting with elevator, mechanical and electrical work specified.

3.2 INSTALLATION

- A. Perform work with competent Certified Elevator Mechanics and Apprentices skilled in this work and under the direct supervision of the Elevator Contractor's experienced foreman.
- B. Install machinery, guide supports, controls, car and all equipment and accessories in accordance with manufacturer's instructions, applicable codes and standards.
- C. Isolate and dampen machine vibration with properly sized sound-reducing anti-vibration pads.
- D. Grout sills and hoistway entrance frames, if required.

3.3 ARRANGEMENT OF EQUIPMENT

- A. Clearance around elevator, mechanical and electrical equipment shall comply with applicable provisions of NEC. Arrange equipment in machine

room so that major equipment components can be removed for repair or replacement without dismantling or removing other equipment in the same machine room. Locate controller near and visible to its respective hoisting machine.

3.4 WORKMANSHIP AND PROTECTION

- A. Installations shall be performed by Certified Elevator Mechanics and Apprentices to best possible industry standards. Details of the installation shall be mechanically and electrically correct. Materials and equipment shall be new and without imperfections.
- B. Recesses, cutouts, slots, holes, patching, grouting, refinishing to accommodate installation of equipment shall be included in the Contractor's work. All new holes in concrete shall be core drilled.
- C. Structural members shall not be cut or altered. Work in place that is damaged or defaced shall be restored equal to original new condition.
- D. Finished work shall be straight, plumb, level, and square with smooth surfaces and lines. All machinery and equipment shall be protected against dirt, water, or mechanical injury. At final completion, all work, including retained equipment, shall be thoroughly cleaned and delivered in perfect unblemished condition.
- E. Beams, slabs, or other building construction protruding more than four inches into the hoistway, all top surfaces shall be beveled at an angle of at least 75 degrees to the horizontal.
- F. Sleeves for conduit and other small holes shall project 50 mm (2 in.) above concrete slabs.
- G. Hoist cables that are exposed to accidental contact in the machine room, secondary and pit shall be completely enclosed with 16-gauge sheet metal or expanded metal or guards.
- H. Exposed gears, sprockets, and sheaves shall be guarded from accidental contact in accordance with ASME A17.1 Section 2.10.

3.5 CLEANING

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

3.6 PAINTING AND FINISHING

- A. Controllers and all other uncoated ferrous metal items shall be painted not less than one factory priming coat or approved equal.
- B. Upon completion of installation and prior to final inspection, all equipment shall be thoroughly cleaned of grease, oil, cement, plaster and other debris. All equipment, except that otherwise specified as to architectural finish, shall then be given two coats of paint of approved color, conforming to manufacturer's standard.
- C. Field painting of governors shall be in accordance with ASME A17.1 Rule 2.18.3.1.
- D. Paint floor designation not less than four inches high on hoistway doors, fascias and/or walls as required by Rule 2.29.2 of the Code. The color of paint used shall contrast with the color of the surfaces to which it is applied.
- E. Elevator hoistway machines and controllers shall be identified by 4 inches high numbers located as directed. Governors, shunt trip circuit breakers, safety plank and cross heads of cars shall be identified by 4 inches high numerals and letters located as directed. Numerals shall contrast with surrounding color and shall be decal or stenciled.
- F. Surface of door frames, door panels, interior cab surfaces and fixtures that become damaged or marred during renovations shall be restored to original condition in a satisfactory manner before final acceptance of work.
- G. Floors:
 - 1. Clean pit and machine room floors and paint deck grey with an epoxy based product.

3.7 PRE-TESTS AND TESTS

- A. Pre-test the elevator and related equipment in the presence of the Resident Engineer or his authorized representative for proper operation before requesting final inspection. Conduct final inspection at other than normal working hours, if required by Resident Engineer.
 - 1. Procedure outlined in the Inspectors Manual for Electric Elevators, ASME A17.2 shall apply.
 - a. Final test shall be conducted in the presence of and witnessed by an ASME QEI-1 Certified Elevator Inspector.
 - b. Government shall furnish electric power including necessary current for starting, testing, and operating machinery of each elevator.
- B. Inspect workmanship, equipment furnished, and installation for compliance with specification.
- C. Balance Tests: The percent of counterbalance shall be checked by placing test weights in car until the car and counterweight are equal in weight when located at the mid-point of travel. If the actual percent of counter balance does not conform to the specification, the amount of counterweight shall be adjusted until conformance is reached.
- D. Full-Load Run Test: Elevators shall be tested for a period of one hour continuous run with full contract load in the car. The test run shall consist of the elevator stopping at all floors, in either direction of travel, for not less than five or more than ten seconds per floor.
- E. Speed Test: The actual speed of the elevator shall be determined in both directions of travel with full contract load, balanced load and no load in the elevator. Speed shall be determined by applying a certified tachometer to the car hoisting ropes or governor rope. The actual measured speed of the elevator with all loads in either direction shall be within three (3) percent of specified rated speed. Full speed runs shall be quiet and free from vibration and sway.
- F. Temperature Rise Test: The temperature rise of the hoisting motor shall be determined during the full load test run. Temperatures shall be measured by the use of thermometers. Under these conditions, the temperature rise of the equipment shall not exceed 50 degrees Centigrade above ambient temperature. Test shall start when all machine room equipment is within five (5) degrees Centigrade of the ambient temperature. Other tests for heat runs on motors shall be performed as

prescribed by the Institute of Electrical and Electronic Engineers.

- G. Check amp readings with empty, balanced, and full load. At full load, the amp readings shall not exceed the motor nameplate amperage.
- H. Car Leveling Test: Elevator car leveling devices shall be tested for accuracy of leveling at all floors with no load in car, balanced load in car, and with contract load in car, in both directions of travel. Accuracy of floor level shall be within plus or minus 3 mm (1/8 in.) of level with any landing floor for which the stop has been initiated regardless of load in car or direction of travel. The car leveling device shall automatically correct over travel as well as under travel and shall maintain the car floor within plus or minus 3 mm (1/8 in.) of level with the landing floor regardless of change in load.
- I. Brake Test: The action of the brake shall be prompt and a smooth stop shall result in the up and down directions of travel with no load and rated load in the elevator. Down stopping shall be tested with 125 percent of rated load in the elevator.
- J. Insulation Resistance Test: The elevator's complete wiring system shall be free from short circuits and ground faults and the insulation resistance of the system shall be determined by use of megohm meter, at the discretion of the Elevator Inspector conducting the test.
- K. Safety Devices and Governor Tests: The safety devices and governor shall be tested as required by ASME A17.1 Section 8.10.
- L. Overload Devices: Test all overload current protection devices in the system at final inspection.
- M. Limit Stops:
 - 1. The position of the car when stopped by each of the normal limit stops with no load and with contract load in the car shall be accurately measured.
 - 2. Final position of the elevator relative to the terminal landings shall be determined when the elevator has been stopped by the final limits. The lower limit stop shall be made with contract load in the elevator. Elevator shall be operated at inspection speed for both tests. Normal limit stopping devices shall be inoperative for the tests.
- N. Setting of Car Door Contacts: The position of the car door at which the elevator may be started shall be measured. The distance from full closure shall not exceed that required by ASME A17.1. The test shall be

made with the hoistway doors closed or the hoistway door contact inoperative.

- O. Setting of Interlocks: The position of the hoistway door at which the elevator may be started shall be measured and shall not exceed ASME A17.1 requirements.
- P. Operating and Signal System: The elevator shall be operated by the operating devices provided and the operation signals and automatic floor leveling shall function in accordance with requirements specified. Starting, stopping and leveling shall be smooth and comfortable without appreciable steps of acceleration or deceleration.
- Q. Performance of the Elevator supervisory system shall be witnessed and approved by the representative of the Resident Engineer.
- R. Evidence of malfunction in any tested system or parts of equipment that occurs during the testing shall be corrected, repaired, or replaced at no additional cost to the Government, and the test repeated.
- S. If equipment fails test requirements and a re-inspection is required, the Contractor shall be responsible for the cost of re-inspection; salaries, transportation expenses, and per-diem expenses incurred by the representative of the Resident Engineer.

3.8 INSTRUCTION OF VA PERSONNEL

- A. Provide competent instruction to VA personnel regarding the operation of equipment and accessories installed under this contract, for a period equal to one eight hour day. Instruction shall commence after completion of all work and at the time and place directed by the Resident Engineer.
- B. Written instructions in triplicate relative to care, adjustments and operation of all equipment and accessories shall be furnished and delivered to the Resident Engineer in independently bound folders. DVD recordings will also be acceptable. Written instructions shall include correct and legible wiring diagrams, nomenclature sheet of all electrical apparatus including location of each device, complete and comprehensive sequence of operation, complete replacement parts list with descriptive literature, and identification and diagrammatic cuts of equipment and parts. Information shall also include electrical operation characteristics of all circuits, relays, timers, and electronic devices, as well as R.P.M. values and related characteristics for all rotating

equipment.

- C. Provide supplementary instruction for any new equipment that may become necessary because of changes, modifications or replacement of equipment or operation under requirements of paragraph entitled "Warranty of Construction".

3.9 INSPECTIONS AND SERVICE: GUARANTEE PERIOD OF SERVICE

- A. Furnish complete inspection and maintenance service on entire elevator installation for a period of one (1) year after completion and acceptance of all the elevators in this specification by the Resident Engineer. This maintenance service shall run concurrently with the warranty. Maintenance work shall be performed by Certified Elevator Mechanics and Apprentices employed and supervised by the company that is providing guaranteed period of service on the elevator equipment specified herein.
- B. This contract will cover full maintenance including emergency call back service, inspections, and servicing the elevators listed in the schedule of elevators. The Elevator Contractor shall perform the following:
 - 1. Weekly systematic examination of equipment.
 - 2. During each maintenance visit the Elevator Contractor shall clean, lubricate, adjust, repair and replace all parts as necessary to keep the equipment in first class condition and proper working order.
 - 3. Furnishing all lubricant, cleaning materials, parts and tools necessary to perform the work required. Lubricants shall be only those products recommended by the manufacturer of the equipment.
 - 4. Equalizing tension, shorten or renew hoisting ropes where necessary to maintain the safety factor.
 - 5. As required, motors, controllers, selectors, leveling devices, operating devices, switches on cars and in hoistways, hoistway doors and car doors or gate operating device, interlock contacts, guide shoes, guide rails, car door sills, hangers for doors, car doors or gates, signal system, car safety device, governors, tension and sheaves in pit shall be cleaned, lubricated and adjusted.
 - 6. Guide rails, overhead sheaves and beams, counterweight frames, and bottom of platforms shall be cleaned every three months. Car tops and machine room floors shall be cleaned monthly. Accumulated rubbish

shall be removed from the pits monthly. A general cleaning of the entire installation including all machine room equipment and hoistway equipment shall be accomplished quarterly. Cleaning supplies and vacuum cleaner shall be furnished by the Contractor.

7. Maintain the performance standards set forth in this specification.
 8. The operational system shall be maintained to the standards specified hereinafter including any changes or adjustments required to meet varying conditions of hospital occupancy.
 9. Maintain smooth starting and stopping and accurate leveling at all times.
- C. Maintenance service shall not include the performance of work required as a result of improper use, accidents, and negligence for which the Elevator Contractor is not directly responsible.
- D. Provide 24 hour emergency call-back service that shall consist of promptly responding to calls within two hours for emergency service should a shutdown or emergency develop between regular examinations. Overtime emergency call-back service shall be limited to minor adjustments and repairs required to protect the immediate safety of the equipment and persons in and about the elevator.
- E. Service and emergency personnel shall report to the Resident Engineer or his authorized representative upon arrival at the hospital and again upon completion of the required work. A copy of the work ticket containing a complete description of the work performed shall be given to the Resident Engineer or his authorized representative.
- F. The Elevator Contractor shall maintain a log book in the machine room. The log shall list the date and time of all weekly examinations and all trouble calls. Each trouble call shall be fully described including the nature of the call, necessary correction performed or parts replaced.
- G. Written "Maintenance Control Program" shall be in place to maintain the equipment in compliance with ASME A17.1 Section 8.6.

END OF SECTION