SECTION 14 12 00
DUMBWAITER DEMOLITION

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section covers the demolition of the existing dumbwaiters EC4, EC5, EC6 and E7C.

B. All remaining equipment related to the dumbwaiters noted above shall be demolished and removed from site in their entirety.

1.2 RELATED WORK

A. Any equipment unrelated to the dumbwaiters located in the existing shafts is addressed in other sections of these Contract Documents.

B. Existing shaft structure is addressed in other sections of these Contract Documents.

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SECTION 14 24 11
HYDRAULIC CART LIFTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section covers the furnishing of all materials and performing all work, complete, for the alterations to Cart Lifts Number 1 (Soiled) and Number 2 (Clean) located in VAMC Washington, DC. These lifts operate between SPD at the basement level and surgery on the second level. For a complete description of work and performance criteria, refer to the remaining parts of this specification. See other contract documents for sequencing of work.

B. The lift work includes but is not limited to the work described below:

1. Replace all existing lift equipment and appurtenances in the lift machine room, hoistway and pit except the hoistway entrance frames and sills, car sling and platform and guide rails. All equipment, specified to be retained, shall be reconditioned in “like new” condition.
2. Provide the following, but not limited to, new pump unit, jack assembly, buffers, car enclosure, door operator, operating and signaling devices, guides, door hardware, traveling cables and electrical wiring from the load side of the power disconnecting means to all parts of the elevator system. Existing raceways in the elevator machine room and hoistway may be reused, if they are found to be code conforming and approval is received from the Contracting Officer.
3. Provide new control and operating systems along with all necessary solid state devices for monitoring acceleration, deceleration, leveling, stopping, door control land location of the elevator in the hoistway and all other components required for a complete microprocessor based system.
4. All materials and equipment specified to be replaced shall be provided new and at least equal in duty and size to existing unless otherwise stated.
5. Materials, equipment and installation shall be such to specifically address use and environmental conditions associated with those found at the site.

C. Coincidentally with the progress of replacing various systems, all reused material shall be checked, modified and repaired or replaced, if necessary, so each item is equal in condition to that of a new item.
D. Everything required to satisfactorily complete lift installation as required by contract documents.
E. Removal and disposal of existing lift equipment which is not reused or as specifically noted herein.
F. Refurbishing, lubrication and painting of existing equipment which is retained and reused. This shall include, but not limited to cleaning, inspection repair and replacement of components. Such equipment must be compatible with new systems and components.

1.2 RELATED WORK IN OTHER SECTIONS

A. A brief description of the work associated with the lift project as specified within other divisions of this specification.
   1. Related architectural work in the machine room, hoistway, lobbies and pit, miscellaneous patching and painting, and all other architectural items specified.
   2. Machine room and hoistway outlets, and other related electrical work shall be provided as specified under Division 16 and as specified within.
   3. Temporary guards at all hoistway openings as required. The Elevator Contractor shall be responsible for the reinstallation of hoistway protection, which they removed for their work activities.

1.3 QUALITY CONTROL

A. Qualifications:
   1. Approval by the Contracting Officer is required of products or services of proposed manufacturer, suppliers, and installers and will be contingent upon submission by Contractor of a certificate stating the following:
      a. Manufacturer is currently and regularly engaged in manufacturing of elevator equipment as one of his principal products.
      b. Installer has technical qualifications of at least three years of successful experience, trained supervisory and installation personnel, and facilities to install elevator equipment specified herein.
      c. Contractor shall submit a list of two or more prior hospital installations where all the lift equipment the contractor proposes to furnish on this project has performed satisfactorily together under conditions of normal use. The list shall include projects

that have been in operation for a period of not less than two years preceding the date of these specifications; include the name and addresses of the Medical Center and the Medical Center Administrators.

2. All equipment shall be the product of the same manufacturer.
3. Approval of manufacturer's equipment will be contingent upon his having a permanent and satisfactory maintenance service branch which shall render services within two hours of receipt of notification. Manufacturer shall submit the names and address of his authorized branch or service department which will render service to this installation, together with certification that the quantity and quality of replacement parts stock on hand is sufficient to warranty continued operation of the lift installation.
4. Approval will not be given to any Elevator Contractor and/or manufacturer who has established on prior projects, either Government, municipal, or commercial, a record for unsatisfactory lift installations, or has repeatedly failed to complete contracts awarded to him within the contract time, or has not the requisite record of satisfactorily performing lift installations of similar type and magnitude.

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.

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.....Safety Code for Elevators and Escalators
A17.2.....Inspectors Manual for Electric Elevators and Escalators

E. National Fire Protection Association:
NFPA 13.....Standard for the Installation of Sprinkler Systems
NFPA 70.....National Electrical Code (NEC)
NFPA 72.....National Fire Alarm and Signaling Code
NFPA 101.....Life Safety Code
NFPA 252.....Fire Test of Door Assemblies

F. Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS):
SP-58.....Pipe Hangers and Supports

G. Society of Automotive Engineers, Inc. (SAE)
J517-91.....Hydraulic Hose

H. Gages:
For Sheet and Plate: U.S. Standard (USS)
For Wires: American Wire Gauge (AWG)

I. American Welding Society (AWS):
D1.1.....Structured Welding Code – Steel

J. National Electrical Manufacturers Association (NEMA):
LD-3.....High-Pressure Decorative Laminates

K. Underwriter's Laboratories (UL):
486A.....Safety Wire Connectors for Alloy, Copper-clad Aluminum, and Copper Conductors
797.....Safety Electrical Metallic Tubing

L. Institute of Electrical and Electronic Engineers (IEEE)

1.5 SUBMITTALS

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

B. Complete scaled and dimensioned layout of each lift installation in plan, elevation, and section.

C. Complete drawings of lift car enclosure modification, showing dimensioned details of construction, location and fastenings to car enclosure and to platform.

D. Dimensioned drawings showing details of all signaling and operating fixtures.

E. Samples (One each):

1. Stainless steel plate, 75 mm by 125 mm (3-inches by 5-inches.)
2. No other samples of materials specified shall be submitted unless specifically requested after submission of manufacturer's name. In case such samples are furnished pursuant to request, adjustment in contract price and time will be made as provided in Section 00 72 00, GENERAL CONDITIONS.

F. Materials Data: Submit the name of manufacturer and type or style designation of the following for approval:
1. Controllers.

1.6 WIRING DIAGRAMS

A. Provide three (3) sets field wiring and straight line wiring diagrams showing all electrical circuits of all lift equipment in the hoistway, as well as the machine room. One (1) set of diagrams shall be framed under plastic or on pivoted hardboards coated with an approved plastic sealer, and mounted in each machine room as directed by COR. In the event field modifications are found necessary during installation, diagrams shall be revised to include all corrections made prior to and during the final inspection.

B. Diagrams shall be delivered to the COR within 30 days of final acceptance.

1.7 ADDITIONAL EQUIPMENT

A. Furnish and install any additional equipment required to operate specified equipment manufactured or contemplated for this installation.

B. Special equipment not required by specification, but manufactured by elevator contractor, which would improve the operation as a whole, may be installed on or 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.

1.8 TOOL CABINET

Provide a metal tool cabinet, having two shelves and a hinged door. cabinet size shall be approximately 1200 mm (48 inches) high, 450 mm (18 inches) wide, 375 mm (15 inches) deep and shall contain not less than 213.4 cubic cm (7 cubic feet) of storage.

1.9 PERFORMANCE STANDARDS

A. The lifts shall be capable of meeting the highest standards of the industry and specifically the following:
1. Contract speed shall mean speed in the UP direction with full capacity load in the car. Speed variation under any load condition, regardless of direction, shall be no more than ten (10) percent.

2. Starting, stopping, and leveling shall be smooth and comfortable without appreciable steps of acceleration and deceleration.

B. Floor Accuracy

1. Accuracy shall be maximum 3 mm (1/8 inch) above or below the floor, regardless of load condition.

1.10 WARRANTY

A. Submit all labor and materials furnished in connection with lift system and installation to terms of "Warranty of Construction" articles of Section 00 72 00, GENERAL CONDITIONS. Warranty shall commence upon final inspection and completion of performance test and upon full acceptance of the installation and shall concur with the length of the maintenance contract.

B. If it becomes evident during warranty period that any device is not functioning properly or in accordance with specification requirements, or if in the opinion of the Contracting Officer, 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 Fed. Spec. QQ-S-766, Class 302 or 304, Condition A with Number 4 finish (150 grit) 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 erection, protect all stainless steel surfaces with a 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.

B. When two or more units of same class of materials, devices 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. All components of an assembled unit shall be products of same manufacturer.
   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. Welding: 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 Publication AWS D1.1 to perform type of work required.

E. Motor nameplates shall state manufacturer's name, rated horsepower, speed, volts, amperes and other characteristics required by NEMA standards, and shall be securely attached to the item of equipment in a conspicuous location.

F. Where key-operated switches or key-operated cylinder locks are furnished in conjunction with any component of the lift installation, four keys for each individual switch or lock shall be furnished. Barrel keys are not acceptable. Attach each key to a tag bearing a stamped or etched legend identifying its purpose. Engrave tags and imprint "Property of U.S. Government" on reverse side.

2.3 CAPACITY, SPEED AND TRAVEL

A. The direct-plunger lift shall have the capacity to lift the live load exclusive of the weight of entire car and plunger, as specified in the following schedule.

LIFT SCHEDULE	
Lift Number	1 & 2
Overall Platform Size	3’-6” Wide x 5’-8” Deep
Clear Car Interior	3’-6” Wide x 5’-8” Deep x 6’-0” High
Rated Load - kg(pounds)	454 kg (1000 Lbs.)
Rated Speed - m/s(fpm)	.45 m/s. (90 fpm)
Total Travel – m(ft)	Existing
Number of Stops	2

LIFT SCHEDULE	
Number of Openings	2
Entrance Type & Size	Vertical Lift – Biparting (Power Operated)3’-6” Wide x 6’-0” High

B. Actual lift speed shall not vary more than 10 percent above or below contract speed. (See Paragraph 142400-1.9,A,1)

2.4 POWER SUPPLY

A. For power supply in each machine room see specification Division 26, ELECTRICAL and electrical drawings. Existing power supply is 460v, 3 phase, 60hz.

B. It shall be the electrical contractor's responsibility to supply the labor and materials for the installation of the following:

l. A feeder from the power source indicated on the drawings to each hydraulic controller.

2. Auxiliary circuits for hydraulic signal and control systems as indicated on the drawings, from the indicated source to each hydraulic controller. The hydraulic controller, the elevator contractor shall supply and install motor and power and signal wiring from the controller to the machine.

2.5 CONDUIT PER NEC

A. Existing raceways and conduit in machine room and hoistway may be reused, it they are found to be Code conforming and approval is received from Contracting Officer. Any new conduit shall meet requirements as specified in following paragraphs.

B. All conduit terminating in steel cabinets, junction boxes, wireways, switch boxes, outlet boxes and similar locations shall have approved insulation bushing. Install a steel locknut under the bushing 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. Do not use set screws or indentations as a means of attachment or connection. Use compression fittings.

D. Conduit size: 19mm (1/2”) minimum.

E. Flexible metal conduit not less than 9.5 mm(3/8-inch) electrical trade size may be used, not exceeding 457 mm (18 inches) in length, for short connections between risers and limit switches, interlocks, and for other

applications permitted by the NEC. Flexible heavy-duty service cord, type S.O., may be used between fixed car wiring and switches on car doors for safety edges and light ray devices.

F. Provide terminal boxes for the conduit and wiring connections to the pump motor.

2.6 CONDUCTORS

A. Existing conductors may be reused. Any new conductors shall meet requirements as specified in following paragraphs.

B. Unless otherwise specified, conductors, exclusive of traveling cables, shall be stranded or solid coated annealed copper in accordance with Fed. Spec. J-C-30 for either Type RHW or THW. Where 16 and 18 AWG are permitted by NEC, either single conductor cable in accordance with Fed. Spec. J-C-580 for Type TF, or multiple conductor cable, 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 coding or other suitable identification for each conductor. Conductors for control boards shall be in accordance with NEC. Permit no joints or splices in wiring except at outlets. Tap connectors may be used in wireways provided they meet all UL requirements.

C. All wiring must test free from short circuits or grounds. Insulation resistance between individual external conductors and between conductors and ground shall be not less than one megohm.

D. Where size of conductors is not given, capacity shall be such that maximum current shall not exceed limits prescribed by NEC.

E. Provide equipment grounding. Ground conduits, supports, controller enclosures, motors, platform and car frames, 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 lift equipment shall be solderless pressure wire connectors in accordance with Fed. Spec. W-S-610. The Contractor may, at his option, make these terminal connections on No. 10 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. Existing traveling cables to be removed. 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. If traveling cables come into contact with the hoistway or cart lift due to sway or change in position, provide shields or pads to the cart lift and hoistway to prevent damage to the traveling cables.

D. Hardware cloth may be installed from the hoistway suspension point downward to the cart lift 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 CONTROLLERS

A. Existing control equipment to be removed. New equipment shall meet requirements as specified in following paragraphs.

B. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.

C. Wiring: Controller wiring shall be neatly arranged, readily accessible, easily traced and securely fastened in place. Identify all spare conductors to controller.

D. Identify each device and fuse (ampere rating) on panels by name, letter, or standard symbol, in an approved indelible and legible manner on device or panel. Coordinate identification markings with identical markings or wiring diagrams.

E. Provide solid state components and printed circuit boards to control the hydraulic machine or signal functions. If this option is exercised, complete details of the components and printed circuit boards, together with a complete operational description, shall be submitted for approval prior to manufacture. Incorporate the following features into the design:
   1. 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. Notch modules so as to prevent insertion of the modules in the inverted position.
   2. Light emitting diode (LEDS) may be used for visual monitoring of individual modules.
   3. Components shall have interlocking circuits to assure fail-safe operation and to prevent unwarranted lift movement in case any component fails to function properly.
   4. Submit method of wire wrappings for point to point wire connections on the mounting racks for approval.
   5. Modules shall be of the type that plug into pre-wired mounting racks. No field wiring or alteration shall be necessary in order to replace defective modules.
   6. Any 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. Any changes to individual modules shall be performed at the factory.
   7. Fabricate module boards from non-conductive, non-corrosive material which is of sufficient strength so as to support all components mounted thereon without warping. Space mounting racks sufficiently apart to prevent accidental contact between individual modules.
   8. All logic symbols and circuitry designations shall be in accordance with ASME Standards.
   9. Design solid state components to operate at a maximum of 40 degrees C (104 degrees F).
   10. Bring wiring connections for operating circuits and for external control circuits to terminal blocks mounted in an accessible location within the controller cabinet. Terminal blocks using pierce-through serrated washers shall not be acceptable.

2.9 MICROPROCESSOR CONTROL SYSTEM

The Contractor shall provide new solid state components and printed circuit boards 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.

2.10 HYDRAULIC PLUNGER ASSEMBLY

A. Existing assembly to be removed. Design cylinder and plunger in accordance with ASME A17.1. It shall be of sufficient size to lift gross load the height specified. Factory test at a pressure equal to twice the calculated working pressure, for strength and to insure freedom from leakage. Provide bottom of cylinder head with internal guide bearing and top of cylinder head with removable packing gland. Packing gland shall permit ready replacement of packing. Victaulic type packing gland head will not be permitted.
   1. Provide a bleeder valve located below the cylinder flange to release air or other gases from the system.
   2. Equip cylinder with drip ring below the packing gland to collect leakage of hydraulic fluid.
   3. Bolt the cylinder mounting brackets to continuous footing channels that also support the rails and buffers.

B. Install a flexible tubing scavenger line with an electrically operated pump between the piston drip ring and oil storage tank. Scavenger line, pump and strainers shall operate independently of hydraulic fluid pressure. Equip scavenger pump with a water float designed to prevent operation of the pump should the pit flood and designed to be manually reset. Strap the pump and reservoir to the pit channels.

C. Plunger shall be heavy seamless steel tubing, turned smooth and true to within plus or minus .38 mm (0.015 in.) tolerance and no diameter change greater than .07 mm (0.003 in.) per-inch of length. Ground the plunger surface to a fine polish finish, 12 micro-inches or finer. Where plunger is multi-piece construction, machine the joints to assure perfectly matching surfaces. No tool marks shall be visible.
   1. Secure plunger to underside of platform supporting beams with fastenings capable of supporting four times the weight of the plunger. The platen plate shall incorporate piston car vibration isolator as specified.
   2. Provide a stop ring welded or screwed to the bottom of plunger that shall prevent plunger from leaving its cylinder.

3. Isolate plunger head from the platen to prevent corrosion or electrolysis.
4. Carefully protect plunger and replace if gouged, nicked or scored.
5. If conditions beneath the pit floor are not adequate to support the total loading of the elevator, install reinforcing members in the pit floor.

D. Before installation, clean entire cylinder wall of all traces of oil, grease, moisture, dirt and scale.

2.11 HYDRAULIC CYLINDER CASING

A. Conditions are such that the presence of existing metal and/or PVC casing could not be confirmed. Contractor is to consider neither currently exists. Some consideration may be given if metal casing is found dependent on conditions. If existing casing is retained, all spoils must be removed leaving a completely clean hole.

B. The casing shall be iron or steel not less than 9 mm (3/8 in.) thick, at least 152 mm (6 in.) larger in diameter than the cylinder. The casing shall be accurately set, positioned, and plumbed to accept plunger assembly. The bottom shall be closed with a minimum of 152 mm (6 in.) of concrete. After setting, the top of the casing shall be sealed.

C. Provide PVC casing liner to fit inside steel casing. Fabricate from schedule 80 PVC pipe with watertight bottom and a top flange gasket to seal to plunger flange and to form a complete, watertight, electrically non-conductive encasement of the entire unit.

D. Provide suitable well hole to accommodate casing. Coordinate the drilling of well hole and setting of the cylinder with construction of concrete pit. Joint between the casing and the pit floor at bottom of pit shall be made watertight.

E. Bid shall be based on drilling hole in dirt, sand, rock, gravel, loam, boulders, hardpan, water, or other obstacles. The removal of all dirt and debris shall also be included.

2.12 PUMP UNIT ASSEMBLY

A. Existing unit to be removed. Completely integrate the pump unit for the control of the elevator and self-contain in a unit fabricated of structural steel. The unit shall consist of a hydraulic fluid pump driven by an induction motor together with oil control valves, piping, etc. Enclose unit on four open sides of the power unit frame with not less than 16 gauge steel removable panel sections. Provide a minimum 50 mm (2 in.) air space between the top of the panels and bottom of tank. Line panels on the interior side with one-inch rigid acoustical insulation board.

B. Control valves shall be electronically controlled. Hydraulic fluid flow shall be controlled to insure speed variation of not more than five (5) percent under all load conditions.

C. Hydraulic system working pressure shall not exceed 500 psi under any load condition.

D. Pump shall be positive displacement, rotary screw type, specifically designed for hydraulic elevator service, having a steady discharge without pulsation to give smooth and quiet operation. Pump output shall be capable of lifting elevator car with rated capacity, with a speed variation of no more than five (5) percent between no load and full load. Pump shall operate under flooded suction in an accurately machined case with the clearance required to assure maximum efficiency. Hydraulic fluid by-pass shall discharge directly into storage tank.

E. Motor shall be squirrel-cage, drip proof, ball bearing, and induction type, with a synchronous speed not in excess of 1800 RPM. Design motor specifically for elevator service, not to exceed nameplate full load current by more than 10% and be continuously rated 120 starts per hour without exceeding a rise of 40 degrees C. Include closed transition SCR soft start.

F. Connect motor and pump with multiple V-belt. Size belts and sheaves for duty involved and design to prevent any metallic contact between motor and pump shaft. Provide isolation units of rubber in shear to prevent transmission of pump and motor vibration to the building. Install expanded metal sheave guard that can be easily removed for servicing and inspection.

G. Hydraulic equipment may be installed within the oil storage tank if applicable for elevator size, speed, and duty rating.

H. Design motor, pump, tank, and piping to accommodate future travel, if specified.

2.13 HYDRAULIC SYSTEM

A. Construct the storage tank of sheet steel, welded construction, and a steel cover with suitable means for filling, a minimum one-inch protected vent opening, an overflow connection, and a valve drain connection. Tank shall act as a storage tank only, and sized to pass through machine room door as shown on drawings. Provide marked gauge to meter hydraulic fluid level. Tank shall be of capacity to hold volume of hydraulic fluid required to raise cart lift to top terminal landing, plus a reserve of not less than ten gallons. Provide a baffle in the bottom of the tank to prevent entry of any sediment or foreign particles

into hydraulic system. Baffle shall also minimize aeration of hydraulic fluid. Permissible minimum hydraulic fluid level shall be clearly indicated. Hydraulic fluid shall be of good grade to assure free flow when cool, and have minimum flash point of 400 degrees F. Provide initial supply of hydraulic fluid for operation of elevator. Provide a data plate on the tank framing indicating the characteristics of the hydraulic fluid used.

B. Furnish and install connections between the storage tank, pump, muffler, operating valves, and cylinder complete with necessary valves, pipe supports, and fittings. All connections between the discharge side of the pump, check valve, muffler, cylinder, lowering valves shall be of schedule 40 steel with threaded, flanged, or welded mechanical couplings. Size of pipe and couplings between cylinder and pumping unit shall be such that fluid pressure loss is limited to 10 percent.

C. Do not subject valves, piping, and fittings to working pressure greater than those recommended by the manufacturer.

D. Support all horizontal piping. Place hangers or supports within 305 mm (12 in.) on each side of every change of direction of pipe line and space supports not over 3.0 meters (10 ft) apart. Secure vertical runs properly with iron clamps at sufficiently close intervals to carry weight of pipe and contents. Provide supports under pipe to floor.

   1. Provide all piping from machine room to hoistway, including necessary supports or hangers. If remote piping is underground or in damp inaccessible areas, install hydraulic piping thru PVC sleeve pipe.

E. Install pipe sleeves where pipes pass through walls or floors. Set sleeves during construction. After installation of piping, equip the sleeves with snug fitting inner liner of either glass or mineral wool insulation.

F. Install blowout-proof, non-hammering, oil-hydraulic muffler in the hydraulic fluid supply pressure line near power unit in machine room. Design muffler to reduce to a minimum any pulsation or noises that may be transmitted through the hydraulic fluid into the hoistway.

G. Arrange control valves to operate so hydraulic fluid flow will be controlled in positive and gradual manner to insure smooth starting and stopping of elevator.

H. Provide safety check valve between cylinder and pump connection which will hold elevator with specified load at any point when pump stops or pressure drops below minimum operating levels.

I. Provide an automatic shut-off valve in the oil supply line at the cylinder inlet. Weld pipe protruding from cylinder at inlet and thread to receive shut-off valve. Activate the automatic shut-off valve when there is more than a ten percent increase in high speed in the down direction. When activated, this device shall immediately stop the descent of the elevator, and hold the elevator until it is lowered by use of the manual lowering feature of the valve. Arrange the manual lowering feature of the automatic shut-off valve to limit the maximum descending speed of the elevator to 15 FPM. The exposed adjustments of the automatic shut-off valve shall have their means of adjustment sealed after being set to their correct position.

J. Provide external tank shut-off valve to isolate hydraulic fluid during maintenance operations.

K. Provide all pump relief and other auxiliary valves to comply with the requirements of the Code and to insure smooth, safe, and satisfactory operation of elevator.

L. Furnish and adjust by-pass and relief valve in accordance with ASME A17.1 Rule 3.19.4.2.

M. Install check valve to hold the elevator car with rated load at any point when the pump stops.

N. Provide shut-off valves in the pit near the cylinder and in the machine room capable of withstanding 150 percent of design operating pressure. Each manual valve shall have an attached handle.

0. Conveniently locate the manual lowering valve, easily accessible, and properly identified with a red arrow and not concealed within the storage tank. Mark the operating handle in red.

P. Provide a low oil control feature which shall shut off the motor and pump and return the cart lift to the lowest landing. Upon reaching the lowest landing, doors will open automatically allowing cart to be removed from the car. Then doors shall close. All control buttons, except the door open button, shall be made ineffective.

Q. Provide oil-tight drip pan for assembled pumping unit, including storage tank. Pan shall be not less than 16 gauge sheet steel, with one-inch sides.

R. The entire hydraulic system, including muffler, shall be tested to withstand a pressure equal to twice the calculated working pressure. Submit certification that test has been performed.

2.14 GUIDE RAILS

A. Retain existing guide rails:

1. Clean, wash and dry guide rails and rail support equipment to remove all traces of oil, dirt and rust. Replace all missing, broken or damaged bolts, tie plates, fish plates and brackets. Tighten all bolts and support equipment. Bolts, brackets etc., in excessive size or length such ass to cause interference of the roller guide equipment shall be removed and replaced with such approved bolts, brackets, etc., which will accommodate the new roller guides. Rails, except running surfaces, shall be painted one coat of approved oil base black metallic paint.
2. The guide rails shall be realigned so that the faces of the rails are plumb within 1/16 inch distance from top to bottom and the rail heads parallel within 1/16 inch at all points per 100 feet height. Metal shims shall be used for alignments and be designed to remain in position, in the event the fastening bolts loosen. All rail brackets are to be spaced to allow no less than 1/4 inch of rail shims between the rail bracket and rail mounting.

2.15 CAR GUIDES

A. Existing to be removed. Install on car and counterweight frame four flexible sliding swivel guide shoes each assembled on a substantial metal base to permit individual self-alignment to the guide rails.
B. Provide each shoe with renewable non-metallic gibs of durable plastic material having low coefficient of friction and long-wearing qualities when operated on guide rails receiving infrequent, light applications of rail lubricant. Gibs containing graphite or other solid lubricants are not acceptable.
C. Flexible guide shoes of approved design, other than swivel type, may be used provided they are self-aligning on all three faces of the guide rails.
D. Provide spring take-up in car guide shoes for side play between rails.

2.16 CROSSHEAD DATA PLATE

Existing crosshead data plate to be retained. Provide a new permanently attach a non-corrosive metal data plate to car crosshead. Data plate shall bear information required by Rule 2.16.3 and 2.20.2.1 of ASME A17.1 related to information associated with this renovation. Etch or stamp such information on plate.

2.17 CAR BUFFERS

A. Existing to be removed. Provide a minimum of two spring buffers for each car. Buffers and supports shall be securely fastened to the pit channels, and in alignment with striker plates on car. Every installed

buffer shall have a permanently attached metal plate showing stroke and loading rating. Buffer anchorage shall not puncture pit waterproofing.

B. Buffers shall be designed and installed to provide minimum car runby required by ASME A17.1.

C. Pipe stanchions and struts shall be furnished, as required, to properly support the buffer.

2.18 NORMAL AND FINAL TERMINAL STOPPING DEVICES

A. Existing devices to be removed. 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 100 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 pump motor and control valves preventing operation of car in either direction.

D. After final stopping switches have been adjusted, through bolt switches to guide rail.

2.19 TOP-OF-CAR OPERATING DEVICE

A. Existing device to be removed. 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.

C. Movement of the cart lift shall be accomplished by the continuous pressure on a direction button and a safety button.

D. Provide an emergency stop toggle type switch.

E. Provide permanent identification for the operation of all components in the device.

F. The device shall be permanently attached to the cart lift crosshead on the side of the cart lift nearest to the hoistway doors used for accessing the top of car.

2.20 WORKMAN’S LIGHTS AND OUTLETS

A. Provide new duplex GFCI protected type receptacles on top of lift car and beneath platform.
B. The receptacles shall be in accordance with Fed. Spec. W-C-596/12D for Type D7, 2-pole, 3-wire grounded type rated for 15 amperes and 125 volts.

2.21 CAR LEVELING DEVICE

A. Provide new car leveling device for lift which shall automatically bring car to within 3 mm (1/8-inch) of exact level with floor landing regardless of load in car or direction of travel.
B. When the car is traveling in the up direction, the car shall level up to the floor; and when the car is traveling in the down direction, the car shall level down to the floor. The car shall at all times level into the floor and shall not stop above or below the floor and level back.
C. One-way leveling, augmented with an anti-creep device, shall not be acceptable.

2.22 EMERGENCY STOP SWITCHES

A. Provide each top-of-car device, pit, etc., with emergency stop toggle switches. Mount stop switch on top-of-car in a common fixture with the top-of-car operating device and stop switch in the pit adjacent to pit access door or adjacent to pit ladder as required by ASME A17.1.
B. Each stop switch shall be red in color and shall have its "Identity" and "STOP" and "RUN" positions legibly and indelibly identified.

2.23 OPERATING AND SIGNALING DEVICE FACEPLATES

A. Fabricate faceplates for all lift operating and signal devices from not less than 3 mm (1/8-inch) thick flat stainless steel, with all edges beveled at least 15 degrees. Install all faceplates flush with surface upon which they are mounted.
B. Faceplates shall be sized to encompass area of existing panels and defacing of the surrounding surface. The centerline of all corridor operating pushbuttons shall be 1 meter (3 feet 6 inches) above the corridor floor.
C. Fasten all car and corridor operating device and signal device faceplates with non-corrosive white metal spanner head or bristol head tamperproof screws.
D. Design car and corridor pushbutton faceplates so that pressure on pushbuttons are independent of pressure on pushbutton contacts.
E. Engraved legends or raised numerals in faceplates shall have lettering ¼ inch high filled with black paint.

F. When wall surface is irregular, means shall be provided to close gap between faceplate and wall surface.

G. All keying for switches specified shall meet requirements of ASME A17.1. Cylinders shall be Best Access 7 pin removable core type to match station standards.

2.24 OPERATING DEVICES AT HOISTWAY LANDINGS

A. Bottom Floor

1. Existing station shall be removed. The new station shall contain an illuminated SEND & RETURN button. Each button shall contain an integral registration light which shall illuminate upon registration of the call and extinguish when the car arrives at the designated floor and the doors open.

2. The station shall also contain a non-illuminated DOOR OPEN, DOOR CLOSE and RESET buttons used to control door operation.

3. The station will contain illuminating signal lights to inform the operator of various conditions. There shall be the following:

a. CART ON which will illuminate when the presence of a cart is detected on the car. It will extinguish when the car is empty.

b. OUT OF SERVICE which will illuminate when the car is placed on Inspection operation, removed from service because of a safety feature activations, stop switch open or loss of main line power. It will extinguish when service is restored.

c. SEND and RETURN which will illuminate when the respective operating program is selected.

4. There will be two – two position key switches. One switch will be engraved using 1/4 inch high characters marked PROGRAM SELECTION with SEND and RETURN designations engraved in 1/8 inch characters. The other switch will be engraved MAINTENANCE using 1/4 inch characters with OFF and ON designation engraved in 1/8 inch characters.

B. Top Floor

1. Existing station shall be removed. The new station shall contain an illuminated CALL and RETURN buttons. Each button shall contain a integral registration light which shall illuminate upon registration of the call and extinguish when the car arrives at the designated floor and the doors open.

2. The station shall also contain a non-illuminated DOOR CLOSE button used to control door operation.

2.25 CORRIDOR LANTERN

A. Existing lanterns to be removed. Provide each car with corridor lantern mounted over the hoistway entrances at each and every floor. Each lantern shall contain a single stroke chime so connected that when the cart lift arrives at a landing, the chime shall sound momentarily. The lenses in each lantern shall be red LED illuminated. Lanterns shall signal in advance of car lift arrival at the landing. Each lantern shall be equipped with a clearly audible electronic chime which shall sound once for car lift arrival. Provide adjustable sound level on audible signal. Car riding lanterns are not acceptable.

2.26 TWO-STOP send and return automatic operation

A. Provide two-stop send and return automatic operation for both cart lifts. Primarily, cart lift number 1 is designated for transport of soiled materials from surgery down to the decontamination area of SPD while cart lift number 2 is designated for transport of clean material from SPD up to surgery. A two position program selector key switch located in the operator control station adjacent to the lift entrance at the SPD bottom floor is provided with a SEND and RETURN position. The reason for the selector switch is to provide flexibility should it ever be needed.

B. The lifts will park at the bottom floor with its doors closed.

C. With the program selector switch in the send position and the send light illuminated, the cart lift will operate as follows:

1. With the lift parked at the bottom floor with the doors closed, pressing the door open button will cause the doors to open.
2. Movement of the cart onto the lift will activate the cart on signal and illuminate the cart on light. Pressing the send button then pressing the door close button will cause the doors to close, register a call for the upper floor and illuminate the send button. Pressure must be maintained on door close button until the doors are closed then the lift will move up.
3. Upon arrive at the upper landing, the car arrival signal will illuminate, the audible arrival signal will sound and the doors will open.
4. The doors will remain open at this level for an adjustable period of time (15 seconds to 120 seconds with an initial setting of 45 seconds) then door open bell will sound to alert people in the area to remove the cart, press the door close button until the doors are closed then the lift will return to the bottom level and open its

doors. The bell will continue to sound until the doors at the top floor are closed. Should the cart be removed at the upper level during the time period the doors are open, as indicated by the clearing of the cart on signal, the hold open time for the doors will be reduced. This time reduction will be adjustable (5 seconds to 30 seconds with an initial setting of 10 seconds). The door open bell will sound to remind the attendant to close the doors. The doors will close by pressing the door close button then a return call will be registered and the lift will return to the bottom level then open its doors.

5. Should the operator decide they need to recall the lift prior to expiration of the long door hold open time, this can be done by pressing the return button in the control panel upon which the short hold open time will start, the door open bell will sound alerting the attendant to press the door close button causing the doors to close and the lift will return.
6. Upon the arrival of the lift at the bottom floor, the car arrival light will illuminate, the audible arrival signal will sound and the doors will open. Should the cart still be on the lift, the doors will remain open until the cart is removed or the operator initiates a send call. Should the cart be removed, the short door open time will activate to alert the operator to press the door close button to close the doors. The lift will remain at this level for the next operation.

D. With the program selector switch in the return position and the return light illuminated, the cart lift will operate as follows:

1. With the lift parked at the bottom floor and the doors closed, the operator can press the send button to dispatch the lift to the upper floor for a pickup.
2. The lift may also be called by an attendant at the upper floor by pressing the call button in the corridor station adjacent to the opening. Provided the doors are closed, the lift will be dispatched to the upper floor for a pickup. If the lift is sitting with the cart on signal activated, the short hold open time will be activated then the door open bell will sound to alert the operator to remove the cart and press the door close button until the doors are closed then the lift will resound to the upper floor call.

3. Upon arrival at the upper landing, the car arrival signal will illuminate, the audible arrival signal will sound and the doors will open.
4. This will allow the attendant to load the cart onto the lift and activate the short door hold open time. After loading, the attendant can press the return button and press the door close button until the doors are closed. The lift will move down to the bottom floor. If the cart is loaded, expiration of the short door hold open time will cause the door open bell to sound until the return call is registered and the doors close. Should the lift arrive and no cart is loaded, the long door hold open time will activate to alert the attendant to either load a cart and activate the return sequence or activate the return sequence directly.
5. Should the operator decide they need to recall the lift prior to expiration of the long door hold open time, this can be done by pressing the return button in the control panel upon which the short door hold open time will start, the door open bell will sound alerting the attendant to press the door close button, causing the doors to close and the lift will return.
6. Upon the arrival of the lift at the bottom floor, the car arrival light will illuminate, the audible signal will sound and the doors will open. Should there be a cart on the lift, the doors will remain open until the cart is removed or the long door hold open time activates. Should the cart be removed, the short door open time will activate to alert the operator to press the door close button to close the door.

E. The maintenance switch is provided to remove the respective lift from program operation and to allow elevator service and inspection personnel direct control of the lift. In the on position, the access switch stations at the bottom landing and upper landing become active. The maintenance switch and access stations will be keyed alike. Use of the access switches will allow entry into the pit and top of the lift.

2.27 AUXILIARY POWER OPERATION

A. Provide a battery backup power source to send each lift to the lowest landing by activating the down valve. After the lift has leveled at the lowest landing, provide power to open the doors automatically. Power shall stay applied to the door open button in the operator’s station so the doors can be opened. The lift shall remain shut down at the bottom landing until normal power is restored. Install a sign on each

controller indicating that power is applied to the down valve and door operator during loss of normal power.

2.28 HOISTWAY ACCESS SWITCHES

A. Provide hoistway access switch for lift at top terminal landing to permit access to top of lift, and at bottom terminal landing to permit access to pit. Mount new switch adjacent to and even with the top of the jamb above the corridor control station. The switch shall have legible, indelible legends to indicate identity and "UP", "DOWN", and "OFF" positions. Design and location of access switches shall be submitted 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 "OFF" position. Barrel keys not acceptable. Lock shall not be operable by any other key which will operate any other lock or device used for any other purpose in the hospital except the MAINTENANCE switch in the bottom floor operating panel. Arrange the hoistway switch to initiate and maintain movement of the lift. When the lift is moved down from the top terminal landing, limit the zone of travel to a distance not greater than the height of the lift crosshead.

B. Provide hoistway door unlocking means at all entrances.

2.29 HOISTWAY ENTRANCES

A. Existing stainless steel hoistway entrance frames to be retained and door panels to be removed.

B. The frames shall be refurbished to match original finish.

C. Provide each door panel frame with four fixed or adjustable, malleable iron, mill-grooved, guide shoes not less than 63 mm (2 1/2 in.). Weight and method of fastening to frames and hoistway, above and below, shall conform to a standard practice of cart lift manufacturer. Provide gibs, struts from floor-to-floor, chains, and steel sheaves with sealed ball or roller bearings. Provide guides and stops for door travel.

D. Door panels shall be flush, hollow metal construction and bear a 1-1/2 hour Underwriters' "B" label, one inch thick, of not less than No. 16 gauge stainless steel on both sides. Panels shall be reinforced. Interior of panels shall be filled with fireproof material. Upper door section shall be fitted with a safety non-crushing astragal and a glass vision panel of 6 mm (1/4 in.) thick, wire glass not less than 76 mm (3 in.) nor more than 102 mm (4 in.) in diameter.

E. Door operators shall be heavy duty closed loop power operators designed to automatically open car and hoistway doors upon arrival of car at each

landing. Door "opening" and "closing" speed shall be one foot per second. Design, construction, and installation of doors and power operator shall preclude the possibility of doors opening until the car stop at a landing.

F. Entrances shall be protected by plastic or paper covering to prevent damage during construction.

2.30 ELECTRIC POWER DOOR OPERATOR

A. Existing door operators to be removed. Provide a heavy duty door operator to automatically open the car and hoistway doors simultaneously when the car is level, 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 and closing the car door and hoistway door simultaneously, at a speed of .3 m (1 ft) per second. A reversal of direction of the doors from the closing to opening operation, whether initiated by obstruction or the door "OPEN" button, shall be accomplished within 38 mm (1-1/2 in.) of door movement.

2.31 ELECTRIC INTERLOCKS

A. Existing hoistway door interlocks to be removed. Equip each hoistway door with an interlock, functioning as hoistway unit system, to prevent operation of cart lift until all hoistway doors are locked in closed position. Hoistway door interlock shall not be accepted unless it meets the requirements of ASME A17.1 Section 2.12.

B. Equip car lift doors with electric contact that prevents operation of cart until doors are closed unless cart is operating in leveling zone or hoistway access switch is used. Cart 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 car 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.

2.32 CAR FRAME

Existing car frame to be retained. Detail of any modifications shall be submitted for approval. All damaged or worn parts shall be replaced. Balance car front to back and side to side. Provide balancing weights and frames, properly located, to achieve the required true balance.

2.33 CAR PLATFORM

A. Existing car platform to be retained. Details of any modifications shall be submitted for approval. All damaged or worn parts to be replaced. It shall be cleaned and polished. It shall be securely fastened. Any missing or damaged hardware shall be replaced.

2.34 CAR ENCLOSURE

A. Existing lift enclosure shall be removed. Car shall have width and depth required for contract load and is constructed of minimum 14-gauge stainless steel except cart floor shall be minimum 10-gauge stainless steel. Construction shall conform to ASME A17.1 Rule 7.2.1. Car floor shall be reinforced to provide adequate support for loading and unloading units and withstand impact of wheeled carts.
   1. Provide car entrance with vertical sliding or bi-parting door constructed of sheet panels of stainless steel, guided and connected to each other by cables running over sheaves mounted at top of car. Car door shall be opened automatically and closed automatically by power operator. Provide safety contact, automatic reversing edge on underside of upper door section.
   2. Provide a flush mounted light fixture in car ceiling. Light shall be connected to illuminate automatically when car arrives at landing and hoistway door is opened and shall be automatically extinguished when hoistway door is closed.
   3. Provide metal nameplate in car showing name of manufacturer and rated load in pounds stamped, etched or raised letters and numerals.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine work of other trades on which the work of this Section depends. Report defects to the COR in writing which may affect the work of this trade or equipment operation dimensions from site for preparation of shop drawings.

B. Ensure that shafts and openings for moving equipment are plumb, level and in line, and that pit is to proper depth, waterproofed and drained with necessary access doors, ladder and guard.

C. Ensure that machine room is properly illuminated, heated and ventilated, and equipment, foundations, beams correctly located complete with floor and access stairs and door.

D. Before fabrication, take necessary job site measurements, and verify where work is governed by other trades. Check measurement of space for equipment, and means of access for installation and operation. Obtain dimensions from site for preparation of shop drawings.

E. Ensure the following preparatory work, provided under other sections of the specification has been provided. If the Elevator Contractor requires changes in size or location of trolley beams, or their supports, trap doors, etc., to accomplish their work, he must make arrangements, subject to approval of the Contracting Officer and include additional cost in their bid. Where applicable, locate controller near and visible to its respective hydraulic pump unit. Work required prior to the completion of the cart lift installation:

1. Supply of electric feeder wires to the terminals of the elevator control panel, including circuit breaker.
2. Provide light and GFCI outlets in the cart lift pit and machine room.
3. Furnish electric power for testing and adjusting cart lift equipment.
4. Furnish circuit breaker panel in machine room for car and hoistway lights and receptacles.
5. Supply power for cab lighting and ventilation from an emergency power panel specified in Division 26, ELECTRICAL.
6. Machine room enclosed and protected from moisture, with self closing, self-locking door and access stairs.
7. Provide fire extinguisher in machine room.

F. Supply for installation, inserts, anchors, bearing plates, brackets, supports and bracing including all setting templates and diagrams for placement.

3.2 SPACE CONDITIONS

A. Code compliance is required for overhead clearance, pit clearances, the size of machine room including equipment clearances, and construction conditions at building site in connection with cart lift installation. Addition or revision of space requirements, or construction changes that may be required for the complete installation of the cart lift must be arranged for and obtained by the Contractor, subject to approval of Contracting Officer. Include cost of changes in bid that become a part of the contract. Provide proper, code compliant installation of

equipment, including all construction, accessories and devices in connecting with cart lift, mechanical and electrical work specified.

B. Where concrete beams, floor slabs, or other building construction protrude more than 100 mm (4 in.) into hoistway, bevel all top surfaces of projections to an angle of 75 degrees with the horizontal.

3.3 ARRANGEMENT OF EQUIPMENT

A. Clearance around cart lift, 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. Where applicable, locate controller near and visible to its respective hydraulic pump unit.

3.4 INSTALLATION

A. Installation shall be performed by Certified Elevator Mechanics and Apprentices skilled in this work and under the direct supervision of the Elevator Contractor’s experienced foreman.

B. Erect hoistway sills, headers and frames prior to erection of rough walls and doors. Erect fascias and toe guards after rough walls are finished.

C. Set hoistway entrances in alignment with car openings, and true with plumb sill lines.

D. Grout sills and hoistway entrance frames.

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

F. Isolate and dampen machine vibration with properly sized sound-reducing anti-vibration pads.

3.5 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 condition.

D. Finished work shall be straight, level and plumb, with true, smooth surfaces and lines. All machinery and equipment shall be protected against dirt, water, and mechanical injury. At final completion all work shall be thoroughly cleaned and delivered in perfect unblemished condition.
E. Sleeves for conduit and other small holes shall project 50 mm (2 in.) above concrete slabs.
F. Exposed gears, sprockets, and sheaves shall be guarded from accidental contact in accordance with ASME A17.1 Section 2.10.

3.6 CLEANING

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

3.7 PAINTING AND FINISHING

A. Hydraulic pump assembly shall be factory painted with manufacturer's standard finish and color.
B. Controllers, cart lift frames and platforms, beams, rails and buffers, except their machined surfaces, cams, brackets and all other uncoated ferrous metal items shall be painted one factory priming coat or approved equal.
C. All equipment, except specified architectural finish, shall be given two coats of paint of approved color, conforming to manufacturer's standard.
D. Stencil or apply decal floor designations not less than 100 mm (4 in.) high on hoistway doors, fascias or walls within door restrictor areas as required by ASME A17.1 Rule 2.29.2. The color of paint used shall contrast with the color of the surfaces to which it is applied.
E. Cart lift pump units, controllers, main line shunt trip circuit breakers, bolster channels, and cross heads of cars shall be identified by 100 mm (4 in.) high numerals and letters located as directed. Numerals shall contrast with surrounding color and shall be stenciled or decals.
F. Hoistway entrances of material lift:
   1. Door panels shall be stainless steel with a brushed finish.
   2. Fascia plates, toe guards, dust covers, hanger covers and other metal work, including built-in or hidden work and structural metal, (except stainless steel entrance frames and surfaces to receive baked enamel

finish) shall be given an approved prime coat in the shop, and one field coat of paint of approved color.

3.8 PRE-TESTS AND TESTS

A. Pre-test the cart lift and related equipment in the presence of the COR or his authorized representative for proper operation before requesting final inspection. Conduct final inspection at other than normal working hours, if required by COR.
   1. Procedure outlined in the Inspectors Manual for Hydraulic 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 cart lift.
   2. Contractor shall furnish the following test instruments and materials on-site and at the designated time of inspection: certified test weights, voltmeter, amp-meter and amp probe, oil pressure gauge, thermometers, direct reading tachometer, megohm meter, vibration meter, sound meter, and a light meter and a means of two-way communication.

B. Inspection of workmanship, equipment furnished, and installation for compliance with specifications.

C. Full-Load Run Test: Cart lift 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 cart lift stopping at all floors, in either direction of travel, for not less than five or more than ten seconds per floor.

D. Speed Test: The actual speed of the cart lift shall be determined in both directions of travel with full contract load and no load in the cart lift. Speed shall be determined by certified tachometer. The actual measured speed of the cart lift with all loads in either direction shall be within five (5) percent of specified rated speed. Full speed runs shall be quiet and free from vibration and sway.

E. Temperature Rise Test: The temperature rise of the pump 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 be started only when all parts of equipment are within five (5) degrees Centigrade of the ambient temperature at time of

starting test. Other tests for heat runs on motors shall be performed as prescribed by the Institute of Electrical and Electronic Engineers.

F. Car Leveling Test: Cart lift leveling devices shall be tested for accuracy of leveling at all floors with no 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.

G. Insulation Resistance Test: The cart lift complete wiring system shall be free from short circuits and grounds and the insulation resistance of the system shall be determined by use of megohm meter, at the discretion of the Inspector conducting the test.

H. Safety Devices Tests: Safety devices shall be tested as required by ASME 17.1 Section 8.10.

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

J. 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 cart lift relative to the terminal landings shall be determined when the cart lift has been stopped by the final limits. The lower limit stop shall be made with contract load in the cart lift. Cart lift shall be operated at inspection speed for both tests. Normal limit stopping devices shall be inoperative for the tests.

K. Working Pressure: Verify working pressure of the hydraulic system by pressure gauge placed in the system line. Take readings with no load and full load in car.

L. Test automatic shut-off valve for proper operation.

M. Setting of Car Door Contacts: The position of the car door at which the cart lift 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.

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

O. Operating and Signal System: The cart lift 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.

P. 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 COR.

3.9 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 COR.

B. In addition to oral instruction, written instructions in triplicate relative to care, adjustments and operation of all equipment and accessories shall be furnished and delivered to the COR 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, fields, relays, timers, regulators 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".

3.10 INSPECTIONS AND SERVICE: GUARANTEE PERIOD OF SERVICE

A. Furnish complete inspection and maintenance service on entire cart lift installation for a period of one (1) year after completion and acceptance of all the cart lifts in this specification by the COR. This maintenance service shall begin concurrently with the warranty. Maintenance work shall be performed by Certified Elevator Mechanic and

Apprentices employed and supervised by the company that is providing guaranteed period of service on the cart lift equipment specified herein.

B. This contract will cover full maintenance including emergency call back service, inspections and servicing the cart lifts listed in the schedule of elevators. The Elevator Contractor shall be required to perform the following:
   1. Monthly 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. 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, and signal system shall be cleaned, lubricated and adjusted.
   5. Guide rails 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.
   6. Maintain the performance standards set forth in this specification.
   7. The operational system shall be maintained to the standards specified hereinafter including any changes or adjustments required to meet varying conditions of hospital occupancy.
   8. 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 using the cart lift.

E. Service and emergency personnel shall report to the COR 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 COR.

F. The Elevator Contractor shall maintain a log in the machine room. The log shall list the date and time of all monthly 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.

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