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SECTION 14420 - WHEELCHAIR LIFTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract including GSA Form 3506" Construction Contract Clauses (Fixed Price), "Document 00800 "Supplementary Conditions," and Division-1 Specifications Sections apply to this Section.

1.2 SUMMARY

A. Furnish all labor, materials, equipment, and services required for complete operating wheelchair lifts.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Well way and Pit:

1. Wall block outs for control and signal fixtures.
2. Structural supports for loads imposed by the lift.
3. Erection of witness box walls after lift is installed.
4. Wood casement door jambs and lift door panels prepared for electronic door strikes.
5. Latch bolt throw with mortise exit compatible with electronic strike, magnetic hold open devices, hinges, spring hinges, closer and door

B. Electrical Service, Conductors and Devices:

1. GFCI convenience outlet in machine equipment space.
2. Guarded florescent light fixtures, minimum 2-feet long, maximum 4-feet long in machine equipment space designated by the Contracting Officer.
3. Single phase mainline power feeders to terminals of each lift controller with protected, lockable "off" disconnect switch.
4. Temporary power and illumination to install, test and adjust lift equipment.
5. Conduit runs from (designated by the Contracting Officer) to lift control stations, interlocks, magnetic hold open locations and under the lift table and into pump locations. Conduit size ¾" minimum.

1.4 DEFINITIONS

A. HYDRAULIC wheelchair lifts are hereby defined to include systems in which lifts are hoisted directly or indirectly by action of a hydraulic plunger and cylinder, with other components of the work including fluid storage tank, pump, piping, valves, lift platform, entrances, control systems, signal equipment, guide system, electrical wiring, and devices for operating, leveling, maintenance, and similar required performances and capabilities.



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B. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A 17.1 any reference to Code in the technical sections shall mean A17.1.

1.5 SYSTEM PERFORMANCE REQUIREMENTS

A. Lift requirements are as follows:

1. Speed: +10% of 8 fps under any loading condition.
2. Capacity: Safely lower, stop, and hold up to 125% of rated load of 500 lbs.
3. Stopping Accuracy: 1/8 -inch under any loading condition.
4. Pressure: Design and factory test fluid system components for 13,780 kPa. Do not exceed operating pressure of 11,700 Kpa.

1.6 SUBMITTALS

A. Submit the following in accordance with Conditions of the Contract and Section 03100, Submittals.

B. Product Data for each lift unit, indicating capacities, sizes, performances, operations, safety features, controls, finishes, and similar information. Indicate any variations from specified requirements.

C. Shop Drawings shall include dimensioned drawings for each lift, showing plans, elevations, sections and large-scale details indicating service at each landing, coordination with building structure and relationships with other construction. Indicate any variations from specified requirements plus maximum dynamic and static loads imposed on building structure at points of support. Indicate access for lift machinery spaces.

D. Shop Drawings shall also include catalog numbers, costs, and other such descriptive data as may be required to complete and identify the equipment including all operating fixtures, controls, and safety features and their operation. Approval of materials and equipment shall be based on the data presented and shall be tentative, subject to demonstration of satisfactory operation of the equipment.

E. Fixture diagrams, cuts, and Shop Drawings.

F. Samples of exposed finishes for signal equipment, 4-inch square samples.

G. Samples of engraved and epoxy filled graphics, Braille plates and mounting provisions. This material is to be coordinated with work provided by the signage contractor.

H. Wiring diagrams detailing locations and wiring for power, signal and control systems and differentiating clearly between manufacturer-installed wiring and field-installed wiring. Indicate maximum and average power demands.



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- I. Certificates and Permits: Provide Contracting Officer with copies of all inspection, acceptance certificates and operating permits as required by governing authorities to allow normal, unrestricted use of lifts.
- J. Calculations: Meet electrical requirements necessary to verify adequacy of electrical provisions
- K. Maintenance Manuals: Bound manuals for hydraulic lift. Include operating and maintenance instruction, parts listing with sources indicated, recommended parts inventory listing, emergency instructions, and similar information.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Installer who has completed lift installations similar in material, design, and extent to that indicated for Project which have resulted in installations with a record of successful in-service Performance.
- B. Proof of Competency: Submit a list of prior comparable installations, together with the names and addresses of the buildings, the names of their owners or managers, and any other pertinent information required by the Contracting Officer.
- C. A minimum of ten (10) years successful experience is required in designing, furnishing, installing and servicing lift systems of comparable size, scope and function to that required by this Contract.
- D. Regulatory Requirements: All the work covered by these specifications is to be done in full accord with the national, state and city codes, ordinances and elevator safety orders and GSA Design guidelines as are in effect at the time of the execution of the Contract.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, unopened protective packaging.
- B. Store material in original protective packaging, prevent soiling, physical damage, and wetting.
- C. Protect equipment and exposed finishes during transportation, erection, and construction against damage and stains.

1.9 SEQUENCING AND SCHEDULING

- A. Coordination: Coordinate lift work with work of other trades for proper time and sequence to avoid construction delays. Use benchmark, lines, and levels designated by Contractor to ensure dimensional coordination of the work.



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2.0 WARRANTY

- A. Provide manufacturer's warranty agreeing to replace, repair, or restore defective materials and workmanship of lift work during warranty period, with the exception of ordinary wear and tear, and unusual abuse or neglect. Ordinary wear and tear is not excepted if the lifts are maintained under a separate service contract. Warranty period shall commence upon completion and final acceptance of all lifts by the Contracting Officer. This warranty shall be in addition to, and not a limitation of, other rights the Owner may have against the Contractor under the Contract Documents.
- B. Warranty period is 5 years starting on the date of Substantial Completion, Warranty does not cover unusable abuse or neglect.
- C. Provide coincidental product warranties where available for major components of lift work. Submit with maintenance manuals.

PART 2 - PRODUCTS

2.1 [14420-10] WHEEL CHAIR LIFT SYSTEMS

2.2 MANUFACTURERS

- A. Other manufacturer's products of equal or greater quality than those specified in this Section may be used. Submit request for substitution approval before the bid in accordance with Section 01631 Product Substitutions.
- B. Approved Manufacturers: T L Shield and Associates, Inc. 818/509-8228.

2.3 MATERIALS AND COMPONENTS

A. Steel:

- 1. Sheet Steel: Stretcher-leveled, cold-rolled, commercial quality carbon steel Class 1 complying with ASTM A366, mane finish.
- 2. Structural Steel Shapes and Plates: ASTM A6, ASTM A36 and ASTM A08.

- B. Paint: All exposed metal work furnished under this Section, except as otherwise noted, shall be cleaned of oil, grease, scale and other foreign matter and factory paint 1 shop coat of manufacturer's standard rust-resistant primer and minimum 1 shop coat alkyd enamel.

2.4 MACHINE SPACE EQUIPMENT

- A. Provide manufacturer's engineered wheelchair lift systems that fulfill the requirements of this Section. Where components are not otherwise indicated, provide standard components, furnished by manufacturer as included in standard engineered wheelchair lift systems and as required for a complete system.



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1. Arrange equipment in spaces shown on Drawings. Provide identifying number on each pump unit, controller, and disconnect switch, and provide means to install equipment in machine space. Comply with NEC, Article 110-16a, working clearances.

2.5 WHEELCHAIR LIFT MACHINES AND EQUIPMENT

A. Hydraulic Machines and Lift Equipment:

1. Provide manufacturer's standard indirect plunger-cylinder unit for each lift, with electric pump-tank-control system equipment.
2. Pump Unit: Provide assembled unit consisting of high pressure positive-displacement pump, intermittent duty cycle, super torque induction motor, master-type control valves combining safety features, holding, direction, bypass, stopping and manual-lowering functions, solenoid release valve, shut-off valve, oil reservoir with protected-vent opening, oil gauge and outlet strainer, drip pan and connections all mounted on isolating pads. Enclose with removable ventilated sheet metal enclosure. Drip pan is to be removable without complete disassembly of pump unit enclosure.

B. Controller:

1. Frame: Securely mount all assemblies, power supplies, chassis switches, relays and other items on a substantial, self-supporting steel frame. Completely enclose equipment with covers and ventilation to prevent overheating.
2. Switch and Relay Design: Direct-current type, magnet operated with contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating or excessive wear, and provide a wiping action to prevent sticking due to fusion. Provide switches carrying highly inductive currents with arc deflectors or suppressor.
3. Power Supplies: UL recognized, with short-circuit protection.
4. Wiring: CSA labeled copper wires for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
 - a. Permanently mark components (relays, fuses, PC board, etc).
 - b. Use stable capacitor or crystals as the time base for electronic time-delay devices.

C. Noise and Vibration Control:

1. To minimize noise and vibration in occupied areas, mechanically isolate lift equipment from the machine space electrically isolate enclosure, pump motor.
2. Limit noise level relating to elevator equipment and its operation to no more than 40kBa.

- D. Pressure Hose: Provide SAE 100 R2AT double wire braid hydraulic pressure hose, high pressure connections and oil for the system. Provide size, type and hose recommended by manufacturer.



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- E. Inserts: Furnish required concrete inserts and similar anchorage devices for the installation of lift platform base, machinery, and other components of lift work.
- F. Lift Cylinder: Provide twin lift cylinders of seamless steel pipe. Provide minimum 3-1/2" diameter cylinders with top level bypass to limit deck travel. Design head to receive unit type packing. Design cylinder base to accept minimum 1-inch pivot pin. Provide with hydraulic velocity fuses mounted at base of cylinder.
- G. Plunger: Polished seamless steel tubing or pipe with top designed to accept minimum 1-inch pivot pin at connection to lift platform deck.
- H. Lift Cylinder Support: Provide steel channels to support lift cylinders and transmit loads to building structure.
- I. Normal and Final Terminal Stopping Devices: Provide limit switch rack with nylon cams and take-up reel. Provide with final limit to deactivate lift in event of normal control limit failure.
- J. Electrical Wiring and Wiring Connections:
 - 1. Conductors and Connections: Provide copper throughout with individual wires coded and connections on identified studs or terminal blocks. Use no splices or similar connection in wiring except at terminal blocks, control cabinets, junction boxes, or conduits. Provide 10% spare conductors throughout. Run spare wires from lift connection points to individual elevator controller in the machine space. Tag spares so they can be identified in the machines space.
 - 2. Conduit, etc. Conduit size 3/4" minimum. Do not use flexible conduit exceeding 3-feet in length. Pit Stop Switch: Provide, as required, per Code.

2.6 LIFT EQUIPMENT

- A. Lift Frame: Mounted, stationary style, welded or bolted, rolled or formed steel channel construction. Provide steel scissor leg stabilizer assembly of one-piece construction with accurate alignment of all holes. Provide dual roller retainers with grease fittings on cylinder pivot points. Roller and pivot pins shall be minimum 1-inch ground and chrome steel 75,000 lbs. minimum yield. Provide fiber guide bushings with chrome clevis pin pivot points.
- B. Deck: Provide deck unit constructed of minimum 1/4-inch steel with straight toe guards on each side.
- C. Finish Floor Covering: Carpet by others. Refer, as required, to Section 09680.
- D. Lift Door Electrical Contact: Arrange so that lift cannot operate unless doors are closed and locked within tolerance allowed by Code.



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2.7 CONTROL SYSTEMS

A. Provide relay logic based control system for lift as required to provide automatic operation of the type indicated.

B. Two Stop Collective:

1. Operate lift (with or without an attendant) from buttons located at each landing, and on the lift. Activation of a landing station or lift station for level other than level at which lift is standing shall automatically start lift and cause it to proceed to the landing corresponding to registered lift call or landing call, provided all landing gates are in the closed and locked position.
2. Slow down and stop lift automatically at landing corresponding to registered call. As slow down is initiated for a call, automatically cancel the call and render the call button for that direction of travel ineffective.
3. Sequence of Operation:
 - a. Witness Box lift shall be normally held and locked in the raised 15" position. Lift access gate panel shall be closed and locked, and gate panel at Judges bench shall be closed and locked. When lift is activated by lower landing call button, all gates shall be closed and locked with electric strikes before lift platform is lowered. When lift is in lowered position, access gate shall be unlocked. Any deviation from this sequence requires Contracting Officer's approval.

C. Automatic Stopping Accuracy: Stop lift platform within 1/8-inch above or below the landing sill. Avoid over travel, as well as under travel, and maintain stopping accuracy regardless of load on lift or direction of travel.

D. Motion Control: AC type with unit valve suitable for operation specified and capable of providing smooth, comfortable acceleration, retardation and stop. Limit the difference in speed between full load and no load to not more than +10% of the contract speed.

2.8 SIGNAL EQUIPMENT

A. Provide signal equipment to comply with requirements indicated below.

B. Provide constant pressure landing-call and car-call buttons.

C. Except for buttons and illuminated signal elements, fabricated signal equipment with exposed surfaces of No. 4 brushed stainless steel finish.

D. Lift Control Station: Provide lift control station on inside face of wood Witness Stand partition with faceplate containing flush or raised call button for each landing served and other buttons, switches, and controls required for specified car operation and control. Provide operating device symbols as required by Code. Mark other buttons and switches with manufacturer's standard identification for required use or function.



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1. Provide one wall mounted lift control station. Equip car control station with required keyed control switches and service controls.
2. Suitably identify floor buttons, and stop switch by raised and painted letters or symbols per Uniform Federal Accessibility Standards including Braille, or as approved by the Contracting Officer.
3. Locate operating controls as indicated on Drawings.
4. Provide 1/8-inch raised floor push buttons.
5. Provide stop switch with markings to show "run" and "stop" positions.

E. Landing Push-Button Station: Provide landing push-button station at each landing as shown on Drawings.

1. Provide 1 riser; locate adjacent to lift at locations shown on Drawings. Install stations with up and down control buttons centered at handicapped height, 40-inches above the floor.
2. Provide keyed on-off-bypass switch at lower landing. Provide on-off position button (or switch) to activate system. Provide bypass position to disable electric strike to allow lower door to be opened with lift in raised position for maintenance access. Key to be removable in "off" position.

2.9 ENTRANCE/DOOR HARDWARE

A. Door Strike: Provide 24 VDC Electric Strike with brushed stainless steel finish with minimum 1/2-inch latch bolt throw with mortise exit hardware, as approved by Contracting Officer, prevent movement of lift deck if lift door panel is not fully closed and latched.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to commencing lift installation, examine wellway, wellway openings, pits, and machine space as constructed; verify all critical dimensions and examine supporting structure and all other conditions under which lift work is to be installed.

3.2 INSTALLATION OF LIFT SYSTEM

A. Comply with manufacturer's instructions and recommendations for work required during installation, referenced codes and specifications.

B. Welded Construction: provide welded connections for installation of lift work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of work parts. Comply with AWS standards for workmanship and for qualifications of welding operators.



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C. Sound Isolation: Mount rotating and vibrating lift equipment and components on vibration absorption mounts, designed to effectively prevent transmission of vibrations to structure and machine space and thereby, eliminate sources of structure -borne noise from lift system.

3.3 WORKMANSHIP

A. Perform work as specified with due care, including shoring, bracing, etc. Be responsible for damage, which may be caused by such work to any part or parts of existing structures. Perform patching in accordance with applicable technical sections of the specifications.

1. Materials or items designated to be installed shall be as specified.
2. Finish surfaces as specified. Clean surfaces of dirt, grease, loose paint, etc., before finishing.

B. Lubrication: Lubricate operating parts of systems, as recommended by manufacturer.

C. Alignment: Coordinate installation of lift door panels and entrance frames with Section 06400, Architectural Millwork.

D. Leveling Tolerance: 1/8-inch, up or down, regardless of load and direction of travel.

E. Adjust motors, pumps, valves, controllers, leveling switches, limit switches, stopping switches, door strikes, etc., to achieve required performance levels.

F. Fabricate and assemble various parts in shop to minimize field assembly. Assemble parts which require close field fit in the shop and mark for field erection.

G. Equipment Installation: Install machine space equipment including lift, and motor control and with clearances in accordance with referenced codes and specifications upon completion of installation.

1. Install items so that access for maintenance is safe and readily available.
2. Install equipment to afford maximum safety and continuity of operation.

3.4 FIELD QUALITY CONTROL

A. Test operate lift continuously between lowest and highest landings served, lifting full rate capacity load for a minimum period of 30 minutes. Readjust stops and other devices and signal equipment for accurate landings and operation of system after completion of test.

3.5 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis as equipment is installed.



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3.6 DEMONSTRATION

- A. Instruct Contracting Officer in proper use, operation, and daily maintenance of lifts. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Contracting Officer in normal procedures to be followed in checking for sources of operational failures or malfunction.

3.7 OPERATION AND MAINTENANCE MANUAL

- A. Submit complete sets of neatly bound written information necessary for proper maintenance and adjustment of equipment. Refer to the Contracting Officer for number of sets required. Printed information shall be furnished upon completion including table of contents and locator tabs. Information required as a minimum is as follows:

1. Straight-line wiring diagrams showing the electrical connections of all lift equipment in the wellway as well as the machine space. Mount one set on tempered hardboard panels with protective plastic covering, racked or similarly protected in each lift machine space.
2. A legend sheet shall be furnished with each set of drawings containing the following information:
 - a. Name and symbol of each component.
 - b. Location on drawings, drawing sheet number and area of component.
 - c. Location of apparatus whether on controller, power unit, starter, wellway or lift platform.
3. Bound instructions explaining all operating and safety features including but not limited to all apparatus in the car and lobby control panels, system operation, power unit, valve, pump, control, lift door equipment and fixtures.
4. Lubrication charts indicating all lubricating points and type of lubricant recommended for all equipment.
5. Parts catalogs for all replaceable parts including ordering forms and instructions.
6. Adjusters manual complete with adjustment settings, sequence of operation and other technical data required for adjustment, tuning, maintenance and operation of lifts.
7. Three sets of keys to operate all keyed switches and locks shall be furnished upon completion. Keys shall be properly tagged. All keying shall be coordinated with the Contracting Officer.
8. User instruction manual: Include access codes required for accessing microprocessor equipment for adjusting or programming.

END OF SECTION 14420