exhibit 3

SPH hydraulic elevators

part 1 – general

* 1. summary
1. Scope: It is the purpose of this specification to include all labor, material, tools, rigging and equipment necessary to:
2. Modernize existing passenger and freight elevators, complete in every respect, make code and ADA required changes, and meet the requirements as indicated and/or specified. The elevators are located at School of Public Health in Houston, Texas.
3. Coordinate the work of this Section with work of other Sections as required to properly execute the work as necessary to maintain satisfactory progress of the work of other Sections.
4. The alterations of the elevators must be properly coordinated so that the building will not be without elevator service at any time. Schedule the removal of elevators from service with the Owners representative. Only one elevator at a time can be removed from any group.
5. If these specifications are not complete as to any minor detail of a required feature, or with regards to the manner of combining or installing parts, material or equipment, but there exists an acceptable trade standard for good and workmanlike practices, such detail shall be deemed by implication to have been required by these specifications in accordance with such standard.
6. Any component listed as retain existing in this document must be fully inspected by the contractor to meet current Code requirements. Any repairs or refurbishment of retained devices or components is to be included in Contractor’s Base bid.
7. Related work required by the elevator contractor as part of base bid:
8. Provide wiring from the existing disconnects to the new controllers, provide additional disconnect devices for all elevators where equipment is not in line of sight of disconnects.
9. Provide cab lighting disconnects for each cab.
10. Provide GFCI receptacles in pits, machine rooms and secondary levels.
11. Include all electrical alterations to the transfer switches to accommodate emergency power.
12. Include lighting alterations in machine rooms, pits and overheads as required to meet current Code requirements.
13. Include all miscellaneous electrical work and fire alarm work or shunt trips to provide a turn- key project.
14. Provide pit ladders where required, alter existing ladders if required to meet Code.
15. Fire caulking as required in the hoist-ways.
16. Other applicable related work items shall be included, in addition to the above items, to be included with bid documents showing complete scope of work.
17. Site Visit and Inspection of Existing Equipment:
18. By submitting a bid, Contractor certifies that he has visited and inspected the site and existing facilities and has informed himself in detail as to all existing conditions that may affect the work. Failure to do so will not be considered sufficient justification for additional compensation and/or extension of contract time.
19. For access to the Building, arrangements must be made through the University of Texas Health Procurement Department.

1.02 SUBMITTALs

1. Shop Drawings, Descriptive Data: Submit quantities which are required to be returned, plus five (5) copies showing location and arrangement of machine room and hoist-way equipment. Submit drawings, in the same quantity, of all auxiliary equipment furnished in this contract. Submittals are required on all new equipment and devices installed on this modernization.
2. Descriptive Data: Submit details of operation and auxiliary equipment for approval prior to manufacture.
3. Samples: All exposed materials with finish and all custom fixture fabrications.
4. Complete hall call button assembly.
5. Omit all logos from exposed finishes or components.
6. All cab finishes including front returns per Architect’s schedule.
7. Maintenance Data: Provide written information necessary for proper maintenance and adjustment of the equipment prior to final acceptance as follows:
8. Straight line wiring diagrams of as-installed elevator circuits with index of location and function of all components. Leave one set in machine rooms. Provide 3 corrected sets for Owner’s file 90 days after acceptance.
9. Lubricating instructions and recommended lubricant grade.
10. Parts catalogs and maintenance manuals.
11. Include any special tools, pass words or manuals that are required for maintenance, trouble shooting, adjustments or performing safety tests of the elevators for the Owner’s use. Controllers shall not contain any devices, sim cards, tools or other removable devices that when removed will inhibit serviceability of controllers.
12. If the Contractor requires the Owner to sign a lease for the special trouble-shooting tool, a copy of the lease shall be submitted with the bid.
13. Provide 5 sets of keys per group for all keyed functions.
	1. references
14. Comply with applicable building codes and elevator codes at the project site, including but not limited to the following:
15. ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code.
16. ASME/NFPA 70 National Electrical Code.
17. ASME/NFPA 80 Fire Doors and Windows.
18. Americans with Disabilities Act – Accessibility Guidelines (ADAAG).
19. AMSE/A17.1, Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People.
20. ASME/UL 10B and ASTM E152, Fire tests of door assemblies.
21. Model building codes.
22. All other local applicable codes.
23. Make application for, secure and pay for all necessary permits and certificates of inspection for all equipment included herein, as required by the various departments of the Local and State Authorities. Furnish the Owner certificates and approval as required by the local governing authorities having jurisdiction.
24. In addition to the permits, inspections and test specified and the governing codes, the elevator contractor will be required to have performed speed and load carrying capacity and heat tests at his own expense.
25. Any damage of any kind to the car or the adjoining structure which may develop through performance of any tests shall be repaired at no additional costs to the Owner.
	1. contractors responsibility
26. The electrical and mechanical design is based on the existing power characteristics and heat releases. The Contractor shall submit with bid any power characteristics or heat releases of this equipment that exceeds the existing characteristics. Any additions or modifications requested at a later date will be at the expense of the Contractor.
27. Store materials in a dry protected area. Protect and handle materials in accordance with manufacturer’s recommendations to prevent damage, soiling, or deterioration.
	1. warranty
28. Provide warranty to replace, repair, or restore parts or components that fail or do not operate properly due to poor field or factory workmanship, engineering or design for a period 24 months from the date of signed final acceptance.
	1. maintenance
29. Furnish regular maintenance for the elevators on an interim basis once the award has been made until all elevators have been completed and accepted by the Owner. The maintenance service shall comprise regular examinations of the installation by competent and trained mechanics on a weekly basis, and shall include all necessary adjustments, greasing, oiling, cleaning, and supply of parts and accessories necessary to keep the equipment in good operating condition, except such replacement of parts made necessary by misuse, accidents not attributable to failure of equipment or workmanship, and negligence of the Owner. All associated labor and materials for City and State testing are to be included in the base maintenance proposal. 5 year testing shall be done after hours and included in base maintenance bid.
30. Repair work shall be carried out only by the Elevator Contractor’s personnel, using only standard parts furnished by the Elevator Contractor and shall not be assigned or transferred to any agent.
31. The monthly cost of this interim maintenance shall be provided in your bid, but not added to the base price of the elevator modernization. Provide a monthly deduct during the period when elevators are out of service and being modernized.
	1. full maintenance bid
32. Elevator Contractor shall provide a full maintenance proposal per maintenance RFP for the elevators starting from completion and acceptance of all elevators, the cost shall be a separate item and not included in base elevator bid. This bid is to be submitted with equipment bid for review. Provide a monthly discount for the first 24 months of the maintenance contract when the new equipment warranty is in effect. All associated labor and materials for City and State testing are to be included in the base maintenance proposal. 5 year testing shall be done after hours and included in base maintenance bid.
	1. quality assurance
33. The specific product or material manufactured by any of the following listed manufacturers is “acceptable” only if the specific product or material can evidence exact compliance with the contract documents and governing codes.

 1. Kone Elevator Company

 2. Otis Elevator Company

 3. Schindler Elevator Company

 4. ThyssenKrupp Elevator Company

1. Elevator Contractor must be able to demonstrate that he has installed and maintained similar elevators to those specified and which have given satisfactory service; has been in successful operation for at least ten (10) years; maintains locally an adequate stock of parts for replacement or emergency purposes; has available qualified persons to do the work.
2. The controls shall not have any software embedded that shuts the elevator down if the equipment is not malfunctioning, and forces the Owner to call the Manufacturer for service.

1.09 PARTS AND PRINTED CIRCUIT BOARDS

1. Contractor guarantees they will sell parts and printed circuit boards to the Owner or the Owner’s Agent. The sale shall not be dependent on an exchange component.

part 2 products

* 1. manufacturers
1. Only the following manufacturer and dispatching system is acceptable:
2. For all elevators:

Kone Elevator

Otis Elevator

Schindler Elevator

ThyssenKrupp Elevator

* 1. type and general characteristics

|  |  |
| --- | --- |
|  | Library Elevator |
|  |  |
| Quantity: | One (1) |
| Capacity | 2200 |
| Speed | 125 feet per minute |
| Floors Served | B, \*1, 2 |
| Stops and Openings | 3 / 3 Front |
| Operation | Simplex |

MACHINE ROOM

|  |  |
| --- | --- |
| Control | New Microprocessor Controls with solid state starter |
| Pump Unit | Provide new submersible type hydraulic unit complete with unit valve, silencer and oil cooler. |
| Motors | Provide new, designed for hydraulic application. |
| Leveling devices | Provide new |
| Fireman Service | Provide new Phase I & II |

HOISTWAY

|  |  |
| --- | --- |
| Limit Switches | Provide New |
| Hoist-way Door Interlocks | Provide New |
| Hoist-way Door Closers | Provide New |
| Hoist-way Door Tracks | Reuse Existing |
| Hoist-way Door Hangers | Reuse Existing; replace worn or damaged hangers |
| Hoist-way Door Sills | Reuse Existing; alternate per landing noted on bid form |
| Hoist-way Door Frames | Reuse Existing |
| Hoist-way Door Panels | Reuse Existing; alternate per landing noted on bid form |
| Hoistway Fascia and Toe Guard | Reuse Existing-Replace any damaged or missing pieces. Alter toe guard to meet code |
| Hoistway Door Unlocking  | Provide stainless steel escutcheons in all hoistway doors. Arrange proper tabs that work with standard flop-key.  |
| Hatch Wiring and Travel Cables | Provide new complete. Hoist-way duct may be reused if suitable. |
| Guide Rails  | Reuse Existing |
| Buffers | Reuse existing |
| Pit Stop Switches | Relocate to be accessible from the pit ladder  |
| Car Sling | Reuse Existing |
| Car Door Contact | Provide New |
| Car Roller Guides | Provide New Rollers |
| Platform | Reuse Existing |
| Car Enclosure | Reuse Existing  |
| Cab Threshold | Provide New; Nickel Silver |
| Car Doors | Reuse Existing  |
| Toe Guard | Alter to meet code  |
| Return Panels & Header | Provide New |
| Communications | New incorporated in car station |
| Floor Covering | Reuse Existing  |
| Door Operator | Provide new closed loop operation.  |
| Car Door Hangers | Retain existing; Replace all hanger rollers and adjust up-thrusts. |
| Car Door Track | Retain Existing |
| Door Protection | Provide New infra-red door protection |
| Car Operating Panels | Provide New; match existing quantity and detail. |
|  |  |
|  | SIGNALS |
|  |  |
| Car Position Indicators | New incorporated in car operating panel |
| Car Lanterns | Provide New |
| Hall Buttons | Provide New surface mount |

|  |  |
| --- | --- |
|  | Dock Elevator |
|  |  |
| Quantity: | One (1) |
| Capacity | 2500 |
| Speed | 75 feet per minute |
| Floors Served | B, \*1 |
| Stops and Openings | 2 / 1 Front; 1 Rear |
| Operation | Simplex |

MACHINE ROOM

|  |  |
| --- | --- |
| Control | New Microprocessor Controls with solid state starter |
| Pump Unit | Provide new submersible type hydraulic unit complete with unit valve, silencer and oil cooler. |
| Motors | Provide new, designed for hydraulic application. |
| Leveling devices | Provide new |
| Fireman Service | Provide new Phase I & II |

HOISTWAY

|  |  |
| --- | --- |
| Limit Switches | Provide New |
| Hoist-way Freight Door Locks | Provide New |
| Hoist-way Freight Door Closers | Provide New freight door relating components |
| Hoist-way Door Tracks | Reuse Existing |
| Hoist-way Door Sills | Reuse Existing |
| Hoist-way Door Frames | Reuse Existing |
| Hoist-way Door Panels | Reuse Existing |
| Hoistway Fascia and Toe Guard | Reuse Existing-Replace any damaged or missing pieces. Alter toe guard to meet code |
| Hoistway Door Unlocking  | Provide new pull chain boxes  |
| Hatch Wiring and Travel Cables | Provide new complete. Hoist-way duct may be reused if suitable. |
| Guide Rails  | Reuse Existing |
| Buffers | Reuse existing |
| Pit Stop Switches | Relocate to be accessible from the pit ladder  |
| Car Sling | Reuse Existing |
| Car Gate Contact | Provide New |
| Car Slide Guides | Provide New Inserts |
| Platform | Reuse Existing |
| Car Enclosure | Reuse Existing  |
| Car Gate | Reuse Existing  |
| Toe Guard | Alter to meet code  |
| Communications | New incorporated in car station |
| Floor Covering | Reuse Existing  |
| Car Gate Operator | Retain Manual |
| Car Gate Track | Retain Existing |
| Car Operating Panels | Provide New; match existing quantities and details. |
|  |  |
|  | SIGNALS |
|  |  |
| Car Position Indicators | New incorporated in car operating panel |
| Hall Buttons | Provide New surface mount |

* 1. performance
1. Speed: +/- 5% under any loading condition.
2. Capacity: Safely lower, stop and hold up to 125% rated load.
3. Leveling: +/- ¼” under any loading condition.
4. Door Closing time, Thrust and Kinetic Energy shall comply with ASME Code and ADA.
5. Floor-to-Floor Performance Time: Floor to floor performance time (from time door starts closing at one floor to fully opened and level on next successive typical floor, regardless of loading conditions or direction of travel). Hydraulic passenger – 14.5 seconds.
	1. power unit
6. The power unit (oil pumping and control mechanism) shall be compactly and neatly designed, with all of the components listed below combined in a self-contained unit.
7. Pump shall be especially designed and manufactured for oil hydraulic elevator service.
8. Motors shall be high starting torque, single-speed, of standard manufacturer and of duty rating to comply with herein specified speed and loads.
9. New hydraulic pump incorporated in submersible pump unit.
10. Valve: The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control up and down starting, acceleration, transition from full speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a low-pressure switch and shut-off valve. All valves must be located as to make them readily accessible for servicing. Provisions shall be incorporated to securely lock all adjustments.
11. Tank: Provide storage tanks constructed of steel in conformance with ASME A17.1, Section 304. A tank heater, thermostatically controlled, shall be provided in the storage tank to maintain proper minimum oil temperature. Provide a thermostatically controlled oil cooler that will automatically maintain the temperature of the oil at a level that provides smooth transition between high and low speed.
12. Power Controller: a power controller shall contain necessary electrical silver contactors, electro-mechanical switches and thermal overload relays. Components shall be mounted in NEMA 1 enclosure. Logic control system shall be microprocessor based, integrated solid state circuitry. System shall be protected from environment and vibrations.
13. Piping: All necessary pipe and fittings to connect power unit to jack unit, and a complete charge of oil of the proper grade shall be furnished to each unit. A main line strainer and shut-off assembly of the self-cleaning type with a 60-mesh element, and a magnetic drain plug shall be furnished and installed in the oil line. The unit shall be designed for 400 psi working pressure, shall be compact in design with easy access for cleaning. Sound isolating couplings, a minimum of two, shall be installed in the oil line in machine room between pump and jack. Each Coupling shall consist of two machined flanges separated by a neoprene seal to absorb vibration and to positively prevent metal-to-metal contact in the oil line. Couplings shall be designed and manufactured in such manner that they will be absolutely blowout proof. Oil-hydraulic silencer (muffler device) shall be installed in the oil line near power unit.
14. Vibration pads shall be mounted under the power unit assembly to isolate the unit from the building structure.
15. Provide identifying numbers on power unit, controller and disconnect switch.
	1. electrical circuit failure protection
16. The electrical control circuit shall be designed so that if a malfunction should occur, due to motor starter failure, oil becoming low in the system, or the car failing to reach a landing in the up direction within a pre-determined time, the elevator car will automatically descend to the lowest terminal landing. Power operated doors will automatically open when the car reaches that landing to allow passengers to depart. The doors will then automatically close and all control buttons, except the door open button in the car station, shall be made inoperative. The malfunction shall then be corrected and the elevator placed back in service through the mainline disconnect switch.
	1. elevator leveling
17. System shall be designed for automatic flush leveling of the car in both directions, controlled by a sensing system which once set, requires no periodic adjustment. System shall provide two way leveling.
	1. motion control
18. Furnish and install microprocessor motion controllers for each elevator.
19. The motion control system shall perform all of the functions of safe elevator motion and elevator door control. This shall include all of the hardware and software required to connect, transfer and interrupt power, and protect the equipment against overloads. The motion control shall interface with the microprocessor control system.
	1. operation
20. General Operation and control: A microprocessor based control system shall be provided to perform all of the functions of safe elevator motion and elevator door control. This shall include all of the hardware required to connect, transfer and interrupt power, and protect the motor against overloading. Each controller cabinet containing memory equipment shall be properly shielded from line pollution. Microprocessor system shall be designed to accept reprogramming with minimum system down time.
21. Car Button Independent Service All Elevators: A switch shall be provided in the car operating station which, when actuated, shall disconnect the elevator from the hall buttons, and permit operation from the car buttons only.
22. Car Reversal Operation: A car without registered car calls arriving at a floor where both up and down hall calls are registered shall initially respond to the hall call in the direction that the car was traveling. If no car call or hall call is registered for further travel in that direction, the car shall close its doors and immediately re-open them in response to the hall call in the opposite direction. The direction lanterns shall indicate the change direction when the doors re-open.
	1. general operation and control
23. Control of the elevator shall be automatic in operation by means of push buttons in the car numbered to correspond to floors served, for registering car stops and by Up/Down push buttons at all landings.
24. Momentary pressing of one or more buttons shall dispatch the car to designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which buttons are pressed.
25. Each landing call shall be canceled when answered.
26. Each elevator shall have its own computer and dispatch algorithm. Should one computer lose power or become inoperative in any way, the other computer shall be capable of accepting and answering all hall calls.
27. When both computers are in operation, only one shall assume the role of dispatching the hall calls to both cars.
28. The dispatching algorithm for assigning hall calls shall be real time, based on estimated time of arrival. In calculating the estimated time of arrival for each elevator, the dispatcher shall consider, but not be limited to, the location of the elevator, the direction of travel, the existing hall calls and car call demands, the door times flight times, lobby removal time penalty and coincidence calls.
29. The controller shall have field programmable outputs to activate different functions based on customer needs.
	1. auxiliary operation and controls
30. General: In addition to primary control system features, provide the following controls or operational features for the passenger and service elevators, except where otherwise indicated.
31. Special Emergency Service – Phase I: The activation of a key switch in a lobby level hall station shall return all cars in the group express to the designated floor, by-passing all car and hall calls. The cars shall park at the designated floor with their doors open and will not respond to car or hall calls unless the SES-II switch in the car is activated. This system shall be in conformance with the current ASME Code, Section 211.3. Heat and smoke or products of combustion sensing devices are to be furnished by others but the elevator contractor shall furnish contacts on the elevator controller to receive signals from the sensing device. If an elevator is on Independent Service, when the elevators are recalled, a buzzer shall sound in the car and a jewel shall be illuminated as required.
32. Special Emergency Service – Phase II: In-car control of each elevator during the emergency operation, by means of a key switch in each car shall be provided. Operation shall be per ASME Code, Rule 211.3.
33. Emergency Power Operation: Provide battery powered emergency lowering for each car. Car shall lower and park with the doors closed after a door time out period. The door open button shall remain activated.
34. Emergency Lighting and Alarm Bell (No Electrical Power to Car): Car mounted 12 volt battery unit including solid state charger and testing means enclosed in common metal container rechargeable lead acid or nickel cadmium battery with 10 year minimum life expectancy. When normal power to the car fails, the system shall automatically provide power to the car emergency light and to the alarm bell circuit.

2.11 Electrical Wiring

1. Electrical wiring shall comply with the ASME and National Electrical Code and all local codes. Wiring shall be included for all devices installed.
2. Furnish and install complete insulated wiring to connect all parts of the equipment. Properly ground all components as required by the National Electric Code.
3. Insulated wiring shall have a flame retarding and moisture resisting outer cover and shall be run in a metal conduit, metallic tubing, or wire ducts.
4. Provide 6 percent spare wires between each controller, hoistway junction box and control panes, also 6 percent spare conductors in each trail cable; all spares shall be properly tagged or otherwise identified with clear and indelible markings.
5. Tag code all field wiring at junction points; control wiring in traveling cables at their terminals in the machine room; elevator car junction box and connections within the car. Test entire wiring system for insulation to ground.
	1. plunger
6. Retain the present cylinder. The cylinder shall have all cavities and pits filled and polished and the packing replaced. Replace any single bottom cylinder to meet ASME A17.1.
	1. guides and buffers
7. Guides for each elevator car shall be thoroughly cleaned and re-lubricated. Elevator guide rails shall be properly fastened to the building structure. Each connection is to be verified by the elevator contractor.
8. Retain the existing buffers. They shall be mounted on continuous channels fastened to the elevator guide rail or securely anchored to the pit floor and substantial extension shall be provided, as required.
	1. pit switch
9. An emergency stop switch shall be located in the pit accessible from the pit access door.
	1. Hoistway door interlock
10. Provide new at all passenger landings. Replace freight interlocks with new at all landings.

 B. Provide new pick-up rollers.

* 1. hoistway door unlocking devices
1. Unlocking devices shall be provided at all floors with metal escutcheons to match the door finish on passenger elevator. Provide new pull chain boxes on freight elevator.
	1. top or car operating device
2. Each elevator shall be provided with an operating device mounted from or on the car crosshead which will permit slow speed (150 fpm or less) operation for purposes of adjustment, inspection, maintenance, and repair. A transfer switch shall be provided in the top of the car operating device fixture which will permit the disconnecting of hoistway access switch or switches and render top of car operating device operative. The operating device shall be mounted in a metal box and shall be rigidly secured in a position conveniently accessible to workmen on top of the car.
	1. car top lights
3. Electric light with wire guard and GFI convenience outlet fixture on car top which shall meet the requirements of ASME A17.1, Rule 204.7a(4).
	1. door operator
4. Provide new master door operator with the “closed loop” feature, capable of opening doors at not less than 1 ½ fps and accomplishing reversal in 2 ½ inch maximum of door movement on passenger elevator. Doors shall open automatically when car arrives at floor to permit transfer of passengers; after timed interval, doors shall automatically close. Arrange operator so doors can be opened by hand from inside car in case of power failure, if cars are within leveling zone.
	1. door re-opening and control device
5. Provide new proximity type door protection on passenger elevator.
6. Provide new safety boots on hoist-way door panels on freight elevator.
	1. automatic terminal limit switches
7. Provide new mechanical final limit switches.
	1. roller guides
8. Provide new rollers.
	1. car door hangers and tracks
9. Replace all door hanger rollers on passenger elevator.
10. Retain door tracks on freight elevator.
	1. car door electrical contact
11. Provide new.
	1. hoistway entrances
12. Retain existing.
13. Fascia Plates: Replace any missing or bent fascia plates. Fascia plates shall be finish painted with one coat of rust-inhibitive prime paint.
14. Door Closers: Provide new closers at all floors on passenger elevator.
15. Door Linkage: Provide new linkage at all floors on freight elevator.
	1. car enclosure
16. Cab interiors shall be retained.
	1. car doors
17. Provide new stainless steel on passenger elevator.
18. Retain car gate on freight elevator.
	1. hall button fixtures
19. Passenger elevator shall have one riser of surface mount hall buttons. The circular buttons shall have an illuminated round button. Face plates shall have a #4 satin finish stainless steel.
20. Freight elevator shall have one riser of surface mount hall buttons. The circular buttons shall have a vandal resistant illuminated round button. Face plates shall have a #4 satin finish stainless steel.
	1. car lantern fixtures
21. Provide new car lantern fixture installed in “strike” side of car jamb. The lanterns, when illuminated, shall indicate the elevator car which shall stop at the landing and in what direction the car is set to travel. When the car reaches a predetermined distance from the floor where it is going to stop, the corresponding hall lantern shall illuminate and the gongs sound once for up and twice for down. The hall lantern shall remain illuminated until the car doors close in preparation for leaving the floor.
	1. car position indicator
22. The elevators shall have one digital readout fixture incorporated in new car operating panel.
23. Fixtures shall be LED type and include floor sounding single adjustable tone of no less than 20 Decibels at not more than 1500 hertz, shall sound as the car is passing or stopping at a floor.
	1. car operating panels
24. The elevators shall have one (1) integral car operating panels per car and shall include the following:
25. Self-illuminating, floor registration with markings on buttons.
26. Alarm and door control buttons.
27. Firefighters key switch, pilot light, call cancel and floor passing buzzer.
28. All buttons shall be designated by raised markings with Braille, applied with concealed fasteners to meet ADA requirements. Stick on markings are not acceptable.
29. Engraved elevator number and elevator capacity on faceplate or front return.
30. Provide key operated controls for car stop switch, fan switch, car light switch, light rheostat, independent service, inspection service, and 110 volt GFCI convenience outlet.
31. Locate to meet ADA requirements.
32. Logo or manufacturers name not permitted on exposed surfaces.
33. Provide vandal resistant buttons on freight elevator.
	1. communications system
34. The emergency communication system shall be mounted behind the main car operating panel and be designed to provide two-way communication between the elevator and a point outside the hoistway. Audio and visual two-way communication is required. System shall automatically dial a programmable number to a point outside hoistway.
35. Visual messages shall be provided to indicate the status of an emergency call. The visual message will illuminate and shall read: “Message Received” when the emergency call button is pressed.
36. Raised letter and Braille shall be integrated and permanently marked on the faceplate identifying the device as a speech independent emergency telephone. Surface painted or applied graphics shall not be acceptable.
37. Emergency communication system must be able to provide receiving agent with information identifying building and elevator number whenever an emergency call is placed.
38. Emergency communication system shall comply with Federal Communication Commission (FCC) regulations and Americans with Disabilities Act (ADA).
39. When the party called by someone in the cab hangs up, the telephone shall disconnect immediately without giving a busy signal in the cab.
	1. SMoke sensor tie-in
40. System to interface with smoke sensors, including alternate level refuge. (Others will run wiring from the smoke sensors to the elevator machine room interface where the elevator contractor connects to their controls).

2.36 MONITOR

 A. Provide Lift-Net elevator management system at location to be determined by University of Texas Health Systems allowing building management to monitor the elevator equipment.

**Overall System Requirements**

An interactive system to monitor and manage the elevator, escalator and moving walkway equipment shall be provided (hereinafter called "The System"). The data collection, data storage and real - time monitoring portion of the system shall be based on Microsoft Windows, and able to run on Windows XP Pro or later operating systems, including Windows Server and Virtual Machines.

The system shall be network based and be capable of interfacing with all makes and types of elevator, escalator and walkway control systems. The system shall collect data via serial data link to all major manufacturers latest microprocessor based equipment. The system shall also be capable of collecting data via hardwired interface connections on earlier vintage relay based equipment.

The system shall be capable of mixing all manufacturers serial and hardware linked equipment on a single screen using individual status point blocks and fault event lists specifically tailored for each type of equipment. Status point and fault lists pertaining to any monitored equipment shall be configurable on-site by the installing technician. The system shall be modular and the addition of future banks of equipment shall a simple process which can be accomplished by a field technician on site.

The system shall be capable of operating on any TCPIP based network including but not limited to Ethernet, Token Ring, Arc-net and Lift-Net. The addition of unlimited monitoring terminals shall be possible on the network. Monitoring terminals shall be capable of operating "peer to peer" without a single server. The system shall also be capable of operating on a client server basis where job conditions so dictate. The failure of a single network device (other than a sole server in a client-server based system) shall not affect the operation of the rest of the system.

The system shall provide multiple banks, including multiple buildings, on a single monitoring terminal screen. The system shall be capable of simultaneous monitoring of at least five hundred elevator / escalator / walkway units on a single monitoring station. All monitored banks and historical data shall be visible from any monitoring terminal on the network. Monitoring terminals shall use TCIP protocol to communicate over LAN, WAN, VLAN or Internet where router, firewall and other systems allow.

Entry into the network shall be multi-level password protected.

The system shall be capable of real time display of all monitored status points on all monitored equipment. Fault and event notification screens and audible alarms shall be immediately displayed on selected monitoring stations, based on Boolean logical combinations of the monitored status points. Different fault and event tables shall be defined on a per-bank basis. The system shall collect and store all status, fault and event information for later reporting and analysis. The system shall provide statistical analysis of hall call response times, traffic patterns, fault conditions, service logs and security usage in graphical and tabular format.

The system shall maintain a record of every status point change occurring on the monitored equipment, and provide the ability to replay these events in a simulation at a later time in real time, slow speed, single step, reverse, or fast forward. This information shall be retained for a period of at least twenty-six weeks, and a mechanism shall be provided whereby this information may be archived.

The system shall store traffic, fault and statistical data for a period of at least three (3) years. The system shall log error type, car number, floor position and major system status points whenever a fault or logged event occurs.

In the case of a power failure the system shall be capable of connecting to an emergency power back-up unit. The loss of power shall not affect any stored data. The system will automatically re-boot the program and continue to operate after a power loss or other system malfunction.

**Paging Feature**

The system shall be capable where desired of paging a service technician or other personnel based on pre-defined parameters of elevator faults or conditions. The paging system shall provide the ability to page multiple numbers determined by the type of event triggering the notification, and shall be able to page different numbers based on preset times of day. (i.e. Different shifts). The system shall be capable of sending text messages to full text pagers in addition to supporting standard DTMF pagers.

**Remote Access Internet and Dial-in Feature**

The system shall be capable where desired of allowing approved individuals under multi-level password control to access all system features via the local area network, internet, or via modem over the public telephone network. The remote access feature shall use a “thick client” version of the Lift-Net software package that shall be integrated into the monitoring system and shall not use third party "remote control" software products.

**Remote Access Via WEB Browser Interface Feature**

The system shall be capable where desired of providing a subset of the real-time elevator & escalator information via a standard web browser interface. This interface will be provided by integrating web server software either into the local Lift-Net server or adding a second server remote from the Lift-Net server. In either case, a standard web browser will communicate with the lift-net web server and display status of devices, and may allow certain controls. The web server hosting the application and the lift-net server way reside in two different computers or they may reside side by side in the same computer. The remote web browser application will require standard plug-ins that are freely available to everyone. The Lift-Net application may be accessed via a web browser from the local network, or from a remote location via vpn or via the internet. In order to access the application from a remote location from the client's network, security policies & firewalls in the client's network must be configured such that the lift-net computer(s) can be accessed via the internet.

**Data Transmission to Central Support Location**

The system shall be capable where desired of transmitting fault, car usage and other data to a remote service desk or other office location for further processing, technician dispatch or other purposes. The data may be transmitted via the local area network, internet, or via modem over the public telephone network.

 **Interface to Third party Building Management Systems**

The system shall be capable where desired of interfacing and exchanging data with a variety of third party building management systems such as Johnson Controls, Siemens, Landis & Staefa and others. Information shall be exchanged by BACNet Protocol as a preference. Modbus protocol, Lift-Net protocol or other suitable methods may also be designated.

**Control Capabilities**

The system shall be capable where desired of operating interactive control features provided in the elevator control system. These features may be revised as the requirements of the building change. Some of these interactive controls may include but are not limited to: security floor lockouts, entering car and hall calls, Fireman's return service, lobby recall, VIP service, suspicious person and terrorist return, Up/Down peak or hospital Code Blue service. Local codes and controller type may affect the availability or operation of these features.

**The following outline highlights the minimum requirements of the remote monitoring system:**

**A. Elevator/Escalator/Moving Walkway Monitoring Equipment shall have these minimum characteristics:**

1. **Monitoring Station Hardware**
	1. Central processing unit – Microsoft Windows microcomputer - desk top or mini-tower (multiple machine rooms or lobby displays)
	2. Type - Pentium or most current high–performance processor
	3. Speed – most current high-performance
	4. Internal hard drive – adequate storage for three years data for entire system
	5. Modem (where needed) – most current high-performance
	6. Display –color min resolution 1024X768, capable of simultaneous display of all monitored units
	7. Printer – current HP Color Desk Jet Series
	8. Keyboard - MS Windows compatible
	9. Mouse - MS Windows compatible
	10. Power requirements – 90 – 230 Volts AC 50 - 60Hz @ 8A
2. **Machine Room Hardware (applies to hardware interface jobs only)**
	1. Controller interface panels shall utilize high quality printed circuit boards
	2. Input voltage range - 5 - 250V AC/DC
	3. Compatible with all types and makes of controllers
	4. Operating temperature range - 45 - 112 degrees Fahrenheit.
	5. Humidity range - 10% - 85% non-condensing
	6. Modular design - capable of future expansion
	7. Power requirements – 90 – 230 VAC 50 - 60Hz @ 3A
	8. The following electrical specifications for hardware interface circuitry shall apply:
		1. Input circuit loading: < 2 ma
		2. Input impedance: >270K ohm @ 100VDC
		3. Inputs - Optical isolation: >3500 VRMS @ 1 sec.
		4. Outputs - Relay form "C" contact rated 1/3 HP inductive, 3A, 250VDC
3. **Monitoring Station Operating System Software**
	1. MS Windows XP Pro or later
	2. MS Windows 2003 Server or later

**B. Network capability**

* 1. Minimum number of nodes (combined PC, elevator / escalator / walkways): 500
	2. Minimum I/O points per node (input or output): 2040
	3. Access time to status bit change (typical 6-car bank): <25ms
	4. Must be Capable of operating on RS485, RS422, Ethernet, Token Ring, Arc-net, Lift-Net, Fiber-Optic and mixed WAN TCPIP Networks.

**C. The system shall display and record the following information for each monitored unit:**

(The following is intended as a guideline – hardware connections to each status point mentioned on every control system may be impractical. Serial data links may include many more points.)

1. **Elevators** - Applies to both hydraulic and traction elevators
	* 1. Group operational mode
		2. In/out of service
		3. In/out of group service
		4. Emergency power
		5. Supervisory failure
		6. Location and direction of hall calls
	1. Individual car status - expandable menus
		1. Direction of travel
		2. Independent service
		3. Inspection service
		4. Fire service
		5. Position of elevator
		6. Door status (open, opening, closing, closed)
		7. Door dwell time
		8. Load by-pass
		9. Emergency power
		10. Power on/off
		11. Door detector
		12. Safety circuit
		13. Door zone
		14. Stop switch
		15. Alarm button
		16. Registered Car Calls
	2. Keyboard, Mouse and time clock control capabilities (where applicable)
		1. Floor lockouts (car or hall)
		2. Lobby recall
		3. VIP service
		4. Fireman's service
		5. Hospital Code Blue
		6. Up/Down Peak
	3. Faults monitored with visual and audible alarm, triggered by combinations of any of the above status points
		1. Safety circuit
		2. Alarm bell
		3. Door reversal devise
		4. Earthquake
		5. Other faults that will render the unit inoperable

**Reports**

Reports shall be available in color graphical format both on-screen and printed on paper. It shall be possible to conveniently switch from one report type to a different type, and from one bank to another using minimal mouse clicks and key strokes. Reports shall be displayed after minimal waiting time. Data for all reports shall be continuously recorded and stored. Reports shall be displayed by simply selecting a date and time range, bank of equipment, and report type. Date and time range selections shall carry forward from one report selection to the next. Reporting functions shall be sub-divided into the following categories:

1. **Traffic Reports (elevators)**
	1. Number of hall calls per floor (hall call distribution on a per floor basis)
	2. Number of hall calls per hour (24 hour time-line)
	3. Hall call waiting times per floor (hall call waiting time distribution on a per floor basis)
	4. Hall call waiting times per hour (24 hour time-line)
	5. Distributed hall call response graph (24 hour time-line)
	6. Detailed hall call response graph (%calls / n seconds)
	7. Longest wait times including floor #, wait time, date, time, and direction
2. **Fault Reports (elevators)**
	1. Ten most recent faults (most recent faults listed per bank)
	2. Fault log - displays the entire fault log for a given time period
	3. Faults per car (fault distribution on a per car basis)
	4. Faults per floor (fault distribution on a per floor basis)
	5. Faults per day (fault distribution on a per day or week basis)
3. **Car Use Statistics (elevators)**
	1. Car use by hour (24 hour time-line of car calls, car starts, door cycles, delayed car, load by pass)
	2. Car use statistics (same as above, shown for an entire bank)
4. **Group Service Log (elevators)**
	1. Cars in service (24 hour time-line with text log of group availability of each car)
	2. Indicator of percent time in useful service per unit
	3. Group functions (24 hour time line with text log of actuation of group functions - Up peak, Dn peak, Fire Svc, Em Pwr, ect.)

**Interactive Features**

 **Security Access Features**

The system where desired shall be capable of providing security enable / disable of all hall and car calls through on – screen menus at a minimum. The monitoring system shall also be capable of interfacing directly with card readers and security keypads in stand-alone mode, and in-directly through a serial interface with a third party security system. When in stand-alone mode, the monitoring system shall maintain a database of elevator users and security pass codes. When on secure mode the use of each elevator will be recorded in a file together with the time, authorized pass code and destination for each call.

**Elevator Control Features**

The system shall be capable where desired of controlling certain features on each elevator. All control points shall be capable of seven-day twenty-four hour time clock automatic operation, or manual operation from the mouse and keyboard. The control points may include but not be limited to the following (where desired on the particular job, allowed by local codes and available on the particular elevator control equipment)

* 1. Lobby recall
	2. Car call security lockout
	3. Hall call security lockout
	4. Fireman's Service
	5. Independent service
	6. VIP Service
	7. Emergency Power Selected Car
	8. Terrorist Service
	9. Suspicious Person Return feature

**System Installation and Testing**

It is anticipated that all connections to elevator / escalator / walkway equipment will be accomplished by high level qualified technicians using industry standard methods, materials and protections. Technicians shall be licensed, bonded and insured such as local regulations require.

All features of each unit shall be 100% tested and documented using a laptop computer in the machine room at the individual unit before connecting that unit to the network. Further testing shall then take place proving solid network communications and reliable data transmission to remote terminals.

Documentation describing the testing procedures and results for the entire system shall be provided upon system acceptance.

part 3 – executION

3.01 SCOPE

1. Installation shall meet all of the standard requirements of paragraph 1.03 for installation and inspection, tolerances, and qualifications. All work required for completion of a first-class installation is the responsibility of the contractor, even if not included in this specification.
2. Performance of the elevator shall meet requirements of Paragraph 2.03.
	1. painting
3. All elevator equipment not painted, wire duct, miscellaneous iron and steel work located within the machine room or hoistway, shall be given a finish coat of paint. Material that has factory finish paint, shall have all scratches or mars painted after installation.
4. Finish coat shall have hard, tough semi-gloss surface.
	1. clean up
5. Remove daily trash from hoistways, pits, and machine rooms including all packing material and debris resulting from this work. Leave all elevator spaces broom clean.
	1. acceptance testing
6. Tests shall be performed by the Elevator Contractor at his expense in the presence of the Owner’s representative. The elevators shall be subjected to the following acceptance inspection and tests:
7. Inspection and tests required by applicable portions of Requirements, 1.03.
8. Inspection and tests required by Federal, State, and Local codes and ordinances.
9. Test safety circuit, loop circuit, and the drive circuits at 500 volts. Minimum resistance to ground shall be one meg ohm.
10. General riding quality, leveling accuracy, and quietness of operation shall be acceptable to the Owner’s representative.
	1. use of elevators
11. The elevators shall not be used for construction purposes, or during the period prior to turning over the project to the Owner. Should the elevators be authorized for temporary use, the following conditions shall apply:
12. The Elevator Contractor shall provide a temporary acceptance form for the user to sign.
13. Neither the new installation period, the guarantee, shall start at this time unless specifically approved in writing by the Owner.
14. The user shall provide, if job conditions require, all temporary enclosures, guards or other projection of the hoistway openings, power, signal devices, car lights, protection of any elevator entrances, cars, fixtures, and any other equipment that is installed.
15. The user shall return the elevators in the same condition they were in when placed on temporary service and shall pay the Elevator Contractor for repairs or clean up.
16. The user shall allow the Elevator Contractor to perform routine maintenance or repairs.
17. The cost of temporary service shall be worked out between the Elevator Contractor and the user.
18. As elevators are completed, the Owner shall have the prerogative of accepting and using them, shutting them down, or accepting them under an Interim Service Agreement described below:
19. The Owner shall have the prerogative of continuing the Interim Service Agreement until all elevators in the group (or building) are completed.
20. The guarantee period and new installation service will start at the termination of the interim service period.
21. The cost of interim service shall not exceed the prorated cost of the monthly maintenance bid required by these specifications.
	1. acceptance
22. Final acceptance of the installation shall be made only after all field inspections and tests are complete, punch list items are complete, all Owner’s information items listed in 1.02.C have been furnished, and the Owner’s representative is satisfied that the installation has been satisfactorily completed.

ALTERNATES

1. Provide unit price (per opening) to replace hoist-way sills.

2. Provide unit price (per opening) to replace hoist-way door panels.

END OF SECTION 14211