exhibit 2

Medical School ELECTRIC TRACTION 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 ten (10) existing passenger elevators 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 Medical School Building, 6431 Fannin 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. NFPA 70 National Electrical Code.
17. NFPA 80 Fire Doors and Windows.
18. Americans with Disabilities Act – Accessibility Guidelines (ADAAG).
19. ASME 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 the original 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 contractor’s 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.

1.04 contractor's responsibility

1. The electrical and mechanical design shall be based on the existing power characteristics, feeders, breakers and heat releases. The Contractor shall submit with bid any power characteristics or heat releases of this equipment that exceeds that of the equipment in place. Any additions or modifications requested at a later date will be at the expense of the Contractor.
2. 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
3. For new equipment installed, 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 of all elevators.
   1. maintenance
4. 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.
5. 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.
6. 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.

1.07 full maintenance bid

A. 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.

1.08 quality assurance

1. 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, forcing 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 same shall not be dependent on an exchange component.

part 2 products

* 1. manufacturers

1. The following manufacturers are acceptable:
2. For all elevators:

Kone Elevator

Otis Elevator

Schindler Elevator

ThyssenKrupp Elevator

* 1. type and general characteristics

|  |  |  |
| --- | --- | --- |
|  |  | Passenger Elevator Nos. 1 - 8 |
|  |  |  |
| 1. | Quantity: | Eight (8) – Four (4) Duplexes |
| 2. | Capacity | 3500 pounds |
| 3. | Speed | 400 fpm |
| 4. | Floors Served | B, \*G, 1 – 7 |
| 5. | Stops and Openings | 9 Front Stops and Openings |
| 6. | Operation | Duplex Automatic |

MACHINE ROOM

|  |  |
| --- | --- |
| Control | New Microprocessor Controls with solid state drives for geared elevators. |
| Machine | Clean the exterior, drain, flush and refill bearings. Replace seals and seal machines to prevent leaks. Repaint machines. Replace any worn rubber isolation pads. Check traction sheaves for abnormal wear, replace any that are not in excellent condition. . |
| Motors | Provide new |
| Governor | Provide new |
| Leveling devices | Provide new |
| Fireman Service | Provide new Phase I & II |

HOISTWAY

|  |  |
| --- | --- |
| Deflector Sheaves | Reuse Existing; refurbish/replace leaking seals, bearings or sheave grooves |
| Hoist Cables | Clean, lubricate and examine for breaks and wear, replace as required. |
| Governor Cables | Provide New |
| 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, Provide alternate pricing per opening as noted on bid form. |
| Hoist-way Door Frames | Reuse Existing |
| Hoist-way Door Panels | Reuse Existing |
| Hoist-way Fascia and Toe Guard | Reuse Existing, alter to meet current Code requirements. |
| Hoist-way Access | Provide New |
| Hatch Wiring and Travel Cables | Provide new complete. Hoist-way duct may be reused if suitable. |
| Main and Counterweight rails | Reuse Existing |
| Buffers | Reuse Existing; drain, flush, refill, paint and test |
| Pit and Secondary Stop Switches | Provide New |
| Counterweight | Retain Existing |
| Counterweight Roller Guides | Provide New |
|  | CAR |
| Car Sling | Reuse Existing |
| Safeties | Reuse Existing; clean, refurbish and test |
| Car Door Contact | Provide New |
| Car Roller Guides | Provide New |
| Platform | Reuse Existing |
| Car Enclosure | Reuse Existing |
| Cab Threshold | Provide new; Nickel Silver |
| Car Doors | Reuse existing, clean refinish to match new returns. |
| Toe Guard | Retain existing, alter as required to meet Code. |
| Return Panels | Provide New |
| Communications | Provide new system, provide additional stations in machine rooms and security desk to meet Code requirements. |
| Floor Covering | Reuse existing |
| Door Operator | Provide New |
| Car Door Hangers | Reuse Existing, replace worn or damaged hangers |
| Car Door Track | Reuse Existing |
| Door Protection | Provide new infra-red door protection |
| Car Operating Panels | New, match all existing finish quantity and details. |
|  |  |
|  | SIGNALS |
|  |  |
| Car Position Indicators | New incorporated in car operating panels |
| Hall Lanterns | New with electronic tones and LED bulbs to meet ADA requirements. Incorporate digital position indicator at each landing. |
| Hall Buttons | Provide new hall buttons with LED bulbs. Include any alterations to openings to be done after business hours. |

|  |  |  |
| --- | --- | --- |
|  |  | Service Elevator Nos. 9 - 10 |
|  |  |  |
| 1. | Quantity: | Two (2) |
| 2. | Capacity | 5000 pounds |
| 3. | Speed | 400 fpm |
| 4. | Floors Served | B, BR, \*G, 1 – 7, PH |
| 5. | Stops and Openings | 10 Front / 1 Rear |
| 6. | Operation | Duplex Automatic |

MACHINE ROOM

|  |  |
| --- | --- |
| Control | New Microprocessor Controls with solid state drives for geared elevators. |
| Machine | Clean the exterior, drain, flush and refill bearings. Replace seals and seal machines to prevent leaks. Repaint machines. Replace any worn rubber isolation pads. Check traction sheaves for abnormal wear, replace any that are not in excellent condition. . |
| Motors | Provide new |
| Governor | Provide new |
| Leveling devices | Provide new |
| Fireman Service | Provide new Phase I & II |

HOISTWAY

|  |  |
| --- | --- |
| Deflector Sheaves | Reuse Existing; refurbish/replace leaking seals or sheave grooves |
| Hoist Cables | Clean, lubricate and examine for breaks and wear, replace as required. |
| Governor Cables | Provide New |
| 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, provide alternate pricing per opening as noted on bid form. |
| Hoist-way Door Frames | Reuse Existing |
| Hoist-way Door Panels | Reuse Existing |
| Hoist-way Fascia and Toe Guard | Reuse Existing, alter to meet current Code requirements. |
| Hoist-way Access | Provide New |
| Hatch Wiring and Travel Cables | Provide new complete. Hoist-way duct may be reused if suitable. |
| Main and Counterweight rails | Reuse Existing |
| Buffers | Reuse Existing; drain, flush, refill, paint and test |
| Pit and Secondary Stop Switches | Provide New |
| Counterweight | Retain Existing |
| Counterweight Roller Guides | Provide New |
|  | CAR |
| Car Sling | Reuse Existing |
| Safeties | Reuse Existing; clean, refurbish and test |
| Car Door Contact | Provide New |
| Car Roller Guides | Provide New |
| Platform | Reuse Existing |
| Car Enclosure | Reuse Existing |
| Cab Threshold | Provide new; Nickel Silver |
| Car Doors | Reuse existing, clean refinish to match new returns. |
| Toe Guard | Retain existing, alter as required to meet Code. |
| Return Panels | Provide New |
| Communications | Provide new system, provide additional stations in machine rooms and security desk to meet Code requirements. |
| Floor Covering | Reuse existing |
| Door Operator | Provide New |
| Car Door Hangers | Reuse Existing, replace worn or damaged hangers |
| Car Door Track | Reuse Existing |
| Door Protection | Provide new infra-red door protection |
| Car Operating Panels | New, match all existing finish, quantity and details. |
|  |  |
|  | SIGNALS |
|  |  |
| Car Position Indicators | New incorporated in car operating panels |
| Hall Lanterns | New with electronic tones and LED bulbs to meet ADA requirements. Incorporate digital position indicator at each landing. |
| Hall Buttons | Provide new hall buttons with LED bulbs. Include any alterations to openings to be done after business hours. |

* 1. performance

1. Speed: +/- 3% under any loading condition.
2. Capacity: Safely lower, stop and hold up to 125% rated load.
3. Leveling: +/- 1/8” under any loading condition.
4. Door Closing time, Thrust and Kinetic Energy shall comply with ASME Code and ADA.

E. Floor to Floor Performance Time: Floor to floor performance time of 9.0 seconds for the passenger elevators, 11.0 seconds for the service elevators, regardless of loading conditions or direction of travel).

* 1. MACHINE ROOM EQUIPMENT

1. Identification: Provide identifying numbers on drive, machine, governor, controller and disconnect switch.
2. Provide Code Data Plate on the controller for each controller in accordance with ASME A17.1 Code Data Plate Requirements.
3. Machine: Provide machine work as required to place the machines in first class operating condition. Check and replace seals that are leaking. Check for excessive sheave wear and noisy bearings, replace any that have noticeable problems. Provide all work as detailed in schedule.
4. A variable voltage, variable frequency power drive shall be provided to apply variable voltage to the elevator motor. The controller shall, during the acceleration and retardation periods, gradually change voltage applied to the elevator motor without interruption of the power to the motor. The system shall be designed to properly filter and control noise, spiking and other objectionable by-products. The successful bidder must be able to demonstrate that he has successfully installed similar equipment. Static drives shall operate satisfactorily when applied and connected to the building electrical distribution system that has disturbance levels of up to the maximum allowed by IEEE-519 standard for general systems. IEEE 519 shall be used as drive design guidelines for current harmonics.
5. A digital velocity encoder shall be provided on the motor giving feedback to the controller on motor speed and position. Provide line filters, noise spike or notching suppressors to insure other computer-operated equipment in the building will not be affected.
6. The system shall meet or exceed all requirements of IEEE 519 standard for general systems. The position selector shall be part of the microprocessor system. The car position in the hoist-way shall be digitized through a primary position encoder. The microprocessor control system shall store the floor position and slowdown points in memory.
7. The drive control system shall be a dual-loop feedback system based primarily on car position. The velocity profile shall be calculated by the microprocessor control system producing extremely smooth and accurate stops. The velocity encoder shall permit accurate position/velocity feedback shall permit a fast and accurate control of acceleration and deceleration. The vertical acceleration rate shall be not less than 3.3 ft./sec.² for speeds through 500 fpm.
8. Provide line reactors, line filters or motor filters on the line to prevent interference from line to drive and from drive to motor. Prevent motor noise and electrical distortion back to the building electrical power supply system. Transformers or reactance units shall be mounted in neoprene in shear isolators similar to Mason Industries, Type ND or as approved with a minimum static deflection of 0.15 inch. An effective electrical filter / reactor limiting electrical noise shall be provided. Filtering system shall meet IEEE 519.

1. Visible Ground Wire: All electrical machine room equipment shall have a visible ground wire at least #8 in size, bare or green insulation.
2. Brake: The brake shall be retained and reused. Brake coil shall be checked for proper operation and rewound or replaced if needed. Brake linings shall be replaced if visibly worn.
3. Governor: The governor shall actuate a switch when excessive descending speeds occur, disconnecting power to the motor and applying the brake application of the safety. Existing governors shall be thoroughly cleaned and retested.

I. Up fall devices: Reuse and refurbish up fall or unintended upward motion devices on each elevator. Include any requirements for slab x ray or structural calculations that you might require in the attachment of these devices.

* 1. AUTOMATIC TWO WAY LEVELING.

1. Each elevator will have two way leveling to automatically bring the car to a stop approximately level with any floor for which a stop has been initiated, regardless of load, rope stretch of direction of travel.
2. Automatic leveling control shall permit the synchronization of door opening with the stopping of the car at a floor.
   1. ELEVATOR SUCCESSIVE STARTING
3. After all drives in a group have been shut down due to lack of normal power, only a single drive shall be allowed to start up at one time.
   1. NORMAL STOPPING DEVICES
4. Provide slow-down and normal stopping devices on top of each car.

* 1. GUARDS

1. In addition to guards for sheaves and other similar items hereinafter specified, attention is directed to the requirements relative to guarding of exposed gears, sprockets, tape or rope sheaves, or devices of selectors, floor controllers, or signal machines, and the ropes, chains, or tapes for driving same in machine rooms, pits and secondary spaces. Kick angles shall be included around all unprotected openings in the machine room floor. Handrails shall be provided on car tops where over head clearances allow. Cover any openings in machine room floors.
   1. motion control
2. Furnish and install microprocessor motion controllers for each elevator.
3. 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 controller shall interface with the microprocessor control system.
   1. operation and control systems
4. Provide “Duplex Automatic” operation and control systems for each group of passenger elevators and Service Elevator Nos. 9 and 10.

2.11 operation

1. 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. The system shall also perform car operational and group supervisory control. Each controller cabinet containing memory equipment shall be properly shielded from line pollution. Micro-computer system shall be designed to accept reprogramming with minimum system down time.

B. Anticipated in Rush Device: To maintain sufficient lobby elevator capacity to handle anticipated heavy in rush traffic the system shall include a device to call all of the cars in the group to the lobby without waiting for a lobby call. The device shall only operate predetermined heavy rush periods. During these periods, cars shall be automatically dispatched from the lobby when they become loaded nearly to capacity or, if not loaded to capacity, on a variable time interval calculated on the basis of the number of cars at the lobby and other data representative of traffic in the system. The cars shall continue to operate in this manner until the end of the pre-determined period.

C. Off Peak Geographical Spacing: When the cars are at rest, they shall be assigned throughout the building to pre-determined zones. The first car entering a zone shall become assigned to that zone. A car may run through an occupied, assigned zone in search of an occupied zone in which to park. While there are no calls registered the cars shall remain in a zone parked with door closed. The lowest zone shall consist of the main floor and adjacent floor, above or below, as required to suit design requirements. The remaining floors shall be divided into equal zones with one car randomly assigned to each zone. Optimized response to hall calls shall be below, as required to suit design requirements. The remaining floors shall be divided into equal zones with one car randomly assigned to each zone. Optimized response to hall calls shall be achieved by computing a relative system response (RSR) time for each registered hall call. The computation of each car’s (RSR) time to a hall call shall be based on, but not limited to, such relevant factors as distance, service to previously assigned car, and hall calls, car load, direction, door and car motion status, and coincidence of car and hall calls. The car with the least RSR shall have this call assigned to it. RSR computations for each hall call are repeated several times a second and the hall call assignment might be changed if a more suitable car is found.

D. Moderate Up and Moderate Down Traffic programs: When incoming traffic at the lobby floor increases as indicated by two cars leaving the lobby in the up direction, filled to capacity with a pre-determined adjustable time period, cars assigned to upper zones shall be called to the lobby without waiting for a lobby call. Calls shall be automatically dispatched from the lobby when they become loaded nearly to capacity or, if not loaded to capacity, on a variable time interval calculated on the basis of the number of cars at the lobby and other data representative of traffic in the system. The cars shall continue to operate in this manner until the lobby traffic has been reduced to a predetermined level. When down calls above the lobby increases to a predetermined level, assignment of a car to the lobby ceases and the lobby car shall travel up to assist the other cars. Cars arriving at the lobby, after discharging passenger shall be dispatched upward. The cars shall continue to operate in this manner until the down traffic has been reduced to a pre-determined level.

E. Anticipated Exit Device: To prepare the system for heavy outgoing traffic, operation shall be such that upon arrival at the lobby of any car, loaded more than a pre-determined capacity during a regularly anticipated exit period, assignment of a car to the lobby ceases and the lobby car shall travel up to assist the other cars. Cars arriving at the lobby, after discharging passengers, shall be dispatched upward. The cars shall continue to operate in this manner until the end of the regularly anticipated exit period.

F. Car to Lobby Operation: Provide a key operated switch for each elevator in the Life Safety Panel which, when actuated, shall cause the corresponding elevator to make a trip to the lobby as soon as the car is available for response to the special call.

G. Load Weighing Dispatching: A load weighing device shall be provided which shall dispatch the cars away from the main lobby floor when the load in the car reaches a pre-determined capacity. The load dispatch weight shall be adjustable.

H. Load Weighing Bypass: A load weighing device shall be provided which shall be set to operate at a pre-determined percentage of the load in the car. The car shall bypass hall calls when this device is actuated. The bypass load weight shall be adjustable and separate from the load weighing dispatch weight.

I. Anti-nuisance: A system shall be provided so that when the number of car calls is greatly disproportionate with the weight of the car all car calls shall be canceled without making any stops. The ratio of calls to weight shall be adjustable.

J. 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.

K. Car Reversal Operation: A car without registered car call 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 reopen them in response to the hall call in the opposite direction.

1. Car Delay Operation: If, for any reason, the doors are prevented from closing and the car is unable to respond to a call, the calls shall be transferred to another car.
   1. general operations and control
2. Control of the elevator shall be automatic in operation by means of pushbuttons in the car numbered to correspond to floors served, for registering car stops and by up/down push buttons at each intermediate landing and call pushbuttons at terminal landings.
3. The 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.
4. Each landing call shall be canceled when answered.
5. When the car is traveling in the up direction, it shall stop at all floors for which car buttons or up hall buttons have been pressed. It shall not stop at floors where down buttons only have been pressed unless the stop for the floor has been registered by a car button, or unless the down call is at the highest floor for which any buttons have been pressed.
6. The pressing of an up button when the car is traveling in the down direction shall not interrupt the travel unless the stop for that floor has been registered by a car button, or unless the up call is the lowest for which any button has been pressed.
7. When the car has responded to high or lowest stop, and stops are registered for the opposite direction, its travel shall reverse automatically and it shall then clear the calls registered for that direction.
8. Should both up and down calls be registered at an intermediate floor, only the call corresponding to the direction in which the car is traveling shall be canceled upon the stopping of the car at the landing.
9. An adjustable time delay shall be provided so that after the car has stopped in response to a hall button, the entering passenger may register his car button before the car will reverse to answer calls in opposite direction.
10. Car station shall contain a key operated toggle switch for the car light, a fan switch and a door open button for stopping the closing motion of the doors and causing them to return automatically to their position.
11. The buttons in the car and hall stations shall be of the light-up type and shall indicate that a call has been registered for that landing.
12. Elevators shall have car button independent service. When a key operated switch in the car panel is activated the car shall be disconnected from the hall buttons and shall only respond to car buttons. Car doors shall be closed by pressing the door close button.
13. Provide secured access operation utilizing cab pushbuttons for access. Changeable codes shall be programmed and altered from the monitor at the security desk. The codes shall have the ability to vary from floor to floor and be changed by the Owner.
14. Provide wiring provisions for card reader operation. Include programmable recall and shutdown for non reader elevators. Card readers will be by others. Any existing security circuitry resident on controllers shall be moved to new controllers or replaced as part of the base elevator scope.
15. Provide door hold button in service car that will hold doors open from 10 to 40 seconds, time to be adjustable on site. Doors will begin to close upon activation of a car button in the cab to override time delay.

O. Check and verify that all existing functions and operations are maintained and duplicated in the modernized controllers.

* 1. auxiliary operation and controls

A. 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.

1. 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 and by-pass all car and hall calls. The cars shall park at the designated floor with the 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.
2. 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.
3. Provide the required fixture changes for Special Emergency Service, Phase I & II including new key switches with required engraving as well as new push buttons in car station for “Call Cancel”, “Door Close”.
4. Emergency Power Operation:
5. Coordinate / provide connection with the emergency power supply, transfer switch and wiring to the controller in each machine room.
6. The elevator contractor’s system shall automatically run one pre-selected elevator per group down to the lobby floor at full speed where it shall park with doors open. The system shall then consecutively select elevators until all cars are parked at the selected floor. The assignment shall then be passed back to a pre-designated car. If any fail to run, the selection shall be passed on to the next car.
7. The system shall include a manual override for the use of Firemen or other authorized emergency personnel. The elevator contractor’s system shall include manual interlocking pushbutton switches. There shall be one switch for each elevator for manual control; one automatic operation and one off position. The switches shall be located in the Life Safety Panel.
8. The elevator contractor shall furnish and install the necessary equipment and wiring from the respective elevator controllers to the switches in the Life Safety Panel.
9. The group elevator controllers shall receive signals from the generator control sequence panels before transferring from normal to emergency power, and when the power transfers from emergency to normal.

1. 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.

2.14 guide rails

A. Car and counterweight guide rails, brackets and bracket spacing shall conform to ASME A17.1 Code requirements. If additional supports are required to meet Code requirements, this work shall be the responsibility of the Contractor.

B. Clean and lubricate all rail clips and realign rails as required to meet ride quality specified in the maintenance agreement.

* 1. pit switch

1. New pit switches shall be provided. Add second pit switch for pits in excess of 66 inches deep.
   1. ropes
2. Suspension ropes and their connections shall conform to ASME A17.1. All ropes shall be closely inspected and replaced if they are not in compliance with Code specifications.
   1. elevator counterweights
3. A counterweight shall be equal in weight to approximately the weight of the car plus a minimum of 40 percent of the rated load. Include re balance for all cabs after alterations are completed.
   1. car and counterweight buffers
4. Buffers may be reused. They should be drained, filled with new oil, cleaned, painted and tested.
   1. overhead switches
5. New as required.
   1. hoistway door interlock

A. Each elevator hoist-way door shall be equipped with a unit system hoist-way door interlock. The interlock shall prevent the operation of the elevator driving machine by the normal operating device unless the hoist-way is locked in the closed position. The interlock shall also prevent the opening of the hoist-way door from the landing side unless the car is either stopped or being stopped.

* 1. hoistway ACCESS SWITCHES

1. Provide new, make any changes to comply with current codes. Provide escutcheon tubes in all doors where they are missing.
   1. elevator compensation
2. Retain existing where applicable, verify that all ropes meet Code specifications.

B. Thoroughly clean all comp sheaves, re-seal all bearings and adjust switches to no more than half travel for rope stretch.

* 1. electrical wiring

1. Electrical wiring shall comply with the ASME and National Electrical Codes and all applicable 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 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. (Existing conduit, tubing or duct may be re-used if in satisfactory condition and suits job conditions.)
4. Provide 6 percent spare wires between each controller, leveling device, hoist-way junction box, and control panel, also, provide 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.
6. Provide total of six (6) shielded pairs for security use in the traveling cables for the elevator. The shielded pairs shall be located in a cable that is not used to carry alternating current circuits. Include one stranded coaxial cable for each elevator for future camera use. Camera wiring shall include adequate wiring to reach any portion of car top, coil and leave behind front return for future use. The shielded wiring shall extend to junction box in the elevator machine room.
7. Provide three, two conductor 18Ga shielded pairs of wiring in each car for fire alarm and fire phone jack use.
8. Provide an alternate price to include one fiber optic bundle in each cab for future use.
9. Existing feeders: If Contractor requires any change in electrical service or transfer switch operation he must contact Herb Smith of Persohn/Hahn Associates at least five (5) days prior to bid date. Contractor shall have every opportunity to survey this equipment prior to bidding. Any changes shall be submitted in writing as stated above. Any changes required after bids are taken shall be at the Contractors expense.
   1. top of car operating device
10. Each elevator shall be provided with an operation device mounted from or on the car crosshead which will permit slow (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 disconnection of hoist-way switch or switches and render the 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
11. Electric light with wire guard and GFI convenience outlet fixture on car top which shall meet the requirements of ASME A17.1.
    1. door operator
12. Provide new closed loop type door operators.
    1. door opening and door control device
13. Provide new proximity type door protection for all passenger / service elevators.
14. Door open timing feature.
15. Operate in conjunction with proximity devices to provide adjustable, reduced, hold open time once beams are broken and re-established.
16. When doors are held open beyond an adjustable time, buzzer sounds and doors shall close at reduced speed.
17. There shall be a difference in door hold open times between car and hall calls. Door speed, thrust and kinetic energy shall comply with the ASME Code. Door hold open times shall comply with “Handicapped Requirements”.
    1. final limit switches
18. In addition to the normal limit switches, a hoist-way final limit switch shall be installed at the top and at the bottom of each hoist-way.
19. Final limit switches shall be so located that they open at or about the time the buffer is engaged by the time the buffer is engaged by the car or counterweight.
    1. carframe and safety
20. Car frame shall be reused, check for alignment and torque all fasteners to eliminate squeaks.
    1. platform
21. Retain existing, repair any platforms where welds have broken resulting in popping noises.
    1. roller guides
22. Provide with new car and counterweight with Elsco or approved equal.
    1. CAR door hangers and tracks
23. Refurbish or replace damaged existing sheave type hangers with polyurethane that roll on a polished steel track and guided at the bottom by non metallic shoes sliding in a smooth threshold groove.

* 1. car door electrical contact

1. Shall operate in conjunction with car door so elevator cannot operate unless doors are closed or within the tolerance allowed by Code.
   1. hoistway entrances
2. Frames: Reuse existing. Provide new jamb plate and numbering.
3. Doors and Sight Guards: Reuse existing. Repair or replace any missing or damaged sight guards or astragals. Sand back side of doors to remove all rust and repaint. Provide alternate pricing (line provided on bid form) per landing for new baked enamel door panels.
4. Sills: Reuse existing. Provide alternate pricing (line provided on bid form) per opening to be replaced with new aluminum sills. Do not include pricing in base bid.
5. Hanger Supports: Reuse existing headers, sand to remove all rust and repaint.
6. Fascia Plates: Reuse existing, alter where required to meet current Code requirements.
7. Closers: Provide new at each level where existing units have any noise or roughness
8. Door Hangers and Tracks: Reuse Existing. Sheave and rollers shall be replaced if not in like new condition. Tracks and all associated hardware shall be cleaned.
9. Hanger Cover Plates: Reuse existing. Replace any damaged or missing hanger cover plates.
10. Floor Numbers: Provide four inch numbers on hoist way side of elevator entrance doors at all floors.
    1. car enclosure
11. Car interiors shall be retained.

B. Include five (5) sets of pads, one (1) for each duplex elevator banks. Include a hook or hanging system.

* 1. car doors

1. The car door system shall be designed so that the car doors may not be opened more than 4” from the inside of the car if the car is outside the unlocking zone of a landing.

B. Replace any damaged or missing door astragals.

C. Clean and refinish car doors on all passenger elevators to match finish on new return panels.

* 1. emergency exits

1. All cars shall have ceiling emergency exits per current codes.
   1. hall button fixtures
2. Provide new pushbutton devices with LED bulbs and matching (to existing finishes at each level) faceplates. Provide phase 1 fireman’s 3 position switch at the ground floor for each group of elevators as required. Include exit graphics engraved on faceplate. Contractor shall provide new back boxes if required and provide all wall cutting where boxes are replaced. Any new plates must cover existing areas so wall finishes are not required to be replaced or altered. Any re finish work in lobbies required by fixture alterations shall be included in the base bid. All cutting of lobby finishes shall be done after hours by the contractor and included in the base bid. Include all Code required graphics to be engraved on new faceplate. Provide vandal resistant buttons for service elevators. Provide stainless steel with LED surround buttons for tower passenger elevators.
   1. Hall lantern fixtures
3. Provide new hall lanterns with a new electronic tone. 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. Include new LED type bulbs. Incorporate digital position indicator in each lantern device at all floors.
   1. car position indicator
4. Provide new in each car operating panel, match existing quantity for each elevator.
5. Fixtures shall 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.
6. Include voice annunciator system in each car that announces floors and direction of travel. Voice shall be a female and the volume shall be adjustable.
   1. car operating panels
7. Provide new car operating panels and returns to match fit, and design of current returns. New returns to match existing finishes.

B. The elevator car operating panels shall include the following:

1. Self-illuminating floor registration buttons without markings on buttons, finish to match faceplate. Match button type specified for hall buttons.
2. Alarm, door control buttons.
3. Firefighter’s key switch, pilot light, call cancel and buzzer in appropriate cabinet.
4. Jack for Firefighter’s headset. Include wiring to fire control panel.
5. All buttons shall be designated by raised markings with Braille, applied with concealed fasteners to meet ADA requirements. Stick on markings are not acceptable.
6. Engraved elevator number, Phase II fireman’s instructions, no smoking signs and elevator capacity on faceplate or return panel.
7. Lockable service cabinet containing controls for car stop switch fan switch, car light switch, light rheostat, independent service, inspection service, and 110 volt convenience outlet.
8. Car panels shall match existing finishes.
9. Locate to meet ADA requirements.
10. ADA hands free phone shall be concealed in the front return.
11. Logos or manufacturer’s name are not permitted on exposed surfaces.
12. Provide provisions for card reader operation to include flush mounted glass window and welded studs to mount new reader device which will be furnished and installed by others.
13. Integral certificate frame to be located on service cabinet door.
    1. communications systems
14. 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 hoist-way. Audio and visual two-way communication is required. System shall automatically connect to a point outside hoist-way.
15. 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.
16. 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.
17. Emergency communication system must be able to provide receiving agent with information identifying building and elevator number whenever an emergency call is placed.
18. Emergency communication system shall comply with Federal Communication Commission (FCC) regulations and Americans with Disabilities Act (ADA).
19. Provide additional stations to meet Code requirements for machine room communication.

G. Where required provide communication loss warning.

2.43smoke sensor tie-in

A. System to interface with smoke sensors, including alternate level refuge.

* 1. Lifesafety panel

1. Elevator bid price shall include the cost of all wiring and conduit from various elevator banks to the existing location. Faceplate shall be No. 4 finish stainless steel and coordinated to fit into the existing space. Life safety panel shall include all elevators.
2. Position indicators for all elevators.
3. One fireman’s SES switch (on/off) per elevator bank.
4. Jack for Firefighters headset.
5. One car to lobby switch for all elevators.
6. Emergency power selection switches and pilot lights, either keyed or behind a locked door.

2.45 smoke sensor tie-in

1. The existing smoke sensor signals for main and alternate floor fireman’s return will be reconnected to the new control equipment.
   1. 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. Specific requirements are detailed in Attachment A of bid package.

**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.

1. Performance of the elevator shall meet requirements of Paragraph 2.03.
2. Barricades for work in passenger lobbies shall be approved by the Contractor. Barricades shall at a minimum be 8 feet tall and painted a color acceptable to the Owner, graphics related to progress of the modernization shall be provided and approved by the Owner.
   1. painting
3. All elevator equipment not painted, wire duct, miscellaneous iron and steel work located within the machine room or hoist-way, 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.

C. All paint to have low VOC and be approved for the intended use.

* 1. clean up

1. Remove daily, all trash from hoist-ways, pits, and machine rooms including all packing material and debris resulting from this work. Remove daily to dumpsters, all trash. Large quantities of trash must be accommodated by Contractor supplied dumpster, coordinate location at dock with Owner.
   1. acceptance testing
2. Tests shall be performed by the Elevator Contractor at his expense in the presence of the Owner’s representative. After hours testing shall be included in the base bid for all acceptance inspections and general testing that will interfere with normal building operations. The elevators shall be subjected to the following acceptance inspection and tests:
3. Inspection and tests required by applicable portions of Requirements, 1.03.
4. Inspection and tests required by Federal, State, and Local codes and ordinances.
5. Test safety circuit, loop circuit, and the drive circuits at 500 volts. Minimum resistance to ground shall be one megohm.
6. General riding quality, leveling accuracy and quietness of operation shall be acceptable to the Owner’s representative and within requirements detailed in the maintenance agreement.
   1. use of elevators
7. As elevators are completed, the Owner shall begin using them under an Interim Service Agreement described herein:
8. The Owner shall continue the Interim Service Agreement until all elevators in the group (or building) are completed.
9. The guarantee period and new maintenance service will start at the termination of the interim service period.
10. The cost of interim service shall not be included in the modernization bid.
    1. acceptance
11. 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 14210