Old Chemistry #1 Elevator Modernization

DIVISION 14 - CONVEYING SYSTEMS

Section 14240 - Hydraulic Elevators

1.01 WORK INCLUDED

A. Replace existing Hotchkis control system on State ID #122, located it the Old Chemistry located at 1306 East University Tucson, AZ. 85721.

1 Remove and replace existing elevator controls and selector system with Motion Control Engineering Model HMC-2000 (programmable), Simplex Collective Selective system including modem. This system must be compatible with existing campus MCE remote communication and supervisory system.

2 Replace landing system with MCE Model LS-QUTE landing system.

3 (REUSE) existing fixtures, Survivor Plus Vandal Resistant Stainless Steel fixtures. Install (EPCC-2) Access key switches in the hall push button plates. Install new car operating panel.

4 Remove and replace existing door operator with GAL "MOVFER" Heavy duty door operating system including new door operator, new clutch, new door rollers, door hangar tracks and rollers (car and hall), pick up assemblies, new gate switch and door interlocks and door gibbs.

5 All old materials will be removed and disposed of by the contractor.

6 The University of Arizona has first salvage rights on all equipment.

1.02 SUBMITTALS

1 Submit bound operation and maintenance manuals for the new equipment (4 copies) with operating and maintenance instructions, parts listing, recommended parts inventory listing, purchase sources, listing for critical components, emergency instructions, complete "as built" wiring and block diagrams including input signals, and diagnostic and/or trouble-shooting guide shall be furnished to the Owner.

2 Submit a complete list of all items to be furnished and installed under this section. Included manufacturer’s specifications, catalog cuts, and other data to demonstrate compliance with the specified requirements.

3 Submit complete shop drawings for all work in this section, showing dimensions and locations of all items including supporting structure and clearances required.
4. Manufacturer's recommended installation procedures which, when approved by the owner, shall be the basis for inspecting and accepting or rejecting actual installation procedures used on the work.

5. Submit one (1) complete clean set of drawing prints and specifications with "as-built" conditions marked in crisp red ink. Sign and attest to the documents as reflecting all conditions "as-built".


1.03 QUALITY ASSURANCE

A. Acceptable elevator manufacturers are:
   1. Kone Elevator Company
   2. Otis Elevator Company
   3. Schindler Elevator Company
   4. Thyssen Krupp Elevator Company
   5. Southwest Elevator Company

B. Installer Qualifications: An approved installer regularly engaged in manufacturing, installing, and servicing elevators of the type required for the project.

   1. The Manufacturer of the machine, controller, signal fixtures, door operators, cab, entrances, and all other major parts of the elevator operating equipment.
   2. The major parts of the elevator equipment shall be manufactured in the United States, and not be an assembled system.
   3. The manufacturer shall have a documented, on-going quality assurance program.
   4. The manufacturer or an authorized agent of the manufacturer with no less than five years of satisfactory experience installing elevators equal in character and performance to the project elevators.

C. Installers Requirements:
   1. Successful bidders to provide a list of all employees who will be on site.
   2. Successful bidders employees are to wear picture I.D. with company logo that is displayed and clearly visible.
   3. Any employee of the contractor that dose not comply with established University policies will be permanently removed from University property.

D. Regulatory Requirements:
   1. ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code
   2. UBC Building Code
1.04 DELIVERY, STORAGE AND HANDLING

1. Deliver elevator materials, components and equipment in manufacturer's protective packaging.

2. Store materials in a dry protected area provided by others. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling, or deterioration.

1.05 MAINTENANCE

1. Starting at the time of substantial completion of the complete project, provide complete systematic inspection and maintenance of the elevator for a period of 12 months. Including 24/7-callback service.

2. Furnish trained experts and equipment to check, adjust, lubricate, and otherwise maintain the elevator in operation with out defects or deterioration. Replace or repair materials and parts that become defective or deteriorated for any reason except through abuse or misuse by Owner.

2.01 ENGINEERED HYDRAULIC ELEVATOR

A. Attributes (Hydraulic Elevator):

2. Speed: 90
3. Operation: Selective Collective
4. Control: Microprocessor based, Motion Control Engineering HMC-2000 (programmable)
5. Travel: TBD
6. Stops: 3
7. Openings: 3
8. Power: 208 Volt 3 Phase
9. Car Doors: 2 speed side opening
10. Hoist way entrance: 2 speed side opening
13. Photo curtain shall be model A850G7 Gatekeeper Max by Adams Elevator Equipment Co.
14. Car telephone shall be model no. A936P3-2 as manufactured by Adams Elevator Co..
16. Elevator shall have provisions for handicapped and complying with the requirements of ANSI A117.1 and ADA Guidelines.
B. Control panel (NEW)

1. Car position and direction indicators, illuminated with light emitting diodes.
2. Fan key switch (EPCO-1).
3. Emergency stop key switch (EPCO-1).
4. Independent service key switch (EPCO-1).
5. Inspection/Access key switch (EPCO-2).
6. Fire-fighter service key switch (AZFS).
7. Alarm bell push type switch.
8. Engrave Fire Service instructions.
10. Engrave "Elevator Inspection Certificate On File At Facilities Management".
11. Light key switch (EPCO-1).
12. Emergency light located in car control panel.

2.02 ENVIRONMENTAL CONSIDERATIONS

A. Ambient room temperature: 32 F to 104 F (0 C to 40 C).

B. Humidity: not over 95% humidity.

2.03 OPERATION, EQUIPMENT AND FUNCTION

A. Controller: Solid State Motion Control Engineering HMC-2000 for hydraulic elevators. Provide upgrade controller to be fully compatible with Owner's existing campus wide monitoring system. Mount controller to machine room wall to prevent vibration of solid state equipment. Dedicated permanent status indicators shall be provided on the controller to indicate the following: when the safety circuit is open, when the door locks are open, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on fireman's service, when the elevator is out of service timer has elapsed or when the motor limit timer or valve timer has elapsed. In addition, provide means of displaying other special or error conditions that are detected by the microprocessor. The elevator shall not require the functioning or presence of the microprocessor to operate on car top inspection or hoistway access operation (if provided) in order to provide a reliable means to move the car if the microprocessor fails.

The elevator controller shall utilize a microprocessor based logic system and shall comply with (ANSI/ASME 17.1) safety code for elevators. The control equipment shall have all control parameters stored permanently on erasable programmable read-only memories (EPROM), and shall have permanent indicators to indicate important elevator status's as an internal part of the controller. The system shall provide comprehensive means to access the computer memory for elevator diagnostic purposes without need for any external devices. Systems that require hook-up of external devices for trouble-shooting are not acceptable.
Failure of any single magnetically operated switch, contractor, or relay to release in the intended manner or the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contractor or relay to release in the intended manner or the occurrence of a single accidental ground shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

Dedicated permanent status indicators shall be provided on the controller to indicate the following: when the safety circuit is open, when the door locks are open, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on fireman’s service, when the elevator is out of service timer has elapsed or when the motor limit timer or valve limit timer has elapsed. In addition, provide means of displaying other special or error conditions that are detected by the microprocessor.

A motor timer shall be provided which, in the event of the pump motor being energized longer than a predetermined time, shall cause the car to descend to the lowest landing, open the doors automatically and then re-close then, The car calls shall then be canceled and the car taken out of service automatically. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.

A valve limit timer shall be provided which shall automatically cut off the current to the valve solenoids if they have been energized longer than a predetermined time. The car shall then be canceled and the car taken out of service automatically. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.

An out of service timer (T.O.S.) shall be provided which will automatically take the car out of service if the car is delayed in leaving the landing while there are calls existing in the building. The car shall not respond to hall calls while in this mode of operation, and the photo eye in put shall be unresponsive in the event that a faulty photo eye unit was delaying the car.

Door protection timer shall be provided for both the open and close directions which will help protect the door motor and which will help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time in the event that the door is prevented from reaching the open position. The door close protection timer will reopen the doors for a short time in the event that the door-closing attempt fails to make up the door locks after a predetermined time.
A minimum of three different door standing open times shall be provided. A car call time value shall predominate when a car call only is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of a door reopen from a photo curtain or door open button, a separate short door time value shall predominate. The timing value for these timers must be field adjustable.

Nudging: If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at a slow speed in the close direction and to be unresponsive to the photo curtain. A buzzer shall sound while nudging operation is active.

Hall or car call registration and lamp acknowledgment shall be by means of a single wire per call besides the power busses. Systems that register the call with one wire and light the call acknowledgment lamp with a separate wire are not acceptable.

Fireman’s Phase I emergency recall operation, alternate level Phase I emergency recall operation, and Phase II emergency in-car operation shall be provided according to applicable codes. Keyed (AZFS)

Independent service operation shall be provided such that the actuation of a key switch in the car-operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls and will ignore hall calls. Car and hoistway doors will only close by constant pressure on car call buttons or a door close button until the car starts to move. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns and gongs shall be inoperative. Keyed (EPCO-2)

Simplex selective collective automatic operation shall be provided for all single car installations. Operation of one or more car or hall call buttons shall cause the car to start and run automatically provided the hoistway door interlocks and car door contacts are closed. The car shall stop at the first car or hall call set for the direction of travel. Stops shall be made in the order in which the car or hall calls set for the direction of travel are reached, irrespective of the order in which they were registered. If only hall calls are set for the opposite direction of travel exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting the calls. For multiple car installations use duplex, triplex etc.

The car shall be equipped with two-way leveling to automatically bring the car within plus or minus (1/4") of landing level at any landing regardless of load.

A selector switch shall be provided on the controller to select high or low speed during access or inspection operation as long as speed does not exceed 150 feet per minute.

A test switch shall be provided. In the "test" position, this switch shall allow independent operation of the elevator without the door open function for purposes of adjustment or testing the elevator. The elevator shall not respond to hall calls shall not interfere with the other car in a duplex installation.
A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call including stuck push-buttons. Call demand at another floor shall cause the car to eventually ignore the defective call and continue to provide service in the building.

B. Solid State Motor Starter

1. Provide a new solid-state motor starter to limit current inrush during starting and to provide gradual acceleration of the motor.
2. Motor starting shall not be initiated by mechanical contacts.
3. The starter shall include a current limit adjustment range of 200% to 450% of the overload adjustment range.
4. Provide an internal fault detection system, if the internal fault detection system detects a failure, power shall be removed from the motor.

C. Hydraulic Jack (REUSE)

1. (REUSE) existing plunger-cylinder units.
2. Install new piping without routing underground. Where not possible, rout piping through schedule 40 PVC before back filling.
3. Hydraulic hose for sound deadening is not permitted.

D. Hydraulic Pump (NEW)

1. Pumping Unit: The pumping unit shall be of integral design and shall include an electric motor connected to a submersible pump, a hydraulic control system, hydraulic fluid reservoir and necessary piping connections all compactly designed as a self-contained unit. This unit shall be designed for vibration free operation. The unit shall be factory adjusted and tested before shipment to the job site. The testing procedure shall include actual job type conditions of load, speed, etc. Refer to the drawings for remote arrangement of hydraulic unit for this project.

2. The pump shall be specifically designed for all hydraulic operation and shall be of the positive displacement type. Oil flow shall be controlled in such a manner that car operation will be smooth and quiet in both directions of travel. Accurate car leveling shall take place in both the up and down direction. The control valve shall be easily adjusted from the front of the power unit.

3. The "up start" system shall be adjustable and designed to initiate the stop of the elevator and shall control the acceleration smoothly and evenly.

4. The "down start" system shall be adjustable and designed to initiate the stop of the elevator and shall control the deceleration of the elevator smoothly and evenly.

5. The power unit shall have a have shut-off valve which will isolate the oil reservoir to enable servicing of the pump hydraulic assembly. The shut off valve shall be located in the machine room and in the pit as directed by Owner.
6. A suitable muffler designed to withstand the high pressure shall be installed in the power unit in a blowout proof housing.

7. Submersible Pump: The submersible pump shall be a positive displacement screw type to give smooth operation and shall be especially designed and manufactured for elevator service.

E. Elevator Pit Hydraulic Oil Return Pump (Reuse Existing)

1. Drip Pan Return Pump: 120V fractional h.p. pump suitable for pumping of hydraulic fluid. Furnish pump with float activated on/off switch.
2. Drip Pan: 24 gauge, galvanized sheet metal of suitable size to accommodate return pump.

F. Door Equipment

2. Provide emergency access in all hoist way doors.
3. All doors shall have 1-1/2 hr. label or other identification acceptable to governing authorities.
4. Provide adjustable new nylon guide (by Nylube or Adams Elevator Equip. Co.).
5. Heavy-duty doors. Provide door skin on both sides of elevator doors. (Reuse Existing)

G. Hoistway Equipment

1. Normal and Final Terminal Stopping devices: Per code.
2. Electrical Wiring:
   a. Conductors: Provide all new copper wiring throughout, with all connections made on identified studs and terminal blocks, control cabinets, junction boxes or conduits. Provide 10 percent spare conductors throughout. Provide four pairs of spare shielded communication wire to the car, in addition to those required by features of this specifications, to be tagged in machine room. All spare wiring to run from car connection points to individual elevator controllers in the machine room.
   b. Conduit, Etc.: Painted or galvanized steel conduit and duct. Conduit size shall be ¾ inch minimum. Flexible conduit exceeding 18 inches in length shall not be used. Flexible heavy-duty service cord may be used between fixed car wiring and car door for light curtain.
   c. Travelling cables: Provide all new wiring and traveling cable, flame and moisture resistant outer cover. Prevent traveling cables from rubbing or chafing against hoistway or elevator equipment within hoistway.
   d. Provide all new hoistway wiring and switches.

G. Lobby Position Indicator

Provide tamper resistant Adams Elevator Equipment Co. lobby position indicator on the first and second levels, digital read out illuminated by light emitting diodes.
H. Smoke Detectors

Smoke and heat detectors shall be compatible and tie into building fire system. (Existing)

I. Hall Direction Indicator

Up and down tamper resistant SURVIVOR PLUS as manufactured by Adams Elevator Equipment Co. Direction indicators to be provided in the hall wall at each landing, with a single chime or tone for up and double chime or tone for down direction and shall be illuminated by light emitting diodes.

J. Photo Curtain

1. Photo Curtain: An electric passenger sensing device of the photo curtain shall project across the entrance to prevent the car and hoist way doors from closing if a passenger or object interrupts the curtain.
2. Nudging: If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at a slow speed in the closed direction and to be unresponsive to the photo curtain. A buzzer shall sound while nudging operation is occurring.

K. Car Operating Station (NEW)

1. Flush mounted operating panel shall be mounted in the car return panel and shall contain the devices required for the specified operation. The buttons and devices shall be of the easy readability type and the floor designation buttons shall become illuminated when pressed and shall stay illuminated until the floor call is answered. Provide continuous hinge on panel for easy access to internal components. Locate hinges on side of panel nearest wall of the elevator. The car operating shall contain the floor designations, and all the controls indicated.
2. Car position indicator, illuminated with light emitting diodes.
3. Fan key switch (EPCO-1)
4. Emergency stop key switch (EPCO-1).
5. Independent service key switch (EPCO-1).
6. Inspection/Access key switch (EPCO-2)
7. Firefighter service key switch (AZFS)
8. Alarm bell push type switch.
9. Light key switch (EPCO-1).
10. Engraved capacity plate and elevator designation.
11. Engraved firefighter’s service instructions
15. Emergency phone.
2.04 EXECUTION

A. Telecommunication Link

1. Install communication cable for controller modem not to exceed 24" from controller.
2. Install communication cable for car phone not to exceed 24" from controller.
3. Install modem MC – PA board and modem outlet inside of controller.

B. Adjust And Balance

Make necessary adjustments of equipment to ensure elevator operates smoothly and accurately.

C. Protection

Locate and protect movable equipment and controls in such a way that they can only be operated by authorized persons.

D. Inspections and Testing

1. Obtain and pay for inspections and permits to assure that test are performed as required by regulations of authorities. Conduct all tests and inspections in the presence of the Owner.
2. Final Inspection shall be after all new equipment is installed and operating correctly.
3. Inspect installation in accordance with ANSI-A17.2
4. Deliver test certificates and permits to Owner.

E. Operation And Maintenance

1. Instruct Owner’s personnel in proper use, operations and daily maintenance of elevators.
2. Training shall include operation of diagnostic microcomputer and servicing of elevator microprocessor.
3. Make final check of each elevator operation, with Owner’s personnel present and just prior to date of substantial completion. Determine that control systems and operating devices are functioning properly.
4. Continuing Maintenance: Provide 1-year maintenance on elevators on an as-needed basis as part of standard 1-year warranty on new equipment and upgrades.
5. Maintenance shall include systematic examination, adjustment and lubrication of new elevator equipment; replacement of seals, packing and valves to maintain required factor of safety; performance of maintenance work with out removing car during peak traffic periods and providing 24 hour emergency call back service during maintenance period, at an additional cost to Owner.
6. Repair or replace electrical and mechanical parts of the new elevator equipment using only genuine standard parts produced by manufacturer of equipment concerned.

7. Ensure that competent personnel handle maintenance service, maintain and adequate stock of parts for replacement of emergency purposes, locally, and have qualified personnel available at such places to ensure the fulfillment of this service without unreasonable loss of time.

F. Cleaning

1. Remove all trash and debris from site during elevator installation.
2. Clean all elevator surfaces, removing all dirt, dust, spots, and scratches. Any damage shall be repaired or replaced as directed by Owner, at no cost to Owner.
3. Prior to substantial completion, remove protection from finished or ornamental surfaces and clean and polish surfaces with due regard to type of material.
4. Remove tools, equipment and surplus materials from site.

End of Section 14240
Bio Science East #1 Elevator Modernization

DIVISION 14 - CONVEYING SYSTEMS

Section 14240 - Hydraulic Elevators

1.01 WORK INCLUDED

A. Replace existing Elser control system on State I D #0117, located it the Bio Science East located at 1330 East South Campus Drive Tucson, AZ. 85721.

1 Remove and replace existing elevator controls and selector system with Motion Control Engineering Model HMC-2000 (programmable), Simplex Collective Selective system including modem. This system must be compatible with existing campus MCE remote communication and supervisory system.

2 Replace landing system with MCE Model LS-QUTE landing system.

3 (REUSE) existing fixtures, Survivor Plus Vandal Resistant Stainless Steel fixtures. Install (EPCO-2) Access key switches in the terminal hall bush button plates. Install new car operating panel.

4 Remove and replace existing door operator with GAL "MOVFER" Heavy duty door operating system including new door operator, new clutch, new door rollers, door hanger tracks and rollers (car and hall), pick up assemblies, new gate switch and door interlocks and door gibbs.

5 All old materials will be removed and disposed of by the contractor.

6 The University of Arizona has first salvage rights on all equipment.

1.02 SUBMITTALS

1 Submit bound operation and maintenance manuals for the new equipment (4 copies) with operating and maintenance instructions, parts listing, recommended parts inventory listing, purchase sources, listing for critical components, emergency instructions, complete "as built" wiring and block diagrams including input signals, and diagnostic and/or trouble-shooting guide shall be furnished to the Owner.

2 Submit a complete list of all items to be furnished and installed under this section. Included manufacturer's specifications, catalog cuts, and other data to demonstrate compliance with the specified requirements.

3 Submit complete shop drawings for all work in this section, showing dimensions and locations of all items including supporting structure and clearances required.
4 Manufacturer's recommended installation procedures which, when approved by the owner, shall be the basis for inspecting and accepting or rejecting actual installation procedures used on the work.

5 Submit one (1) complete clean set of drawing prints and specifications with "as-built:" conditions marked in crisp red ink. Sign and attest to the documents as reflecting all conditions "as-built".

6 Provide four (4) copies of Operation and Maintenance Manuals, Installation Manuals and Parts Manual necessary for full servicing of the elevator and microprocessor.

1.03 QUALITY ASSURANCE

A. Acceptable elevator manufacturers are:
   1. Kone Elevator Company
   2. Otis Elevator Company
   3. Schindler Elevator Company
   4. Thyssen Krupp Elevator Company
   5. Southwest Elevator Company

B. Installer Qualifications: An approved installer regularly engaged in manufacturing, installing, and servicing elevators of the type required for the project.

   1. The Manufacturer of the machine, controller, signal fixtures, door operators, cab, entrances, and all other major parts of the elevator operating equipment.
   2. The major parts of the elevator equipment shall be manufactured in the United States, and not be an assembled system.
   3. The manufacturer shall have a documented, on-going quality assurance program.
   4. The manufacturer or an authorized agent of the manufacturer with no less than five years of satisfactory experience installing elevators equal in character and performance to the project elevators.

C. Installers Requirements:
   1. Successful bidders to provide a list of all employees who will be on site.
   2. Successful bidders employees are to wear picture I.D. with company logo that is displayed and clearly visible.
   3. Any employee of the contractor that does not comply with established University policies will be permanently removed from University property.

D. Regulatory Requirements:
   1. ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code
   2. UBC Building Code
1.04 DELIVERY, STORAGE AND HANDLING

1. Deliver elevator materials, components and equipment in manufacturer's protective packaging.

2. Store materials in a dry protected area provided by others. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling, or deterioration.

1.05 MAINTENANCE

1. Starting at the time of substantial completion of the complete project, provide complete systematic inspection and maintenance of the elevator for a period of 12 months. Including 24/7-callback service.

2. Furnish trained experts and equipment to check, adjust, lubricate, and otherwise maintain the elevator in operation with out defects or deterioration. Replace or repair materials and parts that become defective or deteriorated for any reason except through abuse or misuse by Owner.

2.01 ENGINEERED HYDRAULIC ELEVATOR

A. Attributes (Hydraulic Elevator):

1. Capacity: 2030
2. Speed: 50
3. Operation: Selective Collective
4. Control: Microprocessor based, Motion Control Engineering HMC -2000 (programmable)
5. Travel: TBD
6. Stops: 4
7. Openings: 4
8. Power: 208 Volt 3 Phase
9. Car Doors: 2 speed side opening
10. Holst way entrance: 2 speed side opening
13. Photo curtain shall be model A850G7 Gatekeeper Max by Adams Elevator Equipment Co.
14. Car telephone shall be model no. A936P3-2 as manufactured by Adams Elevator Co.,
16. Elevator shall have provisions for handicapped and complying with the requirements of ANSI A117.1 and ADA Guidelines.
B. Control panel (NEW)

1. Car position and direction indicators, illuminated with light emitting diodes.
2. Fan key switch (EPCO-1).
3. Emergency stop key switch (EPCO-1).
4. Independent service key switch (EPCO-1).
5. Inspection/Access key switch (EPCO-2).
6. Fire-fighter service key switch (AZFS).
7. Alarm bell push type switch.
8. Engrave Fire Service instructions.
10. Engrave "Elevator Inspection Certificate On File At Facilities Management"
11. Light key switch (EPCO-1).
12. Emergency light located in car control panel.

2.02 ENVIRONMENTAL CONSIDERATIONS

A. Ambient room temperature: 32 F to 104 F (0 C to 40 C).

B. Humidity: not over 95% humidity.

2.03 OPERATION, EQUIPMENT AND FUNCTION

A. Controller: Solid State Motion Control Engineering Motion-2000 for hydraulic elevators. Provide upgrade controller to be fully compatible with Owner's existing campus wide monitoring system. Mount controller to machine room wall to prevent vibration of solid state equipment. Dedicated permanent status indicators shall be provided on the controller to indicate the following: when the safety circuit is open, when the door locks are open, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on fireman's service, when the elevator is out of service timer has elapsed or when the motor limit timer or valve timer has elapsed. In addition, provide means of displaying other special or error conditions that are detected by the microprocessor. The elevator shall not require the functioning or presence of the microprocessor to operate on car top inspection or hoistway access operation (if provided) in order to provide a reliable means to move the car if the microprocessor fails.

The elevator controller shall utilize a microprocessor based logic system and shall comply with (ANSI/ASME 17.1) safety code for elevators. The control equipment shall have all control parameters stored permanently on erasable programmable read-only memories (EPROM), and shall have permanent indicators to indicate important elevator status's as an internal part of the controller. The system shall provide comprehensive means to access the computer memory for elevator diagnostic purposes without need for any external devices. Systems that require hook-up of external devices for troubleshooting are not acceptable.
Failure of any single magnetically operated switch, contractor, or relay to release in the intended manner or the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contractor or relay to release in the intended manner or the occurrence of a single accidental ground shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

Dedicated permanent status indicators shall be provided on the controller to indicate the following: when the safety circuit is open, when the door locks are open, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on fireman's service, when the elevator is out of service timer has elapsed or when the motor limit timer or valve limit timer has elapsed. In addition, provide means of displaying other special or error conditions that are detected by the microprocessor.

A motor timer shall be provided which, in the event of the pump motor being energized longer than a predetermined time, shall cause the car to descend to the lowest landing, open the doors automatically and then re-close then, The car calls shall then be canceled and the car taken out of service automatically. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.

A valve limit timer shall be provided which shall automatically cut off the current to the valve solenoids if they have been energized longer than a predetermined time. The car shall then be canceled and the car taken out of service automatically. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.

An out of service timer (T.O.S.) shall be provided which will automatically take the car out of service if the car is delayed in leaving the landing while there are calls existing in the building. The car shall not respond to hall calls while in this mode of operation, and the photo eye in put shall be unresponsive in the event that a faulty photo eye unit was delaying the car.

Door protection timer shall be provided for both the open and close directions which will help protect the door motor and which will help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time in the event that the door are prevented from reaching the open position. The door close protection timer will reopen the doors for a short time in the event that the door-closing attempt falls to make up the door locks after a predetermined time.
A minimum of three different door standing open times shall be provided. A car call time value shall predominate when a car call only is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of a door reopen from a photo curtain, or door open button, a separate short door time value shall predominate. The timing value for these timers must be field adjustable.

Nudging: If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at a slow speed in the close direction and to be unresponsive to the photo curtain. A buzzer shall sound while nudging operation is active.

Hall or car call registration and lamp acknowledgment shall be by means of a single wire per call besides the power busses. Systems that register the call with one wire and light the call acknowledgment lamp with a separate wire are not acceptable.

Fireman's Phase I emergency recall operation, alternate level Phase I emergency recall operation, and Phase II emergency in-car operation shall be provided according to applicable codes. Keyed (AZFS)

Independent service operation shall be provided such that the actuation of a key switch in the car-operating panel will cancel any existing car calls, and hold the doors oper at the landing. The car will then respond only to car calls and will ignore hall calls. Car and hoistway doors will only close by constant pressure on car call buttons or a door close button until the car starts to move. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns and gongs shall be inoperative. Keyed (EPCO-1)

Simplex selective collective automatic operation shall be provided for all single car installations. Operation of one or more car or hall call buttons shall cause the car to start and run automatically provided the hoistway door interlocks and car door contacts are closed. The car shall stop at the first car or hall call set for the direction of travel. Stops shall be made in the order in which the car or hall calls set for the direction of travel are reached, irrespective of the order in which they were registered. If only hall calls are set for the opposite direction of travel exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting the calls. For multiple car installations use duplex, triplex etc.

The car shall be equipped with two-way leveling to automatically bring the car within plus or minus (1/4") of landing level at any landing regardless of load.

A selector switch shall be provided on the controller to select high or low speed during access or inspection operation as long as speed does not exceed 150 feet per minute.

A test switch shall be provided. In the "test" position, this switch shall allow independent operation of the elevator without the door open function for purposes of adjustment or testing the elevator. The elevator shall not respond to hall calls shall not interfere with the other car in a duplex installation.
A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call including stuck push-buttons. Call demand at another floor shall cause the car to eventually ignore the defective call and continue to provide service in the building.

B. Solid State Motor Starter

1. Provide a new solid-state motor starter to limit current inrush during starting and to provide gradual acceleration of the motor.
2. Motor starting shall not be initiated by mechanical contacts.
3. The starter shall include a current limit adjustment range of 200% to 450% of the overload adjustment range.
4. Provide an internal fault detection system, if the internal fault detection system detects a failure, power shall be removed from the motor.

C. Hydraulic Jack (REUSE)

1. (REUSE) existing plunger-cylinder units.
2. Install new piping without routing underground. Where not possible, rout piping through schedule 40 PVC before back filling.
3. Hydraulic hose for sound deadening is not permitted.

D. Hydraulic Pump

1. Pumping Unit: The pumping unit shall be of integral design and shall include an electric motor connected to a submersible pump, a hydraulic control system, hydraulic fluid reservoir and necessary piping connections all compactly designed as a self-contained unit. This unit shall be designed for vibration free operation. The unit shall be factory adjusted and tested before shipment to the job site. The testing procedure shall include actual job type conditions of load, speed, etc. Refer to the drawings for remote arrangement of hydraulic unit for this project.

2. The pump shall be specifically designed for all hydraulic operation and shall be of the positive displacement type. Oil flow shall be controlled in such a manner that car operation will be smooth and quiet in both directions of travel. Accurate car leveling shall take place in both the up and down direction. The control valve shall be easily adjusted from the front of the power unit.

3. The "up start" system shall be adjustable and designed to initiate the stop of the elevator and shall control the acceleration smoothly and evenly.

4. The "down start" system shall be adjustable and designed to initiate the stop of the elevator and shall control the deceleration of the elevator smoothly and evenly.

5. The power unit shall have a have shut-off valve which will isolate the oil reservoir to enable servicing of the pump hydraulic assembly. The shut off valve shall be located in the machine room and in the pit as directed by Owner.
6. A suitable muffler designed to withstand the high pressure shall be installed in the power unit in a blowout proof housing.

7. Submersible Pump: The submersible pump shall be a positive displacement screw type to give smooth operation and shall be especially designed and manufactured for elevator service.

E. Elevator Pit Hydraulic Oil Return Pump (Reuse Existing)

1. Drip Pan Return Pump: 120V fractional h.p. pump suitable for pumping of hydraulic fluid. Furnish pump with float activated on/off switch.
2. Drip Pan: 24 gauge, galvanized sheet metal of suitable size to accommodate return pump.

F. Door Equipment

2. Provide emergency access in all hoist way doors.
3. All doors shall have 1-1/2 hr. label or other identification acceptable to governing authorities.
4. Provide adjustable new nylon guide (by Nylube or Adams Elevator Equip. Co.).
5. Heavy-duty doors. Provide door skin on both sides of elevator doors. (Reuse Existing)

G. Hoistway Equipment

1. Normal and Final Terminal Stopping devices: Per code.
2. Electrical Wiring:
   a. Conductors: Provide all new copper wiring throughout, with all connections made on identified studs and terminal blocks, control cabinets, junction boxes or conduits. Provide 10 percent spare conductors throughout. Provide four pairs of spare shielded communication wire to the car, in addition to those required by features of this specifications, to be tagged in machine room. All spare wiring to run from car connection points to individual elevator controllers in the machine room.
   b. Conduit, Etc.: Painted or galvanized steel conduit and duct. Conduit size shall be ¾ inch minimum. Flexible conduit exceeding 18 inches in length shall not be used. Flexible heavy-duty service cord may be used between fixed car wiring and car door for light curtain.
   c. Traveling cables: Provide all new wiring and traveling cable, flame and moisture resistant outer cover. Prevent traveling cables from rubbing or chafing against hoistway or elevator equipment within hoistway.
   e. Provide all new hoistway wiring and switches.

G. Lobby Position Indicator

Provide tamper resistant Adams Elevator Equipment Co. lobby position indicator on the first and second levels, digital read out illuminated by light emitting diodes.
H. Smoke Detectors

Smoke and heat detectors shall be compatible and tie into building fire system. (Existing)

I. Hall Direction Indicator

Up and down tamper resistant SURVIVOR PLUS as manufactured by Adams Elevator Equipment Co. Direction indicators to be provided in the hall wall at each landing, with a single chime or tone for up and double chime or tone for down direction and shall be illuminated by light emitting diodes.

J. Photo Curtain (NEW)

1. Photo Curtain: An electric passenger sensing device of the photo curtain shall project across the entrance to prevent the car and hoist way doors from closing if a passenger or object interrupts the curtain.
2. Nudging: If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at a slow speed in the closed direction and to be unresponsive to the photo curtain. A buzzer shall sound while nudging operation is occurring.

K. Car Operating Station (NEW)

1. Flush mounted operating panel shall be mounted in the car return panel and shall contain the devices required for the specified operation. The buttons and devices shall be of the easy readability type and the floor designation buttons shall become illuminated when pressed and shall stay illuminated until the floor call is answered. Provide continuous hinge on panel for easy access to internal components. Locate hinges on side of panel nearest wall of the elevator. The car operating shall contain the floor designations, and all the controls indicated.
2. Car position indicator, illuminated with light emitting diodes.
3. Fan key switch (EPCO-1).
4. Emergency stop key switch (EPCO-1).
5. Independent service key switch (EPCO-1).
6. Inspection/Access key switch (EPCO-2).
7. Firefighter service key switch (AZFS).
8. Alarm bell push type switch.
9. Light key switch (EPCO-1).
10. Engraved capacity plate and elevator designation.
11. Engraved firefighter's service instructions
12. Engraved "Certificate of Inspection on file at Facilities Management".
15. Emergency phone.
2.04 EXECUTION

A. Telecommunication Link

1. Install communication cable for controller modem not to exceed 24" from controller.
2. Install communication cable for car phone not to exceed 24" from controller.
3. Install modem MC -- PA board and modem outlet inside of controller.

B. Adjust And Balance

Make necessary adjustments of equipment to ensure elevator operates smoothly and accurately.

C. Protection

Locate and protect movable equipment and controls in such a way that they can only be operated by authorized persons.

D. Inspections and Testing

1. Obtain and pay for inspections and permits to assure that test are performed as required by regulations of authorities. Conduct all tests and inspections in the presence of the Owner.
2. Final inspection shall be after all new equipment is installed and operating correctly.
3. Inspect installation in accordance with ANSI-A17.2
4. Deliver test certificates and permits to Owner.

E. Operation And Maintenance

1. Instruct Owner’s personnel in proper use, operations and daily maintenance of elevators.
2. Training shall include operation of diagnostic microcomputer and servicing of elevator microprocessor.
3. Make final check of each elevator operation, with Owner’s personnel present and just prior to date of substantial completion. Determine that control systems and operating devices are functioning properly.
4. Continuing Maintenance: Provide 1-year maintenance on elevators on an as-needed basis as part of standard 1-year warranty on new equipment and upgrades.
5. Maintenance shall include systematic examination, adjustment and lubrication of new elevator equipment; replacement of seals, packing and valves to maintain required factor of safety; performance of maintenance work with out removing car during peak traffic periods and providing 24 hour emergency call back service during maintenance period, at an additional cost to Owner.
6. Repair or replace electrical and mechanical parts of the new elevator equipment using only genuine standard parts produced by manufacturer of equipment concerned.

7. Ensure that competent personnel handle maintenance service, maintain and adequate stock of parts for replacement of emergency purposes, locally, and have qualified personnel available at such places to ensure the fulfillment of this service without unreasonable loss of time.

F. Cleaning

1. Remove all trash and debris from site during elevator installation.
2. Clean all elevator surfaces, removing all dirt, dust, spots, and scratches. Any damage shall be repaired or replaced as directed by Owner, at no cost to Owner.
3. Prior to substantial completion, remove protection from finished or ornamental surfaces and clean and polish surfaces with due regard to type of material.
4. Remove tools, equipment and surplus materials from site.

End of Section 14240
Family Consumer Resources #1 Elevator Modernization

DIVISION 14 - CONVEYING SYSTEMS

Section 14240 - Hydraulic Elevators

1.01 WORK INCLUDED

A. Replace existing Eiser control system on State ID #0138, located in the FCR Building located at 1110 East South Campus Drive Tucson, AZ. 85721.

1 Remove and replace existing elevator controls and selector system with Motion Control Engineering Model HMC-2000 (programmable), Simplex Collective Selective system including modem. This system must be compatible with existing campus MCE remote communication and supervisory system.

2 Replace landing system with MCE Model LS-QUTE landing system.

3 REUSE existing Survivor Plus Vandal Resistant Stainless Steel fixtures. Install (EPCO-2) Access key switches in the terminal hall bush button plates. Install new car operating panel.

4 Remove and replace existing door operator with GAL “MOVFER” Heavy duty door operating system including new door operator, new clutch, new door rollers, door hanger tracks and rollers (car and hall), pick up assemblies, new gate switch and door interlocks and door gibbs.

5 All old materials will be removed and disposed of by the contractor.

6 The University of Arizona has first salvage rights on all equipment.

1.02 SUBMITTALS

1 Submit bound operation and maintenance manuals for the new equipment (4 copies) with operating and maintenance instructions, parts listing, recommended parts inventory listing, purchase sources, listing for critical components, emergency instructions, complete "as built" wiring and block diagrams including input signals, and diagnostic and/or trouble-shooting guide shall be furnished to the Owner.

2 Submit a complete list of all items to be furnished and installed under this section. Included manufacturer’s specifications, catalog cuts, and other data to demonstrate compliance with the specified requirements.

3 Submit complete shop drawings for all work in this section, showing dimensions and locations of all items including supporting structure and clearances required.
4 Manufacturer's recommended installation procedures which, when approved by the owner, shall be the basis for inspecting and accepting or rejecting actual installation procedures used on the work.

5 Submit one (1) complete clean set of drawing prints and specifications with "as-built" conditions marked in crisp red ink. Sign and attest to the documents as reflecting all conditions "as-built".

6 Provide four (4) copies of Operation and Maintenance Manuals, Installation Manuals and Parts Manual necessary for full servicing of the elevator and microprocessor.

1.03 QUALITY ASSURANCE

A. Acceptable elevator manufacturers are:
   1. Kone Elevator Company
   2. Otis Elevator Company
   3. Schindler Elevator Company
   4. Thyssen Krupp Elevator Company
   5. Southwest Elevator Company

B. Installer Qualifications: An approved installer regularly engaged in manufacturing, installing, and servicing elevators of the type required for the project.

   1. The Manufacturer of the machine, controller, signal fixtures, door operators, cab, entrances, and all other major parts of the elevator operating equipment.
   2. The major parts of the elevator equipment shall be manufactured in the United States, and not be an assembled system.
   3. The manufacturer shall have a documented, on-going quality assurance program.
   4. The manufacturer or an authorized agent of the manufacturer with no less than five years of satisfactory experience installing elevators equal in character and performance to the project elevators.

C. Installers Requirements:
   1. Successful bidders to provide a list of all employees who will be on site.
   2. Successful bidders employees are to wear picture I.D. with company logo that is displayed and clearly visible.
   3. Any employee of the contractor that does not comply with established University policies will be permanently removed from University property.

D. Regulatory Requirements:
   1. ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code
   2. UBC Building Code
1.04 DELIVERY, STORAGE AND HANDLING

1. Deliver elevator materials, components and equipment in manufacturer’s protective packaging.

2. Store materials in a dry protected area provided by others. Protect and handle materials in accordance with manufacturer’s recommendations to prevent damage, soiling, or deterioration.

1.05 MAINTENANCE

1. Starting at the time of substantial completion of the complete project, provide complete systematic Inspection and maintenance of the elevator for a period of 12 months. Including 24/7-callback service.

2. Furnish trained experts and equipment to check, adjust, lubricate, and otherwise maintain the elevator in operation with cut defects or deterioration. Replace or repair materials and parts that become defective or deteriorated for any reason except through abuse or misuse by Owner.

2.01 ENGINEERED HYDRAULIC ELEVATOR

A. Attributes (Hydraulic Elevator):

2. Speed: 85
3. Operation: Selective Collective
4. Control: Microprocessor based, Motion Control Engineering HMC-2000 (programmable)
5. Travel: TBD
6. Stops: 3
7. Openings: 3
8. Power: 208 Volt 3 Phase
9. Car Doors: 1 speed side opening
10. Hoist way entrance: 1 speed side opening
13. (NEW) Photo curtain shall be model A850G7 Gatekeeper Max by Adams Elevator Equipment Co.
14. Car telephone shall be model no. A936P3-2 as manufactured by Adams Elevator Co..
16. Elevator shall have provisions for handicapped and complying with the requirements of ANSI A117.1 and ADA Guidelines.
B. Control panel (hinged to swivel for easy access) complete with the following:

1. Car position and direction indicators, illuminated with light emitting diodes
2. Fan key switch (EPCO-1).
3. Emergency stop key switch (EPCO-1).
4. Independent service key switch (EPCO-1).
5. Inspection/Access key switch (EPCO-2).
6. Fire-fighter service key switch (AZFS).
7. Alarm bell push type switch.
8. Engrave Fire Service instructions.
10. Engrave "Elevator Inspection Certificate On File At Facilities Management".
11. Light key switch (EPCO-1).
12. Emergency light located in car control panel.

2.02 ENVIRONMENTAL CONSIDERATIONS

A. Ambient room temperature: 32 F to 104 F (0 C to 40 C).

B. Humidity: not over 95% humidity.

2.03 OPERATION, EQUIPMENT AND FUNCTION

A. Controller: Solid State Motion Control Engineering HMC-2000 for hydraulic elevators. Provide upgrade controller to be fully compatible with Owner’s existing campus wide monitoring system. Mount controller to machine room wall to prevent vibration of solid state equipment. Dedicated permanent status indicators shall be provided on the controller to indicate the following: when the safety circuit is open, when the door locks are open, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is or fireman’s service, when the elevator is out of service timer has elapsed or when the motor limit timer or valve timer has elapsed. In addition, provide means of displaying other special or error conditions that are detected by the microprocessor. The elevator shall not require the functioning or presence of the microprocessor to operate on car top inspection or hoistway access operation (if provided) in order to provide a reliable means to move the car if the microprocessor fails.

The elevator controller shall utilize a microprocessor based logic system and shall comply with (ANSI/ASME 17.1) safety code for elevators. The control equipment shall have all control parameters stored permanently on erasable programmable read-only memories (EPROM), and shall have permanent indicators to indicate important elevator status's as an internal part of the controller. The system shall provide comprehensive means to access the computer memory for elevator diagnostic purposes without need for any external devices. Systems that require hook-up of external devices for trouble-shooting are not acceptable.
Failure of any single magnetically operated switch, contractor, or relay to release in the intended manner or the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is unlocked or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, contractor or relay to release in the intended manner or the occurrence of a single accidental ground shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.

Dedicated permanent status indicators shall be provided on the controller to indicate the following: when the safety circuit is open, when the door locks are open, when the elevator is operating at high speed, when the elevator is on independent service, when the elevator is on fireman’s service, when the elevator is out of service timer has elapsed or when the motor limit timer or valve limit timer has elapsed. In addition, provide means of displaying other special or error conditions that are detected by the microprocessor.

A motor timer shall be provided which, in the event of the pump motor being energized longer than a predetermined time, shall cause the car to descend to the lowest landing, open the doors automatically and then re-close then, The car calls shall then be canceled and the car taken out of service automatically. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.

A valve limit timer shall be provided which shall automatically cut off the current to the valve solenoids if they have been energized longer than a predetermined time. The car shall then be canceled and the car taken out of service automatically. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.

An out of service timer (T.O.S.) shall be provided which will automatically take the car out of service if the car is delayed in leaving the landing while there are calls existing in the building. The car shall not respond to hall calls while in this mode of operation, and the photo eye in put shall be unresponsive in the event that a faulty photo eye unit was delaying the car.

Door protection timer shall be provided for both the open and close directions which will help protect the door motor and which will help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time in the event that the door are prevented from reaching the open position. The door close protection timer will reopen the doors for a short time in the event that the door-closing attempt fails to make up the door locks after a predetermined time.
A minimum of three different door standing open times shall be provided. A car call time value shall predominate when a car call only is canceled. A hall call time value shall predominate whenever a hall call is canceled. In the event of a door reopen from a photo curtain, or door open button, a separate short door time value shall predominate. The timing value for these timers must be field adjustable.

Nudging: If the doors are prevented from closing for longer than a predetermined time, door nudging operation shall cause the doors to move at a slow speed in the close direction and to be unresponsive to the photo curtain. A buzzer shall sound while nudging operation is active.

Hall or car call registration and lamp acknowledgment shall be by means of a single wire per call besides the power busses. Systems that register the call with one wire and light the call acknowledgment lamp with a separate wire are not acceptable.

Fireman's Phase I emergency recall operation, alternate level Phase I emergency recall operation, and Phase II emergency in-car operation shall be provided according to applicable codes. Keyed (AZFS)

Independent service operation shall be provided such that the actuation of a key switch in the car-operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls and will ignore hall calls. Car and hoistway doors will only close by constant pressure on car call buttons or a door close button until the car starts to move. While on independent service, hall arrival lanterns or jamb mounted arrival lanterns and gongs shall be inoperative. Keyed (EPCO-1)

Simplex selective collective automatic operation shall be provided for all single car installations. Operation of one or more car or hall call buttons shall cause the car to start and run automatically provided the hoistway door interlocks and car door contacts are closed. The car shall stop at the first car or hall call set for the direction of travel. Stops shall be made in the order in which the car or hall calls set for the direction of travel are reached, irrespective of the order in which they were registered. If only hall calls are set for the opposite direction of travel exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting the calls. For multiple car installations use duplex, triplex etc.

The car shall be equipped with two-way leveling to automatically bring the car within plus or minus (1/4") of landing level at any landing regardless of load.

A selector switch shall be provided on the controller to select high or low speed during access or inspection operation as long as speed does not exceed 150 feet per minute.

A test switch shall be provided. In the "test" position, this switch shall allow independent operation of the elevator without the door open function for purposes of adjustment or testing the elevator. The elevator shall not respond to hall calls shall not interfere with the other car in a duplex installation.
A timer shall be provide to limit the amount of time a car is held at a floor due to a defective hall call or car call including stuck push-buttons. Call demand at another floor shall cause the car to eventually ignore the defective call and continue to provide service in the building.

B. Solid State Motor Starter

1. Provide a new solid-state motor starter to limit current inrush during starting and to provide gradual acceleration of the motor.
2. Motor starting shall not be initiated by mechanical contacts.
3. The starter shall include a current limit adjustment range of 200% to 450% of the overload adjustment range.
4. Provide an internal fault detection system, if the internal fault detection system detects a failure, power shall be removed from the motor.

C. Hydraulic Jack

1. Reuse existing plunger-cylinder units. Install new Texacone Chevron packing in plunger-cylinder assembly.
2. Install new piping without routing underground. Where not possible, rout piping through schedule 40 PVC before back filling.
3. Hydraulic hose for sound deadening is not permitted.

D. Hydraulic Pump

1. Pumping Unit: The pumping unit shall be of integral design and shall include an electric motor connected to a submersible pump, a hydraulic control system, hydraulic fluid reservoir and necessary piping connections all compactly designed as a self-contained unit. This unit shall be designed for vibration free operation. The unit shall be factory adjusted and tested before shipment to the job site. The testing procedure shall include actual job type conditions of load, speed, etc. Refer to the drawings for remote arrangement of hydraulic unit for this project.

2. The pump shall be specifically designed for all hydraulic operation and shall be of the positive displacement type. Oil flow shall be controlled in such a manner that car operation will be smooth and quiet in both directions of travel. Accurate car leveling shall take place in both the up and down direction. The control valve shall be easily adjusted from the front of the power unit.

3. The "up start" system shall be adjustable and designed to initiate the stop of the elevator and shall control the acceleration smoothly and evenly.

4. The "down start" system shall be adjustable and designed to initiate the stop of the elevator and shall control the deceleration of the elevator smoothly and evenly.

5. The power unit shall have a have shut-off valve which will isolate the oil reservoir to enable servicing of the pump hydraulic assembly. The shut off valve shall be located in the machine room and in the pit as directed by Owner.
6. A suitable muffler designed to withstand the high pressure shall be installed in the power unit in a blowout proof housing.

7. Submersible Pump: The submersible pump shall be a positive displacement screw type to give smooth operation and shall be especially designed and manufactured for elevator service.

E. Elevator Pit Hydraulic Oil Return Pump (Reuse Existing)

1. Drip Pan Return Pump: 120V fractional h.p. pump suitable for pumping of hydraulic fluid. Furnish pump with float activated on/off switch.
2. Drip Pan: 24 gauge, galvanized sheet metal of suitable size to accommodate return pump.

F. Door Equipment

2. Provide emergency access in all hoist way doors.
3. All doors shall have 1-1/2 hr. label or other identification acceptable to governing authorities.
4. Provide adjustable new nylon guide (by Nylube or Adams Elevator Equip. Co.).
5. Heavy-duty doors. Provide door skin on both sides of elevator doors. (Reuse Existing)

G. Hoistway Equipment

1. Normal and Final Terminal Stopping devices: Per code.
2. Electrical Wiring:
   a. Conductors: Provide all new copper wiring throughout, with all connections made on identified studs and terminal blocks, control cabinets, junction boxes or conduits. Provide 10 percent spare conductors throughout. Provide 4cur pairs of spare shielded communication wire to the car, in addition to those required by features of this specifications, to be tagged in machine room. All spare wiring to run from car connection points to individual elevator controllers in the machine room.
   b. Conduit, Etc.: Painted or galvanized steel conduit and duct. Conduit size shall be ¾ inch minimum. Flexible conduit exceeding 18 inches in length shall not be used. Flexible heavy-duty service cord may be used between fixed car wiring and car door for light curtain.
   c. Traveling cables: Provide all new wiring and traveling cable, flame and moisture resistant outer cover. Prevent traveling cables from rubbing or chafing against hoistway or elevator equipment within hoistway.
   d. Provide all new hoistway wiring and switches.

G. Lobby Position Indicator

Provide tamper resistant Adams Elevator Equipment Co. lobby position indicator on the first and second levels, digital read out illuminated by light emitting diodes.
H. Smoke Detectors

Smoke and heat detectors shall be compatible and tie into building fire system.
(Existing)

I. Hall Direction Indicator

Up and down tamper resistant SURVIVOR PLUS as manufactured by Adams Elevator Equipment Co. Direction indicators to be provided in the hall wall at each landing, with a single chime or tone for up and double chime or tone for down direction and shall be illuminated by light emitting diodes.

J. Photo Curtain (NEW)

1. Photo Curtain: An electric passenger sensing device of the photo curtain shall project across the entrance to prevent the car and hoist way doors from closing if a passenger or object interrupts the curtain.
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2. Car position indicator, illuminated with light emitting diodes.
3. Fan key switch (EPCO-1)
4. Emergency stop key switch (EPCO-1).
5. Independent service key switch (EPCO-2).
6. Inspection/Access key switch (EPCO-2).
7. Firefighter service key switch (AZFS)
8. Alarm bell push type switch.
9. Light key switch (EPCO-1).
10. Engraved capacity plate and elevator designation.
11. Engraved firefighter's service Instructions
12. Engraved "Certificate of Inspection on file at Facilities Management"
2.04 EXECUTION

A. Telecommunication Link

1. Install communication cable for controller modem not to exceed 24" from controller.
2. Install communication cable for car phone not to exceed 24" from controller.
3. Install modem MC – PA board and modem outlet inside of controller.

B. Adjust And Balance

Make necessary adjustments of equipment to ensure elevator operates smoothly and accurately.

C. Protection

Locate and protect movable equipment and controls in such a way that they can only be operated by authorized persons.

D. Inspections and Testing

1. Obtain and pay for inspections and permits to assure that test are performed as required by regulations of authorities. Conduct all tests and inspections in the presence of the Owner.
2. Final inspection shall be after all new equipment is installed and operating correctly.
3. Inspect installation in accordance with ANSI-A17.2
4. Deliver test certificates and permits to Owner.

E. Operation And Maintenance

1. Instruct Owner’s personnel in proper use, operations and daily maintenance of elevators.
2. Training shall include operation of diagnostic microcomputer and servicing of elevator microprocessor.
3. Make final check of each elevator operation, with Owner’s personnel present and just prior to date of substantial completion. Determine that control systems and operating devices are functioning properly.
4. Continuing Maintenance: Provide 1-year maintenance on elevators on an as-needed basis as part of standard 1-year warranty on new equipment and upgrades.
5. Maintenance shall include systematic examination, adjustment and lubrication of new elevator equipment; replacement of seals, packing and valves to maintain required factor of safety; performance of maintenance work with out removing car during peak traffic periods and providing 24 hour emergency call back service during maintenance period, at on additional cost to Owner.
6. Repair or replace electrical and mechanical parts of the new elevator equipment using only genuine standard parts produced by manufacturer of equipment concerned.

7. Ensure that competent personnel handle maintenance service, maintain and adequate stock of parts for replacement of emergency purposes, locally, and have qualified personnel available at such places to ensure the fulfillment of this service without unreasonable loss of time.

F. Cleaning

1. Remove all trash and debris from site during elevator installation.
2. Clean all elevator surfaces, removing all dirt, dust, spots, and scratches. Any damage shall be repaired or replaced as directed by Owner, at no cost to Owner.
3. Prior to substantial completion, remove protection from finished or ornamental surfaces and clean and polish surfaces with due regard to type of material.
4. Remove tools, equipment and surplus materials from site.

End of Section 14240