

UCSC Elevator **Standards**

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PRELIMINARY

DIVISION 14 CONVEYING SYSTEMS

SECTION 14240 – ROPED HYDRAULIC PASSENGER ELEVATOR (HOLELESS)

PART 1 – GENERAL

1.1 GENERAL CONDITIONS

- A. The Contractor under this Division of the Work (elevator contractor) is referred to the Contract Forms and General Conditions of these specifications, all of which apply to this Division of the Work.
- B. No machine Roomless Elevator (MRL) to be used on UCSC campus .

1.2 SCOPE OF WORK

- A. The work of this division shall consist of the complete installation of one hydraulic passenger elevator in the _____ Building located on the UCSC campus. Bidders shall include all labor, materials, and services required for the complete installation of all the elevator equipment as herein specified, including hoistway entrances and elevator car enclosure.
- B. In all cases where a device or part of the equipment is herein referred to in the singular, it is intended that such reference shall apply to as many of such devices or parts a required to make a complete installation.

1.3 GENERAL

- A. These specifications cover the complete installation of the elevator system, in accordance with the drawings and as specified herein. The elevator contractor shall include all work and materials, except that listed under “Related Work By Other Contractors”, for a complete and operational elevator system .

1.4 *ACCEPTABLE ELEVATOR INSTALLERS

- A. Elevator Service Co.
- B. Kone Elevator Co.
- C. Schindler Elevator Co.
- D. Otis Elevator Co.
- E. Thyssen/Krupp
- F. Ascent Elevator

*Note 1: Above is not a list of elevator manufacturers; it is a list of INSTALLERS only. Elevator installer must provide the equipment specified.

*Note 2: General contractor shall in his bid name all the sub-contractors during bid opening.

1.5 DRAWINGS

- A. Before beginning fabrication and work, the elevator contractor shall prepare all drawings necessary to show the general arrangement of the elevator equipment. Approval of drawings and other data (submit minimum of eight sets), which are submitted by the elevator contractor through the General Contractor, to the Owner and architect. Drawings must be obtained before proceeding with fabrication and installation of the equipment. Field verify existing conditions and hoistway sizes prior to preparation of drawings. Submit provisions for delivery drilling machine into the construction site and setting it in place to provide the drilling process.

1.6 REQUIREMENTS OF REGULATORY AGENCIES

- A. Perform all work in accordance with applicable codes, the California Safety Code (Title 8), the National Electrical Code, and ANSI A17.1-2004, as referenced therein and all of the provisions in the UCSC Standard General Conditions. Give all necessary notices, obtain all State and Municipal permits, pay all fees necessary in connection with the installation, including sales and use taxes as applicable, and make all tests as are called for by the regulations of such authorities. These tests shall be made in the presence of the authorized representative of such authorities and the owner's representative. It is the responsibility of the elevator contractor to provide any variances from the Governing Authority that could be necessary for a complete acceptable elevator installation.
- B. Comply with "Elevator Guidelines to Ensure Accessibility by People with Disabilities" as noted in Part 14.0.

1.7 GUARANTEE

- A. The elevator contractor shall guarantee that the materials and workmanship of the apparatus installed by him/her under this specification are first-class in every respect, and that he will make good any defects not due to ordinary wear and tear or improper use or care, which may develop within one year from date of final payment.

1.8 SCHEDULING OF OPERATIONS

- A. During the progress of the work, job meetings will be subject to call between the Owner's representatives, and the contractor's representatives. The Contractor shall provide a representative to attend meetings held from time to time for the purposes of schedule coordination and consideration of technical and construction matters. The Contractor's representative shall be the job superintendent or other person who is authorized to act as the agent of the Contractor.
- B. Refer to bid documents for schedules of start and completion of constructions.

1.9 MAINTENANCE

- A. After completion of the installation, maintenance and 24-hour callback service for the equipment furnished under this specification shall be provided for a period of twelve (12) months as part of this Contract. This service shall also include regular examination (biweekly); advise UCSC elevator maintenance at 831-459-2581 each time after completion of service and supply written record of service to the University and logged in machine room, this should include an oil log of the installation during regular working hours by trained employees of this Contractor, and shall include all necessary adjustments, greasing, oiling, cleaning supplies and parts to keep the equipment in proper operation, except parts made necessary by misuse, accidents or neglect caused by others.
- B. All maintenance service must be performed by the installers and not by any other services agency. Also, the installer must have an established maintenance and service organization available for performance in the County of Santa Cruz that can provide regular and emergency service, 24 hours a day, every day of the year.
- C. Note: It is the responsibility of UCSC Elevator Maintenance to respond to any emergency regarding elevators. In the event that someone is trapped in an elevator that is under contracted maintenance, during regular work hours Monday through Friday, the University Elevator Maintenance will respond to free the passengers as soon as possible to minimize the inconvenience to users.

- D. A detailed record of work performed by University Elevator Mechanics is maintained in the Elevator Shop. Contractors should contact Elevator Maintenance to review work performed by University Elevator Mechanics.
- E. The elevator contractor shall be responsible to service record and maintain all elevator emergency circuits (including the fire service circuit, related equipment and sensors) as part of the regular elevator maintenance contract.

1.10 **RELATED WORK OF OTHER DIVISIONS**

- A. Following is a brief description of work by other divisions included in this Contract. The elevator contractor shall co-ordinate this work with the General Contractor. This work must be done in accordance with the codes having jurisdiction and the approved drawings of the elevator contractor.

1. Pit and Hoistway:

- a. Provide a legal hoistway, properly framed and enclosed, and a pit of proper depth.
- b. Provide access ladder in pit.
- c. Provide recesses for hall indicators and hall buttons.
- d. Install all supports for guide rail brackets. Guide rail bracket inserts shall be furnished by elevator subcontractor.
- e. All cutting of walls, floors, or partitions, together with any repairs made necessary thereby, if any.
- f. All painting of hoistway, machine room floor, walls and ceiling and elevator pit floor and walls. Apply two coats of light gray oil based paint to elevator pit floor, pit walls (paint pit walls to the height of lowest landing sill), elevator Machine Room floor and two coats of oil based white semi-gloss paint to Machine Room walls and ceiling.
- g. Rough openings, as required by the elevator contractor's drawings.
- h. The hoistway walls shall not receive finished treatment whether it is material or paint, until the elevator entrances have been set in place by the elevator subcontractor.
- i. Provide bevel guards where beams or walls project beyond 2" into general line of hoistway.
- j. Provide recesses and/or supports for the entrance sills of horizontal slide passenger type hoistway doors.
- k. Provide grouting under sills and around frames, after the entrances are fastened in place.
- l. Furnish, install and maintain the required fire rating of elevator hoistway walls, including the penetration of firewall by elevator fixture boxes.
- m. All seismic work related to the elevator components.

2. Machine Room:

- a. Provide a properly lighted and ventilated machine room. Temperature in Machine Room to be maintained between 60 deg. F and 80 deg. F. Provide mechanical cooling for machine room where shown and specified. Lighting in Machine Room shall be fluorescent type. Position lighting so it does not create shadows while service personnel are working on major equipment.
- b. Provide a 15-pound class B-C fire extinguisher in elevator Machine Room.
- c. Provide access doors, in the Machine Room, Main entrance door to elevator Machine Room shall be self-closing/self-locking type. Door hardware shall be keyed to UCSC Lockshop system.
- d. In hydraulic elevators, the machine room shall be adjacent to the elevator hoistway.
- e. Insulate machine room walls to avoid noise transfer to adjacent rooms. Sound transmission class (STC) shall be a minimum of 25.

3. Electrical Work:

- a. Adequate power from the power mains to fused disconnect switch in elevator Machine Room as required, including necessary fused mainline disconnect switches. All power work from mainline disconnects switches in elevator machine room to controllers and other elevator equipment shall be provided by the elevator contractor.

- b. Provide one separate 120 volt single phase circuit protected with a heavy-duty type fused disconnect switch in elevator Machine Room for car lighting. Provide additional disconnect and circuits for ventilation; monitoring devices, GFCI protected plugs on car and hoistway. Wiring and conduit from life safety panel or any other monitor station to elevator machine room.
 - c. Provide a duplex electrical receptacle (3 ft. above finished floor), light and switch in the pit. Provide a duplex electrical receptacle, light and switch within 18" of lock-side of jamb in machine room. Provide duplex electrical receptacle near controller and whatever additional electrical receptacles are needed to meet ANSI 17.1-2004 and N.E.C. Codes. Light in the pit shall be operable from hoistway door opening.
 - d. Provide a single tube continuous fluorescent light fixture strip (full height of hoistway) with guard. This lighting shall be operable from the elevator pit and top landing . The design is to be agreed on with the project manager .
 - e. All receptacles shall be GFCI .
 - f. Telephone conduit between nearest telephone closet and junction box in elevator machine room.
4. All telephone cable and conduit between machine room terminals and controller and car shall be provided by elevator contractor.

PART 2 – OUTLINE OF NEW EQUIPMENT TO BE FILLED OUT BY THE ELEVATOR CONSULTANT

- A. Quantity: _____
- B. Capacity: _____ pounds
- C. Speed: _____ FPM
- D. Travel Distance: _____, (Field verify)
- E. Stops/Number of Openings Front: _____ (_____ Front, _____ rear)
- F. Floors Served, ____, ____, ____, ____, ____ (____ is Main Floor Egress)
- G. Platform Size (Width x Depth): ____' - ____" (side to side) x ____' - ____" (front to back), size to be maximum allowable.
- H. Door Size/Operation: ____' - ____" Wide x ____' - ____" High, Two-Speed
- I. Machine Type: Hydraulic/Location
- J. Control: Microprocessor Type, See 11.0
- K. Operation: Selective/Collective
- L. Entrances: ____' - ____" Wide x ____' - ____" High, Two-Speed, (field verify).
- M. Operating Fixtures: See item 7.0 and 11.0
- N. Power Supply: 208 Volts/3Phase/60 Cycle;
- O. Motor Data: HP/Manufacturer & Model/Efficiency
- P. Auxiliary Operations: See Specifications 4.2, 4.3, 4.4
- Q. Hoistway Size: ____' - ____" Wide x ____' - ____" Deep Approx.; (Field verify)
- R. Machine Room Location – room number: _____
- S. Guides – Roller Type. See item 11.0
- T. Pit Depth – (4' -0" +/-) Field verify
- U. Additional Features:
 1. Multi-light LED hall position indicator at main floor landing and inside car.
 2. Infra-red type door protection
 3. Fire service Phase I and Phase II
 4. Car ventilation blower
 5. Hoistway access package
 6. Protective pads and hooks
 7. Telephone and telephone cabinet (see 7.4)
 8. Certificate frame
 9. Hand-rails
 10. Emergency car light (integral with car operating panel)
 11. Provisions for handicapped: raised makings for hoistway door jambs, adjustable door open times
 12. Refer to "Elevator Guidelines to Ensure Accessibility by People with Disabilities" item 14.0.
 13. Return of car to egress floor, automatically, when power is lost.

14. Reynolds and Reynolds UV2 Powervator , factory installed and wired on the elevator controller.
15. Car sized for a medical stretcher to fit into car.
16. Inside car emergency red light if machine fails.

PART 3 – PRODUCTS

3.1 ROPED HYDRAULIC ELEVATOR (HOLELESS)

A. Oil Hydraulic Machine:

1. The power unit shall be of a compact, self-contained design including pump, drive motor, oil control unit assembly, oil storage tank, removable drip pan and a rigid structural steel frame with storage tank supports. Unit shall be sound attenuated and be mounted on 2-inch thick 4” x4” isolation neoprene pad.

B. Pump:

1. The pump shall be a positive displacement screw type, for maximum smoothness and quietness and shall be directly coupled to the motor. Do not use pumps mounted in the oil.

C. Motor:

1. The drive motor shall be of premium efficiency and have a duty rating sufficient for hydraulic elevator requirements.

D. Oil Control Unit:

1. The oil control unit shall consist of electrically actuated and hydraulically operated valves with all adjustments accessible without removing the assembly from the oil lines. An automatic bypass valve shall provide smooth starting and stopping in the up direction and shall give regulated up leveling speed under varying load conditions in the car. The lowering and down leveling valve shall be fully adjustable for smoothness and speed of operation and shall be designed to close automatically if the power fails. Operation of a manual valve shall permit the car to be lowered at slow speed in the event of the power failure. A safety check valve shall hold the car when the pump is at rest and a relief valve shall be provided which is capable of bypassing the entire output above the normal working pressure. Permanently install a liquid filled pressure gauge on oil control unit.

E. Oil Storage Tank:

1. The oil storage tank shall be of sufficient capacity for the full travel of the car with a reserve of not less than 10 gallons and shall have a drain connection, means of isolating oil in the tank for servicing of pump and valves, an effective pump suction strainer and a removable cover. The cover shall be designed for low velocity breathing with a protected vent opening to prevent entry of liquids or debris into the tank. Tanks with single small vent openings shall be guarded against accidental blockage, which may cause collapse of the tank during operation of the elevator in the up direction. Tank to be located in elevator equipment room.

F. Oil:

1. Sufficient specially prepared hydraulic oil with greater than 400 degrees F. flashpoint and proper viscosity and lubricating qualities shall be provided. Indicate type of oil used and its viscosity value.
2. Oil shall be of the biodegradable type , listed as green product in the USGBC directory .

G. Sound Reduction with Isolating Panels and Muffler:

1. In addition to selection of individual components to minimize noise generation, a blow-out proof muffler for absorption of hydraulic pulsations shall be installed in the oil line between the pump and the cylinder, and the hydraulic machine shall be provided with rubber isolation pads to prevent transmission of noise and vibration to the building structure. Sheet steel panels lined with sound-deadening material

shall enclose the motor and pump location area of the hydraulic machine for reduction of air-borne noise.

H. All Hydraulic Supply Piping:

1. Shall be schedule 80 black steel pipe. Welded pipe only. No grooved fittings are allowed. The system must be free from seepage at all joints.
2. All piping shall be run above ground, exposed for maintenance.
3. Maximum total equivalent length of piping is 30 ft.
4. Acoustically insulate pipes and fittings to reduce noise .

I. Shut-Off Valve:

1. Manually operated valves shall be provided and installed in the oil supply line to isolate the cylinder and plunger unit from the hydraulic machine. Provide two valves-one in pit near jack assembly and another one in the machine room near machine. Valves shall be rated twice the operating pressure and shall be the same size as the pipe.

J. Oil Strainer:

1. A self-cleaning strainer shall be provided and installed in the oil line between the hydraulic machine and the cylinder plunger unit to protect the oil control valves during downward travel of the elevator. The strainer shall have a 40-mesh 316 stainless steel screen for removal of solid particles and a magnetic drain plug for removal of ferrous materials. The strainer assembly shall be designed for at least 600 psi working pressure.

K. Isolation Coupling (s):

1. One isolation coupling(s) shall be provided to abate the transmission of noise produced by the vibration of the pumping unit. Proper location of the isolation coupling(s), in the oil deliver line, shall be determined by the elevator subcontractor.
2. Pressure rating for the isolation couplings shall be in accordance with ANSI A17.1-2004 .

L. Cylinder and Plunger Unit:

1. The cylinder shall be all above ground and fabricated of steel pipe. The cylinder head shall have a bronze, babbitt or phenolic-lined bearing and an integral drip ring. Packing shall be of the self-adjusting type not requiring external adjustment and shall allow operation of the plunger with minimum friction. The packing gland shall be arranged to return automatically to the reservoir any oil, which may escape the packing ring. Structural steel shapes shall be provided to support the cylinder and to transmit vertical loads to the pit floor.
2. The plunger shall be constructed of seamless steel pipe or tubing turned true and smooth and polished to a fine finish. A stop plate to prevent the plunger from leaving the cylinder shall be welded to the bottom of the plunger.
3. Grey cast iron or other brittle materials shall not be used and the cylinder and plunger unit shall be factory tested at not less than 600 psi, or as per ASME A17.1-2004 and State of California Elevator Code. For strength and freedom from leakage. Units of multiple section construction shall be securely joined by couplings. Cylinder couplings shall have all joints welded before installation to prevent leakage.
4. Provide a stainless steel drip pan (at pit floor) or drip ring around cylinder with scavenger pump. Oil piping between pump and oil storage tank and all related power wiring.

M. Ropes:

1. Ropes shall be steel compatible to ropes used on traction elevators.

3.2 CONTROL

A. Controller:

1. The elevator controller shall utilize a microprocessor based logic system and shall comply with (ANSI/ASME 17.1-2004) safety code for elevators. The system shall provide comprehensive means to

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access the computer memory for elevator diagnostic purposes without need for any external devices, and shall have permanent indicators to indicate important elevator status as an integral part of the controller. Systems that require hookup of external devices for troubleshooting are not acceptable. The elevator control equipment shall be provided such that at least three (3) elevator service companies can maintain the equipment. Immediate availability of replacement parts shall be guaranteed and no special proprietary diagnostic devices will be utilized. An O.E.M. control, serviceable only by the O.E.M. will not be accepted. Controller shall be provided with the capability of in-the field changes for certain variables such as door time. These changes should be stored permanently using non-volatile memory. Thus, if the power to the unit is disconnected, the system will maintain the programmed variables. The Car Diagnostic Display shall have the capability of selecting either the operational or programming modes and/or displaying the status of all inputs and outputs and capability of remote diagnostics to be interfaced with UCSC's elevator shop IBM compatible computer system.

2. Failure of any single magnetically operated switch, conductors, 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, conductors 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.
3. Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is open, when the door locks are open, when the elevator is running at high speed, when the elevator is on independent service, when the elevator is on fireman's service, when the elevator out of service timer has elapsed or when the motor limit timer or valve limit timer has elapsed. Provide a switch, in case of the duplex, to select which of the two cars' statuses is to be displayed on the indicators, in addition, provide means of displaying other special or error conditions that are detected by the microprocessor.
4. The elevator shall not require the functioning or presence of the microprocessor to operate normally during car top inspection operation or hoistway access operation in order to provide a reliable means to move the car if the microprocessor fails.
5. A Motor limit timer function 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 them and the elevator shall then be rendered unresponsive to any automatic operation. Operation may be restored by cycling the power disconnect switch or putting the car on access of inspection operation.
6. A valve limit timer function 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 them and the elevator shall then be rendered unresponsive to any automatic operation. Operation may be restored by cycling to power disconnect switch or putting the car on access or inspection operation.
7. Low Oil Control:
 - a. A low oil control feature shall protect the hydraulic components if the elevator fails to complete its upward travel in the normal time.
 - b. Actuation of the low oil control circuit shall stop the pump and lower the car to the lowest landing. Power-operated doors shall open to permit passengers to depart and shall then close. The car shall remain parked at that landing completely removed from demands for service.
 - c. To return the car to normal service, the malfunction shall be corrected and the elevator controls reset in the machine room.
8. 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.
9. Door protection timers 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 close the door locks after predetermined time.

10. 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 cancelled. A hall call time value shall predominate whenever a hall call is cancelled. In the event of a door reopen from the safety edge, photo eye, a separate short door time value shall predominate.
11. Door Timing – Separate adjustable timing means shall be provided to establish independent minimum passenger transfer time for car stops, hall stops, main lobby stops, and door reversal operations (short door time.)
12. Hall call 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 acknowledgement lamp with a separate wire are not acceptable. Phase I emergency recall operation, and Phase II emergency in-car operation shall be provided within the controller according to applicable local codes.
13. Independent service operation shall be provided such that 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 arrival lanterns and gongs shall be inoperative.
14. The car shall be equipped with two-way leveling to automatically bring the car within plus or minus ¼ inch of exact level at any landing regardless of load up to maximum capacity.
15. 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.
16. A test switch shall be provided. In the “test” position, this switch shall allow independent operation of the elevator without any door open functioning for purposes of adjustment or testing the elevator. The elevator shall not respond to hall calls and shall not interfere with the other car in a duplex installation.
17. 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 pushbuttons. Call demand at another floor shall cause the car to eventually ignore the defective call and continue to provide service in the building.
18. Simplex selective collective automatic operation shall be provided for the single car installations. Operation of one or more car call 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 call or hall call set for the direction of travel of car. Stops shall be made in the order in which the car calls or hall calls set for the direction of operation of the elevator are reached, irrespective of the order in which they were registered. If only hall calls set for the opposite direction of travel of the elevator exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting calls. Emergency return unit shall return car to elevator base when power is lost.
19. Simplex home landing operation shall be provided and, if no calls are registered shall cause the car to travel to a predetermined home landing floor and stop without providing a door operation. The ability to change home landing feature shall be provided.
20. If the car is enroute to the home landing and a call appears from the direction opposite to which the car is traveling, the car shall slow down, stop, and then accelerate in the opposite direction, toward the call. The home landing function shall cease instantly upon the appearance of a normal call and the car shall proceed non-stop in response to any normal call.
21. Provide fluorescent lighting at front and back inside the controller cabinet.
22. Controller shall include factory installed and wired Reynolds and Reynolds UV2 Powervator as emergency power battery system .
23. Manufacturer:
 - a. Elevator controller shall be as manufactured by Elevator Control or Motion Control Engineering (MCE), or SMARTRISE modified to include all features noted above including soft start features to limit inrush current Remote diagnostics shall be included ..
 - b. Model number of controller shall be reviewed with campus elevator engineer prior to including it in the specifications.

B. Collective Operation:

1. Operation shall be automatic by means of the car and landing buttons. Stops registered by the momentary actuation of the car or landing buttons shall be made in the order in which the landings are reached in each direction of travel after the buttons have been actuated. All stops shall be subject to the respective car or landing button being actuated sufficiently in advance of the arrival of the car at that landing to enable the stop to be made.
2. If all calls in the system have been answered, the car shall park at the last landing served or the pre-determined home landing.

PART 4 – AUXILIARY OPERATIONS:

4.1 FIREFIGHTER’S SERVICE:

A. The following operation sis for the use of firemen and other authorized personnel.

1. Automatic passenger elevators shall conform to the following:
 - a. A three position (on, off, and by-pass) key-operated switch shall be provided at the main floor for each single elevator or each group of elevators. The key shall be removable only in the “on” and “off” positions. When the switch is in the “on” position, all elevators controlled by this switch and which are on automatic service shall return non-stop to the main floor, and the doors shall open and remain open.
 - 1) An elevator traveling away from the main floor shall reverse at the next available floor without opening its doors.
 - 2) Elevators equipped with automatic power-operated doors and standing at a floor other than the main floor, with doors open, shall close the doors without delay and proceed to the main floor.
 - 3) Door reopening devices for power-operated doors, which are sensitive to smoke, heat or flame shall be rendered inoperative.
 - 4) All car and corridor call buttons shall be rendered inoperative and all call registered lights and direction lanterns shall be extinguished and remain inoperative.
 - 5) A car stopped at a landing shall have its “Emergency Stop Switch” rendered inoperative as soon as the doors are closed and it starts toward the main floor. A moving car, traveling to or away from the main floor, shall have its “Emergency Stop Switch” rendered inoperative immediately.
 - 6) A sensor in each elevator lobby, which when activated prevents cars from stopping at that floor, shall not be substituted for the above requirements.
 - b. Sensing Devices: In addition to the key-operated switch required in “1” above, heat and smoke or products of combustion sensing devices shall be furnished and installed in each elevator lobby at each floor, except the main floor (Note – Egress floor is 1st floor.) The activation of a sensing device in an elevator lobby shall cause all cars in all groups that serve that lobby to return non-stop to the main floor. They key operated switch when moved to the “by-pass” position, shall restore normal service independent of the sensing devices. Smoke detectors shall be photoelectric type, 120 vac. entex Corp. Model 8100. Submit drawings showing locations of smoke heads and exposed conduit for owner’s approval prior to installation.
 - c. A three position (off-hold-on) key-operated switch shall be provided in each car and shall be effective only when the main floor key-operated switch is in the “one” position or a sensor has been activated and the car has returned to the main floor or other approved level. They key shall be removable in all positions, and shall not change the operation until the car is at a floor with doors fully opened.
 - d. The operation of elevators on Fire service shall be as follows:
 - 1) An elevator shall be operable only by a person in the car.
 - 2) Elevators shall not respond to elevator corridor calls.
 - 3) The opening of power-operated doors shall be controlled only by continuous pressure “open” buttons or switches. If the switch or button is released prior to the door reaching the fully open position, the doors shall automatically recluse. Open doors shall be closed by continuous pressure on “Door Close” switch or button.

- 4) Mean shall be provided to cancel registered car calls.
- 5) When the switch is in the 'hold' position, the car shall remain at the floor with its doors open.
- 6) Elevators can be removed from individual car fire service by moving the key-operated switch to the "off" position and the car is at the main floor or other approved level.
- e. The switches required above shall be operated by the same key but are not a part of a building master key system. There shall be a key for the main floor switch and for each elevator in the group and these keys shall be kept on the premises by person responsible for maintenance and operation of the elevators, in a location readily accessible to authorized persons, but not where they are available to the public. **TURN OVER ALL KEYS TO PROJECT MANAGER.** Project Manager shall deliver key to elevator foreman. These keys shall be the Fire Service Keying System.
- f. Instructions of operation shall be provided as required by code.

- B. Elevators arranged for dual operation shall: (Applicable to dual elevators in one lobby)
 - 1. Conform to the automatic operation described above when on automatic operation.
 - 2. Be provided with a signal system consisting of both visual and audible types to alert the attendant to close the door and return non-stop to the main floor or other approved level. Provisions shall be made to alert the attendant in the same manner when a heat and smoke or products of combustion sensing device is activated.
- C. Alternate Floor Fire Service:
 - 1. The activation of a sensing device at the main floor lobby (item 2 above) shall cause the elevator to return non-stop to the alternate floor and the doors shall open and remain open. The alternate fire service floor shall be the 2nd floor.
 - 2. Operation to the elevator shall conform to "Firefighters' Service." When sensing devices are activated, the elevator shall return non-stop to the designated egress floor and the doors shall open and remain open.
 - 3. When building sensor activate at the egress fire service floor, elevator shall automatically be dispatched to that building's 2nd floor, which has been designated "alternate" fire service floor where the elevator doors shall open and remain open.

4.2 LOAD BYPASS OPERATION: NORMALLY NOT REQUIRED

4.3 ANTI-NUISANCE FEATURE: NORMALLY NOT REQUIRED

4.4 INDEPENDENT SERVICE OPERATION: (Discuss with Building Manager if needed or not)

- A. A two-position switch shall be provided in the car-operating panel.
- B. When the switch is placed in the independent service position , the mode of operation shall be amended as follows:
 - 1. The car is disconnected from the supervisory system.
 - 2. Existing car calls shall be cancelled.
 - 3. The cars shall bypass landing calls.
 - 4. Continuous pressure on the car button of the selected floor shall close the doors and start the car toward the selected floor. Pressure shall be required on the button until the car starts. Releasing the car button before the car starts shall cause the doors to automatically reopen.
 - 5. After the car has arrived at the floor and the doors have automatically opened, the cars shall remain until another car button is pressed or until they key switch is returned to the normal position.

PART 5 – HOISTWAY EQUIPMENT

5.1 PROVISIONS FOR HOISTWAY ACCESS:

- A. Keyway:

1. Furnish and install hoistway door unlocking devices at all landings (with removable plugs) in accordance with requirements of the latest Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, and as permitted by the local Code.
2. The hoistway door-unlocking device shall unlock and permit the opening of the hoistway door from the access floors irrespective of the position of the car. The design of the device shall be such as to prevent unlocking the door with common tools. The means for unlocaking the door shall be available and used only by inspectors, maintenance men, and repair men.

B. Hoistway Access:

1. Furnish and install hoistway access switches and associated devices (at floors 1 and 2) in accordance with requirements of the latest Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, and as permitted by Local Code.

5.2 TOP OF CAR OPERATING DEVICE:

- A. An operating device shall be provided on the top of the car located in the front between the car crosshead and hoistway door, complete with an Emergency Stop Switch, a Selections Switch, and UP and DOWN Operating Buttons. This device shall comply with ANSI A17.1-2004 and local codes.
- B. Operation from the top of the car shall not be permissible unless all electric door contacts are closed.

5.3 PIT STOP SWITCH:

- A. A switch shall be located in each elevator pit, in accordance with ANSI A17.1-2004 and local codes.

5.4 LANDING DOOR HANGERS

- A. Each hoistway door shall be suspended by two (2) sheave type hangers running on a hanger track provided integral with the hoistway entrance. Each hanger shall consist of a polyurethane tread on a metal hub equipped with precision ball bearings mounted onto a steel bracket. The hanger sheaves shall not be less than 3-1/4 inches in diameter. The track shall be so shaped as to permit free movement of sheaves without regard to vertical adjustment of the sheave brackets. An up-thrust roller shall be provided beneath the track and each sheave wheel, capable of withstanding a vertical thrust equal to the carrying capacity of the upper sheave. The up-thrust roller shall be adjustable for fine vertical adjustment and the face of the roller shall be so shaped as to conform to the bottom face of the hanger track.
- B. Manufacturer: GAL, with MOM operator.

5.5 ELECTRIC WIRING

- A. Complete insulated wiring shall be furnished and installed to connect all parts of the equipment furnished by the elevator contractor. Wiring shall conform to the requirements of the latest edition of the National Electrical Code. Include rigid conduit or EMT, at least 1/2" diameter, and short lengths of flexible conduit. Conduit or EMT shall terminate in junction boxes. Conduit, EMT, wiring duct, conduit fittings, enclosures and junction boxes shall be galvanized steel or aluminum.
- B. All wiring shall have a flame retarding moisture resisting outer cover and shall be run in metal conduit. Flexible metallic tubing or wire ducts.

- C. Traveling cables shall have flame retarding and moisture resisting outer cover. They shall be flexible and suitably suspended to relieve strains in the individual conductors. Provide the required quantity plus at least 210 percent spares. All wiring between telephone in car and a junction box in elevator machine room shall be provided by the elevator contractor. Conductors shall be numbered to correspond to numbered terminal at the car and machine room
- D. Terminal blocks shall be coded to identify the circuits. Multiconductor cables shall have the conductor color coded and numbered.
- E. Each elevator car shall be provided with a suitable GFCI receptacle fitted with a wire lamp guard on top of the car and a suitable duplex plug receptacle.
- F. Unless otherwise specified, control wiring shall be minimum size #18 AWG. Wire size shall be large enough so that the voltage drop under inrush conditions will not adversely affect operation of the controls.
- G. Electrical Receptacle in Car: Provide duplex electrical receptacle in car. Locate receptacle approximately 2” above finished floor below car station. Provide matching face plate on receptacle.
- H. Phase Protection: Provide 3-phase power monitor for elevator power supply, which monitors phase loss, low voltage, phase reversal, phase unbalance, and has an automatic reset. The three-phase power monitor shall be Time Mark Corp. model 257 or model approved by the Elevator Shop.
- I. Execution:
 1. Install all power wiring in raceway system. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.
 2. Splice cables and wires only in outlet boxes, junction boxes or pull boxes. (Note – No wire splicing allowed in raceway or wire ducts.)
 3. Install cable supports for all vertical feeders in accordance with the NEC. Provide Kellum GRIP type supports, which firmly clamp each individual cable and tighten due to cable weight.
 4. All terminal strip connections shall be identified with corresponding reference numbers from cable termination chart and electrical straight-line diagrams.

5.6 MACHINE FINISH AND PAINTING

- A. All exposed surfaces of machines and motors, controllers, etc., shall be repainted after field installation and before acceptance by Owner with rust resisting gloss enamel paint.

5.7 EMERGENCY ALARM BELL (May be deleted)

- A. An alarm bell shall be provided and mounted on the car. When the emergency alarm bell button in the car is pressed, the alarm bell shall sound.
- B. Alarm bell should operate per ASME A17.1-2004 and State of California Elevator Code.

5.8 GUIDE RAILS

- A. Planned steel tee guide rails shall be furnished and installed to meet ANSI A17.1-2004 requirements, including suitable brackets and clamps for attachment to the building structure. The guide rails and car frame shall be so located that the car is in balance with the guides. The machined tongue and groove joints shall be fitted with machined fishplates fastened to each rail with at least 4 through bolts. Rails are to be cleaned of any shipping or protective coatings at time of installation.
- B. All joins shall be located free of interference with supporting clamps and brackets. Shims used to obtain rail alignment shall be designed to remain in position, even though the fastening bolts may be loosened.

- C. The guide rails shall be installed and aligned with their machined faces plumb within one-eighth of an inch from top to bottom of the hoistway.
- D. Minimum Rail Size – 16 pounds/ft. upgrade rails based on application
- E. Note: For an elevator replacement, guide rails may be reused. If reused, re-align and refinish.

5.9 BUFFERS

- A. Buffers shall be installed in the pit to meet ANSI A17.1-2004 requirements. These buffers shall be fastened to steel channels furnished and installed by the Elevator Contractor.

5.10 TERMINAL STOPPING DEVICES

- A. Slow-down, normal and emergency stopping devices shall be furnished and installed for the car. The devices shall be so arranged that as the car approaches either terminal landing, a roller with noiseless tread, mounted on a moveable car, shall come into contact with cams located in the hoistway, and through the operation of the stopping device, bring the car automatically to a smooth stop at the terminal landing. The full width of the roller tread shall engage the cam surface. The emergency car stopping system shall comply with the A17.1 – 2004 requirements.

5.11 LANDING SYSTEM

- A. This landing system shall provide high speed stepping signals, one-floor-run stepping signals, leveling, and door zone signals. Each output signal shall be electrically isolated and shall be capable of reliably operating at 120VAC.
- B. The system shall consist of a steel tape with mounting hardware to accommodate the complete travel of the elevator, a car top assembly with tape guides and sensors, and magnetic strips for stepping and leveling.
- C. The leveling and stopping accuracy of the system shall be within ¼ inch of the floor level and shall correct for over travel or under travel to within the same accuracy, regardless of load variations or direction of travel.
- D. Landing control system shall be as manufactured by Interface Projects, Co., Model IP-8300 (including any required modifications to accept elevator control systems or approved equal.

PART 6 – CAR EQUIPMENT

6.1 POWER DOOR OPERATION:

- A. The car and hoistway doors shall be operated quietly and smoothly by an electric operator, which shall open and close the car door and respective hoistway door simultaneously. The doors shall open automatically when the car is leveling at the respective floor and, when operating without an attendant, shall close after a predetermined time has elapsed. Momentary pressure on the “Open Door” button in the car shall cause the doors to remain open or, if closing, to reopen and reset the time interval.
- B. The doors shall be opened at rated speed (2 ft/sec.) and the closing speed shall be per Code. Door closing force shall be as allowed by code.
- C. An electric contact for the car doors shall be provided which shall prevent elevator movement away from the floor unless the door is in the closed position as defined by Code.

- D. Each hoistway door shall be equipped with an auxiliary door closing device and a positive electro-mechanical interlock to prevent the operation of the elevator until the interlock circuit is established and the doors are locked and closed.
- E. Selective, synchronous door operation shall be provided so that doors at slightly different levels are not to open at the same time. Therefore, each door is to have its own synchronous opening.
- F. Manufacturer:
 1. Gal, MOH operator.

6.2 DOOR PROTECTION AND REOPENING DEVICE

- A. Adams Gatekeeper 2000 or Innovation Smart Edge, Model 2002 with additional Dual Eye Ray Unit or Janus 3D, or Tri-Tronics

6.3 ADAPTIVE DOOR TIMING:

- A. Door open times will be varied subject to the call situation causing the stop:
 1. Shortest timing, when car call only causes stop.
 2. Longer timing, when hall call only causes stop.
 3. Longest timing, when coincident hall and car calls exist.
 4. All timing shall meet ADA guidelines as a minimum.

6.4 CAR FRAMES

- A. Car frame shall consist of structural steel members that are securely welded or bolted together and the frame shall be so reinforced and braced as to relieve the car enclosure of undue strains. Steel bumper plates shall be provided to engage the buffers.

6.5 CAR PLATFORMS AND FLOORING:

- A. Each passenger type car platform shall consist of a structural steel frame with a wood and metal composite floor (i.e. one layer of 3/4" plywood plus 14 gauge steel plate plus 3/4" thick plywood plus finish flooring.) The platform and floor must be suitable for "Class C3" loading. Top finish flooring on car shall be furnished and installed by Elevator Contractor of the type and color selected by Owner.
- B. Each passenger type platform shall be equipped with an extruded aluminum threshold and a steel toe guard at the loading edge. The underside of the platform shall be fireproofed to comply with local codes.

6.6 CAR ISOLATION:

- A. The steel platen plate used to secure the car frame to the plunger shall be provided with rubber pads to effectively prevent transmission of vibration from the plunger to the complete car frame, platform and car enclosure.

6.7 ROLLER GUIDES FOR CAR:

- A. Each roller guide shall consist of three wheels (minimum roller diameter – 6") tired with a durable resilient material; each rotating on ball bearings having sealed-in lubrication; all assembled on a substantial metal base and so mounted as to provide continuous contact of all wheels with the corresponding rail surface under all conditions of loading and operations. The wheels shall run on three finished rail surfaces. The roller guides shall be properly secured at top and bottom on each side of car frame. Provide roller guides at top and bottom of car.

B. The roller guides shall run on dry guide rails.

C. Manufacture: ELSCO Type A.

PART 7 – OPERATING FIXTURES (Based on the manufacturer PTL)

7.1 CAR OPERATING PANEL:

- A. The operating panels in the car shall consist of one vandal resistant stainless steel flush mounted control panel. The main control panel shall contain a series of push buttons with illuminated call registration devices, numbered to correspond to the various landings serviced; In Car Stop Key Switch, Alarm Button (connected to a bell located on the car), and a Door Close, Door Open button for each entrance. Alarm bell shall be operated from its own independent battery pack power supply. The control panel shall also contain separate key operated switches for fire service, inspection, independent service, car lights and car fan. The panel shall contain all floor buttons; stop key switch, alarm, door open and door close buttons for each entrance. All the key switch cylinders shall be standard Adams Fixtures.
- B. Buttons shall be made of brushed stainless steel, Innovation Industries Vandal Resistant with LED lamp for illumination, with translucent floor designations.
- C. Provide emergency light in car operating panel with nickel cadmium batteries.
- D. Manufacturer: PTL Performer Series. All shall be vandal resistant. Other manufacturer is Innovation Industries.

7.2 HALL PUSH BUTTON:

- A. Hall push buttons shall be installed at each floor to permit waiting passengers to call the elevator to the floor.
- B. Fixtures shall have up and down buttons at intermediate floors and single buttons at top and bottom floors. Braille denotation shall be of the replaceable type bolted from the rear of contrasting colors mounted per ADA Guidelines.
- C. Buttons shall be made of # 4 brushed stainless steel vandal resistant with LED lamp for illumination) and shall illuminate to indicate all call has been registered. Button shall remain illuminated until the call has been answered.
- D. All Buttons (included in Section 7.1) shall conform to ADA requirements.
- E. Provide engrave graphic emergency sign and illustration on all hall push button station plates: “IN CASE OF FIRE USE STAIRWAY FOR EXIT.” “DO NOT USE ELEVATOR.”
- F. Hall position indicator shall be part of the hall push button panel on all floors and shall be led type.
- G. Manufacturer: PTL Performer Series. Other manufacturer is Innovation Industries. All shall be vandal resistant.

7.3 FLOOR PASSING CHIME:

- A. Provide a floor-passing chime to meet ADA requirements.
- B. Manufacturer is PTL Performer Series or Innovation Industries.

7.4 COMMUNICATION SYSTEM (TELEPHONE):

Campus Elevator Standards

- A. Provide hand-free vandal resistant emergency telephone integral with the main car-operating panel, with wiring (shielded pairs) to terminals on control panel in machine room. Phone shall keep working during power failure. Coordinate work with UCSC ITCOM. Phone shall be one push button to talk type and flash when call is answered.
- B. Manufacturer: CEECO Model SSP-571-X-ADA – with Braille Plate.

7.5 CAR POSITION INDICATOR:

- A. An LED Multi-light position indicator shall be vandal resistant and be provided above door in the car. It shall indicate the floor at which the car is stopped or passing and the direction the car is traveling. The cover plates shall be # 4 stainless steel. Indicator shall be LED type.
- B. Manufacture: PTL Performer Series or Innovation Industries.

7.6 CAR TRAVELING LANTERN:

- A. Shall be provided at both sides of door jambs, digital type and shall be ADA compliant.
- B. Manufacture: PTL Performer Series or Innovation Industries.

7.7 CAR FIRE ALARM HORN: (OMITTED)

PART 8 – ELEVATOR ENCLOSURES

- A. All cab material; design, lighting, ventilation and exits shall comply with “American National Standard Safety Code for Elevators, ANSI A17.1-2004 and/or local codes. Where codes conflict the more stringent shall apply.
- B. Wall panels shall be of wood construction and applies to a steel shell. Applied panels shall be finished with plastic color Core laminate of color or pre-vandalized stainless steel as selected by Owner. Shell (except reveals) shall be painted black. The reveals shall be stainless steel or pre-vandalized stainless steel as selected by Owner.
- C. Returns shall be of stainless steel construction and have a #4 brushed finish. Cutouts shall be provided for operating elements and fixtures.
- D. Canopy shall be constructed from formed and reinforced 16-gauge steel finished in white enamel and shall have an overall height of 8’0” from the finished floor. An emergency exit shall be provided which is locked from the top of the car.
- E. Provide coved lighting in cab. Coves shall be made of stainless steel and run entire length of cab walls with # 4 finish and located at ceiling level with fluorescent lights (two 4 ft. and two 2 ft., warm, white, deluxe lamps in each cove) on both sides of cab. Also comply with ADA lighting level requirements. Provide stainless steel protective guards consisting of two mesh, 14 gauge, wire cloth encased in a U-channel frame and of adequate size for maintenance. These guards shall be secured in place with tamper proof screws. Submit shop drawings prior to fabrication for Owner’s approval. See Sketch at end of this section for detail.
- F. Entrance columns shall be # 4 brushed stainless steel finish. Columns shall run from floor to canopy, be finished in a vertical grain, and shall be integral to the returns.
- G. Entrance transom shall be # 4 brushed stainless steel finish. Columns shall run from floor to canopy. Transom shall run the full width of the car and be finished in a horizontal grain.

- H. Doors shall be of hollow metal construction, suitably reinforced and sound deadened. Interior shall be stainless steel with # 4 finish and equipped with NYLUBE door guides.
- I. A single speed fan shall be provided that matches the ceiling and is mounted to the canopy. Air intake to the fan shall be through the 3/8" diameter holes (adequate in number to allow free passage of required air quantity) drilled in canopy. Submit shop drawing of canopy for approval prior to fabrication.
- J. A 3/8" x 2" bar handrail with radiused ends of # 4 brushed stainless steel finish shall be provided to meet code requirements.
- K. Car sills shall be extruded aluminum.
- L. Finished floor covering shall be furnished and installed by the elevator contractor. The type shall be "Endura" style with base color to be selected by Owner.

PART 9 – HOISTWAY ENTRANCES

9.1 ENTRANCES

- A. The entrances shall consist of flush hollow metal door panels, bolted unit type frames, sills, hanger covers, fascia plates or toe guards, headers, struts, sight guards and hardware.

9.2 FRAMES:

- A. Unit frames shall be fabricated of No. 14 U.S. gauge steel comprising the head and side jamb sections which shall be securely bolted to form one piece unit construction and shall be securely fastened to the sill and hanger support. They shall be returned on the hoistway side to present a neat appearance.

9.3 DOORS:

- A. Doors shall be flush hollow metal panels fabricated of No. 16 gauge steel, minimum. The doors shall be 1-1/4" thick and reinforced with continuous members. Panels shall have sound deadening insulation. Doors shall have removable non-metallic gibs to run in the sill guideway with minimum clearance. Door panels shall conform to the National Elevator requirements. Door unlocking devices shall be provided at all floors and as required by local codes. Sight guards shall be provided for all entrances. The doors shall be equipped with nylube door guides. See 9.9 for finish.

9.4 SILLS

- A. Sills shall be of extruded aluminum construction with a non-slip wearing surface. They shall be supported on steel brackets and securely fastened to the floor. Grooves for the door guides shall have minimum clearance for the guides. The sills must be suitable for "Class C3" loading.
- B. Sills for parking structures elevator shall be of special construction for more durability.

9.5 STRUTS:

- A. Steel angle struts (3" x 3" x 1/4") shall extend from the sill to the building beam above and shall be securely fastened to ensure rigidity and adequate support for the header.

9.6 HEADERS:

- A. Headers shall be constructed of 3/16" formed steel to provide support for the frame and hangers.

9.7 HANGER COVERS:

- A. Hanger covers shall be fabricated of No. 14 gauge steel extending the full width of the hanger pocket. A section shall be easily removable from inside the car for servicing the hanger.

9.8 FASCIA, COVERS, AND TOE GUARDS:

- A. Fascia, including hanger covers, toe guards and dust covers shall be fabricated of No. 16 U.S. gauge steel. Fascia shall span the width of the opening 6 inches. Dust cover shall extend a minimum of 8 inches above the header and the toe guard shall extend a minimum 8' below the sill. Both shall return to the wall at a 60 degree angle.

9.9 FINISH

- A. Struts, headers, hanger covers, fascia, dust covers, and toe guards shall have matte black finish. All landing doors and entrance frames shall be stainless steel with # 4 brushed finish.

PART 10 – ACCESSORIES

10.1 CAR AND/OR HALL OPERATING KEY:

- A. Provide two switches (security) for each floor. One is for on/off security and one is for momentary override. These shall be BEST cylinders with core to be keyed by UCSC Lock Shop.

PART 11 – SHOP DRAWINGS AND SAMPLE SUBMITTALS

- A. Samples: Submit samples of stainless steel, and floor, enamel colors and wall finish materials.
- B. SHOP DRAWINGS: Submit eight (8) copies of Shop Drawings as required showing the general and detailed arrangement of all elevator equipment. Show ceiling, lighting, signal fixtures, and smoke detectors including routing of exposed conduit.
- C. PRODUCT DATA: Submit the manufacturer's specification and data sheets, and standard details. Include pictures, catalog cuts, or other suitable illustrations of all elevator equipment that will be exposed in the finish work, including car, hoistway entrance, and signal and control apparatus.
- D. CERTIFICATES: Finish without cost to the Owner all certificates necessary as evidence that the elevator conforms to the applicable laws, ordinances, and requirements.

PART 12 – PERFORMANCE

12.1 CONTRACT SPEED:

- A. Actual speed shall vary no more than +/- 5% from speed specified under any loading condition or direction of travel.

12.2 LEVELING ACCURACY:

- A. Consistently level within +/- 1/4" under all loading conditions.

12.3 DOOR TIMES:

- A. The door opening time, measured from the instant the doors start to open until within 1” of the fully open position, shall not exceed Code standards.
- B. Long door and short door “hold open” times, shall be set at 4.0 and 2.5 seconds respectively.

PART 13 – EXECUTION

13.1 SITE INSPECTION

- A. Prior to preparation of drawings, the contractor shall examine the hoistway and machine room areas and verify that no discrepancies or irregularities exist which would adversely effect the execution of the work.
- B. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.

13.2 CLEANUP

- A. Keep work areas orderly and free of debris on a daily basis.
- B. Remove filings and loose materials resulting from this work from hoistways.
- C. Clean all dirt, oil and grease from machine room and pit equipment and floors.
- D. Clean car, car enclosures, entrances, hoistways, operating and signal fixtures and trim of dirt, oil, grease, and finger marks.

13.3 ACCEPTANCE DEMONSTRATION AND PERFORMANCE TEST

- A. Demonstrate to Owner, or Owner’s designated representative, the operation of the elevator system. Demonstration shall include:
 - 1. Installation compliance with specifications.
 - 2. Contract speed, capacity, and floor-to-floor performance compliance with specifications.
 - 3. Stopping accuracy and car ride compliance with specifications.
 - 4. Operation of signal fixtures and operation of supervisory or dispatching system.
 - 5. Promptly remove all work rejected by the Engineer for failure to meet specifications and replace to comply with requirements, at no additional cost to the Owner. All expenses of repairing work of other Trades damaged by this replacement shall be borne by Contractor.
 - 6. Rejected work which is not made good within a reasonable time, determined by the Engineer, may be corrected by the Owner at Contractor’s expense.
 - 7. Upon completion of installation and before final acceptance, conduct a running speed test with full design load to verify compliance with performance requirements. Also refer to Article 1.6 of this division.
 - 8. Operating Instructions: Provide instructions to the Owner’s personnel, including safety procedures, proper operation of the equipment, and routine maintenance procedures.

13.4 PERFORMANCE GUARANTEE

- A. The elevator contractor shall assume full responsibility to furnish and provide a complete and functional elevator and to obtain and furnish the University final State Elevator Inspection approval. All costs necessary to correct code deficiencies cited by the State Elevator Inspector will be paid by the elevator contractor as part of this Contract at no additional cost to the Owner.

13.5 FINAL SUBMITTALS

- A. Provide four complete sets (bound and properly arranged) of the parts lists and operators manuals prior to receiving final payment. Following is a brief summary of items:
1. Legible schematic wiring diagrams including all changes made during installation.
 2. Description of operation of elevator system installed.
 3. Pump Package: Including valve and accessories
 4. Buffers.
 5. Guide Rollers on Car.
 6. Controller and Selector: Including parts information on Relays, Printed Circuit Boards, Reverse Phase Relays, Switches, Lamps, Electrical Cables, Monitors, Modems, Diagnostic, Hardware, Diagnostic Software, and Overload Protection Devices.
 7. Door Assemblies: Including Hangers, Rollers, Door Motor, Door Operator, Door Clutch Assembly, Door Closers, Door Drive Arms, Related Hardware, Sheaves, Door Guides, Interlocks, Safety Door Edge.
 8. Signal Equipment: Including Car Stations, Hall Stations, Position Indicators, Direction Indicators, Fire Service Panel, Smoke Detectors, Keyswitches, and Pushbutton Assemblies.
 9. Car Top Inspection Station, Limit Switches, Solid State Leveling Control Units, Leveling Switches, Alarm Bell.'

13.6 TECHNICAL TRAINING

- A. On site technical training shall be held for the purpose of familiarizing UCSC Elevator Support Mechanics with operations and troubleshooting procedures. The session shall accommodate up to ten personnel in each session and consist of forty hours of training. (This to include two 2-day sessions and the fifth day reserved for any additional diagnostic training). Training on equipment controller shall be provided by trained factory service engineers for controller manufacturer through the elevator installers. Submit details of training with bid.

PART 14 - ELEVATOR GUIDELINES TO ENSURE ACCESSIBILITY BY PEOPLE WITH DISABILITIES

- A. Elevators shall meet the guidelines of the Americans with Disabilities Act using the Uniform Federal Accessibility Standards (UFAS) relevant to elevators (Section 4.10 Elevators), dated 26 January 1992, as the technical requirements.
- B. Elevators shall meet the requirements of the State of California relevant to barrier free design and elevators.
- C. Elevators shall meet UCSC ADA requirements.

PART 15 – ELEVATOR COMMISSIONING SEQUENCE PROGRESS CHECK SHSEET

15.1 Overview: Work may consist of modernization or replacement of existing elevators, or installation of new elevators. Covers both types of elevators – hydraulic type and electric traction type.

15.2 Specification Section: _____ Elevator Type & No. _____

15.2 Acknowledgements

<u>Owner</u>	<u>Contractor</u>	
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_____	_____	Shop Drawings Submitted (To A/E)
_____	_____	Print Review Completed (by UCSC Elevator Dept.)
_____	_____	Shop Drawings Approved
_____	_____	Elevator(s) – Contract UCSC Elevator Dept.
_____	_____	Telephone Order Placed (1 or 2 lines per elevator)
_____	_____	O&M Manual (Draft) Submitted and approved
_____	_____	Field Review Completed (by UCSC Elevator Dept. prior to installation)
_____	_____	Major Components Delivered
_____	_____	Jack Inspection Completed (for Hydraulic type) by UCSC Elevator Dept.
_____	_____	Electrical Complete
_____	_____	Adjusting Performed
_____	_____	Issues from Adjusting Resolved
_____	_____	Installation Complete
_____	_____	Final Adjusting Completed (UCSC Elevator Dept. attends)

_____	_____	Code Inspection Complete (State of California Elevator Inspector), Report Submitted to Owner
_____	_____	Mfgr's Performance Testing Completed (Running Speed Test with Full Design Load)
_____	_____	Elevator Accepted by UCSC Elevator Dept.
_____	_____	O&M Manual (Final Submitted
_____	_____	All Punch-List Items Completed
_____	_____	Operator Training/Instruction Scheduled and completed
_____	_____	System Accepted by Owner

DIVISION 14
CONVEYING STANDARDS

SECTION 14000: CONVEYING STANDARDS

I. GENERAL

A. CODES

1. Conveying equipment shall comply with all applicable codes.
2. Note in particular the following provisions of the ADA:

"In elevator cars, a visual car position indicator shall be provided above the car control panel or over the door to show the position of the elevator in the hoist way. As the car passes or stops at a floor served by the elevators, the corresponding numerals shall illuminate, and an audible signal shall sound. Numerals shall be a minimum of 1/2 inch high. The audible signal shall be no less than 20 decibels with a frequency no higher than 1500 Hz. An automatic verbal announcement of the floor number at which a car stops or which a car passes may be substituted for the audible signal."

3. ADA appendix: "A special button may be provided that would activate the audible signal within the given elevator only for the desired trip, rather than maintaining the audible signal in constant operation."

Note non-standard ADA emergency communication provisions below.

4. Design shall comply with California Building Code Part 7: Elevator Safety Construction Code.
5. *Elevator cab dimensions shall comply with gurney requirements as specified in CCR Emergency Medical Access (CCR 3003.5.1a).*
6. *Consultants are advised that the California Elevator Safety Code Title 8 has adopted many of the requirements of ASME A17.1. This code impacts the following areas: sprinklers and smoke detectors located in the hoistway and machine room, shunt trip of elevator power and sump pumps. The campus in consultation with the Fire Marshal and the State elevator inspector have developed a standard for elevator configuration that complies with this code as follows: The hydraulic oil and elevator cab shall be constructed of non-combustible materials and certified as such by the manufacturer. The hoistway enclosure shall be constructed of fire resistive construction. Fire sprinkler heads and smoke/heat detectors are not to be installed at the top of the hoistway. A heat detector with shunt trip control of the elevator shall be installed in the elevator machine room within 2 feet of the fire sprinkler head. A smoke detector shall be installed in the machine room to recall the elevator. A sump pump with an oil sensor shall pump pit water to the sewer via an air gap. The sump pump controller panel shall not be installed in the hoistway or machine room. PLEASE COORDINATE WORK OF MECHANICAL AND ELECTRICAL CONSULTANTS WITH THESE REQUIREMENTS.*

- B. *Qualifications - Elevator installer shall have offices located within 1 hour drive of campus to facilitate service during warranty period.*

II. MATERIALS

1. Elevator or wheelchair lift shall be provided with a telephone. Terminate telephone station cable at elevator enclosure and at cable closet punchblock as directed by Owner's Representative.
 - a. *Telephones must be a ring down type. Stainless steel face. Hands free. Adjustable conversation timer. Automatic disconnect.*
 - b. *Telephone shall be CEECO model 'SSP-571X-w/Braille Plate' (full size model) 'SSP-550X-w/Braille Plate' (mini-model), to match existing, no substitutions.*
 - c. *Telephone instrument shall be mounted in an enclosed cabinet accessible via a hinged cover. Telephone shall not be a speakerphone integrated into the control panel.*
2. *Provide a sump pump on emergency power controlled by Stancor Inc. Oil Minder system integral pump and oil sensor (no known equal) level control set to disable pump operation in the presence of oil. (Tel. # 203-268-7513). Locate controller outside of elevator machine room and hoistway. Route discharge piping to the sanitary sewer via an air gap.*
3. Provide tamper/vandal proof hall and cab push buttons.
4. Flooring to be rubber. Normament 925A or 885B.
5. Elevator cab underlayment sub-floor to be high density plywood or particle board.
6. Elevator controller shall be non-proprietary type so as to allow service and programming by UCSC or elevator service companies selected by the University. There shall be an integral LCD display to accomplish field programming: Elevator Controls Model 800, or equal.
7. Rails shall comply with the Title 24 regulations for handrails, including provisions regarding cross-sectional dimensions and gripping surfaces.
8. Signs: Provide signs with print and Braille as follows:
 - a. At telephone:

EMERGENCY PROCEDURES
In case of emergency, press button.
Voice communication is not required;
Emergency personnel will respond.
 - b. Near call buttons outside elevator:

ELEVATOR INFORMATION
If this elevator is not functioning , call x9-4444 (24 hours/day)
For campus information, call the campus operator (x0).
The nearest telephone is [to be filled in for each building].
[If there is a second elevator or alternate route out of the building, that will be listed here)
The nearest Area for Evacuation Assistance is [to be filled out for each floor of each building]
9. *Piping shall be approved steel piping between pump and ram (no rubber piping). Use ball valves, not gate valves.*

III. EXECUTION

1. Acceptance testing:

Contractor shall arrange for State of California Inspector testing and acceptance. Contractor shall obtain State of California load test and operating permit upon completion and deliver to UCSC Electrical maintenance supervisor via University's Representative.

2. Keys:

Deliver two copies of fire recall and elevator operating keys to UCSC Electrical maintenance supervisor via Owner's Representative.

3. If emergency generator power is available, connect it to car emergency lighting

4. Operation during a power failure:

Hydraulically operated elevators are preferred because they can be lowered during a power failure. Provide hydraulic elevators with self-lowering capabilities so that the car is automatically lowered to the bottom floor and the doors are opened during a power failure.

5. Maintenance during Warranty Period:

Provide complete continuing maintenance (including labor and materials repair) on entire elevator equipment during regular working hours during warranty period at no additional cost.

6. Maintenance Tool and Software Manuals:

Should micro processor based control system be used, provide maintenance tools, adjusting procedures and supporting software documentation required for the complete maintenance of the entire system including diagnostics and adjusting. Maintenance tool may be hand held or built into control system and shall be of the type not requiring recharging or reprogramming nor of the automatic destruct type. The tool and supporting software may be programmed to operate only with this project's identification serial numbering. *Maintenance tool shall allow University's campus wide elevator maintenance contractor to maintain the elevator.*

7. Elevator Recall:

When smoke is detected at non-recall floors, elevator shall be recalled to the lowest floor that allows grade level access without stairs (confirm location with campus Fire Marshal). If smoke is detected at the recall floor, the elevator shall be recalled to the floor above the recall floor.

8. Hydraulic Piping:

Hydraulic piping and telemetry cabling to be routed above grade, if possible. Below grade piping shall be wrapped to prevent corrosion.

9. Do not locate exhaust fan in elevator machine room. See Elevator Safety Code.

DIVISION 14 CONVEYING SYSTEMS

SECTION 14240 – ROPED HYDRAULIC PASSENGER ELEVATOR (HOLELESS)

PART 1 – GENERAL

1.1 GENERAL CONDITIONS

- A. The Contractor under this Division of the Work (elevator contractor) is referred to the Contract Forms and General Conditions of these specifications, all of which apply to this Division of the Work.

1.2 SCOPE OF WORK

- A. The work of this division shall consist of the complete installation of one roped hydraulic passenger elevator in the _____ Building located on the UCSC campus. Bidders shall include all labor, materials, and services required for the complete installation of all the elevator equipment as herein specified, including hoistway entrances and elevator car enclosure.
- B. In all cases where a device or part of the equipment is herein referred to in the singular, it is intended that such reference shall apply to as many of such devices or parts a required to make a complete installation.
- C. Provide elevator commissioning as outlined in Part 15.0.

1.3 GENERAL

- A. These specifications cover the complete installation of the elevator system, in accordance with the drawings and as specified herein. The elevator contractor shall include all work and materials, except that listed under “Related Work By Other Contractors”, for a complete and operational job.

1.4 *ACCEPTABLE ELEVATOR INSTALLERS

- A. Elevator Service Co.
- B. Kone Elevator Co.
- C. Schindler Elevator Co.
- D. Otis Elevator Co.
- E. Thyssen/Krupp
- F. Ascent Elevator

*Note 1: Above is not a list of elevator manufacturers; it is a list of INSTALLERS only. Elevator installer must provide the equipment specified.

*Note 2: General contractor shall in his/her bid name all the sub-contractors during bid opening.

1.5 DRAWINGS

- A. Before beginning fabrication and work, the elevator contractor shall prepare all drawings necessary to show the general arrangement of the elevator equipment. Approval of drawings and other data (submit minimum of eight sets), which are submitted by the elevator contractor through the General Contractor, to the Owner and architect. Drawings must be obtained before proceeding with fabrication and installation of the equipment. Field verify existing conditions and hoistway sizes prior to preparation of drawings.

1.6 REQUIREMENTS OF REGULATORY AGENCIES

- A. Perform all work in accordance with applicable codes, the California Safety Code (Title 8), the National Electrical Code, and the American National Standard Safety Code for Elevators; ANSI A17.1-2004, as referenced therein and all of the provisions in the UCSC Standard General Conditions. Give all necessary notices, obtain all State and Municipal permits, pay all fees necessary in connection with the installation,

including sales and use taxes as applicable, and make all tests as are called for by the regulations of such authorities. These tests shall be made in the presence of the authorized representative of such authorities and the owner's representative. It is the responsibility of the elevator contractor to provide any variances from the Governing Authority that could be necessary for a complete acceptable elevator installation. Also refer to Article 14.3 of this Division.

- B. Comply with "Elevator Guidelines to Ensure Accessibility by People with Disabilities" as noted in Part 14.0.

1.7 GUARANTEE

- A. The elevator contractor shall guarantee that the materials and workmanship of the apparatus installed by him under this specification are first-class in every respect, and that he will make good any defects not due to ordinary wear and tear or improper use or care, which may develop within one year from date of final payment.

1.8 SCHEDULING OF OPERATIONS

- A. During the progress of the work, job meetings will be subject to call between the Owner's representatives, and the contractor's representatives. The Contractor shall provide a representative to attend meetings held from time to time for the purposes of schedule coordination and consideration of technical and construction matters. The Contractor's representative shall be the job superintendent or other person who is authorized to act as the agent of the Contractor.
- B. Refer to bid documents for schedules of start and completion of constructions.

1.9 MAINTENANCE

- A. After completion of the installation, maintenance and 24-hour callback service for the equipment furnished under this specification shall be provided for a period of twelve (12) months as part of this Contract. This service shall also include regular examination (biweekly); advise UCSC electric shop at 831-459-2581 each time after completion of service and supply written record of service to the University and logged in machine room, this should include an oil log of the installation during regular working hours by trained employees of this Contractor, and shall include all necessary adjustments, greasing, oiling, cleaning supplies and parts to keep the equipment in proper operation, except parts made necessary by misuse, accidents or neglect caused by others.
- B. All maintenance service must be performed by the installers and not by any other services agency. Also, the installer must have an established maintenance and service organization available for performance in the County of Santa Cruz that can provide regular and emergency service, 24 hours a day, every day of the year.
- C. Elevator service provider and/or UCSC Fire Department respond to elevator entrapments.
- D. Work is to be performed by the contracted Elevator Service Provider and submit to electric shop a record of the work performed during the entrapment incident. Electric shop will keep log of all incidents that occur.
- E. The elevator contractor shall be responsible to service record and maintain all elevator emergency circuits including the fire service circuit, related equipment and sensors as part of the regular electric shop contract.

1.10 RELATED WORK OF OTHER DIVISIONS

A. Following is a brief description of work by other divisions included in this Contract. The elevator contractor shall co-ordinate this work with the General Contractor. This work must be done in accordance with the codes having jurisdiction and the approved drawings of the elevator contractor.

1. Pit and Hoistway:
 - a. Provide a legal hoistway, properly framed and enclosed, and a pit of proper depth.
 - b. Provide access ladder in pit.
 - c. Provide recesses for hall indicators and hall buttons.
 - d. Install all supports for guide rail brackets. Guide rail bracket inserts shall be furnished by elevator subcontractor.
 - e. All cutting of walls, floors, or partitions, together with any repairs made necessary thereby, if any.
 - f. All painting of hoistway, machine room floor, walls and ceiling and elevator pit floor and walls. Apply two coats of light gray oil based paint to elevator pit floor, pit walls (paint pit walls to the height of lowest landing sill), elevator Machine Room floor and two coats of oil based white semi-gloss paint to Machine Room walls and ceiling.
 - g. Rough openings, as required by the elevator contractor's drawings.
 - h. The hoistway walls shall not receive finished treatment whether it is material or paint, until the elevator entrances have been set in place by the elevator subcontractor.
 - i. Provide bevel guards where beams or walls project beyond 2" into general line of hoistway.
 - j. Provide recesses and/or supports for the entrance sills of horizontal slide passenger type hoistway doors.
 - k. Provide grouting under sills and around frames, after the entrances are fastened in place.
 - l. Furnish, install and maintain the required fire rating of elevator hoistway walls, including the penetration of firewall by elevator fixture boxes.
2. Machine Room:
 - a. Provide a properly lighted and ventilated machine room. Temperature in Machine Room to be maintained between 60 deg. F and 80 deg. F. Provide mechanical cooling for machine room where shown and specified. Lighting in Machine Room shall be fluorescent type. Position lighting so it does not create shadows while service personnel are working on major equipment.
 - b. Provide a 15-pound class B-C fire extinguisher in elevator Machine Room.
 - c. Provide access doors, in the Machine Room, Main entrance door to elevator Machine Room shall be self-closing/self-locking type. Door hardware shall be keyed to UCSC Lockshop system.
3. Electrical Work:
 - a. Adequate power from the power mains to fused disconnect switch in elevator Machine Room as required, including necessary fused mainline disconnect switches. All power work from mainline disconnects switches in elevator machine room to controllers and other elevator equipment shall be provided by the elevator contractor.
 - b. Provide one separate 120 volt single phase circuit protected with a heavy-duty type fused disconnect switch in elevator Machine Room for car lighting. Provide additional disconnect and circuits for ventilation; monitoring devices, GFCI protected plugs on car and hoistway. Wiring and conduit from life safety panel or any other monitor station to elevator machine room.
 - c. Provide a duplex electrical receptacle (3 ft. above finished floor), light and switch in the pit. Provide a duplex electrical receptacle, light and switch within 18" of lock-side of jamb in machine room. Provide duplex electrical receptacle near controller and whatever additional electrical receptacles are needed to meet ANSI 17.1-2004 and N.E.C. Codes. Light in the pit shall be operable from hoistway door opening.
 - d. Provide a single tube continuous fluorescent light fixture strip (full height of hoistway) with guard. This lighting shall be operable from the elevator pit and top landing. All receptacles shall be GFCI type.
 - e. Telephone conduit between nearest telephone closet and junction box in elevator machine room.
4. All telephone cable and conduit between machine room terminals and controller and car shall be provided by elevator contractor.

PART 2 – OUTLINE OF NEW EQUIPMENT (TO BE FILLED OUT BY ELEVATOR CONSULTANT)

- A. Quantity: _____
- B. Capacity: _____ pounds
- C. Speed: _____ FPM
- D. Travel Distance: _____,
- E. Stops/Number of Openings Front: _____ (_____ Front, _____ rear)
- F. Floors Served, _____, _____, _____, _____, _____ (_____ is Main Floor Egress)
- G. Platform Size (Width x Depth): _____' - _____" (side to side) x _____' - _____" (front to back), size to be maximum allowable.
- H. Door Size/Operation: _____' - _____" Wide x _____' - _____" High, Two-Speed
- I. Machine Type: Hydraulic/Location
- J. Control: Microprocessor Type, See 11.0
- K. Operation: Selective/Collective
- L. Entrances: _____' - _____" Wide x _____' - _____" High, Two-Speed, Operating Fixtures: See item 7.0 and 11.0
- M. Power Supply: 208 Volts/3Phase/60 Cycle;
- N. Motor Data: HP/Manufacturer & Model/Efficiency
- O. Auxiliary Operations: See Specifications 4.2, 4.3, 4.4
- P. Hoistway Size: _____' - _____" Wide x _____' - _____" Deep Approx.;
- Q. Machine Room Location – room number: _____
- R. Guides – Roller Type. See item 11.0
- S. Pit Depth – (4' -0" +/-) Field verify
- T. Additional Features:
 1. Multi-light LED hall position indicator at main floor landing and inside car.
 2. Infra-red type door protection
 3. Fire service Phase I and Phase II
 4. Car ventilation blower
 5. Hoistway access package
 6. Protective pads and hooks
 7. Telephone and telephone cabinet (see 7.4)
 8. Certificate frame
 9. Hand-rails
 10. Emergency car light (integral with car operating panel)
 11. Provisions for handicapped: raised makings for hoistway door jambs, adjustable door open times
 12. Refer to "Elevator Guidelines to Ensure Accessibility by People with Disabilities" item 15.0.
 13. Car suitable for a medical stretcher.
 14. Inside car emergency red light to indicate elevator machine failure.

PART 3 – PRODUCTS

3.1 HYDRAULIC ELEVATOR

- A. Oil Hydraulic Machine:
 1. The power unit shall be of a compact, self-contained design including pump, drive motor, oil control unit assembly, oil storage tank, removable drip pan and a rigid structural steel frame with storage tank supports. Unit shall be sound attenuated and be mounted on 2-inch thick 4" x4" isolation neoprene pad.
- B. Pump:
 1. The pump shall be a positive displacement screw type, for maximum smoothness and quietness and shall be directly coupled to the motor. Do not use pumps mounted in the oil.
- C. Motor:
 1. The drive motor shall be of premium efficiency and have a duty rating sufficient for hydraulic elevator requirements.

- D. Oil Control Unit:
1. The oil control unit shall consist of electrically actuated and hydraulically operated valves with all adjustments accessible without removing the assembly from the oil lines. An automatic bypass valve shall provide smooth starting and stopping in the up direction and shall give regulated up leveling speed under varying load conditions in the car. The lowering and down leveling valve shall be fully adjustable for smoothness and speed of operation and shall be designed to close automatically if the power fails. Operation of a manual valve shall permit the car to be lowered at slow speed in the event of the power failure. A safety check valve shall hold the car when the pump is at rest and a relief valve shall be provided which is capable of bypassing the entire output above the normal working pressure. Permanently install a liquid filled pressure gauge on oil control unit.
- E. Oil Storage Tank:
1. The oil storage tank shall be of sufficient capacity for the full travel of the car with a reserve of not less than 10 gallons and shall have a drain connection, means of isolating oil in the tank for servicing of pump and valves, an effective pump suction strainer and a removable cover. The cover shall be designed for low velocity breathing with a protected vent opening to prevent entry of liquids or debris into the tank. Tanks with single small vent openings shall be guarded against accidental blockage, which may cause collapse of the tank during operation of the elevator in the up direction. Tank to be located in elevator equipment room.
- F. Oil:
1. Sufficient specially prepared hydraulic oil with greater than 400 degrees F. flashpoint and proper viscosity and lubricating qualities shall be provided. Indicate type of oil used and its viscosity value.
 2. Oil shall be of the biodegradable type listed as green product in USGBC directory of green products .
- G. Sound Reduction with Isolating Panels and Muffler:
1. In addition to selection of individual components to minimize noise generation, a blow-out proof muffler for absorption of hydraulic pulsations shall be installed in the oil line between the pump and the cylinder, and the hydraulic machine shall be provided with rubber isolation pads to prevent transmission of noise and vibration to the building structure. Sheet steel panels lined with sound-deadening material shall enclose the motor and pump location area of the hydraulic machine for reduction of air-borne noise.
- H. All Hydraulic Supply Piping:
1. Shall be at least schedule 80 pipe. Welded pipe only. No grooved fittings are allowed. The system must be free from seepage at all joints.
 2. All piping shall be run above ground, exposed for maintenance.
 3. Maximum total length of piping is 30 ft. .
 4. pipe acoustical insulation shall be Sounddowns quilted 2 inch thick pipe wrap with reinforced mylar protective finish . Manufacturer is SOUNDDOWN . Insulation shall include all fittings .
- I. Shut-Off Valve:
1. Manually operated valves shall be provided and installed in the oil supply line to isolate the cylinder and plunger unit from the hydraulic machine. Provide two valves-one in pit near jack assembly and another one in the machine room near machine. Valves shall be rated twice the operating pressure and shall be the same size as the pipe.
- J. Oil Strainer:
1. A self-cleaning strainer shall be provided and installed in the oil line between the hydraulic machine and the cylinder plunger unit to protect the oil control valves during downward travel of the elevator. The strainer shall have a 40-mesh screen for removal of solid particles and a magnetic drain plug for removal of ferrous materials. The strainer assembly shall be designed for at least 600 psi. working pressure.
- K. Isolation Coupling (s):
1. One isolation coupling(s) shall be provided to abate the transmission of noise produced by the vibration of the pumping unit. Proper location of the isolation coupling(s), in the oil deliver line, shall be determined by the elevator subcontractor.

L. Cylinder and Plunger Unit:

1. The cylinder shall be fabricated of steel pipe, closed at the bottom and provided with a removable cylinder head and packing gland at the top. The cylinder head shall have a bronze, babbitt or phenolic-lined bearing and an integral drip ring. Packing shall be of the self-adjusting type not requiring external adjustment and shall allow operation of the plunger with minimum friction. The packing gland shall be arranged to return automatically to the reservoir any oil, which may escape the packing ring. Structural steel shapes shall be provided to support the cylinder and to transmit vertical loads to the pit floor.
2. The plunger shall be constructed of seamless steel pipe or tubing turned true and smooth and polished to a fine finish. A stop plate to prevent the plunger from leaving the cylinder shall be welded to the bottom of the plunger.
3. Grey cast iron or other brittle materials shall not be used and the cylinder and plunger unit shall be factory tested at not less than 600 psi, or as per ASME A17.1-2004 and State of California Elevator Code. For strength and freedom from leakage. Units of multiple section construction shall be securely joined by couplings. Cylinder couplings shall have all joints welded before installation to prevent leakage.
4. Provide a stainless steel drip pan (at pit floor) or drip ring around cylinder with scavenger pump. Oil piping between pump and oil storage tank and all related power wiring.

M. Ropes:

1. Ropes shall be same as used on traction elevators per ASME A17.1-2004

3.2 CONTROL

A. Controller:

1. The elevator controller shall utilize a microprocessor based logic system and shall comply with (ANSI/ASME 17.1-2004) safety code for elevators. The system shall provide comprehensive means to access the computer memory for elevator diagnostic purposes without need for any external devices, and shall have permanent indicators to indicate important elevator status as an integral part of the controller. Systems that require hookup of external devices for troubleshooting are not acceptable. The elevator control equipment shall be provided such that at least three (3) elevator service companies can maintain the equipment. Immediate availability of replacement parts shall be guaranteed and no special proprietary diagnostic devices will be utilized. An O.E.M. control, serviceable only by the O.E.M. will not be accepted. Controller shall be provided with the capability of in-the field changes for certain variables such as door time. These changes should be stored permanently using non-volatile memory. Thus, if the power to the unit is disconnected, the system will maintain the programmed variables. The Car Diagnostic Display shall have the capability of selecting either the operational or programming modes and/or displaying the status of all inputs and outputs and capability of remote diagnostics to be interfaced with UCSC's elevator shops future IBM compatible computer system.
2. Failure of any single magnetically operated switch, conductors, 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, conductors 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.
3. Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is open, when the door locks are open, when the elevator is running at high speed, when the elevator is on independent service, when the elevator is on fireman's service, when the elevator out of service timer has elapsed or when the motor limit timer or valve limit timer has elapsed. Provide a switch, in case of the duplex, to select which of the two cars' statuses is to be displayed on the indicators, in addition, provide means of displaying other special or error conditions that are detected by the microprocessor.

4. The elevator shall not require the functioning or presence of the microprocessor to operate normally during car top inspection operation or hoistway access operation in order to provide a reliable means to move the car if the microprocessor fails.
5. A Motor limit timer function 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 them and the elevator shall then be rendered unresponsive to any automatic operation. Operation may be restored by cycling the power disconnect switch or putting the car on access of inspection operation.
6. A valve limit timer function 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 them and the elevator shall then be rendered unresponsive to any automatic operation. Operation may be restored by cycling to power disconnect switch or putting the car on access or inspection operation.
7. Low Oil Control:
 - a. A low oil control feature shall protect the hydraulic components if the elevator fails to complete its upward travel in the normal time.
 - b. Actuation of the low oil control circuit shall stop the pump and lower the car to the lowest landing. Power-operated doors shall open to permit passengers to depart and shall then close. The car shall remain parked at that landing completely removed from demands for service.
 - c. To return the car to normal service, the malfunction shall be corrected and the elevator controls reset in the machine room.
8. 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.
9. Door protection timers 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 close the door locks after predetermined time.
10. 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 cancelled. A hall call time value shall predominate whenever a hall call is cancelled. In the event of a door reopen from the safety edge, photo eye, a separate short door time value shall predominate.
11. Door Timing – Separate adjustable timing means shall be provided to establish independent minimum passenger transfer time for car stops, hall stops, main lobby stops, and door reversal operations (short door time.)
12. Hall call 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 acknowledgement lamp with a separate wire are not acceptable. Phase I emergency recall operation, and Phase II emergency in-car operation shall be provided within the controller according to applicable local codes.
13. Independent service operation shall be provided such that 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 arrival lanterns and gongs shall be inoperative.
14. The car shall be equipped with two-way leveling to automatically bring the car within plus or minus ¼ inch of exact level at any landing regardless of load up to maximum capacity.
15. 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.
16. A test switch shall be provided. In the “test” position, this switch shall allow independent operation of the elevator without any door open functioning for purposes of adjustment or testing the elevator. The elevator shall not respond to hall calls and shall not interfere with the other car in a duplex installation.

17. 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 pushbuttons. Call demand at another floor shall cause the car to eventually ignore the defective call and continue to provide service in the building.
18. Simplex selective collective automatic operation shall be provided for the single car installations. Operation of one or more car call 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 call or hall call set for the direction of travel of car. Stops shall be made in the order in which the car calls or hall calls set for the direction of operation of the elevator are reached, irrespective of the order in which they were registered. If only hall calls set for the opposite direction of travel of the elevator exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting calls.
19. Simplex home landing operation shall be provided and, if no calls are registered shall cause the car to travel to a predetermined home landing floor and stop without providing a door operation. The ability to change home landing feature shall be provided.
20. If the car is enroute to the home landing and a call appears from the direction opposite to which the car is traveling, the car shall slow down, stop, and then accelerate in the opposite direction, toward the call. The home landing function shall cease instantly upon the appearance of a normal call and the car shall proceed non-stop in response to any normal call.
21. Provide fluorescent lighting at front and back inside the controller cabinet.
22. Manufacturer:
 - a. Elevator controller shall be as manufactured by Elevator Control Model 800 or Motion Control Engineering model HMC, or SMARTRISE (modified to include all features noted above including soft start features to limit inrush current and remote diagnostics). Also see item 11.0.

B. Collective Operation:

1. Operation shall be automatic by means of the car and landing buttons. Stops registered by the momentary actuation of the car or landing buttons shall be made in the order in which the landings are reached in each direction of travel after the buttons have been actuated. All stops shall be subject to the respective car or landing button being actuated sufficiently in advance of the arrival of the car at that landing to enable the stop to be made.
2. If all calls in the system have been answered, the car shall park at the last landing served or the predetermined home landing.

PART 4 – AUXILIARY OPERATIONS:

4.1 FIREFIGHTER’S SERVICE:

A. The following operation is for the use of firemen and other authorized personnel.

1. Automatic passenger elevators shall conform to the following:
 - a. A three position (on, off, and by-pass) key-operated switch shall be provided at the main floor for each single elevator or each group of elevators. The key shall be removable only in the “on” and “off” positions. When the switch is in the “on” position, all elevators controlled by this switch and which are on automatic service shall return non-stop to the main floor, and the doors shall open and remain open.
 - 1) An elevator traveling away from the main floor shall reverse at the next available floor without opening its doors.
 - 2) Elevators equipped with automatic power-operated doors and standing at a floor other than the main floor, with doors open, shall close the doors without delay and proceed to the main floor.
 - 3) Door reopening devices for power-operated doors, which are sensitive to smoke, heat or flame shall be rendered inoperative.
 - 4) All car and corridor call buttons shall be rendered inoperative and all call registered lights and direction lanterns shall be extinguished and remain inoperative.
 - 5) A car stopped at a landing shall have its “Emergency Stop Switch” rendered inoperative as soon as the doors are closed and it starts toward the main floor. A moving car, traveling to

or away from the main floor, shall have its “Emergency Stop Switch” rendered inoperative immediately.

- 6) A sensor in each elevator lobby, which when activated prevents cars from stopping at that floor, shall not be substituted for the above requirements.
- b. Sensing Devices: In addition to the key-operated switch required in “1” above, heat and smoke or products of combustion sensing devices shall be furnished and installed in each elevator lobby at each floor, except the main floor (Note – Egress floor is 1st floor.) The activation of a sensing device in an elevator lobby shall cause all cars in all groups that serve that lobby to return non-stop to the main floor. The key operated switch when moved to the “by-pass” position, shall restore normal service independent of the sensing devices. Smoke detectors shall be photoelectric type, 120 vac. entex Corp. Model 8100. Submit drawings showing locations of smoke heads and exposed conduit for owner’s approval prior to installation.
 - c. A three position (off-hold-on) key-operated switch shall be provided in each car and shall be effective only when the main floor key-operated switch is in the “one” position or a sensor has been activated and the car has returned to the main floor or other approved level. The key shall be removable in all positions, and shall not change the operation until the car is at a floor with doors fully opened.
 - d. The operation of elevators on Fire service shall be as follows:
 - 1) An elevator shall be operable only by a person in the car.
 - 2) Elevators shall not respond to elevator corridor calls.
 - 3) The opening of power-operated doors shall be controlled only by continuous pressure “open” buttons or switches. If the switch or button is released prior to the door reaching the fully open position, the doors shall automatically recluse. Open doors shall be closed by continuous pressure on “Door Close” switch or button.
 - 4) Mean shall be provided to cancel registered car calls.
 - 5) When the switch is in the ‘hold’ position, the car shall remain at the floor with its doors open.
 - 6) Elevators can be removed from individual car fire service by moving the key-operated switch to the “off” position and the car is at the main floor or other approved level.
 - e. The switches required above shall be operated by the same key but are not a part of a building master key system. There shall be a key for the main floor switch and for each elevator in the group and these keys shall be kept on the premises by person responsible for maintenance and operation of the elevators, in a location readily accessible to authorized persons, but not where they are available to the public. **TURN OVER ALL KEYS TO PROJECT MANAGER.** Project Manager shall deliver key to elevator foreman. These keys shall be the Fire Service Keying System.
 - f. Instructions of operation shall be provided as required by code.

B. Elevators arranged for dual operation shall: (Applicable to dual elevators in one lobby)

1. Conform to the automatic operation described above when on automatic operation.
2. Be provided with a signal system consisting of both visual and audible types to alert the attendant to close the door and return non-stop to the main floor or other approved level. Provisions shall be made to alert the attendant in the same manner when a heat and smoke or products of combustion sensing device is activated.

C. Alternate Floor Fire Service:

1. The activation of a sensing device at the main floor lobby (item 2 above) shall cause the elevator to return non-stop to the alternate floor and the doors shall open and remain open. The alternate fire service floor shall be the 2nd floor.
2. Operation to the elevator shall conform to “Firefighters’ Service.” When sensing devices are activated, the elevator shall return non-stop to the designated egress floor and the doors shall open and remain open.
3. When building sensor activate at the egress fire service floor, elevator shall automatically be dispatched to that building’s 2nd floor, which has been designated “alternate” fire service floor where the elevator doors shall open and remain open.

4.2 LOAD BYPASS OPERATION: NORMALLY NOT REQUIRED

4.3 ANTI-NUISANCE FEATURE: NORMALLY NOT REQUIRED

4.4 INDEPENDENT SERVICE OPERATION: (To be provided.)

- A. A two-position switch shall be provided in the car-operating panel.
- B. When the switch is placed in the independent service position, the mode of operation shall be amended as follows:
 - 1. The car is disconnected from the supervisory system.
 - 2. Existing car calls shall be cancelled.
 - 3. The cars shall bypass landing calls.
 - 4. Continuous pressure on the car button of the selected floor shall close the doors and start the car toward the selected floor. Pressure shall be required on the button until the car starts. Releasing the car button before the car starts shall cause the doors to automatically reopen.
 - 5. After the car has arrived at the floor and the doors have automatically opened, the cars shall remain until another car button is pressed or until they key switch is returned to the normal position.

PART 5 – HOISTWAY EQUIPMENT

5.1 PROVISIONS FOR HOISTWAY ACCESS:

- A. Keyway:
 - 1. Furnish and install hoistway door unlocking devices at all landings (with removable plugs) in accordance with requirements of the latest Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, and as permitted by the local Code.
 - 2. The hoistway door-unlocking device shall unlock and permit the opening of the hoistway door from the access floors irrespective of the position of the car. The design of the device shall be such as to prevent unlocking the door with common tools. The means for unlocaking the door shall be available and used only by inspectors, maintenance men, and repair men.
- B. Hoistway Access:
 - 1. Furnish and install hoistway access switches and associated devices (at floors 1 and 2) in accordance with requirements of the latest Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, and as permitted by Local Code.

5.2 TOP OF CAR OPERATING DEVICE:

- A. An operating device shall be provided on the top of the car located in the front between the car crosshead and hoistway door, complete with an Emergency Stop Switch, a Selections Switch, and UP and DOWN Operating Buttons. This device shall comply with ANSI A17.1-2004 and local codes.
- B. Operation from the top of the car shall not be permissible unless all electric door contacts are closed.

5.3 PIT STOP SWITCH:

- A. A switch shall be located in each elevator pit, in accordance with ANSI A17.1-2004 and local codes.

5.4 LANDING DOOR HANGERS

- A. Each hoistway door shall be suspended by two (2) sheave type hangers running on a hanger track provided integral with the hoistway entrance. Each hanger shall consist of a polyurethane tread on a metal hub equipped with precision ball bearings mounted onto a steel bracket. The hanger sheaves shall not be less than 3-1/4 inches in diameter. The track shall be so shaped as to permit free movement of sheaves without regard

to vertical adjustment of the sheave brackets. An up-thrust roller shall be provided beneath the track and each sheave wheel, capable of withstanding a vertical thrust equal to the carrying capacity of the upper sheave. The up-thrust roller shall be adjustable for fine vertical adjustment and the face of the roller shall be so shaped as to conform to the bottom face of the hanger track.

B. Manufacturer: GAL, with MOM operator.

5.5 ELECTRIC WIRING

- A. Complete insulated wiring shall be furnished and installed to connect all parts of the equipment furnished by the elevator contractor. Wiring shall conform to the requirements of the latest edition of the National Electrical Code. Include rigid conduit or EMT, at least ½” diameter, and short lengths of flexible conduit. Conduit or EMT shall terminate in junction boxes. Conduit, EMT, wiring duct, conduit fittings, enclosures and junction boxes shall be galvanized steel or aluminum.
- B. All wiring shall have a flame retarding moisture resisting outer cover and shall be run in metal conduit. Flexible metallic tubing or wire ducts.
- C. Traveling cables shall have flame retarding and moisture resisting outer cover. They shall be flexible and suitably suspended to relieve strains in the individual conductors. Provide the required quantity plus at least 210 percent spares. All wiring between telephone in car and a junction box in elevator machine room shall be provided by the elevator contractor. Conductors shall be numbered to correspond to numbered terminal at the car and machine room
- D. Terminal blocks shall be coded to identify the circuits. Multiconductor cables shall have the conductor color coded and numbered.
- E. Each elevator car shall be provided with a suitable GFCI receptacle fitted with a wire lamp guard on top of the car and a suitable duplex plug receptacle.
- F. Unless otherwise specified, control wiring shall be minimum size #18 AWG. Wire size shall be large enough so that the voltage drop under inrush conditions will not adversely affect operation of the controls.
- G. Electrical Receptacle in Car: Provide duplex electrical receptacle in car. Locate receptacle approximately 2” above finished floor below car station. Provide matching face plate on receptacle.
- H. Phase Protection: Provide 3-phase power monitor for elevator power supply, which monitors phase loss, low voltage, phase reversal, phase unbalance, and has an automatic reset. The three-phase power monitor shall be Time Mark Corp. model 257 or model approved by the Elevator Shop.
- I. Execution:
 - 1. Install all power wiring in raceway system. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.
 - 2. Splice cables and wires only in outlet boxes, junction boxes or pull boxes. (Note – No wire splicing allowed in raceway or wire ducts.)
 - 3. Install cable supports for all vertical feeders in accordance with the NEC. Provide Kellum GRIP type supports, which firmly clamp each individual cable and tighten due to cable weight.
 - 4. All terminal strip connections shall be identified with corresponding reference numbers from cable termination chart and electrical straight-line diagrams.

5.6 MACHINE FINISH AND PAINTING

- A. All exposed surfaces of machines and motors, controllers, etc., shall be repainted after field installation and before acceptance by Owner with rust resisting gloss enamel paint.

5.7 EMERGENCY ALARM BELL (May be deleted)

- A. An alarm bell shall be provided and mounted on the car. When the emergency alarm bell button in the car is pressed, the alarm bell shall sound.
- B. Alarm bell should operate per ASME A17.1-2004 and State of California Elevator Code.

5.8 GUIDE RAILS

- A. Planned steel tee guide rails shall be furnished and installed to meet ANSI A17.1-2004 requirements, including suitable brackets and clamps for attachment to the building structure. The guide rails and car frame shall be so located that the car is in balance with the guides. The machined tongue and groove joints shall be fitted with machined fishplates fastened to each rail with at least 4 through bolts. Rails are to be cleaned of any shipping or protective coatings at time of installation.
- B. All joins shall be located free of interference with supporting clamps and brackets. Shims used to obtain rail alignment shall be designed to remain in position, even though the fastening bolts may be loosened.
- C. The guide rails shall be installed and aligned with their machined faces plumb within one-eighth of an inch from top to bottom of the hoistway.
- D. Minimum Rail Size – 16 pounds/ft. upgrade rails based on application
- E. Note: For an elevator replacement, guide rails may be reused.

5.9 BUFFERS

- A. Buffers shall be installed in the pit to meet ANSI A17.1-2004 requirements. These buffers shall be fastened to steel channels furnished and installed by the Elevator Contractor.

5.10 TERMINAL STOPPING DEVICES

- A. Slow-down, normal and emergency stopping devices shall be furnished and installed for the car. The devices shall be so arranged that as the car approaches either terminal landing, a roller with noiseless tread, mounted on a moveable car, shall come into contact with cams located in the hoistway, and through the operation of the stopping device, bring the car automatically to a smooth stop at the terminal landing. The full width of the roller tread shall engage the cam surface. The emergency car stopping system shall comply with the A17.1 – 2004 requirements.

5.11 LANDING SYSTEM

- A. This landing system shall provide high speed stepping signals, one-floor-run stepping signals, leveling, and door zone signals. Each output signal shall be electrically isolated and shall be capable of reliably operating at 120VAC.
- B. The system shall consist of a steel tape with mounting hardware to accommodate the complete travel of the elevator, a car top assembly with tape guides and sensors, and magnetic strips for stepping and leveling.
- C. The leveling and stopping accuracy of the system shall be within ¼ inch of the floor level and shall correct for over travel or under travel to within the same accuracy, regardless of load variations or direction of travel.
- D. Landing control system shall be as manufactured by Interface Projects, Co., Model IP-8300 (including any required modifications to accept elevator control systems or approved equal.

PART 6 – CAR EQUIPMENT

6.1 POWER DOOR OPERATION:

- A. The car and hoistway doors shall be operated quietly and smoothly by an electric operator, which shall open and close the car door and respective hoistway door simultaneously. The doors shall open automatically when the car is leveling at the respective floor and, when operating without an attendant, shall close after a predetermined time has elapsed. Momentary pressure on the “Open Door” button in the car shall cause the doors to remain open or, if closing, to reopen and reset the time interval.
- B. The doors shall be opened at rated speed (2 ft/sec.) and the closing speed shall be per Code. Door closing force shall be as allowed by code.
- C. An electric contact for the car doors shall be provided which shall prevent elevator movement away from the floor unless the door is in the closed position as defined by Code.
- D. Each hoistway door shall be equipped with an auxiliary door closing device and a positive electro-mechanical interlock to prevent the operation of the elevator until the interlock circuit is established and the doors are locked and closed.
- E. Selective, synchronous door operation shall be provided so that doors at slightly different levels are not to open at the same time. Therefore, each door is to have its own synchronous opening.
- F. Manufacturer:
 - 1. Gal, MOH operator.

6.2 DOOR PROTECTION AND REOPENING DEVICE

- A. Adams Gatekeeper 2000 or Innovation Smart Edge, Model 2002 with additional Dual Eye Ray Unit or Janus 3D, or Tri-Tronics

6.3 ADAPTIVE DOOR TIMING:

- A. Door open times will be varied subject to the call situation causing the stop:
 - 1. Shortest timing, when car call only causes stop.
 - 2. Longer timing, when hall call only causes stop.
 - 3. Longest timing, when coincident hall and car calls exist.
 - 4. All timing shall meet ADA guidelines as a minimum.

6.4 CAR FRAMES

- A. Car frame shall consist of structural steel members that are securely welded or bolted together and the frame shall be so reinforced and braced as to relieve the car enclosure of undue strains. Steel bumper plates shall be provided to engage the buffers.

6.5 CAR PLATFORMS AND FLOORING:

- A. Each passenger type car platform shall consist of a structural steel frame with a wood and metal composite floor (i.e. one layer of ¾” plywood plus 14 gauge steel plate plus ¾” thick plywood plus finish flooring.) The platform and floor must be suitable for “Class C3” loading. Top finish flooring on car shall be furnished and installed by Elevator Contractor of the type and color selected by Owner.
- B. Each passenger type platform shall be equipped with an extruded aluminum threshold and a steel toe guard at the loading edge. The underside of the platform shall be fireproofed to comply with local codes.

C. Car to be suitable for a medical stretcher .

6.6 CAR ISOLATION:

- A. The steel platen plate used to secure the car frame to the plunger shall be provided with rubber pads to effectively prevent transmission of vibration from the plunger to the complete car frame, platform and car enclosure.

6.7 ROLLER GUIDES FOR CAR:

- A. Each roller guide shall consist of three wheels (minimum roller diameter – 6”) tired with a durable resilient material; each rotating on ball bearings having sealed-in lubrication; all assembled on a substantial metal base and so mounted as to provide continuous contact of all wheels with the corresponding rail surface under all conditions of loading and operations. The wheels shall run on three finished rail surfaces. The roller guides shall be properly secured at top and bottom on each side of car frame. Provide roller guides at top and bottom of car.
- B. The roller guides shall run on dry guide rails.
- C. Manufacture: ELSCO Type A.

PART 7 – OPERATING FIXTURES

7.1 CAR OPERATING PANEL:

- A. The operating panels in the car shall consist of one vandal resistant stainless steel flush mounted control panel. The control panel shall contain a series of push buttons with illuminated call registration devices, numbered to correspond to the various landings serviced; In Car Stop Key Switch, Alarm Button (connected to a bell located on the car), and a Door Close, Door Open button for each entrance. Alarm bell shall be operated from its own independent battery pack power supply. The control panel shall also contain separate key operated switches for fire service, inspection, independent service, car lights and car fan. The auxiliary panel shall contain all floor buttons; stop key switch, alarm, door open and door close buttons for each entrance. All the key switch cylinders shall be standard Adams Fixtures.
- B. Buttons shall be made of brushed stainless steel, Innovation Industries Vandal Resistant with LED lamp for illumination, with translucent floor designations.
- C. Provide emergency light in car operating panel with nickel cadmium batteries.
- D. Manufacturer: PTL Performer Series or Innovation Industries. All shall be vandal resistant.

7.2 HALL PUSH BUTTON:

- A. Hall push buttons shall be installed at each floor to permit waiting passengers to call the elevator to the floor.
- B. Fixtures shall have up and down buttons at intermediate floors and single buttons at top and bottom floors. Braille denotation shall be of the replaceable type bolted from the rear of contrasting colors mounted per ADA Guidelines.
- C. Buttons shall be made of # 4 brushed stainless steel (vandal resistant with LED lamp for illumination) and shall illuminate to indicate all call has been registered. Button shall remain illuminated until the call has been answered.

- D. All Buttons (included in Section 7.1) shall conform to item 14.0.
- E. Provide engrave graphic emergency sign and illustration on all hall push button station plates: “IN CASE OF FIRE USE STAIRWAY FOR EXIT.” “DO NOT USE ELEVATOR.”
- F. Hall position indicator shall be part of the hall push button panel on all floors and shall be led type.
- G. Manufacturer: PTL Performer Series or Innovation Industries. All shall be vandal resistant.

7.3 FLOOR PASSING CHIME:

- A. Provide a floor-passing chime to meet ADA requirements.
- B. Manufacturer is PTL Performer Series or Innovation Industries.

7.4 COMMUNICATION SYSTEM (TELEPHONE):

- A. Provide hand-free vandal resistant emergency telephone integral with the main car-operating panel, with wiring (shielded pairs) to terminals on control panel in machine room. Phone shall keep working during power failure. Coordinate work with UCSC ITCOM. Phone shall be one push button to talk type and flash when call is answered.
- B. Manufacturer: CEECO Model SSP-571X - ADA– with Braille Plate.

7.5 CAR POSITION INDICATOR:

- A. An LED Multi-light position indicator shall be vandal resistant and be provided above door in the car. It shall indicate the floor at which the car is stopped or passing and the direction the car is traveling. The cover plates shall be # 4 stainless steel. Indicator shall be LED type.
- B. Manufacture: PTL Performer Series or Innovation Industries.

7.6 CAR TRAVELING LANTERN:

- A. Shall be provided at both sides of door jambs, digital type and shall be ADA compliant.
- B. Manufacture: PTL Performer Series or Innovation Industries.

7.7 CAR FIRE ALARM HORN: (OMITTED)

PART 8 – ELEVATOR ENCLOSURES

- A. All cab material; design, lighting, ventilation and exits shall comply with “American National Standard Safety Code for Elevators, ANSI A17.1-2004 and/or local codes. Where codes conflict the more stringent shall apply.
- B. Wall panels shall be of wood construction and applies to a steel shell. Applied panels shall be finished with plastic color Core laminate of color or pre-vandalized 316 stainless steel as selected by Owner. Shell (except reveals) shall be painted black. The reveals shall be stainless steel or pre-vandalized stainless steel as selected by Owner.
- C. Returns shall be of stainless steel construction and have a #4 brushed finish. Cutouts shall be provided for operating elements and fixtures.

- D. Canopy shall be constructed from formed and reinforced 16-gauge steel finished in white enamel and shall have an overall height of 8'0" from the finished floor. An emergency exit shall be provided which is locked from the top of the car.
- E. Provide coved lighting in cab. Coves shall be made of stainless steel and run entire length of cab walls with # 4 finish and located at ceiling level with fluorescent lights (two 4 ft. and two 2 ft., warm, white, deluxe lamps in each cove) on both sides of cab. Also comply with ADA lighting level requirements. Provide stainless steel protective guards consisting of two mesh, 14 gauge, wire cloth encased in a U-channel frame and of adequate size for maintenance. These guards shall be secured in place with tamper proof screws. Submit shop drawings prior to fabrication for Owner's approval. See Sketch at end of this section for detail.
- F. Entrance columns shall be # 4 brushed stainless steel finish. Columns shall run from floor to canopy, be finished in a vertical grain, and shall be integral to the returns.
- G. Entrance transom shall be # 4 brushed stainless steel finish. Columns shall run from floor to canopy. Transom shall run the full width of the car and be finished in a horizontal grain.
- H. Doors shall be of hollow metal construction, suitably reinforced and sound deadened. Interior shall be stainless steel with # 4 finish and equipped with NYLUBE door guides.
- I. A single speed fan shall be provided that matches the ceiling and is mounted to the canopy. Air intake to the fan shall be through the 3/8" diameter holes (adequate in number to allow free passage of required air quantity) drilled in canopy. Submit shop drawing of canopy for approval prior to fabrication.
- J. A 3/8" x 2" bar handrail with radiused ends of # 4 brushed stainless steel finish shall be provided to meet code requirements.
- K. Car sills shall be extruded aluminum.
- L. Finished floor covering shall be furnished and installed by the elevator contractor. The type shall be "Endura" style with base color to be selected by Owner.

PART 9 – HOISTWAY ENTRANCES

9.1 ENTRANCES

- A. The entrances shall consist of flush hollow metal door panels, bolted unit type frames, sills, hanger covers, fascia plates or toe guards, headers, struts, sight guards and hardware.

9.2 FRAMES:

- A. Unit frames shall be fabricated of No. 14 U.S. gauge steel comprising the head and side jamb sections which shall be securely bolted to form one piece unit construction and shall be securely fastened to the sill and hanger support. They shall be returned on the hoistway side to present a neat appearance.

9.3 DOORS:

- A. Doors shall be flush hollow metal panels fabricated of No. 16 gauge steel, minimum. The doors shall be 1-1/4" thick and reinforced with continuous members. Panels shall have sound deadening insulation. Doors shall have removable non-metallic gibs to run in the sill guideway with minimum clearance. Door panels shall conform to the National Elevator requirements. Door unlocking devices shall be provided at all floors and as required by local codes. Sight guards shall be provided for all entrances. The doors shall be equipped with nylube door guides. See 9.9 for finish.

9.4 SILLS

- A. Sills shall be of extruded aluminum construction with a non-slip wearing surface. They shall be supported on steel brackets and securely fastened to the floor. Grooves for the door guides shall have minimum clearance for the guides. The sills must be suitable for "Class C3" loading.
- B. Sills for parking structures elevator shall be of special construction for more durability.

9.5 STRUTS:

- A. Steel angle struts (3" x 3" x ¼") shall extend from the sill to the building beam above and shall be securely fastened to ensure rigidity and adequate support for the header.

9.6 HEADERS:

- A. Headers shall be constructed of 3/16" formed steel to provide support for the frame and hangers.

9.7 HANGER COVERS:

- A. Hanger covers shall be fabricated of No. 14 gauge steel extending the full width of the hanger pocket. A section shall be easily removable from inside the car for servicing the hanger.

9.8 FASCIA, COVERS, AND TOE GUARDS:

- A. Fascia, including hanger covers, toe guards and dust covers shall be fabricated of No. 16 U.S. gauge steel. Fascia shall span the width of the opening 6 inches. Dust cover shall extend a minimum of 8 inches above the header and the toe guard shall extend a minimum 8' below the sill. Both shall return to the wall at a 60 degree angle.

9.9 FINISH

- A. Struts, headers, hanger covers, fascia, dust covers, and toe guards shall have matte black finish. All landing doors and entrance frames shall be stainless steel with # 4 brushed finish.

PART 10 – ACCESSORIES

10.1 CAR AND/OR HALL OPERATING KEY:

- A. Provide two switches (security) for each floor. One is for on/off security and one is for momentary override. These shall be BEST cylinders with core to be keyed by UCSC Lock Shop.

PART 11 – SHOP DRAWINGS AND SAMPLE SUBMITTALS

- A. Samples: Submit samples of stainless steel, and floor tile, enamel colors and wall finish materials.
- B. SHOP DRAWINGS: Submit eight (8) copies of Shop Drawings as required showing the general and detailed arrangement of all elevator equipment. Show ceiling, lighting, signal fixtures, and smoke detectors including routing of exposed conduit.
- C. PRODUCT DATA: Submit the manufacturer's specification and data sheets, and standard details. Include pictures, catalog cuts, or other suitable illustrations of all elevator equipment that will be exposed in the finish work, including car, hoistway entrance, and signal and control apparatus.
- D. CERTIFICATES: Finish without cost to the Owner all certificates necessary as evidence that the elevator conforms to the applicable laws, ordinances, and requirements.

PART 12 – PERFORMANCE

12.1 CONTRACT SPEED:

- A. Actual speed shall vary no more than +/- 5% from speed specified under any loading condition or direction of travel.

12.2 LEVELING ACCURACY:

- A. Consistently level within +/- 1/4” under all loading conditions.

12.3 DOOR TIMES:

- A. The door opening time, measured from the instant the doors start to open until within 1” of the fully open position, shall not exceed Code standards.
- B. Long door and short door “hold open” times, shall be set at 4.0 and 2.5 seconds respectively.

PART 13 – EXECUTION

13.1 SITE INSPECTION

- A. Prior to preparation of drawings, the contractor shall examine the hoistway and machine room areas and verify that no discrepancies or irregularities exist which would adversely effect the execution of the work.
- B. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.

13.2 CLEANUP

- A. Keep work areas orderly and free of debris on a daily basis.
- B. Remove filings and loose materials resulting from this work from hoistways.
- C. Clean all dirt, oil and grease from machine room and pit equipment and floors.
- D. Clean car, car enclosures, entrances, hoistways, operating and signal fixtures and trim of dirt, oil, grease, and finger marks.

13.3 ACCEPTANCE DEMONSTRATION AND PERFORMANCE TEST

- A. Demonstrate to Owner, or Owner’s designated representative, the operation of the elevator system. Demonstration shall include:
 - 1. Installation compliance with specifications.
 - 2. Contract speed, capacity, and floor-to-floor performance compliance with specifications.
 - 3. Stopping accuracy and car ride compliance with specifications.
 - 4. Operation of signal fixtures and operation of supervisory or dispatching system.
 - 5. Promptly remove all work rejected by the Engineer for failure to meet specifications and replace to comply with requirements, at no additional cost to the Owner. All expenses of repairing work of other Trades damaged by this replacement shall be borne by Contractor.

6. Rejected work which is not made good within a reasonable time, determined by the Engineer, may be corrected by the Owner at Contractor's expense.
7. Upon completion of installation and before final acceptance, conduct a running speed test with full design load to verify compliance with performance requirements. Also refer to Article 1.06 of this division.
8. Operating Instructions: Provide instructions to the Owner's personnel, including safety procedures, proper operation of the equipment, and routine maintenance procedures.

13.4 PERFORMANCE GUARANTEE

- A. The elevator contractor shall assume full responsibility to furnish and provide a complete and functional elevator and to obtain and furnish the University final State Elevator Inspection approval. All costs necessary to correct code deficiencies cited by the State Elevator Inspector will be paid by the elevator contractor as part of this Contract at no additional cost to the Owner.

13.5 FINAL SUBMITTALS

- A. Provide four complete sets (bound and properly arranged) of the parts lists and operators manuals prior to receiving final payment. Following is a brief summary of items:
 1. Legible schematic wiring diagrams including all changes made during installation.
 2. Description of operation of elevator system installed.
 3. Pump Package: Including valve and accessories
 4. Buffers.
 5. Guide Rollers on Car.
 6. Controller and Selector: Including parts information on Relays, Printed Circuit Boards, Reverse Phase Relays, Switches, Lamps, Electrical Cables, Monitors, Modems, Diagnostic, Hardware, Diagnostic Software, and Overload Protection Devices.
 7. Door Assemblies: Including Hangers, Rollers, Door Motor, Door Operator, Door Clutch Assembly, Door Closers, Door Drive Arms, Related Hardware, Sheaves, Door Guides, Interlocks, Safety Door Edge.
 8. Signal Equipment: Including Car Stations, Hall Stations, Position Indicators, Direction Indicators, Fire Service Panel, Smoke Detectors, Keyswitches, and Pushbutton Assemblies.
 9. Car Top Inspection Station, Limit Switches, Solid State Leveling Control Units, Leveling Switches, Alarm Bell.'
 10. Laptop computer, 250 MHZ minimum with computer table and chair.

13.6 TECHNICAL TRAINING

- A. On site technical training shall be held for the purpose of familiarizing UCSC Elevator Support Mechanics with operations and troubleshooting procedures. The session shall accommodate up to ten personnel in each session and consist of forty hours of training. (This to include two 2-day sessions and the fifth day reserved for any additional diagnostic training). Training on equipment controller shall be provided by trained factory service engineers for controller manufacturer through the elevator installers. Submit details of training with bid.

PART 14 - ELEVATOR GUIDELINES TO ENSURE ACCESSIBILITY BY PEOPLE WITH DISABILITIES

- A. Elevators shall meet the guidelines of the Americans with Disabilities Act using the Uniform Federal Accessibility Standards (UFAS) relevant to elevators (Section 4.10 Elevators) as the technical requirements.
- B. Elevators shall meet the requirements of the State of California relevant to barrier free design and elevators.

PART 15 – ELEVATOR COMMISSIONING SEQUENCE PROGRESS CHECK SHEET

15.1 Overview: Work may consist of modernization or replacement of existing elevators, or installation of new elevators. Covers both types of elevators – hydraulic type and electric traction type.

15.2 Specification Section: _____ Elevator Type & No. _____

15.2 Acknowledgements

<u>Owner</u>	<u>Contractor</u>	
_____	_____	Shop Drawings Submitted (To A/E)
_____	_____	Print Review Completed (by UCSC Elevator Dept.)
_____	_____	Shop Drawings Approved
_____	_____	Elevator(s) – Contract UCSC Elevator Dept.
_____	_____	Telephone Order Placed (1 or 2 lines per elevator)
_____	_____	O&M Manual (Draft) Submitted and approved
_____	_____	Field Review Completed (by UCSC Elevator Dept. prior to installation)
_____	_____	Major Components Delivered
_____	_____	Jack Inspection Completed (for Hydraulic type) by UCSC Elevator Dept.
_____	_____	Electrical Complete
_____	_____	Adjusting Performed
_____	_____	Issues from Adjusting Resolved
_____	_____	Installation Complete
_____	_____	Final Adjusting Completed (UCSC Elevator Dept. attends)
_____	_____	Code Inspection Complete (State of California Elevator Inspector), Report Submitted to Owner
_____	_____	Mfgr’s Performance Testing Completed (Running Speed Test with Full Design Load)
_____	_____	Elevator Accepted by UCSC Elevator Dept.
_____	_____	O&M Manual (Final Submitted)
_____	_____	All Punch-List Items Completed
_____	_____	Operator Training/Instruction Scheduled and completed
_____	_____	System Accepted by Owner

DIVISION 14 CONVEYING SYSTEMS

SECTION 14250 – ELECTRIC TRACTION PASSENGER ELEVATOR

PART 1 – GENERAL

1.1 GENERAL CONDITIONS

- A. The Contractor under this Division of the Work (elevator contractor) is referred to the Contract Forms and General Conditions of these specifications, all of which apply to this Division of the Work.

1.2 SCOPE OF WORK

EDITOR: EDIT THE FOLLOWING TO SUIT PROJECT

- A. The work of this division shall consist of providing a complete traction passenger elevator in the _____ Building located on the UCSC campus. Bidders shall include all labor, materials, and services required for the complete installation of all the elevator equipment and hoistway equipment as herein specified.
- B. In all cases where a device or part of the equipment is herein referred to in the singular, it is intended that such reference shall apply to as many of such devices or parts a required to make a complete installation.
- C. Elevator installer shall obtain all approvals for any applicable code installation to accommodate this new Elevator at no additional cost to Owner prior to starting construction.
- D. Refer to architectural and electrical drawings, and coordinate accordingly.
- E. Review specifying a Regenerative Machine.

1.3 GENERAL

- A. These specifications cover the complete installation of a new elevator system, in accordance with the drawings and as specified herein. The elevator contractor shall include all work and materials, except that listed under “Related Work By Other Contractors”, for a complete and operational system.
- B. Machine Roomless Elevator (MRL) is NOT acceptable on UCSC campus.

1.4 *ACCEPTABLE ELEVATOR INSTALLERS

- A. Elevator Service Co.
- B. Otis Elevator Co.
- C. Schindler Elevator Co.
- D. Kone Elevator Co.
- E. Thyssen/Krupp Co.
- F. Ascent Elevator

*Note 1: Above is not a list of elevator manufacturers; it is a list of INSTALLERS only. Elevator installer must provide the equipment specified.

*Note 2: General contractor shall in his/her bid name all the sub-contractors during bid opening.

1.5 DRAWINGS

- A. Before beginning fabrication and work, the elevator contractor shall prepare all drawings that show the arrangement of the elevator equipment. Approval of drawings and other data (submit minimum of eight sets), which are to be submitted by the elevator contractor to the Owner representative, must be approved before

proceeding with fabrication and installation of the equipment. Coordinate field conditions and sizes prior to preparation of drawings.

1.6 REQUIREMENTS OF REGULATORY AGENCIES

- A. Perform work in accordance with applicable codes, the State of California Elevator Safety Code (Title 8), the National Electrical Code, and the American National Standard Safety Code for Elevators; ANSI A17.1-2004, as referenced therein and the provisions in the UCSC Standard General Conditions. Give all necessary notices, obtain State and Municipal permits, pay fees in connection with the installation, including sales and use taxes as applicable, and make tests as are called for by the regulations of such authorities. These tests shall be made in the presence of the authorized representative of such authorities and the owner's representative. It is the responsibility of the elevator contractor to provide any variances from the Governing Authority that could be necessary for a complete acceptable elevator installation.
- B. Comply with "Elevator Guidelines to Ensure Accessibility by People with Disabilities" attached herein with these specifications.

1.7 GUARANTEE

- A. The elevator contractor shall guarantee that the materials and workmanship of the apparatus installed by him/her under this specification are first-class in every respect, and that he/she will make good any defects not due to ordinary wear and tear or improper use or care, which may develop within one year from date of final payment or extended new product service period.

1.8 MAINTENANCE

- A. After completion of the installation, maintenance and 24-hour callback service for the equipment furnished under this specification shall be provided for a period of twelve (12) months as part of this Contract. This service shall also include regular examination (biweekly); to equal a minimum of (26) inspections in the one-year period. In the event the 26 site visitations are not completed the elevator contractor will extend his/her warranty covering all callbacks, repairs, parts, testing, labor and any other item necessary to keep the elevator in like new condition until the twenty-six maintenance site visitations have been completed. Advise University elevator department each time before and after completion of service) of the installation during regular working hours by trained employees of this Contractor, and shall include all necessary adjustments, greasing, oiling, cleaning, supplies and parts to keep the equipment in proper operation, except parts made necessary by misuse, accidents or neglect caused by others.
- B. All maintenance service must be performed by the installers and not by any other services agency. Also, the installer must have an established maintenance and service organization available for performance in Santa Cruz County that can provide regular and emergency service, 24 hours a day, every day of the year.
- C. Elevator Service Provider and/or UCSC Fire Department respond to elevator entrapments.
- D. Work is to be performed by the contracted Elevator Service Provider and submit to electric shop a record of the work performed during the entrapment incident. Electric shop will keep log of all incidents that occur.
- E. The elevator contractor shall be responsible to service and maintain all elevator emergency circuits including the fire service circuit, related equipment and sensors) as part of the regular elevator maintenance contract.

1.9 RELATED WORK OF OTHER DIVISIONS

A. Following is a brief description of work by other divisions included in this Contract. This work must be done in accordance with the codes having jurisdiction and the approved drawings of the elevator contractor.

1. Architectural Work: See architectural drawings and specifications.
2. Electrical Work: See electrical drawings and specifications.
 - a. Elevator contractor shall coordinate with all other trades working in hoistway and be available to operate the elevator in a “running platform” manner to allow other trades to complete their work.

NOTE: All telephone cable and conduit between machine room terminals and controller and car shall be provided by elevator contractor.

PART 2 – OUTLINE OF NEW EQUIPMENT (To be filled out by Elevator Consultant) .

- A. Elevator Number: State Number _____
- B. Type of Service: Passenger or Combination Passenger/Service
- C. Elevator Type: Overhead, traction, geared, machine located in elevator machine room (Room No. _____)
- D. Quantity: one
- E. Capacity: 3000 pounds
- F. Speed: 250 FPM
- G. Travel: 53' -6 + or – (to suit project)
- H. Number of Stops: 4
- I. Number of Door Openings: 4
- J. Floors Served: 1, 2, 3, 4
- K. Main Floor Egress: _____; Alternate Floor Egress: _____
- L. Hoistway Size: ___' - ___" Wide x ___' - ___" (to edge of sill) – Approx. Existing; Field Verify
- M. Pit Dimensions: _____ long x ___ wide x ___ deep
- N. Platform Size: _____ long x _____ wide
- O. Car Interior Dimensions: ___ long x ___ wide x _____ high
- P. Car Door Size/Operation: _____ wide x _____ high
- Q. Door Opening Type: Single Speed, Center Opening
- R. Machine Type/Location: Geared/Overhead
- S. Control: Microprocessor Type
- T. Operation: Selective/Collective
- U. Power Supply: 460 Volts/3Phase/60 Cycle; Motor Horsepower: 20
- V. Fire Fighter Service: Yes, phases 1 and 2
- W. Independent Service Operation: Yes
- X. Load Bypass Operation: Yes
- Y. Anti-nuisance Feature: Yes
- Z. Special Key Switches: Yes, (two key switches per floor, one for security on & off, one for momentary override.)
- AA. Additional Features:
 1. Hall position indicator at main floor and inside car, infrared type door protections, special emergency service Phase I and Phase II, car ventilation blower, hoistway access package, protective pads and hooks, telephone and telephone cabinet (see 7.5), certificate frame, hand-rails, emergency car light. Car traveling lantern in each jamb.
 2. Provisions for handicapped: raised markings for hoistway doorjamb, adjustable door open times.
 3. Refer to “Elevator Guidelines to Ensure Accessibility by People with Disabilities” attached herewith for additional requirements.
 4. Battery Lowering Device .
 5. Car sized to accommodate a medical stretcher.

PART 3 – PRODUCTS

3.1 ELECTRIC TRACTION ELEVATOR (GEARED)

- A. Geared Machine:
1. The machine shall be of the single worm geared traction type with motor, brake, gearing and driving sheave mounted in proper alignment on a cast iron or structural steel bedplate.
 2. The worm shall be of forged steel, integral with the worm shaft and provided with a ball bearing thrust designed to take the end thrust of the worm in both directions. Thrust shall be removable without dismantling machine or require the removal and re-installation of the brake pulley. The worm geared shall be hobbled from a bronze rim, which shall be accurately fitted and bolted to the gear spider.
 3. The driving sheave shall be grooved for the proper number and size of hoist ropes and so designed as to maintain constant traction. The driving sheave shall be of the renewable traction sheave rim type.
 4. The adjustable roller or anti-friction metal bearings shall include adequate means for lubrication.
- B. Motor: The motor shall be coupled to the worm shaft, and specifically designed for elevator service. Motor shall be one hour rated, class F insulation, premium efficiency (---% minimum efficiency) and shall be suitable for variable speed operation.
- C. Brake: A double-shoe brake of the cushioned short-stroke adjustable type shall be provided. The brake shall be designed to stop and hold the car with 125% of the rated load per code requirements. The brake shall be designed so it is instantly and automatically applied in the event of power failure. An emergency break or rope break shall be provided as per A17.1-2004.
- D. Machine Location and Foundation/Bedplate: The elevator machine shall be placed directly over the hoistway upon structural steel beams. The bedplate shall consist of structural steel members fabricated into a rigid unit designed to minimize deflection.
- E. Isolation: The machine bedplate shall rest on isolation pads of proper density to effectively isolate the machine from the building structure.
- F. All exposed surfaces of machine, motor and governor shall be painted with rust-resisting gloss, gray color enamel after installation.
- G. Manufacturer: Hollister Whitney or Titan.
- H. Provide wrap-type retardant filter on the air intakes to the machine motor for protection of motor internal components.

3.2 PROGRAMMABLE CONTROLLERS FOR AC TRACTION ELEVATORS:

- A. Controller Description:
1. The controller shall use a variable voltage variable frequency drive or flux vector for the control of three phase frequency drive or flux vector for the control of three phase AC induction motors.
 2. The drive shall use a three-phase, full-wave bridge rectifier and capacitor bank to provide a bus for the solid-state inverter.
 3. The drive shall use power semiconductor devices and pulse width modulation, with a carrier frequency of not less than 2kHz, to synthesize the three-phase, variable voltage variable frequency output to operate the hoist motor in an essentially synchronous mode.
 4. The drive shall have the capability of being adjusted or programmed to achieve the required motor voltage, current and frequency, in order to properly match the characteristics of the AC elevator hoist motor.
 5. The drive shall not create excessive audible noise in the elevator machine motor.

6. The drive shall limit the total harmonic distortion (THD) reflected back into the power system to the following values at any motor speed from 50-100 percent.
 - a. Drive input voltage waveform: Less than 3 percent THD.
 - b. Drive input current waveform: Less than 100 percent THD.
7. The University will measure reflected THD. The elevator contractor shall provide at no additional cost any additional devices required to meet the above THD limits.
8. The drive shall be a heavy-duty type, capable of delivering sufficient current required to accelerate the elevator to contract speed with rated load. The drive shall provide speed regulation appropriate to the motor type.
9. A means shall be provided for removing regenerated power from the drive's power supply during dynamic braking. This power shall be dissipated in a resistor bank, which is an integral part of the controller. Failure of the system to remove the regenerated power shall cause the drive's output to be removed from the hoist motor.
10. A contractor shall be used to disconnect the hoist motor from the output of the drive each time the elevator stops. This contractor shall be monitored and the elevator shall not start again if the contractor has not returned to the de-energized position when the elevator stops.
11. All power feed lines to the brake shall be opened by an electro-mechanical switch. A single ground, short circuit or solid-state control failure shall not prevent the application of the brake.
12. The controller shall provide stepless acceleration and deceleration and provide smooth operation at all speeds.
13. The power control shall be arranged to continuously monitor the performance of the elevator in such a way that if the car speed exceeds 150 fpm during access, inspection or leveling, the car shall shut down immediately, requiring a reset operation.
14. The automatic leveling zone shall not extend more than 12" above or below the landing level nor shall the doors begin to open until the car is within 12" of the landing. In addition, the inner leveling zone shall not extend more than 3" above or below the landing. The car shall not move if it stops outside the inner leveling zone unless the doors are fully closed and locked.
15. The system shall use an automatic two-way leveling device to control the leveling of the car to within 1/4" or better above or below the landing sill. Overtravel or undertravel shall be compensated for and the car brought level to the landing sill.
16. The appropriate landing system shall be used with this controller and shall be of steel tape type.
17. Elevator controller shall include emergency battery power to operate the elevator and open doors During power outage , factory installed and wired .

B. Specifics for Closed Loop System:

1. Closed loop tachometer feedback control shall be provided. The control system shall continuously monitor the elevator speed signal from a velocity transducer and compare it with the intended speed signal to verify proper and safe operation of the elevator and to correct the actual speed to match the intended speed.

C. Specifics for VVVF Drives (For speeds of 150fpm or below): (NOT APPLICABLE)

1. NOTE: For VVVF applications, the AC motor shall have slip specifications between 8 percent and 12 percent, or a NEMA rating of "D".
2. The VVVF drive shall be capable of providing a braking pulse to use in the stopping sequence of the elevator. The braking pulse shall take the form of an adjustable DC current pulse applied to the AC motor for an adjustable period of time (0 to .75 seconds.)If all calls in the system have been answered, the car shall park at the last landing served or the pre-determined home landing.
3. The VVVF drive shall be able to be programmed with different volts per hertz patterns, which shall be used to adjust the drive control characteristics.

D. Specifics for Flux Vector Drive (For speeds over 150fpm) NOTE: For flux vector applications, the AC motor shall have slip specifications of 5 percent or less, or a NEMA rating of "A" or "B".

1. The flux vector drive shall be capable of producing full torque at zero speed.
2. The flux vector drive shall not require DC injection braking in order to control the stopping of the car.

3. The flux vector drive shall utilize encoder feedback to regulate hoist motor speed. The encoder shall be mounted to the motor shaft.

- E. The controller shall be UL, ETL or CSA listed, and shall meet FCC part 15 subpart J limits for radio frequency interference.
- F. Fluorescent lighting shall be provided at the front and back inside the controller cabinet.
- G. Controller manufacturer shall be Motion Control Engineering (MCE) Model IMC-AC controls, closed loop with remote diagnostics or Elevator Control Co. drive (similar to MCE) with remote diagnostics , smartrise. Drives shall be ABB, Toshiba, Elevator Control Corp. or Baldor with applicable options.
- H. Drive shall be specifically manufactured for elevator applications.
- I. Elevator controller is to be equipped with provisions for emergency power connections.

PART 4 – AUXILIARY OPERATIONS:

4.1 FIREFIGHTER’S SERVICE: (Phase 1 & Phase 2)

- A. The following operation is for the use of firefighters and other authorized personnel.
 - 1. Automatic passenger elevators shall conform to the following:
 - a. A three position (on, off, and by-pass) key-operated switch shall be provided at the main floor for each single elevator or each group of elevators. The key shall be removable only in the “on” and “off” positions. When the switch is in the “on” position, all elevators controlled by this switch and which are on automatic service shall return non-stop to the main floor, and the doors shall open and remain open.
 - b. An elevator traveling away from the main floor shall reverse at the next available floor without opening its doors.
 - c. Elevators equipped with automatic power-operated doors and standing at a floor other than the main floor, with doors open, shall close the doors without delay and proceed to the main floor.
 - d. Door reopening devices for power-operated doors, which are sensitive to smoke, heat or flame shall be rendered inoperative.
 - e. All car and corridor call buttons shall be rendered inoperative and all call registered lights and direction lanterns shall be extinguished and remain inoperative.
 - f. A car stopped at a landing shall have its “Emergency Stop Switch” rendered inoperative as soon as the doors are closed and it starts toward the main floor. A moving car, traveling to or away from the main floor, shall have its “Emergency Stop Switch” rendered inoperative immediately.
 - g. A sensor in each elevator lobby, which when activated prevents cars from stopping at that floor, shall not be substituted for the above requirements.
 - 2. Sensing Devices: In addition to the key-operated switch required in “1” above, heat and smoke or products of combustion sensing devices shall be furnished and installed in each elevator lobby at each floor, except the main floor (Note – Egress floor is 1st floor.) The activation of a sensing device in an elevator lobby shall cause all cars in all groups that serve that lobby to return non-stop to the main floor. They key operated switch when moved to the “by-pass” position, shall restore normal service independent of the sensing devices. Sensors at each floor shall be connected separately from sensors at main floor. Smoke detectors shall be photoelectric type, 120 vac. Gentex Corp. Model 8100. Submit drawings showing locations of smoke heads and exposed conduit for owner’s approval prior to installation.
 - 3. A three position (off-hold-on) key-operated switch shall be provided in each car and shall be effective only when the main floor key-operated switch is in the “on” position or a sensor has been activated and the car has returned to the main floor or other approved level. They key shall be removable in all positions, and shall not change the operation until the car is at a floor with doors fully opened.
 - 4. The operation of elevators on Fire service shall be as follows:
 - a. An elevator shall be operable only by a person in the car.

- b. Elevators shall not respond to elevator corridor calls.
 - c. The opening of power-operated doors shall be controlled only by continuous pressure “open” buttons or switches. If the switch or button is released prior to the door reaching the fully open position, the doors shall automatically recluse. Open doors shall be closed by continuous pressure on “Door Close” switch or button.
 - d. Mean shall be provided to cancel registered car calls.
 - e. When the switch is in the ‘hold’ position, the car shall remain at the floor with its doors open.
 - f. Elevators can be removed from individual car fire service by moving the key-operated switch to the “off” position and the car is at the main floor or other approved level.
5. The switches required above shall be operated by the same key but are not a part of a building master key system. There shall be a key for the main floor switch and for each elevator in the group and these keys shall be kept on the premises by person responsible for maintenance and operation of the elevators, in a location readily accessible to authorized persons, but not where they are available to the public. **TURN OVER ALL KEYS TO PROJECT ENGINEER.**
6. Instructions of operation shall be provided as required by code.

B. Elevators arranged for dual operation shall: (Applicable to dual elevators)

- 1. Conform to the automatic operation described above when on automatic operation.
- 2. When firefighter emergency operation is activated and the elevator is on independent or inspection operation the elevator shall be provided with a signal system consisting of both visual and audible types to alert the attendant to close the door and return non-stop to the main floor or other approved level. Provisions shall be made to alert the attendant in the same manner when a heat and smoke or products of combustion sensing device is activated.
 - a. Alternate Floor Fire Service:
 - b. Alternate Floor Fire Service:
 - c. The Activation of a sensing device at the lobby (item 2 above) shall cause all elevators to return non-stop to the alternate floor and the doors shall open and remain open. (The alternate fire service floor shall be defined as any building floor other than the main fire service floor.)
 - d. Operation of the elevators shall conform to “Firefighters’ Service.” When sensing devices are activated, the elevators shall return non-stop to the designated main floor and the doors shall open and remain open. When building sensors activate at the main fire service floor, elevators shall automatically be dispatched to that building’s second floor, which has been designated “alternate” fire service floor where the elevator doors shall open and remain open.

4.2 INDEPENDENT SERVICE OPERATION:

- A. Independent service operation shall permit one or more elevators to be removed from the group control and used without interfering with the normal operation of the remainder of the group.
- B. A two-position switch shall be provided in the car-operating panel for each elevator.
- C. When the switch is placed in the independent service position, the mode of operation shall be amended as follows:
 - 1. The car is disconnected from the supervisory system.
 - 2. Existing car calls shall be cancelled.
 - 3. The cars shall bypass landing calls.
 - 4. Continuous pressure on the car button of the selected floor shall close the doors and start the car toward the selected floor. Pressure shall be required on the button until the car starts. Releasing the car button before the car starts shall cause the doors to automatically reopen.
 - 5. After the car has arrived at the floor and doors have automatically opened, the cars shall remain at the floor until another car button is pressed or until the key switch is returned to the normal position.
 - 6. Should all cars be put on independent service, all hall calls registered shall be cancelled. Further registration of hall calls shall be inhibited.

LOAD BYPASS OPERATION:

To automatically delete hallway call buttons when car is loaded to its limit. Load bypass operation shall be adjustable from the controller to adjust the load at which to bypass hall calls not delete them.

SPECIAL KEY SWITCHES:

- A. Provide (2) key switches per floor. One shall be for security on & off and one shall be for momentary override. Keys shall be keyed to UCSC's KEY SYSTEM and shall be coordinated with KEY OFFICE through owner representative.

4.5 ANTI-NUISANCE FEATURE: (Discuss with Project Manager if needed or not)

PART 5 – HOISTWAY EQUIPMENT

5.1 PROVISIONS FOR HOISTWAY ACCESS:

- A. Anti-nuisance operation shall be provided to prevent the elevator control system from responding to a faster than normal rate or registration of car calls. The "normal" rate of registration of car calls shall be programmable on an individual elevator basis within the group.
- B. The hoistway door-unlocking device shall unlock and permit the opening of the hoistway door from the access floors irrespective of the position of the car. The design of the device shall be such as to prevent unlocking the door with common tools. The means for unlocaking the door shall be available and used only by inspectors, maintenance men, and repair men.
- C. Access switches – Furnish and install hoistway access switches and associated devices (at floors 1 and 4) in accordance with requirements of the latest Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, and as permitted by the Local Code.

5.2 TOP OF CAR OPERATING DEVICE:

- A. An operating device shall be provided on the top of the car located in the front between the car crosshead and hoistway door, complete with an Emergency Stop Switch, GFCI plug, fire service lamp and buzzer, lamp and guard, a Selections Switch, and UP and DOWN Operating and Safety Buttons. This device shall comply with ANSI A17.1-2004 and local codes.
- B. Operation from the top of the car shall not be permissible unless all electric door contacts are closed.

5.3 PIT STOP SWITCH:

- A. A switch or switches shall be located in each elevator pit, in accordance with ANSI A17.1-2004 and local codes, which, when turned to the "OFF" position will cause the electric power to be removed from the elevator motor and brake. This switch shall be lockable in the "OFF" position.

5.4 LANDING DOOR HANGERS

- A. Each hoistway door shall be suspended by two (2) sheave type hangers running on a hanger track provided integral with the hoistway entrance. Each hanger shall consist of a polyurethane tread on a metal hub equipped with precision ball bearings mounted onto a steel bracket. The hanger sheaves shall not be less than 3-1/4 inches in diameter. The track shall be so shaped as to permit free movement of sheaves without regard to vertical adjustment of the sheave brackets. An up-thrust roller shall be provided beneath the track and each sheave wheel, capable of withstanding a vertical thrust equal to the carrying capacity of the upper sheave. The up-thrust roller shall be adjustable for fine vertical adjustment and the face of the roller shall be so shaped as to conform to the bottom face of the hanger track. Door closers shall be sill mounted.

- B. Manufacturer: GAL, with MOH operator.

5.5 HOISTWAY DOORS AN DOOR OPERATORS:

- A. Provide new hoistway doors similar to new car doors, see item 6.8, including hardware and tracks.
- B. The hoistway doors shall be operated quietly and smoothly by an electric operator, which shall open and close the car door and respective hoistway door simultaneously. The doors shall open automatically when the car is leveling at the respective floor and, when operating without an attendant, shall close after a predetermined time has elapsed. Momentary pressure on the “open Door” button in the car shall cause the doors to remain open or, if closing, to reopen and reset the time interval.
- C. Manufacturer: GAL, with MOH operator.

5.6 STRIP LIGHTING IN THE HOISTWAY: (Discuss with Project Manager if needed or not)

- A. Strip lighting for full length of each hoistway shall be provided by others but all necessary arrangements to install same are to be covered by elevator contractor. Refer to electrical drawings and specifications.

5.7 ELECTRIC WIRING

- A. Complete insulated wiring shall be furnished and installed to connect all parts of the equipment furnished by the elevator contractor. Wiring shall conform to the requirements of the latest edition of the National Electrical Code. Include rigid conduit or EMT, at least ½” diameter, and short lengths of flexible conduit. Conduit or EMT shall terminate in junction boxes. Conduit, EMT, wiring duct, conduit fittings, enclosures and junction boxes shall be galvanized steel or aluminum.
- B. All wiring shall have a flame retarding moisture resisting outer cover and shall be run in metal conduit. Flexible metallic tubing or wire ducts.
- C. Traveling cables shall have flame retarding and moisture resisting outer cover. They shall be flexible and suitably suspended to relieve strains in the individual conductors. Provide the required quantity plus at least 210 percent spares. All wiring between telephone cabinet in car and a junction box in elevator machine room shall be provided by the elevator contractor. Conductors shall be numbered to correspond to numbered terminal at the car and machine room.
- D. Terminal blocks shall be coded to identify the circuits. Multiconductor cables shall have the conductor color coded and numbered.
- E. Each elevator car shall be provided with a suitable receptacle fitted with a wire lamp guard on top of the car and a suitable duplex plug receptacle.
- F. Unless otherwise specified, control wiring shall be minimum size #18 AWG. Wire size shall be large enough so that the voltage drop under inrush conditions will not adversely affect operation of the controls.
- G. Electrical Receptacle in Car: Provide GFCI duplex electrical receptacle in car. Locate receptacle approximately 2” above finished floor below car station. Provide matching face plate on receptacle.
- H. Phase Protection: Provide 3-phase power monitor for elevator power supply, which monitors phase loss, low and high voltage, phase reversal, phase unbalance, and has both manual and automatic resets. Leave in manual position.

- I. Execution:
 - 1. Install all power wiring in raceway systems. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.
 - 2. Splice cables and wires only in outlet boxes, junction boxes or pull boxes. (Note – No wire splicing allowed in raceway or wire ducts.)
 - 3. Install cable supports for all vertical feeders in accordance with the NEC. Provide Kellum GRIP type supports, which firmly clamp each individual cable and tighten due to cable weight.
 - 4. All terminal strip connections shall be identified with corresponding reference numbers from cable termination chart and electrical straight-line diagrams.

5.8 MACHINE FINISH AND PAINTING

- A. All exposed surfaces of machines and motors, controllers, etc., shall be repainted after field installation and before acceptance by Owner with rust resisting gloss enamel light gray color paint.

5.9 EMERGENCY ALARM BELL:

- A. An alarm bell with its own source of emergency power shall be provided and mounted on the car. When the emergency alarm bell button in the car is pressed, the alarm bell shall sound. Operation shall be in accordance with A17.1-204 and the State of California Elevator Safety Code (Part 8).

5.10 HOISTING AND GOVERNOR ROPES:

- A. The elevator shall be provided with hoisting ropes, specifically designed for elevator service, of sizes and numbers sufficient to comply with the requirements of the Code. The number and sizes of ropes proposed to be used shall be indicated on the shop drawings.
- B. Governor ropes shall comply with the requirements of the Code, shall be at least 3/8 inch in diameter, and specifically designed for elevator service.
- C. Use only poured-babbitted type sockets to fasten the ropes.

5.11 COUNTERWEIGHTS:

- A. Elevator shall be suitably counterbalanced for smooth and economical operation by adjusting the quantity of existing and or new counterweight fillers. Contractor to check for frame integrity to insure no defects exist or shall replace. Weight shall be contained in a structural steel frame properly guided with suitable roller guides. The counterweights shall be equal to the weight of the complete elevator car and approximately 40% of the rated load.
- B. The counterweight frame shall be equipped with roller guides. Each roller guide shall consist of three wheels, each a minimum of 6" inches in diameter, tired with a durable resilient material. The guides shall be designed as to maintain continuous contact with the guide rails.
- C. Manufacturer of roller guide: Elasco Model B.

5.12 GUIDE RAILS

- A. The car and counterweight guide rails shall be provided and cleaned so that the faces of the rails are plumb within one-sixteenth (1/16) of an inch in 100 feet of travel. Paint back plains with gray paint.

5.13 BUFFERS

- A. Must be oil type buffer for speed over 200 fpm, buffers shall be in accordance with ANSI A17.1-1996 code. The buffers shall be fastened to steel channels provided and installed by the elevator contractor.

5.14 NORMAL STOPPING DEVICES

- A. Slow-down and normal stopping devices shall be furnished and installed for each car. The devices shall be so arranged that, as the car approaches either terminal landing, a series of activation devices mounted in the hoistway shall activate bi-stable magnetic reed switches mounted on the car and automatically bring the elevator to a smooth stop at the terminal floor.

5.15 FINAL LIMIT SWITCHES:

- A. In addition to the normal limit stops, a hoistway final limit switch shall be installed at the top and at the bottom of each hoistway. These final limit switches shall be operated by a fixed cam securely attached to the car. The switches shall be so located that they are operated should the car travel a predetermined distance above or below the upper or lower terminal floor. These limit switches shall be independent of any other stopping devices, shall be positively opened without the use of springs and shall cut off all power from the motors and brakes and prevent the operation of the car in either direction.
- B. Final limit switches shall be so located that they open at or about the time the buffer is engaged by the car or counterweight.

5.16 AUTOMATIC TWO-WAY LEVELING:

- A. Each elevator car shall 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, or direction of travel.
- B. Automatic leveling control shall permit the synchronization of door opening with the stopping of the car at a floor.

5.17 SHEAVES:

- A. New deflector sheaves shall be provided to properly lead the hoisting ropes from the machine to the car and/or counterweight. Sheaves shall be cast iron accurately machined and grooved for the diameter of ropes used and supported by steel beams furnished in place by the elevator contractor. The bearings shall be permanently lubricated type commonly referred to as sealed bearings. Existing steel channels at top of hoistway may be reused if engineering data supplied by Elevator Contractor supports their reuse and shall be paint stripped and repainted.
- B. Deflector sheave guard: When deflector sheave extends below the bottom of machine beams, a substantial metal guard shall be provided below the sheave and attached to the sheave supports.

5.18 LANDING SYSTEM

- A. This landing system shall provide high speed stepping signals, one-floor-run stepping signals, leveling, and door zone signals. Each output signal shall be electrically isolated and shall be capable of reliably operating at 120 VAC.
- B. The system shall consist of a steel tape with mounting hardware to accommodate the complete travel of the elevator, a car top assembly with tape guides and sensors, and magnetic strips for stepping and leveling.
- C. The leveling and stopping accuracy of the system shall be within ¼ inch of the floor level and shall correct for over travel or under travel to within the same accuracy, regardless of load variations or direction of travel.

- D. Manufacturer: Landing control system shall be as manufactured by Interface Projects, Co., Model IP-8300 (including any required modifications to accept elevator control systems) or approved equal (under Owner's Options.)

PART 6 – CAR EQUIPMENT

6.1 POWER DOOR OPERATION:

- A. The car and hoistway doors shall be operated quietly and smoothly by an electric operator, which shall open and close the car door and respective hoistway door simultaneously. The doors shall open automatically when the car is leveling at the respective floor and, when operating without an attendant, shall close after a predetermined time has elapsed. Momentary pressure on the "Open Door" button in the car shall cause the doors to remain open or, if closing, to reopen and reset the time interval.
- B. The doors shall be opened at rated speed and the closing speed shall be per Code. Door closing force shall be as allowed by Code.
- C. An electric contact for the car doors shall be provided which shall prevent elevator movement away from the floor unless the door is in the closed position as defined by Code.
- D. Each hoistway door shall be equipped with an auxiliary door closing device and a positive electro-mechanical interlock to prevent the operation of the elevator until the interlock circuit is established and the doors are locked and closed.
- E. Car doors shall be provided with zone locking.
- F. Manufacturer: Gal, MOH operator

6.2 DOOR PROTECTION AND REOPENING DEVICE

- A. Manufacturer: Tri-Tronics or Janus 3D

6.3 ADAPTIVE DOOR TIMING:

- A. Door open times will be varied subject to the call situation causing the stop:
 - 1. Shortest timing, when car call only causes stop.
 - 2. Longer timing, when hall call only causes stop.
 - 3. Longest timing, when coincident hall and car calls exist.
 - 4. All timing shall meet ADA guidelines as a minimum.

6.4 CAR SLING, SAFETIES AND GOVERNORS:

- A. Provide new car sling and safeties.
- B. The new safety, of type required by Code, shall be mounted on the bottom members of the car frame and shall be operated by a speed governor located over the hoistway. The safety shall be arranged to stop the car whenever excessive descending speed is attained and means shall be provided to cut off power from the motor and apply the brake prior to application of the safety.
- C. Manufacturer: Hollister-Whitney or Titan.

6.5 CAR PLATFORMS AND FLOORING:

- A. Each passenger type car platform shall consist of a structural steel frame with a wood and metal composite floor (i.e. one layer of ¾” plywood plus 14 gauge steel plate plus ¾” thick plywood plus finish flooring.) Top finish flooring on cars shall be furnished and installed by Elevator Contractor and shall be as described in item 8.K.
- B. Each passenger type platform shall be equipped with an extruded aluminum threshold and a steel toe guard at the loading edge. The underside of the platform shall be fireproofed to comply with local codes.
- C. Car suitable for a medical stretcher .

6.6 PLATFORM ISOLATION:

- A. Each passenger type platform shall be mounted on rubber pads supported on an auxiliary steel frame fastened to the car frame. This arrangement shall form an isolating cushion between the car and the steel car frame.
- B. Car roller guides (ELSCO type A): The elevator frame shall be provided with roller guides. Each roller guide shall be 6: in diameter, tired with a durable resilient material. The guides shall be designed so as to maintain continuous contact with the guide rails.

6.7 CAR AND COUNTERWEIGHT ROLLER GUIDES:

- A. The car and counterweight system shall be provided with roller guides. The guides shall be designed so as to maintain continuous contact with the guide rails.
- B. Manufacture: ELSCO Model A for car and model “B” for counterweight.

6.8 CAR DOORS:

- A. Doors shall be flush hollow stainless steel panels. Panels shall have sound deadening insulation. Doors shall have removable non-metallic gibs to run in the sill guideway with minimum clearance. Door panels shall conform to the National Elevator Code A17.1-2004 and the Underwriter’s Laboratories 1-1/2 hour fire test requirement. Door unlocking devices shall be provided as required by local codes. The doors shall be equipped with nylube door guides.
- B. Car door hangers and tracks shall be provided similar to hoistway doors.

PART 7 – OPERATING FIXTURES

7.1 CAR OPERATING PANEL:

- A. The operating panel in the car shall consist of vandal resistant stainless steel panel. (Taper all projected sides of car panel back to return panel for a neat appearance. Submit drawings for approval prior to fabrication.) The main control panel shall contain a series of push buttons with illuminated call registration devices, numbered to correspond to the various landings serviced; In Car Stop Key Switch, Alarm Button (connected to a bell located on the car), and a Door Close, Door Open button for each entrance. Alarm bell shall be operated from its own independent battery pack power supply. The control panel shall also contain separate key operated switches for inspection, independent service, car lights and car fan.
- B. Buttons shall be made of brushed stainless steel with LED for illumination, with translucent floor designations, with Braille.
- C. Provide emergency light in car-operating panel with nickel cadmium batteries.
- D. Manufacturer: PTL or Innovation Industries. All shall be vandal resistant.

E. Refer to detail on drawings.

7.2 HALL PUSH BUTTON:

- A. ADA compliant vandal resistant illuminating LED type Hall push buttons shall be installed at each floor to permit waiting passengers to call the elevator to the floor.
- B. Fixtures shall have up and down buttons at intermediate floors and single buttons at top and bottom floors.
- C. Buttons shall be made of vandal resistant stainless steel and shall illuminate to indicate a call has been registered. Button shall remain illuminated until the call has been answered. Provide oversized vandal resistant brushed stainless steel cover plates at all push button stations to cover all openings (including the openings that result from removal of existing hall push button stations or any other devices.)
- D. Provide engraved graphic emergency sign and illustration on all hall push button station plates: "IN CASE OF FIRE USE STAIRWAY FOR EXIT." "DO NOT USE ELEVATOR."
- E. Manufacturer: PTL Performer Series or Innovation Industries.
- F. Refer to detail on drawings.

7.3 FLOOR PASSING CHIME:

- A. Provide a floor-passing chime to meet ADA requirements.
- B. Manufacturer is PTL or Innovation Industries.

7.4 COMMUNICATION SYSTEM (TELEPHONE):

- A. Provide hand-free vandal resistant emergency telephone in the car, with wiring (shielded pairs) to terminals on control panel in machine room.
- B. Phone shall keep working during power failure. Coordinate work with UCSC IT Department. Phone shall be one push button to talk type and flash when call is answered. Telephone shall be an integral part of the car panel.
- C. Manufacturer: CEECO Model SSP-571-X-ADA with hand free operation, and with Braille plate.

7.5 CAR TRAVELING LANTERN:

- A. Shall be provided at both sides of door jambs and shall be ADA compliant.
- B. Manufacturer: PTL or Innovation Industries.
- C. Refer to detail on drawings.

7.6 CAR FIRE ALARM HORN: (OMITTED)

7.7 CAR POSITION INDICATOR:

- A. An LED (Light Emitting Diode) vandal resistant digital type position indicator shall be provided inside car, above door. It shall indicate the floor at which the car is stopped or passing and the direction the car is traveling. The cover plates shall be # 4 stainless steel.
- B. Manufacture: PTL Performer Series or Innovation Industries.
- C. Refer to detail on drawings.

PART 8 – ELEVATOR ENCLOSURES

- A. All cab material; design, lighting, ventilation and exits shall comply with “American National Standard Safety Code for Elevators, ANSI A17.1-2004 and/or local codes. Where codes conflict the more stringent shall apply.
- B. Wall panels and reveals shall be of rigidized 316 stainless steel construction and applied to a steel shell. Applied panels shall be by G&R Elevator Co. or other approved.
- C. Returns shall be of stainless steel construction and have a #4 brushed finish. Cutouts shall be provided for operating elements and fixtures. Minimize thickness of return to maximize clear floor area.
- D. Canopy shall be constructed from formed and reinforced 16-gauge steel finished in white enamel and shall have an overall height of 8’0” from the finished floor. An emergency exit shall be provided which is locked from the top of the car.
- E. Provide coved lighting of 20 foot candle in cab. Coves shall be made of stainless steel with # 4 finish and located at ceiling level with fluorescent lights (two 3 ft., warm, white, deluxe lamps in each cove) on both sides of cab. Also comply with ADA lighting level requirements. Provide stainless steel protective guards consisting of two mesh, 14 gauge, wire cloth encased in a U-channel frame and of adequate size for maintenance. These guards shall be secured in place with tamper proof screws. Submit shop drawings prior to fabrication for Owner’s approval. See Sketch at end of this section for detail.
- F. Entrance columns shall be # 4 brushed stainless steel finish. Columns shall run from floor to canopy, be finished in a vertical grain, and shall be integral to the returns.
- G. Entrance transom shall be # 4 brushed stainless steel finish. Columns shall run from floor to canopy. Transom shall run the full width of the car and be finished in a horizontal grain.
- H. Doors shall be of hollow metal construction, suitably reinforced and sound deadened. Interior shall be stainless steel with # 4 finish and equipped with NYLUBE door guides.
- I. A single speed fan shall be provided that matches the ceiling and is mounted to the canopy. Air intake to the fan shall be through the 3/8” diameter holes (adequate in number to allow free passage of required air quantity) drilled in canopy. Submit shop drawing of canopy for approval prior to fabrication.
- J. A 3/8” x 2” bar handrail with radiused ends of # 4 brushed stainless steel finish shall be provided to meet code requirements.
- K. Car sills shall be extruded aluminum. Car sills for elevator in parking structures shall be nickel silver.
- L. Finished floor covering shall be furnished and installed by the elevator contractor. The type shall be “Endura” style with base and color to be light gray.
- M. In lab buildings, where animals are transferred using the elevator, provide diamond shaped stainless steel

Flooring , none-skid type and rigidized (Vandal Resistant) stainless steel walls and ceiling . All panels shall be Washable type .

N .Cab Manufacturers:

1. G&R Elevator Co.
2. Haunstein Burmeister
3. Tyler
4. Brice Southern
5. Columbia

PART 9 – HOISTWAY ENTRANCES

9.1 ENTRANCES

- A. The entrances shall consist of flush hollow metal door panels, bolted unit type frames, sills, integral hanger(s), hangar covers, fascia plates, headers, struts, sight guards and hardware.

9.2 FRAMES:

- A. New Unit frame shall be fabricated of No. 14 U.S. gauge steel comprising the head and side jamb sections, which shall be securely bolted to form one piece unit construction and shall be securely fastened to the sill and hanger support. They shall be returned on the hoistway side to present a neat appearance.

9.3 HOISTWAY DOORS:

- A. New doors shall be flush hollow metal panels fabricated of No. 16 U.S. gauge steel, minimum. The doors shall be 1-1/4” thick and reinforced with continuous members. Panels shall have sound deadening insulation. Doors shall have removable non-metallic gibs to run in the sill guideway with minimum clearance. Door panels shall conform to the National Elevator Code A17.1-2004 and the Underwriter’s Laboratories 1-1/2 hour fire test requirement. Door unlocking devices shall be provided at all floors and as required by local codes. Sight guards shall be provided for all entrances. Provide new hoistway doors at all landings. The doors shall be equipped with nylube door guides.
- B. Doors interior shall be painted black.
- C. Doors exterior finish shall be polished stainless steel.

9.4 SILLS

- A. Sills shall be of extruded aluminum construction with a non-slip wearing surface. They shall be supported on steel brackets and securely fastened to the floor. Grooves for the door guides shall have minimum clearance for the guides. The sills must be suitable for “Class C3” loading.

9.5 STRUTS:

- A. x 3” x 1/4” steel angle struts shall extend from the sill to the building beam above and shall be securely fastened to ensure rigidity and adequate support for the header.

9.6 HEADERS:

- A. Headers shall be constructed of 3/16” formed steel to provide support for the frame and hangers.

9.7 FASCIA, COVERS, AND TOE GUARDS:

- A. Fascia, including hanger covers, toe guards and dust covers shall be fabricated of No. 16 U.S. gauge steel. Fascia shall span the width of the opening 6 inches. Dust cover shall extend a minimum of 8 inches above the header and the toe guard shall extend a minimum 8' below the sill. Both shall return to the wall at a 60 degree angle.
- B. Finish:
 - 1. Struts, headers, hanger covers, fascia, dust covers, and toe guards shall have matte black finish. New entrance frames (existing) shall be finished in stainless steel of color selected by Owner. All landing doors shall be new and finished in enamel of color selected by owner.
 - 2. All existing heads and jambs shall be stripped to bare metal, prepared with primer and finished with two coats of enamel paint.

9.8 HALL POSITION INDICATOR:

- A. Shall be provided at each floor in elevator lobby or hallway, above hoistway door. Description shall be as in item 7.7 or cap part of the hallway buttons and shall be digital in red color (LED type).

PART 10 – ACCESSORIES

10.1 CAR AND/OR HALL OPERATING KEY SWITCHES: SEE ITEM 4.4

PART 11 – ELEVATOR COMMISSIONING: BY UCSC PHYSICAL PLANT, LEAD BY UCSC PHYSICAL PLANNING AND CONSTRUCTION

PART 12 – SHOP DRAWINGS AND SAMPLE SUBMITTALS

12.1 SAMPLES:

- A. Submit samples of car interior wall, car floor tile and enamel colors. Do not proceed with the orders until samples are approved by engineer.

12.2 SHOP DRAWINGS:

- A. Submit eight (8) copies of Shop Drawings as required showing the general and detailed arrangement of all elevator equipment. Show ceiling, lighting, signal fixtures, and smoke detectors including routing of exposed conduit.

12.3 PRODUCT DATA:

- A. Submit the manufacturer's specification and data sheets, and standard details. Include pictures, catalog cuts, or other suitable illustrations of all elevator equipment that will be exposed in the finish work, including car, hoistway entrance, and signal and control apparatus.

12.4 CERTIFICATES:

- A. Furnish without cost to the Owner all certificates necessary as evidence that the elevator conforms to the applicable laws, ordinances, and requirements.

PART 13 – PERFORMANCE

13.1 CONTRACT SPEED:

- A. Actual speed shall vary no more than +/- 1/4" under loading conditions.

13.2 LEVELING ACCURACY:

- A. Consistently level within +/- 1/4" under loading conditions.

13.3 DOOR TIMES:

- A. The door opening time, measured from the instant the doors start to open until within 1" of the fully open position, shall not exceed Code standards.
- B. Long door and short door "hold open" times, shall be set at 4.0 and 2.5 seconds respectively and shall be ADA compliant.

PART 14 - EXECUTION

14.1 SITE INSPECTION

- A. Prior to preparation of drawings, the contractor shall examine the hoistway and machine room areas and verify that no discrepancies or irregularities exist which would adversely effect the execution of the work.
- B. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.

14.2 CLEANUP

- A. Keep work areas orderly and free of debris on a daily basis.
- B. Remove filings and loose materials resulting from this work from hoistways.
- C. Clean all dirt, oil and grease from machine room and pit equipment and floors.
- D. Clean car, car enclosures, entrances, hoistways, operating and signal fixtures and trim of dirt, oil, grease, and finger marks.
- E. Polish shine all stainless steel components.
- F. Clean all guide rails.

14.3 PERFORMANCE GUARANTEE

- A. The elevator contractor shall assume full responsibility to furnish and provide a complete and functional elevator and to obtain and furnish the University final State Elevator Inspection approval. All costs necessary to correct code deficiencies cited by the State Elevator Inspector will be paid by the elevator contractor as part of this Contract at no additional cost to the Owner.

14.4 FINAL SUBMITTALS

- A. Provide four complete sets (bound and properly arranged) of the parts lists and operators manuals prior to receiving final payment. Following is a brief summary of items:
- B. Legible schematic wiring diagrams including all changes made during installation.
- C. Description of operation of elevator system installed.

- D. Hoisting machine: Including Motor, Brake, Geared Machine and associated devices such as Tach Motors or Monitors.
- E. Deflector Sheaves, Governor and Governor Tail Sheaves, Safeties, Buffers.
- F. Counterweight Assembly, Guide Rollers on Counterweight and Car, Cable Shackles, Safeties and rope brake or other approved emergency stopping device.
- G. Controller and Selector: Including parts information on Relays, Printed Circuit Boards, Reverse Phase Relays, Switches, Lamps, Electrical Cables, Monitors, Modems, Diagnostic Hardware, Diagnostic Software, and Overload Protection Devices.
- H. Door Assemblies: Including Hangers, Rollers, Door Motor, Door Operator, Door Clutch Assembly, Door Closers, Door Drive Arms, Related Hardware, Sheaves, Door Guides, Interlocks, Safety Door Edge.
- I. Signal Equipment: Including Car Station, Wall Stations, Position Indicators, Direction Indicators, Fire Service Panel, Smoke Detectors, Key switches, and pushbutton Assemblies.
- J. SCR Drive Units, Transformers, Chokes.
- K. Car top Inspection Stations, Limit Switches, Solid State Leveling Control Units, Leveling Switches, and Alarm Bell.
- L. Lap top computer with related programming for elevators monitoring, minimum of 250 MHZ, flat screen with rigid stand and chair studied for computer work.

14.5 TECHNICAL TRAINING

- A. On site technical training shall be held for the purpose of familiarizing UCSC Elevator Support Mechanics with operations and troubleshooting procedures. The session shall accommodate up to ten personnel in each session and consist of forty hours of training. (This to include two 2-day sessions and the fifth day reserved for any additional diagnostic training). Training on equipment controller shall be provided by trained factory service engineers for controller manufacturer through the elevator installers. Submit details of training cost with bid.

PART 15 - ELEVATOR GUIDELINES TO ENSURE ACCESSIBILITY BY PEOPLE WITH DISABILITIES

- A. Elevators shall meet the guidelines of the Americans with Disabilities Act using the Uniform Federal Accessibility Standards (UFAS) relevant to elevators (Section 4.10 Elevators) as the technical requirements.
- B. Elevators shall meet the requirements of the State of California relevant to barrier free design and elevators.

PART 15 – ELEVATOR COMMISSIONING SEQUENCE PROGRESS CHECK SHEET

15.1 Overview: Work may consist of modernization or replacement of existing elevators, or installation of new elevators. Covers both types of elevators – hydraulic type and electric traction type.

15.2 Specification Section: _____ Elevator Type & No. _____

15.2 Acknowledgements

<u>Owner</u>	<u>Contractor</u>	
_____	_____	Shop Drawings Submitted (To A/E)
_____	_____	Print Review Completed (by UCSC Elevator Dept.)
_____	_____	Shop Drawings Approved
_____	_____	Elevator(s) – Contract UCSC Elevator Dept.
_____	_____	Telephone Order Placed (1 or 2 lines per elevator)
_____	_____	O&M Manual (Draft) Submitted and approved
_____	_____	Field Review Completed (by UCSC Elevator Dept. prior to installation)
_____	_____	Major Components Delivered
_____	_____	Jack Inspection Completed (for Hydraulic type) by UCSC Elevator Dept.
_____	_____	Electrical Complete
_____	_____	Adjusting Performed
_____	_____	Issues from Adjusting Resolved
_____	_____	Installation Complete
_____	_____	Final Adjusting Completed (UCSC Elevator Dept. attends)
_____	_____	Code Inspection Complete (State of California Elevator Inspector), Report Submitted to Owner
_____	_____	Mfgr’s Performance Testing Completed (Running Speed Test with Full Design Load) PLUS testing of the emergency power battery system .
_____	_____	Elevator Accepted by UCSC Elevator Dept.
_____	_____	O&M Manual (Final Submitted

_____	_____	All Punch-List Items Completed
_____	_____	Operator Training/Instruction Scheduled and completed
_____	_____	System Accepted by Owner