PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Quality assurance and general design criteria for:
   a. Electric (geared) passenger elevators.
   b. Hydraulic passenger elevators.

2. Identification of general work by related disciplines.

3. Service, freight and hospital elevators are not included except when "passenger" elevators are used for these purposes.

B. Related Sections:

1. Section 01500 - Temporary Facilities and Controls:
   a. Barricades for hoistway.
   b. Protection of hoistway entrances during construction and temporary use.

2. Section 05120 - Structural Steel.

3. Section 05500 - Metal Fabrications:
   a. Ladders and platforms.
   b. Intermediate rail brackets.
   c. Gratings.
   d. Sill supports and sill grating.
   e. Divider beams.

4. Section 07110 - Sheet Membrane Waterproofing: Elevator pit waterproofing.

5. Section 08305 - Access Doors.

6. Section 10600 - Partitions: Protective screen between machine room and pits.

7. Section 14210 - Electric Traction Elevators.

8. Section 14240 - Hydraulic Elevators.

9. Division 16 - Electrical:
   a. Installation and connection of power feeders.
   b. Fused, main line switches.
   c. Circuit breakers.
   d. Standby generator power.
   e. Smoke sensors.
   f. Telephone.
   g. Car lighting and auxiliary feeder circuits.
1.2 REFERENCES:

A. American Society of Mechanical Engineers (ASME):
   3. A17.5: Elevator and Escalator Electrical Equipment.

B. UFAS: Uniform Federal Accessibility Standards.


D. National Fire Protection Association (NFPA):
   1. NFPA No. 70, National Electric Code (NEC).
   2. NFPA No. 80, Fire Safety of Hoistway Entrances.

1.3 SUBMITTALS:

A. Shop Drawings:
   Submittal shall include:
   1. Basic elevator layouts with clearances and loads.
   2. Brochures exhibiting door operator and motor.
   3. Indication of space requirements.
   4. General arrangement of elevator equipment.
   5. Connections, attachments, reinforcing, and anchorage.
   6. Location and amount of loads and reactions to be carried on the building structures.
   7. Door controllers for freight elevators.
   8. Car operating panels, landing buttons, hall fixtures, car position indicators.
   10. Hoistway doors and frames.
   11. Summary of electrical loads, main and auxiliary feeder requirements and mechanical heat loads.

B. Samples:
   1. Submit samples of finishes for cars and entrances.
   2. Submit samples of tactile identification plates.

C. Certificates and Test Reports:
   1. Submit written, certified reports for required tests, recording the dates performed, test method (description), test results, interpretation of the results, and recommended action. Where required, submit additional copies directly to governing authorities.
2. Provide certificates and operating permits to the Owner for each elevator, obtained from governing authorities, as necessary for normal, unrestricted use of the elevators.

D. Maintenance Manuals:

1. Submit four copies of bound maintenance manuals for each elevator or group of elevators. Include As-Built, one-line wiring diagrams for power, lighting, signals, controls and communication, full maintenance and operating instructions, parts lists, recommended spare parts and emergency parts inventory, sources of purchase and similar information. Include engineering data for microprocessor based systems.

2. Diagnostic Test Equipment and Instructions: Diagnostic test device together with one set of all supporting information necessary for interpretation of test data and troubleshooting of system. The instruction period for use of the controller diagnostics and interpretation of test results by Owner's maintenance personnel shall not be less than one eight-hour day for the work included under this section.

1.4 QUALITY ASSURANCE:

A. Regulatory Requirements:

1. Elevator Code: Except for more stringent requirements as indicated or imposed by governing regulations (which must be complied with), comply with applicable requirements of AMSE A17.1, "Safety Code for Elevators and Escalators" (hereafter referred to as the "Code").

2. NFPA Code: Comply with applicable NFPA codes, and specifically with sections relating to electrical work and elevators.

3. Fire Resistance of Entrances: Comply with NFPA No. 80, and provide units bearing UL labels with 30-min. temperature rise on labels.

   a. Provide UL or other approved label rating entrance at 1-1/2 hr. (B-label).

4. Physically Challenged Accessibility Standard: Except as otherwise indicated, comply with "Uniform Federal accessibility Standard", including clearances, control and jamb signage, locations for signal equipment, door timing cycles, and similar provisions.

B. Installer Qualifications:

1. The elevator installer shall be an authorized licensee of the manufacturer, who has not less than 5 years successful experience with the installation of similar elevators, and who is currently under contract for maintenance of similar elevators in the area, and who maintains a service center within 75 miles of the University of Colorado, Boulder Campus.

C. Permits and Inspections:
1. The Elevator Installer shall obtain and pay for inspections and permits, and make such tests required by authorities having jurisdiction.


3. Tests shall be made in presence of authorized representative of regulating authorities, together with representatives of the Architect and the Owner.

4. Supply personnel and equipment for tests and final acceptance required by the Architect and the Owner.

1.5 JOB CONDITIONS:

A. Temporary Elevator Use:

1. Existing Elevators and New Elevators in Existing Buildings: Not permitted.

2. New Construction and New Additions: Permanent elevators may be used at no charge to Subcontractor or other contractors for transporting personnel, small tools, materials, and equipment, provided as follows:

   a. Entire car is lined (floor, walls, ceiling) with 0.75" Fir Plywood or equivalent;
   b. Total load carried does not exceed rated capacity of elevator;
   c. Incremental load carried does not exceed load classification of elevator.
   d. No materials, equipment, trash, tools or other items too large to be readily moved into and out of the car be carried in the elevator;
   e. Before acceptance of the building, linings are removed, all exposed surfaces are in new condition, all controls, relays, other parts showing any wear have been replaced.
   f. Entire elevator, including machinery, electrical components, doors, operators and controls are tested, adjusted, and put in new condition with specified warranties and maintenance to take effect at date of the Notice of Acceptance;
   g. Written clearance has been obtained from the Elevator Installer stating that the installation is safe and complete for this use prior to using it;
   h. The Contractor signs the Elevator Installer's standard agreement and release forms for this usage and pays his charges for maintenance, service, repairs, and reconditioning;
   i. Not more than one elevator is used for such transporting service.
1.6 MAINTENANCE:

A. Starting at the date of the Notice of Acceptance, provide complete systematic inspection and maintenance of elevators concurrent with one year new equipment warranty.
   1. Furnish trained experts and equipment to check, adjust, lubricate and otherwise maintain the elevators.
   2. Repair or replace defective or worn materials or parts except as cause by misuse or abuse by Owner or building occupants.

B. This service shall include regular examinations of the installation by competent and trained employees of this Subcontractor, and shall include all necessary adjustments, lubrication, cleaning, supplies, and parts to keep the equipment in perfect operation, except such parts made necessary by misuse, accidents, or negligence not caused by this Subcontractor.

C. The Elevator Subcontractor shall have bona fide proven manufacturer's service facilities within 75 miles of the project, which shall be maintained direct by the manufacturer. This Subcontractor shall also have in inventory, within 75 miles of the project, the necessary replacement parts for satisfactory servicing.

D. Make corrective adjustments, repairs within 24 hours of notification by Owner. Should such repairs be required outside of normal working hours, Owner will pay differential cost between regular and overtime.

1.7 WARRANTY:

A. Provide written warranty in four copies signed by Installer and Elevator Manufacturer agreeing to replace defective materials or workmanship as follows:
   1. Operational failures.
   2. Performance below specified minimums.
   3. Excessive deterioration or aging.
   4. Unsafe conditions.
   5. Excessive noise or vibration.
   6. Abnormal wear considering intensity of use, unexpected or unsatisfactory conditions.

B. Warranty will not include:
   2. Abusive use.
   3. Vandalism.
   4. Failure of the structure.
   5. Failure of power supply.

C. Make corrective adjustments or repairs within 24 hours of notification by the Owner.
   1. Should such repairs be required outside of normal working hours, Owner will pay differential cost between regular and overtime hours.

D. Warranty period: One year starting at the date of the Notice of Acceptance of all
elevators included under scope of this work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

1. Elevators Unlimited, Inc.
2. AMTECH Reliable.
3. Centric Elevator Corp.
5. Montgomery Elevator Co.
6. Otis Elevator Co.
7. Schindler Elevator Corp.
8. Approved substitute under the provisions of Section 01600.

2.2 GENERAL DESCRIPTION:

A. Requirements and Criteria:

1. Specify for Each Elevator:
   a. Number and type.
   b. Capacity and speed.
   c. Travel.
   d. Stops and openings.
   e. Inside car or outside platform dimensions.

2. Operation: Provide automatic or group automatic operation of the type indicated below and defined in the Code as "Operations".
   b. Group Control for Two Elevators: 2-car "Group Automatic Operation".
   c. Group Control for Multiple Cars: Where more than two elevators are scheduled in a group operation, provide solid-state modular microprocessor to control car movements. Provide automatic dispatching of selected cars in response to changes in demand for different traffic conditions including heavy incoming, heavy 2-way, heavy outgoing, and light off hours as variations of normal 2-way traffic.
   d. Provide special operation as dictated by special program requirements.

3. Leveling: Automatic two-way leveling and releveling. Leveling accuracy ± 1/4".


6. Hoistway and Car Entrance Frames: Stainless steel or baked enamel.

7. Hoistway and Car Doors: Stainless steel or baked enamel.
8. Cab Design: Manufacturer's standard unitized steel cab with stainless steel front returns and other finishes selected by the Architect.

ADD PROTECTIVE BLANKET LINING TO CAB DESIGN IF REQUIRED.

9. Firefighters Service:

a. Key switch and indicator jewel in hall pushbutton station or separate panel at "home" level.


10. Telephone: Elevator Speakerphone as manufactured by Adams, Model 931-Phone or approved substitute having hands-free operation and meeting UFAS requirements. Include the following:

a. Lexan push button.
b. Metal identification plate with raised letters and braille.
c. Automatic dialing.
d. Automatic shutoff.
e. LED indicator.
f. Recall and tracking.

REVISE PLATFORM TO HEAVY-DUTY AND INCLUDE APPROPRIATE LOAD CLASSIFICATION FOR ELEVATORS THAT WILL BE USED FOR SERVICE OPERATIONS.


12. Mechanical Ventilation: Supply fan with outlet diffuser, 10 cfm per sq. ft. of floor area, NC rating of 25 or less.

USE RUBBER FLOORING SYSTEM IN FREIGHT ELEVATORS.


14. Platform: Manufacturer's standard duty welded steel platform designed with safety factor to handle specified load.

15. Stainless steel handrails on each side and rear of elevator with top located approximately 32 inches above floor and complying with UFAS requirements.

16. Miscellaneous Features:

a. Emergency stop switch in pit.
b. Back contact on stop switch in car to ring alarm bell.
c. Guarded light and GFCI protected convenience outlets, top and bottom of car. GFCI protected convenience outlet in car.
d. Key-operated hoistway access device and top-of-car operating device.
Mount key switches in door frames at top and bottom floors with only ferrule exposed.

e. Emergency alarm bell, located on car.
f. Car top emergency exit opened from outside only, with contact.
g. Emergency "Versalite" car lighting with short circuit protection.

2.3 WIRING:

A. All necessary wiring shall be furnished and installed in the hoistway in accordance with the National Electrical Code and University of Colorado Electrical Standards.

B. Traveling Cable: Flame and moisture resistant.

C. Provide 10 percent spare conductors and two sets of shielded communication wires for each elevator.

2.4 BUFFERS:

A. Substantial buffers shall be furnished and installed in the elevator pit. They shall be mounted on continuous channels fastened to the elevator guide rail or securely anchored to the pit floor and substantial extensions will be provided, if required.

B. Provide car buffer stabilization channels, buffer access ladders and platforms.

2.5 DOOR OPERATOR CONTROLLER:

A. Manufacturer: Moline Accessories Company (no substitutions).

B. Include the following features and options:

1. Totally ball bearing, belt driven door operator.
2. Solid state controller.
3. Control and adjustment of operator from car top.
4. Adjustable closing torque for code requirements.
5. Nudging (slow closing).

C. Direct drive geared operators, A.C. controlled units with oil checks or other deviations from the above are not acceptable.

2.6 DOOR OPERATION:

A. Provide System manufactured by G.A.L Manufacturing Corp (MOVFR)-no substitutions.

B. A direct current motor-driven heavy duty operator shall be furnished and installed, designed to operate the car and hoistway doors simultaneously.

C. Door movements shall be electrically cushioned at both limits of travel and the door operating mechanism shall be arranged for manual operation in event of power failure.

D. Doors will then resume closing cycle. Doors shall automatically open as the car arrives at the landing and shall automatically close after an adjustable time interval or when the
car is dispatched to another landing.

2.7 ELECTRONIC PASSENGER SENSING DEVICE:

A. Provide protective edge system manufactured by T.L. Jones (no substitutions).

B. A solid state electronic detector designed to operate as described below shall be provided at the entrance of the elevator car.

C. After a stop is made, the doors shall remain open for an adjustable time interval. Closing may be initiated instantaneously by registration of a car call.

D. The doors will remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door movement is obstructed for a predeter-

2.8 INTERLOCKS:

A. Each hoistway entrance shall be equipped with an approved type interlock tested as required by Code. The interlock shall be designed to prevent operation of the car away form the landing until the doors are locked in the closed position as defined by Code and shall prevent opening the doors at any landing from the corridor side unless the car is at rest at that landing or is in the leveling zone and stopping at that landing.

B. Interlocks shall bear Underwriters Laboratories "B" label of approval.

2.9 HOISTWAY DOOR UNLOCKING DEVICE:

A. Hoistway door unlocking devices as specified by the ASME A17.1 code shall be provided at all floors with escutcheon to permit authorized persons to gain access to hoistway when elevator car is away from the landing.

2.10 CAR OPERATING STATION:

A. A main car control panel shall be provided in the car and shall contain the devices required for the specified operations. Provide vandal resistant pushbuttons, controls and signals.

B. The lowest module shall contain the "door open", "door close", "keyed emergency stop switch" and illuminating alarm button.

C. Intermediate modules shall contain car and hall illuminated vandal resistant floor buttons which will illuminate when a call is registered and will remain illuminated until the call is answered.

D. The top module shall contain the required switches.

E. All raised floor indications and symbols shall be located immediately adjacent to the left of the floor buttons and fully integrated in the module design. No applied symbols shall be allowed.
F. There shall be no floor indications or symbols on the buttons.

2.11 LANDING BUTTONS:

A. Vandal resistant landing pushbutton stations shall be provided.

B. The buttons shall be illuminated to indicate that a call has been registered at that floor for the indicated direction.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL:

A. Upon nominal completion of each elevator installation, and before permitting use of the elevator (either temporary or permanent), perform acceptance tests as required by governing regulations. Comply with ASME A17.2, Part II, "Standard Practices for the Inspection of Elevators".

3.2 DEMONSTRATION:

A. Instruct the Owner's personnel in the proper use, operation and daily maintenance of the elevator. Review emergency provisions, including emergency access and procedures to be followed at a time of failure in operation and other building emergencies. Train Owner's personnel in the normal procedures to be followed in checking for the source of an operational failure or malfunction. Confer with the Owner on the requirements for a complete elevator maintenance program.

B. Make a final check of each elevator operation just prior to acceptance of the elevator work by the Owner. Determine that all operating devices are functioning properly.

3.3 TESTING:

A. General: Upon completion of elevator, in addition to the usual tests required by State Safety Orders, the Elevator Installer shall perform a one-hour full load Heat and Run Test on elevator.

B. Upon completion of the equipment installation, provide the following tests and inspections. The Owner will oversee all tests, but the Contractor is to provide all labor and materials required to perform the tests.

1. A check to see that workmanship and equipment furnished and installed comply with the Specifications.

2. Contract speed check and floor-to-floor time checks for compliance with performance requirements of these specifications (test weights required for this purpose shall be furnished by the Installer).

3. A complete check of performance including:

INDICATE SPEED AND FLOOR-TO-FLOOR TIMES IN CONTRACT DOCUMENTS BASED ON ACTUAL BUILDING DESIGN.
a. Starting, accelerating, running.
b. Decelerating, leveling, stopping.
c. Door operation including stall pressure.
d. Emergency features (including lighting).

4. Test the following:

a. Loop circuits.
b. Set safety and perform in accordance with ASME A17.1 Part 10.
c. Door interlocks.
d. Safety circuits.

C. Final acceptance of the entire installation shall be made only after all equipment has satisfactorily passed the aforementioned inspection and tests and the electrical diagrams have been provided.

END OF SECTION 14200