MODULAR ELEVATOR SPECIFICATIONS
AC3000 AND AC4000

PART 1- GENERAL

1.0 SUMMARY

A. Section Includes: Supply and complete installation and testing of the hydraulic passenger elevators indicated on Drawings including cylinders, plungers, pumping units, oil storage tanks, controllers, guide rails, and entrances.

B. Related Sections

1. Excavating, Backfilling and Compacting for Utilities: Section 02222.
2. Elevator Pit Concrete; Cast-In-Place Concrete: Section 03300.
3. Resilient Flooring: Section 09650.
4. Heat and Smoke Sensing Devices: Division 15.
5. Power and Telephone Service to Elevator Control Panel: Division16.

1.1 SUBMITTALS

A. Submit in accordance with Section 01300: Submittals and Section 01350: Deferred Approval Items.

1. Shop Drawings: Submit complete shop drawings, indicate control, power and piping diagrams.
   Include dimensioned plan of hoistway and machine room and full height section through hoistway.

2. Submit engineering calculations for the guide rail supporting brackets, splice locations, and jack(s) support beams and brackets.

3. Submit a complete list of all items to be furnished and installed under this Section.

B. Submit manufacturer's recommended installation procedures which, when approved by the architect, shall be the basis for inspecting and and accepting or rejecting actual installation.

C. Samples: Submit samples showing full range of colors and textures of all finish materials specified including 2" x 3" sample of light-diffusing plastic ceiling panels.

D. Maintenance Manuals: Furnish to the inspector prior to final inspection, one bound maintenance manual containing specifications and instructions for the maintenance and adjustment of operating equipment and controls. Include with the special control directions, any special tools or testing equipment required.

E. Submit Project Record Drawings in accordance with Section 01720.

1. Submit one (1) 24" x 36" reproducible vellums.

1.2 QUALITY ASSURANCE

A. Work of this section shall conform to the following standards:

1. American National Standard Safety Code for Elevators (ANSI) A17.1
2. The National Electrical Code (NEC)
3. The American National Standard Specifications (ANSI) A117.1
4. "Minimum Passenger Elevator Requirements for Handicapped", Third edition, as published by the National Elevator Industry, Inc.

B. Qualifications of Subcontractor: Elevator contractor shall be regularly engaged in the business of installing and servicing elevators of the type specified and shall have a local history of successful installations acceptable to the architect.

C. Qualifications of Installer: Provide a thoroughly qualified, trained and experienced person who shall be present at site and shall direct all work performed under this section.

1.3 PRODUCT HANDLING

A. Use all means necessary to protect the materials required by this section before, during and after installation and to protect the work form other trades. In the event of damage, immediately make all necessary repairs and replacements at no cost to the district. All such costs shall be borne by the responsible party.

1.4 WARRANTY AND MAINTENANCE

A. Warranty: Provide special project warranty, signed by the contractor, installer and manufacturer, agreeing to replace/repair/restore defective materials and workmanship of elevator work during warranty period. "Defective" is hereby defined to include, but not by way of limitation, operation or control system failures, performances below required minimums, excessive wear, unusual deterioration or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise or vibrations, and similar unusual, unexpected and unsatisfactory conditions.

1. The warranty period is for 12 months starting on date of acceptance by the State Elevator Inspector or 13 months from date of delivery of elevator unit(s).

B. Maintenance Service: Provide full maintenance service by skilled, competent employees of elevator installer for a period of 12 months following date of acceptance. Include monthly preventative maintenance, performed during normal working hours. Include repair/replacement of worn or defective parts or components and lubrication, cleaning and adjusting as required for proper elevator operation in conformance with specified service. Exclude only repair/replacement due to misuse, abuse, and accidents for neglect cause by persons other than Installer's personnel.

C. Warranties: Provide coincidental product warranties where available for major components of elevator work. Submit with maintenance manuals.

PART 2- PRODUCTS

2.0 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, Manufacturers offering products that may be incorporated in the work include but are not limited to the following:

1. Phoenix Modular Elevator Inc.
   912 South 12th Street
   Mount Vernon, IL 62864
   (618) 244-2314

2.1 SYSTEMS AND EQUIPMENT

A. General characteristics:

1. Type: Oil hydraulic passenger.
2. Control: Electric-hydraulic passenger.
3. Capacities: 2000 lbs.
4. Speed: 100 FPM
5. Operation: Automatic selective collective. Controller shall be non-proprietary type and provide any special tools and instructions for repair and maintenance. Relay logic controllers not acceptable.
6. Car interior clear dimensions: As indicated on drawings. Cab clear Height –7'-6'.
7. Hoistway Door: 3'-0' x 7'-0' clear, single slide entrance with approved "B" label, hollow metal.
8. Door Operation: Car and hoistway doors, medium speed, power operated.

9. Signals: Illuminated buttons in car operating panel, illuminated hall call station visible and audible "in-car lantern".
10. Special Features: Emergency lighting and alarm bell, automatic failure protection, Braille symbols and access compliance provisions, infra-red beam door re-opening device, inspection switch, and hoistway access switch and car-top inspection station.
11. Travel: total travel distance (floor to floor) shall be as indicated in Drawings.
12. Power Supply: Alternating current, 208,220,440 volts 3 phase or 1 phase, 60 Hertz.
13. Dedicated Electrical Lines: Car lighting, 120 volts with lockable disconnect in Machine room, see NEC E620-53; Machine Room and elevator pit; Machine Room and Elevator receptacles. Install ¾" conduit from nearest telephone terminal cabinet to machine room. Conduit in machine room shall be rigid metallic from disconnect to controller. Terminate in 4-S box, + 6'-0" above floor, cover of box indelibly marked "ELEVATOR EMERGENCY TELEPHONE".

B. Car Frame:

1. A car frame fabricated from formed or structural steel members shall be provided with bracing to support platform and car enclosure.
2. Car platform shall be formed steel.
3. Car frame shall be isolated from platen plate by means of rubber isolation mounts.

C. Elevator Cab:

1. Interior car finish shall be high-pressure plastic laminate. Colors shall be selected by the architect.
2. Provide 1-1/4" O.D. round stainless steel handrail(s) in car. Mount handrails 34" to top of rail from floor with a 1-1/2" clearance from wall.
3. Ventilation of car shall be a natural draft vent.
4. Drop ceiling shall have separate light diffusing polycarbonate panels.
5. Lighting: Provide 36" fluorescent light fixtures and bi-pin type lamps, energy-efficient type.
6. Provide 4" high rubber top-set and vinyl composition tile floor as selected by the Architect. (To be installed by others).
7. Provide an emergency light and alarm unit approved for elevator use. Battery powered emergency units shall have a self-contained charging unit capable of maintaining a peak charge without damage to the battery.
8. Provide flush mounted stainless steel car operating panel. (See Article 2.02, Paragraph H).
9. Provide a car top inspection station with an "emergency stop" switch and with constant pressure "up-down" direction buttons which shall make the normal operating devices inoperative and give the Inspector complete control of elevator.
10. Provide elevator emergency telephone. (See Article 2.02, Paragraph A.13).

D. Car Door:

1. Door finish shall be solid color enamel or stainless steel as selected by the architect.
2. Pre-opening of doors shall not be installed.
3. Doors shall be power-operated automatic opening and closing, connected to the hoistway door opposite by a movable clutch mechanism.

E. Hoistway Entrance Doors:

1. Hoistway entrance doors shall be hollow metal, horizontal sliding type and shall include frames, sills, doors, hangers, hanger supports, hanger covers, fascia plates, and all necessary hardware. Finish shall be solid color enamel or lacquer as selected by the architect. Hoistway entrances shall bear "B" Label. (DO NOT paint over labels on doors or frame).
2. Provide landing identification on the hoistway side of entrance doors. Stencil 4" high Arabic numerals 12" above the bottom and 12" below the top of the door panel. Paint color shall provide maximum visual contrast to background color.

F. Guide Rails:

Install guide rails for code standard "T" shaped steel for car and counter-weight guides. All bolts shall have a minimum of 2 threads showing beyond fastening nut.

G. Elevator Door Safety System:

1. Infra-red curtain unit using beams of invisible infra-red light to protect passengers against closing elevator doors.
2. Provide system by the following manufacturers:
    a. Electro-Mechanical Industries
    b. T. L. Jones
    c. Janus Products
    d. Or approved equal.
3. Car doors shall have an electronic obstruction sensing, reopening device. Device shall automatically reinstate operation after blockage is cleared.
4. Door shall be held open for normal cycle of seven seconds and shall be reopened by beam interruption. Time shall be adjustable within control panel.

H. Car Operating Panel:

1. A flush-mounted stainless steel operating panel shall be mounted in each car and shall contain all devices required for specified operation. Panel shall be hinged.
2. Push buttons in operating panel shall be installed between 35" and 54" above car floor.

3. Floor registration pushbuttons shall be metal with lighted floor Designation engraved and filled on each push-button. Emboss correct Braille designation on panel face immediately to left of each pushbutton.
4. Emergency "stop" and "alarm" pushbuttons, mounted 35" center to car floor, shall be metal with tactile symbols etched into pushbuttons or panel face. Alarm button shall be on left. Stop button shall be key operated only.
5. Provide door "open" and "close" pushbutton switches immediately Above "stop" and "alarm" switches. Activated door "open" switch shall override automatic door closing circuit immediately, opening and holding door in full open position until pushbutton is released. Activated door "close" switch shall override automatic door hold open timer circuit only and immediately start door closing operation but shall not override door protection devices.
6. Key operated switch in control panel shall control car lights. Switches For car lights, electronic door protection unit, and independent operation shall be operated with same key, but key shall not operate inspection switch.
7. Key switches for control of car mounted equipment and special operation of elevator shall be installed in operating panel above highest floor button.
8. Hoistway access switches and inspection switch in car shall operate with one key. This key shall not operate any other switch used for operating other elevator equipment or circuit logic.

I. Landing Requirements:

1. Hall call stations shall be #16 gage stainless steel, satin finish, flush mounted, 42" center line to floor with a visual call registered indicator. Stations shall contain call switches, call registered indicator. Stations shall contain call switches, call registered indicators and fire recall switch when applicable.
2. Provide push button or push button with key operated cutout switches. Key removable in "off" or "neutral" position only. Install lock cylinder in a way that will mechanically prevent rotation in mounting plate. Hall call switches shall be 6 pin key cylinders to match school keyway. (See Finish Hardware Section).
3. Identify hoistway entrances, as to landing served, by permanently installing 1/8" thick metal plates on both jambs of frame. Plates shall be riveted in all 4 corners. Plates shall be centered 60" above floor. Etch plates with 2" high Arabic numerals and corresponding Braille symbol to left or below. Braille symbol and numeral shall be raised .030" above background.
4. At all landings, permanently install fire signs. Signs shall be mounted Above call station and read "In case of fire use stairway for exit. Do not use elevator". Sign shall be securely fastened with rivets.
5. Provide visible and audible "in-car lantern", located on car door jamb, visible from proximity of hall call station, indicating direction of travel to persons waiting on landing.

J. Operations:

Selective Collective Operation: Elevator shall be controlled automatically by means of push buttons in car marked to correspond with respective landings served and by "Call' key switch at each hoistway opening. Momentary pressure on any button shall operate car, if all car and hoistway doors are closed. Stop switch and car push-button station, when in off position, will render elevator inoperative and which will enable attendant or passenger to stop at any point during its travel.

K. Hoistway Access:

Hoistway "Access" switches shall be provided at top landings and bottom, if required.

L. Emergency Operation (Fire Recall Circuit):

Emergency operation shall comply with local Code and provide following.

1. Emergency operation key switch at main floor, flush in wall, to Return elevator to main floor with operating instructions etched on switch cover plate.
2. Non-self resetting smoke detectors shall be installed at each elevator landing except main landing, to cause elevator to return to main floor if activated. Smoke detectors shall be tied into elevator controller but not into any other detection system. Smoke detector system not required in fully sprinkled buildings.

M. Elevator Controls:

Elevator controls shall cancel "up" direction demands and return car to bottom landing should main motor thermal protective device actuate on an over heat or fault condition. Controls shall prevent re-initiation of "up" demands until all thermal protective devices are reset to normal positions or fault cleared.

N. Jack Units:

1. Hydraulic jacks shall be supported on pit floor. Any space under jack base plate and pit floor shall be completely filled with non-shrink grout after installation.
2. Jack unit shall be of sufficient size to lift gross load height required and shall be factory tested to insure adequate strength and freedom from leakage. No brittle material, such as gray cast iron, shall be used in jack construction. Hydraulic jack cylinders shall be clean and free of all rust and debris.
3. Twin holeless, twin telescopic holeless or in-ground jacks, as travel dictates.

O. Power Unit:

1. Oil pumping and control mechanism shall be compactly and neatly designed.
2. Pump shall be especially designed and manufactured for oil-hydraulic Elevator service. Hydraulic pump motor shall have continuous ground to main slab. Output of pump shall not vary more than 10% between “no load” and “full load” on elevator car.
3. Drive shall be by direct coupling.
4. Protect motors classed as intermittent duty against continuous operation with a magnetic switch and overload relays of sufficient number and size and a integral thermal sensor.
5. Thermal overload relays of main motor magnetic shall be manual reset. Protective operation of motor magnetic switch thermal overload relay or integral thermal sensor shall prevent operation of main device motor, but shall not prevent operation in down direction of elevator nor prevent normal operation of power door operator.
6. Hydraulic control valves shall be multi-control integral valve unit, with 2 direction leveling “soft-stop” features and manual lowering control.
7. Power unit assembly shall be designed and installed to prevent transmission of operation noise outside machine room.

P. Piping and Oil Supply:

1. Storage Tank: Storage tank shall be constructed of steel. Equip with a gate shut-off valve between tank outlet and pump inlet. An initial supply of oil, of proper grade, sufficient for proper operation shall be provided in installed. Oil tank shall be secured to meet seismic requirement of the code.
2. Sound Isolating Couplings: Install sound isolating coupling in oil line between pump and jack, located in the machine room.
3. Muffler: A blow-out proof muffler, designed to minimize transmission of fluid pulsation shall be installed in piping between pump and cylinder.
4. Hydraulic piping system shall be designed and installed without leaks.
5. Hydraulic lines between machine room and hoistway shall be installed above grade where possible. Underground lines shall have a heavy coating of non-corrosive mastic and a double wrapping of PVC pipe wrapping tape .01” thick or a continuous flexible .02” thick plastic sleeve.
6. Trenches shall be back-filled only after pipe installation has been approved by the site construction inspector.

Q. Keying:

Furnish to owner keys for every key-operated switch, including hoistway access, inspection and fireman recall switch.

R. Telephone Cable:

Install a braided shielded 2 conductor NO. 20 AWG telephone cable between car telephone cabinet and dialer backboard in elevator machine room. Conductors and shield shall be

continuous between cabinet and junction box, installed in a legal wire way except for traveling cable. Shield shall be braided and one end grounded.

S. Traveling Cable:

Traveling cable shall be in accordance with National Electric Code, Type E, EO and ETT. Cables shall be U.L. approved.

T. Elevator Emergency Telephone:

1. Provide a complete and operational emergency elevator telephone. Auto dialer shall be programmed to automatically dial primary number and secondary number as specified by the owner.
2. Telephone Company shall provide a dedicated telephone line to be terminated at main telephone terminal backboard in a RJ-11 jack. RJ-11 jack shall be marked with telephone line number and labeled "ELEVATOR TELEPHONE".

PART 3-EXECUTION

3.0 EXAMINATION

A. Prior to commencing elevator installation, examine pre-fabricated hoistway, hoistway openings pits and machine rooms as constructed; verify all critical dimensions and examine supporting structure and all other conditions under which elevator work is to be installed. Notify contractor in writing of any dimensional discrepancies or other conditions detrimental to the proper installation or performance of elevator work. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.1 INSTALLATION OF ELEVATOR SYSTEM

A. General:

Comply with manufacturer's instructions and recommendations for work required during installation.

B. Excavation for Pit:

Excavate for each elevator pit to accommodate installation of modular elevator unit; comply with applicable requirements of Division 2 "Excavation" sections.

C. Install modular elevator units plumb and accurately centered for elevator car position and travel; anchor securely in place.

D. Welded Construction:

Provide welded connections for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

E. Coordination:

Coordinate elevator work with work of other trades for proper time and sequence to avoid construction delays. Use benchmarks, lines and levels designated by contractor to ensure dimensional coordination of the work.

F. Sound Isolation:

Mount rotating and vibrating elevator equipment and components on vibration-absorption mounts, designed to effectively prevent transmission of vibrations to structure and thereby to eliminate sources of structure-borne noise from elevator system.

G. Install piping connection between hoistway and machine room without routing underground where possible. Where not possible, cover underground piping with permanent protective wrapping before backfilling.

H. Lubricate operating parts of system, including ropes, if any, as recommended by manufacturers.

I. Alignment:

Coordinate installation of hoistway entrances with installation of modular elevator unit for accurate alignment of entrances.

J. Leveling Tolerance:

½-inch, up or down, regardless of load and direction of travel.

K. Finish interior walls at hoistway entrances and trim to modular elevator unit. Provide sill or finish floor in area of hoistway door penetration in accordance with plans.

3.2 FIELD QUALITY CONTROL

A. Acceptance Testing:

Upon nominal completion of each elevator installation and before permitting use of elevator (either temporary or permanent), perform acceptance tests ad required and recommended by Code and governing regulations or agencies.

B. Operating Tests:

Load each elevator to its rated capacity and operate continuously for 30 minutes over its full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of pump motor (except submerged pumps) during 30-minute test period. Record failures of elevator to perform as required.

C. Advise contractor, owner, architect and inspection department of governing agencies in advance of dates and times tests are to be performed on elevators.

3.3 PROTECTION

A. At time of substantial completion of the elevator work (or portion thereof), provide suitable protective coverings, barriers, devices, signs or such other methods or procedures to protect elevator work from danger or deterioration. Maintain protective measures throughout remainder of construction period.

B. Provide similar protective measures for elevator units that will be placed in temporary service, including inspection and maintenance service during period of temporary service.

3.4 DEMONSTRATION

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

B. Make a final check of each elevator operation with owner's personnel present just prior to date of substantial completion. Determine that control systems and operating devices are functioning properly.

END OF SECTION 14240