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**ARCHITECTURE, ENGINEERING AND CONSTRUCTION**



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DOCUMENTS

SPECIFICATION DIVISION 14

NUMBER SECTION DESCRIPTION

DIVISION 14 CONVEYING SYSTEMS

SECTION 142423 - HYDRAULIC PASSENGER ELEVATOR

END OF CONTENTS TABLE

2-04: Substantially revised, adopted as new master.

1. DIVISION 14 CONVEYING SYSTEMS
   1. SECTION 142423 - HYDRAULIC PASSENGER ELEVATOR
      1. General
         1. RELATED DOCUMENTS

INCLUDE PARAGRAPH 1.1.A and b IN EVERY SPECIFICATION SECTION. EDIT related sections 1.1.B to make it project specific.

* + - * 1. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 1 Specification Sections, and other applicable Specification Sections including the Related Sections listed below, apply to this Section.
      1. SCOPE OF WORK

spec Editor: revise the following to suit project.

* + - * 1. The work of this division shall consist of the complete installation (or replacement) of one hydraulic passenger elevator in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Building. 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.
        2. 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 as are required to make a complete installation.
        3. Soil testing: The soil around existing piston is to be tested by University of Michigan's OSEH Department. This contractor is to coordinate related work with Owner and notify the Owner, through the project manager, when pit soil is accessible for sampling and testing.
        4. Outline of work by University of Michigan's OSEH Department:

Analysis and testing of soil contamination.

Transport of removed contaminated soil to a dumping site with MDEQ permit.

Contact number at OSEH is (734) 763-4642.

* + - 1. GENERAL
         1. 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.
      2. ACCEPTABLE ELEVATOR INSTALLERS \*
         1. Kone Elevator Co.
         2. Detroit Elevator Co.
         3. City Elevator Co.
         4. Schindler Elevator Co.
         5. Otis Elevator Co.
         6. Thyssen Elevator (Dover)

\* 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. DRAWINGS
         1. 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 to the Owner or architect, 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 building and setting it in place to provide the drilling process. See item 1.2.C for soil testing.
      2. REQUIREMENTS OF REGULATORY AGENCIES
         1. Perform all work in accordance with applicable codes, the State of Michigan Elevator Code, the National Electrical Code, and the American National Standard Safety Code for Elevators; ANSI A17.1-2000, as referenced therein and all of the provisions in the University of Michigan's Standard General Conditions dated January, 1996. 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 obtain any variances from the Governing Authority that could be necessary for a complete acceptable elevator installation. Also refer to Article 14.3 of this section.
         2. Comply with "Elevator Guidelines to Ensure Accessibility by People with Disabilities" as noted in PART 15.0.
      3. GUARANTEE
         1. 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.
      4. SCHEDULING OF OPERATIONS
         1. Contractor must note that the building will be occupied between the hours of 7:00 A.M. and 6:00 P.M. Construction scheduling is of utmost importance. Refer to special conditions for additional information. 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.
         2. Refer to bid documents for schedules of start and completion of constructions.

spec Editor: Delete the following article if project is not for Housing.

* + - 1. Special project for U of M Housing.
         1. The building will be occupied and used by student's residence or conferences attendees throughout the construction period.
         2. Comply with the following special safety and security requirements for work conducted within student occupied buildings and areas:

Schedule Work during the hours of 8:00 am through 6:00 PM, 7 days a week, with the following restrictions:

Occupied Buildings: Do not begin work that will generate noise or vibration before 9:00 AM.

Building Access: During regular business hours (7:30 AM through 4:00 PM; Monday through Friday, except University-recognized holidays), notify Owner's Representative for access to Project site.

* + - * 1. Individual areas can be opened as often as once each day by the Owner's building facilities manager. When more frequent daily access is required, or when access is required for more than 5 working days, obtain keys from the Housing Security Department, or from the University Key Office. Use keys to obtain access to areas in strict compliance with approved construction schedule issued to Housing Security. When working in more than one area, check with the building facilities manager to ensure no scheduling conflicts exist.

Building access outside of regular business hours and on weekends is available only with the written approval of the Owner's Representative. Coordinate access with the Owner's Representative and the Owner's Public Safety Department.

Security: Purchase University-provided photographic identity badges for each person engaged in on-site work, and ensure that workers wear badges at all times on University property. Purchase cost per badge is $3.00. Coordinate through Owner's Representative.

Badges are required in occupied buildings when the Contract Time is longer than 1 week.

Personal Conduct Restrictions: Employees of the Contractor and subcontractors shall comply with the following restrictions regarding personal conduct while on University of Michigan property:

Smoking: Smoking is strictly prohibited except in specially designated areas.

* + - * 1. Harassment: Conduct considered by the Owner as harassing is strictly prohibited, including the use of profanity; or the use of derogatory or demeaning gender or race-related comments or actions. The Owner reserves the right to require the Contractor, at no additional cost to the Owner, to remove from the Project all personnel who violate this policy.

spec Editor: Delete the following article if project is not in the Medical school

* + - 1. Special project for U of M Medical School.
         1. Types of special construction requirements include the following:

Use of premises.

Scheduling of work.

Hot-work.

Medical School facilities.

Noise and vibration control.

Protections when using epoxy paints.

* + - * 1. This Section contains requirements that apply to Divisions 1 through 14 and Divisions 21, 22, 23 and 26 of the specifications.
        2. Related Work of other Sections:

Division 01 Section "Summary" for general restrictions on site use.

* + - * 1. USE OF PREMISES
        2. Coordinate use of premises under direction of the Owner's Representative.

The building in which Project is located will be continuously occupied during construction. Coordinate construction efforts with Owner to minimize interference with Owner's operations.

Provide and maintain access of Owner's personnel to toilets, telephone closets and janitor closets on Owner-occupied floors throughout Contract Time.

Maintain emergency egress routes for Owner's personnel as directed by Owner's Representative.

Existing toilets designated by Owner may be used by Contractor's personnel for personal use only during construction. Do not use toilet facilities to conduct construction operations without written permission of Owner's Representative.

If use of toilets for construction activities is permitted by Owner's Representative, clean toilet facilities daily.

Contractor's staging area is strictly limited to areas indicated on the drawings. Where no staging area is indicated, Contractor's use of site is limited to areas within the Contract bounds, or as reasonably required to complete the Work. Strictly comply with Owner's Representative's directions establishing staging and operation areas, through-building routes, and locations for material delivery and disposal.

Arrange parking for Contractor's personnel in accordance with Article 47 of the University of Michigan Standard General Conditions.

Smoking is prohibited in all University of Michigan buildings and on the grounds of selected University campuses, as indicated. Smoking is prohibited at the Project site, including mechanical rooms, utility spaces and roof tops.

Smoking is prohibited on the grounds of the University of Michigan Hospitals and the Medical School Campus.

* + - * 1. SCHEDULING OF WORK

Schedule work with Owner to fit Owner's operations, to facilitate completion of this work, to coordinate with and expedite new construction work on project, and as follows:

Schedule with Owner work that interferes with facility operation, including shut-off of mechanical and electrical services and encumbrance of Owner's ingress and egress routes and normal operation. Provide the following notice of planned interruption of services:

Provide not less than 10 working days' notice before interruption, with final confirmation not less than 72 hours before interruption.

When permitted by Owner's Representative to deliver items of equipment to Owner's loading dock facilities, schedule such deliveries in advance with Owner. Provide minimum 24 hours' notice prior to planned delivery time of equipment.

Schedule work between 7:30 AM and 5:00 PM, Monday through Friday, unless otherwise approved by Owner.

Start of Operations: Do not commence work before insurance and bonds have been submitted to Owner.

* + - * 1. HOT WORK

Hot Work: Perform all Work in conformance with the Owner's "hot work" program as a requirement of Article 53 of the Standard General Conditions. In general, the program specifies special procedures to be used for hot work, including, but not limited to, obtaining permits, preparations, operation and post-operation fire watches.

"Hot work" operations include, but are not necessarily limited to, cutting, welding, brazing, torch soldering, high-speed metal grinding, and other operations using torches, irons, heat guns, or similar open-flame or high-heat generating equipment.

* + - * 1. MEDICAL SCHOOL FACILITIES

Scheduled Suspended-Work Periods: The University's Medical School conducts regularly scheduled academic examinations throughout the year. Certain construction operations to be performed within the Medical Science Unit II Research Wing, second and third floors, are expected to result in noise, vibration, utility shut-offs, and other nuisances that will negatively affect the examination environment.

Upon request of the Owner's Representative, suspend activities conducted within the indicated areas that produce noise, vibration, and other nuisances, or that otherwise have, in the opinion of the Owner, the potential to disturb Medical School examinations:

The precise dates, times, and durations of the work suspension periods are unknown. The Owner's Representative will provide full details of each required work suspension not less than 7 calendar days prior the beginning of the suspension.

Include in the construction schedule 20 working days, of eight hours each, of suspended work time within the areas indicated.

Daily Cleaning Program: In public areas, including lobbies, corridors, elevator cabs, and similar areas used for construction traffic, but outside the limit of the Project, comply with the following:

Either at the end of each working day or before 7:30 AM each working day, broom clean floors using commercial cleaning compound. Wet mop floors after broom cleaning to completely remove dirt, dust, and scuff.

Storage of construction related materials and equipment, including temporary storage of all types, is prohibited outside the Project limits.

Nuisance Control Program: Schedule dust, noise, vibration, and fume generating activities during evenings and weekends. Evenings include the hours from 5:30 PM to 6:30 AM, each Monday through Friday. Weekends include the hours from 5:30 PM each Friday through 6:30 AM the following Monday. Applicable nuisance-generating activities include:

Demolition work, including cutting, coring, asbestos abatement, and debris removal operations.

Use of gasoline or diesel-powered vehicles or equipment.

Utility shut-downs and tie-ins.

Fume/odor generating construction activities, including application of non-water-based paints, epoxy coatings, resinous flooring and similar materials that release significant quantities of volatile organic compounds during application and cure.

Construction activities in public areas (including corridors, lobbies and stairs) outside the immediate Project limits.

Delivery of materials to site and trucking of debris from site.

Transportation of construction materials and debris through public areas (including corridors, lobbies and stairs) to and from immediate Project limits.

* + - * 1. Protections when using epoxy paints

The building will be occupied during construction.

Comply with the following requirements for Work involving the application of solvent-borne epoxy paints or high-build epoxy products:

Protect the work area where the epoxy paints are applied. Provide temporary barrier enclosures around the work area consisting of 8 mil polyethylene sheeting supported by wood or metal studs. The joints in the sheeting and the perimeter of the barriers must be sealed.

Provide temporary equipment to ensure that the work area is under negative pressure relative to the rest of the building.

Provide seven days' notice prior to the beginning of epoxy application. The Owner's Representative shall schedule a meeting to coordinate activities required to achieve the protection requirements indicated above and to determine whether air quality monitoring will be performed during epoxy application. Attendees at the meeting shall include the General Contractor, the Subcontractor for the epoxy application, the Owner's Representative and a representative of the University of Michigan's Occupational Safety and Health Department (OSEH).

* + - 1. MAINTENANCE
         1. After completion of the installation, provide maintenance and 24-hour callback service for the equipment furnished under this section for a period of twelve (12) months as part of this Contract. This service shall also include regular examination (biweekly; advise U. of M. elevator dept. @ 747-3276 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.
         2. 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 City of Ann Arbor that can provide regular and emergency service, 24 hours a day, every day of the year.
         3. Note: It is the responsibility of the U. of M. Elevator Department 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 Department will respond to free the passengers as soon as possible to minimize the inconvenience to users. It is within the right of the University to remove covers, open doors, install monitoring equipment, etc. However, all of this work shall be performed by elevator mechanics licensed by the State of Michigan only.
         4. A detailed record of work performed by University Elevator Mechanics is maintained in the Elevator Shop. Contractors should contact the Elevator Shop to review work performed by University Elevator Mechanics.
         5. 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.
      2. RELATED WORK OF OTHER DIVISIONS
         1. 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.

Pit and Hoistway:

Provide a legal hoistway, properly framed and enclosed, and a pit of proper depth.

Provide access ladder in pit.

Provide recesses for hall indicators and hall buttons.

Install all supports for guide rail brackets. Guide rail bracket inserts shall be furnished by elevator subcontractor.

All cutting of walls, floors, or partitions, together with any repairs made necessary thereby, if any.

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.

Rough openings, as required by the elevator contractor's drawings.

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.

Provide bevel guards where beams or walls project beyond 2" into general line of hoistway.

Provide recesses and/or supports for the entrance sills of horizontal slide passenger type hoistway doors.

Provide grouting under sills and around frames, after the entrances are fastened in place.

Furnish, install and maintain the required fire rating of elevator hoistway walls, including the penetration of firewall by elevator fixture boxes.

Machine Room:

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 as 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.

Provide a 15-pound class B-C fire extinguisher in elevator machine room.

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 U of M key system "Schlage No. 356566".

Electrical Work:

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.

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.

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 and N.E.C. Codes. Light in the pit shall be operable from hoistway door opening.

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.

Telephone conduit between nearest telephone closet and junction box in elevator machine room.

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

* + 1. OUTLINE OF new EQUIPMENT

spec Editor: revise the following to suit project.

* + - * 1. Quantity: \_\_\_\_\_\_\_\_
        2. Capacity: \_\_\_\_\_\_\_\_ pounds
        3. Speed: \_\_\_\_\_\_ FPM
        4. Travel Distance: \_\_\_\_\_\_\_\_\_\_\_\_, (Field verify)
        5. Stops/Number of Openings Front: \_\_\_\_\_\_\_ (\_\_\_\_ front, \_\_\_\_ rear)
        6. Floors Served: \_\_\_, \_\_\_, \_\_\_, \_\_\_, \_\_\_, (\_\_\_ is Main Floor Egress)
        7. Platform Size (Width x Depth): \_\_\_'-\_\_\_" (side to side)x \_\_\_'-\_\_\_" (front to back), size be maximum allowable but minimum matching existing.
        8. Door Size/Operation: \_\_\_'-\_\_\_" Wide x \_\_\_'-\_\_\_" High, Two-Speed
        9. Machine Type: Hydraulic/Location Basement
        10. Control: Microprocessor Type, See 11.0
        11. Operation: Selective/Collective
        12. Entrances: \_\_\_'-\_\_\_" Wide x \_\_\_'-\_\_\_" High, Two-Speed, (match existing, field verify).
        13. Operating Fixtures: See item 7.0. and 11.0
        14. Power Supply: 208 Volts/ 3 Phase/ 60 Cycle;
        15. Motor H.P.: 40 maximum
        16. Auxiliary operations: See Specifications 4.2, 4.3 & 4.4
        17. Hoistway Size: \_\_\_'-\_\_\_" Wide x \_\_\_'-\_\_\_" Deep Approx.; (Field Verify)
        18. Machine Room Location - Basement, room number: \_\_\_\_
        19. Guides - Roller Type. See item 11.0
        20. Pit Depth - (4'-0" +/-) Field Verify
        21. Additional Features:

Multi-light LED hall position indicator at main floor landing and inside car.

Infra-red type door protection

Fire 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 (integral with car operating panel)

Provisions for handicapped: raised markings for hoistway door jambs, adjustable door open times

Refer to "Elevator Guidelines to Ensure Accessibility by People with Disabilities" item 15.0.

* + 1. PRODUCTS
       1. Hydraulic Elevator
          1. Oil Hydraulic Machine:

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.

* + - * 1. Pump:

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.

* + - * 1. Motor:

The drive motor shall be of standard manufacture and have a duty rating sufficient for hydraulic elevator requirements.

* + - * 1. Oil Control Unit:

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 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 of the pump without increasing the system pressure more than 25% above the normal working pressure. Permanently install a liquid filled pressure gage on oil control unit.

* + - * 1. Oil Storage Tank:

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.

* + - * 1. Oil:

Sufficient specially prepared hydraulic oil with greater than 400 degrees F. flashpoint and of proper viscosity and lubricating qualities shall be provided.

* + - * 1. Sound Reduction With Isolating Panels And Muffler:

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.

* + - * 1. All Hydraulic Supply Piping:

Shall be at least schedule 80 pipe. Threaded pipe only no victaulic fittings are allowed. The system must be free from seepage at all joints.

* + - * 1. Shut-Off Valve:

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.

* + - * 1. Oil Strainer:

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.

* + - * 1. Isolation Coupling(s):

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 delivery line, shall be determined by the elevator subcontractor.

* + - * 1. Cylinder and Plunger Unit:

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, babbit 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.

The exterior of the cylinder shall be treated with a corrosion resistant compound and double-lap wrapped with a commercial grade wrapping, such as Scotchwrap or Tapecoat, before installation.

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.

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 A17.1-2000 and State of Michigan 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.

The well for the cylinder shall be provided by the Elevator Contractor, including drilling and dirt removal. Provide outer cylinder casing and related schedule 40 PVC protective covering. Casing shall be schedule 40 steel pipe, with welded joints and welded steel bottom.

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.

* + - 1. Control
         1. Controller:

The elevator controller shall utilize a microprocessor based logic system and shall comply with (ANSI/ASME 17.1-2000) 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 U. of M.'s elevator shops existing IBM compatible computer system.

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.

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 are to be displayed on the indicators. In addition, provide means of displaying other special or error conditions that are detected by the microprocessor.

The elevator shall not require the functioning or presence of the microprocessor to operate 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.

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 or inspection operation.

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.

Low Oil Control:

A low oil control feature shall protect the hydraulic components if the elevator fails to complete its upward travel in the normal time.

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.

To return the car to normal service, the malfunction shall be corrected and the elevator controls reset in the machine room.

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.

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.

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.

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).

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 acknowledgment 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.

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 on independent service any hall arrival lanterns or jamb mounted arrival lanterns and gongs shall be inoperative.

The car shall be equipped with two-way leveling to automatically bring the car within plus or minus 1/4 inch of exact level at any landing regardless of load up to maximum capacity.

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

A test switch shall be provided. In the "test" position, this switch shall allow independent operation of the elevator without 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.

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.

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 the calls.

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.

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.

Provide florescent lighting at front and back inside the controller cabinet.

Manufacturer:

Elevator controller shall be as manufactured by Motion Control Engineering model HMC-1000 (modified to include all features noted above) including soft start features to limit inrush current and remote diagnostics. Also see item 11.0.

* + - * 1. Collective Operation:

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.

If all calls in the system have been answered, the car shall park at the last landing served or the pre-determined home landing.

* + 1. Auxiliary Operations:
       1. Firefighter's Service:
          1. The following operation is for the use of firemen and other authorized personnel.

Automatic passenger elevators shall conform to the following:

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.

An elevator traveling away from the main floor shall reverse at the next available floor without opening its doors.

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.

Door reopening devices for power-operated doors, which are sensitive to smoke, heat or flame shall be rendered inoperative.

All car and corridor call buttons shall be rendered inoperative and all call registered lights and direction lanterns shall be extinguished and remain inoperative.

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.

A sensor in each elevator lobby, which when activated prevents cars from stopping at that floor, shall not be substituted for the above requirements.

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 any 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, Gentex Corp. Model 8100. Submit drawings showing locations of smoke heads and exposed conduit for owner's approval prior to installation.

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. 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.

The operation of elevators on Fire service shall be as follows:

An elevator shall be operable only by a person in the car.

Elevators shall not respond to elevator corridor calls.

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 doors reaching the fully open position, the doors shall automatically reclose. Open doors shall be closed by continuous pressure on "Door Close" switch or button.

Means shall be provided to cancel registered car calls.

When the switch is in the 'hold' position, the car shall remain at the floor with its doors open.

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.

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 persons 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. Project engineer shall deliver keys to Elevator foreman. These keys shall be Adams Fire Service Keying System.

Instructions of operation shall be provided as required by code.

* + - * 1. Elevators arranged for dual operation shall:

Conform to the automatic operation described above when on automatic operation.

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.

* + - * 1. Alternate Floor Fire Service:

spec Editor: revise the following to suit project.

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 \_\_\_\_\_floor at landing "\_\_\_\_".

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.

When building sensors activate at the egress fire service floor, elevator shall automatically be dispatched to that building's \_\_\_\_\_ floor, which has been designated "Alternate" fire service floor where the elevator doors shall open and remain open.

* + - 1. load bypass operation: normally not required
      2. anti-nuisance feature: normally not required
      3. Independent Service Operation:
         1. A two-position switch shall be provided in the car-operating panel.
         2. When the switch is placed in the independent service position, the mode of operation shall be amended as follows:

The car is disconnected from the supervisory system.

Existing car calls shall be canceled.

The cars shall bypass landing calls.

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.

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 the key switch is returned to the normal position.

* + 1. Hoistway Equipment
       1. Provisions for Hoistway Access:
          1. Keyway:

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.

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 unlocking the door shall be available and used only by inspectors, maintenance men, and repair men.

* + - * 1. Hoistway Access:

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 the Local Code.

* + - 1. Top of Car Operating Device:
         1. 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 A17.1-2000 and local codes.
         2. Operation from the top of the car shall not be permissible unless all electric door contacts are closed.
      2. Pit Stop Switch:
         1. A switch shall be located in each elevator pit, in accordance with ANSI A17.1-2000 and local codes.
      3. Landing Door Hangers
         1. 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.
         2. Manufacturer: GAL, with MOM operator.
      4. Strip Lighting
         1. 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. ELECTRIC WIRING
         1. 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.
         2. All wiring shall have a flame retarding moisture resisting outer cover and shall be run in metal conduit, flexible metallic tubing, or wire ducts.
         3. 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 10 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 terminals at the car and machine room.
         4. Terminal blocks shall be coded to identify the circuits. Multi-conductor cables shall have the conductor color coded and numbered.
         5. 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.
         6. 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.
         7. 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
         8. 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.
         9. Execution:

Install all power wiring in raceway systems. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.

Splice cables and wires only in outlet boxes, junction boxes or pull boxes. (Note - No wire splicing allowed in raceway or wire ducts).

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.

All terminal strip connections shall be identified with corresponding reference numbers from cable termination chart and electrical straight-line diagrams.

* + - 1. MACHINE FINISH AND PAINTING
         1. 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.
      2. EMERGENCY ALARM BELL
         1. 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.
         2. Alarm bell should operate per ASME A17.1-2000 and State of Michigan Elevator Code.
      3. GUide rails
         1. Planned steel tee guide rails shall be furnished and installed to meet ANSI A17.1-2000 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.
         2. All joints 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.
         3. The guide rails shall be installed and aligned with their machined faces plumb within one-eighth (1/8) of an inch from top to bottom of the hoistway.
         4. Minimum Rail Size - 16 pounds/ft. Upgrade rails based on application.
         5. Note: For an elevator replacement, guide rails may be reused.
      4. buffers
         1. Buffers shall be installed in the pit to meet ANSI A17.1-2000 requirements. These buffers shall be fastened to steel channels furnished and installed by the Elevator Contractor.
      5. terminal stopping devices
         1. 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 movable arm, 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 A17.1-2000 requirements.
      6. landing system
         1. 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.
         2. 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.
         3. The leveling and stopping accuracy of the system shall be within 1/4 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.
         4. Landing control system shall be as manufactured by Interface Products, Co. model IP-8300 (including any required modifications to accept elevator control systems) or approved equal (under Owner's Options).
    1. car equipment
       1. Power door operation:
          1. 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.
          2. The doors shall be opened at rated speed (2ft/sec.) and the closing speed shall be per Code. Door closing force shall be as allowed by code.
          3. 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.
          4. 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.
          5. 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.
          6. Manufacturer:

Gal, MOH operator.

* + - 1. door protection and reopening device
         1. Adams Gatekeeper 2000 or Innovation Smart Edge, model 2002 with additional Dual Eye Ray Unit or Janus 3D.
      2. adaptive door timing:
         1. Door open times will be varied subject to the call situation causing the stop:

Shortest timing, when car call only causes stop.

Longer timing, when hall call only causes stop.

Longest timing, when coincident hall and car calls exist.

All timing shall meet ADA guidelines as a minimum.

* + - 1. car frames:
         1. 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.
      2. car platforms and flooring:
         1. 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.
         2. 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.
      3. Car isolation:
         1. 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.
      4. roller guides for car:
         1. 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.
         2. The roller guides shall run on dry guide rails.
         3. Manufacturer: ELSCO Type A.
    1. operating fixtures
       1. Car operating panel:
          1. The operating panels in the car shall consist of two vandal resistant stainless steel flush mounted control panels. 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 main 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.
          2. Buttons shall be made of brushed stainless steel, Innovation Industries Vandal Resistant with LED lamp for illumination, with translucent floor designations.
          3. Provide emergency light in car operating panel with nickel cadmium batteries.
          4. Manufacturer: PTL Performer Series (trail basis) or Innovation Industries. All shall be Vandal Resistant.
       2. Hall push button:
          1. Hall push buttons shall be installed at each floor to permit waiting passengers to call the elevator to the floor.
          2. Fixtures shall have up and down buttons at intermediate floors and single buttons at top and bottom floors. Braille denotations shall be of the replaceable type bolted from the rear of contrasting colors mounted per ADA Guidelines.
          3. Buttons shall be made of #4 brushed stainless steel vandal resistant with LED lamp for illumination) and shall illuminate to indicate a call has been registered. Button shall remain illuminated until the call has been answered.
          4. All Buttons (included in Section 7.1) shall conform to item 15.0.
          5. 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"
          6. Hall position indicator shall be part of the hall push button panel on all floors and shall be led type.
          7. Manufacturer: PTL Performer Series (trial basis) or Innovation Industries. All shall be Vandal Resistant.
       3. Handicap provisions:
          1. See PART 15.0.
       4. floor passing chime:
          1. Provide a floor-passing chime to meet ADA requirements.
          2. Manufacturer is PTL Performer Series (trail basis) or Innovation Industries.
       5. communication system (telephone):
          1. 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. Engrave faceplate with: "EMERGENCY PHONE - 911". Phone shall keep working during power failure. Coordinate work with U of M ITCOM. Phone shall be one push button to talk type and flash when call is answered.
          2. Manufacturer: Adams Lifeline A930P5T Call Tracker or Innovation Industries or PTL.
       6. car position indicator:
          1. A 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.
          2. Manufacturer: PTL Performer Series or Innovation Industries.
       7. car traveling Lantern:
          1. Shall be provided at both sides of door jambs, digital type and shall be ADA Compliant.
          2. Manufacturer: PTL Performer Series or Innovation Industries.
       8. car fire alarm horn: (omitted)
    2. elevator enclosures
       - 1. All cab material; design, lighting, ventilation and exits shall comply with "American National Standard Safety Code for Elevators, ANSI A17.1-2000" and/or local codes. Where codes conflict the more stringent shall apply.
         2. Wall panels shall be of wood construction and applied 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.
         3. Returns shall be of stainless steel construction and have a #4 brushed finish. Cutouts shall be provided for operating elements and fixtures.
         4. 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.
         5. 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 florescent 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.
         6. 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.
         7. 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.
         8. 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.
         9. 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.
         10. A 3/8" x 2" bar handrail with radiused ends of #4 brushed stainless steel finish shall be provided to meet code requirements.
         11. Car sills shall be extruded aluminum.
         12. Finished floor covering shall be furnished and installed by the elevator contractor. The type shall be "Endura" style with base and color to be selected by Owner.
         13. Telephone: See PART 7.5.
    3. hoistway entrances
       1. ENTRANCES:
          1. 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.
       2. Frames:
          1. Unit frames shall be fabricated of No. 14 U.S. gage 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.
       3. Doors:
          1. 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 A17.1-2000 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. The doors shall be equipped with nylube door guides. See Part 9.9 for finish.
       4. Sills:
          1. 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.
          2. Sills for parking structures elevator shall be of special construction for more durability.
       5. Struts:
          1. 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.
       6. Headers:
          1. Headers shall be constructed of 3/16" formed steel to provide support for the frame and hangers.
       7. Hanger covers:
          1. 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.
       8. Fascia, covers, and toe guards:
          1. 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 plus 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 60o angle.
       9. Finish:
          1. 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.
    4. accessories
       1. Car and/or hall operating key:
          1. 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 U of M Key Shop.
    5. elevator commissioning: by u of m elevator shop see PART 15.3
    6. Acceptable products:
       - 1. Fixtures (Car Operating Panel, Hall Push Button): Vandal Resistant, PTL Performer Series (trail basis) or Innovation Industries.
         2. MICRO-PROCESSOR BASED CONTROLLER (For Hydraulic Elevators): Motion Control Engineering Model or O. Thompson with soft start features to limit inrush current and remote diagnostics.
         3. DOOR OPERATOR & EQUIPMENT: GAL Manufacturing Corp. MOH Operator, car and hall door tracks, car and door hangers with roller assemblies. All interlocks, pickup rollers and operating linkage manufactured by GAL.
         4. PUMP PACKAGE: Standard dry type pump unit that complies with all duty requirements of this Section consisting of Delaval Imo pump with Maxton Valve and all required accessories.
         5. DOOR PROTECTIVE DEVICE: Gatekeeper 2000 from Adams Elevator Equipment Company, Juans Model 3D or Innovation Smart Edge Model No.2002 with additional Dual Eye Ray Unit.
         6. TELEPHONE: Adams Lifeline with call tracker Model A-930P5T integral with Main car operating panel, or Innovation Industries.
         7. ROLLER GUIDES: Elsco Model "B" on car.
         8. CAR TOP INSPECTION STATION: Adams Model A-910A with A-910X5 guard.
         9. FLOOR PASSING INDICATOR: Per ADA requirements, use tone only.
         10. FLOOR ANNOUNCEMENT SYSTEM: Adams part No. A-102A "Adams Voice" including 23 standard floor and direction message or approved voice unit from controller manufacturer.
         11. CAB MANUFACTURERS:

G & R Elevator Mfg.

Havenstein Burmeister

Tyler

Brice Southern

Columbia

* + - * 1. DOOR GUIDES: NYLUBE
        2. Limit Switch: EECO
        3. Buffers: Quality Elevator BUF series.
    1. shop drawings and sample submittals
       - 1. Samples: Submit samples of stainless steel, and floor tile, enamel colors and wall finish materials.
         2. 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.
         3. 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.
         4. CERTIFICATES: Furnish without cost to the Owner all certificates necessary as evidence that the elevator conforms with the applicable laws, ordinances, and requirements.
    2. performance
       1. Contract speed:
          1. Actual speed shall vary no more than +/- 5% from speed specified under any loading condition or direction of travel.
       2. Leveling accuracy:
          1. Ensure car is consistently level within +/- 1/4" under all loading conditions.
       3. Door times:
          1. 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
          2. Long door and short door "hold open" times, shall be set at 4.0 and 2.5 seconds respectively.
    3. execution
       1. site inspection
          1. 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 affect the execution of the work.
          2. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.
       2. cleanup
          1. Keep work areas orderly and free of debris on a daily basis.
          2. Remove filings and loose materials resulting from this work from hoistways.
          3. Clean all dirt, oil and grease from machine room and pit equipment and floors.
          4. Clean car, car enclosures, entrances, hoistways, operating and signal fixtures and trim of dirt, oil, grease, and finger marks.
       3. acceptance demonstration and performance test (commissioning)
          1. Demonstrate to Owner, or Owner's designated representative, the operation of the elevator system. Demonstration shall include:

Installation compliance with specifications.

Contract speed, capacity, and floor-to-floor performance compliance with specifications.

Stopping accuracy and car ride compliance with specifications.

Operation of signal fixtures and operation of supervisory or dispatching system.

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.

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.

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

Operating Instructions: Provide instructions to the Owner's personnel, including safety procedures, proper operation of the equipment, and routine maintenance procedures

* + - 1. performance guarantee
         1. 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.
      2. final submittals
         1. 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:

Legible schematic wiring diagrams including all changes made during installation.

Description of operation of elevator system installed.

Pump Package: Including valve and accessories.

Buffers.

Guide Rollers on Car.

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.

Door Assemblies: Including Hangers, Rollers, Door Motor, Door Operator, Door Clutch Assembly, Door Closers, Door Drive Arms, Related Hardware, Sheaves, Door Guides, Interlocks, and Safety Door Edge.

Signal Equipment: Including Car Station, Hall Stations, Position Indicators, Direction Indicators, Fire Service Panel, Smoke Detectors, Keyswitches, and Pushbutton Assemblies.

Car Top Inspection Station, Limit Switches, Solid State Leveling Control Units, Leveling Switches, Alarm Bell.

* + - 1. technical training
         1. On-site technical training shall be held for the purpose of familiarizing University of Michigan 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 of controller manufacturer through the elevator installers. Submit details of training with bid.
    1. ELEVATOR GUIDELINES TO ENSURE ACCESSIBILITY BY PEOPLE WITH DISABILITIES
       - 1. 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.
         2. Elevators shall meet the requirements of the State of Michigan Department of Labor Building Code relevant to barrier free design and elevators, Section 512.10.

end of section 142423