

EQUIPMENT ROOMS, ELEVATOR

Security / Identification: All mechanical equipment rooms that house elevator machinery shall be lockable and securable such that access is limited to elevator mechanics employed by the U of I. The door serving each room shall be a fire rated door in accordance with the applicable provision of the Building Code. It shall be 42" wide, and shall swing out into the corridor. It shall be equipped with a closer, and shall have a store room function lockset that is keyed to the standard elevator machine room key. Machine room doors, pit access, and overhead access doors shall have accommodations for or be keyed with, a Russwin 6D1R key cylinder. Therefore, it will be necessary for the F&S Locksmith Shop to provide keying.

Equipment Room Location and Access: Entrances to elevator machine rooms shall be located off a public corridor, or through a mechanical equipment room. Entrance shall not be through an office, classroom, or rest room.

Elevator machine rooms shall not be located next to occupied spaces, classrooms, conference rooms, or offices. If, in an existing building, locating a machine room in such a location is unavoidable, the enclosure shall be constructed to restrict sound transmission to the adjacent occupied spaces.

Elevator machine rooms shall not be located underneath bathrooms or rooms with water flooding possibilities.

Hydraulic elevator machine rooms shall be located adjacent to the elevator hoist way and pit area at the lowest level of elevator travel.

Traction elevator machine rooms shall be located directly over the hoist way of the elevator served by that equipment.

Equipment Room Size / Layout: Machine room shall be of adequate size to comply with the size requirements of the elevator manufacturer, ASME A17.1, OSHA, and NEC. Size shall be sufficient to allow access to and around all equipment to accommodate adjustment and future repairs, such as the removal of motors and

pumps. (*This is a frequently missed item*). Clearances around all electrical equipment shall comply with NEC. Machine rooms for hydraulic elevators shall be designed so that there is a minimum of 4' to the nearest wall or door to one side of the pumping unit. See National Elevator Industry, Inc standards (www.neii.org) for machine room sizes.

Other Equipment in Machine Room (Frequently Missed Item): "Only such electrical wiring, raceway, cables, or ductwork used *directly* in connection with the elevator shall be installed inside the machine room. Drain lines, other systems conduits or ductwork, etc. may not be installed or routed through the elevator machine room." This is per ASME A17.1, section 2.7.2.

Coordination with Other Trades: All electrical contractor and HVAC equipment installations shall be coordinated with the elevator installer, and shall not be installed until the location has been coordinated with the elevator contractor.

Vibration Isolation: In any locations where there is equipment located overhead, vibration isolation shall be provided.

Temperature Control: ASME Code requires that the temperature within an elevator equipment room be maintained between 55 and 110 degrees F, non-condensing. Given that elevator equipment produces a substantial amount of heat, space cooling is typically required. Space heating is rarely required and thus has not been addressed here. Multiple approaches may be taken to provide space cooling.

The simplest approach involves providing opening(s) in the equipment room wall and/or door and allowing heat to be transferred to an adjacent space via passive air movement. Although simple, this approach yields limited cooling capacity and allows noise and odors to be transferred into the adjacent space, which is typically a conditioned corridor. Also, provision must be made at each opening to maintain code-compliant fire separation.

A more common approach involves the use of a ducted exhaust system to remove warm air from the equipment room and discharge

it outdoors. Makeup air is typically provided via an opening between the equipment room and an adjacent space. Again, a corridor typically serves as the source of makeup air. This approach captures odors but provides an open path for noise transmission. This can typically be overcome, however, with the installation of a lined makeup air duct extended to an appropriate location. A downside to this approach is its potential contribution to negative building pressurization. This can promote outdoor air infiltration. Note: When this approach is used a dedicated exhaust fan and room thermostat shall be provided. This allows exhaust fan operation to be minimized while ensuring that temperature control requirements are satisfied.

Yet another approach involves the use of a stand-alone cooling unit, capable of year-round operation. This capability is best accomplished via connection to the campus central chilled water system. When this approach is taken it is preferred that the unit be located in an adjacent space with ductwork used to transfer conditioned air into the equipment room. Unfortunately the floor plan rarely accommodates such space. Thus, an overhead location is often sought. For reasons enumerated elsewhere within these *U of I Facilities Standards*, such installation is disallowed. The remaining option is that of locating the unit within the confines of the equipment room itself. This is discouraged, largely due to the difficulty of coordinating its location with that of essential elevator equipment. Typically the final room layout is not determined until an elevator contractor prepares initial shop drawings. It is difficult for the AE team to adequately anticipate space constraints without knowing the actual dimensions of installed equipment, electrical disconnects, etc. ASME and NEC have minimum clearance requirements that must be factored in. **Under no circumstance shall cooling equipment be located above any piece of elevator equipment.**

Given the number of options and factors that must be considered, the design team shall work in conjunction with F&S Engineering Services personnel via the U of I Project Manager to determine the most appropriate design solution for each project.

Fire Rating: Machine rooms shall have all holes and penetrations fire caulked to meet the fire rating of the machine room. This includes the ceiling, and the juncture of walls and ceiling.

Fire Extinguisher: Class ABC fire extinguishers shall be provided in elevator machine rooms and mounted to the wall in a location convenient to the access door – per ASME.

Electrical Requirements:

As stated previously, no other equipment may be installed in elevator machine rooms until the location of the equipment is coordinated directly with the elevator contractor's equipment locations.

When fire sprinklers are present in elevator machine rooms, there shall be a shunt trip circuit breaker for main line power to remove power from elevator controls before activation of sprinkler.

Elevator machine room lighting and outlets shall be supplied by a separate branch circuit.

Main line disconnect shall be located in the elevator machine room within sight of the elevator motor and controller, and adjacent to machine room entry door. There shall be one disconnect for each elevator. Clearances and labeling shall be in accordance with NEC 620.

Car lighting disconnect (one for each elevator) shall also be located in elevator machine room in accordance with NEC 620. Additional electrical requirements are provided in technical sections of these *Standards*.