

SECTION 01 81 10 - BUILDING SERVICE EQUIPMENT ACCESSIBILITY REQUIREMENTS

1. GENERAL:

- A. This section details the requirements for accessibility of building service equipment and systems that require regular access for operation, inspection, repairs and maintenance.
- B. The Project team shall be responsible to ascertain that the entire mechanical, electrical, plumbing, fire protection and specialty equipment (MEPFPS) Systems can be safely installed, maintained, serviced and replaced without the removal, relocation, or disturbance of adjacent or unrelated systems, disturbance of the building structure, or affect any part of the building structure for the installation and removal of equipment. In existing buildings, the project team shall ensure that remaining equipment has proper accessibility when adding new systems and equipment.
- C. RELATED SECTIONS:
 - Section 01 35 25 – Facilities Fall Protection
 - Section 01 81 11 – Confined Spaces

2. ACCESSIBILITY PLANS:

- A. Separate "Equipment Accessibility and Rigging Plan" drawings shall be developed and provided for all large MEPFPS equipment.
- B. Equipment accessibility plans shall be floor plans that indicate, as crosshatched areas, the required service clearances around the equipment for routine service access, and space required to both operate and replace related valves and accessory components, per the manufacturer's requirements, applicable standards and good engineering practices.
- C. Accessibility plans shall include clearances required for rigging and removal of the equipment as well as the dedicated clearances required for rigging and removal of major equipment components for periodic inspection and service, such as pull space for removal of tube bundles for heat exchangers and chillers, shaft pull space, space for removal of boiler inspection hatches, and other required equipment clearances.
- D. Equipment rigging plans shall indicate sizes of major pieces of equipment and clearly marked paths of removal from the point of installation to the exterior loading area of the building. The design of doorways, ramps, driveways, and passageways are to ensure that all equipment can be removed and replaced without removing any walls, doors, or other equipment, and that trucks and cranes can be deployed at the point of exit. Entire egress path shall be coordinated for removal of equipment.
- E. Egress paths of equipment through removable louvers or rooftop ventilation louvers are acceptable provided they are crane accessible.

3. EQUIPMENT ACCESSIBILITY AND SERVICING SPACE:

- A. All MEPFPS equipment shall be designed and installed to allow for ready access, operation and servicing of components, per the manufacturer's requirements, applicable standards and good engineering practices.
- B. Access to equipment and equipment service shall comply with OSHA 1910 - Occupational Safety and Health Standards.
- C. Equipment requiring service shall not be located in permit-required confined spaces.
- D. All efforts shall be made to locate all equipment requiring service indoors and outside of occupied spaces.
- E. Clearances around equipment such as skids, pumps, air handlers, tanks, valves, heaters, backflow devices, etc. shall be sufficient to allow inspection, service, repair or replacement without the need to remove unrelated elements of permanent construction such as conduits, pipes, ducts, and cable trays.
- F. Ensure that HVAC equipment coils, heat exchangers or tubes, motors, pumps, fans, valves, dampers and damper actuators can be readily accessed, diagnosed, and replaced.
- G. Components requiring regular maintenance shall not require the use of portable ladders, lifts, or other devices for service access, except for: fan coil units, VAV boxes and dampers, and electrical lighting equipment located above ceilings, and less than 10 feet above the floor.
- H. Avoid locating MEPFPS components requiring maintenance over lab benches, lab equipment or desks, etc. which would preclude simple ladder access, where such equipment is required to be installed in occupied spaces.
- I. Outdoor equipment locations, including rooftops, are not preferred except for cooling towers and exhaust fans. The following criteria shall be followed in the decision-making process to locate equipment outdoors:
 - Serviceability and access
 - Aesthetics
 - Noise
 - Equipment durability
 - Vandalism
- J. Do not block equipment access when locating valves.
- K. Provide clearly marked isolation valves for risers, mains, and mechanical rooms.

- L. For valves being provided with position indication, mount them such that the position indicators are readily visible from floor level, and per valve manufacturer's requirements.
- M. Include isolation valves and unions for all hydronic components including control valves that require periodic removal for repair and inspection.
- N. Provide inspection capability for coils, control dampers and pitot tubes with access doors or other removable components.
- O. Show location of control panels and BAS cabinets serving multiple units on the design documents.
- P. System control and electrical panels shall be located at working height and located in well lighted spaces. Control panels are not acceptable mounted above ceilings.
- Q. Floor drains shall be provided nearby to pumps, process equipment, AHU coils, and water treatment stations, etc. to allow drainage of equipment without installing low horizontal piping that would be a tripping hazard.
- R. Preference is for mounting of air handler temperature control valves and piping system isolation and control valves to allow for serviceability from the floor without the use of ladders; maximum height 7'0" AFF.
- S. Where service valves are mounted 8 feet or higher above the floor, provide a service platform, catwalk, or valve chain wheels and safety-trimmed chains.

4. ELEVATION REQUIREMENTS:

- A. MEPFPS equipment requiring maintenance shall be installed below 8' elevation above finished floor. This applies to pumps, fans, air handlers, control valves and other controls, coils, terminal units, balance dampers, etc. When exceptions to this requirement must be made, the following requirements shall be followed:
 - Isolation valves located above 8' elevation require chain operators.
 - For equipment mounted over 8' elevation, the project shall provide a permanent access platform.
- B. Extension ladders require adequate floor space for a 1:4 slope to access elevated equipment. and may require a ladder holdoff for resting the ladder feet.

5. ACCESS PLATFORMS:

- A. Detailed elevation and plan drawings shall be provided for all required access platforms.
- B. Large equipment such as high plume exhaust fans, double stacked air handlers, cooling towers and outdoor-mounted generators shall have approved access platforms that provide ready and safe access to all components that may require inspection, repair, replacement, servicing, or removal, without the use of stepladders.

- C. Platforms require proper fall protection and stair or ladder access; alternating stair treads are prohibited.

6. EQUIPMENT ROOM DESIGN REQUIREMENTS:

- A. Equipment rooms shall be adequate in size for the proper servicing of equipment, including access for replacement of all mechanical equipment, and provide for required spare parts storage.
- B. Equipment rooms shall be accessible by a standard stair or elevator. Ship's ladders and steep stairs are NOT acceptable.
- C. Double doors are preferred; but at a minimum, a single door, minimum of 36 inches wide.
- D. Adjoining pieces of equipment shall be separated by a minimum of three feet.
- E. Mechanical, plumbing and fire suppression rooms located above occupied floor levels shall be curbed, room floors waterproof sealed, and all floor penetrations sleeved to 2" above the floor to prevent liquid spills and leaks from traveling out of the space.
- F. Equipment rooms shall be well lit, maintaining a minimum of 30 foot-candles. Lighting shall be switched at each exit. Power 50% of mechanical room lighting from standby generator power source where it is available. Where generator power is not available, provide for local emergency lighting throughout the space.
- G. Provide 120VAC convenience outlets in equipment rooms to provide for ready servicing of equipment.
- H. Provide adequate number of floor drains in mechanical, plumbing and fire suppression rooms; drains are to be connected to the sanitary sewer system, not to the storm sewer. Locate drains to avoid running of condensate drains and other similar equipment across room floors. Provide trap primers as required per code.
- I. Locate all floor-mounted major MEPPFS equipment on concrete housekeeping pads.
- J. Provide thermostatically controlled ventilation and heat as required.

7. ABANDONED EQUIPMENT:

- A. Abandoned mechanical, electrical and plumbing equipment in the work area shall be removed.

- B. This applies to components above the ceiling such as abandoned pneumatic tubes, humidifiers, ducting, conduit, etc.
- C. Equipment that is reusable or can be used for spare parts should be considered for return to Facilities Management.

8. ACCESS DOORS:

- A. All serviceable equipment (smoke dampers, fire dampers, control dampers, duct smoke detectors, fans, valves, coils, terminal units, pumps, filters, isolation valves, clean-outs, junctions, etc.) installed behind an inaccessible finished surface requires the installation of suitable access doors.
- B. Ensure that access is not blocked by conduit, wire trays, ductwork, etc.
- C. Access doors shall be labeled indicating the equipment housed within.

9. MEANS FOR EQUIPMENT REPLACEMENT:

- A. Provide a means for lifting and removing heavy MEPFPS equipment, such as motors and pumps, when the following is met:
 - Equipment over 150 pounds which may not be reached with a portable hoist. Portable hoists extend up to 8' elevation and are rated for 150 to 500 pounds depending upon the lift height and required extension of the boom.
 - Equipment over 8 feet elevation above the floor and more than 70 lbs.
- B. Means for lifting and removal may include monorails, jib-cranes, and 5,000 lb. rated eyehooks fastened to the building structure.

End of Section