

**Part 1 General****1.1 Summary**

- .1 Unless otherwise indicated, follow the standards below when planning for an Electrical Room. These standards are not intended to restrict or replace professional judgment.
- .2 Electrical closets which are small auxiliary spaces used to house limited electrical equipment may be required to follow some of the requirements of the present standard. Applicable requirements shall be discussed during the Design phase.
- .3 These guidelines should be read with the specific technical sections of McGill's Building Design and Technical Standards.

**1.2 Design Requirements for Electrical Rooms**

- .1 Electrical Rooms' geometry, location in the building, access and construction must be considered early at the Design phase in order to limit:
  - .1 Noise transmission to other spaces.
  - .2 Vibration transmission to other spaces.
  - .3 Conflicting circulation with the other users of the building.
- .2 Distribution of Electrical Rooms:
  - .1 Transformer vaults and switchgear rooms shall be located as far away as possible from program spaces (e.g. data server rooms, computer laboratories, etc.) to avoid Electric Magnetic Field disturbances.
  - .2 Transformer vaults must remain free of other systems not associated with electrical distribution systems.
  - .3 Transformer vaults shall be located as close as possible to the building's service entrance.
  - .4 Main distribution with switchgear shall be designed in a separate room if possible.
  - .5 Electrical panels:
    - .1 Minimum of one (1) panel per floor; this panel shall serve only that floor.
    - .2 There shall be no feed-through or riser panels; individual feeds to each panel are required.
  - .6 Elevator equipment rooms and shafts shall be exclusive to this usage and therefore not be used for other electrical distribution.
- .3 Walls:
  - .1 Concrete or concrete blocks are preferred.
  - .2 Gypsum boards can be used for distribution closets and rooms with dry transformers.
  - .3 Walls shall be painted; they cannot be left unfinished, nor simply primed.
  - .4 Specify a (3) hours fire resistance for rooms with transformers using dielectric liquids.

- .4 Floors:
  - .1 Concrete slab is preferred:
    - .1 Thickness as per equipment and building requirements.
    - .2 Floors and curbs shall be sealed.
  - .2 Floor finish (including concrete curbs and bases): non-skid, medium-gray colored epoxy coating is preferred (painted or trowel applied). Refer to section 09 91 26 for paint requirements.
  - .3 Resilient floor finish can be used for distribution closets. Carpet is to be avoided.
  - .4 In existing buildings, floor finishes in electrical closets must be consistent with the building's other similar rooms' floor finishes.
  - .5 Floors and curbs in electrical rooms where dielectric liquids are used shall be waterproofed to prevent leakage into occupied space below.
- .5 Ceilings:
  - .1 Exposed structure (no ceiling).
  - .2 Ceiling shall be painted.
  - .3 Gypsum board insulated assembly can be used in rooms where sound attenuation is a concern.
- .6 Doors:
  - .1 Standard height double doors are preferred. Door dimensions shall always accommodate the biggest piece of equipment to be moved-in/moved-out of the electrical room.
    - .1 Minimum door opening shall be 1200mm (48").
    - .2 Where single 1200mm door cannot be installed, minimum width of door shall be at least 915mm (36").
    - .3 Doors shall swing in the direction of exit.
  - .2 Specify metal kick plate on push of doors.
  - .3 Specify Card Reader Access.
  - .4 Doors shall be fire rated as per Code requirements.
  - .5 Refer to section 08 71 10 for door hardware requirements.
- .7 Electricity:
  - .1 All lighting shall utilize energy efficient fixtures, refer to section 26 50 00 for specific requirements.
  - .2 Lighting shall be switched at each door to the room. Light switches shall be easy to reach when entering the room.
  - .3 At least one light shall be circuited to the emergency panel.
  - .4 In main transformer rooms (dielectric filled or dry type), all lighting shall have emergency generator power. If generator is not available, specify long lasting batteries (at least 18 hours charge).
  - .5 One duplex 20A electrical outlet shall be provided for every 15m<sup>2</sup> of floor space.

- .8 Fire Protection:
  - .1 Sprinklers: critical electrical equipment shall be protected from water damages, water sprinklers shall be avoided. Whenever possible, and permitted by Codes, specify fire detectors and fire rated rooms in lieu of automatic sprinklers protection. No sprinkler shall be installed in main electrical rooms.
  - .2 Fire Extinguisher: at least one fire extinguisher shall be installed in all Electrical Rooms (supplied and installed by McGill). Coordinate with McGill Emergency Measures and Fire Prevention Office for number of Fire Extinguishers, location and mounting space required.
  - .3 Penetration in Fire rated assemblies shall always be sealed to maintain the fire rating of the assembly.
  
- .9 Heating and Ventilation:
  - .1 Temperatures in the Mechanical Rooms shall range from 13°C (minimum) to 28°C (maximum).
  - .2 Room temperatures in main electrical rooms shall be monitored. Monitoring programs shall send automatic warning alarms to McGill Electrical Services if minimum or maximum temperatures are reached.
  - .3 In transformer and switchgear rooms, there shall not be any HVAC equipment, ductwork or piping other those servicing these rooms.
  
- .10 Equipment installation
  - .1 Equipment mounting:
    - .1 Equipment shall be installed so that no vibrations are transmitted to surrounding areas.
    - .2 Dry type transformers shall be floor mounted on rubber pads for vibration isolation.
    - .3 Unistrut Channels for support of ceiling-mount equipment shall be bolted to concrete where possible.
    - .4 Plywood panels used for equipment mounting shall be fire rated.
    - .5 Penetration in fire rated assemblies shall always be sealed to maintain the fire rating of the assembly. Space between conduits and sleeve wall to be fireproofed, same fire rating as required for the floor slab.
    - .6 Seismic Code requirements must be met.
  - .2 Clearances:
    - .1 Proper coordination with other Professionals shall be done during the Design Phase to validate that the necessary clearances are available from delivery point to final location of equipment.
    - .2 Final equipment design must demonstrate that the minimum clearances recommended by the manufacturers and required by Code have been considered:
      - .1 Installation clearances between equipment,
      - .2 Clearances required for maintenance,
      - .3 Minimum clearance required to bring the equipment into the electrical room.

- .3 Consider back access whenever possible or required by manufacturer. For maintenance purposes, rear panels shall be mounted on hinges.
- .3 Sleeves for vertical pipe/conduit penetrations:
  - .1 Use sleeves for vertical pipe/conduit penetrations. Sleeves shall extend 100mm above the concrete base or above the floor slab and shall extend 30mm below floor slab.
  - .2 Space between conduits and sleeve wall to be fireproofed, same fire rating as required for the floor slab.
- .4 Concrete curbs:
  - .1 Install concrete curbs around ducts or multiple pipes penetrations. Concrete curbs shall be 100mm x 100mm and have rounded or chamfered edges.
- .5 Concrete bases (Bases de propreté):
  - .1 Concrete bases for equipment shall be finished with the same epoxy coating as the floor. Yellow color shall be used on the height and 50mm around both upper and lower perimeters for visual contrast to avoid tripping hazards.
  - .2 Concrete bases shall be at least 100mm thick, shall have chamfered or rounded borders, and shall be made of 2500psi concrete (minimum) and according to Structural Engineer's recommendation.
  - .3 Concrete bases shall be reinforced of woven wire fabric and doweled to supporting floor slab.
  - .4 For small equipment, metal bases may be permitted. Its approval shall be discussed during the Design phase.
- .6 Catch basins:
  - .1 Transformers using dielectric liquids must be installed in a sealed, waterproof catchment basin. This basin shall be dimensioned to hold 100% of the liquid and be surrounded with concrete curbs at least 100mm high and 150mm wide. There shall be no piping nor other penetrations in the catchment basin.

**Part 2      Related Technical Sections**

The technical sections of the McGill Building Design and Technical Standards should be consulted with the current document, most notably (but not limited to) the following:

| <b>Section Number</b> | <b>Title of Section</b>                          |
|-----------------------|--|
| <b>03 05 10</b>       | <b>Concrete</b>                                  |
| <b>04 05 10</b>       | <b>Common Work for masonry</b>                   |
| <b>08 11 14</b>       | <b>Metal Doors and Frames</b>                    |
| <b>08 71 10</b>       | <b>Hardware</b>                                  |
| <b>09 21 16</b>       | <b>Gypsum Board Assemblies</b>                   |
| <b>09 65 16</b>       | <b>Resilient Sheet Flooring</b>                  |
| <b>09 91 26</b>       | <b>Painting</b>                                  |
| <b>21 00 00</b>       | <b>Fire Suppression</b>                          |
| <b>22 00 00</b>       | <b>Plomberie</b>                                 |
| <b>23 00 00</b>       | <b>Heating, Ventilation and Air Conditioning</b> |
| <b>26 00 00</b>       | <b>Électricité</b>                               |
| <b>26 05 29</b>       | <b>Fixations Parasismiques</b>                   |
| <b>26 50 00</b>       | <b>Éclairage</b>                                 |

**END OF SECTION**