

**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 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 Stage 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.) for avoiding 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 panels 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 are preferred:
    - .1 Thickness as per equipment and building requirements.
    - .2 Floors and curbs shall be sealed.

- .2 Non-skid, epoxy coating is preferred (painted or trowel applied).
  - .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 liquids are used shall be waterproofed to prevent leakage into occupied space below.
  - .6 Use sleeves for vertical pipe/conduit penetrations. Sleeves shall extend 100mm above and 30mm below floor slab. Space between conduits and sleeve wall to be fire proofed, same fire rating as required for the floor slab.
  - .7 Install concrete curbs around ducts or multiple pipes penetrations. Concrete curbs shall be 100mm x 100mm.
  - .8 Transformers using dielectric liquids must be installed in a sealed, waterproofed 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.
  - .9 Concrete base (for equipment) shall have chamfered borders, yellow color used on the height and 50mm around both upper and lower perimeters.
- .5 Ceilings:
- .1 Exposed structure (no ceiling).
  - .2 Ceiling shall be painted.
  - .3 Gypsum board insulated assembly can be used in room where sound attenuation is a concern.
- .6 Doors:
- .1 Standard height double doors are preferred. Doors dimensions shall always accommodate the biggest piece of equipment to be moved-in/moved-out of the electrical room.
  - .2 Width shall be as dedicated by Codes and equipment requirements (minimum 915mm).
  - .3 Specify metal kick plate on push of doors.
  - .4 Specify Card Reader Access.
  - .5 Doors shall be fire rated as per Codes 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 be transmitted to surrounding areas.
    - .2 Dry type transformers shall be floor mounted on rubber pads for vibration isolation.
    - .3 Unistrut Channels shall be bolted to concrete where possible.
    - .4 Plywood panels used for equipment mounting shall be fire rated.
  - .2 Clearances:
    - .1 Final equipment design must demonstrate that the minimum clearances recommended by the manufacturers and required by Code have been taken into account:
      - .1 installation clearances between equipment,
      - .2 clearances required for maintenance,
      - .3 minimum clearance required to bring the equipment into the electrical room.
    - .2 Consider back access whenever possible or required by manufacturer. For maintenance purposes, rear panels shall be mounted on hinges.
    - .3 The final equipment design must demonstrate that proper coordination with other Professionals have been performed, particularly for validating the necessary clearances from delivery point to final location of equipment.
  - .3 Seismic Code requirements must be met.

**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 (Electricité)</b>     |
| <b>26 50 00</b>       | <b>Éclairage</b>                                 |

**END OF SECTION**