



.1 General

- .1 The use of AC90 (BX) cabling inside buildings is generally permitted only for luminaire drops and in tight spaces such as millwork and lab benches. Special permission must be obtained in writing from the Consultant and FMEL for uses elsewhere.
- .2 This section describes the accepted types of conduit and underground ducts for the campus.
- .3 The use of electric non-metallic tubing (ENT) is **not** permitted on campus.
- .4 To provide flexibility, conduit home run fill should be limited to 20% in order to accommodate pulling of future conductors.
- .5 Conduit is not permitted inside concrete slabs for educational buildings. All conduit shall be surface mounted under suspended slabs. Underground conduit shall be “under” the slab.

.2 Basic Wiring Method

- .1 Underground or in concrete exterior to building:
 - .1 All wiring shall be in PVC DB2 conduit, complete with bonding conductor sized to suit.
- .2 Concrete walls and slabs interior to building:
 - .1 All wiring shall be in rigid PVC conduit, complete with bonding conductor sized to suit (minimum ¾”).
 - .2 Conduit shall run under slabs-on-grade and NOT in concrete, sized to suit.
 - .3 All wiring in areas of suspended slabs shall be EMT surface mounted to the underside of slab.
- .4 Partition walls and ceilings:
 - .1 All wiring to be run in EMT conduit for branch circuits. EMT for fire alarm and low voltage raceways, and EMT and wire for all feeders and surface wiring in electrical and mechanical rooms.
- .5 T-bar ceilings:
 - .1 EMT and wire to junction box with flexible armoured cable drops for individual luminaires (no feed through wiring to luminaires allowed, except for luminaires butted together). Allow adequate cable to relocate luminaire one T-bar space in any direction.
- .6 Motors and transformer connections (and all equipment that vibrates):
 - .1 Short (600 to 1200mm) PVC jacketed flexible conduit with liquid tight connectors shall be used. Wire shall be stranded for all sizes. Allow sufficient slack to avoid strain on connectors at extreme extension of equipment movement.
- .7 Surface raceways - interior:
 - .1 All surface raceways shall be EMT, except if located without protection in areas susceptible to damage, which shall be rigid steel conduit.
- .8 Surface raceways - exterior:
 - .1 All surface raceways shall be rigid PVC conduit, protected from damage and excessive heating to the Consultant's satisfaction.
- .9 Gutters/Wireways:
 - .1 Gutters/wireways for branch circuits above and below electrical panels shall be minimum of 250mm high. Depth and width shall be as required by Electrical code.



.3 Location

- .1 Locate electrical devices on walls with main regard for convenience of operation and conserving wall space, in conjunction with the electrical drawings. Switches, receptacles, fire alarm pull stations, etc. generally to be vertically lined up where items are in the same general location. Adjacent common devices to be installed in common outlet box.
- .2 Do not install outlets back-to-back in party wall; allow minimum one stud space horizontal clearance between boxes. Install behind all outlets in party walls a Lowry Acoustic backing pad.
- .3 Locate light switches on latch side of doors. Locate disconnect devices in mechanical rooms on latch side of door.
- .4 All outlets located on exterior walls to be complete with moulded plastic vapour barriers to maintain integrity of wall vapour barrier system.
- .5 All raceways and wiring shall be installed concealed in building fabric, except for mechanical and electrical rooms where they shall be installed on the surface.
- .6 All outlet boxes, junction boxes, and cabinets to hold electrical devices shall be mounted so the equipment can be flush mounted.
- .7 All junction boxes and other raceway access devices shall be mounted avoid being visible from public areas. Obtain approval for any and all junction boxes that (due to the building design) cannot be concealed.
- .8 All junction boxes mounted, out of necessity, on surface of solid walls shall be painted to match adjacent surface, with junction boxes painted to match designated system.

.4 Installation

- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
- .2 Conceal conduits except in mechanical and electrical service rooms and in unfinished areas.
- .3 Use electrical metallic tubing (EMT) except above 2.4 m not subject to mechanical injury.
- .4 Use rigid PVC conduit underground, in corrosive areas, and surface mounted in wet areas not subject to damage.
- .5 Use flexible metal conduit for connection to motors in dry areas, connection to recessed incandescent fixtures without a prewired outlet box, connection to surface or recessed fluorescent fixtures and work in movable metal partitions.
- .6 Use liquid tight flexible metal conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations.
- .7 Use explosion proof flexible connection for connection to explosion proof motors. Install conduit sealing fittings in hazardous areas. Fill with compound.
- .8 Minimum conduit size for lighting and power circuits: 21 mm.
- .9 Minimum size for conduit home runs shall be 21 mm.
- .10 Provide minimum 50% spare capacity in conduit for all branch circuits.
- .11 Install fish cord in empty conduits.
- .12 Run 2-27 mm spare conduits up to ceiling space and 2-27 mm spare conduits down to ceiling space from each flush panel. Terminate these conduits in junction boxes in ceiling space or in case of an exposed concrete slab, terminate each conduit in surface type box.
- .13 All conduits shall be fastened to structure with steel straps (no cast type straps allowed).
- .14 All EMT fittings to be steel (no cast type fittings).



.5 Rigid PVC Ducts and Raceway

- .1 Install PVC conduit and fittings using new PVC cement, approved by the conduit manufacturer. PVC Cement to be Low VOC type.
- .2 Clean terminations with solvent and bevel inside edge of field cut conduit.
- .3 Protect conduit and fittings from water and keep dry while making connections.
- .4 Secure PVC raceway using PVC clamp on surface runs, and use tie wire in concrete slab when connecting to rebar.

.6 EMT Raceway

- .1 Insure that fittings are installed on raceway to provide effective continuity of raceway ground

.7 Fire Stopping

- .1 Apply ULC approved fire stopping assembly to all conduit penetrations passing through fire rated walls and floors.
- .2 Provide shop drawings showing details for each type of application on the project. Shop drawings shall include catalogue data and installation details.
- .3 For all communication sleeves accessible via ceilings or in stacked closets/rooms passing through floors, provide 2 hour rated STI EZ-PATH assembly. Provide minimum four(4) 100mm square sleeves between each floor and each communication closet/room.