# conduits, fittings and boxes

## DESIGN GUIDELINES

Summary:

* 1. This section provides guidelines and standards for Conduit, MC Cable, Surface Raceway, Boxes and Fittings.
1. Design
	1. Conduit:
		* Conduit stubbed up above accessible ceiling for fire alarm, telephone and data shall be turned into open plenum area at 90 degrees and provided with insulated bushings. Turn into room at a minimum of 10” above drop ceiling tile.
		* Refer to Fire Alarm System Design Standard for conduit requirements for fire alarm wiring.
		* All conduits shall contain an equipment grounding conductor. The conduit system must not be used as a grounding source.
		* In-slab conduit is NOT allowed on any project unless specifically approved by WUSM.
		* All lighting and receptacle branch circuit homeruns shall be in conduit from the source panel out to a ceiling box in the vicinity of the loads being served. MC cable is allowed from the local homerun junction box down to the devices within the walls.
		* In no case shall MC cable originate from the source panel.
		* All exposed conduit used in outside/exterior electrical applications shall be Rigid, IMC conduit or aluminum.
		* Electrical Non-Metallic Tubing ENT (blue “Smurf” tubing) is NOT allowed.
		* Motors and Vibrating Equipment: Use flexible metal conduit. Use liquid tight flexible metal conduit for installation in exterior locations, moisture or humidity laden atmosphere, corrosive atmosphere, water or spray wash down operations, inside airstream of HVAC units, and locations subject to seepage or dripping of oil, grease, or water.
		* Provide a green equipment grounding conductor with flexible and liquid-tight flexible metal conduit.
	2. Surface Raceway
		* Surface raceway for the routing of branch circuits in finished spaces shall only be utilized where approved by WUSM. Where provided, surface raceways in finished spaces shall be painted to match the surrounding surfaces and style shall be approved by WUSM.
	3. Boxes:
		* Outlet boxes mounted back-to-back in the same wall are not allowed.
		* For rooms with special sound requirements, provide fire-stop putty pads on the back side of outlet boxes to reduce sound transmission.

Labeling/Identification:

* 1. Identify raceways, boxes and cables of certain systems with color banding and labeling as follows:
		+ Junction box and pull-box covers shall be labeled with permanent marker indicating panel board name and the circuit number(s) of all internal wiring.
		+ Conduits for Systems over 600V shall be labeled with their voltage (ie. “4,160V”).
		+ Fire alarm system conduits shall be solid red or be provided with red bands as follows: Colored adhesive marking tape. Make each color band 2 inches wide, completely encircling the conduit and place adjacent bands of 2-color markings in contact, side by side.
		+ Locate labels and bands at changes in direction at penetrations of walls and floors at 50 foot maximum intervals in straight runs and at 25 foot intervals in congested areas.

Firestop:

* 1. Where conduits, wireways, and other electrical raceways pass through fire partitions, fire walls, smoke partitions, or floors, install a fire stop that provides an effective barrier against the spread of fire, smoke and gases.

Related Sections

* 1. Building Wire and Cable

## EQUIPMENT and PRODUCT REQUIREMENTS

1. Conduit:
	1. Size: In accordance with the NEC, but not less than 1/2-inch.

Fittings:

* 1. EMT Fittings: Steel set screw and compression fittings are acceptable. Where feasible, type of fittings shall be uniform throughout the project.
	2. Rigid Steel and IMC Conduit Fittings: Threaded couplings, locknuts and bushings.
	3. Flexible Metal Conduit Fittings: Clamp-type, with insulated throat.
	4. Only steel materials are acceptable.
	5. Die-cast fittings are NOT acceptable.

## END OF SECTION