

1. This section provides guidelines for the basic materials and methods for electrical installations.
2. Circuit conductors
  - a. Provide minimum #12 AWG conductors except for control wire, which can be #14 AWG if properly protected.
  - b. All conductors shall be stranded copper wires. Aluminum cable shall not be used.
  - c. Provide Type THHN and THWN moisture and heat resistant conductors insulated for at least 600 volts.
  - d. Circuit conductors shall be color coded as follows:
    - i. Conductors that are on 208 volt, three phase circuits shall be black, red, and blue (phases A, B, C respectively) with a white neutral.
    - ii. Conductors that are on 480volt, three phase circuits shall be brown, orange and yellow (phases A, B, C respectively) with a gray neutral.
  - e. Do not install more than six current carrying conductors in a conduit. Grounding conductors are not included in this count.
  - f. When more than one neutral conductor passes through a junction or pull box, identify the neutral conductor and associated phase conductors by either taping associated conductors together or with numbered labels attached to each conductor.
  - g. Provide separate raceways and junction boxes for conductors of different voltage systems, such as 208V and 480V.
  - h. Install all underground cables of any classification in a raceway system. Direct burial of underground cables is not allowed.
  - i. Identify junction boxes with panel and circuit number on cover with black indelible ink.
  - j. Provide full size neutral conductors for lighting and power, except for circuits connected to non-linear loads. For non-linear loads provide either a dedicated neutral for each phase or an oversized neutral sized to carry the maximum possible current on the neutral.
3. Raceway systems
  - a. Conduit:
    - i. Minimum conduit size for power and lighting circuits is  $\frac{3}{4}$ ."
    - ii. Minimum conduit size for control circuits is  $\frac{1}{2}$ ."
    - iii. Use EMT inside buildings unless subject to physical damage.
    - iv. Use rigid galvanized or IMT conduit if subject to physical damage.
    - v. MC cable is not allowed.
    - vi. Non-metallic flexible conduit is not acceptable.
    - vii. Leave a pull string in all spare conduits.
    - viii. Support conduit from the building structure. DO NOT support from the ceiling grid system.
  - b. Metallic flexible conduit is allowed for the following uses:
    - i. Connections to vibrating equipment. In wet or damp locations use liquid-tight.
    - ii. Final connection to light fixtures.
    - iii. For remodel work where circuit is fished within existing wall.
  - c. Surface metal raceway (SMR):
    - i. Limit the use of SMR. Where possible fish flex down walls or open and repair sheet rock walls. Where used, the minimum size allowed is 700SMR.
  - d. Conduit sizes for media and computer equipment will vary by specific room requirements. Check with Academic Technology and User Services (ATUS) staff for specific room requirements. Podia generally require at least two 2" conduits plus a separate conduit for electrical. All conduit

used for media wiring must allow for passage of wiring with connectors through the entire length of the conduit.

4. Grounding
  - a. Provide a ground wire with all branch circuits including lighting and receptacle circuits. Conduit as the sole ground is not acceptable.
5. Neatly type labels on all receptacle covers which indicates panelboard number and circuit number for each receptacle (Brother P-Touch labeler or equal).
6. Clearly identify each field component with supply panel and circuit number.
7. Receptacles and wall switches
  - a. Receptacles color: ivory Phenolic resin.
    - i. Specification grade, UL rated, 20-ampere minimum size.
  - b. Light switches color: ivory Phenolic resin
    - i. U. L. listed, specification grade.
  - c. Write panel and circuit numbers with a magic marker inside each receptacle box.
  - d. Receptacle devices must be firmly mounted flush with the wall.
  - e. Provide ivory colored high abuse nylon device plates.
8. Remove any unused wiring affected by renovation work (as a result of demolition or change in circuit requirements) back to the branch circuit protective device and identify such device as a spare. No unused circuit wiring shall be left in any box unless it is designated and identified as spare or future wiring.

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