

## SECTION 260502 - COMMON ELECTRIC MATERIALS AND METHODS

### PART 1 - GENERAL

#### 1.1 GENERAL

- A. **Mounting Heights:** Outlet mounting heights as indicated on the plans are approximate. Determine the exact mounting heights (and locations) of outlets in the field with relation to architectural detail and equipment being served. Coordinate outlet location with equipment, with furniture plans and with architectural elevation plans. Where mounting heights are not detailed or dimensioned, contact the Owner's Representative for direction. Prior to rough-in, coordinate final mounting heights of system outlet boxes in field with Owner's Representative. Install boxes at heights as follows, to center of box, unless directed otherwise in field or otherwise noted on E-series drawings or architectural plans. In cases where using center of box for measurement would result in a switch-height device having an operable component higher than 48 inches above finished floor, install boxes lower as needed so that uppermost part of operable component is no higher than 48 inches. Height of boxes dimensioned from ceiling apply to rooms having ceilings 9' or less; in rooms having higher ceilings, locate these as directed in the field.

Switches – Counters:	44" (field verify & match recept. heights)
Switches – Elsewhere:	46"
Occupancy Sensors, Wallbox:	46"
Occupancy Sensors, Elsewhere:	As recommended by manufacturer
Receptacles – Counters:	44" (field-verify)
Receptacles – Elsewhere:	18"
Laundry Washer/Dryer Recepts:	46" (field-verify)
Starters:	46"
Disconnects:	46"
Circuit Breaker Panelboards:	72" to top unless code dictates otherwise
Wall Mounted Luminaires:	As noted on plans or directed by Design Prof.
Control Stations:	46"
Communication Outlets:	18"
Fire Alarm Manual Pull Stations:	46" to top of operating handle
Fire Alarm A/V Annunciators:	80" to bottom of outlet box
Other Outlets/Fixtures/Equipment:	As directed by Design Professional

- B. **Lock-Out Tag-Out Devices:** Provide permanently installed lock-out tag-out devices compliant with NFPA 70 and OSHA, with padlocking provisions, at source overcurrent devices for the following applications.
- Where the normal NFPA 70-compliant location of the disconnecting means is impracticable or introduces additional or increased hazards to persons or property.
  - Where required by NFPA 70.
  - Where required by OSHA.
  - Where required by any other authority having jurisdiction.

- C. **Electrical Installations:**

1. Install conduit, wiring, outlet box and junction box type work in finished areas concealed. Such work installed in unfinished areas may be exposed only at the discretion of the Owner's Representative.
2. All new electrically related work shall be supported directly from building structural members. New electrically related work shall not be supported from ductwork, ductwork hangers, ceiling supports, existing conduit supports, etc. All conduits (and cable assemblies, where applicable) shall be routed parallel to building structural members. Noncompliant work installed by the electrical contractor shall be removed and reinstalled to the satisfaction of the Owner's Representative and the Design Professionals, at the expense of the electrical contractor.
3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work.
4. Provide systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and architectural/structural components. Provide factory-furnished filler plates in unused spaces of manufactured equipment.
5. Install electrical equipment to facilitate servicing, maintenance, and repair and replacement of equipment components. Install equipment for ease of disconnecting, with minimum of interference with other installations. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope. Protect the structure, furnishings, finishes, and adjacent materials.
6. Verify dimensions by field measurements. Take measurements and be responsible for exact size and locations of openings required for the installation of work. Where detailed method of installation is not indicated or where variations exist between described work and approved practice, follow direction of the Owner's Representative.
7. Provide no wire size smaller than No. 12 for branch circuits unless otherwise noted on plans for control circuits, or otherwise indicated in a Division 26 specification section. Provide larger sizes where required by prevailing codes or indicated on contract documents. Provide neutral conductor for all multi-pole feeders. Provide grounded ("neutral") conductor(s) for all multi-pole feeders and branch circuits unless this contractor determines in field that the affected load(s) will never have need for a neutral conductor and NEC does not mandate otherwise. Provide minimum 3/4" conduit size.
8. Do not install device wall outlets directly back to back, where located on opposite sides of common walls. Offset outlets by at least two feet for applications in fire rated walls and smoke rated walls and applications in acoustically treated walls. Offset outlets by at least one foot for other applications.
9. Provide wires continuous from outlet to outlet and properly splice joints. Provide insulation value for joints 100% greater than that of the wire. Mechanical wire splicers may be used. Where friction and rubber tape is used, provide tape

conforming to Federal Specifications HH-T-11 and HH-T-111. Where plastic electrical tape is used, provide Scotch #33, or approved equal. Provide minimum 8" tail for conductors terminating at each wired outlet at their outlet fittings to facilitate installment of devices, luminaires, etc.

10. Use of synthetic or plastic "tie-wraps", "zip ties", "wire ties" and similar products are not permitted as a permanent means of anchoring, securing, supporting or otherwise installing any cables, conductors, conduits, raceways, devices, equipment or other electrical work.
11. If during construction it becomes apparent that some specific minor changes in layout will result in a neater job or better arrangement, make such alterations without additional compensation and without having to offer credit. Obtain Design Professional's review before making such changes. Provide workmanship throughout that conforms to the standards of best practice. Marks, dents and finish scratches are prohibited on exposed materials, luminaires, fittings, etc. Clean inside of panels and equipment boxes.
12. Special Occupancies: Provide all electrical work in Special Occupancies as defined and described in Chapter 5 of NFPA 70 in strict compliance with Chapter 5 of NFPA 70, in addition to compliance with specified and drawn requirements of Division 26.

A. Connectors and Connections:

1. Provide complete assembly of materials for each type of required electrical connection, including but not limited to, pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, solderless wire-nuts, and other items and accessories as needed to complete splices and terminations of types indicated.
2. Unless otherwise indicated, provide wires/cables (conductors) for electrical connections that match, including sizes and ratings, of wires/cables that are supplying electrical power. Provide electrical connectors and terminals that mate and match, including sizes and ratings, with equipment terminals, and that are recommended by equipment manufacturer for intended applications. Provide connectors that are specifically UL listed and labeled for the exact splicing/termination application, including for instances where solid conductors are spliced/connected to stranded conductors. Provide electrical insulating tape, heat-shrinkable insulating tubing and boots, wirenuts, cable ties, etc. as recommended for use by accessories manufacturers for intended applications.
3. Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams. Mate and match conductors of electrical connections for proper interface between electrical power supplies and installed equipment. Cover splices with electrical insulating material to achieve insulation at least 100 percent in excess of electrical insulation rating of those conductors being spliced. Prepare cables and wires, by cutting and stripping covering armor, jacket, and insulation properly to ensure uniform and neat appearance where cables and wires are terminated. Exercise care to avoid cutting through tapes which will remain on conductors. Do not "ring" copper conductors while skinning wire.
4. Ground metal frames of portable and stationary direct-wired electrically operated equipment by connecting frames to the circuit equipment grounding conductor and to grounded metal raceway. Provide necessary electrical connections between the specified equipment and junction boxes, disconnect switches, and starters near equipment with flexible metallic conduit and matched connectors. Do not expose flexible conduit in finished areas.

5. Wire and connect electrical equipment furnished under this branch of work, other branches of work and by the Owner. Review documents of other trades to identify electrically operated/controlled equipment that is furnished or installed by the Owner, or by other trades. Provide power connections and local disconnects for same. Provide control wiring (including relays, starters, etc.), as required to render equipment fully operable unless indicated otherwise on drawings or in project manual. Determine exact requirements in field from respective equipment installer.

**PART 2 - PRODUCTS (INCLUDED IN PART 1 ABOVE AS APPLICABLE)**

**PART 3 - EXECUTION (INCLUDED IN PART 1 ABOVE AS APPLICABLE)**

**END OF SECTION 260502**