Electrical metallic tubing or rigid nonmetallic conduit is permitted to be used when closely routed against frames and equipment enclosures.

(l) Outlet boxes of dimensions less than those required in Table 314.16(A) of the National Electrical Code, NFPA No. 70–2005, are permitted provided the box has been tested and approved for that purpose.

(m) Boxes, fittings, and cabinets shall be securely fastened in place, and shall be supported from a structural member of the home, either directly or by using a substantial brace. Snap-in type boxes provided with special wall or ceiling brackets that securely fasten boxes in walls or ceilings shall be permitted.

(n) Outlet boxes must fit closely to openings in combustible walls and ceilings and must be flush with the finish surface or project therefrom. In walls and ceilings of noncombustible material, outlet boxes and fittings must be installed so that the front edge of the box or fitting will not be set back from the finished surface more than ¼ inch. Plaster, drywall, or plasterboard surfaces that are broken or incomplete must be repaired so that there will be no gaps or open spaces greater than ⅛ inch at the edge of the box or fitting.

(o) Appliances having branch-circuit terminal connections which operate at temperatures higher than 60 °C (140 °F) shall have circuit conductors as described in paragraphs (p) (1) and (2) of this section:

(1) Branch-circuit conductors having an insulation suitable for the temperature encountered shall be permitted to run directly to the appliance.

(2) Conductors having an insulation suitable for the temperature encountered may be run from the appliance terminal connections to a readily accessible outlet box placed at least one foot from the appliance. If provided, these conductors must be in a suitable raceway or Type AC or MC cable, of at least 18 inches but not more than 6 feet in length.

(p) A substantial brace for securing a box, fitting, or cabinet must be as described in the National Electrical Code, NFPA 70–2005, Article 314.23(B), or the brace, including the fastening mechanism to attach the brace to the home structure, must withstand a force of 50 lbs. applied to the brace at the intended point(s) of attachment for the box in a direction perpendicular to the surface on which the box is installed.

(q) Where the sheathing of NM cable has been cut or damaged and visual inspection reveals that the conductor and its insulation has not been damaged, it shall be permitted to repair the cable sheath with electrical tape which provides equivalent protection to the sheath.

[40 FR 58752, Dec. 18, 1975. Redesignated at 44 FR 20679, Apr. 6, 1979, as amended at 58 FR 55020, Oct. 25, 1993; 70 FR 72052, Nov. 30, 2005; 78 FR 73991, Dec. 9, 2013]

§ 3280.809 Grounding.

(a) *General.* Grounding of both electrical and nonelectrical metal parts in a manufactured home shall be through connection to a grounding bus in the manufactured home distribution panelboard. The grounding bus shall be grounded through the green-colored conductor in the supply cord or the feeder wiring to the service ground in the service-entrance equipment located adjacent to the manufactured home location. Neither the frame of the manufactured home nor the frame of any appliance shall be connected to the neutral conductor in the manufactured home.

(b) *Insulated neutral.* (1) The grounded circuit conductor (neutral) shall be insulated from the grounding conductors and from equipment enclosures and other grounded parts. The grounded (neutral) circuit terminals in the distribution panelboard and in ranges, clothes dryers, counter-mounted cooking units, and wall-mounted ovens shall be insulated from the equipment enclosure. Bonding screws, straps, or buses in the distribution panelboard or in appliances shall be removed and discarded. However, when service equipment is installed on the manufactured home, the neutral and the ground bus may be connected in the distribution panel.

(2) Connection of ranges and clothes dryers with 120/240 volt, 3-wire ratings shall be made with 4 conductor cord and 3 pole, 4-wire grounding type plugs, or by type AC metal clad conductors enclosed in flexible metal conduit. For

120 volt rated devices a 3-conductor cord and a 2-pole, 3-wire grounding type plug shall be permitted.

(c) *Equipment grounding means.* (1) The green-colored grounding wire in the supply cord or permanent feeder wiring shall be connected to the grounding bus in the distribution panelboard or disconnecting means.

(2) In the electrical system, all exposed metal parts, enclosures, frames, lamp fixture canopies, etc., shall be effectively bonded to the grounding terminal or enclosure of the distribution panelboard.

(3) Cord-connected appliances, such as washing machines, clothes dryers, refrigerators, and the electrical system of gas ranges, etc., shall be grounded by means of an approved cord with grounding conductor and grounding-type attachment plug.

(d) *Bonding of noncurrent-carrying metal parts.* (1) All exposed noncurrent-carrying metal parts that may become energized shall be effectively bonded to the grounding terminal or enclosure of the distribution panelboard. A bonding conductor shall be connected between each distribution panelboard and an accessible terminal on the chassis.

(2) Grounding terminals shall be of the solderless type and approved as pressure-terminal connectors recognized for the wire size used. Star washers or other approved paint-penetrating fitting shall be used to bond terminals to chassis or other coated areas. The bonding conductor shall be solid or stranded, insulated or bare and shall be No. 8 copper minimum, or equal. The bonding conductor shall be routed so as not to be exposed to physical damage. Protection can be afforded by the configuration of the chassis.

(3) Metallic gas, water and waste pipes and metallic air-circulating ducts shall be considered bonded if they are connected to the terminal on the chassis (see §3280.809) by clamps, solderless connectors, or by suitable grounding-type straps.

(4) Any metallic roof and exterior covering shall be considered bonded if (i) the metal panels overlap one another and are securely attached to the wood or metal frame parts by metallic fasteners, and (ii) if the lower panel of the metallic exterior covering is secured by metallic fasteners at a cross member of the chassis by two metal straps per manufactured home unit or section at opposite ends. The bonding strap material shall be a minimum of 4 inches in width of material equivalent to the skin or a material of equal or better electrical conductivity. The straps shall be fastened with paint-penetrating fittings (such as screws and star washers or equivalent).

[40 FR 58752, Dec. 18, 1975. Redesignated at 44 FR 20679, Apr. 6, 1979, as amended at 58 FR 55020, Oct. 25, 1993]

§ 3280.810 Electrical testing.

(a) *Dielectric strength test.* The wiring of each manufactured home shall be subjected to a 1-minute, 900 to 1079 volt dielectric strength test (with all switches closed) between live parts and the manufactured home ground, and neutral and the manufactured home ground. Alternatively, the test may be performed at 1080 to 1250 volts for 1 second. This test shall be performed after branch circuits are complete and after fixtures or appliances are installed. Fixtures or appliances which are listed shall not be required to withstand the dielectric strength test.

(b) *Additional testing.* Each manufactured home must be subjected to the following tests:

(1) An electrical continuity test to assure that metallic parts are effectively bonded;

(2) An operational test of all devices and utilization equipment, except water heaters, electric ranges, electric furnaces, dishwashers, clothes washers/dryers, and portable appliances, to demonstrate they are connected and in working order; and

(3) Electrical polarity checks to determine that connections have been made in accordance with applicable provisions of these standards and Article 550.17 of NFPA 70–2005 (incorporated by reference, see §3280.4). Visual verification is an acceptable electrical polarity check.

[58 FR 55020, Oct. 25, 1993, as amended at 86 FR 2523, Jan. 12, 2021]

§ 3280.811 Calculations.

(a) The following method shall be employed in computing the supply cord