

permanent ladder and have headroom at all points less than 900 mm (3 ft), the wiring shall be permitted to be installed on the edges of rafters or joists facing the attic or roof space.

394.30 Securing and Supporting.

(A) Supporting. Conductors shall be rigidly supported on noncombustible, nonabsorbent insulating materials and shall not contact any other objects. Supports shall be installed as follows:

- (1) Within 150 mm (6 in.) of each side of each tap or splice, and
- (2) At intervals not exceeding 1.4 m (4½ ft).

Where it is impracticable to provide supports, conductors shall be permitted to be fished through hollow spaces in dry locations, provided each conductor is individually enclosed in flexible nonmetallic tubing that is in continuous lengths between supports, between boxes, or between a support and a box.

(B) Securing. Where solid knobs are used, conductors shall be securely tied thereto by tie wires having insulation equivalent to that of the conductor.

394.42 Devices. Switches shall comply with 404.4 and 404.10(B).

394.56 Splices and Taps. Splices shall be soldered unless approved splicing devices are used. In-line or strain splices shall not be used.

Part III. Construction Specifications

Δ **394.104 Conductors.** Conductors shall be of a type identified in Table 310.4(1).

ARTICLE

395

Outdoor Overhead Conductors over 1000 Volts

395.1 Scope. This article covers the use and installation for outdoor overhead conductors over 1000 volts, nominal.

This article is performance based. It provides the objectives for compliance, rather than prescriptive requirements. These objectives can be met through existing consensus standards for installation of overhead conductors, such as ANSI/IEEE C2, *National Electrical Safety Code (NESC®)*.

395.10 Uses Permitted. Outdoor overhead conductors over 1000 volts, nominal, shall be permitted only for systems rated over 1000 volts, nominal, as follows:

- (1) Outdoors in free air
- (2) For service conductors, feeders, or branch circuits

Informational Note: See IEEE C2, *National Electrical Safety Code*, and ANSI/IEEE 3001.2, *Recommended Practice for Evaluating the Electrical Service Requirements of Industrial and Commercial Power Systems*, for additional information on outdoor overhead conductors over 1000 volts.

395.30 Support.

(A) Conductors. Documentation of the engineered design by a licensed professional engineer engaged primarily in the design of such systems for the spacing between conductors shall be available upon request of the authority having jurisdiction and shall include consideration of the following:

- (1) Applied voltage
- (2) Conductor size
- (3) Distance between support structures
- (4) Type of structure
- (5) Wind/ice loading
- (6) Surge protection

(B) Structures. Structures of wood, metal, or concrete, or combinations of those materials, shall be provided for support of overhead conductors over 1000 volts, nominal. Documentation of the engineered design by a licensed professional engineer engaged primarily in the design of such systems and the installation of each support structure shall be available upon request of the authority having jurisdiction and shall include consideration of the following:

- (1) Soil conditions
- (2) Foundations and structure settings
- (3) Weight of all supported conductors and equipment
- (4) Weather loading and other conditions such as, but not limited to, ice, wind, temperature, and lightning
- (5) Angle where change of direction occurs
- (6) Spans between adjacent structures
- (7) Effect of dead-end structures
- (8) Strength of guy wires and guy anchors
- (9) Structure size and material(s)
- (10) Hardware

(C) Insulators. Insulators used to support conductors shall be rated for all of the following:

- (1) Applied phase-to-phase voltage
- (2) Mechanical strength required for each individual installation
- (3) Impulse withstand BIL in accordance with Table 490.24(a)

Informational Note: See 395.30(A), (B), and (C), which are not all-inclusive lists.

ARTICLE

396

Messenger-Supported Wiring

Part I. General

396.1 Scope. This article covers the use, installation, and construction specifications for messenger-supported wiring.