(i) The polarity of buried wire or cable “tip” and “ring” conductors shall be maintained by making the connections in accordance with Table 2, as follows:

<table>
<thead>
<tr>
<th>Pair</th>
<th>Color of insulation</th>
<th>Color of marking</th>
<th>Color of insulation</th>
<th>Color of marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White</td>
<td>Blue</td>
<td>Blue</td>
<td>White</td>
</tr>
<tr>
<td>2</td>
<td>White</td>
<td>Orange</td>
<td>Orange</td>
<td>White</td>
</tr>
<tr>
<td>3</td>
<td>White</td>
<td>Green</td>
<td>Green</td>
<td>White</td>
</tr>
<tr>
<td>4</td>
<td>White</td>
<td>Brown</td>
<td>Brown</td>
<td>White</td>
</tr>
<tr>
<td>5</td>
<td>White</td>
<td>Slate</td>
<td>Slate</td>
<td>White</td>
</tr>
<tr>
<td>6</td>
<td>Red</td>
<td>Blue</td>
<td>Blue</td>
<td>Red</td>
</tr>
<tr>
<td>7</td>
<td>Red</td>
<td>Orange</td>
<td>Orange</td>
<td>Red</td>
</tr>
<tr>
<td>8</td>
<td>Red</td>
<td>Green</td>
<td>Green</td>
<td>Red</td>
</tr>
<tr>
<td>9</td>
<td>Red</td>
<td>Brown</td>
<td>Brown</td>
<td>Red</td>
</tr>
<tr>
<td>10</td>
<td>Red</td>
<td>Slate</td>
<td>Slate</td>
<td>Red</td>
</tr>
<tr>
<td>11</td>
<td>Black</td>
<td>Blue</td>
<td>Blue</td>
<td>Black</td>
</tr>
<tr>
<td>12</td>
<td>Black</td>
<td>Orange</td>
<td>Orange</td>
<td>Black</td>
</tr>
<tr>
<td>13</td>
<td>Black</td>
<td>Green</td>
<td>Green</td>
<td>Black</td>
</tr>
<tr>
<td>14</td>
<td>Black</td>
<td>Brown</td>
<td>Brown</td>
<td>Black</td>
</tr>
<tr>
<td>15</td>
<td>Black</td>
<td>Slate</td>
<td>Slate</td>
<td>Black</td>
</tr>
<tr>
<td>16</td>
<td>Yellow</td>
<td>Blue</td>
<td>Blue</td>
<td>Yellow</td>
</tr>
<tr>
<td>17</td>
<td>Yellow</td>
<td>Orange</td>
<td>Orange</td>
<td>Yellow</td>
</tr>
<tr>
<td>18</td>
<td>Yellow</td>
<td>Green</td>
<td>Green</td>
<td>Yellow</td>
</tr>
<tr>
<td>19</td>
<td>Yellow</td>
<td>Brown</td>
<td>Brown</td>
<td>Yellow</td>
</tr>
<tr>
<td>20</td>
<td>Yellow</td>
<td>Slate</td>
<td>Slate</td>
<td>Yellow</td>
</tr>
<tr>
<td>21</td>
<td>Violet</td>
<td>Blue</td>
<td>Blue</td>
<td>Violet</td>
</tr>
<tr>
<td>22</td>
<td>Violet</td>
<td>Orange</td>
<td>Orange</td>
<td>Violet</td>
</tr>
<tr>
<td>23</td>
<td>Violet</td>
<td>Green</td>
<td>Green</td>
<td>Violet</td>
</tr>
<tr>
<td>24</td>
<td>Violet</td>
<td>Brown</td>
<td>Brown</td>
<td>Violet</td>
</tr>
<tr>
<td>25</td>
<td>Violet</td>
<td>Slate</td>
<td>Slate</td>
<td>Violet</td>
</tr>
</tbody>
</table>

(c) Kinks or splices shall not be permitted in aerial service wire spans.

available for inspection during normal business hours at RUS, room 2905, U.S. Department of Agriculture, 1400 Independence Avenue, SW., STOP 1598, Washington, DC 20250–1598, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(e) Aerial service wire shall be installed using the maximum practicable sag consistent with the required ground clearance and good construction practices. In no event shall the minimum sags be less than the values shown on construction drawing 505 contained in §1755.510 for various span lengths and loading areas provided. Span lengths shall not exceed 250 ft (76 m).

(f) To reduce vibration and galloping, aerial service wire shall be twisted one complete turn for each 10 ft (3 m) of span length at the time of installation.

(g) The methods of attaching aerial service wires at poles shall be as illustrated in construction drawings 503–2 and 504 contained in §1755.510.

(h) Horizontal and vertical climbing spaces on poles used jointly with power circuits shall be provided in conformance with the requirements of Rule 236 of ANSI/IEEE C2–1997, NESC.

(i) Not more than four aerial service wires shall be distributed from any one 7⁄16 in. (10 mm) drive hook, or more than two aerial service wires from any one 5⁄16 in. (8 mm) drive hook. Aerial service wires and drive hooks shall be arranged so that the load does not pull the drive hook out of the pole. When more than one drive hook is required, the drive hooks shall be staggered with a minimum separation of 1 in. (25.4 mm) horizontally on centers and 1 1⁄2 in. (40 mm) vertically on centers. If drive hooks are placed within 3 in. (76 mm) of the top of the pole and on the opposite side of the pole’s circumference, a vertical separation of at least 3 in. (76 mm) shall be provided. A drive hook shall not be placed on the top of a pole or stub pole.

(j) When connecting aerial service wires to cable pairs at terminals, sufficient slack shall be provided so that each aerial service wire shall reach any binding post position as shown on construction drawing 312–1 contained in §1755.510.

(k) Aerial service wire attachments on utility poles and the manner of placing bridle rings and entering cable terminals shall be as shown on construction drawing 503–2 contained in §1755.510.

(l) Not more than two conductors shall be connected to any terminal binding post. Where it is necessary to bridge more than two aerial service wires at the same closure, the aerial service wires shall be terminated in aerial service wire terminals connected in parallel with a No. 20 AWG bridle wire which shall be terminated on the binding posts of the filled terminal block.

(m) Where aerial service wire is attached to aerial plastic cable, it shall be brought directly into a ready-access closure and shall be terminated on the binding posts of the filled terminal block as shown on construction drawing 503–2 contained in §1755.510.

(n) The conductor of copper coated steel reinforced aerial service wires identified by tracer ridges shall be used as the ring (negative battery) conductor of the pair, and shall normally be connected to the right or lower binding post of a pair on filled terminal blocks and NIDs or fused primary station protectors.

(o) Nonmetallic reinforced aerial service wire pair identification. (1) The tip and ring conductors of nonmetallic reinforced aerial service wires shall be identified in accordance with Table 3, as follows:

<table>
<thead>
<tr>
<th>Pair number</th>
<th>Tip color</th>
<th>Ring color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>White/Blue or White</td>
<td>Blue</td>
</tr>
<tr>
<td>2</td>
<td>White/Orange or White</td>
<td>Orange</td>
</tr>
<tr>
<td>3</td>
<td>White/Green or White</td>
<td>Green</td>
</tr>
</tbody>
</table>

TABLE 3—NONMETALLIC REINFORCED AERIAL SERVICE WIRE COLOR CODE
(2) The ring (negative battery) conductor of the pair shall normally be connected to the right or lower binding post of a pair on filled terminal blocks and NIDs or fused primary station protectors.

(p) When it is necessary to avoid intervening obstacles between a pole and a building, span clamp attachments shall be used to support the aerial service wires at points between the poles that are supporting the cable on the suspension strand as indicated by construction drawings 501–1 and 501–2 contained in §1755.510.

(q) Aerial service wire strung from pole to pole shall be placed entirely below or entirely above any existing wire or cable. When adequate ground clearance can be obtained, preference shall be given to placing aerial service wire below wire and cable.

(r) When more than one aerial service wire is installed from pole to pole, the first aerial service wire shall be sagged in accordance with construction drawing 505 contained in §1755.510. Succeeding aerial service wires shall be sagged with 2 in. (50.8 mm) more sag for each aerial service wire.

(s) Aerial service wire spans from pole to buildings shall follow the shortest feasible route commensurate with the requirements of paragraph (t) of this section and shall be sagged in accordance with construction drawing 505 contained in §1755.510. The route shall avoid trees and other obstructions to the extent practicable. Where trees cannot be avoided, tree trimming permission shall be obtained from the owner or the owner’s representative, and all limbs and foliage within 2 ft (600 mm) of the finally sagged wire shall be removed. If tree trimming permission cannot be obtained, the matter shall be referred to the borrower for resolution before proceeding with the installation.

(t) Aerial service wires shall contact buildings as closely as practicable at a point directly above the NID, or fused primary station protector. Generally, horizontal drop wire runs on buildings shall not exceed 20 ft (6 m). The warning given in §1755.505(f)(11) regarding drilling holes in aluminum and vinyl siding applies also to attaching aerial service wires.

(u) The point of the first building attachment shall be located so that the aerial service wire will be clear of roof drainage points.

(v) Where practicable, aerial service wires shall pass under electrical guys, power distribution secondaries and services, tree limbs, etc.

(w) Aerial service wire shall not pass in front of windows or immediately above doors.

(x) Aerial service wires shall be routed so as to have a minimum clearance of 2 ft (600 mm) from any part of a short wave, ham radio, etc. antenna mast and a television antenna mast in its normal vertical position and of the possible region through which it sweeps when being lowered to a horizontal position.

(y) Aerial service wires shall be installed such that all clearances and separations comply with either section 237 of ANSI/IEEE C2–1997, NESC, or ANSI/NFPA 70–1999, NEC®, or local laws or ordinances, whichever is the most stringent.

2. Aerial service wire attachments to buildings shall be as follows:

(1) First attachments on buildings shall be made in accordance with construction drawings 506, 507, or 508–1 contained in §1755.510, as applicable;

(2) Intermediate attachments on buildings shall be made in accordance with construction drawings 510 or 510–1 contained in §1755.510; and

(3) Uninsulated attachments shall be permitted to be used as follows:
§ 1755.506

(i) Wherever NIDS are used as permitted by section 800–30(a)(1) of the ANSI/NFPA 70–1999, NEC®; and

(ii) On masonry and other types of nonflammable buildings.

(aa) Insulated attachments shall be used on wooden frame, metallic siding and other types of combustible buildings where fused primary station protectors are used, as required by section 800–30(a)(2) of ANSI/NFPA 70–1999, NEC®.

(bb) Aerial service wire runs on buildings shall be attached vertically and horizontally in a neat and most inconspicuous possible manner. See construction drawing 513 contained in §1755.510. Horizontal runs on buildings are undesirable and shall be kept to a minimum. Diagonal runs shall not be made.

(cc) Aerial service wire runs on buildings shall be located so as not to be subjected to damage from passing vehicles, pedestrians, or livestock.

(dd) Minimum separation between aerial service wires and other facilities on or in buildings shall be in accordance with §1755.505(f)(8), Table 1.

(ee) Appropriate devices for attaching aerial service wires to buildings vary with the type of building construction and with the type of customer access location equipment. Table 4 lists various types of attachments and their application with respect to construction, customer access location equipment, and proper mounting devices. Construction drawings 506 through 513 contained in §1755.510 illustrate requirements with respect to various angles of service wire contacts and uses of various attachments. Table 4 is as follows:
**NOTES:**

1. Screw dimensions are minimum. Where appropriate, either or both dimensions shall be increased. All wood screws for exterior use shall be stainless steel. All other exterior metal devices shall be stainless steel, zinc coated steel, silicon bronze, or corrosion resistant aluminum alloy.

2. Toggle bolt dimensions are minimum. Where appropriate, either or both dimensions shall be increased.

3. All devices should be attached to stud-

4. Screw-type devices shall be secured by means of expansion-type anchors. Equivalent manual or machine-driven devices may be used. Where toggle bolts are specified equivalent devices may be used.

5. Pilot holes shall be provided for screws and bridle rings in shingles and drop siding.

6. Attachment device not applicable.
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7. Attachment device applicable but no separate fastening device required.
8. To convert English units to Metric units use 1 in. = 25.4 mm.

(ff) Fastener spacings for vertical and horizontal runs on frame or masonry buildings shall not be more than 6 ft (2 m) apart. Fasteners should be spaced close enough to prevent the aerial service wire from “slapping” against the building during windy conditions.

(gg) When it is necessary to pass behind or around obstructions such as downspouts and vertical conduits, the aerial service wire shall be supported firmly with attachment devices placed not more than 6 in. (152 mm) from the obstruction as illustrated in Figures 4 and 5 of paragraph (hh) of this section. Preferably, the aerial service wire should be routed behind obstructions to minimize the possibility of mechanical damage to the aerial service wire in the event repair work to the obstruction is required.

(hh) When passing around building projections of masonry or wood or around corners, aerial service wires shall be installed as illustrated in Figures 5 and 6. Figures 4, 5, and 6 are as follows:
FIGURE 4
AERIAL SERVICE WIRE CROSSING OBSTRUCTIONS
WOODEN BUILDING SURFACES

SKETCH A: PASSING BEHIND DRAIN SPOUT
(PREFERRED INSTALLATION METHOD)

SKETCH B: PASSING IN FRONT OF DRAIN SPOUT

SKETCH C: CROSSING IN FRONT OF CONDUIT

SKETCH D: CROSSING BEHIND CONDUIT
(PREFERRED INSTALLATION METHOD)

SKETCH E: PASSING POWER, RADIO, OR GROUNDING CONDUCTOR
FIGURE 5
AERIAL SERVICE WIRE CROSSING OBSTRUCTIONS
MASONRY BUILDING SURFACES

SKETCH A: PASSING BEHIND DRAIN SPOUT
(PREFERRED INSTALLATION METHOD)

SKETCH B: PASSING IN FRONT OF DRAIN SPOUT

SKETCH C: CROSSING IN FRONT OF CONDUIT

SKETCH D: CROSSING BEHIND CONDUIT
(PREFERRED INSTALLATION METHOD)

SKETCH E: PASSING BEHIND FOREIGN WIRE
(PREFERRED INSTALLATION METHOD)

SKETCH F: MASONRY BUILDING PROJECTIONS
(ii) In areas where ice and snow conditions are severe, aerial service wires shall be located so that ice and snow falling from the roof will not strike the wires. However, where aerial service wires must pass under the sloping part of the roof, first attachments shall be made as close as practicable to the eaves.

(jj) If two aerial service wire spans are required to the same building, the first attachment shall be such that both aerial service wires can be attached at the same attachment device. Refer to construction drawing 508–1 contained in §1755.510. Where more than two aerial service wires are required, additional attachment devices
§ 1755.507 Aerial cable services.

(a) Where more than six pairs are needed initially, and where an aerial service is necessary, the service shall consist of 22 AWG filled aerial cable of a pair size adequate for the ultimate anticipated service needs of the building. The cable shall comply with the requirements of §1755.390, RUS specification for filled telephone cables, and shall be RUS accepted or RUS technically accepted.

(b) Aerial cable services shall be constructed in accordance with specific installation specifications prepared by the RUS borrower or the engineer delegated by the borrower.

(c) Unless otherwise specified in the installation specifications, aerial cable service installations shall meet the following requirements:

(1) Strand supported lashed construction shall be used.

(2) Where practicable a 5/16 in. (8 mm) utility grade strand and automatic clamps shall be used in slack spans to avoid damage to the building.

(3) Construction on poles shall comply with applicable construction drawings for regular line construction. Aerial service cable shall be spliced to the main cable in accordance with §1755.200, RUS standard for splicing copper and fiber optic cables.

(4) Where practicable, aerial cable shall pass under electrical guys, distribution secondaries, and services.

(5) The suspension strand shall be attached to the building by wall brackets as indicated in Figure 7 as follows: