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(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 2—COLOR CODES FOR TIP AND RING CONNECTIONS OF INSIDE WIRING CABLE

Pair	Tip		Ring	
	Color of insulation	Color of marking	Color of insulation	Color of marking
1	White	Blue	Blue	White
2	White	Orange	Orange	White
3	White	Green	Green	White
4	White	Brown	Brown	White
5	White	Slate	Slate	White
6	Red	Blue	Blue	Red
7	Red	Orange	Orange	Red
8	Red	Green	Green	Red
9	Red	Brown	Brown	Red
10	Red	Slate	Slate	Red
11	Black	Blue	Blue	Black
12	Black	Orange	Orange	Black
13	Black	Green	Green	Black
14	Black	Brown	Brown	Black
15	Black	Slate	Slate	Black
16	Yellow	Blue	Blue	Yellow
17	Yellow	Orange	Orange	Yellow
18	Yellow	Green	Green	Yellow
19	Yellow	Brown	Brown	Yellow
20	Yellow	Slate	Slate	Yellow
21	Violet	Blue	Blue	Violet
22	Violet	Orange	Orange	Violet
23	Violet	Green	Green	Violet
24	Violet	Brown	Brown	Violet
25	Violet	Slate	Slate	Violet

[66 FR 43317, Aug. 17, 2001, as amended at 69 FR 18803, Apr. 9, 2004]

§ 1755.506 Aerial wire services.

(a) Aerial services of one through six pairs shall consist of Service Entrance Aerial (SEA) assembly units, in accordance with RUS Bulletin 1753F–153 (RUS Form 515d), Specifications and Drawings for Service Installations at Customer Access Locations. The wire used for aerial services shall conform to the requirements of §§ 1755.700 through 1755.704, RUS specification for aerial service wires, and shall be RUS accepted or RUS technically accepted. Copies of RUS Bulletin 1753F–153 are available upon request from RUS/USDA, 1400 Independence Avenue, SW., STOP 1522, Washington, DC 20250–1522, FAX (202) 720–4120.

(b) If aerial wire services are to be connected to aerial cable pairs, the NIDs or fused primary station protectors and grounds shall be installed and connected before the aerial service wires are attached to the customer's structure.

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

(d) Aerial service wires shall be run in accordance with the construction drawings contained in § 1755.510 and shall conform to all clearance requirements of the ANSI/NFPA 70–1999, *NEC*®, and ANSI/IEEE C2–1997, NESC, or local laws or ordinances, whichever are the most stringent. The *National Electrical Code*® and *NEC*® are registered trademarks of the National Fire Protection Association, Inc., Quincy, MA 02269. The ANSI/NFPA 70–1999, *NEC*®, and ANSI/IEEE C2–1997, NESC, are incorporated by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of ANSI/NFPA 70–1999, *NEC*®, are available from NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts 02269–9101, telephone number 1 (800) 344–3555. Copies of ANSI/IEEE C2–1997, NESC, are available from IEEE Service Center, 455 Hoes Lane, Piscataway, New Jersey 08854, telephone number 1 (800) 678–4333. Copies of ANSI/NFPA 70–1999, *NEC*®, and ANSI/IEEE C2–1997, NESC, are

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 1.5 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 3—NONMETALLIC REINFORCED AERIAL SERVICE WIRE COLOR CODE

Pair number	Conductor color	
	Tip	Ring
1	White/Blue or White	Blue
2	White/Orange or White	Orange
3	White/Green or White	Green

TABLE 3—NONMETALLIC REINFORCED AERIAL SERVICE WIRE COLOR CODE—Continued

Pair number	Conductor color	
	Tip	Ring
4	White/Brown or White	Brown
5	White/Slate or White	Slate
6	Red/Blue or Red	Blue

(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 lines 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.

(z) 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:

(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:

Table 4
DEVICES FOR ATTACHING AERIAL SERVICE WIRES TO BUILDINGS (1), (2), (8)

TYPE OF ATTACHMENT		TYPES OF FASTENING DEVICES											
		FRAME BUILDINGS (3)								FIRE RESISTANT BUILDINGS (4)			
		FUSED STATION PROTECTOR				NID				(NID OR FUSED STATION PROTECTOR)			
		Wood Shingle–Composi–tion (5)	Plywood–Plastic–Board Paneling	Thin Brick–Stucco–Plaster	Metal Sheath	Wood Shingle–Composi–tion (5)	Plywood–Plastic–Board Paneling	Thin Brick–Stucco–Plaster	Metal Sheath	Concrete Block	Tile	Brick Stone Concrete	Steel
Knob, S	Under 30° Angle	2–1/2" x #18 FH Screw	3" x #18 FH Screw	3" x #18 FH Screw	2–1/2" x #18 FH Screw	2–1/2" x #18 FH Screw	3" x #18 FH Screw	3" x #18 FH Screw	2–1/2" x #18 FH Screw				
	Over 30° Angle	5/16" Angle Screw	5/16" Angle Screw	3/8" Angle Screw	5/16" Angle Screw	5/16" Angle Screw	5/16" Angle Screw	3/8" Angle Screw	5/16" Angle Screw				
Knob, C		2–1/2" x #10 RH Screw	3" x #10 RH Screw	3–1/2" x #10 RH Screw	2–1/2" x #10 RH Screw	Note 6	Note 6	Note 6	Note 6				
Bracket, House		2" x #14 RH Screw	2" x #14 RH Screw	2–1/2" x #14 RH Screw	2" x #14 RH Screw	Note 6	Note 6	Note 6	Note 6				
Bracket, Corner		2" x #14 RH Screw	2" x #14 RH Screw	2–1/2" x #14 RH Screw	2" x #14 RH Screw	2" x #14 RH Screw	2" x #14 RH Screw	2–1/2" x #14 RH Screw	2" x #14 RH Screw	3/16" x 4" Toggle	3/16" x 4" Toggle	2" x #14 RH Screw	3/16" x 4" Toggle
Screweye, Insulated		1" Shank	1" Shank	2" Shank	1" Shank	Note 6	Note 6	Note 6	Note 6				
Ring, Bridle, Drive		Note 6	Note 6	Note 6	Note 6	Note 7	Note 7	Note 6	Note 7	Drive Anchor	Note 6	Drive Anchor	Note 6
Ring, Bridle, Screw		Note 6	Note 6	Note 6	Note 6	Note 7	Note 7	Note 6	Note 7	Expansion Anchor	Note 6	Expansion Anchor	Note 6
Hook, Drop Wire		Note 6	Note 6	Note 6	Note 6	2" x #14 RH Screw	2" x #14 RH Screw	2" x #14 RH Screw	2" x #14 RH Screw	1/4" x 4" Toggle	1/4" x 4" Toggle	2" x #18 RH Screw	1/4" x 3" Toggle
Hook, House		Note 6	Note 6	Note 6	Note 6	2" x #14 RH Screw	2" x #14 RH Screw	2" x #14 RH Screw	2" x #14 RH Screw	Expansion Anchor	Note 6	Expansion Anchor	Note 6
Ring, Bridle, Toggle										3/16" x 4" Toggle	3/16" x 4" Toggle	Note 6	3/16" x 4" Toggle
Clamp, One Hole, Offset or closed "U" Cable Strap		Note 6	Note 6	Note 6	Note 6	3/4" x #6 RH Screw	3/4" x #6 RH Screw	3/4" x #6 RH Screw	3/4" x #6 RH Screw	1" x #6 RH Screw	1/8" x 4" Toggle	1" x #6 RH Screw	1/2" x #6 SM Screw

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 studding.

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 dropsiding.

6. Attachment device not applicable.

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

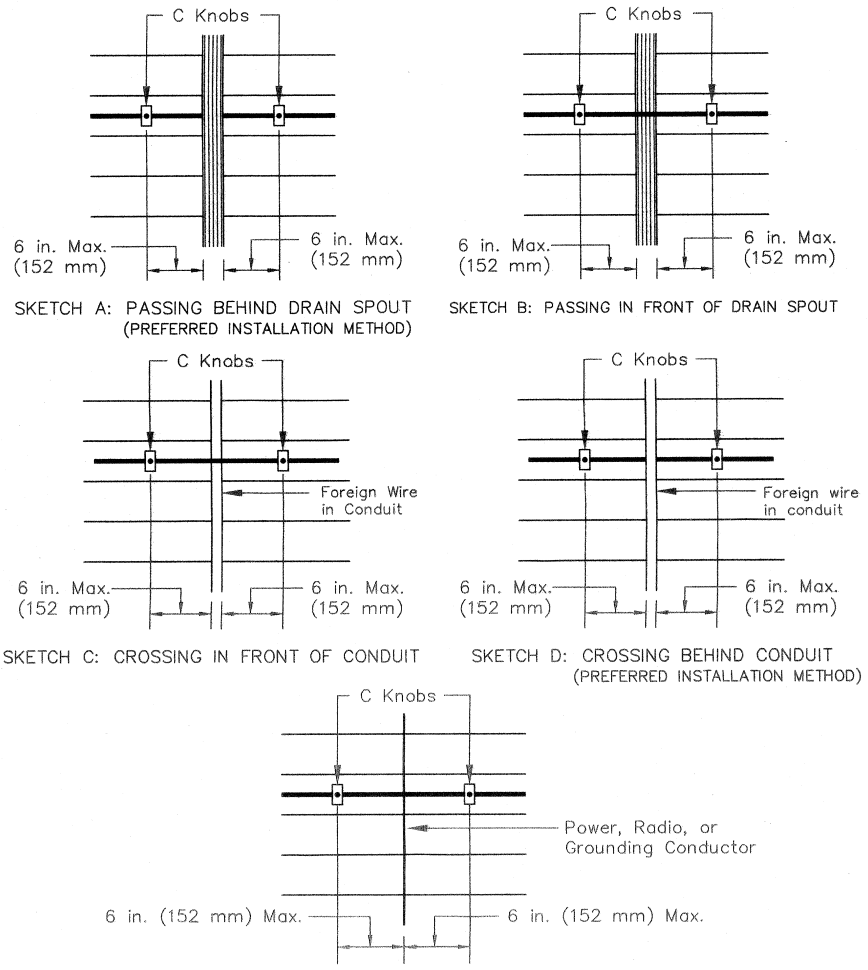
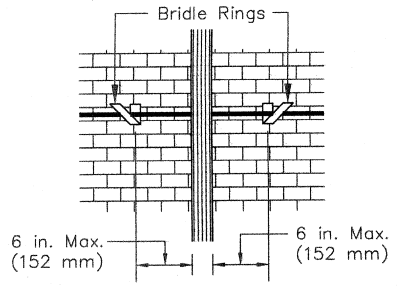
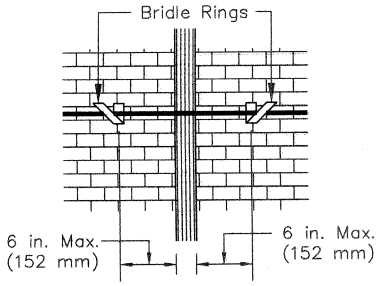


FIGURE 5

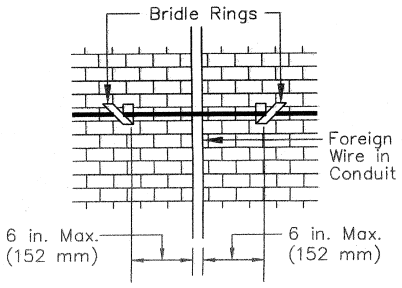
AERIAL SERVICE WIRE CROSSING OBSTRUCTIONS
MASONRY BUILDING SURFACES



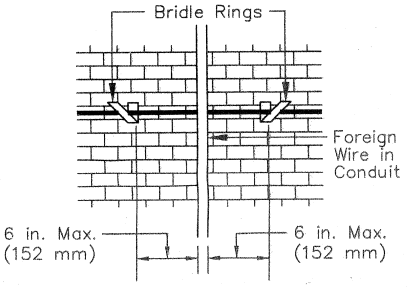
SKETCH A: PASSING BEHIND DRAIN SPOUT
(PREFERRED INSTALLATION METHOD)



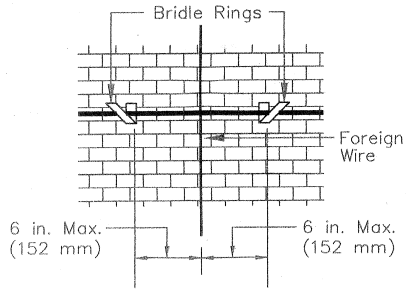
SKETCH B: PASSING IN FRONT OF DRAIN SPOUT



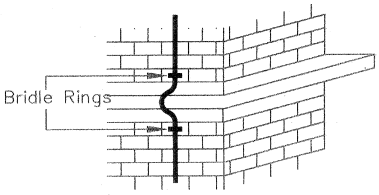
SKETCH C: CROSSING IN FRONT OF CONDUIT



SKETCH D: CROSSING BEHIND CONDUIT
(PREFERRED INSTALLATION METHOD)



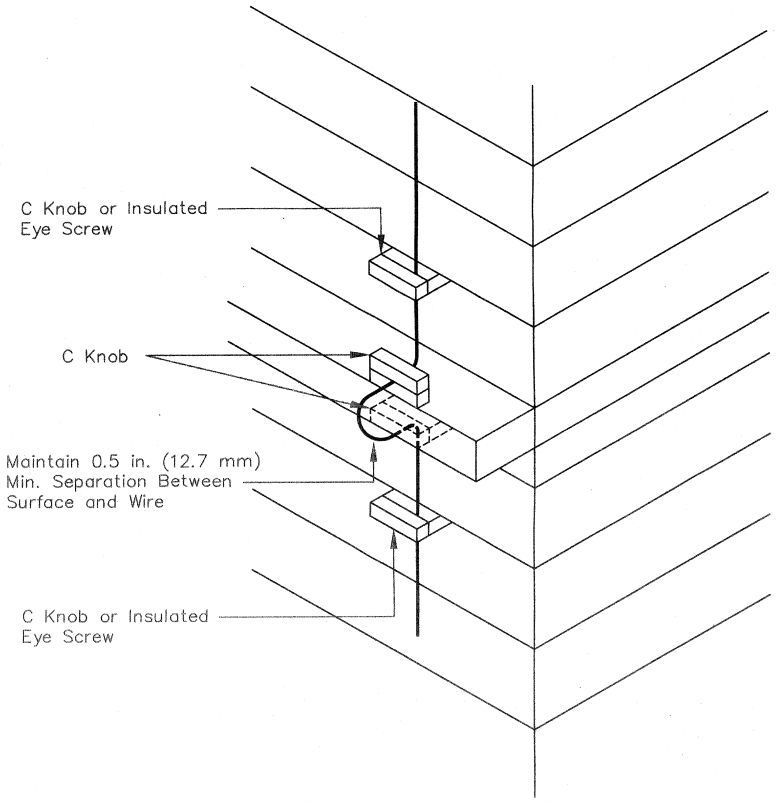
SKETCH E: PASSING BEHIND FOREIGN WIRE
(PREFERRED INSTALLATION METHOD)



SKETCH F: MASONRY BUILDING PROJECTIONS

FIGURE 6

AERIAL SERVICE WIRE CROSSING COMBUSTIBLE 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

in the same general location on the building shall be used.

(kk) When two or more aerial service wire runs are required on the same building they shall share the same type of attachment devices.

(ll) Aerial service wire entrances to buildings shall conform to sketch B of construction drawing 510–2 contained in § 1755.510, unless the entrance is made through a conduit.

(mm) When the aerial service wire approaches the entrance hole from above, a 1.5 in. (40 mm) minimum drip loop shall be formed in accordance with sketch B of construction drawing 510–2 contained in § 1755.510.

(nn) If an entrance conduit which slopes upward from outside to inside is available and suitably located, it shall be used for the aerial service wire entrance.

[66 FR 43317, Aug. 17, 2001, as amended at 69 FR 18803, Apr. 9, 2004]

§ 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: