DROP WIRING

DROP WIRE RUNS ON AND INSIDE BUILDINGS FASTENING AND EQUIPPING INTERMEDIATE AND LAST ATTACHMENTS

CONTENTS

1. GENERAL

1.01 This practice provides information on material to be used and the rules to be followed for planning drop wire runs on buildings; the methods of fastening and equipping intermediate and last attachments; the methods of running drop wire on building walls and structures; and the methods of running drop wire inside buildings.

1.02 This practice replaces CTSP 475-300-401 and CTSP 475-300-415, all copies of which should be removed from the file and destroyed. See CTSP 475-302-401 for information on first attachments of drop wire runs.

1.03 The attachments to be used in any installation depend on a number of factors, such as:

a. Loading areas.

b. Number of drops to be placed.

c. Type of surface to be attached to.

d. Insulated or noninsulated attachments, etc.

1.04 The use of insulated or noninsulated attachments is covered in CTSP 475-500-402.

1.05 Where station protectors are required, plan the wire run so that the location of the point of entrance and the location of the station protectors conform to the methods covered in CTSP 475-500-405.

CAUTION: It is possible for foreign voltage to be present on buildings covered with metal siding. Test siding with B voltage tester before starting any work.

2. RULES

2.01 When planning drop wire runs on buildings, observe the following instructions:

a. Locate the drop wire run on the building giving consideration to permanency, accessibility, and appearance.

b. Locate runs preferably on the rear and side walls of a building.

c. Locate the run to require the minimum length of wire and as few turns as practicable. Keep runs horizontal or vertical.

d. Locate horizontal runs above the reach of the public.

e. If it would not appreciably increase the length of the run, locate vertical runs preferably in the angle formed by intersecting walls.

f. Locate the run to avoid light and power wires and so that it will encounter a minimum number of other obstructions.

g. Avoid runs on tin, sheet metal, or other materials requiring frequent repairs or renewals.

h. Avoid locating runs on walls which are likely to be added to, or on intermediate structures of a deteriorated or temporary construction. Select alternate routes.

i. Avoid vertical runs within 2 feet of a downspout where ice conditions are severe.

j. Do not make attachments to chimneys.

k. On building walls finished with stucco, rigid composition shingles, thin-wall brick veneer, and similar materials, locate attachments on wood trim if practicable and if the trim is sufficiently substantial to provide adequate support for the drop wire.

l. Maintain clearances from foreign wires. See CTSP 475-300-407.

2.02 Reuse an existing drop wire at a reinstallation wherever practicable. Inspect the wire carefully and, if necessary:

a. Tighten all loose rings and replace missing rings.

b. Replace spliced drop wire.

c. Where necessary, place mechanical protection around building projection, electrical conduits, and other obstructions.

d. If the insulation is weatherworn, replace the wire.

e. Remove strings or other foreign matter which may detract from wire run appearance.

3. SPACING OF ATTACHMENTS

3.01 Space drop wire attachments 6 feet apart or less on horizontal and vertical runs. For example, a 7-foot run would have attachments spaced 3 feet 6 inches apart.

3.02 Locate attachments so that fasteners will be placed no closer than 10 inches to the corner or top of a wall, except in turning corners.

3.03 Place additional attachments as required to keep exposed wires terminated at fused-type protectors from touching flammable surfaces.

3.04 When establishing a wire run on a building wall where cable has been placed, the wire run should parallel the cable run.

3.05 When paralleling cable is attached to building wall by cable clamps, place rings in every third cable clamp where clamps are 17 inches apart, and in every other cable clamp where clamps are 26 inches apart.

4. WIRE CARRYING CAPACITIES OF DRIVE RING, WIRE LOOPS, BRIDLE RINGS, AND INSULATED SCREW EYES

4.01 Table A shows the fastener to be used on drop wire attachments on various types of walls.

4.02 Table B shows the drop wire capacity of wire loops, drive rings, bridle rings, and insulated screw eyes.

5. INTERMEDIATE ATTACHMENTS ON BUILDINGS

5.01 Make all vertical or horizontal attachments on a straight line. For best results, fashion a plumb bob and hang from the first attachment. Use this as a guide.

TABLE A. Fasteners for Intermediate Attachments on Drop Wire

ATTACHMENT		FASTENER QTY	FASTENER TYPE		TYPE OF CONSTRUCTION		REMARKS
Wire Loops	No. 5/8 No. 1-1/4	1	Wire Loop Fastener	3/4 in. 1 in. 1-1/4 in.	Concrete Mortar Cinder Cement	Block	Fasteners for hand-type drive tools
Drive Rings	1/2 in.	1	3/16 in. x 5/8 in. Drive Anchor CTS # 68-21-001-9		Masonry or substantial brick veneer		
	5/8 in. and 7/8 in.	1	1/4 in. x 1 in. Drive Anchor CTS # 68-21-002-7				
	5/8 in. L* 7/8 in. L* 1-1/4 in. 1-1/4 in. L*	1	1/4 in. x 1 in. Drive Anchor CTS # 68-21-003-5				
C Bridle Rings	7/8 in.	1	No. 12 Plastic Anchor CTS # 68-21-034-5		Masonry or substantial brick veneer		
	1-1/4 in. 1-5/8 in.	1	No. 16 Plastic Anchor CTS # 68-21-034-5				
	3 in.						

** The L type is equipped with longer shank.*

TABLE A. Fasteners for Intermediate Attachments on Drop Wire (Continued)

ATTACHMENT	FASTENER QTY	FASTENER TYPE	TYPE OF CONSTRUCTION	REMARKS
B or M Bridle Rings	1	Utility Clip	Angle Irons, I beams, etc.	
C Knob (used only where fused protectors are required)	1	2-1/2 in. No. 10 RH galvanized wood screw	Exposed woodwork (outdoors)	Locate screw approximately 1 inch above bottom shingle or clapboard.
	1	2 in. No. 8 RH blued wood screw	Exposed woodwork (indoors)	
	1	3 in. No. 10 RH galvanized wood screw	Stucco on wood	
E Drop Wire Clamp	1	Headed Drive Pins 3/4 in.	Concrete	Fasteners for hand-type drive tools
		Headed Drive Pins 1 in.	Mortar	
		Headed Drive Pins 1-1/4 in.	Cinder Block / Cement Block	
	1	3/16 in. x 1 in. Plastic Anchor	Brick	
	1	1 in. No. 8 RH galvanized wood screw	Wood siding or shingle and metallic siding on wood	Locate screw approximately 1 inch above bottom shingle or clapboard.
	1	3/16 in. x 3 in. toggle bolt	Hollow wall	

* *The L type is equipped with longer shank.*

TABLE B. Attachment Capacity

TYPE OF RING OR INSULATED SCREW EYE	SIZE	MAXIMUM NUMBER OF WIRES	
		DROP WIRE	STATION WIRE
Drive Rings	1/2	2	3
	5/8 and 5/8 L*	6	9
	7/8 and 7/8 L*	16	22
	1-1/4 and 1-1/4 L*	30	40
Wire Loops†	No. 5/8	6	9
	No. 1-1/4	30	40
Bridle Rings	7/8	6	9
	1-1/4	16	22
	1-5/8	30	40
	3	100	140
A or M Bridle Rings	1-1/4	16	22
Insulated Screw Eyes	5/8 and L*	4	
	1 S and L*	10	

* *L represents longer shank.*
† *Install with suitable wire loop fastener.*

5.02 Drop wires extended with **fuseless protection** should be supported with the following attachments:

a. Drive rings on wood frame building.

b. Wire loops and a suitable wire loop fastener on masonry surfaces.

c. Toggle bridle rings on hollow surfaces.

d. Bridle rings as a substitute for drive rings when:

(1) Drive rings are likely to split woodwork.

(2) An intermediate support is needed for greater wire carrying capacity.

5.03 Drive rings equipped with a drive anchor, or bridle rings equipped with a plastic anchor may be used on masonry surfaces if they can be used to better advantage than wire loops.

5.04 Drop wire runs that require **fused protection** and that are to be attached to a flammable surface should be supported with porcelain hardware such as:

a. Insulated screw eyes.

b. A "C" knob may be used if not more than two wires are to be placed.

NOTE: Place drop wire in C knob so that tension is in a clockwise direction on C knob when only one drop wire is used.

5.05 Figures 1 through 8 illustrate spacing of typical wire runs using a variety of attachments.

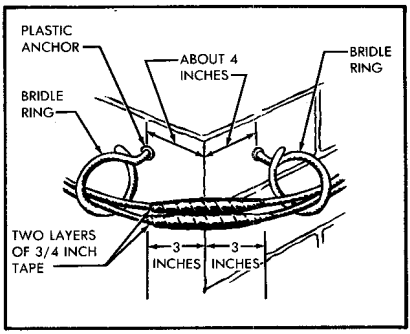

FIGURE 1. Bridle Ring

6. INTERMEDIATE ATTACHMENTS INSIDE BUILDINGS

6.01 Drop wire runs between the point of entrance and the station protector should be kept as short as practicable.

6.02 Exposed runs that require fused protection and attach to flammable surfaces should be supported with insulated attachments.

6.03 Space attachments 16 inches apart on runs between the point of entrance and the protector or connecting block. Spacing will vary at corners with type of attachment used. See Figure 5.

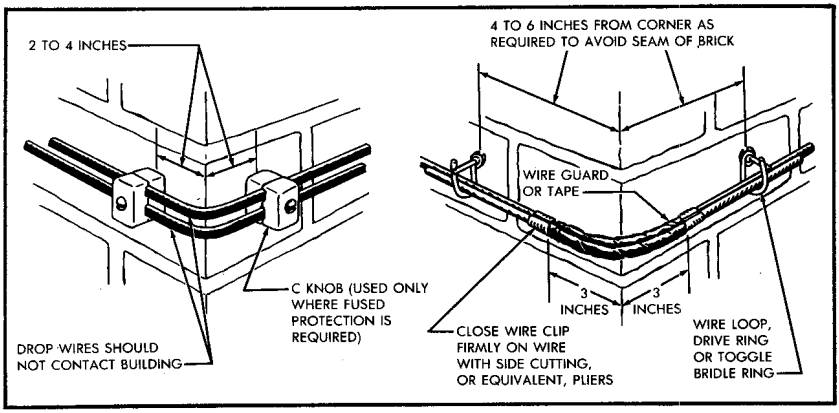

FIGURE 2. Intermediate Building Attachment at Outside Corner

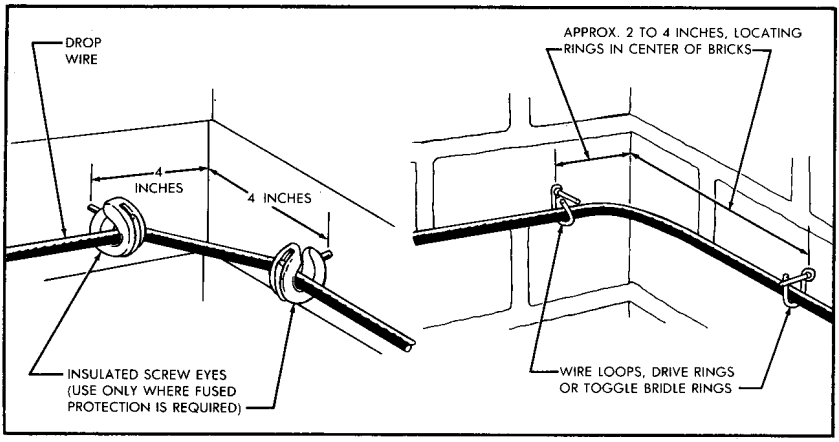

FIGURE 3. Intermediate Building Attachments at Inside Corners

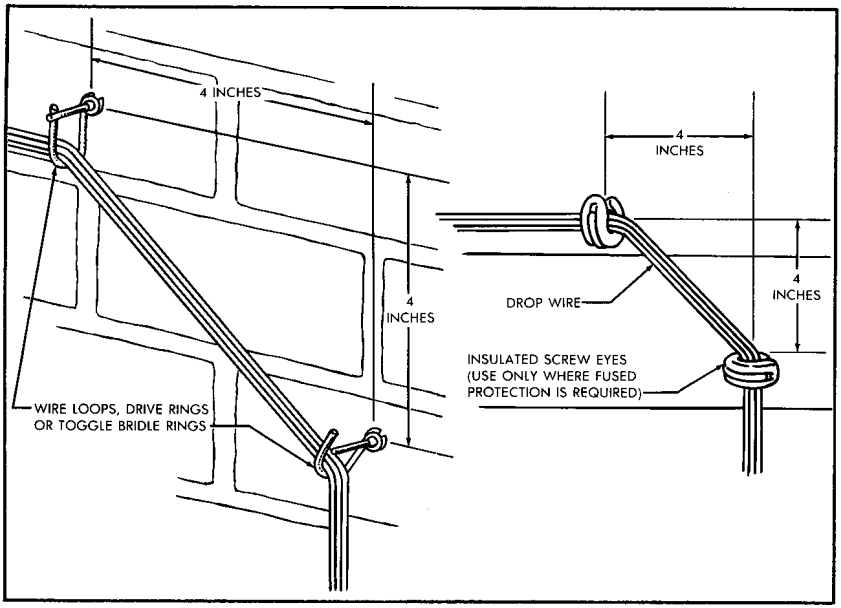

FIGURE 4. Intermediate Building Attachments to Change Direction of Wire Run

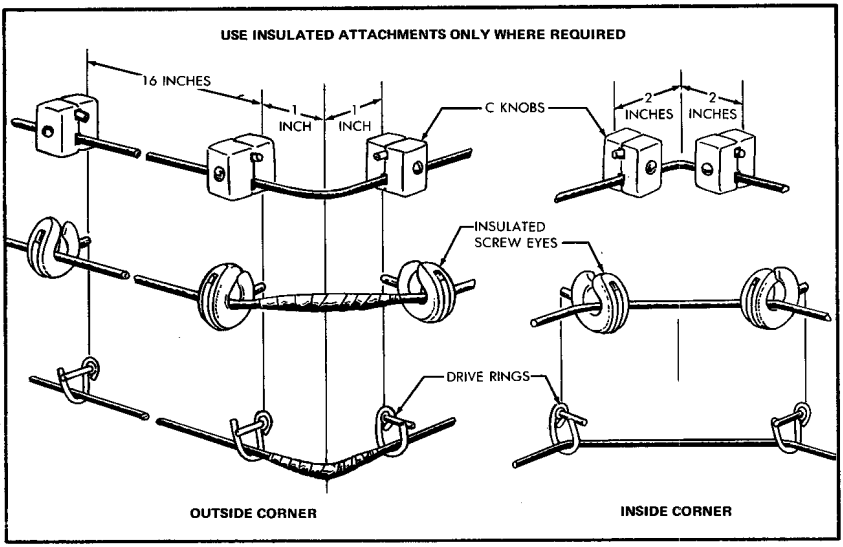

FIGURE 5. Attachments Inside of Building

6.04 Where drop wires are extended from unexposed plant, or from the station side of a fuseless protector, the method of fastening between the point of entrance and the connecting block or subscriber set is the same as for fastening station wire.

7. PARALLELING CABLE RUN

7.01 When establishing a wire run on a building wall where cable has been placed, attach the wire run as follows (Figure 6):

a. Place a drive ring or a C bridle ring in every third cable clamp where clamps are 17 inches apart.

b. Place the drive ring or C bridle ring in every other clamp where the clamps are 26 inches apart.

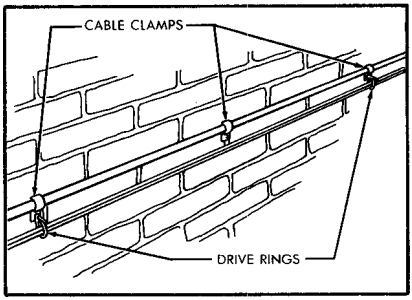

FIGURE 6. Drive Ring or Bridle Ring Run Paralleling Cable Attached with Cable Clamps

8. ATTACHING TO STEEL STRUCTURES

8.01 Manufacturing buildings, warehouses, piers, etc., require special means of attaching. Methods of attaching which have proven practicable are:

a. The utility clip (Figure 7), equipped with either a drive ring or the A or M bridle ring, is used to support wire runs on I beams, angle irons, etc., on beam thickness of 1/8 to 1/2 inch.

b. Beam clamps equipped with C or T knobs or bridle rings can be used in various applications to attach to I beams, angle irons, etc. See Figure 8.

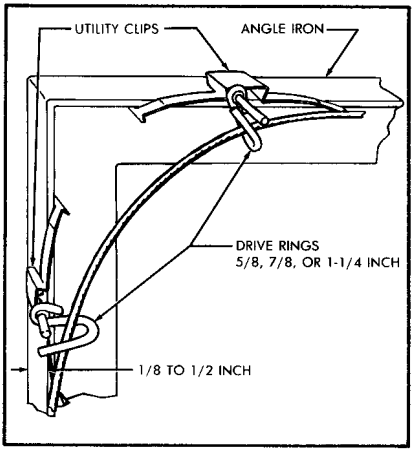

FIGURE 7. Utility Clips

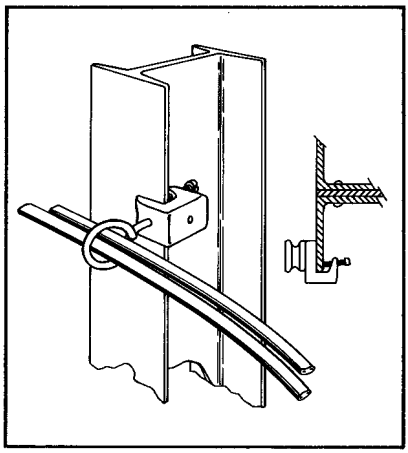

FIGURE 8. Beam Clamp and Bridle Ring

9. PARTY LINE TAPS

9.01 Party line taps should be avoided. When it is necessary to make a tap, use a wire terminal. In making a party line connection, a bridge may be made at the most accessible point in an existing wire run, provided this point is 50 feet or more away from the terminal, or if there is no space available on the binding posts for terminating the new party. If the most convenient point for bridging in the run is within 50 feet of the terminal, run the wire to the terminal, provided there is space available on the binding posts.

10. LAST ATTACHMENTS

10.01 The last attachment should be located within 18 inches of the building entrance hole.

10.02 Where fused protection is used, use a C knob or an S or T knob with a D Clip. The E drop wire clamp is used with fuseless protection.

10.03 Place drop wire in C knob so that tension is in a clockwise direction on C knob when only one drop wire is used.

10.04 See Figure 9 for typical arrangements for last attachments.

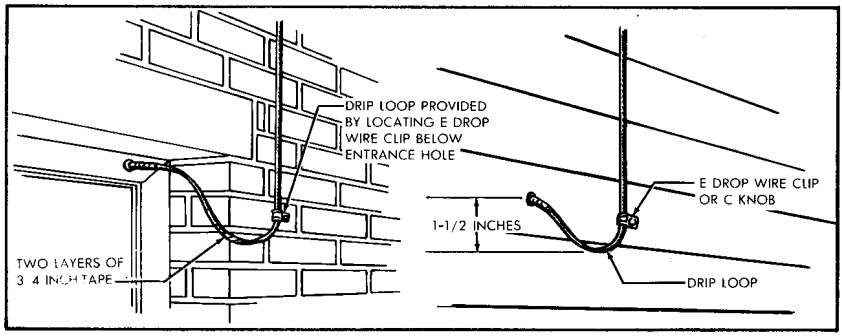

FIGURE 9. Last Attachment, Building Entrance Hole

11. BUILDING ENTRANCE HOLES FOR DROP WIRES

11.01 Use plastic tubes at building entrance holes for drop wire where fused protection is required and the wire passes through a flammable surface. Place tube as shown in Figure 10. Cut plastic tubes with a hacksaw or diagonal pliers. Do not use split tubes at entrance holes.

11.02 When drilling building entrance holes, consider the following:

a. Drill holes away from side where appearance is most important.

b. Slope holes upward from outside.

c. Use seams when drilling through masonry.

d. Take care to avoid splintering wood or cracking masonry or brick.

e. Drill clearance hole on all types of shingle siding.

11.03 Sizes of building entrance holes for wires and plastic tubes are shown in Table C.

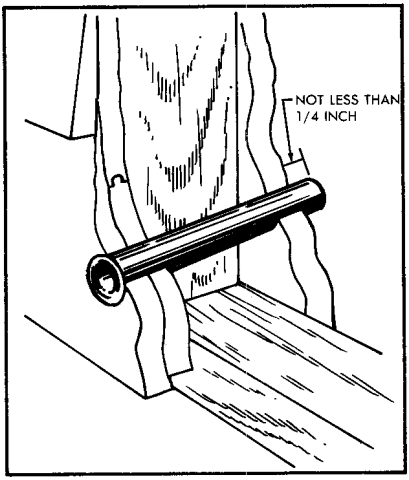

FIGURE 10. Placing Tube

TABLE C. Sizes of Building Entrance Holes for Drop Wires and Plastic Tubes

NUMBER OF DROP WIRES	1	2	3	1	2	3	4
	Plastic Tube Required			Tube Not Required			
Tube Size, Inch	3/8	1/2	5/8				
Entrance Hole Size, Inch	1/2	5/8	3/4	3/8	1/2	5/8	3/4