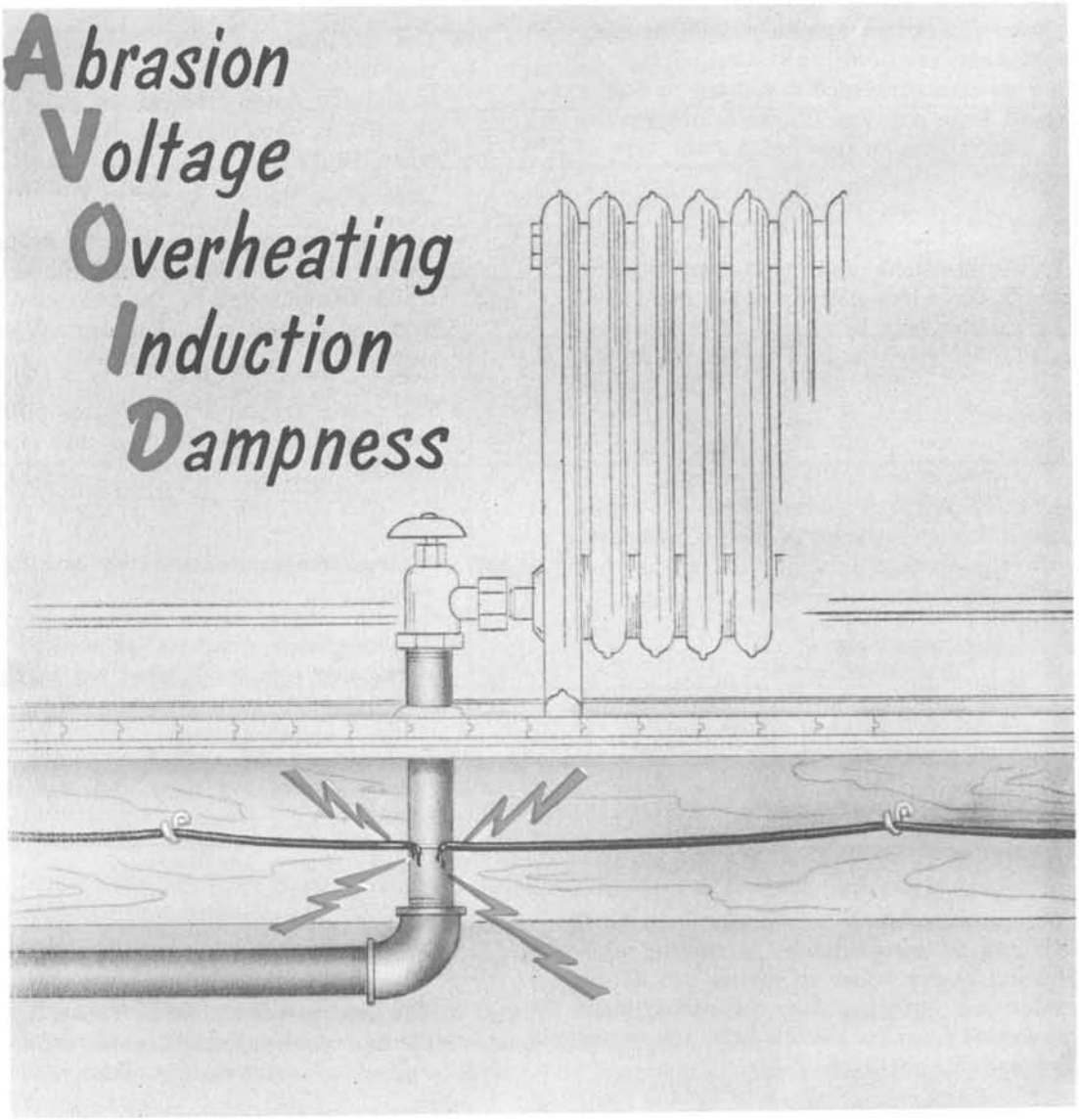
SEPARATION AND MECHANICAL PROTECTION

FOR WIRE AND CABLE

1.00 INTRODUCTION

This section specifies the minimum separations that are required in or on buildings between telephone station wires, ground wires, or station cables and foreign wires, foreign cables, or metallic objects.



2.00 GENERAL

2.01 In general, the separations are required for electrical reasons. However, uncovered steam and hot water pipes, stationary metal gratings, etc, also must be considered because of excessive heat and abrasion.

2.02 Cold water pipes sweat under certain conditions; therefore, cross wires *over* rather than under the pipes.

2.03 The type of station protector ground employed determines to some extent the minimum separations required for station wiring. All associated stations connected to a main station or PBX served from a group of protectors require the same separations as specified for the type of ground employed.

2.04 The separations and protection requirements for wires placed on the outside of buildings, such as may be run to off-premise extensions, outdoor stations, loud ringing bells, etc, are the same as specified for drop and block wires and are covered in Table B.

2.05 All inside wires or cables installed in explosive atmospheres shall be placed in accordance with the instructions pertaining to that equipment.

Do not run wires or cables through removable gratings.

2.06 Wire or cable shall not be placed in pipe, conduit, or compartment containing electric light and power wires or cables, nor in the same outlet box, junction box, or compartment unless separated from the electric light and power wires by a suitable partition.

2.07 Whenever practicable avoid running telephone wire or cable in the same conduit, molding, or runway with signal circuits which are operated by battery or from a step-down transformer. Strict adherence to this recommendation will minimize the possibility of interference by either or both parties during placing or maintenance activities.

3.00 GROUNDS

3.01 **Common ground location** is a location where:

- The telephone company, as well as other wire-using companies, makes connections to metallic water pipes of the same public or private water systems to provide electrical protection for its plant in the building.
- The telephone company protector ground is connected to a driven ground rod or pipe which is connected to the grounded electrode of a multigrounded neutral power system.
- The power system driven rod or pipe and the telephone ground rod are bonded together.

3.02 **Noncommon ground location** is a location where:

- The telephone company, as well as other wire-using companies, does not make connections to the same ground medium.
- Separate ground rods for telephone and power service are used and not bonded together.

4.00 SEPARATIONS

The separations shown in Tables A and B are minimum requirements. Greater separations shall be provided where readily obtainable.

TABLE A

SEPARATIONS BETWEEN STATION WIRE OR STATION CABLE RUNS (PARALLEL OR CROSSING) AND TYPE OF PLANT – WITHIN BUILDINGS

Type of Plant Involved		Noncommon Ground Location			Common Ground Location
		Separation min	Alternative for Crossing Only (Use Only if Separation Cannot Be Obtained)		Separation min
Power Supply	Open Light or Power Wires over 300 Volts	2 ft*	No crossing permitted		2 ft*
	Open Light or Power Wires under 300 Volts	2 in.	See Note		2 in.
	Wires in Conduit or in Armored or Nonmetallic Sheath Cable or Power Ground Wires	2 in.			None
Radio and Television	Antenna Lead-in and Ground Wires	4 in.	See Note		4 in.
Signal or Control Wires		2 in.			None
Telephone Drop or Block Wire	Using Fused Protectors	2 in.	See Note		2 in.
	Using Fuseless Protectors	None			None
Telephone Ground Wire		None			None
Sign	Neon Signs and Associated Wiring from Transformer	6 in.	SK station wire with shield grounded or lead cable with sheath grounded. Ground requirements same as for signaling ground.‡		6 in.
Lightning System	Lightning Rods and Wires	6 ft	No Alternative	4-inch minimum separation if the telephone, power, and lightning systems are: All grounded to an extensive water system or Rods are used and bonded together.§	6 ft
Pipe	Steam or Hot Water or Heating Ducts	2 in.¶	Split poreclain tube extending 2 inches beyond each side of object being crossed.		1 in.¶
Stationary Grating, Metal Shutter, Grillwork, etc			E, P, or S wire guard or two layers of friction tape required in all cases to resist abrasion.		

Note: Plastic tube†; E, P, or S wire guard; or two layers of friction tape extending 2 inches beyond each side of object being crossed.

* Separation for parallel runs only. Required to provide working space.

† Add split porcelain tube to existing wire.

‡ To prevent accidental breakage, avoid neon sign location if alternate run is possible.

§ See C Section entitled Protector and Signaling Grounds.

¶ Excessive heat may damage plastic-insulated wires; therefore, avoid heating ducts and other heat sources.

TABLE B

SEPARATION BETWEEN STATION WIRE OR STATION CABLE RUNS

(PARALLEL OR CROSSING) AND TYPE OF PLANT — ON OUTSIDE WALLS OF BUILDINGS

Type of Plant Involved		Noncommon or Common Ground Locations	
		Separation min	Alternative for Crossing Only (Use Only if Separation Cannot Be Obtained)
Power Supply	Service Drops or Open Wiring Not Over 750 Volts	4 in.	P or S wire guard extending 2 inches beyond each side of object being crossed.
	Wires in Conduit or in Armored or Nonmetallic Sheath Cable or Power Ground Wires	2 in.	
Radio and Television	Antenna Lead-in and Ground Wires	4 in.	
Signal Wire	Open Wires or Wires in Conduit or Cable	2 in.	
Communication Wire	Foreign Open Wires and Wires in Conduit or Cable	2 in.	
	Between Exposed and Unexposed Telephone Company Wires		
	Using Fuseless Protectors	None	
Metallic Object	Downspouts and Gutters	2 in.	
	Stationary Gratings, etc		
Telephone Ground Wire		None	
→ Sign	Neon Signs and Associated Wiring from Transformer	6 in.	S wire guard, 12 inches long.*
Lightning System	Lightning Rods and Wires	6 ft	4-inch minimum separation if the telephone, power, and lightning systems are: • All grounded to a common medium, ie, metallic water pipes. • Bonded together when separate ground rods are used.

→ * To prevent accidental breakage, avoid neon sign location if alternate run is possible.

5.00 WIRE PROTECTION

5.01 Where it is not practicable to obtain recommended minimum separation at crossings other than those shown as no alternative in Tables A and B, or where wire or cable runs are subject to mechanical damage, abrasion, or excessive heat, a protective covering is required as follows:

- Split porcelain tube extending 2 inches beyond each side of object being crossed (indoors).

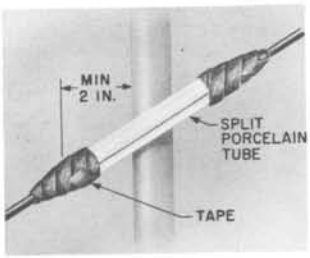


Fig. 1 — Crossing Exposed Steam Pipes

- Split porcelain tube only where tube is added to existing wire. Where a split tube is used:
  1. Place flat side of tube in a plane parallel to pipes, electric wires, etc.
  2. Secure split tube by placing two turns of lashing wire about 1 inch from each end of tube.

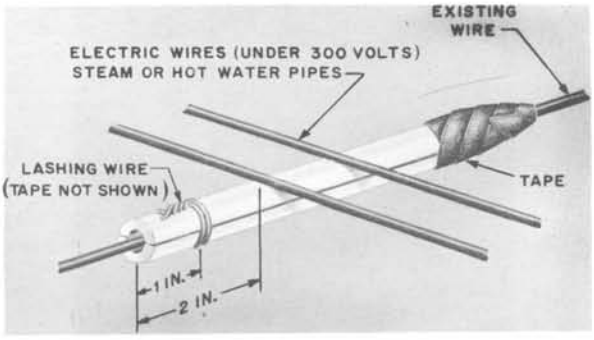


Fig. 2 — Securing Split Tubes

  3. Bend pigtail over and cover lashing wire with two layers of friction tape.
  4. Also use clamps or staples as shown in Fig. 3 if support for tube is needed.

- Plastic tube, E wire guard, or two layers of friction tape extending 2 inches beyond each side of object being crossed (indoors).

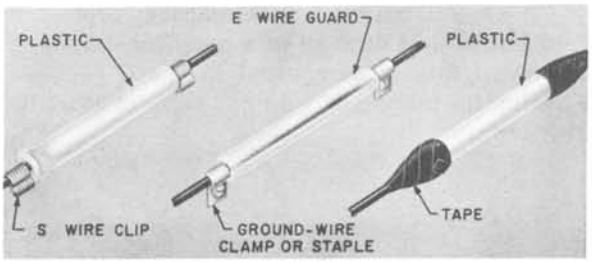


Fig. 3 — Securing Plastic Tubes or E Wire Guard

- P or S wire guard or two layers of friction tape in all cases to resist abrasion. E wire guard (plastic tubing) may be used in place of friction tape or P wire guard at indoor locations where improved appearance is desired.

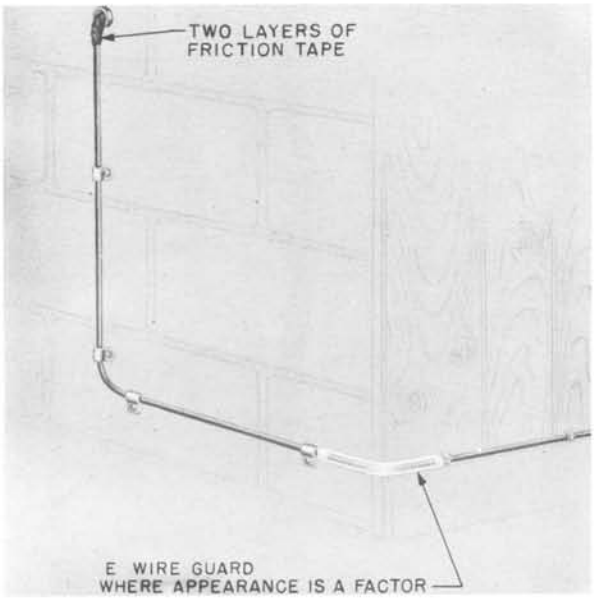


Fig. 4 — Use of Tape or E Wire Guard

5.02 Where plastic insulated wire or cable passes through wall or floor adjacent to wall or baseboard (indoors), protection with friction tape or E wire guard is not required unless wire is subject to mechanical damage or abrasion.

5.03 Where interior wiring passes over floor away from wall or baseboard, protect it from mechanical damage with overfloor ducts and associated fittings as covered in the C Sections covering the placing of wire and cable in conduits or raceways.

5.04 The following figures are typical examples of outdoor wiring requiring protection.

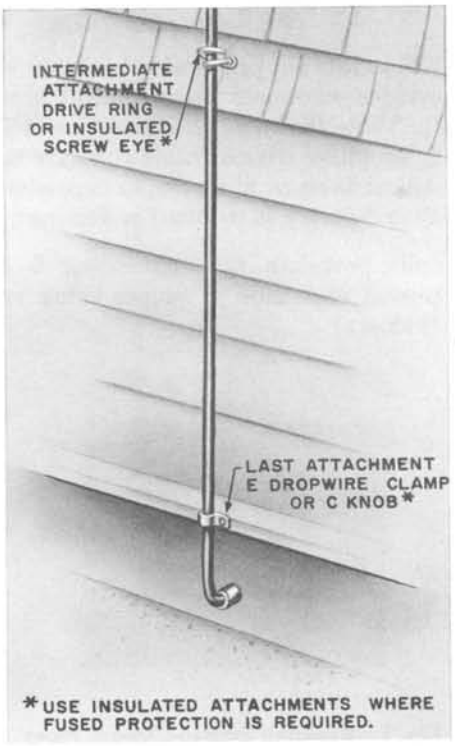


Fig. 6 — Crossing Wood or Stucco on Wood Building Projection

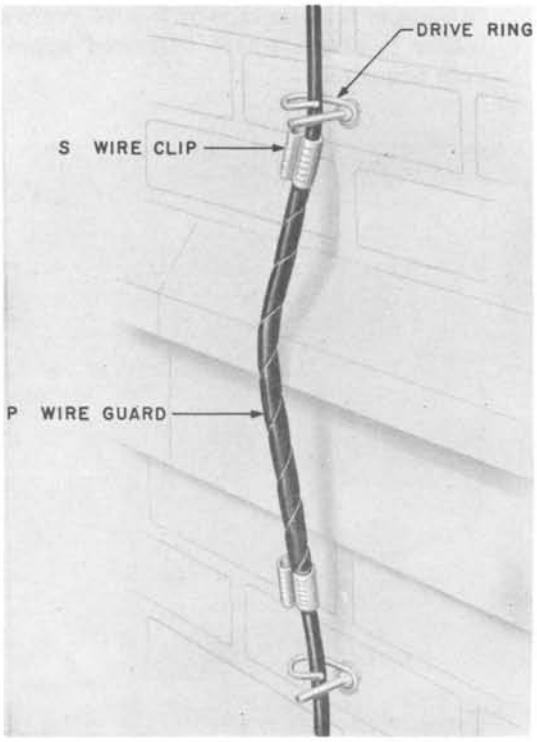


Fig. 5 — Crossing Masonry Building Projection

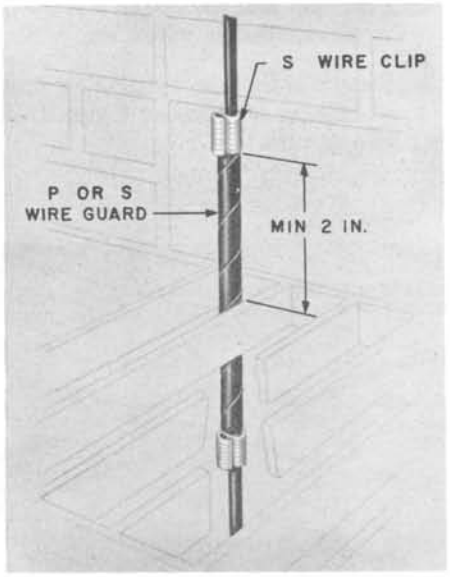
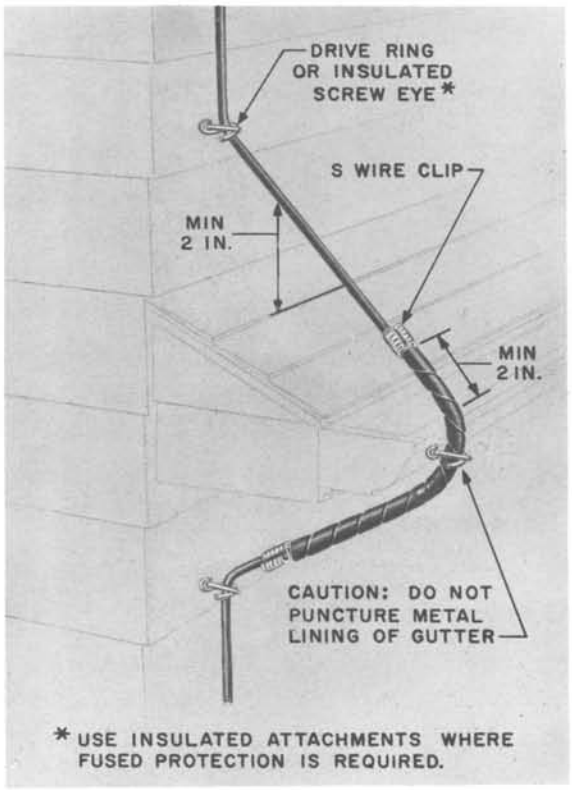
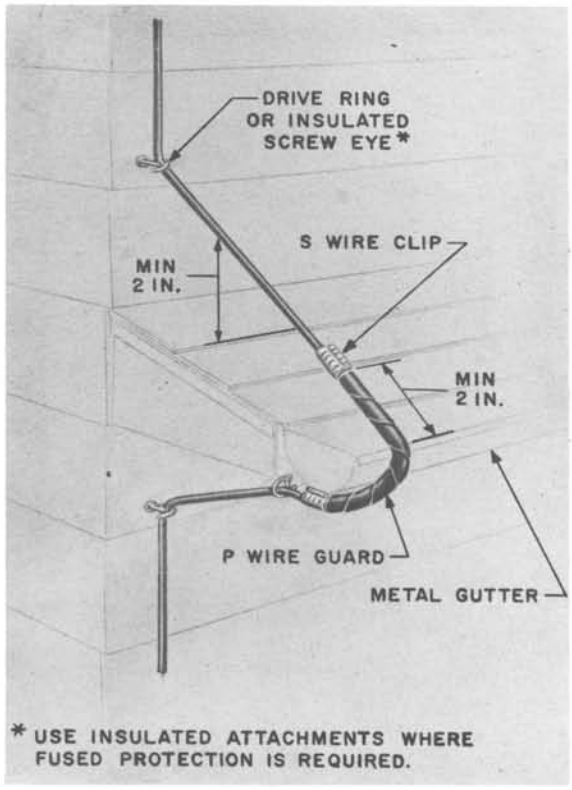


Fig. 7 — Protecting Wire Run through Stationary Metal Grating

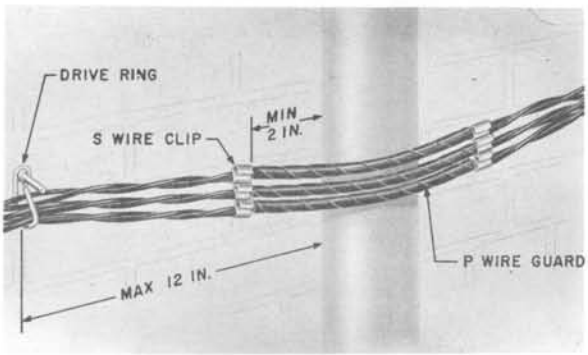


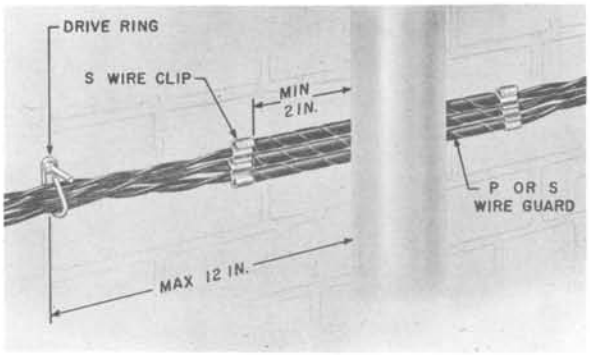
Metal-lined Wooden Box Gutter



Metal Gutter

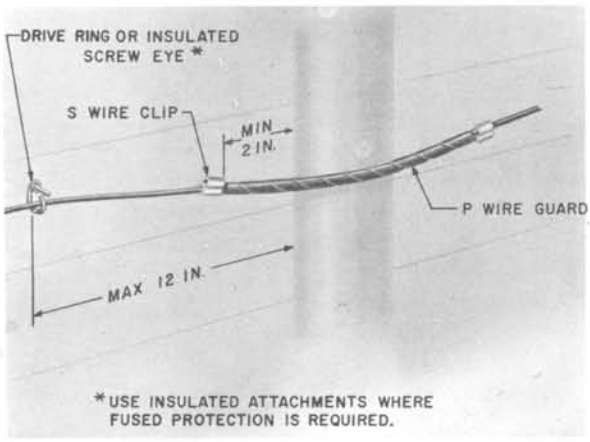
Fig. 8 — Crossing Building Overhangs and Gutters

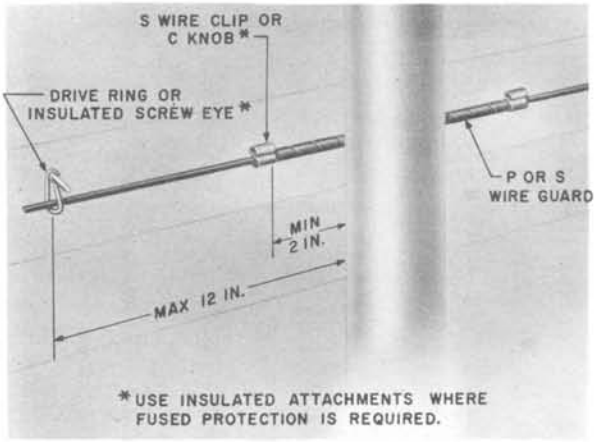




Masonry or Brick Surface

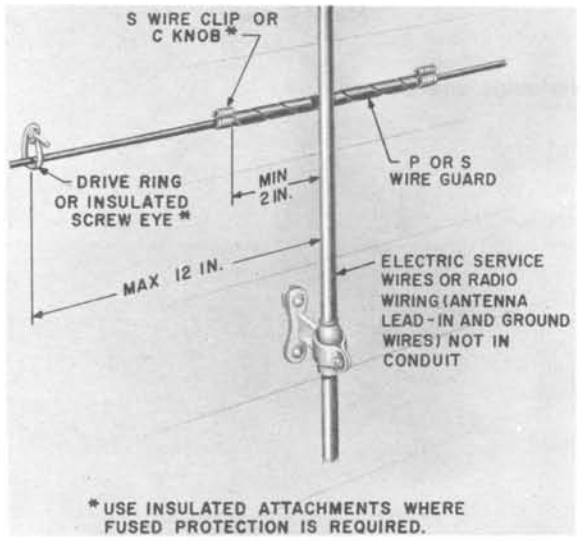
Fig. 9 — Wires Crossing Downspout



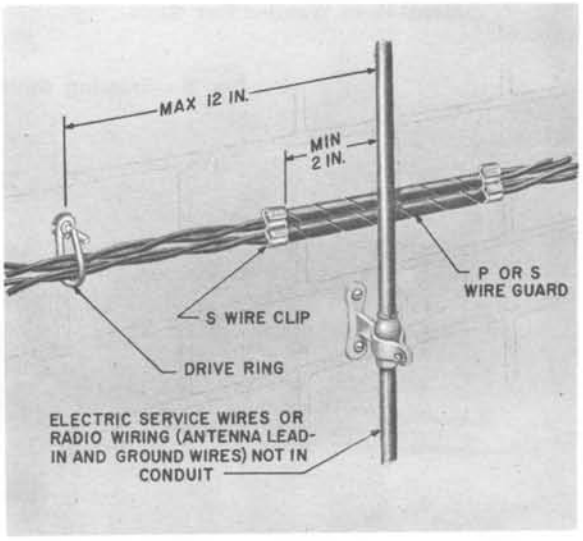


Wood, Stucco on Wood, or Metal Siding on Wood Surface

Fig. 10 — Wires Crossing Downspout

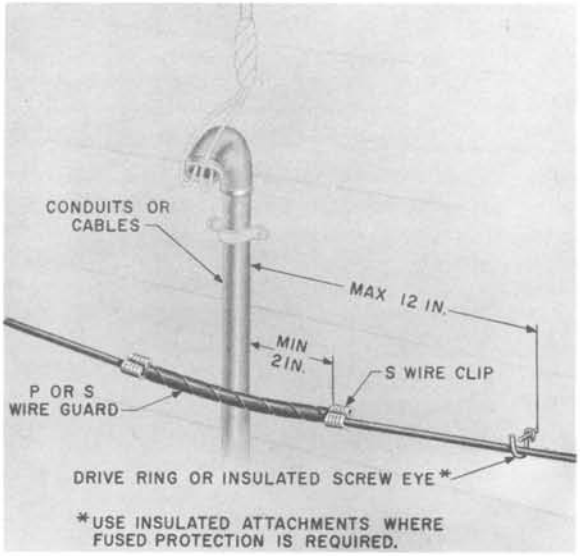


Wood, Stucco on Wood, or Metal Siding on Wood Surface

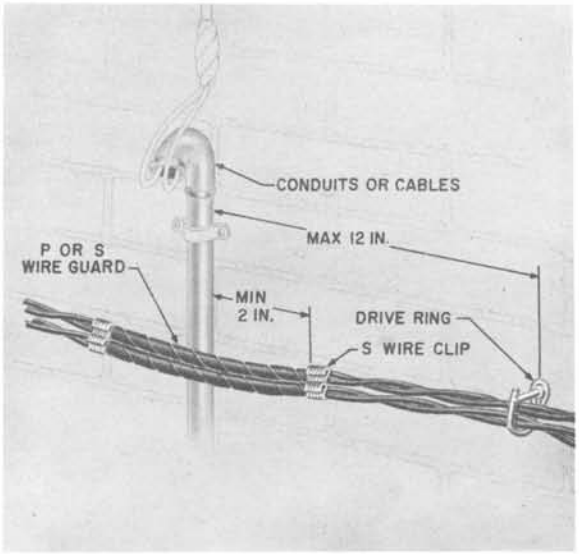


Masonry or Brick Surface

Fig. 11 — Wires Crossing Power Service, Radio Wires, or Television Wires



Wood, Stucco on Wood, or Metal Siding on Wood Surface



Masonry or Brick Surface

Fig. 12 — Wires Crossing Foreign Cables, Metal Conduits, Open Signal Wires, or Ground Wires