

## ERECTING POLES INSTALLING LIGHTNING PROTECTION

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### 1. GENERAL

1.01 This section describes the installation of lightning protection wires on poles.

1.02 This section is reissued to update information on the installation of the protection wire and on the pole line construction features illustrated. Since the issue covers a general revision, arrows ordinarily used to indicate changes are omitted.

1.03 Place protection wires only where authorized by the detail plans or other instructions. These installations will generally be confined to localities where severe lightning occurs and where the poles are so exposed that damage could be expected if the poles were not protected.

1.04 In this section no distinction is made between guys with or without strain insulators nor between guys attached to anchors installed in earth and those attached to rock anchors.

1.05 The protection wire should be 109 steel construction wire as steel line wire is too

stiff to be placed easily. Attach the wires to poles by means of 3/4-inch galvanized staples. The staples should be spaced at intervals of 18 inches or less as required to keep the wire securely in position.

1.06 The location of the vertical run on the pole depends upon the types of attachments. In general, on poles carrying open wire only, the vertical run is located on the face portion of the pole in position to clear the crossarms, as shown in Fig. 1 and 4. On poles carrying cable only, the vertical run is located on the face or back of the pole, as shown in Fig. 1 and 6.

### 2 TERMINATING WIRE

2.01 Wherever the protection wire or a portion of it terminates, a 90° bend should be made in the wire approximately 1/2 inch from the end and the end should be driven into the pole to reduce the possibility of injury to workmen or others.

2.02 The termination of the wire at the roof of the pole under several different conditions is shown in Fig. 1. In terminating the protection

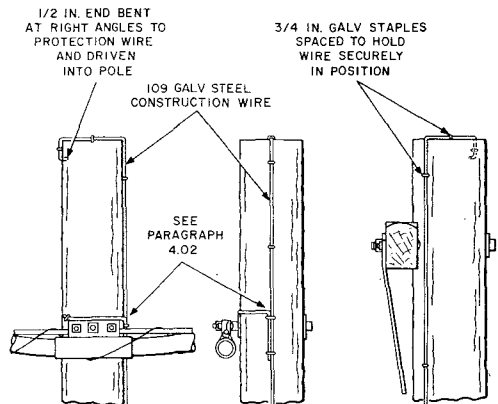
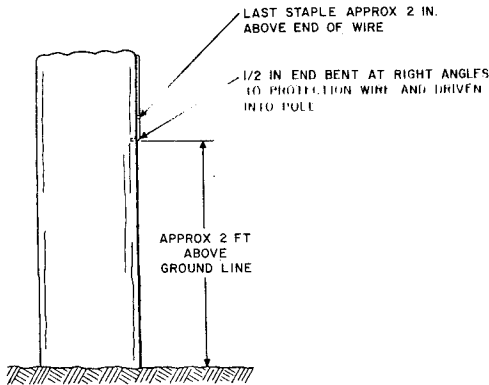


Fig. 1—Terminating Wire on Roof of Pole

\*\*Reprinted to comply with modified final judgment.

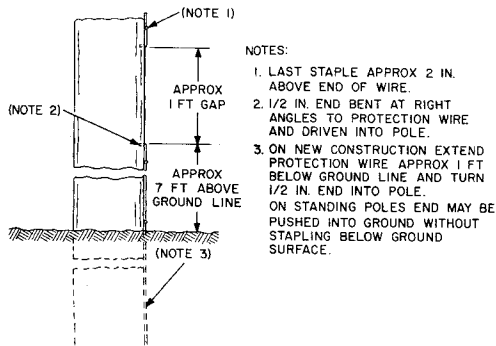
wire, pass it directly across the roof of the pole from the point at which the vertical run meets the roof, extend it down the opposite side of the pole a distance of about 2 inches, turn the end in and staple it.

**2.03** The method of terminating the lower end of the protection wire on a pole carrying open wire only or on a pole carrying cable, which is located on private right of way and is inaccessible to pedestrians, is shown in Fig. 2.



**Fig. 2—Terminating Wire at Base of Pole Carrying Open Wire or Cable—Inaccessible to Pedestrians.**

**2.04** The method of terminating the lower end of the protection wire on cable poles which are accessible to pedestrians is shown in Fig. 3.

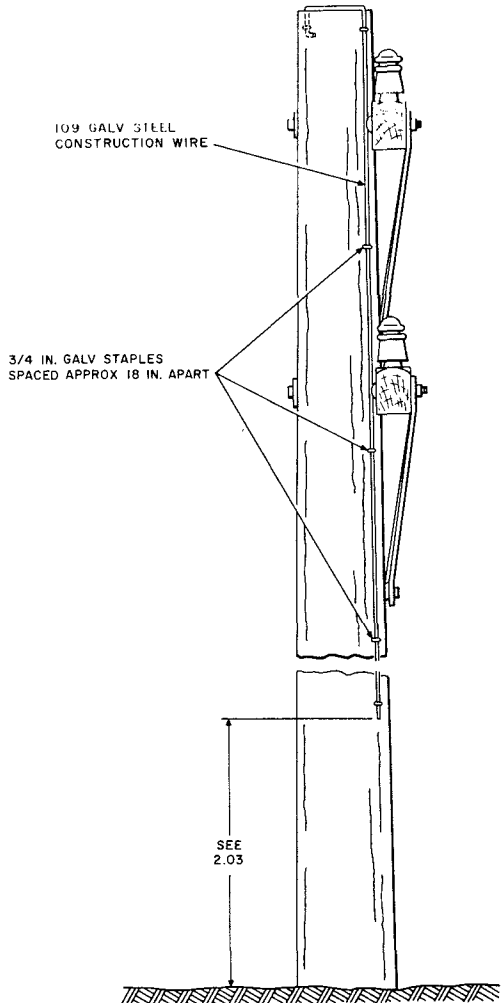


**Fig. 3—Terminating Wire at Base of Pole Carrying Cable which is Accessible to Pedestrians**

**3. INSTALLING PROTECTION WIRES ON POLES CARRYING OPEN WIRE ONLY**

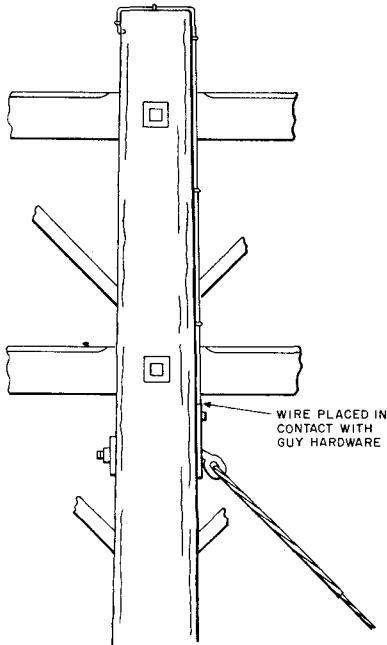
**3.01** On pole without guy, place protection wire as shown in Fig. 4.

**3.02** On anchor guyed open wire poles, if the guy or its associated hardware is attached to the pole above the second crossarm position, no protection wire is required.



**Fig. 4—Open Wire Pole Without Guy**

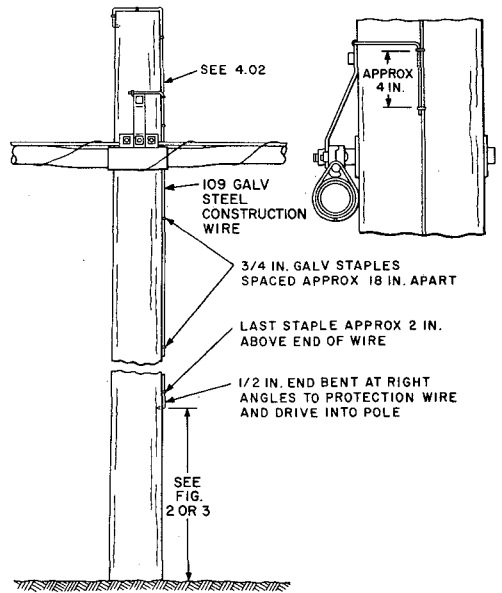
**3.03** If the guy and associated hardware are below the second crossarm position, locate the vertical run directly above the portion of the guy hardware that is highest on the pole. Terminate the protection wire to lay along the upper edge of the guy hardware, as shown in Fig. 5.



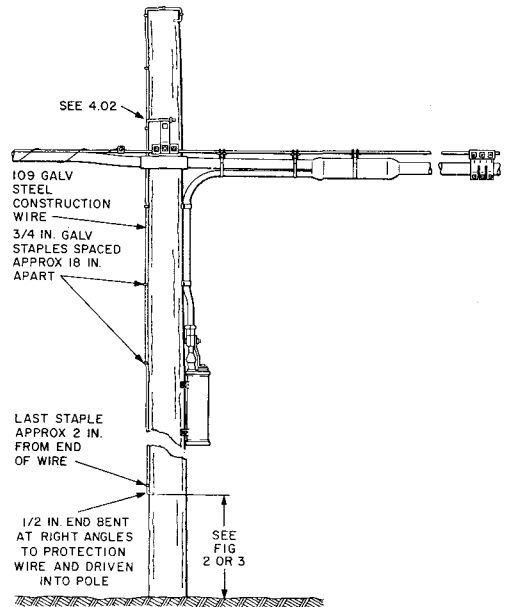
**Fig. 5—Open Wire Pole With Guy**

**4. INSTALLING PROTECTION WIRES ON CABLE POLES**

**4.01** Locate the vertical run of protection wire on either the face or back of the pole. See Fig. 6. If there is a loading coil case mounted on the face of the pole, locate the protection wire on the back and vice versa. This location enables the protection wire to pass the cable with satisfactory clearance and permits a convenient connection to be made between the protection wire and the hardware used in attaching the suspension strand to the pole. No connection is needed between the protection wire and the loading case support. Fig. 7.



**Fig. 6—Cable Pole—No Wire or Guy**



**Fig. 7—Cable Pole with Load Coil Case**

4.02 Connect the protection wire to a convenient portion of the hardware used in attaching the suspension strand. This connection can be made by laying the wire along the upper edge of the reinforcing strap or along the upper edge of the washer between the suspension clamp and the pole. In the case of a new installation, the connection can be made by passing the connecting wire behind the washer, suspension clamp, or other hardware. Fig. 8 shows several ways of making the connection. If there are two cables on one suspension bolt, the connection should be made at only one end of the bolt. If there are cables at different levels on the pole, connections should be made to one of the suspension clamp attachments at each level.

4.03 When a pole carrying cable only with an anchor guy has any portion of the hardware used in attaching the guy within 18 inches of the top of the pole, no protection wire is required.

4.04 If there is no portion of the guy or associated hardware within 18 inches of the top of the pole, locate the vertical run of protection wire

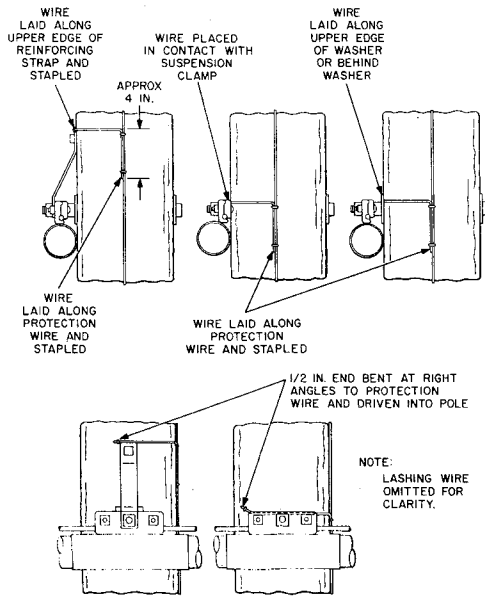


Fig. 8—Cable Pole with Protection Wire Connections

directly above the portion of the guy hardware that is nearest the top of the pole. Terminate the protection wire to lay along the upper edge of the hardware. Do not connect the protection wire to the cable in this case or continue it down the pole. See Fig. 9.

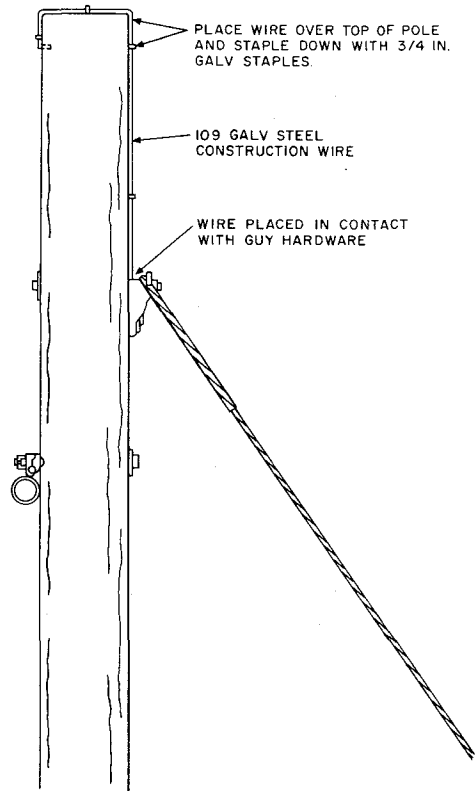
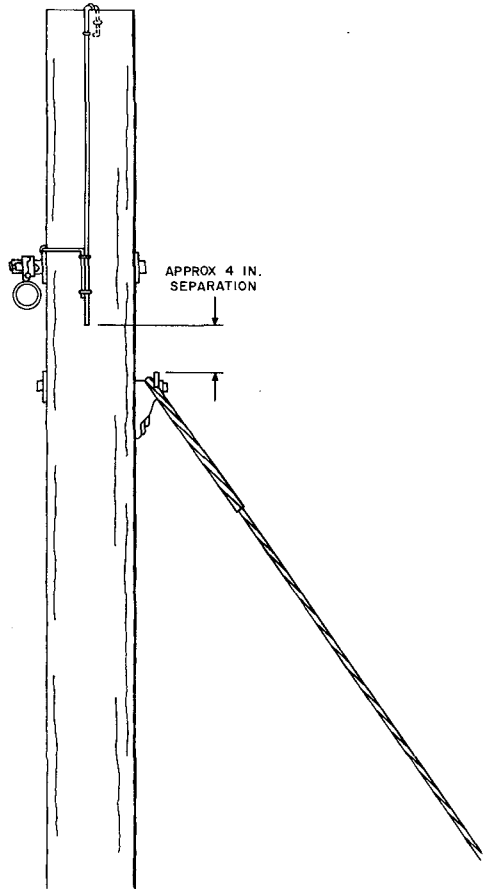


Fig. 9—Cable Pole Guy Hardware More than 18 Inches from Top

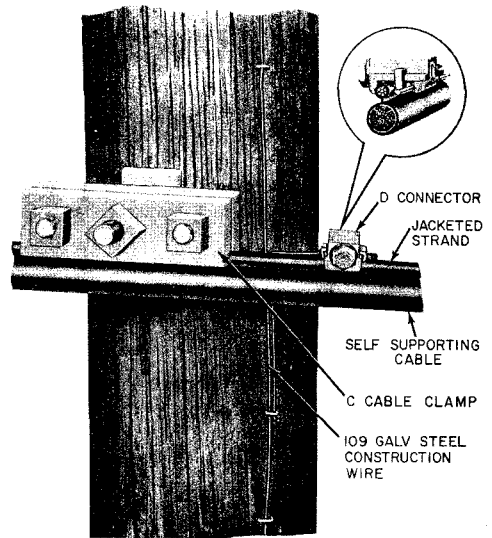
4.05 If the guy is below the cable, locate the protection wire on the face or back of the pole as outlined in 4.01. Connect it to the suspension clamp hardware (4.02), and terminate it with a 4-inch separation from the guy. See Fig. 10.



**Fig. 10—Cable Pole Guy Below Cable (See 4.03)**

**4.06** Install protection wire on poles carrying self-supporting cable in same manner as for other cable poles except as follows:

- (a) Connect protection wire directly to strand of self-supporting cable with a D Connector as shown in Fig. 11.
- (b) Replace B or C Sheave Supports with a C Cable Clamp, or D Connector can be permanently secured to the strand at points of maximum lightning exposure.



**Fig. 11—Lightning Protection Pole with Self-Supporting Cable**

**4.07** On unguyed pole carrying loading coil cases on both face and back of pole, select a location for the vertical run that will provide convenient working space for placing the protection wire as it passes by the main cable. Provide connection with the suspension strand hardware as shown in 4.02. Swing the protection wire to the side of the pole immediately after it passes the cable. Contact with the loading coil case supports is not required but may be made if it is not convenient to avoid it.

**4.08** On guyed pole carrying one or more loading coil cases, the protection wire should be carried from the top of the pole to lay along the upper edge of the guy hardware as described in 4.04.

**4.09** On an H fixture carrying loading coil cases, install protection wire on each pole of the fixture. The installation should be in accordance with the methods described in 4.01 or 4.08.

**5. INSTALLING PROTECTION WIRES ON POLES CARRYING BOTH OPEN WIRE AND CABLE**

**5.01** On a pole with no guy, locate the vertical run on the pole as shown in 3.01 where it passes by the crossarms. Swing it to the face of the pole as it passes by the cable, as shown in 4.01. Provide a separation of about 4 inches between the suspension strand hardware and the protection wire, using a branch protection wire, if necessary. The separation between the protection wire and cable sheath should be more than 4 inches. Continue the protection wire down the pole and terminate it as described in 2.03.

**5.02** With anchor guy on pole, place the protection wire from the roof of the pole to lay along upper edge of guy hardware. If the guy is above the second crossarm position, no protection wire is required.

**6. GUYED OR BRACED POLES OTHER THAN ANCHOR GUYED POLES (OPEN WIRE OR CABLE)**

**6.01** If there is 4 inches or less separation on the stub between the anchor guy and the pole-to-stub guy, place a protection wire on the guyed pole in the same manner as if the pole itself were anchor guyed.

**6.02** If the separation between the pole-to-stub guy and the anchor guy on the stub is more than 4 inches, connect the protection wire to the guy hardware and suspension strand hardware, if any, and continue it toward the ground and terminate it as described in 2.03 or 2.04. No protection wire is required on the stub or pole which carries the anchor guy.

**6.03** With pole-to-tree guy, install the protection wire in the same manner as if the poles were unguyed. The protection wire may be in contact with the guy or guy hardware as it passes down the pole.

**6.04** With a pole-to-pole guy, install the protection wire in the same manner as for an unguyed pole.

**6.05** With a push braced pole, install the protection wire on the pole only. If metal plates are used for attaching the brace to the pole, the protection wire may be placed in contact with the plate without being attached to it as the wire passes down the pole.

**7. JOINTLY USED POLES**

**7.01** *Do not place protection wires on jointly used poles*