

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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WIRE STRINGING PRECAUTIONS

LINES IN JOINT USE OR

NEAR POWER WIRES

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1. GENERAL

1.01 This section replaces Issue 1 and outlines the general precautions to be observed when stringing open wire on jointly used pole lines and special precautions for joint and non-joint lines requiring drainage units. It has been rewritten to expand the information on protective grounding. Crossings above or below electric light or power wires are covered in another section of the practices.

1.02 **All workmen handling ropes, wires, reels, wire raising tools, etc., MUST WEAR RUBBER GLOVES during the stringing and tensioning operations where the wire is placed on jointly used poles.** When rubber gloves must be worn it is also important to avoid all body contacts with wires, guys, strands, etc., which could become energized by contact with the wire being handled. Do not remove gloves until after the wire is tensioned. The use of rubber gloves during the tying-in operation is not generally required if electrical clearances are standard in the section under construction and adequate precautions have been taken to prevent contact with power wires. However, if there is any questionable condition which may jeopardize the safe conduct of the tying-in operation, rubber gloves shall be worn.

1.03 Where practicable, string the wire out on the ground and then lay the wire up on the crossarms or pole brackets. Keep the wire under control by means of a handline where changes in grade or other conditions might cause a contact with the power wires during stringing or tensioning.

1.04 If necessary, wire may be pulled over the crossarms. When using this method, it is advisable to place the wire over every other crossarm to reduce surging and flip-ups to a minimum.

1.05 When tensioning or stringing wire over crossarms, pull the wire with an even, steady pull to prevent surging or flipping up. Avoid kinks which may tend to snag the wire in brush or on crossarms. The sudden release of a wire which is caught and under tension may cause the wire to flip up and contact a foreign conductor. Observe carefully for conditions where this might occur and, if necessary, keep the wire under control by means of a handline.

1.06 Tie the wire down with a handline at brackets or on crossarms at upward changes in grade. Do not remove handline ties until the wire is permanently tied to the insulator. The handline tie may be loosened to permit tying-in.

1.07 Avoid rough handling of wire during tensioning and tying operation to prevent flip-ups.

2. PROTECTIVE GROUNDING

2.01 Additional protection against electrical shock hazards may be obtained by proper grounding of the wire while it is being placed.

2.02 **However, such protective grounding in no way modifies or makes unnecessary the safety measures outlined in this and related sections.**

2.03 The effectiveness of grounding conductors for the protection of personnel and plant under conditions of contact between telephone and power wires depends upon the voltage of the power line, the operating characteristics of the fuses or circuit breakers in the power system, and principally upon the resistance of the ground connection to the telephone conductor.

2.04 It is therefore necessary to obtain a low resistance ground connection as outlined in Paragraph 2.05 if protective grounding is to be effective in preventing the building up of hazardous voltages to ground on the telephone plant in the event of an electrical contact.

2.05 Low resistance ground connections include the following:

- (a) The grounding conductor of a multi-grounded neutral power system.

Note A: A ground connection should never be made by telephone personnel in the space on the pole above telephone attachments.

Note B: If the construction work order does not indicate or if field supervision does not definitely know that the power system is of the multi-grounded neutral type, obtain the information from the engineer. Unless the ground is definitely known to be of the low resistance type, the ground must be assumed to be a high resistance ground and the work performed accordingly.

- (b) An aerial cable sheath and supporting strand that
- is connected to a central office ground, or
 - is connected to an underground cable which is connected to a central office ground. (If the electrical continuity of aerial cable which is connected to a grounded underground cable is interrupted at a cross-connecting terminal which is not bonded across, or by an insulating joint, the aerial cable sheath and suspension strand cannot be considered as a satisfactory low resistance ground connection.)
 - is considered to be adequately grounded for grounding aerial cable guys. Such cables can usually be identified by the fact that the cable guys are electrically connected to this suspension strand and contain no strain insulators.

If there is any doubt as to whether an aerial cable is satisfactory for grounding aerial wire, as outlined in this section, the question shall be referred to the Plant Engineer.

Note: A ground connection may be made to an aerial cable guy strand provided that there is no strain insulator in the guy strand between the ground connection and the pole, and provided that the guy is attached to the same eyebolt that supports the cable suspension strand, or is bonded to the cable suspension strand.

2.06 High resistance ground connections include the following:

- (a) Anchor rods and down guys.
(b) Single or multiple telephone ground rod installations.

2.07 Open wire lines exposed by joint use or paralleling high voltage power lines are subject to induced voltages. Such voltages may be objectionable, when the wire is **not** connected to central office equipment as would be the case during wire stringing operations.

2.08 Grounding of the conductors will reduce these induced voltages substantially. While low resistance ground connections are preferred, connection to a high resistance ground as outlined in Paragraph 2.06 will be effective against induced voltages.

3. GROUNDING PROTECTION—JOINT USE

3.01 Telephone conductors being placed on jointly used poles should be grounded during wire stringing and tensioning operations as outlined in the following:

(a) **When low resistance grounds can be obtained**, ground the line conductors at 1/2 mile intervals, by running a wire from a ground to a bare wire or bonding ribbon fastened along the top of the crossarm. If the wire is payed out on the ground, it need not be grounded until it is laid up on the crossarms or brackets. If the wire is pulled out from stationary reels, the reels should be grounded. If wire is payed out from moving reels, the reels cannot be effectively grounded; in such cases ground the wires to a low resistance ground at the beginning of the run where the wires are snubbed to a pole or permanently dead-ended.

(b) **When low resistance grounds cannot be obtained, and drainage units** (104A or 108A Protectors) are specified, ground stationary reels to a high resistance ground. If wire is being placed from moving reels, ground the wires to a high resistance ground at the beginning of the run where the wires are snubbed to a pole or are permanently dead-ended. One such ground is adequate. It must be remembered that this type of grounding will offer no protection in the event that telephone wires should accidentally come in contact with power wires, but will reduce induced static voltages to a very low and safe value.

(c) **When low resistance grounds cannot be obtained, and drainage units** (104A or 108A Protectors) are not specified, no protection against power contacts is afforded by grounding.

3.02 Generally it is not necessary to maintain the ground connections during tying-in operations unless drainage units are to be installed.

3.03 Where drainage units (104A or 108A Protectors) are specified, maintain the ground connections until the drainage units have been connected. Ground connections should be maintained during the tying-in operations by means of jumper wires and line wire clips.

4. GROUNDING PROTECTION—NON-JOINT USE

4.01 Telephone wire being placed on non-jointly used lines must be grounded when drainage units (104A or 108A Protectors) are specified to be installed on the line. Grounding should be in accordance with procedures given in Paragraphs 3.01 (b) and 3.03 of this section.

4.02 In some locations, open wire lines may pick up static charges from dry sand and dust being blown across the wires. In such locations, it may be desirable to ground wires during construction in accordance with Paragraphs 3.01 (b) and 3.03 of this section, even though drainage units (104A or 108A Protectors) are not to be installed.