BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G51.113.1
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AT&T Co Standard

SUSPENSION STRAND
PLACING — PRECAUTIONS

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1. GENERAL

1.01 This section outlines the general precautions to be observed when placing suspension strand on jointly-used pole lines and at power crossings to avoid electric shock and at road crossings to avoid traffic congestion.

1.02 The precautions listed herein supplement precautions contained in other sections of the Practices.

1.03 **All workmen handling suspension strand, reels, ropes, associated trucks and trailers, etc., during placing, tensioning, and dead-ending operations on jointly-used lines or on non-joint sections involving power crossings must wear rubber gloves** except, that where suitable low resistance grounds can be obtained, rubber gloves may be removed after initial ground connection has been made. 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 strand being handled in the event it should become energized.

1.04 All ropes used in conjunction with placing operations on jointly-used lines or at power crossings shall be dry manila ropes, free from metallic strands. Do not continue operations when ropes can not be maintained in a dry condition.

2. PROTECTIVE GROUNDING

2.01 Protection against electric shock hazards on joint-use lines or at power crossings may be obtained by effective grounding of the suspension strand while it is being placed.

2.02 The effectiveness of grounding suspension strand for the protection of personnel and plant under conditions of contact between strand and power wires depends principally upon the resistance to ground of the ground connection to the strand.

2.03 **It is necessary to obtain a connection to a low resistance ground** 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.

2.04 **Low resistance ground connections include the following:**

(a) An aerial cable sheath and supporting strand that is connected without an insulating joint to an underground or buried cable or to a central office ground.

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

(b) An aerial cable guy strand which is attached to the same bolt with a supporting strand meeting the requirements of (a) or is bonded to it, and which does not contain a strain insulator between the point of grounding connection and the suspension strand.

(c) The vertical 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.** The connection between the strand ground wire and the power system grounding conductor may be made by telephone personnel in or below the telephone space if this procedure meets with the approval of the power company. In the absence of such agreement, grounds as in 2.04 (a) must be used or the precautions for placing ungrounded strand must be observed.

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.

2.05 Anchor rods and guys, and single or multiple telephone ground rod installations, are not to be considered suitable protective grounds for the grounding of strand during placing.

2.06 When low resistance grounds can be obtained:

(a) On jointly-used lines, ground the suspension strand at 1/4 mile intervals during placing and maintain any temporary connections until the strand is tensioned and dead-ended.

(b) At power crossings, ground the strand as close as practicable to the crossing span before making the crossing.

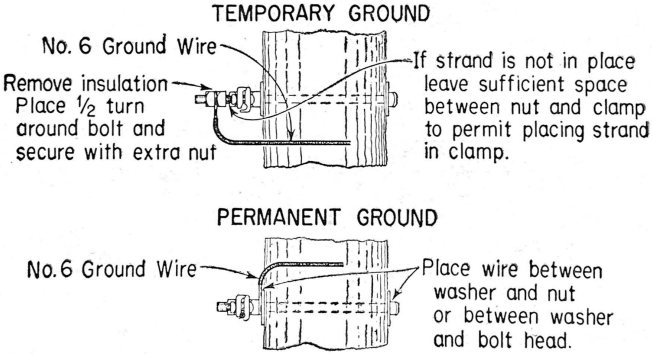
2.07 Where strand is to be run out from a stationary reel location, select a location as close as practicable to a low resistance ground connection point to permit grounding the strand early in the placing operation.

2.08 When conditions permit and strand is to be placed by the moving reel method, start placing operations from a point where the strand can be grounded. For example, start from the junction pole of a grounded strand and cable, and dead-end and ground the new strand immediately.

3. ATTACHING GROUNDS

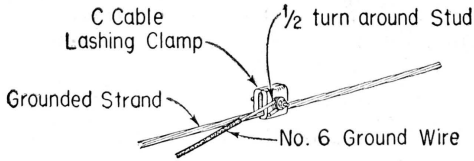
3.01 On jointly-used lines, all workmen having occasion to handle the strand, reels, lines, connected vehicles, etc., in connection with the placing operation shall wear rubber gloves until after a suitable low resistance ground connection has been made.

3.02 Make the necessary grounding connections to the suspension strand using No. 6 Ground Wire as follows:

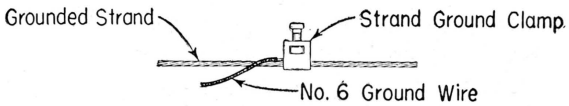


3.03 Attach the No. 6 Ground Wire to a low resistance ground connection, as discussed in Par. 2.04.

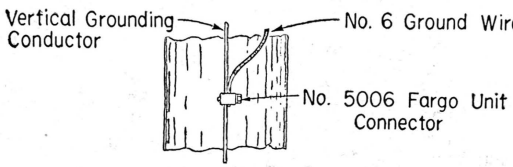
(a) For connection to a grounded strand (except size 25M), use a cable lashing clamp.



(b) For connection to 25M strand, or if cable lashing clamps are not available, use a strand ground clamp.



(c) For connection to a vertical grounding conductor of a power system multi-grounded neutral use 5006 Fargo Unit Connector. **Do not connect the temporary ground directly to the power neutral wire** as this wire is in the power space above telephone attachments.



3.04 When completing the circuit to ground, grasp the conductor being attached, using rubber gloves and avoiding body contact with all other strands, wires, etc., on pole, and touch the conductor to the grounded conductor. This method should be used, for example, when placing the strand in a clamp previously connected to ground or when attaching the No. 6 Ground Wire to the grounded conductor. A spark may result due to a static or induced charge on the strand. However, these charges dissipate rapidly and a second spark should not result if the contact is repeated. A prolonged arc on initial contact or a repeated spark indicates a potential difference between the conductors due to power supply voltages. Contact should not be further maintained or repeated and the condition must be investigated before work operations proceed further.

4. PREVENTION OF FLIP-UPS AT LOW POLES

4.01 At upward changes of grade (low poles) on jointly-used lines special precautions are required during placing to prevent the pulling-in line and the strand from rising into possible contact with the power wires.

4.02 A one-sheave cable block lashed to the low pole at the desired attachment level may be used to restrain the pulling-in line and the strand when pulling strand over drive

hooks or over the nut on the suspension bolt between the pole and the suspension clamp. Do not rely on placing the strand underneath the drive hook or suspension bolt.

4.03 A one-sheave cable block lashed to the base of the low pole may also be used where strand is being pulled in along the ground.

4.04 When placing strand by the moving reel method, stop the placing vehicle just past the low pole and lash the strand securely to the base of the pole.

5. POWER CROSSINGS

5.01 When placing suspension strand on pole lines involving power crossings, **workmen handling the strand, pulling-in line, ropes, etc., must wear rubber gloves until the strand is tensioned and secured** or, in the case where a suitable ground can be obtained, until after the rigging is completed in the crossing span and the strand is grounded.

5.02 Where the strand crosses under a power wire in a span or on a jointly-used pole line, where there is any possibility of the strand being whipped up into contact with the power wire during the stringing or tensioning operations, hold the strand down by means of a 3/8-inch or larger rope, so as to prevent the contact.

5.03 Where the suspension strand is to be placed over trolley wires or power wires of not more than 750 volts, proceed as follows in the crossing span:

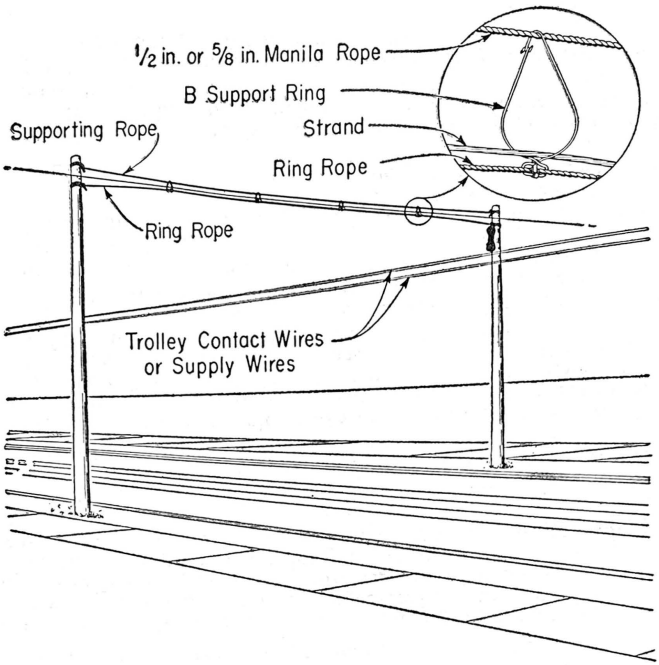
(1) Place two 1/2-inch or 5/8-inch ropes over the crossing and tie one (supporting rope) securely to the crossing poles about 1 foot above the desired attachment level of the suspension strand. **All ropes used in these operations should be dry manila ropes, free from metallic strands.**

(2) The second rope (ring rope) should be greater than twice the length of the crossing. Attach a support ring to the ring rope and secure a third rope (pulling line) to the first support ring.

(3) As the ring rope is pulled into the crossing span, attach support rings every 3 feet. Clip the rings over the supporting rope making sure that the pulling line is inside the rings.

(4) When the span is ringed, tie the ring rope securely to the crossing poles below the suspension strand attachment level.

(5) Pull the strand through the rings in the crossing span using the pulling line previously placed.



Note: If cable is to be placed in the crossing span do not remove the support rings. Untie the supporting rope and leave it in the rings as a cable pulling line. Retension the ring rope so that the rings are supported at the top by the strand and below by the ring rope. Thus, the span is prepared for cable placing operations.

(6) In removing the ring rope add support rings at three foot intervals from the last ring to the end of the rope, to prevent the rope from whipping into the power wires.

6. ROAD CROSSINGS

6.01 Where strand is to be placed over a highway and interference with traffic must be kept to a minimum, the method employed for placing strand over power wires (Par. 5.03) may be used to advantage.