

**BELL SYSTEM PRACTICES**  
**Outside Plant Construction**  
**and Maintenance**

**SECTION G32.405**  
**Issue 1, June, 1931**  
**Provisional Standard**

**DROP AND BLOCK WIRING**  
**REPAIRING**

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**1. GENERAL**

1.01 The forces engaged in the repair of drop and block wires should be familiar with the construction methods and details of drop and block wiring, as covered in the Placing sections (G32.100 group) and should be guided by those sections as well as by the practices included in this section.

1.02 The following general principles should be applied in making repairs to drop and block wires:

- (a) Correct the condition which has caused the service to be impaired, doing the work in such a manner as to prevent the recurrence of the same trouble and to eliminate, as far as practicable, any unsatisfactory conditions that might result in the development of trouble in the near future.

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- (b) The workmen should keep in mind the fact that there may be many conditions in the plant not conforming to the present standard requirements, but which do not present a hazard to or a potential impairment of the service. It is not usually economical in these cases to bring such conditions into conformity with standard practices.
- (c) Where it is necessary to repair drop or block wires by replacing a damaged portion of wire, make the repairs by cutting in a short piece of new wire unless the portion to be repaired is 25 feet or less from a wire end which can be conveniently disconnected. Under such conditions it will usually be advisable to splice in a new piece of wire to the end of the wire run.
- (d) In making repairs involving splicing in new portions of wire, avoid making more than two additional splices in each conductor in any one span. Where splices already exist in the span, these should be cut out if they are within five feet of the new splice to be made.
- (e) When a drop or block wire is taken down for the purpose of making repairs and the insulation is found badly weatherworn or deteriorated, it will usually be advisable to replace the entire portion of the wire in that condition.
- (f) In making drop wire rearrangements on poles where it is necessary to splice out the existing drop wire in order to properly reach the cable terminal, the splice may be made at any convenient point provided the wire is new or the condition of the insulation is good. Where the insulation is considerably aged or weatherworn, the splice should be made at a point in the span well beyond the wire support so that good insulation will be provided at the point where the tie is made or wire clamp attached.
- (g) In re-making dead-end ties on twisted pair wire after the wire has been taken down for repairs or rearrangements, re-make the dead end by use of knob and wire tie described in Section G32.110 unless drop was originally supported by a clamp. In re-making dead-end ties on parallel wire, use wire ties unless wire at dead end is in a portion of new wire cut in or drop was originally supported with a clamp, in which case a drop wire clamp may be used if desired.

Drop wire clips may be substituted for straight ties on runs along the lead, if for any reason it becomes necessary to remove the intermediate ties on either parallel or twisted pair wire and the clips can properly be used.

- (h) Avoid making temporary repairs whenever possible. Where the repairman or inspector is unable to permanently repair defects or to correct hazardous conditions because of lack of proper equipment, material or due to the nature of the work involved, he should be governed by instructions of the test deskman or dispatcher, or by local practices.

1.03 Before leaving a line upon which work has been done or repairs have been made suitable tests should be made in accordance with local instructions to determine that the line is in good working condition.

## 2. ABRADED WIRE

2.01 When repairing drop or block wires where the insulation has become abraded to such an extent that repairs are necessary, one of the following methods should be used to repair the wire:

- (a) Where abrasion is caused by tree limbs and trimming the trees to obtain satisfactory clearance is more economical than rerouting the wire, trim the trees if the necessary permission can be secured. In pruning or trimming trees follow the methods outlined in the instructions covering tree pruning. Repair the abrasion as outlined in paragraphs 2.04 and 2.05 if possible, otherwise splice in a new portion of wire.
- (b) Where not practicable to avoid abrasion by tree trimming, replace or repair the abraded portion of the drop or block wire as outlined under (a) and
1. Reroute the drop or block wire if practicable to avoid tree interference. (See paragraph 2.02.)
  2. If not practicable to reroute drop or block wire, place B tree guards at exposed points. (See Section G32.160.)

NOTE: Tree guards should never be placed over portions of the wire on which the insulation is abraded and has not been repaired.

- (c) Where a twisted pair, or parallel drop wire span which is exposed to twigs or foliage is in such condition as to require repairs and it is not practicable to trim trees or

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reroute wire, replace span using Resistant Braid drop wire. Protect Resistant Braid drop wire from contact with tree limbs or branches larger than 1/2 inch in diameter at point of contact with type B tree guards as the insulation on this wire will not withstand these contacts for any considerable period of time.

- (d) If abrasion in wire runs along building walls is caused by projections, replace or repair the abraded portion of the wire and to prevent further injury place additional attachments or provide mechanical protection for wire as outlined in Section G32.160.

2.02 Where it is not economical or practicable to clear contacts with trees, building roofs, poles, or other structures which have caused abrasion or to adequately protect wire from mechanical injury by one of the methods outlined in paragraph 2.01, reroute the wire. This may be done by one of the following methods which are listed in order of preference:

- (a) Distribute from a different pole or from a different point on the same pole provided such a change will not interfere with proper clearances. If permission for an attachment to an existing nearby pole or building can be obtained, this may enable the interference to be cleared.
- (b) Make the point of attachment to the subscriber's premises at a different location, provided such a change will not interfere with proper clearances.
- (c) Use span clamps. Span clamps make riding of the strand difficult and the wire less accessible for maintenance, but should be used if a clear run cannot be secured in any other manner.

2.03 When necessary to reroute wires the work should be done in accordance with the instructions outlined in the Placing sections (G32.100 group).

2.04 In parallel wire, when only the braid or the rubber insulation on one wire has been damaged for a distance of less than 12 inches and the wire shows no signs of corrosion, repair by taping over both wires as outlined in paragraph 3.01. Where rubber insulation on both wires is damaged for a distance of less than 12 inches, wrap each wire separately with rubber tape as outlined in paragraph 3.01 before applying the

2.05 In twisted pair wire, where the insulation on one or both wires has been damaged for a distance of less than 12 inches and the wires show no indication of corrosion, repair by taping wires separately over the damaged parts as outlined in paragraph 3.01.

2.06 In cases where the length of the damaged braid exceeds approximately 12 inches or where the braid has been damaged at several points in the span, the abraded portion of the wire should be replaced as outlined in paragraph 1.02. In every case either the cause of the abrasion should be removed or suitable mechanical protection or additional attachments should be placed on the wire so that further abrasion will be avoided.

### **3. PLACING RUBBER AND FRICTION TAPE**

3.01 When placing rubber and friction tape in connection with repair of drop and block wires, proceed as follows:

- (a) **PLACING RUBBER TAPE**—Wrap 2 layers of 3/4 inch rubber tape in reversed layers with an overlap of 1/2 the width of the tape. Start wrap at center, wrap to 1 inch beyond the end of the insulation defect, reverse wrap to 1 inch beyond the insulation defect on the opposite end, reverse and end at center. Keep the tape under tension while it is being wrapped. Press the taped section firmly between the fingers or in the palm of the hand to cement the two layers of tape together.
- (b) **PLACING FRICTION TAPE**—Wrap 2 layers of 3/4 inch black friction tape in a similar manner. The friction tape shall be carried 1/2 inch beyond the ends of the rubber tape.

### **4. WEATHERED OR DETERIORATED WIRE**

4.01 When the insulation on drop or block wires becomes weather-worn or deteriorated to such an extent that the service has been impaired because of low insulation, it is generally advisable to replace the entire section of weathered or deteriorated wire. The new wire should be placed in accordance with the instructions outlined in the Placing sections (G32.100 groups).

## **5. TROUBLE AT TIES OR SUPPORTS**

5.01 When clearing drop or block wire trouble which locates at a tie, clamp or clip, replace the damaged portion of the wire. Clamps, clips or wire ties should not be placed over splices or taped portions of the wire.

## **6. OPENS**

6.01 Repair opens in drop or block wires by splicing in a section of wire unless there is sufficient slack available in existing wire so that both wires of the pair may be spliced out with a single splice in each wire. Where only one conductor is open, repairs can often be made by splicing in a short section in the wire affected.

6.02 Where opens can not be readily located after test and a careful visual inspection with the wire taken down, replace the span or section in which the open is located.

6.03 Where opens are located in block wires not under tension such as in ring runs, repairs may often be made by pulling sufficient slack to permit splicing both wires of the pair.

6.04 When repairing opens in drop or block wires, care should always be taken to make the splice in such a way that any strain will be equalized between both wires of the pair.

## **7. SHORTS AND GROUNDS—NOT DUE TO ABRASION OR AT DROP WIRE SUPPORTS**

7.01 If an exact location of the trouble can not be obtained after test and a careful visual inspection with the wire taken down, replace the span or section in which the trouble is located.

7.02 When trouble location is exactly known, make repairs to parallel wire as follows:

- (a) Remove braid from wire for a distance of approximately 2 inches beyond each end of the defective portion of the insulation.
- (b) Remove rubber insulation from the conductor affected for a distance of 1/2 inch beyond each side of the defective portion of the insulation and inspect conductors for corrosion, nicks or other injuries.

(c) If conductors are not injured, cover each conductor from which the rubber insulation has been removed with two wrappings of 3/4 inch rubber tape and both conductors with two wrappings of 3/4 inch black friction tape applied in the same manner as when making a splice.

7.03 When trouble location is exactly known, make repairs to twisted pair wire as follows:

(a) Remove braid and rubber insulation from the conductor affected for a distance of 1/2 inch from each side of the wire defect and inspect conductors for corrosion, nicks or other injuries.

(b) If conductors are not injured, cover each conductor from which insulation was removed with two wrappings of 3/4 inch rubber tape and two wrappings of 3/4 inch black friction tape applied in the same manner as when making a splice.

7.04 If the inspection of the wire at the point of trouble indicates that a conductor is corroded or injured to such an extent that subsequent breakage of the wire is probable, cut out the defective piece and complete repairs in the manner outlined in paragraphs 6.01 to 6.04.

## **8. KINKS**

8.01 Kinks which have been pulled tight in wire runs or spans and which require repairs should be cut out and wires spliced in a manner similar to that outlined in paragraphs 6.01 to 6.04.

## **9. LOOSE, DEFECTIVE OR MISSING ATTACHMENTS OR SUPPORTS**

9.01 When it is necessary to replace loose, broken, deteriorated or missing attachments or supports follow the instructions outlined in Section G32.115. Never reinstall attachments which have become loose, by using holes for original fasteners except where longer screws or larger anchors can be satisfactorily installed.

9.02 Where crimped cable rings, used to support block wire runs on messenger, have slipped, replace rings with the present standard type rather than respace the slipped rings.

## **10. DETERIORATED, DEFECTIVE OR SLIPPED TREE GUARDS**

10.01 Deteriorated or defective tree guards that are required to protect drop and block wires from abrasion should be replaced. Tree guards that have slipped to the extent that abrasion to the insulation may occur, should be reinstalled to afford proper protection. Tree guards should be placed as outlined in Section G32.160.

## **11. CLEARANCES ON BUILDINGS**

11.01 Adequate clearances from obstructions should be provided for existing drop and block wires. It may be necessary to place spout straps, corner brackets, rings, tape, etc., as outlined in Section G32.160.

11.02 Porcelain tubes should be placed when other means will not provide the required protection. Install the tubes in the following manner:

- (a) Remove all ties and wire fastenings between the unprotected point and the most accessible terminating point.
- (b) After complying with local instructions in regard to informing the repair clerk and subscriber that the line is to be opened, disconnect the wire at the most accessible terminating point. Slip a tube of the required length over the wire. Reconnect the wire as soon as possible in order to restore service.
- (c) Move the tube to the unprotected point and fasten in accordance with the methods outlined in Section G32.160.
- (d) Refasten wire in standard manner.

11.03 It may be advisable to place split porcelain tubes to protect a wire run on buildings from electrical injury. This depends on the number of wires in the run as well as the distance between the unprotected point and the nearest terminating point.

## **12. HAZARDS FROM ELECTRIC WIRES OR STRUCTURES**

12.01 When clearances from electric wire, or structures require correction, follow local instructions with reference as to whether the telephone plant should be rearranged or the power company should be requested to rearrange their plant. Where the location of the telephone plant is to be changed to provide proper clearances, follow the methods of re-routing outlined in paragraph 2.02.