BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

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CABLE SPLICING—GENERAL
GENERAL RULES FOR MAKING A SPLICE

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1. GENERAL

1.01 This section covers the more important factors to be considered in making a cable splice. Detailed instructions for certain of the operations are given in other sections.

1.02 All splices should be carefully planned so that they will be properly located for the splicing operations, and for final supporting. If the main cable is cut, try to locate the splice so that a split lead sleeve will not be required.

2. SIZE OF LEAD SLEEVE AND SHEATH OPENING

2.01 Determine the size of lead sleeve to be used for the splice. In most cases this can be done by referring to the tables of lead sleeve sizes. If the cable is to be placed under continuous gas pressure, use extra strength lead sleeves for the 5-inch and larger sizes. For conditions not covered in the tables consult the supervisor.

2.02 Determine the proper location of the splice. Regardless of the kind of sheath, the opening is made 3 inches shorter than the length of the sleeve given in the tables of sleeve sizes for lead sheath cable. In multiple unit type cable rotate the core, if necessary, to bring the units in alignment across the splice. Place the cotton tape or muslin protection on the core at the edge of the sheath. Prepare the lead sleeve and, if practicable, slide it over one of the cable ends.

2.03 If two cables enter the splice on the same side, a Y joint with a lead wedge will be required. Select the proper size wedge to fit the cables, and place it in the crotch.

2.04 Tie and support the cables so that they will not move during the splicing operations.

3. PROTECTION OF SPLICE OPENING

3.01 Protect the splice while it is being made so that moisture will not enter it.

3.02 When working in a manhole place a tarpaulin or approved equivalent over the manhole wall in back of the splice, so that the insulation on the conductors will not absorb moisture from the wall. If necessary, hang a tarpaulin, or a rubber blanket across the roof of the manhole to keep drippings from the street or from the manhole roof from falling on the splice.

3.03 When a splice is made in aerial cable during a rainstorm wrap a collar of friction tape around the cable at each side of the splice, inside of the tent. The friction tape will form drip collars which will prevent water from running along the cable sheath to the splice.

3.04 If a splice is to be made at an exposed location, where suitable shelter cannot be obtained, do not open the sheath of the cable during stormy weather.

4. CONDUCTOR JOINTS AND COTTON SLEEVES

4.01 Determine the following:

(a) Whether the conductors are to be joined with straight, bridge or butt joints.

(b) Whether the joints are to be twisted or made with tinned copper sleeves.

(c) Whether the joints are to be soldered.

(d) Whether single wall or double wall cotton sleeves are to be used.

4.02 Select the proper type and size cotton sleeve.

4.03 Determine the number of rows of cotton sleeves to be made in the splice.

5. METHODS OF SPLICING CONDUCTORS

5.01 In splicing conductors one or more of the splicing methods listed below may be followed.

Random Splicing

5.02 In random splicing the conductors are spliced according to the color code of the cable and the cable count of the groups or units. No attempt is made to identify the conductors in the groups or units.

Bunch Splicing

5.03 In bunch splicing, the conductors are spliced from bunches containing specific groups or counts.

Test Splicing

5.04 In test splicing it is necessary to establish the identity of each conductor that is to be spliced. In paired cable, the pair numbers are determined from termination or from some point where the cable is boarded. In quadded cable the conductors may be spliced according to the measured electrical characteristics, such as capacitance unbalance, as well as by identification from a termination.

Boarding

5.05 Boarding is the term which indicates the operation of identifying conductors in advance of splicing, and placing them in numbered holes in testboards made of linen or fibre. In working cables one end of a short length of insulated wire is tied around the conductors and the other end is placed through the hole in the testboard. Boarding may be done at random, by identifying from a termination, or by selecting conductors according to color or number sequence in layers.

Cable Transfer or Throw

5.06 A cable transfer or throw is the term which indicates the transfer of conductors from their existing connections to new ones, either in the same cable or in another cable. A transfer may involve all or part of a cable. Circuit transfers at terminations are often associated with cable transfers, and in many cases the circuit and the cable transfers must be made simultaneously.

Section Throw

5.07 Section throw is the term which indicates the replacement of a length of cable between two points because of failure or for other reasons, and the associated transfer of all of the conductors in the old section to the new section.

6. GENERAL RULES FOR MAKING A SPLICE

6.01 Detail work prints are generally issued for most splicing jobs. These should be studied carefully to determine the sequence of operations and the need for bunching, testing, boarding, etc.

6.02 Before opening a working cable, notify the Central Cable Locating Bureau or the Wire Chief.

6.03 In cables containing working circuits conduct all operations carefully to avoid interference with the circuits. Do not splice working circuits to defective conductors.

6.04 Start the splice by joining conductors that are located toward the back of the splice and work toward the front. Keep the conductors as straight as possible allowing only enough slack to make a symmetrical splice. Avoid unnecessary interweaving and crossovers.

6.05 In joining paired conductors, splice tip to tip and ring to ring. Do not reverse pairs except under the following conditions:

(a) At terminals where reversal of the stub cable pairs is necessary to maintain the correct position of tip and ring binding posts in the terminal.

(b) In splices, to correct for an existing reversal in a working pair which would otherwise require reversing a cross-connection at an unattended office. Consult the supervisor with respect to the policy of reversing the pair or reversing the cross-connection at attended offices.

6.06 Do not split pairs or quads. If necessary, identify the conductors from the opposite end of the cable to make certain that the conductors are correctly associated.

6.07 As far as possible keep conductors in their correct color groups or units. Do not transpose conductors except as specified on the work prints or as required in splicing defective conductors.

6.08 Splice tracers to tracers except as required in splicing defective conductors or because of a difference in the number of tracers on opposite sides of a splice. A difference in the number of tracers is a common occurrence when joining layer type cables to multiple unit cables because the layer type cables generally have two tracers regardless of size, whereas the multiple unit cables have at least one tracer for each 101 pairs.

6.09 Quadded conductors in toll or toll entrance cables which are to be left dead at a splice but which terminate at some point along the route shall be looped at the splice for testing purposes. One pair of the quad should be spliced to the other pair of the same quad connecting tip to tip and ring to ring.

7. SUPPLIES AND MATERIALS

7.01 Arrange to have the necessary supplies and materials available before starting a splice.