BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G63.261.1
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AT&T Co Standard

ELECTROLYSIS TESTING
TEST POINTS ON BURIED CABLE

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1. GENERAL

1.01 This section covers the method of locating and installing electrolysis test points on buried cable.

2. TYPES

2.01 Electrolysis test points on buried cable are of three general types; current test points, potential test points and cable to foreign structure test points. Any or all of these three types may be involved at a single location although usually only two of them are present.

2.02 A current test point is designed for measuring the current on the cable by means of millivolt drop over a known length of cable sheath (usually 30 feet).

2.03 A potential test point is designed for measuring the potential between cable and earth by means of connections to the cable and to a permanent ground electrode located approximately 4 feet from the cable.

2.04 A cable to foreign structure test point is designed to permit measurement of the potential between the cable and a near-by foreign structure. For this purpose it is desirable to make a permanent connection to the cable and to the foreign structure, when authorized, at a point close to the cable which will permit measurements to be made to determine the electrolytic effect of the one structure on the other.

3. FREQUENCY OF TEST POINTS

3.01 Current and potential test points along non-carrier routes shall be installed at approximately 5-mile intervals.

3.02 Current test points along carrier routes shall be installed on either side of, and immediately adjacent to, each auxiliary repeater station. In addition, if the repeater sections are more than 5 miles long additional test points shall be installed, so spaced that the distance between test points does not exceed 5 miles.

3.03 Deviations should be made from the normal spacing suggested above in order to avoid placing test points at inaccessible locations. In addition, it may be practicable to have these test points coincide with the special test points which must be installed in areas where foreign structures are present as outlined below:

(a) Where pipe lines, or railways operated by direct current, or using direct current for signal circuits, cross the cable route current test points shall be installed on each side of the crossing.

(b) Where pipe lines, or railways as mentioned above are parallel to and within one mile of the cable route current test points shall be installed at one-mile intervals within the limits of the parallel.

(c) Where pipe lines, and railroads as mentioned above are parallel to and within 1,000 feet of the cable route current test points shall be installed at 3,000-foot intervals within the limits of the parallel. These test points and those outlined in (b) above can generally be located at splices.

(d) Current and potential test points shall also be installed on the cable at locations where mining, or other equipment using direct current, is being operated within one mile of the cable route.

3.04 In addition to the test points outlined above it is desirable to install current test points on each side of a section of light wire armored or submarine cable if the normal test points are not within 1,000 feet of such cable.

4. CONNECTIONS AT TEST POINTS

Terminals and Wire

4.01 The connections from cable, ground electrode, foreign structure, etc., shall be terminated in 102A or 102B Wire Terminals which shall be installed in accordance with the standard practices. Where less than five leads are to be

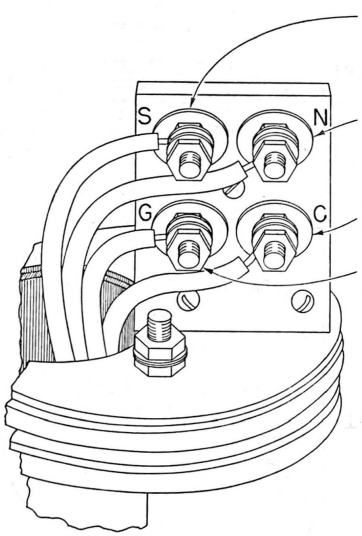
terminated the two pair 102A Terminal is satisfactory. Where five or more leads are needed, as at pipe line crossings, the three pair 102B Terminal shall be used.

4.02 In territories where no gopher protection is required AL wire may be used. Where gopher protection is required B Underground Wire is necessary. The wires of the B Underground Wire pair shall be twisted together at each end and treated as a single conductor. The armor wires should be so terminated and insulated that they will not contact the cable, foreign structure, etc.

Identification of Test Leads

4.03 The test leads at terminals shall be suitably stenciled for identification as illustrated below.

102-A WIRE TERMINAL



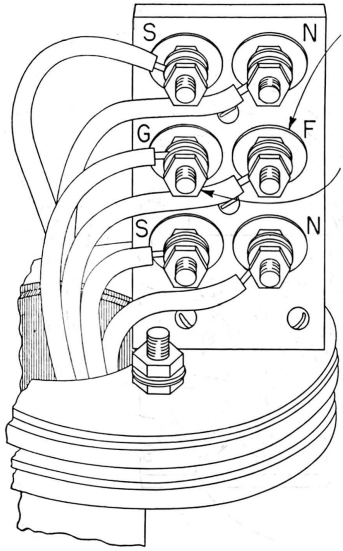
Terminal for current test lead to cable at south or west end of 30 ft. test interval Stencil S or W.

Terminal for current test lead to cable at north or east end of 30 ft. test interval N or E.

Terminal for potential test lead to cable. Stencil C.

Terminal for potential lead to ground electrode. Stencil G.

102-B WIRE TERMINAL



Terminal for current test lead to pipe or other foreign structure. Stencil F.

Terminal for potential lead to ground electrode. Stencil G.

Note: Terminate the current test leads from the south or west test section on the two top terminals. Terminate the leads from the north or east test section on the two bottom terminals.

Connections to Cable

4.04 On tape armored, gopher protected and jute protected cable it is necessary to expose the sheath at the points where the test leads are connected. The connections are made as outlined below.

(1) Remove about 4 inches of the protective covering.

(2) Secure the test leads to the sheath with copper lashing wire and solder.

(3) Cover soldered joint with asphalt paint and friction tape. Then restore the corrosion protection with one half-lapped layer of Tapecoat applied in the usual manner.

4.05 On modified tape armored and wire armored cables the test leads may be soldered directly to the tape or wire armor unless the sheath is exposed for other reasons. If connection is made to wire armor care should be taken to

ensure that all of the armor wires are bonded together at the point of connection. Protect the soldered joint as outlined above.

Ground Electrode

4.06 The ground electrode is prepared as outlined below.

(1) Solder the conductors of the AL or B Underground Wire to the inside of a 1-1/2-inch x 15-inch lead sleeve. If B Underground Wire is used, the armor should be stripped back and wrapped with DR and friction tape to insure separation from the sleeve.

(2) Wrap the conductors at the soldered joint with 3 or 4 turns of DR tape and beat down the end of the sleeve on the tape.

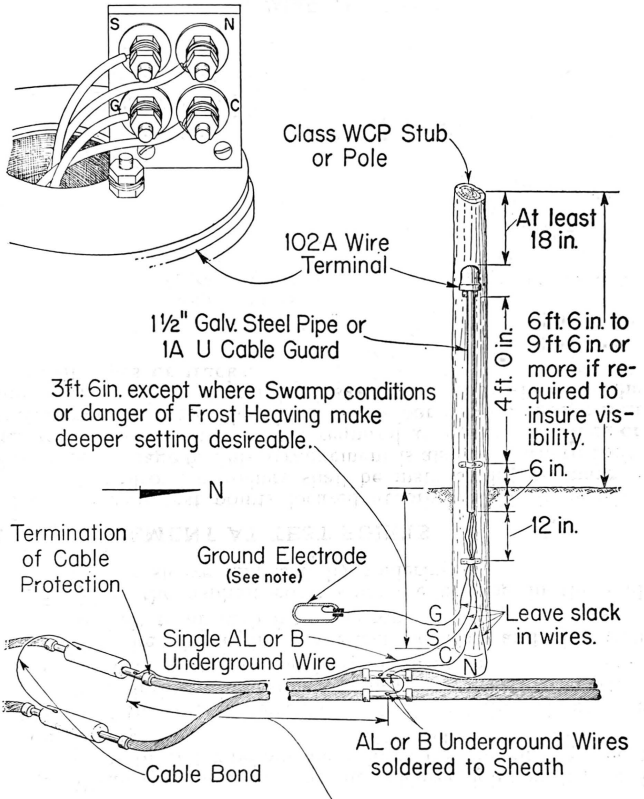
(3) Seal the joint between the sheath and the rubber tape by painting with asphalt paint. Then beat in the other end of the sleeve until a 3/4-inch diameter hole remains.

(4) Set the sleeve in a vertical position and fill with asphalt to an inch from the top.

(5) After the asphalt cools complete beating in the end of the sleeve and seal by soldering.

5. ARRANGEMENT AT TEST POINTS

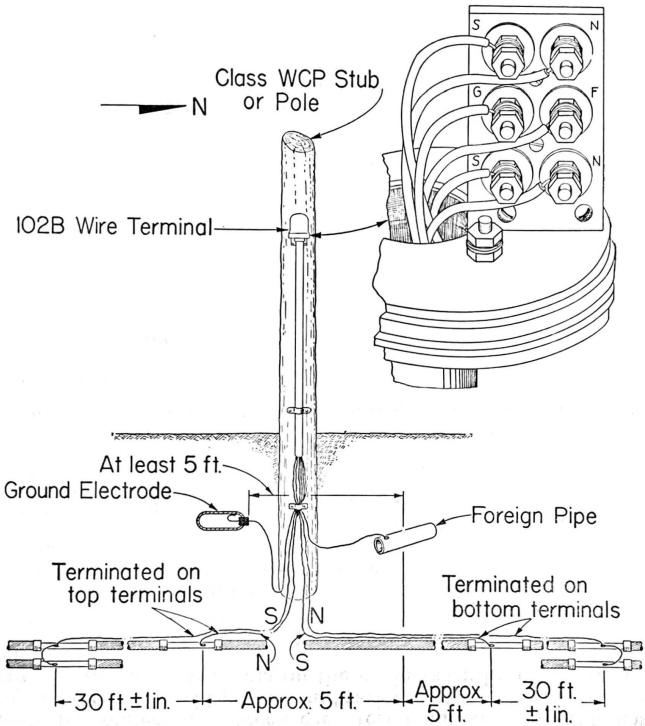
5.01 Current test points located at other than single pipe or railroad crossings shall be installed in the manner illustrated on page 6. This arrangement is also used where facilities for electrolysis testing are required at a group of pipes or tracks crossing the cable within a 100-foot section except that similar test points should be installed on both sides of the group of pipes or tracks.



30 ft. ± 1 in. as measured along cable. There must be no Bonds, Splices or other Sheath or Armor discontinuities between points of connection of Test Leads.

Note: Horizontal separation between electrode and cable about 4 feet.

5.02 Current test points located at single pipe line or railroad track crossings shall be installed as illustrated below.



Note:- Dimensions, type of wire, etc., shown for 102A Wire Terminal (Para. 5.01) also apply to this installation.

5.03 Where the pipe crossing is under a road or because of other obstacles it is impracticable to terminate the test leads at a single point as illustrated in Paragraph 5.02 it will be necessary to install test points as illustrated in Paragraph 5.01 located on both sides of and as close to the crossing as practicable.

5.04 The illustrations on pages 6 and 7 show single AL leads. However, on installations involving Tape Armored, Modified Tape Armored or Wire Armored cables, two AL wires should be connected between each test point and the terminal. This arrangement will permit calibration of the cable resistance between the two test points on the cable as outlined in another section.