BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G73.225.3
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AT&T Co Standard

PRESSURE TESTING
CONSTRUCTION TESTS
PROCEDURE DURING SPLICING

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1. GENERAL

1.01 This section describes the construction tests to be made on cable lengths, solder work, by-pass connections and other equipment during splicing operations. This section replaces the related information in Section G73.225, Issue 1, which is cancelled.

1.02 The installation of permanent pressure testing equipment should preferably coincide with the progress of splicing work so that the regular plug and valve installations will be available for testing purposes.

2. FLASH TESTS OF SOLDER WORK

2.01 Flash tests are for the purpose of determining the soundness of wiped joints and soldered seams of lead sleeves and of solder connections to the sleeve or sheath of the cable, such as valves, flanges and other pressure fitting connections.

2.02 All wiped joints and solder work on cables to be maintained under continuous pressure shall be flash tested upon completion. Flash tests are also made on cables not maintained under pressure when instructed by the supervisor or covered by instructions pertaining to the particular job.

Cables under Continuous Pressure

2.03 The procedure for making a flash test on cables to be maintained under continuous pressure is as follows:

2.04 Where a valve is not available install an F flange and F valve in the sleeve.

2.05 Adjust a pressure testing regulator under a no flow condition to feed gas at a pressure not to exceed 20 pounds. Admit gas to the cable until the normal pressure at which the cable will be maintained is reached. This should be checked by a 3-1/2-inch gauge or by turning off the regulator and reading the back pressure on the low pressure gauge of the regulator.

2.06 Then with the gas cylinder still connected and gas entering the sleeve, solution test all solder work and the adjacent cable sheath and examine closely for leaks. Continue along the sheath as far as can be reached conveniently. In manholes, the sheath should be tested to the duct entrance in each direction. Use a splicer's mirror, if necessary, to examine the back of the sleeve and sheath.

2.07 If any leaks are found, disconnect the gas, release the pressure built up in the cable and repair the leaks. Then repeat the flash test. After tests have been completed replace F valves with F flange plugs unless the location is to be a permanent valve point.

Cables Not under Continuous Pressure

2.08 The procedure for making a flash test on cables which are not to be maintained under continuous pressure is as follows:

2.09 Drill a hole in the sleeve with a cable drill and install a pressure testing clamp over the hole.

2.10 Flash test the sleeve in accordance with Paragraphs 2.05 and 2.06 above. On cables about one inch diameter or smaller, a B Pressure Testing Pump may be used in place of the gas cylinder.

2.11 If any leaks are found, disconnect the gas, release the pressure built up in the cable and repair the leaks. Then repeat the flash test. After tests have been completed seal the hole in the sleeve with a B screw plug.

3. TESTS OF SPLICED SECTIONS

3.01 If the cable is supplied under pressure or placed under pressure during installation, pressure measurements should be made on all cable lengths just prior to opening the ends for splicing. If any leak is indicated, add gas if necessary and solution test the valves and end seals in an attempt to locate the leak. If the leak is not found, the condition should be recorded on the pressure data form so that steps can be taken to locate and clear the leak. A cylinder of gas should be

connected to the section containing the leak, if necessary, to maintain pressure until the leak can be located and repaired.

3.02 As splicing progresses, the completed section between the work location and the gas plug or section end should be kept charged by leaving a cylinder of gas connected near the plug with the regulator set at six pounds for underground or buried cable and three pounds for aerial cable. As the distance of the splicing work from this tank increases, gas should also be introduced at such intermediate points as required to maintain adequate pressure in the completed section. Before opening the end to splice on additional lengths, a pressure reading should be made in the completed section to be sure that there is adequate pressure.

3.03 If there are isolated sections, such as load sections, that are to be left disconnected from the remainder of the cable for some time, and if moisture conditions justify, consideration should be given to charging such lengths when the last splice is made, in order to ensure that moisture troubles will not occur.

4. TESTS OF PLUGS AND BY-PASS CONNECTIONS

4.01 Pressure tests should be made to ensure the proper operation of B By-Pass Valves and the free flow of gas through by-pass connections, to guard against the possibility of copper ells or valves being blocked by solder or other material. Also, a check should be made of the tightness of gas pressure plugs.

4.02 To make these tests a pressure testing valve is necessary on each side of the by-pass, located within a few feet of the point where the by-pass pipe connects to the cable. In most cases these valves are already available as standard construction, mounted either directly in the cable sheath or connected to the end of lead pipes, as in buried or underground construction. Where pressure testing valves are not available, F type flanges and F valves should be installed for the tests. Upon completion of the tests, the extra valves should be removed and screw plugs placed in the flanges.

4.03 Tests should be made as follows, selecting a time when the cable is under gas pressure and there is no open splice in the section.

(1) With the by-pass valve open, check the gas pressure on each side of the by-pass by means of a 3-1/2-inch gauge. The two readings should be the same.

(2) Place a gauge on one valve, remove the core of the other, and observe the drop in pressure. This drop should be rapid, reducing to two pounds or less within 15 minutes.

(3) Restore the valve core and place a second gauge on this valve. Observe the restoration of pressure on both gauges. They should read the same during pressure build up.

(4) Repeat procedures outlined in (2) and (3) in the reverse order.

(5) If the above tests are unsatisfactory it is an indication of solder or other material in the lead pipe or connections which should be removed.

4.04 To check the tightness of gas plugs and closed by-pass valves, connect a manometer to the valve on one side of the plug and record readings for a 5-minute period to insure that the pressure is stabilized. If the readings remain the same, remove the core of the valve on the other side of the plug. Record manometer readings for a second 5-minute period. If there is any variation from the previously observed reading, the tightness of the plug and by-pass valve should be suspected and corrective measures taken by repair or replacement of the valve or remaking of the plug. The test should be repeated after the repair work has been done.

5. GAS SECTION COMPLETION TESTS

5.01 When all splicing work has been completed in the overall gas section, the section should be charged to the desired operating pressure as covered in the section on charging cables.

5.02 When the cable has been charged, adjust the contactors and place the alarm circuit in operation. In cases where it is not practicable to place the alarm circuit in operation immediately, pressure readings should be made semiweekly at three points in the gas section, midpoint and near each end, during the period that the alarm circuit is not in service.

5.03 Approximately a week after charging has been completed pressure readings should be made at every fourth valve point, starting at the plug. If these measurements indicate a leak, enough additional measurements should be made to permit location and clearance if practicable.

5.04 If these measurements do not indicate a leak of sufficient size to be located and cleared they should be repeated after two to three weeks and the average pressure loss in pounds per month calculated as described in another section on maintaining cables under pressure.

5.05 A gas section is considered satisfactory if it meets the requirements for allowable normal loss in pressure given in the sections on maintaining cables under pressure.