

**Rural Utilities Service, USDA**

**§ 1755.402**

(d) The sequence of tests and measurements described in this standard have been prepared as a guide. Variations from the sequence may be necessary on an individual application basis.

(e) There is some overlap in the methods of testing shown; also, the extent of each phase of testing may vary on an individual basis. The borrower shall determine the overall plan of testing, the need and extent of testing, and the responsibility for each phase of testing.

[62 FR 23960, May 2, 1997]

**§ 1755.402 Ground resistance measurements.**

(a) The resistance of the central office (CO) and the remote switching ter-

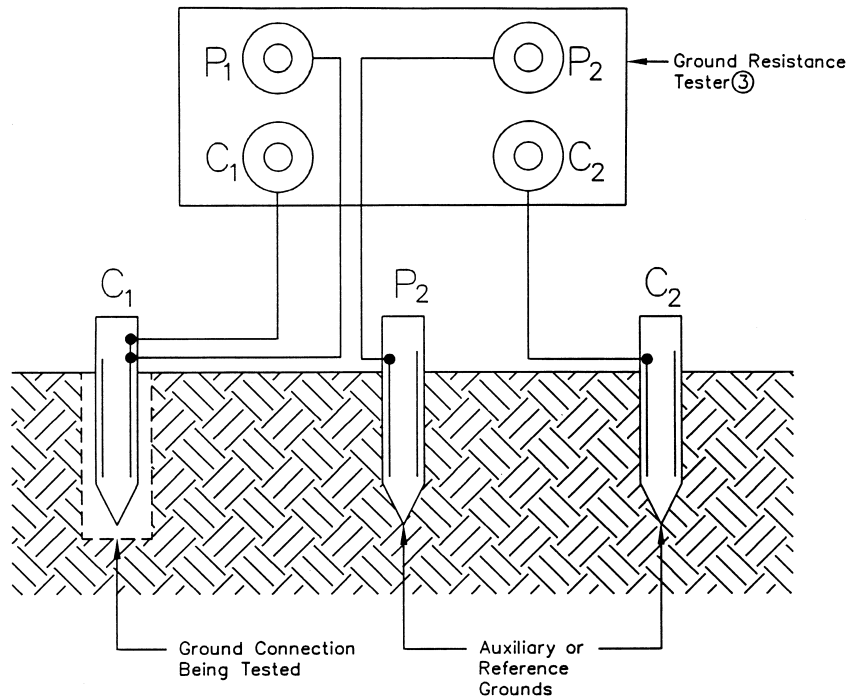
minal (RST) ground shall be measured before and after it has been bonded to the master ground bar (MGB) where it is connected to the building electric service ground.

(b) The ground resistance of electronic equipment such as span line repeaters, carrier terminal equipment, concentrators, etc. shall be measured.

(c) *Method of measurement.* The connection of test equipment for the ground resistance measurement shall be as shown in Figure 1. Refer to RUS Bulletin 1751F-802, "Electrical Protection Grounding Fundamentals," for a comprehensive discussion of ground resistance measurements.

(d) *Test equipment.* The test equipment for making this measurement is shown in Figure 1 as follows:

FIGURE 1  
GROUND RESISTANCE MEASUREMENT ①, ②



Notes:

- ①. Measurement procedure for COs, RSTs, and electronic equipment housings approximately 10 ft by 10 ft (3 m by 3m) or smaller shall be as follows: The minimum distance between the CO ground (C<sub>1</sub>) being tested and C<sub>2</sub> = 100 ft (30.5 m). Take several measurements moving P<sub>2</sub> from 50 ft to 75 ft (15.2 m to 23 m) away from CO ground C<sub>2</sub>. Resistance should initially rise then level off and then start rising again. The value to record for CO ground resistance is the value where it levels off which usually should occur with P<sub>2</sub> at 62 % of the distance between the CO ground and C<sub>2</sub>.
- ②. Measurement procedure for COs, RSTs, and electronic equipment housings larger than 10 ft by 10 ft (3 m by 3 m) shall be in accordance with the test equipment manufacturer's instructions.
- ③. Dynatel Research-Vibroground, General Radio-Megger Bridge, Associate Research-Megohm Meter or equivalent.

(e) *Applicable results.* (1) For the CO and RST, the resistance after the bond has been made to the MGB electric service ground shall not exceed 5 ohms. Where the measured ground resistance exceeds 5 ohms, the borrower shall determine what additional grounding, if any, shall be provided.

(2) For electronic equipment, the ground resistance shall not exceed 25 ohms. Where the measured ground resistance exceeds 25 ohms, the borrower shall determine what additional grounding, if any, shall be provided.

(3) When ground resistance measurements exceed the ground resistance requirements of paragraphs (e)(1) and (e)(2) of this section, refer to RUS Bulletin 1751F-802, "Electrical Protection Grounding Fundamentals," for suggested methods of reducing the ground resistance.

(f) *Data record.* Results of the CO and RST ground resistance measurements shall be recorded. A suggested format similar to Format I, Outside Plant Acceptance Tests—Subscriber Loops, in §1755.407 or a format specified in the applicable construction contract may be used. Results of the electronic equipment ground resistance measurements shall be recorded. A suggested format similar to Format II, Outside Plant Acceptance Tests—Trunk Circuits, in §1755.407 or a format specified in the applicable construction contract may be used. Data showing approximate moisture content of the soil at the time of measurement, the temperature, the type of soil and a description of the test equipment used shall also be included.

(g) *Probable causes for nonconformance.* Refer to RUS Bulletin 1751F-802, "Electrical Protection Grounding Fundamentals," and Telecommunications Engineering and Construction Manual (TE&CM) Section 810, "Electrical Protection of Electronic Analog and Digital Central Office Equipment," for possible causes of nonconformance and suggested methods for corrective action.

[62 FR 23960, May 2, 1997]

**§ 1755.403 Copper cable telecommunications plant measurements.**

(a) *Shield or shield/armor continuity.* (1) Tests and measurements shall be made to ensure that cable shields or shield/

armors are electrically continuous. There are two areas of concern. The first is shield or shield/armor bonding within a pedestal or splice and the second is shield or shield/armor continuity between pedestals or splices.

(2) Measurement techniques outlined here for verification of shield or shield/armor continuity are applicable to buried cable plant. Measurements of shield continuity between splices in aerial cable plant should be made prior to completion of splicing. Conclusive results cannot be obtained on aerial plant after all bonds have been completed to the supporting strand, multi-grounded neutral, etc.

(3) *Method of measurement.* (i) The shield or shield/armor resistance measurements shall be made between pedestals or splices using either a Wheatstone bridge or a volt-ohm meter. For loaded plant, measurements shall be made on cable lengths that do not exceed one load section. For nonloaded plant, measurements shall be made on cable lengths that do not exceed 5,000 feet (ft) (1,524 meters (m)). All bonding wires shall be removed from the bonding lugs at the far end of the cable section to be measured. The step-by-step measurement procedure shall be as shown in Figure 2.

(ii) Cable shield or shield/armor continuity within pedestals or splices shall be measured with a cable shield splice continuity test set. The step-by-step measurement procedure outlined in the manufacturer's operating instructions for the specific test equipment being used shall be followed.

(4) *Test equipment.* (i) The test equipment for measuring cable shield or shield/armor resistance between pedestals or splices is shown in Figure 2 as follows: