

56. The factor of safety in poles supporting telephone wires at road crossings and along roadways, and at all other places where the safety of the public is involved, shall be at least 4.

57. Poles erected on private property with the consent of the owner of such property shall have such factor of safety as the owner of the property demands.

58. Poles must in all cases be placed clear of gateways.

59. The length of each pole must be such as will support the wires at a safe height above the ground.

60. Angle poles should be strengthened either by staying or strutting.

61. Every pole shall be so placed as to avoid unduly obstructing pedestrian or vehicular traffic.

62. The length of the span between poles will vary according to the class of country, the number of wires on the pole, and the dimensions of the poles used. For reliable service a span not exceeding three chains is recommended.

Cross-arms.

63. Cross-arms shall be of durable timber, and shall be of sufficient strength to support any load likely to be placed upon them.

64. As a general rule, when more than three wires are required on a pole line cross-arms should be used.

65. Poles should be slotted to take the cross-arm, which should be secured to the pole by a bolt of $\frac{1}{2}$ in. diameter and of suitable length.

66. The distances between insulators fixed to the cross-arm should be not less than 9 in.

Insulators.

67. Where cross-arms are used, insulators having straight spindles should be used where the wires are straight through. "J" bolts may be used where line wires terminate.

68. Where there is only one wire on a pole line an insulator affixed to a straight spindle at the top of the pole may be used.

69. Where only two or three wires are required on a pole line, insulators supported by swan-neck bolts screwed into the pole alternately on opposite sides may be used.

70. American button insulators should not be used except when their use is unavoidable, and then only upon the shortest lines. Insulators of the "petticoat" type give the best results, and are essential on long lines.

Wires.

71. Galvanized-iron wire of the following sizes is most economical and suitable for use in the construction of private telephone lines: (a) No. 12 gauge, weighing 150 lb. per mile; or (b) No. 10 $\frac{1}{2}$ gauge, weighing 200 lb. per mile. Iron wire of smaller gauge than No. 12 shall not be used. If the line is a long one, or is erected in country subject to snow, wire of No. 10 $\frac{1}{2}$ gauge should be used. Larger wire than No. 10 $\frac{1}{2}$ gauge may be used provided the poles are strong enough to carry the load.

72. Galvanized-iron binding wire No. 16 gauge, weighing 60 lb. per mile, should be used for binding the line wire to the insulators and also for making joints in the wire.

73. In jointing line wires, the Britannia joint should be used. In making this joint the ends of the two lengths of wire to be jointed are cut off square, cleaned thoroughly, and laid side by side for a distance of 2 $\frac{1}{2}$ in. The binding wire being taken in the middle of its length is applied first at the centre of the joint, is whipped evenly round the wires until the right-hand portion is finished, then the left-hand portion is similarly dealt with. A suitable soldering flux is applied, the joint is rapidly soldered, superfluous metal wiped off, and the joint allowed to cool naturally.

74. It is of the utmost importance that all joints in a line wire or any other wire used for telephone purposes shall be properly soldered.

Telephones.

75. Private telephone lines intended to be connected with a telephone office must be equipped with telephones of the pattern known as high-wound or bridging-bell.

76. Low-wound telephones are only suitable for use on lines not used for connecting with the Department's system, and on which there are only two telephones—that is, one at each end.

77. The number of telephones on any line connected with a telephone office must not exceed ten, exclusive of the instrument in the telephone office.

78. The number of telephones on any line connected with a telephone exchange must not exceed six.

79. Two Leclanche cells or two dry cells should be used for the operation of each telephone.

80. Where extension telephones are fitted on party lines suitable switches must be provided, so that the main and any extension telephones connected therewith are not in circuit at the same time.

Earth-plates.

81. Where metallic circuits are used, the earth connection is part of the equipment installed for the purpose of protecting the telephone from lightning discharges.

82. Where earth-working circuits are used the earth connection also forms part of the speaking circuit.

83. In both cases mentioned in the two preceding paragraphs it is absolutely necessary that a good connection be obtained and maintained with the general mass of the earth. This point is of prime importance.

84. A good "earth" may be obtained by joining the earth-wire to any of the following:—

(a.) To a sheet of galvanized iron 2 ft. square buried in permanently moist ground.

(b.) To a length of galvanized-iron pipe 5 ft. long driven into ground which is permanently moist.

(c.) To a water-pipe connected with an underground water-supply system.

85. Telephone earth-wires must not be connected to gas-pipes or electric-lighting conduit.