

these limits, or on the instructions of the Inspecting Engineer, the Council shall connect a recording voltmeter to record the pressure between the lines at their entrance to the consumers' premises, and shall supply to the Inspecting Engineer a chart showing the variations in voltage between the lines at this point for a period of seven consecutive days. If the variations thus recorded exceed the above limits the Council shall take immediate steps to comply with this regulation. If after thirty days a similar chart shows that the above limits of variations in voltage are not complied with a breach of these regulations shall be deemed to have been committed. If the accuracy of the Council's recording voltmeter is questioned by the consumer a standard instrument shall be supplied by the Inspecting Engineer, the reading of which shall be accepted as final.

#### *Switchboards.*

5. All switchboards shall be made of and mounted on material that is not inflammable, and the maximum permissible current in any switchboard conductor or conductor leading thereto shall not exceed the values permitted under the rules of the Institution of Electrical Engineers of Great Britain.

Every switch intended to be used for breaking a circuit and every circuit-breaker shall be so constructed or arranged that it cannot with proper care be left in partial contact, or accidentally fall or move into contact when left out of contact.

All switchboard circuits shall be so arranged that the course of any conductor can be readily identified.

Adequate means for access, free from danger, shall be provided for every switchboard passage-way, and the following provisions shall apply to all switchboard working-platforms and passage-ways, unless the bare conductors, whether overhead or at the sides of the passage-ways, are otherwise adequately protected against danger by divisions or screens or other suitable means:—

- (a.) Passage-ways constructed for low-pressure switchboards shall have an overhead clearance of 7 ft. between the conductors and the floor, and a clear width measured from bare conductor of not less than 3 ft.
- (b.) Bare conductors shall not be exposed on both sides of the switchboard passage-way unless (1) the clear width of the passage is not less than 4 ft. 6 in., measured between bare conductors; or (2) the conductors on one side are so guarded that they cannot accidentally be touched.

Suitable means, such as rubber mats and gloves, shall be provided and used when necessary adequately to prevent danger.

#### *Circuit-breakers.*

6. All outgoing feeders and distributors from any generating-station or power-house shall be provided with automatic circuit-breakers or fuses set to open at 100 per cent. excess current over the rated full load of such feeder or distributor, with a time-limit not exceeding ten seconds.

#### *Distribution.*

7. The distribution may be carried out either by underground or overhead conductors; provided that if at any time it is deemed by the Minister to be detrimental to the public safety for the conductors or any particular class of conductors to be overhead, such conductors shall, on receipt of notification to that effect from the Minister, and within ten months of such notification, be laid underground, and all consequent and necessary alterations made by and at the cost of the Council.

#### *Overhead Electric Lines.*

8. The diameter of any conductor in any electric line laid or erected for the supply of electrical energy shall not be less than 0.104 in. diameter (No. 12 S.W.G. or 7/20 S.W.G.); provided that No. 14 S.W.G. may be used for service wires where length of span does not exceed 66 ft. If the material of the conductor is aluminium the conductor shall be stranded.

The stress in overhead conductors shall not exceed 25,000 lb. per square inch for copper, 12,000 lb. per square inch for aluminium, 34,000 lb. per square inch for steel, and 22,500 lb. per square inch for iron in the extreme case of a temperature of 20° Fahr. and a wind-pressure of 18 lb. per square foot of diametral plane occurring simultaneously. The span between supports and the sag shall be determined to conform with the above limiting stresses.

No overhead low-pressure electric lines shall come within 2 ft. of any aerial wires or cables belonging to another authority except where it may be permitted to pass either set of wires between other wires at a pole or support.

Electric lines at low pressure shall be insulated throughout either with triple braiding impregnated with waterproof compound or with vulcanized india-rubber; provided that where circumstances permit the lines may, with the consent of the Minister, be bare.

Earthed neutrals and intermediate conductors may in all low-pressure circuits be bare.

All overhead electric lines at low pressure shall be carried at a minimum height of 18 ft. above the ground.

When an aerial line crosses a street the angle between the line and the direction of the street at the place of crossing shall not, without the consent of the Minister, be less than 60°, and the span shall be as short as possible.

Where an aerial line crosses or is in proximity to any metallic substance precautions shall be taken by the Council against the possibility of the line coming into contact with the metallic substance by breakage or otherwise.

#### *Supports for Overhead Lines.*

9. All aerial wires shall be attached to suitable insulators, carried on cross-arms of suitable material and cross-section, and they shall be so attached to the insulators or guarded that they cannot fall away from the support. Conductors covered with insulating material shall be so attached that their insulation shall not be impaired where they are secured to the insulator.

Every support for an aerial line shall be of durable material and properly strengthened against forces due to wind-pressure, change of direction of line, and unequal length of span. The factor of safety of such supports shall be at least 4 (four) if of iron, steel, or reinforced concrete, and 6 (six) if of wood, taking into consideration all possible stresses, including wind-pressure at 20 lb. per square foot on plane surfaces and 12 lb. per square foot of diametral plane for cylindrical surfaces.

The distance between distribution-line supports within borough limits shall not exceed 200 ft. except by approval of the Minister.

#### *Location of Overhead Lines.*

10. Except by permission of the Minister of Telegraphs, or subject to an agreement between the Post and Telegraph Department and the Council, all overhead electric lines shall be placed on the opposite side of the street to that on which any telegraph lines exist; and where the erection of the electric lines necessitates the alteration of any telegraph lines, and such alteration is approved by the Minister of Telegraphs, the cost of the alteration shall be borne by the Council.

In running the lines authorized by this license through or along any street where no telegraph line exists the Council shall keep to one side of the street, and in running wires to the opposite side of the street the Council shall arrange so as to interfere as little as possible with the route of any future telegraph lines.

#### *Facilities for Service Connections.*

11. Where electric lines are on one side of the street and electric-telegraph lines on the other, and service is required to be given from either to the other side of the street, the Council and the Minister of Telegraphs shall give to each other reasonable facilities as far as possible to effect supply.

#### *Lines not in Use.*

12. An aerial line shall not be permitted to remain erected after it has ceased to be used for the supply of energy unless the Council intends within a reasonable time again to take it into use.

#### *Post and Telegraph.*

13. Where electric lines are permitted to be supported on telegraph poles all details of the supports and the insulation shall be approved by the Minister of Telegraphs, who may, on giving to the Council reasonable notice in that behalf, require the Council to remove such electric lines at any time from such telegraph poles, and without payment of any compensation to the Council.

Wherever it may be necessary to cross telegraph wires the electric lines shall cross over or under the telegraph wires as may be decided by the Minister of Telegraphs, and shall be at least 2 ft. distant.

Where lead-covered telephone cables are crossed above or below by the electric wires the latter wires shall be insulated with not less than 600-megohm-per-mile grade of vulcanized rubber throughout the crossing-span, and in every such span the maximum tension in the wire shall not exceed one-half the elastic limit of the wire under the conditions of minimum temperature and wind-pressure specified in clause 8.

In cases where it may be required to cross with the low-pressure electric-light wires through any other aerial wires or through cables because of the impracticability of crossing above or below (and crossing shall be effected above or below if possible), all such through crossings, if permitted, shall be