

of diametrical plane occurring simultaneously. The span between supports and the sag shall be determined to conform with the above limiting stresses.

Where an aerial line crosses a street the angle between the line and the direction of the street at the place of crossing shall not be less than 60 degrees, 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.

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 with triple braiding impregnated with waterproof compound; provided that, where circumstances permit, the lines may, with the consent of the Minister, be bare.

Electric lines at high pressure shall be covered with vulcanized rubber of at least 600-megohms grade, provided that where circumstances permit the lines may, with the consent of the Minister, be bare.

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.

#### SUPPORTS FOR OVERHEAD ELECTRIC LINES.

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

All overhead lines at high pressure shall be carried at a minimum height of 19 ft. above the ground.

An aerial wire shall not in any part thereof come within 5 ft., measured horizontally or vertically, from any part of any building or erection other than a support for the line, except where brought into a building for the purpose of supply.

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 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 outside borough limits shall be such that the moment resulting from a wind-pressure of 30 lb. per square foot of plane surface and 18 lb. per square foot of diametrical plane upon a cylindrical surface upon the lines and supports shall not exceed one-half of the applied moment which is sufficient to cripple the support if of iron, steel, or ferro-concrete, and shall not exceed one-fourth of the breaking-stress in the case of wood. The factor of safety of supports within borough limits shall be four in the case of steel, iron, or ferro-concrete, and five in the case of wood, calculated upon the ultimate strength of material under the same conditions of wind-pressure as hereinbefore mentioned.

The distance between supports within borough limits shall not exceed 150 ft., except by approval of the Minister.

#### LOCATION OF OVERHEAD LINES.

8. 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 road or 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 road where no telegraph line exists the Council shall keep to one side of the road, and in running wires to the opposite side of the road the Council shall arrange so as to interfere as little as possible with the route of any future telegraph lines.

#### RAILWAY CROSSINGS.

9. No work of any nature shall be erected or constructed upon, over, or under any part of the New Zealand Government railways until the Council has obtained the consent of the Minister of Railways thereto, as required by section 4 of the Government Railways Amendment Act, 1910 (No. 2).

#### POST AND TELEGRAPH WIRE-CROSSINGS.

10. At telegraph crossings the electric lines shall pass over or under the telegraph wires or cables as may be decided by

the Minister of Telegraphs, and shall be at least 2 ft. distant. Where it is impracticable to cross above or below, the electric lines may be taken through; but when permitted to be taken through, the crossing shall be made at a pole in manner to be approved by the Minister of Telegraphs.

Where the electric lines intersect telegraph lines, the latter shall be suitably insulated if deemed necessary; and when the crossing is above and near a pole the spans on each side of the pole may be insulated. This insulation shall be effected at the expense of the Council in cases where the telegraph lines existed previously to the erection of the electric lines.

Where high-pressure electric lines intersect telegraph lines the former shall be insulated with not less than 600-megohms grade of vulcanized rubber, and the low-pressure wires with weather-proofed insulation as prescribed in clause 6.

Where deemed necessary efficient guard-wires, effectively earthed, shall be erected in a manner to meet with the approval of the Minister of Telegraphs at all crossings or places where electric lines intersect telegraph lines, or at any place where such protection may be considered necessary.

The Council shall bear the expense of such guard-wires in all cases where an electric line intersects any telegraph line previously existing.

Earth wires where led down poles shall be encased for a distance of 8 ft. from the ground.

#### ELECTRIC LINES ON TELEGRAPH POLES.

11. Where electric lines are permitted to be supported on telegraph poles all details of the supports and of 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.

#### SERVICE CONNECTIONS FACILITIES.

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

#### SERVICE CONNECTIONS FROM AERIAL LINES.

13. Service lines shall be taken direct from line-insulators to insulators supported and firmly attached to some portion of the consumer's premises which is not accessible to any person without the use of a ladder or other special appliance. Every portion of any service line which is outside a building and is within 7 ft. of any part of the building shall be rubber insulated.

#### MAINTENANCE.

14. Every aerial line, including its supports, its conductors, and their insulating covering, and all structural parts and electrical appliances and devices belonging to or connected with the line, shall be duly and efficiently maintained by the Council as regards both electrical and mechanical conditions.

#### TRANSFORMERS.

15. Where high-pressure transformers are attached to poles they shall be placed so as to be inaccessible except by the use of a ladder or other special appliance. Where high-pressure transformers are placed in sub-stations, all high-tension conductors shall be thoroughly insulated or protected from accidental contact; and the sub-station shall be entirely inaccessible to unauthorized persons. Where high-pressure transformers are placed on consumers' premises, the whole of the apparatus shall be enclosed or rendered inaccessible except to authorized persons. The cases of all transformers shall be earthed by means of a copper conductor at least 0.022 square inch in section.

#### LIGHTNING-ARRESTERS.

16. Where any portion of any electric line or support for an electric line is exposed to such a position as to be liable to injury from lightning, it shall be efficiently protected against such liability.

#### UNDERGROUND CONDUCTORS.

17. Underground conductors shall be thoroughly insulated, and shall be protected from mechanical damage by steel armouring or by wooden boxing or earthenware, stoneware, concrete, iron, or fibre conduits or pipes. They shall be laid wherever possible under the footpaths and with a cover of at least 12 in. from the surface of the pavement. Where laid under any other part of the road such cover shall be increased to 2 ft.

All conduits, pipes, casings, and street boxes used as receptacles for electric lines shall be constructed of durable material, and they shall be of ample strength to prevent