

*Area of Supply.*

7. The area of supply shall consist of the Borough of Tauranga as at present constituted, together with the Waimapu and Te Puke Ridings of the Tauranga County as at present constituted, such area of supply being indicated within a pink border on P.W.D. 34825, plan A, deposited in the office of the Minister of Public Works at Wellington, in the Provincial District of Wellington.

*System of Supply.*

8. Electrical energy shall be generated in the form of three-phase alternating current at a frequency of 50 cycles per second, and pressure not exceeding 400 volts between phases. This shall be transformed up to 11,000 volts for transmission from the generating-station to the transformer sub-stations.

In the sub-stations it shall be transformed down to 400 volts between phases, and 230 volts between each phase and the neutral for low-tension distribution.

The low-tension distribution shall be on the three-phase four-wire system, one phase wire and the neutral being used for single-phase service.

The supply to street-lighting incandescent lamps and to private consumers for lighting purposes shall be at 230 volts.

*Neutral to be earthed.*

9. The neutral point of one or more of the generators in service shall be earthed.

The neutral point of each secondary distributing system shall be earthed at the transformer.

*Regulation of Pressure.*

10. The pressure shall be maintained within 4 per cent. on lighting-distributing circuits above or below the declared pressure at the consumers' terminals. The Council shall supply a suitable recording voltmeter for this service, and on complaint by any consumer that the variations in voltage exceed 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 variation in voltage are not complied with a breach of these regulations shall have been 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.*

11. All switchboards shall be made of and mounted on material that is not inflammable, and no switchboard conductor shall carry electric current at a density exceeding 1,000 amperes per square inch. No conductor at a pressure above 650 volts shall be exposed on the front of any switchboard, and the back of any switchboard carrying exposed conductors at a pressure over 650 volts shall be screened off and accessible only to authorized persons.

All power-house and sub-station switchboards shall be provided with two efficient and independent earth connections connected in parallel, to one of which all frames, instrument-cases, and other metal parts shall be connected. Means shall be provided for testing the resistance between these two connections through the earth. Such tests shall be made at least once a month and recorded.

*Circuit-breakers.*

12. All outgoing feeders and distributors from any transformer house or sub-station shall be provided with automatic circuit-breakers or fuses set to open at 50 per cent. excess current over the rated full load of such feeder or distributor, with a time-limit not exceeding ten seconds.

*Distribution.*

13. 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, they 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.*

14. Overhead electric lines shall consist of conductors of hard-drawn copper, aluminium, or other material of not less than 0.02 square inch section in spans exceeding 200 ft.,

nor less than 0.0129 square inch section in spans exceeding 100 ft., and not less than 0.0072 square inch in section in spans under 100 ft.

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 32° 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.

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 spans shall be as short as possible. The minimum height of the line shall be 20 ft. above the street-level.

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

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

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

Electric lines at extra high pressure shall be bare.

High-pressure and extra-high-pressure lines shall not be carried on the same poles or supports, except in special circumstances and with the consent of the Minister.

Low-pressure and extra-high-pressure lines shall not be carried on the same poles or supports, except in special circumstances and with the consent of the Minister.

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 20 ft. above the ground.

All overhead lines at extra high pressure shall be carried at a minimum height of 23 ft. above the ground.

At road crossings the above minimum heights shall be increased in each case by 2 ft.

*Telephone Wires on Transmission-line Poles.*

15. The telephone wire or wires shall be of hard-drawn copper or other material, and shall not be less than No. 12 standard wire gauge. The minimum clearance between the lowest point of the span and the ground shall be 18 ft.

The wire shall be suitably guarded against lightning, and shall be fused. Such arrangements shall be made where the telephone is placed as will prevent the possibility of injury resulting to any person using the telephone should a power-wire come into contact with the telephone wire or from leakage.

*Supports for Overhead Lines.*

16. 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 outside borough limits shall be such that the moment resulting from a wind-pressure of 30 lb. per square foot and 18 lb. per square foot of diametral 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 the 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 200 ft. except by approval of the Minister.

*Location of Overhead Lines.*

17. 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