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**NEW ZEALAND ELECTRICAL**

**CODE OF PRACTICE**

**for**

**ELECTRICAL SAFE DISTANCES**

NZEC 34:2001

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**for**

**ELECTRICAL SAFE DISTANCES**

Issued by:  
Manager, Standards and Safety,  
Ministry of Consumer Affairs,  
Wellington, New Zealand

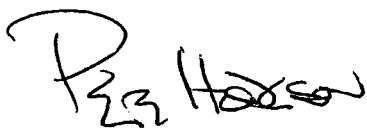
## THE ELECTRICITY ACT 1992

### **Approval of the New Zealand Electrical Code for Practice for Electrical Safe Distances 2001 (*NZCEP 34:2001*) and the revocation of the New Zealand Electrical Code of Practice for Electrical Safety Distances 1993 (*NZCEP 34:1993*)**

Pursuant to section 38 of the Electricity Act 1992, I hereby revoke the New Zealand Electrical Code of Practice for Electrical Safety Distances 1993 (*NZCEP 34:1993*) and approve the New Zealand Electrical Code of Practice for Electrical Safe Distances 2001 (*NZCEP 34:2001*).

The New Zealand Electrical Code of Practice for Electrical Safe Distances 2001 (*NZCEP 34:2001*) was published by the Manager, Standards and Safety, Ministry of Consumer Affairs, acting under delegated authority (*pursuant to section 41 of the State Sector Act 1988*) from the Chief Executive, Ministry of Economic Development on the 3<sup>rd</sup> day of August 2001.

Dated this 21<sup>st</sup> day of December 2001.



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Minister of Energy

## **COMMITTEE REPRESENTATION**

This Code of Practice was prepared by the Ministry of Consumer Affairs, in consultation with the following:

The Building Industry Authority  
Transpower New Zealand Ltd  
Electricity Engineers' Association of NZ (Inc)  
Institution of Professional Engineers NZ  
Tranz Rail Ltd  
Telecom NZ Ltd  
Telstra Saturn

## **REVIEW**

This Code of Practice will be revised as occasions arise. Suggestions for improvements of this Code are welcome. They should be sent to the Manager, Standards and Safety, Ministry of Consumer Affairs, PO Box 1473, Wellington.

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## INTRODUCTION

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This Electrical Code of Practice (Code) sets minimum safe electrical distance requirements for overhead electric line installations and other works associated with the supply of electricity from generating stations to end users.

The minimum safe distances have been set primarily to protect persons, property, vehicles and mobile plant from harm or damage from electrical hazards. The minimum distances are also a guide for the design of electrical works within substations, generating stations or similar areas where electrical equipment and fittings have to be operated and maintained.

The Code has been designed to include, in its various sections, requirements that were previously contained in the Electricity Regulations 1997 (the Regulations). Compliance with this Code is mandatory.

- **Section 1** is a general section, including this Code's scope, interpretation and glossary.
- **Sections 2 and 3** cover the safe distance requirements for building works and excavation near overhead electric line support structures. It also covers the construction of buildings and other structures near conductors and the installation of conductors near existing buildings and similar structures.
- **Section 4** covers the requirements for maintaining safe distances between conductors and the ground and water, including restrictions on material being deposited under or near conductors.
- **Section 5** covers the responsibilities of parties who work or operate mobile plant near overhead electric lines and other electrical works.
- **Sections 6 – 8** cover the requirements for safe design and installation of overhead electric and telecommunications systems and other electrical works and ~~controls on access to conductors.~~
- **Section 9** covers minimum safe approach distance requirements for persons working near exposed live parts.
- **Section 10** covers the responsibilities of owners of electricity supply works for inspection and maintaining records.

## SECTION 1

### SCOPE, INTERPRETATION, GLOSSARY AND GENERAL

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#### 1.1. SCOPE

1.1.1 This Code covers safety issues, in so far as they relate to safe distances to overhead electric lines, telecommunication lines, line equipment and fittings, and personnel working on or near to such lines equipment.

1.1.2 This Code sets out minimum requirements in respect of the following matters:

- (a) Excavations or construction near overhead electric line supports;
- (b) Limits for construction near conductors;
- (c) Limits for the installation of conductors near existing buildings and similar structures;
- (d) The separation and height of conductors above ground etc;
- (e) The separation of overhead telecommunications lines and conductors;
- (f) Overhead electric line access, supports and stays;
- (g) Limits on material deposited or placed under or near an overhead electric line;
- (h) Operation of mobile plant near conductors;
- (i) Safe distances for the design of substations, switchyards and switchboards;
- (j) Minimum approach distances to exposed live parts; and
- (k) Inspection and records.

1.1.3 The content of this Code does not exempt any person from compliance with any statutory requirements in respect of the matters in clause 1.1.2.

1.1.4 This Code does not apply to:

- (a) Distance limits for large loads (e. g. buildings and over-dimension loads) travelling down roads.
- (b) Optical fibre ground wire or optical fibre cables that are contained in or wrapped around any conductor.
- (c) Hazards from trees.

#### 1.2. INTERPRETATION

The Electricity Act 1992 and the Electricity Regulations 1997 contain definitions that are to be used in conjunction with this Code. These include: associated equipment; direct contact; electrically safe; exposed conductive part; fittings; high voltage; indirect contact; insulated; live or alive; live part; low voltage, and works.

In this Code, unless the context otherwise requires:

1.2.1 **Bare conductor** - means a conductor without covering or not insulated.

1.2.2 **Competent employee** – means an employee who can demonstrate to their employer, at any time, that they have the necessary knowledge, skills and experience to carry out electrical or telecommunications work in the vicinity of overhead electric lines, or exposed live metal, safely and to the standards used by the employer.

1.2.3 **Conductor** – means a wire, cable or form of metal designed for carrying electric current but does not include the wire of an electric fence.

1.2.4 **Distance** (for conductors) - unless otherwise specified, means the distance under the worst case

combination of maximum sag, load current, solar radiation, climatic conditions, etc, and in which the conductor creep process is complete (in the case of a line crossing another line, the worst case is that which results in the minimum spacing between the two lines).

- 1.2.5 **Mobile plant** - means cranes, elevating work platforms, tip trucks or similar plant, irrigation booms, any equipment fitted with a jib or boom and any device capable of being raised and lowered.
- 1.2.6 **Overhead electric line** – means conductors and support structures.
- 1.2.7 **Telecommunication line** - means any overhead wire or wires or conductors of any kind (including a fibre optic cable) used or intended to be used for the transmission or reception of signs, signals, impulses, writing, sounds or intelligence of any nature by means of any electromagnetic system. It includes any pole, insulator, casing, fixture, or other equipment used or intended to be used for supporting, enclosing, surrounding, or protecting any such wire or conductor; and also includes any part of a line.
- 1.2.8 **Traction systems** - means any overhead conductor or fitting for any train, locomotive, tram, trolley bus or electric overhead travelling crane.

### 1.3. GLOSSARY OF ABBREVIATIONS USED IN THIS CODE

a.c.	Alternating current
d.c.	Direct current
LV	Low voltage
kV	Kilovolts
m	Metres
mm	Millimetres
V	Volts

## **SECTION 2**

### **MINIMUM SAFE DISTANCES FOR EXCAVATION AND CONSTRUCTION NEAR OVERHEAD ELECTRIC LINE SUPPORTS**

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#### **2.1 GENERAL**

- 2.1.1 This section outlines the requirements for building or excavation near overhead electric line support structures (towers, poles and stay wires). The minimum safe distances are designed to limit the chance of damage or hazards being created by the building or excavation. The minimum distances also ensure that the support structures can be accessed for inspection and maintenance.
- 2.1.2 Excavations and other works near overhead electric line supports can compromise the structural integrity of the overhead electric line.
- 2.1.3 Metallic or conducting paths near overhead electric line supports can transfer voltage potentials that could create step and touch currents during earth fault conditions.
- 2.1.4 Any consent and associated conditions given under this section shall be reasonable, and shall not be unreasonably withheld.

#### **2.2 EXCAVATION NEAR OVERHEAD ELECTRIC LINE SUPPORTS**

- 2.2.1 Subject to clause 2.2.2, prior written consent of the pole owner shall be obtained for any excavation or other interference with the land near any pole or stay wire of an overhead electric line where the work:
- (a) is at a greater depth than 300mm within 2.2 m of the pole or stay wire of the line; or
  - (b) is at a greater depth than 750 mm between 2.2 m and 5 m of the pole or stay wire; or
  - (c) creates an unstable batter.
- 2.2.2 Clause 2.2.1 does not apply to vertical holes, not exceeding 500 mm diameter, beyond 1.5 m from a pole or stay wire.
- 2.2.3 Prior written consent of the tower owner shall be obtained for any excavation or other interference with the land near any tower supporting an overhead electric line where the work:
- (a) is at a greater depth than 300 mm within 6 m of the outer edge of the visible foundation of the tower; or
  - (b) is at a greater depth than 3 m between 6 m and 12 m of the outer edge of the visible foundation of the tower; or
  - (c) creates an unstable batter.
- 2.2.4 Nothing in clauses 2.2.1 - 2.2.3 applies in respect of normal agricultural cultivation or the repair, sealing, or resealing of the existing surface of any road, footpath, or driveway.
- 2.2.5 Figures 1 and 2 provide a quick reference to the minimum safe distances for excavation near overhead electric line supports.

#### **2.3 INSTALLATION OF CONDUCTIVE FENCES NEAR OVERHEAD ELECTRIC LINE SUPPORTS**

- 2.3.1 Fences of conductive materials shall not be attached to any tower or conductive pole of a high voltage overhead electric line.
- 2.3.2 Fences of conductive materials should not be constructed within 2.2 m of any tower or conductive pole of a high voltage overhead electric line between 1 kV - 50 kV.
- 2.3.3 Except with the prior written consent of the overhead electric line owner, fences of conductive

materials shall not be constructed within 5 m of any tower or conductive pole of a high voltage overhead electric line of 66 kV or greater. As part of the consent, the overhead electric line owner may prescribe the design of any such fence to be constructed within this 5 m distance.

- 2.3.4 Where the construction of an overhead electric line would cause a contravention of the principles of clause 2.3.3, the line owner shall, at the line owner's cost, carry out an engineering study and undertake such remedial work as is necessary to maintain electrical safety.
- 2.3.5 Figures 1 and 2 provide a quick reference to the minimum safe distances for installation/construction of conductive fences near overhead electric line supports.

#### **2.4 CONSTRUCTION OF BUILDINGS AND SIMILAR STRUCTURES NEAR OVERHEAD ELECTRIC LINE SUPPORTS**

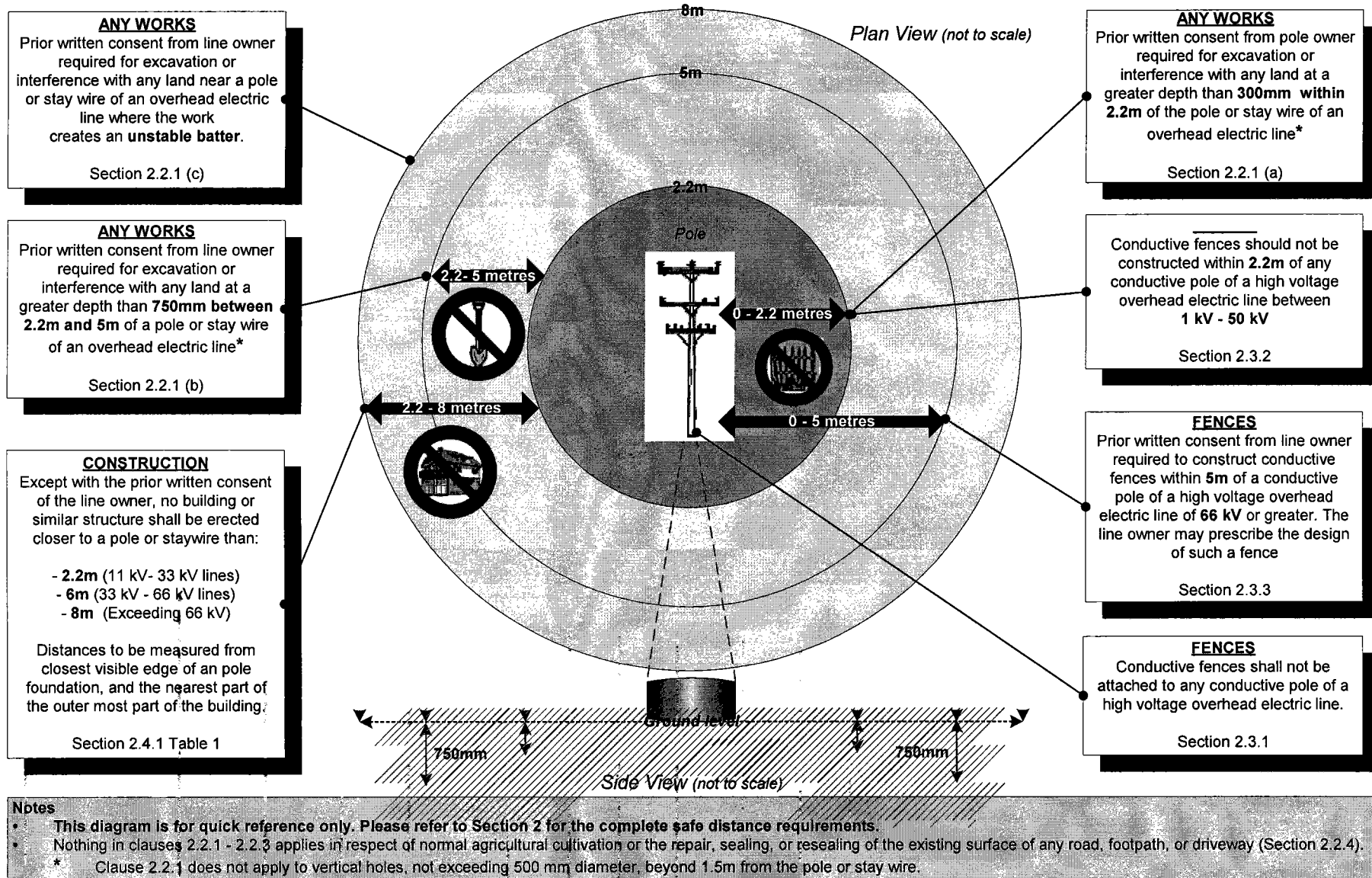
- 2.4.1 Except with the prior written consent of the overhead electric line owner, no building or similar structure shall be erected closer to a high voltage overhead electric line support structure than the distances specified in Table 1. The distances in Table 1 are to be measured from the closest visible edge of the overhead electric line support foundation, and the nearest part of the outermost part of the building. Refer to section 3 of this code for minimum safe distances between buildings (and other structures) and conductors.

**TABLE 1 MINIMUM SAFE DISTANCES BETWEEN BUILDINGS AND OVERHEAD ELECTRIC LINE SUPPORT STRUCTURES**

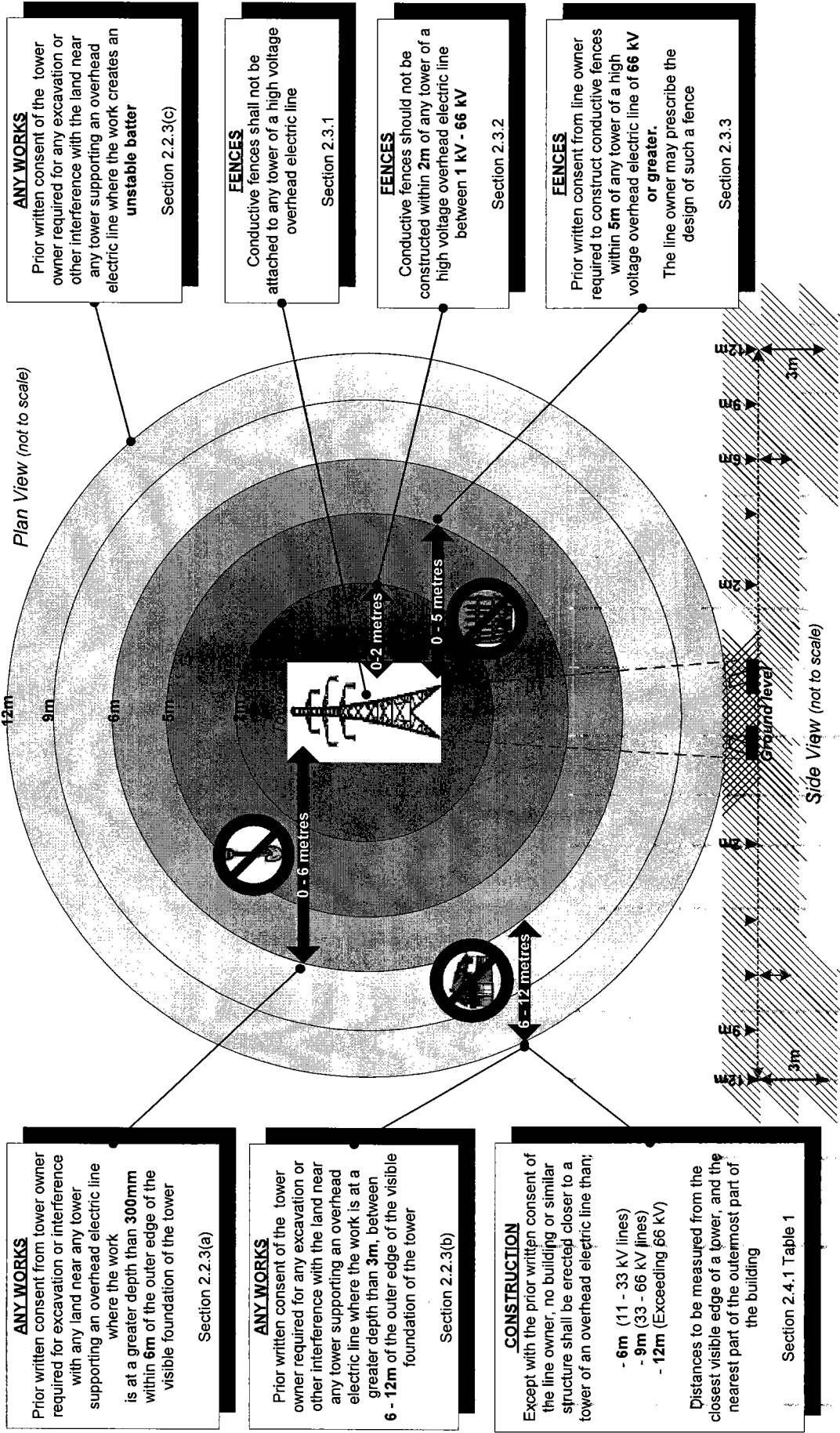
<b>Circuit Voltage</b>	<b>Pole</b>	<b>Tower (pylon)</b>
11 kV to 33 kV	2 m	6 m
Exceeding 33 kV to 66 kV	6 m	9 m
Exceeding 66 kV	8 m	12 m

- 2.4.2 Figures 1 and 2 provide a quick reference to the minimum safe distance requirements for the construction of buildings and other structures near overhead electric line supports.

**FIGURE 1 MINIMUM SAFE DISTANCES FOR EXCAVATION AND CONSTRUCTION NEAR POLES OR STAY WIRES**



**FIGURE 2** MINIMUM SAFE DISTANCES FOR EXCAVATION AND CONSTRUCTION NEAR TOWERS



This diagram is for quick reference only. Please refer to Section 2 for the complete safe distance requirements. Nothing in clauses 2.2.1 - 2.2.3 applies in respect of normal agricultural cultivation or the repair, sealing, or resealing of the existing surface of any road, footpath, or driveway (Section 2.2.4).