Inappropriate development can pose a significant risk to the operation of the National Grid. Electrical and physical hazards due to development and land use can result in line faults or power outages, which have flow on effects for the security of the network. This ultimately affects the operation of the overall electricity system and can be inconvenient and expensive not only to Transpower but to consumers. The main issues are:

- risks of electrical hazard
- risks to National Grid towers and poles
- blocking off access to support structures
- noise, visual effects and inconvenience of landowners and occupiers.

Quick tip...

For more information, or if you have any questions, call us on 0508 526 369 (LANDOWNER)
Risks of electrical hazards

Electrical hazards and shocks can occur due to either direct contact with National Grid lines, or via a ‘flashover’ where electricity jumps the gap across from the conductor to another object or structure (such as an aerial on a house or a house).

Buildings and structures

Building too close to National Grid lines (including their support structures), and not meeting the required separation distances, can create unsafe situations and increase the risk of electrical hazards to people and property.

Not just buildings are at risk. Other structures, for example, fences, retaining walls, light poles, signs or goal posts, can also increase the risks of electrical hazards. Long runs of metal and wire fencing parallel to National Grid lines can also increase risks as the hazardous voltages can be transferred from the lines to the fence or other structure.
Earthworks

Earthworks under or near to National Grid lines can reduce safe separation distances between the ground and the lines. In the image below, the work around the monopole structure has reduced the safety clearance between the conductors and ground, causing a potential hazard to traffic passing along the new road.

Dust

Dust from construction or day-to-day activities can adversely affect the functioning of the lines and can cause flashovers. Industries that involve particulate or hot gas emissions (such as cement plants and quarries), major earthworks and particularly corrosive emissions can create major issues for National Grid lines, including reducing insulator performance and increasing the risk of flashovers.
Mobile plant/machinery

Use of mobile plant (such as cranes, forklifts, front-end loaders and irrigators) can also pose a hazard to both the lines and the safety of the operators. Work that requires large heavy machinery or mobile plant can also create dangerous situations if safe separation distances are breached. All mobile plant must remain a minimum of 4 metres from the lines at all times.

People

National Grid lines carry high voltage electricity. It is extremely important that people working around National Grid lines are aware of the lines and the safe separation distances that need to be maintained between themselves, the tools or equipment they are using, materials they are holding or moving and the conductors (wires). The New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34) sets out safe separation distances for people working near overhead lines. For people working near National Grid lines, the minimum safe approach distance limits are:

- for 110 kV lines and below – 4 metres.
- for 220 kV lines and above – 6 metres.

If you are unsure of the voltage of any line, we recommend you maintain a 6 metres distance from the conductors.
**Trees and vegetation**

Planting trees too close to National Grid lines can increase risks of electrical hazards and may cause a fault that will affect the operation of the line, injury or death to someone near the tree, or damage to land and property.

If trees touch high voltage conductors or a flashover occurs, dangerous voltages may arise in the area around the tree or on the tree itself. High voltage electricity flowing into trees can also cause trees to ignite. The effect of a tree fire can be very severe in rural and forest areas, as well as threatening human and animal life.

Refer to Section 10 of this guide for additional advice on planting near the National Grid.

**Other activities**

Although open space and recreation activities are often preferred and recommended as the best use of land under the lines, some activities, such as kite flying, use of model aeroplanes and drones, boating and fishing, must be avoided around the lines due to the electrical hazards. Structures such as children’s playgrounds also need to be located safe distances from the lines and conductors.
**Risks to National Grid support structures**

Development and activities too close to National Grid support structures can also affect the structural integrity of the support structures. Earthworks (any kind of soil disturbance, including drilling) too close to towers or poles, or the diversion of water, can physically undermine the stability of towers or poles.

Direct contact with National Grid conductors and structures can also cause structure failure. There have been examples where towers have been driven into, or trees have fallen on the line, weakening the support structure and risking collapse.

![Examples of development too close to transmission lines and the consequences of not keeping clear of the structure.](image)
Constraints on access

Property boundaries through subdivision and new buildings and structures can constrain or block vehicle access to the lines. Access is required for inspection and maintenance activities. Constrained access can result in increased time, effort and cost of line inspections and patrols, and routine maintenance work. This can also result in inconveniences to landowners as well as to Transpower.

Noise and visual effects

National Grid lines can emit noise, especially in damp weather, so people in buildings too close to the lines may be affected by this. Similarly, National Grid lines, and especially their support structures, can be visually unattractive.

Conductors swinging in the wind can worry those living below, and rainwater collects on and drips from them. Setbacks can help manage or reduce these effects.

The visual impact of the structures is often less of a concern in areas of commercial or industrial development due to the scale and character of such areas.

For more information on the location of building platforms refer to Sections 4-5 on subdivision and redevelopment.

In these images, development around National Grid structures has constrained access to them.

We are here to help.

Contact Transpower to discuss your proposal: transmission.comidor@transpower.co.nz