

A GUIDE TO WORKING SAFELY AROUND VECTOR'S ELECTRICITY, GAS AND COMMUNICATIONS NETWORKS.

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CREATING A NEW
ENERGY FUTURE

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WORKING SAFELY

VECTOR IS LEADING THE TRANSFORMATION OF THE ENERGY SECTOR TO CREATE A NEW ENERGY FUTURE.

We're identifying and developing options that will provide value, choice and service for our customers throughout New Zealand and deliver sustainable shareholder returns.

We are New Zealand's largest distributor of electricity and gas, owning and operating networks that span the Auckland region. We are focused on meeting the energy needs of more than 553,000 customers across the country.

Our smart metering business has deployed more than 1 million meters throughout New Zealand, and in 2016 we expanded into Australia.

Through Vector Communications we build, monitor and maintain our own fibre network for businesses who demand fast, reliable and secure data networks.

We have just under 800 staff and employ more than 1,000 contractors. With a strong record of health, safety and environmental leadership, our aim is to keep all contractors, customers and the public safe around our network.

We encourage you to read this document first to ensure you keep yourself and others safe before you dig on private or public property or work near overhead lines or other equipment above ground.

We're sure that you'll agree with us that safety for yourself, your co-workers and the public is the responsibility of everyone on a work site.

YOUR LEGAL REQUIREMENTS

The WorkSafe Excavation Safety Good Practice Guideline has minimum safe work practices for carrying out any work near all underground and overhead pipes, power, communications lines and any other utility services. Another useful document is WorkSafe's Guide for Safety with Underground Services.

All underground services must be located and confirmed, by way of industry recognised techniques including hand digging and hydrovacing, before any excavation can be carried out with machinery.

Other laws and regulations specifying safe working practices to be followed are:

- Electricity Act 1992 and amendments.
- Gas Act 1992 and amendments.
- Health and Safety at Work Act, 2015.
- NZECP34:2001 Electrical Safe Distances.
- Health and Safety in Employment (Pipeline) Regulations 1999.
- Electricity Safety Regulations 2012.

If we consider that anyone has breached any of the above laws and regulations we may refer the matter to WorkSafe for investigation. Vector has a duty to report notifiable events to WorkSafe. Vector may also take legal action to recover both the cost of repairs and the cost of lost business from any party responsible for damaging our network.

BEFORE STARTING WORK

- Before starting any work you must obtain reference maps that show the approximate location of our underground electricity, gas and communications cables and pipes. Please call 0508 VECTOR (0508 832 867) for these maps.
- For work near power poles, overhead lines, pipes or cables please call 0508 VECTOR (0508 832 867). You may need a Close Approach Consent, High Load Consent or electricity, gas and communications service disconnection.

PLANNING YOUR WORK

Please allow enough time to plan your work. As a rule of thumb you should allow:

- two working days for reference maps and temporary electricity service disconnections
- up to two working days for on-site advice and Close Approach Consent
- up to five working days for High Load Consents
- up to 15 days for service disconnections

THE DANGERS



If you hit an electricity cable or overhead power line there is a risk of:

- fatal electrocution or critical injury
- flashover causing serious burns
- cable explosion
- fire
- loss of critical supply to hospitals, medically dependant customers and businesses

If an electricity cable is cut by an excavator, or contact is made with an overhead line, anyone touching metal parts of the machine may receive an electric shock.

Electricity can also travel through the ground, or any metal object in contact with the ground, causing the neighbouring ground to become live.



If you hit a natural gas pipe there is a risk of:

- gas igniting, causing serious harm to life and property
- gas accumulating in adjacent buildings with the potential to explode

The force of escaping gas from a high pressure pipeline can also cause serious personal injury and damage.

Please note that any electronic equipment in the vicinity, including mobile phones, could cause the escaping gas to ignite.



If you hit a communications cable there is a risk of:

- loss of eyesight from viewing laser light directly from the broken cable
- disruption to signalling or cutting off monitoring or control from an electricity substation
- injury from the brittle glass used in the cables which can break easily
- interruption of critical communications services

SAFETY WHILE DIGGING

Before you begin any digging work you should find out where Vector's electricity, gas and communications cables and pipes are. Overhead lines in the area doesn't automatically mean an absence of underground cables.

Please note that our cables and pipes are laid at different depths in the ground. These may vary from just under the surface to over 1200mm deep. Customer service pipes are generally between 300mm and 1000mm deep.

We cannot guarantee the depth of any cable or pipe because alterations to the ground cover may reduce or increase the depths. We recommend that you do not rely on finding buried marker tape when you dig, as this may not be present if the cable or pipeline was installed by a directional drill or thrusting.

Please **do not** use toothed excavator buckets when digging close to underground assets.



Step 1: Obtain reference maps

Visit www.beforeudig.co.nz to request plans at least two working days before you begin work. We'll then email you the free reference maps that indicate the approximate location of underground cables and pipes.

Please note that these reference maps are valid for 28 days from the date of issue; new maps have to be requested after 28 days.

The accuracy of our maps cannot always be guaranteed as road re-alignment, reconstruction, alterations to ground cover and property boundaries can all affect accuracy. This means that you will have to confirm the location of our cables and pipes within your work site before you begin any work.

Step 2: Locate assets in relation to your worksite

If your worksite is indicated within 10 metres of our cables or gas pipes you must carry out a cable/pipe location to identify the approximate location of the cables or pipes

Use the maps, and a pipe or cable underground locator to ascertain if your proposed worksite is near our electricity cables or gas pipes



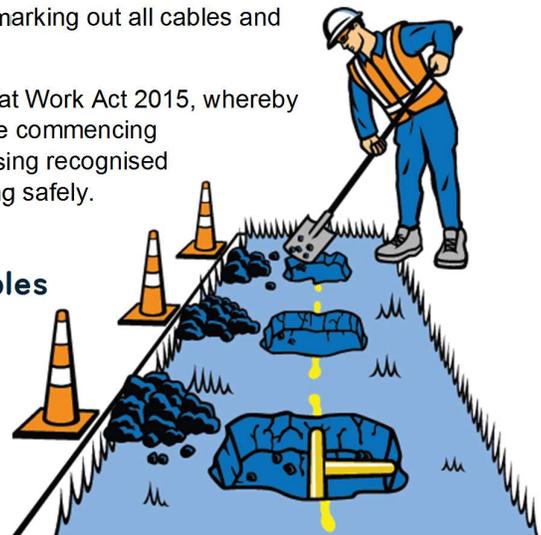
Step 3: Mark out the approximate locations of cables and pipes

Use the reference maps obtained as a guide for locating and marking out all cables and pipes within your work site.

Please note your responsibilities under the Health and Safety at Work Act 2015, whereby you must establish the location of underground services before commencing excavation. You must also locate the services by 'potholing' using recognised techniques to expose cables and pipes and to continue working safely.

Step 4: Confirm the physical location of cables and pipes by pot holing

Potholing requires using recognised hand digging and/or hydrovacating techniques to expose the cables and pipes. These techniques are less likely to result in a strike on the services that causes serious damage to cables and pipes. For your own safety you must pothole with caution. If you damage a cable or pipe please report this immediately to Vector by calling 0508 VECTOR (0508 852 867).



Remember to check for other services coming off a main such as water and private service cables and pipes.

Step 5: Use a designated Safety Observer

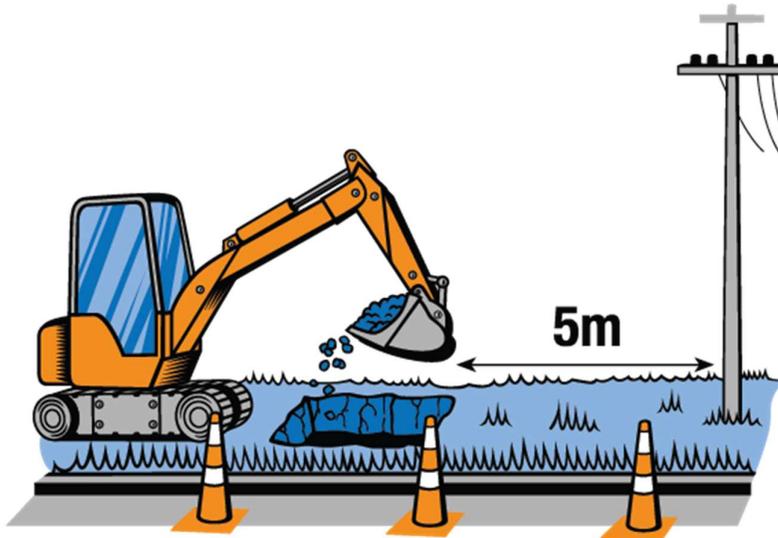
All works within 2 metres of subtrans electrical cables and strategic gas pipes. A competent safety observer (a person with the skills, knowledge and experience deemed competent by the PCBU employing them) needs to be employed for monitoring excavation safety around our assets.

Step 6: Continue Working safely

- If you discover marker tape or protective covering for unmarked cables, you must pothole to expose the cable.
- Always assume that cables are live until confirmed otherwise by a Vector representative.
- If you want to lift, lower, sift or remove any cable or expose a cable so that more than one meter is supported, specialist involvement is required by Vector's relocations team.
- Backfill should be a recommended stone free soil or approved thermal backfill.
- Don't forget to put mechanical protection and warning tape back when reinstating.

Excavating Near Power Poles

- Do not dig within five metres of one of Vector's power poles without a **Close Approach Consent** as this could cause the power pole to collapse.
- We will provide guidance and on-site advice where necessary.



Close Approach Consents

For safety reasons, Close Approach Consents are required for:

- all works within 2 metres of subtrans electrical cables and strategic gas pipes
- all works within 4 metres of overhead lines
- excavating within five metres of a power pole or within 12m of a tower or pylon
- all excavation works within 2 metres of any other type of electrical cable or gas pipe, you must follow the "Safety While Digging" guidelines in this guide
- excavating within 5 metres of a Distribution Sub Station and 10 metres within a Zone Substation
- working within four metres of overhead lines
- all work above overhead lines

You must contact us (0508 VECTOR 0508 832 867) if any subtrans cables or strategic gas pipes are shown on the maps you have requested. This is to determine whether on-site advise, a standover or a Close Approach Consent is required and, if so, to arrange it.

You must not use any mechanical excavator within one metre of strategic cables or pipes – you must hand dig. Exceptions to this are only permitted if the excavation technique is expressly provided for in the Close Approach Consent.

Please note that Close Approach Consents are only valid for the dates applied for and the location and type of works agreed to on the consent.

Safe Digging Summary

In summary, key action points to note to ensure safe digging are:

1. Obtain reference maps from us before you start work. Please call 0508 VECTOR (0508 832 867).
2. If our maps show electricity, gas or communications cables or pipes you must locate them before you start work.
3. Pothole using recognised techniques to expose cables and pipes.
4. The actual location and depth of cables and pipes can differ from what's on Vector's maps because other earthworks can change these.
5. Watch out for customer services coming off the mains.
6. Follow the WorkSafe's Guide for Safety with Underground Services [and](#) Excavation Safety Good Practice Guideline.
7. Recommended backfilling material must be used.
8. You will be advised if you need a Close Approach Consent or provided on-site advice.
9. You must obtain a Close Approach Consent for all excavations within five metres of a pole.

WORKING SAFELY NEAR OVERHEAD LINES

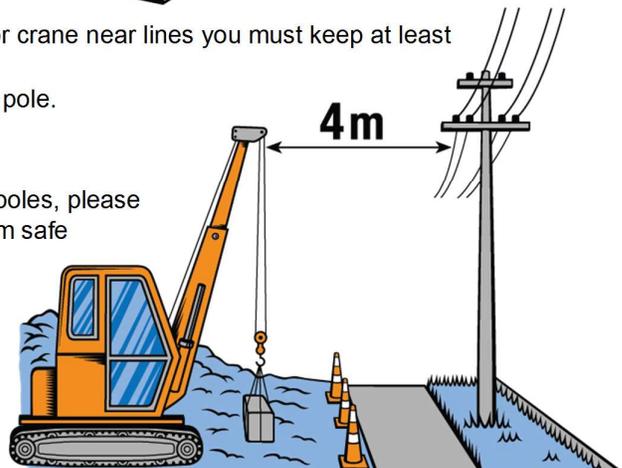
When working near overhead lines and power poles, keep a careful watch and make sure that you maintain a safe working distance from overhead lines at all times.



- When operating machinery such as a digger or crane near lines you must keep at least four metres clear of overhead power lines.
- Do not excavate within five metres of a power pole.

When planning to work near overhead lines or power poles, please note that you are legally required to follow the minimum safe distances set by the New Zealand Electrical Code of Practice – NZECP 34:2001 Electrical Safe Distances.

All work activity must be kept at least four metres from overhead power lines. If you need to work closer, you must obtain a Close Approach Consent which will take two working days to process.



Building near Overhead Lines



Please ensure that structures, such as garages and extensions to houses, remain well clear of overhead lines.

Minimum distances allowed between any new buildings and overhead lines have been set by the New Zealand Electrical Code of Practice NZECP 34:2001. Please note that the minimum safe distances will differ depending on the voltage of the overhead lines.

To find out the voltage of the lines that you are planning to build near to, please call 0508 VECTOR (0508 832 867).

If your works do not comply with Table 2 of NZECP 34:2001 (see below), specialist engineering advice will be required to confirm that the works comply with Table 3 of NZECP 34:2001 (see page 11 of [The New Zealand Code of Practice for Electrical Safe Distances](#)). We do not provide specialist engineering advice but we are able to recommend providers if you call us on 0508 VECTOR (0508 832 867).

Please note that any work **above** an overhead line requires a consent.

| Minimum safe distances from buildings to overhead lines | | |
|---|---|--|
| Voltage |  Minimum distance beneath powerlines |  Minimum distance to side of powerlines |
| Not exceeding 1kV | 4.0m | 3.5m |
| Exceeding 1kV but not exceeding 11kV | 5.5m | 5.0m |
| Exceeding 11kV but not exceeding 33kV | 7.0m | 8.5m |
| Exceeding 33kV but not exceeding 110kV | 7.5m | 9.5m |
| Exceeding 110kV | Refer to Table 2 of NZECP34 | |

Temporary Electricity Disconnection service

Repairs to roofing, spouting, painting, water-blasting, tree trimming and scaffolding may be dangerous if carried out close to overhead service lines - the lines connecting a home or business to the lines and poles in the street.

To stay safe, we recommend you call us on 0508 VECTOR (0508 832 867) to have the power temporarily disconnected when working near overhead service lines.



Please allow two working days to process the temporary disconnection request. This service is free on private properties.

Working Safely near Overhead Lines and other equipment above ground - Summary

In summary, key action points to note when working near overhead lines and other equipment above ground are:

1. Note the position of all overhead lines and power poles on a work site and in the area.
2. Follow the four metre rule: all work activity must be kept at least four metres from overhead lines. Obtain a Close Approach Consent if you need to work closer. Please call 0508 VECTOR (0508 832 867)
3. Do not excavate within five metres of a Vector power pole or 12m of a tower or pylon, get a Close Approach Consent if you need to dig closer.
4. Close Approach Consents take two working days to process.
5. Follow the NZECP 34:2001 Electrical Safe Distances when building near overhead lines. For more information, visit www.energysafety.govt.nz.
6. If you are working near overhead electricity service lines or a service connection, have the power temporarily disconnected before you start work.

REMOVAL OR DEMOLITION OF A BUILDING

Please note that you will have to organise the disconnection of both gas and electrical connections before removing or demolishing a building.



For free electrical and communications disconnection requests, please call 0508 VECTOR (0508 832 867) and allow two working days to process the request.



For gas disconnection requests please contact your gas retailer. If you don't know who the gas retailer is, please call us 0800 VECTOR (0800 832 867) and allow 10 working days to process this request. Charges may apply for this service.



TRAVELLING WITH HIGH LOADS

You must apply for a High Load Consent if you plan to move a tall structure, such as a house or a boat, with a height that is 4.25m or greater.

Please call 0508 VECTOR (0508 832 867) and allow up to five working days to process the consent. We recommend that you also check with your local telecommunications company about the height of their lines as well.

The table below summarises all possible scenarios when travelling with high loads:

| Height (m) | Conditions |
|----------------|---|
| 4.25 – 5.0 | <ul style="list-style-type: none"> You will need to obtain written permission from us and any other owners of overhead obstructions that the load or vehicle can't clear safely. |
| Over 5.0 – 6.5 | <ul style="list-style-type: none"> Along with the above conditions, you will also need a permit from the Over-dimension Permit Issuing Agency (OPIA). 0800 OVERSIZE (0800 683 774) |
| Over 6.5 | <ul style="list-style-type: none"> Along with the above conditions you will also need written approval from the Transport Agency. |

* If a disconnection is necessary, a 15 day notice period is required so that Vector can inform customers who will be affected.

WHAT TO DO IN AN EMERGENCY



If you hit an electricity cable or overhead power line:

- Treat the cable or overhead line as live – jump well clear and get back at least 10 metres.
- Evacuate the immediate area.
- If you are in a machine, stay there.
- If you are at serious risk from another hazard, such as fire, and must leave the machine, jump well clear. Do not touch metal surfaces, or the machine and ground at the same time.
- Leave damaged cables exposed for us to fix.
- Call us immediately on 0508 VECTOR (0508 832 867).
- In the event of an electric shock don't touch the person until you are certain the source of electricity has been removed. Call 111.





If you hit a natural gas pipe:

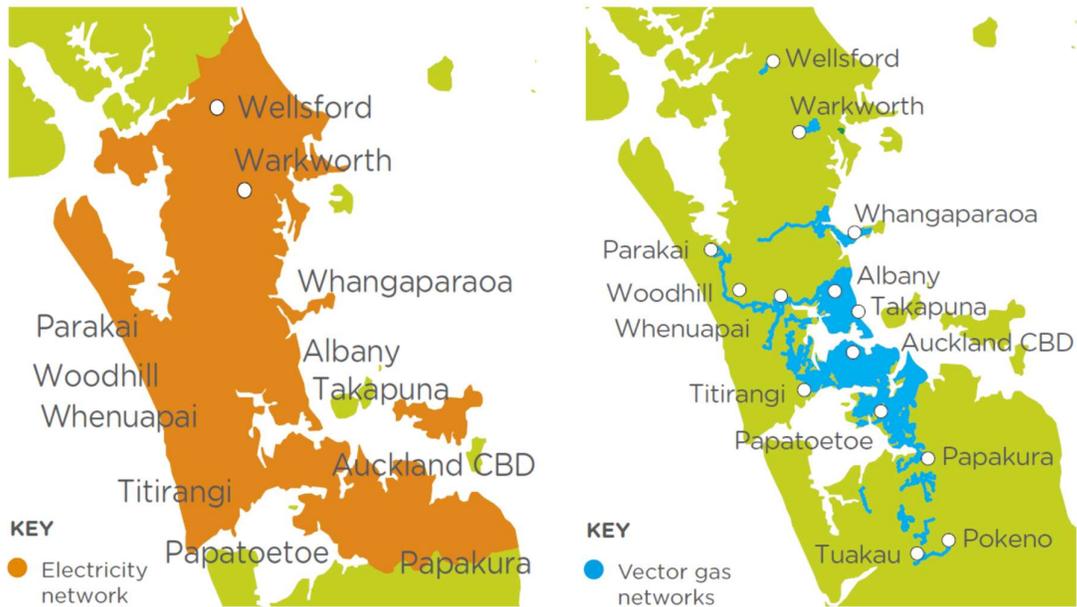
- Switch off all machinery and remove all sources of ignition, including mobile phones and cameras.
- Do not smoke.
- Move at least 20 metres away and call the fire service on 111.
- Evacuate the immediate area.
- Leave the damaged pipe to vent, keeping it open and free from any materials or equipment.
- Turn all vehicles off and leave where they are.
- Leave any ignited gas fires to burn.
- Move away if you are near fumes; do not inhale fumes.
- Call us immediately on 0800 764 764.



If you hit a communications cable:

- Do not look directly at the cable as laser light may damage eyesight.
- Leave damaged cable exposed for us to fix it.
- Call us immediately on 0800 826 436 (select option 1, then select option 2 for Vector Communications).

Our Electricity and Gas Network Coverage



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