

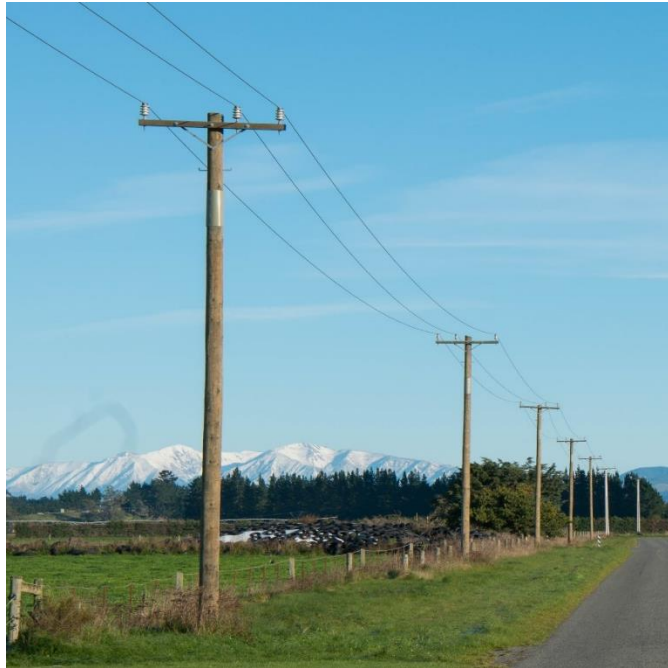
# Close Approach to Power Lines

# About MainPower

- Delivering electricity to North Canterbury and Kaikoura
- Build and maintain an efficient and safe electricity network
- Transport electricity from 5 Transpower grid exit points to over 39,000 homes and businesses
- Charge electricity retailers for delivering electricity to consumers




# MainPower has responsibility for overhead and underground networks



# MainPower has a responsibility for keeping the electricity on





# Keeping Safe Around Electricity

# Electricity is a serious hazard

Overhead distribution lines:

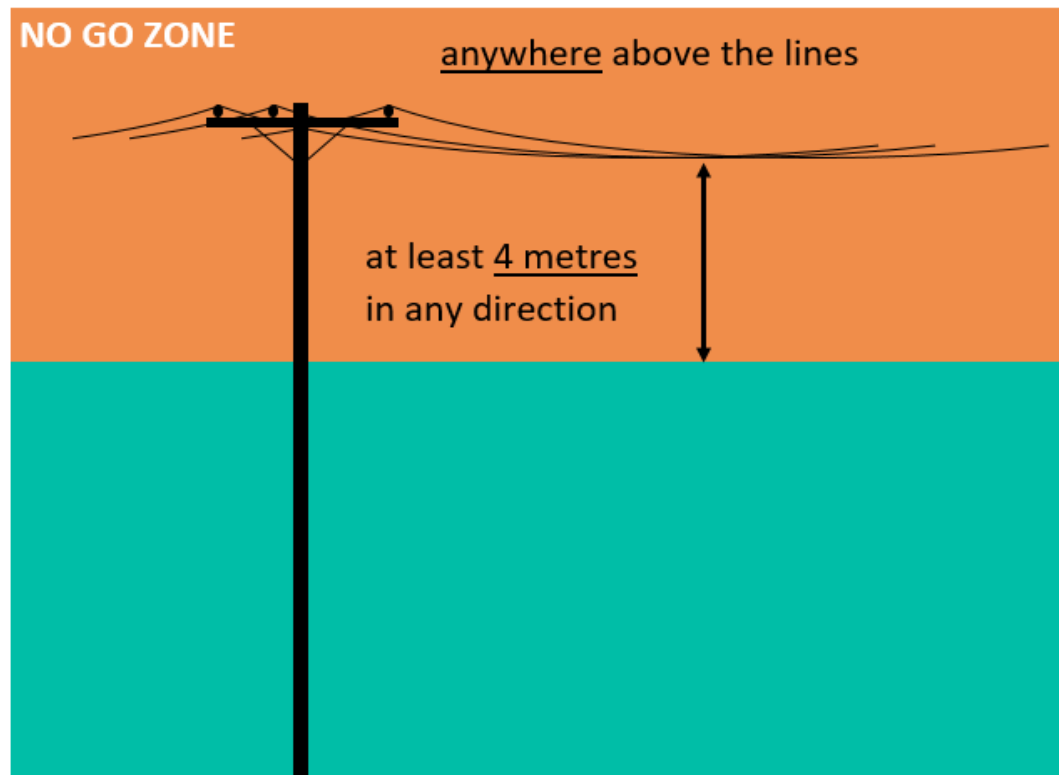
- Carry very high voltages - up to 66,000 volts
- Rely on an “air gap” to keep the electricity from escaping to the ground
- **Electricity can arc through the air into any conductive thing which gets too close.**
- The human body, most tools, and vehicles all conduct electricity very effectively. Trees can also conduct electricity.
- The higher the voltage, the further the electricity can jump
- The effects of high voltage electric current on the human body include serious first degree burns and cardiac arrest



# Keep away from live lines

The general public must remain at least four (4) metres from overhead lines. This applies to the lines, not the power pole.

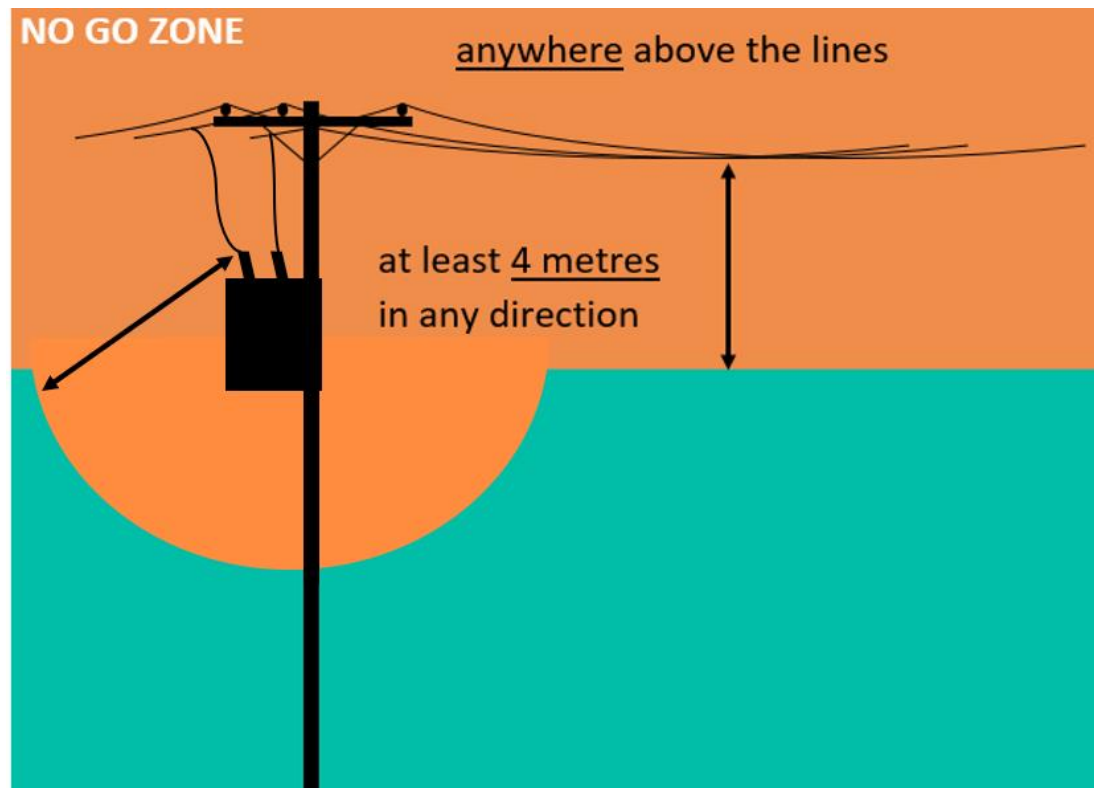
To get closer, consent is required from MainPower.



# Be aware of pole-top equipment

The same rule also applies to switches, transformers, and other live equipment mounted on a pole

To get closer, consent is required from MainPower.





# Keep machines away from live lines

Getting too close or making contact with power lines will cause electrical current to rush through a vehicle and into the ground. This can damage vehicles and cause harm to nearby people.

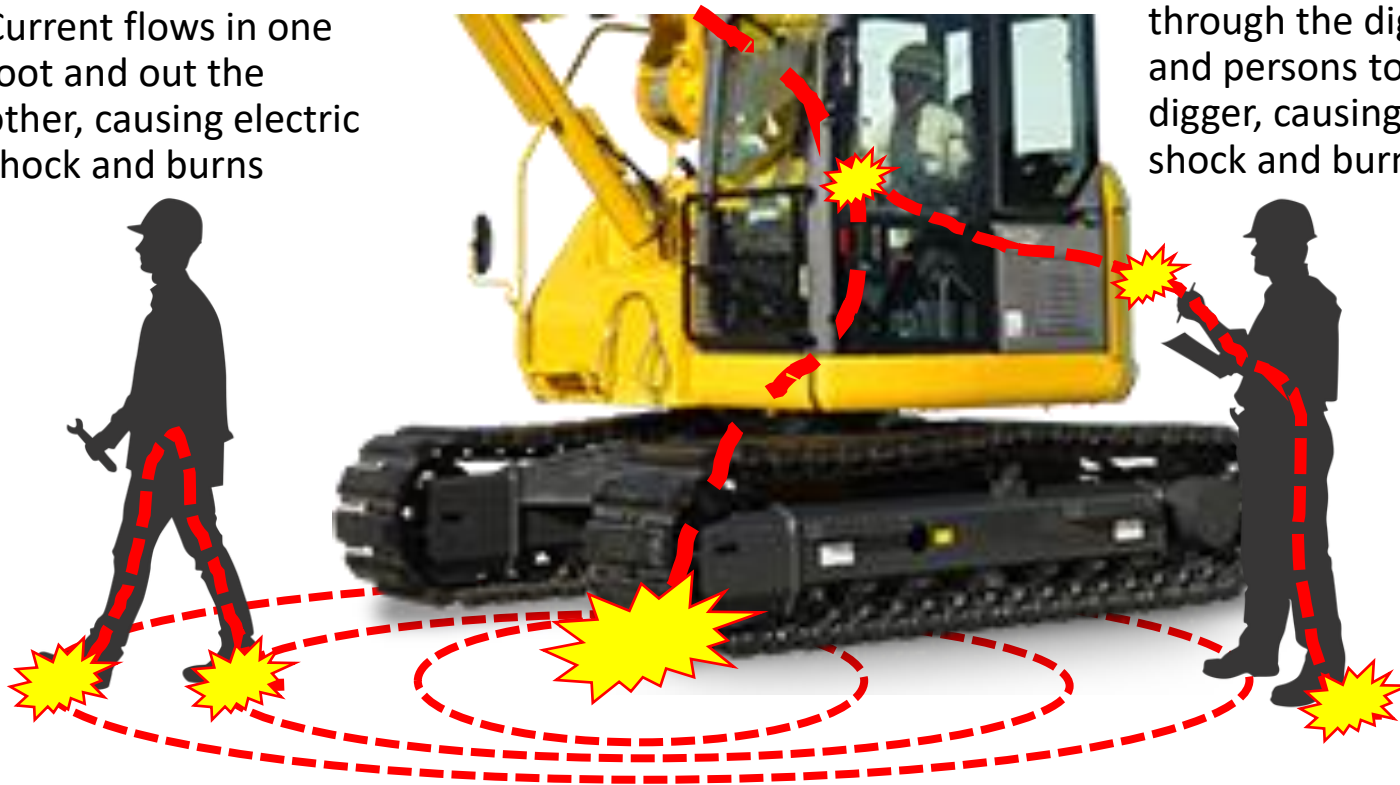


# Step and Touch Potential

Electricity will flow down through the machine and live the ground around it. This can cause harm to persons nearby.

Current flows in one foot and out the other, causing electric shock and burns

Electrical current flows through the digger chassis and persons touching the digger, causing electric shock and burns



Earth Potential Rise (voltage in the ground)

# Beware of underground cables

- Underground cables carry voltages from 230 volts to 66,000 volts.
- Cables are common in the roadside and residential areas.
- Underground cables are easily damaged by excavators, crowbars, or picks.
- **Piercing the insulation will cause an electrical arc flash (explosion)**

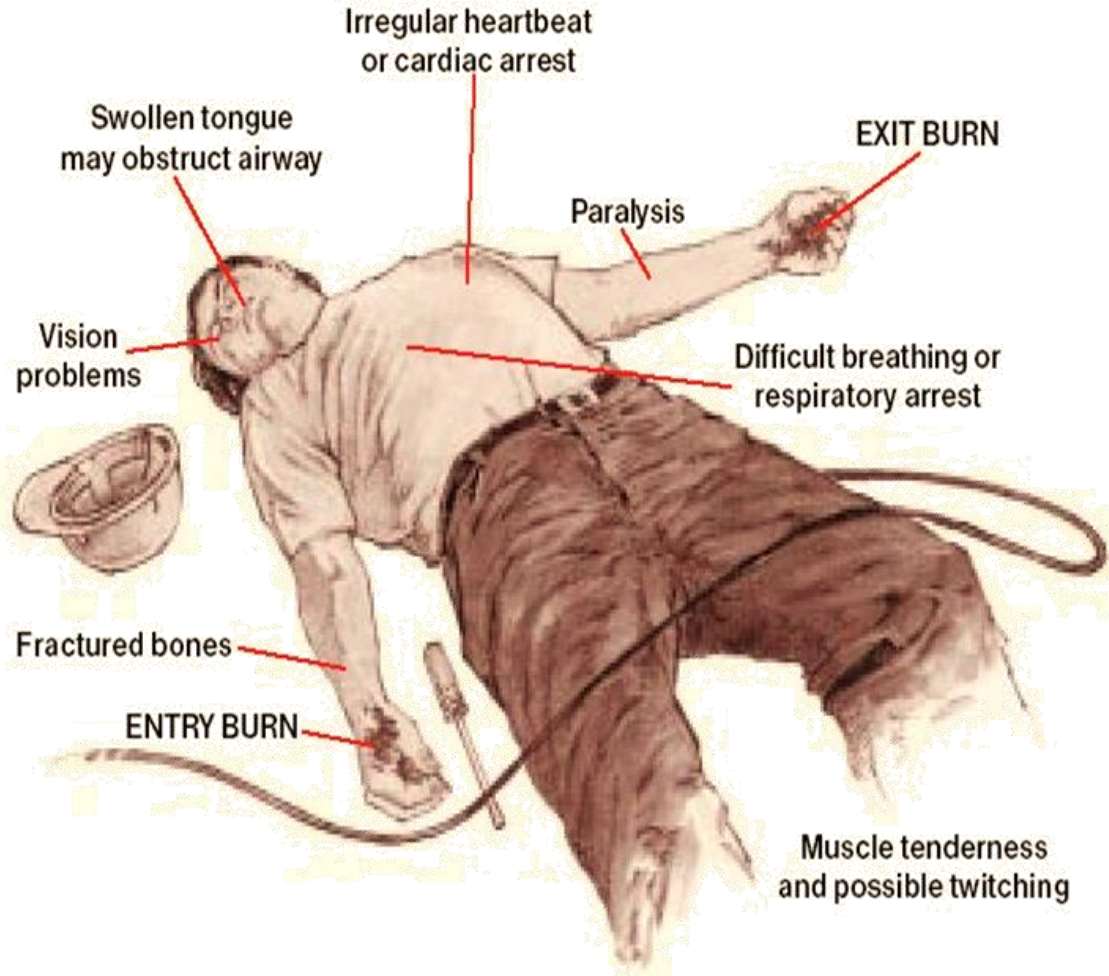




# Effects of electricity on the human body

Restless or irritable,  
loss of consciousness,  
possible convulsions

Electricity  
can cause  
serious harm





# Close Approach Consent

# Managing work near power lines

Some work requires people or machinery to come within four (4) metres from power lines. It is a legal requirement to hold a **Close Approach Consent** from MainPower.

## Close Approach Consent

- Depending on the work being undertaken, a reduced Minimum Approach Distance (MAD) may be allowed
- MainPower will issue restrictions and special conditions to keep workers, the public, and the network safe



# Digging and Underground Cables

MainPower requires you to hold a Close Approach Consent when digging within four metres of underground cables. It is **your responsibility** to find cables and avoid damaging them:

- **Locate cables** before digging. Be sure to use a wide searching sweep with a cable locator or ground-penetrating radar – much wider than the area to be excavated.
- Pot-holing or hydro vacuuming must be used to confirm cable location and depth **before** using mechanical excavation within 2.0 metres of cables.

**Do not rely on plans, always use a locator.** Plans may be inaccurate or incomplete.





# Receiving a Close Approach Consent

The **Supervisor** on the worksite must receive and hold the Close Approach Consent.

## Supervisor's Responsibilities

1. Contact MainPower's Control Room to advise them *before starting work* (03) 311 8312
2. Ensure the work complies with the conditions of Consent
3. Contactable by MainPower at all times while work is progressing
4. Remain on site while any person or machinery is within 4 metres of the line
5. Ensure all other work party members are aware of the electrical hazards
6. *Be competent – must have completed this training course*
7. Contact the Control Room to sign out once work is complete (03) 311 8312



**Example Document:**

# Close Approach Consent to work near overhead power lines

<b>Approval number:</b>			
<b>Location of work site:</b>			
<b>Site Supervisor:</b>		<b>Phone:</b>	

The distance between any live overhead line and any mobile plant or load carried shall be **“AT LEAST 4.0 METRES”** unless the operator has received written consent from the overhead electric line owner allowing a reduced distance.

Where any mobile plant is likely to be used at any time in the proximity of overhead lines, the owner or operator of such device shall affix an approved warning notice in a conspicuous place as near as practicable to the operator’s position. The notice shall be maintained in a legible condition and shall state: **“WARNING, KEEP CLEAR OF POWER LINES”**.

## INSTRUCTIONS WHEN WORKING NEAR OVERHEAD POWER LINES

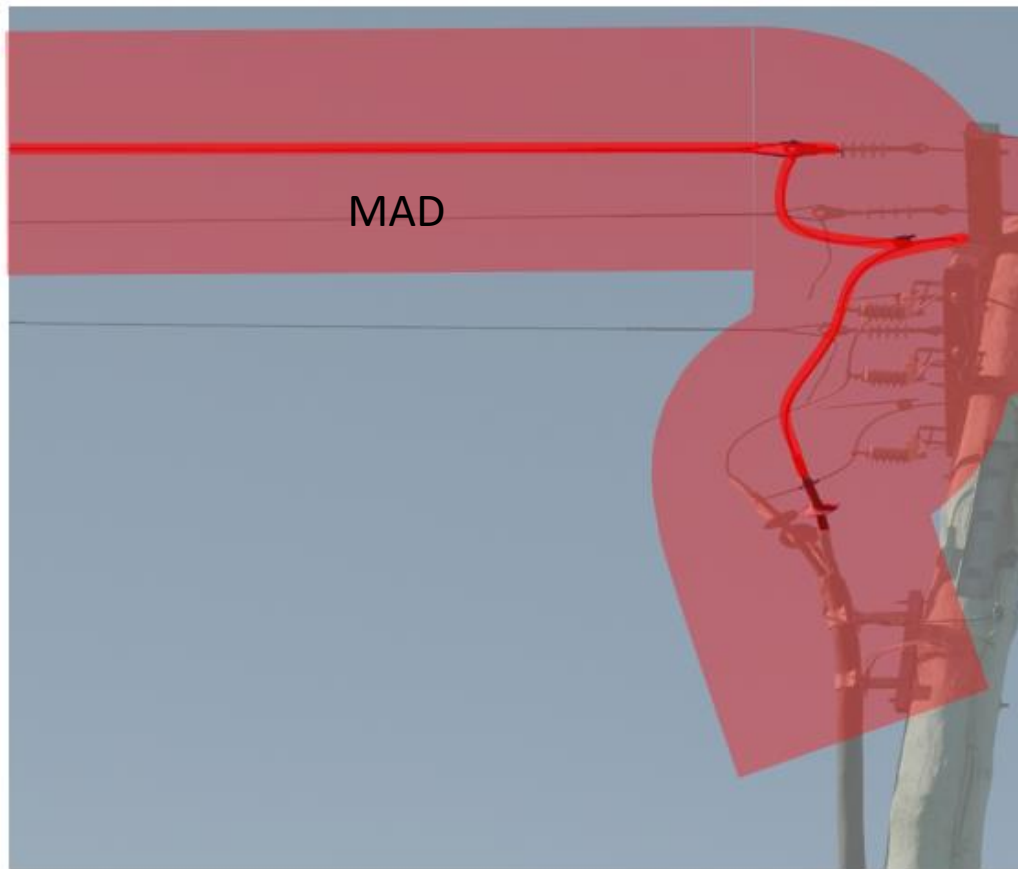
*Note: This approval must be available for inspection on site at all times*

In accordance with NZECP 34:2001 Section 5, you are hereby notified that the voltage of the conductors in the street/location specified above is:		<b>Volts</b>	
The <b>Minimum Approach Distance (MAD)</b> to be observed is:		<b>Metres</b>	
<b>Date of Issue:</b>		<b>Date of Expiry:</b>	
<b>Issued By: (Print Name)</b>		<b>Signed:</b>	

# Complying with your consent

1. **Strictly observe the reduced approach distance** listed on your consent. This minimum distance exists to keep you safe
2. Only competent workers can work at the reduced distance
3. A copy of the consent must be held on site while work is undertaken
4. Work can be halted by MainPower at any time
5. No warning signs or flags can be affixed to power poles
6. If the work cannot proceed safely, then **it must stop immediately**
7. The consent is non-transferrable
8. The consent holder is liable for any damage the work causes to MainPower's network

# Working at Reduced Minimum Approach Distance (MAD)



Think of the MAD as a **NO GO ZONE** around bare live equipment.

Example shows a low voltage line

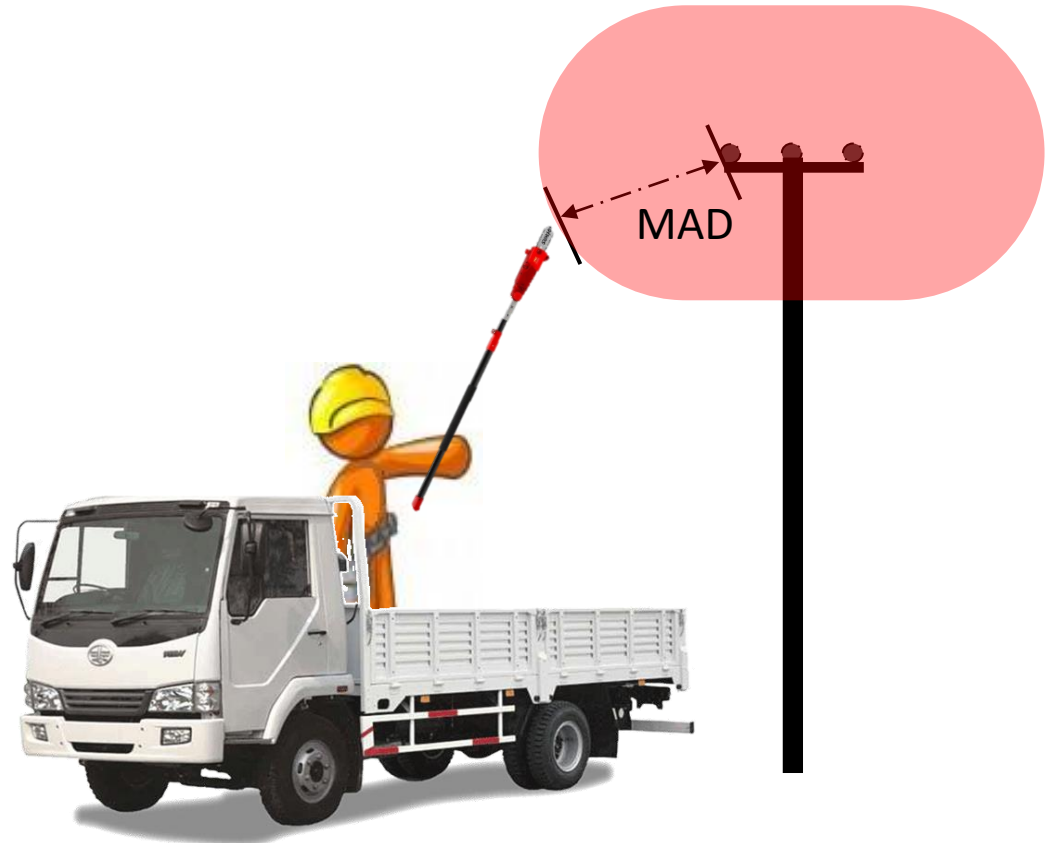
Higher voltages = larger MAD

# Working at reduced Minimum Approach Distances (MAD)

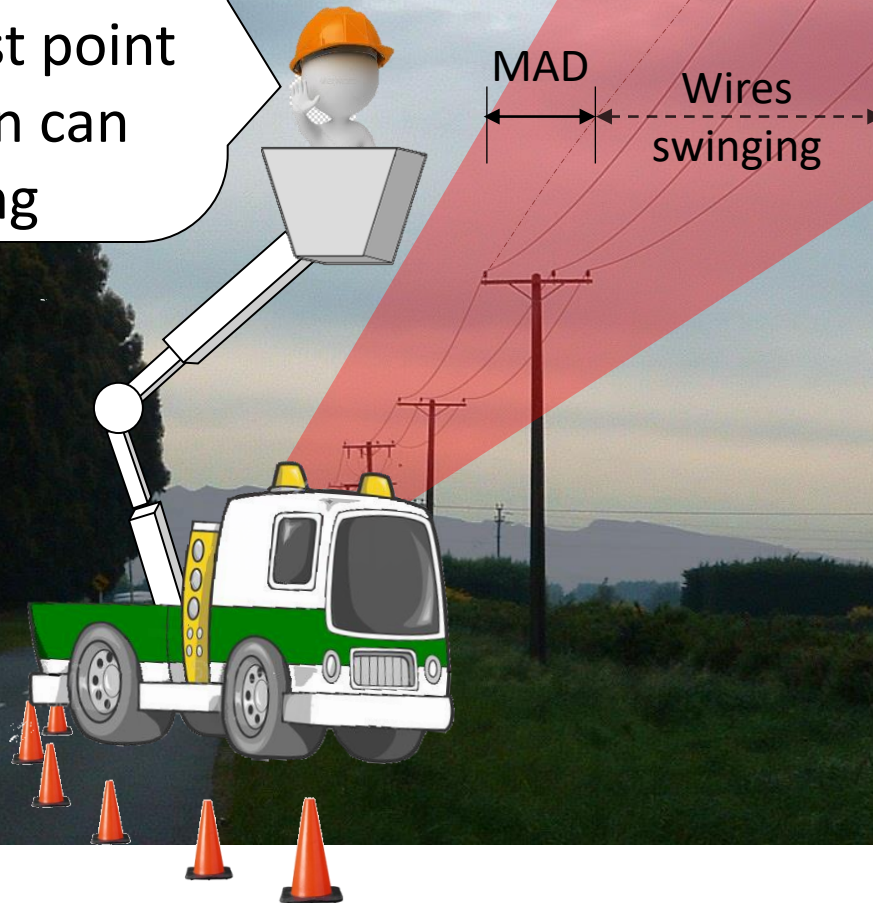
These distances apply to any part of a person's body and anything in contact with them. **Do not breach the reduced distance.**

## Examples:

- Tools: pole-saws, measuring tapes
- Vehicles, ladders
- Scaffolding and scaffold poles
- Equipment: ropes, hard hats
- Tree branches
- Roofing iron, fencing wire



In windy conditions, the MAD is measured from the widest point the span can swing





# Managing the electrical hazards



**The MAD must not be breached.**

At the worksite, prior to approaching lines you **MUST**...

1. Identify all electrical hazards
2. Assess the risk of coming too close to those hazards
3. Take steps to ensure that your team, your tools, and your vehicles stay outside the Minimum Approach Distance (MAD)

We will discuss these three steps in the following pages.

The employer is responsible for ensuring all persons are competent for the task at hand, including understanding the risks presented by electrical hazards.

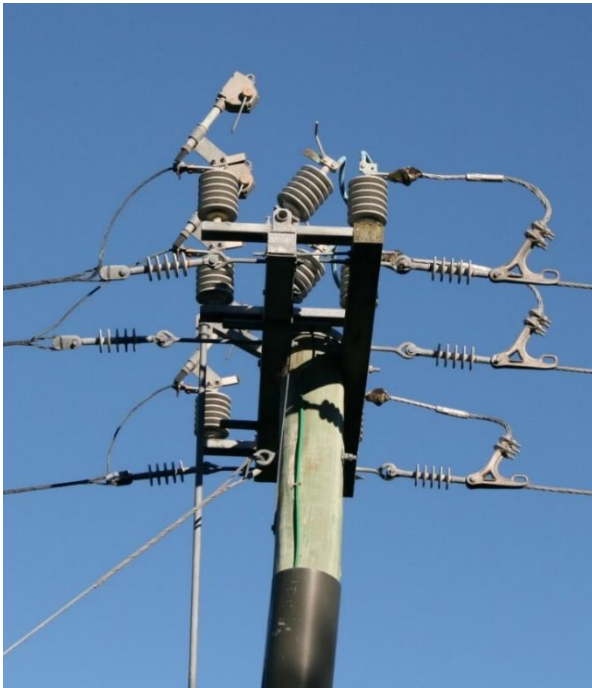


# 1. Identify all electrical hazards

To work near live lines (conductor), you must remain a minimum safe distance from any live part

- The overhead lines are **NOT** the only live part

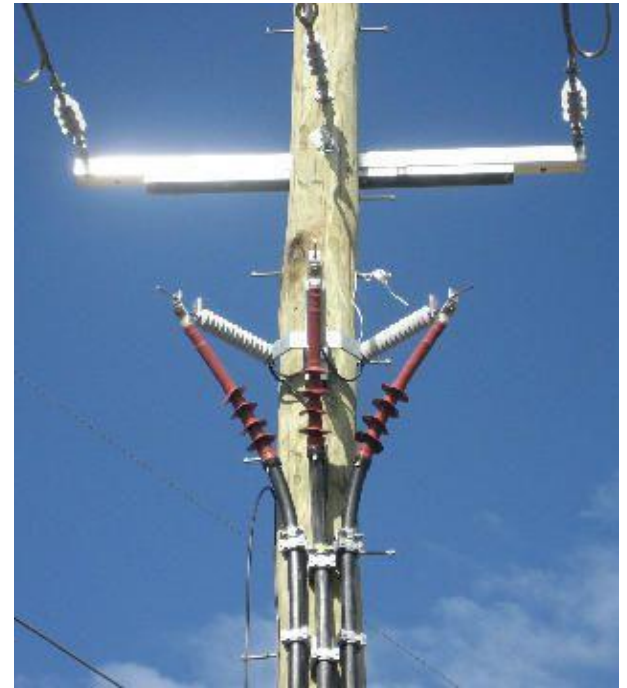
Pole Mounted Switchgear



Pole Mounted Fuses



Cable Terminations



## 2. Assess the risk of breaching MAD

The risk of inadvertently getting too close to live parts must be managed. The work you are undertaking effects the chance of getting too close.

Some work has a higher chance of breaching the MAD, and extra precautions are necessary.

Example: Roofer working near power lines

- Handling roofing iron near powerlines, would increase the risk of breaching the MAD, especially in windy conditions. The iron could be difficult to control and could be blown into the lines.



# 3. Controlling the risk

If there is a risk that the MAD will be breached, then you need to take extra steps to control the risk, this may include:

- Increase your distance from the line
- Affix warning signs and/or bunting flags
- Appoint a safety observer to alert workers when things get close
- Employ electrical specialists
- Use specialised machinery
- Arrange for the line to be isolated and earthed by MainPower
- Other actions fitting the situation

Warning & Bunting



Safety Observer



# Controlling the risk

If its not safe **don't do it!**



Nothing is so important that  
it can't be done safely.



# In the event of an accident



# Incident and accident reporting

Any accidental contact with any overhead line, underground cable, or damage to any network asset, **however slight**, shall be reported **immediately**.

The lines / cables may appear undamaged, but electrical protection could have operated further down the line, disconnecting customers.



**Stop work  
Immediately**  
**Treat all lines  
as LIVE**



**Call MainPower Control Room  
(03) 311 8312**

- Give your name
- Job name and location
- Details of what happened



**MainPower  
Control Centre**

- Will take immediate action to ensure the safety of people and the network

**Thank you for  
your attention**