

SCAFFOLDING AND GUARDRAIL SYSTEM WORK NEAR OVERHEAD POWERLINES

ADVICE ON MANAGING THE RISKS OF ERECTING, USING AND DISMANTLING OF SCAFFOLDING AND GUARDRAIL SYSTEMS NEAR OVERHEAD POWERLINES AND ASSOCIATED ELECTRICAL EQUIPMENT UP TO 22,000 VOLTS.

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SCAFFOLDING WORK NEAR OVERHEAD POWERLINES

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1. OVERVIEW

This document provides advice on managing the risks of erecting, dismantling, and using scaffolding and guardrail systems near overhead powerlines and associated electrical equipment with an operating voltage up to and including 22,000 volts. It is based on Safe Work Australia's information sheet, *Scaffolding work near overhead powerlines* and the WorkSafe ACT Safety Advice '*Best practice working on roofs*.'¹

More information is in the:

- Evoenergy Electrical Safety Rules (available on the Evoenergy website)
- Evoenergy Accreditation and Authorisations procedure (available on the Evoenergy website)
- AS2550 Safe Use of Mobile Plant
- AS4576:2020 Guidelines for Scaffolding

All costs associated with the management of scaffolding within the vicinity of Evoenergy assets will be the responsibility of the person(s) erecting, dismantling, or using the scaffolding.

2. WHAT ARE THE RISKS?

Contact with energised overhead electric lines by erecting, dismantling, and using scaffolding can cause death, electric shock or other injury to plant operators and workers.

This can be caused directly or indirectly by electricity—a close approach to line conductors may allow a 'flashover' to occur. The risk of flashover increases as the line voltage increases.

2.1 Managing the risks

You must manage the risks associated with scaffolding work near energised overhead powerlines and associated electrical equipment by:

- 📌 A PCBU who erects, and dismantles a scaffold at a workplace must be accredited by Evoenergy to work inside the 4-metre approach distance to the Evoenergy network; and
- 📌 Scaffolding personnel working for the accredited PCBU must be authorised by Evoenergy as Supervised Workers.

A Supervised Worker in this instance means a worker who is employed by an Evoenergy accredited company and has successfully completed the Electrical Safety Rules (ESR) and is authorised to sign onto an Access Authority to perform work in the relevant work procedures and safety instructions for which they have demonstrated competence. A supervised worker will also have up to date First-aid and CPR training.

Successful completion of the ESR will support the PCBU develop their own procedures to:

- 📌 Identifying potential hazards.
- 📌 Enable effective consultation with Evoenergy to implement controls to mitigate the risks associated with the identified hazards; and
- 📌 Providing workers with an understanding of what work zones and safe approach distances are required for safe operations.

When assessing the risks, the PCBU must consider:

¹ <https://www.worksafe.act.gov.au/health-and-safety-portal/safety-topics/safety-advice/stop-construction-falls/best-practice-working-on-roofs> Last viewed 6th December 2022.

- 📌 the location, height, arrangement, and visibility of overhead powerlines and supporting structures, e.g., poles, towers and stay wires
- 📌 the voltage of powerlines and exposed energised parts and whether they are insulated or bare
- 📌 possible sway or sag of the powerlines
- 📌 the scaffold's dimensions and operating characteristics including inherent stability
- 📌 conductivity if the scaffolds are earthed
- 📌 the minimum clearance distance from the closest part of the scaffold or plant being used to the powerlines
- 📌 erecting and dismantling scaffolding
- 📌 the type of work activities required and the frequency of work tasks
- 📌 the qualifications, competency, skill, and experience of people doing the work, and
- 📌 safe work practices and procedures e.g., a safety observer and or Access Authority.

2.2 Controlling the risks

The best way to eliminate the hazard is by preventing people, plant, equipment, and materials from coming close enough to energised overhead electric lines for direct contact or 'flashover' to occur. The PCBU must consider:

- 📌 Consulting with Evoenergy to de-energise the electric line
- 📌 Isolating and earthing the line for the duration of the work
- 📌 re-routing the electric line away from structures and the scaffolding after consultation and agreement from Evoenergy, or
- 📌 replacing existing overhead powerlines with underground electric cables.

The PCBU should arrange for de-energising or moving the powerlines in consultation with Evoenergy as soon as possible.

**Contact Evoenergy on 132 386 to arrange for the de-energisation of the electric line
network.connectionapplication@evoenergy.com.au**

3. APPROACH DISTANCE FOR THE ERECTION AND DISMANTLING OF SCAFFOLD

AS/NZS 4576:1995: Guidelines for scaffolding sets a 4-metre approach distance for metallic scaffolding used near overhead electric lines.

This 4-metre approach distance cannot be encroached without contacting Evoenergy to determine a safe system of work for the erection, use and dismantling of the scaffolding.

Where the erection of conductive scaffolding has the potential to breach the 4-metre approach distance to Evoenergy's overhead network, the PCBU must consult Evoenergy about additional controls before the work can begin.

When planning scaffolding work, you should use 4 metres initially and then consider other factors that may require a greater approach distance including:

- 📌 the proximity of overhead powerlines
- 📌 the proximity and operating radius of vehicles, cranes, and other moving plant
- 📌 environmental conditions, for example, storm activity, wind strength and direction, heavy rain, ice, hail and lightning, and entry and exit for workers, materials, and plant
- 📌 the 4m or greater approach distance that applies **in any direction where metallic scaffold is erected, used, or dismantled near overhead powerlines** (refer to Figure 1), or
- 📌 if there is a risk the 4m approach distance cannot be maintained, you must contact Evoenergy to determine a safe system of work for the erection, use and dismantling of the scaffolding.

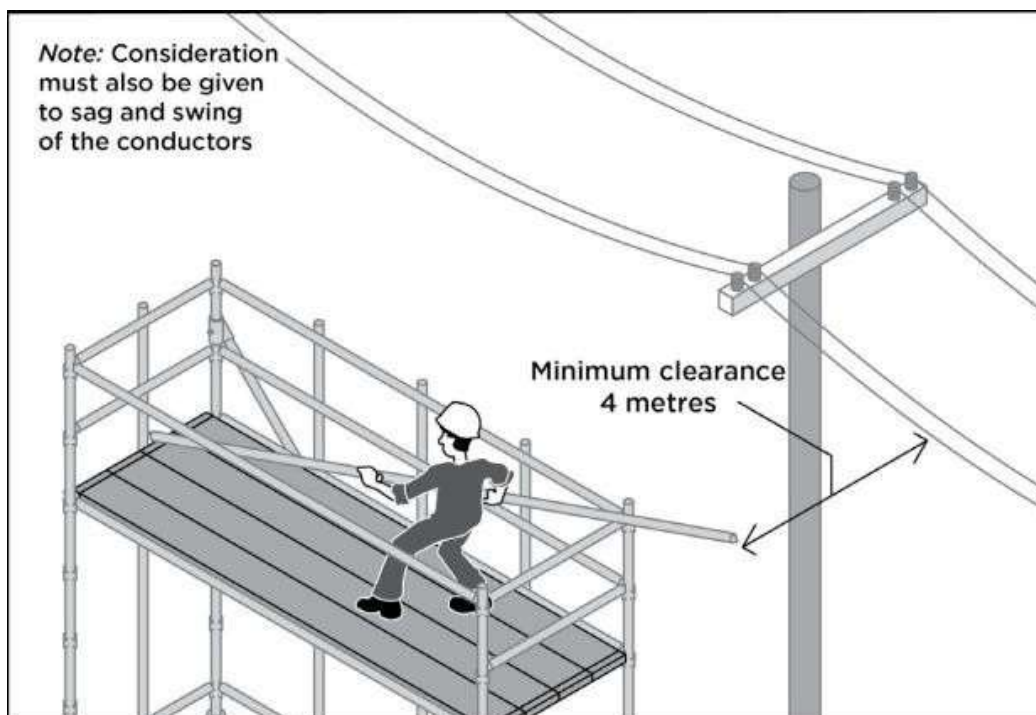


FIGURE 1. THE 4M APPROACH DISTANCE THAT APPLIES IN ANY DIRECTION WHERE METALLIC SCAFFOLD IS ERECTED, USED OR DISMANTLED NEAR OVERHEAD POWERLINES. SOURCE: SAFE WORK AUSTRALIA

A competent person should verify the presence, location, type, and operating voltage of all overhead powerlines adjacent to the work site. The competent person could be an electrical engineer for example. Powerlines must always be treated as energised unless an Access Authority (Access Permit or Permit to Work de-energised) has been issued confirming the powerlines have been de-energised.

4. MINIMUM APPROACH DISTANCE FOR ERECTED SCAFFOLDING USING A HOARDING AND ENCLOSURE SYSTEM

To mitigate the risk of electrocution of scaffolders and construction workers, a hoarding and enclosure system must be used on erected scaffold to prevent the inadvertent contact with the electric powerline. An example of inadvertent contact would be a roofer lifting and moving a 6-metre steel roofing batten into the electric power line.

Hoarding is a containment sheeting fixed to the external face of a scaffold to form a physical barrier between workers and overhead electric lines and associated electrical equipment.

Evoenergy will not re-energise an electric powerline adjacent to erected scaffolding unless the minimum hoarding installation conditions documented in Figure 2 have been met.

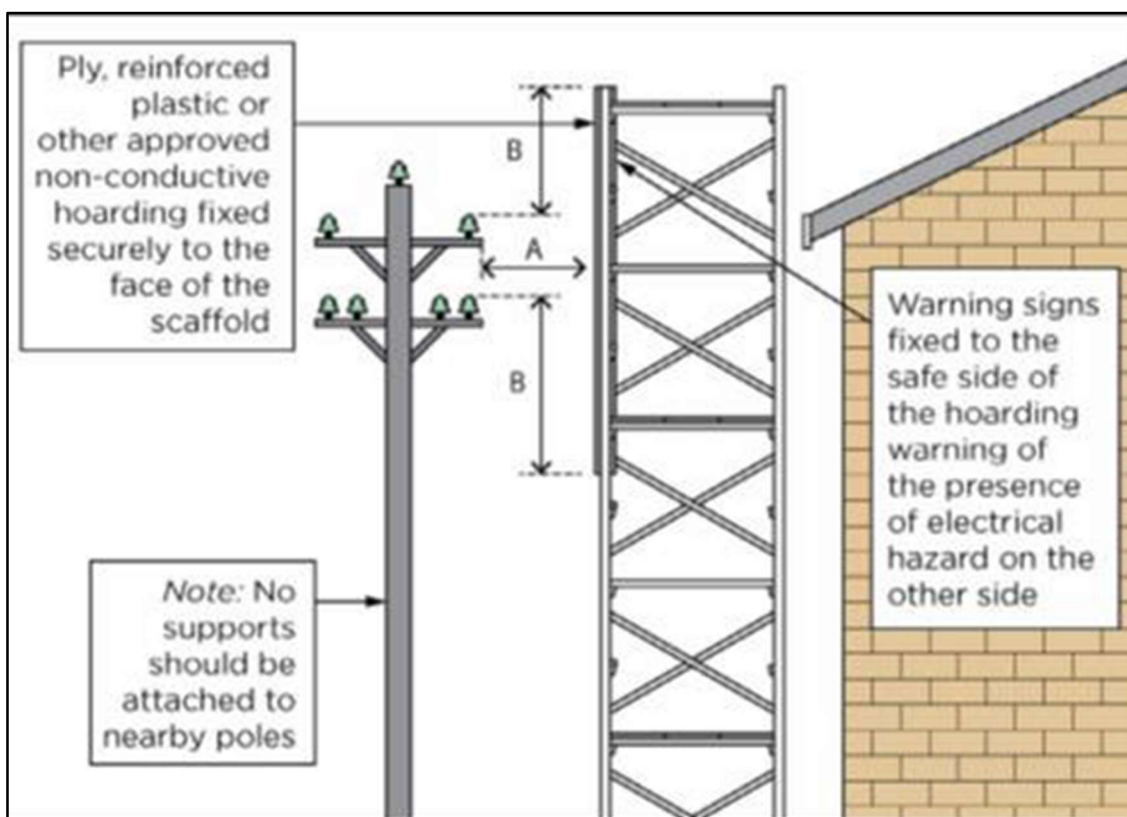


FIGURE 2. THE HORIZONTAL SAFETY DISTANCES (A) AND VERTICAL MECHANICAL CLEARANCES (B) FROM ELECTRICAL CONDUCTORS REQUIRED BY EVOENERGY. SOURCE: SAFE WORK AUSTRALIA

- ▶ “A” greater than or equal to distance of 1.5m for low voltage and 2.0m for 11kV -22kV from the nearest conductor, including sag and sway (AS/NZS 4576 and Evoenergy Electrical Safety Rules requirement) *
- ▶ “B” greater than or equal to 2.4m from the nearest conductor, including sag and sway.
- ▶ If conductors are higher than the top section of the scaffolding, then the scaffolding work area must be covered with the same hoarding on top of the scaffolding to the full length and width of the scaffolding
- ▶ gaps between fitted sheets of plywood must not exceed 3mm

- 📌 no exposed cut or drilled holes in the sheets of plywood
- 📌 the scaffolder must use non-conductive means to attach the plywood to the scaffold and ensure the arrangement can withstand the wind load
- 📌 signs must be attached to the safe side of the hoarding warning of the electrical hazard and that the hoarding must not be removed
- 📌 Ensure a competent person visually inspects the hoarding and the enclosure daily to ensure they are in a satisfactory condition and remain impenetrable.

*** Where the minimum distances and controls listed above cannot be maintained, then scaffolding is not permitted to be used. Alternative controls such as those listed in "Controlling the risks" must be implemented. All costs for such controls are the responsibility of the PCBU undertaking the work.**

A person with management or control of a scaffold at a workplace must check the clearance distances before erecting any scaffolding near overhead powerlines. An electrical engineer can provide the safety clearance distances used to design the scaffolding and control the risks. Clearance distances must be maintained.

The PCBU should consider arranging for Evoenergy to identify exposed energised low voltage conductors, up to and including 1000 volts, and fitting them with approved visual indicators to make the hazard more visible. e.g., tiger tails.

Tiger tails should be installed the full length of the scaffolding plus a minimum distance of 5 metres beyond each end of the scaffolding.

A competent person should visually inspect the tiger tails each day before scaffolding operations start. If tiger tails have been moved or damaged, Evoenergy must be contacted so they are replaced or relocated in the correct position.

Note: Tiger tails alone do not provide protection against mechanical interference or electrical hazards. Using tiger tails does not allow workers to encroach Minimum Approach Distances.

5. EXTRA CONTROL MEASURES FOR ELECTRICAL WIRES PASSING THROUGH A SCAFFOLD

Where low voltage insulated electrical services or equipment pass through a scaffold, they should be de-energised for the duration of the work, or fully enclosed to meet Evoenergy requirements (refer to Figures 3 and 4) using a non-conductive material, for example, moisture-resistant flooring grade particleboard, dry timber, dry plywood or similar material or plastic piping approved by Evoenergy.

Additional controls for consideration to minimise the risks include substituting the hazard or work practice with something safer, for example using alternative plant that cannot enter an unsafe zone.

Alternatively, the PCBU should consider the use of engineering controls such as:

Substituting the scaffold with an insulated elevated work platform, or for example using an insulated fibreglass handle on a paint roller instead of a conductive aluminium extension handle.

If a risk remains, use administrative controls such as:

- 📌 a safety observer to warn people before they enter an unsafe zone, or
- 📌 making hazards more visible by using approved visual indicators, for example, tiger tails.

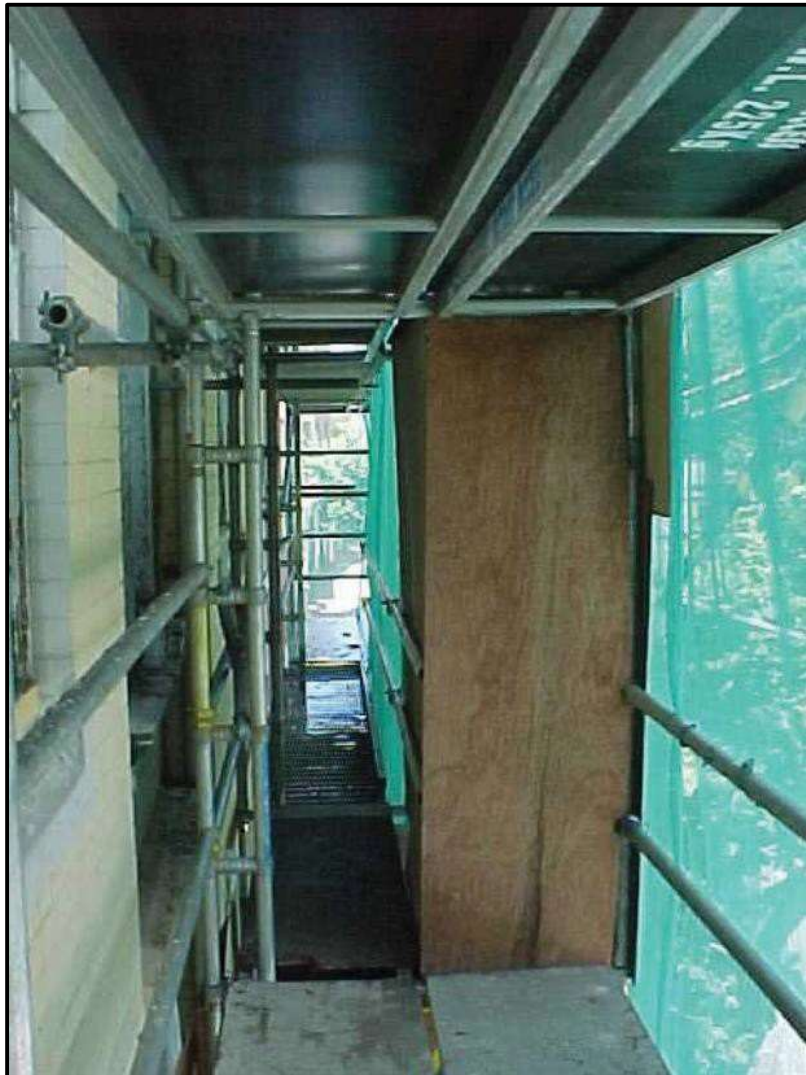


FIGURE 3. EXAMPLE OF HOARDING IN PLACE TO PROVIDE A BARRIER TO AN ENERGISED OVERHEAD LOW VOLTAGE NETWORK. SOURCE: SAFE WORK AUSTRALIA



FIGURE 4. LOW VOLTAGE ELECTRICAL WIRES PASSING THROUGH A SCAFFOLD.

6. BEST PRACTICE FOR WORKING ON ROOFS

The position of any powerline adjacent to the worksite must be noted on the PCBU site hazard management plans. Where guardrail systems are used for working on a roof, Evoenergy must be contacted prior to work commencing to verify minimum approach distances between any part of the worker or equipment and any overhead power line.

Minimum approach distances as specified by WorkSafe ACT are:

- 📍 2 metres for circuit voltages 400 volts and below; and,
- 📍 6 metres for circuit voltages above 400 volts.

Unless the PCBU has Evoenergy accreditation and the roofing workers are authorised by Evoenergy, the

WorkSafe ACT distances shall not be reduced.

Regardless of whether the PCBU is accredited by Evoenergy to work closer than the above distances, there shall be a plan in place to work safely. In all cases the plan should take the means of access, the skill level of the employees, and the nature of the work into account.

If the work could breach the Minimum Approach Distances, then work must not proceed with the electric line energised.

A safety observer must be appointed if there is potential for a worker to forget where they are positioned relative to the energised conductors.

Factors for the PCBU to consider include but are not restricted to:

- 🗨 the nature and duration of the of task.
- 🗨 the need to continually relocate or change the position of the work platform.
- 🗨 the complexity of task (complex movement of objects, a need to adjust work position while wearing a harness or fall restraint); and,
- 🗨 fatigue.

7. SAFE WORK METHOD STATEMENTS (SWMS)

A SWMS is required for high-risk construction work carried out on or near energised electrical installations or services.

For a person with management or control of a scaffold at a workplace to attain Evoenergy Accreditation, the business must provide Evoenergy with their own documented SWMS for managing the risks associated with erecting, using and dismantling scaffold near Evoenergy's electric lines. The SWMS must be based on a risk assessment, and the SWMS and risk assessment must be available to all workers on site for the duration of the work.

For further information please refer to the Accreditation and Authorisations procedure which describes the process of obtaining and maintaining company accreditation and worker authorisations for work on or near the network.

8. INSPECTION AND MAINTENANCE

A person with management or control of a scaffold at a workplace has a responsibility to ensure a scaffold is inspected and maintained so it is safe to use. This includes inspections at hand-over and post-handover and after scaffold repairs, modifications, or additions.

9. CONTACT DETAILS

COMPANY	CONTACT	PHONE	EMAIL
Evoenergy	Faults and emergencies	13 10 93	faultscallcentre@evoenergy.com.au
Evoenergy	Planned outages	13 23 86	network.connectionapplication@evoenergy.com.au

VERSION CONTROL

VERSION	DETAILS	APPROVED
1.0	Initial Document	Wayne Cleland – 2018 Manager Electrical Works Practices
2.0	Include WorkSafe ACT requirements for guardrail systems	Brendan Commons – 2022 Electrical Works Practices Manager

DOCUMENT CONTROL

DOCUMENT OWNER	PUBLISH DATE	REVIEW DATE
Leylann Hinch	19/10/2020	22/08/2024