



SAFE

WORKING AT HEIGHTS



GUIDE 2004

WorkCover. Watching out for you.



Disclaimer

This guide provides general information about the obligations of contractors and employers under the occupational health and safety and workers compensation laws. The Guide gives some suggestions for complying with these obligations, especially as they apply in construction work situations.

However, this Guide is not intended to represent a comprehensive statement of the law as it applies to particular problems or to individuals or as a substitute for legal advice. Full details of legal obligations and responsibilities are set out in the occupational health and safety and workers compensation legislation referred to in the publications list. If you refer to the legislation you should take care to ensure that you use the most up-to-date version, available from www.legislation.nsw.gov.au. You should seek legal advice if you need assistance on the application of the law to your situation.

Acknowledgement

This is a NSW Construction Industry Reference Group project in partnership with WorkCover NSW.

© WorkCover NSW

What's in this Guide

1.	About this Guide	1
2.	How did it happen?	2
3.	Legislative requirements	4
4.	Risk management	5
5.	Specific control measures	10
5.1	Temporary work platforms	11
5.2	Guardrails	16
5.3	Fall-arrest systems	19
5.4	Roofs greater than 45 degrees	25
5.5	Brittle or fragile roofs	26
6.	Objects falling from heights	27
7.	Portable ladders	29
8.	Electrical safety – overhead powerlines	31
8.1	Eliminate the hazard	31
8.2	Safe working distances	32
9.	Terms used in this Guide	35
10.	Where can I get more information?	37
11.	Your notes	41

1. About this Guide

Falls from heights are a significant problem on construction sites, resulting in serious injury and death of workers. For the victims, their families and the community, each injury is one too many. It is not just the young and inexperienced workers that may be injured. Experience is no guarantee of immunity from injury.

This Guide is a useful tool for all those working at height in construction related industries. It provides practical information and solutions for creating and maintaining a safe working environment when working at height.

The Guide summarises some key aspects of the legislation and Codes of Practice specific to the construction industry and associated trades to encourage the highest possible level of health and safety when working at height.

Please read the Safe Working at Heights guide carefully. Take it with you on jobs. Show it to other workers.

2. How did it happen?

Case Study 1

A 44-year-old painter died from severe head injuries after falling through a corrugated plastic skylight. The painter fell some 5.5 metres onto the concrete floor below.

At the time of the accident four painters were preparing the roof surface for repainting, using a specially constructed roofing ladder. It was positioned on the edge of the skylight. The painter either slipped or overbalanced off the ladder and fell sideways onto the plastic skylight. Another painter tried unsuccessfully to hold onto him before he fell through the skylight to the concrete floor below.

The Coroner found that death was by misadventure because the employer failed to install safety mesh. The death of the painter could have been prevented by safety mesh under the skylight. This case also shows that roofing ladders are only effective if the painter stays on the ladder itself. It is a fact that workers can fall off ladders.

Case Study 2

A painter, who had been working on an aluminium extension ladder, used the ladder to get to a part of the roof to paint the wall above. The roof was 40-year-old corrugated asbestos cement roofing without underpinning wire mesh. It is believed that a very strong gust of wind blew the ladder to the ground, forcing the painter to cross the roof to get to an open window. In crossing the roof, it collapsed and the painter fell 6.2 metres to the concrete floor below and was killed.

The Coroner heard from the Inspector that the roof pre-dated regulations requiring the installation of wire mesh underneath new roofs. However, catwalks should have been provided instead.

The death of this worker is as much a reflection on the misuse of ladders as it is on the unsafe nature of unmeshed fibre-cement sheeting. If scaffolding had been erected, there probably would not have been any need to work off the roof, or at least to cross the roof to exit. Even securing the ladder would have prevented it blowing over and possibly averted the accident.

3. Legislative requirements

This Guide uses the legislative framework as a basis for providing practical advice on how to plan for safe working at height and how to establish control measures to prevent injury to persons working at heights as part of a safe system of work.

The use of the term 'must' in this Guide means that the requirements are mandatory under occupational health and safety legislation and required to be followed to comply with the legislation. The term 'should' indicates a recommendation.

Legislative framework in New South Wales

You will find the general principles for managing the prevention of falls in workplaces in the following legislation and guidance material:

- *Occupational Health and Safety Act 2000* (the OHS Act).
- *Occupational Health and Safety Regulation 2001* (the OHS Regulation).
- Guidance and other material including Codes of Practice, Safety Guides and Australian Standards.

Note: Australian Standards that are referred to in legislation such as the *OHS Regulation 2001* have legal status and are mandatory. The Code of Practice Technical Guidance incorporates without modification a number of Australian Standards. Standards adopted in this way have the same legal status as a Code of Practice. Australian Standards which are not included in legislation may be adopted voluntarily but have no legal status.

See page 37 for more information.

4. Risk management

The appropriate control measures for a particular system of work are generally determined by individual job factors. Conducting a risk assessment identifies these.

Employers and self-employed persons must identify any foreseeable hazards, assess their risks and take action to eliminate or control them. Risk management is a regulatory requirement.

A risk assessment, in consultation with workers and with their participation, should be conducted for all work, irrespective of height, and appropriate control measures put in place. Consultation with workers is a regulatory requirement.

The risk assessment process is a problem solving process that when taken step-by-step will lead to informed decisions about how best to avoid or control the impact of risks. There are four basic steps:

Step 1: Identify the problem (hazard identification).

Step 2: Determine how serious a problem it is (assess the risks).

Step 3: Decide what needs to be done to solve the problem
(eliminate or control risks).

Step 4: Review the risk assessment process and control measures to ensure risks are still adequately addressed.

Control measures

The Occupational Health and Safety (OHS) Regulation requires that certain measures are taken to control the risks associated with working at heights. Chapter 4 of the OHS Regulation deals with known hazards associated with specific work premises and working environments. It prescribes controls that must be applied to manage them. Division 6 of Chapter 4 specifies particular risk control measures. These measures address the risks associated with working at heights. Division 6 – Working at heights – is made up of the following provisions:

- Clause 56 specifies particular risk control measures relating to the prevention of falls from heights.
- Clause 57 specifies particular risk control measures relating to falling objects.
- Clause 58 specifies particular risk control measures relating to scaffolding.
- Clause 59 specifies particular risk control measures relating to lifts.
- Clause 60 specifies particular risk control measures relating to brittle or fragile roofs.
- Clause 61 specifies particular risk control measures relating to building control maintenance.

- Clause 64 specifies particular risk control measures relating to electricity including work in close proximity to overhead electrical powerlines.

This Guide discusses some of the requirements of clauses 56, 57, 58, 60 and 64. However, it is not intended to represent a comprehensive statement of law as it applies to particular problems, individuals or as a substitute for legal advice. You should seek legal advice if you need assistance on the application of the law to your situation.

Prevention of falls from heights

Clause 56 specifies the measures to control the risks associated with falls from heights. Unlike other areas of the OHS Regulation, the appropriate risk control measures are not solely determined by conducting a risk assessment. Instead, clause 56 specifies a mandatory hierarchy of controls, which relate solely to the risks associated with people falling from heights. This hierarchy of controls informs the risk assessment process.

The control measures in order are:

- (i) The provision and maintenance of a stable and securely fenced work platform (such as scaffolding or other form of portable work platform).

- (ii) If complying with (i) is not reasonably practicable, the provision and maintenance of secure perimeter screens, fencing, handrails or other forms of physical barriers that are capable of preventing the fall of a person.
- (iii) If complying with (ii) is not reasonably practicable, the provision of other forms of physical restraints that are capable of arresting the fall of a person from a height of more than two metres.

An employer must also ensure the provision of a safe means of movement between different levels at the place of work.

There are particular requirements that apply when using each control measure including fall arrest devices.

In deciding the most appropriate controls to use, an employer must try and apply the first control measure and can only consider the second if it is not reasonably practicable to use the first. Similarly, the third control measure can only be considered if it is not reasonably practicable to employ either the first or the second.

‘Reasonably practicable’ concerns the ability to apply a control measure. In applying the control measures, it may be impracticable to use the first, for example due to space restrictions where it is not possible to erect scaffolding or to employ other portable work platforms, such as an elevating work platform (cherry picker or scissor lift). Similarly, it may not be reasonably practicable to use a

physical barrier, for example, because it may not be possible to fix it due to the roof profile or type of rafters being used.

Where a control measure lower in the hierarchy of controls is used, the reasons for it not being reasonably practicable to apply a higher control should be documented. Whatever control is used, it must safeguard people from the risks associated with falls from a height.

It is important to be aware that the OHS Regulation does not specify a height at which the control measures must be implemented. This is because there are risks associated with working from any elevated position. However, it does require that a physical restraint capable of arresting the fall of a person from a height of two metres be used where it is not reasonably practicable to employ either of the higher measures in the hierarchy of controls (that is (i) and (ii) as above).

The risks associated with falling from a height must be controlled, and, in some instances, this may require the use of more than one control measure. For example, in erecting formwork, there may be a fall hazard at the perimeter of the formwork and at the leading edge as it advances across a site. This may require a guardrail system at the perimeter together with a fall arrest system for use at the leading edge.

5. Specific control measures

The risks associated with working at heights must be controlled. The following control measures are listed in the order in which they must be applied under clause 56 of the OHS Regulation.

1. Temporary work platforms

Risks must be controlled through the use of stable and securely fenced work platforms (such as scaffolding or other forms of portable work platform).

2. Guardrails

Guardrails should only be used in situations when it is not reasonably practicable to use temporary work platforms.

3. Fall arrest systems

Fall arrest systems should only be used in situations when it is not reasonably practicable to use either temporary work platforms or guardrails.

5.1 The safe use of temporary work platforms

The OHS Regulation includes the following requirements relating to scaffolds.

- Scaffolding must comply with AS/NZS 1576.
- Scaffolding, as well as temporarily erected structures, intended or used to support sheetings, hoardings, guardrails, means of access or egress and entertainment equipment, must be erected and dismantled in accordance with AS/NZS 1576 Scaffolding (clause 58(d) OHS Regulation). Guidance on the practical application of AS/NZS 1576 is given in AS/NZS 4576 Guidelines for Scaffolding.

Note: AS/NZS 4576 is incorporated into the Code of Practice for Technical Guidance.

- Clause 58(a) of the OHS Regulation requires an employer to ensure that a scaffold from which a person could fall more than four metres, and its supporting structure, is inspected by a competent person:
 - (a) Before its first use.
 - (b) As soon as practicable, and before its next use, after an occurrence that might reasonably be expected to affect the stability or adequacy of the scaffold or its supporting structure, such as a severe storm or earthquake.
 - (c) Before its use following repairs.
 - (d) At least every 30 days.

- If an inspection of a scaffold or its supporting structure indicates an unsafe condition, an employer must ensure that appropriate repairs, alterations and additions are carried out and the scaffold and its supporting structures are reinspected by a competent person before the scaffold is used (clause 58(b) OHS Regulation).
- There must be safe access to the scaffold platform (clause 56 OHS Regulation).
- Scaffolds are to be erected, altered and dismantled only by competent persons. All scaffolding over four metres in height must be erected by a certificated scaffolder (clause 265, 266 and 270 OHS Regulation).
- Each working platform and access platform must have full edge protection comprising handrail, mid-rail, and toeboard or a handrail and infill panel (clause 58(d) and 94 OHS Regulation).
- If the scaffold is incomplete and left unattended, an employer must ensure that appropriate controls are put in place to prevent unauthorised access, including the use of danger tags and warning signs (clause 58(c) OHS Regulation).

Additional recommendations for the safe use of scaffolding

In addition to the requirements of the OHS Regulation, the following measures should also be considered as a means of controlling risk.

- Scaffolding should only be placed in service after it has been formally handed over by the erection crew and on receipt of a handover certificate.
- The scaffold should be checked for alterations or removal of planks, toeboards and guardrails before use.
- The scaffold should be stable and if necessary should be secured to the building or structure in enough places to prevent collapse.
- The scaffold should be checked for clearance from nearby powerlines prior to its erection.
- Where scaffolding is used to protect against falls at the perimeter of a building, the scaffolding should be as close to the eaves as possible, but no lower than 500mm beneath the edge of the roof. This may require lifting the working level or installing an intermediate hop-up platform between the working platform and the edge of the roof.
- Mobile scaffold wheel locks should be engaged before people work from the scaffold.

- Persons should leave a mobile scaffold before the scaffold is moved.
- The path of travel of a mobile scaffold should be checked for electrical and other hazards such as excavations, before it is moved.

The safe use of elevating work platforms

- Elevating work platforms (EWPs) must comply with the Australian Standard AS 1418.10 Cranes, hoists and winches Part 10: Elevating work platforms. All boom type EWPs ('cherry pickers') and non-boom-type EWPs (including 'scissor lifts') with a platform movement greater than 2.4 metres that were designed and manufactured after 1 September 2001 must have their design registered with WorkCover. Their use, including maintenance requirements, should comply with AS 2550.10 Cranes, hoists and winches – Safe use Part 10: Elevating work platforms.
- Before hiring EWPs, the employer (who hires the equipment) must carry out a risk assessment to ensure the EWP is appropriate for the intended work. This process should also include the selection and use of the appropriate configuration of EWP for the task. Guidance on this is given in AS 2550, Part 10.

- Out-of-level audible and/or visible alarms should be fitted on any EWP's which are not provided with out-of-level limiting switches. Where practicable the alarm switches should be fail safe in their design.
- Persons operating EWP's must be properly trained in their operation and use. Where equipment is hired, all necessary instructions should be provided by the hire company initially, and then the employer as required, to ensure that persons operating the EWP are competent to do so.

(Note: A certificate of competency is required to operate boom-type EWP's with a boom length greater than 11 metres).

- Self-propelled EWP's should only be used on firm level surfaces unless the equipment is designed for non-level surfaces and the manufacturers instructions state this.
- Every person working in the cherrypicker should wear an appropriate fall arrest device connected to a dedicated anchor point in the basket.
- The EWP should be left in a properly stowed safe configuration whenever it is unattended. It should not be left extended as it may make the unit unstable.

5.2 The safe use of guardrails

The perimeter of buildings, structures, pits, tanks, floor openings, etc, should have guardrails to stop people falling over the edge. The guardrails should have the necessary strength so that they are able to withstand the impact of a person falling against them. Where guardrails are used, they should be in place prior to any work commencing and should not be removed until all work is complete.

Guardrails should be erected by competent persons trained in the safe erection and dismantling of guardrails. They should be constructed in accordance with AS/NZS 1576 Scaffolding and AS 1657, Fixed platforms, walkways, stairways and ladders – design, construction and installation, or, for guardrails installed on the roofs of domestic housing, AS/NZS 4994.1 temporary roof protection for housing and residential buildings Part 1: General requirements.

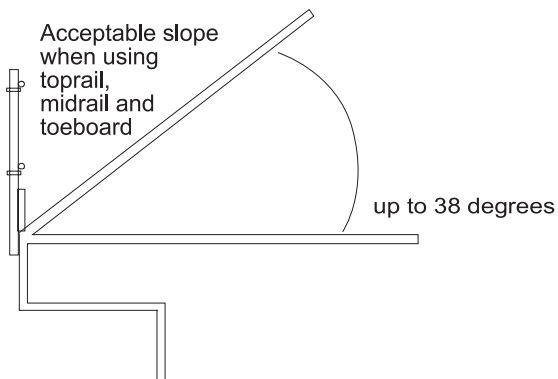
Prior to installing a guardrail system at the edge of a roof, it is important to check that it is suitable for that roof. Particular attention should be given to ensuring that the supporting members, including the rafters where the system is connected to them, can support the loads that will be generated should a person fall against the rails. This should be checked with the rafter supplier before committing to the type of system chosen. (Some types of guardrail systems use brackets that are fixed to the roof trusses at their point of fabrication.)

It is also important to make sure that the system can be erected to follow the roof's profile and does not result in any gaps through which a person can fall. This is a potential problem on buildings with an unusual plan profile or roof construction. In such circumstances, if a system is not available to fully secure the edge of the roof, all gaps between the roof and the guardrail system should be filled locally.

A risk assessment should be used to determine anticipated loads and should consider factors which influence the load on the guardrail system. These may include:

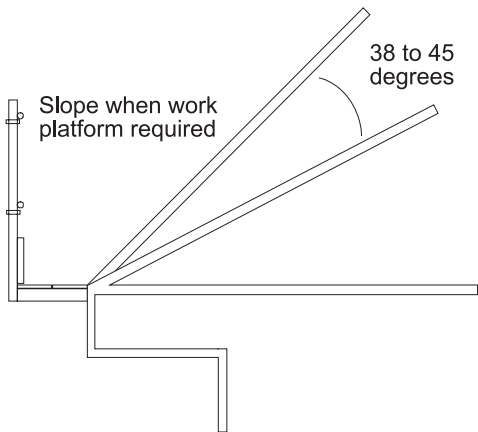
- The type of roof surface – for example, a person may generate more momentum in falling down a roof with glazed tiles rather than unglazed tiles.
- Roof pitch – the steeper the pitch, the greater the speed generated.
- The length of the rafter – the longer a person falls, the more speed they can build up.

Guardrails including those on scaffolding should be between 900mm and 1100mm above the working surface and have a top rail, mid-rail and a toeboard, or include an infill panel that incorporates a kickplate. The toprail should be between 900mm and 1100mm above the working surface measured 300mm from the inside edge of the guardrail.



Where the pitch of the roof exceeds 38 degrees, a platform should be constructed in order to minimise the likelihood of a person falling onto the top rail or over the guardrailing system. The platform should be a minimum of 450mm wide (two planks), include guardrails on the outside perimeter of the platform and should not be used to stack materials or equipment.

Misuse of working platforms may lead to the creation of additional hazards in relation to trips and slips, people falling onto materials or collapse of the platform.



5.3 Fall-arrest systems

Industrial fall arrest systems and devices are designed to stop an accidental fall and may consist of some or all of the following:

- Anchorage point or static line (also known as a safety line or horizontal lifeline)
- Energy absorber
- Inertia reel or fall arrest device
- Fall arrest harness
- Lanyard or lanyard assembly.

Fall arrest equipment such as harnesses and lanyards can be used as travel restriction systems to prevent workers moving from safe to unsafe areas. Fall arrest systems and devices should be used in

accordance with the manufacturer's instructions and when mixing components, check for compatibility before use. Components should comply with the relevant part of the Australian Standard AS/NZS 1891.

Hazards

Potential hazards listed below should be noted in the use of connecting hooks in both fall-arrest and suspension applications.

- Latch may not close or may not lock:
 - due to weakened spring
 - when caught on clothing
 - due to corrosion or other contamination, which prevents free movement
 - due to bent latch, which prevents free movement.
- Dynamic rollout may occur on some hooks. A twisted lanyard or pole strap may cause the connecting D-ring to rest on and load the latch. If pressure is accidentally applied on the locking lever, the latch will open and release the connector.

Requirements for the use of fall arrest systems

Clause 56(2) of the OHS Regulation requires that, if a fall arrest device is provided for use by persons at work, the employer must ensure that:

- All anchorage points for the device are inspected by a competent person before their first use and then on a regular basis so that they are capable of supporting the design loads.
- If the load bearing capacity of an anchorage point is impaired, the anchorage is immediately made inoperable so as to prevent its use.
- Any harness, safety line or other component of the device that shows wear or weakness to the extent it may cause the device to fail is not used.
- All persons using the device have received training in the selection, assembly and use of the system.
- Adequate provision is made for the rescue of a person whose fall is arrested by a fall arrest device.

Suggestions for safe use of fall-arrest systems

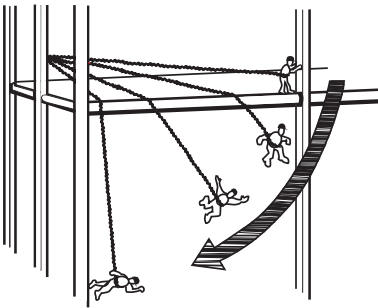
In addition to the requirements of the OHS Regulation, the following measures should also be considered as a means of controlling risk.

- Persons should not work alone when using a fall arrest system.
- Before each use, hooks should be checked for correct operation. If the hook does not close and lock quickly the mechanism may be partially jammed, bent or the spring weakened. Unless cleaning rectifies the problem the hook should not be used.
- Loose clothing should be avoided as it may become entangled in the hook and prevent closure.
- A visual check should be made to ensure that the hook has closed fully and is not tangled in clothing. For the rear connection, a person should connect before putting on the harness or have someone else check it for them.
- The user should be familiar with the operation of the hook before use.
- There should be adequate clearance inside the snap hook enclosure so that the D-ring cannot become jammed in any position.

- Whenever a hook is required to make a connection between the worker and the anchorage point, an automatic locking or double locking hook is recommended as snap hooks can open accidentally.

Pendulum effect

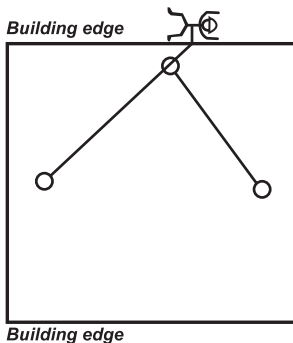
The 'pendulum effect' is a potential hazard associated with the use of fall arrest systems. The pendulum effect may also occur within the interior of a roof if the positioning of the inertia reel allows for a significant length of unsupported line connected to the user.



Following an arrested fall at this extreme diagonal, the inertia reel line moves back along the roof, dropping the worker dangerously down to the ground.

To eliminate the pendulum effect:

- A secondary anchorage point and lanyard or line should be used (see figure below).
- Place the inertia reel anchorage point more or less perpendicular to the position of the line at the perimeter edge. A mobile anchorage helps here.
- A perimeter guardrail could be used to prevent any falls over the perimeter.



Rescue plan

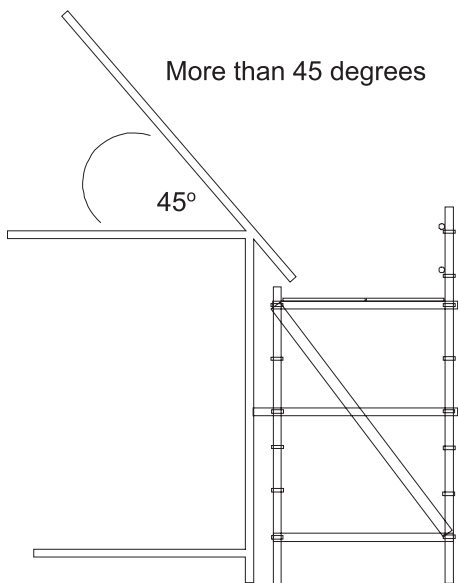
It is essential that before using a fall-arrest system, a plan is in place for the rescue of anybody left suspended mid-air, following a fall.

Serious injury or even death can occur in a matter of minutes, particularly where the person's movement or breathing is restricted or where they are unconscious.

5.4 Roofs greater than 45 degrees

Where the pitch of the roof exceeds 45 degrees, a risk assessment should be used to determine the additional safeguards required.

Additional safeguards that should be considered include the use of wider platforms, higher guardrails, mesh infill panels, fall arrest systems, perimeter scaffolding or the use of cherrypickers.



5.5 Risk control measures for brittle or fragile roofs

Clause 60 of the OHS Regulation introduces risk control measures relating to brittle or fragile roofs. It requires an employer to ensure that the risk of falls associated with persons working on, or passing across roofs, that are wholly or partly covered by brittle or fragile roofing material are controlled by the use of the following measures:

- Permanent walkways.
- If this is not practicable, adequately secured temporary walkways or other means to prevent the fall of persons working on or passing across the roof.

6. Objects falling from heights

It is important to consider the risks associated with objects falling from heights. Clause 57 of the OHS Regulation specifies particular risk control measures for controlling the risks associated with objects falling from heights. It requires:

- An employer to provide a safe means of raising and lowering plant, materials and debris in the place of work.
- A secure physical barrier to be provided to prevent objects falling freely from buildings or structures in or in the vicinity of the workplace.
- Where it is not possible to provide such a barrier, the provision of measures to arrest the fall of objects. These measures may include the platform of a scaffolding system or certain types of other roof edge protection systems, or the careful positioning of a toeboard that forms part of the guardrail, or the use of appropriate infill panels to the guardrail.
- Personal protective equipment to minimise the risks associated with falling objects.

Where the controls used to safeguard persons on the roof do not prevent objects from falling then means must be used to protect persons working under or near the roof. These may include the provision of a screen or an overhead protective structure that catches falling objects, or the establishment of a no-go zone with the necessary barriers and training of personnel in its observation. This last method represents administrative means of controlling an identified risk (see clause 5 of the OHS Regulation) and, in accordance with the principles of risk management, should only be used if it is not reasonably practicable to use others.

7. The safe use of portable ladders

A ladder is used for gaining access to areas above or below the ground or other levels not provided with permanent access. If it is not practicable to use the control measures specified in Clause 56 of the Regulation a ladder may be used to carry out lightweight work of short duration.

When using portable ladders, the following suggestions for controlling risk should be considered:

- Use the correct ladder for the job.
- Use only industrial ladders – do not use domestic ladders.
- Examine ladders for defects and damage before use.
- Ladders should be adequately supported at the base.
- Set the ladder at a slope of 4 in 1 – ladders must be angled one out and four up.
- Ladders should extend at least one metre above the access level.
- Ladders should be firmly secured or tied off or held firmly by another person.
- The ties should be attached to the stiles of the ladder and not the rungs.

- A ladder should not be walked by the person standing on the ladder.
- One person on a ladder at a time with three body limbs on the ladder at all times.
- Do not climb higher than the third rung from the top of the ladder.
- Only work on a job within easy arm's reach from the ladder.
- Ladders (other than trestle ladders) should not be used to support planks as a work platform.
- Metal ladders or wire reinforced ladders must not be used where electrical hazards exist.
- Climb and descend facing the ladder maintaining three points of contact with the hands gripping the stiles or each rung.
- Do not carry anything in your hands when climbing or descending.
- Do not place ladders in vehicle or pedestrian traffic areas.
- Long and heavy ladders (greater than 20kg) should be handled by at least two people.
- Stepladders should only be used in the fully open position.
- Wear slip resistant footwear when using ladders.
- Clean off footwear and ladder rungs before using the ladder.

8. Electrical safety – overhead powerlines

One of the most common causes of electrocution in the workplace is contact with overhead electrical powerlines. This is because people can misjudge heights and distances between the ground and overhead powerlines when carrying equipment like poles and ladders, erecting scaffolding or operating equipment with height extension such as mobile scaffold and EWPs.

Clause 64 of the OHS Regulation specifies particular risk control measures for controlling the risks associated with working in close proximity to overhead electrical powerlines. When working at heights near overhead powerlines the following control measures should be considered:

8.1 Eliminate the hazard

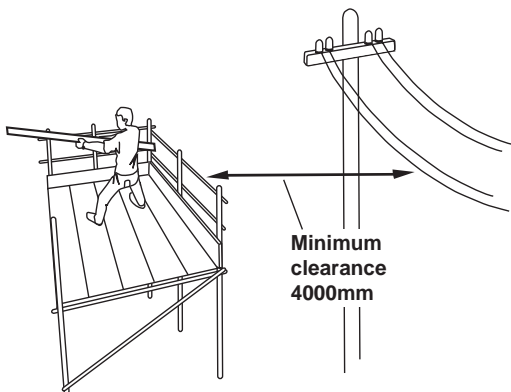
The best method of eliminating the hazard involving overhead powerlines is to de-energise and isolate the power supply and obtain documentary evidence of the continuing isolation of the power supply before proceeding with the work. Overhead power line covers or bunting such as tiger tails may be used to highlight visibility of the powerlines. The covers or bunting should not be regarded as insulation.

8.2 Safe working distances

Ensure that a thorough examination of the approaches and surroundings of the site is carried out before taking plant, scaffolding materials or tools to the site or setting it up. This examination is to determine what precautions need to be taken to prevent any part of the plant, scaffolding, materials or tools coming into contact with overhead powerlines:

Where overhead electrical powerlines are in close proximity to a scaffold or ladder, the following clearances should be observed.

- (a) Four metres where any metal material is being handled or metal equipment, including ladders and scaffolding, is being used, or
- (b) One and a half metres, where only non-conductive material, such as dry timber is being handled.



Note: End protection omitted for clarity

Further guidance on the safe erection, use and dismantling of scaffolding near overhead powerlines can be found in AS/NZS 4576 – Scaffolding.

Where overhead electrical powerlines are in close proximity to cranes and mobile plant, the following clearances should be observed.

Nominal voltage	Minimum approach distance
Not exceeding 132,000 V	3 metres
Above 132,000 V but not exceeding 330,000 V	6 metres
Above 330,000 V	8 metres

In calculating these distances the following factors should be considered:

- The sag of the overhead powerlines.
- The swing of the load during handling.
- The effect of wind forces.

If there is a possibility that minimum safe approach distances cannot be maintained, the relevant electricity power supply authority must be contacted and a written risk assessment and a safe system of work developed. For example, accidental contact with long conductive materials being used such as guttering, scaffold or guardrail poles etc.

A safety observer should also be present to observe the position of the plant, tools or materials and to warn workers that they are approaching the proximity of the overhead powerlines.

Further guidance on the operation of cranes, mobile plant including EWPs in close proximity to overhead powerlines can be found in the Interim Guide for Operating Cranes and Plant in Proximity to Overhead Powerlines and AS2550.1 Cranes, hoists and winches – Safe use Part 1: General requirements.

9. Terms used in this guide

Anchorage points are secure points of attachment for lifelines and lanyards.

Boom type elevating work platform is a powered telescoping device, hinged device or articulating device, or any combination of these devices, used to support a platform that can be propelled horizontally as well as vertically and on which personnel, equipment or materials can be elevated, being a platform that can be projected laterally outside its wheel base.

Competent person for any task means a person who has acquired through training, qualifications or experience, or a combination of them, the knowledge and skills to carry out that task.

Elevating work platform (EWP) is a telescoping device, scissor device or articulating device, or any combination of these devices, used to move personnel, equipment or materials to and from work locations above the support surface.

Energy absorber (deceleration device) is an attachment designed to be used in connection with fall arrest equipment that reduces the shock to the body and anchorage point by absorbing some of the fall energy.

Fall arrest system is a system incorporating a fall arrest harness that is designed to minimise the length and severity of a fall.

Fall arrester is a mechanical device that arrests a fall by locking onto the lifeline but at the same time allowing freedom of movement.

Inertia reel is a retractable lifeline that has a fall arrester built into the feeding mechanism of the line.

Lanyard is flexible line, rope or strap used to connect the containment device of a fall safety system to an anchorage or lifeline. They are usually less than 1.8 metres long.

Lifeline is a heavy line used to transfer an anchorage site to a more convenient or secure site while providing horizontal or vertical freedom of movement.

Mobile scaffold is an independent freestanding scaffold that is mounted on castors. (Ref AS/NZS 4576.)

Static line is a taut horizontal lifeline attached to two anchorage points.

Tiger tails are a form of high visibility bunting that provides a visual warning to personnel of the location of powerlines. They do not provide protection against mechanical interference or from electrical hazards.

10. Where can I get more information?

WorkCover NSW

Phone: 13 10 50

www.workcover.nsw.gov.au

OHS Legislation

Occupational Health and Safety Act 2000

Occupational Health and Safety Regulation 2001

www.legislation.nsw.gov.au

Australian Standards

Standards Australia

Phone: 1300 65 46 46

www.standards.com

Department of Energy, Utilities and Sustainability

Phone: 9901 8888

www.deus.nsw.gov.au

WorkCover Codes of Practice

(the full list is available at www.workcover.nsw.gov.au)

Safe Work on Roofs Part 1 – Commercial and Industrial Buildings

(Catalogue No. 304)

Safe Work on Roofs Part 2 – Residential Buildings

(Catalogue No. 308)

Moving Plant on Construction Sites (Catalogue No. 1310)
Occupational Health and Safety Induction Training for Construction
Work (Catalogue No. 302)
Technical Guidance (Catalogue No. 962)

WorkCover Position Papers

Policy Statement: The requirements for scaffolding in NSW
Measures used to control the risks associated with working at height

Portable ladders

WorkCover Safety Guide: Portable Ladders (Safety Guide No. 4503)

WorkCover Position Paper: Working off stepladders

AS/NZS 1892.1 – 1996 Portable ladders Part 1: Metal

AS/NZS 1892.2 – 1992 Portable ladders Part 2: Timber

AS/NZS 1892.3 – 1996 Portable ladders Part 3: Reinforced plastic

AS/NZS 1892.5 – 1999 Portable ladders Part 5: Selection, safe use
and care.

Scaffolding

AS/NZS 1576 – Scaffolding

AS/NZS 4576 – Guidelines for scaffolding

AS 1577 – Scaffold planks

Roof edge protection

AS/NZS 4994.1 Temporary roof edge protection for housing and residential buildings – general requirements

Platforms, walkways and stairs

AS 1657 – Fixed platforms, walkways, stairways and ladders – Design, construction and installation

Lift installation

AS/NZS 4431 Guidelines for safe working on new lift installations in new constructions

Elevating work platforms

AS 1418.10 Cranes, Hoists and Winches – Safe use Part 10

Elevating work platforms. This is the design standard

AS 2550.10 Cranes, Hoists and Winches – Safe use Part 10:

Elevating work platforms. Use and maintenance.

Electrical safety – overhead powerlines

Interim Guide for Operating Cranes and Plant in Proximity to

Overhead Power Lines – Department Energy, Utilities and

Sustainability

AS 2550.1 Cranes, hoists and winches – Safe use Part 1: General requirements for further guidance on using cranes, including EWP's in close proximity to overhead powerlines.

Fall arrest

WorkCover Safety Guide: Use of fall-arrest systems

(Safety Guide No. 4512)

WorkCover Guidelines for Building Facade Access Systems

(Safety Guide No. 4070)

AS 2626-1983 - Industrial safety belts and harnesses - Selection
use and maintenance AS/NZS 1891.1 Industrial fall-arrest systems
and devices, Part 1: Safety belts and harnesses

AS/NZS 1891.2 Industrial fall-arrest systems and devices,
Part 2: Horizontal lifeline and rail systems

AS/NZS 1891.3 Industrial fall-arrest systems and devices,
Part 3: Fall-arrest devices

AS/NZS 1891.4 Industrial fall-arrest systems and devices,
Part 4: Selection, use and maintenance

AS/NZS 4488.1:1997 Industrial Rope Access Systems –
Specifications

AS/NZS 4488.1-1997/Amdt 1-1999 Industrial Rope Access Systems
– Specifications

AS/NZS 4488.2:1997 Industrial Rope Access Systems – Selection,
use and maintenance

Catalogue No. **1321**

WorkCover Publications Hotline **1300 799 003**

WorkCover NSW

92-100 Donnison Street Gosford NSW 2250

Locked Bag 2906 Lisarow NSW 2252

WorkCover Assistance Service **13 10 50**

Website **www.workcover.nsw.gov.au**



ISBN 1 920984 00 3 ©Copyright WorkCover NSW 2004.

Production and printing by cmSolutions – 02 9743 8777