



# SAFE

## WORKING AT HEIGHTS

GUIDE 2006

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](http://www.legislation.nsw.gov.au). You should seek legal advice if you need assistance on the application of the law to your situation.

## **Acknowledgement**

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# 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 investigating 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 are required to be followed to comply with the legislation. The term 'should' indicates a recommendation.

### Legislative framework in New South Wales<sup>1</sup>

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.

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<sup>1</sup> The OHS Act 2000 is currently under review. You must use the most up to date version of the legislation available from [www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au)



See page 40 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.

The risk management 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. You must involve your workers when undertaking risk management. This is a regulatory requirement. 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 2001* 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 power lines.

In addition, Clause 142 specifies particular risk control measures for powered plant used to lift or move people.

This Guide discusses some of the requirements of clauses 56, 57, 58, 60, 64 and 142. 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*
- Prefabricated scaffolding that was designed or altered after 1 September 2001 must be design registered with WorkCover.
- 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, and
  - (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, and

(c) Before its use following repairs, and

(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.

- A scaffold 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 power lines prior to its erection.
- Where scaffolding is used to protect against falls at the perimeter of a building, the platform 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 mobile elevating work platforms**

- Mobile elevating work platforms (MEWPs) must comply with *AS 1418.10 (Int): Cranes, hoists and winches: Elevating work platforms*. All boom type MEWPs ('cherry pickers') and non-boom-type MEWPs (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 – Safe use – Elevating work platforms*.
- Before hiring MEWPs, the employer (who hires the equipment) must carry out a risk assessment to ensure the MEWP is appropriate for the intended work. This process should also include the selection and use of the appropriate configuration of MEWP for the task. Guidance on this is given in AS 2550.10.

- Out-of-level audible and/or visible alarms should be fitted on any MEWPs which are not provided with out-of-level limiting switches. Where practicable the alarm switches should be fail safe in their design.
- Persons operating MEWPs 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 MEWP are competent to do so.

**Note:** *A certificate of competency is required to operate boom-type MEWPs with a boom length greater than 11 metres.*

- MEWPs are designed as a work area and **not** for access purposes. Persons should only egress from an elevated MEWP in an emergency or if a thorough risk assessment identifies that as the only practicable means of gaining access to an area. In such circumstances, the requirements of AS 2550.10 should be followed.
- Self-propelled MEWPs 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 MEWP 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.
- MEWPs must be fitted with an emergency retrieval device that will enable the platform to be lowered in the event of a malfunction of the normal operating power source
- In addition, the MEWP should have a controlled descent device to enable persons on the platform to be evacuated in the event of an emergency
- The MEWP should be provided with a self-escape or rescue facility to allow persons on the platform to escape in the event of a malfunction.

## **Other types of temporary platforms**

There are other types of temporary work platforms available such as mast climbing work platforms and crane workboxes. Some of these have specific requirements for design registration under the OHS Regulation.

## 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 (Int): Temporary roof edge protection for housing and residential buildings – General requirements*.

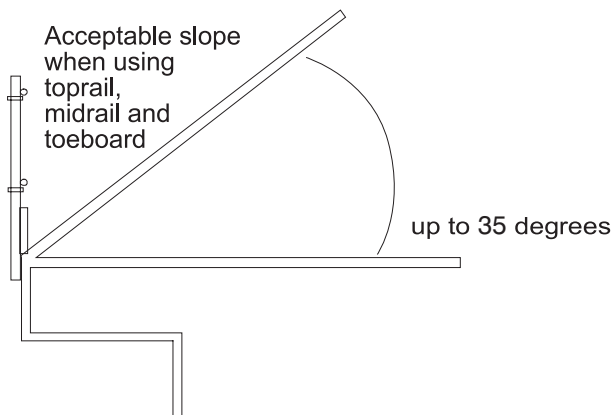
Prior to installing a guardrail system at the edge of a roof, it is important to check that it is suitable for that roof. Particular attention should be given to ensuring that the supporting members, including the rafters where the system is connected to them, can support the loads that will be generated 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 top rail should be between 900mm and 1100mm above the working surface measured 300mm from the inside edge of the guardrail.

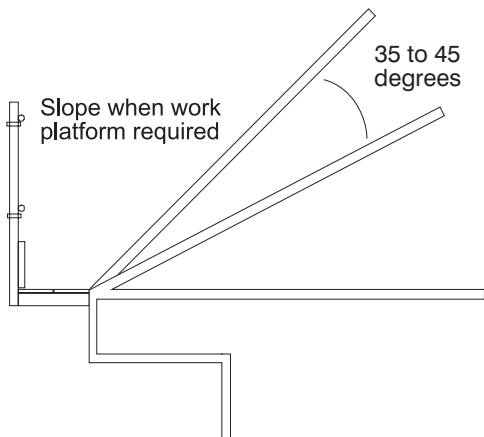


**Figure 1 A guardrail system on a roof with a slope of up to 35°**

Note: An infill panel should be used where the slope is greater than 26°

Where the pitch of the roof exceeds 35 degrees but is less than 45 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 an infill panel on its outside perimeter 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.



**Figure 2 Slope when work platform required**

### **5.3 Fall-arrest systems**

Industrial fall arrest systems and devices are designed to stop an accidental fall and shall 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 accordance with the manufacturer's instructions and when mixing components, check for compatibility before use. Components should comply with the relevant part of *AS/NZS 1891: Industrial fall arrest systems and devices*.

Fall arrest systems require a minimum distance to be effectively activated, usually 4 metres. It is therefore essential that there are no objects within this fall zone and that the activation distance is not greater than the height above the ground or other surface.

## **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. In addition, the user should carry out a visual inspection before every use.
- 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**

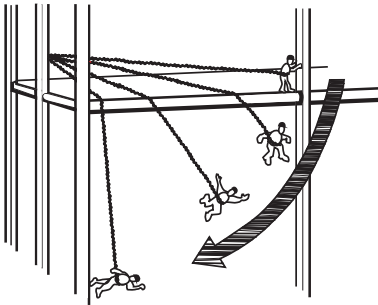
In addition to the requirements of the OHS Regulation, the following measures should also be considered as a means of controlling risk.

- It is strongly recommended that persons using fall arrest systems should not work alone. Where it is necessary that persons do work alone they should be constantly monitored to ensure that they have not fallen. In the event of a fall, it is vital that the person be rescued as soon as possible, even if uninjured. This is necessary as a suspended person may suffer suspension trauma.
- 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.

**Figure 3** The 'pendulum effect'

## 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.

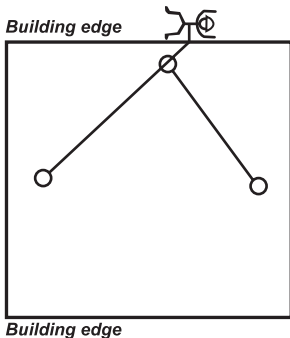


Figure 4 Eliminating the pendulum effect

## 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.

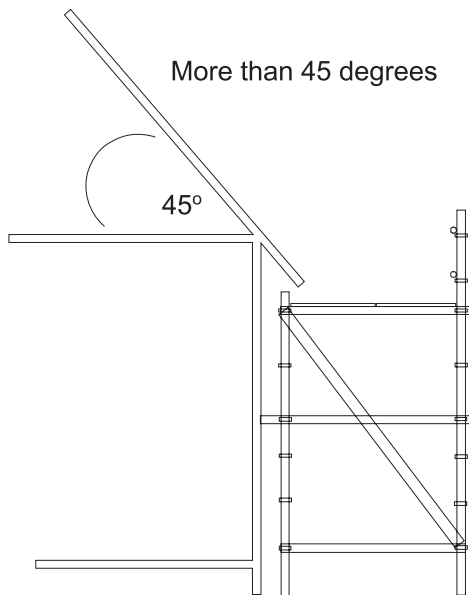


Figure 5 Additional safeguards required where the pitch of the roof exceeds 45°

## **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. Mechanical lifting equipment

Mechanical lifting equipment such as tile elevators and builders hoists should be provided where appropriate. Where tile elevators and builders hoists are used, the following should be considered:

- the risk of manual handling injuries during installation and removal
- appropriate control measures to prevent injury during use, for example, guarding the drive mechanisms and nip points on elevator belts
- the area around the equipment should be barricaded to prevent access and risk of injury to persons below from falling objects or the operation of the machine
- a method of installation that maintains the effectiveness of any edge protection that is in place. Edge protection should be restored immediately after removal of lifting equipment.

**Note:** A person must hold the appropriate certificate of competency to operate certain types of plant, including a builders hoist.

## 9. Electrical safety – overhead power lines<sup>2</sup>

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

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

### 9.1 Eliminate the hazard

The best method of eliminating the hazard involving overhead power lines 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

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<sup>2</sup> WorkCover NSW is currently developing a *Code of Practice Work Near Overhead Power Lines*. Check the WorkCover website at [www.workcover.nsw.gov.au](http://www.workcover.nsw.gov.au) for the most up to date information.

power lines. The covers or bunting should not be regarded as insulation against electrical hazards.

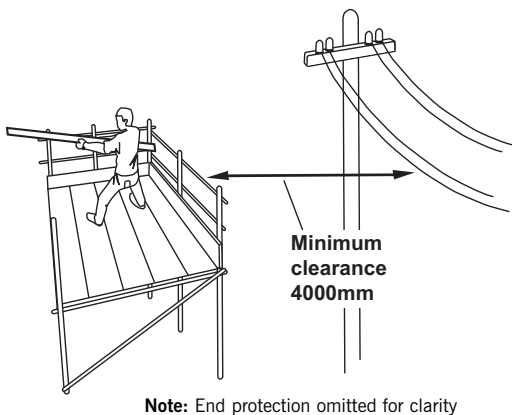
## **9.2 Safe approach distances**

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 power lines.

Where overhead electrical power lines 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.

If a hazard involving scaffolding and overhead power lines has been identified, a written risk assessment must be undertaken to determine the risk to persons encroaching within the four metre approach distance. Overhead power lines should be de-energised and an access authority or other form of written documentation obtained from the network operator if the scaffold and the overhead power line is or has the potential to come within the four metre approach distance.



**Figure 6 Safe approach distances**

Further guidance on the safe erection, use and dismantling of scaffolding near overhead power lines can be found in the *WorkCover Position Paper: Work near or in close proximity to Overhead Power Lines* and in *AS/NZS 4576: Scaffolding*.

Where overhead electrical power lines are in close proximity to cranes and mobile plant, the following approach distances should be observed:

<b>Nominal voltage</b>	<b>Minimum approach distance</b>
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 approach distances the following factors should be considered:

- The sag and swing of the overhead power lines.
- The movement of the load or materials during handling.
- The effect of wind forces.

If there is a possibility that minimum approach distances cannot be maintained, the relevant network operator must be contacted and a written risk assessment and a safe system of work developed.



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

Further guidance on the operation of cranes and, mobile plant including EWPs in close proximity to overhead power lines can be found in the *WorkCover Position Paper: Work near or in close proximity to Overhead Power Lines, AS2550.1: Cranes, hoists and winches – Safe use – General requirements* and *AS 2550.5: Cranes, hoists and winches – Safe use – Mobile Cranes*.

If using a MEWP close to power lines, AS 1418.10 (Int) specifies the requirements for insulating MEWPs for such purposes and an appropriate MEWP that complies with this Standard should be used.

## 10. 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.

**Mobile elevating work platform (MEWP)** 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.)

**Network Operator** means the owner, controller or operator of an electricity network (also known as an electricity supply authority)

**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 power lines. They do not provide protection against mechanical interference or from electrical hazards.

# 11. Where can I get more information?

## **WorkCover NSW**

Phone: 13 10 50

[www.workcover.nsw.gov.au](http://www.workcover.nsw.gov.au)

## **OHS Legislation**

*Occupational Health and Safety Act 2000*

*Occupational Health and Safety Regulation 2001*

[www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au)

## **Australian Standards (SAI-Global: publisher and distributor of Australian Standards)**

Standards Australia

Phone: 1300 65 46 46

[www.standards.org.au](http://www.standards.org.au)

## **Department of Energy, Utilities and Sustainability**

Phone: 8281 7777

[www.deus.nsw.gov.au](http://www.deus.nsw.gov.au)

## **WorkCover Codes of Practice**

(the full list is available at [www.workcover.nsw.gov.au](http://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**

*Advice on use of crane workboxes* (Publication No. 4398)  
*Design of plant that can be used for Multiple Purposes* (Publication No. 4401)  
*Measures used to control the risks associated with working at height* (Publication No. 4379)  
*Requirements for scaffolding in NSW – Policy Statement*  
*Work near or in close proximity to Overhead Power Lines* (Publication No. 4667)  
*Working off stepladders* (Publication No. 4395)  
*Work platforms for forklift trucks* (Publication No. 4399)

### **Portable ladders**

*WorkCover Safety Guide: Portable Ladders* (Safety Guide No. 4503)  
*AS/NZS 1892.1: Portable ladders – Metal*  
*AS/NZS 1892.2: Portable ladders – Timber*  
*AS/NZS 1892.3: Portable ladders – Reinforced plastic*  
*AS/NZS 1892.5: Portable ladders – 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 (Int): 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*

## **Mobile elevating work platforms**

*AS 1418.10(Int): Cranes, Hoists and Winches – Elevating work platforms.* This is the design standard

*AS 2550.10: Cranes – Safe use – Elevating work platforms.*

## **Electrical safety – overhead power lines**

*WorkCover Position Paper: Work near or in close proximity to Overhead Power Lines*

*AS 2550.1: Cranes, hoists and winches – Safe use General requirements.*

*Electrical Hazard Awareness for Operators of High Machinery*  
(Publication No. 326)

## **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/NZS 1891.1: Industrial fall-arrest systems and devices Safety belts and harnesses*

*AS/NZS 1891.2: Industrial fall-arrest systems and devices Horizontal lifeline and rail systems*

*AS/NZS 1891.3: Industrial fall-arrest systems and devices Fall-arrest devices*

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

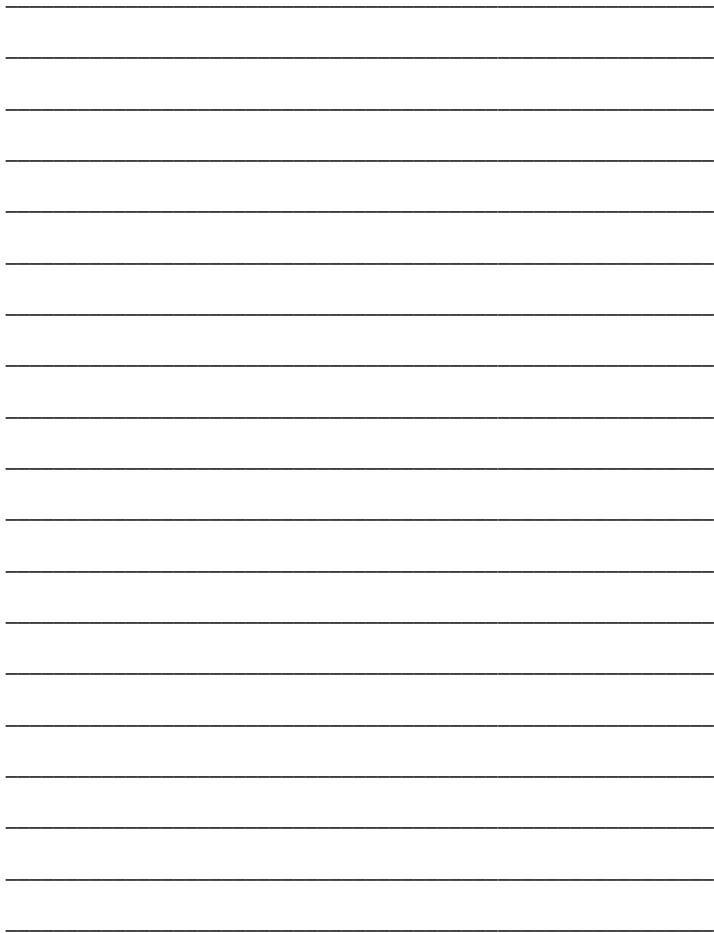
*AS/NZS 4488.1: Industrial Rope Access Systems – Specifications*

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

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







## Are you going deaf?

Hearing loss caused by work is preventable but once your hearing has gone, it won't come back. Hearing loss caused by exposure to noise at work is a major health issue for employers and workers in the construction industry in New South Wales. Factors that contribute to hearing damage are noise levels and how long people are exposed to the noise, daily or over a number of years.

### How do you know if you have a noise problem on your site?

Consider the following questions:

- In your workplace, is a raised voice needed to communicate with someone about a metre away?
- Do people in the area notice a reduction in hearing over the course of a day?
- Do workers ask to repeat things already said?
- Do workers experience any of the following:
  - A sensation of ringing in the ears (tinnitus)
  - The same sound having a different tone in each ear?
  - Blurred hearing?
- Are any long-term workers hard of hearing?
- Do any workers operate noisy machinery for long periods?

If you answered, 'yes' to any of the above questions, the chances are that your workplace could be putting workers hearing at risk.

For further information contact WorkCover Assistance Service on **13 10 50** or go to **[www.workcover.nsw.gov.au](http://www.workcover.nsw.gov.au)**



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