

# CODE OF PRACTICE



WORKSAFE VICTORIA

# PREVENTION OF FALLS IN HOUSING CONSTRUCTION

March 2004

OCCUPATIONAL HEALTH AND SAFETY ACT 1985  
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## **Occupational Health and Safety Act 1985**

The *Occupational Health and Safety Act* sets out general duties of care applying to employers, employees, self-employed persons, occupiers, designers, manufacturers, importers and suppliers. The Act enables regulations to be made in relation to the safety, health and welfare of people at work.



## **Occupational Health and Safety (Prevention of Falls) Regulations 2003**

The *Occupational Health and Safety (Prevention of Falls) Regulations* apply to fall hazards of more than 2 metres. The aim of the Regulations is to prevent people at work from falling and to prevent or reduce injury that result from those falls.

Section 47(1) of the Act states that failure to comply with regulations made under the Act is an offence.



## **Code of Practice for the Prevention of Falls in Housing Construction**

The *Code of Practice for the Prevention of Falls in Housing Construction* provides practical guidance on how to eliminate or reduce risk of falling from height in the housing construction industry. The code aims to cover typical hazards involved in construction work on buildings and structures of three habitable storeys or less, based on classes 1, 2 and 10 of the Building Code of Australia.

### **Falls above 2 metres**

Part 2 of the code provides practical guidance on how to comply with the Regulations.

### **Falls below 2 metres**

Part 3 of the code provides practical guidance on how to comply with general duties of the Act in relation to risks of falls through 2 metres or less.

Appendix 1 explains the code's legal status.



## PART 1: INTRODUCTION

### 1. PURPOSE AND SCOPE OF THE CODE

The Code of Practice for the Prevention of Falls in Housing Construction provides practical guidance to builders, contractors and their employees on how to eliminate or reduce the risk of falling from height in the housing construction industry.

This code covers typical fall hazards involved in construction work on buildings and structures of three habitable storeys or less, based on classes 1, 2 and 10 of the Building Code of Australia.

### 2. DUTIES OF BUILDERS AND SUBCONTRACTORS

#### What must the builder do to prevent falls?

The *Occupational Health and Safety Act 1985* (the Act) imposes a duty on employers to protect their employees from risks to their health and safety. As the builder with overall management and control of the building site this duty extends to any subcontractors, and their employees, you have engaged to carry out works on the site. In addition, the *Occupational Health and Safety (Prevention of Falls) Regulations 2003* (the Regulations), require you to ensure that your own employees and your subcontractors, including their employees, are protected from the risk of a fall of more than 2 metres, as far as practicable.

One way of fulfilling your obligations under the Regulations is to set up fall protection to cover all workers on site, instead of leaving it up to individual contractors to provide their own systems. Alternatively, the contract could specify that the subcontractor must supply fall protection. However, if you adopt this approach, you have a duty to ensure that the subcontractor provides fall protection in accordance with the contract, for the duration of the work.

Regardless of who provides the fall protection, you have a duty under the Act to make sure that it is provided and maintained for all people on site, so far as practicable.

Careful project planning can help to reduce the risk. Sequence jobs so that different trades are not interfering with each others' work. Schedule activities so that your employees and subcontractors are not working above or below each other at the same time.

#### Checklist for employers/builders

When selecting and coordinating contractors and work schedules, ensure that:

- the contract has been prepared to take into account the fall protection needs of all parties
- you have provided the subcontractor with plans, specifications and any other information that will assist him or her in performing the work safely
- the subcontractor understands the correct sequence of critical operations to be carried out on site
- the subcontractor is competent to perform the work safely. (Competence may have been developed through training and/or experience)
- you or the subcontractor have identified fall hazards and assessed the risk of falling, for example, through a documented risk assessment such as a Job Safety Analysis (JSA)
- you or the subcontractor have implemented effective fall protection measures
- you have set in place sufficient supervision to monitor the subcontractors' safety performance.



## What must a subcontractor do to prevent falls?

If you are a subcontractor who has direct employees, the Act imposes duties on you as an employer to protect your employees from risks to their health and safety. This duty extends to any other subcontractors, and their employees, you have engaged to undertake work on the site.

At the same time the Act and the Regulations consider you, *and your employees*, to be employees of the builder who has duties in respect of your health and safety, as previously discussed.

Employer obligations therefore apply to *both* the builder and to you as a subcontractor. Generally, the more control builders have over the work environment and the task to be performed, the greater their responsibilities towards subcontractors and their employees. On the other hand, the more autonomy subcontractors have in carrying out the job, the greater their responsibility towards their own employees. The key is to determine which things are within the control of each duty-holder. Where feasible, this should be determined before the job starts and be set down in the contract.

Under the Act, you have a duty to ensure that your activities do not expose anybody (including other workers, site visitors and members of the public) to health and safety risks. However, your duty does not extend to the activities of other subcontractors (other than your own). For example, a roofing contractor is not required to check that another subcontractor, such as a painting contractor, has provided the necessary fall protection for the painters. This responsibility rests with the builder and the painting contractor.

## Checklist for subcontractors

Before commencing work on a job, ensure that:

- the contract clearly establishes the responsibilities of builder and subcontractor regarding the provision and maintenance of fall protection
- you have all the information needed to do the job safely
- you or the builder have identified fall hazards and prepared a documented risk assessment such as a JSA (see section 3.3 for advice on risk assessment)
- agreed risk controls are in place and safe work procedures have been established
- your employees (if any) have received adequate training and instruction in the use of the agreed risk controls and safe work procedures.

You should notify the builder if any unexpected fall hazards are identified before or during the job.



## PART 2: FALLS FROM MORE THAN 2 METRES

### 3. DUTIES OF EMPLOYERS

If you are an employer (including a subcontractor with employees) you have specific duties under the *Occupational Health and Safety (Prevention of Falls) Regulations 2003* (the Regulations) to protect your employees from falls from heights of more than 2 metres. These duties extend to any contractors and their employees that you engage to work for you.

If another person is carrying out a task on your behalf, you have a responsibility to ensure that he or she has the appropriate information, instruction and training to carry out the task safely.

#### 3.1 Consult your employees

Your workers' experience and knowledge can help you identify and control fall hazards. Therefore, it is a good idea to consult with them directly.

If your workers have an elected health and safety representative, the Regulations require you to consult with this person, so far as practicable, when carrying out hazard identification, risk assessment and risk control.

The housing construction industry employs many people from non-English speaking backgrounds. When consulting, you should consider the communication needs of these employees.<sup>1</sup>

#### 3.2 Identify fall hazards

Before work starts, you must identify all tasks that might cause an employee or subcontractor to fall more than 2 metres (see Figure 1).

This includes moving around the site as well as to and from the task.

In particular, you must identify tasks carried out:

- on any structure or plant being constructed, demolished, inspected, tested, maintained, repaired or cleaned
- on a fragile surface (for example, cement sheeting roofs, fibreglass sheeting roofs and skylights)
- on a potentially unstable surface (for example, where there is potential for ground subsidence or where the supporting surface may collapse. Unsuitable supporting surfaces include stacks of building materials, timber pallets and bricks)
- using equipment to gain access to the elevated level (for example, when using scaffolds or portable ladders)
- on a sloping or slippery surface where it is difficult for people to maintain their balance (for example, on glazed tiles and/or a surface with a gradient exceeding 1 in 8 [7 degrees])

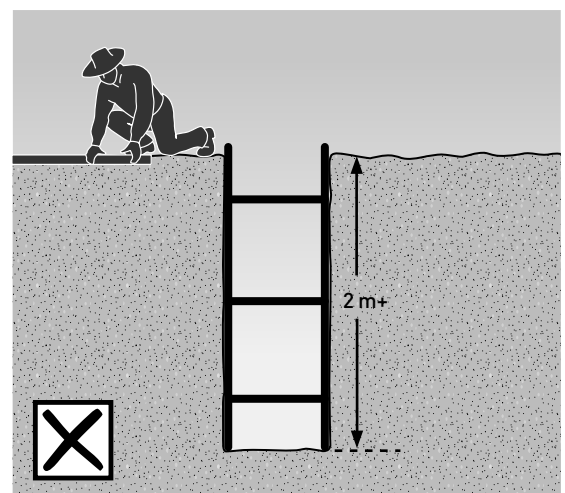
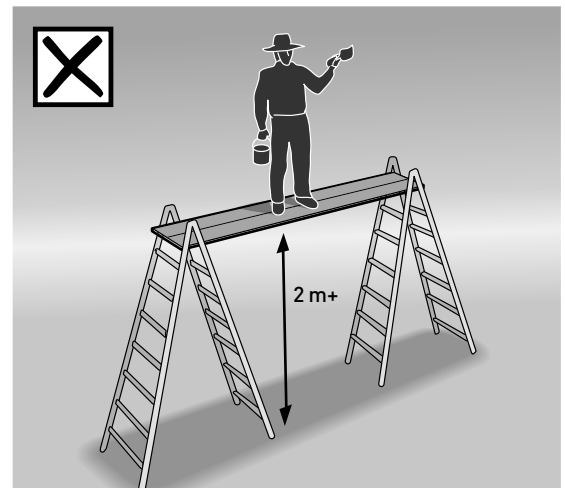
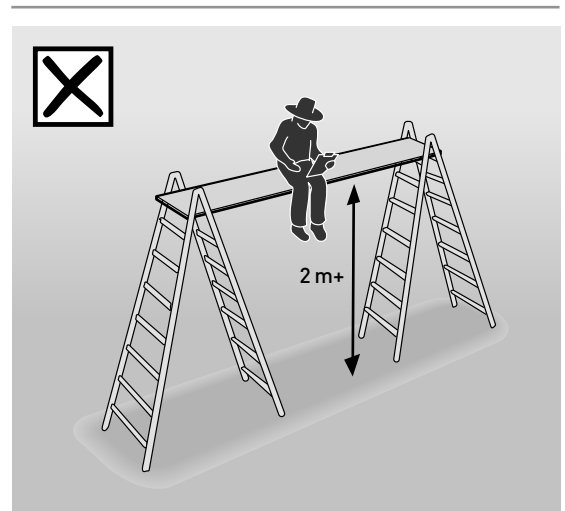


Figure 1 Situations with fall heights of more than 2 metres

<sup>1</sup> Refer to WorkSafe's *Code of Practice for Provision of Occupational Health and Safety Information in Languages other than English* for guidance on providing information, instruction and training in multilingual workplaces.



- near an unprotected open edge (for example, near perimeters without guardrailing, or incomplete stairwells)
- near a hole, shaft or pit into which a person could fall (for example, trenches, pile holes or service pits).

### 3.3 Assess the risk of a fall

Once you have identified a fall hazard, you must assess the risk (or likelihood) of a fall occurring.

#### Risks of the task

The following factors present a risk.

- Workers are handling unstable or cumbersome objects (such as sheets of plaster that can be caught by the wind).
- Building materials, large tools, or equipment are being manually carried up to the job.
- The task is lengthy and exposes workers to the risk for long periods of time.
- Workers are using chemicals such as solvents or paints that may cause dizziness or loss of coordination.
- New or inexperienced workers are involved in the task.

#### Risks within the working environment

The following factors present a risk.

- The slope of the raised work surface makes it difficult for workers to maintain their balance.
- The work surface is slippery (wet, oily, dusty or glazed).
- The work surface is uneven (for example, broken ground).
- The work surface is too restricted, preventing workers from moving freely.
- Tools, work materials and debris clutter the work surface.
- Workers are carrying out the task in adverse weather conditions (for example, in rain, strong or gusty winds, extreme heat or cold, or high humidity).
- There are unprotected edges or penetrations that are difficult to see because of obstructions, glare or deep shadows.
- Multiple contractors or trades are in the same work area at the same time.

#### 3.3.1 Generic risk assessment

If similar tasks or processes are to be carried out at a number of housing construction sites under your control, you may only need to do one risk assessment. However, a single (or generic) risk assessment will only be appropriate if the fall hazards and risks and the work environment for the sites covered by the assessment are the same or similar.

For example, if a generic assessment is undertaken by an industry association as a model to be used by a number of different employers with essentially identical workplaces, you are responsible for ensuring that the assessment is valid for your workplace before deciding to adopt it.

It is a good idea to consult with your employees and subcontractors when preparing generic assessments. If there are health and safety representatives, you are required to consult with them as far as practicable.

### 3.4 Control the risk

If there is a risk that a fall may occur, you must take action to eliminate the risk. If this is not practicable, you must reduce the risk as far as practicable. The Regulations set out a hierarchy (or ranking) of risk controls that you must apply.

Eliminating the risk of a fall is the most effective way of protecting your employees and subcontractors. Methods of achieving this are listed at the top of the hierarchy.

You must apply the controls in the order listed (see 3.4.1 Hierarchy of control). Only where it is not practicable to use a higher order control may you then use a control at the next lower level.

Where it is practicable to undertake part of a task using a higher order control, that control must be used to the extent possible. Where a risk of a fall remains in undertaking the works, then the next level of controls must be applied wherever practicable.

#### 3.4.1 Hierarchy of control

Level 1: Undertake the work **on the ground or on a solid construction** (see section 5.1 and 5.2)

Level 2: Undertake the work using a **passive fall prevention device** (see section 5.3)

Level 3: Undertake the work using a **work positioning system** (see section 5.4)

Level 4: Undertake the work using a **fall injury prevention system** (see section 5.5)

If after considering all of the control measures listed above and a risk remains, you must control the risk using the following forms of control:

Level 5: Undertake the work **from ladders, or implement administrative controls** (see section 5.6 and 5.7)



## PART 2: FALLS FROM MORE THAN 2 METRES

### 3.4.2 What does practicable mean?

“Practicable” does not just mean the cost in dollar terms. To determine what is practicable, you must take into account:

- **severity of the hazard or risk**  
How likely is it that employees will fall? How serious are the injuries likely to be, and how many people are likely to be exposed to the fall hazard?
- **state of knowledge**  
What is known about the hazard and the ways of controlling the risk? How do similar businesses or workplaces control the risk of falling? What information can OHS professionals, industry associations, unions and government bodies provide? What can you find out from manufacturers and suppliers about risk control equipment?
- **availability and suitability of ways to remove or mitigate the hazard or risk**  
Are the fall protection measures you have identified available? Are they designed and constructed for the worksite, the task and the employees or subcontractors using them?
- **cost of removing or mitigating the hazard or risk**  
What are the costs of eliminating or reducing the hazard or risk, now and in the future?

### 3.4.3 Make sure fall protection measures do not introduce new risks

You must reduce, as far as practicable, any risks associated with the installation, erection or removal of plant or equipment intended to control the risk of a fall. Workers (such as scaffolders and guardrail installers) employed to install, erect or remove a fall protection measure must not be exposed to a greater risk than the measure is designed to control, even if it is highly effective once in place.

If plant or equipment is used to control the risk, it must be “fit for purpose”, that is, it must be designed and constructed for the task and the working environment.

Consider the following in regard to the plant or equipment:

- Has it been designed to enable workers safe access and egress to both the plant and equipment and onto any necessary parts of the structure (such as access onto a roof)?
- Have the fall risks for workers erecting or installing the plant or equipment been identified and controlled?

- Has it been designed for all the intended loads, including temporary placement of materials?
- Have the foundations been assessed to take the imposed loads?
- During installation, use or dismantling, is it possible for workers or equipment to come into contact with powerlines (for example, when landing roof trusses onto the house frame by crane)?

### 3.4.4 Maintain fall protection measures

The Regulations require you to ensure that fall protection measures are properly used and maintained. This means that plant and equipment provided as fall protection should be inspected, tested and serviced regularly. Fall protection measures should be monitored regularly to make sure that employees (including subcontractors) are using them properly. Where an alteration of specific plant or fall protection measures is to be undertaken, the builder should make sure that the integrity of the system is maintained and that clear arrangements to this effect are in place with subcontractors.

### 3.4.5 Establish emergency procedures

Unless the risk of a fall has been eliminated by arranging for work to be done on the ground or from solid construction, you will need to ensure that emergency procedures are established.

When developing these procedures consider the different types of emergency and rescue scenarios that might arise. Use the information from your risk assessment to help you in this task. In the event of a fall, will it be necessary to retrieve the injured worker? If so, procedures must be developed to undertake such rescues.

The emergency procedures must also cover the provision of first aid. The procedures should:

- specify whether trained first aiders are required, and if so, the number needed, the competencies required, and the first aid equipment necessary<sup>2</sup>
- identify the nearest hospital and medical treatment rooms
- establish means of contacting the emergency services promptly.

If the job is to be carried out in a remote location outside the mobile telephone network and other means of communication are not available, alternative procedures will need to be developed that do not rely on the rapid attendance of emergency services.

Emergency procedures should be rehearsed. Make sure that all workers likely to be involved in performing emergency procedures know what to do in the event of a fall from height.

<sup>2</sup> See WorkSafe's **Code of Practice for First Aid in the Workplace** for more information.





### 3.4.6 Provide instruction, information and training

Employees and subcontractors performing any task involving a fall hazard must be provided with the information, instruction and training necessary to enable them to work safely and without risks to their health in relation to:

- the nature of the task that involves a fall hazard
- the need for, and proper use of, measures to control the risk of a fall.

The amount and type of information, instruction and training required will depend on the severity of the hazard and the risk involved. It will also depend on the level of skill required to operate or use the control measure. Tasks involving complex work procedures or risk control measures will require more comprehensive training processes.

For example, individual fall arrest systems (IFAS) require a high level of competence to use safely. Workers using these systems should be trained to anchor, fit, use and maintain the IFAS correctly. They must also have an understanding of the nature of the fall hazard and the risks of injury associated with tasks that they undertake using IFAS. This training should cover the risks of injury associated with an arrested fall. Appendix 4 sets out the specific information, instruction and training required for workers using IFAS.

Extensive training may not be needed for fall protection measures that require little or no skill to use safely, such as guardrailing. Information and instruction may be all that is needed for these measures. (For example, employees and subcontractors should be instructed not to stand on or climb over the guardrailing.) However, workers need to have knowledge of why the system is necessary and any limitations of the system.

Information should be provided in a form that can be understood by all employees. This may include providing information in languages other than English.

**Remember that while training is important, it is not a substitute for the effective control of risk.**

## 4. DUTIES OF EMPLOYEES

If you are an employee of a builder or an employee of a subcontractor exposed to fall hazards, your employer must provide you with the information, instruction and/or training you need to do your job safely. Builders also have this duty to their subcontractors.

The way you work and the way you use the fall protection measures must be in accordance with the information, instruction and training you receive from your employer. However, if you believe that the work cannot be carried out safely, you should discuss your concerns with your supervisor or health and safety representative.

You must not alter plant or equipment provided to control the risk of falling (such as scaffolds and guardrailing) unless:

- the builder has agreed that you are to alter the plant or equipment
- both you and the builder consider that you have sufficient information, instruction and training to perform the alterations correctly.



## PART 2: FALLS FROM MORE THAN 2 METRES

### 5. FALL PROTECTION MEASURES

Employers have a duty to control the risk of falls in the workplace. This section provides detailed guidance on practicable fall protection measures appropriate for a range of typical activities in the housing industry. The guidance is set out in the order of the hierarchy of control described in section 3.4.1. Wherever it is practicable to do so, controls at the top of the hierarchy must be implemented before consideration is given to implementing lower order controls. Refer to section 3.4.1 for further advice.

Fall protection measures must also be suited to the particular task, the severity of risk and the employees involved.

#### 5.1 Work on the ground

Eliminating the need to work at height is the most effective way of protecting workers from fall hazards. Think about how the work could be done without exposing them to a risk of falling from a height or into a depth. Examples of elimination include:

- off-site prefabrication of wall frames and trusses
- using tilt-up concrete construction instead of concrete walls constructed *in situ*.

#### 5.2 Work from solid construction

Where work is being done from solid construction, workers are provided with an environment where the likelihood of a fall is minimised. "Solid construction" means an area that:

- is structurally capable of supporting workers, material and any other loads applied to it
- is provided with guardrailing around its perimeter and all open penetrations from or through which workers could fall
- has an even and readily negotiable surface and gradient
- allows workers to enter and leave the work area safely.

Solid construction must satisfy **all** of the following requirements.

##### Structural strength

Different types of work involve different loads on the supporting surface. Make sure that the surface and its supports can safely carry the expected loads – including workers, material, tools and equipment. When in doubt, get a structural engineer to determine the safe load capacity before use.

Ensure that, where props are used to support suspended floors, formwork or similar areas:

- proprietary brand props are marked with their safe working load
- timber props are designed for the loads imposed
- the props are secured top and bottom
- the props are tied to each other in the longitudinal and transverse directions to form a stable, free-standing structure.

##### Surface and gradient

Ensure that:

- surfaces of solid construction are non-slip and free from trip hazards and traps
- smooth surface working areas are not steeper than 7 degrees (1 in 8 gradient). Cleated or grated surfaces, which provide greater slip resistance, should not be steeper than 20 degrees (approximately 1 in 3 gradient).

##### Edge protection

Perimeter protection must be provided on the exposed edges of a solid construction. These include:

- the perimeters of buildings or other structures
- the perimeters of skylights or other fragile roof materials
- openings in floor or roof structures.

##### Additional void protection

Where there is a risk that workers performing tasks off trestles or ladders may fall over the guardrailing, stairwells and other openings in the floor should be covered. The covering should be designed to withstand any loads that may be applied to it and secured to prevent dislodgment.

##### Access and egress

Every solid construction must have safe and suitable means of access and egress, such as:

- existing floor levels
- permanently installed platforms, ramps, stairways and fixed ladders complying with *AS 1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation*
- temporary access ways and temporary stair systems
- secured single portable ladders set up at a slope of between 4:1 and 6:1, and extending at least 900 mm above the stepping-off point.

Stepladders and trestle ladders should not be used for access to, or egress from, solid construction.



### 5.3 Passive fall prevention devices

A “passive fall prevention device” is any fall protection system that once erected or installed requires no further ongoing adjustment, alteration or operation by any person to ensure the integrity of the system to perform its function as a fall prevention system. Examples include temporary work platforms and guardrails.

#### 5.3.1 Temporary work platforms

A “temporary work platform” is a platform, other than a permanently installed fixed platform, used to provide a working area for the duration of the job. The design of the platform prevents workers from falling. Temporary work platforms commonly used in the housing construction industry include scaffolds (fixed or mobile), elevating work platforms and portable platforms.

##### 5.3.1.1 Scaffolds

Scaffolds are a common means of providing a safe platform for working at height. There is a wide variety of scaffold systems available.

Scaffold working platforms are generally rated as light, medium or heavy duty.

- **Light duty** – up to 225 kg per bay. This is suitable for works undertaken by a maximum of 2 people with a maximum of 65 kg of tools and materials. Examples include painting, electrical work, many carpentry tasks and other light tasks. Platforms should be at least 2 planks wide.
- **Medium duty** – up to 450 kg per bay. This is suitable for general trades work. Platforms should be at least 4 planks wide.
- **Heavy duty** – up to 675 kg per bay. This is what is needed for bricklaying, concreting, demolition work and most other work tasks involving heavy loads or heavy impact forces. Platforms should be at least 5 planks wide.
- **Special duty** – has a designated allowable load as designed.

These safe load limits include the weight of people (which is taken to be a nominal 80 kg<sup>3</sup>) plus the weight of any materials, tools and debris on the working platform. Therefore, a properly constructed mobile scaffold with a light duty platform can safely support 1 worker and 145 kg of tools and material, or 2 workers and 65 kg of tools and materials.

Any scaffold from which a person or object could fall more than 4 metres must be erected, altered and dismantled by, or under the direct supervision of, a person with a WorkSafe certificate of competency of the appropriate class.

Detailed information about the selection, installation, use and maintenance of scaffolds is provided in *AS/NZS 4576 Guidelines for Scaffolding*.

Appendix 5 provides an example of a documented administrative control for the erection and dismantling of modular scaffolds.

#### **Information, instruction and training for workers using scaffolds**

Where work is performed from a scaffold, employers must ensure that the relevant workers know:

- what loads the scaffold can safely take (such as how many bricks per bay)
- that unauthorised alterations must not be made to the scaffold (such as removing guardrails, planks, ties, toeboards and braces)
- that working platforms need to be kept clear of debris and obstructions along their length
- that incomplete or defective scaffolds must never be accessed.

Where mobile scaffolds are in use, employers must ensure that workers know that the scaffold should:

- remain level and plumb at all times
- be kept well clear of powerlines, open floor edges and penetrations
- never be accessed until all castors are locked to prevent movement
- never be moved while anyone is on it.

#### **Ladder bracket scaffolds**

The use of ladder brackets to support planks is not an acceptable means of providing fall protection for people working above 2 metres. Advice on the use of ladder brackets below 2 metres is given in Part 3.

#### **Trestle scaffolds**

Trestle scaffolds may be used at heights greater than 2 metres, if guardrailing is incorporated to prevent people from falling off the open side or end of the work platform (see Figure 2). The system (including planks) should be assembled according to the manufacturer’s specifications.

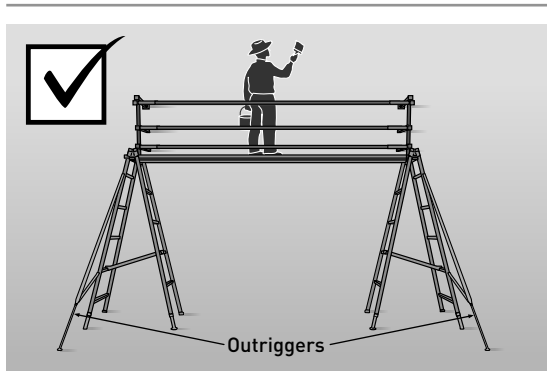
Some trestle ladder scaffolds include outriggers. Trestle ladder scaffolds are only suited to light duty tasks such as painting and rendering.

When adjusting the height of a trestle scaffold, make sure that only the purpose-designed pins are used. Do not use nails or pieces of reinforcing bar.

<sup>3</sup> The current review of the Australian Standards for Scaffolding may result in the nominal weight of a person being increased.



## PART 2: FALLS FROM MORE THAN 2 METRES



**Figure 2** Trestle ladder scaffold with guardrailing and outriggers for stability

The maximum spacing of trestles should not exceed the maximum recommended span of the scaffold planks. Since 1993 random length scaffold planks manufactured in accordance with AS 1577 have this information marked on them. Where this information is not known reference may be made to Table 1.

Work should only be performed between the trestles. Where a trestle scaffold is more than 1 bay in length, heavy loads (such as bricks, blocks or similar) should be placed directly over the trestles.

Further guidance on trestle ladder scaffolds is provided in AS 4576 *Guidelines for Scaffolding*. A certificate of competency is not required for the erection of these types of scaffolds.

**TABLE 1: MAXIMUM SPAN OF SOLID TIMBER SCAFFOLD PLANKS COMPLYING WITH AS 1577**

Nominal thickness of plank (mm)	Maximum span (m)
38	1.5
50	2.0
63	2.5

### 5.3.1.2 Elevating work platforms

Elevating work platforms (EWPs) include scissor lifts, cherry pickers, boom lifts and travel towers. There are battery powered and internal combustion engine types. Some are designed for hard flat surfaces only, while others are designed to be operated on rough terrain.

People working in travel towers, boom lifts or cherry pickers should wear a properly anchored safety harness. Operators of travel towers, boom lifts and cherry pickers with boom lengths exceeding 11 metres need to hold the appropriate WorkSafe certificate of competency. People working in scissor lifts are not required to wear a safety harness.

For further guidance, refer to WorkSafe's *Code of Practice for the Prevention of Falls in General Construction*. Additional information is provided in AS 2550.10 *Cranes – Safe Use – Elevating work platforms*.

### Information, instruction and training for workers using EWPs

Workers using EWPs must be trained and instructed in the safe loading and safe operating procedures for the particular brand and type of equipment.

### 5.3.1.3 Step platforms

Commercially available step platforms are extremely stable and provide a much larger work surface than a stepladder. Some models are collapsible and adjustable to heights above 2 metres.

### 5.3.2 Perimeter guardrailing

Guardrailing may be used to provide effective fall protection at:

- the perimeters of buildings or other structures
- the perimeters of skylights or other fragile roof materials
- openings in floor or roof structures
- edges of excavations.

Except as otherwise noted guardrailing, where used, should:

- incorporate a top-rail 900–1100 mm above the working surface
- incorporate a mid-rail
- incorporate a toeboard, except where:
  - specific advice in this code indicates it may be impractical to do so, **and** alternative control measures, such as no go zones, are implemented to ensure no people are at risk of being hit by falling objects from the works above
- be of robust construction and designed in accordance with the AS 1657 *Fixed platforms, walkways, stairways and ladders – design, construction and installation*.

Wall-framing incorporating studs at 600 mm centres and 1 row of noggings is an acceptable alternative to guardrailing. Where the frame incorporates window or door openings, additional members should be provided across these openings to provide the equivalent fall protection to the guardrailing described above.

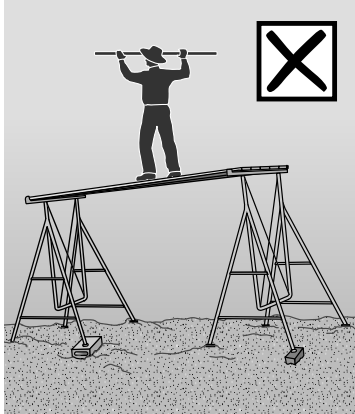
Proprietary systems should be configured, installed, used and dismantled according to the manufacturer's instructions.

Where timber guardrailing is not specifically designed in accordance with AS 1657 the member sizes set out in Table 2 and Table 3 may be used for guardrail and post sizes respectively.

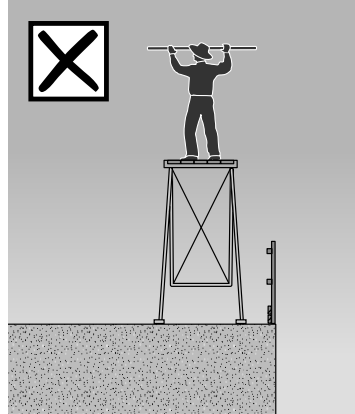
## PART 2: FALLS FROM MORE THAN 2 METRES



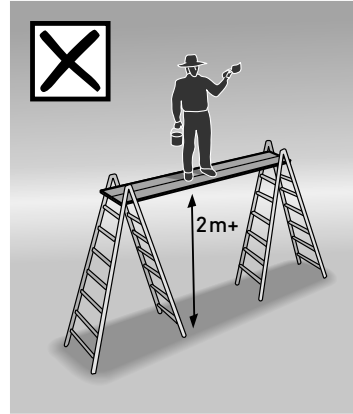
Figure 3 Examples of wrongly used trestle scaffolds



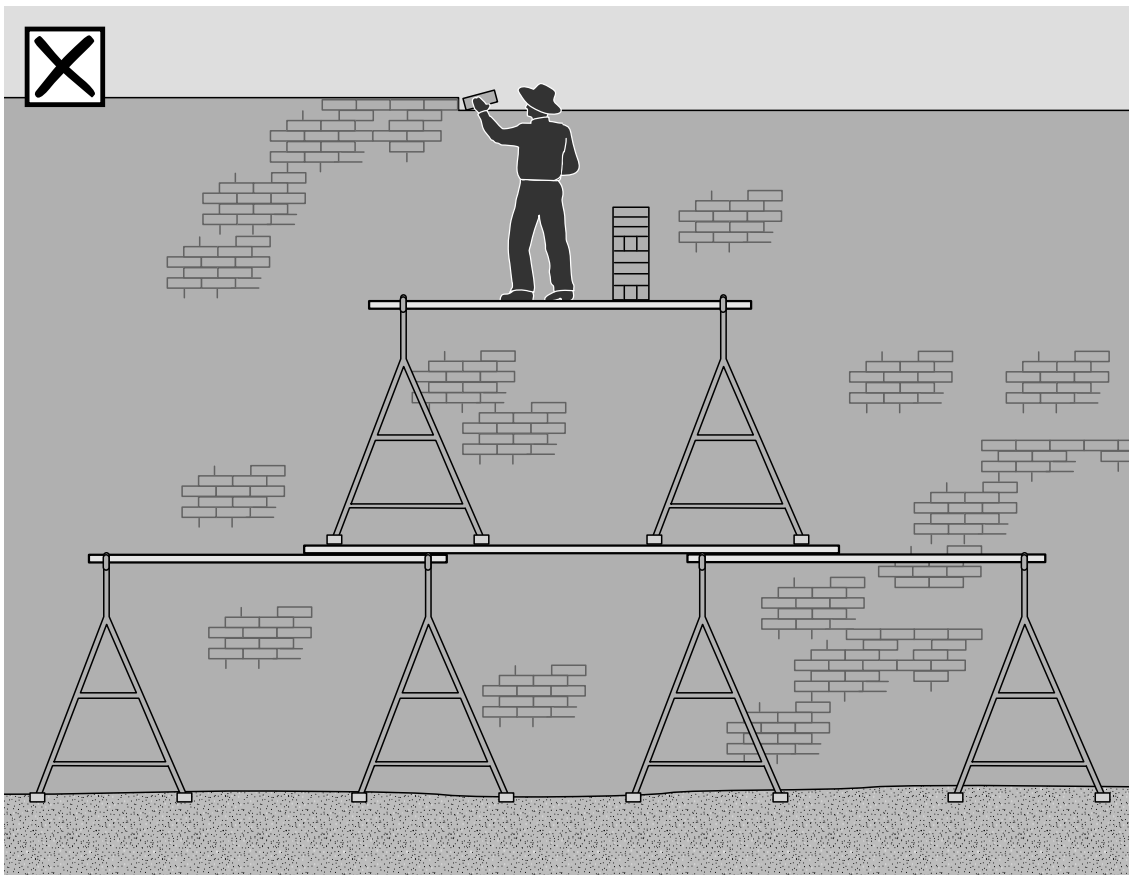
(a) Trestle scaffold set up on uneven, sloping ground with unsuitable soleplates



(b) Worker could fall over the perimeter guardrail



(c) Worker could fall more than 2 metres



(d) Never piggy-back trestles



## PART 2: FALLS FROM MORE THAN 2 METRES

Note: Table 2 and Table 3 are only applicable for guardrails at the perimeter of working platforms, floors or other **horizontal** surfaces.

Wherever feasible, guardrailing should be constructed such that, when an outward force is applied, the posts are subjected to bending about their strong axis (see Figure 4).

Building timber should be inspected by a competent person to determine whether it is suitable for use as guardrailing. The methods for connecting timber posts to the support structure or rails to posts should have adequate strength for the purpose intended. Figure 4 gives 2 connection detail examples.

**TABLE 2: TIMBER GUARDRAILS**

Guardrail size depth x width (nominal sizes) (mm)	Maximum guardrail span (m)	
	F8 HW or MGP 12 seasoned pine	F7 pine
100 x 38	2.7	NA
100 x 50	3.5	NA
2 nos 90 x 35**	NA	3.5

\*\*Timber members to be nailed together at maximum 300 mm intervals in 'T' or 'L' sections

**TABLE 3: TIMBER GUARDRAIL POSTS**

**Timber guardrail posts  
Minimum nominal sizes and gradings  
(maximum span of guardrails less than 3.5 m)**

Bending about weak axis	Bending about strong axis
2 nos 90 x 35 MGP 12 seasoned pine	100 x 38 F8 HW, or 90 x 45 MGP 12

### Guardrails for trenching works

Where trenching works present a risk of people falling on the site, any such risk may be controlled by the provision of:

- guardrailing
- a barrier, approximately 2 metres back, to prevent people approaching the trench.

### Guardrails for roof work

Further specific advice on guardrailing for roofing works is given in section 6.9.2.

### 5.3.3 Safety mesh

Safety mesh may sometimes be an appropriate risk control measure for roofing works. Guidance on the installation and use of safety mesh is provided in WorkSafe's *Code of Practice for the Prevention of Falls in General Construction*.

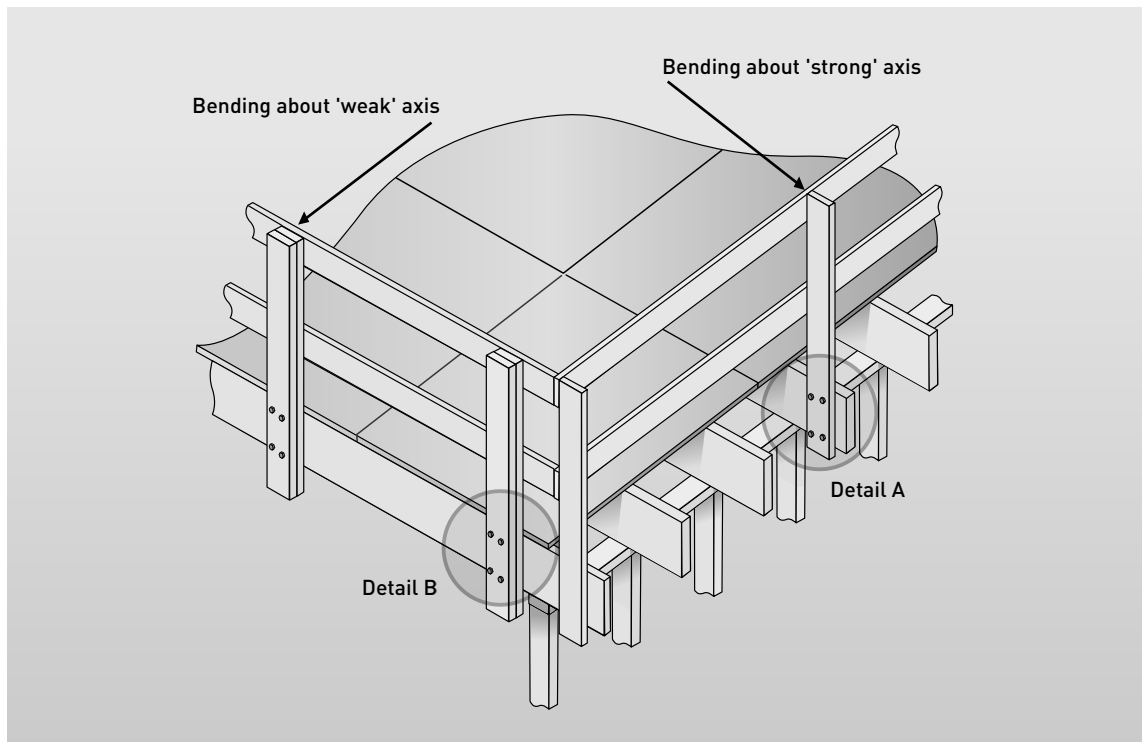
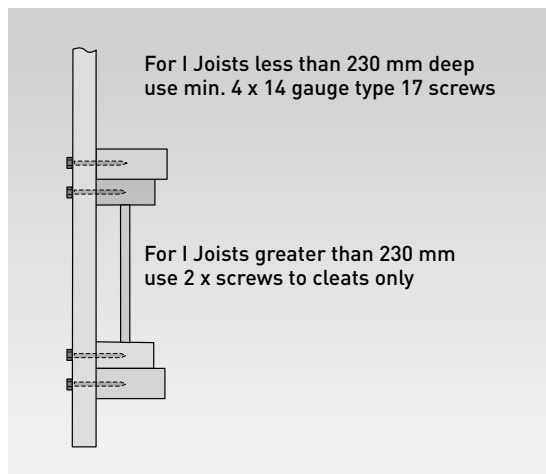
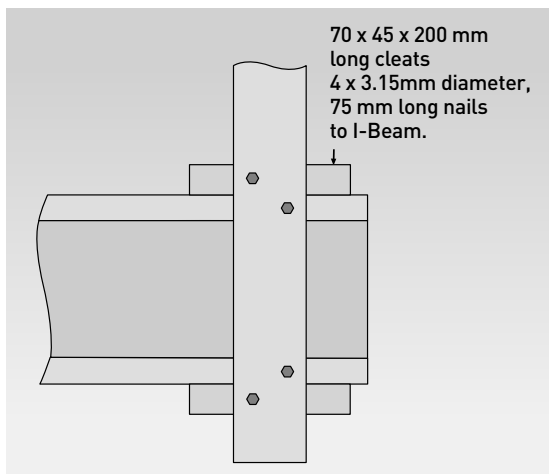
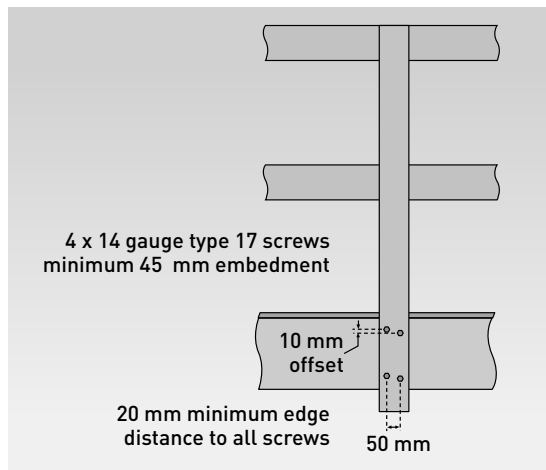
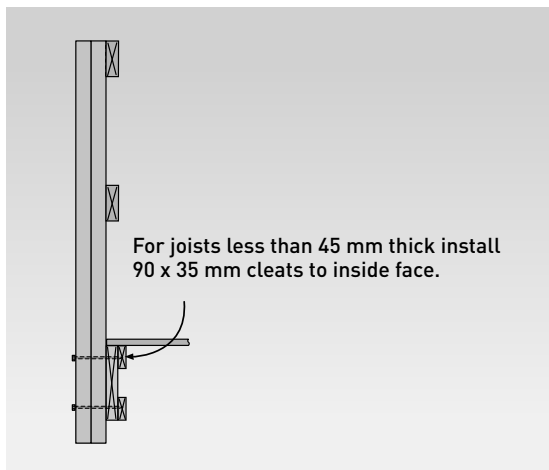


Figure 4 Timber guardrail (with alternative connection details)

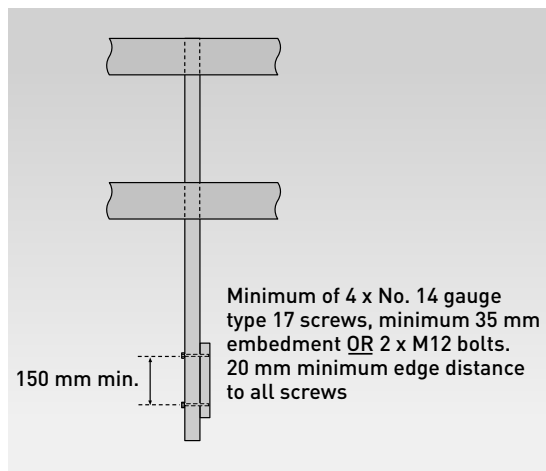
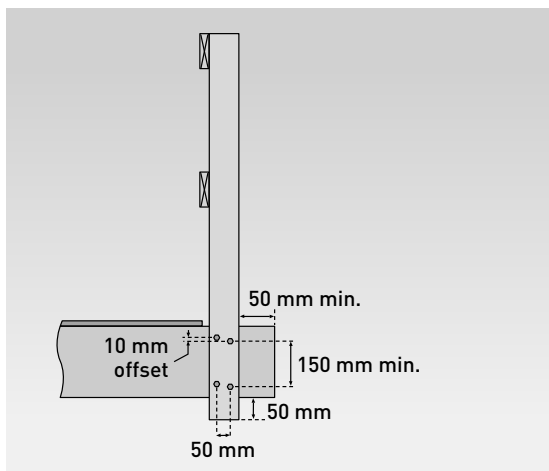
## PART 2: FALLS FROM MORE THAN 2 METRES



Detail 'A' Bending about strong axis: I-Beam joists



Detail 'B' Bending about weak axis



Detail 'A' Bending about strong axis: solid floor joists



## PART 2: FALLS FROM MORE THAN 2 METRES

### 5.4 Work positioning systems

A “work positioning system” is equipment, other than temporary work platforms, that enables a worker to be positioned and safely supported at a work location to carry out a task. Advice on the use of travel restraint systems is given below. Examples of other work positioning systems include Industrial Rope Access Systems (IRAS) and drainers’ hoists. Further advice on these systems, which have limited application in housing construction, may be found in WorkSafe’s *Code of Practice for the Prevention of Falls in General Construction*.

#### 5.4.1 Travel restraint systems

A travel restraint system prevents the user from approaching an unprotected edge on a building or structure. Generally, the system consists of a safety belt or harness connected by a lanyard to a suitable anchorage point or static line. This equipment must be set up to prevent a free fall from occurring.

A purpose-designed, temporary roof anchor, when used in accordance with the manufacturer’s instructions, may be used as part of a travel restraint system on metal deck or tiled roofs.

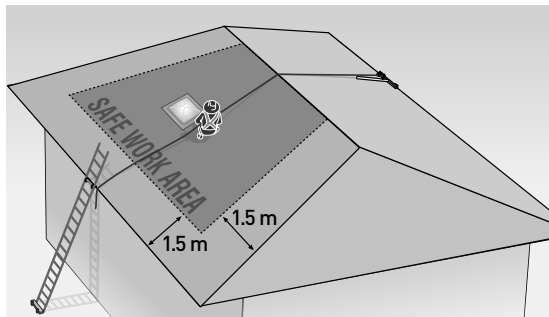


Figure 5 Use of temporary roof anchor

Travel restraint systems should **only** be used for tasks of short duration (such as replacing a broken roof tile or final inspections) where it is not practicable to adopt a fall protection system that prevents falls by providing a physical barrier (such as guardrailling). This is because travel restraint systems require a high level of user skill to operate safely and greater supervision (see Figure 5).

**Travel restraint systems are not fall arrest devices.** Typical anchorage points for these systems are not designed for the impact loads applied in the event of a fall. Therefore, where there is **any** possibility that a person using a travel restraint device may approach an edge from where a fall is possible, a travel restraint system should not be used.

### 5.5 Fall injury prevention systems

A fall injury prevention system means equipment intended to prevent, or reduce the severity of, an injury to a person if a fall does occur. These systems include industrial safety nets, catch platforms, and individual fall arrest systems.

#### 5.5.1 Safety nets

Safety nets can provide a satisfactory means of protection while allowing workers maximum freedom of movement.

An internal safety net may be an effective method of arresting falls for Class 10 buildings such as haysheds, machinery sheds or garages. They can also be effectively used over stairwell openings.

Guidance on the use of safety nets is provided in WorkSafe’s *Code of Practice for the Prevention of Falls in General Construction*.

#### 5.5.2 Catch platforms

A catch platform is a temporary platform located below a work area to catch a worker in the event of a fall. The platform should be designed to sustain the maximum potential impact load. Scaffolding components may be used to construct a mobile catch platform.

All catch platforms should:

- incorporate a fully planked out deck
- be positioned to maintain a minimum of 2 metres beyond all unprotected edges of the work area, except where extended guardrailling is fitted to the catch platform
- be positioned as close as possible to the underside of the work area, and in no case be greater than 1 metre below the work area.

Heavy duty trestle scaffolds can be used as simple and inexpensive catch platforms, particularly in voids and stairwells.

#### **Catch platforms for roofing work**

Specific guidance on the erection of catch platforms for roofing work is given in section 6.9.3.

#### 5.5.3 Individual fall arrest systems (IFAS)

Individual fall arrest systems are intended to arrest a falling person safely and reduce the impact of the fall. The safe and correct use of IFAS relies on many factors including the design and availability of substantial engineered anchorage points. Accordingly IFAS have limited application in housing construction.

Guidance on the use of IFAS is provided in WorkSafe’s *Code of Practice for the Prevention of Falls in General Construction*.





### 5.6 Use of portable ladders

Portable ladders are a relatively low-cost option for persons intending to undertake work at height. Their affordability combined with the ease with which they may be transported and relocated has resulted in ladders being used extensively in the housing industry. However, many falls take place when people are working from ladders.

Under the Regulations that only apply where persons are exposed to a fall hazard of more than 2 metres, portable ladders may only be used where other methods of working at height are not practicable. Further guidance on the use of ladders where people are exposed to the risk of a fall of up to 2 metres is given in Part 3.

Generally, ladders are only appropriate for short-duration, light tasks such as painting a downpipe, repairing a gutter or carrying out minor electrical installations.

#### 5.6.1 Duties of employers (including subcontractors with employees)

In addition to the relevant requirements set out in section 3.4, the Regulations require that where an employer chooses a fixed or portable ladder to control the risk of a fall, the employer must ensure that the ladder is:

- appropriate for the task to be undertaken
- appropriate for the duration of the task
- set up in a correct manner.

#### 5.6.2 Selection of ladders

Employers must make sure that portable ladders are correctly selected for the task to be undertaken. In doing this, employers must have regard to the duration of the task, the physical surroundings of where the task is to be undertaken, and the prevailing weather conditions. For example, metal ladders or metal reinforced ladders should not be used for live electrical work.

Typically, ladder use for construction work involves repetitive, high volume use and handling, requiring them to be of robust design and construction.

**Ladders used for construction works should be industrial grade, not domestic grade.**

#### 5.6.3 Safe use of ladders

Any ladder used at a workplace must be set up on a surface that is solid and stable, and set up to prevent the ladder from slipping (see Figure 6).

Slipping of ladders can be prevented by:

- placing single and extension ladders at a slope of 4 to 1, and setting up stepladders in the fully opened position
- securing single and extension ladders at both the top and bottom.

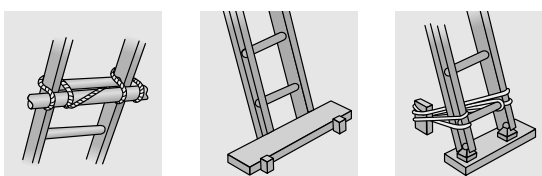


Figure 6 Some effective ways of securing a ladder

People using ladders should not:

- handle or use ladders where it is possible for the worker or the ladder to make contact with powerlines
- use metal or metal reinforced ladders when working on live electrical installations
- set up the ladder in places, such as driveways and doorways, where a person or vehicle could hit it. If necessary, erect a barrier or lock the door shut
- use a stepladder near the edge of an open floor, penetration, or on scaffolding to gain extra height
- over-reach (the worker's belt buckle should be within the ladder stiles throughout the work)
- use any power (air, hydraulic, electric or battery) equipment or tool, specifically designed to be operated with two hands, such as concrete cutting saws and circular saws
- use tools that require a high degree of leverage type force which, if released, may cause the user to over-balance or fall from the ladder such as stillsons or pinch bars
- carry out work such as arc welding or oxy cutting
- work over other people
- allow anyone else to be on the ladder at the same time.

Except where additional and appropriate fall protection equipment is used in conjunction with the ladder, any person using a ladder should **not**:

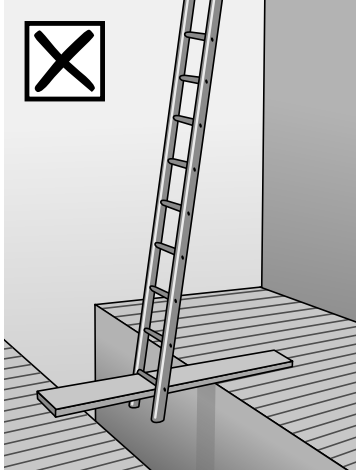
- face away from the ladder when going up or down, or when working from it
- stand on a rung closer than 900 mm to the top of a single or extension ladder
- stand higher than the second tread below the top plate of any stepladder.

Figure 7 illustrates some unsafe practices which employers should ensure do not occur on their sites.

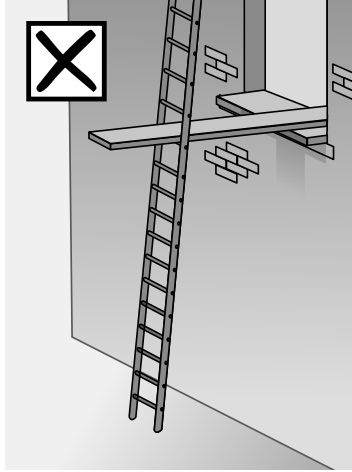


## PART 2: FALLS FROM MORE THAN 2 METRES

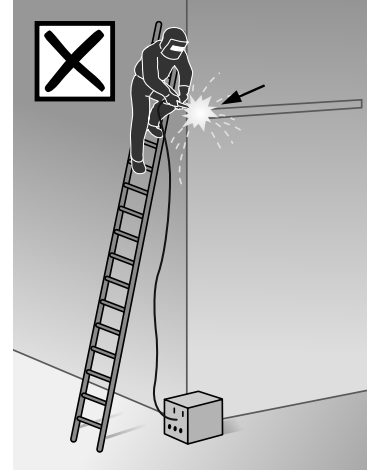
Figure 7 Examples of unsafe ladder use



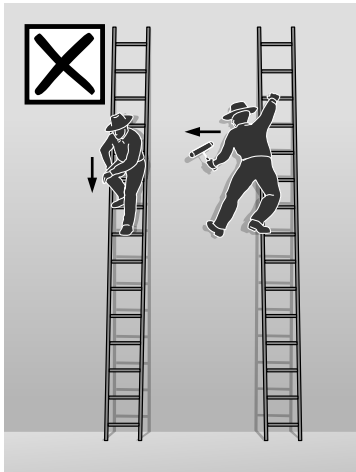
(a) Ladder set up incorrectly



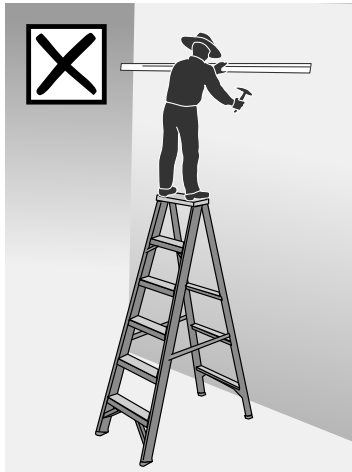
(b) Ladder set up incorrectly



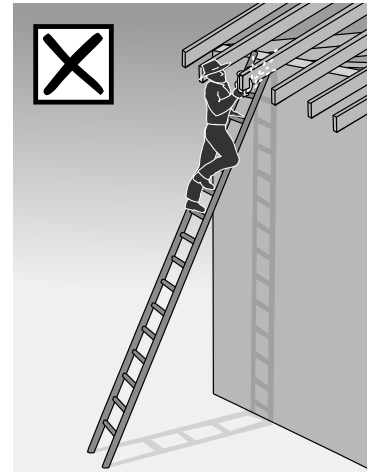
(c) Performing hot work from ladder



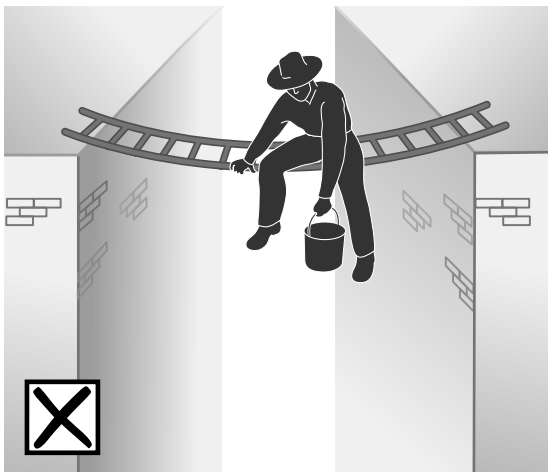
(d) Facing away from the ladder to descend; over-reaching



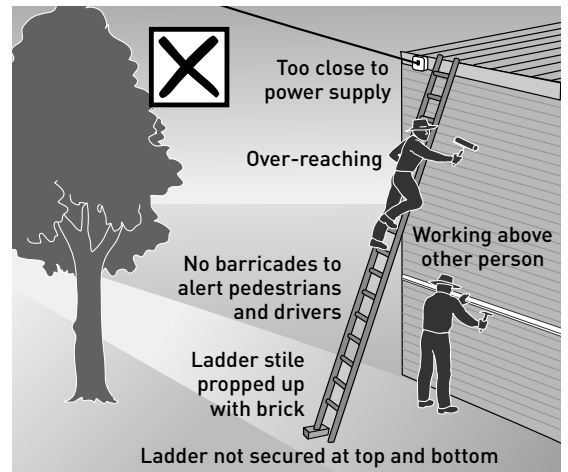
(e) Standing on top plate of stepladder



(f) Using power saw off ladder



(g) Ladder not being used for its intended purpose



(h) Poor work practices

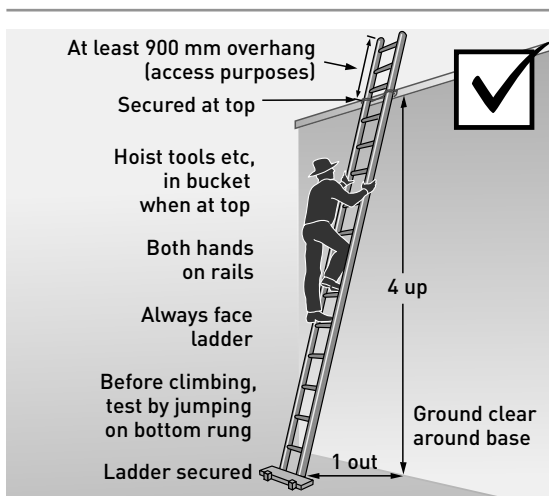


Figure 8 Example of acceptable ladder use

#### 5.6.4 Ladder maintenance

Ladders should be regularly inspected by a competent person. Ladders with any of the following faults should be replaced or repaired:

- timber stiles warped, splintered, cracked or bruised
- metal stiles twisted, bent, kinked, crushed or with cracked welds or damaged feet
- rungs, steps, treads or top plates which are missing, worn, damaged or loose
- tie rods missing, broken or loose
- ropes, braces, or brackets which are missing, broken or worn
- timber members that are covered with opaque paint or other treatment which could disguise faults in the timber.

#### 5.7 Administrative controls

An “administrative control” is a system of work or safe work method that helps to reduce a worker’s exposure to a fall hazard. An example of this is a requirement that sheet flooring be laid by pushing it out from the centre of the building structure, rather than from the edge.

Administrative controls are often used to support other fall protection measures. For example, Appendix 5 provides a sample work method for the safe erection and dismantling of a scaffold. Administrative controls may also be used to limit the time workers are exposed to a fall hazard and/or the number of workers involved in the task.

If an administrative control is used as the **only** means of reducing the risk associated with a particular task, the employer is required to record the following details:

- a description of the administrative control used
- a description of the task to which the administrative control relates.

Section 6 of this code sets out a number of work methods for common building tasks. Some of these methods rely solely on administrative controls and must therefore be documented. Where an employer adopts the work practices detailed in section 6, this is regarded as complying with the regulations for those matters. In all other cases where administrative controls are relied on to control the risk of a fall, these must be documented.

If a task is routinely carried out by employees and subcontractors, it may be appropriate to record a standard safe work procedure for the task.

Records must be kept until the work covered by the administrative control has been completed.

It is wise to involve contractors and employees in the development of administrative controls. People who perform a task regularly often have a good understanding of the risks involved.



## PART 2: FALLS FROM MORE THAN 2 METRES

### 6. SAFE WORK METHODS FOR COMMON TASKS

This section identifies common tasks in the construction of a typical one or two storey house and describes methods that eliminate or reduce the risk of falls associated with these tasks.

Where an employer adopts the work practices detailed in section 6, this is regarded as complying with the regulations for those matters. Alternative methods of controlling the risk of falls may be used, but the employer must be able to demonstrate that these methods fulfil the requirements of the Regulations.

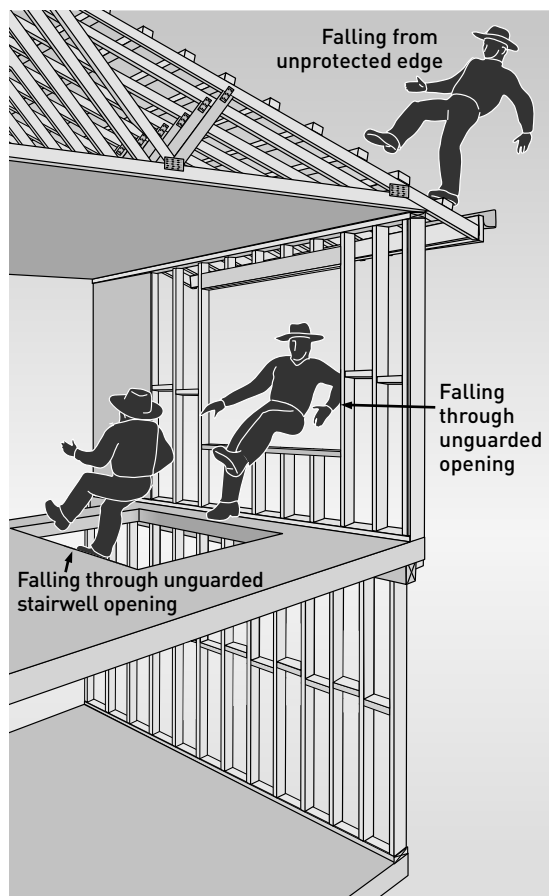


Figure 9 Potential falls in the housing construction industry

Some of the safe work methods set out in this section are administrative controls; that is, they do not require the provision of physical fall protection such as scaffolding or guardrailling. As set out in section 5.7, where an employer adopts these controls no further recording of the control is required.

Administrative controls may only be used:

- for the particular task described
- to the maximum height stated for the work method
- if the ground around the structure is natural soil, free of building materials (such as brick pallets), impalement hazards (such as fences and stumps) and other obstacles.

### 6.1 Framing tasks

#### 6.1.1 Floor laying

In order to construct a solid work area for the construction and/or erection of wall frames, flooring should be laid to ground and upper floors at the earliest opportunity.

(Note: Working from open floor joists is an unacceptable work practice for any task.)

Laying flooring is a task that potentially exposes workers to the risk of both internal and external falls. Steep sloping sites increase the potential fall heights.

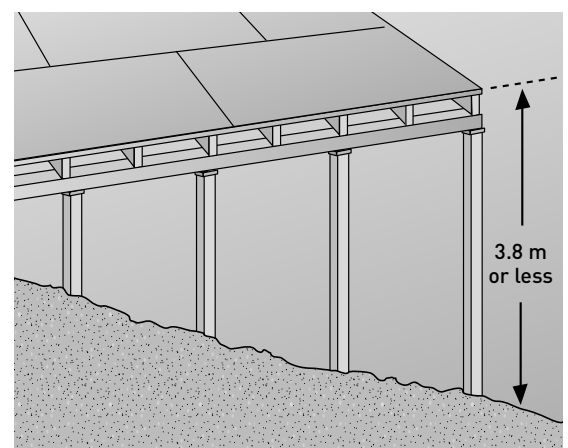
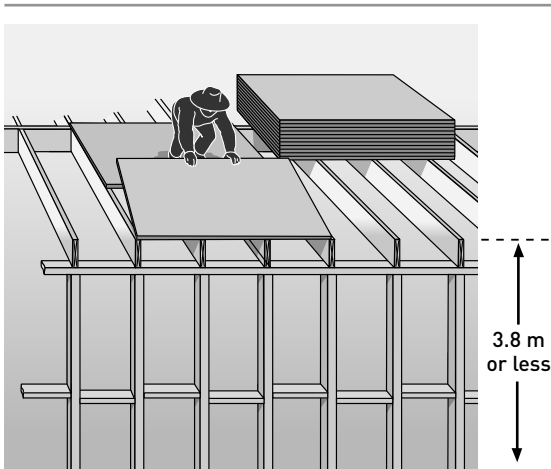


Figure 10 Sub-floor with sheet flooring  
(Fall height 3.8 metres or less)

The laying of floor sheets should begin adjacent to an internal or external access point which provides initial fall protection for the workers. Laying of sheets should then proceed using a safe work procedure that prevents workers from falling over the leading edge, as shown in Figure 11.

Where strip flooring is to be installed, temporary sheet flooring may be laid as fall protection. Advice on guarding of all stairwells and voids is given in section 6.3.

## PART 2: FALLS FROM MORE THAN 2 METRES

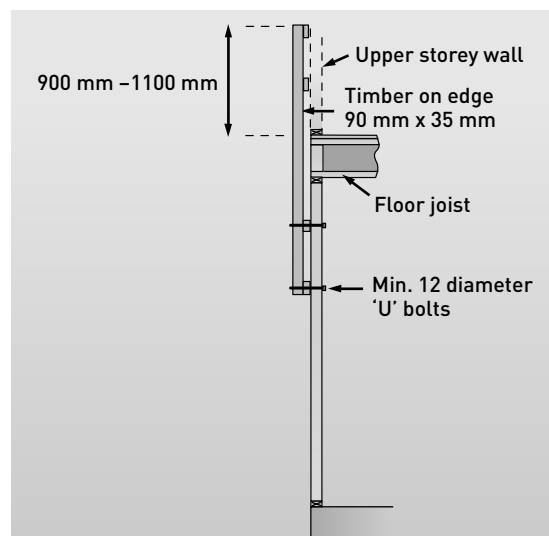
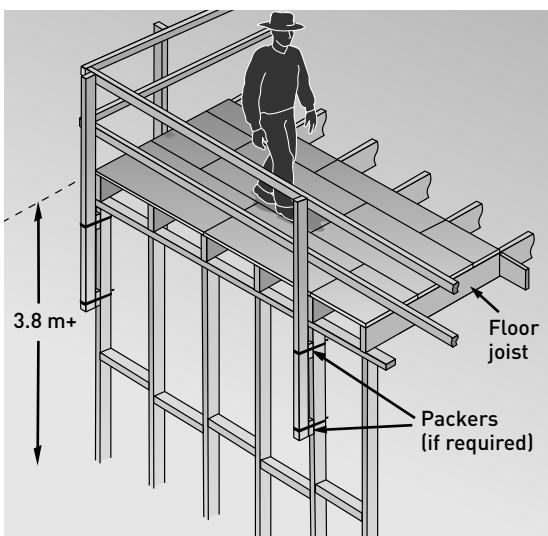
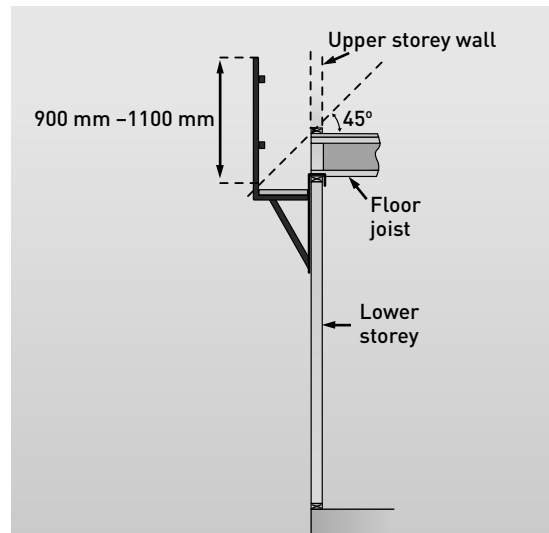
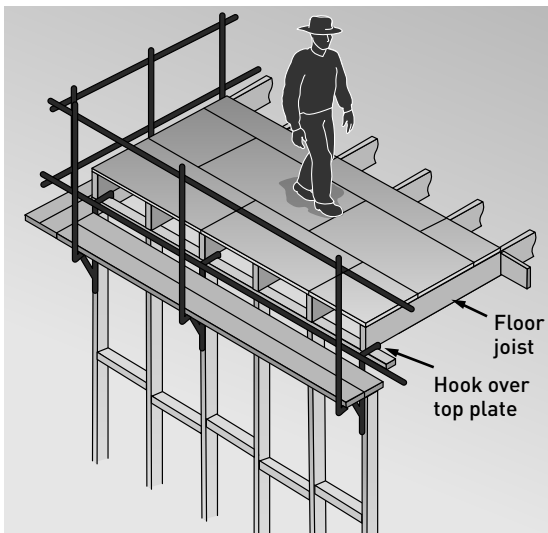


**Figure 11** Laying sheet flooring at upper level  
[Fall height 3.8 metres or less]

### Laying flooring – fall height greater than 3.8 metres

Where the potential fall height exceeds 3.8 metres edge protection should be provided. This may be external scaffolding or guardrailing as shown in Figure 12.

Safe access egress must also be provided to the floor. One method of providing suitable access is by the construction of a temporary staircase.



**Figure 12** Examples of upper floor edge protection



## PART 2: FALLS FROM MORE THAN 2 METRES

### 6.2 Fixing ceiling joists and upper level floor joists

The setting out and nailing of level ceiling joists or upper level floor joists should be done by working off scaffolding set upon the floor below. Trestle scaffolds may be used as shown in Figure 13.

**Under no circumstances should any person “walk” the external top plate.**

Where scaffolds are not suitable, the work may be done using ladders from the floor below.



Figure 13 Installing ceiling or upper level floor joists

Section 5.3.1.1 of this code provides further information about the use of trestle scaffolds.

### 6.3 Guarding openings

All stairwells, atriums and voids should be sturdily guarded, covered with an industrial safety net or sheeted over, regardless of the fall distance from the upper level floor. Guardrailing should be provided in accordance with section 5.3.2 of this code. In particular, toeboards should be fitted to prevent tools and materials from being kicked into the void.

Voids and atriums should be guarded as soon as possible after laying sheet flooring, as illustrated in Figure 14.

Where a person working from a trestle scaffold, stepladder or similar may fall over the guardrail and through the opening, the opening should be covered with temporary flooring, timber sheeting, an industrial safety net or similar – even if guardrails have been erected around it.

Any coverings or temporary floors and their supports must be of robust construction capable of withstanding impact loads from any potential falls.

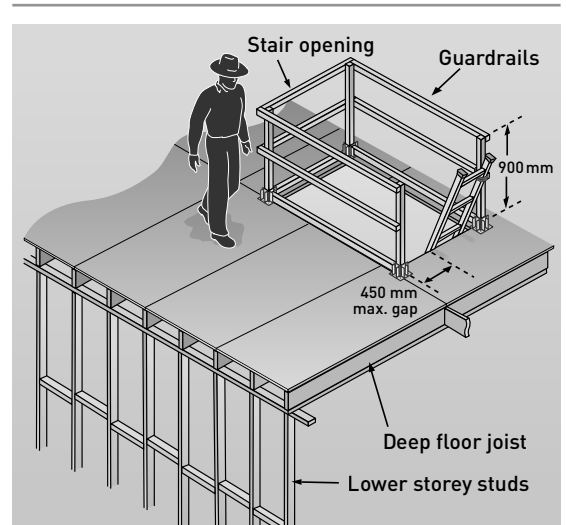


Figure 14 Void at upper level guarded

### 6.4 Wall framing

Once sheet flooring has been laid and openings have been guarded, work on wall framing may commence. Where possible, make sure that the top and bottom plates of the wall frame under construction are kept at least 1.5 metres from the perimeter of the building. When fixing the end studs to the wall frame, workers should face the edge of the floor while keeping their centres of gravity within the frame under construction, as shown in Figure 15. Wherever possible, workers should avoid entering the 1.5 metre “no go zone” when constructing the wall frame.

Where there is insufficient room for the establishment of a 1.5 metre no go zone, wall frames should be constructed in a safer area or physical fall protection should be provided in accordance with Figure 12.

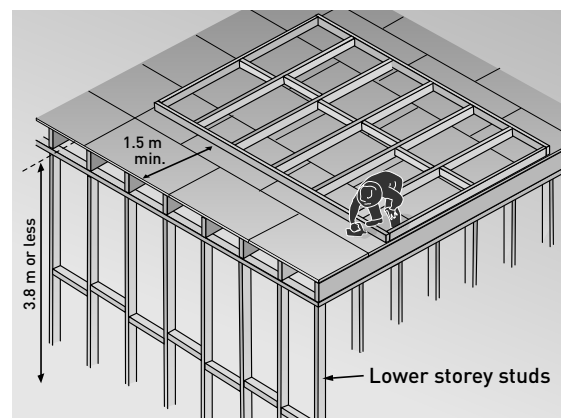


Figure 15 Constructing upper level wall frames  
[Fall height less than 3.8 metres]



Window or door openings in external wall frames should be fitted with guardrails prior to raising the frame.

All braces and fixings should be prepared prior to raising the frames. When raising and fixing each wall frame, make sure that the workers remain behind the frame, as it will provide a measure of protection from external falls (see Figure 16).

Where the potential fall height for people constructing or erecting wall frames is more than 3.8 metres, edge protection should be provided as shown in Figure 12.

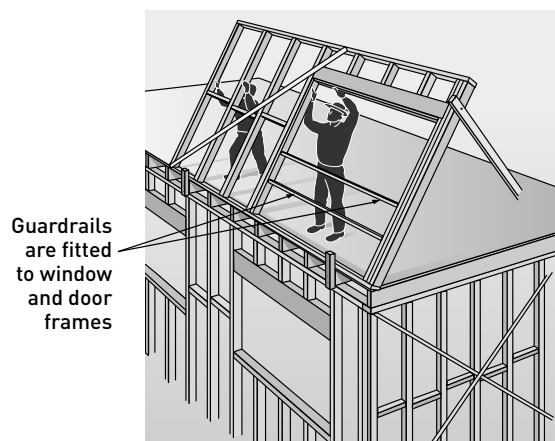


Figure 16 Erecting upper level wall frames

### 6.5 Installing prefabricated roof trusses

Where practicable, roof trusses should be placed by crane on the wall top plates at the time of delivery. The truss erector, supplier and transporter should liaise to confirm the order in which the trusses are to be loaded onto the truck. The trusses should be able to be unloaded at the site in the order that minimises the amount of handling needed to be done by the truss erectors. When working at height, the erectors should be able to access the next required truss from the top of the truss stack.

The builder, in consultation with relevant sub-contractors, should ensure that any locations designated for the landing of trusses will not overload the wall frames. Where trusses have not been landed directly onto the top plates, a safe system of lifting the trusses to the upper level needs to be developed. At no time should any worker stand on the top plate to receive roof trusses passed up from below.

The erection of roof trusses involves both internal and external fall hazards.

The erection of trusses may be undertaken from internal wall top plates or from scaffold planks supported on internal wall top plates providing:

- no person works closer than 1.5 metres to an external wall, including gable end walls
- planks are adequately supported across their spans

Note:

- the allowable spans for timber planks are given in section 5.3.1.1
- laminated timber, aluminium and steel planks must be used in accordance with the manufacturer's directions
- no person is exposed to the risk of a fall into a stairwell or other void.

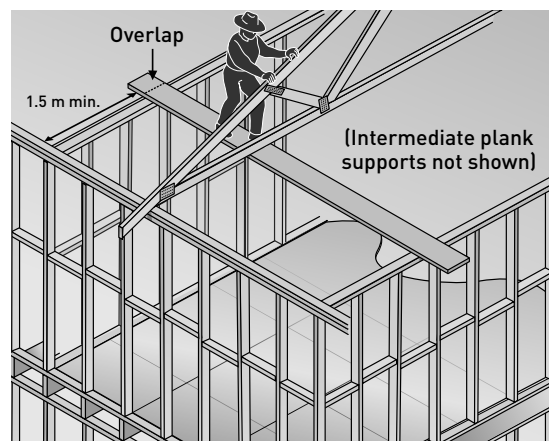


Figure 17 Installing roof trusses

Workers locating and fixing trusses at the perimeter of a building may work from an external scaffold or from trestle scaffolds set up on the floor as depicted in Figure 18. Alternatively such work may be undertaken off ladders in accordance with section 5.6.

Under no circumstances should any person "walk" the external top plate unless a system of physical fall protection has been provided to control the risk of an external fall.

If work is to be carried out from trestle scaffolds near window and door openings an additional guardrail maybe necessary. Standard height guardrails will be too low to prevent a person falling from the trestle scaffold, from falling through the window or door opening.

Stair and void openings should be protected as described in section 6.3.



## PART 2: FALLS FROM MORE THAN 2 METRES

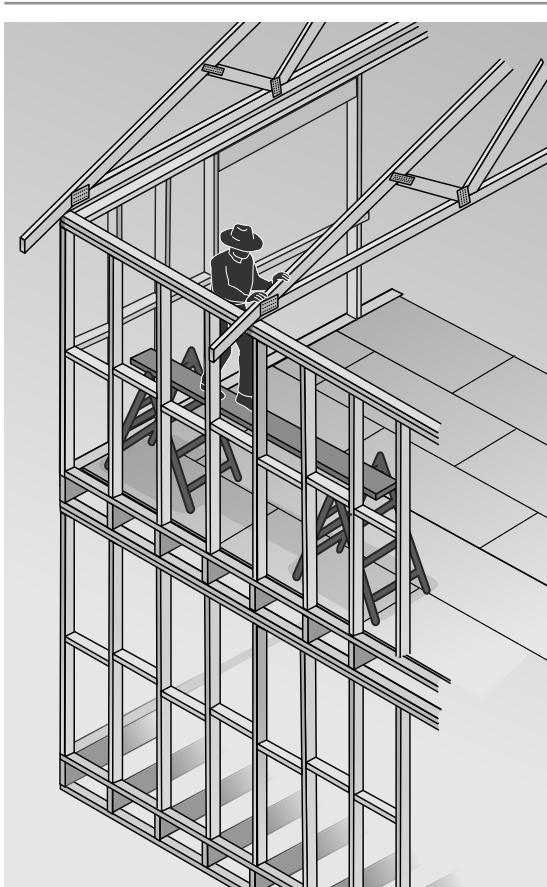


Figure 18 Installing roof trusses

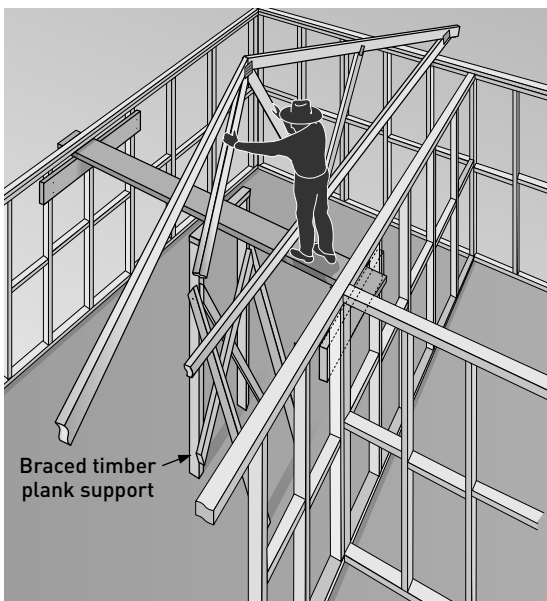


Figure 19 Truss erection – Internal support

### 6.6 Fixing roof battens to trusses

In addition to the external fall protection described in section 6.9.1, roof trusses and battens should be spaced at not more than 900 mm centres to reduce the risk of internal falls. While fixing battens, the worker should position his or her body over a roof truss at all times and avoid over-reaching, as illustrated in Figure 20.

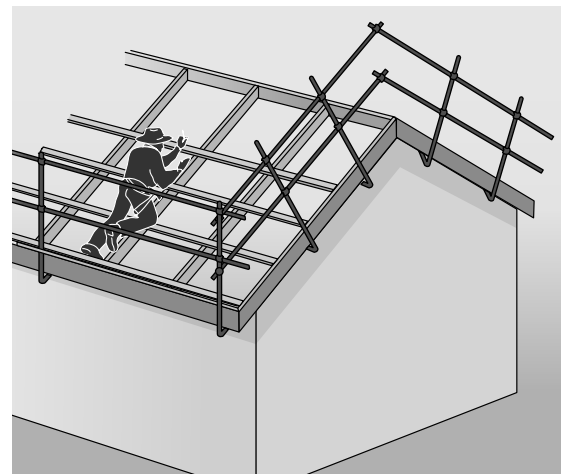


Figure 20 Fixing roof battens to trusses

### 6.7 Constructing a conventional roof

When constructing a conventional roof, ceiling joists and hanging beams can be passed up internally through a stair opening or externally through the upper level wall frame. When receiving roof timbers passed through the upper level wall frame, the risk of an external fall can be reduced by bracing the body against a wall stud.

When raising rafters, it is common practice for a carpenter to stand with one foot on the top plate and the other on a ceiling joist. There is a significant risk of an external fall when performing this task. Where it is necessary for carpenters to use the top plate in passing up the rafters or hanging beams, the risk of a fall should be reduced by fixing a scaffold plank to the ceiling joists and then working as shown in Figure 21.





**Figure 21** Work method when positioning hanging beams and rafters

Where ceiling joists are erected prior to pitching the rafters, the placement of the ridge beam, and the fixing of rafters to it, may be done from planks placed on the ceiling joists, provided the conditions listed in section 6.5 are maintained. Where ceiling joists are not erected, a work platform will need to be provided for framers to work from.

Framers working at the external wall should work internally from either scaffolding or ladders as described in section 6.5, or from an external perimeter scaffold. An external working platform will also provide a work platform for tasks such as trimming rafters and installing eaves. Where a bracket scaffold system is used, the wall frames must be braced as necessary to ensure adequate strength and to prevent excessive deflection.

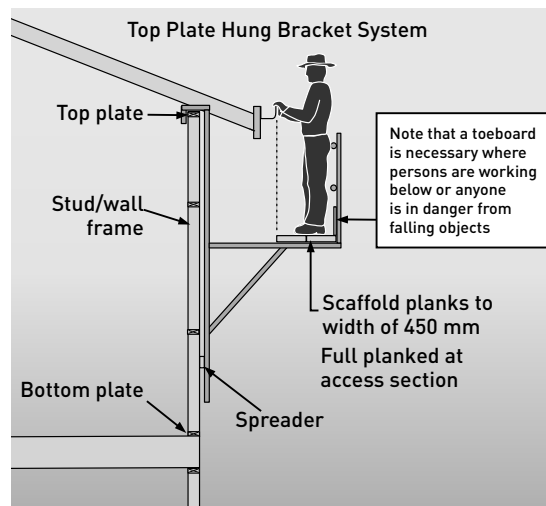
Where feasible, roofing members should be pre-cut at ground level.

### 6.8 Fixing fascias and gutters

On eaveless houses, fascias and gutters may be installed by working off trestle scaffolds or ladders from inside the house frame.

Where the design involves eaves, an external platform should be provided for fascia and gutter installation work. All external work platforms above 2 metres must be at least 2 planks, (450 mm), wide. Guardrailing should be fitted where the fall height is 2 metres or greater, or where there are impalement hazards.

A bracket scaffold with at least 2 planks and guardrailing is suitable for fascia/gutter installation work (see Figure 22). The scaffold should be erected from within the structure, so that the upper level wall frame provides fall protection for the erectors. Single scaffold planks are only acceptable for work platforms where the fall height does not exceed 2 metres.



**Figure 22** Fixing gutters using a typical bracket scaffold

### 6.9 Roofing tasks

Roofing work involves several tasks which potentially expose workers to the risk of falls both through and from the edge of the roof structure.

This section gives basic advice on the provision of fall protection for roofing work. This code **does not provide** advice where the roofing work involves:

- brittle roofing materials such as fibreglass or cement sheets (see WorkSafe's *Code of Practice: Prevention of Falls in General Construction*)
- dismantling or demolition work (see WorkSafe's *Code of Practice on Demolition*).



## PART 2: FALLS FROM MORE THAN 2 METRES

### 6.9.1 Risk controls – general

Builders and subcontractors must assess and control the fall risk of people undertaking roofing work. (See sections 3.3 and 3.4.)

#### **Critical angle**

One of the key risk factors to be considered when determining the type of risk control measures to put in place for roofing works is the pitch of the roof. The critical angle is the roof pitch below which it is considered that roof workers may reasonably be able to work and walk across the roof.

Builders and subcontractors should determine the critical angle as part of their risk assessment in accordance with section 3.3. In no case should the critical angle be taken as greater than the following:

- 10 degrees for roofs where the presence or likelihood of surface moisture, oil or other conditions makes the roof slippery
- 23 degrees for fully glazed tiles or metal deck roofing materials
- 26 degrees for concrete or semi-glazed tiles or shingles.

#### **Access/egress**

Suitable access must be provided for workers to access the roof to undertake works. The access should incorporate the following as appropriate to the edge protection system being used.

- Workers should be able to access through the roof edge protection without having to climb over the top or mid-rail.
- Guarding to openings should be self-closing.
- Access ladders should be secured against movement.
- Where a platform is located more than 300 mm below the roof edge, then additional means of access to the roof should be provided.
- Where a tile elevator is used it should be installed so that tiles can be received at the roof level.

#### **Work up to 3 metres**

Where roof workers are not exposed to the risk of an external fall of greater than 3 metres **and** the pitch of the roof is not greater than the critical angle, then the primary risk control measure may be the establishment of a cleared area around the perimeter of the building known as a “clear zone”.

Where a clear zone is relied on as part of the fall control measures it must:

- extend 2 metres out from the edge of the gutter line
- consist of natural soil
- be barricaded where there is a risk of other people entering the zone

- be kept clear of all hard surfaces, impalement hazards (including fences, set out hurdles, stumps and partial verandah structures), building materials (including brick pallets and timber), and other obstacles.

#### **All other roofing work**

Where the risk of a fall or the likely injury consequences from a fall are increased, then additional control measures should be implemented. **A system of physical fall protection** should be provided under **any** of the following circumstances:

- where a worker may be exposed to the risk of a fall greater than 3 metres
- where a 2 metre clear zone cannot be established
- where the 2 metre clear zone is no longer being maintained
- the pitch of the roof is greater than the critical angle.

### 6.9.2 Guardrail systems for roofing work

Guardrail systems should include top, mid and bottom rails or toeboards. Where toeboards are used in place of a bottom rail they must be able to withstand the likely impact loads.

The design and testing of guardrail systems should comply with:

AS/NZS 4994.1 *Temporary roof edge protection for housing and residential buildings, Part 1 General requirements.*

The installation of guardrail systems should be in accordance with:

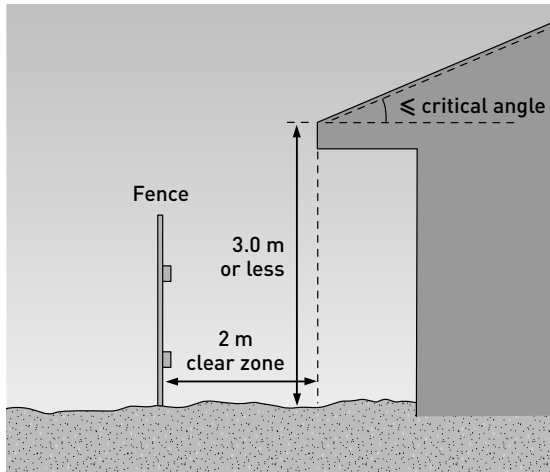
AS/NZ 4994.2 *Temporary roof edge protection for housing and residential buildings, Part 2 Installation and dismantling,* and include the following:

- toeboards or mesh infill to prevent tools, materials or debris falling from the roof, unless a 2 metre no go zone has been established to prevent people entering the area below
- a clear gap between rails not exceeding 450 mm
- no gap between the roof edge, including the gutter, and a guardrail located outside the roof line exceeding 100 mm
- a clear distance between the roof cladding and the bottom rail of not less than 150 mm and not greater than 275 mm
- an effective guardrail height above the roof surface of not less than 900 mm or greater than 1100 mm. (For roofs over 10 degrees pitch the effective height should be measured from a point 300 mm inside the roof edge.)
- non-structural infill panels where the pitch of the roof exceeds the critical angle.

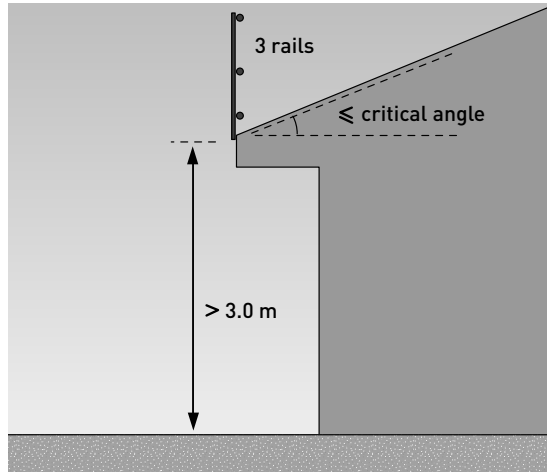
# PART 2: FALLS FROM MORE THAN 2 METRES



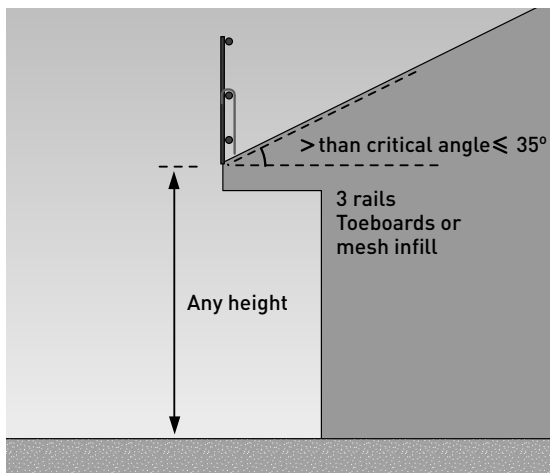
Figure 23 Guardrail systems for roofing work



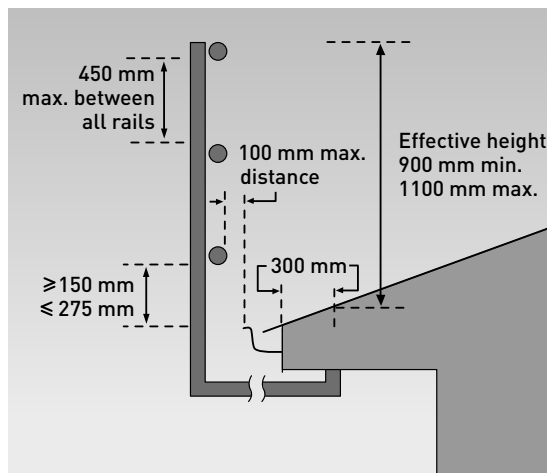
(a) Fall height up to 3.0 metres – roof pitch at or below critical angle



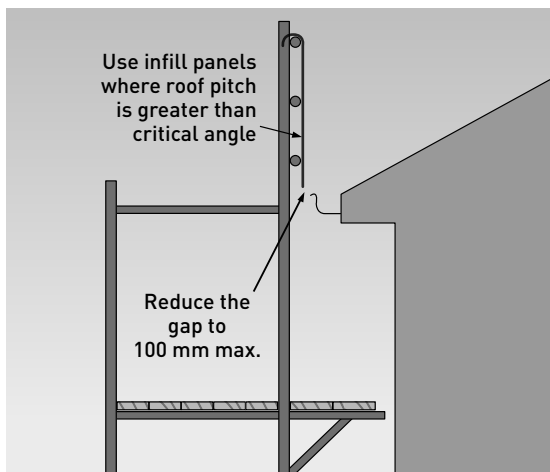
(b) Fall height greater than 3.0 metres – roof pitch at or below critical angle



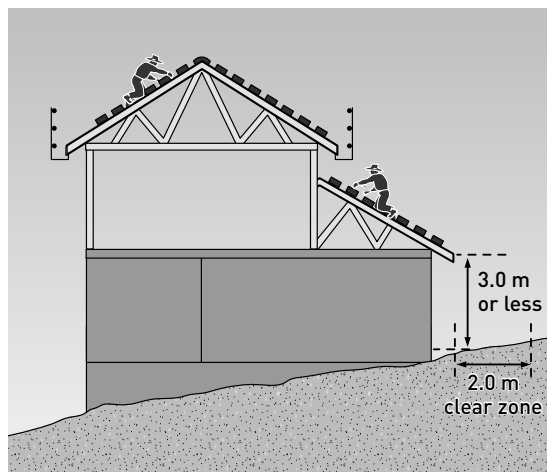
(c) Roof pitch greater than critical angle



(d) Guardrail outside roof line



(e) Scaffolding providing guardrail protection



(f) Installing roofing at two levels  
[Note: end guardrails omitted for clarity]



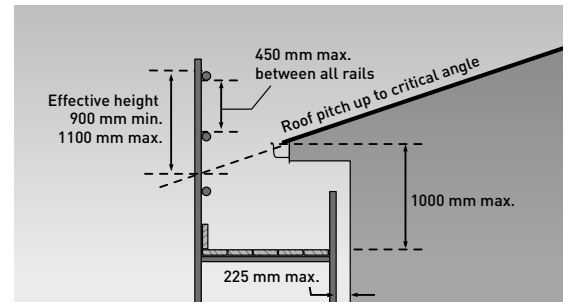
## PART 2: FALLS FROM MORE THAN 2 METRES

### 6.9.3 Catch platforms

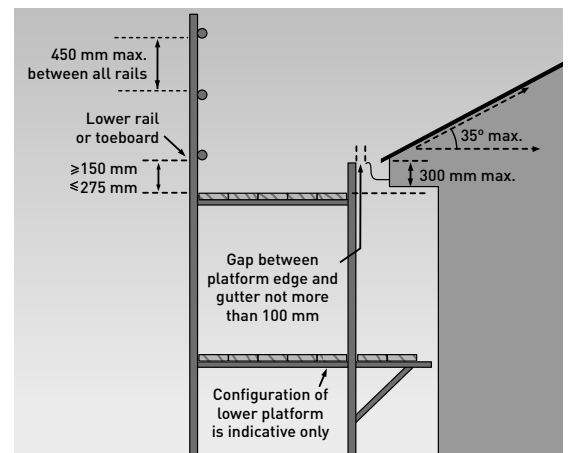
Catch platforms may be constructed from many types of scaffolding systems. Catch platforms used to control the risk of a fall should:

- where the roof pitch is not greater than the critical angle, be positioned as close as feasible to the underside of the roof, and in no case greater than 1 metre below the roof edge
- where the pitch of the roof is greater than critical angle, be positioned as close as feasible to the underside of the roof and in no case more than 300 mm below the roof edge. The gap between the platform edge and the gutter line shall not exceed 100 mm
- have a guardrail with an effective height of not less than 900 mm or greater than 1100 mm above the point where the roofline projection intersects the guardrailing
- where there is an increased risk of falling due to slippery roofing materials such as fully glazed tiles or the presence of dust, moisture or oil on roofing, be positioned not more than 300 mm below the roof edge, regardless of roof pitch
- incorporate a rail or toeboard within 100 mm of where the roof line projection intersects the guardrailing
- incorporate a toeboard at the platform's outer edge
- be extended to finish not more than 225 mm from the building face or be fitted with edge protection on the platform's inner edge
- be kept clear of equipment, materials and debris.

Figure 24 Catch platform for roofing works



(a) Roof pitch up to critical angle



(b) Roof pitch greater than critical angle

### 6.10 Steep roofs

Where the slope of a roof exceeds 35 degrees, the roof is an inappropriate surface to stand on even with guardrailing or a catch platform. In these circumstances, roof workers need a system to prevent sliding and to prevent falls from the perimeter, comprising one or more of the following:

- a work positioning system
- a roof ladder
- a scaffold platform, located at the roof edge.



### 7. WORKED EXAMPLE

The following is provided as an example of how builders may undertake a hazard identification, risk assessment and risk control process.

#### Example: Fall protection for external works

A builder (principal contractor) has a contract to construct a two-storey house and has engaged subcontractors to undertake much of the work. The house design includes brick veneer construction, timber windows, tile roof, attached garage and a large stairwell. The house site is reasonably level and access is good. Many trades will need to work on the external facade of the building.

#### Fall hazards

The builder consulted with his subcontractors and found out how they intended to perform tasks at height. The fall hazards identified are set out below.

#### Risk assessment

The builder considered the risks to which subcontractors could be exposed when carrying out the identified tasks. (Note: Depending on the control measures finally selected the builder may need to review the hazards identified and reassess the associated risks. For example, where individual controls are selected for each task a more detailed identification and risk assessment of tasks undertaken by each trade should be undertaken.)

#### Carpenters

Carpenters are to undertake several tasks which require them to work at the perimeter of the partially framed house for long periods of time. This will expose them to the risk of falling. Carpenters may also be exposed to the risk of a fall as a result of working from an inadequate or incomplete work platform.

#### Roof tiler

The roof tiler will be exposed to a high risk falling when working near the perimeter of the roof surface. The potential for serious injury increases where:

- the fall height from eave to ground level increases
- works occur on slippery roofs – for example, where glazed ceramic tiles are to be fitted
- the task must be carried out rainy or windy conditions
- building materials or structures are present within the potential fall zone.

#### Plumber

The plumber intends to install gutters and downpipes with an employee and two extension ladders. This will expose the plumber and his employee to a high risk of falling, as they will need to use both hands to handle tools and materials.

#### Bricklayer

Although the bricklayer usually erects and uses his own scaffold, it is often incomplete and poorly maintained. He is therefore at considerable risk of falling. Overloading the scaffold and poor housekeeping will increase the likelihood of a fall.

#### Painter

The painter is willing to use a scaffold erected by the bricklayer, but if it has already been removed by the time he starts work, he will paint the upper level windows, fascia and gutters with the aid of an extension ladder. In this event, he will be exposed to the risk of falling for long periods of time. Rain and wind would increase the likelihood of a fall.

#### Summary

A summary of the risk assessment issues are set out in Table 4.



## PART 2: FALLS FROM MORE THAN 2 METRES

**TABLE 4: TIMBER GUARDRAILS**

Trade	Task	Issues identified	Fall hazard (fall of more than 2 m)	
			External fall	Internal fall
Carpenters	Install upper level floor joists	Walking top plate; hazardous use of ladders	X	X
	Lay sheet flooring on the upper level floor joists	Walking top plate	X	X
	Construct and erect walls at upper level	Construct at upper level, then raise using props	X	
	Install roof trusses	Walking of internal and external top plates	X	X
	Install fascia/gutter	Use top plate hung bracket platform system – no guardrail	X	
	Prepare and install eaves	Use incomplete bricklayers scaffold	X	
Roof tiler	Fix roof battens	For both tasks potential for falling at the perimeter. A number of risk factors identified including fall height, 'slipperiness' of roof, roof pitch, fall zone housekeeping etc.	X	X
	Lay roof tiles		X	
Plumber	Install gutter and downpipes	Use extension ladders when handling long lengths of material	X	
Bricklayer	Lay bricks	Use own incomplete scaffold with no guardrail	X	
Painter	Painting the eaves and fascia	Use extension ladder and/or parts of bricklayers scaffold when available	X	

Note: This example focuses on fall hazards alone. Other hazards are not considered, except where the hazard may increase the risk of a fall.



### Risk control

The builder selected the most **practicable** fall protection by considering:

- **the severity of the hazard and risk**  
Tradespeople working on the project will be exposed to potential falls of up to 6 metres. If such a fall were to occur, it could result in very severe injuries or death. Some workers will be exposed to the risk for extended periods of time.
- **what is known about the hazard or risk and the ways of controlling it**

Builders and tradespeople in the housing industry recognise that there are a variety of ladders, trestle systems, hanging bracket systems, and “brickies” scaffolding systems available. Many of these systems may provide the specific trades for which they are intended with a reasonable level of fall protection. However, this approach requires each trade to erect its own work platform, often with one or more of the following consequences.

- Where works are not fully coordinated, some trades or tasks are undertaken without the provision of an acceptable working platform.
- Working platforms are sometimes altered without the permission of the original trade for whom it was erected.
- Working platforms are often incomplete.
- Maintenance of the platforms relies on the diligence of each individual trade.
- The erection, alteration and maintenance of several scaffolding systems exposes more people to the risk of falling.

Many people recognise that properly erected perimeter scaffolding (often used in conjunction with other systems) is an effective means of eliminating or reducing the risk of falls. Work systems involving a perimeter scaffold may provide fall protection for all trades working at height on the edge or face of a housing construction site. The effective use of perimeter scaffold does however require the builder to coordinate the timing of the various trades, the delivery of materials and the availability of competent persons to alter the scaffolding as needed.<sup>4</sup>

- **which of the fall protection methods was most readily available and suitable**

There is a wide range of readily available scaffold systems. Bracket scaffolds can be erected quickly and cheaply but will not be suitable for all trades. For example, these systems cannot be used by bricklayers.

A heavy duty, ground-up perimeter scaffold is suitable for all trades working on the project, including bricklayers. It provides a means of access and a safe work platform for all the tasks identified above. This type of perimeter scaffolding can also provide guardrailing for balcony or window openings until the windows or balustrades are in place.

- **the cost of eliminating or reducing the hazard/risk**

The tasks of erecting and dismantling of scaffolds by different trades may add time and cost to the project, create considerable scheduling problems and repeatedly expose workers to the risk of falling.

The builder calculated that, provided the various trades were scheduled and coordinated effectively, the cost of the perimeter scaffold could be justified. Trades would not need to provide and erect their own work platforms, reducing the length of time needed to complete the project.

### Fall protection selected

To control the risk of external falls the builder engaged a certificated scaffolder to erect a heavy duty, ground-up perimeter scaffold. The builder coordinated the works to ensure:

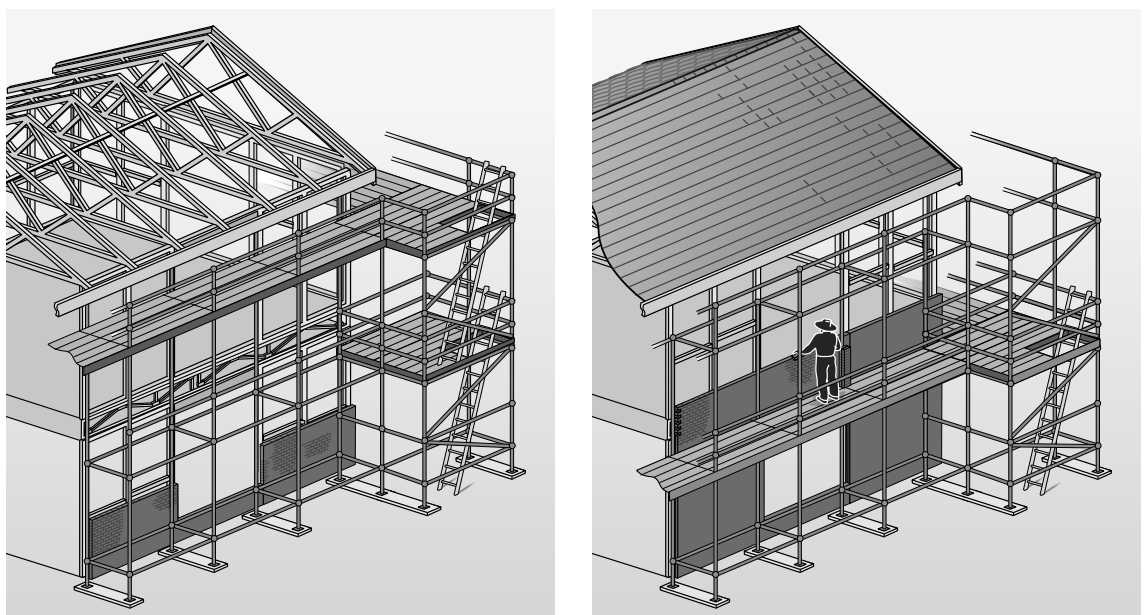
- that the lower brickwork is laid prior to the erection of the scaffold
- an upper platform is erected initially for use by truss installers and fascia/gutter installers
- a guardrail is provided for roof workers
- the scaffold is then altered by a competent person, as necessary, for ongoing brick-laying work
- other trades are coordinated to use the scaffold as it becomes available.

As a condition of the contract, the scaffolder was required to follow the documented safe work procedure set out in Appendix 4 of this code.

<sup>4</sup> Raising or lowering a working platform constitutes alteration of a scaffold. Where the scaffold exceeds 4 m in height, the alteration must be performed by, or under the direct supervision of, a person holding a Scaffolding Certificate of Competency.



## PART 2: FALLS FROM MORE THAN 2 METRES



**Figure 25** Erection of perimeter scaffolding providing fall protection for all trades  
[Note: not to scale; ledgers and bracing omitted for clarity]





## 8. DUTIES OF EMPLOYERS UNDER THE OCCUPATIONAL HEALTH AND SAFETY ACT 1985

A fall from almost any height can result in injury. A person falling onto a hard surface such as concrete may suffer serious injury or death if they strike their head first, even if the height of the fall is small. If the ground surface is asphalt or packed earth, a fall of 1 metre has the potential to kill or at least cause serious injury.

Potential falls from heights of 2 metres or less are not covered by the Regulations. The general duties of care under the *Occupational Health and Safety Act 1985* (the Act) apply in these circumstances. If you are an employer, you have a duty under section 21 of the Act to provide and maintain, so far as practicable, a working environment that is safe and without risks to health. This duty extends to the provision and maintenance of plant and systems of work. In other words, risks of falling from heights of up to 2 metres must be controlled.

Assessing the risk of these falls does not need to be complicated. In most cases, you can simply:

- look for the hazards
- decide who might be harmed and how
- if a risk exists, consider ways of doing the task more safely
- take action to eliminate the risk. If it is not practicable to do so, reduce the risk so far as practicable.

### 8.1 Preventing falls of 2 metres or less

Some common work tasks performed at heights of 2 metres or less are illustrated here, along with solutions that prevent or reduce the risk associated with these tasks.

For further guidance on the issue of stilts, refer to WorkSafe's Safety Alert – "Dangers in Using Stilts for Elevated Work".<sup>5</sup>



Figure 26 (a) Hazard: plasterers' stilts



Figure 26 (b) A safer alternative: plasterers' trestles

<sup>5</sup> Available on WorkSafe's website: [www.worksafe.vic.gov.au](http://www.worksafe.vic.gov.au).



## PART 3: FALLS FROM 2 METRES OR LESS

### Portable ladders

For general advice on the selection and maintenance of ladders refer to Part 2, section 5.6 of this code.

Persons using ladders should not:

- handle or use ladders where it is possible for the worker or the ladder to make contact with powerlines
  - use metal or metal reinforced ladders when working on live electrical installations
  - set up the ladder in places, such as driveways and doorways, where a person or vehicle could hit it. If necessary, erect a barrier or lock the door shut
- use a stepladder near the edge of an open floor, penetration, or on scaffolding to gain extra height
  - over-reach (the worker's belt buckle should remain within the ladder stiles throughout the work)
  - use any power (air, hydraulic, electric or battery) equipment or tool specifically designed to be operated with two hands and which may require the operator to brace themselves against the high level of torque exerted by the tool

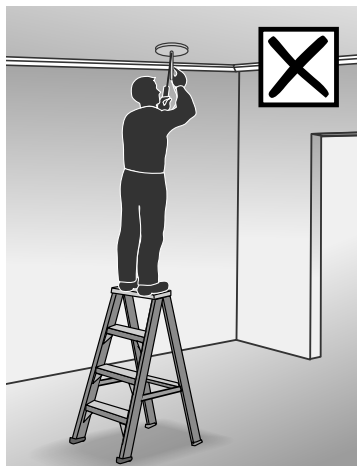


Figure 27 (a) Hazard: standing on the top plate of a stepladder



Figure 27 (b) A safer alternative: select the right ladder or step platform for the job



Figure 28 Hazard: makeshift means of gaining height. A safer alternative: trestles as shown in Figure 26 (b)



- carry out work such as arc welding or oxy cutting unless step platforms or other temporary work platforms are not feasible and the task is of short duration and a safe work procedure is followed
- use tools requiring the use of both hands and dynamic movement such as axes and crowbars
- use tools which require a high degree of leverage type force which, if released, may cause the user to over balance or fall from the ladder such as stillsons or pinch bars
- work over other people
- allow anyone else to be on the ladder at the same time.

Except where additional and appropriate fall protection equipment is used in conjunction with the ladder, any person using a ladder should **not**:

- face away from the ladder when going up or down, or when working from it
- stand on a rung closer than 900 mm to the top of a single or extension ladder
- stand higher than the second tread below the top plate of any stepladder.

A ladder must be set up on a surface that is solid, stable and secure. It must be set up to prevent it from slipping.

### Ladder bracket scaffolds

Ladder bracket scaffolds are constructed from single or extension ladders with brackets to support scaffold planks. Use only for very minor tasks where the worker cannot fall more than 2 metres. When using ladder bracket scaffolds, observe the following.

- Only use industrial grade single or extension ladders.
- Pitch the ladders at a horizontal to vertical slope ratio of 1:4.
- Make sure the ladders are firmly footed on a level surface.
- Secure the ladders against movement.
- Keep the horizontal distance between brackets to 2.4 m or less.
- Make sure the planks are genuine scaffold planks in good condition.
- Provide barricades or other suitable controls to prevent traffic damage.
- No more than one person should be supported in any bay of the scaffold.
- Do not stack materials on the working platform.

For more information, refer to AS/NZS 4576 *Guidelines for Scaffolding*.

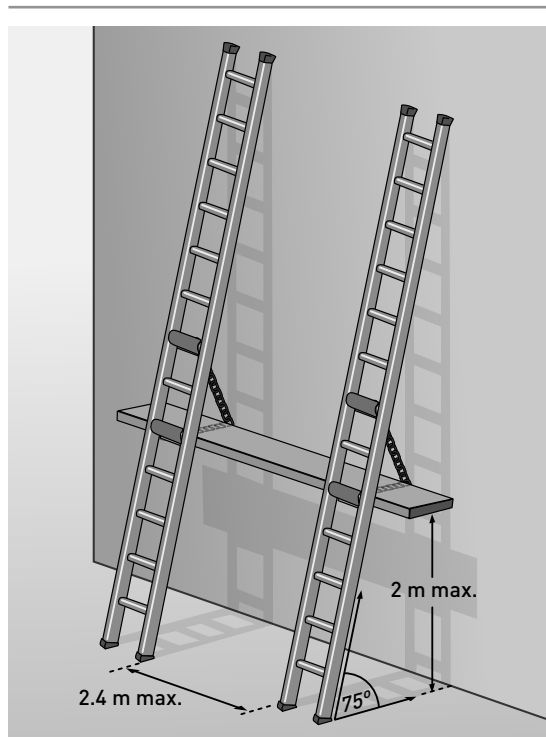


Figure 29 A ladder bracket scaffold

### 8.2 Information, instruction and training requirements under the Act

Under the Act, the employer must provide employees with sufficient information, instruction and training to enable them to work safely and without risking their health. Where workers are exposed to potential falls of 2 metres or less, information, instruction and training should explain:

- the hazards and risks associated with work performed at these heights
- how to follow health and safety procedures associated with this work
- the reasons fall protection measures have been set in place and how to use them properly.

Those supervising the work should also receive training.

The amount and type of information, instruction and training needed will depend on the risk involved, the complexity of the work procedures and type of fall protection measures used.



## APPENDICES

### APPENDIX 1 WHAT IS A CODE OF PRACTICE?

#### What is a code of practice?

An approved code of practice gives practical guidance on how to comply with a general duty under the Act or a specific duty under the Regulations. Compliance with the provisions in an approved code of practice, where relevant, may constitute compliance with the provisions of the Act or Regulations to which the code is giving practical guidance.

Generally, an approved code of practice contains various courses of action which are designed to achieve health and safety standards required by the Act and Regulations. Codes usually contain a number of options for meeting standards.

#### Who do they apply to?

Codes of practice may be written to provide practical guidance for any person placed under obligation by the Act or its Regulations, for example, occupiers, manufacturers and employees. Each approved code of practice will state the people for whom the guidance is intended.

#### What is their legal status?

The provisions in a code are not mandatory. That is, a person may choose to comply with the relevant provision of the Act or Regulations in some other way, provided that the method used also fulfils the requirements of the Act or Regulations. A person or company cannot be prosecuted simply for failing to comply with an approved code of practice.

However, in legal proceedings, failure to observe a relevant approved code of practice can be used as evidence that a person or company has contravened or failed to comply with the provisions of the Act or Regulations. If a person has not adopted the method described in the code, it is up to that person to show that the legal requirement has been met by an alternative method. Therefore, an approved code of practice should be followed, unless there is an alternative course of action that would also fulfil the requirements of the Act or Regulations.

A WorkSafe inspector may cite an approved code of practice as a means of remedying alleged non-compliance when issuing an improvement notice or a prohibition notice. Similarly, a health and safety representative may cite an approved code of practice in a provisional improvement notice when providing directions as to how to remedy an alleged non-compliance.

### APPENDIX 2 PUBLICATIONS INCORPORATED IN THIS CODE

The following is a list of technical standards incorporated in this code to provide additional guidance on compliance with particular duties.

AS 1577	<i>Scaffold planks</i>
AS 1657	<i>Fixed platforms, walkways, stairways and ladders – Design, construction and use</i>
AS 1891.1	<i>Industrial fall arrest systems and devices – Safety belts and harnesses</i>
AS 1891.3	<i>Industrial fall arrest systems and devices – Fall arrest devices</i>
AS 1891.4	<i>Industrial fall arrest systems and devices – Selection, use and maintenance</i>
AS 2550.10	<i>Cranes – Safe use – Elevating work platforms</i>
AS 3566.1	<i>Self-drilling screws for the building and construction industries, Part 1: General requirements and mechanical properties</i>
AS 3828	<i>Guidelines for the erection of building steelwork</i>
AS 4576	<i>Guidelines for scaffolding</i>
AS/NZS 4994.1	<i>Temporary roof edge protection for housing and residential buildings, Part 1: General requirements</i>
AS/NZ 4994.2	<i>Temporary roof edge protection for housing and residential buildings, Part 2: Installation and dismantling</i>



### What is the effect of incorporating documents in a code of practice?

Incorporation of a published technical standard in a code of practice has the effect of making that published standard as amended from time to time form part of the code. The standards listed in this code provide guidance on how to comply with the *Occupational Health and Safety (Prevention of Falls) Regulations 2003*.

It is important to note that the standards themselves have not been written specifically as guidance on how to comply with the duties under the Regulations. As such, following the provisions of an incorporated standard may not constitute full compliance with the relevant duties. This is because the standard itself may not deal with all the matters relevant to the identification tasks involving fall hazards, the assessment of risks associated with these tasks, and risk control. Appropriate judgement needs to be exercised in such circumstances.

To the extent that provisions of an incorporated standard are relevant to a duty under the Regulations, following those provisions (as is the case with any code provision) is regarded as compliance with the relevant duty under the Regulations.

However, as with other code provisions, provisions of an incorporated standard are not mandatory – alternative measures may be used in order to comply with the duties under the Regulations.

It should be noted that many of the published technical standards listed in this code contain provisions expressed in a mandatory manner, that is, they state that a person “shall” do some action. The mandatory provisions in the published technical standards are not mandatory for the purpose of the code. Appropriate judgement needs to be exercised in such circumstances and the Regulations should be consulted to determine the regulatory requirements in Victoria.

## APPENDIX 3 TIMBER SCAFFOLDS

### Section 1: Introduction

#### 1.1 Scope

This appendix sets out recommended rules for the construction of timber scaffolds where all of the following apply:

- works carried out in connection with buildings or structures of three habitable storeys or less, based on classes 1, 2 and 10 of the Building Code of Australia
- where the vertical distance between the working platform and the lowest level to which a person or object could fall does not exceed 6 metres
- where the scaffold supports no more than one full-length working platform.<sup>6</sup>

#### 1.2 General

All scaffolds should be designed and constructed in accordance with AS/NZ 1576.1 *Scaffolding – Part 1: General Requirements*. Scaffolds which are constructed in accordance with Part 2 or Part 3 of this appendix are deemed to comply with AS/NZ 1576.1.

Where it is intended to construct any timber scaffold which:

- does not comply with Part 2 or Part 3
- has a working platform greater than 2 metres above the lowest level to which a person or object may fall.

The builder and subcontractor should ensure that a copy of the detailed design drawings for the scaffold, prepared by a competent person, are kept on site.

The timber sizes listed in this Appendix are the nominal sizes for dressed seasoned timber. Where the alternative use of unseasoned timber is nominated the equivalent rough sawn size may be used.

<sup>6</sup> Short working platforms may be set up in different positions on a scaffold provided that not more than one working platform is set up or used in any one bay.



### **Section 2: Timber scaffolds – Maximum 2 metre lift heights**

This section provides deemed to comply advice for all independent and single pole timber scaffolds, where the lift heights do not exceed 2.0 metres.

#### **2.1 Scaffold components**

Load bearing structural members used or intended to be used in the construction of a timber scaffold in accordance with this Part, including standards, ledgers, guardrails, midrails, putlogs, braces, ties and rakers, shall have a stress grading of not less than one of the following:

- (a) F8 unseasoned hardwood
- (b) MGP 12 seasoned pine.

The minimum cross-sectional dimensions of structural members shall be as specified in sections 2.4 to 2.9.

All components intended for use in the construction of a timber scaffold shall be visually inspected for defects prior to each use and components found to be in an unserviceable condition shall not be used.

#### **2.2 Working platform**

Working platforms supported by timber scaffolds shall be classified as:

- light duty, for loads (persons and materials) of up to 225 kg per bay
- medium duty, for loads (persons and materials) of up to 450 kg per bay
- heavy duty, for loads (persons and materials) of up to 675 kg per bay.

The minimum width of working platforms shall be:

- 450 mm for light duty working platforms
- 900 mm for medium duty working platforms
- 1.0 m for heavy duty working platforms.

Planks used or intended to be used in the construction of working platforms shall be random planks<sup>7</sup> complying with AS 1577, *Scaffold planks*. The maximum spans of solid timber scaffold planks complying with AS 1577 are given in section 5.3.1.1.

Scaffold planks forming a working platform shall:

- be of uniform thickness to prevent trip hazards
- be closely laid across the full width of the scaffold to prevent traps and to prevent material or debris from falling through gaps

- extend beyond their end putlogs not less than 150 mm nor more than 250 mm
- be supported by putlogs at spacings not greater than the maximum spacing marked on the plank<sup>8</sup>
- except at returns or on unusually shaped profiles, be butted rather than lapped
- where, necessary, be adequately secured against uplift or displacement.

#### **2.3 Fixings**

Any reference to the use of screws in this section means the use of 10 gauge self drilling screws complying with AS 3566.1. Screws must be long enough to have a minimum embedment length of 35 mm into the supporting member.

Fixing for ledgers shall be not less than:

- one 12 mm diameter mild steel bolt, nut and washer
- where the ledger rests on blocking, a 10 mm mild steel bolt, nut and washer. The blocking should be a minimum 200 mm long of the same cross sectional area as the ledger and secured by a minimum of 2 screws to the standard.

Guardrails, midrails, braces and ties shall be fixed with a minimum of 2 screws.

Putlogs shall be nailed to the upper surface of the ledger to secure them against dislodgement.

#### **2.4 Standards**

Standards shall be vertical and shall be pitched on timber soleplates of sufficient area to distribute imposed loads without observable subsidence.

There shall be no cavity under a sole plate immediately below a standard.

Where the height of the scaffold requires joints in the standards, they shall be staggered and shall not occur:

- in adjacent standards in the same lift
- in the same standard in adjacent lifts
- more than once between adjacent ledgers
- more than 300 mm from a ledger.

Joints in standards shall be butted and spliced.

The minimum cross-sectional dimensions of standards, and the maximum longitudinal and transverse spacing of standards are set out in Table 5.

<sup>7</sup> "Random plank" is defined in AS 1577, *Scaffold planks*, as "a scaffold plank of any length which is designed and intended to be simply supported by putlogs and to overhang its end supports".

<sup>8</sup> Random scaffold planks manufactured prior to 1993 may not have their maximum allowable span marked on them. In such cases, putlog spacings shall not be greater than 1.5 m for 38 mm thickness scaffold planks, 2.0 m for 50 mm thickness scaffold planks or 2.5 m for 63 mm thickness scaffold planks.



TABLE 5: STANDARDS

Min. nominal size (mm)	Duty classification of working platform	Max. centre-to-centre longitudinal spacing	Max. centre-to-centre transverse spacing
70 x 35	Light duty	1.2 m	660 mm
90 x 35	Light duty	2.4 m	1.2 m
90 x 45	Medium duty	2.4 m	1.2 m
90 x 70	Heavy duty	2.4 m	1.2 m

### 2.5 Ledgers

Each longitudinal row of standards shall be joined on the inside face with horizontal ledgers, with their greater cross-sectional dimension vertical, extending the full length of the scaffold.

The distance between the surface supporting a standard and the first ledger and the distance between vertically adjacent standards shall not exceed 2 metres.

The minimum cross-sectional dimensions of ledgers are set out in Table 6.

Joints in ledgers shall be butted and spliced. The joints shall be staggered and shall not occur:

- in horizontally adjacent ledgers in the same bay
- in vertically adjacent ledgers in the same bay
- in the same ledger in the same bay
- in the end bays of a scaffold
- more than 300 mm from a standard.

TABLE 6: LEDGERS

Min. nominal sizes (mm)	Duty classification of working platform
70 x 35	Light duty
90 x 45	Medium duty
90 x 70	Heavy duty

### 2.6 Putlogs

The scaffold shall be fixed in the transverse plane at each lift with putlogs.

Putlogs shall be set above ledgers with their greater cross-sectional dimension vertical and shall be securely fixed to the ledgers or standards. No joint shall occur in the length of a putlog.

At each end of the scaffold, a putlog shall be fixed at a distance not greater than 200 mm from the edge of the standard.

Where the scaffold is two or more bays in length, a pair of putlogs shall be fixed, one on either side of the intermediate standards, with the putlog spacing being not greater than 500 mm.

Where the planks of a working platform butt away from the standards, additional putlogs may be required. In any case, the overhang of planks shall not be less than 150 mm nor more than 250 mm.

In the case of a single pole scaffold, the inside end of each putlog shall be fixed to the house frame by a minimum of 2 screws and shall also be seated on minimum 300 mm long timber blocks of the same cross-section, fixed to the frame studs with a minimum of two nails.

The cross-sectional dimensions and the maximum span of putlogs are set out in Table 7.

TABLE 7: PUTLOGS

Min. sizes (mm)	Duty classification of working platform	Maximum centre to centre span
70 x 35	Light duty	660 mm
90 x 45	Medium duty	1.2 m
125 x 45	Heavy duty	1.2 m



## APPENDICES

### 2.7 Bracing

Transverse braces shall be fixed diagonally in each lift at each end of the scaffold.

Longitudinal braces shall be fixed in each lift of the scaffold to the outside of the outer row of standards, with the distance between braced bays not exceeding three bays in length.

Braces shall be fixed diagonally as close as possible to the intersection of the standards and ledgers and, in the first lift, the lower end of a brace shall be fixed as close as possible to the intersection of the standard and its soleplate.

In the case of a single pole scaffold, the inside end of a transverse brace shall be fixed as close as possible to the intersection of a putlog and the building or structure.

Braces shall be a minimum of F8 unseasoned hardwood or MGP 12 seasoned pine with cross-sectional dimensions not less than:

- 70 x 35 mm for a scaffold supporting a light duty working platform
- 90 x 45 mm for a scaffold supporting a medium duty or heavy duty working platform.

### 2.8 Stability

Every scaffold shall be effectively stabilised by tying to the building or an adjacent structure, or by rakers to the ground.

Ties and rakers shall comply with the following.

- Except in single pole scaffolds, ties shall be fixed to both standards.
- Where rakers are used, they shall be of the same material as the standards, fixed to the outer standards and, at ground level, they shall be firmly footed or fixed with timber stakes driven into the ground, and they should be positioned at approximately 45 degrees to the horizontal.
- The first level of ties or rakers shall not be higher than 4 metres above the lowest soleplate.
- The distance between longitudinally adjacent ties or rakers shall not exceed two bays.
- Ties shall not be fixed to the cladding of a building or structure.
- Ties and rakers shall be positioned so as not to obstruct access along the working platform.
- No more than one lift shall be constructed above the highest level of ties or rakers.
- The minimum cross-sectional dimensions of ties shall be the same as for braces.
- Ties and rakers shall be continuous in their length.

### 2.9 Splicing of members

Where standards or ledgers are spliced, such joints shall be butt joints with fishplates of the same cross-sectional dimensions fixed equidistant on each side of the butt point, and bolted through with four 12 mm diameter mild steel bolts, washers and nuts, spaced at 225 mm centres.

### 2.10 Working platform edge protection and access

Working platforms shall be provided with edge protection and with safe means and access and egress in accordance with Section 8 of AS/NZS 4576 *Guidelines for Scaffolding*. Section 5.3.2 of this code also provides guidance on guardrailing.





### Section 3: Timber scaffolds: single pole with high first lift height

This section provides deemed to comply advice for single pole timber scaffolds with:

- a first lift height of up to 6.0 metres
- a maximum load rating of medium duty.

These scaffolds are typically suitable for many work tasks in the construction of double storey extensions, including the fixing of cladding, general carpentry, rendering and painting. Scaffolds prescribed in this section are not suitable for heavy duty works such as bricklaying.

### 3.1 Configuration

The configuration of scaffolds prescribed in this part shall be as shown in Figure 30.

For scaffolds erected in accordance with this Part the primary loads are transferred directly from the working platform to the putlogs at each standard. These putlogs transfer the loads directly to the standard at the outer face and to the building frame at the inner face.

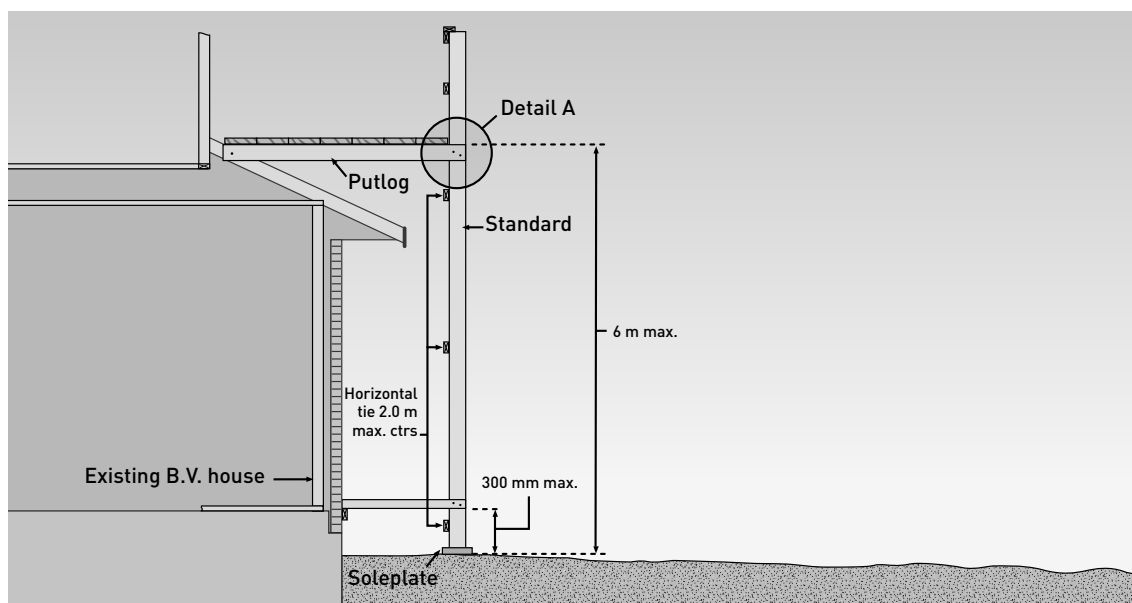
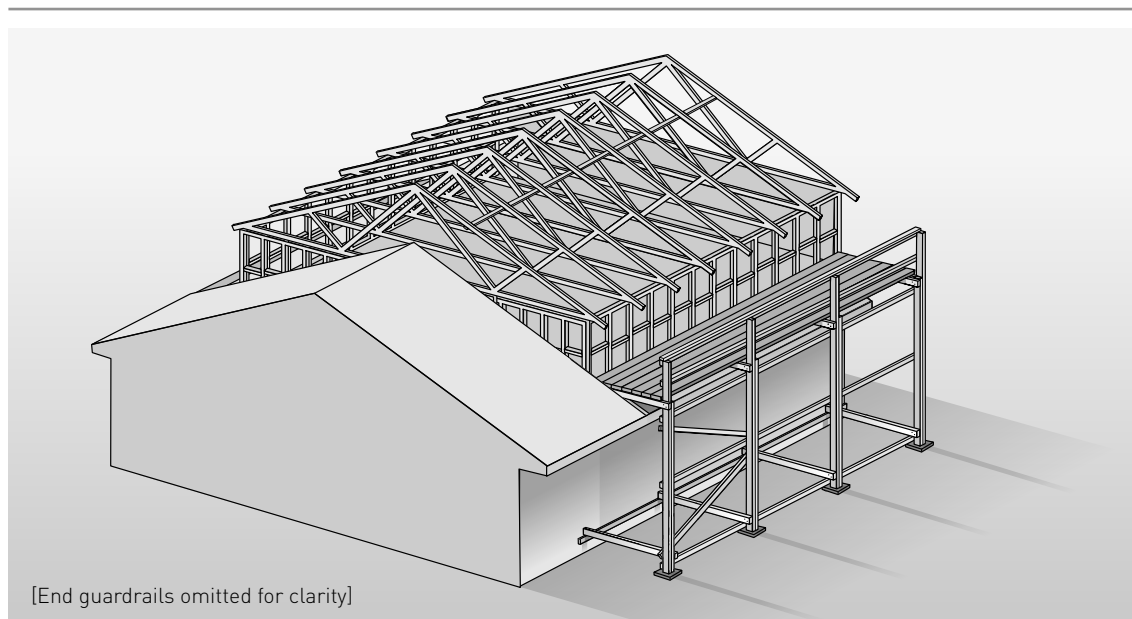
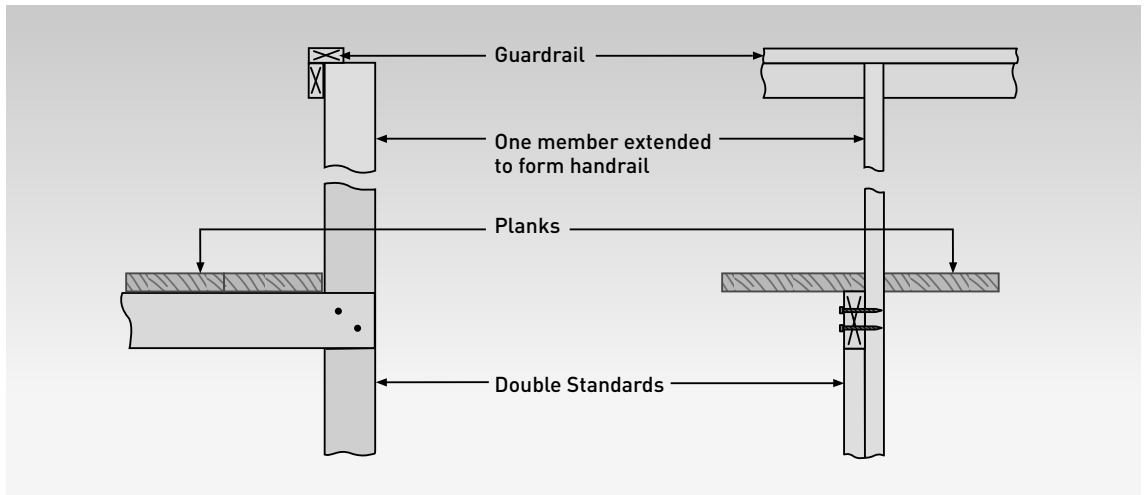


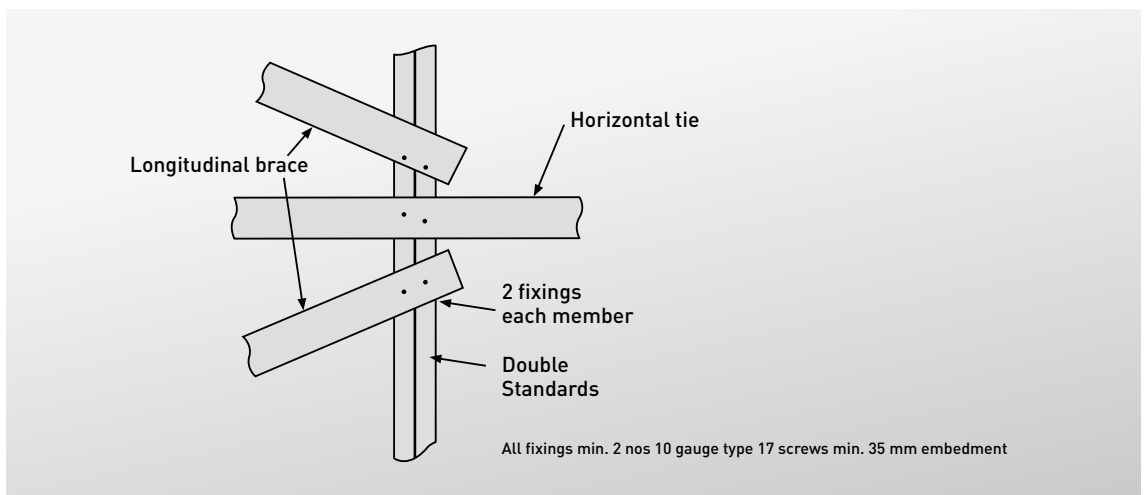
Figure 30 Timber scaffold (single pole – high first lift)



Figure 31 Timber scaffold (single pole – high first lift) Details



Detail 'A' Putlog to standard



Bracing details

### 3.2 Scaffold components

Load bearing structural members used or intended to be used in the construction of a timber scaffold in accordance with this Part, including standards, guardrails, midrails, putlogs, braces, ties and rakers, shall have dimensions and stress gradings as specified in sections 3.4 to 3.9.

All components intended for use in the construction of a timber scaffold shall be visually inspected for defects prior to each use and components found to be in an unserviceable condition shall not be used.

### 3.2 Working platform

Working platforms supported by timber scaffolds constructed in accordance with this part shall comply with section 2.2 and shall be classified as:

- light duty, for loads (persons and materials) of up to 225 kg per bay
- medium duty, for loads (persons and materials) of up to 450 kg per bay.

Where the lapping of planks at the putlogs creates a tripping hazard for the task being undertaken, a bevelled transition should be provided.



### 3.3 Fixings

Any reference to the use of screws in this Part means the use of 10 gauge Type 17 self-drilling screws complying with AS 3566.1. Screws must be long enough to have a minimum embedment length of 35 mm into the supporting member.

All fixings for horizontal ties, putlogs and braces shall be not less than 2 nos 10 gauge screws to each standard.

Putlogs at each standard shall bear directly on the standard and be fixed to the standard as shown in Figure 31. The inside end of these putlogs shall be fixed to the building rafter with minimum one M12 bolt or equivalent.

### 3.4 Standards

Standards shall have a stress grading not less than:

- F8 unseasoned hardwood
- MGP 12 seasoned pine.

The minimum cross-sectional dimensions and shall be in accordance with Table 5. Double standards shall be nailed together at maximum 300 mm intervals.

The maximum longitudinal spacing of standards shall be 2.7 metres.

Except as noted in this section, standards shall be constructed in accordance with section 2.4.

**TABLE 8: STANDARDS**

Height to working platform	Minimum (nominal) sizes
6.0 m	2 nos 120 x 45
5.0 m	2 nos 120 x 45
4.0 m	2 nos 90 x 45
3.0 m	2 nos 90 x 45

### 3.5 Horizontal ties

Each longitudinal row of standards shall be joined on the inside face with horizontal ties with their greater cross-sectional dimension vertical, extending the full length of the scaffold.

All horizontal ties shall be:

- a minimum size of 70 x 45 or 90 x 35 MGP 12 seasoned pine
- located at a maximum centre to centre vertical spacing of 2.0 metres with the lowest tie being not greater than 300 mm above the sole plate.

Joints in horizontal ties shall be staggered and shall not occur:

- in vertically adjacent members in the same bay
- in the same member in the same bay
- in the end bays of a scaffold.

### 3.6 Putlogs

The scaffold shall be fixed in the transverse plane at the working platform lift. In this type of scaffold design the putlogs also perform the function of tying the scaffold to the building. Putlogs shall:

- be located at each standard
- putlogs shall be fixed to their support in accordance with section 3.3
- be continuous along their length.

The cross-sectional dimensions and the maximum span of putlogs are set out in Table 6.

**TABLE 9: PUTLOGS**

Span of putlog	Minimum sizes and grading
2.4 m	140 x 45 F17 KDHW
1.8 m	140 x 45 F17 KDHW
1.2 m	150 x 50 F7 Oregon

### 3.7 Lower transverse ties

Each standard shall be tied to the structure with the transverse lower tie members.

Lower ties shall be:

- a minimum size of 70 x 45 or 90 x 35 MGP 10 seasoned pine
- located within 300 mm of the sole plate.

### 3.8 Bracing

Longitudinal braces shall be fixed to the standards, as shown in Figure 31, with the distance between braced bays not exceeding three bays in length.

Braces shall be fixed diagonally as close as possible to the intersection of the standards and horizontal ties and, in the first lift, the lower end of a brace shall be fixed as close as possible to the intersection of the standard and its soleplate.

Braces shall be a minimum of F8 unseasoned hardwood or MGP 12 seasoned pine with nominal cross-sectional dimensions not less than 90 x 35 mm.



## APPENDICES

### 3.9 Splicing of members

Where members are spliced, such joints shall be butt joints with fishplates of the same cross-sectional dimensions fixed equidistant on each side of the butt point, and bolted through with four 12 mm diameter mild steel bolts, washers and nuts, spaced at 225 mm centres.

### 3.10 Working platform edge protection and access

Working platforms shall be provided with edge protection and with safe means and access and egress in accordance with Section 8 of AS/NZS 4576 *Guidelines for scaffolding*. Section 5.3.2 of this code also provides guidance on guardrailing.

## APPENDIX 4 EXAMPLE OF A DOCUMENTED ADMINISTRATIVE CONTROL

### Safe Work Procedure – Erection and Dismantling of Modular Scaffolds

#### Scope

This procedure applies to the erection and dismantling of normal scaffolds constructed from any make or model of prefabricated modular scaffolding system except for cantilevered base lifts and hung scaffold configurations. This procedure should only be used where an advance guardrail system cannot be used for the protection of the scaffolders.

#### Application

This procedure applies to any worksite where the builder or contractor is erecting/dismantling modular scaffolds.

#### Responsibility

The person nominated by the builder or contractor is responsible for ensuring that this procedure is carried out at all times.

Each person engaged to erect and dismantle a modular scaffold must be trained in this procedure and work in accordance with it.

#### Procedure

1. Except during the relocation of planks to the next lift, any person working aloft must work from a fully decked platform.
2. When relocating the last plank in a run, the person lifting the plank will brace his/her back against a standard and keep the feet spread, with one foot securely on the transom and one foot securely on the ledger.
3. The access system (stairs or ladders) will be installed progressively as the scaffold is erected. Climbing the scaffold framework is forbidden.
4. After planking the lift, the next immediate task is to top up any standard on open sides and ends which breaks below guardrail height.
5. Where standards or ledgers need to be passed up before the guardrail is installed, the scaffolder will brace himself/herself against an unjoined standard which extends at least to guardrail height.



6. Guardrails will next be fixed to all open sides and ends from which a fall of more than 2 metres is possible. This will be completed before any other work task. These guardrails are to be left in place until dismantling of the lift.
7. Erection of the remainder of the lift can now proceed with edge protection in place.
8. Dismantling will be carried out in reverse order.



## NOTES

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