Workplace Health and Safety Regulation 2008

On 1 September 2008, the *Workplace Health and Safety Regulation 1997* was repealed and replaced by the *Workplace Health and Safety Regulation 2008*. The new Regulation:

- remakes provisions of the old Regulation
- removes the rural industry exemption from existing regulatory requirements (except in relation to operator licensing for earthmoving equipment and particular cranes) over the next two years
- changes the numbering.

Workplace Health and Safety Queensland will be undertaking a process to review and update all forms and documents on the departmental website to ensure consistency with the new regulation. Until this process is complete, all forms and documents must be read in conjunction with the information provided in the comparison table (PDF, 255 KB). The comparison table has been provided to assist with the practical application of the *Workplace Health and Safety Regulation 2008*. It is not intended to provide a determination or comment on compliance or to provide legal interpretation. It is intended as a guide only and is provided as an information source only.

Workplace Health and Safety Amendment of Codes of Practice Amendment Notice (No. 1) 2008

A number of workplace health and safety codes of practice have been amended to bring them into line with the *Workplace Health and Safety Regulation 2008*. Current codes of practice need to be read in conjunction with the information provided in the *Workplace Health and Safety Amendment of Codes of Practice Amendment Notice (No. 1) 2008* (PDF, 322 KB). However, this document does not include amendments to the following codes of practice:

- Compressed Air Recreational Diving and Snorkelling
- Recreational Technical Diving
- Scaffolding
- Safe Design and Operation of Tractors

Scaffolding Code of Practice 2004

Important information about the Scaffolding Code of Practice 2004

1. The code replaces the *Scaffolding Advisory Standard 1999.*
2. The code was made on 7 September 2004
3. The code commenced on 10 September 2004
4. The code was amended on 28 April 2006.
5. The code expires 10 years after it commenced.

What is this Code of Practice about?

The *Scaffolding Code of Practice 2004* provides practical advice on ways to manage exposure to the risk of death or injury related to the erection, use, maintenance, alteration and dismantling of scaffolding.

The code can help persons conducting a business or undertaking identify what control measures need to be implemented to ensure the health and safety of persons at or near the workplace.

Workplace health and safety obligations and the *Workplace Health and Safety Act 1995*

The *Workplace Health and Safety Act 1995* (WHS Act) imposes obligations on certain persons to ensure workplace health and safety. Workplace health and safety is ensured when persons are free from the risk of death, injury or illness created by workplaces, relevant workplace areas, work activities or plant and substances used at a workplace. Ensuring workplace health and safety involves identifying and managing exposure to the risks at your workplace.

How can I meet my obligations?

Under the WHS Act, there are three types of instruments made to help you meet your workplace health and safety obligations – regulations, ministerial notices and codes of practice.

IF there is a regulation or ministerial notice about a risk, you MUST do what the regulation or notice says.

If there is a code of practice about a risk, you MUST either:

a) do what the code says; or
b) do all of the following –
   - adopt and follow another way that gives the same level of protection against the risk;
   - take reasonable precautions; and
   - exercise proper diligence

CONTENTS

1. Introduction

1.1 Scaffolding

Under the *Workplace Health and Safety Regulation 1997* (WHS Regulation) scaffolding means a temporary structure (not including a trestle ladder) supporting a platform used to perform work.

For the purposes of this code of practice a 'temporary structure' refers to scaffolding that can be assembled and disassembled, for example, modular scaffolds, hanging bracket scaffolds, tube and coupler scaffolds and mobile scaffolds.

A platform that is not intended to be dismantled (i.e. work platforms where the platforms and framework are welded together) falls outside the scope of this standard as it is not considered to be a temporary structure.

1.2 Scaffolding work

Under the WHS Regulation, scaffolding work means the erection, alteration or dismantling of scaffolding.

Note: Technical terms that have been used in this code of practice are defined in appendix 1

2. Training and competency

Parts 3 and 17 of the WHS Regulation outline the requirements for training and responsibilities of relevant persons, supervisors and persons performing prescribed occupations

2.1 Certificates for prescribed occupations

Under the WHS Regulation, a person must hold a **basic, intermediate** or **advanced scaffolder**[1] certificate if a person or thing may fall more than 4 metres from the scaffold.

Note: *The 4 metre height threshold for these certificates is separate to the WHS Regulation requirements for 3 metres (housing construction work) or 2 metres (other construction work) fall from height thresholds. (Refer to section 6.2 Risk of a fall of at least 3 metres or 2 metres).*

[1] See Appendix 1 for definitions

2.2 Competent persons

Under the WHS Regulation a person is not required to hold a certificate if a person or thing may fall 4 metres or less from the scaffold. However, persons conducting a business or undertaking and principal contractors still have a general obligation to ensure the workplace health and safety of themselves, workers and other persons. This includes ensuring any person performing scaffolding work is competent. The person should receive information, instruction, training and supervision in the safe erection, dismantling, maintenance and alteration of the scaffolding.

2.3 Trainees

Trainees are permitted to perform work in a prescribed occupation, provided the trainee is adequately supervised by a ticketed person who is on site, and a written record outlining the training received (i.e. a logbook), is maintained.

3. Planning for scaffold work

3.1 Planning construction activities

Planning before scaffolding work starts can help eliminate many of the associated health and safety risks. An effective plan will help identify ways to protect persons who are:

- erecting, dismantling, maintaining and altering the scaffolding
- using the scaffolding
- near the scaffolding (for example, other workers and members of the public)

A scaffold plan is one tool that can assist you to safely plan and manage scaffold work and help you meet some of your health and safety obligations under the WHS Act.

3.1.1 Scaffold plan

A scaffold plan should be prepared and provided by the employer or self-employed person doing scaffold work. To develop an effective and useful scaffold plan consult with:

- the scaffold designer, for example, to discuss the design loads and the capability of the structure to support any additional loadings;
- the builder or principal contractor, for example, to assess the location of underground drains or pits. The work should be planned so as to avoid excavating service trenches under, through or adjacent to scaffolds; and
- workers, workplace health and safety committees, workplace health and safety officers (WHSO) and workplace health and safety representatives (WHSR), regarding erecting, dismantling, maintaining and altering the scaffolding.

The scaffold plan should include a site layout plan and detail the elevations and sections of the scaffold. It is to be made available for inspection at the worksite.

The scaffold plan should address the following issues:

- basis of design
- foundations (including ground conditions and loadings)
- supporting structure
- access and egress
- tying
- bracing
- type of scaffold
- edge protection

Refer to section *5 General design* and section *7 Types of scaffold* section for further information on each of these issues.

Under the WHS Regulation, there are two other tools which can help to plan work, such as scaffolding work. These tools are construction safety plans (CSP), and work method statements (WMS) for high risk construction activities. A WMS or CSP may even form part of a scaffold plan.

Refer to Part 17 of the WHS Regulation for requirements regarding who must develop a CWP or a WMS for high risk construction activities, when it must be prepared and what it must include.

3.2 Obligations regarding plant

Persons conducting a business or undertaking, under section 28 of the WHS Act, have an obligation to ensure the workplace health and safety of themselves and other persons is not affected by the conduct of the relevant person's business or undertaking. This applies whether the relevant person is an employer, self employed person or otherwise. Relevant person's obligations are addressed throughout this code of practice.

Designers of plant (for example, scaffolding) under section 32 of the WHS Act, have an obligation to:

- ensure that the plant is designed to be safe and without risk when used properly; and
- provide information on its safe use.

Designers must also register their plant design with Workplace Health and Safety Queensland (WHSQ) (see Schedule 4 of the WHS Regulation).

Manufacturers of plant, under section 32A of the WHS Act, have an obligation to:

- ensure plant is manufactured to be safe and without risk when used properly;

- test and examine the plant to ensure it has been manufactured to be safe; and
- provide information on its safe use when supplied to another person.

Suppliers of plant, under section 32B of the WHS Act, have an obligation to:
- examine and test the plant to ensure it is safe and without risk when used properly or ensure the manufacturer has given an assurance that the plant has been examined and tested; and
- ensure the plant is accompanied by information about the way it must be used to ensure health and safety.

Owners of plant, under section 35 of the WHS Act have an obligation to ensure plant is maintained in a safe condition and without risk the health when used properly.

Erectors and installers of plant, under section 33 of the WHS Act, have an obligation to:
- erect or install the plant in a way that is safe and without risk to health; and
- ensure that nothing about the way the plant was erected or installed makes it unsafe and a risk to health when used properly.

Principal contractors, under section 31 of the WHS Act and Part 17 of the WHS Regulation, have obligations and requirements relating to the supply of plant for common use at the workplace. Principal contractors must ensure plant supplied for common use is safe and effectively maintained while it is provided.

Refer to the WHS Act for further details regarding health and safety obligations. Also refer to the *Plant Code of Practice* for specific requirements regarding plant.

4. Hazards

A number of hazards exist that have the potential to cause death or injury when working with scaffolding. These include:

4.1 work near powerlines

4.2 mobile plant and traffic

4.3 mixing and matching scaffold components

4.4 falls from heights

4.5 falling objects

4.6 scaffold collapse

4.7 manual tasks

4.1 Work near powerlines

In Queensland, information and guidance for working near exposed live electrical parts are provided in the following publications.

- *Electrical Safety Act 2002* (ES Act)
- *Electrical Safety Regulation 2002* (ES Regulation)
- *Code of Practice for Working near Exposed Live Parts 2002*
- *Code of Practice for Electrical Work 2002*

The ES Act outlines general electrical safety obligations. The ES Regulation states the allowable distance for working near an electrical part. The Codes of Practice give practical advice on safe systems of work and exclusion zones.

Care must be taken when doing scaffolding work in close proximity to bare and insulated electrical lines and hidden electrical cables (for example, cables concealed behind a surface where an anchor is to be fitted).

When work is to be performed around electrical parts the following steps should be taken.

- Contact the electricity entity in control of the electrical part to confirm voltage, insulation and appropriate systems of work.
- Determine the **exclusion zone**[2] by referring to Schedule 2 in the ES Regulation.

[2] An exclusion zone is a safety envelope around an electrical part (exposed part or an overhead insulated electric line). No part of a worker, operating plant or vehicle may cross into the exclusion zone while an electrical part is live.

4.2 Mobile plant and traffic

Mobile plant and vehicular traffic are hazards which can potentially affect worker safety and the safe use and structural integrity of scaffolding.

Outlined below are control measures that can be used to prevent or minimise exposure to the risk of death or injury from moving plant and traffic.

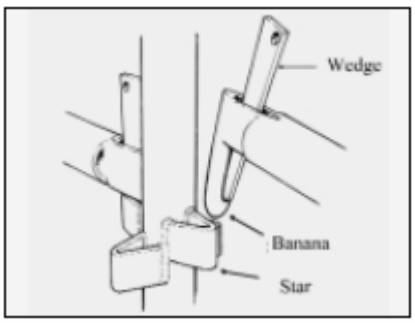
- Re-route motor vehicles and mobile plant away from the location of the scaffold, for example, by using traffic controllers to redirect traffic.
- Use barricades, signs, posts, buffer rails, guards, or concrete or timber kerbs to prevent mobile plant and traffic from coming into contact with scaffolding.
- Ensure scaffolding does not have any unnecessary protrusions, such as over-length **transoms**, **putlogs**, tie tubes or over-height **standards**[3].

4.3 Mixing and matching scaffold components

Components from different manufacturers or suppliers, while looking compatible, are often of different dimensions and tolerances. Mixing and matching incompatible scaffold components can lead to difficulties in disassembly which in turn may increase the risk of musculoskeletal injury, increase wear on the components, and affect the load capacity of the scaffold.

The following controls can be used to prevent or minimise the risk of injury and scaffold collapse due to the incorrect mixing and matching of components.

- Do not mix scaffolding from different manufacturers, unless an engineer approves that:
  (a) the components are of compatible size and strength;
  (b) the components have compatible deflection characteristics;
  (c) the fixing devices are compatible; and
  (d) the mixing does not lessen the strength, stability, rigidity or suitability of the scaffold.
- See also *AS/NZS 4576 – Guidelines for Scaffolding* which sets out the assurances that are needed before the components of different prefabricated scaffolding systems can be mixed in a scaffold.



[3] See Appendix 1 for definitions

Figure 1. *Mixing and matching components. Avoid mixing and matching different modular systems. Often connection points known as the 'star' and 'banana' used on these systems are of a different shape and tolerance and are not compatible.*

- Do not mix scaffolding tubing of different outer diameters and strengths. For example, do not mix aluminium and steel components as steel clamps may cause aluminium tubing to be crushed reducing the strength of the tube.
- 'Beam clamps' or 'flange clamps' should be provided with information about safe use, including tightening torque required and when to use different types of couplers. If no information is provided contact the supplier, manufacturer or designer of the scaffold.
- Stairs should be secured to the scaffold bay. If not secured, the supplier should provide documentation illustrating the maximum amount of clearance allowed between the transom and the top and bottom of the stair module.
- Ensure the gap between the end of a stair module and a transom is as small as practicable. Large gaps can lead to stairs dislodging and falling when a load is placed onto it.

4.4 Falls from height

Refer to section *6 Erecting and dismantling scaffold*.

4.5 Falling objects

Part 17 of the WHS Regulation prescribes control measures that relevant persons and principal contractors must implement to prevent or minimise exposure to the risk of death or injury to persons, including workers, from construction work where an object could fall on or otherwise hit persons during the work.

Under the WHS Act, obligation holders, including relevant persons and principal contractors must ensure the workplace health and safety of themselves and others is not affected by the conduct of their business or undertaking.

This obligation includes preventing or minimising exposure to the risk of death or injury from falling objects.

The following are examples of control measures that may be used to prevent or minimise exposure to the risk of being hit by falling objects.

- Establish exclusion zones around scaffolding and adjoining areas to prevent unauthorised persons from accessing the area.
- Use perimeter containment screening (see also perimeter containment screening section, scaffold fans, hoardings or gantries to contain falling objects.
- Erect and dismantle scaffold in built-up areas during quiet times.

- Never drop materials from a scaffold – use mechanical hoists to move materials.
- Attach danger tags and warning signs such as ‘Keep Out – Falling Objects’ and ’Danger – Incomplete Scaffolding’ in obvious locations to warn persons of hazards.

4.6 Scaffold collapse

See section *7 Types of scaffolding* for control measures which may be used to prevent or minimise exposure to the risk of death or injury from scaffold collapse.

4.7 Manual tasks

Manual tasks are part of nearly all work done by scaffolders. Manual tasks include any activity where workers grasp, manipulate, carry, move (lift, lower, push, pull), hold or restrain a load. For example, handling components, erecting and dismantling scaffolds, unloading vehicles, or using hand tools such as podger hammers or scaffolding spanners.

The *Manual Tasks Code of Practice 2000* (MTCOP) provides information about how to prevent or minimise exposure to risk factors that contribute to or aggravate work related musculoskeletal disorders.

To prevent or minimise exposure to the risk of injury from manual tasks, obligation holders need to:
- manage exposure to risks as set out in section 27A of the WHS Act (the MTCOP provides specific information about risk management in relation to problem manual tasks);
- design work processes or purchase equipment that prevents or minimises the risk of musculoskeletal injuries;
- consult with WHSO, WHSR (where appointed), WHS committees and workers about their work activities; and
- train workers in how to erect, install, alter and dismantle scaffold in a way that prevents or minimises the risk of musculoskeletal injuries.

Risk factors associated with manual tasks fall into three categories.
- **Direct stressors** directly stress the body. They include factors such as the level of muscular force exerted, working postures, repetition of actions, the vibration absorbed from equipment and the duration of time these conditions are sustained.
- **Contributing risk factors** directly influence the task demands. They include the work area layout, use of tools, nature of loads and load handling. If these components are redesigned, the impact of the direct stressors can be reduced.
- **Modifying risk factors** can contribute to a further change in the impact of other risk factors. They include individual factors and work organisation.

Control measures for manual tasks fall into two major categories – design and administrative controls. Design controls make changes to the work area, tools or equipment, or the way a job is done and/or the provision of mechanical aids to reduce the effort required to do the job. Design controls are preferred as they are permanent and can eliminate or minimise exposure to risk factors.

Administrative controls are achieved by modifying work practices, policies and procedures to reduce exposure to the risk of a musculoskeletal injury. Administrative controls are less preferred as they only reduce exposure to the risk factors, rely on ongoing supervision to ensure they are implemented, and may be forgotten under stressful conditions (for example, when trying to meet deadlines).

4.7.1 Examples of design controls

Job design and redesign

- Use scaffold systems which are made of lighter weight materials and use modern technologies (for example, modular systems which have shorter standard lengths or systems that are made of aluminium rather than steel or timber).
- Use components that are shorter in length thereby reducing the weight of the standards and making them easier to handle.
- Store scaffolding components as close as practical to the work area in order to minimise the distance over which loads are manually moved. Clear access ways should also be ensured so that materials and equipment can be easily accessed.
- Avoid using different types of scaffolding together as increased force may be required to assemble and dismantle components that are not made to fit together.
- Use the appropriate tools for the work performed and avoid over tightening scaffold couplers which results in the need for greater force when loosening them during the dismantling stage.

Mechanical aids

- Use mechanical aids such as cranes, hoists, pallet jacks or trolleys to move equipment and materials wherever possible (for example, when lifting bundles of components, moving components/materials around the site, or unloading vehicles). Team lifting is not a preferred method for load handling and should only be used as a last resort when mechanical aids cannot be used or the work cannot be redesigned. Workers must be trained in team lifting techniques and adequate numbers of workers must be provided.
- Use electric winches (preferred) or gin wheels to lift components up the scaffold.

4.7.2 Examples of administrative controls

Work organisation

- Incorporate rest breaks or task variety into the job where the risk can not be prevented or minimised.

- Ensure there are adequate numbers of workers to meet deadlines.

Task specific training
- Workers should be provided with education and training in relation to the performance of manual tasks. This includes training in the correct use of mechanical devices, tools and equipment, as well as safe performance of the specific manual tasks and handling methods (for example, team lifting).

Preventative maintenance program
- Clean and maintain tools, equipment and scaffolding components regularly. Tools and equipment which are not properly maintained, as well as components that have been damaged and therefore no longer fit easily together, may require increased force when using them.

Personal protective equipment (PPE)
- PPE and clothing can increase the potential for injury if it is lacking or unsuitable for the work performed (for example, incorrectly sized gloves interfere with a worker's gripping ability and manual dexterity and this contributes to increased muscular effort and fatigue). If gloves are worn it is important that the appropriate type of glove is chosen based upon the work requirements and different sizes are provided so that the right size for the worker can be selected.

5. General design

The following section provides general advice regarding the safe construction of basic types of scaffolds.

Note: *Under the WHS Act, designers, manufacturers and suppliers of plant must ensure that plant is accompanied by information about the safe use of the plant.*

5.1 Principles of design

The design of the scaffold should take into account:
- the strength, stability and rigidity of the supporting structure;
- the intended use and application of the scaffold;
- the safety of persons engaged in the erection, alteration and dismantling of the scaffold;
- the safety of persons using the scaffold; and
- the safety of persons in the vicinity of the scaffold.

5.2 Basis of design

The design of the structural **members**[4] and components of a scaffold should comply with *AS 1576 Scaffolding (Parts 2 and 4)* and *AS/NZS 1576 Scaffolding (Parts 1, 3 and 5)*.

5.3 Foundations

Scaffolding foundations must be able to carry and distribute all the weight of the scaffold, including any extra loads, for example, perimeter containment screens, placed on the scaffold.

Consideration should be given to the following when designing the foundation of the scaffolding.

5.3.1 Ground conditions

Water and nearby excavations may lead to soil subsidence and the collapse of scaffold. Any likely watercourse, such as a recently filled trench, which has the potential to create a wash out under the scaffold base, should be diverted away from the scaffold.

The principal contractor or relevant person should ensure ground conditions are stable and inform scaffold erectors of any factors which may affect ground stability, before the scaffold is erected.

5.3.2 Loadings

Scaffolding needs to be designed for the most adverse combination of dead, live and environmental loads that can reasonably be expected during the period that the scaffold is in use.

The dead, live and environmental loads will need to be calculated during the design stage to ensure the supporting structure and the lower standards are capable of supporting the loads. The design of such scaffolds and **ties**[5] must be approved by a competent person or an engineer.

Follow the specifications of the manufacturer, designer or supplier for the maximum loads of the scaffold.

5.3.2.1 Environmental loads

Consider environmental loads, particularly the effects of wind and rain on the scaffold. For example, environmental loads imposed by wind and rain may be heightened if perimeter containment screens, shadecloth or signs are attached to the scaffold. Staggering the joints in standards may help control the risk of scaffold collapse from environmental loads.

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[4] & [5] See Appendix 1 for definitions.

Refer to *AS/NZS 1576.1 Scaffolding – General Requirements* (section 2.4) for additional information.

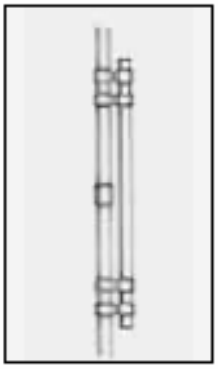

Figure 2. *'Tension splices' or 'through bolts' may be required to secure scaffold components together to accommodate any environmental loads.*

5.3.2.2 Dead loads

Dead loads refer to the self weight of the scaffold structure and components including any working, catch or **access platforms**, stairways, ladders, screens, sheeting, platform brackets, **suspension ropes**[6], secondary ropes, traversing ropes, tie assemblies, scaffolding hoists or electrical cables. Dead loads should be calculated in accordance with *AS/NZS 1576.1 Scaffolding – General Requirements*.

5.3.2.3 Live loads

The live load includes:
- the weight of persons;
- the weight of materials and debris;
- the weight of tools and equipment; and
- impact forces.

Scaffolds should not be used to support formwork and plant, such as hoist towers and concrete pumping equipment, unless the scaffold is specifically designed for this purpose.

The live loads applied to a **working platform**[7] should be in accordance with those specified in Table 1.

[6] & [7] See Appendix 1 for definitions.

Table 1. Requirements for working platforms

	Design total load (kg per platform per bay)	Design concentrated load (as part of total load – to be applied in the most adverse position within the bay) (kg)	Minimum width of platform (mm)
Light duty < 3 metres during housing construction work < 2 metres during other construction work For example: painting, cleaning or fascia and gutter installation	125 (1.2kN)	100 (1kN)	225
Light duty ≥ 3 metres during housing construction work ≥ 2 metres during other construction work	225 (2.2kN)	100 (1kN)	450
Medium duty For example: finishing trades where light materials are stacked on the platform.	450 (4.4kN)	150 (1.5kN)	900
Heavy duty For example: bricklaying and demolition work (special duty may be required for some demolition activities).	675 (6.6kN)	200 (2kN)	1000
Special duty	Seek guidance from designer, manufacturer, supplier or engineer		

Note: *No materials are permitted on platforms 450 mm wide or less. All other scaffolds must have a clear platform width of at least 450 mm.*

5.4 Supporting structure

Consider the capability of the supporting structure to bear the most adverse combination of loads possible during the use of the scaffold. Obtain advice from an engineer before erecting scaffolds on verandas, suspended flooring systems, compacted soil, **parapets**[8] and awnings.

Propping may be required where the supporting structure is not capable of bearing the most adverse combination of loads.

5.4.1 Soleboards and baseplates

Soleboards and **baseplates**[9] can be used to evenly distribute the load from the scaffold to the supporting surface (see Figure 3). Both soleboards and baseplates may be required for use on less stable surfaces, such as soil, gravel, fill or other product which creates a system of beams and flat slabs.

[8] & [9] See appendix 1 for definitions.

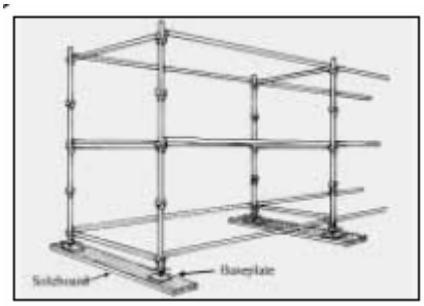

Figure 3. *Soleboards and baseplates*

The size of the soleboard will vary depending on the supporting surface. If in doubt you may need to consult an engineer to determine the bearing capacity of the ground or other supporting structure.

Soleboards should be level and some digging may be required to obtain a level surface.

Adjustable bases can be used on uneven surfaces for modular scaffold systems. No part of the baseplate or adjustable base should protrude over the side of the soleboard to ensure the loads are imposed evenly on the soleboard.

Needles and **spurs**[10] should be considered where ground conditions are very unstable.

5.5 Stability

Scaffold stability may be achieved by:

- tying the scaffold to a supporting structure;
- guying to a supporting structure;
- increasing the dead load by securely attaching **counterweights**[11] near the base; and
- adding bays to increase the base dimension.

5.6 Tying

Tie methods and spacing need to be in accordance with the instructions of the manufacturer, designer or supplier.

Outlined below are safe work practices and control measures for tying scaffold.

- Consult with the scaffold designer, manufacturer, supplier or an engineer if it is not practical to position the ties in accordance with the instructions.
- More ties may be required if:

[10] & [11] See Appendix 1 for definitions.

(a) the scaffold is sheeted or netted due to increased wind loadings;
(b) it is used as a loading platform for materials or equipment; and
(c) attaching lifting appliances or rubbish chutes.

- The principal contractor or a relevant person should have a competent person regularly inspect the existence and effectiveness of scaffold ties to ensure they are not modified or altered by unauthorised persons (for example, finishing trades who may loosen, relocate or remove ties to obtain access to walls and openings).
- Consult with the scaffold designer or supplier before attaching additional loads on the scaffold, for example, signs and perimeter containment screens.
- Cast-in anchors or 'through bolts' (i.e. pass through a wall) are preferred to drill-in expansion or chemical anchors for securing scaffold ties because of possible failure due to faulty tensioning or epoxies.
- Drill-in expansion anchors should be limited to the load (torque) controlled type. The **working load limit**[12] should be limited to 65% of the 'first slip load' stated in the information provided by the supplier.
- Deformation-controlled anchors, including self-drilling anchors and drop-in (setting) impact anchors, should not be used.
- Where drill-in expansion or chemical anchors need to be used, the following proportions of anchors should be tested and proof loaded to the working load multiplied by a factor of 1.25:
  (a) 10% of drill-in expansion anchors; and
  (b) all chemical anchors.
- Drill-in expansion or chemical anchors should have a safety factor of 3 to 1 on their failure load. If any anchors fail, the remaining anchors on the same level should be tested.
- Ties should not obstruct access along the working and access platforms.
- Ties should interconnect with both the inner and outer scaffold standards (unless otherwise specified by an engineer) to increase the rigidity of the scaffold.

5.7 Working platforms

Working platforms, except suspended scaffolds should have duty classifications and dimensions complying with section *5.3.2 Loadings*.

Each scaffold should be designed to carry the required number of working platforms and to support its live loads.

The following are safe work practices or control measures for working platforms.

- Scaffold planks should:
  (a) have a slip-resistant surface;
  (b) not be cracked or split;
  (c) be of uniform thickness;

[12] See Appendix 1 for definitions.

(d) be captive (i.e. can not be kicked off) and fixed to prevent uplift or displacement during normal use; and
(e) be positioned so that no single gap between planks exceeds 25 mm and the total gap between all planks does not exceed 50 mm.

- Planks should not be lapped on straight runs of modular and tube and coupler scaffolding but may be lapped on hanging bracket scaffolds.

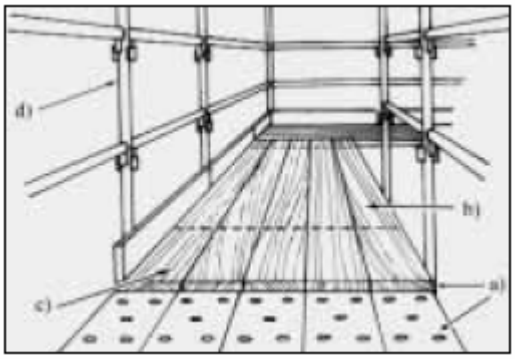

Figure 4. *Overlapping planks. Lapped scaffold planks may sometimes be used to cover gaps around corners of scaffold bays. These planks generally may not need to be secured, provided the following are met: (a) timber is lapped over metal planks. (b) planks are 1.2 metres long or greater. (c) plank overlap, past the edge of the plank underneath, is 300 mm or greater. (d) standards prevents planks from moving sideways on the scaffold.*

- If using plywood sheets to cover gaps between scaffold bays the plywood sheets should be:
  (a) a minimum of 17 mm thick;
  (b) only used to cover gaps less than 500 mm wide (unless approved by an engineer); and
  (c) secured.
- Metal planks lapped on other metal planks should be secured.
- All hop-up brackets should be provided with tie bars to stop brackets from spreading apart, causing planks to dislodge, unless otherwise specified by the scaffold designer.
- The overhang of planks which are supported by putlogs should be greater than 150 mm but less than 250 mm – otherwise uplift might occur.
- Avoid nailing or screwing laminated planks into position, unless otherwise specified by the manufacturer. Moisture penetrating the planks can cause damage and may not be easily detected.
- In cyclone prone areas all planks should be secured against uplift during cyclone season. In Queensland, cyclone prone areas include areas north of Bundaberg. Refer to *AS 1170 Structural Design Actions (Part 2)*.

5.8 Fall arresting platforms

Under Part 17 of the WHS Regulation, a relevant person may use a fall arresting platform as a control measure to arrest a person's fall during construction work. Fall arresting platforms must comply with section 217B of the WHS Regulation.

The requirements in Part 17 apply only to falls from heights during construction work. However, other industries may choose to follow and adopt the control measures in Part 17 to control the risk of a fall from heights. Following these standards may help other industries meet their health and safety obligations under the WHS Act.

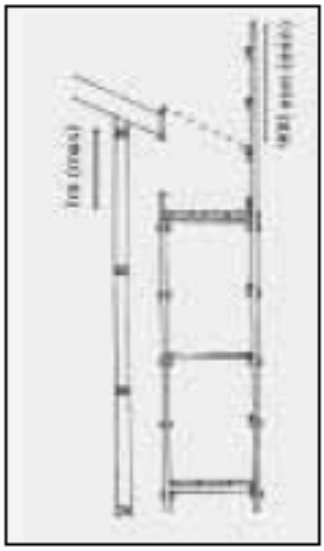

Figure 5a *Fall arresting platform ≤ 260*

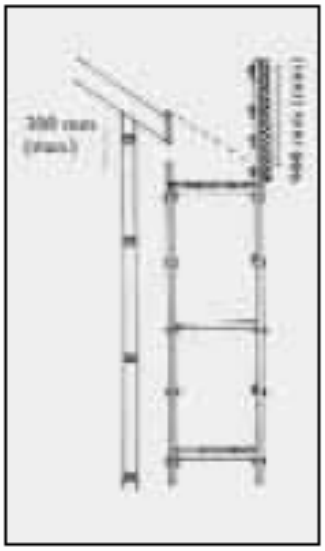

Figure 5b *Fall arresting platform > 260*

- If the slope of the surface where work is being done is:
  (a) not over 26º – then install the platform no more than 1 metre lower than the surface; or
  (b) over 26º – then install the platform no more than 300 mm lower than the surface.
- The fall arresting platform must:
  (a) be unobstructed and at least 675 mm wide for the length of the platform;
  (b) be able to withstand the impact of a fall onto it; and
  (c) have edge protection erected:
    i. along the outer edge of the length of the platform; and
    ii. along the edges of each end of the fall arresting platform.
- If the internal gap (the gap between the inner edge of the length of the platform and the face of the building or structure immediately beside the platform) exceeds 225 mm, then implement a control measure to control the risk of a fall.

5.9 Edge protection

Section 216 in Part 17 of the WHS Regulation outlines the requirements for edge protection which may be used as a control measure to prevent the risk of death or injury from a fall during construction work.

The requirements in Part 17 apply only to falls from heights during construction work. However, other industries may choose to follow and adopt the control measures in Part 17 to control the risk of a fall from heights. Following these standards may help other industries meet their health and safety obligations under the WHS Act.

Note: *Written approval should be obtained from an engineer before installing edge protection on a scaffold system which was not originally designed, supplied or manufactured with edge protection. Approval should include specifications on how to install and maintain edge protection.*

5.10 Access and egress

Workers must be provided with safe access to and egress from scaffold during the erection, use and dismantling of scaffolding. Common means of access and egress include:

- temporary stairs or portable ladder access systems installed at the start of erection, progressed with the scaffold, and used by the scaffolder whenever possible;
- permanently installed platforms or ramps;
- personnel hoists (non-mechanical forms of egress, such as a ladder or stair tower should be provided in case of emergency); and
- using the existing floor level of a building, provided such access is safe.

Note: *Scaffolders should not climb standards externally. A scaffolder may climb an inside standard internally provided the fall distance is less than 3 metres (during housing construction work) or less than 2 metres (during other construction work).*

5.10.1 Ladders

Relevant persons who intend to do construction work that involves a single or extension ladder must refer to Part 17 of the WHS Regulation. Part 17 sets out the requirements for using ladders, including the maximum allowable height of a single or extension ladder, the safe position of a ladder and how it is to be used.

The requirements in Part 17 apply only to falls from heights during construction work. However, other industries may choose to follow and adopt the control measures in Part 17 to control the risk of a fall from heights. Following these standards may help other industries meet their health and safety obligations under the WHS Act.

The following are additional safe work practices which should be followed when working on ladders:

- Ladders may be used where access to the working platform is needed by only a few persons, and where tools and equipment can be delivered

separately to the working platform (for example, by materials hoist, crane or a rope and gin wheel).
- Ladders should be within a separate ladder access bay of the scaffold, wherever space permits.
- If the access bay is part of the working platform, a trap door is to be provided. Strict controls are to be implemented to ensure the trap door remains closed while working from the platform.
- Ladders should be set up on a firm, level surface and not used on scaffold bays to gain extra height.

5.11 Perimeter containment screening

Part 17 of the WHS Regulation defines perimeter containment screening which is used to protect persons from falling objects during construction work.

The requirements in Part 17 apply during construction work. However, other industries may choose to follow and adopt the control measures in Part 17 to control the risk of falling objects hitting people. Following these standards may help other industries meet their health and safety obligations under the WHS Act.

- Perimeter containment screens must be made of mesh or of timber, plywood or metal sheeting. Perimeter containment screens made of mesh must comply with section 179 of the WHS Regulation. The requirements for mesh are summarised in Table 2 (see also Figure 6).

Table 2. Summary of requirements for mesh perimeter containment screens under the WHS Regulation

Mesh pattern	Size of mesh openings (max)	Mesh gauge
Square or other rectangle		
- with prescribed lining*	50 mm x 50 mm	2.5 mm
- without prescribed lining*	25 mm x 25 mm	2.5 mm
- without prescribed lining*	25 mm x 50 mm	2.5 mm
Not square or other rectangle		
- with prescribed lining*	50 mm in any direction	2.5 mm
- without prescribed lining*	25 mm in any direction	2.5 mm

* **prescribed lining** means intact shade cloth, or another intact lining, that when tested, wet or dry, in accordance with method A in AS 2001.2.4 has a mean bursting pressure of at least 1000 kPa.

- The framework supporting a screen must be able to bear the load of the screen.
- Each of the following gaps must be not over 25 mm:

(a) the gap, measured horizontally, between screens immediately beside each other;
(b) the gap, measured vertically, between a screen and another screen immediately above it; and
(c) the gap, measured vertically and horizontally, between a screen and the framework supporting it.

- Containment sheeting should be installed no higher than the upper most tie.
- Where work is carried out close to pedestrian or vehicular access, scaffolds that are sheeted down to hoarding level can minimise both the risk to the public and the area lost to public access.

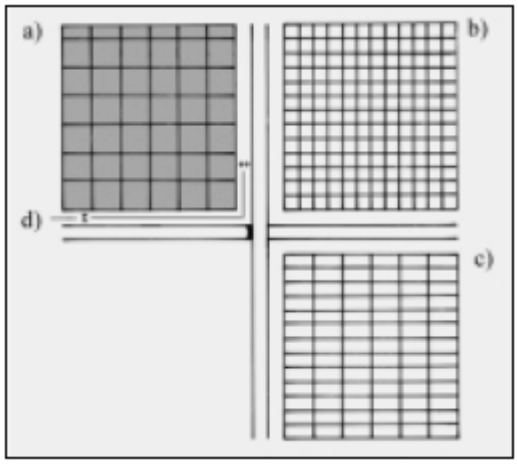

Figure 6. *Containment screening. a) 50 mm x 50 mm (max) openings with prescribed lining. b) 25 mm x 25 mm (max) openings without prescribed lining. c) 50 mm x 25 mm (max) openings without prescribed lining. d) gap measured vertically and horizontally between the screen and the framework supporting it must not be over 25 mm.*

6. Erecting or dismantling scaffold

A relevant person who intends to do construction work that is the erecting or dismantling of scaffolding must comply with Part 17 of the WHS Regulation.

The requirements in Part 17 apply only to falls from heights during construction work. However, other industries may choose to follow and adopt the control measures in Part 17 to control the risk of a fall from heights. Following these standards may help other industries meet their WHS obligations under the WHS Act.

6.1 Risk of a fall at any height

Under Part 17 of the WHS Regulation, before a relevant person starts construction work that is to erect or dismantle scaffolding they must:
(a) identify any hazards that may result in a fall, or cause death or injury from a fall;
(b) assess the risk of death or injury; and
(c) implement control measures to prevent or minimise the level of exposure to the risk.

Hazards which may increase the risk of death or injury from a fall while erecting, altering or dismantling scaffolding include:

- poor environmental conditions, for example:
  (a) strong winds that may cause workers to lose balance;
  (b) rain causing a slippery work surface; and
  (c) glare emitted from work surfaces and/or poor lighting affecting visibility;
- materials, equipment or protruding objects below, or in adjoining work area, for example:
  (a) pallets of construction materials;
  (b) vertical reinforcing steel;
  (c) a rubbish skip;
  (d) exposed starter bars; and
  (e) picket fences;
- void areas not identified or protected, for example, ladder access voids;
- incomplete scaffolds or loose scaffold components where work is being done, or is likely to be done; and
- inadequate training, instruction and supervision of scaffold workers.

6.2 Risk of a fall of at least 3 metres or 2 metres

Under the WHS Regulation, if there is a risk of a fall of at least 3 metres (during housing construction work) or 2 metres (during other construction work) when doing scaffolding work, the relevant person must ensure that:
(a) control measures are put in place to prevent the person falling or
(b) the person uses a fall-arrest harness system or
(c) if the person is erecting a scaffold – the person follows the prescribed work method outlined in section 217K of the WHS Regulation or
(d) if a person is dismantling a scaffold – the person follows the prescribed work method outlined in section 217L of the WHS Regulation.

6.2.1 Safe erection of scaffolding

The following summarises the prescribed work method for erecting scaffolding outlined in section 217K of the WHS Regulation (see also figures 7 to 9).

- After enough components of the scaffolding have been erected to support it, immediately install:
  (a) a **platform** at least 450 mm wide along the full length of the section of scaffolding;

(b) **edge protection** across the space between the uprights forming the outer frame of the scaffolding at the level the scaffolding has reached; and
(c) a means of access (for example, temporary stairs or a ladder) to the level the scaffolding has reached.

- Before the next level of the scaffolding is erected, a platform must be installed below the level at a distance of not more than:
  (a) 3 metres if the erection of the scaffolding is housing construction work; or
  (b) 2 metres otherwise.
- A section of the platform may be left open to allow the passing of planks or other scaffolding components between levels.
- A platform does not need to be installed on the bottom level of the scaffolding.
- A platform may be removed after work has started two levels above the level from which the platform is to be removed.

Note: *If platforms are removed, they can only be removed in a progressive manner in accordance with section 217K and 217L of the WHS Regulation. Prior to dismantling the complete scaffold, planks will need to be reinstalled to ensure safety of workers.*

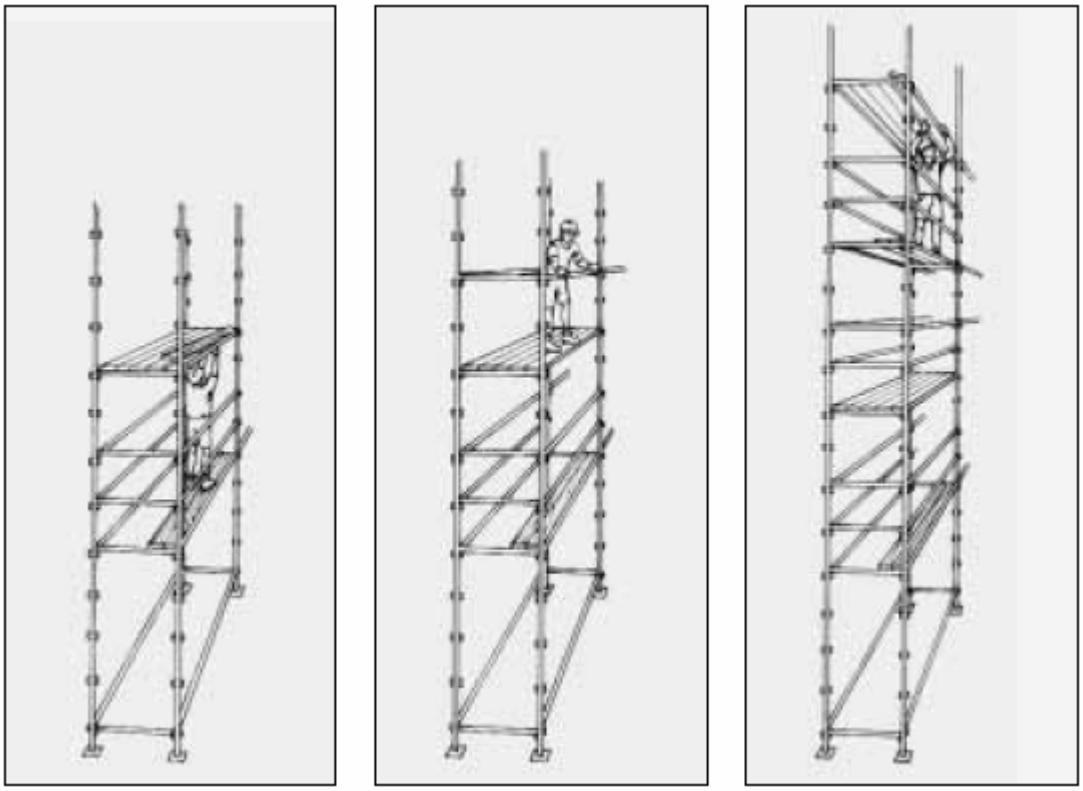

Figure 7. Work from a platform at least 450 mm wide to install planks overhead. Platform does not need to be installed on the bottom level of the scaffolding.

Figure 8. Immediately install edge protection after enough components of the scaffolding have been erected. A section of the platform may be left open to allow scaffolding components to be passed between lifts.

Figure 9. Worker on two planks must have a fully decked platform positioned beneath them at a distance of no more than 2 metres (not housing construction work) or 3 metres (housing construction work).

6.2.1.1 Additional safe work practices

The following additional safe work practices should be followed when erecting scaffold.

- Scaffold 'fittings' and other connections should be securely tightened. Where 'safety fittings' are used, they should be fitted in accordance with the scaffold plan.
- All scaffold components should be installed as the scaffold is erected. For example, the installation of:
  (a) all bracing and ties; and
  (b) **guy ropes** or **buttresses**[13].
- Consider using specifically designed loading platforms and/or back propping to prevent overloading the building floor or the scaffold.
- Obtain certification from an engineer before erecting scaffold on awnings.
- Limit the number of workers on a scaffold at any one time.
- Develop a methodical work sequence if more than one worker will be on the scaffold at the one time, for example, allocate specific tasks to each scaffolder.
- Work from a full deck of planks whenever possible.
- Do not climb on **guardrails**[14] to gain extra height.
- Where the internal gap[15] on scaffolding (includes hanging bracket scaffolding) is greater than 225 mm, put in place measures to control the risk of a fall. For example, install:
  (a) edge protection which complies with section 216 of the WHS Regulation, on the inside edge of the platform; and
  (b) additional scaffold planks to minimise the size of the internal gap.

6.2.2 Safe dismantling of scaffolding

The following summarises section 217L of the WHS Regulation which prescribes the safe method for dismantling scaffold.

- Edge protection and any means of access can be removed as the scaffolding is dismantled, provided it is removed at the last possible stage.

[13] & [14] See Appendix 1 for definitions.

[15] The gap between the inner edge of the length of the platform and the face of the building or structure immediately beside the platform.

- A platform of at least 450 mm wide, at the level the dismantling has reached, is in place, where practicable.
- Ensure that when dismantling scaffold, the platform immediately below the level the worker is standing on, has a full set of planks across its width and is no lower than:
  (a) 3 metres (during housing construction work) or
  (b) 2 metres (during other construction work).
- A section of the scaffold may be left open (for example no platform in place) to allow the lowering of planks or other scaffolding components between levels.

Note: *To prevent death or injury to persons and damage to components, do not drop scaffolding components from heights when dismantling scaffold.*

6.2.3 Scaffold alteration

Control measures to minimise the risk of death or injury during scaffold alteration include ensuring:
- the scaffold designer is consulted before making any alterations;
- only a competent person makes scaffold alterations;
- scaffold alterations are in accordance with the scaffold plan;
- alterations do not compromise the structural integrity of the scaffold; and
- systems are in place (for example, regular inspections) to identify unauthorised interference with the scaffold.

6.2.4 Fall-arrest systems

Fall-arrest systems used as a control measure to arrest a person's fall during construction work must comply with the requirements set out in Part 17 of the WHS Regulation.

Generally, fall-arrest systems are not appropriate for erecting scaffolding because:
- workers are likely to hit a component of the scaffold before the fall is arrested;
- obtaining suitable anchorage points that can support a load of 15kN may be difficult;
- continuously hooking on and off the scaffold may be inconvenient; and
- fall arrest lines may become trip hazards.

Fall-arrest systems should only be used during the following scaffold activities.
- erecting or dismantling 'drop' or 'hung' scaffold where the scaffold is constructed from top to bottom, this allows for a clear fall zone, in the event of a fall;
- the fixing and removal of trolley tracks on **suspension rigs**[16];

[16] See Appendix 1 for definitions.

- erecting or dismantling cantilevered needles and decking between the needles. Fall arrest systems could also be used during the erection of the first **lift**[17] of scaffolding where workers are standing on the deck between the needles;
- the erection and dismantling of cantilevered scaffolds prior to or when removing the initial platform; and
- the attachment and removal of spurs projecting from the supporting structure.

6.2.4.1 Rescue procedures

Under Part 17 of the WHS Regulation, you must ensure that there are written procedures about:
(a) safely retrieving a person who has fallen and
(b) ensuring the safety of the person involved in the retrieval.

In the event of an accident, the suspended person must be retrieved immediately – otherwise there is the risk of permanent injury to the person. Rescue procedures must also ensure the safety of the persons involved in the retrieval.

Emergency plans may need to identify the location and means of access for the rescuer.

A fall-arrest system should not be used unless there is at least one other person (or two persons if the fallen person is heavy or unconscious) on site who will be able to rescue the user.

If an elevating work platform (EWP) is to be used for a rescue, it should be readily available and at all times be able to reach the position of the person using the fall-arrest system.

Workers must be provided with training in the safe and correct use of the fall-arrest system.

[17] See Appendix 1 for definitions.

7. Types of scaffold

Consider the design, shape and location of the building or other structure when selecting the type of scaffold to be used. Choose a scaffold system that is most adaptable to the contour of the building or other structure, particularly if a modular scaffold is being considered. Also consider the purpose for which the scaffold is to be used, for example, bricklaying, plastering or demolition.

The following section identifies different types of scaffolds and control measures to prevent or minimise exposure to the risk of death or injury.

Note 1: *Scaffolds should be erected in accordance with the designer's instructions and the scaffold plan.*

Note 2: *A person doing scaffolding work more than 4 metres in height must hold a certificate for basic, intermediate or advanced scaffolding (see also section 2 Training and competency for more information).*

7.1 Independent scaffold

An independent scaffold consists of two or more rows of standards connected longitudinally and transversely.

7.1.1 Birdcage scaffold

A birdcage scaffold is an independent scaffold that consists of more than two rows of standards in both directions and is connected by **ledgers**[18] and transoms. It is mainly used for work that is to be carried out on a single level, such as ceilings.

Refer to the designer's specifications when erecting and dismantling birdcage scaffolds made from modular scaffolding.

The following control measures should be implemented for birdcage scaffolds made from tube and coupler scaffolding.

- Provide untied birdcage scaffolds with lengthwise bracing at each outer longitudinal row of standards.
- Only use birdcage scaffold to support formwork that has been specifically designed for this purpose.
- Provide longitudinal bracing or a tied face at every third longitudinal row of standards.
- Brace the outside row of standards on each face and each third row internally with longitudinal bracing.
- Provide transverse bracing at every fourth bay on the ends of the scaffold.
- Use scissor lifts to erect or dismantle birdcage scaffolds.

[18] See Appendix 1 for definitions.

Note: *A fall arrest system is generally not an appropriate control measure for the erection or dismantling of perimeter and birdcage scaffolds (see section 7.2.3 Fall arrest systems for further information). Use another control measure to prevent or minimise exposure to the risk of death or injury from a fall.*

7.1.2 Tower scaffold

A tower scaffold is an independent scaffold consisting of four vertical members connected longitudinally and transversely.

The following control measures should be implemented for tower scaffolds.

- Construct the tower with modular, frame, or tube and coupler scaffolding.
- Ensure the tower is resting on firm level ground with the wheels or feet properly supported. Do not use bricks or building blocks to take the weight of any part of the tower.
- Ensure the height of a tower scaffold, from the bottom of the scaffold to the working surface, is no greater than three times the minimum base dimension, unless otherwise specified by the manufacturer, supplier or designer.
- Use alternative height to base ratios or extra support if the scaffold is:
  (a) sheeted or likely to be exposed to strong winds;
  (b) loaded with heavy equipment or materials;
  (c) used to hoist heavy materials or support rubbish chutes;
  (d) used for operations involving heavy or awkward equipment (for example, grit blasting or water-jetting); and
  (e) supporting a ladder.

7.1.3 Mobile scaffold

A mobile scaffold is an independent scaffold that is freestanding and mounted on **castors**[19].

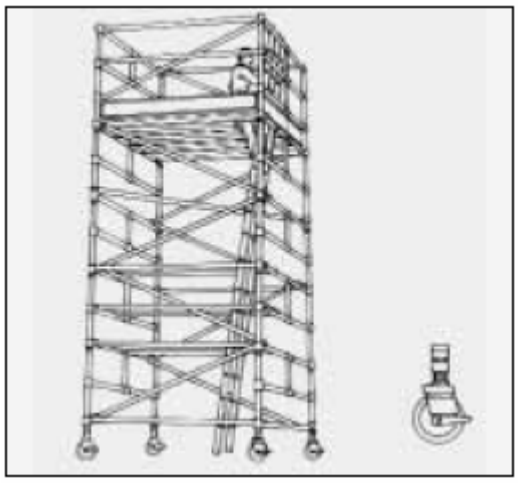

Figure10. *Mobile scaffold*

[19] See Appendix 1 for definitions.

Mobile scaffolds must be provided with information regarding safe use and erection. If scaffolding is to be altered, contact the manufacturer or supplier for additional guidance.

All modular mobile scaffolds are to be erected in accordance with manufacturer's specifications.

The following control measures should be implemented for mobile scaffolds.

- The height of a mobile scaffold, from the bottom of the scaffold to the working surface, should be no greater than three times the minimum base dimension, unless otherwise specified by the manufacturer, supplier or designer.

Note: *Some mobile scaffolds (for example, aluminium) may not be stable at a 3 to 1 height ratio. AS 1576 Scaffolding specifies a side load test for verifying the stability of scaffolding. Documentation verifying that the mobile scaffold complies with this test is required.*

- Use a secure internal ladder with a protected opening (for example, a hinged trap door) for access and egress to and from the scaffold.
- Select the appropriate size and capacity castors to support the total mass of the dead and live loads of the scaffold.
- Use castors that have the working load limit clearly marked.
- Castors fitted to standards should be locked before erection continues.
- Castors with adjustable legs should be used and adjusted to keep the platform level when the supporting structure is at different heights.
- Incorporate plan bracing at the base of mobile scaffolds to provide greater stability.
- Before moving mobile scaffolds check that:
  (a) there are no power lines or other overhead obstructions;
  (b) the ground is firm and level;
  (c) no person is on the scaffold;
  (d) no equipment and material can be dislodged from the platform;
  (e) the supporting surface is free of obstructions (a small obstruction may cause a mobile scaffold to overturn); and
  (f) electrical equipment and leads can not be tangled.
- Brakes on castors are to be locked at all times unless moving the scaffold.
- Never move the scaffold in windy conditions.
- Push or pull the mobile scaffold from the base – never use powered vehicles to move the scaffold.
- If lifting a mobile scaffold by crane, sling the scaffold at its lowest point to prevent dislodgment of scaffold components. However, a crane should not be used to lift aluminium mobile scaffolds because the scaffold components may fail.

7.1.4 Hung scaffold

A hung scaffold is an independent scaffold that hangs from another structure, but is not capable of being raised or lowered when in use.

The following control measures should be implemented for a hung scaffold.

- The hung scaffold should be designed by a competent person and verification obtained that the structure that is to support the hung scaffold is capable of bearing the load.
- The scaffold plan should include information about the position of the safety couplers.
- If a cantilevered suspension rig is to be used, information should be included on how the rig is to be constructed and secured.
- Standards on a hung scaffold should be tension spliced (refer to Figure 2).
- All vertical hanging tubes are to be provided with safety couplers at the suspension points and underneath the platform.

7.2 Single pole scaffold

A single pole scaffold consists of a single row of standards connected by ledgers. Putlogs are fixed to the ledgers and built into the wall of the building or structure.

A single pole scaffold is dependent upon the structure against which it is placed for support. It is important that no components of this type of scaffold are removed until the scaffold is being dismantled.

7.3 Suspended (swingstage) scaffold

A suspended scaffold incorporates a suspended platform that is capable of being raised or lowered when in use. An example of a suspended scaffold is a swingstage scaffold.

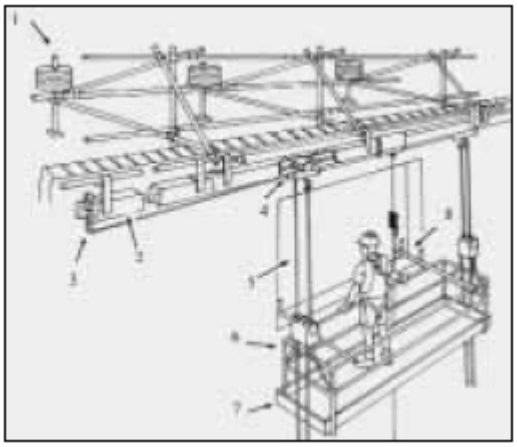

Figure 11. *Suspended (swingstage) scaffold. 1 Counterweight, 2 Traversing track, 3 Through bolted stop to prevent trolley from leaving track, 4 Trolley, 5 Suspension rope, 6 Scaffolding hoist, 7 Cradle, 8 Tie.*

The following control measures should be implemented for a hung scaffold.

- Ensure safe access and egress to and from the **cradle**[20].
- Consult and instruct workers on the correct procedures for using and working on suspended scaffolds. Include instructions on raising and lowering operations, particularly in the event of an emergency (for example, power failure).
- Ensure a rescue procedure is developed before starting work.
- Suspended scaffold components should be inspected for damage, wear and cracks before use and at pre-determined intervals. Non-destructive testing for cracks in high stress areas (for example, dye penetrant testing) may be needed to identify cracks not easily visible.
- The suspension system and the cradle should be designed to withstand the stalling load applied by all scaffold hoists in use. This feature prevents failure in the event of the cradle snagging on an obstruction.

Control measures should also be implemented for each component of a suspended scaffold system including suspension systems, scaffold hoists, cradles and trolleys.

Suspension systems

- Ensure the suspension system is designed and constructed in accordance with the designer's specifications.
- Inspect the suspension system before use and after relocation to ensure all components are in working order.
- Ensure persons who use suspended scaffolds receive training and instruction on the safe use of the system, including information on hoist operation and emergency procedures.
- Obtain engineer certification that the suspension needles, parapets, roof structure or other parts of the structure can support the 'parapet clamps' or **outriggers**[21]. An example of an unsuitable support system would be timber or single skin brick parapets.
- General access to the suspension system should be restricted.
- Ensure counterweights are secured to prevent unauthorised removal.
- Suspension ropes should be inspected for damage such as kinks, wear, corroded or broken wires, and replaced if necessary.

Scaffold hoists

- Ensure the scaffold hoists comply with the manufacturer's specifications. Only suspension ropes noted in the specifications (on compliance plate attached to the hoist) should be used.
- Hoisting systems which incorporate self-levelling devices should be used.
- After each use, ensure a trained person dismantles, inspects and tests scaffold hoists, in accordance with the manufacturer's instructions.

[20] & [21] See Appendix 1 for definitions.

- Electric scaffold hoists should have a device to limit the lifting capacity of the hoist to a maximum of 1.25 times the rating of the hoist, as specified in *AS 1576.4 Suspended scaffolding*.

Cradles

- Cradles are to be constructed in accordance with the manufacturer's specifications.
- Inspect all connection fixings before use to check they are secure.
- Evenly distribute materials in the cradle.
- Cradles should be clearly marked with the safe working load (SWL). The length and type of material used to construct the cradle will influence the SWL of the cradle. For example, longer cradles will generally have a reduced SWL. Verify the SWL with the manufacturer or supplier where there are no clear markings on the cradle.
- To restrict the lateral movement of the cradle, use suction caps, tie off the cradle with rope or use cradles with suction fans.
- Personal fall arrest systems should be used while working in cradles. Fall arrest systems that are attached to an independent fall arrest line are preferred to systems anchored to the cradle because they will support the worker if the cradle or suspension system fails.
- Work should cease and the cradle lowered to the ground during windy conditions.

Trolleys

- To prevent a trolley from falling off the beam, use lower keeper plates or a strap that wraps around the top of the beam. Trolleys that are not fitted with such a system should be removed from service. Obtain guidance from manufacturers and designers on effective systems to use.

7.4 Special scaffolds

7.4.1 Cantilever scaffold

A cantilever scaffold is a scaffold that is supported by cantilevered load-bearing members.

The following control measures should be implemented for a cantilevered scaffold.

- Design and position cantilever beams in accordance with the engineer's requirements and the scaffold plan.
- Ensure a competent person certifies that the supporting structure can support the cantilevered scaffold.
- The following are preferred methods for fixing the inboard length of the cantilevered beam to the structure:
  (a) fix the beam to the floor below using a positive fixing (for example, a u-bolt fitted over the beam and through the concrete floor slab);
  (b) use counterweights on the beam; or

(c) install props to the top of the beam and to the underside of the floor above. Ensure the props are fixed to prevent dislodgement.

7.4.2 Hanging bracket scaffold

Hanging bracket scaffolds are systems supported by frames on buildings or other structures. Hanging brackets are sometimes in the shape of an upside down 'L', one arm of which is fixed to a vertical surface, the other projecting horizontally to support scaffold planks.

Other hanging bracket scaffold systems may include horizontal members that are supported by floors of buildings or other structures.

The following control measures should be implemented for hanging bracket scaffolds.

- A safe means of access for persons installing hanging brackets should be provided. Where fall arrest systems are used, these must comply with the WHS Regulation.
- Connectors are used where differential deflection[22] becomes a tripping hazard.
- Hanging bracket scaffolds and their means of support should be designed by an engineer. Engineering verification may be provided by calculation and/or load testing.
- Supporting structure should be able to support dead and live loads applied by the hanging brackets.
- Where hanging bracket scaffolding is to be used as a fall arresting platform, the scaffolding must comply with section 217B of the WHS Regulation.
- Spacing of brackets should not exceed the maximum plank spans specified by the manufacturer.
- Planks may overlap planks on straight runs on hanging bracket scaffolds, provided the overlap is at least 300 mm.

Note: *This does not refer to overlap of planks on putlogs. Minimum and maximum overlapping for planks on putlogs is provided in AS 1576 Scaffolding.*

7.4.3 Spur scaffold

A spur scaffold is a scaffold that is supported by inclined load-bearing members.

The following control measures should be implemented for a spur scaffold.

- Fix propping systems between the floor and ceiling at intervals to suit the spacing of the standards within the scaffold.

[22] Differential deflection occurs when two scaffold planks sag unevenly.

- Suitable headstocks should be provided at the top of each propping system to distribute the loads imposed.
- All propping systems should be securely tied together and braced.
- Spurs exceeding 1.8 metres in length should be braced in both directions at the centre, unless designed otherwise.

7.5 Scaffolding for demolition work

At a minimum, heavy or special duty scaffolding should be used during demolition work to contain dislodged materials or to provide a safe working platform and edge protection for workers.

Factors which affect the stability of scaffolding for demolition work include:
- load imposed by demolished material dislodged onto the scaffold;
- wind forces acting on containment sheeting on the scaffold face;
- water retention in containment sheeting by capillary attraction;
- progressive removal of building elements affecting the lateral stability of the upper portion of the scaffold; and
- progressive removal of ties and dismantling of scaffold.

These factors should be considered when using scaffolding for demolition work.

The following control measures should be implemented for scaffolding for demolition work.
- The vertical spacing of scaffold ties may have to be reduced to facilitate the demolition cycle.
- Containment sheeting on the internal face of the scaffold should be installed to deflect any material into the building. This reduces the potential for overloading the scaffold.
- Ensure the scaffold is dismantled progressively and in line with the demolition work.
- Scaffold planks should be secured to prevent dislodgement from falling debris.

8. Inspection and maintenance procedures

Procedures must be developed for the inspection and maintenance of the scaffold to ensure it remains in a safe condition. The inspection of scaffolding on site is particularly important when the scaffold is in place for a prolonged period of time.

8.1 Frequency of inspection

The frequency of inspections may vary depending on weather and site conditions, the type and size of the scaffold and the risks associated with scaffold collapse.

Generally, scaffolds should be inspected:
(a) before first use and within every 30 days;
(b) after alteration or repair; and
(c) after any event likely to affect the stability of the scaffold (for example, following strong winds or storms).

Discuss appropriate intervals for inspection with the supplier when the scaffold is first installed.

The person inspecting the scaffold must be capable of determining areas that have been incorrectly altered and have experience in identifying faults in the scaffolding.

Inspection records should be kept on site and include the location, comments, date and time of inspections, relevant design or specification reference and the person who conducted the inspection. Further information can be found in the *AS/NZS 4576 Guidelines for scaffolding*.

8.2 Structural inspection

Under the WHS Act, suppliers and owners of plant must ensure their plant is without risk to health when used properly. Procedures for the regular inspection of new and re-used equipment should be developed and implemented to ensure defects and structural damage is detected.

8.3 Hand over inspections

The person responsible for the erection of the scaffold should provide the relevant person or principal contractor with a handover certificate which is kept on site until the scaffold has been dismantled.

See also *Appendix 5 Scaffold handover certificate: scaffolding over 4 metres*.

Appendix 1 – Dictionary

Access platform – a platform that is only used or intended to be used to provide access for persons, or for persons and materials to or from places of work.

Advanced scaffolder – a person who performs:

(a) the work of an intermediate scaffolder; and

(b) scaffolding work associated with:

i. hung scaffolds, including scaffolds hanging from tubes, wire ropes and chains; or

ii. suspended scaffolds.

Basic scaffolder – a person who performs scaffolding work associated with:

(a) prefabricated scaffolds;

(b) cantilevered materials hoists with a maximum working load of 500 kg;

(c) ropes;

(d) gin wheels;

(e) safety nets and static lines; or

(f) bracket scaffolds.

Baseplate – a metal plate that is able to distribute the load from a standard to a supporting structure and is an integral part of scaffolding.

Butt – a tube fixed to a scaffold and butting to an adjacent structure, to prevent horizontal movement of the scaffold in the direction of the structure.

Buttress – a support to the side of a scaffold which provides for an effective increase in the on-ground base width, allowing a greater freestanding height.

Castor – a swivelling wheel attached to the lower end of a standard, for the purpose of supporting and moving a scaffold.

Catch platform – a platform attached to the lower end of a scaffold, to contain falling objects.

Counterweight – a weight or series of weights that counterbalance a scaffold from overturning.

Cradle – the suspended platform part of a suspended scaffold.

Guardrail – a horizontal structural member to prevent persons from falling off any platform, walkway, stairway or landing.

Guy rope – a rope used to help stabilise a vertical member.

Intermediate scaffolder – a person who performs:

(a) the work of a basic scaffolder; and

(b) scaffolding work associated with:

i. cantilevered crane loading platforms;

ii. cantilevered and spurred scaffolds;

iii. barrow ramps and sloping platforms;

iv. perimeter safety screens and shutters;

v. mast climbers; or

vi. tube and coupler scaffolds, including tube and coupler covered ways and gantries.

Ledger – a horizontal structural member that longitudinally spans a scaffold.

Lift – the vertical distance from the supporting surface to the lowest ledge of a scaffold or level at which a platform can be constructed. Also, the vertical distance between adjacent ledgers or levels of a scaffold at which a platform can be constructed.

Member – anything that forms part of the scaffold assembly.

Needle – a cantilevered structural member that forms part of the scaffold assembly.

Outrigger – a framed component that increases the effectiveness of base dimensions of a tower and is attached to the vertical load-bearing members.

Parapets – a vertical element usually located at the edge of a balcony, roof, bridge or similar structure.

Putlog – a horizontal structural member, spanning between ledgers or between a ledge and an adjacent wall, that is intended to support a platform.

Soleboard – a board that is able to distribute the load from a load-bearing member to a supporting surface and is intended for use underneath baseplates.

Spur – an inclined load-bearing member that transmits a load to a supporting structure.

Standard – a vertical structural member that transmits a load to a supporting structure.

Strut – a member that supports a comprehensive force.

Suspension rig – a supporting structure (including the trolley rack) from which a cradle is suspended.

Suspension rope – a rope carrying the weight of a cradle and supporting an imposed load.

Tie – a member or assembly of members used to tie a scaffold to a supporting structure.

Transom – a horizontal structural member transversely spanning an independent scaffold between standards.

Working load limit – the maximum working load that may be applied to any component or system.

Working platform – a platform from which persons perform work and may also be used to support materials and equipment.

Appendix 2 – Inspection checklist

1. **Scaffold vicinity**

   - ☐ Has public protection been provided?
   - ☐ Have sufficient safeguards against electric powerlines been provided?
   - ☐ Is there sufficient control over vehicle movement?
   - ☐ Is there sufficient control over crane operation?
   - ☐ Are there sufficient controls over the storage, handling and use of hazardous substances?
   - ☐ Are scaffolds erected a safe distance away from trenches or excavations?

2. **Supporting structure**
   - ☐ Is the supporting structure in good condition?
   - ☐ Does the supporting structure have adequate strength?
   - ☐ Are there sufficient controls to prevent deterioration of the supporting structure?
   - ☐ Are all measures to strengthen the supporting structure adequate?
   - ☐ Is the risk of the supporting structure being overloaded from other sources adequately controlled?
   - ☐ Is the scaffold built on solid ground? If built on soft ground, are soleboards used to properly distribute the load?

3. **Soleboards and baseplates**
   - ☐ Are there sufficient soleboards?
   - ☐ Are the soleboards of suitable material and in a serviceable condition?
   - ☐ Are the soleboards secure?
   - ☐ Are there sufficient baseplates?
   - ☐ Are the baseplates of the appropriate type?
   - ☐ Are the baseplates serviceable and of suitable dimensions?
   - ☐ Are the baseplates secure?

4. **Scaffold structure**
   - ☐ Are the standards bearing firmly?
   - ☐ Are the standards plumb (or as designed)?
   - ☐ Are the longitudinal standard spacings correct?
   - ☐ Are the transverse standard spacings correct?

- ☐ Are the joints in standards correctly positioned?
- ☐ Are the joints in standards correctly secured (special duty or hung scaffold)?
- ☐ Are the ledgers level (or as designed)?
- ☐ Are the ledgers continuous (or as designed)?
- ☐ Are the lift heights correct?
- ☐ Are the horizontal ledger spacings correct?
- ☐ Are the ledgers correctly secured?
- ☐ Are ledger joints correctly positioned (tube and coupler scaffold)?
- ☐ Are the joints in ledgers correctly secured (tube and coupler scaffold)?
- ☐ Are there sufficient transoms/putlogs?
- ☐ Are the transoms/putlogs correctly positioned and secured?
- ☐ Is the bracing adequate?
- ☐ Is the scaffold sufficiently stable?
- ☐ Are the ties correctly positioned and correctly fixed?

5. Platforms

- ☐ Does the scaffold have the required number of working platforms?
- ☐ Are the working platforms at the required locations?
- ☐ Are catch platforms correctly positioned?
- ☐ Are the platforms and supporting scaffold constructed for the appropriate duty live loads?
- ☐ Are the platform dimensions suitable for the intended work?
- ☐ Is there adequate edge protection?
- ☐ Are the platforms correctly constructed?
- ☐ Are planks secured against wind?

6. Access and egress

- ☐ Is there safe access and egress to every scaffold platform?
- ☐ Are temporary stairways correctly installed?
- ☐ Are portable ladders of an industrial grade, serviceable and correctly installed?
- ☐ Are access ways and access platforms correctly installed?

7. Containment sheeting

- ☐ Has the scaffold been designed for wind loading on any containment sheeting?
- ☐ Are the fixing ties secure?

- ☐ Are there any rips or tears?
- ☐ Are the overlap joints satisfactory?

8. General fitness for purpose

- ☐ Is there adequate provision for material handling?
- ☐ Are the clearances between the scaffold and adjacent structures correct?
- ☐ Is there adequate protection from falling debris?
- ☐ Has the scaffold been adequately designed to support all attachments?
- ☐ Are all approaches and platforms effectively lit?

9. Mobile scaffolds

- ☐ Is the supporting surface hard and flat?
- ☐ Is the area of operation free of floor penetrations, powerlines and other hazards?
- ☐ Are the castor wheel locks in working order? They should be locked at all times, except during movement of the scaffold.

Appendix 3 – Published technical standards

Australian Standards

AS/NZS 1576.1 – General requirements
Sets out design and operational requirements for scaffolding, except trestle scaffolding, portable ladders intended to be used as working platforms and elevating working platforms.

AS 1576.2 – Couplers and accessories
Specifies requirements for materials, design and performance of couplers and accessories for use with tubular scaffolding.

AS/NZS 1576.3 – Prefabricated and tube-and-coupler scaffolding
Specifies requirements for prefabricated and tube-and-coupler scaffolding. It is to be read in conjunction with AS/NZS 1576.1.

AS 1576.4 – Suspended scaffolding
Specifies requirements for the materials, design, erection and dismantling of suspended scaffolds including the supporting structure.

AS/NZS 1576.5 Scaffolding – Prefabricated splitheads and trestles
Specifies requirements for splitheads and trestles that are used as supports for temporary platforms.

AS/NZS 4576 – Guidelines for scaffolding
Gives practical guidance for the training and certification of scaffolders, the preparation of sites for scaffolding, and the safe selection, supply, erection, alteration, dismantling, maintenance, inspection and use of scaffolding and scaffolding equipment.

AS 1170.2 Structural design actions – wind actions
Sets out procedures for determining wind speeds and resulting wind actions to be used in the structural design of structures subjected to wind actions.

Appendix 4 – Risk management process

There are five basic steps in the workplace health and safety risk management process including:

1. identifying the hazards;
2. assessing the risks that may result because of the hazards;
3. deciding on the control measures to prevent or control the level of the risks;
4. implementing the control measures; and
5. monitoring and reviewing the effectiveness of the control measures.

Further information is available in the *Risk Management Code of Practice*.

Appendix 5 – Scaffolding handover certificate: scaffolding over 4 metres

Scaffold supplier/erector	Client
Certificate No:	Client Name:
Company Name:	
Address:	Address:
	Site Address:
Contact Phone:	Contact Phone:
Fax:	Fax:

Project Details		
Project/Reference Number:		
Description of area handed over:		
Drawings attached:		
Intended use of scaffold:		
Duty Classification:		
Number of working decks:		
Top working platform height:		
3 m Bays:	2.4 m Bays:	1.8 m Bays:
1.3 m Bays:	0.8 m Bays:	Access Bays:
Additional Details:		

Handover of scaffold	
The scaffold detailed above, has been erected in accordance with the attached drawings, Workplace Health and Safety Queensland Scaffolding Code of Practice, AS 1576 (1-5) and AS 4576 and is suitable for its intended purpose.	
Name:	Signature:
Certificate No:	
Time:	Date:

Acceptance – on behalf of the client	
Name:	Signature:
	Date:
Please arrange for scaffold to be inspected at intervals not exceeding 30 days or immediately following any incident which may affect the adequacy of the scaffold.	