

AS 4576:2020



STANDARDS
Australia



Guidelines for scaffolding



AS 4576:2020

This Australian Standard® was prepared by BD-036, Scaffolding. It was approved on behalf of the Council of Standards Australia on 10 August 2020.

This Standard was published on 21 August 2020.

The following are represented on Committee BD-036:

- Australian Aluminium Council
- Australian Chamber of Commerce and Industry
- Australian Council of Trade Unions
- Australian Industry Group
- Australian Steel Institute
- Better Regulation Division NSW
- Engineered Wood Products Association of Australasia
- Engineers Australia
- Hire and Rental Industry Association of Australia
- Housing Industry Association
- Master Builders Australia
- National Scaffolding Association of Australia
- WorkCover Queensland
- WorkSafe Victoria

This Standard was issued in draft form for comment as DR AS 4576:2020.

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ISBN 978 1 76072 953 0

Guidelines for scaffolding

Originated as AS/NZS 4576:1995.
Revised and redesignated as AS 4576:2020.

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Preface

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee BD-036, Scaffolding, to supersede AS/NZS 4576:1995.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide guidance for the preparation of sites for scaffolding, and the safe selection, supply, erection, alteration, dismantling, maintenance, inspection and use of scaffolding and scaffolding equipment. It is a companion to the AS(/NZS) 1576 series of Standards.

The major changes in this edition are as follows:

- (a) The format and structure of the Standard has been revised.
- (b) Guidance has been added on working over water.
- (c) Guidance has been added on using bay extension (hop-up) platforms and tie bars.
- (d) The guidance on training has been updated and no longer covers certification of scaffolders.
- (e) Clauses giving requirements for Australian and New Zealand Certificates of Competency have been deleted (now available from regulatory authorities).
- (f) Requirements for suspended scaffolds have been deleted (now in AS/NZS 1576.4).
- (g) Guidance on mast climbing work platforms has been deleted (now in AS 2550.16).
- (h) Guidance for use of harnesses attached to scaffolding has been added.
- (i) Guidance on trestle ladder scaffolds has been added.
- (j) Guidance on tying of scaffolds and on working platforms has been enhanced.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

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NOTES

Australian Standard®

Guidelines for scaffolding

Section 1 Scope and general

1.1 Scope

This Standard gives practical guidance for training, the preparation of sites for scaffolding, and the safe selection, supply, erection, alteration, dismantling, maintenance, inspection and use of scaffolding and scaffolding equipment. It is a companion to the AS(/NZS) 1576 series of Standards. This series and AS/NZS 1577 take precedence over this Standard.

This Standard gives guidance for the general use of scaffolding, including the following items:

- (a) Portable ladders used as access to platforms.
- (b) Trestle scaffolds and trestle ladder scaffolds.
- (c) Bracket scaffolds.
- (d) Temporary stairways, landings, ramps and other access ways.
- (e) Temporary catch platforms.
- (f) Ropes and gin wheels.

1.2 Exclusions

This Standard does not give guidance for the following items:

- (a) Temporarily installed edge protection that does not form part of the scaffold.
- (b) Portable ladders not used in connection with scaffolding.
- (c) Permanently installed walkways, stairways, ladders and catwalks.
- (d) Building maintenance units.
- (e) Crane boxes, scissor hoists, boom-type elevating work platforms (i.e. cherry pickers), lifts, and combined personnel and materials hoists.
- (f) Falsework, shoring, back-propping and any other framework for the support of floors, walls, roofs and structural members of buildings, structures, ships, boats or mines.
- (g) Swing stages and boatswain's chairs.

NOTE Requirements for swing stages and boatswain's chairs are provided in AS/NZS 1576.4.
- (h) Temporary seating stands, stages, lighting towers and camera towers for concerts, sporting events, substantially comprised of scaffolding equipment.
- (i) Temporary roofs substantially comprised of scaffolding equipment.
- (j) Mast climbing work platforms.

1.3 Normative references

There are no normative references in this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

1.4 Terms and definitions

For terms and definitions used in this document and the scaffolding industry generally, see the glossary of terms in [Appendix A](#).

Section 2 Training

2.1 General

To erect, alter and dismantle scaffolding correctly, safely and efficiently, a competent person should have the following knowledge and skills:

- (a) Be able to read and understand the supplier's information, general site plans, design drawings and specifications for scaffolds.

NOTE An ability to make simple calculations of dead load and live load may be needed.

- (b) Have a thorough knowledge of the scaffolding equipment including the identification of the system being used.

NOTE The use of uncertified and untested scaffold system combinations should be avoided.

- (c) Have thorough knowledge of the construction methods and design requirements associated with that equipment.
- (d) Be able to recognize common hazards at the worksite and be capable of taking effective precautions to control risks to health and safety arising from these hazards.
- (e) Visually inspect scaffolding equipment for faults.
- (f) Have the physical skills needed for scaffolding construction.
- (g) Be competent in manual lifting techniques.
- (h) Work safely and confidently at heights.
- (i) Correctly use the various tools, ropes and gin wheels.
- (j) Erect and dismantle scaffolding in the correct sequence.

2.2 Information from regulatory authorities

Refer to the relevant regulatory authority for information about scaffold registration and licensing requirements.

Section 3 Hazards

3.1 Identification of hazards

Hazards commonly associated with scaffolding include the following:

- (a) Engaging in the erection and dismantling of a scaffold or access equipment.
- (b) Working over water.
- (c) Falls from heights.
- (d) Falling objects.
- (e) Manual handling.
- (f) Electricity.
- (g) Corrosive substances.
- (h) Volatile atmospheres.
- (i) Movement of cranes, vehicles and machinery.
- (j) Weak or unstable supporting structures or unsuitable ground conditions.
- (k) Stacking of equipment in unstable conditions.
- (l) High winds and storms.
- (m) Proximity to sources of radiation (e.g. mobile phone towers).
- (n) Potential flammability of encapsulation.

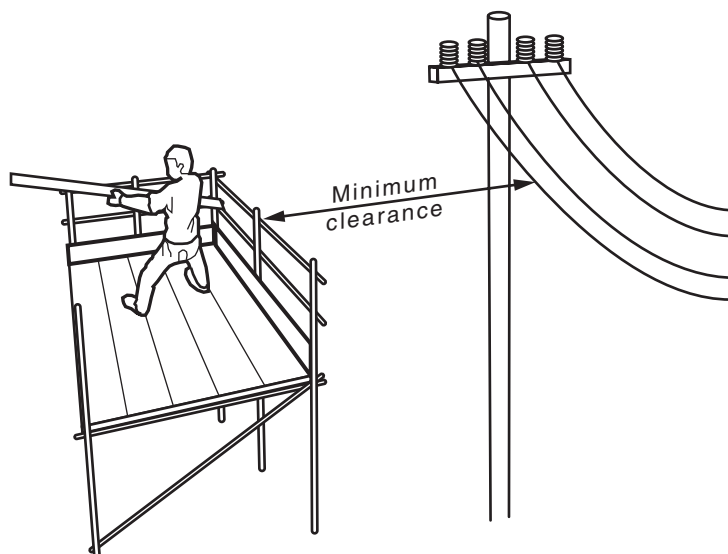
3.2 Proximity to power lines

Power lines are a potential hazard to persons erecting, working from or in the vicinity of a scaffold.

Contact the electricity supply authority for information before erecting, using and dismantling scaffolding in close proximity to power lines. For voltages of 11kV or less “close proximity” is typically a minimum clearance of 4 m between power lines and the adjacent scaffolding but may vary depending on electricity supply authority requirements (see [Figure 3.2\(A\)](#)).

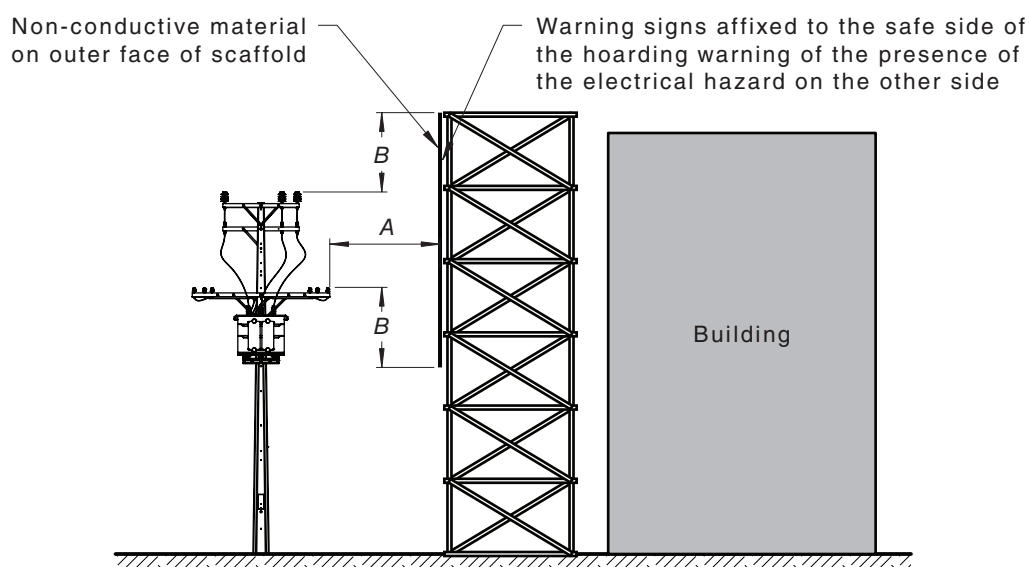
The fitting of non-conductive materials on the outer face of the scaffold adjacent to power lines may be required by the electricity supply authority (see [Figure 3.2\(B\)](#)).

Metallic fixings should not protrude through the face of the non-conductive material towards the powerlines.



NOTE Allow for sag and swing of power lines when assessing a minimum clearance distance.

Figure 3.2(A) — Clearance to power lines



NOTE A and B are the horizontal and vertical clearances specified by the electricity supply authority.

Figure 3.2(B) — Example of scaffolding with non-conductive material facing adjacent to power lines

3.3 Proximity to hazardous plant

3.3.1 Identification

Operational plant, vehicular traffic and corrosive or explosive substances pose hazards affect the safe use of a scaffold or the structural integrity of the scaffold. The risks from these hazards should be identified, evaluated and controlled.

3.3.2 Vehicular traffic

Precautions should be taken to prevent scaffolds being endangered by the movement of vehicles and other plant. To minimize the risk of traffic damage to scaffolds, the following measures should be taken:

- (a) Motor vehicles and mobile plant should be re-routed away from the location of the scaffold.
- (b) Where (a) is not practicable, barriers should be installed to shield the scaffold from traffic damage.
- (c) Where neither (a) nor (b) are practicable, a competent person should be assigned to direct traffic in the vicinity of the scaffold.

In addition to the above precautions, care should be taken when unloading and loading equipment from trucks.

3.3.3 Cranes

Precautions should be taken to prevent scaffolds being endangered by the movement of cranes.

A scaffold in the operational radius of a crane is in danger of damage from suspended loads. Such scaffolds should not contain any unnecessary obstructions such as over-length transoms, putlogs, tie tubes or over-height standards that may be impacted by the suspended load. It may be necessary to evacuate the scaffold and its vicinity during lifting operations. Where it is not practicable to suspend crane operations for the life of the scaffold, the operational radius of the crane should be limited, so that loads cannot come into contact with the scaffold or its supporting structure. Clear instructions should be given about taking particular care while moving loads near to scaffolding.

3.3.4 Plant with moving parts

Fail-safe lock-out procedures should be used to prevent plant from being activated where scaffolds are constructed on, over or inside items of plant such as overhead gantry cranes, conveyors, turbines and crushers.

3.3.5 Boilers

Clearances between power generation boilers and scaffolding should allow for the expansion of the boiler during firing and its contraction following shutdown.

3.3.6 Corrosive substances

High concentrations of acids, alkalis and salts can corrode scaffolding components (especially aluminium components), leading to structural failure of the scaffold. Where any corrosive substance is to be stored on or near a scaffold, compatible corrosion-resistant scaffolding materials should be used. Where this is not practicable, the frequency of scaffold inspections should be increased to detect early indications of structural deterioration.

3.3.7 Explosive atmospheres

Petrochemical plants, powdered milk factories and flour mills are common examples of workplaces with high explosion risks. The use of scaffolding can increase the risk of an explosion if the scaffolding equipment can spark upon impact. The following measures may need to be taken:

- (a) Remove the hazard before constructing the scaffold.
- (b) Construct the scaffold from non-conductive material such as timber or fibreglass.

3.4 Expert advice

Expert advice should be sought during the planning stage of the project and when unforeseen circumstances or changes to the project schedule occur, to identify potential hazards and to assess and control risks.

NOTE Expert advice is available from a number of sources, including equipment suppliers, health and safety professionals, industry organizations, work health and safety authorities, scaffolding and access design consultants, subcontractors and work health and safety committees.

3.5 Risk assessment

Risks associated with hazards can be assessed by considering the following three key factors:

- (a) *Frequency* — The frequency of a particular type of injury occurring can be gauged from incident recall, accident records, industry statistics and a consideration of possibilities. One injury per 1 000 person hours is generally regarded as low, and one injury per 100 person hours is generally regarded as high.
- (b) *Duration* — The duration of a person's exposure to a hazard is often expressed as a percentage of each work day. Less than 20 % is generally regarded as low and more than 60 % is generally regarded as high.
- (c) *Severity* — The potential severity of injuries is generally classified as being low for scratches and bruises and high for death and permanent incapacity.

3.6 Risk control

Where a risk assessment reveals a significant risk to health or safety, controls may be needed to minimize the probability of the risk occurring.

Wherever possible, the identified hazard should be eliminated. For example, prefabricating work on the ground can eliminate the hazard of persons falling.

Where it is not possible to eliminate hazards, risks can be controlled by taking the following measures:

- (a) Selecting a less hazardous form of scaffolding or access system.
- (b) Modifying the design of the system.
- (c) Isolating the scaffold.

Where these measures do not adequately control risk, the use of appropriate personal protective equipment may be necessary. Personal protective equipment should only be used where other solutions are not practicable. For example, individual fall arrest systems should not be the primary means of protecting people working at heights.

Section 4 Site for erection

4.1 Introduction

There are a range of hazards such as power lines, traffic, plant and explosive substances that should be identified and assessed prior to erecting a scaffold. Specific guidance for hazards is given in [Section 3](#).

4.2 Public places

Protective measures should be taken to separate the public from the dangers of scaffolding while erecting, altering or dismantling scaffolding, particularly on, over or adjacent to any public thoroughfare or adjoining property.

Contact the relevant regulatory authority for information about any permits that may be needed.

4.3 Work areas

The preparation of a work area should allow for the safe erection, alteration or dismantling of scaffolding, including the safety of all site personnel.

There should be a firm supporting surface for storing equipment and erecting the scaffold. Debris and unnecessary materials and equipment should be removed and space provided for the delivery, unloading and stacking of scaffolding equipment.

Before unloading or loading scaffolding equipment from a public road at the site, the following steps should be taken:

- (a) Place signs well in advance of the unloading and loading area to warn oncoming motor traffic of the potential hazard.
- (b) Position signs or barriers to keep pedestrians away from any risks.
- (c) Determine whether a permit is needed and develop a traffic management plan to eliminate risks.
- (d) Select a competent person as spotter for the unloading and loading of the equipment to prevent accidental contact by hoisting equipment where power lines are in the vicinity of the unloading and loading area.
- (e) Isolate the work area from other site personnel.

The scaffolding equipment should be stacked or palletized when not in use. An example of well-stacked scaffolding equipment is given in [Figure 4.3](#).

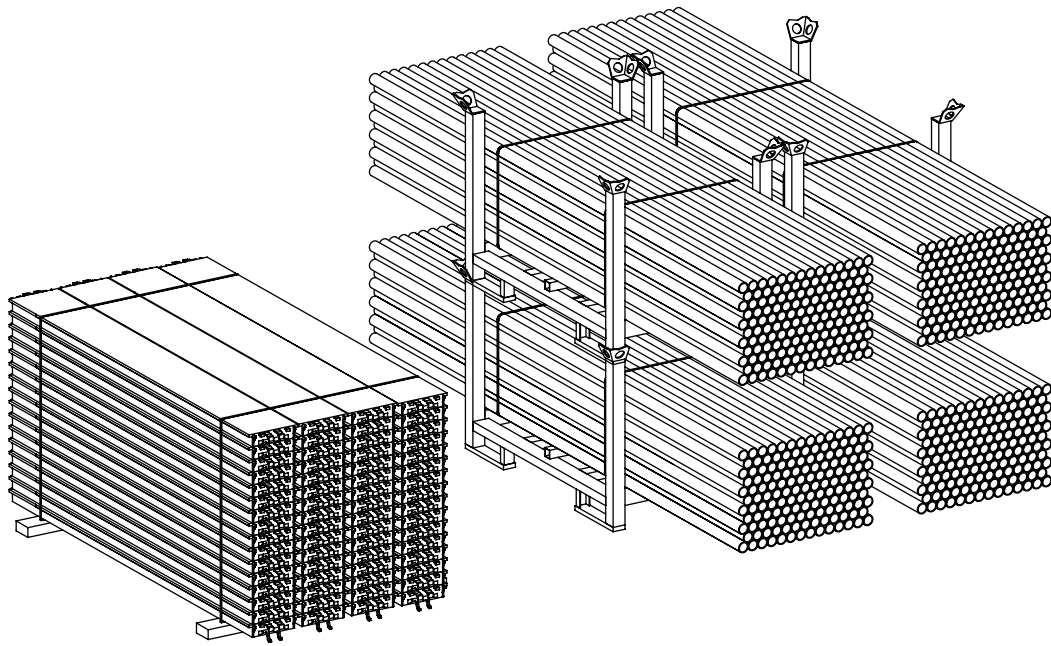


Figure 4.3 — Typical example of well-stacked scaffolding equipment

Section 5 Tools and equipment

5.1 Introduction

All tools and equipment should be fit for purpose and in safe working condition. Tools and equipment prescribed by scaffolding suppliers' information should be used as directed. The tools and equipment that are commonly used to erect, maintain and dismantle scaffolding are described in this Section, see [Figure 5.1](#).

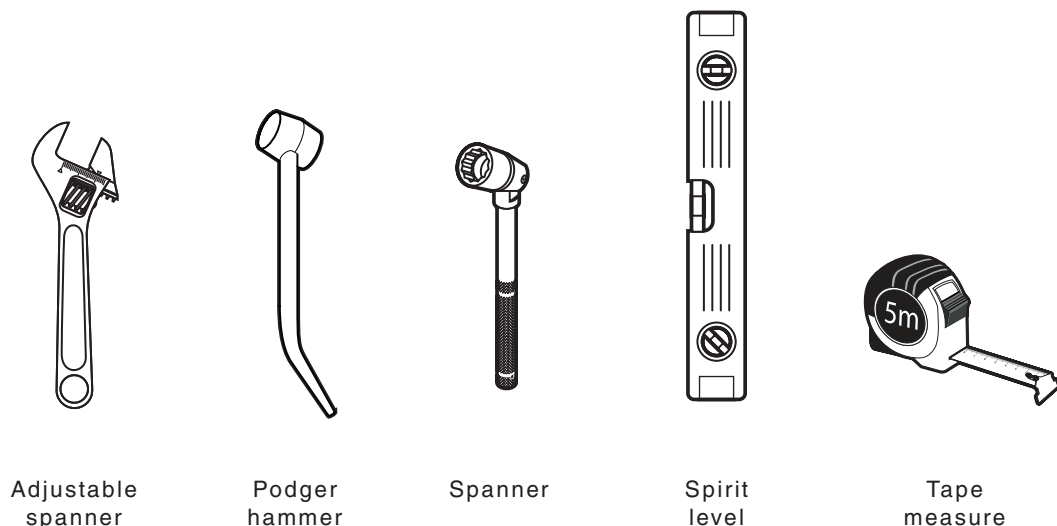


Figure 5.1 — Examples of commonly used scaffolding tools

5.2 Spanners

The handle of spanners (scaffold keys) should be not less than 200 mm nor more than 250 mm long. Scaffold spanners with a worn rivet or a sloppy head should be repaired or replaced.

5.3 Podger hammers

Podger hammers with a loose head or a hairline crack at the juncture between the head and the shaft should be replaced.

5.4 Adjustable spanners

An adjustable spanner (shifter or shifting spanner) is normally used where an obstruction makes the use of a scaffold spanner impossible.

Care should be taken to avoid burring nuts and bolt heads when using an adjustable spanner. The arm of an adjustable spanner used for couplers should be not less than 200 mm nor more than 250 mm long.

5.5 Spirit levels

Spirit levels are used to check that scaffolding members are horizontal or plumb.

When working at height, compact spirit levels should be capable of safe stowing on a scaffolder's belt when not in use.

5.6 Tape measures

Tape measures or rules should be carried in a purpose-designed pouch on a scaffolder's belt or clipped to the inside of the belt, to minimize the risk of dislodgment while working aloft.

5.7 Scaffolder's belt

A scaffolder's belt should be used to safely carry scaffold tools while they are not used.

The belt should be made of sturdy leather, canvas webbing or material of equivalent strength and characteristics.

Leather or canvas frogs (bayonet holders) should be used to secure scaffold spanners, podger hammers and adjustable wrenches. Folding rules and small spirit levels should be secured in carpenter's chisel pouches or similar.

5.8 Tool lanyards

Tool lanyards may be used to reduce the risk of tools falling when in use.

5.9 Industrial safety helmets

Requirements for industrial safety helmets are set out in AS/NZS 1801. Industrial safety helmets should be worn where there is a risk of objects falling from above and on any work site where a hard hat sign is displayed. Helmets with side impact protection may be required.

5.10 Gloves

Gloves should be close fitting and have a palm with a non-slip surface.

5.11 Footwear

Footwear should be comfortable, provide maximum grip and give protection from pinching, jamming and crushing. A range of lightweight flexible footwear with steel or plastic protective caps is available. For guidance, refer to AS/NZS 2210.1 and AS 2210.2.

5.12 Rope

Rope used as a hand line for the raising or lowering of scaffolding gear should be at least 12 mm in diameter. Rope used for haulage with a gin wheel should be at least 16 mm in diameter. Rope may be fibre or synthetic. It should have a load rating not less than the load to be lifted.

Prior to being cut, fibre rope should be whipped with twine on either side of the proposed cut (see [Figure 5.12](#)) to prevent the rope from unlaying or fraying. The length of each whipping should be at least equal to the rope diameter.

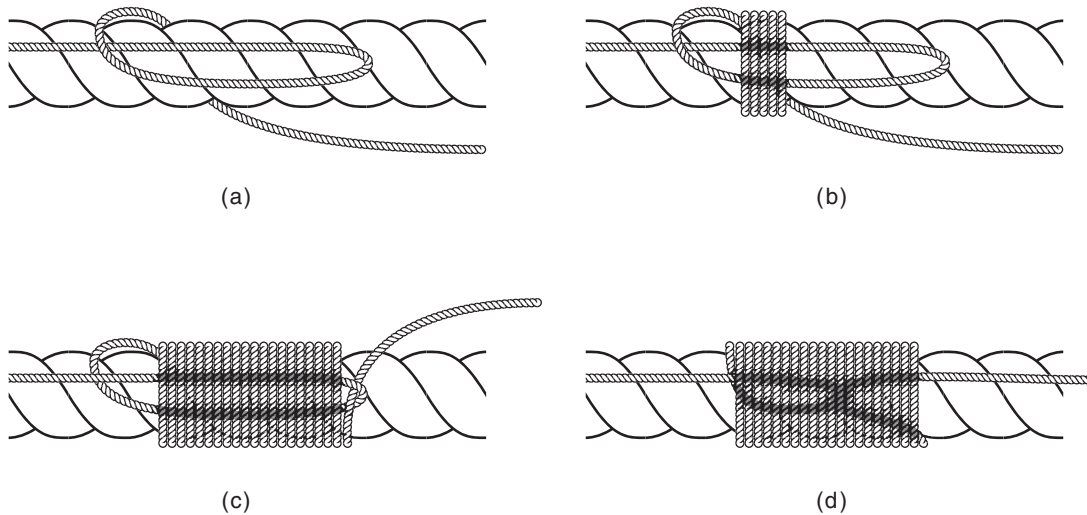


Figure 5.12 — Common whipping

Cut ends of synthetic ropes should be sealed as specified in the supplier's information to prevent the rope from unlaying or fraying.

Rope should be stored as specified in the supplier's information.

Rope that is in use should be thoroughly inspected along its entire length on a daily basis for defects such as the following:

- (a) External wear.
- (b) Cuts and abrasions.
- (c) Burns.
- (d) Powdered or hairy fibres.
- (e) High-stranding or kinking.

WARNING — If there is any reasonable doubt about the soundness of a rope, it should be removed from service.

Guidance on the care and use of fibre rope is given in AS 4142.1.

5.13 Webbing slings

Requirements for flat synthetic-webbing slings and their care and use are set out in AS 1353.1 and AS 1353.2 and for round synthetic slings in AS 4497.

Section 6 Planning of scaffolds

6.1 General

The first step in the planning process of safely erecting and using scaffolding is to carefully select the correct scaffolding equipment for the particular job.

Scaffolds as a minimum should —

- (a) be constructed in accordance with design drawings or specifications or the supplier's documented information;
- (b) incorporate adequate and appropriate means of access and egress;
- (c) have safeguards to protect persons within their vicinity from hazards arising from their presence and use;
- (d) allow the necessary work to be carried out safely;
- (e) be of a type and purpose with respect to all potential users and type and scale of work to be undertaken;
- (f) be in the location where platform levels are fitted with the number of platforms to be worked on simultaneously with duty ratings suitable to the work to be carried out; and
- (g) have a duty loading and platform dimensions appropriate to the number of people, materials and equipment for the anticipated work.

6.2 Scaffold guidelines

Guidelines for a scaffold include the following:

- (a) Proximity of public spaces or adjoining properties and any need to protect the public or the adjacent property.
- (b) Opportunities to tie to the permanent structure or space to erect buttress scaffolds.
- (c) Proximity and operating radius of vehicles, cranes and other moving machinery.
- (d) Proximity of power lines or hazardous substances.
- (e) Strength and condition of the ground or other supporting structure including any limitations and critical features of the supporting structure, such as point load limitations or counterweights on roofs, see [Clause 6.3](#).
- (f) Profile of the work face and any adjacent structure.
- (g) Levels at which the job will be carried out, the desired location of working platforms and the number of platforms to be worked on or loaded at any one time.
- (h) Possibility of significant impact forces being applied to the scaffold such as demolition work and mechanical loading of materials.
- (i) Exposure of the scaffold to significant environmental loads such as wind-loading, snow loads, ice build-up and heavy rain on shade cloth.
- (j) Entry and exit for workers, materials and plant including access to working platforms and passage through the scaffold.
- (k) Systems for promptly rescuing persons from the scaffold in the event of an accident or other emergency.

- (l) Type of work to be undertaken and platform dimensions.
- (m) Materials and equipment to be used for the job and their dimensions and weight.
- (n) Number of people needed for the job.
- (o) Expected duration of the job.
- (p) Work that will precede and follow the job.
- (q) Maximum allowable dead load of the scaffold, which may be relevant where the scaffold is to be lifted by crane, built inside a vessel or used in a situation where its weight and location needs to be known.
- (r) Roof edge and slab edge protection, refer to AS/NZS 4994.

6.3 Supporting structure

The strength of the supporting structure should be assessed by a competent person. The assessment should include the following considerations:

- (a) The most adverse combination of dead loads, environmental loads and live loads generated by the scaffold and its use.
- (b) Effect of any counterweight attached to the scaffold.
- (c) Any equipment or other plant likely to be used on or from supporting structures.
- (d) Any alterations to be made to supporting structures.
- (e) Likely deterioration of supporting structures.

Where an assessment indicates the need for a supporting structure to be strengthened, the measures adopted should be as specified by a competent person.

6.4 Installation design

6.4.1 Design considerations

The installation design for the scaffold should make provision, where applicable, for the following:

- (a) Wider than system-normal spacing of standards.
- (b) Reaction loads from beams or spurs installed to support bays with standards not extending to the supporting surface.
- (c) Self-weight of containment sheeting, brackets, couplers and other non-system components
- (d) Loading limitations for bays sharing standards with stair towers.
- (e) Environmental loads that may reduce the bay live load rating.

6.4.2 Design documentation

The installation design for the scaffold should include the following information where relevant:

- (a) Location of working platforms.
- (b) Measures to protect the public or adjoining property.
- (c) Location of power lines, services, public thoroughfares and operational plant.

- (d) Nature and location of any hazardous substances.
- (e) Clearances needed at the work face and in relation to other structures or plant.
- (f) Access to and egress from working platforms.
- (g) Dimensions for working platforms.
- (h) Type and location of edge protection.
- (i) Maximum number of platforms to be worked on or loaded at any one time.
- (j) Duty loadings suitable for working platforms.
- (k) Expected significant environmental loads and measures to cope with them.
- (l) Dead load of the designed scaffold, where the scaffold is to be lifted by crane, built inside a vessel or used in a situation where its weight needs to be known.
- (m) Any limitations and critical features of the supporting structure such as point load limitations or counterweights on roofs and how the installation design accounts for them.

Section 7 General design

7.1 General

Work health and safety regulations apply to the construction of scaffolds.

Requirements for the erection, alteration and dismantling of scaffolds are set out in AS/NZS 1576.1, AS/NZS 1576.2, AS 1576.3, AS/NZS 1576.4, AS/NZS 1576.5 and AS 1576.6.

Scaffolds should be built as provided in the supplier's documented information for prefabricated systems or to a design checked by a competent person. The design of a scaffold may be either a complex set of drawings for a large scaffold or a clear sketch for a small scaffold. Evidence of the suitability of the design should be capable of being demonstrated.

General loading information is given in [Appendix B](#).

7.2 Foundations

7.2.1 Loads

The foundations for a scaffold should be adequate to carry and distribute the loads imposed at each standard and of the whole loaded scaffold.

The loads likely to be carried by the scaffold's standards may need to be calculated to determine if the supporting surface can hold them safely. Calculations include the dead load and the live load. The dead load includes the self-weight of the standard plus the connected components, including ledgers, transoms, putlogs, braces, ties, planks, guardrails and attachments such as counterweight and encapsulation. The live load is the duty live load for persons plus materials for each platform in each bay and should be based on the values given in [Table 7.6](#).

To calculate the live load on a standard, it should be assumed that each standard in a bay of a façade scaffold supports one quarter of the duty live load on each platform in each adjoining bay.

NOTE Wind loading on free standing scaffolds or scaffolds with rakers or buttress bays may impose additional loads on the standards and supporting structures particularly if the scaffold is encapsulated.

7.2.2 Supporting structures and surfaces

The duty of the scaffold, the height of the scaffold and the ground conditions should be considered when the foundation is designed. Where an excavation is planned near a scaffold, the supporting structure should support the scaffold without any subsidence. The foundation should be maintained in good condition for the life of the scaffold.

On hard-level surfaces, such as steel or concrete, standards should be supported on baseplates. Soleplates may also be used where surfaces need protection.

On timber flooring, pedestrian pavements and any other supporting structure that may be adversely affected by point loads from standards, the load from the standards should be distributed by baseplates and soleplates. Soleplates should be at least equivalent in size and strength to scaffold planks and be long enough to prevent visual subsidence or damage to any supporting structure. Where sole plates are required they need to be designed to transfer the imposed loads from the base plates to the supporting structures or for anticipated ground conditions.

On surfaces such as soft asphalt and compacted gravel, soleplates with a size of at least 500 mm × 220 mm should be used under the baseplates. Scaffold plank soleplates may not be sufficient under some heavy duty scaffolds, very high scaffolds or where the scaffold may be undermined [see [Figure 7.2\(A\)](#), [Figure 7.2\(B\)](#) and [Figure 7.2\(D\)](#)].

The possible undermining of soleplates due to erosion of supporting surfaces by water should be considered.

Where the scaffold is founded on sloping ground or a prepared slope, each standard should have a stable foundation, or be secured to prevent it slipping down the slope [see [Figure 7.2\(C\)](#)]. Supporting surfaces with slopes steeper than 1 in 10 should be assessed by a competent person.

7.2.3 Advice

Advice should be sought from a competent person such as a structural engineer before scaffolds are erected on supporting structures including verandas, roofs and suspended flooring systems. The suitability of compacted soil or unstable ground to support the scaffold may need to be evaluated by a competent person such as a geotechnical engineer.

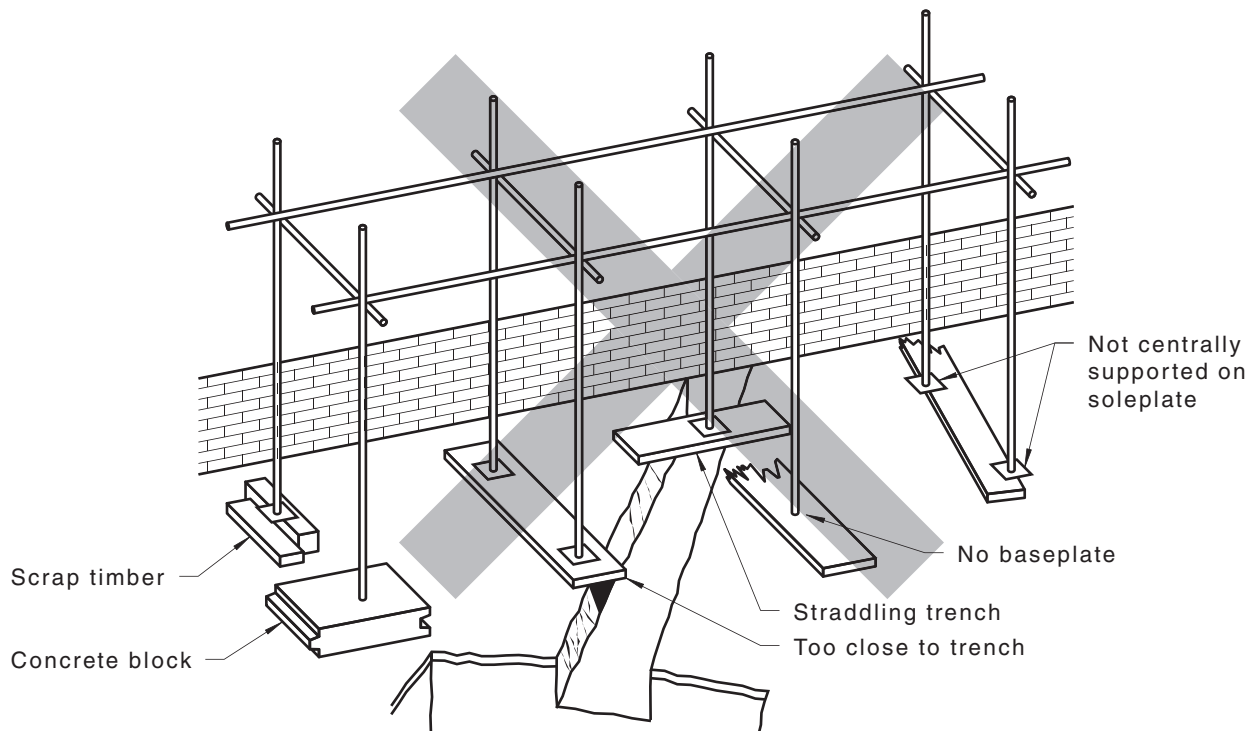


Figure 7.2(A) — Unsafe foundation

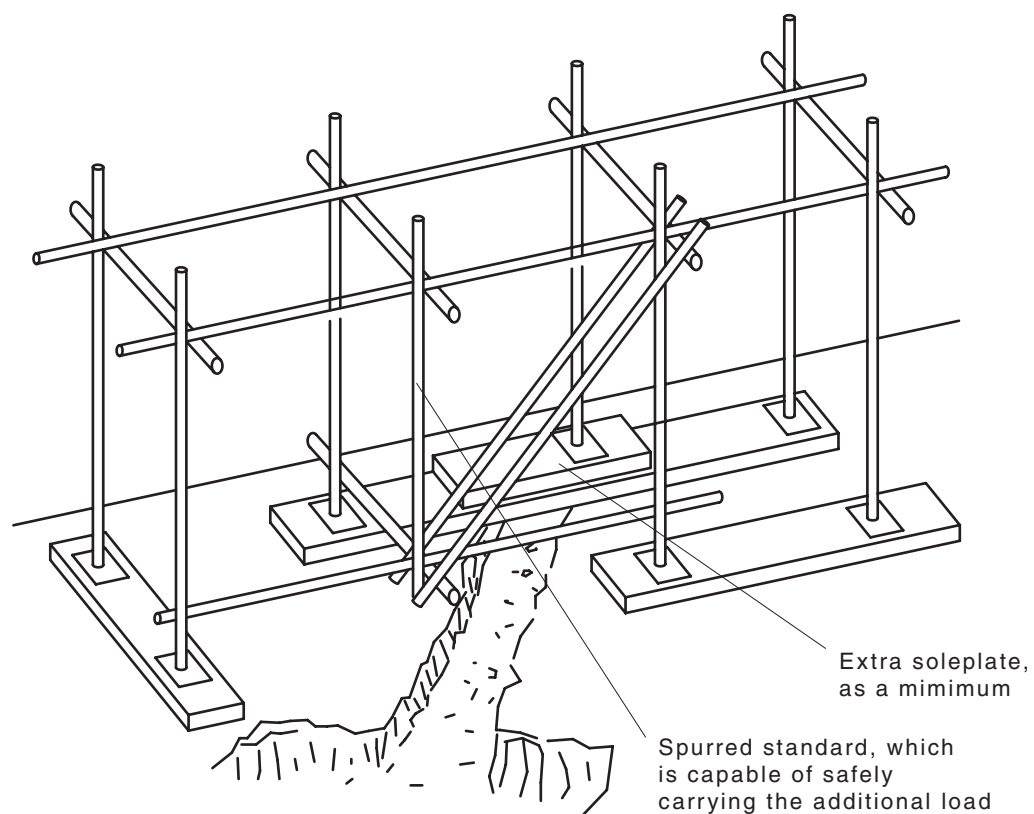


Figure 7.2(B) — Adequate foundation

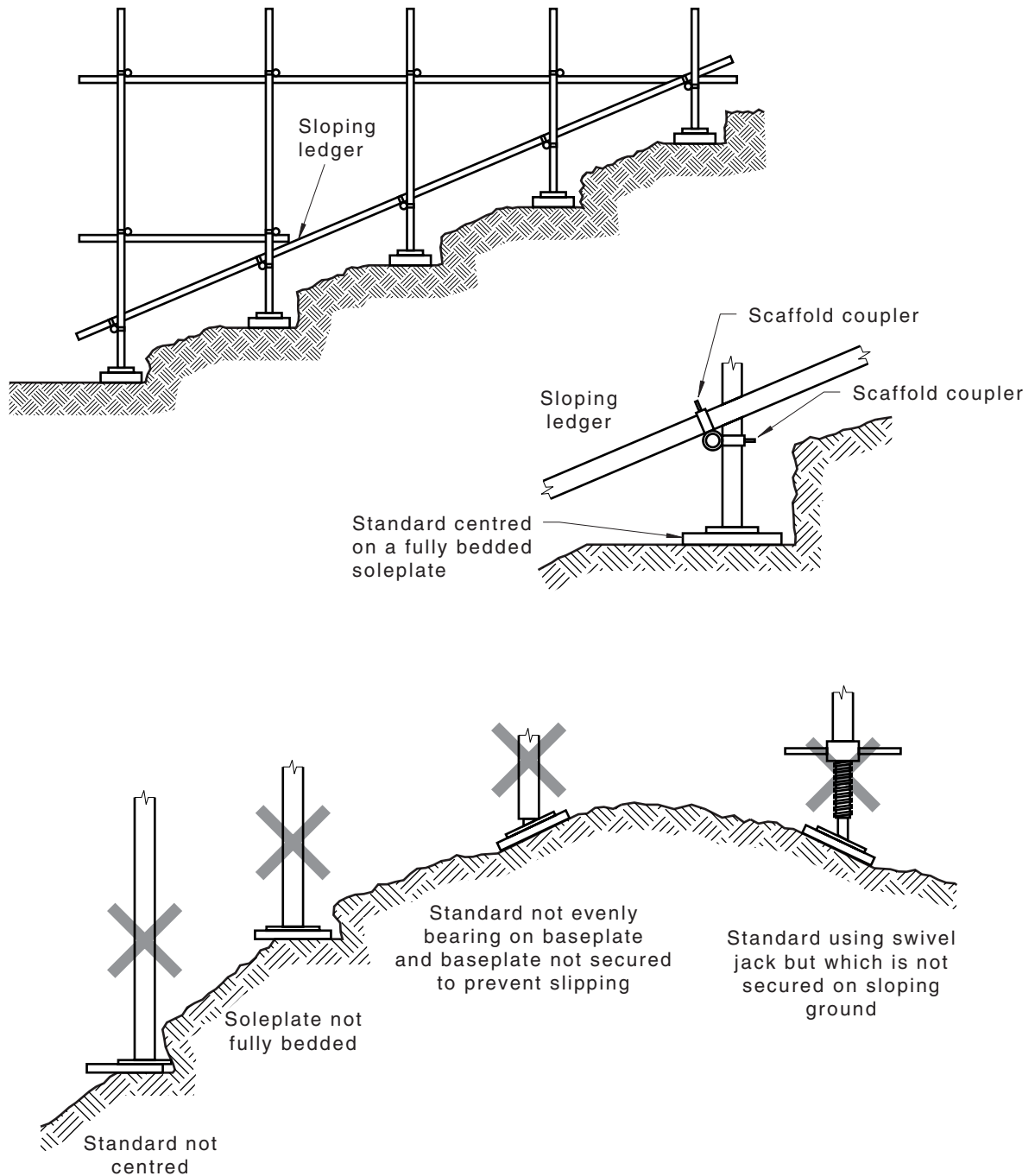


Figure 7.2(C) — Foundations on sloping ground

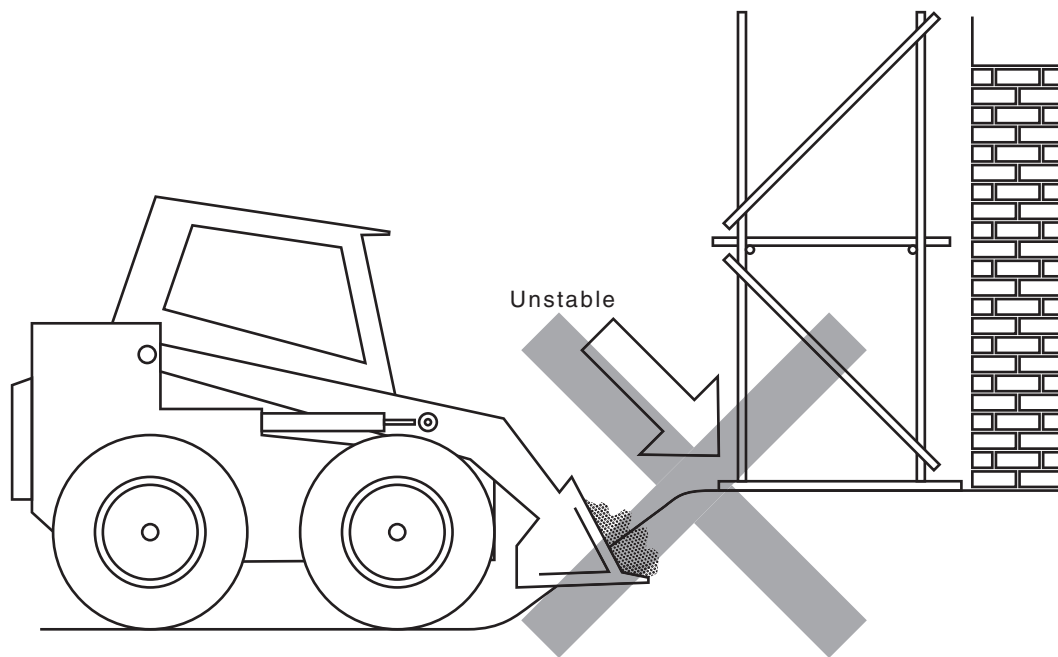


Figure 7.2(D) — Undermining of supporting foundation

7.3 Stability

A scaffold needs to have stability to resist overturning, uplift and sliding. Stability may be achieved by —

- (a) tying the scaffold to a supporting structure;
- (b) guying to a supporting structure;
- (c) increasing the dead load by securely attaching counterweights near the base; or
- (d) adding back-up buttress bays to increase the base dimension, refer to AS 1576.6 for requirements for freestanding stability.

Requirements where a dead load alone is used to provide stability are set out in AS/NZS 1576.1. Where the stability of a scaffold is in doubt, assessment should be carried out by a competent person.

7.4 Tying

Requirements for ties for unsheathed tube-and-coupler scaffolds are set out in AS 1576.6. AS 1576.6 may also be used as guidance for tying of prefabricated modular scaffolds. Tie methods and spacing may also be specified in the supplier's information.

For prefabricated modular scaffolds, in the absence of suppliers' information, ties may be connected to the inner standard only, provided the connection is within 300 mm above or below a transom that connects the inner and outer standards.

Post-installed concrete anchors should be either chemical anchors, screw anchors, coil expansion anchors or torque-controlled expansion anchors. Such anchors should be used only when drilling is performed as specified in the manufacturer's installation information by a competent person. For guidance on the use and installation of post-installed anchors, refer to AS/NZS 1576.1.

Ties should not obstruct clear access along the full length of the working and access platforms. [Figure 7.4](#) shows examples of tie assemblies.

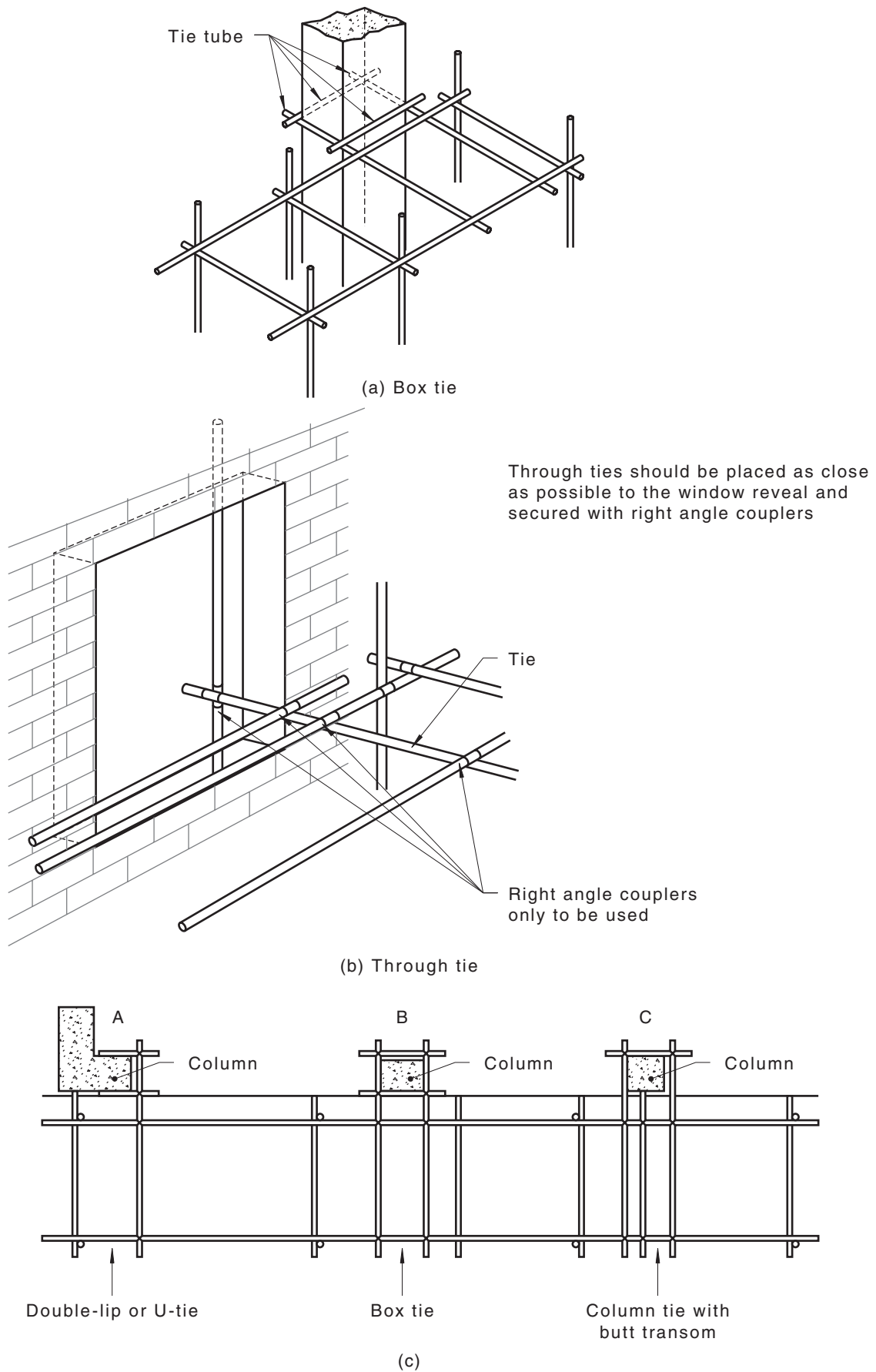


Figure 7.4 — Examples of tie assemblies

7.5 Rigidity

Rigidity can be achieved through the use of bracing. Bracing members may be scaffold tubes on tube-and-coupler scaffolding or prefabricated bracing members for prefabricated modular scaffolding. Tube and coupler bracing may also be used with prefabricated modular scaffolding.

Where required braces may be fixed diagonally on the longitudinal face of the scaffold or transversely across the end bay where displacement forces need to be restrained.

Where diagonal bracing is used, brace members should extend from the base of the scaffold to the top lift. Bracing does not have to extend to the height of the top guardrail. Typical transverse bracing is illustrated in [Figure 7.5](#).

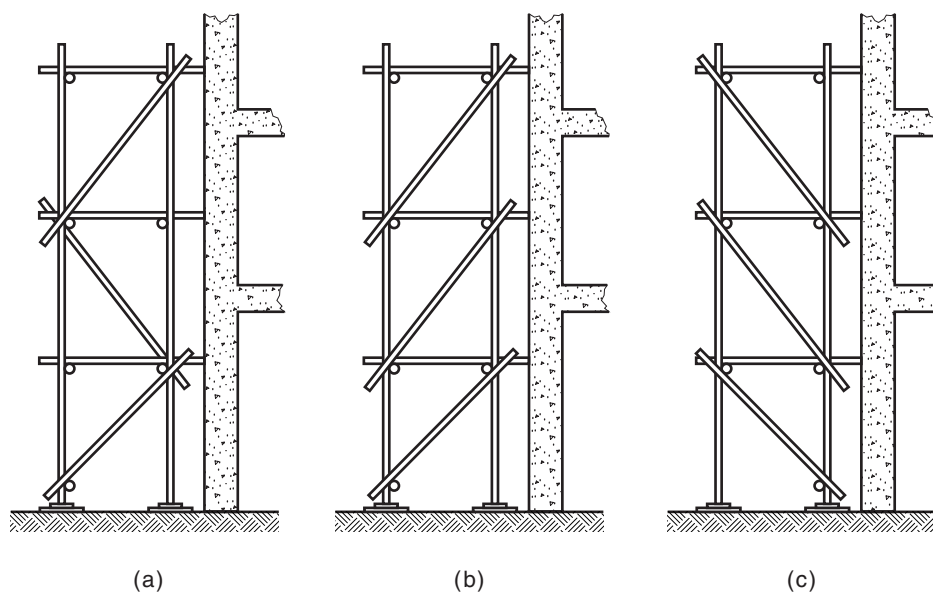


Figure 7.5 — Typical transverse bracing for a scaffold

7.6 Working platforms

7.6.1 Dimensions and decking integrity

Scaffold platforms, should be constructed from either prefabricated decking components or scaffold planks. Requirements for decking components are set out in AS/NZS 1577.

The working platform should be wide enough to allow clear and unobstructed access along its entire length and to accommodate materials and equipment.

Clear and unobstructed access should be not less than 450 mm wide where passage is for persons using hand tools only. Bay extension platforms may be used to provide access. Requirements for bay extension platforms are set out in AS/NZS 1576.1.

Working platforms should have a category and dimensions as shown in [Table 7.6](#).

Working platforms should not be pitched at an angle steeper than 3° (slope of 1 to 19) to the horizontal. Platforms should have a slip-resistant surface.

Planks or decking forming the surface of a working platform should be of uniform thickness and positioned to avoid significant gaps and tripping hazards. Where necessary they should be fixed to prevent uplift or displacement in normal use.

Lap plates or similar components may be required to cover gaps resulting from the layout of scaffold decking.

Planks should be butted not lapped, except at returns, curved faces or unusual profiles. Examples of unsafe working platforms are shown in [Figure 7.6.1](#).

Scaffold platforms need to be stable and have a slip-resistant surface to safeguard users from falls that may result in injury. These provisions may include the use of captive planks or decking units in prefabricated scaffolds, or planks of random length having sufficient mass to remain stable and counteract the effect of overhang on putlogs or transoms when stepped on by persons or loaded by the wheels of material transporters pushed along the working platform.

When short planks of random length are used, it may be necessary to secure the planks to their supporting putlogs. This may be achieved by tying planks down with flexible steel wire rope, tautly tied, or purpose-designed plank straps. Plank straps or fittings that incorporate protruding bolts and nuts should be used only where they do not present a trip hazard, such as at the ends of the platform. Steel fixing tie wire should not be used to secure planks.

Where the lapping of planks along the length of a platform is unavoidable, trip hazards may be avoided by fixing lengths of timber of the same thickness as the planks, cut at a 45° angle, or fixing of purpose-designed rounded end pieces, at the full length of the ends of the lapping planks.

At changes in the direction of a platform, lapped planks may be used without additional measures. At such a point, users will be conscious that they are about to change direction as they move from one run of the scaffold to another and, therefore, are likely to be aware of changes in plank elevation at such change in direction.

Platforms may be exposed to the risk of dislodgment when they are on scaffolds subject to extreme wind conditions such as at high altitudes, cyclonic seasons in tropical zones, particularly high scaffolds or locations subject to wind funnelling as occurs within high-rise precincts in major cities. In these situations, relying on the “tight fit” of planks or platform units will not be sufficient to ensure that they are not dislodged. Lashing of planks or using plank straps to positively secure the platform are two methods that could be used.

Closely decked planking is used to prevent materials and small tools from inadvertently falling through the gap between the scaffold planks. Gaps of width greater than 10 mm between planks within a bay should be avoided.

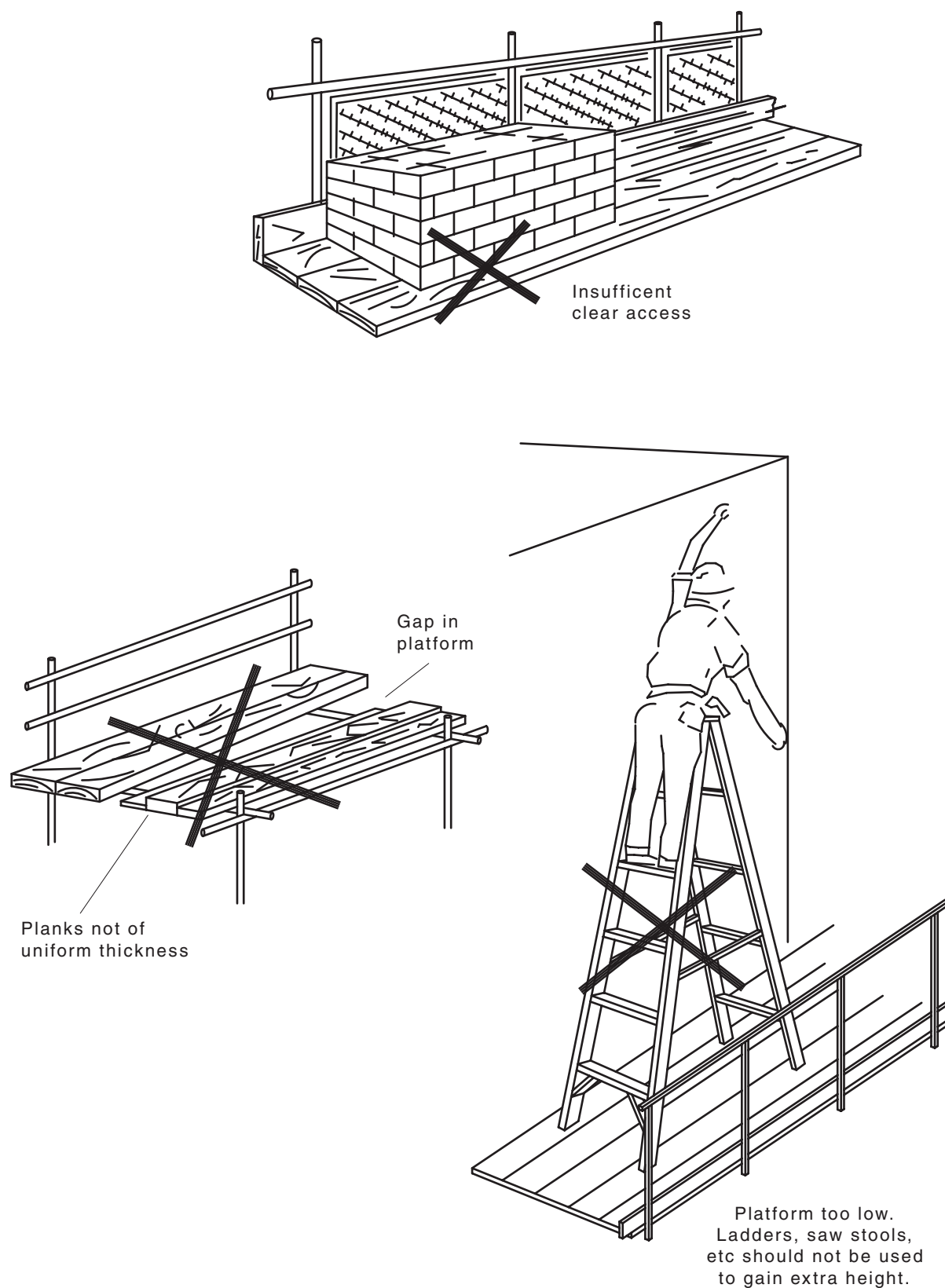


Figure 7.6.1 — Examples of unsafe working platforms

7.6.2 Duty categories

Duty categories are listed in [Table 7.6](#). Each of the three basic duty categories of 'light' 'medium' and 'heavy' allows a maximum live load, from workers, materials, tools and equipment, that may be applied to one working platform level within one bay. A bay is an area between four most proximate vertical supporting standards.

Where a scaffold system or a scaffold installation is referred to as 'heavy duty', this will only imply a capacity to support the heavy duty category loading on one working level of a bay where the four standards defining that bay, and the unshared standards of all adjacent bays, are not supporting any other loads except the system self-weight and all of those standards extend in uninterrupted vertical lines from the supporting surface to the top working platform.

Similarly 'light' and 'medium' duty systems and installations may be limited to a single instance of bay working platform level at the applicable duty category unless it is established that multiple working levels are allowable.

7.6.3 Working platform levels

Unless specified otherwise in the suppliers documentation or installation design, not more than one working platform level should be used within any bay.

The application of multiple working levels intended within a bay will require more detailed information about the system and the installation.

System information should include the number of working platform levels per bay for various installed heights and any associated limit to the total number of platforms installed.

Installation considerations should include the criteria given in [Clause 6.4.1](#).

Depending on the capacity of the system in use, and the configuration of the installation; a combination of duty categories may be allowed at a number of working platform levels within a particular bay or series of bays.

During each stage of work conducted from the scaffold, any platforms that are fully decked, but are not included in the allowed working platforms, will be classified as 'closed platforms'.

At levels where platforms are needed to provide a path to and between separated working platform bay areas, those platforms should be designed with an appropriate duty rating, see [Table 7.6](#).

The acceptable combinations, of duties at working platform levels, should be displayed at point of entry to the scaffold and appropriately administered during all phases including installation, use, modification and dismantling.

See [Figures 7.6.3\(A\)](#) and [7.6.3\(B\)](#) for examples of working platforms with different duty loads.

Table 7.6 — Loads and dimensions for working platforms

Categories (refer to AS/NZS 1576.1)	Approximate maximum total load per working platform level per bay ^c kg	Approximate maximum mass of any single concentrated load of materials or equipment (as part of total load) kg	Minimum length or width of platform mm
Light duty ^a	225	120	450
Medium duty	450	150	675
Heavy duty	675	200	900 ^b
Special duty	Refer to AS/NZS 1576.1		
Loading platforms	Refer to AS/NZS 1576.1		

Table 7.6 (continued)

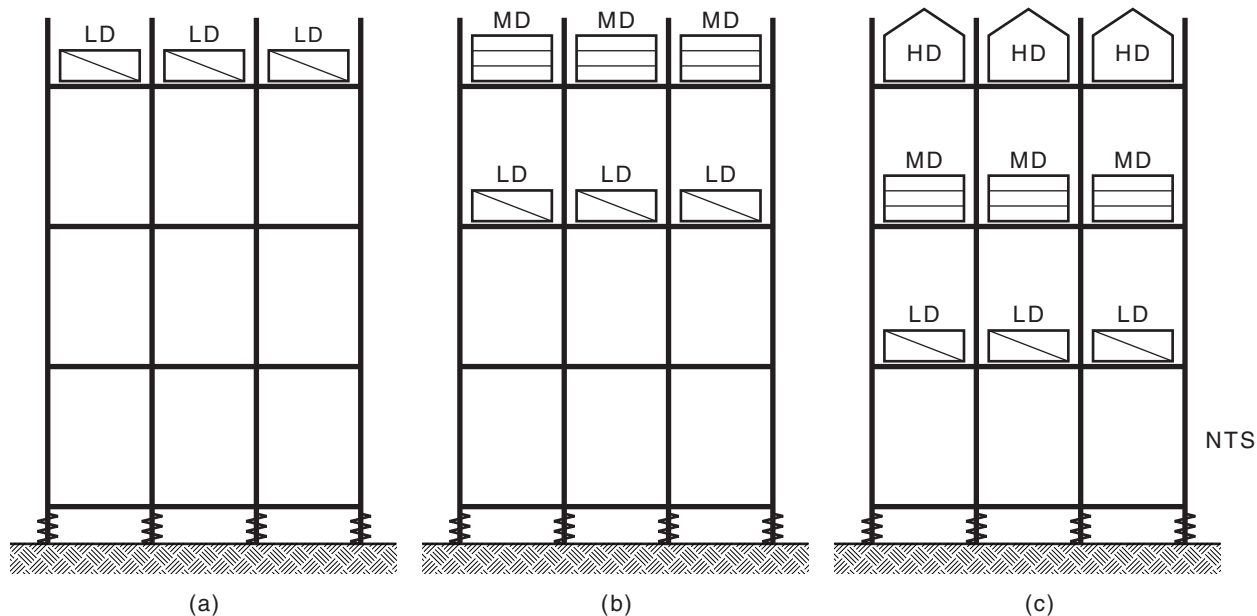
Categories (refer to AS/NZS 1576.1)	Approximate maximum total load per working platform level per bay ^c kg	Approximate maximum mass of any single concentrated load of materials or equipment (as part of total load) kg	Minimum length or width of platform mm
Bay extension platform	Up to 225 ^d	120	220

^a Materials should not be stored on light duty working platforms.

^b 675 mm where additional access is provided by a bay extension platform of not less than 450 mm width.

^c The number of working platform levels within a bay that may be simultaneously loaded is limited by the installation design.

^d The total load on the working platform and the adjacent bay extension platform should not exceed the duty loading of the working platform unless the combined platforms are specifically designed for special duty category.



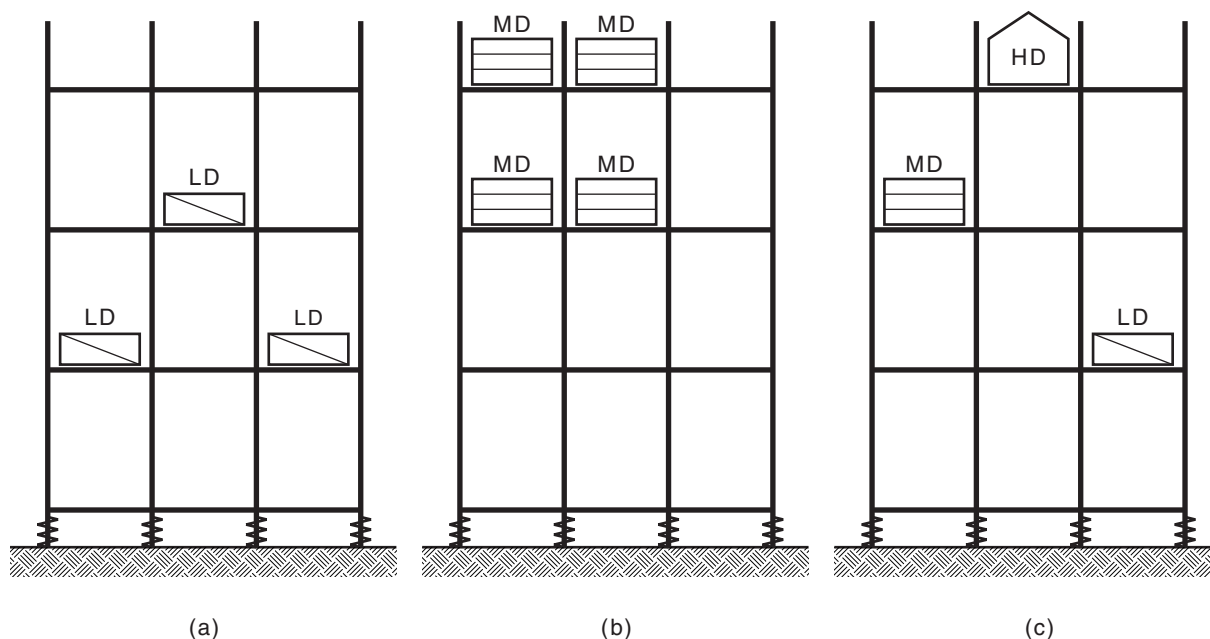
Key

(a) One loaded level per bay — Light duty LD

(b) Two loaded levels per bay — Light duty LD + medium duty MD

(c) Three loaded levels per bay — Light duty LD + medium duty MD + heavy duty HD

Figure 7.6.3(A) — Examples of working platforms with different duty loads



Key

- (a) Three bays loaded on one level each bay — Light duty LD
- (b) Two bays loaded on two levels — Medium duty MD
- (c) Three bays loaded one level each bay — Medium duty MD + heavy duty HD + light duty LD

Figure 7.6.3(B) — Examples of working platforms with mixed or different duty loads per bay

7.7 Hop-up (bay extension) platforms

A hop-up platform, also known as a bay extension platform, is formed by the use of platform brackets that are supported by and connected to standards.

To prevent a scaffold plank or prefabricated platform from sliding off the end of the platform bracket it should be retained on the platform bracket by either a positive stop or a tie bar.

To prevent a scaffold plank or prefabricated platform from falling between platform brackets, brackets of 250 mm or more in length should be prevented from rotation by either a tie bar or engagement of plank hooks.

Brackets up to 250 mm in length typically incorporate end stops and are not restrained with tie bars. See [Figure 7.7](#) for typical brackets and tie bar details.

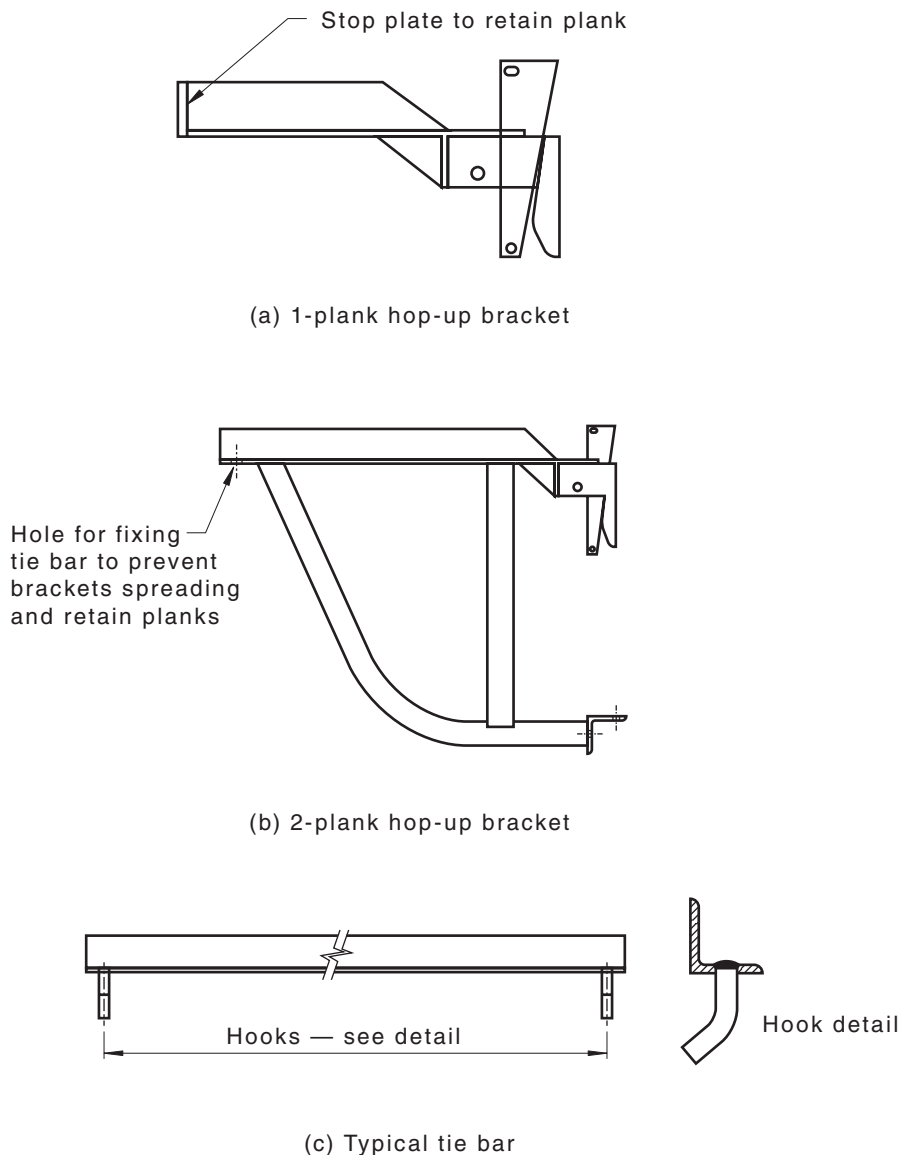


Figure 7.7 — Typical platform brackets and tie bar details

7.8 Edge protection

7.8.1 General

Edge protection should be provided to the open sides and ends of any platform from which a person or object could fall 2 m or more.

Where the nature of the work makes it difficult for a person to be fully aware of the proximity of the platform edge (e.g. overhead work or welding) or where there are hazards in the fall area, edge protection should be provided, regardless of the height of the platform.

Suitable forms of edge protection are as follows:

- (a) Guardrails, midrails and toeboards.
- (b) Guardrails and toeboards, together with suitable infill such as brickguards or 17 mm plywood.
- (c) Mesh panels performing the function of a guardrail and incorporating kickplates.

7.8.2 Guardrails and midrails

Rope should not be used as guardrailing. Chain may only be used to close off access openings in guardrailing.

Guardrails and midrails in tube-and-coupler scaffolding should be supported at intervals not exceeding 3 m, parallel with the platform and not further than 100 mm outside the platform edge. The guardrail should be not less than 900 mm above the platform. The midrails should be positioned such that the maximum vertical gap between guardrail, mid rail and toeboard does not exceed 500 mm.

Guardrails, midrails and stanchions may be constructed from one of the following:

- (a) Scaffold tube.
- (b) Purpose-designed components.
- (c) Oregon, hardwood or other timber of equivalent strength and characteristics with nominal cross-sectional dimensions of 100 mm × 50 mm.

7.8.3 Toeboards and kickplates

Toeboards and kickplates should have a minimum height above the platform surface of 150 mm. Performance requirements for toeboards and kickplates are set out in AS 1576.3. The gap between the platform and the toeboard or kickplate should not exceed 10 mm. Metal or timber scaffold planks in accordance with AS/NZS 1577 may be used as toeboards.

7.8.4 Mesh panels

Fabricated mesh panels that are used instead of guardrails should be at least as strong as a guardrail. Panels should be made of mesh consisting of—

- (a) apertures not exceeding 50 mm × 50 mm where steel wire of not less than 4 mm diameter is used; or
- (b) apertures not exceeding 50 mm × 25 mm where steel wire of not less than 2.5 mm diameter is used.

They should also incorporate a strong kickplate with a height of at least 150 mm.

7.8.5 Other safeguards

For working platforms or access bays between working platforms, trap doors or self-closing gates should be provided where fixed edge protection is absent due to a ladder or stairway.

Where there is no guardrail or midrail provided adjacent to the working face of a building or a structure, the face should be as follows:

- (a) Be less than 225 mm from the platform edge.
- (b) Extend at least 900 mm above the top surface of the platform.
- (c) Have a strength and rigidity of not less than that of a guardrail.
- (d) Perform the function of a guardrail and midrail in all other respects.

Where a toeboard or kickplate is not provided adjacent to the working face of a building or structure, the gap between the platform edge and face should be less than 225 mm.

Where necessary, cantilevered catch platforms should be provided to prevent unintended spillages from falling to the ground, see [Figure 7.8](#).