



The small plant professionals

Steel Frame Scaffolding

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Introduction

Aztex scaffolds are designed to Australian Standards and consist of a number of component parts. When used in accordance with recommended procedures, Aztex scaffolds provide safe, easy to use scaffolding solutions for a diverse range of jobs, work site requirements and conditions.

Health and safety legal obligations vary from one jurisdiction to another. This manual serves as a guide and is based on the information and training provisions of the National Standard for Plant NOHSC: 1010. Before using Aztex scaffolding, make sure you are aware of the specific occupational health and safety legislative obligations of the jurisdiction (State or Territory) where the scaffolding is to be used.

Make sure everyone is adequately trained and competent. This means ensuring everyone has received training and has the required skills and knowledge to safely and correctly use and work with scaffolding. Ensuring the right training is provided and that people are competent to carry out their job is an employer's duty of care.

Training, skills and knowledge requirements will vary from one job and worksite to another. Before commencing any work, employees need to be adequately inducted and notified of any changed conditions or circumstances that could impact on their health and safety. Take a look at the job, work area and scaffolding requirements. Establish the skills and knowledge requirements of personnel and provide the necessary information and training to enable employees and other persons such as labour hire employees, contractors and visitors to carry out their jobs in a safe manner.

Before using an Aztex scaffold, work through the general safety information contained in this guide. Always follow recommended procedures and abide by the provisions of all legislative requirements, Standards or Codes of Practice. (Where further information is required, contact the manufacturer).



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Chapter 1: Working Safely With Scaffolding

1.1: General Health and Safety Guidelines

Consider the following key points before using or working with scaffolding.

Legal Obligations	
Are user's aware of their legal obligations with respect to the use of scaffolding?	Erect, dismantle, transport, store and use scaffolding in accordance with any provisions outlined in Australian or International Standards, legislation (Acts, Regulations) and/or Codes of Practice. People need to be aware of their obligations and adhere to the provisions at all times.
Risk Management – Scaffolding	
Has a risk assessment been conducted on scaffolding components and structures to identify any hazards?	<p>The principles of risk management should be applied to work activities involving scaffolding. As you go about your work remember the risk assessment and control procedures:</p> <p>IDENTIFY ASSESS CONTROL MONITOR</p>  <p>A risk assessment of all scaffold components, site conditions and erected scaffold structures should be carried out at key times in the operational cycle to identify any hazards. The following thinking prompts provide a starting point for risk assessment:</p> <ul style="list-style-type: none"> • Potential for injury due to crushing, trapping, cutting. • Hazardous environmental conditions of the work environment such as electricity, noise, friction, vibration, fire, explosion, hot or cold parts, gases, vapour, fumes, dust, vehicles and other plant. • Unstable foundations. • Potential instability due to environmental loads – wind, snow, ice, etc. • Failure of scaffold - collapse of parts, potential to overturn. • Potential for falling objects from overhead or onto the ground. • Ergonomic/manual handling hazards. • Access and egress hazards. • Damaged component parts undermining the strength and capacity of the scaffold. • Impact loads.

Risk Management – Scaffolding cont...

Are people aware of the hazards associated with scaffolding and the general precautions to be taken?

- Do not work on scaffolding in inclement weather (i.e. wet, raining, excessive wind or lightning). Assess climatic and environmental conditions before commencing work.
- Assess environmental loads such as snow, ice and high wind on the stability of scaffold structures.
- Always use expert advice (i.e. a competent and appropriately qualified person) when assessing environmental loads and the use of screen cloth.
- Exercise caution when working near electricity. Scaffolds must be at least 4 metres from uninsulated power lines or other electrical transmission apparatus.



WARNING - Metal conducts electricity. Be aware of electrical hazards and take the necessary precautions

- Do not use platform brackets/hop ups without conducting a risk assessment of the overturning effect on the scaffold structure.
- Observe correct lifting and carrying procedures whenever handling, erecting, dismantling, packing and storing scaffold components.
- Use manual handling equipment wherever possible to avoid manual handling injury.
- Use caution when machinery is being used nearby. Considerable damage can be caused by even a slight bump from a vehicle or machinery.
- Provide overhead protection where hazards exist for personnel on or nearby scaffolding.
- Never overload scaffolds.
- Install proper guardrails along all open sides and ends of scaffold platforms to prevent falls.
- Install toeboards to prevent objects falling from scaffold platforms onto people working below.
- Install overhead protection where people are exposed to falling objects.
- Secure planks at all times.
- Erect barricades and/or lights wherever there is a hazard to workers or the public.

Have the risks associated with scaffolds been adequately controlled?

Where a risk assessment identifies a need to control a risk to health and safety, the risk should be eliminated and where it cannot be eliminated, the risk should be minimised.

Guarding

Are safety guards fitted to those parts of the scaffold where there is an identified hazard? (Eg. Falls from height, falling objects.)

You will need to identify the hazards associated with scaffolds to determine the adequacy of the guarding and the type of guarding required to prevent injury.

Guarding takes many forms:

- Physical barriers such as cages, fences, enclosures, gates, doors, covers, etc.

Most countries and states have legislation or guidance material such as standards and codes of practice covering scaffold and guarding requirements. You should be aware of the requirements covering scaffolding in your State or Territory and make sure it complies. **NEVER REMOVE OR BYPASS SAFETY GUARDS.**

Authority to Use

Are you appropriately qualified to work with scaffolding?

You should only ever use, erect, dismantle or maintain scaffolding that you have been trained and authorised to use. This means having the appropriate qualifications such as a scaffolder's certificate where there is a risk of a fall exceeding 4 metres or being assessed as competent by a suitably qualified person where frame scaffolding under 4 metres is used.

Are the scaffolding procedures employed on the worksite approved by a qualified person such as the employer, site manager, team leader, supervisor or qualified scaffolder?

- No task should be performed, unless approved by your employer, supervisor or appropriately qualified scaffolder.
- Never attempt to use or work with scaffolding unless you have been trained and assessed as competent in the correct and approved procedures. For scaffolding where a person or object can fall 4m or more, you must hold a current scaffolder's certificate.
- Only appropriately qualified personnel should attend to electrical work or tasks requiring a qualified tradesperson.

Training and Competence

Have all persons working with scaffolding been adequately trained?

Scaffolding requirements will vary from one site and job to another. Only qualified, competent persons should erect, dismantle or alter scaffolding.

Have persons undertaking training been assessed as competent by a suitably qualified person?

If you are responsible for other people consider the following points before any work is commenced:

- Consider the type and construction of scaffold and the roles and responsibilities of people employed to use and work with it.
- Consider the level of employee qualification required to carry out specific scaffolding job functions (see AS/NZS 4576).
- Use only certified scaffolders on those jobs where formal certification and qualifications are required .
- Identify any gaps in the skills and knowledge requirements of employees.
- Assess the type of training employees need to safely and effectively use scaffolding and carry out their job.
- Consider the resources required to deliver adequate scaffold training.
- Develop training programs to meet identified scaffold training needs and/or access appropriate training programs from recognised and suitably qualified outside providers.
- Identify those stages in the operational cycle when training is required (e.g. induction, new scaffolds, new processes, new people).
- Provide written safe work procedures wherever possible.
- Use the procedures outlined in this manual as a guide and apply them to the requirements of the work site and job.
- Point out clearly and distinctly, any risk associated with the site and the use of scaffolding.
- Provide adequate on the job instruction and supervised practical experience.
- Point out and describe the risk controls in place.
- Assess employee competence to safely use and work with scaffolding once training has been completed.
- Use suitably qualified personnel (following the guidelines of AS/NZS 4576) to assess the competence of trainees.

Where required by legislation, are people qualified and certified to the required standard?

Personal Safety

Are you correctly dressed for the job?	<p>When working with scaffolding it is important that you are appropriately dressed. This means NO loose clothing or jewellery and hair should be tied back or confined.</p> <p>If working outdoors, adequate protection from the sun will be required. This could include, but is not limited to, the wearing of:</p> <ul style="list-style-type: none">• A long sleeved shirt.• Long trousers.• A hat with brim (e.g. wide brimmed hat or foreign legion style cap).• Sun glasses.• Sunscreen.
Are you in good health?	Scaffolders and persons working on scaffolds must be physically well and mentally alert. Never work on, or erect scaffolding if unwell or taking medication that may affect mental alertness or judgement.
Is Personal Protective Equipment (PPE) required? Do you know what is required and is it in good working order?	<p>Some jobs will require the wearing of personal protective equipment. This could be:</p> <ul style="list-style-type: none">• Eye protection.• Hearing protection.• Scaffolders gloves.• Safety boots.• Hard hat. <p>Depending on the work environment there may be a requirement to wear other forms of PPE such as breathing equipment or special purpose overalls. A risk assessment will identify these needs.</p> <p>It is important you know what you need to wear, how to wear it correctly and that you wear it at all times. If unsure about PPE requirements or PPE is missing or damaged, see your supervisor immediately.</p>

Lockout and Tagging Systems, Safety Warnings and Decals

Is there an approved system for scaffold lockout and tagging in place?	<p>Where a scaffold is:</p> <ul style="list-style-type: none">• Under construction.• Out of use.• Has not been signed off in a formal hand over procedure. <p>A system for lock out and tagging should be in place. This should include:</p> <ul style="list-style-type: none">• A procedure for locking out or isolating the scaffold to prevent unauthorised entry or use• A procedure for warning personnel that the plant is in a state of lockout.
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Lockout and Tagging Systems, Safety Warnings and Decals cont...

Are all employees aware of the system of lock out and tagging?	Employees must be made aware of the system for lockout and tagging and recognise that certain rules apply to this system. For example: <ul style="list-style-type: none">• Never remove a lock or tag placed by another person• Do not attempt to use or enter the area when a scaffold is locked out and tagged.
Are scaffold components clearly, legibly and permanently labelled with relevant warnings and decals to alert personnel to hazards and load rating specifications?	The law in most countries and states requires warnings or safety decals to be clearly, permanently and legibly marked on an item of plant. Do not remove, paint over or allow dirt to build up on designer/manufacturer's safety warnings, or labels such as load ratings. Report damaged or missing warnings and decals immediately.

Specifications and Use

Are specifications known? Do scaffolds and component parts meet all statutory requirements?	Guidelines for Scaffolding AS/NZS 4576 outlines scaffolding requirements and specifications. All users of scaffolding should be familiar with the requirements of the Standard and ensure specifications are adhered to at all times. Users of scaffolding should consider the following general specifications: <ul style="list-style-type: none">• Guardrails to be installed where a person could fall 2 metres or more or as a risk assessment indicates.• Adjustable baseplate extension not to exceed 450mm. 150mm must remain in the frame.• Scaffold must be at least 4.0m from uninsulated power lines or other electrical transmission apparatus.• No mixing of components with other manufacturers or systems (except guardrail).• Platforms must be fully planked.• Do not exceed scaffold rated capacity – based on light, medium and heavy duty (See section 3.1).• Never drop or apply an impact load to platform.• Do not allow material or debris to accumulate on working platform.• Access to the working platform should always be from the internal ladder access. Exercise caution when entering or leaving a working platform.• Examine an erected scaffold thoroughly to make sure it is set up properly. The scaffold should be erected to be plumb, level, rigid and square.• Do not alter or adjust scaffold components with persons or material on scaffold.• Do not lean ladders against scaffold, (do not use ladders on working platforms).• Make sure all braces are locked in place.• Provide overhead protection where hazard exists for personnel on or nearby scaffolding.• Do not overload scaffolds.
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Specification and Use cont...

- Equip and maintain all platforms with proper guardrails, along all open sides and ends of scaffold platforms.
- Secure planks when necessary.
- All scaffolds where a person or object could fall 4.0m or more must be erected by a qualified scaffolder.
- Ladders must be stable, secure. angled at a recommended incline ration of 4:1 (but no more than 6:1) and extended 1.0m above platform.
- Do not overtighten nuts and bolts. Use a scaffold spanner.
- Provide overhead protection where people are exposed to falling material.
- Inspect and test scaffolding in accordance with legislative requirements. This includes but is not limited to, inspection on a daily basis before use and once every 30 days by a qualified person or when a risk assessment indicates.

AS/NZS 4576 outlines general use specifications. Users of scaffolding should be aware of the general use specifications and adhere to them at all times. Some important guidelines for use are outlined below:

- Inspect equipment before use. Check for missing parts. Check ties and subsidence.
- Do not use defective equipment.
- Do not abuse or misuse scaffold equipment. Only use equipment the way it was intended.
- Keep all equipment in good repair.
- Do not stack materials higher than guardrail mesh or toeboard.
- Stand on platform only – Do not try to increase height by standing on guardrails, extra ladders, trestles, boxes, etc.
- Do not use platform brackets/hop ups without conducting a risk assessment of the overturning effect on the scaffold structure.
- Platform bracket/hop ups are for personnel only. NOT material storage.
- Use both hands when climbing onto scaffold platforms. Use the designated ladder and maintain a firm grip whilst climbing. Do not carry anything while climbing. Do not climb on braces.

1.2: Health and Safety Guidelines for Erectors

These guidelines are intended for those persons involved in the erection, modification or dismantling of scaffolds. This is not an exhaustive list. Persons involved in the erection, modification and/or dismantling of scaffolding should be certified as required by law and competent to carry out their job.

- Assess environmental loads such as snow, ice and high wind on the stability of scaffold structures.
- Always use expert advice (i.e. a competent and appropriately qualified person) when assessing environmental loads and the use of screen cloth.
- Exercise caution when working near electricity. Scaffolds must be at least 4 metres from uninsulated power lines or other electrical transmission apparatus.



WARNING - Metal conducts electricity. Be aware of electrical hazards and take the necessary precautions

- Do not install platform brackets/hop ups without conducting a risk assessment of the overturning effect on the scaffold structure.
- Observe correct lifting and carrying procedures whenever handling, erecting, dismantling, packing and storing scaffold components.
- Use manual handling equipment wherever possible to avoid manual handling injury.
- Use caution when machinery is being used nearby. Considerable damage can be caused by even a slight bump from a vehicle or machinery.
- Equip and maintain all platforms with proper guardrails, along all open sides and ends of scaffold platforms.
- Install toe boards to prevent objects falling from scaffold platforms onto people working below.
- Install overhead protection where people are exposed to falling objects.
- Install adequate and appropriate access ladders.
- Secure planks at all times.
- Erect barricades and/or lights wherever there is a hazard to workers or the public.
- Never drop or apply an impact load to a platform.
- Examine an erected scaffold thoroughly to make sure it is set up properly. The scaffold should be erected to be plumb, level, rigid and square.
- Do not alter or adjust scaffold components with persons or material on scaffold.
- Do not lean ladders against scaffold, do not use ladders on working platforms.
- Make sure all braces are locked in place.
- Do not overtighten nuts and bolts. Use a scaffold spanner.
- Do not use defective components in the scaffold. Inspect scaffold components as they are installed.
- Do not mix Aztex Scaffold components with those of other manufacturers or other scaffolding systems (except guardrail).
- Do not bridge between towers with planks or stages.
- Lockout and tag scaffolds using an appropriate system when scaffolds are incomplete, defective or have not been subject to “Approval” inspection.
- Indicate by means of appropriate tagging when a scaffold has been inspected and “Approved, Ready to Use”.

1.3: Health and Safety Guidelines for Scaffold Users

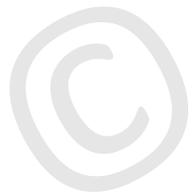


Your job may require you to use a scaffold in order to carry out certain job functions. Before commencing work, make sure you are familiar with the safe working guidelines for using scaffolds.

Users of scaffolding should be aware of the general use specifications and adhere to them at all times. Some of the more common hazards created by users are summarised below as important guidelines for use. These guidelines are not exhaustive. Individual organisations should assess the risk associated with the use of scaffolding as it pertains to the job and work environment and ensure their employees are adequately trained and competent to use scaffolding in a safe manner.

- Do not work on scaffolding until you have been properly inducted in its use and assessed as competent.
- Do not work on scaffolding until it has been inspected for your shift and is tagged as “Approved Ready to Use”.
- Always inspect (visual inspection) scaffold before use. Check for missing parts, ensure ladder access, full planking, guardrails and ties are in place. Check foundations for subsidence. Ensure the scaffold is plumb, rigid and square.
- Do not work on scaffolding if you notice any components which are damaged. Report damaged scaffold components immediately.
- Use only scaffolds that are correctly shored (i.e. plumb, square and rigid).
- Do not work on scaffolding in inclement weather (i.e. wet, raining, excessive wind or lightning). Assess climatic and environmental conditions before commencing work.
- Do not work on ice or snow covered platforms.
- Do not abuse or misuse scaffold equipment. Only use equipment the way it was intended.
- Keep all equipment in good repair.
- Do not use a scaffold unless a proper ladder or other equivalent safe means of access has been provided.
- Enter scaffolds by the safe means of access. Never climb guardrails or the scaffold itself.
- Do not climb on braces.
- Do not use a scaffold if the working platform is not planked all the way across. Do not use the scaffold if there is only one or two planks where there should be more.
- Do not use a scaffold if the planks are not scaffold grade. Scaffold grade planks will be clearly and legibly stamped with the weight bearing load and Standard conformance number.
- Do not use a scaffold if the planks are bowing.
- Do not work on a scaffold if you feel weak, sick or dizzy or are taking medication that causes drowsiness or impairs reflexes.
- Do not work on a scaffold when under the influence of alcohol or drugs.
- Always wear the correct PPE for the job and worksite. If you are unsure of the correct PPE – see your supervisor before commencing work.
- Use both hands when climbing onto scaffold platforms. Use the designated ladder and maintain a firm grip whilst climbing. Do not carry materials as you climb.
- Do not jump onto planks or platforms.
- Do not stack materials higher than guardrail mesh or toeboard.

- Do not overload the platform by more than its intended uniform loading.
- Do not overload the scaffold by point loading a plank above its capacity.
- Do not overload a platform by point loading a frame above its capacity.
- Do not bridge between two scaffolds by planks.
- Do not use the scaffold unless proper falling object protection for the users and workers below has been provided.
- Do not allow tools, materials or debris to accumulate on scaffold platforms and cause a hazard.
- Stand on platform only – not on guardrails, extra ladders, trestles, boxes etc to increase height.
- Do not use platform brackets/hop ups without conducting a risk assessment of the overturning effect on the scaffold structure.
- Platform bracket/hop ups are for personnel only. NOT material storage.
- Do not alter the scaffold. Competant scaffolders may only perform scaffold alterations.
- Do not use heat producing activities such as welding without taking precautions to protect the scaffold components.
- Do not use a scaffold with a material hoist tower or for the mounting of derricks unless the scaffold is designed for such use.



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Chapter 2: Scaffold Components and Equipment

2.1: Components of the Basic Scaffold

Aztex scaffolds are designed to Australian Standards and consist of a number of component parts. When used in accordance with recommended procedures, Aztex scaffolds provide safe, easy to use scaffolding solutions for a diverse range of jobs, work site requirements and conditions. A guide to the (basic) scaffold components is detailed below.



Overview of a basic scaffold

Frame

The frame consists of two standards or uprights joined at the top by a transom or horizontal structural member.

The section at the top of each standard is known as a spigot. The spigots are designed to hold the frames of subsequent lifts and guardrail posts on the top most level of scaffold.

Guardrail spigots located on the standards provide an attachment point for the guardrail. The guardrail is fitted with a set of hooks corresponding to the guardrail spigots of the frame.

On each standard there are two pinlocks – four per frame. The pinlocks secure the cross braces to the frame. Each pinlock has an open and closed position. When erecting scaffolding, the pinlock should be in the open position for ease of attaching the cross brace. To secure the cross brace/s, the pinlock must be in the closed position. (Figures 2.01, 2.02, 2.03, 2.04, 2.05)



Figure 2.01: The scaffold frame



Figure 2.02: The spigot section of the scaffold frame



Figure 2.03: The guardrail spigot



Figure 2.04: The pinlock in the open position



Figure 2.05: The pinlock in the closed position

(Punched Hole) Crossbrace

The brace is fixed diagonally to the pinlocks of the frame standards and consists of two members joined at the mid point by a bolt and nut. The brace can be collapsed for transport and storage and opened for bracing together two scaffold frames. (Figures 2.06, 2.07, 2.08)



Figure 2.06: The crossbrace in the “closed” position for transport/storage



Figure 2.07: The crossbrace in the “open” position as it is fixed to the frame



Figure 2.08: The points at which the crossbrace is fixed to the pinlocks of the frame standards

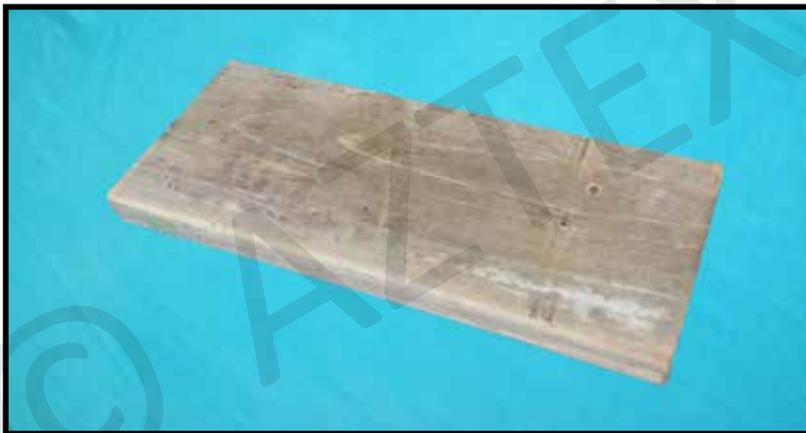


Figure 2.10: An example of a soleplate

Adjustable Baseplate

This consists of a baseplate and adjustable leg which is used for purposes of load support and levelling the scaffold. The baseplate distributes the load from the vertical standard of the frame through the soleplate to the supporting ground structure or surface. The adjustable leg consists of a threaded rod with a nut, which is designed to fit inside the vertical standard of the frame and support the standard load. (Figure 2.09)

Soleplates

The soleplate distributes the scaffold load from the baseplate to the ground or other supporting structure. Soleplate dimensions and requirements are determined by the height and width of the scaffold as well as the stability of the ground on which the scaffold is erected. (Figure 2.10)



Figure 2.09: An adjustable baseplate

Scaffold Plank

A decking component of standard width and depth, designed to conform to AS 1577. Set side by side, scaffold planks provide a working platform. The number of planks required is determined by the type and size of scaffold frame. Each end of the plank is fitted with a steel end. The plank ends are positioned over a transom during erection of the working platform.

(Figures 2.11, 2.12)

Access Platform

A platform that provides access to and from different levels of the scaffold for people, materials and equipment. The access platform may also be called a hatch deck. The hatch deck is equivalent in width to three scaffold planks and is constructed of waterproof plywood conforming to AS 1577. (Figure 2.13)



Figure 2.11: A scaffold plank



Figure 2.13: An access platform of hatched deck



Figure 2.12: Steel end of a scaffold plank

Ladder

The ladder allows movement between scaffold platforms. (Figure 2.14)



Figure 2.14: A scaffold ladder



Figure 2.15: A ladder rail

Ladder Rail

A ladder rail is used to provide an anchor point for the ladder (Figure 2.15)

Guardrail

A galvanised mesh structure designed to prevent people and objects falling from the working platform.

Guardrail hooks (located on both sides of the guardrail - top and bottom) are adjustable, and drop into the guardrail spigots of the scaffold frame to secure the guardrail in place.

A metal toeboard or kickboard is permanently fixed to the bottom of the guardrail to prevent tools or materials falling from the working platform. (Figures 2.16, 2.17, 2.18)

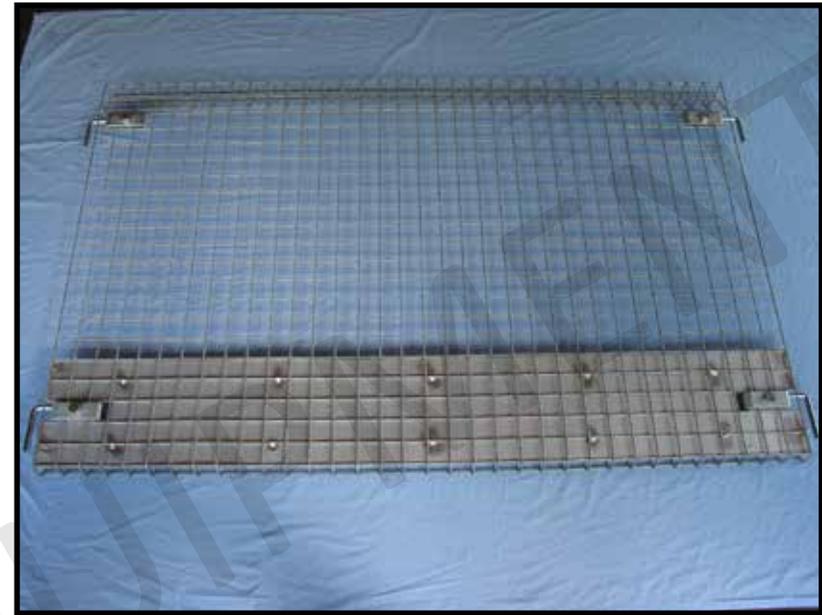


Figure 2.16: A guardrail



Figure 2.17: Guardrail hooks



Figure 2.18: Guardrail hooks are located top and bottom of the guardrail

Guardrail Post

Guardrail posts are only required on the top most level of the scaffold. The posts are fitted to the spigots of the scaffold frame standards of the lift below. The guardrail is then secured to the post to prevent persons and objects from falling. The post is fitted with a clamp to secure the post. The guardrail is slid into spigots positioned at the top and the bottom of the guardrail post. (Figures 2.19, 2.20)

Right Angle Coupler

This is a non swivel load bearing coupler used to connect two tubes at right angles to each other. In a scaffold the right angle coupler is used on the intermediate levels to connect a ladder support rail to a scaffold frame. Without the support rail a ladder at the intermediate level will move around and become unstable. (Figure 2.21)



Figure 2.19: Overview of the guardrail post



Figure 2.21: A right angle coupler



Figure 2.20: A guardrail post showing the clamp and bottom spigots

2.2: Scaffold Components - Table of Weights

The following table lists the weight of individual scaffold components supplied by Aztex Equipment. You will need to consider the weight of component parts when calculating scaffold loads. The weight of scaffold components should also be considered when:

Conducting a manual handling risk assessment – employers should be aware of component weights and ensure appropriate manual handling procedures and controls are in place to prevent injury associated with poor manual handling practice.

When determining the appropriate vehicle/equipment for the movement and transport of scaffold components – only trucks and manual handling equipment appropriately load rated should be used when moving and transporting scaffold components.

Scaffold Component	Weight (Kg)
1.5m Frame	20
1.5m Frame (Narrow)	18
1.0m Frame	14
1.0m Frame (Narrow)	12
Crossbrace (to suit 1.5m frame)	6
Crossbrace (to suit 1.0m frame)	5
Adjustable Baseplate	6
Soleplate	3
Scaffold Plank (4.8m)	27
Scaffold Plank (4.2m)	25
Scaffold Plank (2.4m)	14
Captive Planks	12
Guardrail	13
Guardrail Post	5
Coupler	1
Steel Tube (per Meter)	4.5

2.3: Tools and Equipment

Before you can erect, maintain or dismantle scaffolding, you will require a few basic tools and items of equipment. A description of the required tools is outlined below. (Figures 2.22, 2.23)

Scaffold Spanner - A box or tube type wrench with a swing over handle that has been purpose designed for the tightening and releasing of couplers.

Magnetic Spirit Level - A spirit level is used to level the base of the scaffold. The job of levelling the scaffold is made easier when the spirit level is magnetic.

Tape Measure - The tape measure is used to check distances and square scaffold components relative to each other.

Scaffolder's Belt - The scaffolder's belt includes provision for all scaffold equipment as well as other tools. The belt is worn around the waist and provides a safe and efficient means of carrying tools.



Figure 2.22: A scaffolders belt



Figure 2.23: Basic scaffold equipment (left to right) Scaffold Spanner, Magnetic Spirit Level, Tape Measure, Riggers Gloves

2.4: Personal Protective Equipment (PPE)

Personal Protective equipment is designed to prevent injury arising from the hazards associated with scaffolding operations and components. Handling scaffolding equipment can be hazardous. Scaffold planking is heavy, scaffold frames can be awkward, and braces can pinch. Appropriate personal protective equipment can reduce the risk of injury.

Different operations and site specific hazards will determine the type of PPE to be worn. Make sure you know what sort of PPE you should wear before starting a job.

Riggers's Gloves - The metal surfaces of the scaffold components may contain metal burrs or sharp sections. Metal components left in full sun, can become hot. Close fitting, non slip gloves, specifically designated for scaffolding work should be worn at all times when handling scaffold components to protect the hands from potential cuts and burns.

Footwear - Worksites will require personnel to wear safety footwear. Such footwear should comply with the relevant Australian Standards (AS/NZS 2210).

Safety Helmets - Industrial safety helmets complying with AS/NZS 1801 should be worn wherever there is a risk of objects falling from above and on any worksite where a hard hat is required to be worn.

Eye Protection - A risk assessment will identify the need for eye protection. Eye protection requirements will depend on the work environment and job being performed. Eye protection should conform to AS/NZS 1337.

Hearing Protection - A risk assessment will identify the need for hearing protection. Hearing protection requirements will depend on the work environment and job being performed.



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Chapter 3: Estimating Scaffold Requirements

Before you can begin to erect or work with a scaffold, you will need to assess the requirements of the job and plan a suitable scaffold structure.

3.1: Scaffold Loads

In scaffolding, load is normally considered in terms of the dead load and the duty live load.

The dead load generally refers to the weight of the scaffold itself. This includes the weight of the frames and all connected components such as braces, ties, planks, guardrails and attachments. The dead load increases as the height of the scaffold goes up. Other forces may contribute to the dead load. These include environmental factors such as wet planks, snow and ice and the effect of wind on sheeting attachments such as shade cloth.

The duty live load considers the function of the scaffold and the loads it must carry. Function is best expressed as the use to be made of the scaffold (e.g. light, medium or heavy duty use). The nature of work to be performed is a good indicator. A bricklayer is more likely to impose a heavier load than a painter for example because the weight of bricks is much higher than a few cans of paint. The live load accounts for the materials and equipment to be used and stored on the scaffold as well as the maximum number of people working on it at any given point in time.

Scaffolds should be designed to carry the required number of working platforms and to support the live load.

When designing scaffolds and estimating component requirements follow the required specifications outlined in the table below.

Duty Classification as specified in AS/NZS 1576	Approximate maximum total load for people and materials (Kg per platform per bay)	Approximate maximum mass of any single concentrated load of materials or equipment (as part of total load) (Kg)	Minimum length and/or width of platform (mm)
Light Duty*	225	100	450
Medium Duty	450	150	900
Heavy Duty	675	200	1000

* Materials must not be stored on light duty working platforms that have the minimum allowable width.



Scaffolds should be designed to carry the required number of working platforms and to support the live load.

3.2: Designing a Scaffold Structure

Step 1: Define the function of the scaffold

1. Think about the type of work to be carried out on the scaffold. (For example, painting, rendering, bricklaying.)
2. Define the function of the scaffold in terms of duty load. Duty loads are normally expressed as:
 - Light Duty: This includes activities such as painting, where the scaffold will be required to carry people and paint supplies
 - Medium Duty: This includes activities such as rendering where the scaffold will be required to carry people and mixed render materials
 - Heavy Duty: This includes activities such as bricklaying where the scaffold will be required to carry people, bricks and mortar.

Step 2: Determine the duty rating load

1. Having defined the function of the scaffold in terms of light, medium or heavy duty, go to the table in Section 3.1 Scaffold Loads and determine the total load for people and materials. Note this down. For example a bricklayer should have defined the function as heavy duty. This means that the duty rating load (people and materials) cannot exceed 675kg.
2. Determine the maximum mass of any single concentrated load of materials or equipment using the table in Section 3.1 Scaffold Loads. For example, a bricklayer having defined the function as heavy duty must not exceed 200kg with any single concentrated load. This specification refers to a single point load exerted on a single vertical member or frame.

Step 3: Determine the minimum width/length platform proportions

1. The load ratings govern the minimum platform width allowable. Using the table in Section 3.1, determine the minimum length and width dimensions of the scaffold platform. For example, the platform dimensions for a heavy duty scaffold such as that used by a bricklayer, must be no less than 1000mm in both the length and width.
2. Note the specifications down. You will need these specifications when it comes to estimating component requirements.



Working platforms are subject to minimum width and length dimensions. At all times, ensure working platforms meet minimum length and width dimensions.

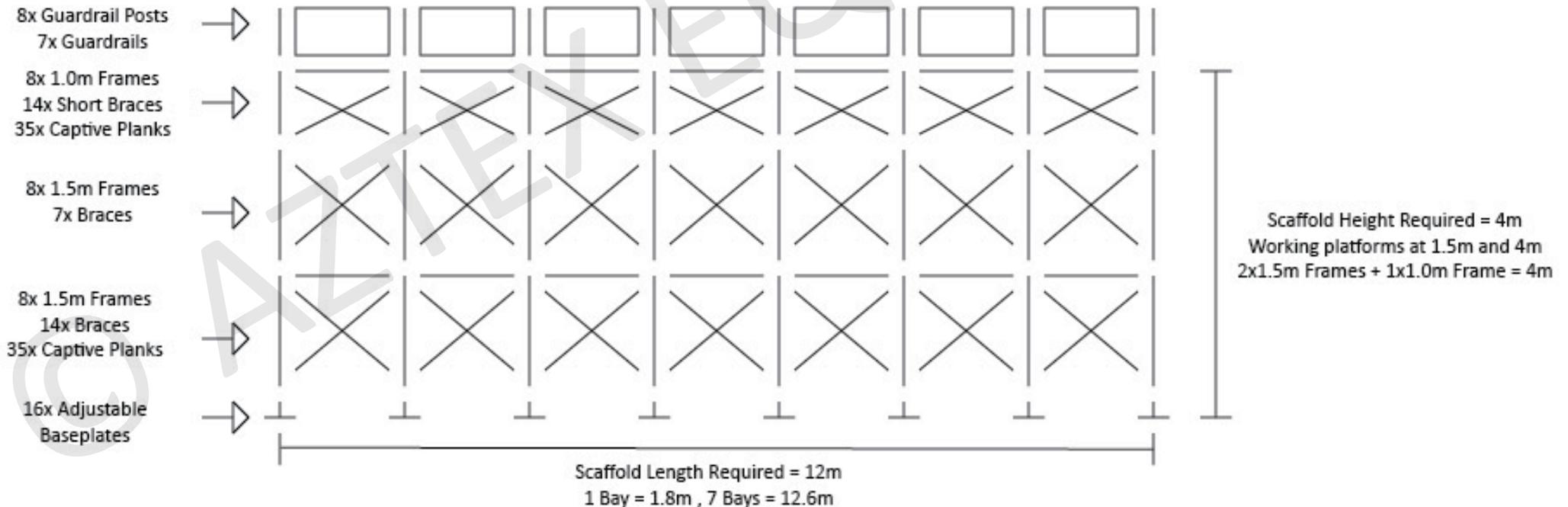
Step 4: Estimate the number of bays and lifts

1. Estimate the number of bays required to build the scaffold. You will need to know the length of the job. (For example, the length of wall being constructed).
2. Estimate the number of lifts required to build the scaffold. You will need to know the height to which the scaffold must be built. Remember, any job where a person or object could fall over 4 metres a certified scaffolder will be required to erect the scaffold. Also, the basic scaffold must not exceed a working height of 15 metres.



**Only a certified scaffolder can erect scaffolding where a fall exceeding 4 metres in height is possible.
The scaffold must not exceed a working height of 15 metres.**

Note: The diagram pictured below is an example of a scaffold plan (how to work out the required scaffold components) of a scaffold that is 12m long with a working platform of 4m and 1.5m. Using a diagram similar to this, in conjunction with the steps outlines in section 3.2 will help with calculating the quantity of scaffold components required.



Step 5: Estimate the number of working platforms required

1. A working platform is one that carries people and materials. The number of working platforms to be erected will depend on the job. This calculation will determine requirements for components such as guardrails, hatches and ladders.
2. The number of working platforms in use at any one point in time is limited to 3 working platforms in the vertical direction. Whilst more working platforms can be erected at the time of building the scaffold, only 3 platforms can be used (i.e. carry people and materials) at any given point in time. As work proceeds, some platforms will become redundant whilst others will come into use.



In the vertical direction, the number of working platforms is restricted to 3 at any one point in time.

3. In the horizontal direction there is no restriction on the number of working platforms in use.
4. Determine the number of working platforms to be included in the scaffold design and incorporate this in the scaffold plan.

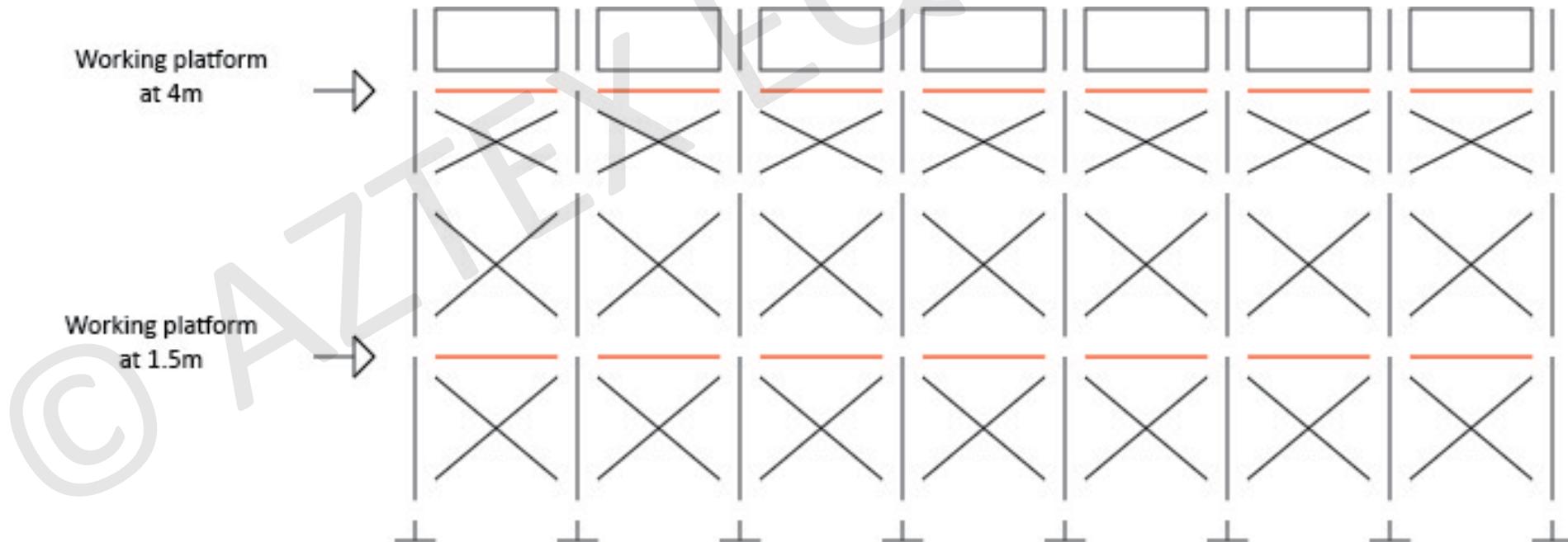


Figure X: Pictured is the same scaffold plan as on the previous page, note the working platforms hi-lighted in red.

Step 6: Determine tie requirements

1. Ties are used to secure and stabilise a scaffold. The type of tie and the components required will be determined by the job and the design of the scaffold. As a general rule of thumb tie requirements are based on a height to width ratio, (i.e. the higher and narrower the scaffold, the greater the need to tie the scaffold in).
2. Design and plan the system of ties. Consider:
 - The spacing of the vertical and horizontal tie assemblies
 - The load forces applied
 - The function of the scaffold
 - Access and egress points from working and access platforms
3. Estimate tie component requirements including the number of tubes and couplers required.



Ensure tubing and couplers used to tie in scaffolds conform to the relevant Standard AS 1576 and any other legislative requirement.

Step 7: Calculate scaffold component requirements

1. From the information compiled above:
 - Scaffold function – light, medium or heavy duty
 - Load rating – dead and duty live load
 - Platform dimensions
 - Number of bays
 - Number of lifts
 - Number of working platforms
 - Tie requirements
2. Calculate the type and number of components required to build the planned scaffold.

As a rule of thumb (and for a basic scaffold structure), there are certain primary components that are nearly always used when erecting a scaffold structure. See the diagram below.

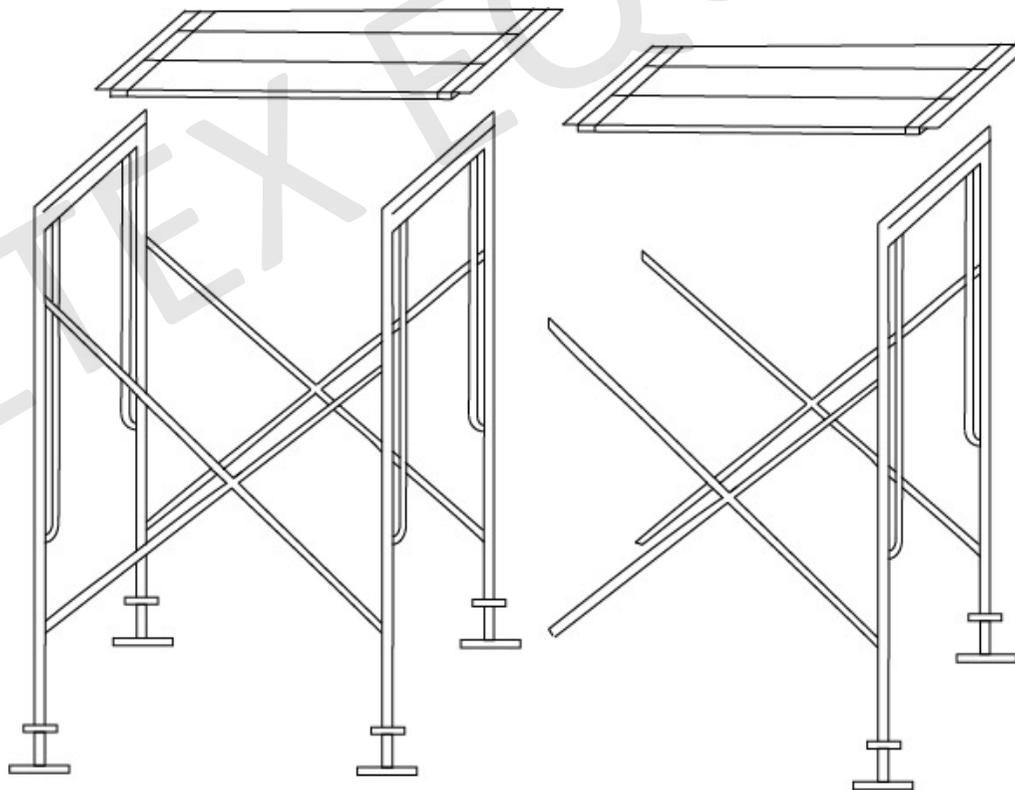
To erect a single bay you will need the following components:

- 2x Frames
- 2x Crossbraces
- 4x Adjustable baseplates
- Captive planks

For subsequent bays you will need the following components:

- 1x Frame
- 2x Crossbraces
- 2x Adjustable baseplates
- Captive planks

When erecting multiple lifts, the components are exactly the same as outlined above with the exception of the adjustable baseplates and the captive planks (depending on where working platforms are required).



Chapter 4: Inspection, Care and Maintenance

4.1: Inspection of Scaffold Components

The maintenance of components used in the construction of scaffolding is very important. Visual inspection is essential to provide a safe and reliable scaffolding inventory.

It is the responsibility of the:

- The supplier
- Erector
- User

To ensure the regular inspection of scaffold component parts. A suitably qualified and competent person should carry out such inspection.

Inspections should be undertaken:

- Routinely - as part of a regular schedule of hazard identification and risk assessment (not more than 30 days).
- At key times in the operational cycle – upon receipt, when removed from storage, installation and commissioning, in use and following dismantling
- When conditions or work practices change.

Damaged or unserviceable components must be set aside for repair or discarded in accordance with legal disposal requirements. Only suitably qualified and competent persons should repair damaged component parts.

Check each of the scaffold component parts for defect or damage in accordance with routine maintenance schedules and at key times in the operational cycle. Damaged or unserviceable components should be set aside for repair or disposal. The ready reckoner provides a guide to the inspection of scaffold components.

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4.1.1: Aztex Equipment Scaffold Component Inspection Ready Reckoner



Date: _____

Site: _____

YES	NO	Scaffolding Component Parts To Be Inspected
		Welded components are free of cracks or broken welds if YES - proceed with use. If NO - set aside for repair or disposal
		Tubing is free of splits if YES - proceed with use. If NO - set aside for repair or disposal
		Tubing is straight and not bent if YES - proceed with use. If NO - set aside for repair or disposal
		Tubing is free of cracks if YES - proceed with use. If NO - set aside for repair or disposal
		Tubing has not been crushed in any way and is free from dents and dimples if YES - proceed with use. If NO - set aside for repair or disposal
		The cross section of tubular members is round and without deviation if YES - proceed with use. If NO - set aside for repair or disposal
		Metal scaffold components have been checked to ensure they are free of rust both inside and out. This has been confirmed using a flashlight to inspect the insides if YES - proceed with use. If NO - set aside for repair or disposal
		There are no missing members if YES - proceed with use. If NO - set aside and replace missing components or send for repair or disposal
		The pinlocks on all frames are fully functional and free from wear or damage if YES - proceed with use. If NO - set aside for repair or disposal
		There is no evidence of components having been subjected to extremes of heat or fire if YES - proceed with use. If NO - set aside for repair or disposal
		The vertical legs of frames and other components with straight sections, are completely straight and without deviation if YES - proceed with use. If NO - set aside for repair or disposal
		Adjustable baseplate threads are in working order and free of damage if YES - proceed with use. If NO - set aside for repair or disposal
		Soleplates are of a suitable material (Standard requirements) and in serviceable condition if YES - proceed with use. If NO - set aside for repair or disposal
		Rivets or bolts on braces are in sound working order and free of wear and damage if YES - proceed with use. If NO - set aside for repair or disposal
		The ends of crossbraces are in sound working order and are not bent or broken if YES - proceed with use. If NO - set aside for repair or disposal
		Clamps are in sound working order and are not bent or broken if YES - proceed with use. If NO - set aside for repair or disposal
		Scaffold planks are sound and free of wear or damage such as bowed, warped or split sections if YES - proceed with use. If NO - set aside for repair or disposal
		Scaffold planks are sound and free of damage such as cut outs, burns, oil stains or projecting nails if YES - proceed with use. If NO - set aside for repair or disposal
		Component parts show no sign of exposure to chemical if YES - proceed with use. If NO - set aside for repair or disposal
		Component parts show no sign of exposure to extreme heat if YES - proceed with use. If NO - set aside for repair or disposal
		Frames and other components are square and unwarped if YES - proceed with use. If NO - set aside for repair or disposal
		Component parts are clean and free from foreign material such as dirt, grease, cement, adhesives. Especially where sections join each other if YES - proceed with use. If NO - set aside for repair or disposal
		Moving parts are lightly lubricated and move freely if YES - proceed with use. If NO - set aside for repair or disposal

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4.2: General Maintenance of Scaffold Components

Scaffold components must be regularly cleaned and inspected to ensure they are maintained in optimum condition and working order. Care of scaffold components will provide a safe and reliable scaffolding system.

4.2.1: General Cleaning

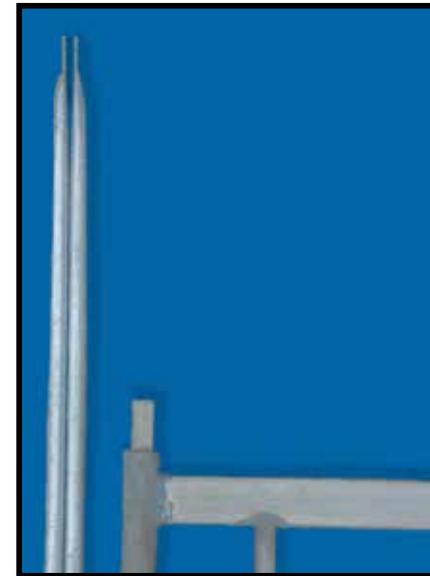
All components should be regularly inspected and cleaned. In cases of severe deterioration, the components should be discarded. Superficial cleaning should be carried out by scraping, brushing or other abrasive methods which do not affect any surface treatment such as galvanising.

Clean the threads on adjustable baseplates by wire brushing. Keep the scaffold as clean as possible but especially where sections are designed to join to each other (e.g. adjustable baseplates, pinlocks and all pivoting connections.)

Threaded parts require particular care when any treatment involving special cleaning processes or the deposit of protective coatings is applied, to ensure that threads retain their shape and size.



An example of dirty scaffold components



An example of clean scaffold components

4.2.2: Repairs

A scaffolder is very limited to the type of repairs they are authorised to carry out. All repairs must be performed by qualified persons who have received instructions specific to the equipment being repaired. Some points to consider in the repair of equipment include:

- Consult the manufacturer before attempting any repairs – there are many things that cannot be done to repair scaffolds.
- Only suitably qualified and competent persons should determine whether scaffolding components can be repaired or should be disposed of.
- Only qualified and approved persons should repair scaffold components.
- If there is any doubt about the soundness of component parts, the said component should be disposed of.
- Only genuine and approved manufacturer’s parts should be used to replace damaged or worn components.

Typical Defects	Repairs Required
Bowed or Slightly Bent Tubes	Tubes that have been bowed or slightly bent may be straightened provided it can be done without deforming the circular section of the tube.
Deformed Tubes	Any section of deformed tube must be discarded.
Straightening	Work hardening and consequent tendency to brittleness occurs during each bending or straightening operation, therefore straightening should only be carried out by a competent person.
Fittings	All fittings should be examined regularly and care taken that moving parts are sound and lubricated to ensure easy and positive movement. Heat must not be applied except by the manufacturer.

4.2.3: Maintenance of Planks

Maintenance entailing regular inspection and proof testing is necessary to ensure that planks reaching the end of their service life and which are no longer safe for use, are detected and removed from service. The following recommendations for care in maintenance are provided to assist users to maximise service life whilst maintaining the necessary levels of safety.

To maximise service life and ensure safety in use, planks should not be subjected to mechanical, physical or chemical forces. Such forces are likely to cause damage and render the plank unsafe for use.

- Clean and maintain planks regularly.
- Take precautions to prevent slag burns from oxy cutting or welding.
- Take precautions to prevent chemical contamination.
- Avoid overloading and stressing planks.
- Inspect planks regularly and in accordance with recommended inspection regimes to ensure they are safe to use.
- Remove any planks with obvious defects from service or those suspected of having been misused.
- Replace damaged or worn plank ends.

- Provide regular support for planks over long spans or those being used as ramps.
- Do not use planks over spans greater than those recommended.
- Do not drop planks from excessive heights.
- Do not drop heavy materials onto planks.
- Do not allow vehicles to drive over planks
- Do not use planks as crossover boards or duckboards for vehicles.
- Do not use planks as saw benches – even shallow saw cuts reduce strength.
- Do not spill strong acids or alkalis on planks.
- Do not paint over or treat planks in any way that may conceal defects.
- Do not stress planks by overloading or overstressing such as impact loading.

4.2.4: Testing and Verification of Planks

Where planks have been subjected to physical, mechanical or chemical degradation, they must be tested to verify continued use. Fractures resulting from overload may not be readily apparent by inspection - proof testing is the only means of detection. Therefore regular inspection and strength testing is recommended.

Whilst planks are largely unaffected by exposure to moderate strength acids or alkalis, strong acids and alkalis will attack the naturally occurring lignin which binds wood fibre and in time cause a reduction in plank strength. For planks used in these environments regular proof testing is recommended.

The frequency of testing depends upon the nature of use. Furthermore, any plank subject to trauma or showing any obvious signs of degradation should be withdrawn from use pending verification of strength by proof testing.



An example of split/damaged planks

4.3: Inspection of Erected Scaffolds

Erected scaffolds should be inspected as part of a regular schedule and at certain key times in the operational cycle. This means scaffolds should be inspected:

- At commissioning
- Daily – prior to use
- Routinely – every 30 days by a qualified person
- Prior to dismantling.

Apart from routine inspections, the principles of hazard identification and reporting should be employed at all times. This means, personnel working on or around scaffolding should be alert to scaffold hazards. People should also be aware of their obligation to report scaffold damage, site conditions or work practices that could place people at risk.



Not only is a regularly scheduled system of inspection required, but all personnel working on or around scaffolding should be aware of potential scaffold hazards and report hazards immediately.



A system of scaffold tagging is recommended to communicate the operational status or lock-out of a scaffold

4.3.1: Erected Scaffold Inspection Guidelines

Use the criteria outlined below when inspecting scaffolds. If any hazard or condition that could lead to injury or illness is identified, it should be reported immediately and appropriate corrective procedures actioned before the scaffold is signed off for use.

Inspection Criteria	Explanation
Site and Work Environment	
Sufficient public protection has been provided.	Where the scaffold has been erected adjacent to or over public space or adjoining property, controls such as hoardings, catch platforms, barricades, warning lights, illumination or shade cloth should be in place.
Sufficient safeguards against electric powerlines are provided.	Power lines are a major hazard. Scaffolds should be erected no closer than 4 metres from power lines.
Vehicle movement is strictly controlled.	Uncontrolled vehicle movement in close proximity to a scaffold is a hazard that may lead to the scaffold or its supporting structure collapsing or becoming unstable. Vehicle controls such as protective buffers or re-routing vehicles may be necessary.
Controls over crane operation are in place.	Where cranes operate in close proximity to a scaffold there is a risk that loads may snag on the scaffold or place personnel working on scaffolds in danger. Specific site procedures should be in place where cranes are used.
Controls over the storage, handling and use of hazardous substances are in place.	Where chemicals or hazardous substances are used on the scaffold or in the vicinity of the scaffold. Specific procedures to minimise risk should be in place.
Supporting Structure	
The supporting structure is in good condition.	Soil under the scaffold is well drained and consolidated to prevent water logging. Floors, walls and other structures that provide support or transmit loads from the scaffold are sound.
The supporting structure has adequate strength.	Some structures may require an engineer's certificate. Point loads transmitted by standards and other members such as ties, should be estimated, taking into account dead loads, live loads and environmental loads. The supporting structure may be strengthened by back propping or other suitable means.
Controls are in place to prevent adverse deterioration of the supporting structure.	A number of hazards can impact on the safety of scaffold support structures: <ul style="list-style-type: none"> • Soil/ ground movement and destabilisation • Trenching and excavation work • Demolition of supporting structures. To prevent deterioration of the supporting structure control measures must be implemented.
Methods to strengthen supporting structures are adequate.	Back propping complies with AS 3610. Controls are in place to ensure that any material or equipment used to strengthen a supporting structure is not removed or damaged.

Supporting Structure cont...	
The supporting structure is not overloaded from other sources.	Controls to prevent the following should be in place: <ul style="list-style-type: none"> • Vehicle loads • Stored materials • Impact forces • Debris build-up
Soleplates and Baseplates	
Sufficient soleplates are in place.	Soleplates should be provided to distribute the load transmitted by standards.
Soleplates are of a suitable material and in serviceable condition.	Recommended soleplates are used and conform to Australian Standard AS/NZS 4576.
Soleplates are secured.	Soleplates should be positioned to prevent them being dislodged or undermined.
Sufficient baseplates are in place.	All standards are fitted with a metal baseplate to distribute the load.
Baseplates are of the correct type and conform to specification.	Adjustable baseplates are in place and conform to AS/NZS 1576.
Baseplates are serviceable and of suitable dimensions.	Baseplates conform to AS/NZS 1576 and are not bowed or bent.
Baseplates are secure.	Where a risk assessment has identified the possibility of slippage or dislodgment, the baseplates should be secured by approved means (e.g. nails, screws or welding).
Scaffold Structure	
Standards are plumb.	Standards that are not vertical will take less load than standards which are vertical.
Platforms	
The scaffold has the required number of working platforms.	The number of working platforms should be sufficient for the intended work, but should be no more than the number stated in the design specifications and supplier information.
Working platforms are at the required location.	Working platforms should be positioned so that the intended job tasks can be carried out without unnecessary restriction or overreaching. The height of the platform and the amount of clearance from the working face are critical factors.
Platforms and supporting scaffold structures can safely support duty live loads and conform to specification.	The nature of the work to be performed from the scaffold and the weight of materials to be deposited on platforms will determine whether the platforms should be light duty, medium duty or heavy duty.
Platform dimensions are suitable for the intended end use.	Working platforms should be wide enough for the storage of any material that will need to be placed on the platform while maintaining clear access along their entire length and allowing sufficient space to perform the intended work tasks without unnecessary obstruction. Platforms need to be large enough to catch any falling debris.

Platforms cont...	
Adequate edge protection is in place.	Edge protection is required at the open sides and ends of all working platforms and access platforms from which a person or object could fall more than 2 metres or if required by risk assessment.
Platforms are correctly constructed.	Scaffold planks should be checked for deterioration or damage. Working platforms are required to be: <ul style="list-style-type: none"> • Slip resistant • Closely decked • Incapable of uplift under working conditions • Level • Free of trip hazards.
Planks are secured against wind where wind hazards have been identified.	Some locations (e.g. cyclone prone areas and alpine regions) are prone to wind gusts, which may dislodge planks.
Access and Egress	
Access and egress is provided to all working platforms.	A means of safe access and egress must be provided to all working platforms. This can be achieved with stairways, access ways, ladders or other suitable means.
Portable ladders are of an industrial grade, serviceable and correctly installed.	Industrial grade ladders for access and egress must be used. Ladders should be checked for defects and deterioration to conform to AS/NZS 1819.
Accessways are correctly installed.	Accessways must be 450mm wide for people or 675mm wide for people and materials.
Ties	
Ties are of adequate strength to stabilise the scaffold.	Tie assemblies should be spaced vertically and horizontally to stabilise the scaffold against the combined effect of: <ul style="list-style-type: none"> • Environmental loads • Live loads. Each tie assembly must have a minimum tensile and compressive working load capacity of 6.0kN.
There is clear access along the full length of working platforms and access platforms.	Ties should not obstruct in any way the full length of a working platform or access platform.
Tie tubes and couplers meet specification.	The type of tube and coupler used in the system of ties, conforms to AS/NZS 1576.

General Fitness for Purpose	
Clearances between the scaffold and adjacent scaffold are correct.	Specific clearances are required particularly where cladding or similar work is undertaken from a scaffold. Boilers and similar plant may be subject to significant expansion and contraction due to temperature variation (230mm max).
Adequate protection from falling debris is provided.	Some jobs may expose workers and or pedestrians to falling debris. Adequate and suitable precautions must be in place.
Approaches and platforms are effectively lit.	If insufficient natural lighting, artificial lighting must be erected and set up to avoid glare and deep shadows.

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Chapter 5: Transport and Storage of Scaffold Components

5.1: Transporting Scaffold Components

When transporting scaffold components follow the safety precautions outlined below.

- Use a suitable vehicle of adequate capacity.
- Distribute the load to suit the vehicle.
- Use suitable restraint equipment. Ensure it is in good condition and of adequate capacity.
- Provide adequate load restraint.
- Drive carefully and observe all road laws and site procedures.
- Regularly check load restraint during the trip.
- Comply with government laws, rules and regulations at all times. (For further information refer to: “Load Restraint Guide – Guidelines for the Safe Carriage of Loads on Road Vehicles”, Australian Government Publishing Service.
- Do not climb on stacks of equipment. They may be unstable and cause you to trip or fall or cause damage to scaffold components.
- Be careful when stacking or removing tubing from storage. It is round and will roll if not properly blocked.
- Use cribbing to minimise the chance of hand or finger crushing.
- Do not try to catch falling, sliding or slipping equipment.
- Use extreme caution when handling wet equipment, it can be very slippery.
- Follow the manufacturer’s instructions when using strapping equipment.
- When cutting strapping, wear eye and face protection and stand clear of the ends of the bands as well as any area where the equipment may fall when released.



Scaffolding equipment can cause injury unless handled correctly. Poor handling may also result in damage to scaffold components. Damaged components can reduce scaffold strength and stability, increasing the risk of scaffold collapse or destabilisation.

5.2: Storage of Scaffold Components

Proper storage of scaffolding equipment helps to ensure that scaffolding is safe and fit to be used. Improperly stored equipment can result in damage, loss of equipment strength, and loss of safe operation. Whether the storage is in a scaffolder's warehouse or at the job site, the following conditions should always be met:

- Store equipment so that it is easily accessible.
- Allow for the safe movement of trucks, forklifts or other handling equipment.
- Do not obscure access/egress points, emergency exits, safety signs and warnings or emergency equipment with scaffold components.
- Provide adequate support to keep scaffold components off the ground.
- Provide support between layers so that suitable materials can be handled by forklifts.
- Store different size parts in separate stacks.
- Clearly mark part numbers on all stacks.
- Provide boxes or bins for small parts.
- Segregate and isolate any component parts that are in need of repair. Store damaged components in a clearly marked area until repaired or disposed of to ensure they do not go back into the general inventory.
- Discard or destroy damaged parts following appropriate and legal disposal procedures.
- Do not stack equipment so high, that it becomes unstable. Unstable stacks can fall and cause serious injury or death as well as damage to component parts.
- Provide blocking to prevent tubing from rolling when being handled. Unsupported tubing may become damaged or roll onto personnel causing injury.
- Keep storage areas in a clean and orderly condition.
- Do not put scaffold components (especially planks) into storage when wet. Always dry component parts before storing away.
- Planks that remain wet for long periods of time (months) are likely to mildew and decay. Any plank showing evidence of mildew should be allowed to dry and tested for verification of strength before use.
- Wet planks should be stacked on level bearers well clear of the ground with spacers between each layer. Locate the stack in a dry, well ventilated location and align spacers with bearers. A minimum of three spacers per layer is recommended.
- Dry Planks should be stored under cover.



Examples of scaffolding component storage

Chapter 6: Procedures for the Erection and Dismantling of Scaffolds

6.1: Scaffold Foundations

The foundation is the supporting structure on which a scaffold is erected. To ensure scaffold stability, the scaffolder must first ensure a sound foundation. Scaffold foundations must be adequate to carry and distribute the loads imposed at each standard and of the whole loaded scaffold. An inadequate foundation can cause a scaffold to collapse.

To ensure an adequate foundation, consideration should be given to the intended use of the scaffold and the environment in which it is to be erected.

To work out whether the supporting surface or foundation is adequate, consideration should be given to the load the foundation will be required to bear.

6.1.1: Ground Conditions

Ground conditions will need to be assessed for adequacy before a scaffold is erected. Failure to identify hazardous ground conditions will lead to inadequate and unsafe foundations, exposing workers and other persons to risk.

Suitable ground conditions	Unsuitable ground conditions
<ul style="list-style-type: none">• Hard level surfaces such as concrete or steel• Well compacted and drained soils	<ul style="list-style-type: none">• Soft, loose soils• Uncompacted surfaces• Water logged soils• Subsidence prone areas• Areas exposed to excavation or trenching works

If you are unsure or have any concerns about the stability of the ground conditions, a suitably qualified and competent person should be consulted. It may be necessary to consult a civil or structural engineer.

6.1.2: Safe Foundations

The purpose of a good foundation is to spread the load over a wide area. Consideration should be given to the ground or structure on which the scaffold is to be erected as well as the live and dead loads to be carried. The use of baseplates and soleplates are necessary to stabilise scaffolds and their foundations.

A baseplate is a member used to distribute the load through a soleplate to the ground or other supporting structure. A baseplate is a plate that is able to distribute the load from a load bearing member to a supporting structure. The foundation conditions will determine the requirement for baseplates and soleplates and the dimensions and specifications of each.

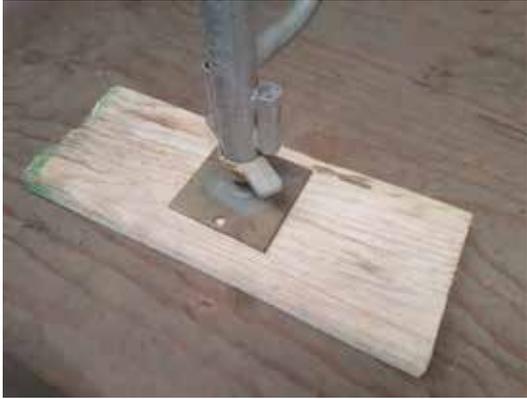
The total load and the conditions of the supporting soil or floor determine the size of the foundation. When soil conditions are poor or frozen, it may be necessary to dig down to an adequate base material. If this is not practical, then the leg load must be spread over a much larger area using larger soleplates or continuous decking under the scaffold legs. To support scaffolds, backfilled soils must be well compacted and levelled. Mud or soft soil must be replaced with gravel or crushed stone that has been well compacted.



At all times, baseplate and soleplate design and use should conform to AS/NZS 1576

Adequate Foundation	What It Looks Like	Explanation
<p>Hard Level Surfaces such as concrete or steel</p>	 <p>The hard concrete surface provides an adequate foundation, however, the verticle member (standard) is supported on a baseplate.</p>	<p>Standards should be supported on baseplates.</p> <p>Soleplates may be necessary if the surface requires protection or a larger surface area.</p> <p>A suitably qualified person should be consulted if unsure.</p>

Adequate Foundation	What It Looks Like	Explanation
<p>Point loads from standards are evenly distributed by baseplates and soleplates</p>	 <p>Soleplates distribute point loads from baseplates and standards on a firm ground</p>	<p>Soleplates distribute the load and ensure a sound foundation.</p>
<p>On sloping ground, the soleplate is level and fully bedded</p>	  <p>Fully bedded and level soleplates provide a sound foundation on sloping ground</p> <p>Remove earth to level and square the foundation for soleplates</p>	<p>Excavate or remove earth to bed a soleplate so that it is square and level. This may require some spade work or over large areas, powered equipment may be necessary.</p> <p>Do not level the foundation by backfilling unless appropriate backfilling material is used and it is well compacted. Simply shovelling earth to level and fill foundations increases the risk of subsidence and erosion.</p>

Adequate Foundation	What It Looks Like	Explanation
<p>Timber flooring, pedestrian pavements and any other supporting structure likely to be adversely affected by point loads from standards, require the load to be distributed by baseplates and soleplates.</p>		<p>A qualified structural engineer should be consulted to determine load ratings and foundation requirements including use of baseplates and soleplates to distribute point loads. Soleplate dimensions should also be assessed.</p>
<p>Near excavations – an adequate foundation supports the scaffold without any risk of subsidence</p>	 <p>The distance from the trench is greater than or equal to the depth of the ditch.</p>	<p>The legs are placed at least the depth of the ditch away from the edge of the excavation to eliminate subsidence risk.</p>
<p>Soft asphalt or compacted gravel</p>	 <p>Soleplates of dimension 500mmx220mm distribute the load of baseplates on a foundation of compacted gravel.</p>	<p>Soleplates with dimensions of 500mm x 220mm must be used under baseplates.</p>



Foundations must be maintained in good condition for the life of the scaffold

6.1.3: Unsafe Foundations

The stability of the scaffold depends on a safe foundation. Poor work practices such as those shown in the figures below will destabilise a scaffold, exposing workers and others to the risk of serious injury or death.

Unsafe Foundation	What It Looks Like	Nature Of Risk	Control
<p>Standard sitting directly on unstable foundation (e.g. scrap materials such as timber and bricks).</p>	<div style="display: flex; flex-direction: column; align-items: center;">  <p data-bbox="1084 802 1408 874">Unstable foundation and concentrated point load</p>  <p data-bbox="1084 1230 1408 1302">Unstable foundation and concentrated point load</p> </div>	<p data-bbox="1458 767 1771 911">Scrap timber, bricks and tiles fail to meet the specifications of AS/NZS 1576.</p> <p data-bbox="1458 959 1771 1031">The point load is concentrated.</p> <p data-bbox="1458 1078 1771 1150">The foundation is unstable.</p> <p data-bbox="1458 1198 1771 1342">High risk of foundation collapsing and causing scaffold to overturn/collapse.</p>	<p data-bbox="1821 919 2134 1062">Baseplates and soleplates meeting the requirements of AS/NZS 1576 to be used.</p>

Unsafe Foundation	What It Looks Like	Nature Of Risk	Control
<p>Baseplate/s not centrally supported on soleplate/s</p>	<div data-bbox="450 153 976 552" data-label="Image"> </div> <p data-bbox="1160 293 1406 363">Baseplate off centre to soleplate</p> <div data-bbox="450 628 976 1027" data-label="Image"> </div> <p data-bbox="1128 794 1406 865">Baseplate straddling soleplate and ground</p> <div data-bbox="450 1110 976 1509" data-label="Image"> </div> <p data-bbox="1010 1257 1406 1366">Sloping foundation - soleplate incorrectly bedded and baseplate off centre</p>	<p>Scaffold destabilised – possible risk of collapse due to:</p> <ul style="list-style-type: none"> The baseplate slipping from the soleplate Skewing of the scaffold. 	<p>Baseplates must always be centrally supported on soleplates.</p>

Unsafe Foundation	What It Looks Like	Nature Of Risk	Control
<p>No baseplate – standard placed directly on ground or flooring</p>	 <p>Standard seated directly on ground – point loading extremely high</p>	<p>Point Load/s not evenly distributed destabilising scaffold and increasing the risk of the scaffold overturning or collapsing</p>	<p>Load from the standard to be distributed by both baseplates and soleplates</p> <p>Baseplates and soleplates meet Australian Standard specifications AS/NZS 1576.</p>
	 <p>Standard placed directly on concrete floor – point loading extremely high</p>		
	 <p>Standard placed directly on suspended particle board floor</p>		

Unsafe Foundation	What It Looks Like	Nature Of Risk	Control
<p>Soleplate straddling a trench or excavated area</p>	 <p>Soleplate straddling a trench</p>	<p>Scaffold destabilised – possible risk of collapse due to:</p> <ul style="list-style-type: none"> Uneven point load distribution Subsidence and collapse of structure into the trench. 	<p>Soleplates to be bedded in a firm foundation away from trenches or excavation work at all times.</p> <p>The distance of the scaffold from the trench positioned near trenches or excavation areas</p>
<p>Unstable foundation – bricks stacked to raise and level scaffold. Point load concentrated on unstable stack.</p>	 <p>Point load concentrated on an unstable foundation of bricks</p>	<p>The point load is concentrated.</p> <p>The foundation is unstable.</p> <p>High risk of foundation collapsing causing scaffold to overturn/collapse.</p>	
<p>No soleplate under baseplate</p>	 <p>The baseplate has no soleplate for scaffold support and load distribution over the foundation</p>	<p>Concentrated point loads.</p> <p>No soleplate to distribute load evenly over a foundation that would normally require a soleplate.</p> <p>High risk of scaffold overturn or collapse.</p>	<p>Soleplates to be used on all required foundations.</p> <p>Soleplates of type and dimension conforming to AS/NZS 1576 to be used.</p>

Unsafe Foundation	What It Looks Like	Nature Of Risk	Control
<p>Soleplate positioned too close to a trench or excavated area</p>	 <p>Trench being cut under scaffold</p>	<p>Scaffold destabilised – possible risk of collapse due to:</p> <ul style="list-style-type: none"> Uneven point load distribution Subsidence and collapse of structure into the trench. 	<p>Relocate scaffold to sound foundation/s.</p>

6.1.4: Foundations on Sloping Ground

Where the scaffold is founded on sloping ground, each standard must have a stable foundation. Slopes steeper than a one in ten gradient must be assessed by a suitably qualified and competent person. All soleplate areas must be levelled by excavating rather than by filling and compacting.



Scaffold founded on sloping ground – levelled and squared

Adequate Foundation	What It Looks Like	Explanation
<p data-bbox="91 807 434 879">Soleplate is level and fully bedded.</p>	<div data-bbox="488 188 1014 584">  </div> <p data-bbox="1128 485 1426 635">Fully bedded and level soleplates provide a sound foundation on sloping ground</p> <div data-bbox="488 639 1014 1037">  </div> <div data-bbox="488 1094 1014 1492">  <p data-bbox="1079 1141 1426 1251">Remove earth to level and square the foundation for soleplates</p> </div>	<p data-bbox="1458 560 2159 707">Excavate or remove earth to bed a soleplate so that it is square and level. This may require some spade work or over large areas, powered equipment may be necessary.</p> <p data-bbox="1469 868 2145 1051">Do not level the foundation by backfilling unless appropriate backfilling material is used and it is well compacted. Simply shovelling earth to level and fill foundations increases the risk of subsidence and erosion.</p>

Adequate Foundation	What It Looks Like	Explanation
<p>Point loads are distributed by a baseplate on a fully bedded and level soleplate</p>	 <p>Point load distributed by a baseplate and soleplate</p>	<p>The baseplate must be centred on the soleplate. The soleplate must be fully bedded on a level surface.</p>
<p>Level foundations ensure a level and square scaffold</p>	 <p>Square and level scaffold on sloping ground</p>	<p>Scaffold platforms must be square and level. On sloping ground this can only be achieved where the foundations bearing the point loads are square and level.</p>

6.1.5: Unsafe Foundations on Sloping Ground

Unsafe Foundation	What It Looks Like	Nature Of Risk	Control
<p>Unlevel foundation on sloping ground</p>	 <p>Soleplates have been laid straight onto sloping ground without levelling the foundation</p>	<p>Scaffold collapses due to:</p> <ul style="list-style-type: none"> • Soleplate slides downhill • Baseplate slips off soleplate. 	<p>Level the foundation before erecting scaffold. Ensure soleplate level and fully bedded.</p>

Unsafe Foundation	What It Looks Like	Nature Of Risk	Control
<p>Unsuitable materials used to chock baseplates to level foundation</p>	 <p>Discarded building materials used to chock baseplates to achieve a level scaffold</p>  <p>Levelling achieved by the chocking of standards</p>	<p>Scaffold collapses due to:</p> <ul style="list-style-type: none"> •Collapse of foundation •The baseplate slips off the foundation. 	<p>Level the foundation before erecting scaffold.</p> <p>Ensure soleplate level and fully bedded.</p> <p>Only use soleplates conforming to AS/NZS 1576.</p>
<p>Soleplate is not fully bedded</p>	 <p>Soleplate is not fully supported by the foundation</p>	<p>Scaffold collapses as a consequence of subsidence.</p> <p>Soleplate moves on the foundation destabilising the scaffold.</p>	<p>Level the foundation before erecting scaffold.</p> <p>Ensure soleplate level and fully bedded.</p>

Unsafe Foundation	What It Looks Like	Nature Of Risk	Control
<p>Baseplate not centred and unsupported</p>	 <p>Baseplate rides high of the soleplate because the foundation is unlevel</p>	<p>Point loads are not uniformly distributed over the soleplate causing the scaffold to be unstable.</p> <p>High risk of collapse.</p>	<p>Level and fully bed soleplate.</p> <p>Centre baseplate on soleplate and ensure load is fully and uniformly distributed.</p>

6.1.6: Procedure for Siting Scaffolds

Step 1: Perform a site inspection

1. Perform a site inspection. The bearing surface must be able to adequately support the scaffold and all the loads placed on it.

Step 2: Assess the site conditions to ensure suitability and capability to support the scaffold structure.

1. Determine the subsurface conditions in a general way – using the ready reckoner as a guide (see section 6.1.7 for the Siting Scaffolds Ready Reckoner).
2. Determine which of the common types of supports are most suitable for construction under the existing conditions. Consideration must be given to:
 - Capacity to carry the required loads
 - Likelihood of settling causing instability.
3. Reject any types of supports that are obviously unsuitable. If you are unsure of the capacity of the supports to meet the required specifications consult a structural engineer or competent person.
4. Make a detailed study of the remaining types of supports and tentative scaffold designs. This will include obtaining more detailed information about the scaffold loads and subsurface conditions to determine the number and size of soleplates required.
5. If the foundation is an existing structure, contact a suitably qualified person to determine whether the structure is capable of supporting the scaffold structure and loads.
6. Use the ready reckoner (section 6.1.7) as a guide whilst making your assessment.

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6.1.7: Aztex Equipment Scaffold Siting Ready Reckoner

Date: _____

Site: _____

YES	NO	
		Soil is well consolidated If YES - this aspect of the supporting structure is in good condition. If NO - look for alternative site or seek expert advice
		Soil is well drained to prevent water-logging If YES - this aspect of the supporting structure is in good condition. If NO - look for alternative site or seek expert advice
		Trenching and/or excavation hazards have been identified If YES - this aspect of the supporting structure is in good condition. If NO - conduct a risk assessment to identify any hazards or seek expert advice
		Identified trenching and excavation hazards have been adequately controlled If YES - this aspect of the supporting structure is in good condition. If NO - implement appropriate controls and seek expert advice
		All necessary measures have been taken to adequately strengthen the supporting structure If YES - implement controls. If NO - identify the necessary controls and implement appropriate actions seeking expert advice where necessary
		The supporting structure is adequate to carry the combined dead and live loads If YES - continue with assessment. If NO - look to reassess scaffold requirements seeking expert advice where required
		There are sufficient soleplates to distribute the full load transmitted by the standards without damage or failure If YES - continue with assessment. If NO - recalculate requirements seeking expert opinion as required
		The soleplate are of a suitable material (meeting Standard requirements) and in serviceable condition If YES - continue with assessment. If NO - replace soleplates with those meeting Standard requirements
		Soleplates can be positioned on site to prevent them from being dislodged or undermined If YES - this aspect of the supporting structure is adequate If NO - determine appropriate actions seeking expert advice
		There are sufficient baseplates to distribute the combined live and dead loads If YES - this aspect of the supporting structure is adequate If NO - determine appropriate actions seeking expert advice
		Baseplates are of an appropriate type to provide adequate levelling and prevent dislodgement If YES - continue with assessment If NO - replace baseplates with those meeting Standard requirements
		Baseplates are serviceable and of suitable dimensions If YES - continue with assessment If NO - replace baseplates with those meeting Standard requirements
		Hazards associated with slippage or dislodgement have been assessed and provisions for fixing the baseplates have been made If YES - this aspect of the supporting structure is adequate If NO - determine appropriate actions seeking expert advice

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6.2: Setting Up the Work Area

Step 1: Check the unloading site and ensure safety measures are implemented

1. Check into the site, advising the site manager or supervisor of delivery of scaffold components.
2. Check with the site manager or supervisor at the location of the unloading zone. This should be in close proximity to the erection site to reduce manual handling.
3. Undertake site induction if this is the first time on the site. Seek information about the worksite and conditions to verify scaffold requirements.
4. Proceed to the unloading area.
5. Check the area designated for unloading. Ensure the unloading procedure and placement of scaffold components does not:
 - Interfere with the movement of site traffic
 - Block emergency access and egress points (people and vehicles)
 - Place site workers or drivers of other vehicles at risk
 - Place visitors to the site or the public at risk
 - Block thoroughfares.
6. Be conscious of the work area and take the necessary precautions to safeguard personal health and safety and that of your fellow workers. Take into account the activities of fellow workers and any plant or vehicles operating in the vicinity.
7. Put on any personal protective equipment (PPE) required. This should include safety boots and scaffolder's gloves as a minimum. The site risk assessment may require other forms of PPE such as hard hats, hearing protection, safety eyewear. If unclear of the PPE requirements, check with the site manager or supervisor before commencing work.

Step 2: Unload scaffold components

1. Using correct lifting and carrying techniques, commence unloading the vehicle of scaffold components. Remove topmost items first.
2. Stack the components into groups of like pieces to optimise efficiency of the erection process



Components stacked into groups of like pieces to optimise efficiency

When stacking components:

- Do not stack heavy items on top of lighter items – there is a risk of damaging components and therefore destabilising the scaffold once erected
- Do not stack anything on top of ladders – ladders can be easily damaged which will reduce their load bearing capacity
- Lay frames flat to prevent bending or distortion, which will reduce the load bearing capacity of the erected scaffold.



Grouped together, the erection process is faster and more efficient. Components are less likely to sustain damage due to poor handling

6.3: Erecting a Scaffold

When the first bay is erected, all subsequent bays are built onto it.

Step 1: Protect workers and pedestrians from scaffold hazards

1. Cordon off the scaffold erection site with high visibility tape to prevent injury to pedestrians and persons working in the vicinity.

Step 2: Check scaffold components for wear or damage

1. Check each of the scaffold component parts for defect or damage prior to use. Damaged or unserviceable components should be set aside for repair or disposal. (See Section 3.1 *Inspection and Maintenance of Scaffold Components*).

Step 3: Erect the First Bay

1. Locate the work area or starting point for the first bay. Starting points include either an internal corner or where the ground is sloping, the highest point. On sloping ground, always work down hill when the scaffold is two or more bays.
2. Place the soleplates for the first bay (four in all) in their approximate locations using the tape measure as a guide to the relevant positioning. The soleplates are set to the approximate width of the scaffold frame and the distance between the first frame and second frame of the bay. (Figure 6.01)
3. Place an adjustable baseplates on each soleplate. These should be centred and squared as close as possible to their final position. (Figure 6.02)
4. Using the tape measure, set the starting point adjustable baseplate to 25mm above its lowest adjustment. Eye level the other three adjustable baseplate wing nuts to the same height. The initial adjustments are eye levelled in response to the slope of the ground (Figure 6.03)
5. Lay the first frame on the ground in line with the adjustable baseplates. (Figure 6.04)
6. Insert the two adjustable baseplates into the bottom of the frame standards. (Figure 6.05)
7. Check that the pinlocks located on the frame are open. Attach a cross brace first to one side of the frame and then to the other side of the frame. The crossbrace is attached by slipping the punched holes of the brace over the open pinlocks and then locking the brace in position by closing the pinlock. (Figures 6.06, 6.07, 6.08, 6.09, 6.10)
8. Stand the frame up so that the adjustable baseplates are positioned in the centre of the soleplates. Rest the unattached ends of the crossbraces on the ground to support the frame in a near vertical position. (Figure 6.11)
9. Lay the second frame on the ground and insert its 2 x adjustable baseplates into the bottom of the standards. (Figure 6.12)

10. Stand the frame up placing the adjustable baseplates in the centre of the soleplates. Attach the unattached ends of the two crossbraces to the four pinlocks. Lock the pinlocks to secure the crossbraces. (Figures 6.13, 6.14)
11. Square the bay by measuring diagonally between the four standards and moving the location of the adjustable baseplates until the two measurements are equal in each direction. Whilst undertaking this task, it is important to keep the bay in line with the work area (i.e. the bay line must remain aligned to the face of the work area such as a brick wall). During the process the soleplates may need to be centralised to ensure correct and accurate alignment. (Figure 6.15)
12. Level the first frame by placing a spirit level on the outside of the low side standard and raise or lower the adjustable baseplate wing nut as required. (Figure 6.16)



Always start on the low side when levelling the adjustable baseplates

13. Level and plumb the second frame to the first frame by placing a spirit level on the backside of each standard one at a time and raise or lower the adjustable baseplate wing nut as required. This stage of erecting a scaffold is critical as any inaccuracy here will be magnified as the whole scaffold is completed. (Figure 6.17)



Levelling and plumbing the frames of the first bay are critical to the stability and safety of the scaffold as any inaccuracy here will be magnified as the whole scaffold is completed.



Figure 6.01: Positioning the soleplates for the first bay



Figure 6.02: Baseplates positioned on top of the soleplate



Figure 6.03: Adjusting the starting point adjustable baseplate to 25mm above the lowest point



Figure 6.04: The frame is aligned (on the ground) with the adjustable baseplates



Figure 6.05: Inserting the adjustable baseplates into the frame standards



Figure 6.06: Attaching a crossbrace to one of the standards of the frame



Figure 6.07: The pinlock in the open position



Figure 6.08: Slipping the punched hole of the crossbrace over the open pinlock



Figure 6.09: The pinlock in the closed position to secure the crossbrace to the frame standard



Figure 6.10: Crossbraces attached to both sides of the frame



Figure 6.11: Standing the frame up to the near vertical position



Figure 6.12: The second frame positioned for erection



Figure 6.13: Attaching one of the unattached ends of the crossbrace to the second scaffold frame



Figure 6.14: Crossbraces attached at both ends with the frames of the first bay standing vertical



Figure 6.15: Measuring and adjusting the frames to ensure the bay is square and distances in both directions is equalised



Figure 6.16: To level the frame, a spirit level is attached to the standard and the baseplate adjusted accordingly



Figure 6.17: Levelling and plumbing the second frame to the first

Step 4: Erect the second bay

1. If more than one bay is required, attach two crossbraces to the four pinlocks of the second frame. Lock the pinlocks to secure the crossbraces of the second bay. **(Figures 6.18, 6.19)**
2. Place two soleplates and adjustable baseplates in the approximate location of the third frame or end frame of the second bay. Eye level the adjustable baseplate wing nuts to the same height as the second frame. **(Figure 6.20)**
3. Lay the third frame on the ground and insert its two adjustable baseplates into the bottom of the standards. **(Figure 6.21)**
4. Stand the frame up placing the adjustable baseplates in the centre of the soleplates and attach the unattached ends of the two crossbraces to the four pinlocks of the frame. Lock the pinlocks to secure the crossbrace. **(Figure 6.22)**
5. Square the bay by measuring diagonally between the four standards and moving the location of the adjustable baseplates until the two measurements in each direction are equal. Keep the bay in line with the work area and centralise the soleplates if necessary.
6. Level and plumb the second frame to the first frame by placing a spirit level on the backside of each standard one at a time and raise or lower the adjustable baseplate wing nut as required. **(Figure 6.23)**



Figure 6.18: Attaching the crossbraces of the second bay



Figure 6.19: Attaching the crossbraces of the second bay



Figure 6.20: Positioning the soleplates and baseplates of the end frame of the second bay



Figure 6.21: Aligning the third frame with the adjustable baseplates



Figure 6.22: Securing the crossbraces of the second bay



Figure 6.23: Levelling and plumbing the second bay

Step 5: Build subsequent bays as required

1. Where additional bays are required, follow the procedures detailed in Step 2: Erect the second bay. Three bays are shown in Figure 6.24



Figure 6.24: Three bays

Step 6: Build a work platform or interim platform (where the platform is not a working platform)

1. If the first level is to be used as a work platform, fully plank the platform except for an end bay where an access platform and ladder will be positioned (see point 4 and 5 of this step). Taking the first plank and entering through the end frame (Figure X), lift the plank over your head and position the plank ends over the transoms of the frames. (Figures 6.25, 6.26)
2. Continue to position planks along the first level until it is fully planked. (Figure 6.27)
3. Where the first lift is not a working platform and only to be used to continue erecting subsequent lifts, install a minimum of two planks in each bay except the end bay where an access platform or hatch deck will be installed. Install the planks one at a time, holding them in the centre, lifting them overhead and positioning them in the middle of the bay. Under no circumstances should a deck, erected purely for the purpose of erecting subsequent lifts, be used as a work platform. (Figure 6.28)
4. Place a ladder in an end bay. (Note this is positioned at the second frame not the end frame). Place a soleplate under the feet of the ladder to ensure a firm footing. (Figure 6.29)
5. Place an access platform in the end bay with the hatch opening positioned above the ladder. (Figure 6.30)



Figure 6.25: Entering through the end frame



Figure 6.26: Placing the plank over the frame transoms



Figure 6.27: A fully planked work platform where the first level is used as the work platform



Figure 6.28: Planks positioned purely for the purpose of erecting subsequent lifts.



Figure 6.29: Positioning a ladder in an end bay



Figure 6.30: The access platform and ladder positioned in the end bay.

Step 7: Erect the second level (lift) of the scaffold and erect ties as required

1. Climb onto the first level platform via the ladder. (Figure 6.31)

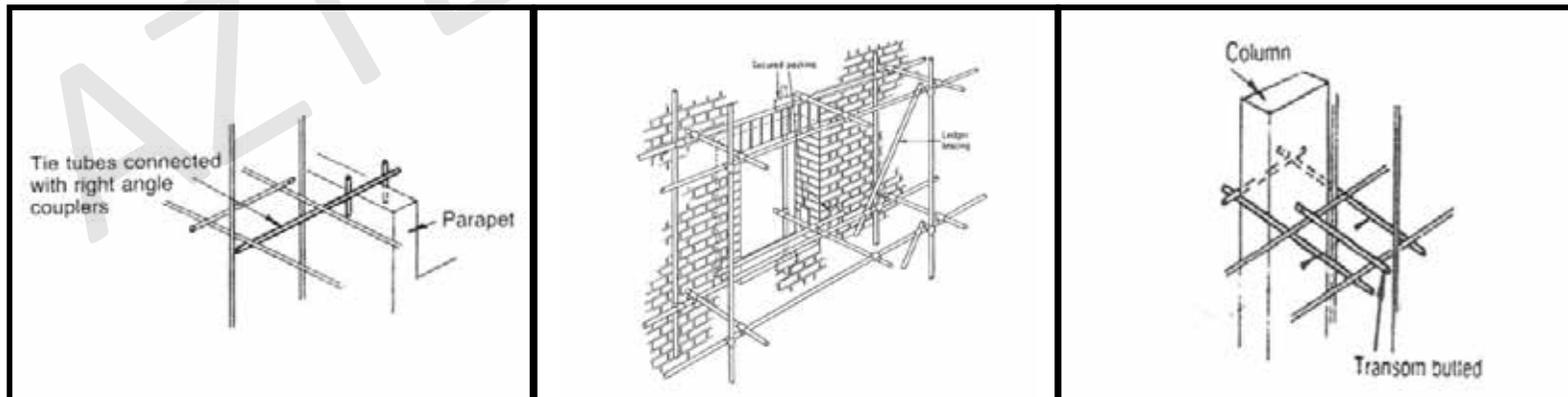


WARNING - At this point the scaffolder working on the scaffold is subject to a fall hazard. Persons erecting scaffolding must be physically well and mentally alert to work above ground level. Constant vigilance, balance, ability and concentration are required. Never work from outside of the scaffold. Always work from the inside of the scaffold. When working above ground level, a second person is required to work on the ground to pass equipment and for safety reasons.

2. When you can no longer work on the ground to erect the scaffold, solicit the assistance of a second person to pass equipment from the ground. When raising equipment, only use rope that is in good condition, carries a load rating suitable to the load and meets Australian Standards. (Figure 6.32)
3. Lift the first frame and place it securely on the spigots of the end frame of the lift below. (Figure 6.33)
4. Lift the second frame and place it securely on the spigots of the adjacent frame of the lift below. (Figure 6.34)
5. Attach the crossbraces (two in the first bay of the second lift) to the pinlocks of the first and second frames (eight in total). Lock the pinlocks to secure the crossbraces. (Figure 6.35, 6.36)
6. Commence erecting ties. Where required, ties should be erected at this point to stabilise and secure the scaffold.



Do not underestimate the number of ties required. The scaffold must be properly and adequately secured.



Some examples of ties used to stabilise and secure scaffolding

7. Collect the required number of scaffold tubes and couplers.
8. Position a tube/s between the scaffold and the structure.
9. Attach the tube to the scaffold using the appropriate coupler. (Figure 6.37)
10. Continue the procedure of tying (points 8 and 9) as the scaffold structure is built.
11. If more than 1 x bay is required, lift the third frame and place it securely on the spigots of the adjacent frame of the lift below.
12. Attach two crossbraces to the eight pinlocks of the second and third frames. Lock the pinlocks to secure the crossbraces to the frames. (Figure 6.38)



Do not erect frames until they can be immediately secured with crossbraces.

13. Continue to erect subsequent bays as per the second bay (points 4 and 5).
14. Continue to erect subsequent lifts as per the procedure detailed in Step 5: Erect the second level (lift) of the scaffold. This procedure is followed until a working platform height is reached.



Figure 6.31: Accessing the work platform or second lift via the hatch deck and ladder



Figure 6.32: The building of subsequent levels is a two person operation



Figure 6.33: Positioning the first frame of the next lift



Figure 6.34: Positioning the second frame of the next lift



Figure 6.35: Securing first one cross brace in the first bay of the second lift



Figure 6.36: Securing the second cross brace in the first bay of the second lift

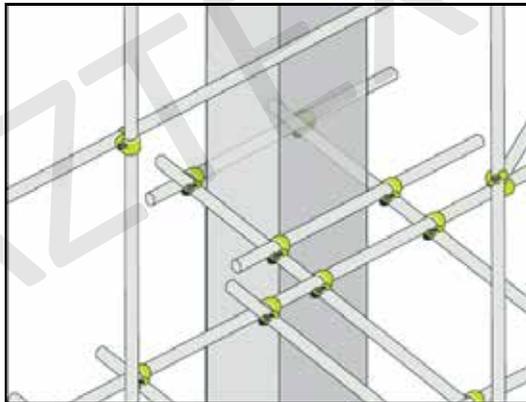


Figure 6.37 Tying the scaffold in to stabilise and secure the scaffold structure - tube and coupler tie



Figure 6.38: The third frame positioned with the scaffolder opening the pinlocks to attach the cross brace

Step 8: Install the guardrails

Guardrails ensure the safety of personnel working on the work platform or access way and prevent objects falling from the work platform onto other workers and pedestrians below. Guardrails are attached to those sides of the scaffold that are open and where there is a risk of falling.



Guardrails must be positioned on all open sides of the scaffold where the bay is used as a work platform or access way.

1. Lift the required number of guardrail posts onto the working platform before starting to install the guardrail. Use correct lifting techniques, ensure any ropes meet Australian Standards and ensure that posts are secure before lifting them onto the platform.
2. One at a time and in the required bay, place a guardrail post on top of the frame standard of the lift below. **(Figure 6.39)**
3. Close the clamp but do not over tighten it. This allows the post to be rotated into position. **(Figure 6.40)**
4. Take the guardrail and with the end of the scaffolder's spanner, loosen the bolts on the guardrail hooks so that they are free to slide. **(Figure 6.41)**
5. Lift the guardrail into position. **(Figure 6.42)** To do this:
 - sit the two lower hooks of the guardrail in the guardrail post spigots
 - line up the two upper hooks with their guardrail post spigots – you may need to rotate the post slightly to ensure it sits in the correct position (this is why the clamp is not initially fully tightened)
 - lower the guardrail into position ensuring all four hooks are in their corresponding spigots
 - tighten the guardrail hooks with the scaffolders spanner
 - tighten the clamps of the guardrail posts with the scaffolders spanner.
6. Secure the ladder. **(Figure 6.43)** To do this:
 - rest a length of scaffold tube across the top of the guardrails on either side of the platform to determine the position
 - secure a right angle coupler to the standard
 - secure the scaffold tube through the right angle coupler
 - tighten the bolts of the right angle coupler to fully secure the ladder rail.
7. Hook the ladder or tie the ladder to the ladder rail. Ensure the feet of the ladder are seated firmly on the ground and the ladder is straight and on the correct incline.
8. An example of basic scaffold constructed following the procedures outlined in 5.3 Erecting Scaffolding is shown below. **(Figure 6.44)**



Figure 6.39: Placing a guardrail post in position



Figure 6.40: Closing the clamp



Figure 6.41: Loosening the bolts of the guardrail hooks



Figure 6.42: Installing the guardrail



Figure 6.43: Fixing the ladder rail



Figure 6.44: A three bay, single lift scaffold structure

Step 9: Inspect and approve scaffold ready for use

1. Once a scaffold has been erected, it must be inspected by a qualified scaffolder and approved as “Ready to Use”. A scaffold approval system requires that a certified scaffolder inspect the erected scaffold and approve it fit for use before anyone uses the scaffold or any materials are loaded onto the working platform.
2. Ensure the scaffold is inspected by a certified scaffolder and a “Ready to Use” approval certificate is issued before anyone is allowed to enter the scaffold structure.



Some examples of “Ready to Use” scaffold tags

6.4: Erecting a Scaffold with an Intermediate Platform and Top Working Platform

Step 1: Erect the first and second levels

1. Erect the first and second levels of the scaffold as per the procedure detailed in Section 5.3 Erecting Scaffolding.

Step 2: Prepare the top working platform

1. With one person working on the ground to pass component parts, place two planks, (one at a time) across the transoms of the frames of the second lift. Leave a space of one plank width to enable component parts to be passed from the ground to the second lift with ease and safety. **(Figure 6.45)**



Use correct manual handling procedures at all times when lifting scaffold components.

2. Position a ladder in the end bay making sure the feet sit squarely on the planks of the first working platform.
3. Position a hatch deck in the first bay of the second lift relative to the ladder. **(Figure 6.46)**



Figure 6.45: Positioning planks to enable the construction of the top work platform



Figure 6.46: The hatchdeck being passed from the ground to the first working platform

Step 3: Attach the guardrail posts

1. You must work with extreme caution as the height has increased by another lift and the work platform of the bay is unguarded. At all times, work with care and be aware of the fall hazard and risk.



Until the guardrails of the next lift are erected, the top platform presents a fall hazard

2. With one person working on the ground and the other on the first level work platform, using correct manual handling techniques, lift the required number of guardrails up and on to the work platform. (Figure 6.47)
3. Using extreme caution, one person should move to the top work platform via the ladder and hatch deck. Remember at this point there are no guardrails in place. The person working on the ground should now move to the first level platform via the ladder.
4. Using extreme caution, being aware of the fall hazard and using correct manual handling techniques, lift the required number of guardrail posts onto the top working platform before starting to install the guardrail.
5. One at a time and starting at the end frame, place a guardrail post on top of the frame standard of the lift below. (Figures 6.48, 6.49)
6. Close the clamp but do not over tighten it. This allows the post to be rotated into position.



Figure 6.47: Lifting guardrail posts onto the first working platform



Figure 6.48: Placing guardrail posts in position when working from the top most work platform



Figure 6.49: Placing guardrail posts in position when working from the top most work platform

Step 4: Fully plank the work platform

1. With one person passing planks and the other laying them, fully plank the top most work platform. This provides the scaffolder with a sound platform on which to work to complete the scaffolding procedure (**Figure 6.50**)



Figure 6.50: Completing the planking of the top most platform

Step 5: Erect the Guardrails

1. This is a two person job. Lift the first section of guardrail onto the top most work platform. (**Figure 6.51**)
2. Take the guardrail and with the end of the scaffolder's spanner, loosen the bolts on the guardrail hooks so that they are free to slide.
3. Lift the guardrail into position. (**Figure 6.52**) To do this:
 - Sit the two lower hooks of the guardrail in the guardrail post spigots
 - Line up the two upper hooks with their guardrail post spigots – you may need to rotate the post slightly to ensure it sits in the correct position (this is why the clamp is not initially fully tightened)
 - Lower the guardrail into position ensuring all four hooks are in their corresponding spigots
 - Tighten the guardrail hooks with the scaffolders spanner
 - Tighten the clamps of the guardrail posts with the scaffolders spanner



Figure 6.51: Lifting guard rail up to the top most platform



Figure 6.52: Installing the guardrail on the top most level

Step 6: Secure the ladder

1. Fit a ladder rail over the tops of the guardrail posts. (**Figure 6.53**)
2. Hook the ladder over the top and secure the ladder with a tie to prevent it moving around.
3. An example of basic scaffold constructed following the procedures outlined in 6.4 Erecting a Scaffold with an Intermediate Platform and Top Working Platform is shown below. (**Figure 6.54**)



Figure 6.53: Positioning a ladder rail



Figure 6.54: Scaffold with intermediate platform and top working platform

6.5: Dismantling Scaffolding

The dismantling of a scaffold is a two person operation. One person dismantles components whilst the other person receives components and takes them away to a designated storage or loading area.

For safety reasons, the effect of removing components on the stability of the scaffold structure should be considered before dismantling or removing scaffold component parts.



Assess the scaffold and work site for risk before commencing the dismantling procedure.

Step 1: Assess the weather conditions

1. Assess the weather conditions prior to dismantling. Under no circumstances should scaffolding be dismantled in inclement weather (i.e. wind, rain, lightning, frost or snow).

Step 2: Check the environment to identify any hazards

1. Look for any hazardous conditions in the vicinity/environment of the scaffold to be dismantled. Be aware of electrical powerlines, ensuring the scaffold is at least 4 metres from electrical devices.
2. Check that the dismantling procedure poses no risk of contacting live power lines with component parts.

Step 3: Check supporting structures/foundations

1. Check supporting structures/foundations have not subsided and are still adequate.
2. Check the area around the foundation looking for signs of excavation or trenching work which could destabilise the foundation and cause it to collapse.

Step 4: Check the scaffolding for alterations

1. Check that the scaffolding has not been altered in any way since the last scheduled inspection and/or during use. Ensure:
 - All guardrails are in place and none have been removed
 - All platforms are in place and none have been removed
 - All braces are in place and none have been removed for access or other reasons
 - All ties are in place and none have been removed
 - All planks are in place and none have been removed.

Step 5: Reconstruct missing scaffold parts

1. Reconstruct scaffold components where modifications have been made before commencing with dismantling procedures.
2. Replace any ties that have been removed before commencing dismantling procedures.
3. Inspect planks prior to undertaking any reconstruction work or before dismantling scaffold to ensure that they are safe to work on.

Step 6: Remove any materials/equipment remaining on platforms

1. Carefully climb onto the scaffold and remove any materials or equipment that may have been left on working platforms during use.



To prevent serious injury from falling objects, all materials and equipment must be removed from scaffold platforms before commencing the dismantling procedure.

Step 7: Dismantle scaffold

1. The dismantling procedure is really the erection procedure in reverse. Safety precautions include:
 - Lower scaffold components as the scaffold is dismantled – do not allow components to accumulate on platforms including those components from the level being dismantled
 - Work in pairs – this is a two person operation, one person dismantles as the other receives and takes away components
 - Do not drop components onto the ground – serious injury, death or damage to components may occur
 - Secure components using correct knots and appropriate rope
 - Signal your intention to lower components to the person on the ground receiving them
 - Carefully lower components one at a time to the ground.
2. Remove the scaffold components in the reverse order to that of the erection procedure leaving any tie as the last component to be removed from the lift. Ties should be left in place as long as possible before removal.



Only remove the ties from the lift you are currently dismantling. Never remove the ties of a lower lift.

3. Stack dismantled equipment into groups in a designated area. Ensure the stacked equipment does not present a hazard or obstruct access ways.
4. If anything is damaged in the dismantling process, segregate it for inspection prior to storage. Do not mix damaged components with dismantled inventory as it will be difficult to locate once packed. Damaged components not segregated may find their way back to the regular scaffolding inventory and pose a risk for future users.

Chapter 7: Scaffolding Competency Checklist

The checklist criteria listed below are not meant to replace recognised systems of competency assessment and scaffolding certification. The checklist criteria has been developed for user's of Aztex Steel Frame Scaffolding who may wish to incorporate the material into site and job specific induction training and/or as part of their workplace program of OHS training and assessment.

Trainee - Use the competency checklist:

- To identify gaps in your skills and knowledge
- As a pretest to work out whether you need further training or have the knowledge and skills necessary to carry out your job correctly and safely
- As a pretest before any competency based assessment is undertaken
- As a ready reckoner and measure of how much you have learnt from your training.

Trainer/Supervisor - Use this competency checklist:

- To identify gaps in the knowledge and skills of employees or others working on your site/job
- As a basis for planning training programs and training sessions
- To ensure employees/others have the necessary skills and knowledge to carry out their job correctly and safely.

Competency Assessor - Use this competency checklist:

- As a guide to the knowledge and skills required of persons to carry out specific jobs competency
- As a questioning tool to find out the knowledge and skills of employees or others working on the job/site
- To ensure employees/others have the requisite knowledge and skills to carry out their job correctly and safely
- To confirm individual competence.

Working Safely with Scaffolding

YES	NO	TASK
		Outlines legal obligations and compliance standards for scaffolds.
		Cites provisions from the different items of legislation and compliance standards.
		Explains how the different provisions impact on the use of scaffolds in the workplace.
		Applies the principles of risk management to work activities involving scaffolding and scaffold components.
		Explains how risk assessment procedures are used at key times in the operational cycle.
		Outlines key areas for scaffold hazard identification.
		Participates in scaffold hazard identification and risk assessment activities.
		Outlines the risk control strategies implemented for scaffolding and scaffolding activities in place for specific jobs and work sites.
		Points out guarding measures in place on erected scaffolds.
		Assesses the adequacy of guarding and points out any defects.
		Identifies those activities competent and authorised to undertake.
		Identifies those activities that can only be carried out by authorised and certified personnel.
		Participates in all training activities designed to develop competence in scaffolding activities.
		Explains the type of clothing best suited to the conduct of scaffolding activities.
		Describes the type of PPE required to be worn when using scaffolding.
		Outlines the type of PPE to be worn for different work environments and work tasks.
		Identifies different warning signs, decals and tagging systems and explains when such systems are used.
		Explains the implications for failing to follow safe work procedures for locking out and tagging plant.
		Cites scaffold specifications as per statutory requirements.

Health and Safety Guidelines for Erectors

YES	NO	TASK
		Cites and explains scaffold guidelines relevant to persons involved in the erection, modification or dismantling of scaffolds.
		Explains how to assess the environmental load of a scaffold.
		States scaffold compliance requirements when erecting, modifying or dismantling scaffolding near electricity.
		Outlines potential hazards associated with the installation of platform brackets and hop ups.
		Demonstrates correct manual handling procedures.
		Explains precautionary measures to be taken when machinery or vehicles are used in the vicinity of scaffolds.
		<p>Outlines and demonstrates the correct procedure for:</p> <ul style="list-style-type: none"> • Installing toeboards • Installing overhead protection • Installing access ladders • Securing planks • Installing guardrails.
		Describes provisions for safeguarding the public against scaffold hazards.
		Describes scaffold inspection procedures and criteria.
		Outlines the implications of mixing scaffold components with those of other manufacturers or systems.
		Cites precautionary measures for the erection, modification and dismantling of scaffolds.

Health and Safety Guidelines for Scaffold Users

YES	NO	TASK
		Participates in scaffold induction training.
		Differentiates between a scaffold “Approved” for use and which has not been approved.
		Outlines hazards to look for in a daily inspection.
		Describes safeguards and precautionary measures for using scaffolding.
		Describes “good” scaffold housekeeping procedures.
		Demonstrates the correct use of scaffolding.
		Describes the different load rating capabilities of scaffolds in use.
		Describes precautionary measures when conducting hot work on scaffolds.

Scaffold Components and Equipment

YES	NO	TASK
		Identifies a range of scaffold components.
		Explains the use and function of different scaffold components.
		Explains what PPE is and the types to be used in different work environments and jobs.
		Outlines basic equipment requirements of a scaffolder and explains how it is used.

Estimating Scaffold Requirements

YES	NO	TASK
		Defines the terms: <ul style="list-style-type: none"> • Dead load • Duty live load
		Relates scaffold load ratings to the different duty classifications of scaffolding (e.g. light, medium, heavy duty).
		Demonstrates and explains the process for designing a scaffold structure including: <ul style="list-style-type: none"> • Defining the scaffold function • Determining the duty load rating • Determining the minimum width/length platform proportions • Estimating the number of bays and lifts • Estimating the number of working platforms • Determining tie requirements • Calculating scaffold component requirements

Inspection, Care and Maintenance

YES	NO	TASK
		Outlines the inspection responsibilities of suppliers, erectors and users of scaffolds.
		Nominates times in the operational cycle when scaffold inspections should be conducted.
		Outlines inspection criteria for scaffold components.
		Describes appropriate methods for cleaning scaffold component parts.
		Describes appropriate repair procedures for scaffold component parts.
		Identifies appropriate personnel to conduct cleaning and repair of scaffold component parts.
		Identifies typical scaffold component defects.
		Explains when repairs can be effected and when component parts must be scrapped.
		Outlines inspection criteria for erected scaffolds.

Transport and Storage of Scaffold Components

YES	NO	TASK
		Outlines safety precautions for the transport of scaffold components.
		Outlines procedures for the safe storage of scaffold components.
		Procedures for the Erection and Dismantling of Scaffolds
		Explains what a scaffold foundation is.
		Describes suitable foundation ground conditions.
		Describes unsuitable foundation ground conditions.
		Points out suitable and unsuitable foundations on a working site.
		Describes what a soleplate is.
		Outlines soleplate specifications.
		Describes a range of adequate foundations on both level and sloping ground.
		Describes a range of unsafe foundations on both level and sloping ground.
		Demonstrates the correct procedure for siting scaffolds.
		Demonstrates the correct procedure for unloading a truck of scaffold components and setting up the working site.
		Demonstrates the correct procedure for erecting a basic scaffold of two or more bays and lifts.
		Demonstrates the correct procedure for erecting a scaffold with an intermediate platform and top working platform.
		Cites safety precautions to be exercised when erecting scaffolding.
		Demonstrates the correct procedure for dismantling a basic scaffold.

Chapter 8: Legislative Requirements and Australian Standards

Australian Standards and Australian/New Zealand Standards

The table below is a list of published technical standards that provide guidance on the design, manufacture and use of certain types of scaffold.

Reference	Title
AS/NZS 1576	Scaffolding - series
AS/NZS 1577	Scaffold decking components
AS/NZS 4576	Guidelines for scaffolding
AS/NZS 1892	Portable ladders
AS/NZS 2210	Safety, protective and occupational footwear
AS/NZS 1801	Occupational protective helmets
AS/NZS 1337	Personal eye protection

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