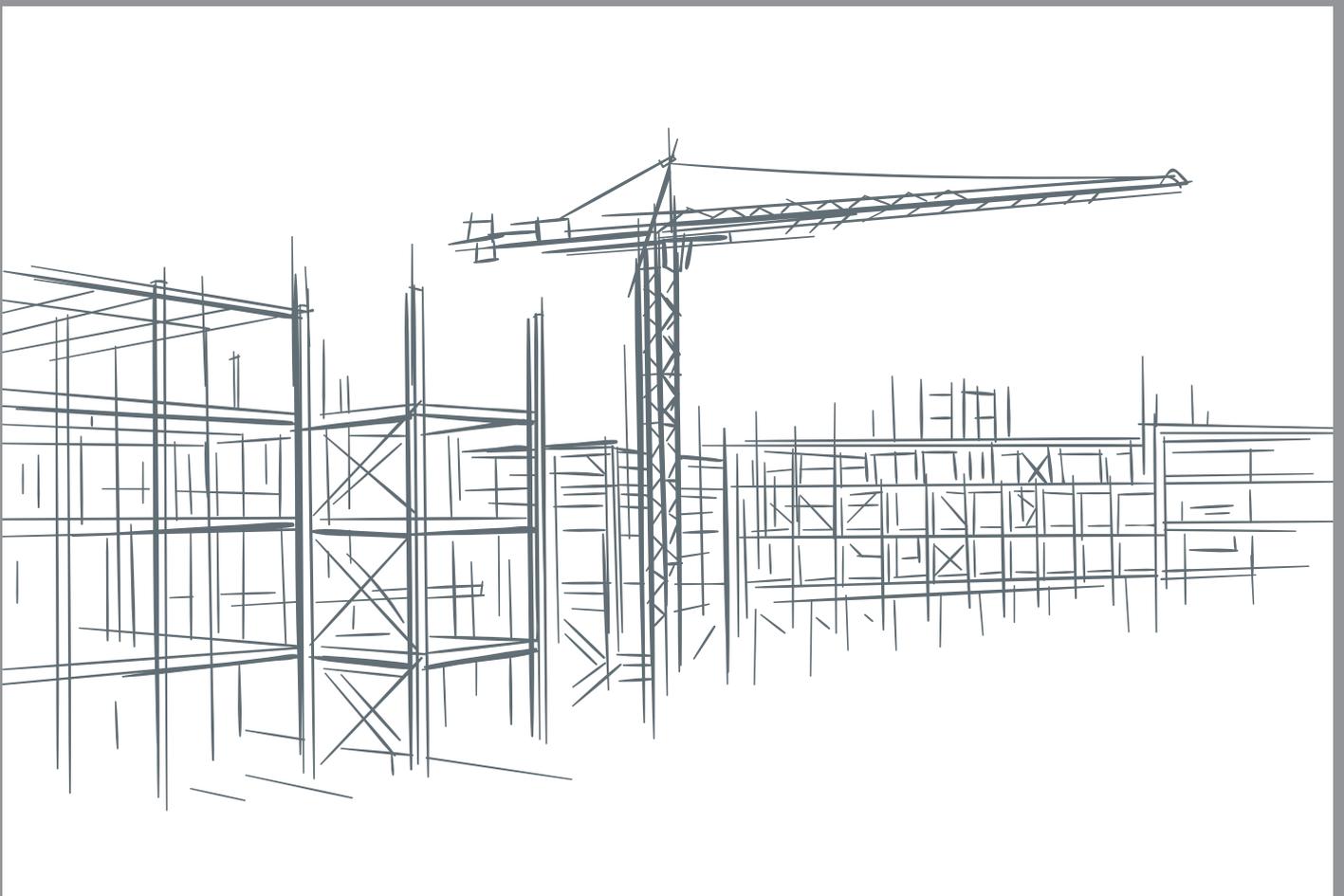




QUICKSTAGE SCAFFOLDING ERECTION MANUAL



VERSION 02

updated 11/2021

The information provided herein complies with the requirements of AS/NZS 1576.1, AS/NZS 1576.2 and AS/NZS 1577 latest editions.

Please refer to this Quickstage Scaffolding Erection Manual in conjunction with the Quickstage Technical User Guide.



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EQUIPMENT

Acrow Australia hires and sells Quickstage scaffolding systems, compatible for all commercial and industrial projects throughout Australia. It is fully compliant with AS1576.

Our scaffold products are hot dipped galvanized and manufactured from high tensile steel, enhancing safety standards and extending product life span. It is rust-resistant, reducing maintenance expenses and relatively lightweight, which can translate to better productivity and lower freight costs.

The basic components and their functions are listed below.

STANDARDS

Standards are the vertical members of the scaffold, which carry the loads imposed on the scaffold and also the self-weight of the scaffold. Standards vary in length from 1.0m to 3.0m in increments of 0.5m. Standards have either a spigot for joining the standards, or are open ended to allow a screw jack top and bottom.

TRANSOMS

Transoms are horizontal members that space standards transversely. Transoms are used to support metal planks/boards that form the deck for working platforms. Transoms are in a size range from 0.5 m to 2.4 m. Special transom trusses are available to support heavy loads in applications such as gantries and loading platforms.

LEDGERS

Ledgers are the horizontal members that space the standards longitudinally. Ledgers are in a size range of 1.2 m to 2.4 m and also are used for edge protection as guardrails and midrails. Ledgers also can be used to support ladder transoms.

BRACES

Braces are available in lengths to suit all typical bay sizes.

0.760 bay	1.9m brace
1.200 bay	2.1m brace
1.800 bay	2.7m brace
2.400 bay	3.6m brace
3.000 bay	4.2m brace

SCAFFOLD STEEL BOARDS

Scaffold boards are made from galvanized sheet steel with a perforated upper surface to provide slip resistance to persons on the steel boards. In the Quickstage system these are prevented from longitudinal movement by the design of the supporting transoms or the hop-up brackets. Ledgers are used to prevent the transoms moving longitudinally and permitting the steel boards to fall.

EQUIPMENT

BASE JACKS

Adjustable base jacks are used to level the base of the scaffold. Generally the shaft has in excess of 500mm of adjustment which is necessary to overcome the 500mm increments in the 'V' pressings on the standards. A sole board should be used under the base jack to distribute the load to the ground. The size and position of the sole board may vary depending on the bearing capacity of the ground or supporting structure. If you have any doubts, please ask your supervisor for advice.

HOP-UP BRACKETS

Hop-up brackets to form platforms are fixed to the working face of the scaffold. Hop-up brackets come in 1-board, 2-board or 3-board sizes. When fitted at the same level as a working platform the hop-up platforms are used as bay extension platforms to increase the width of the working platform bay. 2-board and 3-board hop-up platforms may be fitted above or below the working platform to provide access to overcome variations in the building profile. 1-board hop-up platforms are limited to the same level as a working platform. Typically, 1-board hop-up brackets are fitted with end stops to prevent boards slipping off the end. 2-board and 3-board hop-up brackets must always be used with tie bars fitted to the ends. These have a twofold purpose. One being to prevent boards slipping off the end of the bracket and the other being to prevent the hop-up brackets twisting sideways on the standard resulting in an increased gap at the ends such that a supported board can fall through the gap.

MATERIALS HANDLING

Material is palletised and can be moved and stacked by forklift. Loose items are stored in cage pallets or are contained with shrink wrap to prevent spillage during transportation or crane lifting. Boards are stacked into bundle and strapped to secure the pack together.

The system components are stacked into pallets in the following quantities:

CODE	DESCRIPTION	QTY/PALLET
2622	BASE JACK	100
7010	STANDARD 1.0 METRE	70
7015	STANDARD 1.5 METRE	70
7020	STANDARD 2.0 METRE	70
7025	STANDARD 2.5 METRE	70
7030	STANDARD 3.0 METRE	70
7107	LEDGER 0.7 METRE	100
7112	LEDGER 1.2 METRE	100
7118	LEDGER 1.8 METRE	100
7124	LEDGER 2.4 METRE	100
7206	TRANSOM 0.6 METRE	100
7208	TRANSOM 0.7 METRE	100
7212	TRANSOM 1.2 METRE	70
7218	TRANSOM 1.8 METRE	50
7224	TRANSOM 2.4 METRE	50
7224T	TRUSS TRANSOM 2.4 METRE	10

EQUIPMENT

MATERIALS HANDLING CONT.

CODE	DESCRIPTION	QTY/PALLET
7317	BRACE DIAGONAL 1.7 METRE	80
7321	BRACE DIAGONAL 2.1 METRE	80
7327	BRACE DIAGONAL 2.7 METRE	80
7332	BRACE DIAGONAL 3.2 METRE	80
7336	BRACE DIAGONAL 3.6 METRE	80
7601	ONE BOARD HOP UP	100
7602	TWO BOARD HOP UP	50
7603	THREE BOARD HOP UP	24
7603S	THREE BOARD HOP UP WITH SPIGOT	24
7610	INTERNAL CORNER FILLER 2x2	12
7609	INTERNAL CORNER FILLER 3x3	8
7407	STEEL BOARD 0.7M	50
7412	STEEL BOARD 1.2M	50
7418	STEEL BOARD 1.8M	50
7424	STEEL BOARD 2.4M	50

Pallets and bundles can be stacked to a maximum of 6 high on a hard level surface. Other loose items are stacked into cage pallets for transport or strapped into bundles.

Pallets containing items which are not fully restrained must be plastic wrapped.

RETURNING SCAFFOLD

We encourage our hirers/clients to return scaffold neatly stacked and in the above pallet quantities. i.e. as we deliver it to you.

QUALITY CONTROL FOR SCAFFOLDING

Acrow's components are manufactured from high grade material to meet Australian standards. Each step in production is monitored to ensure quality on dimension and finish.

Acrow Quickstage scaffolding system has been tested by a recognised testing authority. Test certificates can be supplied on request.

Scaffold Inspection & Maintenance

A thorough inspection regime between hiring inspection and maintenance procedures should ensure the serviceability of the components when supplied.

Faults

Some of the things that you should look for when inspecting your scaffold include: checking the welds (ensuring there are no cracks), cleaning any deposits such as concrete, and testing to see that all bolts and pins move freely.

Isolation of faulty components

Acrow expects that, where a component fails or becomes in any way unserviceable during the erection process, the scaffolder will immediately remove it from the scaffold and replace it with a serviceable component. This should be done by clear marking or tagging, or placing in containers or areas that are clearly designated for the storage of rejected equipment. These returns must be immediately counted and taken to the Quarantine area.

Treatment of faulty scaffold

Once faulty or unserviceable components have been isolated, AS/NZS 4576 advises that they be treated in one of the following ways:

- Repaired (e.g. replacing bolts on couplers, replacing missing wedges or appropriate re-welding).
- Reduced in length (e.g. shortening of tube, planks or wire rope to remove defective ends).
- Downgraded (e.g. downgrading a scaffold plank for use as a soleplate, provided the fault does not adversely affect the performance of the soleplate).
- Unserviceable Scaffold must otherwise be scrapped.
- All damaged or faulty scaffold must be recorded in the Non-conformance register.

Procedure

1. Return is booked.
2. Person on Returns duty check Yard Calendar and retrieves contract number.
3. Return arrives at yard.
4. Person on Returns duty will complete an Incoming Return report on the Fat Fingers application (entering contract number from calendar).
5. Once the Incoming Return form is completed, a document number is issued, along with a pallet count.
6. This return is unloaded and stored in the Returns area.
7. When the return is processed (unpacked), Person on Returns duty and assisting Yard employees will assess all unpacked products for damages.

QUALITY CONTROL FOR SCAFFOLDING CONT.

8. All damaged items identified are not counted into stock.
9. A Damages Report is completed on the Fat Fingers application – noting details of damage + photographs.
10. Logistics Admin automatically receives this Damages Report and removes the damaged items from stock.
11. Damaged stock is taken to the Quarantine area until repaired or scrapped.

If damaged item is repairable:

1. A manual repair request docket is completed (triplicate/carbon copy).
2. Damaged item/s + Repair request docket is delivered to the Acrow on-site repairs workshop.
3. Workshop completes repair and returns to incoming stock area with a Repair complete (manual) docket for the Yard Manager's attention.
4. Repair complete docket describes what repairs took place.
5. Yard Manager inspects repaired item/s, then authorizes for this item/s to be returned to stock by completing an Incoming Stock Report on the Fat Fingers Application.
6. Incoming Stock Report is processed by Logistics Admin, who then returns item/s to stock.

If damaged item is non-repairable:

1. Yard Manager will confirm item/s is non-repairable.
2. Stock Disposal is recorded on the Damages report under notes – this is updated & automatically sent to Logistics Admin. Report needs to be completed on the Fat Fingers Application.
3. This report is processed by Logistics Admin and item/s removed from stock.
4. Damaged item/s is then scrapped – if recyclable, scrapped and stored in the recyclable waste container for collection or scrapped and stored in the general waste bin for disposal.

TOOL BELTS

Each scaffolder requires a tool belt in order to perform his work efficiently and safely.

Tool belts, frogs and pouches should be maintained in good condition and should contain the following items:

1. Scaffold hammer with podger end
2. Scaffold key or ratchet spanner
3. Adjustable spanner
4. Small spirit level
5. Measuring tape
6. A pair of nips

It is the responsibility of the scaffolder to supply their own tools and replace any damaged or lost items at their own expense. A tool allowance is incorporated into each scaffolder's hourly rate of pay for this purpose.

SAFE WORK METHOD

1. **Do not use damaged or faulty equipment.** If you detect any fault or damaged components place them to one side and inform the other scaffolders in your team. Damaged items are to be sent back to the yard.
2. Do not erect scaffold within **the vicinity of overhead electrical wires** without written authorisation from the local electricity supplier saying that it is safe to erect or dismantle scaffold in that area.
3. Do not erect scaffolding where there are exposed reinforcing bars below where the scaffold is to be erected. Ask the builder to cover these bars before you commence work in that area.
4. Do not erect any scaffold on a structure unless you are sure it can support the weight of the scaffold and the loads that may be imposed on the scaffold. If you are not sure about the bearing capacity of the ground or the structure to support the scaffold, contact your supervisor before you start erecting.
5. During inclement weather, your supervisor will advise what action to take regarding working on scaffold, or if works are to stop.

There are different methods of erecting and dismantling scaffolding. Methods vary from state to state and client to client. You must comply with the safe working method prescribed by the State Regulator in the State you are working.

6. **You must fit external edge protection comprising guardrails, midrails and toeboards at every lift.** Internal edge protection is required where the working face is 225 mm away from the working platform edge. Edge protection must be fitted bay by bay as each standard is erected. This is for your own protection during erection. During dismantling of the scaffold again only dismantle edge protection bay by bay as the standards are to be dismantled. Edge protection is required wherever you are working.
7. **Sequential method of erection.** Handrails must be fitted bay by bay as soon as the standards to each bay have been installed. You must not install the standards along the entire run of scaffold, they are to be installed one at a time. Handrails are to be fixed one bay at a time, this makes it safer for you when erecting and dismantling and also the handrail will be in place when the lift becomes a working platform. You must have a handrail on the working level you are on where possible.
8. **Erecting in 1 metre lifts.** Working from a fully planked platform with handrails, build the next 2 metre lift. Now place transoms at 1 metre and place 2 boards on the transoms to work off. From this level you can install the standards above if required and fix the handrails and midrails on the lift above. When this is done remove the transoms and place the boards in the lift above.
9. **Erecting using a harness.** Working from a fully planked platform with handrails, build the next 2 metre lift. From the working platform (2 metres from the top lift) attach the harness lanyard to the standard or ledger on the first bay ensuring that the scaffold is tied in accordance with the scaffold plan or this manual. Do not fix the lanyard to standard which has a join above the top lift.

SAFE WORK METHOD

9. Continues

Now access the top working platform from within the bay. Fix standards and handrails to first bay then relocate lanyard to the handrail, then fit standards and handrails to the adjacent bay. Repeat for each bay. Handrails must be fitted bay by bay as soon as the standards to each bay have been installed. You must not install the standards along the entire run of the scaffold and then fix the handrails. This makes it safer for you when erecting and dismantling. You must have a handrail in place on the working level you are on.

10. Erecting using step boards. Working from a fully planked platform with handrails, build the next 2 metre lift. Now place one step board across the midrail and one across the handrail adjacent to a pair of standards. From the step boards you can install the standards above if required and fix the handrails and midrails on the lift above. When this is done remove the step boards and place the boards in the lift above.

11. Unused scaffolding components must not be left on a completed working platform as they be a trip hazard for later users of the scaffold. During breaks in scaffold erection, scaffolding equipment must be stacked in a safe manner to prevent it falling. The supply of containment is a suitable means of preventing stacked equipment falling out from the scaffold. Stacking scaffolding components vertically should not be done unless the components are secured.

12. Erect the access stairs or ladders with the erection of the scaffold to provide access during the erection - unless there is a safe access to the scaffold from the building.

13. Steel boards must not be lapped over other steel boards. Lap plates that are designed to span gaps between steel boars without slipping should be used. Timber boards may be used provided they are secured against movement. When using timber boards to lap over steel boards on the length of a platform, trip hazards can be eliminated by fixing lengths of timber of the same thickness as the planks cut at a 45° angle, or fixing purpose-designed rounded end pieces, at the ends of the scaffold planks. At changes of direction of a platform, lapped planks are acceptable without additional measures because users will be conscious that they are about to change direction as they move along the scaffold platform.

14. It will be necessary to use a safety harness to erect and dismantle some scaffolds such as drop or hanging scaffolds, scaffolds erected off needles, beams or trusses. It is absolutely necessary that the safety harness is connected to a suitable point that can support the harness load and you must have undertaken safety harness training by an accredited training organisation.

15. The use of ladder beams, trusses and or cantilevered needles must be accompanied by a design drawing of its intended use in each application. You must erect it as shown on the drawing unless your supervisor approves changes to the drawing.

16. Steel boards must not be lapped over steel components. Use only a timber board or a special coverplate, which is secured against slipping, for lapping on steel components. The maximum span for a timber scaffold plank is 1.8m.

17. It may be necessary to use a safety harness to erect and dismantle some other scaffolds such as drop or hanging scaffolds, scaffolds off needles, beams or trusses. In order to use a safety harness, you must have undertaken safety harness training by an accredited training organisation and have a current and valid certificate.

Scaffolders must not climb the stars of the standards, because any slip can result in severe injury.

ERECTION PROCEDURE

Before any erection commences, read the plan, or if there is no plan, work out the position of the scaffold in relation to the building or structure. Determine what size bays will fit where. Look out for overhead power lines.

Take note of any obstructions that may require you to alter the bay size. Look for overhangs, trees or other protrusions that may interfere with the scaffold as it is erected.

Lay out enough components for the complete run of scaffold for 2 or 3 lifts high at least. All the scaffolders in the gang should assist in laying out the correct amount of gear, roughly where the scaffold bays will be. It is more efficient to do this before erecting the first bay.

Start erecting the scaffold at a corner, end of the building or the highest point of the run of scaffold.

Avoid leaning scaffolding components against walls, columns or other surfaces, unless they can be prevented from falling over and causing injury to persons or damage to property. Components need to be against a protection, or leaning into a corner, to prevent them sliding. If the components cannot be secured against falling over then lay them down.

When laying down any components, always ensure a clear walkway has been left, and that the components laid out are not an obstruction to you, your fellow workers, or members of the public.

BASE OF SCAFFOLD

SOLEPLATES

On most surfaces, except concrete, a soleplate must be used under the base jack. In order that the scaffold remains level during use it is important that you ensure the soleplate is of adequate size. If the ground is soft or if you have any doubts about the ground conditions, check with your supervisor and get advice on the most suitable method to overcome the problem. In some cases it may be necessary to obtain an engineer's report on the bearing capacity of the ground prior to erecting the scaffold.

When erecting scaffolds on suspended slabs, needles or any structure such as roofs, you should check with your supervisor regarding propping of the structure which will carry the weight of the scaffold plus any imposed loads placed on the scaffold.

Soleplates must be level. To achieve this the ground may require some digging. Check that soleplates will not be undermined by rainwater runoff. It may be necessary to dig some diversion drains to prevent undermining of the soleplates. Soleplates must not be positioned on the edges of trenches or holes as the ground will not support the load of the scaffold standards, especially when it rains.

BASE JACK

Once you have a good footing for the soleplate a base jack can be placed on the soleplate. Make sure that no part of the jack baseplate overhang and edge of the soleplate.

ERECTION PROCEDURE

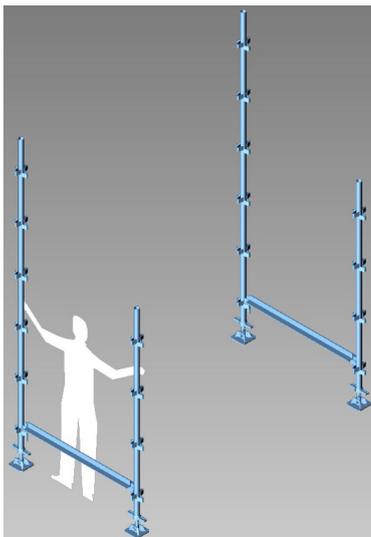
BASE JACK CONT.

If the ground is not level over the length of the scaffold, it is better to start at the highest point and work down the incline. Set the first base jack with the nut as low as possible so that when you proceed down the slope, you will be able to erect as many bays as possible before it is necessary to drop the adjustment down to the bottom and start again. Remember the adjustment on the base jack is sufficient to overcome the spacing of the 'V' pressings or star clusters on the standards.

Scaffolding must not be used as a support structure, such as formwork, unless you have been provided with a layout drawing certifying that the scaffold design can be used as a support.

ERECTING THE FIRST BAY

On most applications the 2m and 3m scaffold standards are to be staggered diagonally. No two adjacent standards may be of the same length. The staggering of standards is to be maintained throughout the complete structure of the scaffold. Having standards of alternating lengths in the scaffold assists with the stability and strength of the scaffold.



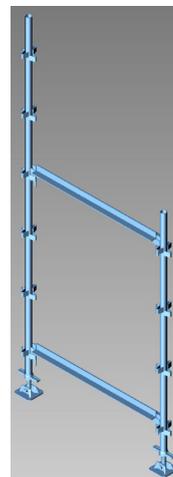
Start with two standards and get your partner to hold these apart while you fit a transom to the bottom 'V' pressing. Your partner holds these standards vertical while you fit a ledger to the inside standard and connect with the next standard in the run of scaffold. Never pick up the next standard in the run unless you have a ledger already in the last standard to connect the next standard. Once you have three legs erected, you can erect the fourth in the same manner.

The maximum height from the base of the scaffold to the first lift is 500mm.

Always have the hole in the spigot pointing in the same direction as the transom.

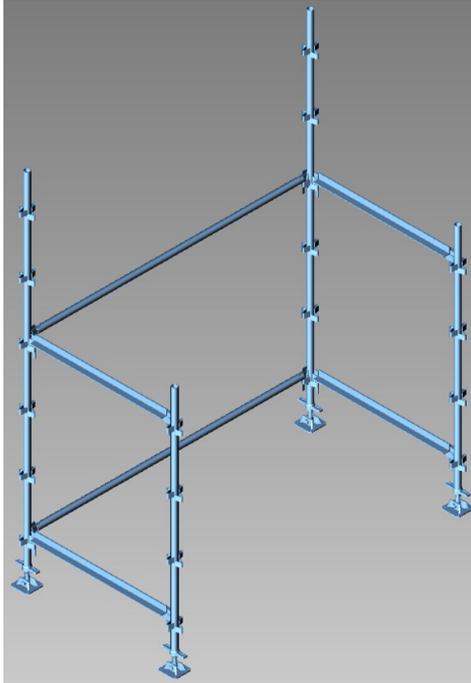
The 'V' pressings in each cluster are different heights and in most situations the lower 'V' pressing carries the transom. It is important that the standards are all turned in the same direction before attempting to level the scaffold.

The first bay will now free stand and the next row of transoms and ledgers can be fixed at usually a 1.5m lift. A 1.5m lift in the base of the scaffold will prevent any high installs of the standards to the full height of scaffold. The maximum lift in any scaffold is 2m in height. Always refer to the designed scaffold drawings for base lifts.



ERECTION PROCEDURE

ERECTING THE FIRST BAY (CONT.)

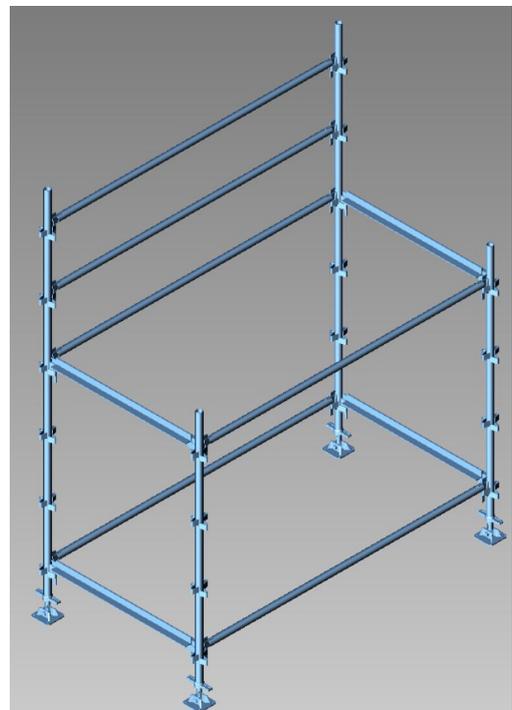


Before the wedges are tapped in tight, the scaffold should be set at the correct distance off the building and then the scaffold should be squared (check the diagonal measurements) and levelled. Start with the first transom, then the inside ledger (nearest the structure) and then the other transom on the second pair of standards. Do not attempt to level the back ledger.

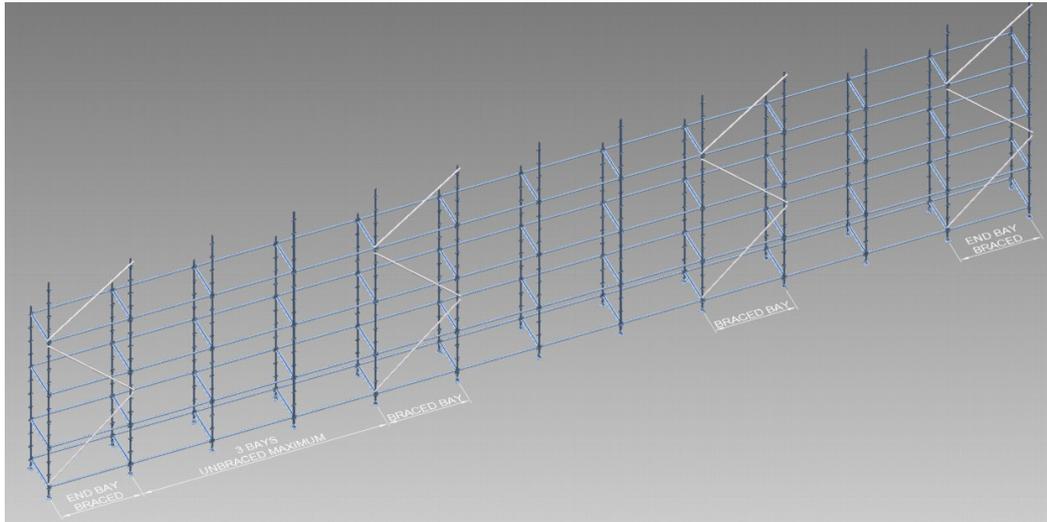
Once the first bay is levelled, repeat the process by fixing ledgers first then base jacks, standards and transoms. Level the scaffold off the first bay and check the measurement off the building.

When the scaffold is level, fix heel and toe bracing at each end and fix face bracing ensuring that no more than three bays are without face bracing. If there is a break in the scaffold, the end of each of the scaffolds must either have a heel and toe brace fitted, or the scaffolds joined, to form a continuous run.

The scaffolds can be joined by using link/swivel ledgers or tube and fittings at each of the ledger/handrail positions.



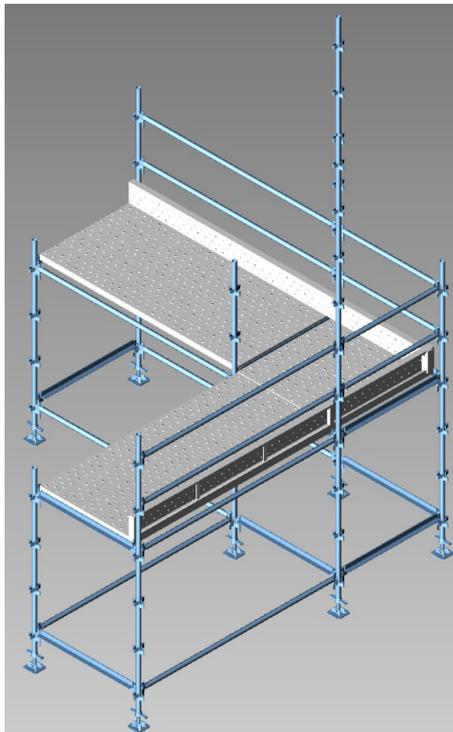
ERECTION PROCEDURE



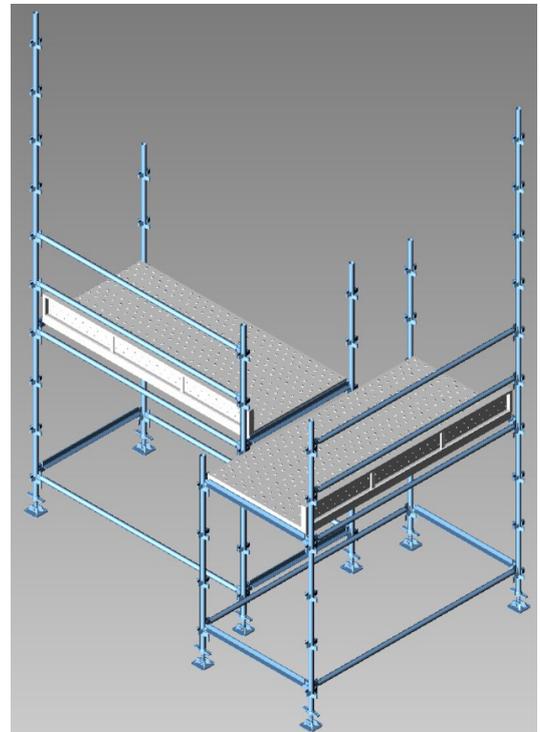
Additional lifts can now be added to the scaffold. Firstly boards are placed in each bay of the scaffold to work off. Install the standards and fix the ledgers and transoms.

Again check that all the standards are turned in the same direction and match the standards below. Bracing must be fitted to the scaffold as it is built and not added later.

The scaffold must now be tied to the structure and secured to maintain the stability of the scaffold. At no time should the scaffold free-stand in height more than three times the minimum base dimension. This also applies when increasing the height of the scaffold. Best practice is to have the scaffold tie installed as the build progresses.



BUILDING A CORNER USING
1.2m x 1.2m BAY



BUILDING A CORNER USING
RETURN TRANSOM

ERECTION PROCEDURE

TYING THE SCAFFOLD TO THE STRUCTURE

To ensure the scaffold remains stable, it is necessary to tie the scaffold to the structure. Tying the scaffold to the structure is very important and you must ensure this is done to meet or exceed the requirements laid out in this manual.

The ties specified for use consist of standard bolt down posts or wall bracket connected to inside scaffold standard with tube, coupler and safety (check) coupler behind.

Listed below are the requirements for tying:

1. A scaffold may free stand to a height three times its minimum base dimension, although in most cases the scaffold should be tied at 4m in height. For example, scaffolds 760mm wide must be tied at 2.4m in height from the base. For scaffolds expected to be erected during the Cyclone season or in exposed locations such as near the edge of a cliff, the tie spacing information given here is not to be followed but needs to be established by an engineer taking into account the effects of wind on the scaffold and any attached encapsulation.
2. The horizontal spacing of ties on the scaffold is dependent on the proposed height of the scaffold.

SINGLE LEG WALL TIES			
HEIGHT OF SCAFFOLD (metres)	HORIZONTAL SPACING OF TIES		
	Between ground or base level up to & incl. 10m level	Over 10m level up to & incl. 30m level	Over 30m level & above
UP TO & INCL. 10m	Every second standard		
>10m - 30m	Every standard	Every standard	
>30m	Every standard	Every standard	Every standard

3. When the scaffold is tied to a return corner of scaffold, this return corner can be counted as a tie to the structure.
4. The tie tube should be fixed to the standard below the transom and as close as practicable to the underside of the transom. Use a right angle coupler to connect to the standard. If it is not possible to connect the standard to the structure because of an opening then use a scaffold tube bridging between the inner and outer face 2 standards and connect the tie to those tubes. Do not connect to the ledgers.

For scaffolds fitted with containment sheeting and subject to high winds, and where the scaffold extends above the top row of ties, it is advisable to connect rakers from the top platform level down to the adjacent supporting structure.

ERECTION PROCEDURE

5. Scaffold with prescribed lining (Shadecloth, Uni-mesh™ etc.) for:

a. <10m TWP with Single leg scaffold ties:

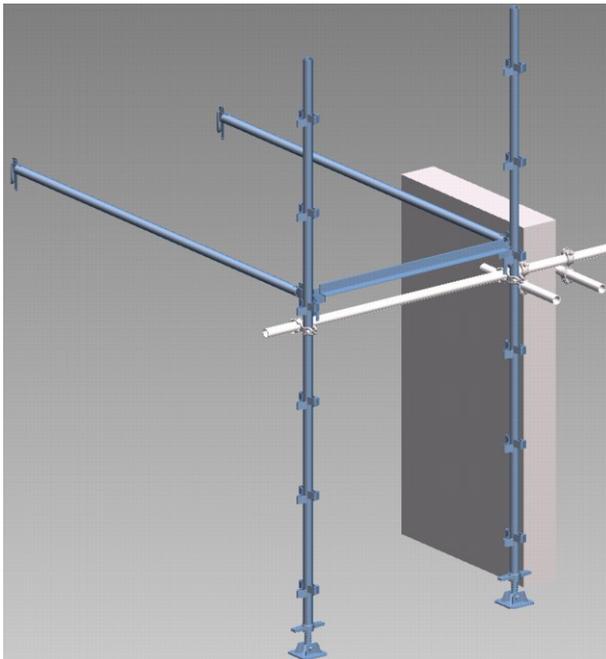
- Ties are required on every standard (2.4m max) and at each floor (4m max) or every second standard (4.8m max) and at each floor (3m max).
- No joints in standards above top tie unless pinned or spliced.
- Prescribed lining is not to extend more than 1m above last tie position (Raker of slab tie) but may extend 2m above last tie provided inside standard is erected and top transom installed.
- If wind speeds are likely to exceed 100kph, additional ties will need to be installed or prescribed lining will need to be removed and boards should be removed or strapped down.

b. up to 30m TWP with Single leg scaffold ties:

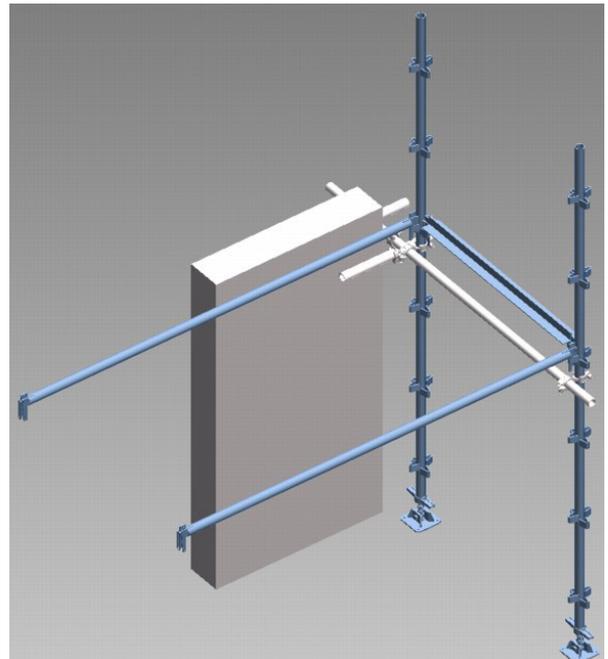
- Ties are required on every standard (2.4m max) and at each floor (4m max).
- No joints in standards above top tie unless pinned or spliced.
- Prescribed lining is not to extend more than 1m above last tie position (Raker of slab tie) but may extend 2m above last tie provided inside standard is erected and top transom installed.
- If wind speeds are likely to exceed 100kph, additional ties will need to be installed or prescribed lining will need to be removed and boards should be removed or strapped down.

NOTE: tying to the front standard only cannot be used unless the scaffold standards are staggered, as stipulated in the section titled "ERECTING THE FIRST BAY".

It is preferable to fix the tie to the structure using short tubes over a windowsill or beam or boxed around columns. However, this is not always possible and subsequently alternative methods for tying have been listed.



TIE TUBES FIXED WITH RIGHT
ANGLE COUPLERS



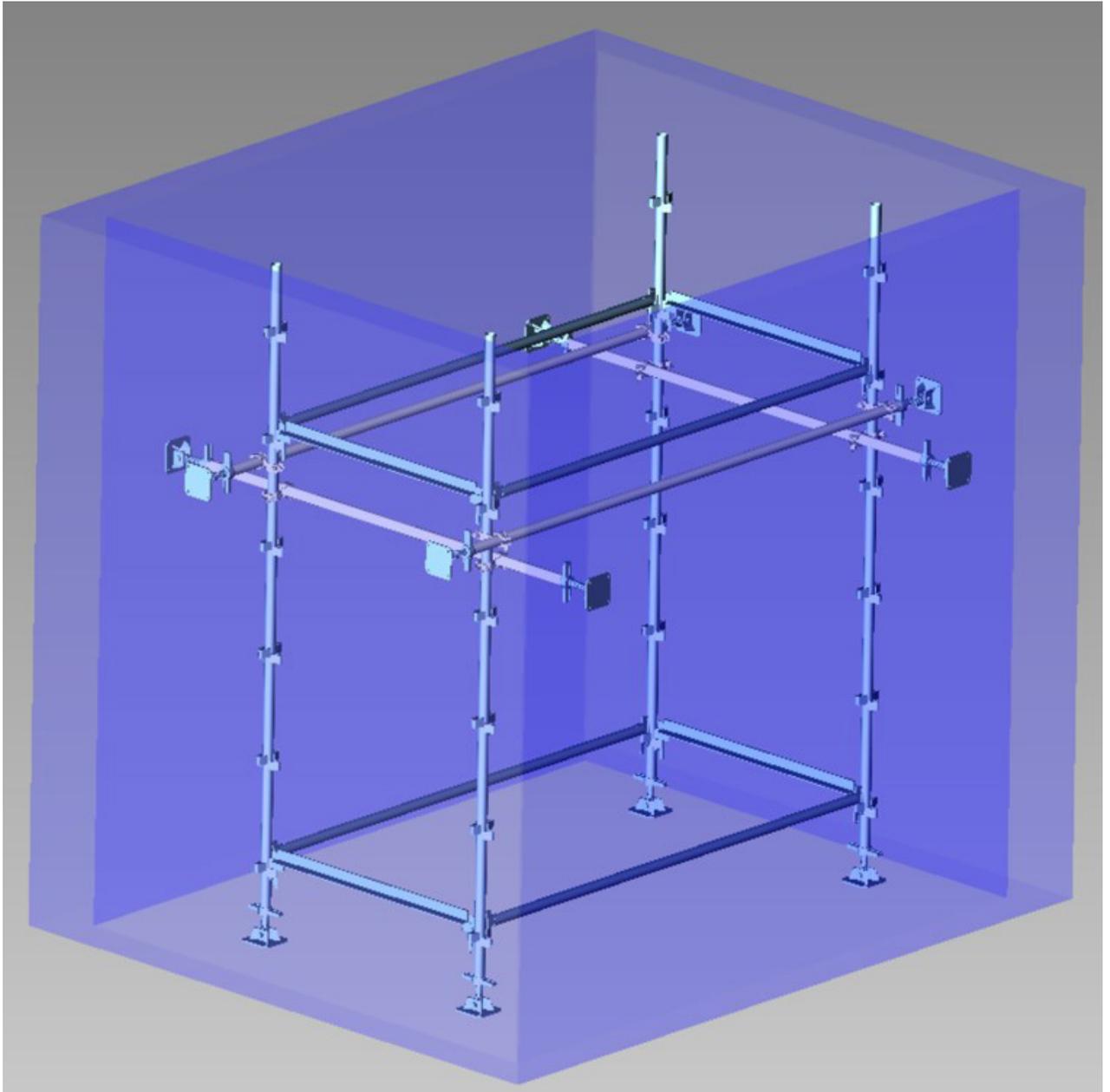
TIE TUBES CONNECTED WITH
RIGHT ANGLE COUPLERS

ERECTION PROCEDURE

TYING IN LIFT SHAFTS & SIMILAR STRUCTURES

Use two tubes to each standard, which assists in keeping the scaffold square. The use of reveal/compression ties in shaft work are a very good alternative tie.

The use of one tube only, butted into the corner, is to be avoided, as 'racking and twisting' can occur.

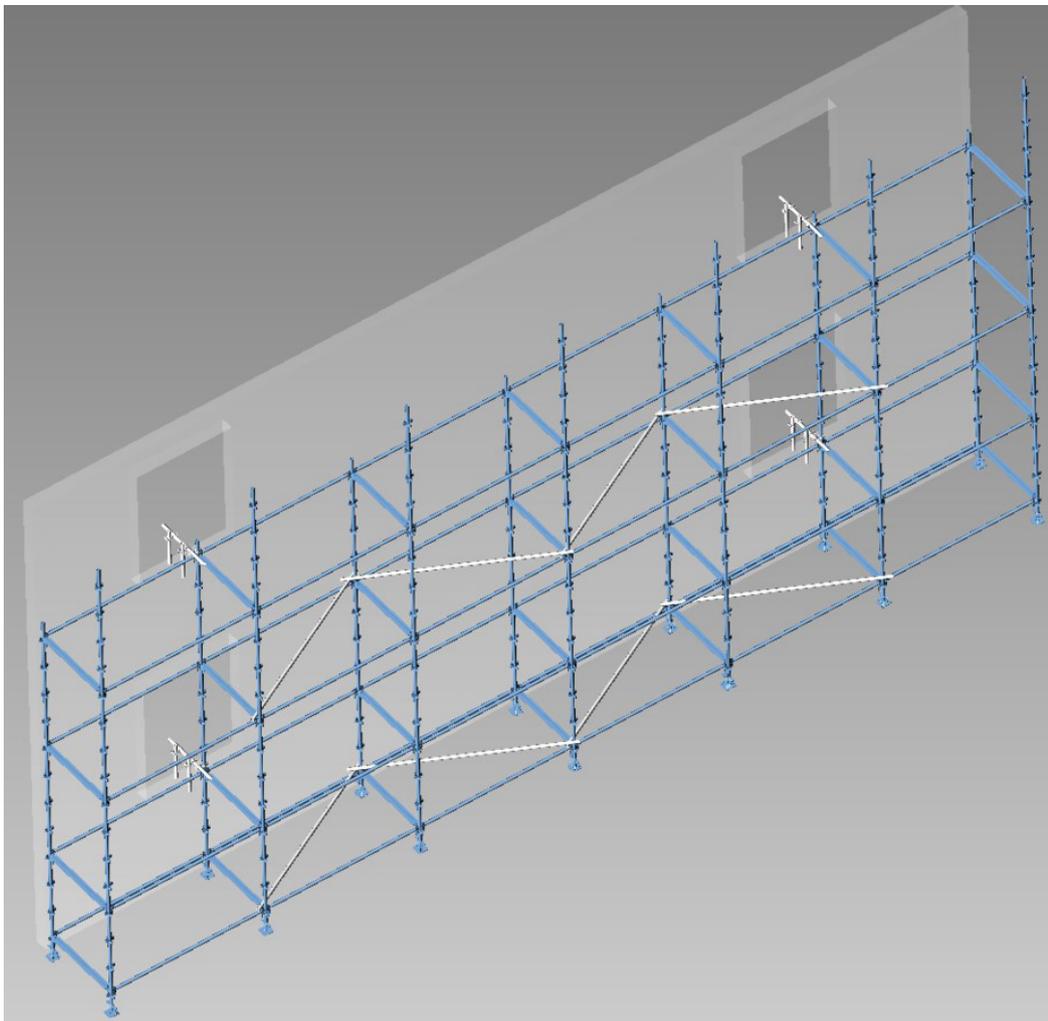


NOTE: DO NOT OVER TIGHTEN SCAFFOLD FITTINGS

ERECTION PROCEDURE

ALTERNATIVE METHODS OF TYING

1. A buttress can be built on the scaffold to increase the base dimension of the scaffold.
2. A hole can be drilled through a wall and a tie bracket can be anchored to the wall.
3. An approved drilled in anchor can be fixed to a wall or beam and a wall tie bracket bolted to the structure. When using a drilled in anchor, the manufacturer's recommendation must be followed. The tension must also be checked with the torque wrench.
4. When it is not possible to tie a particular pair of standards, plan bracing can be fitted between existing ties on that level to stiffen that pair of standards. **It is important that the plan bracing, which should be fixed under the ledgers, extends to the existing standards which are tied to the structure**, otherwise the plan bracing will be ineffective. Always have written approval for this method.



5. Guy wires can be used to tie the scaffold; however, this is rarely used and should be used only as a last resort. If you must use guy wires, a design check by an engineer may be required.
6. Reveal ties, which are usually propped in window reveals or openings, are an effective tie. (Note: there must be a timber pad under each end of the reveal tie.) **The tying of the scaffold must not, however, have more than 50% of the tie comprised of reveal ties.** There are diagrams and drawings in this manual which illustrate tying methods and tying positions. These should be studied closely and used as a guide. They demonstrate the minimum requirement. It is always better to have more ties than necessary, than not enough.

ERECTION PROCEDURE

POINTS TO REMEMBER WHEN TYING THE SCAFFOLD TO THE STRUCTURE

1. Where possible the ties should not obstruct the working level of the scaffold and are best fixed close under the working lift. **Ensure ties do not create a trip hazard on the working platform.**
2. When using wall tie brackets it is preferable to use two swivels to fix the tie tube to the wall bracket. When you have to use a short tube and a right angle coupler, it is best to use the shortest tube possible, as this tube creates a leverage over the anchor which may compromise the safety factor of the anchor.
3. Make sure the part of the structure you are tying to, is structurally sound. **Care should be taken with old brick work. When using drilled-in anchors, the quality and strength of the concrete is important.** If you have any doubts, check with your supervisor. You may need to drill through the wall and bolt through to tie. Always ensure the manufacturer's recommendations are fully complied with.
4. **Do not tie to window frames or any timber structure** as some timber structures are only nailed. These ties are designed to hold a load of over half a tonne so there is no point in fixing a tie to an unstable structure. Think of an alternative method.
5. Do not use damaged or stripped fittings. Damaged fittings should be marked, the bolt removed and put to one side for scrapping or repair.
6. Always follow the design drawings when tying the scaffold. Alterations to the tie sequence may only be made after the scaffold designer or an engineer gives authorisation.
7. If shade cloth is added to the scaffold face above the last tie position, the joins in the standard may need to be spliced or bolted to stop possible separation.
8. **NOTE: DO NOT OVER TIGHTEN SCAFFOLD FITTINGS.** The use of long handled spanners are not recommended as they may damage the fittings.

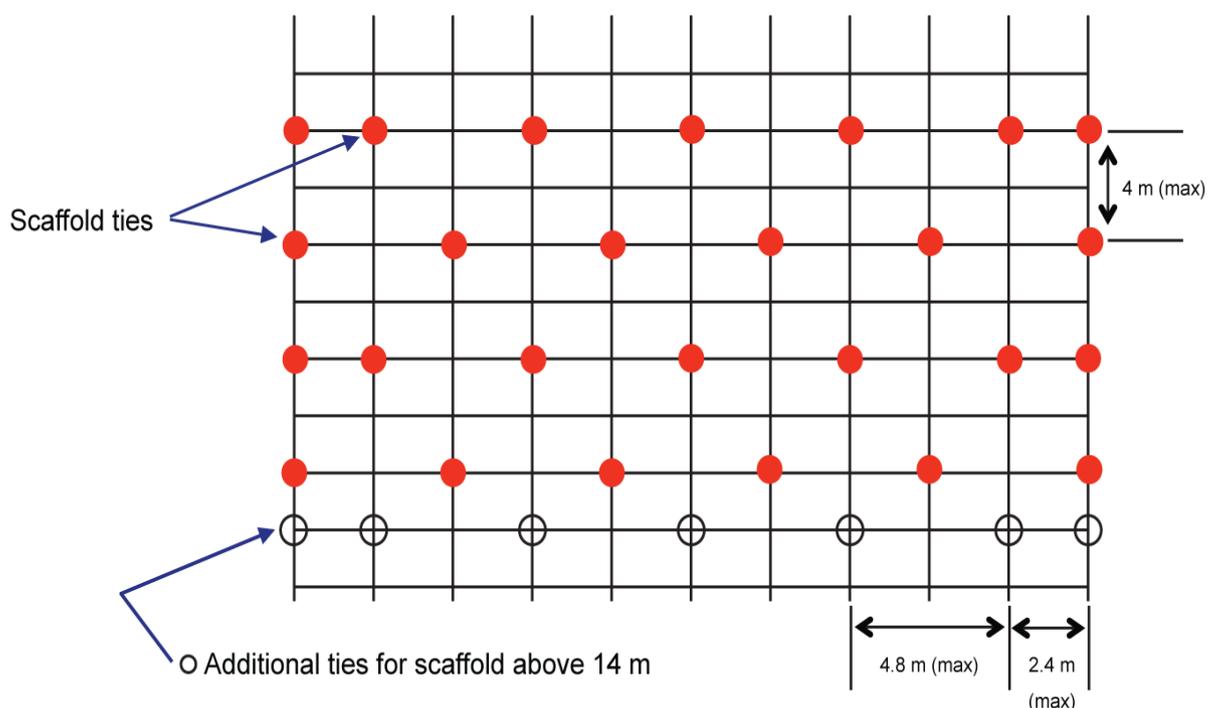


FIGURE: Typical tie pattern*

*Refer to Page 15 in this manual for requirements of tie frequency vs. height of scaffold.

ERECTION PROCEDURE

WORKING PLATFORMS

All working platforms must be fully boarded and have external edge protection comprising a guardrail, midrail and toeboard. If materials are to be stacked on the working platform, a brickguard must be fitted to the scaffold. The use of chain mesh and shade cloth does not mean that the midrail and toeboard can be omitted.

The maximum gap between each plank of a working platform must not exceed 10mm.

The maximum gap between the underside of a toeboard and the adjacent working platform plank must not exceed 10 mm.

The maximum gap between a working platform or a hop-up platform and the working face is 225mm. If the gap between the hop-up platform and the working face is not able to be closed with a wider hop-up platform internal edge protection comprising guardrail midrail and toeboard must be fitted.

At each end of a scaffold run from where a person or object could fall, edge protection comprising a guardrail, midrail and toeboard must be fitted. Transoms may be used in place of ledgers.

Be aware of other trades overloading the scaffold with materials. Light duty working platforms must not have any materials stacked on them. Medium duty working platforms in any bay are limited to 450kg comprising persons and materials including concentrated loads not exceeding 150kg. Heavy duty working platforms in any bay may be loaded with persons and materials up to 675kg including concentrated loads not exceeding 200kg.

LOAD LIMITS FOR WORKING PLATFORMS

LOAD TYPE	MAX. LOAD (SCAFFOLDERS + MATERIALS)	MAX. CONCENTRATED LOAD AS PART OF MAX. LOAD
Heavy duty	675kg per bay	200kg per bay
Medium duty	450kg per bay	150kg per bay
Light duty	225kg per bay	100kg per bay

NOTE: Materials are not permitted on light duty working platforms.

Landings on ladder and stair towers must be fitted with edge protection comprising guardrails and midrails. Stair towers must have handrails for each stair flight. The external face of a stair tower may omit handrails for the stair flight provided the external face is fitted with ledgers at 500mm vertical intervals. Stair tower landings at the same level as a working platform should be fitted with toeboards in addition to the edge protection rails. Ladders must not be vertical but should be pitched at between 70° and 75° to the vertical. Ladders must extend at least 900mm above the landing or there must be suitable hand-holds up to that height. The top of the ladder must be fixed in place with a ladder clamp. **Tie wire must not be used to secure the ladder.**

Only lapboards made of timber and propriety steel lap plates are to be used. The lapboard must overlap the bearing member (e.g. putlog or transom) by a minimum of 300mm.

ERECTION PROCEDURE

NO. OF WORKING PLATFORMS THAT MAY BE LOADED AT ONE TIME

The scaffold installation design must specify the number of working platforms and the applicable loading capacity, as well as if hop-up platforms are allowed.

MAXIMUM ALLOWABLE WORKING DECKS AT ANY ONE TIME			
TOP WORKING PLATFORM	HEAVY DUTY 675KG	MEDIUM DUTY 450KG	LIGHT DUTY 225KG
Up to 12m	5		1
14m	5		
16m	4	1	
18m	4		
20m	3	1	
22m	3		1
24m	3		
26m	2	1	
28m	2		1
30m	2		
32m	1	1	
34m	1		2
36m	1		

Note 1: No material is to be stacked on hop-up platforms at any time.

Note 2: Check the scaffold drawings for the number of decks that may be worked at the same time and their duty loadings.

DISMANTLING PROCEDURE

- 1. Make sure the scaffold is correctly erected and the ties, etc., are still in place** and all materials and debris is removed from the working platform prior to the commencement of dismantling. The work area should be barricaded off to prevent access to other workers and members of the public. Appropriate signage must be displayed to warn other workers and members of the public.
- You must work off a full deck of boards after the base lift. In Queensland you may work off 2 planks provided there is a full deck of planks no more than 2 metres below. Below are accepted methods which can be used to comply with various State regulations and site requirements. Any changes to these procedures must be covered by a specific risk assessment and Work Method Statement.
- 3. Sequential method of dismantling.** Handrails must be removed bay by bay and the standards are to be removed after the handrails in each bay. You must not remove the standards along the entire run of the scaffold, they are to be removed one at a time. This reduces the situations where you are working without a handrail.
- 4. Dismantling in 1 metre lifts.** Working from a fully planked platform with handrails (1 lift down from top) remove the boards on the lift above. Now place transoms at 1 metre and place 2 boards on the transoms to work off. Handrails at 1m and midrail to be added to outside legs of scaffold for this 2 board dismantling platform. From this level you can remove the handrails on the lift above and the standards above if required. When this is done remove the transoms. This is to be repeated on each lift.
- 5. Dismantling using a harness.** Attach the harness lanyard to the standard or ledger of the first bay ensuring that the scaffold is tied in accordance with the scaffold plan or this manual. **Do not fix the lanyard to a standard which has a join above the top lift.** Working from a fully planked platform with handrails, remove the toeboards, handrails and standards on that lift one bay at a time. Go down to level below and remove the boards on the lift above. This is to be repeated on each lift.
- 6. Dismantling using step boards.** Working from a fully planked platform with handrails (1 lift down from top) remove the boards and the transoms on the lift above. Now place one step board across the midrail and one across the handrail adjacent to a pair of standards. From the step boards you can remove the handrails on the lift above and the standards above if required. When this is done remove the step boards. This is to be repeated on each lift.
- Dismantle the scaffold one complete lift at a time whenever possible and leave the handrails in place until the other components are dismantled. **Remove the ties ensuring there is no more than two lifts of scaffold above the top row of ties.**
- Remove scaffolding components from the scaffold as it is dismantled then go to the lift below using the access which is to be dismantled as the scaffold is dismantled.

DISMANTLING PROCEDURE

9. **Remove braces using two scaffolders.** Do not release the top of the brace and let it drop and swing on the bottom coupler as the brace may come loose at the bottom and fall to the ground and cause an injury.
10. Remove the ties making sure not to damage the structure.
11. When the scaffold is dismantled to the base, lift and remove the bottom transom leaving the standard supported by the ledger. Now hold the standard, release the wedge and remove one end of the ledger only. Lift the standard off the jack and stack into a pallet. Now remove the ledger.
12. Repeat this process until the last bay. To dismantle the last bay requires 2 people, as the scaffold may fall over unless the last pair of standards is held upright.
13. All material is to be stacked in pallets for collection. Boards are to be stacked on timber so they can be lifted by crane or forklift.
14. **To prevent death or injury to persons and damage to components, do not drop scaffolding components from heights when dismantling scaffold.**

NOTE: If you are dismantling only part of the scaffold make sure that the remaining scaffold is tied in accordance with this manual and that the bracing is correct. Heel and toe bracing must be fixed to the end of the scaffold that remains.

BIRDCAGE SCAFFOLDS

A birdcage scaffold is an independent scaffold consisting of more than **two** rows of standards in both directions and is connected by ledgers or transoms. It is not practical to have a full deck of boards every 2 metres on a birdcage scaffold due to the extra weight of the boards and manual handling issues. This needs to be considered when designing the scaffold.

1. The birdcage scaffold should be designed with 1.2m or 760mm bays spaced at 4.8m intervals for the length of the scaffold.
2. These bays are planked every 2 metres and erected as a normal scaffold with handrails to prevent the scaffolder from falling.
3. The 1.2m or 760mm bays are joined with components fixed by the scaffolders from within these bays.
4. If there is only a requirement for boards at the top level, bridging ledgers are placed in a similar way. A harness must be used to fix the transom in the bridging ledger and place the boards on the bridging ledger.
5. A Scissor Lift can also be used for this, if access allows.
6. Design the birdcage so that spacing bays to work off can be fully planked and then fill in the middle at the top.

SPECIAL REQUIREMENTS FOR BIRDCAGE SCAFFOLDS

1. Provide lengthwise bracing at each outer row of standards.
2. Provide longitudinal bracing at every third row of standards.
3. Provide transverse bracing at every fourth bay on the ends of the scaffold.
4. Only use a birdcage to support formwork that has been specifically designed for this purpose.
5. Seek engineer drawings and certification prior to hand over certificate.

LADDER BEAMS, NEEDLES & TRUSSES

Ladder beams, needles & trusses are available in a variety of sizes and are used primarily for spanning entrance ways, large voids, or supporting scaffolds cantilevered off higher levels on the building/structure where it is not possible, or practical, to erect them in the normal way from ground level.

The use of ladder beams, needles & trusses must be accompanied by an engineered design drawing of its intended use in each application.

The design drawing **must** be adhered to and if alterations of any kind need to be made then approval must first be given by the Acrow design office, prior to the commencement of alterations or the erection of the scaffolding structure.

Erection & dismantling of scaffolding, using ladder beams, needles or trusses, may only be carried out by intermediate or advanced scaffolders. In many cases the use of harnesses will be required and only scaffolders trained and accredited with the use of harnesses and associated equipment are allowed to use them.

FALL PROTECTION

USE OF HARNESS, LANYARDS, RESTRAINT LINES, RECOVERY (RESCUE) SYSTEMS

There are a host of relevant standards for Height Safety, Equipment & Use. (Refer to 'A guide to Height Safety & personal Fall Protection').

Hazard identification and safety risk assessments should be conducted prior to carrying out any task where working at height is required.

The Hierarchy of Control (AS 1891.4 section 1.5), dictates the methods of protection which should be used.

NOTE: Only those trained and accredited in the correct use of fall protection equipment, are to use such equipment.

PERIMETER HANDRAILS

When installing guardrails to the edge of a slab, or other unprotected edge and it is possible to fall a distance of 2m or more, you must wear a harness and be connected to a static line, a certified anchorage eyelet or to an inertia reel used with an overhead anchor point.

Only personnel trained in the correct use of harness and associated equipment are to use such equipment. Users must be aware of the '**fall clearance**' when working off a single anchor point (Refer AS/NZS 1891.4).

Guardrail posts should be fitted not greater than 300 mm in from the outside edge of a floor or platform. The guardrail should be not less than 900mm above the surface and no more than 1100mm. Midrails are to be fitted with a nominal clear distance between rails not being greater than 450mm. If the guardrail is greater than 900mm above the slab it may be necessary to fit a number of midrails keeping the 450mm as the maximum clear distance. Brickguards may be fitted in place of midrails to prevent objects falling from the edge. **Remember to wear appropriate fall protection equipment when fitting edge protection to an unprotected edge.**

CONTAINMENT SHEETING (ENCAPSULATION)

WHS Regulations define perimeter containment screening as screening which is used to protect members of the public and workers from falling objects during construction work. On scaffolding the most commonly used containment screens are made of mesh. Note - wind load charts for the particular region need to be checked to ensure that the scaffold can bear the load.

UNI-MESH™ - Acrow/Uni-span's patented containment system for scaffolding, 50mm x 50mm grid with shade element with steel wire reinforced. Tested & certified to all relevant Australian standards & WHS regulations. Also available in a fire retardant version, is **UNI-MESH™ FR**.

UNI-GRID™ - Acrow's patented containment system for scaffolding, 25mm x 25mm grid with *no* shade element however steel wire reinforced. Tested & certified to all relevant Australian standards & WHS regulations.

PRESCRIBED LINING - intact shade cloth (or another intact lining) that when tested is in accordance with method A in AS.2001.2.4.

ACCESS & EGRESS

Workers must be provided with safe access to, and egress from, scaffolds during the erection, use and dismantling of scaffolding.

Common means of access & egress include:

Temporary stairs, or ladder access systems, installed at the start of erection and progressed with the scaffold and used by the scaffolders whenever possible;

Permanently installed platforms/ramps;

Stretcher stairs;

Use of existing floor level of a building, provided such access is safe.

STAIR ACCESS

There are two distinct types of stair access that Acrow Australia installs. One is 600mm wide aluminium risers (1.5m), fitted into a 2.4m x 1.2m bay which are used as a general purpose access/egress stairway.

The second is the 'stretcher stair' which is to accommodate the easier evacuation of an injured person. The treads are 1150mm wide with risers of 2m which is equal to the normal scaffold lifts.

The step height from the ground to the first landing should not exceed 300 mm. Use a step-up bracket or a 1-plank hop-up bracket with a metal plank well secured to the bracket.

OTHER SAFETY MATTERS

WORKING IN CONFINED SPACES

A 'confined space' means an enclosed space that:

- a. is at atmospheric pressure when anyone is in the space;
- b. is not intended, or designed primarily, as a workplace;
- c. could have restricted entry to, or exit from, the place;
- d. is, or is likely to contain any of the following:
 1. an atmosphere that has potentially harmful levels of a contaminant;
 2. an atmosphere that does not have a safe oxygen level;
 3. anything that could cause engulfment.

Examples of confined spaces include (but are not limited to) storage tanks, tank cars, process vessels, boilers, silos and other tank-like compartments, pits, degreasers, pipes, sewers, wet & dry wells, shafts, ducts, shipboard spaces (entry through small hatchways or access points), cargo tanks, duct keels, ballast or oil tanks.

Only Acrow/Uni-span personnel, with training and assessment in 'working in confined spaces' and 'confined space safety' are allowed to work in such areas.

If you have any doubts whatsoever as to what constitutes a confined space, consult your supervisor prior to entry.

MANUAL TASKS

Manual tasks include any activity where workers grasp, manipulate, carry, move (lift, lower, push, pull), hold or restrain a load. E.G. Handling components, erecting and dismantling scaffolding and the use of hand tools such as a podger hammer or scaffold spanner.

Proper on site planning by Foreman, Leading Hands, including the correct placement of the scaffold materials, can sometimes eliminate (or at least reduce) unnecessary lifting, carrying etc. and by making use of all available labour resources.

If the site is limited in labour resources or mechanical devices (cranes, forklifts etc.) then the use of gin wheels is another way to handle items that would usually get passed up the scaffold.

There is no need to over tighten scaffold couplers and the tighter they are increases the risk of thread breakdown and 'stripping' and also requires extra force to undo at a later date.

Do not try and lift or carry components in quantities beyond the manual handling weight guidelines.

DEFINITIONS

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

Anchorage point — a secure point on a structure to which a fall arrest device lanyard assembly or restraint line may be secured. This anchorage point must have a minimum strength of 15kN.

Baseplate — a plate to distribute the load from a vertical load-bearing member to the supporting structure, usually through a soleplate.

Bay extension platform — a portion of a working platform that protrudes beyond the face of a scaffold, adjacent to a bay of a scaffold and forming an extension of that bay. The bay extension platform is also known as a hop-up platform.

Birdcage scaffold — a freestanding scaffold consisting of more than two rows of standards connected by ledgers and transoms.

Brace — a member fixed diagonally to two or more vertical members of the scaffold to provide rigidity to the scaffold.

Cantilever scaffold — a scaffold that is supported by structural members to support a scaffold outside an independent scaffold.

Cantilever platform — a platform that extends out from the face of an independent scaffold and is supported by a cantilever scaffold.

Castor — a wheeled assembly that fits to the lower end of a standard to support the scaffold and enable it to be moved horizontally. The castor may be fixed to limit the direction of the horizontal movement or be swivelling to allow movement in any horizontal direction.

Catch platform — a platform attached to the outer face of a scaffold to catch falling debris.

Check coupler/Safety fitting — any right angle coupler or swivel coupler fixed hard against a load bearing coupler to restrict or prevent slippage of that coupler along the tube.

Confined space — refer to the relevant section of State WHS Regulations for a full definition.

Face brace — a brace in a vertical plane on the face of a scaffold.

Fall arrest — a harness fitted with a retractable lanyard (of shock absorbing lanyard) limiting the fall to no more than 2m.

Fall Restraint — a harness fitted with a restraint line which limits the wearer's movement. This is to stop the user from getting into a fall hazard situation.

DEFINITIONS

Fan lift — a cantilevered catch platform.

Guardrail — the highest rail in a system of rails to provide edge protection at a platform edge.

Heel and toe brace — a brace in a vertical plane on the end of a run of scaffold.

Hop up bracket — a cantilevered bracket fitted on the front of a scaffold to provide intermediate working levels. They are also used to fill the gap between the inside standards and the structure.

Hung scaffold — an independent scaffold which is hung from another structure and which is not capable of being raised or lowered when in use. Used when it is not practical to come up from the ground.

Landing — a level area used to provide access to a stairway or ladder, or located at an intermediate level in a system of stairways or ladders.

Ledger — a horizontal structural member connecting adjacent standards, typically longitudinally.

Lift — the vertical distance from the supporting surface to the lowest ledger or level at which a platform can be constructed or the vertical distance between adjacent ledgers or levels at which platforms can be constructed; maximum lift height is 2 metres.

Loading platform — a working platform of a scaffold primarily intended for the storage of materials and equipment.

Member — anything that forms part of the scaffold assembly.

Plan brace — a brace in the horizontal plane connecting diagonally opposite standards, fitted below the ledgers and connected to the standards with right-angle couplers.

Putlog — a horizontal structural member spanning between ledgers, or a ledger and an adjacent wall, and intended to support a platform.

Raker — an inclined tube fixed between a standard and a supporting surface, typically the ground, to keep the scaffold stable.

Scaffold board/plank — a decking component, other than a prefabricated platform, which is used or intended to be used in the construction of any platform supported by a scaffold. This may be timber or steel.

Soleboard — a single member used to distribute the load from two or more baseplates to the ground or other supporting structure. This can be continuous.

Soleplate — a member used to distribute the load through a single baseplate to the ground or other supporting structure.

DEFINITIONS

Spider/Cross Diagonal brace — cross braces in the vertical plane used to stabilize adjacent ladder beams.

Spigot — a tube of smaller diameter than a standard that is fitted at one end of the standard to provide horizontal resistance at the joint between it and the standard above.

Spur — an inclined load-bearing member that transmits a load to the supporting structure or other part of the scaffold. Can be in tension or compression.

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

Stretcher stair — an access stairway with stair treads 1150mm wide, attached to or adjacent to a scaffold for the access and egress of personnel, workers etc. but with a main design function of accommodating the removal of injured personnel.

Strut — a scaffold member that supports a compressive force.

Supporting structure — any structure, structural member or foundation that supports a scaffold.

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

Transom — a horizontal structural member connecting adjacent standards, typically transversely.

Working load limit (WLL) — the maximum working load that may be applied any component of a scaffold.

Working platform — a platform on a scaffold to support persons and materials or equipment for use by them.

QUEENSLAND

1. Workplace Health and Safety Act (2011)
2. Workplace Health and Safety Regulation (2011)
3. Workers' Compensation and Rehabilitation Act 2003
4. Workers' Compensation and Rehabilitation Regulation 2003
5. Formwork code of practice 2016
6. Hazardous manual tasks code of practice 2011
7. How to manage work health and safety risks code of practice 2011
8. Managing risks of hazardous chemicals in the workplace code of practice 2013
9. Managing risks of plant in the workplace code of practice 2013
10. Managing the risk of falls at workplaces code of practice 2018
11. Mobile crane code of practice 2006
12. Scaffolding code of practice 2009
13. Confined spaces code of practice 2011
14. First aid in the workplace Code of Practice 2014

NEW SOUTH WALES

1. Work Health and Safety Act 2011 No 10
2. Workers Compensation Act 1987 No 70
3. Workplace Injury Management and Workers Compensation Act 1998 No 86
4. Work Health and Safety (Construction Work) Code of Practice 2015
5. AS/NZS 3012: 2010 Electrical installations - construction and demolition sites
6. Code of Practice for managing noise and preventing hearing loss at work (section 274)
7. Code of Practice 2009 : safe work on roofs. Part 1, Commercial and industrial buildings
8. Code of practice : safe work on roofs. Part 2, Residential buildings
9. Code of Practice for construction work
10. Code of practice – Overhead Protective Structures
11. Workplace Injury Management and Workers Compensation Act 1998
12. Workers Compensation Regulation 2010
13. Occupational Health and Safety Regulation 2001
14. Code of Practice - Work near overhead power lines 2006
15. Code of Practice - Moving Plant on Construction Sites 2004
16. Code of Practice - Risk Assessment 2001
17. Code of Practice - Technical Guidance 2001
18. Code of Practice - Amenities for Construction Work 1997
19. Code of Practice - Overhead Protective Structures 1995
20. Code of Practice - Formwork 1998
21. Industry Solutions - Erecting, altering and dismantling scaffolding - Part 1: Prefabricated steel modular scaffolding 2010
22. Industry Solutions - Erecting, altering and dismantling scaffolding - Part 2: Aluminium tower-frame scaffolding 2011

DEFINITIONS

VICTORIA

1. Workplace Health and Safety Act (2011)
2. Workplace Health and Safety Regulation (2011)
3. Workers' Compensation and Rehabilitation Act 2003
4. Workers' Compensation and Rehabilitation Regulation 2003
5. Formwork code of practice 2016
6. Hazardous manual tasks code of practice 2011
7. How to manage work health and safety risks code of practice 2011
8. Managing risks of hazardous chemicals in the workplace code of practice 2013
9. Managing risks of plant in the workplace code of practice 2013
10. Managing the risk of falls at workplaces code of practice 2018
11. Mobile crane code of practice 2006
12. Scaffolding code of practice 2009
13. Confined spaces code of practice 2011
14. First aid in the workplace Code of Practice 2014

WESTERN AUSTRALIA

1. Occupational Health and Safety Act 2004
2. Workers Compensation Act 1958
3. Accident Compensation (WorkCover Insurance) Act 1993
4. Accident Compensation (Occupational Health and Safety Act) 1996
5. Accident Compensation Regulations 2001
6. OHS Regulations 2007 + Fact Sheets relating to specific activities & risks
7. Compliance Code - Communicating occupational health and safety across languages 2008
8. Compliance Code - First Aid in the workplace 2008
9. Compliance Code - Prevention of falls in general construction 2008
10. Code of Practice - Manual handling 2000

GENERAL

1. Australian/New Zealand AS/NZS 457 6:1995 "Guidelines for Scaffolding"
2. Australian/New Zealand AS/NZS 1576: 199 1-2000 (Parts 1 - 6) "Scaffolding"
3. Australian/New Zealand AS/NZS 1891.4:2000 "Industrial Fall-Arrest Systems and Devices" (Part 4 Selection use and maintenance)
4. Australian/New Zealand AS/NZS 4360:2004 "Risk Management"
5. National Code of Practice for the Prevention of Musculoskeletal Disorder from Performing Manual Tasks at Work (2007)



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