



GOSCAFFOLDING

SAFETY & ERECTION GUIDE

THIS GUIDE

This booklet is designed as a basic guide for safe handling of scaffolding, and assembly of basic scaffold structure. For more complex structures, or difficult sites, the help of competent designers and/or erectors may be required. For a more comprehensive guide please refer to the Approved Code of Practice for the Safe Erection and Use of Scaffolding, available from the Department of Labour or www.osh.govt.nz.

BEFORE YOU BEGIN

Competent Persons

Persons erecting, dismantling, or altering scaffolding must be competent to perform this type of work. Please refer to the relevant government authority if you are unsure as to who is a competent person. In general, for all erection, alteration and dismantling of scaffolding above 5 m in height a competent person must hold a current national, state or territory certificate to the appropriate class.

Delivery

Loads are delivered by truck and are secured with chains or straps. The truck must not be moved without the load being secured.

New Zealand Standards – All scaffolding must be erected in compliance with AS/NZ 1576:1995 and AS/NZ4576 "Guidelines for Scaffolding". Other Statutory Regulations may also apply, i.e. Code of Practice.

Erectors

Erection, dismantling and alteration requires intensive manual handling of heavy components. All personnel should be trained and competent in manual handling techniques. A minimum of two (2) people, working as a team is recommended for both erection and dismantling.

Work Method

Always work off 3 planks minimum

Tie and brace as you build

Climb inside face between lifts, not the outside face

Do not work in rain or high winds

Risk Management

For erection of any scaffolding a site specific Risk Assessment should be made. Site specific Hazard Identification and Risk Assessment and a Safe Work Methods Statement are recommended.

Damaged Equipment

Always check scaffold items, tools and other equipment for damage before use. Do not use damaged components.

Ground

Check ground, or structure, where scaffold is to be erected. It must be able to carry the load. Use adequate sole plates, especially in soft ground.

Obstacles and Power Lines

Check for obstacles that may interfere with the erection. Scaffolds which approach within 4 m of power lines are not allowed. The electricity authority must be contacted to make the power lines safe.

Scaffold Loading

Do not overload the scaffold. Where the scaffold may be exposed to high winds special precautions may be needed for tying in the scaffold. When cladding or shade cloth is used this can increase the problem. An experienced scaffold design engineer should be consulted in these cases.

Inspection

Erected scaffolds must be regularly inspected for safety. A documented inspection scheme should be implemented.

Work Levels

All platforms should have hand rails, mid rails and toe boards at all open ends and sides of the scaffolding. Adequate safe access must be provided to all working levels.

Signs

Fix a sign to incomplete scaffolds to indicate it must not be used.

WEDGELOCK MODULAR SCAFFOLD

OVERVIEW

The scaffold system is a prefabricated, modular scaffolding system made from high tensile steel and is suitable for many types of construction. The system has been tested to relevant New Zealand standards. As per BS EN 12811-1 and AS/NZ 1576:1995, it is suitable for 20 lifts high with 3 heavy duty working platforms.

ITEMS



Standard

The vertical members which carry all the load of the scaffold. V-pressings are welded in clusters of four along the standards. These V-pressings take the connectors from ledgers, transoms, hop ups, braces etc.



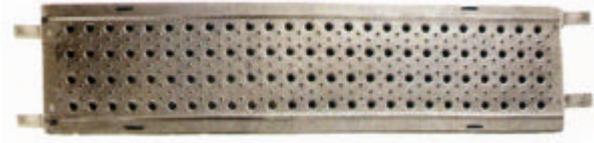
Ledgers

These are the horizontal connectors for the standards. They space the standards along the length of the scaffold. They are also used as hand rails and intermediate rails.



Transoms

Horizontal members which run along the width of the scaffold. The planks, and any weight on the platform, are supported by the transoms.



Planks

Planks placed side by side on the transoms form a platform.



Jacks

Adjustable bases used to level the scaffold, made from solid bar.



Braces

Fitted diagonally, on both the outside and end faces of the scaffold. These brace the structure to stop distortion or swaying.

Hop Up Brackets

Brackets used to hold planks. These are used to form an intermediate platform on the inside or outside of the scaffold.

Ladder Beams

Used to bridge openings and for support of cantilevered scaffold. All applications for ladder beams are subject to design check.

Ancillary Items

Tube, couplers, transom trusses, stairs, wooden planks and other components used in specific applications.

ERECTION

Base out

Ensure the scaffold has a firm base. Check with a qualified engineer if uncertain of the ground bearing capacity.

Soft ground should be consolidated.

Sole plates must be used under the jacks, except concrete. The sole plate must sit level and firmly on the ground. If necessary level the ground by digging.

Use only the correct sole plates and do not use bricks or other masonry.

If erecting scaffold on a suspended slab, needles, roof or any other such structure make certain that the structure can support the load. Special bracing or propping may be required. Check that there are no obstacles in the way; especially overhead power lines which will be within 4 meters of the completed scaffold.

Carry scaffold items to areas adjacent to where they will be erected and lay them next to where they will be erected.

Jacks

Once you have a good footing for the sole plate the jack should be placed on the sole plate.

Make certain the jack is wholly on the sole plate with no overhang. If the ground is not level over the scaffold length start at the highest point and then work down the slope.

Initially set the nut of the adjustable base close to the bottom of the base plate. This will allow for the maximum adjustment of the jack when leveling the scaffold.

Start

If possible start your erection in a corner.

Place two ledgers on either side of the first bay. Place two transoms at either end of the bay.

Generally, for the bottom bays, the front standard will be a 2 m, and the back a 3 m.

The standard joints will then be staggered as the scaffold goes higher. These staggered joints are important for stability, especially for higher scaffolds.

Plan

Plan how you are going to erect the whole scaffold.

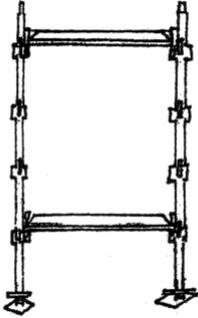
Plan especially for bracing and tying the scaffold into the structure.

Consider safety at all times.

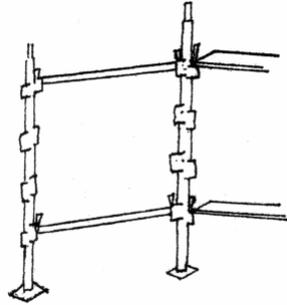
Access to the scaffold is important. It is equally important that other site workers do not enter onto an incomplete scaffold as it is to provide safe access to a completed scaffold.

FIRST BAY

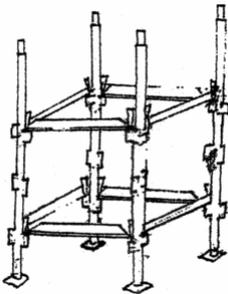
Do not hammer home wedges until the first bay is level and square.



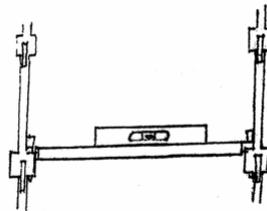
1. Place open end of 2 standards onto the jacks. Turn standards so that V-pressings line up and fit transom into the lowest set of V's. Fit next transom, 1.5 m (max 2 m) higher.



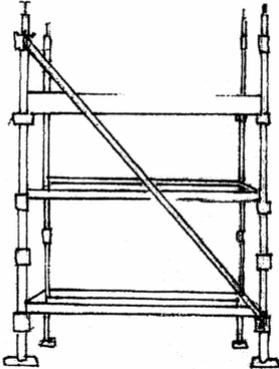
2. Hold this completed frame and fit the third standard, jack and the first ledger. Ledgers are fitted into one of the top V-pressings of a cluster. The bay is now self supporting.



3. Complete the bay by fitting the other standards, ledgers and transoms. Check that the wedges are well seated, and that the scaffold is the correct distance from the work face.



4. Using a spirit level, level the ledgers and transoms by adjusting the jack height. Start at the Standard on the highest point. Check for squareness by measuring diagonals. pressings line up and fit



5. Place planks on the bottom transoms. The fit of the planks is a good double check on bay squareness. This platform is now used to work off and build up the next lift of the scaffold, normally 1.54 m but no more than 2 m.

Maximum height for the first lift from base of scaffold is 500 mm.

Fit planks to the next highest level to form a platform to work off for erecting the rest of the scaffold.

Fit diagonal bracing to outer face and end of the bay. When fitting braces first fit the brace into the upper V-pressings and then the lower one; this is safest and best way of fitting. Wedges can now be tapped home (not heavily) on all connections.

Hop ups can be fitted to the working face. Use correct tie bars for all hop ups, expect I board hob ups.

COMPLETING THE SCAFFOLD

Base

Add horizontal bays until the end of the run is reached.

Use the same standard configuration, 2 m inside and 3 m outside till the end of the run. At the end use two 3 m standards for both inside and outside faces.

Make certain that all V-pressings on the standards are turned the same way.

Level each bay as it is built.

Fully deck out the first lift.

Additional Lifts

Make certain that all V-pressings on the standards are turned the same way.

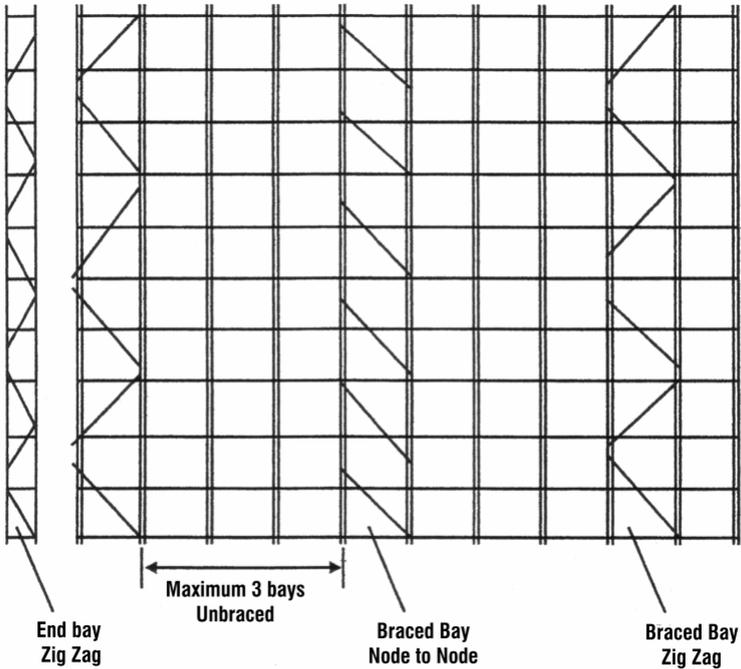
Use 3 planks per bay to work off.

Maximum distance between lifts is 2 m.

Working platforms should be fully decked with planks and must have handrails, midrails (use ledgers and transoms) and toe boards.

Brace and tie the scaffold as it is build, not later.

BRACING



Bracing is required on all scaffolds to add rigidity and minimize distortion and sway.

Face bracing is added to the outside of the scaffold.

A maximum of 3 consecutive horizontal bays can be left unbraced.

End bracing must be fitted at each end.

Zig zag pattern bracing is typically used. The bracing must run continuously up the scaffold, with no breaks.

Node to node bracing running parallel to each other can be used.

Fit braces while building the scaffold, not when complete.

TYING SCAFFOLD TO THE STRUCTURE

CRITICAL REQUIREMENTS

A scaffold may free stand to a height 3 times its minimum base dimension. For example a scaffold 760 mm wide must be tied at a height 2.4 m.

The maximum height of a free standing scaffold is 4 m regardless of base dimensions.

For scaffolds up to 30 m high, tie every second standard.

For scaffolds up to 45 m high, these may require extra ties and should be designed by a competent experienced engineer.

Scaffolds with cladding may require extra ties due to wind loading. Consult a competent experienced engineer.

Scaffold should be tied every 4 m in a vertical direction. This means that when the scaffold is tied every second standard, there is a maximum of 8 m height between ties.

The maximum a scaffold can free stand above the top row of ties is 2 lifts.

A tie on a return corner of the scaffold is counted as a tie to the structure.

Horizontally the maximum distance between ties or from a tied return is 3 bays or 7.2 m.

Tie tubes should be fixed to the standards using right angle couplers. Where tying to standards is not possible, tying to ledgers is allowed, but only if a check coupler is fitted above the ledger, at each end to prevent the ledger from being dislodged.

If possible fix the tie to tie structure using short tubes over a window sill or beam or around columns. Use other methods where this is not possible.

Where possible ties should not obstruct the working level of the scaffold and are best fitted close under the working lift.

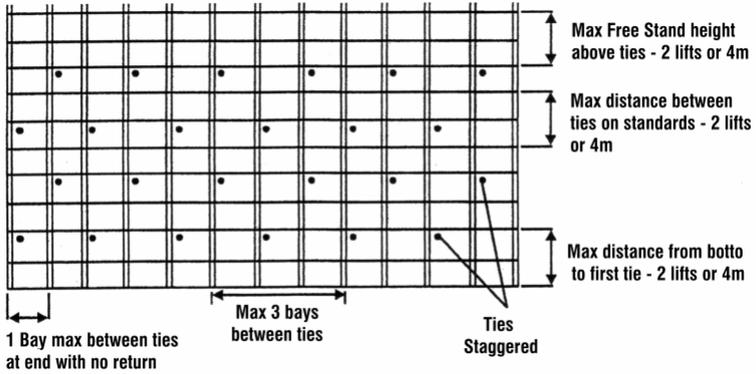
Make certain the structure you are tying to is sound.

Do not tie to a timber window frame or other timber structures. The ties are designed to take a considerable load and must be tied to something substantial.

If tying to old brick work make certain it is sound. This is especially important if using friction anchors for tying.

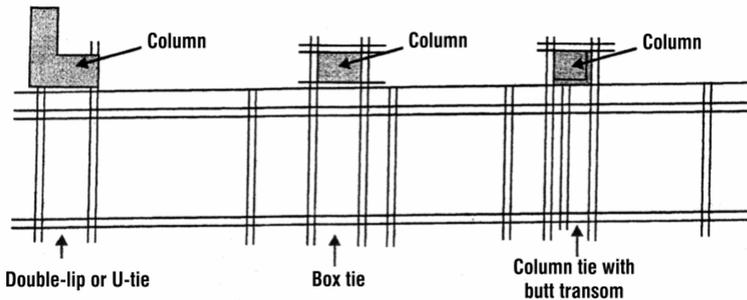
Use only undamaged fittings. Check thread on bolt is not stripped.

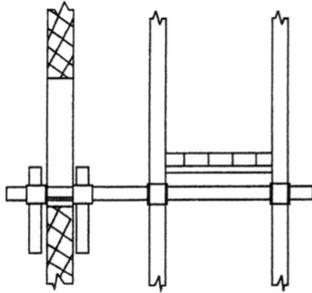
TIE PATTERN



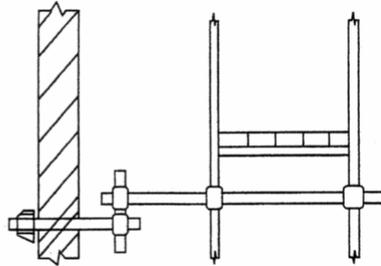
TIE METHODS

The common methods are as below and on the following page. Right angle couplers are used.





Tie Through an Opening



Tie fixed through hole in form with long bolts

Typing to the Scaffold

Tie tubes must be connected to standards and be parallel to the transoms.

Tie tubes should be connected to the standard as close as possible to the V cluster which holds the junction of the transoms and the ledgers, as below;

If the connection is within 300 mm of the underside of the cluster, tie to the front standard with an extra check coupler.

If the connection is further than 300 mm from the underside of the cluster, tie to both the front and back standards. If this is impossible then reinforce the front standard for the full height of the lift with scaffold tube. This reinforcing tube should be tied every 900 mm to the standard with swivel couplers.

Other Ties

The above typical tie methods are preferred. Sometimes these are not possible and other tie methods can be used. These include;

Build a buttress on the base of the scaffold to increase base dimensions.

A hole is drilled through a wall and wall tie bracket bolted to the wall.

A friction or chemical anchor can be fixed to the structure. The manufacturers' instruction as to the correct use of these anchors must be followed.

If the distance between horizontal ties is greater than 3 bays on any level then plan bracing can be used to stiffen the structure. This bracing must extend right up to the standards which are tied to the structure.

If the distance between the vertical ties exceeds 4 m, heel and toe bracing between existing standards, can be used to stiffen the structure. Bracing, both plan and heel and toe, is not a substitute for Positive tied and should be used sparingly.

WORKING PLATFORMS AND ACCESS

All working levels should be fully planked and have hand rails, mid rails and toe boards at all open ends and open sides of the scaffolding.

Do not stack material on the platform higher than the toe board or the brick guard, if fitted.

Maximum gap between the scaffold, or the hop up bracket, and the building is 224 mm. If the gap is wider install a handrail and midrail, or fit a wider hop up.

Make certain that the platform is level with no protrusions or trip hazards on the platform.

Maximum load for a heavy duty working platform is 675 kg per bay, of which 200 kg is the maximum concentrated load.

Be careful that nobody overloads the platform or scaffold.

For scaffolds between 30 m and 40 m high only 2 loaded platforms are allowed.

For a scaffold less than 30 m only 3 loaded platforms are allowed.

ACCESS

Access to working platforms must be provided where there is no safe access from the building to the scaffold.

Preferably access structures are placed next to the scaffold. They may however be built as an integral part of the main scaffold structure.

Ladder access is used when only a few people need to access the scaffold and when materials and tools can be transferred to the scaffold in some other way.

Ladder should protrude a minimum of 900 mm above each platform.

Ladder should be vertically spaced at a maximum of 4 m and must be tied to the scaffold.

STAIRS

Stairs fit within a 1.2 m x 2.4 m bay; rising 1.5 m over the 2.4 m bay length.

First fit 2.4 m ledgers and ½ m transoms at 1.5 m vertical distance.

Fit the first stair on these transoms, next to a standard.

Stairway landings should be next to access landings at working platforms. For all entry and exit points to the stairway allow a head clearance of 2 m.

Install ledger rails at 0.5 m vertical intervals, on both horizontal directions. These act as guard rails.

Install the next stair so that the bottom of this stair is on the same transom as the top of the previous stair. Face this stair in the other direction to form a zig zag pattern of stairs. Install the riser handrail to each stair as soon as possible. Do not wait till the whole stair is built. Bolt the rail with a lock nut to the stair.

HOP UP BRACKETS

Hop Ups are usually placed so that the planks on the hop up are at the same level, or 500 mm below, the working platform.

Tie bars must be used to interconnect the hop ups, turn the corner of the angle of the tie bar on the outside so that the steel plank fits inside the angle.

Do not stack material on hop up brackets.

ALTERING AND DISMANTLING SCAFFOLD

Only qualified persons can make alterations or dismantle a scaffold.

Fix a sign to incomplete scaffolds to show that it can not be used.

At all times the stability of the scaffold structure must be maintained before, during and after any alterations or dismantling. Before starting work check that the scaffold is properly erected.

Clear all material from the work decks before starting dismantling and barricade off access to prevent other site workers going onto the scaffold.

Dismantle the scaffold one complete lift at a time, where possible. Leave handrails in place for as long as possible.

Remove ties only when the scaffold dismantling reaches the level of the ties. Never leave more than two lifts above the top row of ties.

Do not remove diagonal bracing until the standard to which it is attached needs to be dismantled. Use two men to remove bracing for safety. Release the bottom of the brace first for safety.

Work from planks on the bays, and only remove the planks while working from the bay below.

Do not remove ledgers before planks have been removed at any level.

Be careful not to overload one area of the scaffold when stacking the dismantled items into the scaffold.

The last bay must have two men as the last pair of standards will fall over if not supported.

Pack all material in pallets. Planks should be stacked on timber and strapped. This will allow safe removal of all scaffolding.

Never drop material to the ground during dismantling.