Erect and dismantle restricted height scaffolding

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Introduction

Scaffolds are a temporary structure that is used so that work can be done on a building or other structure above the floor level, instead of using ladders.

In this resource you will learn how to erect and dismantle restricted height scaffolding. This kind of scaffolding is suitable for work to be done under 4 metres in height.

Erect scaffolding

You’re ready to erect a scaffold when you’ve:

- completed a thorough plan
- worked out the access and egress routes
- inspected and prepared the site
- calculated the maximum load
- chosen and checked all the scaffolding components

Let’s now look at how to erect a modular (systems) scaffold. This type of scaffold is put together using prefabricated components.

Note: When the structure is completed or being constructed, make sure enough ties can be installed to make the scaffolding stable. The number of ties will depend on:

- the distance between columns
- the distance between walls or windows
- floor heights
- existing finishes
- vehicle access.

Unit frame scaffolds

Erecting a unit frame scaffold

The total number of units and fittings are calculated and then placed in their approximate positions ready to be erected. Before commencing erection, prepare the supporting surface by making sure it is as level as possible, not going to subside under load, not block access and it complies with hazard assessment procedures.
Step 1

Select suitable sole plates, set out their position and bed them as level as possible, unless the surface is concrete or other firm surface.

![Image: Preparation of sole plates on an uneven foundation]

Step 2

Stand a unit frame on each sole plate with a screw jack set to the lowest adjustment, fitted inside the base of each leg or standard. Attach the ends of a folding brace to one frame on one side and then attach the other end of the brace to the other unit frame on the same side.

![Image: Stand frames and attach a folding brace]
**Step 3**

Fit another folding brace to the other side of the same bay and then level up both ends using the adjustable screw jacks. A straight plank or a straight edge may be laid on top of the frames, over the length of the bay, to enable levelling of the bay.

Repeat the process for the remainder of the bays required to make up the length of the scaffold.

**Note:** *It is critical that the first run of bays is level as this will ensure the whole scaffold remains level and plumb for its full height and length.*

Images: Completing the required length of scaffolding and the method for adjusting screw jacks
Step 4

Deck the working platform with planks for the full length of the scaffold to enable safe lifting and fitting of additional unit frames. To install an additional lift, insert the height couplers to connect the next unit frame and then repeat the previous 3 steps.

When the desired height, maximum 4 metres, is reached the working platform should be fully decked out, toe boards fitted, hand rails fitted, additional bracing or outriggers fitted if required and the whole scaffold checked for completion.
Modular scaffolds

Erecting a modular scaffold

All prefabricated scaffolding systems, whether new or modified, must be
design registered with a state, territory or commonwealth regulatory
authority. Make sure you obtain complete instructions from the supplier for
erecting, dismantling, transporting, storing and maintaining the scaffold.

Components from different types of modular scaffold should not be mixed.

The following has been designed to give you a general understanding of the
steps involved in erecting a modular scaffold. It is essential that the steps
that you follow for any scaffolding and components you purchase or hire are
those provided by the supplier or manufacturer.

Modular scaffolds are made up of:

- steel pipes—standards, ledgers, transoms and braces
- patent wedging system—similar to ‘Surelock’, ‘Cuplock’,
  ‘Kwikstage’.

Image: Typical modular components: Transom, standard, ledger, wedge connector
The patent wedging system holds the system together. Prepare the supporting surface so that it: is level, will not do down under load not block access and comply with hazard assessment procedures and then follow these steps:

**Step 1: Prepare sole plates.**

- Select appropriate sole plates.
- Set out their position.
- Make them as level as possible, if the surface is not firm eg concrete
Step 2: Start at one end of the scaffold.

- Set a pair of screw jacks to their lowest adjustment and place on top of the sole plates.
- Slide the end of a standard over the top of each jack.
- Stagger the joins in the standards throughout the height by using a 2-metre standard on one side and a 3 metre on the other – by doing this, the system will be stronger.
- Insert the transom and fit the wedges – don’t tighten the wedges at this stage.
Step 3: Fit the first two ledgers.

- One person holds the standards at one end
- The other person fits one ledger to one side and then the other at the same height as the transom – don’t tighten the wedges at this stage.
Step 4: Set out first bay.

- Attach the third and fourth standards to the ends of the ledgers.
- Fit a transom between them.
- Do not tighten the wedges at this stage.
Step 5: Complete and level first lift.

Select the height for the first lift.

- Insert another two transoms and ledgers to make a complete bay with two levels of connecting members. Note: Set the height of the ledgers at the same level so that the loads are distributed evenly throughout the height of the scaffold.
- Drive the wedges in firmly to make the frame rigid. Level the first bay accurately.

Step 6: Complete and level the first lift.

- Repeat the same procedure to establish the total length of the scaffold.
- Add to the height of the first bay by inserting additional standards and locking them in with the patent vertical wedging system. Note: This system usually has prefabricated metal planks, which fit in between and rest on the transoms. Each subsequent lift should be decked out with planks to enable safe erection and lifting of members.
Step 7: Complete the scaffold.

- Fit patent diagonal face bracing, when the height is correct – it should be wedge fixed to the standards.
- Fit toe boards, handrails, internal or external ladders.

Step 8: Inspect the scaffold.

An authorised person must inspect the scaffold before being used. They should check:
- that the equipment to be used is compatible with the scaffold
- safe working loads are correct
- working platforms are correct for duty classification
- guardrails, midrails and toe boards are in place as required
- lifting equipment is installed in appropriate locations for ease of use.
Lightweight mobile scaffold

Lightweight mobile scaffold, similar to Instant Access, consists of light aluminium tubing, which clips together, and is mounted on rubber castors for use on firm level surfaces.

It is used for lightweight operations such as painting, changing lights, attaching fittings and fixtures, etc., inside structures where stepladders are too short or not safe for use.

**SAFE WORKING LOAD**—2 persons + 25 kg materials = Total Load of 225 kg (Max. SWL 450 kg per tower, if 2 levels are used, i.e. 225 kg per level, where app).

<table>
<thead>
<tr>
<th>WIDTH</th>
<th>1.370m</th>
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<tbody>
<tr>
<td>LENGTH</td>
<td>1.8, 2.4, 3.0m</td>
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<tr>
<td>FRAME HEIGHTS</td>
<td></td>
</tr>
<tr>
<td>BASE FRAME (with castors)</td>
<td>2.0 to 2.2m</td>
</tr>
<tr>
<td>STANDARD EXT. FRAME</td>
<td>1.6m (4 rungs)</td>
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<tr>
<td>GUARD RAIL FRAME</td>
<td>1.1m</td>
</tr>
<tr>
<td>MAXI. PLATFORM HEIGHT</td>
<td>4.0m free standing 9.0m with outriggers or truss base frame</td>
</tr>
<tr>
<td>MAX. WORKING HEIGHT</td>
<td>5.8m free standing 10.8m with outriggers or truss base frame</td>
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Image: Typical components of a mobile scaffold include: plan, horizontal and diagonal braces, castor wheels with adjustable legs, base frame, standard extension frame, guard rail frame, internal ladder, toe board.

Erecting a lightweight mobile scaffold

_(Typical 1.8m (6') Square Tower described)_

Before commencing erection, ensure the supporting surface is as level as possible, not going to subside under load, not have any obstructions and complies with hazard assessment procedures.
Step 1

Attach horizontal brace (yellow hooks) to the vertical tube of base frame. Ensure castors are locked. At this point the frame is self-supporting.

![Image: How the first frame is supported]

Step 2

Attach spare end of brace to the end of the other base frame. Attach the second horizontal brace (yellow hooks) to the other side of the frame. Attach the plan brace(s) (black hooks) diagonally onto the vertical tube below the lowest base frame rung, or as low down as possible.

![Image: Forming first bay]
Step 3

Attach four diagonal braces to the base of the unit as shown below. Level the unit using the adjustable legs.

Fig. 40 The first bay/base is complete

Image: The completed first bay/base
Step 4

Additional extensions. Insert a frame, spigots first, into the top of the base unit and secure into the lock clips. Attach four diagonal braces to the frames as shown below.

![Diagram of additional extensions]

Fig. 41 Fitting additional extensions

Image: Fitting an additional extensions
**Step 5**

Fit the **plain platforms** first, then the **walk-through platform** with the hinges on the trapdoor to the outside of the tower. Insert the **guard rail** spigots into the top of the last frame and secure the interlock clips.

Attach the **horizontal braces** (yellow hooks) to the top rung of the **guard rail frame** and **mid rails** and one **diagonal brace**, for rigidity as shown below.

![Diagram](image)

**Fig. 42 Constructing the platform area**

**Step 6**

To complete the **work platform**, first fit the **toe board** to allow the trapdoor on the platform to open freely.

Finally attach the **ladder** through the **access platform** and clip on the **standoff hooks**, at the base of the **ladder**, to the corresponding rung on the frame. Ensure the access door movement is not impaired.

![Diagram](image)

**Fig. 43 Fitting of toe boards and trap door**

**Image: Fitting toe boards and trap door**
Step 7

It may be necessary to fit ladder ‘change-over’ platforms, where towers require more than one ladder, to enable safe ladder changeover between platforms.

Make sure four horizontal braces are also attached to act as guard rails and mid rails. Check leg adjustment and castor locks. Attach outriggers where required.

Image: Checking buttress leg adjustment and attaching outriggers when required

Image: A completed square tower
Other forms of lightweight scaffold

*Truss Base Frame*

Wide base frames may be added to allow for greater heights to be obtained while retaining stability within the scaffold. Strong threaded leg adjustment is available so the scaffold may be kept plumb and level.

![Image: Truss base frame added to a square tower](image)

**Image: Truss base frame added to a square tower**

**LEG ADJUSTMENT (THREADED)**

- Twist and raise collar past safety locks
- Threaded nut opens
- Threaded leg slides to position
- Lower collar past safety locks
- Close nut and leg locks in position
- Knurled ring for micro adjustment

![Image: Leg adjustment](image)

**Image: Leg adjustment**
**Independent scaffolding**

Used to create long platform runs for lightweight operations such as painting, sign writing, etc.
**Bridging unit**

Allows access between tower scaffolds where access below must be maintained.

![Bridging unit connecting two towers](image)

**Slenderness ratio**

Where the height of a scaffold exceeds three times the minimum base dimension, the scaffold will require either tying to the structure or the fitting of outriggers/raker shores.

Therefore, a scaffold with bay dimensions of 2.4 x 1.2 wide could be erected to a maximum height of 3.6 metres without tying or bracing to comply with the slenderness ratio.

**Ties to structures**

Scaffolding may be tied to structures by the use of special couplers attached to steel tube, which is locked into both of the scaffolds vertical structural supports. The other end of the tube may be passed through an opening in the wall of the structure and tied to columns or reveals, by attaching short lengths of tube at right angles to form a hook or a complete frame around the structural support member.
The height spacing of these ties should be a maximum of two lifts, i.e. 4 metres, and spaced horizontally at a maximum of three bays, i.e. approx. 7.2 metres, or up to approx. 14.4 metres where plan bracing has been added to the full length of the scaffold.

Fig. 50 Ties to structures

Image: Ties to structures
Raker shores

These shores need to be set at $45^\circ$ to the vertical structural members of the scaffold. If the raker shores are more than 2 metres in length they require horizontal tying back to the scaffold and along their length.

They are placed at the same vertical height as the ties and at maximum 7.2 metres (3 bays) along the length of the scaffold.
Dismantle scaffolding

Plan how to dismantle the scaffold safely, and the best order in which to dismantle the main structural components.

This plan should take into account:

- any structural changes from the original design
- any components and equipment are affected by wear, damage and corrosion.

Use the same safety principles for dismantling the scaffold as you would for erecting it. You should:

- use the appropriate lifting equipment to take components to the ground—not throw components from a height
- stack components neatly for storage or re-use
- leave safety sign and barricades until the dismantling process has been completed.