

SAFE ERECTION AND USE OF ALUMINIUM TOWERS/SCAFFOLDS



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1. INTRODUCTION

The Work at Heights Regulations 2005 requires an assessment to be undertaken before starting any work at height. If the assessment confirms that there is no alternative to working at height, then suitable work equipment should be selected, taking into account the nature of the work.

The major reason for selecting aluminium alloy towers to provide access is the lightness of the components and the consequent ease of assembly compared with the heavier sections of steel scaffold structure. In mobile form aluminium alloy towers are easy to move from point to point, but the lightness of the structure means that care has to be taken to ensure the stability of towers. The guidance note will provide details on erection and inspection and state the safe height to which towers can be erected and will give information on the use of stabilisers and outriggers to increase the stability of high towers. If these instructions are observed, aluminium alloy towers provide a stable and firm work platform.

2. APPLICATION

The following University rules apply to all aluminium tower scaffolds erected on University premises.

3. ERECTION AND INSPECTION

Only competent persons are permitted to erect and inspect aluminium tower scaffolds. A person is deemed competent only if they have successfully completed a recognised training course on erection and use of mobile aluminium scaffolds within the last three years. A register of competent persons must be maintained by each relevant department.

4. ERECTION

4.1 Before Erection of Tower

The competent person must be in possession of the Manufacturers Instruction Manual (MIM) before erection begins.

Before using a tower, all components should be checked to see that they are in good condition and are for the same model of tower. Check that the ground is firm and level and take any necessary precautions against collision of persons or vehicles e.g. Barriers and/or signage.

Castors should be checked to see that in each case the castor housing and wheel/tyre is not damaged, that the wheel rotates effectively, that the castor swivel rotates effectively and that the brake functions properly.

Adjustable legs should be checked to see that they are not bent, or the threads damaged. All threads should be clean and free from debris. The device fitted to stop the leg falling out of the frame should be checked to see if it is functioning.

Frames should be checked to see that the members are straight and undamaged. They should be free of extraneous material such as concrete. Spigots should be straight and parallel with the axis of the column tube and the device for locking frames together should be checked to see that it is functioning correctly.

Platforms should be checked to see that they are undamaged and that the frames are square and true. Plywood decks should not be split or warped and should be firmly fixed to the frames. Where toe boards incorporate clips or fittings these should be undamaged and firmly fixed to the toe board. Ancillary parts, such as outriggers and stabilisers, should be checked for damage and effective functioning of hooks and couples.

4.2 Stability of the tower

Towers should be erected and used only on ground suitable for the purpose, generally with a surface of concrete, tarmacadam or similar. Where towers are built on soft, uneven or sloping ground, they should be set on boards or other rigid packing, which will provide a firm foundation.

4.3 Never Use Damaged Equipment

Always climb a tower on the inside, using the ladder rungs within the frame, and gain access to the platform through the trap door platform. Never climb on the outside of a tower.

Each time a mobile tower is relocated it should be re-levelled using the leg adjustment. Each castor should be relocked. When adjustable outriggers are fitted, their sound footing should be checked after each move.

Working platforms should be fully and closely boarded.

Use guardrails and toeboards on all working platforms. Guard rails should be at least 950mm high and an intermediate guard rail should be provided so the unprotected gap does not exceed 470mm.

4.4 Height

The heights at which a tower may be used are shown in the MIM and should be strictly adhered to at all times.

4.5 Outriggers or stabilisers

Outriggers or stabilisers increase the **effective base dimensions** of the tower and must always be fitted when higher towers are required. These should normally be fitted as soon as the first lift is complete.

4.6 Tying-In

Tying-in is normally achieved with compatible aluminium tube and couplers, but the advice of the suppliers should first be sought. It is a good practice to tie-in towers of all heights whenever possible and especially when left unattended or in exposed and windy conditions.

4.7 Wind Loads on the Tower

Wind imposes a horizontal load on the tower tending to overturn it. In normal safe working conditions this tendency to overturn is counteracted by the self-weight of the tower, and the stabilising effect of the outriggers or stabilisers. Do not erect or use in winds in excess of 17mph (the leaves on the trees will rustle)

4.8 Other Horizontal Loads

Apart From wind loads, other horizontal loads can act on the tower. These are mainly caused by the actions of the operatives working on the towers. For example, when using hand tools, such as a drill, pushing on the drill causes equal and opposite force on the tower. Such forces should be avoided as much as possible and in no circumstances should they exceed 20kg (44lb) on freestanding towers.

4.9 Vertical Loads (Lifting Materials etc)

Any vertical load produced by persons or materials within the area of the working platform, adds to the stability of the tower, but any vertical load outside the area of the working platform can be hazardous. For example, heavy materials hoisted with a rope outside the tower have a tendency to overturn the tower, particularly if no outriggers or stabilisers are fitted.

4.10 Safe Loading

The MIM will detail the maximum loads that the tower can support. Generally speaking they will state the designed load capacity (DLC) that can be supported on any platform, and the Safe Working Load that can be supported by the complete tower.

It is recommended that a notice be exhibited at the base of the tower showing the DLC, so that all personnel who use the tower are aware of its safe capacity.

4.11 Moving a tower

Reduce the height of the tower to under 4 meters before moving.
Check that there are no power lines or other obstructions overhead.

Before moving a tower unlock the castors, unlock the outrigger castors or reposition stabiliser feet 12mm (0.5 inch) from the ground.

Check that the area where the tower is being moved to is firm and level.

When moving the tower, push or pull at the base only.

Move the tower by manual effort at ground level only (never used powered vehicles).

No personnel or tools and equipment should be on the tower if it is in motion.

Once in position lock all wheels and reposition outriggers before use.

5. INSPECTION

The University has adopted the 'Scafftag' erection and inspection procedure. This should be used for all tower scaffolds erected by competent persons employed by the University.

5.1 Before Use of Tower

After a tower has been erected, an inspection must be undertaken by a competent person prior to use. An inspection should also be undertaken if there are any substantial additions, dismantling or alterations. The inspection should include the following:

- Check that it is vertical and square and that the horizontal braces and platforms are level.
- Check outriggers or stabilisers are correctly positioned and secured.
- Check that all base plates or castor wheels are fully in contact with the ground, including those on stabilisers or outriggers. All castors should be properly locked.
- Check that all the spigot and socket joint locks holding the frames together are secured.
- Check that all bracing members have been located exactly in accordance with the supplier's instructions.
- Check that all guardrails and toeboards are in position as required.
- Check that all access stairways and ladders are in position and are firmly located.
- Never use the tower in the vicinity of live electrical apparatus or near unguarded machinery.
- Ensure that any holes, ducts, pits or gratings are securely covered.

5.2 During Use of Tower

During use, the tower should be kept in good order. Should parts become damaged they should be replaced before the tower is used again.

6. HAZARDS

Accidents are normally the results of carelessness or failure to observe good working practice. With aluminium alloy towers, accidents can be caused by:

- Height being too great relative to the effective base dimension.
- Failure to use outriggers or stabilisers when required.
- Tower being used on or moved on sloping, uneven or obstructed surfaces without attention to vertical alignment and stability.
- Using a tower, which is not vertical.
- Towers not being tied to building or adjacent structure when they should be.
- Moving the tower carelessly - pulling it along at working platform level.
- Not ensuring ground is clear of obstruction, potholes, ducts etc.
- Not ensuring tower is clear of overhead obstructions.
- Bracing members not being fitted in accordance with instructions.
- Guardrails or toeboards not being fitted allowing men or materials to fall from the working platform.
- Using the tower in adverse weather conditions.
- Using a mobile tower when the castor wheels have not been locked.
- Exceeding the Safe Working Load.

7. SCAFFOLD REGISTER FORM – NO. 91 (PART 1) A

If a tower is in position for 7 days or more, it must be inspected by a competent person, and an entry to that effect made in the appropriate Register, Form 91.