

## **Mobile Tower Scaffold.**

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# **1. INTRODUCTION**

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 structures.

Note that fibreglass towers are also in use in certain industries.

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 place of work at height.

A hazard identification and risk assessment may show that an aluminium tower is not the suitable equipment for the work required!

# **2. REGULATIONS**

The Safety, Health and Welfare at Work Act 2005 and the Construction Regulations 2006 state that only competent persons are permitted to erect move and dismantle a mobile tower scaffold. The Safety Health & Welfare at work (General application) Regulations 2007 – Part 4- Work at Heights Revokes the Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006).

From July 2009 Mobile Tower Scaffold users must have FETAC Certification or recognised equivalent.

A Competent person is someone who has the relevant experience, knowledge and training with a recognised qualification and authorised by the employer to carry out that work.

A person is deemed competent to erect, move and dismantle only if they have successfully completed a recognised training course on the erection and use of mobile tower scaffolds.

The only current recognised course is the CSCS (Construction Skills Certification Scheme) as outlined in the Construction Regulations 2013, Schedule 5 (S.I. No. 291 of 2013) and the Amendment Construction Regulations S.I No. 130-2008.

The course is certified by FETAC and a SOLAS CSCS card is issued to successful learners.

It is the responsibility of the Project Supervisor, Construction Stage to keep a record of those trained for specific tasks. He / she may delegate the job but not the responsibility to a safety officer or other person.

A record of competent persons should be maintained by the site Project Supervisor, Construction Stage or the appointed Safety Officer.

The Erector (You) is also responsible for the safe erection, use and dismantling of a Mobile Tower Scaffold.

It is recommended that a minimum of two people erect, move, or dismantle a mobile tower scaffold.

A Basic or Advanced Scaffolder is already deemed competent to erect mobile tower scaffolds. See S.I no 130/2008-Safety, Health and Welfare at Work (Construction) Amendment Regulations 2008

## **Exclusion Zones.**

Because of the increased risk of falling objects during erection process, provision should be made for an exclusion zone around the place of working area to restrict the movement of site personnel.

Particular attention and additional precautions must be made when working adjacent to the general public. Erect Barriers at ground level to prevent people from walking into the Tower or Work area.

Appropriate signage must be displayed to warn of the dangers involved.

## **3. PRIOR TO ERECTION**

### **3.1 Before the erection of Tower**

The erector must be in possession of the Manufacturers Instruction Manual (MIM) before erection begins. This is a vital document.

The erection process **MUST** follow the instructions set out in the MIM.

Before erecting a Tower, all components should be checked to see that they are in good condition. Ensure that each component is compatible i.e. from the same model and manufacturer.

Castors should be checked to see that in each case the castor housing and wheel tyre is not damaged. 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 free of extraneous materials such as concrete.

Check that the tower components have not been exposed to materials that are corrosive to aluminium (Hydrochloric acid / Potash)

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 Platform decks should not be split or warped and should be undamaged and firmly fixed to the frames.

Ancillary parts, such as outriggers and stabilisers should be checked for damage and effective functioning of hooks and couplers.

### **3.2 Stability of the 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.

Towers should be erected and used only on ground suitable for the purpose, generally with a surface of concrete, tar macadam or similar.

Maximum slope permissible is 1:15 or 6inches fall over 90 inches run or (150mm over 2250mm run)

Towers should never exceed the height above those recommended by the manufacturers instruction manual. Stability of a Mobile Tower Scaffold can be affected by bad work practices. Unless the Tower has been specifically designed you should never

- Sheet a Tower when exposed to strong winds
- Hoist materials or equipment to a high level Platform
- Overload platforms with heavy equipment
- Attach Rubbish chutes to side of Tower.

Where Ground is sloping, or stepped the tower should be prevented from slipping. Base plates and Sole boards should be used.

Where towers are built on soft or uneven ground, Base plates must be fitted in lieu of casters, supported on timber boards. Ensure a firm base /foundation at all times. Never use blocks of bricks as supports under castors or base plates as they will fail under the load or the tower, tools & materials superimposed on it.

Ensure that interlocking clips on tower sections are used and are properly engaged. Never build a tower without interlocking clips.

### 3.3 Access and Guardrails.

**Always:** Climb a tower on the inside using the built in ladder or anti slip rungs. The rise of step must be between 230mm and 300mm. Access to the platform must at all times be through the trap door platform.

**Never:** Climb on the outside of a tower.

External ladders should not be used or placed against aluminium towers.

Working platforms should be fully and **closely** boarded.

Use a minimum of 2 guardrails on all working platforms.

Top guard – rail should be fitted at least 950mm above the platform.

Use toe boards (min. 150mm high) on all working platforms where there is a risk that an object could fall and cause injury.

No gap between guardrails/midrails or guardrail and toe board should be greater than 470mm.

**Warning Notices:** Should be placed on incomplete Towers.

### 3.4 Height.

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

**Never** use ladders or boxes etc on the platform to gain additional height.

**Never** stand on the guardrails or diagonal braces to gain extra height.

If a mobile Tower scaffold is unable to get you to the required platform working position use additional compatible components to increase the tower to a safe height suitable for the task at hand.

Never use the adjustable legs to increase the tower height. Adjustable legs are only used to level the tower at the set up stage on the first lift. Never adjust the legs with personnel or materials on the tower.

### **3.5 Outriggers & Stabilisers.**

Outriggers or stabilisers increase the effective base dimensions of the tower and must always be fitted when higher towers are required. These should be fitted when specified by the manufacturer's instructions.

Always use the type of stabiliser shown on the manufacturer's instructions / component list according to the tower height.

### **3.6 Tying-In.**

Tying-in is normally achieved with compatible aluminium tube and couplers, but the advice of the suppliers should always be first sought.

It is good practice to tie-in towers of all heights whenever possible and especially when left unattended or in exposed and windy conditions.

Towers must be tied in the following circumstances.

- If the height to base ratio is exceeded
- If there is going to be a horizontal load of more than 20kg  
i.e. Grit blasting, Water Jetting.
- If the tower is going to be left for a period of time
- If the wind speed is likely to reach force 5.

### **3.7 Horizontal Loads and Wind.**

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.

Beware of increased wind speeds which can occur between parallel buildings.

Do not erect or use in excessive winds.

Wind velocity is related to wind force, expressed in Beaufort, through the following table.

Beaufort Wind Scale					
Beaufort Number or Force	Wind Speed			Description	Effects on Land
	Mph	Km/hr	knots		
0	<1	<1	<1	Calm	Still, calm air
1	0.3 – 1.5	1-5	1-3	Light air	Rising smoke drifts, wind vain is inactive
2	4– 7	6-11	4-6	Light Breeze	Leaves rustle, can feel wind on your face, wind vanes begin to move.
3	8-12	12-19	7-10	Gentle Breeze	Leaves and small twigs move, light weight flags extend
4	13- 18	20-28	11-16	Moderate Breeze	Small branches move, raises dust, leaves and paper.
5	19- 24	29-38	17-21	Fresh Breeze	Small trees sway
6	25- 31	39-49	22-27	Strong Breeze	Large tree branches move, telephone wires begin to whistle, Umbrellas are difficult to keep under control
7	32- 38	50-61	28-33	Moderate to near gale	Large trees sway, becoming difficult to walk
8	39- 46	62-74	34-40	Gale or fresh gale	Twigs and small branches are broken from trees, walking is difficult.

**Review the risk assessment if the wind is higher than normal.**

Various publications give us differing information which is impossible to reconcile.

- At Beaufort force 4, work has to stop.
- At force 5, the tower must be tied in!
- At force 8, the tower must be dismantled!!!!

**REVERT TO COMMON SENSE!!!!!!**

### 3.8 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.

Avoid leaning against a wall when working on the platform as it increases the horizontal load.

### **3.9 Vertical Loads (Lifting Materials etc).**

A Vertical load produced by persons or materials within an 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. Always lift load within the tower structure or within the base rectangle defined by the stabilisers.

### **3.10 Uniform Distributed Loads (UDL)**

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 one platform, any one level 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 UDL, so that all personnel who use the tower are aware of its safe capacity.

This can be incorporated on the “Scafftag” as part of the GA3 process.

### **3.11 Storage, care and maintenance of the tower components**

All components and equipment should be kept clean, particularly leg locks, spigots and sockets, and other joints. Spigots should be able to fit into easily into sockets. Keep joints and hook mechanisms lubricated with light oil.

Dirt and other debris should be removed with a light brush.

Never strike or hammer components. Never throw or drop components onto a hard surface.

Tower components should be stored vertically for transport and storage.

Damaged components should be discarded and replaced with new components.

Never use a damaged component.

## 4. Moving a Tower

The Sequence:

- Physically check to make sure that **no personnel, tools, equipment or debris** are on the tower.
- **Check** your Route!
- **Reduce** Tower down to 4m before moving if outriggers are in the correct position.
- **Reduce** Tower down to 2 m if outriggers are not in the correct position
- **Look up** for hazards like electric cables, phone lines, balconies, satellite dishes, overhanging eaves, trees etc.
- **Look down** for drains, grills, excavations, kerb edges, pot holes, soft ground etc.
- If moving around a corner – **check around the corner first!**
- **Raise the outriggers/stabilisers** and reposition them as close to the ground as is reasonably practicable and in any event, not more than **25mm**.
- **Unlock the castors**
- Move the tower by **manual effort as low to the ground** as is reasonably practicable.
- Push at base but *never* use powered vehicles to move a Tower
- **Never** move a Tower while there are workers or materials on the Platform
- **Never** move a Tower in windy conditions
- **Lock the Castors**  
**The ONLY time** the castors should be unlocked is during movement.
- **Re-Level** the tower as required
- **Lower** the stabilisers.

## 5. INSPECTION

A record of inspection of all working platforms in excess of 2m platform height must be kept.

The 'Scafftag' record of inspection is useful for giving a visual confirmation that this has been done as well as giving the user details of the design and safe working load. A record of inspection and a GA3 should be completed in accordance with the General Application Regulations 2007 (**Regulation 119**)

### 5.1 Before Use of Tower

After a tower has been erected, an inspection must be undertaken by a competent person prior to use.

**The inspection should include the following:**

- Check that the tower is NOT in the vicinity of live electrical apparatus, near unguarded machinery or any other external hazard prior to your inspection.
- Check that it is vertical and square and that the horizontal braces and platforms are level.
- Check that 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 frame together are secured.
- Check that all bracing members have been located exactly in accordance with the manufacturers instructions.
- Check that all guardrails and toe boards are in position as required.
- Check that all access stairways and ladders are in position and are firmly located.
- Ensure that any holes, ducts, pits or gratings are securely covered

## 5.2 Inspections - During Use of Tower

- Additionally, an inspection must take place and a GA3 signed:
- Inspected every 7 days by a competent person.
- If there are substantial additions, dismantling or alterations.
- After inclement weather
- If subject to impact from a vehicle, crane load etc.
- After a long period where the tower has not been used eg: After an annual builder's holiday.

The same inspection procedures apply. During use, the tower should be kept in good order. In addition, be aware of possible overloading. Should parts have 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 tower is clear of overhead obstructions.
- Guardrails or toe boards not being fitted allowing men or materials to fall from the working platform
- Exclusion Zone not being defined around tower
- Slips – grease, oil, ice etc. on rungs or frame.
- Guardrails or toe boards 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
- Using a Mobile Tower with damaged or faulty brakes.
- Exceeding the Uniform Distributed Load
- Adding Sheeting or Cladding or otherwise increasing the wind load
- Excessive side loads when Tower not tied in.

## **7. HAND – OVER, RECORD OF INSPECTION & GA3**

If a Tower HAS A WORKING PLATFORM HEIGHT IN EXCESS OF 2 METRES, it must be inspected by a competent person, and an entry to that effect made in the appropriate Register, Form GA3.

All records to be kept on-site and thereafter at a registered office for a period of 5 years!

## **8. TOWER HEIGHTS**

The Table below shows the maximum free standing height allowed and is based on the Code of Practise for Access and Working Steel Scaffolds for the maximum permissible base to height ratio.

INSIDE STATIC TOWER	4 X Min. Base dimension
INSIDE MOBILE TOWERS	3.5 X Min. Base dimension
OUTSIDE STATIC TOWERS	3.5 X Min. Base dimension
OUTSIDE MOBILE TOWERS	3 X Min. Base dimension

