

Alternative Stabilisation

Tying-In: An Introduction



INTRODUCTION

These notes give a generic guidance on tying-in methods which can be used with Alto towers. They are not a substitute for your Risk Assessment and Method Statement, or for a proper design and plan for the temporary works concerned, nor are they a substitute for proper training. These notes do not constitute a definitive or comprehensive guide on the subject of tying-in.

Only competent and qualified personnel should undertake erection, dismantling and alteration, organisation, planning or supervision of mobile access towers. The same applies to tying-in of towers. In the case of any doubt, sufficient relevant additional training must be given beforehand to ensure safe use. For further information on the use of mobile access towers consult PASMA (www.pasma.co.uk +44 (0) 845 2 30 4041).

A Risk Assessment and Method Statement must be undertaken before installation commences and should include the relevant tying-in method and tying-in locations to be applied to the specific structure being built.

BS EN 1004 towers built properly according to the manufacturer's are safe, stable structures. However, there are situations where some additional or alternative stabilisation is needed. Examples Include:

- Towers built to more than 8m outdoors/12m indoors.
- Towers being used as a means of access to another place.
- Towers being subject to significant side loads or wind loads.
- Towers where space does not permit deployment of standard stabilisers.
- Towers with cantilevers.

In situations such as these, one of a number of alternative or supplementary stabilisation methods needs to be adopted. Choices Include:

- Larger stabilisers or raker beams
- Butt transom stabilisation
- Buttress stabilisation
- Tying-in
- Adding kentledge or ballast

This introduction explains some basic considerations related to tying-in.

In this context, tying-in refers to a system of components that is used to secure the scaffold to a structure, so that it remains stable without any distortion from variable factors. Essentially, it keeps the structure standing so it doesn't blow over, buckle, or fall over.

As with all working at height, a Risk Assessment and Method Statement must be undertaken before setting out on the task under consideration. Secondly, it is important to understand that tying-in has to be rigid in compression and tension. Simply using a piece of rope or a ratchet strap is not a safe or acceptable solution as it only works in one direction and may itself place distorting forces on the tower.

Generically, tying-in involves attaching rigid tubes to the tower and, by various means, securing them to the adjacent structure. All elements of a tying-in arrangement are essentially linearly arranged and are interdependent. The weakest one of them will fail first- at which point, the whole tie fails.

Alto Towers are made using 48mm extruded tube which is suitable for use with standard scaffolding couplers. Other towers are made using 50mm tube which is too large for standard couplers and generally too thin to take the gripping forces of standard couplers without crushing or deforming. Consequently, you will need to buy expensive special couplers for use with these towers for tying-in applications. Generally, these couplers will exert less grip on the tube.

As a general rule of thumb, for most purposes, correctly applied tying-in is sufficiently effective for Alto towers when applied at approximately 4m intervals both vertically and horizontally. For a single tower, this means every other lift and for a linked, façade or bridge tower, this is termed “every other lift, every other bay”. Ties should be applied to alternate ends of a tower bay at alternate fixing points so that both ends of the tower bay are tied in and forces are equally distributed. There are several kinds of tie types - these include:

- Anchor Ties
- Through Ties
- Reveal Ties
- Box Ties

ANCHOR TIES

Anchor ties involve putting an anchor fixing into the fabric of the adjacent structure. Most commonly, these are masonry anchors with an eyebolt fitting or a plate drilled to accept anchor bolts. A key element of the effectiveness of this sort of tie is the performance of the anchor fixing. It is vital to ensure that the correct type of anchor for the application is selected and correctly installed.



Once appropriate anchor devices are fixed in the required positions, typically, a scaffold tube with a hook fitting is engaged with the anchor and coupled horizontally to the tower. The horizontal part must be long enough to couple to both uprights of the tower frames to spread the loads exerted and to double the effectiveness of the couplers.

If you are planning to use anchor ties, you should be aware and take account of the following sources of information:

BS8539: 2012 - This is the British Standard that provides recommendations for the safe selection & installation of anchors for use in concrete and masonry. The intention is to provide practical guidance for designers, specifiers, manufacturers, suppliers, contractors, installers and testers of anchors.

NASC TG4:19 - This TG contains information on the performance of anchor fixings for use with scaffolding structures.

THROUGH TIES

Through ties are achieved by projecting horizontal scaffold tubes through openings in the adjacent structure and fastening horizontal or vertical tubes in front of and behind the wall located hard against the surface in the manner shown in the following example.



REVEAL TIES

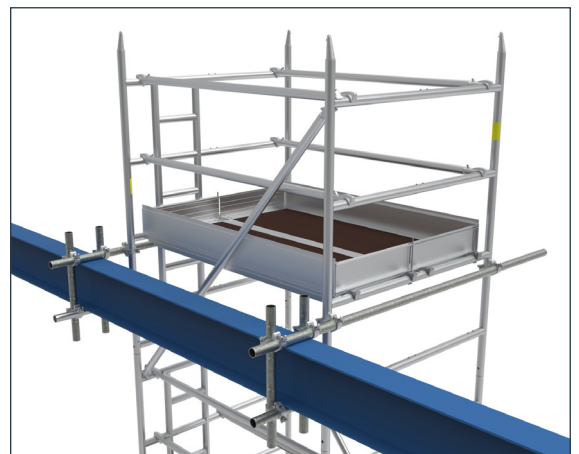
Reveal ties involves jacking or wedging a tube tight between opposite faces of an opening - vertically or horizontally. This tube is then tied back to the main tower structure.

Note: this type of tie relies on friction only and is the least secure type of tie that can be used.



BOX TIES

Box ties are formed by wrapping short tube elements around a girder or pillar using double couplers and fastening these back to the tower using horizontal tubes as before.



More information on tying-in can be found in these sources:

- NASC TG20:21
- blog.designsafe.co.uk/common-tie-methods

Any person using any item of work at height equipment in the workplace including a scaffold tower, either as an employee, employer or as a self-employed person, is subject to the Work at Height Regulations. As a minimum, this means that you must ensure that not only the person building the tower is competent but also those who specify, use or manage the use of a tower are competent to do so.

A competent person is a person who can demonstrate that they have sufficient professional or technical training, knowledge, actual experience, and authority* to enable them to:

- Carry out their assigned duties at the level of responsibility allocated to them;
- Understand any potential hazards related to the work (or equipment) under consideration;
- Detect any technical defects or omissions in that work (or equipment), recognise any implications for health and safety caused by those defects or omissions, and be able to specify a remedial action to mitigate those implications.

Information on the Work at Height Regulations can be found here:

- www.hse.gov.uk/work-at-height/the-law.htm
- www.legislation.gov.uk/ukxi/2005/735/contents/made

If you are using or considering using towers in applications which require tying-in, we strongly recommend obtaining sufficient relevant training to ensure your competence and maximise your safety. You could consider contacting PASMA for more help and support or your tower supplier.

In common with all advisory information provided on our website (www.altoaccess.com), this document provides only general guidance on the subject. It is not a substitute for appropriate training and qualification. If in doubt, seek advice. The company and the authors disclaim all responsibility for any use made of this information.

* "Authority" here means delegated authority to the individual by his/her employer to carry out a certain function or duty.

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