

PASMA[®]

prefabricated access suppliers' and manufacturers' association

OPERATOR'S

CODE OF PRACTICE

APPLIES ONLY TO PREFABRICATED TOWERS
MANUFACTURED IN ALUMINIUM ALLOY OR FIBREGLASS
WHICH MEET PASMA'S PRODUCT APPROVAL CRITERIA
AND WHICH CARRY A CURRENT BRITISH STANDARD OR
OTHER EQUIVALENT MARK OF APPROVAL.

PRODUCED BY
PASMA IN
CO-OPERATION
WITH THE HSE



HSE
Health & Safety
Executive

pasma.co.uk

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NO FALLS

FOUNDATION

PASMA supports the No Falls Foundation

The charity dedicated to preventing falls from height and helping people affected by the consequences of a fall

nofallsfoundation.org

 /NoFallsOrg  @no_falls  /company/NoFallsFoundation

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1. Foreword

Scaffold towers are used every day, across the world, by people in all sorts of professions. They're a popular way to work at height safely and efficiently, allowing the user quick and easy access to areas that are otherwise out of reach. But it's crucial that they are used correctly.

The Prefabricated Access Suppliers' and Manufacturer's Association (PASMA) is an industry body dedicated to preventing falls from scaffold towers, with the safety of tower users placed above all else. PASMA and its members have long committed themselves to the ideals of providing safe scaffold towers and giving all users the necessary information and training to allow them to use towers safely and productively.

The PASMA Operator's Code of Practice serves as a comprehensive, good practice guide for assembling, using, altering and dismantling scaffold towers. This latest revision reflects the state of the art in the industry and changes to product standards. It builds on earlier work to ensure that no one assembling or working on a scaffold tower needs to stand on an unguarded platform.

It explains how towers which conform to product standards, such as EN 1004 or BS 1139-6, not only provide collective fall prevention on the completed structure, but also, by using the recommended 3T or AGR assembly, dismantling and alteration methods, provide collective fall protection during these processes.

It also provides guidance in the correct planning and risk assessment of work at height using towers, before any work starts, which is critical to ensuring that everyone goes home safely.

In addition to its function as a standalone reference document for users, supervisors, managers and safety professionals, the Code of Practice is also intended to supplement PASMA's many training courses by acting as an invaluable reminder of the good practice that delegates have learned during training and work experience.

Everyone who works at height should be able to return home safely to their families each day. Sadly, many thousands of people fall from height every year and it remains a leading cause of workplace fatalities and injuries. The consequences of these falls can be life-changing, for both the victim and their loved ones.

The practical guidance in this revised Code of Practice is designed to keep you, and those around you, safe. By following it, you are calling on the combined experience of the entire tower industry, since PASMA members and its stakeholders, including the UK's Health & Safety Executive, with a wealth of experience between them, have contributed to its production.

2. Introduction

PASMA – the organisation that knows mobile towers and cares about the people that use them

PASMA is an association for the mobile access tower industry, consisting of Manufacturing, Hirer / Dealer, Hire & Assembly, Training and Associate members.

As part of their membership, all members undertake to provide access equipment that is in conformity with PASMA's recognised product standards, such as EN 1004, BS 1139-6 and BS 8620 (or international equivalents).

- Manufacturing members demonstrate compliance to these standards by having 3rd party certification from a Conformity Assessment Body which has been accredited by a national accreditation service (e.g. UK: UKAS, SA: SANAS)
- Hire/Dealer members have and/or offer for sale or hire access equipment which meets the appropriate product standard and has certification
- Hire & Assembly members have and/or offer in the course of the services they offer access equipment which meets the appropriate product standard and has certification
- Training members conduct training in approved centres using certified products and approved instructors

In addition to these requirements, members must also demonstrate compliance to the membership category procedures, Code of Conduct and Code of Practice through regular assessment and audit by the Association.

This edition of the PASMA Code of Practice takes account of the latest Guidance and Product Standards, (refer to Safety Requirements section for details), at time of issue, and supersedes all previous editions.

It is intended to give guidance on best practice for the use of towers, where users have established that work at height cannot be avoided, that there is not an existing safe place of work, and thereafter have selected a tower as the most suitable work at height equipment because of its inherent collective fall protection measures.

Details of the PASMA membership can be found at pasma.co.uk

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3. Scope

This Code of Practice relates to:

- **mobile access towers,**
- **prefabricated tower scaffolds, and**
- **low level work platforms,**

all of which have been designed and 3rd party certified in accordance with British and European Standards, such as EN 1004, BS 1139-6 and BS 8620 (or international equivalents). All PASMA members undertake to supply products which conform to these standards.

Mobile access towers made from prefabricated elements, in accordance with standards such as EN 1004, provide a safe working platform to a height of 8m outdoors (e.g. subject to wind load) and 12m indoors.

Prefabricated tower scaffolds, utilising components from mobile access tower systems and in accordance with standards such as BS 1139-6, can be assembled in a variety of ways to provide safe working at height. PASMA, in consultation with its stakeholders, has split these products into two separate categories.

- **Standard configurations**
Can be safely assembled, used and dismantled in any location by a competent person using a detailed instruction manual, such as Towers with Cantilever and Towers on Stairs.
- **Non-standard configurations**
Site or client specific, assembled by Professional Riggers and come with a safe use, assembly and dismantling plan comprising of instruction manuals, method statements and detailed scheme drawings.

To provide more specific guidance on the hazards and safe use of standard configurations, such as Towers With Cantilevers, PASMA provides supplementary Codes of Practice which accompany prefabricated tower scaffold training courses. Further details can be found on the Association's website, pasma.co.uk.

Low level work platforms, more commonly known as Podiums or Pulpits in accordance with standards such as BS 8620, provide a safe working platform for individual workers with up to 150kg safe working load. The products come fully guard railed with built in access and stabilisation, with a platform height no greater than 2.5m.

This document must be used in conjunction with the appropriate current product instruction manual. Updated versions of these are available for download on the Association's website.

4. Safety Requirements

This code of practice is based upon and incorporates the requirements of the following:

4.1 Legislation

Health & Safety at Work (etc.) Act

4.2 Regulations

Work at Height Regulations

Management of Health & Safety at Work Regulations

4.3 Guidance

HSE INDG401

- Working at Height – A brief guide

HSE Information Sheet CIS 47

- Inspection and Reports

HSE HSG 151

- Protecting the public

Copies of the above are available from your local HSE office, and further information is available from the HSE's website, www.hse.gov.uk

4.4 Standards

- **EN 1004** - Mobile access and working towers made of prefabricated elements
- **EN 1298** - Mobile access and working towers. Rules and guidelines for the preparation of an instruction manual
- **BS 1139, Part 6** - Metal scaffolding. Prefabricated tower scaffolds outside the scope of BS EN 1004, but utilizing components from such systems
- **BS 8539** - Code of practice for the selection and installation of post-installed anchors in concrete and masonry
- **BS 8620** - Low level work platform with one working platform with side protection for use by one person with a maximum working platform height no greater than 2.5 m. Specification

Copies of these and other relevant industry standards can be obtained direct from PASMA

In conjunction with this Code of Practice, users should refer to the following: -

- **Provision & Use of Work Equipment Regulations**
- **Personal Protective Equipment at Work Regulations**
- **Manual Handling Operations Regulations**
- **Reporting of Injuries, Diseases & Dangerous Occurrences Regulations**
- **Construction (Design and Management) Regulations**

5. Training, Competence & Responsibility

5.1 Training

You, your Supervisor and Manager must be competent in the safe use of work at height equipment, which includes towers. The PASMA PhotoCard provides proof that you have undergone and successfully completed training to an internationally recognised standard. Many workplaces will insist on seeing your PASMA PhotoCard before you will be allowed to assemble, alter or dismantle mobile access towers, so it must be retained with you at all times and presented for inspection by anyone in authority.

5.2 Competence

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.

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

Going onto or assembling a tower will involve working at height. The Advisory Committee on Work at Height Training (ACWAHT) indicate that for anyone who works at height, the above definition of a competent person implies they:

- Know and understand the specific legal duties under the Work at Height Regulations which apply to them as an individual
- Understand who controls their activity and the lines of communication to use
- Understand the principles of fall protection that the Regulations require to be used
- Can recognise safe and unsafe situations / activities
- Understand how to deal with the hazards associated with the task allocated to them
- Have adequate training in the correct use and limitations of any work equipment allocated to them for the task
- Understand the need for and the ability to check the adequacy of the safety equipment allocated to them
- Understand that if equipment has been issued to them on a personal basis, an understanding of the correct procedure for storage, maintenance and inspection
- Understand safe procedures of work and state the correct procedure for the task, the emergency (including rescue) procedures in place for the work and their role in it
- Know the procedure for reporting any defects, hazards or unsafe procedures they detect

The information in this Code of Practice and from attending a PASMA training course, will aid you in becoming competent on the safe use of mobile access towers, prefabricated tower scaffolds and low level work platforms.

5. Training, Competence & Responsibility

5.3 Responsibilities

Always, your overriding concern has to be for your safety and the safety of anyone else who is affected by what you do.

You must always read and follow the current instruction manual and on no account attempt to use equipment beyond its limitations.

You must not misuse or abuse equipment and you must not remove or interfere with guardrails or other devices which are provided for your safety.

You must follow the training and instructions given to you, unless you think it would be unsafe to do so.

6. Literacy, Fitness & Health

Since the safe use of mobile access towers requires that you consult safety notices and read and thoroughly understand the current instruction manual, literacy and language comprehension are important requirements for any tower user.

Similarly, since the assembly and use of towers can be physically demanding, users should be physically fit and in good health, and should **generally**, not have problems with eyesight or hearing, heart disease, high blood pressure, epilepsy, fear of heights, vertigo, giddiness, difficulty with balance, impaired limb function, alcohol or drug dependence, including prescribed drugs or psychiatric illness.

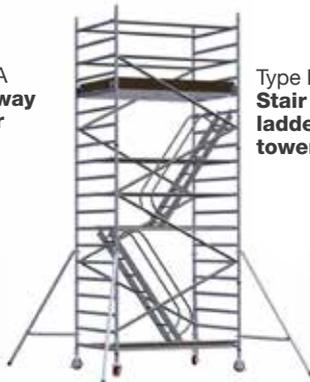
You should also consider how the effects of extremes of temperature – heat and cold; lack of nutrition – fasting; and lack of water – dehydration, can impair your ability to work effectively.

If you have any problems with literacy or language comprehension, are pregnant, or have any doubts about your fitness to use mobile access towers, you **must** bring them to the attention of your employer. This need not preclude you from using towers, provided your employer conducts an assessment and is able to put into place adequate measures to take account of any difficulties you may have.

7. Types of Mobile Access Tower



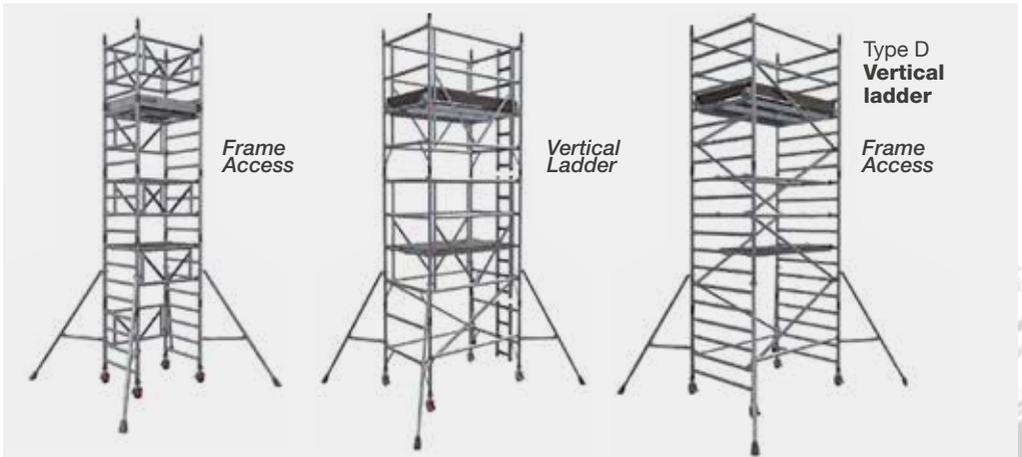
Type A
Stairway
tower



Type B
Stair
ladder
tower



Type C
Inclined
ladder
tower



Frame
Access

Vertical
Ladder

Type D
Vertical
ladder

Frame
Access

For mobile access tower in accordance with EN 1004, the access type may be found in the designation code marked on the tower.

For example;

EN1004 -3-8/12-AXXX - is a mobile tower with stairway access which is defined by the letter A.

EN1004 -3-8/12- XBXX - is a mobile tower with stairladder access which is defined by the letter B.

EN1004 -3-8/12-XXCX - is a mobile tower with inclined ladder access which is defined by the letter C.

EN1004 -3-8/12- XXXD - is a mobile tower with vertical ladder access which is defined by the letter D.

EN1004 -3-8/12-ABCD - is a mobile tower with all access types

8. Components

8.1 Castor

Castor wheels are fitted with braking devices which must always be locked unless you are moving the tower. Castor wheels come in various sizes and load capabilities. Castor wheels must not be used on soft ground without employing sole boards.



8.2 Base Plate

Like the castor, the base plate is attached to the adjustable leg and is particularly intended for use on towers which you do not intend to move or which are sited on uneven or sloping ground.



8.3 Adjustable Leg

Adjustable legs are used to level the tower only. Use in conjunction with either castor or base plate. Do not use the adjustment to gain additional height.



8.4 Frame

Frames provide one of the main structural elements of the tower. They typically come in single width accommodating one platform unit, and double width accommodating two platform units side by side. They are joined together by connecting spigots until the desired height of the tower is reached. The platform unit(s) locates on the rungs of the frame. Frames are available in various heights to ensure you can achieve the exact height you need.



8.5 Access

Access to platform levels can be provided by a number of different means. Stairways and stair ladders are separate components which are positioned within the tower. Integral ladder frames and frames with rungs, which are suitably spaced and slip resistant, also provide a safe means of gaining access. Consult your instruction manual or check the designation code marked on the tower to determine what access is provided for your tower.

8.6 Brace

Braces, either horizontal or diagonal, are structural elements of a tower. You can easily identify the difference between horizontal and diagonal braces, because the diagonals are always longer and the horizontals are the same length as the platform. They are fitted with locking hooks at each end, which are attached to the frame horizontals or verticals to make a rigid modular structure. The current instruction manual will clearly show the bracing pattern for each tower type.



IMPORTANT:
Failure to exactly follow the bracing pattern in the instruction manual may result in a structural failure of the tower



8.7 Platform Units

Platform units normally comprise of a frame with hooks at each end and fitted with a slip resistant surface. They are available in various lengths and may be used singly or placed side by side to form a wider area. Platform units with trapdoors that hinge open are provided to allow you to ascend to and descend from the platform level, from inside the tower. Only Trapdoor Platform units are used on single width towers.



8. Components

8.8 Toe board

Designed to ensure tools and equipment are not dislodged from the platform area. Toe boards come in various sizes to accommodate the differing lengths and widths of towers. The toe boards may be separate pieces or joined together with hinges to form a single folding unit.



8.9 Stabilisers & Outriggers

Stabilisers and outriggers increase the base dimension of the tower providing the required stability. Stabilisers are intended for towers you intend to move less frequently, whereas outriggers, as they are fitted with adjustable legs and castors are for towers which you intend to move more frequently.

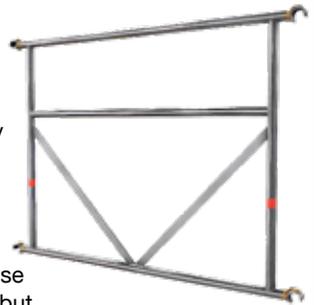
Outriggers require the installation of plan braces to fix them in their optimum position and prevent them folding in whilst the tower is being moved. The current instruction manual will advise which stabilisers/ outriggers are suitable for each height of tower, their positioning and sequence, although as a general rule they must be fitted at the earliest opportunity.



8.10 Advance Guardrail Frames

Advance Guardrails (AGR's) are used in conjunction with tower frames to form modules which are the "building blocks" of the tower structure. They provide stiffness to the tower in the same way as horizontal and diagonal braces do. Some towers use only AGR's and frames whilst others use some additional diagonal and horizontal bracing. The instruction manual for the tower you are building must be followed; whilst AGR's can look similar, tower assembly can differ between different manufacturers.

The AGR's also provide the guardrails to the platform edges. These must not be removed as these not only take away the guardrails but the structural support to the tower.



9. Safety Requirements

9.1 Instruction Manuals

PASMA members supply comprehensive instruction manuals on the assembly and dismantling of towers which will comply with the current standard, and which incorporate the fall protection measures recommended by PASMA, in co-operation with health and safety authorities, to ensure that operatives must never have to stand on an unprotected platform from which they are at risk of fall liable to cause personal injury. Suppliers and users must ensure that these manuals are available to the operatives assembling and using the tower, and to the person supervising the work. Employers must also ensure that the operatives assembling the tower are competent to do so by training (or, if undergoing training, are closely supervised by a competent person). PASMA have designed a recognised certification scheme for this purpose.



9.2 Type & Number of Components

The current instruction manual will provide information on the types of components and the number of components required for a particular tower configuration. Suppliers usually provide a range of different towers and although some components are interchangeable such as adjustable legs and castors, checks must be made to ensure that the correct type and the correct number of components have been supplied. Never attempt to make up deficiencies by the use of alternative parts, random scaffold tubes, couplers or scaffold boards and the like.

9.3 Suitability of Site – Ground Conditions

Towers must be assembled and used only on ground suitable for the purpose, e.g. concrete, tarmac or similar. For soft or uneven ground, towers should be selected that use baseplates instead of castors. To improve ground stability further beneath castors or base plates, sole boards or other decking will provide a firm foundation. Outriggers and stabilisers should be similarly treated.



9. Safety Requirements

9.4 Castors, Base Plates and Adjustable Legs

Begin assembly by fitting either castors or base plates to four adjustable legs. The design includes a feature to prevent the castor or base plate from falling out of the adjustable leg. The adjustable legs are fitted into the lower ends of the verticals of two frames. A retaining mechanism on the adjustable leg prevents it from detaching from the frame. Each leg has a device to vary its extension, so that the tower can be made level on uneven or stepped surfaces. This is NOT a means of gaining additional height and the extension of the adjustable leg must be the minimum possible. If the adjustable legs are not able to level the tower adequately (e.g. the adjustable legs at one end are at full extension and the tower uprights are not vertical) then the supplier's advice must be sought.



9.5 Base Module

The base module, comprising the two frames and braces or advance guardrails, is then assembled according to the current instructions. The adjustable legs must then be adjusted so that the base module is vertical, and the two end frames



are at the same level. PASMA recommends that the tower be checked using a spirit level vertically, across the width and across the length to ensure it is level. It is sensible that the tower be assembled in the position in which it is to be first used; otherwise the tower may have to be adjusted to ensure it remains level when it is moved into the working position. If castors are used, the brakes must be applied before use. If stabilisers or outriggers are required you should generally fix them at this stage, but refer to your instruction manual to be certain, (refer to 9.12 Stability).

9.6 Upper Modules

The upper modules of the tower can now be assembled following the sequence in the current instruction manual. Frames are usually connected by a spigot and socket joint with a locking mechanism which you must ensure is positively engaged and locked. All tower components must be fitted in the correct position and sequence following the current instruction manual. Take particular care to follow the instruction manual to ensure guardrails are installed before you stand on any platform to ensure that you are always prevented from falling in the course of assembly. Check the instructions for the recommended methods for lifting components.



9.7 Braces

Diagonal and horizontal (guardrail) braces have locking hook mechanisms which engage with either horizontal or vertical frame members. When fitted to horizontal members, locking hooks must have their aperture facing downwards. When horizontal braces are fitted to verticals ensure that locking hooks have their aperture facing outwards. In all cases when fitting braces ensure that the hook mechanisms have operated correctly, the brace is securely fixed to the frame, and the hooks are located correctly on both sides.



9.8 Advance Guardrails

Advance Guardrails (AGR's) have locking mechanisms which engage with either the horizontal or vertical tubes of the frames. When fitting ensure you follow the instruction manual correctly as connection methods differ between different tower systems. In all cases, ensure that any locking mechanism in the hooks of the AGR have operated correctly and the AGR is correctly located and secure at both ends.



9.9 Platforms

All platform units have hooks at each end which locate onto the horizontal members of frames. Ensure that these are properly positioned and that the platform units sit firmly and squarely in place. The trapdoor platform units should generally be self-closing. The hinges of trapdoor platform units should be positioned against the outside face of the tower with the trapdoor over the access. Platform units are fitted with a device at one or both ends to prevent uplift by wind, more commonly known as a windlock. If the device is manually operated, ensure it is engaged correctly as soon as the platform is installed. Platforms must be installed at suitable intervals as specified in the instruction manual and depending on the nature of the work.

9. Safety Requirements

9.10 Guardrails and Toe Boards

All platforms from which it is possible to fall a distance liable to cause personal injury must be fitted with guardrails. The diagram shows the dimensions for guardrails and toe boards to comply with Regulations and current product standard. In order to protect users from the risk of falling through an unprotected opening, current regulations require that an intermediate guardrail, or some other suitable barrier, must be installed so that no gap greater than 470mm exists in the side protection.

Towers will be provided with Advance Guardrails or horizontal braces as platform guardrails, depending on the type of tower system. Care must be taken to see that these are correctly fitted in accordance with the instruction manual.

Toe boards, or other suitable barriers, are mandatory at all places of work from which it is possible that tools, equipment or other material may fall, liable to cause personal injury. Their use on non-working platforms is not compulsory unless a risk assessment identifies a risk that items such as tools and / or materials may be stored there and may fall from the unprotected platform.



9.11 Method of Access

Always ascend and descend the tower using the access provided with the tower. Where the access is a separate component such as a clip in ladder, ensure it is installed in accordance with the current instructions.

If frequent ascent and descent is necessary, a stairway or stair ladder tower should be used. If materials or larger tools or equipment need to be carried, a stairway tower should be used.

Access to and from a platform must be via a trap door which must be closed immediately afterwards.

Never use a portable ladder leaning against the outside of the tower to gain access to the platforms

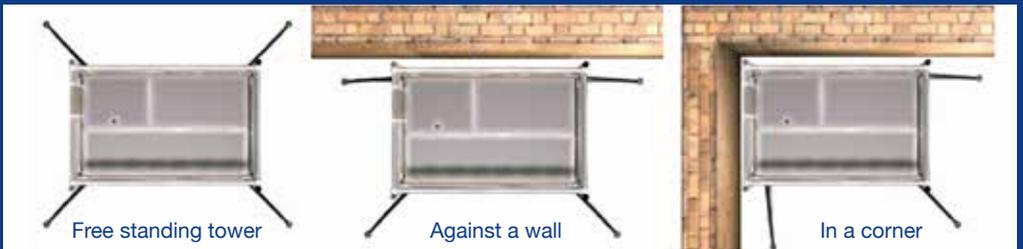
9.12 Stability

A significant reason for selecting towers made of aluminium or fibreglass is their lightness and ease of use compared to heavy steel scaffolding. However, this lightness means that care must be taken to ensure the stability of the tower. The product standards for towers specify calculations which consider wind loads, horizontal forces and other vital factors to determine the stability required for each tower. It is not appropriate or sufficient to apply “rule of thumb” estimations (for example, maximum platform height is calculated on a base to height ratio).



You MUST fit stabilisers or outriggers as stated in the current instruction manual for your make and model of tower. The schedule of components, which is contained in every instruction manual, will specify the exact size of stabiliser or outrigger you must use for each tower height and also how it should be positioned to achieve the required base dimensions. If these instructions are followed, towers provide a stable work platform for a wide variety of applications.

PASMA recommends that stabilisers or outriggers are added at the first available opportunity, usually as soon as the base level is complete. It may be necessary to adjust the stabilisers or outriggers to increase the base dimensions as the tower is built and the height increases. If the stabilisers or outriggers need to be repositioned, for example when a tower is against a wall, you must consider in your risk assessment if the adjacent structure is suitable to support the tower. PASMA recommends that the height of any suitable adjacent supporting structure must be at least 2/3rds of the height of the tower in order to prevent the tower overturning.



PASMA Manufacturers' towers all comply with British and European standards (or international equivalents). This is your guarantee that, amongst other things, your tower meets very strict requirements for stability and meets stringent quality control criteria.

10. Moving the Tower

Towers must be moved with the utmost caution and only by, or under the supervision of, a competent person. Before moving, check the suitability of the intended route to ensure there are no obstructions, both at ground level and overhead, (particularly overhead cables). No persons or materials should be on the tower during movement and the height of the tower must be reduced to 4.0m platform height. Finally, the stabilisers must be left in position and raised a maximum of 25mm (1") from the ground. The tower must only be moved by applying manual effort at or near the base of the tower and you must ensure you have sufficient operatives on hand to control the movement of the structure. Always push the tower and never pull it towards you. After each movement of the tower, lock the castors and check it is still correct and complete. Use a spirit level to ensure that it is upright, resetting the adjustable legs as necessary.

PASMA do not recommend that assembled towers be suspended, for instance, by a crane. The manufacturer must approve any intended use of this nature and provide an appropriate design and method statement.

PASMA recommends outriggers in preference to stabilisers if a tower is to be moved frequently.

Ensure any holes, ducts, pits or gratings are securely covered before moving your tower



11. Tying and Improving Stability

11.1 Tying In

Tying a tower to a suitable adjacent structure can increase the stability and stiffness of a tower. You should follow the guidance in the current instruction manual, or the safe use, assembly and dismantling plan, on where and how the tower should be tied in. Tying a tower should only be undertaken by competent personnel.

Tying-in is normally achieved using tubes and couplers, made from either steel or aluminium, to connect the tower to a rigid structure. The tubing diameter used on a tower varies, so it is important to ensure that you use the correct size coupler to match your tower tube. Using an incorrectly sized coupler (e.g. 48.3mm diameter coupler on 50.8mm diameter tube) can damage the tower tubing and could cause failure. Advice on the correct fittings for your tower should be sought from your supplier or manufacturer.

If anchors are to be used to tie the tower to a rigid structure, such as a concrete blockwork wall, then the code of practice for selection and installation of post-installed anchors in concrete and masonry, BS 8539, should be followed.

Tying-in a tower will not make it invulnerable to wind or other environmental factors. These must be considered as part of the risk assessment process for the use of the tower, and if environmental factors like wind could exceed the maximum permitted, then the tower must be dismantled.

11.2 Ballast Weights

In circumstances where stability cannot be provided by stabilisers, outriggers or tying in, then it may be possible to obtain stability using ballast weights. The specification for the ballast and its placement will be explained in the instruction manual or a safe use, assembly and dismantling plan. Ballast weights placed at the base of the structure will increase tower self-weight, thereby increasing stability. PASMA recommends that ballast must be made of solid materials (i.e. not sand, water or other liquid or granular materials) and must be securely attached to the tower.



12. Dismantling the Tower

Follow the current instruction manual for dismantling and ensure that components are removed in the correct sequence. Take particular care to follow the manufacturer's instructions to ensure you are protected from falling in the course of dismantling and check the instructions recommended methods for lowering components. Remember site conditions may have changed since you assembled the tower.

13. Hazards

13.1 Slips

Avoid slips by not working on towers in snowy or frosty weather or in heavy rain. Similarly, you will also avoid slips by climbing only on those parts of the tower which are designed for climbing - either on the ladder section or on the special slip resistant rungs on some towers.



13.2 Electrocutation

The hazard of electrocution can be avoided by staying well clear of live overhead electrical cables. If you need to work in the vicinity of overhead electrical cables, consult the appropriate national guidance on working safely near electricity and your local power company for advice on safe distances, and be aware of the flash factor, (arcing), particularly in wet conditions.

Aluminium towers are not insulated whilst glass reinforced plastic (GRP) towers provide considerable insulation properties. Contact your supplier for information regarding the insulation properties of glass reinforced plastic towers.



13.3 Striking by Vehicles



If you are working on a tower structure which is sited at, or near, a road, you must take appropriate steps to ensure vehicles cannot come into contact with the tower. Use cones or barriers, or in some cases you may have to arrange traffic diversions. This does not only apply to public highways, you must give the same consideration when you are working in a factory or a site, where forklift trucks, delivery vehicles and such like can cause the same problems. Remember that this is a temporary structure - drivers and forklift operators do not expect the tower to be there.

13.4 Falling Objects

Objects can fall because they are dropped, or thrown intentionally, perhaps in the haste to complete a job. The momentum, which can gather with even lightweight components, makes such a practice extremely dangerous for anyone in the vicinity and is therefore not permitted in any circumstances.

Objects such as tools or materials can fall from the platform unintentionally. Toe boards are designed to prevent such an occurrence and are provided with every tower supplied by PASMA members. Regulations require that they must be installed at all places of work where there is a risk that tools, equipment or materials may fall a distance liable to cause personal injury.

Since there is a higher risk of objects falling during the assembly, alteration or dismantling processes, Regulations also require that you set up an exclusion zone, in the form of a physical barrier to ensure others are prevented from entering the danger area during these activities.

Never use 'ad hoc' methods for storing tools and materials such as boards or other sheet materials set across the guardrails. Only use properly designed proprietary tool trays that fit securely within the guardrails. Consider fitting lanyards to lighter tools to prevent them being dropped by accident.



13.5 Instability – Effects of Wind

One of the major factors affecting stability is the effect of 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. The weather forecast should be taken into consideration as part of the risk assessment process prior to work starting. The wind speed should also be monitored while you are working on the tower. However, determining wind speeds can sometimes present difficulties. PASMA recommends the use of a hand-held wind speed device, (anemometer). If the wind reaches Beaufort Force 4, (17mph) you should cease work and dismantle the tower.

Average mph	Average km/h	Average m/s	Action
17	27	7.6	STOP WORK

Another factor that makes the effect of wind even more dangerous is the attachment of sheets or tarpaulins to towers, or working with sheet materials such as cladding. These act like sails and, even in relatively light winds, can still cause the tower to overturn. Such towers must be tied in at all times and the advice of the supplier must be sought.

Be cautious about the use of towers in open ended buildings, such as hangars or unclad buildings, as the wind forces in such locations can often be greater than if the towers are used outside the building, due to the funnelling effect of the wind.

13.6 Instability – Side Loads

Another example of a side load is where the tower is pushed or pulled, particularly at the top. Pushing or pulling a tower at platform level is very dangerous and could cause the tower to overturn. Side loads at the platform can also be caused by such activities as shot-blasting, high pressure jets, and the use of percussion drills. This list is not exhaustive; there may be other things in your work that could apply side loads. For example, an average pressure washer that uses 10 litres of water per minute (600 per hour) with a bar pressure rating of 140, will give a back thrust of 28kg at a distance from a surface of 30 cm.



This is a guide and can increase or decrease depending on the bar pressure or litre usage. Consideration should also be taken on how close you hold the nozzle to the surface. The maximum allowable side load at the platform is generally 20kg, but the guidance in the current instruction manual for your tower must be followed.

13. Hazards



13.7 Instability – Vertical Loads

Any vertical load outside the area of the tower can be hazardous. For example, heavy materials hoisted outside the effective base area of the tower have a tendency to overturn the tower particularly if no outriggers or stabilisers are fitted, as can be the case with towers of lower height.

Loads must be hoisted within the effective base area of the tower (e.g. within the area bounded by the tower or stabilisers / outriggers where fitted.) Your instruction manual must be consulted about hoisting loads to ensure safe and stable use of the tower.

Most tower manufacturers do not permit the use of lifting devices, such as hoists. If you intend to use such equipment, you must consult and follow the advice given in the current instruction manual.

13.8 Instability – Moving by Vehicles

Pushing, or pulling towers at the bottom, using mechanical means such as forklifts or other vehicles is strictly forbidden. This is a very dangerous practice imposing sudden side loads which could cause the tower to overturn. Towers must only be moved by the application of manual effort at or near the base of the tower.

13.9 Instability – Ground Conditions

Ground conditions can also have a marked effect on the stability of a tower. If a tower is situated on soft or uneven ground or on top of grates or manholes, it is very possible that it could overturn. Like any structure, it is only as good as its foundations.

13.10 Instability – Over-extension of adjustable legs

Do not extend adjustable legs to give additional platform height. The adjustable legs must only be used for levelling the tower.

13.11 Instability – Vertical Alignment

Towers must be checked to ensure they remain vertical. A tower which is not properly vertically aligned is likely to be unstable.

The likelihood of overturning of towers as a result of instability is most often a combination of factors. Being out of level is a common contributory factor.

A very effective way of countering many of the risks of overturning is to alter your freestanding tower so that it takes its stability from an adjacent structure. You should consult your supplier and the current instruction manual for your tower for advice on how to correctly tie your tower in.

13.12 Structural Failure – Overloading

Whilst it is an uncommon occurrence, tower structures can collapse. Investigation shows that this is almost invariably as a result of incorrect assembly, using damaged components or overloading the tower structure.

Do not exceed the maximum safe working load (SWL) stated in the current instruction manual, either on individual platforms or on the whole tower structure, and ensure you evenly distribute the load - do not gather materials, or tools, in a concentrated area.



13.13 Structural Failure – Incorrect Assembly

When assembling and dismantling towers, always follow the sequence explained in the current instruction manual. Use only the correct components in the right place, following the specified bracing pattern. (Refer to 9.2. Type and number of components). It is important that you follow the instruction manual, as the bracing gives the tower its structural strength. Never remove or borrow components from an assembled tower.

13.14 Falls from Height – Improper Use of Guardrails

Statistics show that falls from height are historically amongst the highest causes of fatalities and serious injuries reported each year.

When installed correctly the guardrails are designed to prevent falls from the platform. The principal (top) guardrail is set about 1m (minimum 950mm) above the platform and is intended to be above the user's centre of gravity. The intermediate or middle guardrails are set at approximately the mid-point between the principal guardrail and the platform, so that there is no unprotected gap of more than 470mm.

Although guardrails, or other suitable fall prevention measures, are compulsory at all places of work from which it is possible to fall a distance liable to cause personal injury, some users either do not install them at all, or install them at below the correct height, so that they are below the centre of gravity of the users.

These are extremely dangerous practices, since they can easily lead to unnecessary, potentially fatal, falls from height if the user slips, trips or stumbles at the unprotected, or inadequately protected, work place. Guardrails also have a structural function and their removal may cause failure.



13.15 Falls from Height – Over-reaching

Users must not over-reach or over-stretch over the guardrails. NEVER set up ladders, steps, or other devices on the platform to gain additional working height as this will place the operative above the fall prevention afforded by the guardrails. If you need to go higher, then you must increase the height of the tower.

Only use additional tower components in accordance with the instruction manual to increase the platform height safely.

13. Hazards

13.16 Falls from Height – Climbing Outside of Tower

Climbing up the outside of the tower is expressly forbidden and must never be attempted under any circumstances. Not only does this practice significantly increase the risk of the tower overturning, but, if you do lose your grip, or slip, there is nothing to prevent you falling.



13.17 Falls from Height – During Assembly & Dismantle

PASMA, in co-operation with the health and safety authorities, currently recommend two methods for assembling, altering and dismantling towers which take account of the need to prevent falls during these processes.

Advance Guardrail

This method uses an additional set of equipment allowing guardrails to be placed ahead of the platform from the safety of the level below, so that collective fall prevention measures are in place before the operative stands on the platform.



3T – Through The Trap

This method allows positioning of guardrails from the seated position, through the trap of the platform and place horizontal braces ahead of the user so that collective fall prevention measures are in place before they stand on the platform.

13.18 Falls from Height – Personal Fall Protection Equipment

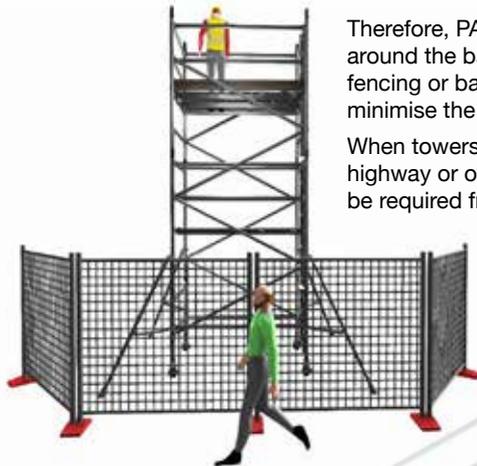
Both PASMA and the health and safety authorities specifically recommend that you **DO NOT** attach safety harness lanyards to mobile access towers. In the event of an arrested fall, you are likely to cause the tower to overturn, not only increasing the risk of further injury to yourself, but also occasioning the additional risk of putting others in the vicinity in danger from the falling tower.



13.19 Working in Public Places

When using a tower in a public place you must consider the potential risks to people nearby. For example:

- the risk of someone being struck by a falling object during
 - assembly and dismantling, such as a tower component, or
 - work, such as a tool or piece of material,
- someone gaining unauthorised access, particularly children, and falling from height.



Therefore, PASMA recommends the installation of security fencing around the base of the tower when working in public places. A fencing or barrier system, of suitable height and size, should minimise the risks of injury and unauthorised access to the tower.

When towers are assembled in certain locations, such as on the highway or other public access areas, a pavement licence may be required from the local authority. This may impose special conditions such as the use of pavement frames, lighting and such like. PASMA has published specific guidance on the use of towers on highway and a licence template which is available from the PASMA website.

14. Safe use of Towers

14.1 Safe Loads

The current instruction manual will detail the maximum loads that the tower can support. The safe working loads must not be exceeded.

Generally speaking, the instruction manual will state the safe working load that a single platform and the whole tower can support.

The instruction manual should also tell you either the number of working platforms that can be used at the same time, or, how to calculate the number of platforms that can be loaded at the same time.

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

14.2 Incomplete Towers

When towers are left in an incomplete state, a notice must be displayed in a prominent position to announce the fact. PASMA recommends the use of the PASMA Tower Inspection Record which is available from pasma.co.uk



15. Care and Maintenance

15.1 Care and Maintenance

Those responsible for the care and maintenance of towers must regularly check and record the condition of the equipment. Damaged tower equipment can significantly affect the assembled tower's ability to support the loads placed on it. Maintaining tower equipment in accordance with the manufacturer's guidance will ensure that you stay safe when using the tower.

The inspection of all tower components should be carried out by a competent person at suitable intervals using the PASMA Inspection Guidance Poster (available from PASMA's website) together with any specific guidance provided by the manufacturer of the equipment. Any defects should be made good by the manufacturer or their approved agent before the component is used further. If recommended by the manufacturer, the mechanism for locking hooks, adjustable legs, castors and other similar mechanisms should be lubricated with a suitable lubricant.

15.2 Component Inspection Checklist

All components should be checked to ensure that they are in good condition and fit for purpose.

- Castors should show no signs of damage or excessive wear. They must function correctly with the wheel free to rotate and the castor free to swivel with the brakes released. When the brakes are locked the wheel should not rotate and if the castor is eccentric when locked the castor should not swivel.
- Adjustable legs should be checked to see that they function correctly. They must not be bent, and the thread must be undamaged, clean and free from debris. The adjustable leg should be inserted and removed from an end frame to see that the device that secures it in position is operating effectively. If they are separate components, check that the device for retaining the castor in the adjustable leg is working properly. The adjustable leg and castor must not drop from the frame under their own weight.
- Frames, stabilisers and braces should be carefully examined to see that the tubes are straight and undamaged, and that joints and welds are not cracked or distorted. They should be free of contamination such as oil, concrete and plaster.
- Interlock devices for locking end frames together should be checked to see that they function correctly.
- Braces should be straight, free from damage and the locking hook mechanisms must operate correctly.
- Ladders should be straight and undamaged with the rungs and treads secure and free from contamination.
- Platform units should be checked to see that the frames are square, straight and undamaged. There should be no cracking of other damage to welds or other joints. The hooks must be undamaged and secure. Deck material should not be split or warped and should be firmly fixed to the frames. Trapdoors should open and close freely.
- Toe boards should be undamaged and should secure correctly to the platform.
- Any labels should be intact and legible.

Any components found to be damaged should be ISOLATED, TAGGED & REPORTED to the responsible person

16. Repairs

Repairs must only be carried out by the manufacturer or other competent person approved by the manufacturer

Components should not be painted or treated subsequent to manufacture in a way that may conceal defects. All labels must be checked and replaced as necessary.

17. Handling, Transportation & Storage

The life of mobile access towers will be increased if proper care is taken of them during handling, assembly, transportation and storage. Before storage components should be dismantled, checked and cleaned. Any concrete or corrosive substance must be removed. Proper stacking will reduce any damage, and will make identification of the components easier for re-issue. Similarly during transportation, equipment should be properly stacked on vehicles.

18. Site Inspection

18.1 Site Inspection

Towers must be inspected as often as is necessary to ensure safety. Although the Regulations make a distinction between the inspection requirements for towers which are used in construction and those which are not, PASMA recommends the following, regardless of activity, as current best practice.

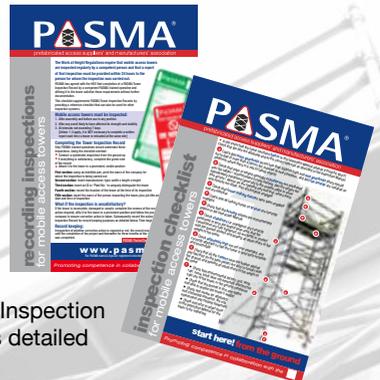
For towers from which it is possible to fall 2m or more, you must

- Inspect after assembly, or significant alteration, and before use
- Complete a written report, before going off duty
- Give the report to the person for whom it was completed within 24 hours
- Re-inspect and report as often as necessary – but at least every 7 days
- BUT, there is no need to re-inspect and report every time the tower is moved at the same location
- Re-inspect and report after any event likely to have affected its stability or structural integrity, such as adverse weather conditions
- Keep a copy of the inspection report safe: At a construction site until the work is completed then at your office for another 3 months

A tower from which it is possible to fall a distance of less than 2m has different inspection requirements. It must be inspected after assembly, and before use; after any event likely to have affected its stability or structural integrity and at suitable intervals depending on frequency and conditions of use.

PASMA recommends the use of the PASMA Tower Inspection Record which not only gives a visual indicator of the tower's inspection status, but also satisfies the requirements of the Regulations to record the inspection, and when affixed to the tower satisfies the requirement to give to the person for whom it was completed, and finally, on completion by retaining the Tower Inspection Record, satisfies the requirement to retain a copy of the record as detailed in the Regulations.

PASMA has produced a PocketCard and Posters explaining the inspection requirements for towers and how Tower Inspection Records must be completed. These and Tower Inspection Records (in packs of 50), can be obtained in the online shop at pasma.co.uk.



18. Site Inspection

18.2 Assembly Checklist

1. Check that you have a copy of the current instruction manual on site and that it has been read and understood.
2. Check the risk assessment document.
3. Check that the correct type and the correct number of components for the height required are present and are undamaged.
4. Lay out the components and check that all castors are locked.
5. Follow the steps outlined in the instruction manual, ensuring that:
 - castors locked and legs correctly adjusted
 - braces and platforms are level
 - tower uprights are vertical
 - stabilisers/outriggers are fitted as specified in the instruction manual
 - platform units located correctly and windlocks on
 - guardrails are in place on all levels
 - toe boards are located correctly
 - tower is inspected prior to use

19. PASMA Training Scheme

As well as being the lead industry body, the organisation consulted by National Standards Bodies, the health and safety authorities and the people to whom users, managers and safety professionals turn for expert advice, PASMA also operates an international training scheme through a network of Approved Training Centres. Training Centres have to meet an exacting set of criteria before they can become PASMA Approved. Instructors are vetted; premises and facilities, course materials and equipment all have to meet exacting standards. Moreover, they are subject to ongoing audit to ensure they continue to meet consistently high standards.

This Code of Practice as well as being a definitive stand alone reference document also serves as support reference for the PASMA Training courses. It forms part of an internationally recognised training course in the PASMA Training Scheme for operatives, supervisors and managers in the safe assembly, use, inspection, repositioning and dismantling of towers. Courses are intended to meet the requirements of the basic syllabus of the Advisory Committee for Work at Height Training, (ACWAHT). Successful delegates receive a PASMA certificate and convenient photocard as proof of competence.

20. PASMA Training Courses

PASMA Approved Training Centres provide a series of Training Course modules covering many uses of mobile access and working towers, prefabricated tower scaffolds and low level work equipment.

- Work at Height (Novice)
- Towers for Users
- Low Level Access
- Combined Towers for Users and Low Level Access
- Towers for Managers
- Towers on Stairs*
- Towers with Cantilevers*
- Towers with Bridges*
- Towers for Professional Riggers*#

These are available in modular form from PASMA Approved Training Centres. The courses marked with * are available for anyone who has already passed the Towers for Users or Combined course. Courses marked with # are currently only available to users working for PASMA Hire and Assembly Members.

Courses are subject to continuing review and authorisation by PASMA and may not always be available immediately, please check with your local training centre for current availability.

PASMA training is available only from PASMA Approved Training Centres

PASMA shares safety advice on its website to encourage the safe use of towers. To access it, visit pasma.co.uk. You will also find more information on PASMA training courses, a link to our YouTube channel and the answers to frequently asked questions, as well as a shop where you can buy more copies of this Code of Practice and other safety-related items.



Download now *for free*

The PASMA app provides a huge range of practical information that can be used on a day-to-day basis including:

- Manufacturers' instruction manuals
- Operator's Code of Practice
- Locate PASMA Training Centres, Hirer Dealers, Hire and Assembly and Manufacturers
- Receive safety bulletins
- Receive PASMA news
- Information about PASMA



Safety Products

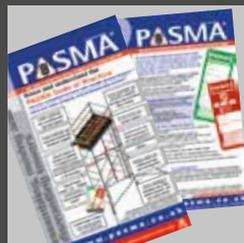
Available at pasma.co.uk



Tower Inspection Record



Stamp of Approval Stickers



PocketCards



Posters



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