



prefabricated access suppliers' and manufacturers' association



training course notes

Towers for Users

www.pasma.co.uk

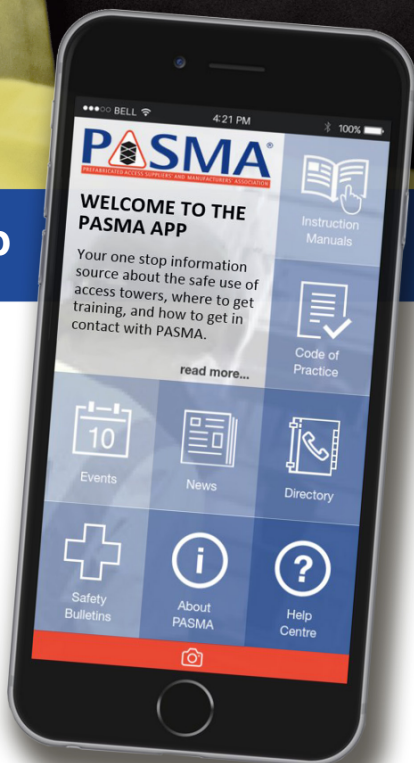




Stay up to date with our free app

The PASMA app is the perfect way to stay up to date with PASMA and the tower industry. It features:

- Instruction Manuals
- Operator's Code of Practice
- Directory of PASMA Training Centres, Hirer Dealers, Hire and Assembly and Manufacturing Members
- Industry News
- Safety Bulletins
- Upcoming Events



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Notes to delegates - please read carefully

This Course Notes booklet forms an integral part of the PASMA course 'Towers for Users' and is not a stand-alone document. The course aims to show you how to use mobile access towers safely.

PASMA, the Prefabricated Access Suppliers' and Manufacturers' Association, is the lead industry body for all matters relating to mobile access towers. All members offer equipment that meets the current British / European Standard, EN 1004 - 1 and have third party product conformity certification from an Approval Body such as BSI (or international equivalent).

PASMA training can only be carried out by PASMA approved training centres, who are subject to assessment and ongoing audit to ensure a consistent quality of training wherever PASMA training is delivered. The PASMA name and logo are UK and International Registered Trademarks of the Association, which can only be used by members of and can only be used by approved training centres in respect of training.

You are encouraged to take as many notes as you wish, as this is a useful method for many in helping to remember important points.

The topics covered in this course are intended to ensure that the course meets the Aims and Objectives and that, on successful conclusion, you will be able to demonstrate the core competences.

If you have any difficulties, whether physical or with language or comprehension, you must bring this to the attention of your instructor.

The written assessment and its requirements will be discussed before you attempt it and consists of a multiple-choice question paper with all points covered in the course of the training module. The pass mark is 80%.

The practical assessment and its requirements will also be discussed in detail before you begin. You will be observed and assessed in a predetermined practical exercise and will be penalised for errors or omissions. Some errors or omissions are considered so serious that they will result in mandatory failure. These will be explained in more detail by your Instructor.





Working at height can be dangerous, which is why it is important you follow the training and instruction you have received today to keep you safe.

Every year, literally millions of people work at height in a variety of industry sectors. Some are more obvious than others, such as construction, roofing and facilities management, but there are also countless others who work at height on a day-to-day basis - often without realising it - in shops, offices, factories and hospitals. The list is almost endless.

What they all have in common is risk. The risk of a fall that might kill them or leave them with serious life-changing injuries with potentially devastating consequences for their families, friends and work colleagues.

Not just the most common cause of fatal injury, falls from height also accounted for an estimated 43,000 non-fatal injuries each year - an average of 118 injuries every day.

The No Falls Foundation, in partnership with other stakeholders, has three aims:

1. To help keep people safe by creating greater awareness and understanding of the risks associated with working at height;
2. To better understand the causes of falls from height through research and the exchange of information and knowledge;
3. To support those people facing the aftermath and consequences of a fall from height.

PASMA supports the No Falls Foundation both through its contribution to its work and programmes but also by

making a contribution for every delegate that is trained through the PASMA training scheme.

If you know anyone who has been affected by a fall from height, or if you are interested in the work of the No Falls Foundation, visit the website:
www.nofallsfoundation.org

Finally, remember you can keep up to speed with everything to do with PASMA and towers by downloading our App.

NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Course Documentation



Your delegate pack includes:

- PASMA Operator's Code of Practice
- PASMA Delegate Booklet
- PASMA Training Course Notes
- Current Instruction Manual



PASMA H&S Fitness Statement

Literacy & Language

Literacy and language comprehension are essential for any tower user. Safe use of Mobile Access Towers requires delegates to consult safety notices and **thoroughly understand the manufacturer's instruction manual**

Physical Fitness

Users should be physically fit and in good health

Meeting the Requirements

If delegates have any problems with comprehension, or any doubts about their fitness, they **must** bring them to the attention of their employer



As well as these Training Course Notes, your delegate pack also includes a copy of the latest PASMA Operator's Code of Practice, a Delegate Booklet which you are required to complete, and which will act as a record of your training and assessment, and lastly a copy or copies of the current instruction manual(s) for the towers used in your training course.

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.

PASMA Training Scheme

Work at Height Novice	Cantilever Towers for Users
Low Level Towers for Users	Towers with Bridges for Users
Towers for Users and Low Level Towers for Users Combined	Linked Towers for Users
Towers for Users	Large Deck Towers for Users
Towers for Managers	Access Tower Specialists
Towers on Stairways for Users	



Similarly, since the assembly and use of mobile access 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, 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.

As well as the Towers for Users course, the PASMA training scheme also offers a range of other courses such as Work at Height Novice, Low Level Towers for Users, Towers for Managers, Cantilever Towers for Users, Towers on Stairways for Users, Towers with Bridges for Users, Linked Towers for Users, Large Deck Towers for Users, and Access Tower Specialists (formerly Towers for Professional Riggers).

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 mobile access 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.

Training modules are also available at different levels from Novice, User, Manager and Access Tower Specialist.

Courses are being developed on a continuous basis, so please check with your Instructor or PASMA training centre for availability.

Since the safe use of mobile access towers

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The PASMA Towers for Users course covers all the Information you need to use towers safely, the roles and responsibilities of users, supervisors and managers, the different types of towers and their components, the two currently recommended methods for assembling and dismantling towers, hazards you should watch out for in the working environment and personal hazards of which you should be aware. The course concludes with assessments to make sure you have understood all the important lessons.

The aims & objectives of the PASMA Towers for Users course are to ensure that you can demonstrate that you are competent to assemble, dismantle, alter, move, inspect and use mobile access towers without risk of personal injury to yourself, or anyone who may be affected by your work.



Although there is no excuse for sloppy and unsafe work, it still goes on. It is vitally important that you practice what you have learned on this Towers for Users course, and do not be tempted to fall into bad habits.

When it comes to your safety, you cannot have the attitude of "It'll do" or "It will never happen to me". It can happen to you and it does, every day.



It also intends to give you an understanding of the legal and regulatory issues affecting work at height with mobile access towers, the relevant product standards which relate to the equipment, and a thorough knowledge of the hazards affecting the use of towers.

NOTES

2 Roles and Responsibilities

You will learn about the legal and regulatory framework which affects the use of towers. You will next learn about Risk Assessments, Method Statements and planning for emergencies and rescue in the context of mobile access tower safe use.



The Health & Safety at Work (etc) Act (HASAWA)

The Health & Safety at Work (etc) Act is the overarching legislation which sets out the framework for health and safety in the workplace.

The Act also gives the authority to the HSE, in consultation with relevant industry bodies, to lay down Regulations which give a more detailed interpretation of the Act and how it applies in certain sectors or activities.

The Health and Safety (Fees) Regulations - Fee For Intervention (FFI)

There is a regulatory duty on HSE to recover its costs for carrying out its regulatory functions from those found to be in material breach of health and safety law. This shifts some of the cost of health and safety regulation from the public purse to those businesses and organisations that break health and safety laws.

The fee includes the costs covering the time of the entire original visit. The total amount recovered will be based on the amount of time it takes HSE to identify the breach and help you put things right (including associated office work), multiplied by the hourly rate.

Your fee may include the inspector's time:

- at your business or workplace
- preparing reports
- getting specialist advice
- talking to you after the visit
- talking to your workers

The fee can vary depending on:

- how long the original visit was
- the time the inspector spent helping you put things right
- the time it took the inspector to investigate your case
- any time HSE spend on taking action against you

Management of Health & Safety at Work Regulations

Every employer shall:

- Make suitable and sufficient assessment of Health and Safety risks to employees and others who may be affected by their works
- Put in place appropriate control measures arising from these assessments (Method Statements)
- Take into account the capabilities of employees with regards to health and safety
- Ensure employees are provided with adequate health and safety training.

Young people at work [HSG165]

There are special provisions within the Management of Health & Safety at Work Regulations in respect of young people. These require that employers take account of young people's inexperience, particularly in high risk activities such as working at height and make special provisions for training and supervision.



Construction Design & Management Regulations (CDM)

Identifies a number of key elements to securing construction health and safety. These include:

- Managing the risks to health and safety by applying the general principles of prevention, which set out the principles dutyholders should use to direct their approach to identifying the measures necessary to control the risks to health and safety in a particular project. CDM requires Designers, Principal Designers, Principal Contractors and Contractors to take account of the principles in carrying out their duties.
- Appointing the right people and organisations at the right time.
- Making sure everyone has the information, instruction, training and supervision they need to carry out their jobs in a way that secures health and safety.
- Dutyholders co-operating and communicating with each other and co-ordinating their work and consulting workers and engaging with them to promote and develop effective measures to secure health, safety and welfare.

Provision and Use of Work Equipment Regulations (PUWER)

General Requirements:

- Suitability of work equipment
- Maintenance and Inspection of work equipment.
- Training requirements, information and instruction for the use of work equipment.
- Stability of the work equipment.

Reporting of Injuries, Diseases & Dangerous Occurrences Regulations (RIDDOR)

These regulations require the reporting of any injuries, fatalities or dangerous occurrences including:

The collapse or partial collapse of any scaffold structure (including towers) over five metres high.

Collapse or partial collapse of a scaffold structure that is assembled over or adjacent to water where there would be a risk of a person drowning who fell from the scaffold.

- Contact with overhead power cables
- Injury to a member of the public
- Seven-day absence from normal duties
- Major Injuries
- Fatalities

Manual Handling Operations Regulations

Avoid the need to undertake manual handling operations where practicable.

Where manual handling operations cannot be avoided, assess health and safety risks associated with the task.

Personal Protective Equipment at Work Regulations

Most work situations require you to wear some sort of PPE. Assembling, working on and dismantling towers is no different. The likely minimum requirement is safety shoes/boots, hard hat, and gloves.

An assessment by your employer may indicate different and/or other site-specific requirements.

The Work at Height Regulations (WAHR)

Introduced in 2005 and superseding the provisions of other regulations in respect of working at height, the Work at Height Regulations have the most significant impact on the use of mobile access towers, and these will be reviewed in some detail over the following pages.



The Health & Safety at Work (etc) Act is an enabling Act. This gives authority to the Health & Safety Executive and is the legislation under which employers & employees may be charged.

It places specific responsibilities on classes of people engaged at work.

Employers: Section 2 (2) Training, Equipment, Environment

Employers must provide:

- Safe plant, equipment and safe systems of work
- Necessary information, instruction, training and supervision
- A safe place of work, with safe access and egress
- Safe handling, storage, maintenance and transport of articles and substances, including plant and equipment.

Employees: Section 7 & 8 own safety, safety of others by acts/omissions

Employees must take reasonable care of their own health & safety and that of others who may be affected by their acts or omissions.

Employees must co-operate with their employers.

It is an offence for anyone to intentionally or recklessly interfere with or misuse anything provided in the interests of health, safety & welfare

Supplier: Section 6 Information on safe use, equipment adequately inspected / tested

Suppliers must provide:

Information for the use of the equipment. Equipment that is safe when being used. Adequate inspection of equipment.

HSE Inspectors have the right:

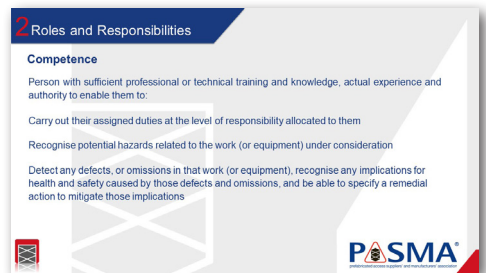
- of entry without an appointment
- to investigate and examine
- to take photos, samples or equipment
- to see documents and take copies
- to dismantle and take away substances
- to have assistance
- to ask questions

If they consider they do not have sufficient authority to carry out their duties, they can assume it.

Penalties for non-compliance

These can be severe and apply not only to corporate bodies, but also to individuals and employees

Substantial fines and imprisonment for up to two years if found guilty.



Although there is no definition of competence given in The Work at Height Regulations (WAHR), the Advisory Committee on Work at Height Training (ACWAHT) which was formed and is chaired by the HSE, and comprises all the lead organisations involved in work at height, has given the following definition of competence for people who are to work at height:

A person with sufficient professional or technical training and knowledge, actual experience and authority* to enable them to carry out their assigned duties at the level of responsibility allocated to them; recognise potential hazards related to the work (or equipment) under consideration and detect any defects or omissions in that work (or equipment), recognise any implications for health and safety caused by those defects and omissions, and be able to specify a remedial action to mitigate those implications.

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

This has previously been defined in other Regulations as simply “a combination of training, technical knowledge and / or experience”.

PASMA training aims to address these requirements and ensure the operative meets this definition of a “competent person”

Particularly in relation to mobile access towers, this definition of a competent person implies:

- To know and understand the specific legal duties under the Work at Height Regulations which apply to them as an individual
- To understand who controls their work at height activity and the lines of communication to use
- To understand the principles of fall protection that the regulations required to be used
- To be able to recognise safe and unsafe situations /activities
- To understand how to deal with the hazards associated with the task allocated to them
- To have adequate training in the correct use and limitations of any work equipment allocated to them for the task
- To understand the need for and the ability to check the adequacy of the safety equipment allocated to them.

If that equipment has been issued to them on a personal basis, an understanding of the correct procedure for storage, maintenance and inspection:

- To 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

- To know the procedure for reporting any defects, hazards or unsafe procedures they detect.



PASMA training aims to equip you with the necessary training to allow you to meet these criteria and this is recognised, on successful completion of the course, by the PASMA Certificate of Competence and Photocard, which is the recognised proof of competence for mobile access tower users.

The card will display an expiry date, but at all times remains the property of PASMA and can be withdrawn if the cardholder engages in inappropriate or dangerous activity whilst working at height on mobile access towers.

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2 Roles and Responsibilities

Work at Height Regulations

What is Work at Height?
 Work in any place where a person could fall a distance liable to cause personal injury.

Above
Below
 Or At Ground Level

The first question we should address and understand is

“What is work at height?”

Work at height is defined as: Work in any place, including a place at, above or below ground level, where a person could be injured if they fell from that place.

Example:

Work below ground level could be work at height if a hole has been excavated and someone may fall either from an unprotected edge or whilst descending.

Work at ground level could be work at height, if it is alongside an empty swimming pool.

You may be able to add to these examples, instances where work is “at height”, even if it is at or below ground level.

Where do the Regulations apply?

Unlike previous regulations which covered work at height activities which were confined to particular activities, such as construction, the WAHR apply everywhere, in all industries and in every work activity at height, where there is a risk of fall liable to cause personal injury.

2 Roles and Responsibilities

Hierarchy of Control Measures

For each step, consider what is reasonable and use 'collective measures' over 'personal measures'

The Regulations set out a framework that ALL duty holders must: Avoid > Prevent > Protect, in that order.

The main objective which applies to all work at height is that you must do all that is reasonably practicable to prevent anyone falling.

Firstly, avoid work at height. This can be achieved at planning and design stage by, for instance prefabricating and installing prefabricated units at height, rather than assembling at height where those assembling are at risk of fall.

Next, if there is an existing safe place with suitable fall prevention measures, use it in preference to work equipment.

This is preferable because whilst assembling or positioning work equipment such as towers, MEWPs or ladders, the operative is at risk of fall during the assembly / installation / dismantle processes.

If neither of these is possible, you should select suitable work equipment with fall prevention measures.

The hierarchy also requires that priority is given to collective measures - that is, measures which prevent or protect any and everyone, over personal measures which prevent or protect only the individual, such as harnesses.

NOTES

2 Roles and Responsibilities

Work at Height Assessment

Carry out a risk assessment before working at height

Work at height should only take place after the following essential assessments have been carried out:

- The task that needs to be done
- Can work at height be avoided?
- Is there an existing safe place of work?
- Is a single bay tower suitable equipment for the task?

Assess – your abilities, ground conditions, overhead conditions, environment and the weather



Prior to working at height, an assessment must be undertaken by a competent person, following the hierarchy of measures to determine the work that needs to be done and whether work at height can be avoided.

If work at height cannot be avoided, but an existing safe place of work is available this should be used in preference to work equipment.

Mobile access towers should only be selected if suitable for the intended work, taking into account the nature of the work, the loads to be applied and other factors which may influence selection such as the ground conditions, overhead obstacles and environmental factors.

Finally, assembly, dismantle, alteration and inspection of mobile access towers must only be undertaken by competent persons.

2 Roles and Responsibilities

Collective Measures

Dimensions are set for components such as guardrails and toe-boards; measures such as these reduce the likelihood of an operative falling through exposed gaps, or the risk of objects falling



Although the Work at Height Regulations are non-prescriptive or goal setting regulations, minimum dimensions are set for guardrails and toe-boards or other equivalent fall prevention methods.

These dimensions are also required by the product standard.

A main guardrail must be not less than 950mm. There shall be no gap of more than 470mm. Toe-boards shall be not less than 150mm.

The maximum gap of 470mm is intended to ensure that you cannot fall through an exposed gap, and although 950mm is the minimum guardrail height, the goal setting nature of the regulations require that a risk assessment take account of the need to add extra guardrails if necessary, if for example the tower is being used by particularly tall operatives, or if there are other factors which mean that the guardrail height will not be effective in preventing falls at 950mm.

2 Roles and Responsibilities

Tower Inspection Record

Inspections must be carried out by a Competent Person:

Inspect **after assembly and before use**

Complete a **written report**, before going off duty

Give to person for whom report was completed within **24 hours**

Re-inspect and report 'as often as is necessary to ensure safety' (or within the previous seven days)

No need to re-inspect when a tower is moved

Keep copy of the **Inspection Report** safe and on site until the work is completed

Then keep in office for a further **3 months**

PASMA recommends the use of the PASMA Tower Inspection Record for this purpose




The Work at Height Regulations require that mobile access towers are inspected after assembly and before use by a competent person, that a written report of that inspection is completed before going off duty, and that a copy of the report is given to the person for whom the report was completed within 24 hours.

PASMA, in consultation with the HSE, has developed the PASMA Tower Inspection Record for this purpose. As well as providing a visual indicator of the tower's inspection status, it also acts as a written report, and by affixing the Record to the tower you satisfy the requirement to "give to the person for whom it was completed within 24 hours".

PASMA Tower Inspection Records are available in packs of 50 from PASMA Member Services (Tel. +44 (0) 345 230 4041) or from www.pasma.co.uk

When the record is full, it is removed from the tower (if the tower is still being used, a new Tower Inspection Record is commenced) and retained as a record of the inspections until the work is completed, and thereafter at your office for a further three months, as required by the Regulations. The HSE Guidance indicates, in addition to the 7 day frequency of inspections, that a tower should be inspected after any event likely to have affected its stability or structural integrity, such as adverse weather conditions. You may be able to think of other events which could have such an effect.

Finally, it is important to note that the Regulations do not require a written report each time a tower is moved or relocated on the same site.

2 Roles and Responsibilities

Incomplete/Damaged Towers

If your tower is incomplete, or is in a dangerous condition you **must** let other people know

A **Tower Incomplete, Tower Damaged or Tower Unsafe** sign should be placed in either:
a prominent position or
adjacent to access point

PASMA recommends the use of the PASMA Tower Inspection Record for this purpose



As well as being suitable for recording inspections, the reverse side of the PASMA Tower Inspection Record can also be used as a visual indicator and record that a tower is not to be used because it is incomplete, damaged or otherwise unsafe.

If your tower is incomplete or is in a dangerous condition, you must let other people know. You should affix a Tower Incomplete, Tower Damaged or Tower Unsafe sign in a prominent position or adjacent to an access point, so that any potential users are aware of its condition and do not attempt to use it.

2 Roles and Responsibilities

Hazards and Risk

What is a HAZARD?
Anything which has the potential to cause harm to someone or something

What is a RISK?
Risk is the chance, high or low, that someone or something could be harmed by a hazard, together with an indication of how serious the harm could be = Consequences




It is important that users of towers fully understand the Risk Assessment, which we will address below, and follow their employer's Method Statement, which we will cover shortly.

In order to do so, you must firstly identify the hazards, that is, anything which has the potential to cause harm to someone or something. Next you must assess the risk, that is, the chance, high or low, that someone or something could be harmed by a hazard, together with an indication of how serious the harm could be. In other words, the consequences.

So far as is reasonably practicable (SFAIRP) involves weighing a risk against the trouble, time and money needed to control it. Source: www.hse.gov.uk/risk/theory/alarpglance.htm

In other words, an employer does not have to take measures to avoid or reduce the risk if it is technically impossible or if the time, trouble or cost of the measures would be grossly disproportionate to the risk.
Source: www.hse.gov.uk/pubns/hsc13.pdf

What the law requires is what good management and common sense would lead employers to do anyway: that is, to look at the risks and take sensible measures to reduce them to a level as low as reasonably practicable (ALARP).
Source: www.hse.gov.uk/pubns/hsc13.pdf

NOTES

2 Roles and Responsibilities

Risk Assessment

A risk assessment is a systematic evaluation of the likelihood and possible consequences of potential hazards which can or may occur during work and is required by law

The purpose of risk assessment is to:

- Highlight any hazards
- Implement control measures to determine how risks can be eliminated or reduced




All work activities, including work at height, require a competent person to create a plan of how the work is to be carried out, based on a risk assessment. This is usually known as a Method Statement and will look at this in more detail shortly. The Method Statement must also consider and plan for emergencies and (where appropriate) rescue, which again we will look at in more detail below.

Source: INDG163 Risk Assessment A brief guide to controlling risks in the workplace
www.hse.gov.uk/pubns/indg163.pdf

This leaflet aims to help you identify, assess and control health and safety risks associated with workplace hazards.

It is mainly aimed at employers, managers and others with responsibility for health and safety, and will also be useful to employees and safety representatives.

The guidance makes clear that only significant findings need to be recorded and emphasises the importance of controlling the risks identified. However, the guidance still suggests that you should identify the hazards, think about who might be harmed, evaluate the risks, record your significant findings and review your risk assessment.

2 Roles and Responsibilities

Method Statements

A method statement is a declaration of processes which must be adopted when undertaking a task

This includes any control measures to eliminate, reduce or isolate any risks which have been assessed

The method statement should:

- Be clear and concise
- Illustrated by simple sketches where necessary
- Avoid ambiguities or generalisations




All work at height requires a competent person to create a plan of how the work is to be carried out (Method Statement), based on a risk assessment and this must also consider and plan for emergencies and rescue, in case something goes wrong. It is important that the plan is written down, communicated and shared with everyone who is involved in the work, so that everyone knows what to do if things do go wrong. It would be a good idea to practice your rescue plan to gauge how well it works, or if you need to make any adjustments to it, when you are not under stress in a real emergency.

Method Statements are for the benefit of those carrying out the work and their immediate supervisors, so should not be overcomplicated.

Equipment needed for safe working should be clearly identified and available before work starts.

2 Roles and Responsibilities

Emergencies and Rescue

- Competent person
- Plan for rescue
- Write it down
- Communicate the plan
- Practice rescue
- Everyone needs to know what to do
- Things may not go to plan
- Don't become a casualty




A medical emergency on a tower, such as a person becoming unwell and therefore unable to descend safely, has to be considered so that, in the event of it occurring, those assisting know what to do. This may include an on-the-spot assessment of the tower if it is incomplete or if its inspection status is unclear (for example, if no visible inspection tag is present).

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Whatever you decide as your plan, the first priority for anyone attempting a rescue is to avoid becoming a casualty yourself.

What rescue plans are there for towers? Is there a template I could use?

It is not possible, or indeed sensible, to give specific guidance regarding rescue plans for towers, as there are so many varying factors to take into account. These variations include (but are not limited to): the reason for the rescue, the persons involved, the dimensions of the tower and its design, the state of build (either partial or complete), the location, the environmental conditions at the time, and other circumstances peculiar to the job site.

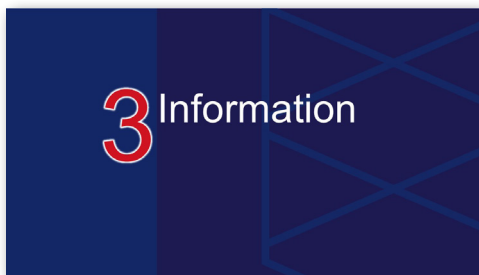
All of these factors, and more, create significant differences to the approach and the potential methods of rescue. However, you might consider a general hierarchy of measures for rescue from a tower which will apply in many cases.

Self-help comes first, i.e. the person(s) are capable of descending the tower without outside assistance.

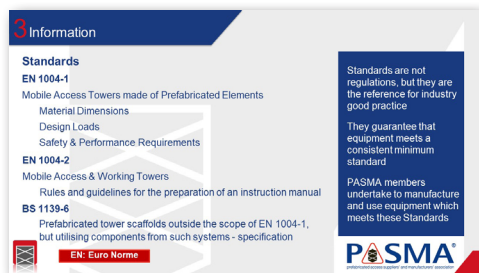
Next is an assisted descent, i.e. the person or persons are capable of descending the tower with assistance from others.

Last is professional rescue, i.e. the person or persons are totally incapacitated, incapable of descending the tower and need to be removed from the tower by others. If the person or persons are incapacitated such that they are unable to descend the tower even with the assistance of others, then their condition is likely to be such that only the professional medical or rescue services (ambulance and/or fire and rescue service) would have sufficient knowledge, skills and experience to effect a safe and successful rescue.

It is highly likely that, in such a circumstance, persons without such professional medical and rescue knowledge, skills and experience, could potentially cause further injury and/or significant risk to themselves or the person(s) in need of rescue.



The information section of the course will introduce you to the Product Standards which relate to mobile access towers and point you to industry guidance and sources of information. Current instruction manuals will be addressed along with the PASMA App and website.



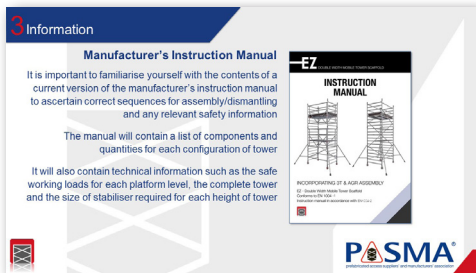
It is important to understand that these standards are not regulations; they are a guarantee that the equipment is designed and manufactured to a minimum, albeit high standard.

EN 1004-1 specifies standards for materials, resistance to overturning and loadings for towers, platforms and side protection, and also sets minimum dimensional requirements such as 950mm height of main guardrail, no unprotected gap of 470mm and toe boards at 150mm minimum. The Standard covers single towers on castors, with a maximum freestanding height of 12.0m indoors and 8.0m outdoors.

Other configurations of towers can be assembled using components from EN 1004-1 but fall outside the scope of that standard.

These configurations are covered by the British Standard, BS 1139-6 - Prefabricated tower scaffolds outside the scope of EN 1004-1 but utilising components from such systems. However, PASMA training centres do offer additional courses covering more complex structures which we will discuss later.

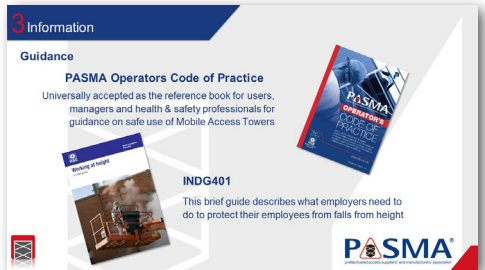
As the nature of the Work at Height Regulations is non-prescriptive, the HSE have made it clear that where terms such as “suitable and sufficient” are used in the regulations, it is to National and European Standards that they will refer to determine the definition of such terms, since the standards are specific in their dimensional and material specifications and properties.



The place to find the manufacturer's recommended assembly and dismantling method(s) is in the current instruction manual.

As well as detailing the exact sequence for assembly and dismantling, it will also contain important safety information; a list of component quantities for each configuration of tower and all of the necessary technical information such as the appropriate stabilisers for the height of tower and the maximum Safe Working Loads for platform(s) and for the complete tower.

NOTES



PASMA Code of Practice

Delegates will receive a copy of the Code of Practice in their delegate pack. The PASMA Code of Practice is the definitive stand-alone reference document for good practice in the use of Mobile Access Towers.

In addition to its function as a stand-alone document for users, their supervisors and managers and health and safety professionals, it is also intended to supplement PASMA approved training courses by serving as a worthwhile reminder of the good practices that delegates have learned during training and work experience.

INDG401 – Working at Height – A brief guide

Simplified guidance from the HSE which describes what you need to do to protect employees, yourself and others from falls from height. Following this guidance is normally enough to comply with the Work at Height Regulations (WAHR). You are free to take other action, except where the guidance says you must do something specific.

NOTES

3 Information

PASMA Website

On the website you can find a full range of information regarding the association, industry news, towers, training and memberships. www.pasma.co.uk



The PASMA website is a useful resource for anyone who has an interest in mobile access towers and contains lots of helpful and current information, including news, upcoming events, guidance, downloads, videos and other resources to inform and educate those who use mobile access towers.

3 Information

Tower Selection

What will you consider before selecting a mobile access tower?

Location of the tower

Ground conditions

Tower width

Tower height

Platform length

Product standard

Safe Working Loads



There are many factors which you should consider when selecting a mobile access tower. You may have to consider the location, the ground conditions, how wide, how long or how high you need the tower. What sort of working load do you need and what are the weather conditions (now or likely). You would also be well advised to consider specifying to the appropriate product standard.

3 Information

PASMA App

A full range of Manufacturer's Instruction Manuals, the Operator's Code of Practice and relevant supporting information is available to view and download via the PASMA App

Suppliers and a list of PASMA training centres are also available and you can choose to be notified of any updates or amendments



PASMA also has a mobile phone App which you can download for free. It places in your hand a huge range of practical information that can be used on a day-to-day basis.

Using the App you get invaluable access to current instruction manuals; the opportunity to check or verify advice in the PASMA Code of Practice; an easy and fast route to finding PASMA training centres, manufacturers and hirers and the opportunity to keep up to date with the latest news and developments.

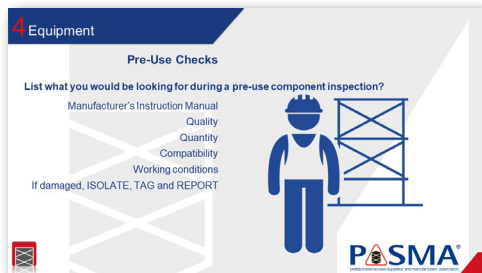
The functionality and usability of the App is under constant development and your suggestions for new or improved features is always welcome.

4 Equipment

To satisfy relevant regulations but, more importantly, to keep you safe, you need to inspect the equipment before use and to fully understand what you are looking **AT** – be able to identify key components using the Current Instruction Manual.

What to look **FOR** – be able to identify faults/defects - guides for this can be found in the current instruction manual.

What to **DO** – to know how to report faults/defects, what records to keep and who to report faults/defects to.



In your pre-use check, you should:

Make sure you have checked all tower components for damage, compatibility and working condition before the you start to assemble the tower.

You must not use faulty or damaged components and you must never use force to fit or remove components.

ISOLATE, TAG AND REPORT any damaged equipment to someone in your organisation who has the authority to order a repair or replacement. This is essential to ensure the damaged equipment is not subsequently used by someone else who is unaware of its condition.



Castors can come in a variety of sizes and colours and can have single or double pedal brake mechanisms.

On inspection, the castor must be free to rotate from side to side, as well as backwards and forwards.

To check the castor is locked before using a tower the wheel should have moved from 'trail' into a 'no-trail' position by fully locking the brake pedal.

The locks must be engaged before you climb your tower, the only time you can unlock them is to move the tower.

The pommel or spigot on top usually has a ball spring retention device that helps secure the castor into an adjustable leg.

Sizes available are 125mm (5 inch), 150mm (6 inch) and 200mm (8 inch) – all sizes will have the Safe Working Load of the castor marked on the wheel housing - pay attention to this.

The castors carry the sum of all the loadings on the tower, including the self-weight of the tower. Avoid using castors on soft ground.

If necessary, use sole boards to distribute the load.



If you are considering using a tower on an incline, soft ground or on stairs then you should not use castors but should instead use base plates. These will fit into the bottom of the adjustable leg in the same way. Use your judgement on inclines, is it too steep to be safe? If in doubt, opt for base plates. After all, it's you who will be on the tower!

The top part of a base plate is the same as a castor, it has the same type of retaining ball spring to help secure it into an adjustable leg. The plate itself helps to distribute and spread the load of the tower more evenly and over a wider area than a castor. It also cannot 'run-away' as a castor could if on stairs or an incline and helps to prevent 'sinking' in soft ground.

You can use a base plates on a single bay tower provided that the manufacturer has provided information on their use within the tower's instruction manual.

Even though the tower is using all the other components from an EN 1004-1 tower, the use of base plates means that it is no longer mobile, so outside the scope of the EN 1004-1 standard. This means that the tower structure will need to comply with the standard BS1139-6 "Prefabricated tower scaffolds outside the scope of BS EN 1004-1 but utilising components from such systems". However, the core competencies for using EN 1004-1 towers with castors will help if you need to substitute these for base plates.



An adjustable leg is what you attach a castor or base plate to, the other end of the leg will have a retaining spring device that will help secure it into a frame at the bottom of your tower- check the current instruction manual to find out which frames – they don't always go in all of the frames.

It's a good tip to leave around 25mm adjustment between the nut and pommel or spigot housing of the castor/base plate so you can rotate the nut up or down as required.

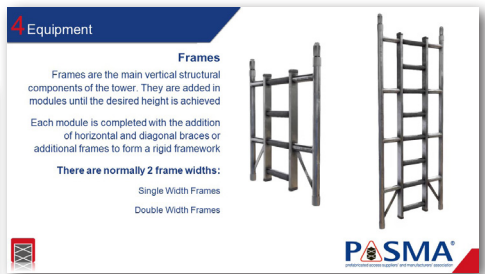
The purpose of an adjustable leg is to level the tower, it is not intended to allow you to gain extra height. If you end up too low, you don't have enough equipment and need to consider how much extra you will require to get to where you want to be safely.

To level the tower, pick a starting point (the

highest point on uneven ground) and use that as a reference point, this is the leg you don't have to adjust, adjust the rest to suit (using a spirit level as a guide).

Some manufacturers have adjustable legs with quick release mechanisms. Never use the adjustment to gain additional height; this has the same effect as building your tower on stilts.

If you need additional height, use additional frames.



There are commonly two widths of frames available to use or hire, Single (sometimes called Narrow) Width and Double Width, although other sizes are available, they are not so widely used.

Frames are modular with standard frames generally at 2 metres in height, but with heights available from different manufacturers varying from 0.25m, 0.5m, 0.75m, 1.0m and so on depending on rung spacings.

Some frames will have a built-in ladder, others have rungs designed to climb. The rung spacings may vary between manufacturers, however, the rung spacing must be between 230mm and 300mm and anti-slip in order for you to climb it safely. If your tower is supplied with clip-in/on ladders they will have the same requirements for anti-slip and rung spacing and should securely fit to the frames provided.

Frames are the main vertical structural components of the tower and are added in modules until the desired height is achieved. They are completed as modules with the addition of horizontal and diagonal braces to form a rigid framework. We will look at braces in more detail below.

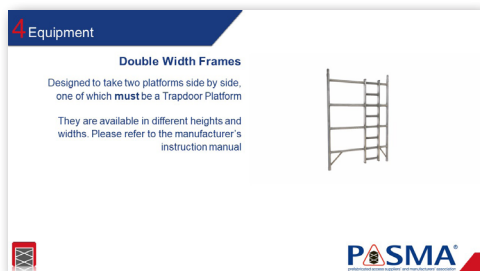
You must not climb plain frames where the rungs are outside of these measurements and are not anti-slip.



Single Width frames, or sometimes called Narrow Width frames range from around 700mm to 850mm in width and can vary in height or the number of rungs depending on the manufacturer, these frames can accommodate one platform- which must always be a Trapdoor Platform.

The ladders **MUST** run continuously, unless and until an intermediate platform is installed, when they may be alternated to the opposite side of the tower.

Refer to the current instruction manual to find out how many of each size and type of frames you require to achieve the height you want to get to.



Double Width frames range from around 1275mm to 1450mm in width and can vary in height or the number of rungs depending on the manufacturer, these frames can accommodate two platforms next to each other on the same rung - one of which must always be a trapdoor or hinged platform.

The ladders **MUST** run continuously, unless and until an intermediate platform is installed, when they may be alternated to the opposite side of the tower. They are also offset to one side.

Refer to the current instruction manual to find out how many of each size and type of frames you require to achieve the height you want to get to.



When connecting frames together they will have a female and male end, these are called spigots. The spigot can be of two types, vertical (straight) spigot, or conical (angled) spigot.

When a frame sits on top of another it must be locked in place, this will generally either be by a pin clip or circlip or by a node on the spigot, but there may be other methods depending on the type of tower you are using.

These pins/nodes must be in place to ensure your tower is safe. In the case of towers which utilise pins, the pins usually also have to be pulled out in order to get the frames on, leaving them in and 'bouncing' the frame may damage the very thing that is keeping you safe!

With conical head spigots, you should pay attention to the way around you position the frame and therefore the spigot - if you position it the wrong way around, you may be exposing yourself to danger by leaning out of the tower to fit the next frame. Check the current instruction manual for a visual of this.

4 Equipment

Access & Egress

Integral Ladder

A ladder which is integrated as part of the frame, commonly known as a ladder frame. Ladder systems must run continuously to the platform.

Vertical Clip-In Ladder

The ladder is a separate component which clips onto the frame.

Frame Access

If the rung spacing is 230-300mm and the rungs are anti-slip, then you can use the frame rungs for climbing.

Stair Ladder

An inclined ladder with shallower angle and flat treads rather than rungs.

Inclined Ladder

Ladders braced at an angle.



Towers must never be climbed from the outside!



4 Equipment

Tower Types

- One person tower ← Single width only
- Vertical ladder ← Double width & single width
- Inclined ladder ← Double width only
- Frame access ← Double width only
- Stairway / Stairladder ← Double width only



The first rule of getting up to a platform for any type of tower, of any height, is that you must never climb up the outside, not only does this put you at a real risk of falling to the ground but you could also cause the tower to topple over with you on it!

Always check the current instruction manual to be sure where to position or line up your ladders, they don't always go in the same place as some manufacturers will have variations on this, but ALL Access and Egress to any platform is ALWAYS from the INSIDE for whatever tower type you have.

For whatever type of ladder provided for your tower it must have rung spacings between 230 – 300mm in order for it to meet safety requirements.

Integral Ladder, which is where a ladder is incorporated into and is a part of the frame, Vertical Clip-in Ladder are separate ladders that clip on to the inside of plain frames, in both cases, when assembling these are offset to one side in Double Width frames so that the ladder will line up with a hinged or trapdoor platform. The ladders MUST run continuously, unless and until an intermediate platform is installed, when they may be alternated to the opposite side of the tower.

A development from traditional towers is the Single User Tower. These use brackets or other such devices to allow the user to hang components on the sides or ends of the tower to reduce the amount of time building the tower. Because of their compact size, they are designed to be built and used by one person only.

A common type of tower in use is the Vertical Ladder Tower with built in ladders. Although less common, Inclined Ladders or Vertical Clip on Ladders can still be used as long as they conform to the approved assembly methods which we will cover in the next section.

Frame Access towers are also a popular type, arguably due to their greater flexibility in platform heights and that all the rungs on the frames are anti-slip and can be used as ladders.

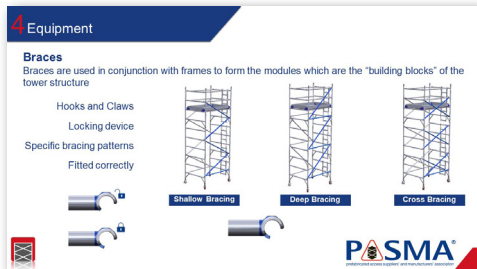
All three of these tower types are available in Single (or Narrow) Width and Double Width.

Stairway or Stairladder Towers are only available in Double Width, why? – A. without a platform next to the ladder, where do you go?

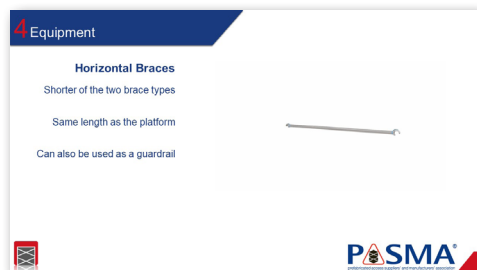
Mobile access towers are modular in construction and are assembled by connecting prefabricated components in a particular sequence, as explained and illustrated in the current instruction manual. The purpose and function of the components is explained in detail in the following pages.

Check the current instruction manual to find out what tower type you have.

NOTES



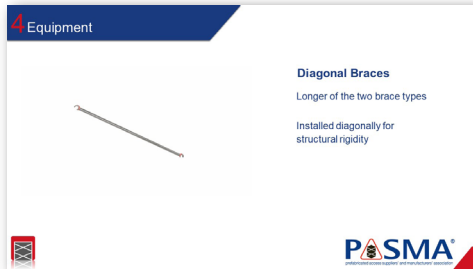
Braces are used in conjunction with frames to form the modules which are the “building blocks” of the tower structure. The number supplied with the tower you have are the correct amount required to keep you safe. Leaving any out ‘to save time’ will only help to speed you to your grave! All braces have hooks or claws at either end with a locking device to prevent them from being accidentally dislodged.



Horizontal Braces, which are the shorter braces and can be identified as such since they are the same length as the platform. As well as forming the horizontal connection between frames, they are also widely used in towers to form the side guardrail protection which is necessary to prevent falls.

Check the current instruction manual to see how these are fitted both at the base of the tower and to form main guardrails and intermediate guardrails – some manufacturers place them face down on the rungs, some, one face down and one face out, some, both face out on the vertical of a frame.

When installing braces to the vertical member of a frame, always ensure that the open face of the hook or claw is facing outwards, this will protect you in the unlikely event of the locking mechanism failing during use.



Diagonal braces are the longer braces and are installed diagonally between frames to make the tower structure rigid. Always use all the diagonals supplied with your tower, without all of these you run the real risk that the tower may collapse.

It is important that diagonal braces are kept inline and not ‘knocked’ to ‘close up gaps’. If a brace is fitted inside another in a pattern, at the other end, a gap will be made on the inside for the next brace, do not ‘knock’ the first one across to close this up, this is what jams braces on and results in them getting hit with hammers getting them off, damaging the very thing that’s keeping you safe!

If a brace has ‘twisted’ out of line don’t try to force it off, move it back in line and it should come off as intended. Also, if out of line they can cause the whole tower to twist and become very difficult to level and align vertically.

Remember to ALWAYS follow the bracing pattern described in the current instruction manual – all towers do not have the same bracing pattern, and you must not assume that you can transfer the bracing pattern from one tower type to another.

Patterns can differ in the form of shallow, deep or cross pattern diagonals, or horizontal cross braced in the base, diagonals should span between the joints in the frames as much as possible.

4 Equipment

Advance Guardrails

- Used in conjunction with frames
- Provides collective prevention
- Requires fewer components
- Various designs available



PASMA®

Advance Guard Rails are used in conjunction with tower frames to form modules which are the “building blocks” of the tower structure.

Advance Guard Rails (AGR's) do the same job as horizontal and diagonal braces in one. Each one replaces up to 4 braces. Designs may vary but all must conform to Standards and Regulations.

If you remove or leave out one of these AGR's not only are you removing your guardrails, you are also removing the structural support to the platform you are standing on, not only putting yourself and others at risk of a fall, but also of the tower collapsing with you on it.

Checking these are mix of a frame and brace checklist, check the hooks are okay, locking mechanisms work, tubes are not dented or bent, or covered in excess plaster, cement or other such contaminants.

4 Equipment

Stabilisers

- Increase the base area of the tower
- Fit at the earliest opportunity
- Provide stability
- Allow you to increase the height of the tower
- Allow tower to be free standing
- Can be fixed or telescopic



PASMA®

A stabiliser's job is to do just that, stabilise your tower, without these you are putting yourself and any others around the area in danger of the tower overturning.

Stabilisers are the more common method of increasing the base size of the tower to allow you to build the tower higher yet remain freestanding.

Your Manufacturer's Instruction Manual will tell you in its kit listing when you are required to use stabilizers, at some low levels you may not need them, but you may want to use them if for example you are near an exposed edge or on a mezzanine with a long way down to the next level.

Stabilisers are available in a variety of sizes, small fixed, telescopic and large 'jumbo'. The taller your tower is going to be the larger your stabiliser will need to be. It is essential that they are fully deployed to achieve the maximum increase in base dimension. If using telescopic ones, extend them to their largest size wherever possible, all stabilizers should be fitted as low down as possible keeping the lower arms as close to horizontal as possible.

Stabilisers should generally be fitted at the earliest opportunity, usually after the first module has been completed, but you should consult the Manufacturer's Instruction Manual for detailed guidance in respect of the tower and stabilisers you are using.

4 Equipment

Outriggers

- Increase the base area of the tower
- Fit at the earliest opportunity
- Provide stability
- Allow you to increase the height of the tower
- Allow tower to be free standing
- Outriggers have adjustable legs and castors for movement



PASMA®

Outriggers are similar to stabilisers, except that they can accommodate an adjustable leg and castor and are therefore more suitable when a tower is to be moved more frequently. However, because they have castors installed, it is essential that plan braces are utilised to prevent the outriggers from folding in when the tower is being moved. Consult the Manufacturer's Instruction Manual for detailed guidance on how this is achieved.

Because you now have eight wheels on the ground you may need to double check any route you are going to move the tower as the outriggers are braced and cannot move in or out of the way of obstructions, potholes, drain or manhole covers and such like.

Outriggers should generally be fitted at the earliest opportunity, usually after the first module has been completed, but you should consult the Manufacturer's Instruction Manual for detailed guidance in respect of the tower and outriggers you are using.

4 Equipment

Platforms

Platform provides a level working area. It has a slip resistant deck with hooks and locking devices

They can be of varying lengths and have a safe working load

Platforms are of three types:

- Fixed Platforms
- Full Hinged Platforms
- Trapdoor Platforms





EN 1004-1 - Nominal vertical distance between platforms = 2m

Platforms are the only component designed to let you stand on them to work! They can be in a variety of lengths ranging from around 1m up to around 3.2m long. The product standard, EN 1004-1, specifies a minimum width of a platform, or combination of platforms, at 600mm.

Platforms are available in three different types – Fixed, Full Hinged and Trapdoor.

Platforms consist of a frame with two hooks at each end, and an anti-slip ply deck. It is important that the anti-slip deck is not painted or otherwise contaminated so that it loses its anti-slip properties, and any defects will be hidden from view.

They must have a means of securing them to the tower to stop them being accidentally becoming dislodged in high winds, and in use should be kept clear of obstacles and debris.

They must be positioned on the tower so that a nominal vertical distance of no more than 2m is between each level. However, all relevant information will be found in the current instruction manual.

4 Equipment

Fixed Platforms

No trapdoor

Can be used in double width towers only





Without an opening the only way onto this platform is via another which has a trapdoor or by climbing over the guardrails thereby putting yourself at risk, that is why they can only be used on a Double Width tower, alongside a trapdoor or full hinged platform.

4 Equipment

Full Hinged Platforms

Normally used on stairway / stairladder towers

Opens to the full length of the platform

Allows access to the working area

Can be used in double width towers only





You have to have somewhere to go when using this type of platform without any fixed deck you would be stuck if you went through it without a fixed deck alongside it, that's why they can only be used in Double Width towers.

The hinges on full hinged platforms must be positioned to the outside edge of the tower – to avoid climbing through and being unable to stand on the adjacent platform.

NOTES

4 Equipment

Trapdoor Platforms

It can be used on both single and double width towers
It allows access to the working area



Some manufacturers will advise a maximum allowable load which applies to all platforms and a maximum load for the completed tower, whilst others require that you calculate the maximum allowable load, by deducting the weight of the components from the maximum load for the completed tower.

Formula to work out SWL for towers (for those which require you to calculate the maximum allowable load).

These are the only platforms you can use on both Single Width and Double Width towers. The trapdoor allows entry up though it to reach a fixed decking, behind you on a Single Width tower, and both behind and to the side on a Double Width tower. The hinges should be towards the outside of the tower on Double Width towers to allow easier access to the fixed decks and also helps with toeboard arrangements.

Some trapdoors are hinged on the left, some on the right, and some even open backwards and to the rear. Double check which way yours hinges before you start your build, as this may affect where you should position your ladder in the base of a Double Width tower.

4 Equipment

Toe Boards

Toe boards prevent tools or equipment falling from the working area

Toe boards must be fitted to all working platforms

Various types: folding, single units with slotted joints and single units with plastic corner units

Various designs

Various materials

Minimum Height = 150mm



Toe-boards, sometimes referred to as kickboards are designed to ensure that tools and equipment are not accidentally dislodged from the platform.

They should be used on any platform where a risk assessment indicates that there is a risk of any tools, equipment or material falling from the platform and therefore likely to cause injury to anyone below.

The risk of falling tools or materials may exist even at low platform heights. If this is the case, then you must fit toeboards to ensure that tools and equipment are not accidentally dislodged from the platform. A set will be generally supplied with every tower type or height. You may require additional sets if you are planning to store materials or equipment on a non-working platform.

There are a number of different designs including separate pieces that lock together or use locking holders and one-piece folding units. Whatever type supplied, they must all have a minimum height of 150mm.

4 Equipment

Safe Working Load

Every tower has its limitations, the SWL sets the maximum load a tower can bear whilst remaining safe

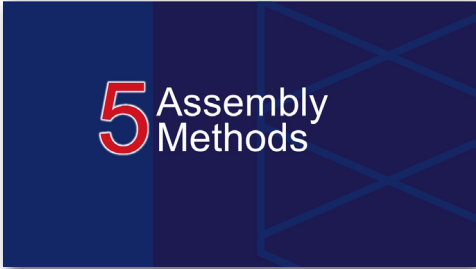
Do not exceed maximum load!

On individual platforms
Or combination of platforms on the same level
Or the complete tower

Lifting operations must stay within the base area. The SWL can be found in the Manufacturer's Instruction Manual



The Safe Working Load (SWL) of individual platforms will generally be shown on a label affixed to the platform, but if it is not, it will be shown in the current instruction manual. The overall SWL of a tower has to take into account the weight of the components used to build it. You also need to know how heavy your equipment, tools and materials are in order to know you are not overloading. If you are placing materials on a platform for storage, do not block or load onto the trapdoor.



Now we know what a tower looks like and what goes into it we can now start to look at how to assemble them safely.



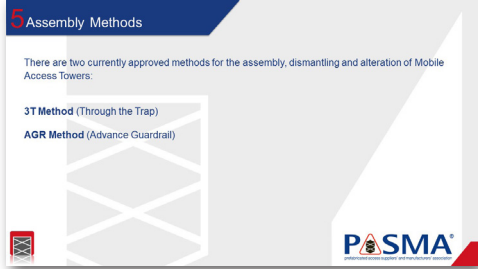
Before you leave the ground, you should get into the habit of carrying out a few short checks that will help you keep safe.

Firstly, double check the Risk Assessment, you should pay attention to any hazards identified and ensure that they have control measures in place, double check nothing has changed since the risk assessment was carried out.

Check the current instruction manual to ensure you have the correct quantity and type of components for your tower and to see if you need to do anything in particular before you start to use it.

Inspect the components for damage or missing parts. It may help, if you have the room, to lay them out to make this easier.

If you do find something wrong with any component remove it from use, identify it as faulty and report it to your manager or the hire company you got it from. Do not use it, you are going to be working at height, it could be dangerous, and you need everything working properly to be safe.



Once you've checked your tower components and reviewed your risk assessment, there are two currently approved methods for assembling, dismantling and altering mobile access towers, which incorporate tall protection throughout these processes.

Take particular care to follow the current instructions 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 manufacturer's recommended methods for lifting components, and make sure you have enough operatives (particularly in higher towers) to handle the components as they are raised..

These methods are 3T (Through The Trap) and AGR (Advance Guard Rail). PASMA manufacturers may recommend either or both methods for their brand of tower.

NOTES

5 Assembly Methods

3T (Through The Trap)



The 3T or Through The Trap method of assembly allows the operative to position himself through the trapdoor of the platform and position horizontal braces ahead of himself to form a guardrail before standing on the platform, thus providing collective fall prevention on any platform before anyone stands on the platform. The process is repeated until the desired height is achieved.

Always remember that you must never stand on an unprotected platform.

As a result of research commissioned by PASMA, it is recommended that users adopt a seated position within the open trap door while assembling, altering or dismantling using the 3T method.

Dismantling and altering mobile access towers using 3T requires the same methods to be applied. Whilst it is necessary to unclip the hooks furthest away from the trapdoor before removal, guardrail braces must never be removed whilst standing on the platform but can only be removed from the safe position through the trap.

This method uses components with which you will probably be familiar, it relies on you putting the guardrails on and taking them off from a seated position on the fixed part of a trapdoor platform with your legs Through The Trap, commonly called the 3T method.

During assembly you install the frames, diagonal braces and then the platforms. Climbing the ladder, you go up into the trapdoor and sit down on the fixed deck with your legs resting on the ladder rungs below (you do not need to do this if it's a stretch or uncomfortable).

You then fit 4 horizontal braces in position as indicated on the current instruction manual to create your guardrail, once these are in place you may stand up, repeating the process until top level is reached, fitting toeboards to working levels.

A 3T tower gives a lot of flexibility in platform levels if you need to change them frequently as you can reposition your guardrails to suit.

5 Assembly Methods

AGR (Advance Guard Rail)



The AGR (or Advance Guard Rail) method uses fewer components, is generally quicker (once you become familiar with it) and is arguably more intuitive.

Although some designs may differ slightly with manufacturers they all work in a similar manner, allowing a person to build the next level completely (apart from toeboards) from the level below. Some AGR towers may have horizontal and diagonals braces in the base, some don't.

5 Assembly Methods

Dismantling a tower

When dismantling a tower you must ensure the following:

Never stand on an unprotected platform

Follow the current version of the Manufacturer's Instruction Manual

Damaged components are isolated, tagged and reported

Components are stored correctly

No heavy loads are placed on components



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 for

the manufacturer's recommended methods for lowering components and make sure you have enough operatives (particularly in higher towers) to handle the components as they are lowered. Remember site conditions may have changed since you assembled the tower.

Problems you may encounter during dismantling both systems:

Braces or AGR's jammed on, this can happen if the tower has been moved around a lot over rough ground. Check alignment and if out, realign before trying again, or try the other end as it may be only one end jammed. Do not use a hammer.

Frames can jam on to each other after loading of levels, try levering one end a bit at a time, or getting one end off completely. Do not use a hammer.

Platforms generally only jam if they are out of square, knock one end across to realign. Do not use a hammer.

Legs and Castors can become jammed in frames, either because the frame has a knock in it, or more likely the leg/inside of the frame has dirt, plaster, dust or such like in it – the only way resolve this is to knock them out or try twisting. Do not use a hammer.

If knocking them out, never strike directly on to a castor or leg nut housing, soften any blow with wood.

If any component is damaged during the dismantling process, identify it, remove it from use and report it.

Once your tower is dismantled, store the components so they won't get damaged, and don't put them where a heavy load may be put on them or vehicles are driving around that may hit or run over them.

6 Work Environment

You must consider all hazards present before work commences. Survey the site, look at the ground conditions, look out for any overhead hazards, traffic, people and such like.

6 Work Environment

Work Activities

Work Activities
Consider the hazards you can see in this section, can you think of any others?



These are just some of the things that you should not be doing on a mobile access tower and could lead to life changing consequences.

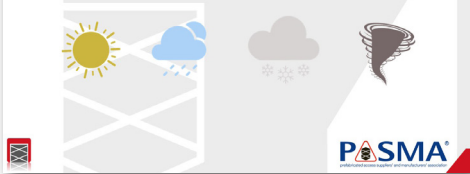
NOTES

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6 Work Environment

Weather Factors

What environmental factors need to be considered when using mobile towers?



Extremes of weather can seriously affect the safe use of mobile access towers.

- Very hot weather
- Heavy rain
- Snow and Frost
- High winds and sand storms

In extreme weather conditions, you should consider postponing work until conditions improve.

6 Work Environment

Adverse Weather

The use of towers should be avoided in adverse conditions such as snow, frost and heavy rain as they are likely to affect anti-slip surfaces

In high winds, be aware of factors which increase the effects of wind and can act as a 'sail'

PASMA recommends the use of a handheld anemometer to determine wind speed

Monitor the weather forecast

Average mph	Average km/h	Average m/s	Action
17	27	7.6	Stop Work



Avoid slips and falls, by avoiding the use of towers in adverse weather conditions such as snow, frost and heavy rain which are likely to affect the anti-slip surfaces.

One of the major factors affecting the stability of towers is the effect of wind. If the wind reaches Beaufort Force 4, (17mph) you should cease work and dismantle the tower.

Determining wind speeds can sometimes present difficulties. PASMA recommends the use of a hand-held wind speed device, (anemometer).

Wind imposes a horizontal load on to 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.

Be aware of other factors which increase the effects of wind, such as the "sail" effect of attaching sheets, tarpaulins and such like, or working with sheet materials like cladding panels. Also be aware of gusting and the funnel effect at the corners of buildings and in buildings which are open.

You should be aware of all extremes of weather, including extreme heat.

6 Work Environment

Ground Conditions



This is an example of inappropriate ground conditions.

6 Work Environment

Ground Conditions

It is essential that an assessment of ground conditions is made before assembling a tower

During assessment consider:

Paved areas, soil, uncompacted fill, cracks, basements, sewers, tunnels, live or shallow services, poorly backfilled trenches, inspection chambers (manholes), tiled surfaces



Ground conditions can 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 inspection chambers (manholes), it is very possible that it could overturn. Like any structure, it is only as good as its foundations. Consider the use of sole boards or spreader plates to distribute the load.

Ensure brakes are always engaged, unless you are moving the tower.

Consider using base plates if the towers is to remain static.



Make sure the tower is level. You can do this by checking with a spirit level.

Starting at the point on the frame that you judge to be the highest, level the frame first by positioning the level on the cross-member of the frame and adjusting the adjustable leg(s) until the bubble is centred, then do the same thing with the lowest horizontal brace. Next, level the other frame, using the same method as before. Finally, check the lowest horizontal brace on the opposite side.

You need to take care to maintain the vertical alignment of the tower, i.e. make sure it stays level. Don't use a tower that is not level. Come down and level the tower before you use it.



The freestanding height of any tower is limited by the smaller of the base dimensions. In simple terms, if you attempt to build the tower too high in relation to its base size, there is a very good chance it will overturn.

The use of stabilisers or outriggers increases the base area of the tower which in turn improves stability and allows you to increase the freestanding height.

First, you need to make sure you are using the right stabilisers / outriggers for the height you intend to build your tower (you'll find that information in the current instruction manual). Next, you need to make sure the stabilisers are used to their greatest effect, you can do this by keeping the lower arm of the stabiliser as close to the horizontal as possible. Using stabilisers with the lower arm at a steeper angle means they are not extended to their fullest and not as effective as they could be.

Ideally, stabilisers should be positioned so that, when viewed from above, they form the biggest square possible so as to make the tower as stable as possible in all directions.



If you have to use a tower close to a building or other structure, you can position the stabilisers in alternative configurations. It is important that you position the inside stabilisers parallel to the wall and that you do not just omit them. Because of the protection afforded by the wall or other structure, you are only permitted to use the parallel stabiliser configuration if the wall extends at least two thirds the height of the tower.

NOTES

6 Work Environment

Load Instability

Side Loads

Never push or pull from the top of the tower or platform level
Other side loads to consider
shot blasting
high pressure jets
use of percussion drills
There may be others specific to your work



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An 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 dangerous and could cause the tower to overturn. Side loads at the platform can also be caused by such activities as shot-blasting, high pressured jets, and the use of percussion drills. The list is not exhaustive; there may be other things in your work that could apply side loads. The maximum allowable side load is 20kg.

6 Work Environment

Load Instability

Vertical Loads

Do not hoist heavy materials outside the effective base area of the tower

Ensure safe working load is not exceeded



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Hoisting any vertical load outside the area of the tower can be hazardous. For example, heavy materials hoisted outside the effective base area (the footprint) 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 (i.e. within the footprint, 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.

Some manufacturers do not recommend 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 and ensure the Safe Working Load is not exceeded.

6 Work Environment

Prior to Moving a Tower

Ensure all personnel, tools and material are removed from the tower

Check the intended route and refer to manufacturer's instructions for good practice when moving

Reduce the height of the tower:

To a maximum platform height when moving of 4m if all 4 stabilisers are in the correct position

Or 2m if only fitted with 3 or less stabilisers

Or as per the manufacturers instruction manual

Leave stabilisers in position and raise no more than 25mm from the ground



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Walk the route, checking the intended route of the move is free of obstructions both at ground level and overhead, particularly overhead electrical cables.

Remove people and material from the tower, reduce the platform height of the tower to 4m leave stabilisers in position and raise no more than 25mm from the ground.

6 Work Environment

Moving a Tower

When moving a tower you should do the following:

Only unlock castors when ready to move

Re-lock castors immediately in new position

Check the tower in its new position, ensuring it is level and components are correctly positioned



Move tower manually and push from the base. Never use mechanical means!



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Ensure there are enough people on hand to control the movement of the structure. Only unlock the castors when ready to move. Use manual effort at or near the base of the tower and push into new position (don't pull!). Check the structure in its new position ensuring it is level and that all components are correctly positioned (i.e. brakes locked and stabilisers lowered and taking load).

Never use any other means other than manual effort, i.e. never use mechanical means.

6 Work Environment

Overhead Power Lines

KEEP A SAFE DISTANCE!

Consult your local power company for advice on safe distances

Aluminium towers are not insulated

Fibreglass towers have insulation properties (you should contact your supplier for further information)

Be aware of arcing (the flash factor), particularly in wet conditions



PASMA
The National Association of Scaffold Erectors and Demolition Contractors

A simple way to avoid electrocution is by keeping clear of overhead electrical cables. Aluminium towers are not insulated, although fibreglass towers do provide considerable insulation properties, (but when they are wet, the surface water can act as a conductor for electricity). For details of the insulation properties, contact your supplier.

If you need to work in the vicinity of overhead electrical cables, consult the appropriate HSE Guidance Note (GS6) and your local power company for advice on safe distances, and be aware of the flash factor, (arcing), particularly in wet conditions.

6 Work Environment

Location

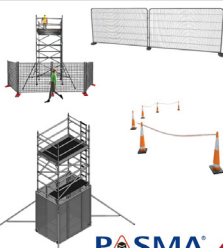
You **must** take reasonable steps to prevent unauthorised access to the tower

Establish an exclusion zone around the danger area using physical barriers, ensuring you identify the correct size for your hazard exclusion area

Consider dismantling the Mobile Access Tower at the end of each work session if unauthorised access cannot be prevented

What makes a barrier effective?

Visibility
Prevention of unauthorised access
Segregation



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The National Association of Scaffold Erectors and Demolition Contractors

When towers are left assembled and unattended in public places, or where vandals or indeed children can gain access to the towers, it is advisable to provide barriers around the tower base to a suitable height to prevent access, or some other suitable means to prevent unauthorised access.

Unauthorised persons gaining access to a mobile tower may not be aware of the hazards and risks associated with its safe use.

While a mobile tower is not available for use, including during its assembly, dismantling or alteration, it shall be marked with general warning signs in accordance with the Health and Safety (Safety Signs and Signals) Regulations 1996(a) and be suitably delineated by physical means preventing access to the danger zone.

In certain locations, a "pavement permit" may be required from the local authority, which imposes special conditions such as the use of pavement frames, lighting and such like. PASMA has published a guidance document and a licence template for such use, www.pasma.co.uk/scaffold-towers/pavement-licence-guidance/

6 Work Environment

Falling Objects

You must fit toe boards and guardrails to all platforms where a risk assessment has shown that there is a danger of people or materials falling; injuring persons or damaging property below



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The National Association of Scaffold Erectors and Demolition Contractors

These could be tools or equipment which are accidentally dropped from the tower structure.

The effect of this is potentially catastrophic for anybody working or passing below. The prevention method for this hazard would be, always use toe-boards on the working platform to prevent tools from falling. Make sure all platforms are clear of equipment and tools prior to moving the tower. Use the current instruction manual to ensure the correct assembly method is used to eliminate the risk of falling.

Identify DANGER AREAS and introduce physical barriers or means which prevent an unauthorised person going beyond them thereby being at risk from falling objects.

You must NEVER throw objects from height! (sometimes referred to as bombing).

6 Work Environment

Personal Fall Protection Equipment

Both PASMA and the HSE specifically recommend that you do not attach safety harness lanyards to mobile access towers



7 Personal Hazards

Hazards to Health

Lung Disease

High-risk work

Some work can cause life-threatening lung diseases. Find out how to protect your workers when they do these tasks:

Construction – cutting, drilling, sanding
Welding
Stonework
Cement and concrete manufacture
Woodworking
Baking and milling
Quarry work



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.

Breathing in dust, gases, vapours and fumes at work can cause life-changing lung disease or make existing conditions worse. Do the right thing and protect your workers from work-related lung disease.

7 Personal Hazards

7 Personal Hazards

Hazards to Health

Work Related Stress

Find out how to manage work-related stress so you can protect your employees

Over 11 million days are lost at work a year because of stress at work

Employers have a legal duty to protect employees from stress at work by carrying out a Risk Assessment



PASMA actively supports health and safety initiatives and works closely with health and safety authorities to bring campaigns to the attention of delegates who attend PASMA training courses.

Excessive pressure and demands at work can cause stress. This can lead to chronic physical and mental health conditions. Do the right thing and protect your workers from work-related stress.

7 Personal Hazards

Hazards to Health

PASMA support the HSE in ongoing campaigns, and we want to share with you some important information

SHINE
A LIGHT ON
WORKERS' HEALTH



GO HOME HEALTHY



7 Personal Hazards

Hazards to Health

Musculoskeletal Disorders (MSDs)

The term MSDs cover any injury damage of the joints, or any other tissues, in the upper, lower limbs or the back

In order to prevent these injuries, a careful manual handling assessment is required for all tasks in the workplace

8.9 million working days lost per year



Go Home Healthy centres on a website that links to HSE guidance, case studies, videos and thought leadership, on the three focal themes. There are also "partner pages" where web users can download collateral from other organisations.

As defined by the HSE, musculoskeletal disorders – or MSDs – refer to any injury, damage or disorder of the joints or other tissues in the upper/lower limbs or the back. Work-related MSDs are those caused by the work a person undertakes. The HSE report that 8.9 million working days are lost each year as a result of work-related MSDs, with a total of 507,000 cases in the last year alone.

8 Assessment

Assessments, both written and practical, are an essential element of the PASMA Training Scheme.

It is by successful completion of the assessments that you can demonstrate you have understood all of the important lessons contained in the PASMA course, and our Training Centres and Instructors can demonstrate that they have given you all the information you need to work safely at height with mobile access towers.

If there are any questions you do not understand, or any elements of the assessment you would like to be explained further, ask your Instructor. Instructors cannot assist you in answering questions, but can give a further explanation of questions if you are in doubt.

8 Assessment

Is there anything wrong here?



PASMA

Review the picture above and see if you can find any more faults. Let us repeat that it is vitally important that you practice what you have learned on this Towers for Users course, and do not be tempted to fall into bad habits.

When it comes to your safety, you cannot have the attitude of “It’ll do” or “It will never happen to me”. It can happen to you and it does, every day.

8 Assessment

Evaluation

Are you able to...

Select	Alter
Inspect	Move
Assemble	Dismantle
Use	Maintain

...Mobile Access Towers safely?

Do you have an understanding of the following?:

- Manufacturer's instructions (for the access tower in use)
- Standards affecting the manufacture and the use of mobile access towers
- Good practice for the safe use of mobile access towers

PASMA

You are now requested to review the aims and objectives to make sure that you now have all the knowledge you need to work safely at height on mobile access towers.

PASMA is anxious to ensure a consistently high quality of delivery in its training courses.

Your honest feedback in respect of the standard of equipment, facilities, hand-outs and course delivery are invaluable in ensuring this, and in assisting us in future development.

PASMA Training Centres and Instructors are required to operate in accordance with written procedures and are subject to on-going independent audit by PASMA Regional Auditors, so you can be assured that any comments or feedback you offer will be taken seriously by your Instructor.

Please remember our final message and take it back to your workplace

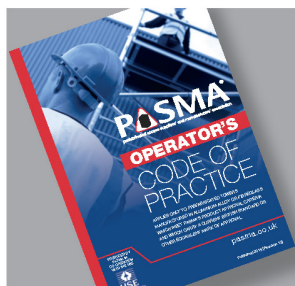
NEVER STAND ON AN UNPROTECTED PLATFORM

8 Assessment

Theory	Practical
Multiple Choice 30 Questions Circle the correct answer If you change your answer place an 'X' on the incorrect answer, circle the correct answer and initial All topics have been covered today If unsure of the meaning of any question, ask instructor Pass Mark - 80%	Split into teams by instructor Use Current Instruction Manual Assemble, move and dismantle as directed by instructor You must use recommended assembly and dismantle method(s) You will be assessed throughout these processes YOU MUST NOT AT ANY TIME: Stand, or attempt to stand on an unprotected platform or place yourself in a position of danger

PASMA

A range of tower safety items are available from PASMA



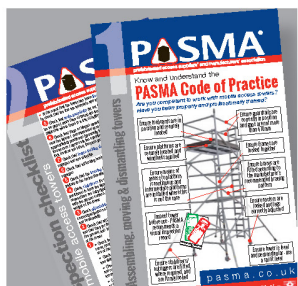
Operator's Code of Practice



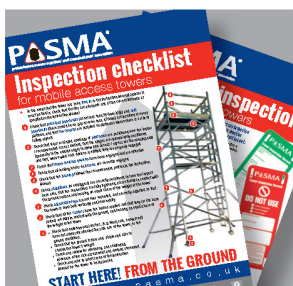
Tower Inspection Records



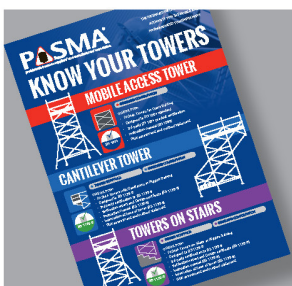
Stamp of Approval Stickers



PocketCards



Posters



Tower Guides



Toolbox Talks



FAQs and Guidance



Tower News & Views

Please visit asma.co.uk

Courses available:



Work at Height Novice

This half day course is designed to cover the essential points for those working at height. It provides vital information about the use of mobile access towers, plus an insight into the use of all forms of access equipment as represented by the Access Industry Forum (AIF).



Towers for Users

PASMA's flagship course, attracting in excess of 70,000 delegates a year, is aimed at personnel who will be responsible for assembling, dismantling, moving and inspecting mobile access towers when using 3T or Advance Guard Rail (AGR) systems.



Cantilever Towers for Users

This course equips experienced tower users with the skillset for more complex tower builds, taking into account the principles of counterbalance calculations for the use of ballast in cantilever applications and much more.



Towers with Bridges for Users

This course teaches experienced tower users how to assemble, dismantle, move and inspect tower bridging units - additional structures that are built over a void or obstruction using platforms as a bridge.



Large Deck Towers for Users

This course teaches experienced tower users how to assemble, dismantle, move and inspect prefabricated tower scaffolds connected laterally at their ends and sides. May also be known as a birdcage tower or boxing ring tower.



Low Level Towers for Users

This course is intended for users of low level access equipment (<2.5m) made from prefabricated tower components, such as folding step units and folding tower units, giving an overview of regulations, legislation and product standards, and covering in-depth current best practice, inspection, and hazards to be avoided.



Towers for Managers

A "must do" course over one day for managers and supervisors responsible for overseeing the work of operatives on site. It is designed to ensure that when working at height using mobile access towers work is properly planned and organised and that those involved are competent and properly trained.



Towers on Stairways for Users

Towers on Stairways teaches delegates how to build stepped towers. The course covers current legislation, regulations and guidance for towers in general, and focuses on hazards specific to using them on stairways.



Linked Towers for Users

This course teaches experienced tower users how to assemble, dismantle, move and inspect linked tower units - additional structures that can be linked at multiple levels.



Access Tower Specialists

Access Tower Specialist (*formerly Professional Tower Rigger*): is the most advanced tower training course. A five-day intensive course covering the practical and theory required to create tower structures in compliance with BS 1139-6. It is intended for advanced users who build towers and tower structures (both standard and non-standard configurations) in the course of their occupation.