



prefabricated access suppliers' and manufacturers' association



training course notes

Towers for Users

Ver 7, Rev 1 0325



NO FALLS FOUNDATION

Working at height has always involved an element of risk, which is why it is important you follow the training and instruction you have received today to keep you and those for whom you are responsible safe.

Every year, literally millions of people work at height in a variety of industry sectors. 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 tens of thousands of non-fatal injuries each year - an average of 100 plus 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 not only 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 to learn more about the work of the No Falls Foundation, visit their website **www.nofallsfoundation.org**

NOTES TO DELEGATES

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 EN1004-1 and have third party product conformity certification from an Approval Body such as the Test and Research Centre, BSI (or equivalent approved body).

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 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 consist of multiple choice questions with all points being covered in the course. This is an open book course and you will be able to consult your notes while undergoing assessments. 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.

Course documentation

As well as these Training Course Notes, your delegate pack also includes a copy of the latest PASMA Code(s) 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 equipment illustrated in your training course.

PASMA training scheme

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).



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.

PASMA H&S health and fitness statement

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

Similarly, since the assembly and use of 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.

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.

Course content

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.

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.

SECTION 1 - AIMS AND OBJECTIVES

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

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.

SECTION 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.

Let's start with an overview of the legislation and regulations.

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.

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.

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
- 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

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.

Learn more at <https://www.hse.gov.uk/youngpeople>

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 duty-holders 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 below.

Duties of an Employer

As a manager/supervisor who manages, plans, supervises and oversees the use of work equipment, you must provide adequate health and safety information to your employees, and where appropriate written instructions as to the use of the work equipment. Employers should consult with employees about the work to be undertaken.

The information they provide should be easily understood and include details on:

- how the work equipment may be used
- any potential abnormal occurrences, and the action to be taken in such an event
- any lessons to be learnt from experiences using work equipment

Instructions must be provided in writing examples may include safety data sheets, warning labels, training manuals or drawings. Whatever the form used it should be appropriate for the employees, such as in the correct language, illustrated where appropriate, and it should account for the level of skill of the workers, and the level of supervision provided.

Information and written instructions should cover:

- health and safety aspects relating to the use of the work equipment
- limitations on usage
- any foreseeable difficulties
- how to deal with them

Everyone who uses manages/supervises the use of work equipment, should be given adequate health and safety training covering work methods and details of the risks and precautions to be taken.

It is particularly important that young people receive adequate training since, due to their relative immaturity and lack of familiarity with the working environment, they may be at greater risk. Training is essential on recruitment, but it should also be considered when:

- tasks change and so do the risks to which employees are exposed
- new technology or equipment is introduced
- work systems change

Duties of a Manager

As a manager or supervisor responsible for overseeing/ controlling the work of operatives who will be working at height, you will need to ensure the work is properly planned and organised, and that those involved in carrying out the work are competent, properly trained and the towers are correctly assembled, maintained and inspected. You must be able to demonstrate that you have had sufficient professional or technical health and safety training, knowledge, experience and authority to enable operatives to:

- carry out their assigned duties at the level of responsibility allocated to them
- identify and understand the nature of any potential hazards related to the work or equipment (i.e. working at height) under consideration
- detect any technical defects or omissions in the work (or equipment) recognise any implications for health and safety caused by those defects or omissions, and be able to specify a remedial action to mitigate those implications.

NB: authority here means authority allocated to the individual by their employer to carry out certain functions or duties.

Section 37 Offences by bodies corporate

(1) Where an offence under any of the relevant-statutory provisions committed by a body corporate is proved to have been committed with the consent or connivance of, or to have been attributable to any neglect on the part of, any director, manager, secretary or other similar officer of the body corporate or a person who was purporting to act in any such capacity, he as well as the body corporate shall be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

(2) Where the affairs of a body corporate are managed by its members, the preceding subsection shall apply in relation to the acts and defaults of a member in connection with his functions of management as if he were a director of the body corporate.

As stated above – duties including neglect of managers at work.

Duties of an employee

It is extremely important employees follow the current instruction manual when assembling, inspecting, using or dismantling a mobile tower.

Employees should never work at height whilst under the influence of alcohol or drugs even prescribed drugs if they affect an individual's judgement or have any other adverse effects such as drowsiness, giddiness or impaired perception or vision.

Employees should not misuse, abuse, remove or interfere with any type of equipment especially if it has been provided for their safety (e.g. guardrails, or other devices provided).

Employees should follow training and instruction unless they think it would be unsafe to do so in the circumstances. They should raise their concerns with their supervisor/line manager. They should also report any safety hazards that could affect them or their work colleagues or others.

PASMA reserves the right to suspend or withdraw the user's certificate in appropriate or dangerous activity whilst working at height on mobile access towers or low level work platforms.

Duties of Suppliers

A supplier can be a manufacturer, distributor, retail outlet or a hirer of equipment. All equipment supplied must conform to the design standards and specifications by the manufacturer and comply with any legislative requirements. Checks should be made to ensure the correct type, and the correct number of components have been supplied with the equipment, together with a copy of the current instruction manual. It is important to note that whilst standards may not be regulations, compliance with the requirements of the standard can be taken as an assurance that the equipment has been designed and manufactured to a minimum standard for safety and quality.

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.

Competence

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 chaired by the HSE, and comprised all the lead organisations involved in work at height, gave 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 delegate 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.

To access the card virtually you have two options:

1. You can access an image of your PhotoCard from the PASMA website (once you have been issued your certificate number), or
2. You can download the TowerSure™ app, which acts as a wallet for your virtual card. TowerSure is a smarter way to manage tower inspections within a single app and offers step-by-step guidance to inspect mobile access towers. Having your Photocard stored within the app means you have it with you at all times, while the app updates in real-time and is linked with your own unique learning record.

Understanding what the Levels and Categories mean on your PhotoCard

Levels

U - User: this is accompanied by a category, the category that denotes the equipment that the card holder is considered competent to use and/or assemble, alter, dismantle, move and inspect.

I – Instructor: for those who deliver PASMA Courses, this is followed by letters and characters that denote the categories they can instruct (see categories below).

M - Manager: is intended for those candidates who are in charge of or supervise others who work at height.

S – Access Tower Specialist (*formerly R - 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.

Categories

- W** Work at Height (Novice)
- L** Low Level
- T** Tower
- A5** Towers on Stairways
- A6** Towers with Cantilever
- A7** Towers with Bridges
- A8** Towers with Links
- A9** Towers with Large Decks

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.

An example of this could be:

Work below ground level can be work at height if, for example, 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.

Hierarchy of Control Measures

The Regulations set out a framework that ALL duty holders must: Avoid > Prevent > Minimise, 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 low level work platforms, 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.

Work at Height Assessment

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.

Collective Measures

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.

- The principal 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.

Hazards and Risk

It is important that users of towers fully understand the Risk Assessment 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/alarplance.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. Source: www.hse.gov.uk/pubns/hsc13.pdf

Risk Assessment

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. The Method Statement must also consider and plan for emergencies and (where appropriate) rescue.

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.

Method Statements

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. 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.

Emergencies and Rescue

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).

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), location, 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.

Types of Rescue

When producing your rescue plan you might consider:

Self-Rescue: In this situation where a person who is incapacitated or injured but is still capable of being able to descend safely under their own effort and using the built-in access. Some assistance may be necessary e.g. holding open a trapdoor, but descent is made by the person using their own physical effort.

Assisted Rescue: Where, with the physical effort and help of others, the person in need of rescue may be safely assisted in a descent of the tower using the built-in access or other equipment.

Professional Rescue: Where the medical condition of the person or the condition of the tower requires the assistance of a professional rescue team - that might be the emergency services.
In assessing methods of rescue consider at least the following:

- Medical condition of the person or persons being rescued and their needs in terms of First Aid or Medical Assistance - on the tower or after rescue
- Condition and capacity of the tower – its stability and strength
- Number of persons needed to assist
- The need and capability to call the emergency services

Self and Assisted Rescues should be carried out following the written plan and stopped if it becomes unsafe to carry on. If the medical condition of the persons to be rescued, or the condition of the tower means that Self Rescue or Assisted Rescue would be unsafe then it is likely that only the professional medical or rescue emergency services would have sufficient knowledge and skills to carry out a safe and successful rescue.

A call to the emergency services must then be made and the attendance of the ambulance and/or fire service requested. The person calling will need to provide:

- the location of the emergency
- medical condition of any injured persons
- details of the incident including the information that the persons are on a mobile tower and at what height
- the information that the condition of the persons or the condition of the tower means that they are unable to effect a self-rescue or an assisted rescue

When considering Professional Rescue in a rescue plan consider the time it may take for the professional rescue services to arrive depending on the location of the work site.

Consider the adequate provision of competent First Aid under those circumstances.

SECTION 3 - INFORMATION

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 website.

Standards

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 more than 470mm, toe boards at 150mm minimum and a maximum nominal height between platforms of 2.0m. The Standard covers single towers on castors, with a maximum freestanding height of 12.0m indoors and 8.0m outdoors.

Other, more complex structures can be formed using towers and components complying with EN 1004-1, but these are outside the scope of this Standard, and are specified in BS 1139-6 Prefabricated tower scaffolds outside the scope of EN 1004-1, but utilising components from such systems. These are also outside the scope of this training course. However, PASMA training centres do offer additional courses covering more complex structures.

As the nature of the Work at Height Regulations is non-prescriptive, the HSE has 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.

Manufacturer's Instruction Manual

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.

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.

PASMA Website

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.

You can also check the validity of a PhotoCard by using the check a card function of the website:

<https://pasma.co.uk/check-a-card/>

You will need to know the first name, last name and certificate number of the user. When you submit this, you will see an image of the PhotoCard. whereby you can then check the qualifications and expiry date.

Tower Selection

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.

SECTION 4 - EQUIPMENT

To satisfy relevant regulations but, more importantly, to keep you and your personnel safe, you need to make sure the equipment to be used has been inspected.

This means that you and your personnel need to know what to look **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 to whom to report faults/defects to.

Pre-Use Checks

In your pre-use check, you should:

Ensure that all tower components have been checked for damage, compatibility and working condition. This must be done by a competent person before anyone starts to assemble the tower.

Make sure faulty or damaged components are never used, and components must never be fitted or removed by force.

Any damaged equipment should be **ISOLATED, TAGGED AND REPORTED** 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.

Components

Castors: 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. You should avoid using castors on soft ground. If necessary, use sole boards to distribute the load.

Base Plates: 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 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.

Adjustable Legs: 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 your 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've not got enough kit 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). Never use Adjustable Legs to gain extra height as you will be putting the tower 'on stilts' and they are not designed to take load in this way. If you need additional height, use additional frames.

Frames: There are commonly two widths of frames available to use or hire, Single (sometimes called Narrow) Width and Double Width, although other sizes can be obtained, 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 shortly. You cannot climb plain frames where the rungs are outside of these measurements and are not anti-slip.

Single 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.

Connecting Spigots: 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 (sloped) 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**, pay attention to what 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.

Access and Egress

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 severe risk of falling to the ground but you could also topple the tower 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 and be anti-slip 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.

Tower Types

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? – Answer: 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.

Braces: 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. All braces have hooks or claws at either end with a locking device to prevent them from being accidentally dislodged.

Horizontal Braces: 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 the 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 it should not be forced 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.

Advance Guardrails (AGR's): Advance Guardrails are used in conjunction with tower frames to form modules which are the “building blocks” of the tower structure. They 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.

Stabilisers: 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. The Current Instruction Manual will list the kit and explain when stabilisers are to be installed or fitted, 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.

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

Outriggers: 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 Current Instruction Manual for detailed guidance on how this is achieved. As 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.

Platforms: 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.

Fixed Platforms - 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.

Full-Hinged Platforms - 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.

Trapdoor Platforms - These are the only platforms you can use on both Single Width and Double Width towers. The trapdoor allows entry up through 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.

Safe Working Load

The Safe Working Load 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 putting yourself at risk of a tower collapse due to overloading. If you are placing materials on a platform for storage, do not block or load onto the trapdoor.

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. Total SWL of structure – total weight of components = SWL available to use on a tower i.e. a tower with 750kg total SWL, components weighing 227kg would have 523kg left of its SWL available to use before reaching its safe limit.

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.

SECTION 5 - ASSEMBLY METHODS

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.

Assembling a Tower

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 fall protection throughout these processes.

Take particular care to follow the current instruction manual to ensure guardrails are installed before you stand on any platform to ensure that you are always prevented from falling in the course of assembly, check the instructions for the 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.

3T (Through The Trap)

The 3T or Through The Trap method of assembly allows the operative to position themselves through the trapdoor of the platform and position horizontal braces ahead of themselves 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.

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. 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.

AGR (Advance Guardrail)

The Advance Guard Rail method of assembly allows the operative to install guardrail frames from a safe area below, before installing the platform(s) thus providing collective fall prevention before anyone gains access to the platform above. This process is then repeated until the desired height is achieved.

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

Dismantling a Tower

Follow the current instruction manual for dismantling and ensure that components are removed in the correct sequence. Take particular care to follow the manufacturer's instructions to ensure you are protected from falling in the course of dismantling and check the instructions 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 only be jammed at one end. 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.

SECTION 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.

Work Activities

Falls from Height - Climbing outside of the tower must never be attempted under any circumstances. Not only does this practice significantly increase the risk of the tower overturning but, if you do lose your grip, or slip, there is nothing to prevent you from falling. Only use the access method provided by the manufacturer.

Overloading - The safe working load for the complete structure and each platform level will be found in the current instruction manual which must be available to everyone assembling and using the tower.

If work needs to be undertaken where the loads are in excess of that permitted then, the selection and use of other, more suitable equipment such as system scaffolding (which can carry much heavier loads) should be considered. Loads on platforms should be evenly distributed. Avoid point loads, such as accumulated materials stored on a platform in one corner.

Unprotected Edge - Statistics show that falls from height are historically amongst the highest causes for fatalities and serious injuries reported each year. The message from PASMA and its members in this respect is simple and clear.

NEVER STAND ON AN UNPROTECTED PLATFORM!

Weather Factors

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.

Adverse Weather

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 slip resistant 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 the tower, this may in extreme conditions cause the tower to overturn. 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.

Ground Conditions

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. You may also consider using base plates if the tower is to remain static.

Always 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.

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.

Stabilisers and Outriggers

The freestanding height of any tower is limited by the smaller of the base dimensions. In simple terms, if you attempt to build a 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 allow you to increase the freestanding height.

First you should make sure the correct stabilisers / outriggers are right for the height of the tower being built (you will find this information in the current instruction manual). Next, you need to make sure the stabilisers are used to their greatest effect, check that the lower arm of the stabiliser is 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.

Tower Stability

If you have to use a tower close to a building or structure, you should position the stabilisers in alternative configurations. It is important that the inside stabilisers are parallel to the wall and that they are not just omitted. 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.

Load Instability

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.

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.

Prior to Moving a Tower

Before moving the tower check the intended route, to ensure it is free of obstructions both at ground level and overhead, particularly overhead electrical cables.

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

Moving a Tower

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 means other than manual effort, i.e. don't use a forklift or vehicle.

Always refer to the current instruction manual when you move any tower structure, for example, cantilever towers and linked towers, require special measures to be taken before being moved.

Overhead Power Lines

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.

Location

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/

Falling Objects

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. Always use toe-boards on the working platform to prevent tools or equipment from falling. Make sure all platforms are clear of equipment and tools prior to moving the tower. To eliminate the risk of people or materials falling, ensure that guardrails and toe boards are fitted.

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

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

Personal Fall Protection Equipment

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

The product standard EN 1004-1 requires that “the mobile tower shall be designed in such that it can be assembled, altered and dismantled without the need for fall protection”.

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.

SECTION 7 - INSPECTING AND RECORDING

The Work at Height Regulations specifically require that where the safety of work equipment depends on how it has been assembled, are inspected prior to use in that position.

Regulations Relating to Inspections

Regulation 12(4), every employer shall ensure that a working platform:

- (a) used for construction work; and
- (b) from which a person could fall 2 metres or more, is not used in any position unless it has been inspected in that position or, in the case of a mobile working platform, inspected on the site, within the previous 7 days.

Regulation 12(7), a person carrying out an inspection of work equipment to which paragraph (4) applies shall:

- (a) before the end of the working period within which the inspection is completed, prepare a report containing the particulars set out in Schedule 7; and
- (b) within 24 hours of completing the inspection, provide the report or a copy thereof to the person on whose behalf the inspection was carried out.

Schedule 7 - Particulars to be included in a report of inspection:

1. The name and address of the person for whom the inspection was carried out.
2. The location of the work equipment inspected.
3. A description of the work equipment inspected.
4. The date and time of the inspection.
5. Details of any matter identified that could give rise to a risk to the health or safety of any person.
6. Details of any action taken as a result of any matter identified in paragraph 5.
7. Details of any further action considered necessary.
8. The name and position of the person making the report.

It is important to know some of the differences between tower types and build processes. It is essential when inspecting a tower, that you have a copy of the current manufacturers' instructions so that you can be certain the tower has been assembled correctly.

PASMA Pocket Card

PASMA pocket cards provide simple straightforward advice for users on such things as environmental factors, ground conditions to the safe and proper use of adjustable legs, stabilisers and frame locking. Pocket cards explain when towers must be inspected, how to complete a tower inspection record, what to do if an inspection is unsatisfactory.

Recording Inspections

PASMA recommend the use of a Tower Inspection Record or the TowerSure™ App for the purpose of recording your tower inspection.

Tower Inspection Record

PASMA, in consultation with the HSE, have developed the PASMA Tower Inspection Record. 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".

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.

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.

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 inspecting a tower structure, you should consider the following as a guide, there may be more you can think of:

CHECK

- environmental factors, have not adversely affected the safe use of the tower, or the ground conditions
- the ground is firm and stable and able to sustain the tower's weight
- review for adequacy and continuing relevance, the risk assessment and method statement
- refer to the current instruction manual for the tower to be inspected
- castors have breaks applied and that they or baseplates are fully in contact with ground
- adjustable legs are not over extended
- stabilisers /outriggers are correctly positioned
- the bracing follows the recommended pattern on the current instruction manual
- locking hooks on braces are correctly engaged
- frame locking devices have been engaged and are effective
- traps or hinged opening of platforms are positioned over the ladder / recommended access method
- hinges are appropriately positioned to allow free access / egress wind lock devices are fitted, and are properly engaged
- main guardrails no less than 950mm and mid guardrails no gap of more than 470mm are installed at every platform level
- toe-boards are installed on platforms where there is a risk of falling objects.

The advantages of using a physical record are:

- **Tangibility:** Physical presence can be reassuring and easier for some to manage.
- **No Technical Skills Required:** Easy to use without needing technical skills or devices.
- **Immediate Access:** No need for electronic devices or power to access.

Some disadvantages of using physical records are:

- **Space Requirements:** Requires physical storage space on site for at least 3 months
- **Searchability:** Time-consuming to search for specific information.
- **Accessibility:** Limited to the physical location of the records.
- **Environmental Impact:** Use of paper/pvc and storage materials can be environmentally taxing.
- **Risk of Physical Damage:** Vulnerable to damage from fire, water, pests, and other physical threats.
- **Cost:** Potentially higher costs for, materials (new record for each tower), and management.

Traditionally this record is in the form of a label that would be attached to the tower, however, the use of digital inspections is becoming more popular.

TowerSure™ Inspection App

PASMA has its own free-to-use digital inspection app called TowerSure. Its primary goal is to streamline and standardise the tower inspection process and offers many advantages:

- **Replaces Traditional Methods:** TowerSure eliminates the need for traditional labels and paper records. Instead, it provides a digital solution that keeps all your inspection data in one place. This means no more lost or damaged paper records, and no more time-consuming manual data entry.
- **Streamlined and User-Friendly:** The app is designed to be streamlined and easy-to-use. Its intuitive interface allows for quick learning and effortless navigation. Users can easily log inspections, track tower conditions, and manage data in real time.
- **Improved Safety:** By digitising the inspection process, TowerSure helps ensure that no detail is overlooked, thus significantly enhancing the overall safety of tower operations. The app stores a digital record of what the tower looked like when you left it.

- **Efficiency:** The app simplifies and standardises the inspection process, reducing the time and effort required to perform thorough inspections. This not only boosts productivity but also allows you to focus on more critical tasks, knowing that your inspections are accurately documented and easily accessible.
- **Data Accessibility:** With TowerSure, all your inspection records are stored digitally via the Console, making them easily retrievable anytime, anywhere. This is particularly beneficial for tracking inspection history and compliance.

Virtual Card

The TowerSure app features a virtual card system, which serves as a digital version of the traditional PASMA training photocard. This virtual card contains all relevant information about the user's training status, certification details, and expiration dates.

Benefits of Competence Checks:

- **Instant Verification:** The virtual card enables immediate verification of a user's competence and certification status, ensuring that only qualified personnel are authorised to perform inspections. This real-time verification reduces the risk of unauthorised or unqualified personnel conducting inspections, thus enhancing safety and compliance.
- **Ease of Access:** Users can access their virtual card anytime, anywhere, through the TowerSure app. This eliminates the need to carry a physical card and reduces the risk of losing important certification details. Supervisors and site managers can quickly verify the credentials of their team members, facilitating smoother operations and quicker decision-making.
- **Up-to-Date Information:** The virtual card is automatically updated with the latest training and certification data.

Digital Inspection Checklists

TowerSure provides comprehensive digital inspection checklists that guide users through the entire inspection process. These checklists are designed to be intuitive and easy to follow, ensuring that no critical steps are missed during inspections.

Benefits of Digital Inspection Checklists:

- **Standardised Inspections:** The digital checklists ensure that all inspections are conducted uniformly, following the same standards and procedures every time. This consistency helps in maintaining high-quality inspections and meeting regulatory compliance.
- **Enhanced Accuracy:** Each step in the checklist is clearly defined and often accompanied by visual aids or examples. This reduces the chances of human error and ensures that inspectors can accurately assess the condition of the tower. The app prompts users to confirm each step, ensuring thoroughness and accuracy in the inspection process.

Comprehensive Digital Records

TowerSure allows for the creation and maintenance of detailed digital records of all tower inspections. These records include all relevant information, such as inspection dates, findings, tower details, and the status of each inspection.

Benefits of Digital Records:

- **Accessibility and Organisation:** Digital records are easily accessible from any device with the TowerSure app. This means you can check the current status of towers, and plan future inspections with ease. The app organises records in a systematic manner, making it simple to locate specific information when needed. This reduces the time spent searching through paper records and enhances overall efficiency. Past inspections can be reviewed by logging in to the TowerSure console (this will be covered later).

- **Enhanced Accuracy and Detail:** Digital records ensure that all inspection data is accurately captured and stored. Inspectors can input detailed notes, attach photos, and log any issues or observations directly into the app. This level of detail helps in maintaining a thorough history of each tower's condition, facilitating better decision-making and maintenance planning.
- **Real-Time Updates:** Inspection records are updated in real-time, providing up-to-date information on the status and condition of towers. This is particularly useful for ongoing projects and for ensuring that all stakeholders have access to the latest data. Real-time updates also mean that any issues identified during inspections can be addressed promptly, minimising downtime and improving safety.
- **Compliance and Reporting:** Digital records make it easier to comply with regulatory requirements. The app can generate detailed reports based on the recorded data, simplifying the process of demonstrating compliance during audits or inspections by authorities. Automated reporting features save time and reduce the administrative burden on inspectors and managers.

Automated Reminders

The TowerSure app includes a feature that automatically sends reminders for upcoming inspections.

Benefits of Inspection Reminders:

- **Consistency and Compliance:** Automated reminders help ensure that inspections are carried out regularly and on time. This consistency is crucial for maintaining compliance with safety regulations and industry standards. Regular inspections help identify and address potential issues before they escalate, ensuring the ongoing safety and reliability of the towers.
- **Efficiency and Time Management:** By receiving timely reminders, inspectors can plan and manage their schedules more efficiently. This reduces the risk of missed inspections and last-minute rushes.

Benefits of Logging Experience

TowerSure enables you to record your experience and competency within the app, making it accessible for others to access as and when required.

- **Comprehensive Experience Log:** Every inspection and activity logged in the app contributes to a detailed record of your professional experience. This includes the types of towers inspected, the frequency of inspections, and any issues identified and resolved. Having a comprehensive log of your experience is invaluable for demonstrating your competence and expertise in the field.
- **Demonstrating Competence:** Regularly logging inspections and activities through the TowerSure app provides a clear and verifiable record of your ongoing competence. This is particularly important for demonstrating to employers and regulatory bodies that you are actively engaged in maintaining high safety and inspection standards. The detailed records can also be used to highlight specific skills and areas of expertise, enhancing your professional profile.
- **Automatic Updates:** As you log your inspections and activities, the app can automatically update your PASMA photocard with the latest information. This ensures that your qualifications reflect your most recent experience and training. Automatic updates reduce the administrative burden of manually tracking and renewing qualifications, making it easier to stay compliant with industry standards.

Inspections Made Simple

TowerSure provides a combination of drop-down menus, QR codes and prompts to make tower inspections simple.

- **Create Your Tower Inspection Using Simple Drop-Down Menus:** The first step in the TowerSure app is to create a new tower inspection entry. This is done using intuitive drop-down menus that guide you through the process. You will need to enter details such as the project name, site location, tower type, and tower ID. These fields help in organising and identifying each tower accurately. The simplicity of the drop-down menus ensures that all necessary information is captured without any hassle, making the setup process quick and efficient.
- **Scan the QR Code on the Label** (*you need to be part of a project for this functionality to work*): Once you have entered the basic details, the next step is to scan the QR code on the inspection record label attached to the tower. Scanning the QR code automatically links the physical tower with its digital record in the app. This integration ensures that all inspections are accurately tracked and documented. The QR code feature eliminates the need for manual entry of the inspection record label, reducing the risk of errors and saving time.
- **Choose the Options that Describe your Tower:** After scanning the QR code, the app will prompt you to choose specific options that describe your tower. This may include details such as the tower's height, configuration, and any special features. These options help in creating a detailed and accurate profile of the tower, which is essential for thorough inspections. By providing precise descriptions, you ensure that all relevant aspects of the tower are considered during the inspection process, enhancing the quality and reliability of the inspections.

Using TowerSure for Tower Inspections

TowerSure is designed to guide you through the inspection process, allowing you the opportunity to check and correct any issues as you go.

- **Begin Your Inspection:** The app will guide you through the inspection process with a series of questions and prompts, ensuring a thorough and consistent inspection every time. Each question is designed to address a specific aspect of the tower's condition, helping you to systematically check for potential issues.
- **Standardised Checklist for Every Tower:** TowerSure uses a standardised checklist that applies to all towers, ensuring that inspections are consistent regardless of the inspector or the tower. This checklist covers all critical safety and maintenance points, such as ground conditions, stability, and structural integrity. Standardisation helps in maintaining high safety standards and makes it easier to train new inspectors, as everyone follows the same procedure.
- **Check and Correct as You Go:** As you proceed through the checklist, you can check off each item and note any issues directly in the app. If you encounter a problem, the app allows you to document it immediately and suggest corrective actions.

This real-time documentation ensures that no issue is overlooked and that corrective measures can be taken promptly. The app's interface is user-friendly, with options to add photos, notes, and other relevant information to each inspection point, providing a comprehensive record of the inspection. By using the app, you can ensure that your inspections are thorough, consistent, and compliant with safety standards, ultimately contributing to the safety and reliability of your towers.

- **Assemblers/Inspectors Details:** Each inspection record includes detailed information about the assemblers and inspectors involved. This includes their names, qualifications, and roles in the inspection process. Having these details helps in verifying the credentials of the personnel involved and ensures accountability and transparency.

- **Map Location:** The app records the precise location of each tower using GPS coordinates. This feature is especially useful for large sites or projects with multiple towers. The map location helps to quickly identify the tower's position and aids in planning and logistics.

The TowerSure Console

If you've set up a project or been added to one, you can easily view all towers within that project using the TowerSure console. This feature enables site managers or those overseeing operations to monitor the status of any towers across their accessible sites, as well as reviewing past tower inspections.

By signing in at <https://ria.pasma.co.uk>, you can manage and track tower safety and inspections. Responsibility is shared, as both the person who inspected the tower will receive reminders via the TowerSure app, and any console user can access this information to take action as needed.

Site and safety managers can use the web-based TowerSure management console to inspect, re-inspect, or spot-check towers, based on their competence level and the organisation's preferences. This approach distributes responsibility between the person who assembled the tower and their supervisor or site manager, ensuring a more comprehensive safety check

This digital record meets the requirements of the Work at Height Regulations, where the report must be kept on-site or be readily available for three months after the inspection.

SECTION 8 - PERSONAL HAZARDS

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.

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:

- **Lung Disease** - 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.
- **Work-Related Stress** - 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.
- **Musculoskeletal Disorders (MSDs)** - 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 6.6 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.

SECTION 9 - ASSESSMENT

Assessments, both written and practical, are an essential element of the PASMA Training Scheme. The assessment is 30 multiple choice questions. It is by successful completion of the assessment 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 manage working 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.

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

PASMA is committed 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!

Training Course Notes – Towers for Users – Ver 7, Rev 1 0325

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