FOREWORD FROM THE HEALTH & SAFETY EXECUTIVE

"Mobile access towers are used extensively in industry.

PASMA, in co-operation and consultation with HSE, has led a wide-ranging review of methods for the safe erection and dismantling of mobile access towers, and the training that supports this. An ergonomics research study conducted by HSL has confirmed that, with correct manual handling techniques and body positioning, the risks are kept within tolerable limits in the AGR (Advance Guard Rail) and 3T (Through The Trap) processes. This means that the principles regarding the use of both processes given in HSE guidance "Tower scaffolds" (CIS10) are still current. The AGR and 3T processes continue to provide recognised safe methods of work.

HSE welcomes publication of this Final Report.

Contractors need to ensure that operatives have appropriate equipment, training and supervision to erect and dismantle mobile access towers safely. Operatives are also responsible for playing their part."

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BACKGROUND, CHRONOLOGY & INTRODUCTION

There have been two processes recommended by PASMA and the HSE for the assembly and dismantling of mobile access and working towers since 2005. These recommendations were developed in consultation with the HSE and are detailed in HSE guidance document CIS 10.
The two processes are: Through the Trap (3T) and Advance Guardrail (AGR).

At the time the 3T method was introduced it was discussed with the HSE that the development and movement towards the use of AGR systems as the predominant process should be an objective of PASMA and its members. More recently, the HSE has expressed the importance of preceding any changes to current guidance with careful evaluation of all factors to ensure that any amendment is practical and will provide an overall improvement to the safe use of mobile towers. Additionally, following the House of Lords Merits Committee Enquiry into the implementation of the Work at Height Regulations (WaHR), there is a highlighted need to understand and assess in advance, the potential benefits and burdens (including economic factors) to all affected sectors that would result from changes to work at height best practice.

At the end of 2009 a number of new AGR systems became available from manufacturers and there was a reported growing interest in the application of the AGR process from users. A small number of manufacturers contended that the Association should amend its guidance and recommended best practice regarding these emerging products. At same time it was 5 years since the 3T method was developed and established by PASMA and the HSE and it was timely and appropriate that it should be reviewed as part of PASMA's aim of continuous improvement.

Consequently, PASMA Council requested that its Manufacturers' Technical Committee investigate the comparative technical, operational and safety aspects of the Through the Trap (3T) and Advance Guardrail (AGR) methods for mobile tower assembly and dismantling. The PASMA Training Committee was also asked to consider the feasibility and practicality of including both methods within both the theoretical and practical elements of the training. The Health & Safety Executive (HSE) were to be involved in the review and other relevant stakeholders invited to participate in a consultation process.

In December 2009, members of PASMA were asked to submit any technical, safety, commercial, operational, training or other pertinent issues and comments, which they considered relevant to the study. An Interim Report was published in March 2010 summarising the submissions of PASMA members. The interim report recommended a number of actions and investigations should be undertaken to objectively examine and determine the basis and veracity of the various submissions. The actions and investigations were carried out during 2010 and included:

- A practical technical workshop where a physical comparative assessment of the assembly and dismantling of mobile towers using both the 3T method and various manufacturers' AGR systems was carried out and filmed for future reference.
- A series of technical workshops which considered the outcome of the physical assessment together with the issues of compatibility, tower stiffness and other points that were highlighted in the interim report.
- A training workshop which considered the issues associated with increasing the AGR content in the practical element of PASMA training courses.

During ensuing dialogue with the HSE it was agreed that PASMA and HSE should engage expert assistance in the form of the Health and Safety Laboratories (HSL) Buxton to carry out a detailed and in-depth study into certain ergonomic aspects of both the 3T method and the latest versions of AGR systems. This research was carried out at the end of 2010.

In March 2011 a process to inform and consult with relevant stake holders was undertaken by PASMA. A briefing document was issued to provide those involved (see annex for details) with information regarding; the results of the initial PASMA survey, the recommendations of the interim PASMA report, the results of the practical, technical and training workshops, dialogue with the HSE and the results of the research carried out by HSL. The results of that consultation process are detailed in this report.

This report, and the process that precedes it, seeks to ensure that a thorough evaluation of the comparative technical and operational safety aspects of the 3T and AGR processes has been undertaken. The recommendations consider both the positive and negative aspects that would result from any change to the relevant PASMA and HSE guidance.

PASMA would like to take this opportunity to thank the PASMA members who have taken considerable time and effort to contribute to this review. We should also like to thank the HSE and the HSL for their valued input and assistance and all other stakeholders for taking time to participate in the consultation process.

EXECUTIVE SUMMARY

Following a wide ranging review by PASMA into the comparative technical and operational safety aspects of the Through The Trap (3T) method and Advanced Guardrail (AGR) systems, PASMA and the HSE confirm that at this time they consider both processes remain equally acceptable for the assembly and dismantling of mobile access and working towers, when followed correctly. This position takes into account the requirements of the Work at Height Regulations and the potential benefits and burdens to all affected sectors that would result from any change to the existing PASMA and HSE recommendations.

Both the 3T and AGR processes are currently included in PASMA training. It is argued that the latter has been limited in the past by a restricted availability of AGR systems and a corresponding lack of demand for detailed training from duty holders and delegates

It appears that the relatively recent growth in interest in AGR's was primarily triggered by manufacturers releasing new AGR designs and implementing very effective marketing campaigns which inferred there was a regulatory demand for the use of AGR systems. The development of interest in AGR systems does not appear to have come from an unprompted and spontaneous demand for AGR systems from duty holders and users. Neither has it resulted from any change in HSE policy as the use of both the 3T method and AGR systems continues to be acceptable to the regulatory authorities.

During the PASMA technical workshops, the position of the 3T method and AGR systems within the hierarchy of measures of the Work at Height Regulations was the subject of considerable debate with widely differing views being expressed. In conclusion to the comprehensive and detailed discussions and analysis on this issue, the PASMA technical committee drafted the following resolution:

"The conclusion of the Technical Committee Review is that, when used in accordance with manufacturers' instructions and guidance, both methods continue to provide an acceptable safe method of work, with AGR systems providing comprehensive fall protection and the 3T method using conventional components to minimise the risk of fall".

As part of the PASMA review and following a suggestion from the HSE, an ergonomics research study was conducted by the Health and Safety Laboratory into aspects of mobile access tower assembly using both the 3T method and AGR systems. The HSL has confirmed that, ***"with correct manual handling techniques and body positioning, the risks to manual handling related musculoskeletal health are kept within tolerable limits in both processes"***.

The PASMA Technical Committee considered the stiffness of Integral type AGR towers built with reduced component counts and concluded that: ***"There were no observed problems with the stiffness of towers complying with EN1004 built using AGR components"***.

The Technical Committee considered a proposition that there is a potential for incorrectly assembled conventional (3T) towers to collapse. Following review, the committee concluded that ***"the risk of reducing the structural integrity of a conventional tower sufficient to generate a risk of collapse through an assembly entirely contrary to the recommended bracing pattern was inconceivable except at the very outermost extremes of the performance envelope of an EN1004 tower"***.

The committee also considered the corresponding possibility that a tower built using an integral AGR system could be subject to collapse as a result of totally incorrect assembly. The committee similarly concluded that the risk was equally inconceivable and therefore equally immaterial.

The PASMA Training Committee has considered the need for existing PASMA card holders to be re-trained to cover the recent developments in AGR products. The committee concluded that it is not necessary for current card holders to re-train until their card has expired (5 years from date of issue) as the content of the current course was sufficient to have provided them with a working knowledge of the AGR process in general and the training and ability to follow manufacturers AGR system instruction manuals. However the committee has determined that the standard Towers for Users course could be enhanced by extending the content to cover the latest developments in AGR systems, particularly Integral type products

PASMA will discuss with the HSE if CIS 10 should be revised to include the new integral type AGR for informative purposes.

The PASMA interim report pointed out that if there is a move to the use of AGR systems from the 3T methodology; there are obvious financial benefits and concerns for different sectors of the mobile tower industry. There are obvious advantages for manufacturers with AGR systems in an emerging AGR market. Conversely, other manufacturers could be disadvantaged in difficult commercial times by having to invest in the development of an AGR system to remain competitive. For others such as equipment owners, training organisations and hire companies, there is a potential need for significant re-investment in new AGR equipment.

Some companies have apparently already begun to invest in AGR systems as a consequence of duty holders demanding the use of AGR systems. PASMA will attempt to open further dialogue with duty holders to reassure them that both systems remain equally acceptable to both PAMSA and the HSE, and to advise them that these prescriptive measures are unnecessary.

DISCUSSION – Technical Issues

The two processes currently recommended by PASMA for the assembly and dismantling of mobile access and working towers are; the Through the Trap (3T) method and the use of Advance Guardrail systems (AGR). These recommendations were developed in consultation with the HSE as safe processes and are detailed in HSE guidance document CIS 10.

In the 3T method, the user is situated within the open platform trapdoor during the operation of installing and removing the horizontal braces acting as the side guardrails to the platform.
The section of CIS10 which covers the 3T method states, **"this allows the person erecting *[and dismantling]* the tower to position themselves at minimum risk during the installation *[and removal]* of guardrails to the next level"**.

The 3T method was a significant step forward in mobile tower safety and when followed correctly, it ensures the operator does not stand on an unprotected platform which was one of the unsafe practises carried out prior to its implementation. The 3T method is arguably a straightforward and consistent process that does not vary depending on the make or configuration of a mobile tower which is obviously a significant safety, operational and training advantage.

However, it should be noted that 3T is a methodology and it is conceivable that operatives will deviate from the process despite their being trained to the highest levels. It may be argued therefore that the 3T method does not eliminate the risk of a fall for this reason

The alternative process for the assembly and dismantling of mobile access and working towers recommended by PASMA and the HSE is the use of an Advance Guardrail system (AGR). The section of CIS 10 which covers AGR systems states, **"The temporary *[advance]* guardrail units provide collective fall prevention"**.

Whereas 3T is a methodology that users are not compelled to follow, AGR systems may through design or other features, reduce or eliminate the risk of a fall by influencing or even obliging the user to proceed in a certain manner.

AGR systems employ guardrail side frames that are positioned in advance from a position on the protected platform below. Alternatively they may use devices to install or remove horizontal braces acting as the side guardrails to the platform.

As a result of recent new product developments there now appears to be two significant product types of AGR systems:

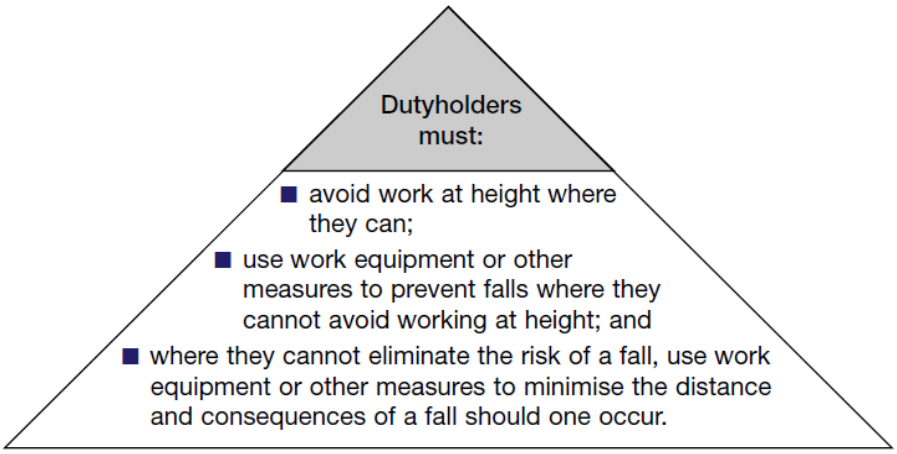
- Integral: Where the AGR system forms part of the tower structure and remains in the same position until the tower is dismantled.

- Additional: Where the AGR system is an additional component to the tower and is used to deploy or recover a guardrail component. It may or may not remain in place on the tower once the tower is completed (and therefore may or may not form part of the final towers structure) and it does not remain in its initial position.

In the second "Additional" group of products there are devices which may be considered as tools used to deploy and recover conventional tower components. When the CIS 10 Guidance was written, supply of AGR systems was extremely limited, typically of the Additional type, often adapted from scaffolding equipment and not always operationally practical for use with mobile access towers.

Whilst the product standard EN1004 should be applied to access towers which incorporate Integral AGR systems, it may not apply to some Additional type AGR products that would fall outside of its scope and which will need to be considered against other relevant standards where applicable. It should be noted that PASMA policy is that manufacturing members must have their towers certified in accordance with EN1004. Any AGR system which falls within the scope of EN1004 must similarly be certified, which includes the need to supply user instructions in accordance with EN1298.

The PASMA Interim report noted a difference in opinion amongst its members regarding if (within the hierarchy of measures of the Work at Height Regulations) the 3T method is a measure that prevents falls during the operation of fitting and removing the guardrails.



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During the PASMA technical workshops the position of the 3T method and AGR systems within the hierarchy of measures of the WaHR was the subject of considerable debate regarding if both the 3T method and AGR systems both fall within the second level i.e. **"use work equipment or other measures to prevent falls where they cannot avoid working at height"** .

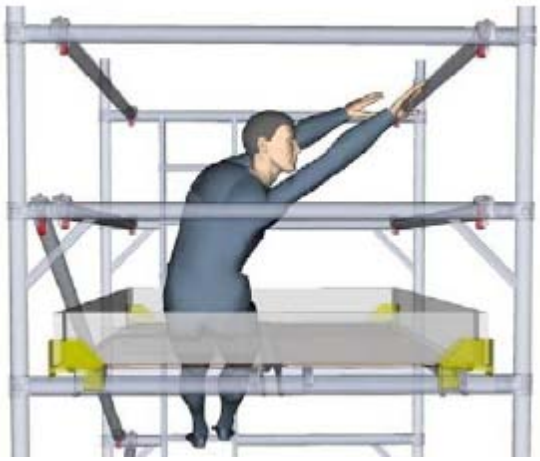
In conclusion to their discussion on this issue, the PASMA technical committee drafted the following resolution:

"The conclusion of the Technical Committee Review is that, when used in accordance with manufacturers' instructions and guidance, both methods continue to provide an acceptable safe method of work, with AGR systems providing comprehensive fall protection and the 3T method using conventional components to minimise the risk of fall".

One of the purported disadvantages of the 3T method is that it requires sideways twisting and reaching movements to deploy and recover the guardrail braces, from the 3T position, particularly on double width towers with longer platform lengths. However, the PASMA Interim report noted concerns raised by some PASMA members regarding the body positions adopted when installing or removing integral AGR frames in similar situations.

PASMA and the HSE engaged Health and Safety Laboratory (HSL) in Buxton to conduct a detailed research programme on both conventional towers using the 3T method and on towers using integral AGR systems to examine these specific ergonomic aspects of the processes. The HSL research considered as its source material the film record taken during the PASMA practical technical workshops and used a number of manual handling analysis techniques, including computer modelling, to assess the different processes. The modelling used a theoretical tower based on dimensional and weight data provided by PASMA manufacturing members. The conclusion of the HSL report is that with both the 3T method and AGR systems, in certain configurations of tower there is a potential risk of musculoskeletal injury to a small proportion of users, (in particular those of shorter stature). However, the HSL report concludes that such risk is kept within tolerable limits in both the 3T and AGR processes for those users if they use correct manual handling techniques and body positioning.

It is important to note that the circumstance from which the potential risk arises is confined to the situation where a double platform is installed in a tower, which has single intermediary platforms. This occurs in both 3T and AGR double width towers at the topmost, (i.e. working) platform, and is not an issue in single width towers which do require these extremes of reach.



As a result of these findings, it is recommended that duty holders (including designers, safety advisors and users) consider recommending or adopting procedures for persons of shorter stature. This may include the use of specific manual handling techniques and body positions, the use of additional components to limit the required reach, or other measures of equal or better effectiveness to reduce the risk of musculoskeletal injury through simultaneous overreaching and lifting in both processes. However, when considering the use of additional components the possible benefits that may be derived should also be considered against the additional manual handling tasks and any resultant risks associated with the installation and removal of the additional components.

During the PASMA Technical Committee's discussions, a point that received considerable attention was the position adopted by users in the 3T method when fitting the side guardrail horizontals.
This is either a "seated" position (fig. 1) on the platform, or a "standing" position on the rungs of the access ladder or end frame with the lower back or buttocks resting against the trapdoor edge (fig. 2).

Figure 1
"Seated" Position

Figure 2
"Standing" Position

During the practical and technical workshops both positions were examined to determine if guidance should be more specific or if either position was more advantageous. In the research examining the two positions carried out on behalf of PASMA and the HSE by the Health & Safety Laboratory (HSL), the "seated "position" was considered to be the preferable position.

Although the seated position places the centre of gravity of the user above the surrounding constraint of the platform trapdoor opening, the user is significantly more stable and secure than in the standing position on a rung of the access ladder or end frame. In the seated position, although the user's centre of gravity is higher, their legs remain within the platform trapdoor opening and should constrain them from falling from the platform.

Another issue discussed in the technical workshops was the alleged potential for incorrectly assembled conventional towers to collapse. This claim was examined by the PASMA Technical committee who concluded that the risk was insignificant and the allegation should be rejected. The committee concluded that the risk of reducing the structural integrity of a tower sufficient to generate a risk of collapse through an assembly entirely contrary to the recommended bracing pattern was only conceivable at the very outermost extremes of the performance envelope of an EN1004 tower. The committee considered the point that incorrectly assembled AGR towers could equally be considered subject to collapse but similarly the risk was immaterial.

One of the suggested benefits of integral type AGR systems is that they can reduce the number of components required in a tower. Whilst some towers built with integral AGR systems with fewer components may comply with the requirements of EN1004, the interim report noted claims from some members that they may be less rigid than equivalent towers built with conventional 3T components and that some users may find these increased levels of movement disconcerting. The PASMA Technical Committee discussed these claims and reviewed integral type AGR towers built with reduced component counts. The committee concluded that: ***"There were no observed problems with the stiffness of towers complying with EN1004 built using AGR components".***

DISCUSSION – Training Issues

As noted previously, although both the 3T and AGR processes are currently covered in the PASMA standard Towers for Users training course, until recently the content for AGR had been limited by both availability of product and lack of specific demand for training in the use of AGR systems.

The Interim report discussed if separate courses for AGR systems and 3T methodology were to be considered, there was a question of a person requiring dual competence where both processes were used. The report identified the members concerns that any training needs to cover all types of AGR system equally in detail and cannot be constrained by an individual make or model. The report noted the potential significant re-investment for training centres to either purchase or hire additional AGR systems for the purpose of providing practical training. The report noted that members had questioned the feasibility of increasing the AGR content of the PASMA training course both in the theoretical and practical segments. As part of the 3T/AGR review workshops, the PASMA Training Committee met and discussed the integral report's findings.

The Training Committee concluded that the current AGR subject matter in the standard Towers for Users course could be enhanced by extending the theoretical and practical content to cover the process in more detail and in particular the latest developments in integral type systems.

They concluded that it would probably be necessary to increase the course duration from 6 to 7 hours accordingly but that it should be possible to continue to conduct courses with 12 delegates, although they recommended that this be trialled before adoption.

The committee discussed the need and the cost for training centres to purchase or rent Integral type AGR systems for the practical part of the training course and concluded that this whilst it would incur additional expenditure for training centres, nevertheless it would be necessary.

The Training Committee concluded that existing PASMA instructors should undertake additional training regarding the new AGR process as there is potentially a limited in-depth experience of the latest AGR product developments. The Training Committee agreed that instructor training workshops on the subject of AGR systems should be organised and that it would be prudent if these workshops were mandatory for all instructors.

The Training Committee discussed the need for existing PASMA card holders to be re-trained to cover the recent developments in AGR products. The committee concluded that it is not necessary for current card holders to re-train until their card has expired (5 years from date of issue) as the content of the current course was sufficient to have provided them with a working knowledge of the AGR process in general and the training and ability to follow manufacturers AGR system instruction manuals.

DISCUSSION – Operational and Commercial Issues

Despite the recent increased interest in AGR systems and an increase in the number of manufacturers offering AGR systems, there remains at this time a relatively small amount of the AGR system equipment available to end users.

The PASMA Interim report noted that, with the recent development of a number of AGR systems and devices which all seek to provide a similar function, designers and manufacturers are filing patents which may conflict with each other. In the event of Intellectual Property conflicts, and the potential for litigation, it is possible that the number of available AGR products will be reduced again. This would generate a similar situation to that which that occurred when CIS 10 was generated where, although a movement towards a more widespread use of AGR may have been considered, it was not possible due to lack of available product. The Interim report questioned if designers and manufactures need to consider that, rather than adopting a protective stance to the IP issues, a more open attitude will be more beneficial to everyone in the longer term.

The PASMA interim report pointed out that if there is a move to the use of AGR systems from the 3T methodology; there are obvious financial benefits and concerns for different sectors of the mobile tower industry. There are obvious advantages for manufacturers with AGR systems in an emerging AGR market. Conversely, other manufacturers could be disadvantaged in difficult commercial times by having to invest in the development of an AGR system to remain competitive. For others such as equipment owners, training organisations and hire companies, there is a potential need for significant re-investment in new AGR equipment. Some hire companies have reportedly already begun to invest in AGR systems for their equipment fleets.

As noted previously in this report, as a result of the HSL research, it is recommended that duty holders consider recommending or adopting procedures for persons of shorter stature in both the 3T and AGR processes. In the case of double width integral AGR towers, the use of additional components may be recommended to limit the required reach by, for instance, installing double platforms at all levels. The use of these additional platforms potentially adds cost and time to build double width integral AGR towers when compared to a conventional tower built using single intermediate platforms. Moreover, as already discussed, when considering the use of additional components the possible benefits that may be derived should also be considered against the additional manual handling tasks and any resultant risks associated with the installation and removal of the additional components.

The Interim report noted that two persons are required to build low level (single lift) towers using some designs of AGR. Although most manufacturers recommend a minimum of two people to build all towers (conventional and AGR) it is reportedly not uncommon for a single person to build a conventional low level tower.

In some applications and advanced tower types, AGR systems may not be suitable for use in all positions and it may be necessary to mix 3T methodology and AGR components. The PASMA interim report noted the potential complications and suggested it may be prudent to avoid mixing the two processes.

The PASMA Interim report noted logistical issues of larger AGR system components in terms of transportation and storage. Integral AGR systems may occupy more space than conventional tower braces. Some companies with less storage or smaller vehicles may not have the additional space required. Additionally, this may generate a potential for increased environmental impact if bigger vehicles or more journeys are required to transport the larger and potentially heavier equipment.

CONSULTATION – Results of stakeholder consultation process

The following stakeholders were contacted as part of the consultation process:

Association for Project Safety – APS

Association of Plumbing and Heating Contractors - APHC

Association of Technical Lighting & Access Specialists - ATLAS

British Safety Council

Edge Protection Federation – EPF

Electrical Contractors Association – ECA

Fall Arrest & Safety Equipment Training – FASET

Health & Safety Executive – HSE

Health & Safety Executive Northern Ireland - HSENI

Heating & Ventilating Contractors Association - HVCA

Hire Association Europe – HAE

Industrial Rope Access Trade Association - IRATA

Institution of Occupational Safety and Health - IOSH

International Institute of Risk and Safety Management - IIRSA

International Powered Access Federation - IPAF

Ladder Association

National Access & Scaffolding Confederation – NASC

National Federation of Roofing Contractors - NFRC

Painting and Decorating Association - PDA

Prefabricated Access Suppliers' & Manufacturers' Association - PASMA

Royal Society for the Prevention of Accidents - ROSPA

Specialist Access Engineering & Maintenance Association - SAEMA

UK Construction Group - UKCG

Work At Height Safety Association - WAHSA

SUMMARY OF CONSULTATION SURVEY RESULTS

1. In response to the question "Were you already aware of the 3T method , AGR systems or other processes used when assembling and dismantling mobile working towers?"
   100% of respondents were aware of the 3T method and 96% were aware of AGR systems

2. In response to the question "Does your organisation, association or company already have a policy regarding the process for assembling and dismantling mobile working towers?"
   84% of respondents had a policy

3. In response to the question "Does your policy permit the use of the 3T method, AGR systems, or both processes?"
   78% permitted the use of both processes
   20% permitted the use of the 3T method
   2% permitted the use of AGR systems

4. In response to the question "As a result of the information in the briefing document, if you have a policy, do you intend to change it?"
   82% of respondents answered NO
   18% of respondents answered YES

5. In response to the question "If you intend to **change** your policy will it now permit the use of, the 3T method only, AGR systems only, or both processes?"
   87% of respondents answered "both processes"
   6.5% or respondents answered "3T method only"
   6.5 % of respondents answered "AGR systems only"

6. In response to the question " If you intend to **create** a policy regarding the use of the 3T method or AGR systems will it permit the use of, the 3T method only, AGR systems only , or both processes?"
   85% of respondents answered "both processes"
   10% or respondents answered "3T method only"
   5 % of respondents answered "AGR systems only"

Tower scaffolds

Construction Information Sheet No 10 (Revision 4)

Introduction

This information sheet is aimed at users of mobile access towers (also known as tower scaffolds or towers). It will also help those who select and specify such equipment.

The Work at Height Regulations 2005 require an assessment to be undertaken before starting any work at height. If the assessment confirms that there is no alternative to working at height, then suitable work equipment should be selected, taking into account the nature of the work.

Mobile access towers are widely used and can provide an effective and safe means of gaining access to work at height. However, inappropriate erection and misuse of towers are the cause of numerous accidents each year. Aluminium and thin-wall steel towers are light and can easily overturn if used incorrectly. Towers rely on all parts being in place to ensure adequate strength. They can collapse if sections are left out.

Before selecting or specifying a tower, you must be satisfied that it is the most suitable item of equipment for the job.

Erecting a tower

Many types of mobile access towers are available. The manufacturer or supplier has a duty to provide an instruction manual which explains the erection sequence, including any bracing requirements. If the tower has been hired, the hirer has a duty to provide this information. This information must be passed on to the person erecting the tower.

Towers should be erected following a safe method of work. There are two approved methods recommended by the Prefabricated Access Suppliers' and Manufacturers' Association (PASMA), which have been developed in co-operation with the Health and Safety Executive.

The first method, an advance guard rail system, makes use of specially designed temporary guard rail units, which are locked in place from the level below and moved up to the platform level. The temporary guard rail units provide collective fall prevention and are in place before the operator accesses the platform to fit the permanent guard rails. The progressive erection of guard rails from a protected area at a lower level ensures the operator is never exposed to the risk of falling from an unguarded platform.

Figures 1 and 2 Advance guard rail

The second method of erection is the 'through-the-trap' (3T). This allows the person erecting the tower to position themself at minimum risk during the installation of guard rails to the next level. It involves the operator taking up a working position in the trap door of the platform, from where they can add or remove the components which act as the guard rails on the level

above the platform. It is designed to ensure that the operator does not stand on an unguarded platform, but installs the components to a particular level while positioned within the trap door of that same level.

The 3T method makes use of standard tower components.

Figures 3 and 4 'Through the trap' (3T)

Towers should only be erected by trained and competent people. There are a number of organisations that provide training for the safe erection and use of tower scaffolds following the methods described above.

Stability

Make sure the tower is resting on firm, level ground with the locked castors or base plates properly supported. Never use bricks or building blocks to take the weight of any part of the tower.

Always check the safe working height by referring to the instruction manual. Towers should never be erected to heights above those recommended by the manufacturer.

Always install stabilisers or outriggers when advised to do so in the instruction manual.

Remember, the stability of any tower is easily affected. Unless the tower has been specifically designed for such use, activities such as those listed below should never be carried out:

- sheeting or exposure to strong winds;
- loading with heavy equipment; and
- using the tower to hoist materials or support rubbish chutes.

Using the tower

There must be a safe way to get to and from the work platform. This must be on the inside of the tower by an appropriately designed built-in ladder. It is not safe to climb up the rungs on the end frames unless the rungs have been specifically designed for the purpose of getting to and from the working platform – these have rung spacings of between 230 and 300 mm and an anti-slip surface. If you are in doubt, consult the instruction manual.

Falls must be prevented where there is a risk that a fall could result in personal injury. The working platform must be provided with suitable edge protection and toe boards. Guard rails should be at least 950 mm high and an intermediate guard rail should be provided so the unprotected gap does not exceed 470 mm.

Never use a tower:

- as a support for ladders, trestles or other access equipment;
- in weather conditions which are likely to make it unstable;
- with broken or missing parts;
- with incompatible components.

Moving the tower

When moving a tower:

- reduce the height to a maximum of 4 m;
- check that there are no power lines or other obstructions overhead;

- check that the ground is firm, level and free from potholes;
- push or pull using manual effort from the base only – never use powered vehicles;
- never move it while there are people or materials on the tower;
- never move it in windy conditions.

Inspection and reports

To prevent the use of incorrectly erected or damaged mobile access towers, they must be inspected by a competent person. This is someone with the experience, knowledge and appropriate qualifications to enable them to identify any risks that are present and decide upon the measures required to control the risks. The requirement for inspection is different for small towers under 2 m, and for towers of 2 m and above.

If the working platform is less than 2 m in height, the tower must be inspected:

- after assembly in any position;
- after any event liable to have affected its stability; and
- at suitable intervals depending on frequency and conditions of use.

If the working platform is 2 m or more in height, it must be inspected:

- after assembly in any position;
- after any event liable to have affected its stability; and
- at intervals not exceeding seven days.

A new inspection and report is not required every time a mobile access tower is moved to a new location on the same site. However, if guard rails or other components have to be removed to enable the tower to be moved past an obstruction, then a pre-use check should be undertaken by a trained and competent user to make sure the tower has been reinstated correctly.

Stop work if the inspection shows it is not safe to continue, and put right any faults.

The result of an inspection should be recorded and kept until the next inspection is recorded. The use of a visible tag system (which can be updated each time a check is carried out) to supplement inspection records is acceptable.

However, if the tower is 2 m or more in height and the inspection is undertaken after installation or assembly, or to comply with the seven-day inspection regime:

- the competent person must:
  - complete the inspection report before the end of the working period;
  - provide a copy of the report to the person the inspection was carried out for, within 24 hours;
- the person receiving the report must:
  - keep it at the site where the inspection was carried out, until construction work is completed;
  - thereafter, keep it at an office for three months.

Protecting the public

When towers are used in public places, extra precautions are required:

- erect barriers at ground level to prevent people from walking into the tower or work area;
- minimise the storage of materials and equipment on the working platform;
- remove or board over access ladders to prevent unauthorised access if it is to remain in position unattended.

Dismantling a tower

To dismantle a tower using the advance guard rail method, the operator starts from the top and reinstates the advance guard rail unit before removing the permanent guard rails and toe boards and descending to the lower level. The advance guard rail units are then relocated to the level below and the process is repeated, with collective fall prevention measures being maintained throughout.

To dismantle a tower using the 3T method, after removing the toe boards, the operator disengages the guard rail hooks furthest from the trap. Guard rail components are then removed with the operator positioned through the trap before descending to the lower level, from where the upper platform and end frames are removed.