



*The ingenuity of
our people creates
endless possibilities*

SAFE ZONE + 2022 Scaffolders' Handbook



**Advanced Safe System
of Work for Scaffolders**

SAFE ZONE +

Advanced Safe System of Work for Scaffolders

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Contents	Foreword Introduction	1
	Scaffolders' Responsibilities	3
	Mandatory Rules	4
	SAFE ZONE + Rules Supporting Information	5
	Techniques to Achieve a Forward Guardrail	10
	Tube and Fitting Advanced Guardrails	10
	System Advanced Guardrails	12
	Scaffolders' Steps	13
	System Hop Up Brackets/ Additional Transoms	14
	Additional Precautions	15
	Short Lift System	15
	Birdcage Scaffolds	16
	Prefabricated Beams	17
	Cantilevered Structures	18
	Loading Bays	19
	System Temporary Roofs	20
	Traditional Temporary Roofs	24
	Falsework and Formwork	25
	Temporary Edge Protection	25
	Work at Height Regulations	26
	Requirements of the Regulations	26
	Planning	27
	Personal Fall Protection Equipment	28
Correct Adjustment of a Safety Harness	30	
Donning a Safety Harness	31	
Twin Tail Lanyards	32	
Inertia Reel Blocks	32	
Inspection and Maintenance of Personal Fall Protection Equipment	34	
Storage	36	
Cleaning	36	
Anchor Points	37	
Suitability of Anchor Points	38	
Unsuitable Anchor Points	38	
Anchor Points for System Scaffolds	40	
Anchor Points for HAKI System Scaffolds	41	
Anchorage to Other Structures	42	
Rescue	44	
Post Rescue Action	47	
Fragile Roofs	48	
Mechanical Lifting Devices	49	

Foreword

We conduct our operations in some of the most challenging work environments our industry has to offer. It goes without saying that working at height represents one of the biggest hazards our scaffolding community are exposed to.

Over the past 20 years we have seen significant improvements in scaffolder safety. With the advancement of technology to improved safe systems of work, I firmly believe that we are at the forefront of working at height risk mitigation, but we should never be complacent. We are always looking for new innovative ways to improve and reduce risks in the workplace.

This booklet has been created with this in mind. It's a guide to an advanced safe system of work for our scaffolders which goes further than the current industry requirements. The concept of SAFE ZONE + sets additional stringent standards of scaffolder safety and provide greater controls to further reduce the risk of falls from height.

I ask that everyone in receipt of this booklet to read and follow the rules and guidance contained within, if you have any queries or questions then I strongly urge you to raise them with your line manager or supervisor before starting work.

We all have a collective responsibility for each other's health and wellbeing, with your continued support we can continue to raise our safety standards and achieve our vision of zero harm.



A handwritten signature in black ink, appearing to read 'John Walsh'.

John Walsh
CEO UK, Ireland & Nordics

Introduction

Falls from height account for almost half the fatal accidents which occur within the construction sector. Scaffolders commonly have to work in very hazardous environments and are regularly exposed to the risk of falls from height.

Since the introduction of SG4, in the year 2000, scaffolder safety has greatly improved, with an 87% reduction in the frequency rate of falls from height involving operatives working for NASC member companies.

However, to maintain the highest standards of safety for scaffolders working at height, **Altrad demands additional measures to be taken, over and above those specified in the current edition of SG4.**

This 'advanced' safe system of work is called SAFE ZONE +.

SAFE ZONE + is compulsory for all Altrad Scaffolders.

This pocket booklet has been produced as a handy, easy to use reference guide for scaffolders, supervisors, management and others who may be involved with the erection, modification and dismantling of scaffolding. It has been updated to reflect the changes to the latest revisions of NASC guidance SG4 as well as TG20 and to include additional information following some learning from recent Altrad incidents.

This document is not exhaustive and does not feature every scaffolding application. However, it has been designed so that the basic principles contained within it can be applied in most scaffolding solutions. If you are unsure how to safely undertake any scaffolding or other work at height task, contact your supervisor, Altrad Safety representative or Altrad Technical Authority for advice.

You have a responsibility to read and understand the safe systems of work contained within this handbook. If there is anything which is unclear, or if you have any questions, you must ask your supervisor, before starting work.

Don't undertake any work unless you have received suitable training and/or instruction.

Introduction

This document endeavours to:

- Explain the legal requirements for work at height;
- Identify the significant hazards that scaffolders are exposed to during typical scaffolding operations;
- Highlight the practical solutions available to control the risks that arise from those hazards.

The principles of the SAFE ZONE + assumes that:

All scaffolds are erected in compliance with the requirements of **TG20, the Altrad Technical Manuals and/or a Bespoke Design.**

All scaffolding squads shall be made up with a balance of qualified, experienced and competent operatives, who hold valid scaffolder cards of suitable grade for the type of scaffold to be erected, altered or dismantled.

When working for Altrad, you must always work to the SAFE ZONE + rules.

If for any reason, the work cannot be completed in full compliance with the mandatory rules of SAFE ZONE +, or if you are in doubt about any of the requirements of this Safe System of Work - **ASK YOUR SUPERVISOR.**

Note

This booklet outlines the minimum requirements for scaffolders to work safely at height. If you work on a site where different requirements apply (e.g. continuous attachment policy at all times until the scaffold is 'tagged'), please note that the site requirements apply **in addition to and not instead** of the provisions contained within this booklet.

Scaffolders Responsibilities

All employees have general duties under health and safety law to take reasonable care of themselves and others who may be affected by what they do or fail to do at work. They must also cooperate with their employer to enable them to carry out their duties.

With particular consideration for working at height and the potential hazards involved, as scaffolders you must always:

- Take positive steps to understand the hazards involved in the job you are doing.
- Always check and understand the requirements of the RAMS before starting work. Never start a job or task (no matter how small) until you have done this.
- If you are in doubt regarding any of the requirements within the RAMS or if you notice any hazards which have not been included, **REPORT THEM TO YOUR SUPERVISOR.**
- Look after and check all safety equipment daily and report any damage or defects. **One day it may save your life.**
- Follow the requirements of your training and the instructions given by your supervisor. Never act in a reckless or careless manner.
- Inform your supervisor of any medical condition which may affect your ability to work safely at height. Do not work at height if affected by drugs (including prescription medication) or alcohol, which could influence your ability to work safely.
- Understand the SAFE ZONE + 'MANDATORY RULES' and always work in full compliance with the requirements of this booklet and your training.
- Before starting any job, make sure that there is a suitable and effective rescue plan in place.
- Have a "brother's keeper" attitude and challenge unsafe working.

Mandatory Rules

Rule 1

During erection, modification and dismantling, your safety lanyard must, at all times, be connected to a suitable anchorage point.

Rule 2

All working platforms (including those required for temporary access) must be fully boarded and all boards should be fitted or removed from the lift below, wherever possible.

Rule 3

Never stand on tubes, beams or pipework.

Rule 4

Single guardrails must always be fitted to the next lift, before gaining access.

Note

These rules are mandatory and must be followed by scaffolders at all times when erecting, altering or dismantling scaffolding.

SAFE ZONE + Rules Supporting Information

Rule 1 Supporting Information

When working at height, Scaffolders must connect their safety lanyards (or Inertia Reel Blocks) to a suitable anchorage point and remain 'clipped on' at all times.

The only exception to this rule is Scaffolders may 'unclip' when working on a fully boarded platform fitted with double guardrails and toeboards (Figure 1) or when ascending/descending fully fitted access ladders (and maintaining 3 point contact). Ladders must also be firmly based on the ground or a fully completed access platform.

If the platform has double guardrails and toe board you may unclip except when reaching below the guardrails e.g. when fixing a brace, assembling/dismantling ladder access and staircases or when handling materials from below or above. (Figure 2)

During the erection process, all levels of the structure must be fully boarded out, with no gaps through which a person or materials could fall.

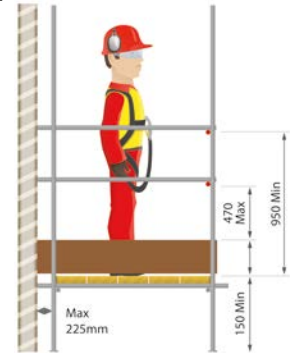


Figure 1: Fully boarded platform with guardrails and toe boards



Figure 2: Always clip on when raising materials

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Rules Supporting Information

Ladders should be fixed as early as possible during the erection process and removed as late as possible during dismantling, to remove the need for scaffolders to climb the structure.

Note

In every case ladders must be either footed or tied before being climbed. This requirement applies to everyone, every time they use a ladder. Climbing up or down scaffold braces or standard projections is strictly prohibited.

Where practicable ladders should always slope at 75° (i.e. 4 vertical to 1 horizontal) and ideally span one lift, but never more than 2 lifts maximum.

Rule 2 Supporting Information

Where scaffold lifts are to be used as working platforms for scaffold users, intermediate guardrails and toeboards should be fixed by the scaffolder, during construction, immediately after gaining access. This enables scaffolders to 'unclip' their safety lanyards and work without restrictions whilst constructing the next lift. (Scaffolders must attach their lanyards when accessing scaffolders steps).

Where lifts are not intended as boarded levels on the completed structure, the boards may be progressively transferred to subsequent lifts during the erection or dismantling process (see Figure 3).

The most efficient option is to leave the scaffold fully boarded, or every alternate lifts boarded, with removal of all boards from lower lifts being the last option.

During the erection and dismantling process, boards should be fitted and removed from below, wherever possible.

During erection Scaffolders should work progressively back towards the ladder access (or staircase) when transferring boards to the next level.

During dismantle Scaffolders should work progressively away from the ladder (or staircase) when transferring boards.

As a last resort if scaffold boards or System Decks (Pans) need to be removed from the same level a **stop end guardrail must be fitted to prevent access to the open edge** and additional guardrails are required to all open edges when the horizontal gap exceeds 225mm. Collective fall protection must be installed prior to deck removal and should be left in place unless it can be safely removed from below. In addition, a suitable anchor point must be used. (Figure 3)

On System Scaffolds a Deck must be left in each bay to aid the removal and replacement of adjacent Decks. (Figure 4)

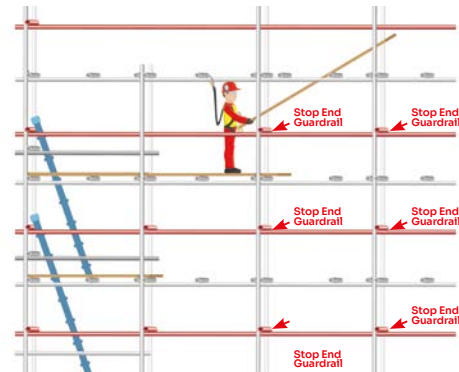


Figure 3: Stop end guardrail

Hempling Standards

Care must be taken when hempling (topping out) standards.

Tubes of appropriate length should be selected to ensure that the maximum height of the upstands are preferably 0.6m, maximum 1.6m, above the boarded platform.

Scaffolders must only select tubes (and system standards) of appropriate length, which they feel comfortable and able to fully control.

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Rules Supporting Information

Hemping Standards (continued)

Where possible hemping must take place from behind collective fall protection. (Figure 5)

When hemping from scaffolders' steps, the upstand should be no more than 1.6m above the step and the length of the standard must not exceed 3.1m.

It is permitted to top out with 16ft tubes from a fully boarded platform with collective fall protection.



Figure 5: Hemping behind collective fall protection

On System Scaffolds a deck should be left in each bay to aid the removal and replacement of adjacent decks.

Note

This technique requires an extra set of decks to start the bay above.



WARNING

Never stand on unsupported boards or incomplete platforms.



Figure 4: Leave a system deck in place to aid removal of others.

SAFE ZONE +

Rules Supporting Information

Rule 3 Supporting Information

Never stand on scaffold tubes, beams, pipework, cable trays. Even when 'clipped on'.

Exceptions:

- Trapeze tubes when erecting/dismantling slung scaffolds, where inertia reel blocks are used at all times.
- If a risk assessment has taken place and concluded that there is no safer method of performing the task other than standing on pipework or steelwork etc. This must be recorded and agreed with the client and senior safety representative on site or the Regional Safety Manager and all reasonably practicable measures must be put in place.

Rule 4 Supporting Information

Single guardrails must always be fitted to the next lift, to all open edges, before gaining access.

Single guardrails must be in place on the next lift before gaining access.

Existing permanent structures such as walls may be used as guardrails providing that the gap between the scaffold and wall is less than 225mm, the wall is at least 950mm above the boarded platform and there are no gaps in the wall larger than 470mm.

Techniques to achieve the forward guardrail

Tube and Fitting Advanced Guardrails

A **vertical advanced guardrail** (Figure 6) should be constructed on the ground (using 2 x 3m scaffold tubes and a single tube to suit the scaffold bay length, connected with right angle couplers) to form a 'goal post' frame. Aluminium tube may be used to reduce weight if preferred.



Figure 6: Vertical Advanced Guardrail

A right angle coupler should then be fixed to each 'upright' tube, 1100mm down from the centre or the top couplers. Note - these must be on the opposite side to the 'guardrail' tube and fixed upside down (Figure 6).

Two Scaffolders should then lift the goal post frame onto the ledger. The upside down couplers will support it until it is secured. An additional guardrail will be required (for the base lift only) for the vertical tubes to act against. (Figure 7)

When the 'permanent' guardrails have been installed, the goal post frame may be raised to the next level (Figure 7). The outside board may be turned back to access the couplers, if necessary. Where tie assemblies, transoms, buttresses or other protrusions obstruct the raising of the goal post, the build sequence will be critical to ensure that the guardrail is raised before other tubes are installed. If the guardrail is obstructed by facade bracing, the bracing should be fixed once the goal post has been raised.

Vertical advanced guardrails are not suitable lanyard attachment points so must not be used for this purpose.



Figure 7: Lifting the Goal Posts

Techniques to achieve the forward guardrail

System Advanced Guardrails

There are various types of advanced guardrails available for system scaffolds. The currently approved items for use at Altrad are listed below. If other types are required, contact the Technical Authority for advice.

- A. HAKI Guard Frames installed using the HAKI Advanced Guardrail tool in accordance with HAKI SSPTS training.
- B. Altrad Plettac Futuro or Metrix Permanent Advanced Guardrails installed in accordance with the Altrad Ring/Rosette training course.
- C. Altrad Plettac Futuro System Integrated Single Advanced Guardrails installed in accordance with the Altrad Ring/Rosette training course.

All advanced guardrails shall be installed from below from behind collective protection on a fully boarded lift to form the guardrails on the next lift. Boards can then be installed from below, ensuring that the lift above is fully boarded before gaining access. Dismantling should take place in the reverse i.e. boards removed from below first then advanced guardrails removed, both from behind collective protection on a fully boarded lift.

Advanced guardrails must not be used as an attachment point for personal fall arrest anchorage.

Scaffolders' Steps

Scaffolders' steps or 'Scaffsteps' are fixed to the main guardrail to provide a temporary platform, 1m above the boarded deck. This enables scaffolders to fit guardrail protection to the lift above, prior to gaining access (Figure 8).



Figure 8: Scaffoldstep User Guide

1. Ensure pre-user checks are carried out.
2. Open the product by disengaging the Velcro strap from the ladder rung, taking care not to trap your fingers in the hinges.
3. Orientate the platform side bars into position.
4. Offer the Step to the top guardrail.
5. Connect the Step to the top guardrail. Ensure that the retaining hooks fully lock around the guardrail.
6. Inspect the position of the ladder feet. If these are not sitting on a flat surface, adjustments need to be made to either the footplate.
7. To move / uninstall the Step, manually retract the retaining hooks simultaneously and disengage from the guardrail. Fold up the platform using the side bars and secure using the Velcro strap.

Additional Precautions

System Hop Up Brackets/ Additional Transoms

For system scaffolds, hop-up brackets or additional transoms fixed between lift heights and boarded out, may be used in place of scaffolder's steps. If the temporary platform height exceeds 500mm in height a fixed or footed ladder or Scaffoldstep must be used for access and egress.



Short Lift System

Once the ledgers and transoms have been fixed, as normal, a temporary intermediate lift (also referred to as a 'dummy' lift) is constructed 1m above the boarded platform. Scaffolders can then deck out the dummy lift to gain access to fix the guardrails on the next lift above.

The boards on the dummy lift may then be raised to the next lift and the transoms can be removed to provide clear access, if required.

The short lift system is ideally suited to system scaffolds but may also be applied to tube and fitting structures, if required.

When using scaffolders' steps, hop-ups or a short lift system, scaffolders (Figure 9) must always be clipped on before gaining access. Access to and egress from the dummy lift must always be gained by a suitable safe method e.g. fixed or footed ladder.



Figure 9: Short Lift Method

Additional Precautions

Birdcage Scaffolds

The main risk when erecting birdcage scaffolds is associated with raising and lowering boards over a large surface area. Intermediate transoms should be fitted to all bays and the whole area boarded out. Double guardrails and toeboards should then be fitted to all perimeter elevations, allowing scaffolders free access to the whole area without the need to be clipped on. This method of construction facilitates efficient and speedy erection of the next lift.

If the full surface area cannot be fully boarded scaffold may be boarded bay by bay ensuring any open edges are protected with collective fall protection.

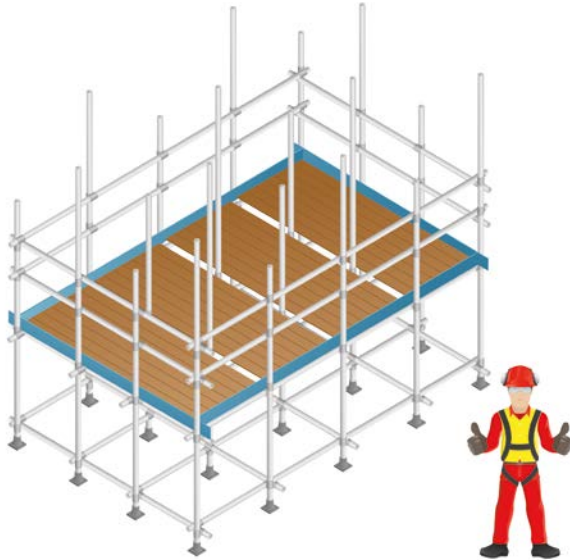


Figure 10: Method for erection of Birdcage Scaffolds

Prefabricated Beams

Where possible, consideration should be given to erecting beamed/bridging structures from Mobile Elevated Working Platforms, temporary scaffold structures or other suitable safe access structures. Doing this enables safer and more efficient rescue and ensures collective fall protection can be used.

Traditionally, when erecting prefabricated beams, scaffolders had to physically climb on the beams (commonly referred to as ‘crabbing’) to fix transoms and braces to form a structural box girder. This method relied solely on the use of twin tail lanyards for continual fall protection. However, in the event of a fall, this method provided great difficulty when carrying out the rescue. Undue delays (due to the difficulty in gaining access and affecting a rescue) puts the fallen operative at great risk.

Therefore, if alternative methods of access as described above cannot be reasonably achieved, transoms and boards should be progressively installed to the lower chords of the beams to form a temporary work platform. Guardrails can then be installed above the prefabricated beams to form some degree of edge protection (see Figure 11). Scaffolders should remain continually attached to a suitable anchor point until the bridge section is complete. All personnel erecting the prefabricated beams must be briefed on the agreed erection and dismantling steps detailed in the method statement. The leading hand of each gang should be an advanced scaffolder or scaffolder with sufficient training for the specific job.



Figure 11: Construction of Prefabricated Beams and temporary boarding

Additional Precautions

Cantilevered Structures

Advanced guardrails can be constructed from the 'horse' or main scaffold, in the form of a horizontal goal post frame. Each side member must be loosely connected through two standards before the frame is pushed out and tightened to form a temporary guardrail over the cantilevered section.

The needles may then be progressively boarded out to create a scaffolders' SAFE ZONE +, for the fixing of rakers and transoms etc. Scaffolders should remain continually attached to a suitable anchor point until the cantilevered section is complete. (Figure 12 and 13)

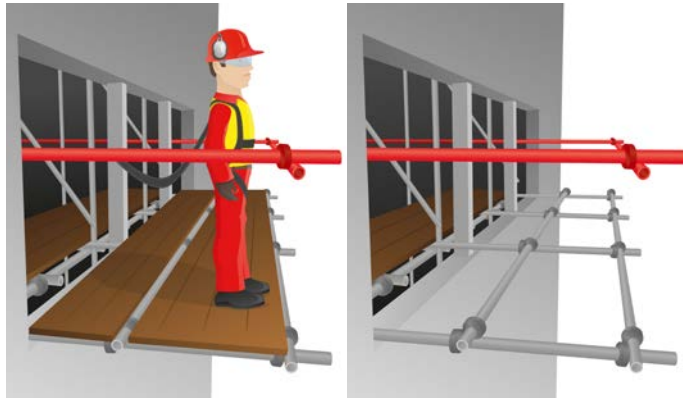
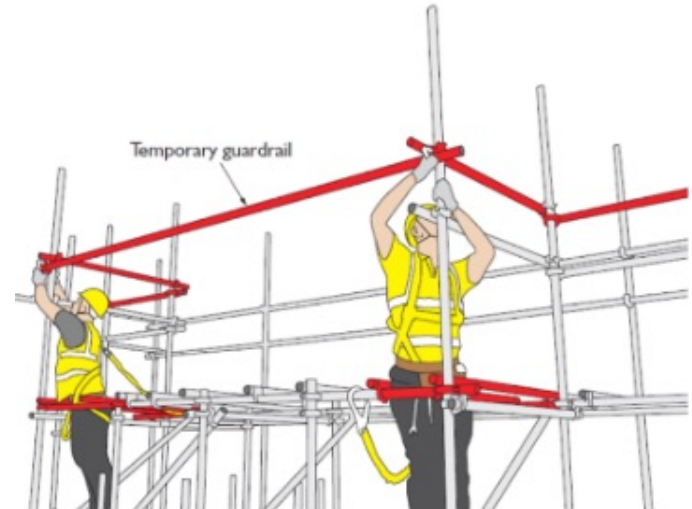


Figure 12: Guardrail pushed out horizontally from back scaffold. Guardrail extension (cantilever on horizontal tube must not exceed 1.20m).

Figure 13: Needles are boarded out to create a scaffolders' SAFE ZONE + before fitting rakers. Maximum 5 boards wide. Must be clipped-on to main scaffold.

Loading Bays

Before installing and removing loading bay gates, scaffolders should fix a temporary guardrail to maintain the scaffolders' SAFE ZONE +. The temporary guardrail is removed once the gate is installed.



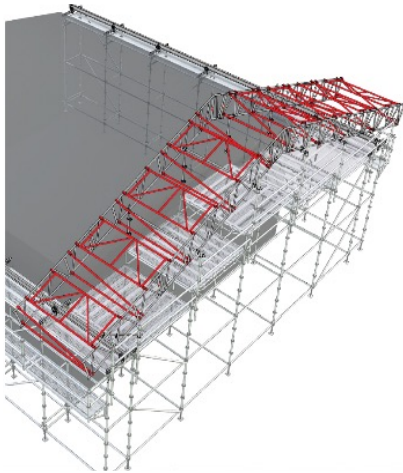
Temporary guardrail for loading bay gate

Additional Precautions

System Temporary Roofs

All system temporary roofs and supporting structures must be subject to a specific Altrad design, and planned to consider specific measures for preventing falls from height. The method of roof erection must take account of all factors and the safest reasonably practicable solution chosen following consultation between the client and Altrad site, safety and design teams. Specific Risk Assessment and Method Statements which detail the key steps of erection, movement/lifting and dismantling must be in place. Altrad do not permit “crabbing” of beams therefore the “hand-built” method of erection is rarely an option unless this can be achieved by erecting from behind collective protection on another structure such as a temporary scaffold or MEWP.

For system roofs eg DESSA, HAKI, Layher etc., all personnel erecting the roof must have attended training by either manufacturer and/ or Altrad and the leading hand of each gang must be an advanced scaffolder.



System temporary roof

Erection, modification and dismantling of temporary roof systems are high risk activities. During the planning stage the following Work at Height Regulations hierarchy must be considered when preparing safe systems of work and build methodology.

Avoid work at Height

This is unlikely to be an entire solution but there may be scope for reducing the amount of working at height. e.g. Assembling sections on the ground and lifting into position.

Prevent fall by collective equipment

1. Can the roof be erected entirely from fully guarded platforms?
2. Can the roof be built using MEWPs or independent towers?
3. Can the roof design be chosen where most of the work can be carried out from fully guarded platforms, rather than relying on harnesses? e.g. A system roof where the covering can be pulled across from the scaffold platforms, rather than a CI roof which has to be worked on in order to install the sheets.

Prevent fall by personal Work Equipment

If personal fall protection equipment has to be relied on, consider the use of lanyards which would provide work restraint rather than a fall arrest system (i.e. it stops the person actually reaching an open edge at all).

Location and adequacy of anchor points need careful consideration.

Operatives must be anchored to separate components.

Mitigate the effect of fall by using collective measures	e.g. Nets below the working areas (if suitable anchor points are available and the nets themselves can be fitted safely).
Mitigate the effect of Fall by using Personal Measures	<p>This is the last resort, and includes fall arrest lanyards. A detailed, job-specific method statement should be prepared: the risks are high and demand a proportionate level of planning, training and supervision. The location and adequacy of anchor points need careful consideration. The type of lanyard should be suitable e.g. twin lanyards for traversing beams (see SG4). Harness inspection regimes should be robust (see HSE leaflet INDG367). Rescue procedure should be in place. Adequate supervision to ensure personal fall protection equipment is used correctly.</p> <p>Operatives must be anchored to separate components.</p>

For details of Safe Systems of Work the appropriate Safety Guidance should be followed. Four methods for constructing temporary roofs are:

1. Building the roof progressively from a gable end scaffold with table lifts and full collective protection, or from another fully protected platform, and rolling out.
2. Building the components on the ground in sections and lifting into position by crane. Whilst this reduces working at height, it also often involves a need to provide working platforms to access the beam lines to connect lifted sections and there can be difficulties weather-proofing joints.

3. Constructing a movable access platform(s) to act as a protected platform for assembly and dismantling.
4. Erecting and dismantling components in-situ from the beams or other roof components using a fully boarded bottom chord and guardrails in addition to PPE.

However, there are other issues that influence the ability to build temporary roofs safely, which include:

- Design brief, or detailed design request, detailing all requirements and discussed between the site and design teams, and client if required, prior to starting the project (may not be required for small simple temporary roofs)
- Job specific risk assessment, discussed between the site and design teams, and client if required, throughout the project (may not be required for small simple temporary roofs)
- A job-specific design aimed at eliminating/reducing the risk of fall and other hazards identified by the risk assessment.
- Scaffolders should be fully trained in the equipment used, with proof of training.
- The designer should be fully familiar with the equipment selected.
- For proprietary temporary roof systems, erection / user guides on the selected method should be provided by the supplier.
- If personal fall arrest is utilised, with twin lanyards, job-specific rescue plan must be provided.
- Anchor points should be determined and agreed with the designer for adequacy.
- A materials handling plan should outline the procedure for getting the materials to the workplace, both to the scaffold working platform and their final fixed position on the roof.
- A job specific method statement must be developed from the above for all temporary roofs which use beams or system components.

Additional Precautions

Traditional Temporary Roofs

When erecting, modifying or dismantling temporary roof structures the SAFE ZONE + Rules must be followed.

All traditional temporary roofs and supporting structures must be subject to a specific Altrad design or use one of the Technical Manual solutions, and planned to consider specific measures for preventing falls from height. In all cases, and as a minimum, a double guardrail must be fitted around the perimeter of the roof of the temporary building/enclosure. Note – Gaps between guardrails must not exceed 450mm.

The sheeting material must be fitted in accordance with the manufacturers instructions and from behind collective fall protection.



Traditional temporary roof

Roofs must be close boarded, with any gaps between boards kept to a minimum. The practise of 'ranch boarding' on the roof is prohibited and any gaps between boards must be for a specific reason, e.g. fixing of metal boards, tying of bungees.

Suitable access and egress must be provided, which should be removed at times when access is not required.

The method of roof erection must take account of all factors and the safest reasonably practicable solution chosen following consultation between the client and Altrad site, safety and design teams. Specific Risk Assessment and Method Statements which detail the key steps of erection, lifting (where required) and dismantling must be in place. Altrad do not permit "crabbing" of beams therefore the "hand-built" method of erection may only be used if the bottom chord of the beams is boarded out to form a safe working platform or erection can be achieved by erecting from behind collective protection on another structure such as a temporary scaffold or MEWP.

For traditional roofs constructed using conventional Tube, Fittings, boards and beams, all personnel erecting the roof must be briefed on the safe erection of the roof and the leading hand of each gang must be an advanced scaffolder.

Falsework and Formwork

When erecting, modifying and dismantling falsework and formwork the basic principles of SAFE ZONE + must be followed.

Temporary Edge Protection

When planning the installation of temporary edge protection the Safe Work at Height Hierarchy of Risk must be considered. This can include the following options; Pre-fix guardrails to steelwork, utilising Mobile Elevated Working Platforms, restraining systems and the use of collective fall arrest systems. At no point during the erection of edge protection should scaffolders be exposed to an open edge unless a fall restraint system is used.

Work at Height Regulations 2005

Requirements of the Regulations

Reg 6 – Follow the Safe Work at Height Hierarchy of Risk

AVOID	Erect low level structures from grade. Build bespoke design scaffolds at ground level and crane in place.
PREVENT	Provide fully decked platforms with guardrails and toeboards etc. to prevent objects or people falling (SAFE ZONE +). Utilise Mobile Elevated Working Platforms.
MITIGATE	Where the risk of falls remains, minimise the distance and consequences of a fall. (e.g. fall arrest). (Note – Safety harnesses provide the lowest level of protection).
At all times	Collective fall protection measures (e.g. guardrails, safety nets etc.) must always take priority over personal protection.

Scaffolders can avoid working at height by erecting, modifying and dismantling structures below 2 metres high from ground level. In addition, Bespoke Designed Scaffold structures can be built at grade, craned in to place and subsequently lowered to ground level to be dismantled. However, due to the fundamental aspects of scaffolding construction, avoiding work at height is not normally an option for scaffolders. The requirement for preventing falls (e.g. by providing adequate work platforms with suitable guardrails or other 'collective' measures) must always be sought before resorting to personal fall protection equipment (i.e. safety harnesses).

Planning

Before scaffolders undertake any work at height, it is essential to plan the work to be performed, taking account of any foreseeable hazards involved and establish suitable control measures.

This process should include the method and sequence of work, how scaffolders can safely gain access, for both themselves and materials, to and from the work zone and how they will prevent falls and dropped objects.

In doing this, they must always consider the hierarchy of preventative and protective measures required by the Work at Height Regulations and the SAFE ZONE + Mandatory Rules.

It is essential that a suitable and sufficient risk assessment is always carried out to consider the tasks to be performed, taking account of any foreseeable hazards and establishing appropriate control measures. In addition, for complex structures a specific suitable method of work (Method Statement) detailing the key steps of erection and dismantle must be produced. All members of the work team and any 'third parties' who may be affected by the work shall be made aware of the hazards and the designated controls. In the case of employees, this must be, as a minimum via a pre-job brief, recorded with signatures on the risk assessment form.

Appropriate levels of competent supervision must be provided for all work, considering the nature of the work and the competence of the scaffolders involved.

Supervisors are responsible for ensuring that suitable safety and rescue equipment is always available and that all work is carried out safely and in compliance with the safe systems of work and the requirements contained within this booklet.

A scaffolder fell 8m from a scaffold he was erecting, resulting in major injuries. He was wearing fall arrest equipment, but had failed to use it in accordance with the training and instruction given by their employer.

The accident was investigated by the HSE, who prosecuted the scaffolder under section 7 of the Health and Safety at Work Act.

In addition he lost wages whilst recovering from their injuries, had to pay a fine of £1200 and received a criminal record.

Personal Fall Protection Equipment

Personal fall arrest equipment forms the lowest level of protection against falls from height, hence the need to always install fully boarded platforms and fix guardrails as soon as possible.

The use of fall arrest equipment alone will not prevent a fall occurring, but if used correctly will reduce the distance and consequences of a fall and could prevent a worker from hitting the ground or impacting other structures.

The utilisation of fully boarded platforms and guardrails provides a much higher level of protection against falls.

The risk of a fall in most scaffolding operations cannot be completely eliminated, so scaffolders must wear a safety harness and a twin tail lanyard at all times when working at height. Fall arrest equipment must always be used in accordance with this booklet and any training and instruction received.

When using personal fall arrest equipment, there is always an inherent risk of injury if a fall should occur. In order to minimise this risk, consideration must be given to reducing the distance and consequences of a fall.

To minimise the potential fall distance, it is important to always position your anchor point as high as possible. The shorter the distance, the lower the forces that will be imposed on the body in the event of a fall. Always transfer your attachment point to the highest available anchor point as soon as one becomes available.

Basic fall protection equipment consists of:

- **Full body harness** complete with front and rear dorsal ring (to BS EN 361). Harnesses should also be fitted with sacrificial parking clips for securing lanyards when not in use. (Figure 15)



Figure 15: Full Body Harness with Parking

Figure 16: Twin Tail Lanyard



- **1.75m twin tail lanyard** (BS EN 354) with a single integral shock absorber (to BS EN 355). (Figure 16)
- **55mm opening scaffold hook** for one handed operation (to BS EN 362).

Other equipment, which may be considered, are twin tail self-retractable lanyards (Figure 17) and inertia reel blocks (to EN 360). (Figure 18)



Figure 17: Twin Tail Self Retracting Lanyard



Figure 18: Inertia Reel Block

Personal Fall Protection Equipment

Correct Adjustment of a Safety Harness

Full-body safety harnesses are designed to prevent injury, but they must be properly adjusted to work efficiently. While some workers mistakenly prefer loose fitting safety harnesses for comfort, harness designs require a snug fit to prevent serious injury in the event of a fall. Placement and connection of the chest strap, leg straps, back strap and D ring critically affect harness fit and your safety. A loose car seat belt will not restrain a person properly in an accident, and neither will a safety harness.

1. Ensure that no straps are twisted and that there are no loose ends.
2. Ensure that the chest strap sits just below the breast bone. If not, adjust the top buckles until it is at the right level.
3. Adjust both leg straps to give a tight but comfortable fit.
4. Check that the fit is correct by inserting 2 fingers flat beneath the shoulder strap. If you can turn your fingers to the vertical position when standing up straight, the leg straps are too loose.
5. The back plate should sit directly between the shoulder blades. You should be able to touch the rear D ring with the tips of your fingers. If necessary, remove the harness and adjust to suit.
6. The back strap should run horizontally across your back.



Figure 19:
Correct
Adjustment
of Safety
Harness

Correct Adjustment of a Safety Harness

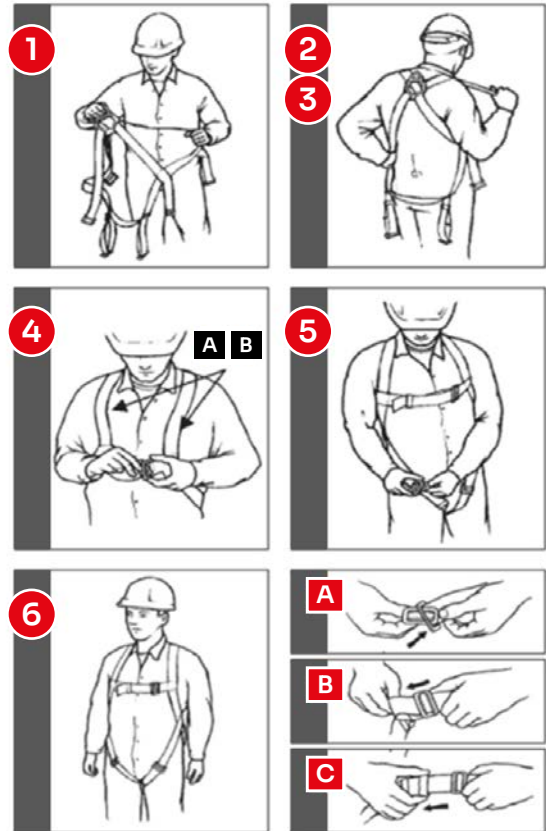


Figure 20: Donning a Safety Harness

Personal Fall Protection Equipment

Twin Tail Lanyards

Twin tail lanyards, with a single integral shock absorber, allow scaffolders to remain continuously attached to a secure anchorage point.

Note - the use of double lanyards, with two shock absorbers, is strictly prohibited. Using this type of equipment could result in double the impact load being imposed on the body, in the event of a fall.

When using only one of the lanyards, scaffolders must NOT wrap the spare lanyard around their body or attach it back to the harness or tool belt, as this could reduce the effectiveness of the energy absorber and increase the load transferred into the body. The spare lanyard, when not in use, should either be clipped onto the same anchor point, or be connected to a purpose designed sacrificial parking clip, fixed to the harness (see Figure 15).

Inertia Reel Blocks

Retractable line fall arrest devices (commonly known as Inertia Reel Blocks) incorporate a steel cable or material webbing line which extends and retracts automatically. Should a fall occur, a braking mechanism contained within the unit, automatically prevents the line paying out to arrest the descent.

Inertia reels are available in various lengths of line and sizes of block and vary in weight. Care must be taken when considering a system of work using inertia reels, as they must be suitable for the particular operation and be used in accordance with the manufacturer's instructions.

When specifying inertia reels, consideration must be made for rescue and recovery, should a fall occur. Where steel inertia lines are used then short webbing connection strops should be connected in line to enable a rescuer to release the primary fall arrest equipment by cutting the webbing strop, if necessary.

Note Inertia Reels should not be used as the primary rescue device unless safe access would be available to the casualty or the individual is already attached to the device.

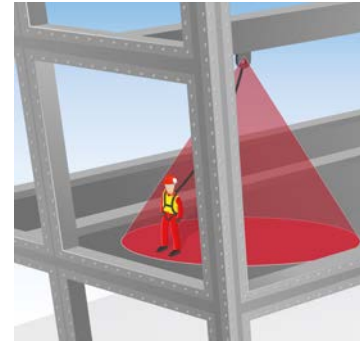


Figure 21: Do not exceed manufacturers maximum recommended angle from vertical (Generally 30°)

Most inertia reels are designed for an anchor point to be located above the scaffolder to limit the distance a person can fall to a minimum.

Generally, inertia reels should only be used in a broadly vertical plane with minimal horizontal movement, thus minimising the pendulum effect, with the risk of striking a structure or the ground, if a fall should occur (Figures 21 and 22).

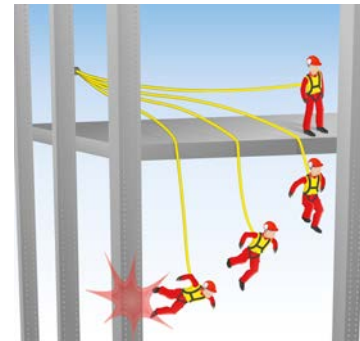


Figure 22: The Pendulum Effect

Personal Fall Protection Equipment

Inertia reels are ideally suited for drop-lift or slung scaffolds, where a suitable anchor point can be fixed above, and scaffolders are then able to erect, alter and dismantle the lift(s) below whilst remaining attached.

Where the inertia reel is mounted out of reach, a tag line can be fitted to the end of the spooling line. This allows the line to be extended for connection to the harness and retracted in a controlled manner when not in use, without the need to climb up to the reel. The tag line should be a lightweight, load-bearing line.

Inertia reel blocks should not be installed where the cable can become entangled with obstructions, pass over sharp edges or where it may come into contact with live electrical cables etc.

Before using an inertia reel block, scaffolders must carry out a pre-use inspection by visually inspecting the casing and cable for damage, checking that the brake indicator has not been activated and checking the locking action by jerking the cable.

The block should never be connected to a lanyard with shock absorber, and the cable should never be allowed to pass beneath arms or legs.

Care should also be taken to keep the cable free from paints, oils, grease or dust and never allow the cable to spring back into the block. These things could result in damage or affect the efficient operation of the mechanism.

Inspection and Maintenance of Personal Fall Arrest Equipment

Fall arrest equipment made from webbing is particularly vulnerable to wear, tear and damage during normal use by scaffolders. Suitable arrangements must therefore be in place for the inspection and storage of all fall arrest equipment to ensure that it always remains fit for use.

A pre-use check of both the harness and lanyard must be carried out by the user before each use. This should be both tactile and visual and consist of slowly passing the hands over the full length of the lanyard and all harness straps to detect any hardening or softening of fibres, ingress of contaminants, evidence of burning,

cuts or loose stitching. All metal parts should be checked for distortion, wear and hooks for safe operation. This inspection should be undertaken in good light and will normally take a few minutes.

Any concerns or defects identified during a pre-use check (or indeed any defects noted during use) should be reported to supervision without delay. The equipment must then be taken out of service, pending a detailed inspection, by a competent person.

Detailed Inspections

Formal in-depth inspections must be carried out by a competent person looking for underlying defects or problems that may not be identified during pre-use checks. Detailed inspections shall be carried out every month.

Interim Inspections

When the equipment is used in arduous conditions, such as dusty or very hot or wet environments or where there is a significant risk of contamination with paint or chemicals, further in-depth inspections may also be required to be carried out, between detailed inspections. The need for interim inspections and their frequency should be identified through risk assessment.

Ancillary equipment, such as strops, inertia reel blocks etc. must also be subject to a suitable inspection regime, which should always include pre use checks. Inertia reel blocks shall also be thoroughly inspected/serviced every 12 months (6 months for retrieval blocks) or sooner if specified by the manufacturer or their authorised service agent. The results of all detailed and interim inspections must be recorded and kept at least until the equipment is disposed of.

Any equipment considered to be defective or unsafe, shall be securely quarantined to prevent it being used. Inertia reel blocks may be returned to the manufacturer or an approved service agent for repair. Other equipment should be destroyed.

Any equipment which has been subjected to an arrested fall, should never be reused.

Personal Fall Protection Equipment

Storage

Often fall arrest equipment is taken off at the end of a shift and tossed in the back of a van, locker, or gang box. Even worse some harnesses and lanyards are left lying around the jobsite, exposed to the elements: rain, heat, freezing temperatures, and direct sunlight.

All of this can potentially result in serious damage. To properly care for your equipment, it is important to keep your harness and lanyard in a clean, cool, dry place.

Harnesses should be hung, so that they don't get crushed, bent, or torn by other objects in the storage area. Sharp tools can slice the nylon and chemicals could cause the material to degrade.

Ensure that your storage area is not in direct sunlight or exposed to a heat source. Heat and UV rays can compromise the materials that make up your harness and lanyard.

Cleaning

Fall arrest equipment should be cleaned on a regular basis. This helps to ensure that there is no substance on the harness and lanyard that could degrade the materials. It also ensures that all parts of the equipment can be clearly seen when they are being inspected.

Care must be taken when cleaning the equipment. Soaking the harness or lanyard can potentially damage the fibres and never use bleach, chlorine or abrasives, as they can also seriously affect the webbing.

Use a damp sponge (warm water only) to wipe away any dust or residue from your straps and buckles.

Then, use soap and water to work up a lather on the straps. The soap should be nothing more than washing up liquid or laundry detergent.

Rinse the lather from the straps using a sponge with clean water, but do not soak the harness or lanyard as this can cause damage.

Finally, wipe the equipment and hang it up to dry.

Whilst cleaning the equipment may seem tedious or a waste of precious time, it's pretty much guaranteed that the wearer will be happy you spent the time, should it ever be needed to save their life. In the end, fall protection equipment is a scaffolders' best friend. Treat it like that and it will be effective when it is needed most.

Anchor Points

Personal fall protection systems are totally reliant on attachment to a suitable anchor point. In the event of a fall, very high loads are transferred to the anchorage, so it is essential to know that the anchor point selected and its supporting structure is adequate to resist the potential imposed loading.

Scaffolds must be erected in accordance with the relevant British and European Standards (e.g. BS EN 12811), Design Solution, and associated technical guidance (e.g. TG 20) so that they remain adequately stable. Where ties and stability measures (e.g. buttressing, kentledge, guys and anchors etc.) are required, they should be installed and removed as the work progresses to ensure optimum stability against overturning or collapse, at all times.

This also includes temporary (dummy) stability measures which are required solely for erecting, altering and dismantling purposes.

It has been established by independent and in-house testing that steel tube and fitting scaffolds, compliant to TG 20 or the Altrad Technical Manual, can provide safe anchor points. However, where alternative scaffolding materials are used, such as, aluminium or glass reinforced plastic (GRP) towers, users must contact the manufacturer to ensure that anchorage to the structure is appropriate.

Personal Fall Protection Equipment

Suitability of Anchor Points

Suitable Anchor Points for Tube and Fittings Scaffolds.

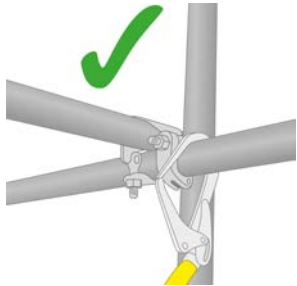


Figure 23: Ledger or Transom fixed with Right Angled Couplers (Double)

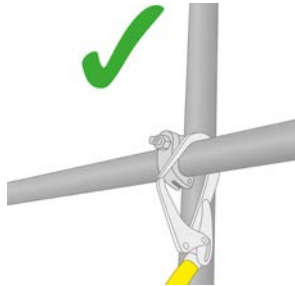


Figure 24: Guardrail fixed with Right Angled Couplers

In addition

- Plan Bracing fixed with Right Angled Couplers
- Standards - Only when using a suitable anchor device e.g. Jordan Clamp, WRAPPA Sling and there are no joints between lift and attachment point

Unsuitable Anchor Points

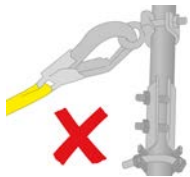


Figure 25: Standards with a joint above platform



Figure 26: Transom below foot level



Figure 27: Putlog transom or bridle tube



Figure 28: Ledger guardrail on single couplers



Figure 29: Where there are joints in ledger or guardrails

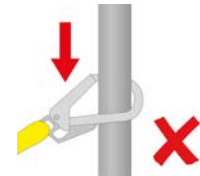


Figure 30: Standards without suitable device



Figure 31: Transoms underslung on non-load-bearing couplers

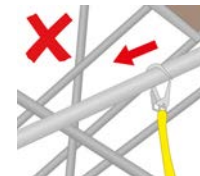


Figure 32: Vertical Brace



Figure 33: Reveal Ties

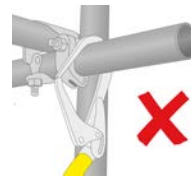


Figure 34: Open Ended Tube

Personal fall protection equipment should not be used during the erection, modification or dismantling of lightweight mobile towers as they do not provide suitably stable and secure anchorage. A Safe System of Work for the erection, use and dismantling that minimises the risk of a fall must be in place and in accordance with the manufacturer's user instructions.

Personal Fall Protection Equipment

Anchor Points for System Scaffolds

Specific rules also apply to system scaffolds and anchor points must be as specified within the manufacturer's user manual and CISRS SSPTS training. (Contact your supervisor if unsure).

Anchor to in order of preference:

- Ledger or transom up to 3.07m long 2m above lift - fully locked
- Rosette large hole 2m above lift and secured by transom
- Rosette large hole 1m above lift and secured by transom or ledger (guardrail)
- 48mm diameter guardrail (not system guardrail) fully locked
- Ledger up to 3.07 long at foot level - fully locked

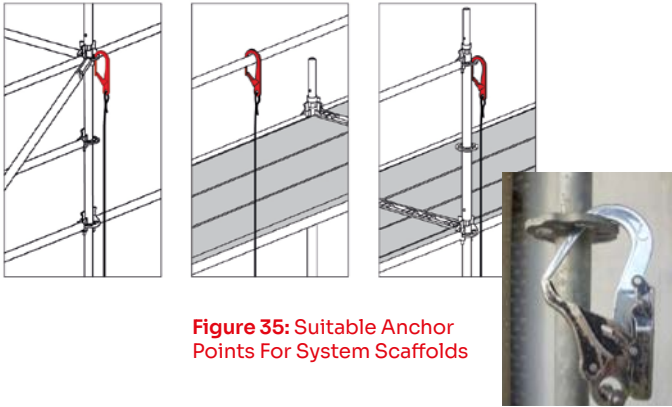
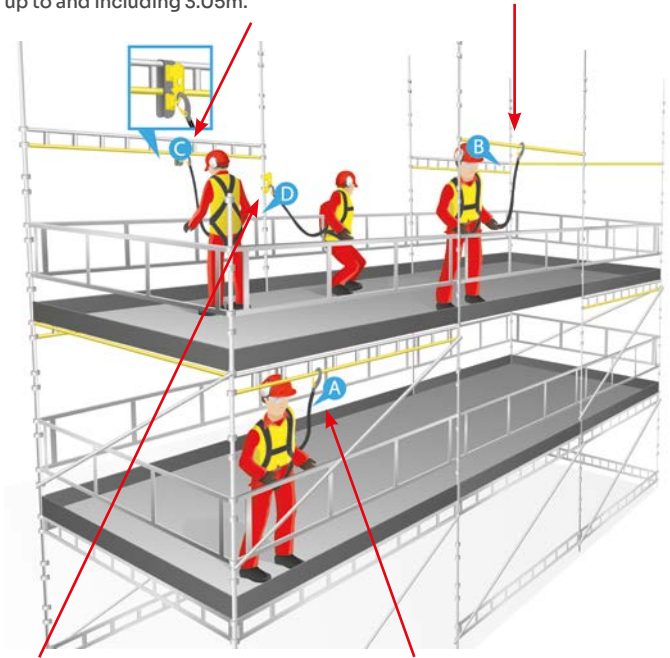


Figure 35: Suitable Anchor Points For System Scaffolds

Anchor Points for HAKI System Scaffolds

C - "Hook" locked to BRS which is already on a ledger beam in a bay up to and including 3.05m.

B - Single ledger beam fixed in a bay up to and including 3.05m.



D - "Hook" locked in to position on unrestrained standards connected up to 1m. NOT next to a standard joint unless pinned.

A - Bottom chord of ledger beam fixed in a bay up to and including 3.05m.

Figure 36: Suitable Anchor Points For HAKI System Scaffolds

Personal Fall Protection Equipment

When using a suitable anchor device designed for the purpose (e.g. Jordan Clamp or WRAPPA Sling), system scaffold standards may also be used as anchor points as long as there are no joints between the lift and the attachment point and the anchor device is installed no higher than 1.0m above the fully completed lift below.

No other points of attachment are recommended. Fall protection equipment should not be attached to system guardrails, brackets and cantilevers, i.e. beams fixed only at one end. Fall protection must not be attached to components that have not been locked into place. Only one person may be attached to the same component at one time.

Note HAKI standard pockets should never be used as anchor points.

Anchorage to Other Structures

Where alternative anchor points need to be used, they should always be checked to ensure that they are suitable and where necessary approval must be sought from the client or site owner.

Possible anchor points may include beams, girders, other structural steelwork and permanent installed anchor points (but only with current inspection certificate). Connection to such members will generally need to incorporate a strop, beam clamp or other proprietary equipment.



Figure 37: Special Connectors and Anchor Devices

Horizontal (tensioned) line systems (Figure 35) may be used to provide access along a lift or structure. However, these must always be proprietary systems or be specially designed by a competent person. Consideration must be given to the amount of deflection in the line, the clearance required below, the suitability of the supporting structure, the ability of the anchor point to support the imposed impact load and the maximum number of persons who may be attached at any one time.

Scaffolders must never fix safety lines unless they have been specifically trained to do so.



Figure 38: Horizontal (tensioned) line systems

Note

Line Systems can be used for restraint and fall arrest. The type of lanyard must be appropriate for the task.

Tension the line, until the Tension Force Indicator reaches the manufacturers recommendations.

These systems should subject to design by a competent person.

Rescue

It is essential to have a rescue and recovery plan in place for any work involving work at height. There are severe health risks associated with anyone who has fallen and remains suspended in a fall arrest harness.

Should an operative accidentally fall and be suspended from their safety harness, this must always be considered an emergency situation and rescue must be administered without delay to reduce the risk of

- Suspension syncope' (also known as 'suspension trauma') occurring.
- Bleeding
- Restricted airways

A suitable Rescue Plan must be in place and fully understood by all involved, before work commences. This requirement remains even if the client insist they carry out all rescues. The rescue techniques and the rescue equipment selected will depend upon the type and complexity of the scaffold structure.

Scaffolders must be fully aware of the emergency procedures, including the means of raising the alarm and alerting the rescue team, before starting every job. This should always be detailed on the Rescue Plan.

Scaffolders working at height must never work alone.

If a fallen scaffolder is not seriously injured or unconscious, in many cases (e.g. when working on an independent birdcage or tower scaffold) he may be able to recover them self, or their colleagues could assist in a rescue, without the use of specialist rescue equipment. It is feasible for a scaffolder to pull them self into the scaffolding structure at a lower lift. On un-boarded lifts, additional boards may need to be re-fitted by their colleagues.

If complete self-recovery is not possible, merely supporting them self on a ledger or other part of the structure until rescued will significantly reduce the risks from the effects of suspension in a safety harness. In some cases, it may be possible to quickly construct a trapeze tube or extend a lower ledger to provide temporary support.

If however the faller is injured, unconscious and/or suspended in mid-air (e.g. when working on slung, cantilevered or bridged structures, and un-boarded scaffolds) rescue is more difficult to achieve and specialist equipment and trained personnel must be on hand to affect a rescue within suitable timescales.

Note We must always plan for worst case scenario.

Some sites may employ dedicated rescue teams which must be called in the event of any emergency. In the case of a fallen scaffolder, suspended by their safety harness, it must be confirmed that they have the capacity to effect a rescue as soon as possible (but in any case within 10 minutes). Otherwise company facilities and procedures must be adopted.

All persons required to carry out rescue and retrieval operations must first receive suitable practical (recorded) training covering the appropriate rescue procedure and equipment available on site.

Suitable rescue kits can be deployed quickly by trained operators to facilitate a remote rescue, without exposing the rescuers to unnecessary risk.

When choosing a rescue kit, it is essential to ensure that it is suitable for each particular scaffolding application. For example:

- Type and location of anchor points
- Is there sufficient rope length to lower a person to the ground from the highest position if necessary?
- Does the device allow casualties to be raised or lowered?
- Is the device a descender only type, which may not be suitable for certain situations such as work over water or very high level work where a large quantity of rope would be required?
- Is the rescue equipment readily available at all times when working at height?
- Are there sufficient numbers of trained personnel available at all times during work at height that can use the equipment?

Some rescue kits require a high anchor point while the original GOTCHA Type is designed to be used on any anchor, high or low.

Rescue



Figure 39: IKAR System (High Anchor)



Figure 40: GOTCHA CRD (High Anchor)



Figure 41: Traditional GOTCHA High or Low Anchor

Figure 42: Retractable Inertia Reel (High Anchor) not be used as the primary rescue device unless safe access would be available to the casualty or the individual is already attached to the device.



Post Rescue Action

The rescued scaffolder should immediately be seen by a qualified First Aider, who may elect to call the emergency .

If the scaffolder is conscious, he should be advised to sit down until a First Aider has examined him and is satisfied that he has fully recovered.



Figure 43: Recovery position

If the operative is unconscious, semi-conscious or injured, the First Aider should ensure that their airway is open, and he is breathing. Only then should he be put in the recovery position and their injuries tended until the emergency arrive.

The Ambulance crew should be made aware that the patient has been suspended in a safety harness and needs to be treated for suspension syncope or orthostatic intolerance.

Fragile Roofs

When working on or near fragile surfaces the following hierarchy must be considered from top down:

Avoid Fragile Surfaces

- Avoid accessing near, across or on fragile surfaces
- Planning to consider alternatives methods of work that avoid the risks from fragile surfaces e.g. Working from a MEWP above or below the surface

Prevent Falls

Prevent fall through fragile surfaces

- Provide platforms, coverings, guardrails or similar protection
- Work from staging's or platforms with guardrails
- Use harness systems to prevent access on or near a fragile surface (work restraint)

Mitigate Falls

Mitigate falls through fragile surfaces

All roofs accessed by scaffolders must be treated as fragile until a competent person has confirmed they are not.

- Post warning signs on the approaches to the fragile surface area
- Scaffolders to receive specific information, instruction and training before commencing work on or near a fragile surface. E.g. RAMS Briefing and equipment training

Mechanical Lifting Devices

For lifting of single tubes, a “Plettac Ring Clamp” or “Jordan Clamp” should be used (Figure 44).

For lifting of double tubes, a “DESSA Double Scaffold Tube Lifting Clamp” should be used (Figure 45).



Figure 44: Single Tube Lifting Device

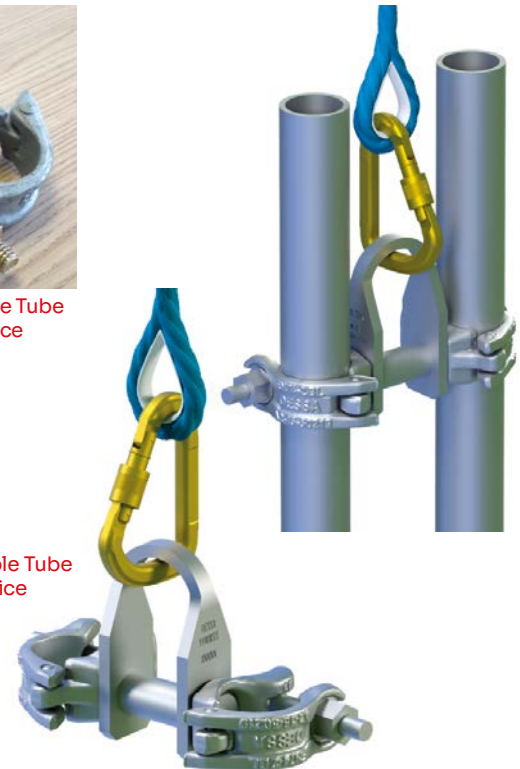


Figure 45: Double Tube Lifting Device

Mechanical Lifting Devices

Scaffold Board Lifting Device

For lifting of scaffold boards, a “S.Wood Board Lifting Strap” or “Spanset Board Sling” should be used (Figure 46).



Figure 46: Spanset Board Sling

System Deck Lifting Device

For lifting system scaffold decks, a 5mm wire rope sling at 500mm long should be used (see Figure 47).

Alternatively, for sites who already have them or if preferred, a Spanset “Deck Lifting Hook” may be used (see Figure 48).



Figure 47: Wire Rope Sling



Figure 48: Deck Hook

SAFE ZONE +

I acknowledge receipt of my personal copy of the SAFE ZONE + Scaffolders’ Handbook and confirm that I have attended the SAFE ZONE + Altrad training.

I agree to abide by the Scaffolder rules, recommendations and Scaffolder responsibilities set out in this booklet and will seek clarification from my Supervisor on any points of which I am unsure.

Print Name:

Signature:

Date:

Job Title:



Altrad Services

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