



Mineral Products Association

The Trade Association for the Aggregates, Asphalt, Cement, Concrete, Dimension Stone, Lime, Mortar and Silica Sand Industries



Guide to Safe Working at Height

Clear, Simple, Smart

Version 1.0

Introduction

The MPA and its members have committed to Vision Zero to ensure that everyone goes home Safe & Well Every Day. Vision Zero is built around eliminating the causes of 'The Fatal 6'. This booklet has been produced to outline how the potential hazards associated with activities that involve working at height can be either eliminated or mitigated within the mineral products industry.

The application of the principles outlined within this handbook will achieve a significant reduction in fatalities and serious injuries due to a fall from height. All incidents involving falls from height can be avoided by applying and following the right procedures or engineering solutions.

Based on the hierarchy of control (HOC), the handbook provides 'clear, simple and smart' guidance for those managing Work at Height. An introduction is provided for each element of the hierarchy of control, along with examples of good practice and questions every site should be asking. The guidance should be considered when conducting a risk assessment and conducting a work at height safety review.

The handbook is designed for use by managers, employees, and contractors within the mineral products industry. Please share it within your organisation.

The booklet has been prepared as part of MPA's Vision Zero strategy.



Vision Zero is built around eliminating the causes of 'The Fatal 6'. These are the high consequence hazards that analysis has shown are responsible for 94% of the fatalities within the industry. The strategy is to focus on these hazards in the work environment and, through a wide range of measures, achieve zero serious incidents or fatalities associated with 'The Fatal 6' by 2025.



Working at Height has been identified as one of 'The Fatal 6'

Work at Height – Fatal 3

17% of fatalities in the industry involve a fall from height. Operatives are exposed to risks associated with working at height whilst undertaking daily activities such as loading, inspecting silos and other processing plants, sampling, access and egress from mobile plant, and undertaking a wide range of maintenance tasks.

In the UK Mineral Industry, there is an over reliance on work at height because of poorly designed plant and machinery. Repeated near misses and falls are caused by missing floor gratings, working from ladders, fragile roofs, openings, and pits, scaffolding and scaffolders, misuse of MEWPs, incorrect use of PPE, crushers, and mobile plant with poor access for maintenance, and failed catwalks on mobile crushers and screens.

This handbook challenges managers to reduce the duration of work at height, and to ensure any remaining work at height is undertaken in the safest possible manner.

This handbook has been jointly developed by the members of the Mineral Products Association (MPA) Work at Height Working Group, as part of 'The Fatal 6' initiative.

Compliance with any guidance set out in this document does not absolve the user from their legal duties under the Health and Safety at Work etc Act 1974 and the Work at Height Regulations (2005).

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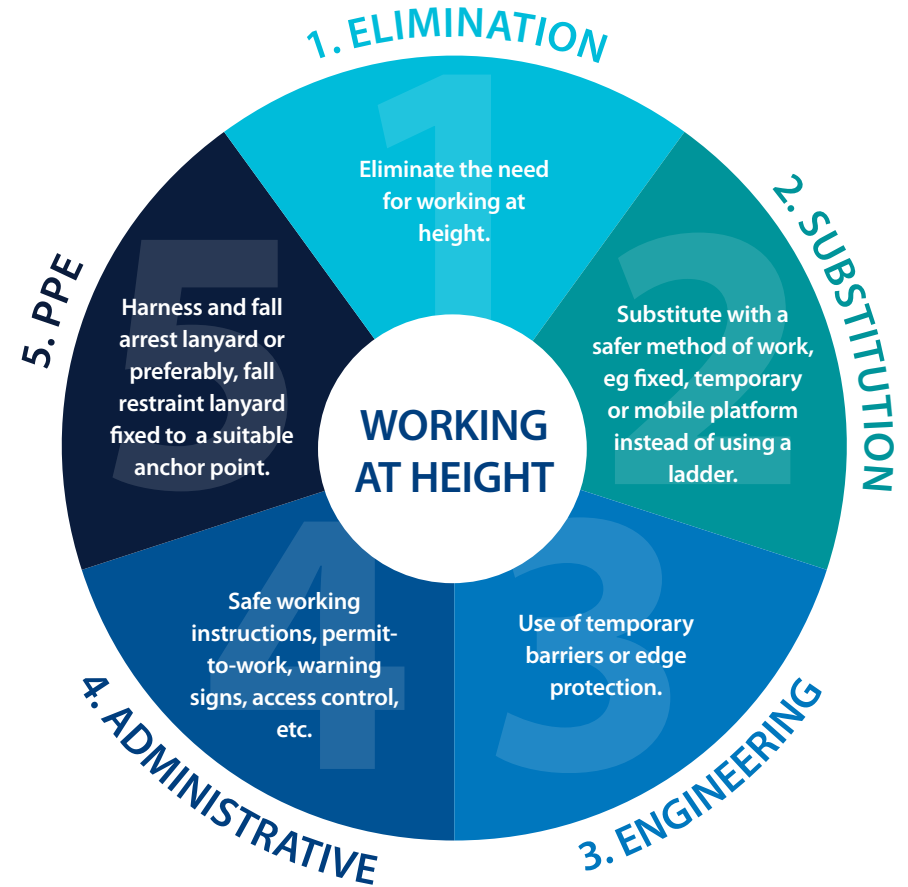
The Hierarchy

Leadership

Good leadership is essential when developing and implementing strategies in your organisation that will eliminate incidents and injuries associated with work at height. Fundamental to the strategy will be application of the hierarchy of controls that is highlighted opposite.

For each Working at Height hazard identified:

- 1: What measures are you using in the hierarchy of controls to mitigate this hazard?
- 2: What steps could you take to move up the hierarchy of controls?



Audit and review

It is important to ensure that your work at height controls and processes are regularly reviewed and audited, both to confirm that procedures are being correctly followed and to identify whether there are opportunities to improve. Is it possible to move a step further up the hierarchy of controls?

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The PDCA cycle

This guide follows the **Plan, Do, Check, Act (PDCA)** approach to explore a variety of factors aimed at reducing incidents involving work at height. This guide will apply the PDCA approach ensures that this can be done thoroughly and appropriately to meet the individual needs of the business. The PDCA framework is a practical way for businesses to make positive changes above the minimum standards.

The PDCA approach achieves a balance between the systems and behavioural aspects of management. It also treats health and safety management as an integral part of good management generally, rather than as a stand-alone system.

PDCA can be applied to working at height management in exactly the same way as it can in other parts of the H&S Strategy for a company. Firstly, using risk assessment principles we need to establish where these risks are apparent using data and incident analysis tools, ensure that we have the required knowledge on how these risks are controlled, benchmark against industry good practice, and evaluate our existing procedures to see if they are fit for purpose.

We need to look for easy, simple and effective work at height plans and procedures, in order to give our managers the tools to “self assess” their operations and understand how each one of the risks can be controlled and mitigated.

However, it is not just physical equipment we need to control; we also have to understand the implications of employee and contractor behaviour as we look to enhance the control measures either in place or the ones we intend to add.

Why and how these control measures work, why they are required, appropriate checks of applicability and feedback mechanisms need to be communicated effectively to everyone.



What Role does Leadership Play when Working at Height?

Organisations - and the directors and managers that run them - have to understand firstly what health and safety (H&S) leadership is, as well as why it is so important. They need to understand their legal responsibilities for the positions they hold, but it is the H&S leadership in their organisation that will be the determining factor in progressing to creating a strong H&S culture and making a change to a safer and healthier workforce.

Health and safety is a business process in the same way that finance, HR, purchasing, sales etc are. And whilst warm words such as “we take H&S seriously” or “it is our number one priority” are important, it is the understanding that the H&S process requires dedicated management time and resources.

Being a safety leader does not only pertain to those with senior management or executive titles. It is important to recognise and empower everyone to take the lead on safety - through demonstrating by example and influencing the people around them to do the right thing.

Proactive ways of encouraging leadership for safety at all levels include publicly recognizing good behaviour, mentoring new hires, and setting leading indicators that all levels can contribute to.

All this requires planning and resources, but the senior leadership has to take full responsibility for H&S culture and processes in the business. It is the leadership's visible commitment to H&S that is the key to holding the segments of the H&S system together and creating a sustainable long-term safety culture improvement. Safety is a “line management” responsibility, which is why so many H&S professionals prefer the title H&S Advisor or Business Partner as opposed to H&S Manager or Director.

Senior Leaders also have to understand that it's not just about incidents, it's about working towards Vision Zero; we have to look at incidents, health and sickness in the workplace as a whole. They also have to believe it is possible; and it is!

“Operational excellence goes



hand in hand with safety excellence”

When considering working at height, Visible Felt Leadership (VFL) would facilitate:

- Everyone on-site to look out for one another, rather than an ‘us vs them’ mentality or ‘blame culture’
- Site Manager and Supervisors to take proactive measures to improving processes, equipment, guards and overall site safety.
- Operatives to speak up or suggest changes where improvements could be made
- Safety to become everyone's responsibility as the business moves towards an interdependent culture.

Changing Safety Cultures – An Aggregate Industry Case Study

Aggregate Industries (AI) embarked on a journey of supporting their frontline supervision in effective engagement with their teams and driving culture forwards. The process was designed to enable supervisors and managers to better understand what they needed to do to influence and drive a good safety culture through effective engagement of their teams. Most importantly it defined what a rich on-site discussion should look like and how it should 'feel' for both the frontline leader and employee.

Reinforcing good habits as well as understanding what actions and expectations make a positive impact on safety all contribute to build an environment where everyone can get actively involved, positively challenge, identify good practices and identify opportunities to reduce risk.

When used to address Working at Height issues, the people on the frontline know what hazards and risks they are exposed to and how to prioritise the hierarchy of controls, but they don't get the chance to communicate it to the wider business. The approach AI have taken actively seeks to promote that knowledge so that it can be shared and used to drive continuous improvement.

It's all about being EPIC!

Expectations - Create a culture of accountability based on setting clear expectations that individuals can influence and / or deliver (a focus on the inputs)

Positivity - Challenge and reinforce the things that you DO want to see; again, a focus on the inputs that help to create safety!

Inquisitive - Ask lots of open questions and focus on the quality (what is the output / what changed?) NOT the quantity (how many have you done?)

Commit - Lead by example, get out onto site, be seen and heard, engage with and get to know your team.

Ask questions and Challenge the Norm:

- Ensure the expectations are understood (remember to focus on quality of inputs)
- Always agree on the safe way to conduct tasks and gain a commitment to act safely before leaving; it takes time!
- Never walk past unsafe behaviour without discussing it with the people involved and ask questions to understand why this unsafe behaviour is in use.
- If you walk by you set the standard, you condone it or you fail to reinforce what should be done!

We must give everyone the opportunity to speak up and participate:

- Ask employees 'what is a good practice on your site that you would share with others?'
- Ask the 5 D's.What do you do that is...
 - difficult?
 - different?
 - dirty?
 - dangerous?
 - deviating (from the agreed process / method)?
- Ask an employee 'what would be the one thing you would change to improve safety?'
- Keep asking 'Why?'

What are the characteristics of a good leader?:

- Lead by example; take responsibility
- Communicate; clarity of purpose / expectations
- Clear vision
- Honesty
- Coaching and feedback
- Visible and accessible, and checking what is actually happening
- Care for the team. Develop people and create more leaders
- Interested in / cares about answers and solutions
- Promotes a good culture
- Consistent; knows what to focus on

Everyone getting involved:

It is:

- Get involved in making decisions
- Help finding solutions to common issues
- Be part of a project team
- Be valued / add value

It is not:

- Just being told what to do
- Just raising concerns
- Listening to someone lead a toolbox talk / start of shift briefing
- Passing a problem to someone else

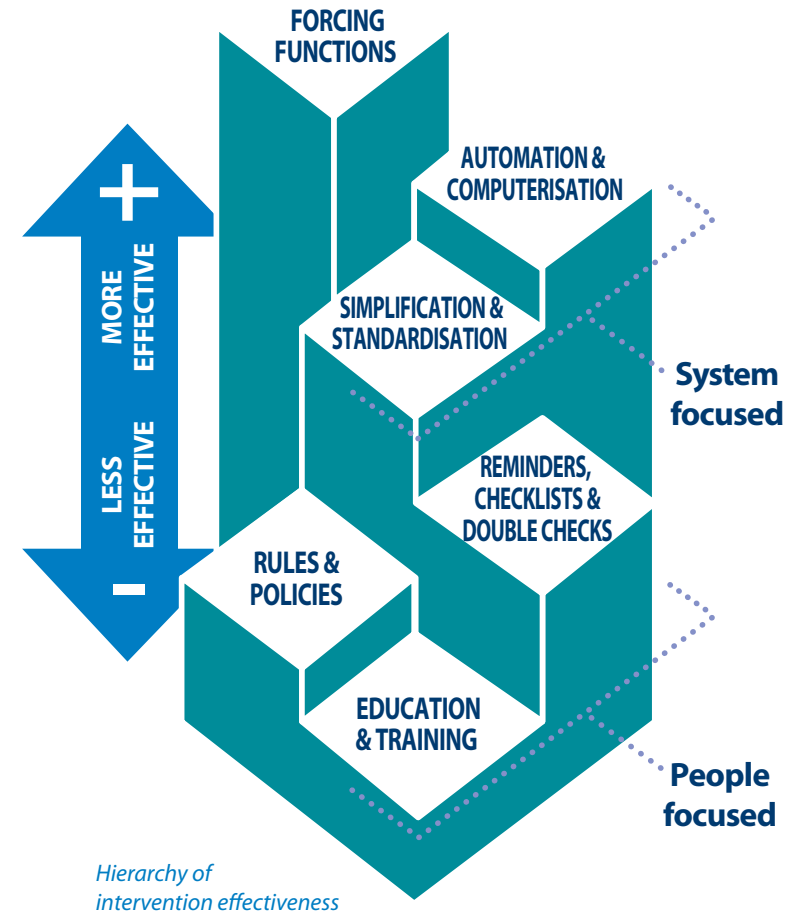
Employees getting Involved - Role Model

- What are the characteristics of a Role Model?
- Leads by example and takes responsibility
- Communicates with workmates
- Honestly interacts with workmates and supervisors so the underlying causes can be found and fixed
- Coaches (up and down) and gives positive feedback
- Interested in / cares about answers and solutions
- Promotes a good culture in team
- Consistently applies rules and wears correct PPE
- If in doubt you have the absolute authority to stop the job and seeks advice

Lastly, the above does involve some time commitment and planning. This won't happen because you simply ask for it or want it, you have to visibly demonstrate that you mean it! You have to put in some time to plan and then get out and spend time talking to, listening and learning from your teams. It is definitely worth the investment though!

Hierarchy of Control

Based on the hierarchy of control, this handbook provides 'clear, simple and smart' guidance for those managing Work at Height. An introduction is provided for each element of the hierarchy of control, along with Good Practice examples and questions every site should be asking. The guidance should be considered when conducting the risk assessment and when conducting a Work at Height safety review.





Introduction to Elimination

Safer By Design

The elimination stage of the hierarchy of controls is by far the most effective, because it removes the risk of incident altogether. Elimination can be built into the design of a project, preventing people from carrying out a risky behaviour in the first place. These are known as forcing functions as they are tasks, activities or events that force a certain action and produce a certain result; in the case of elimination, a safe result. Businesses can examine any job or activity that puts employees at risk of injury and use all of their assets, including their people, to explore ways of eliminating any risk. This is a continuous development and what may have seemed like a proactive solution at one stage will need to be reviewed and evaluated on an ongoing basis.

Many companies still struggle with the elimination step, since they only look at the initial costs of making a fundamental change to the operation of the business. Once they discover the long-term savings, both in operational and workers compensation terms, elimination becomes a more viable directive.

Furthermore, elimination is most effective when it is based on leading indicators as opposed to lagging indicators.

Lagging indicators have historically been considered a good measure of strong health and safety performance. However, reviewing historical industry and FM Conway accident data demonstrated that a high-consequence accident was possible EVEN when all existing key performance indicators (KPIs) were green.

The Deepwater Horizon industrial incident is an example of how lagging KPIs are misleading. At the time of the explosion and resulting oil spill, they were seven years 'Lost Time Accident' free. Then suddenly, one major accident resulted in the death of 11 people.

This analysis identified that there was an element of luck keeping people safe.

Leading indicators are a measure preceding or indicating a future event used to drive and measure activities carried out to prevent and control injury. New Leading indicators can be introduced to the strategy as they become apparent, allowing the business to flexibly manage risk.

Elimination Good practice Examples

By 2028, all Clamshell vehicles will be operated from the ground level and will not require access to the platform, resulting in the elimination of 80,000 Working at Height activities.

This will be achieved by a 360° camera live feed to remote operating position on the ground.



Elimination

Good practice Examples - Case Study

Charcon Construction Solutions with support of British Precast Flooring Federation on working at height on upper floor installation (block and T-beam system).

The installation of first-floor block and beam flooring has been historically done with the use of air bags as a fall protection system. The system was designed to 'soften' the landing if a fall occurred.

The installation of block and T-beam floor has always been done by a competent operative, following agreed procedure, however the risk remained the same. We had experienced a number of falls with the bags mitigating the severity of outcome. Charcon Construction Solutions have suffered two more serious incidents, where subcontractor's operative fell onto and then off the bags through an unprotected opening, subsequently suffering a broken wrist. Although bagging system are still an approved method of fall protection, the Charcon Construction Solutions management team had reviewed the safe operating methods and decided to fundamentally reassess the hierarchy of controls with the emphasis on elimination rather than relying on administrative/procedural approach.

The business case was put together with the support of operational management to introduce the use of safety decking systems, commonly referred to as 'crash decking'. This solution eliminates the risk of falls and enables the operatives to have a safe and comfortable working area.



Bagged room pre floor installation vs safety decking (crash decking)

The benefits of use of safety decking:

- Lightweight and easy to construct and dismantle
- Robust and durable (some systems are up to 200kg/m²)
- Safest fall prevention system currently in use
- Overall cost/benefit outweighs the risk

Questions every site should ask:

- Does this task need to be done from height?
- Can I achieve the same results from the ground?
- Are there controls I can use to eliminate the problem?
- Have any new hazards been created?
- Are new hazards appropriately controlled?
- Are monitoring processes adequate?
- Have workers been adequately informed about the situation?
- Have orientation and training programs been modified to deal with the new situation?
- Are any other measures required?
- Is new technology available that wasn't available before that I can take advantage of to eliminate this hazard?
- What can be done to eliminate other hazards in a process of continuous improvement?



PLAN	DO	CHECK	ACT
Identify activities which present the biggest risk of fatality or life changing injury through working at height	Implement an 'Elimination process' whereby 10% of the activities identified are eliminated through use of innovative practices or technology	Measure the effectiveness of performance once these elimination processes are in place	Where measures were effective, roll out the good practices to the other 90% of activities



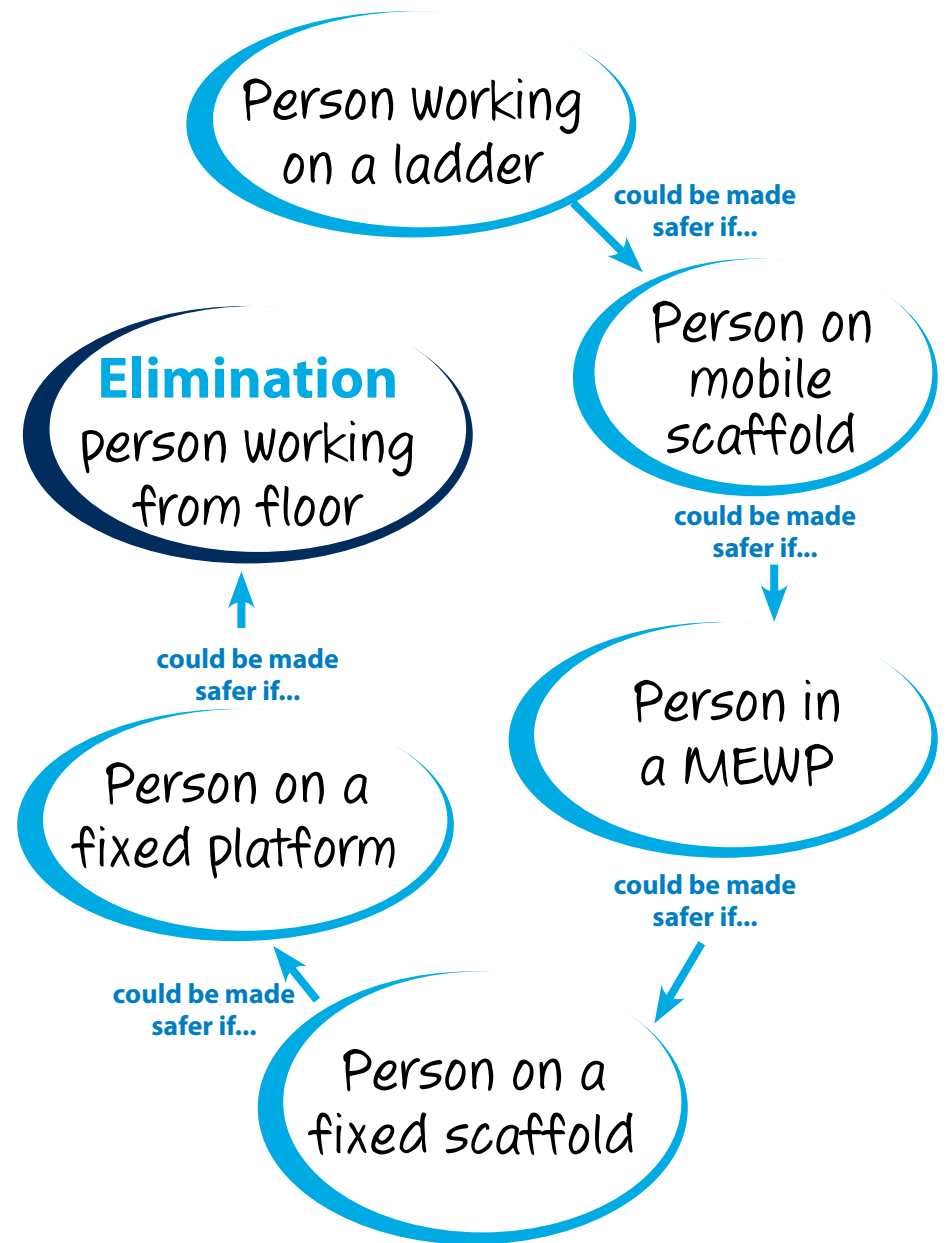
Introduction to Substitution

A fall from height can kill; take a moment, not a fall!
Prevent a fright, when working from a height.

Substitution / Reduce - reduce the potential of the hazard or substitute for a less hazardous version that performs the same job to reduce the risk of harm.

Substitution, the second most effective control, involves replacing something that produces a hazard with something that does not produce a hazard. Be careful to assess what new risks the substitute may pose. To be an effective control, the new way to carry out the WAH task must not introduce alternative risks.

If the task cannot be eliminated and the task must be completed can we reduce the hazard?



Substitution

Good practice Examples

- Can the control measure be changed? Undertake the work from a safe zone. Relocation of equipment requiring maintenance should be considered.
- Access to vehicles, which traditionally used ladders, has been substituted for custom-built aircraft steps including handrail for safer control
- An operator is required to access a WAH area to carry out periodic inspections on a MEWP. Install a staircase and adequate working platform to carry out the inspections safely.
- Additives are loaded on to an additive platform, a swing gate would be controlled by an operative wearing a harness. A swing gate is installed to reduce the working at height and the need for the operative to wear a harness (pictures below)



- Access to an Asphalt plant was via a fixed vertical ladder which had to be climbed frequently. A set of stairs was installed to reduce the WAH



- Using extendable tools from ground level to remove the need to climb a ladder.
- Consider options that require less frequent maintenance
- Installing cables at ground level
- Ground level assembly of edge protection



Questions every site should ask:

- What tasks at this site can expose you to falls from height?
- What are the current control measures?
- What work at height tasks require review?
- What improvements would you suggest?
- How can we reduce the need to work at height?



PLAN

Assess the number of activities that require the use of ladders or hop up platforms with no guardrails

DO

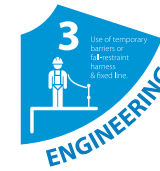
If working at height cannot be eliminated, follow the substitution process flow to replace ladders with, MEWPS, Scaffolds, or platforms. For this to flow I would follow a process: platforms with suitable edge protection, temporary mobile scaffold, fixed scaffolding, MEWP with an aim to engineer a fixed platform, access etc... **THE END GOAL**

CHECK

Complete an audit to assess compliance in a switch from ladders to an appropriate substitute. Carry out point of work risk assessments at the start of every task and consider is this the correct way? Regular supervision by supervisors and management whilst the task is being completed. Inspections and Audits to close the process off.

ACT

Ensure actions are completed or implemented from the assessment.



Introduction to Engineering

Engineering controls

Risks should be reduced to the lowest reasonably practicable level by taking preventative measures. The third most effective method of prevention is engineering controls (after elimination & substitution, see previous sections).

Engineering controls cover a wide range of possible interventions that are intended to reduce worker exposure and isolate people from the hazard. This may involve the physical modification to equipment or the installation of further equipment.

Collective protection systems should be given priority over personal protection systems. Passive systems - those that do not require the worker to do anything - take priority over active systems, which do require the worker to do something eg attach a lanyard.

HSE

"Use work equipment or other measures to prevent falls where you cannot avoid working at height... Give priority to measures which protect collectively over individual measures."

Examples of engineering controls in working at height include use of fixed or temporary barriers, fixed and mobile scaffolding, MEWPS, fall restraint and fixed lines or anchor points.

If work must be carried out a height, a secure platform must be provided that will (where practicable):

- Be securely footed on stable ground (& considering gradient)
- Provide stable and suitable access/egress
- Be fitted with guard rails/barriers on open edges/openings.
- Be secured to existing stable structure where possible
- Support weight of worker and equipment
- Withstand adverse weather

Fixed guardrails

Fixed guardrails eliminate the hazard of falls from height. This is the preferred method of fall protection should working at height be unavoidable.

The system is suitable for multiple users at any time, requiring very basic working at height training, making it the ideal solution for regular and long duration maintenance at roof level.

Whilst they eliminate some hazards, they still need to be inspected by a competent person a minimum of every 12 months in order to ensure their effectiveness and to prevent additional hazards from arising.

Scaffolding

Providing that scaffolding is properly designed, constructed, maintained and used it can provide a safe means of access and platform. The provision of guard rails and toe boards prevents falls and falling objects.

Scaffolding can be either fixed or mobile. Both will have their advantages and disadvantages depending upon the work being carried out but fixed scaffolding is the safer option. There are minimum and maximum heights that must be adhered to, and these should be calculated in the project design and the risk assessment. Further advice for scaffolding can be found in the HSE Guidance.

<https://www.hse.gov.uk/construction/safetytopics/scaffoldinginfo.htm>

A scaffold should be inspected before use for the first time then every 7 days until it is removed. It should also be inspected each time it is exposed to conditions to cause deterioration e.g. following adverse weather conditions, following substantial alteration or if it has been impacted by a vehicle or piece of mobile equipment.

Mobile tower scaffold

Many people are injured using mobile tower scaffolds each year with incidents occurring from dangerous methods of erection and dismantling, defects in the erected scaffold and misuse of the scaffold. However, they can be effective tools when used properly by trained and competent people. When planning a task or project, the hierarchy of control should be used to decide if this is the best approach as where possible it is always safer to use a fixed scaffold than a mobile one.

MEWPs

- MEWPs are designed to provide a safe work platform for temporary work at height.

Much like mobile tower scaffolds, MEWPS present several hazards that must be managed and controlled. Operators have died when trapped in the MEWP basket or when the machine has overturned. Great care must be taken to select the most appropriate MEWP and ensure that use of the machine is properly planned and managed. Operator instruction and training are very important requirements. It is important to select the right MEWP for the job and site. Have a plan for rescuing someone from a MEWP and practice it; someone on the ground should know what to do in an emergency and how to operate the machine's ground controls.

Further guidance on the use of MEWPS can be found here

<https://www.hse.gov.uk/construction/safetytopics/mewp.htm>

Temporary barriers

As with Fixed Guardrails, temporary barriers will, in many cases, be a preferable option for fall prevention if a permanent solution cannot be used. It must be appropriately planned and installed and if the work at height is carried out over an extended period of time, fixed guardrails ought to be considered as a superior option.

Fall restraint harness & fixed line

This type of engineering control is a form of PPE and as such is last in the hierarchy of control.

Work restraint is a personal fall prevention system, whereby the user is physically prevented from reaching an edge by using a harness and a fixed length lanyard attached to a suitably located anchor.

These systems allow a person access to conduct their duties but prevent them from reaching a point where a fall could occur. Fall restraint systems are generally suitable if the person needs to work at the edge of a hazard.

NB -Specify the length of lanyard, remember the purpose is to prevent a fall.

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Questions every site should ask:

- Can you identify what engineering controls you have on site for working at height?
- Can you eliminate or substitute any of the tasks for which you have engineering controls on site, so that you can move up the hierarchy of controls? Can you reduce the potential of the hazard or substitute for a less hazardous version that performs the same?
- Does your WAH access have adequate formal inspection and adequate maintenance regimes?
- Who at your site is trained, competent and authorised to assess and use WAH equipment/accessories?
- Have you a training matrix? Does it ensure that refresher training is up to date?



PLAN	DO	CHECK	ACT
Assess working at height environments where engineering controls could reduce the risk of a fall	Develop edge protection installation plans to provide passive safety solutions where working at height is carried out	Compare accident rates once edge protection is installed to confirm effectiveness in reducing harm	Look to move as many fall restraint systems to move passive edge protection options as is reasonably practicable

4 Introduction to Administration

In line with the specific requirements placed on duty holders by the Work at Height Regulations, Administration Controls are essential to ensure WAH is planned, executed, supervised, monitored and reviewed by competent persons, in accordance with an agreed safe system of work which is based upon a task specific risk assessment.

Administrative controls for work at height can include:

- Training / competency
- Risk Assessments
- Management Systems
- Monitoring Systems
- Standard Operating Procedures (SOPs)
- Authorization/Permit to Work
- Work Observations

These controls do not eliminate the hazards but rely on people to adopt and follow the process; the goal at this level is about reducing risk, which is why it's not the preferred way of supporting long-term safety.

Understanding Competence



Training

Training is an asset to a business as well as to an individual. By ensuring that a workforce is 'competent', a business can take advantage of those individuals who already possess several skills and enable those who don't to acquire them as a part of their personal development. Effective training will improve not only the safety, but also the quality and efficiency of any work done while reassuring workers that they are valued by the company, leading to improved staff retention rates.

A well-rounded approach to training will utilise a 'competency framework'. A successful competency framework should see the following results:

- A reduction in incidents and near misses through poor competence
- An increase in production
- An increase in management trust
- A reliance on the framework to underpin employee reviews/appraisal
- Provide better analysis of training needs
- Show enhanced career management



Good practice Training

Questions every site should ask:

- What is the definition of 'competency' for the role being undertaken?
- Is there a competency framework in place to set out and define competency for every role?
- How is training carried out within the business?
- Is the training relevant to the business?
- Is training presented in the correct format or could technology, professional coaches etc. offer a more appropriate delivery?
- Does the training enable an individual to see opportunities for progression?
- How are training requirements as well as optional opportunities communicated e.g. Learning Management System, Staff Noticeboard or Social Media alerts?
- How are individuals assessed?
- How often does training need renewing?
- Where are personal training logs stored and how are they accessed?
- What tools and resources are made available to individuals following training?
- Does training address 'soft' skills such as communication and leadership in addition to 'hard' technical skills?
- Is it appropriate for training to be conducted in-house or would it be more beneficial to bring in external training providers?
- Does any of the training need to be associated with specific certification or award bodies?

Good practice Training



PLAN

Establish a competency framework to set out and define the competency for key roles.

DO

Roll out training to relevant individuals, ensuring competency is assessed, recorded and a renewal date set.

CHECK

Once training is in place, utilise VFL to sample individuals, covering their engagement and retention of the training as well as their understanding of potential future progression in line with the PLAN's competency framework.

ACT

Use the results of the initial scope to broaden the competency framework in terms of content and individuals in attendance.

Questions every site should ask:

- If work at height is necessary has it been properly planned, organised and is a competent supervisor in place?
- Are those involved in that work competent and trained? If a contractor is involved do contractor checks include an assessment of the competency and experience of personnel, in relation to the activities being carried out and the likely risks?
- Do you have checks in place to ensure the persons allocated to carry out work at height are fit and healthy to do so?
- Have the risks from work at height been properly assessed and has appropriate work equipment been selected?
- Do all sites have general workplace risk assessments for all activities involving working at height and include those areas which are infrequently used or rarely accessed?
- Are briefings/inductions to an appropriate standard and easy to understand?
- Do inductions provide information on designated access routes to work areas and limitations on access to unauthorised areas?
- Has a permit to work at height been identified for the particular task with specific written procedures, assigned competent supervision, and formal authorisation, that adequately manages the risk?
- Do the written procedures include arrangements for emergencies and rescue?
- Are inspection and maintenance records available, including pre-use, alteration, weekly, and statutory 6-monthly checks for the proposed access equipment?
- Where another company provides equipment on site are there measures in place to ensure that it is checked and passed as safe before use?
- Have you checked the provision of and validity of relevant training or competence certificates for plant or equipment operators?

- Is there sufficient appropriate signage in place at work at height locations to warn of the dangers of falls from height?
- Are adequate signs posted indicating access restrictions or warning of dangerous conditions, such as fragile roofs?
- Is there an audit schedule in place to monitor work at height activities?
- Is there a robust Safety Observation reporting system in place for early identification of unsafe conditions or behaviours in relation to work at height?
- Refer to operation and maintenance manuals for manufacturers instructions in relation to maintenance work that may require specific access requirements to work at height?
- Do structural surveys highlight issues that may affect personal safety?



PLAN	DO	CHECK	ACT
Complete a 'Safety Conversation' to understand competence amongst those working at height	Launch a comprehensive training program taking advantage of toolbox talks, e-learning tools, coaching and mentoring to ensure everyone has basic working at height competency	Audit processes to check compliance with trained processes	Once basic competency is established, define advanced competency when working at height



Introduction to PPE

As with other work activities, for work at height, PPE is considered the last resort when establishing control measures. That said, there are times when the use of PPE or PFPE (Personal Fall Protection Equipment) is appropriate as either the primary control - for example; an overhead fall arrest system for vehicle loading - or used to supplement other control measures, e.g; the use of a personal restraint system in the basket of a MEWP.

In this document we have identified that Personal Fall Protection is a system and not just a harness. The system is often referred to as A.B.C where **A** is the anchor point, **B** the body support (harness) and **C** the connecting element between A and B. Wearing a harness in isolation is not going to prevent or arrest a fall!

Work at height can present a diversity of challenges so the range of PFPE solutions are equally diverse and broad, requiring careful consideration and risk assessment to ensure the selected equipment is applicable, appropriate and compatible to the task and the hazards it presents.

PFPE is regarded as category III PPE: protection against mortal danger, and its safe use depends on the user being trained and competent in the pre-use inspection, fitting or installation and use of the appropriate system. There is a statutory requirement for all PFPE to be periodically inspected by a Competent Person. Generally, textile PFPE is subject to a 6 monthly, recorded inspection whilst install systems and anchor points may be inspected annually.

As a requirement of the [Work at Height Regulations](#), the provisions and procedures for rescue also need to be considered during the planning process. The rescue plan needs to be appropriate for the foreseeable emergency situation. For example; for work undertaken in Work Restraint, as the person is prevented from falling, a basic rescue plan outlining the procedure of raising the alarm and stabilizing the casualty until assistance may be appropriate. For Fall Arrest work, where it is foreseeable that the worker could be suspended following a fall, the rescue plan needs to set out the procedure and provisions for an effective rescue. This will include the provision of rescue equipment which is generally also considered PPE.

update hyperlink
<https://www.hse.gov.uk/work-at-height/the-law.htm>

PPE Good practice Examples

Link 3M logo to https://www.3m.com/3M/en_US/fall-protection-us/applications/working-at-heights/



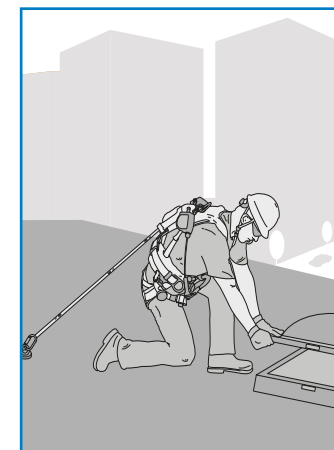
Restraint/Positioning/Fall Arrest Equipment is deemed PFPE (Personal Fall Protection Equipment). PFPE should only be considered when there is no alternative means of protection i.e. the last resort.

Personal fall protection is divided into three categories, which are (in order of increasing risk).

1. Work Restraint

Work restraint systems fall under the title of 'fall prevention' and are designed and rigged to eliminate the possibility of workers falling to lower levels. Restraint lanyards must be of a length that when attached to a suitable anchor point, the user cannot go beyond the edge where the potential for a fall exists.

The benefits are obvious: if the possibility of a fall has been eliminated, the potential for serious injury has also been effectively eliminated. Equipment used in restraint systems is generally less sophisticated than that employed in fall arrest systems since the equipment simply needs to hold the worker back and not support them in a fall. It is important to remember to take all related hazards into account when using a fall restraint system.



2. Work Positioning

Also falling under the title of 'fall prevention', work positioning activities involve the worker being either fully or partially supported by their equipment.

The work positioning lanyard enables the user to be partially supported on a structure or fixed ladder and use both hands to complete a task, while maintaining stability. This is the workers' primary means of preventing a fall. The user must ensure that a suitable secondary means of fall protection is used e.g. Fall Arrest Lanyard.



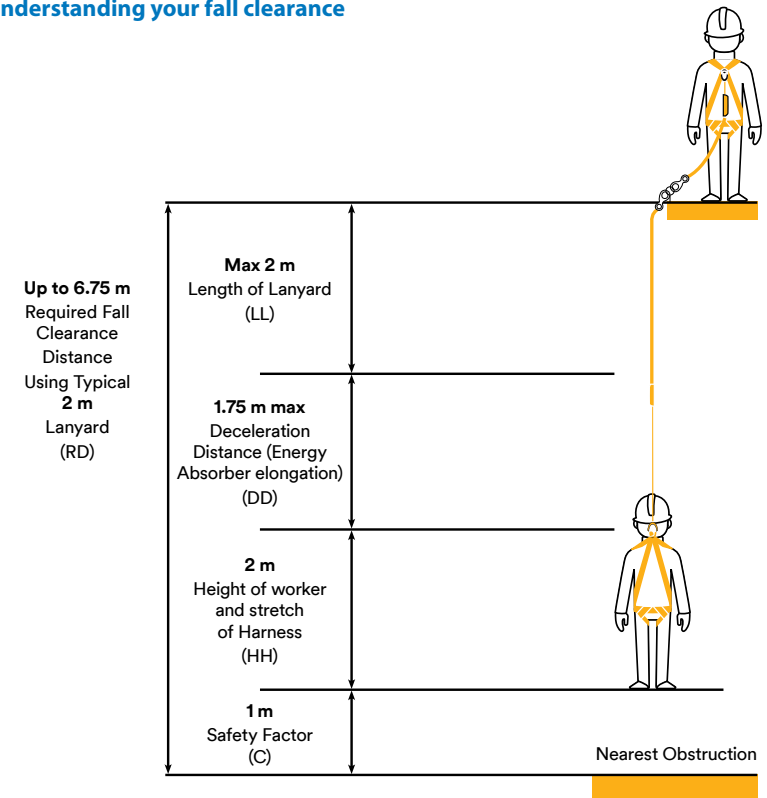
3. Fall Arrest

Whilst Fall Prevention protects the worker by eliminating the risk of falling, it is recognized that it is not always reasonably practicable to achieve this. In such instances, and as a last resort, Personal Fall Arrest Systems are normally implemented.

When planning to use fall arrest equipment, careful consideration needs to be given to specification of the equipment and the distance it requires to arrest a fall. Considerations would include: anchor point position, lanyard length or self retracting Lifeline arresting distance, energy absorber extension and the height of the person. Other hazards may include contact through swinging, if the anchor point is not directly above the user and sharp edges which may sever the lanyard/lifeline. Double lanyards can be used to reduce these risks.



Understanding your fall clearance



LL = Lanyard Length (max 2 m)

DD = Shock Absorber Deployment Length (1.75 m max)

HH = Worker Displacement and Harness Extension = 2 m

C = Safety Factor and Clearance under worker = 1 m

RD = Minimum free distance below feet of the user to Nearest Obstruction = LL + DD + HH + C

This example of fall clearance requirements is of an CE Energy Absorbing Lanyard complying to EN 355 standard.

Whenever possible, when attaching a fall arrest lanyard, choose an anchorage point located ABOVE the position of the user.

Note:
This information is provided as a general explanation. In use the specific manufacturer's product instructions must be read, understood and followed.

Unlike Fall Prevention, Fall Arrest assumes the inevitability of a fall, and is designed to minimize the consequences of a fall by preventing the worker from hitting the level below and limiting the forces in arresting the faller.

Even with this assumption, it must be stressed that fall arrest systems are not a replacement for care and attention in the workplace.

A common problem experienced during the early stages of a fall arrest programme is the increase in falls due to workers feeling invulnerable and becoming careless.

This can often be dealt with through proper training and diligent communication.

PPE Good practice Examples

Fall protection and rescue plans.

If you have established that working at height is unavoidable, it is essential to then put into place a written Fall Protection & Rescue Plan.

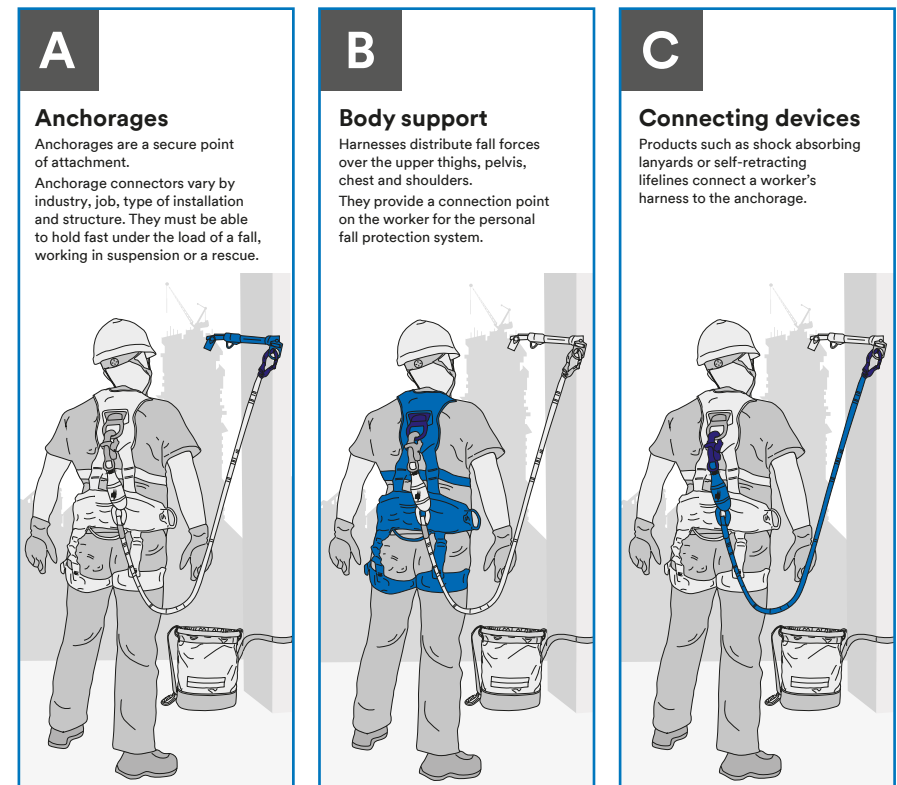
The objective of having a written Fall Protection Plan is to help prevent falls and the subsequent related injuries by identifying potential hazards and associated risks (see pages 8-9). The plan will detail the working methods, equipment, anchor points and training requirements to allow the work to be undertaken safely.

In addition the plan must include planning for the timely rescue of a fallen worker. A fallen worker left hanging in a harness is at serious risk of suspension intolerance, a condition that is caused by the blood draining from the top half of the body, depriving the brain of oxygen. Just 10 minutes in suspension and the risk of permanent damage increases rapidly.

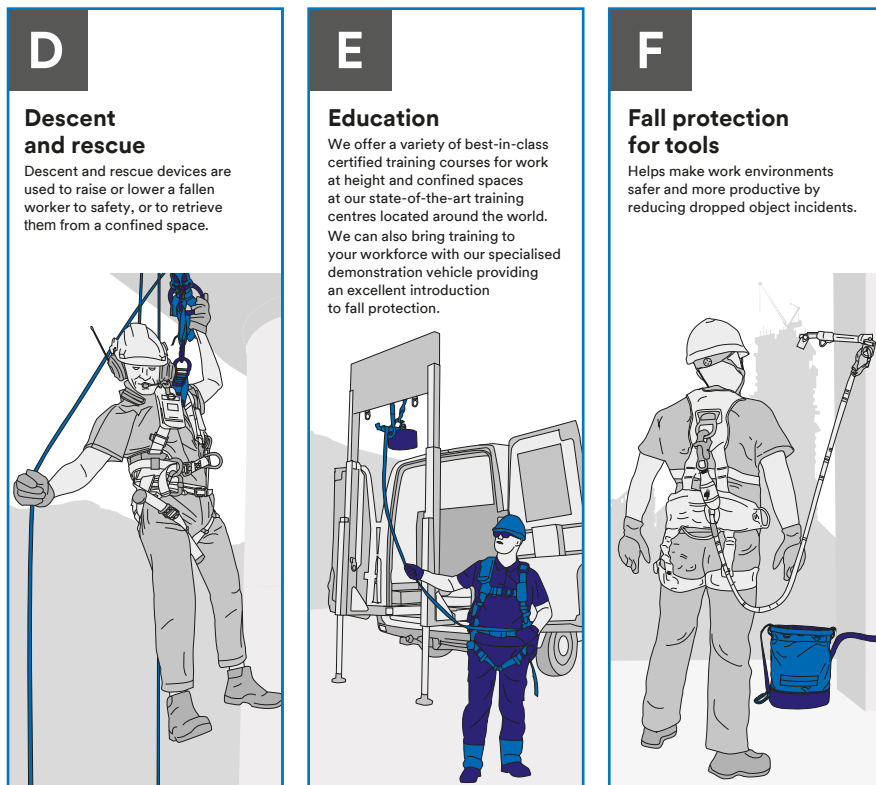
PPE Good practice Examples cont...

ABCs of fall protection.

A typical Personal Fall Arrest System (PFAS) incorporates key components often described as the ABCs of fall protection.



The (A) anchorage/anchorage connector, (B) body support and (C) connecting device - when used together - form a complete system for maximum worker protection. But don't forget the other important components of a comprehensive fall protection programme: (D) descent and rescue, (E) education and (F) fall protection for tools.



Good practice PPE Graphics and Expertise have been provided by 3M

HYPERLINK - https://www.3m.co.uk/3M/en_GB/fall-protection-uk/

Questions every site should ask:

- Is the appropriate Risk Assessment / Method Statement in place?
- Is PPE the appropriate control for the task and environment?
- If the use of PFPE is appropriate, can it be used to prevent the user reaching the hazard – Work Restraint?
- Is the work restraint lanyard the correct length to stop the fall from the unguarded edge or from the MEWP basket?
- Is the anchor point I have selected of adequate strength and allows me to connect from a safe position?
- If working in fall arrest, is there adequate fall clearance below the work position for the selected equipment to arrest the fall?
- Is there a danger of lanyards / Lifelines being severed on a sharp edge?
- Am I trained and competent in the use of the selected PFPE?
- Has the PFPE been inspected?
- Have I carried out a pre-use inspection of the PFPE?
- What are the provisions for rescue?
- What is my rescue plan in the event of an accident?



PLAN

Write a Fall Protection & Rescue Plan for any Working at Height activities that cannot be eliminated

DO

Check that the PPE required in the PLAN is to the specification required for the risks in place

CHECK

Complete a Rescue Plan drill to ensure all PPE is appropriately maintained and its usage understood

ACT

Roll out the Fall Protection & Rescue Plan to all sites with a schedule for regular drills





Introduction to Audit & Review

Safety Review - Have we identified all the risks & are our arrangements effective?

A Safety Review is an examination of the workplace for hazards and elements that increase risk, and an examination of the effectiveness of actions that have been taken to reduce risk; it helps set the company safety goals.

Reviews may be undertaken periodically as technology changes, following the introduction of new legislation, before changes are introduced, before work commences, after tasks have been completed (to capture experience), or following an incident or the publication of new guidance/regulations etc.

A fall from height review should not just cover the obvious risks such as;

- People working at height
- Fragile roofs
- Floor gratings
- MEWPS
- Scaffolding
- Ladders
- Harnesses (and ensuring people clip on)
- Drug and Alcohol abuse policies



It should also cover, the less obvious, where people may be exposed to an inadvertent fall from height such as;

- Accessing work equipment for routine maintenance (e.g. Crushers/silo tops)
- Condition of mobile crusher/screen walkways
- Pits and openings
- Spillages (reducing the effective height of the handrail)
- Damaged or removed handrails
- Areas that have been 'opened up' for maintenance
- Working areas near chute openings, elevators, access hatches, fragile roofs
- Older or 'abandoned areas' of the site
- What the contractors are bringing on to site
- Over reliance on items at the bottom of the hierarchy of control
- Tempting areas for workers to take a short cut or for trespassers/protestors to climb

Introduction to Section 7 Audit cont...

The MPA H&S Awards receives entries every year where maintenance platforms have been retrofitted to remove the risk from working at height. The review should ensure that only safe plant/equipment is purchased in the first place, without the need to work at height when it is maintained.

The ultimate aim is to reduce the number of hours worked at height; a true measure of reducing fall risk.

Safety Audit – Are we actually doing what we say?

A Safety Audit measures conformity with planned arrangements and can also be used to determine compliance with safety regulations. To be successful, the audit needs to ask the right questions; it is a check that stated actions have been carried out e.g. inspections have been completed.

Safety audits:

- Measure and collect information about a safety program's reliability and effectiveness
- Determines if the safety program meets the company's goals
- Examines issues such as safety training and close out of actions



Audit Good practice Examples

GENERAL WORK AT HEIGHT AUDIT



Report Ref:		Division:	
Author:		Contract:	
Audit Date:		Report Date:	
Site Address:		Manager:	
Description:			

Executive Summary:

COMPLIANCE SCORE

100%

This report has been compiled for the purpose of providing summarised information on a Safety, Health, Environmental or Quality audit conducted for the purpose of providing an indication on compliance levels and identifying areas for improvement.

The content of the report may also include: -

- **Positive Aspects** – Areas identified as good practice.
- **Corrective Actions** – Identifying a breach of legislation, FMC Policy or an unsafe act or unsafe condition. Must Do.
- **Recommendations** – Areas of potential improvement where it is highly recommended by the author that action is conducted otherwise issues may arise. Should Do.
- **Observations** – Areas of improvement or potential future actions.

The contents of this report are the author's opinion based on personal observations and information provided by third parties and all issues would have been discussed with relevant Management and Site Supervision at the time of the visit or as a follow up after the visit.

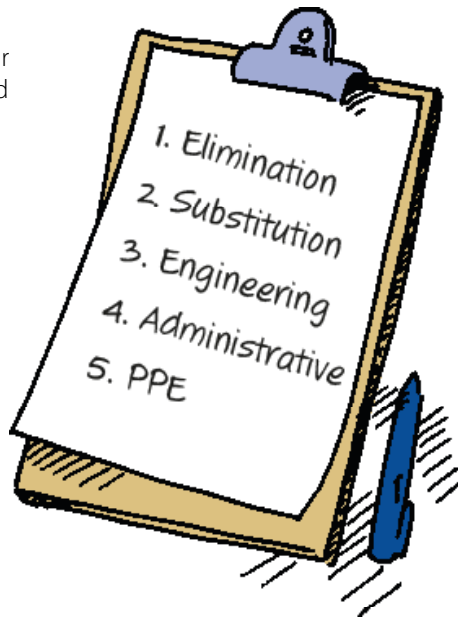
This report refers to an audit conducted on the FMC procedure for complying with our safe system of work for working at height.

The audit will cover the following areas of Work at Height Practices: -

- RAMS Availability and Awareness (FMC Hierarchy of Control)
 - Appointed Persons Register;
 - Competency Requirements;
 - General Site Controls
- Permit to Work (Work at Height);
- Personal Protective Equipment Requirements;
 - Emergency Procedures;
- Pedestrian and Traffic Management and Segregation;

Questions every site should ask:

- Have we undertaken a Work at Height Review and is it up-to-date?
- Does the review identify our Work at Height risk profile; where is our exposure, who's at risk?
- Where are our weakest links/ How reliant are we on the bottom of the pyramid e.g. behaviour & PPE; do we rely on workers clipping on?
- Do we have an improvement programme that actively seeks to eliminate risk (that also covers the purchase of new plant/equipment)?
- Is the improvement programme delivering (or has it sat on the shelf)?
- Have audits been tailored to ask the right questions, do they include some visual element/inspection (e.g. are drivers actually using the sheeting platform)?
- Are we confident that things are improving and have some evidence to prove it?



PLAN

Conduct a review

of fall from height hazards and elements that increase risk, and examine the effectiveness of actions that have been taken to reduce that risk. Think about where you are now and where you need to be.

Do not limit your review to planned activities; consider the industry's history of repeat fall incidents involving 'willing workers', shortcut takers, by passers and drivers.

Establish objectives

and processes to deliver the desired results. Decide how you will measure performance; look for leading as well as lagging indicators. Aim to reduce the overall number of hours worked at height.

DO

Carry out the objectives,

involve workers and develop effective communications, so that everyone is clear about what is needed and can discuss issues, and develop positive attitudes and behaviours. Provide the necessary training, resources and supervision.

Implement the elimination process

and if WAH cannot be eliminated, follow the rest of the hierarchy in order: substitution, engineering, administration and finally PPE.

Closely control those on your site.

Ensure that anyone not directly involved in a planned activity is kept well away from danger/ WAH areas.

CHECK

Carry out audits

and also capture information from inspections, checks, compliance monitoring, safety tours and safety conversations. Actively seek feedback from contractors and employees. Capture incident and near miss data, as well as any other data required for the leading indicators.

Study the data and results gathered and compare this against the anticipated improvements from the plan. Identify problems and investigate their root causes.

ACT

Review your performance.

Learn from root causes, and learn the 'good lessons' too; what went right and why? Learn from other organisations. Revisit plans, processes and risk assessments to see if they need updating

Take action on lessons learned and eliminate them by modifying processes.

Links

hyperlink the links

- Gully Grab Stanton Bonna**
 A new lifting accessory was developed that enabled concrete gullies to be lifted directly from the trailer bed, solely using an excavator. This removed the need for an operator to climb on the back of the trailer.
<https://www.youtube.com/watch?v=i5d3IFhbIO0&feature=youtu.be>
- Pod Truck Cleaning Marshalls**
 Reduced working at height by redesign of cleaning process
<https://www.youtube.com/watch?v=nwSxeYVJNTQ&list=PLXu4cRX3643fk4RFX3B2A4DX1Ld7Sg7GM&index=24>
- Cleaning Platform Smiths**
 Designed by a smaller company to provide safe access to the inside of truck, retractable access steps provide ladder free access. (Password Smiths - starts at 4.29mins)
<https://www.gov.uk/link.link.link>
- Robotic arm wrecking machine Cemex**
 Eliminates risk of being struck by falling material/fall from scaffold.
https://www.youtube.com/watch?v=wFt2hu1e0w&index=13&list=PLXu4cRX3643fRj6msWucQ2L2_6sib63Y_
- Silo Ground Level testing Marshalls**
 Remedial engineering work and investment in a silo protection system has led to a 90% reduction in operator checks conducted at the top of silos (formerly 13,000 a year).
<https://www.youtube.com/watch?v=mijcLN7glmY&list=PLXu4cRX3643dC1W4e08HkYVLPshdSlgrg&index=1>
- Hole system Beresford Flooring**
 Drilling from Ground Level
https://www.youtube.com/watch?v=ZAukq7O5x8&index=22&list=PLXu4cRX3643fRj6msWucQ2L2_6sib63Y_
- Winch operated loading platform Cemex**
 Before platform, a fall could result in a four foot drop onto the railway line or part of the wagon.
https://www.youtube.com/watch?v=AGNILLAcAkgY&index=14&list=PLXu4cRX3643fRj6msWucQ2L2_6sib63Y_
- Hanson kettle cradle Hanson**
 Innovative construction method used for of gas conditioning tower reduces fall from height risk
<https://www.youtube.com/watch?v=fdqqThRbenQ&list=PLXu4cRX3643fk0m1IUhs4ry4HcvmUDUB6&index=23>
- Maerz Kilns – caged access system for internal inspection Singleton Birch**
 Safe inspection access removes fall risk
<https://www.youtube.com/watch?v=zt-e16WP6FU&feature=youtu.be>
- Lifting attachment for safely loading railway sleeper pallets Cemex**
 Removes the need to work at height on the rail wagon.
<https://www.youtube.com/watch?v=92QzJz8q4o0&feature=youtu.be>
- Low level refuelling system Hanson**
 Working at Height risks have been removed
<https://www.youtube.com/watch?v=1dlarbgpuLc&list=PLXu4cRX3643dmvIQIUwIzPngp3boeUY70>
- Increasing the safety of offloading through improved product design Stanton Bonna**
<https://www.youtube.com/watch?v=OF9nxzGkYTI&list=PLXu4cRX3643dmvIQIUwIzPngp3boeUY70>
- Safe access and egress to binder screen Breedon Aggregates Ltd**
 A stairway, retractable step and a moveable/lockable gate mechanism have been fitted to remove the fall from height risk.
<https://www.youtube.com/watch?v=HQUIPVKMIzY&list=PLXu4cRX3643dmvIQIUwIzPngp3boeUY70>
- Safer access to a quarry crusher bowl and reducing working at height risks Lafarge**
 Construction of a safety guard rail assembly that can be lowered into place when entry into the crusher bowl is required.
<https://www.youtube.com/watch?v=pDp00XU-pak&list=PLXu4cRX3643dmvIQIUwIzPngp3boeUY70>



Considerations for Planning and Managing Working at Height

1. Site Manager and Supervisors to take proactive measures to improving planning and management of working at height activities
2. Follow the hierarchy of controls and always start with elimination of the need to work at height if at all possible
3. Plan ahead; to prepare for working at height, persons must be competent and understand the risks
4. Always select work equipment that is safe to use and suitable for the task at hand. Think about whether the new equipment will create any new hazards for instance airbags or fall resist systems.
5. Always follow the manufacturer's instructions for work equipment.
6. Introduce daily checks to ensure machinery and equipment is safe or decide whether it needs maintenance.
7. Allow adequate clearance and exclusion zones underneath any work at height.
8. Choose collective protection that safeguards multiple people before issuing personal protective measures.
9. Always have emergency or rescue procedures in place to deal with any situation in which an incident may occur.
10. Maintain good discipline at all times Do not compromise any existing health and safety controls.

If you do not think it is safe – STOP!



Notes

Notes

Notes



Mineral Products Association

The Trade Association for the Aggregates, Asphalt, Cement, Concrete, Dimension Stone, Lime, Mortar and Silica Sand Industries



essential materials
sustainable solutions

The Mineral Products Association is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries.

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