FALL PROTECTION

Workers need to be physically and psychologically suitable for working at heights

Falls from height continue to be one of the most common causes of work place deaths and injury in the world.

Every time a worker is raised from ground level, they face a greater risk of injury or death by falling, tripping, slipping or sliding. If working from heights is unavoidable, it becomes necessary to use protective equipment to either prevent a fall or minimise injury if a fall were to occur.

This could be in the form of fixed equipment, such as barriers, walls or nets (suitable for either single workers or multiple users); or equipment worn by the workforce themselves - personal protective equipment (PPE).

However, first and foremost it is necessary to ensure the employee is up to working from heights.

Right person for the job

It is vitally important to consider the attributes of a person designated for working at heights.

Some people, such as roofers, steeplejacks or high-rise builders are comfortable with the risk of working at heights, while others suffer from a fear of heights. They would obviously not make good candidates for the job, but it is up to the employer to ascertain suitability.

Some psychologists say that height-tolerant individuals perceive the physical danger of heights, but compensate either through habit, or a comfort level with their sense of physical danger.

Could it be possible that this habitual comfort with heights might lead to complacency where safety is concerned? This is an unexplored area, which emphasises the need for regular safety re-enforcement training.

Necessary skills for a roofer include:

- *An awareness of health and safety issues*
- *A good head for heights*
- *A sense of balance*
- *A good level of fitness*

"YOU SHOULD ALWAYS CONSIDER THE USE OF PERSONAL FALL PROTECTION EQUIPMENT TO PREVENT OR MINIMISE THE CONSEQUENCES OF A FALL WHEN COLLECTIVE PREVENTIVE MEASURES ARE NOT PRACTICAL"

- *The ability to follow strict safe working practices*
- *Good practical skills for using tools and equipment*
- *Excellent organisational and team working skills*

In these days of safety awareness, safety laws and the availability of protective equipment, working at heights is one of the main areas of concern.

Although employers have long held a responsibility for creating a safe working environment at any level, the onus is now on considering the potential for injury from falling from any height in any situation - this can include work below ground as well as above.

Due to high risks involved, a practical and tailored solution is necessary. Following the checklist below may help.

Ensure that:

- *All work at height is properly planned and organised*
- *Those involved in work at height are competent*
- *The risks from work at height are assessed and appropriate work equipment is selected and used*
- *Risks from fragile surfaces are properly controlled*
- *equipment for work at height is properly inspected and maintained*

There is a simple hierarchy for managing and selecting equipment for work at height. Duty holders should:

- *Avoid work at height where they can*
- *Prevent falls using work equipment or other measures where they cannot avoid working at height*
- *Protect where they cannot eliminate the risk of a fall, use work equipment or other protective measures to minimise the distance and consequences of a fall should one occur*

Accidents on the rise

The current world economic crisis has actually caused an increase in the number of accidents working at heights.

The increase could be due to staff shortages and increased workloads, with the remaining people being expected to work harder and complete additional tasks each day.

Injuries involving those who work at heights are also generally much more severe than other workplace accidents. These types of injuries can often be life-threatening, leaving the victim in a serious condition. It is therefore essential that foremen of crews working on rooftops and other raised surfaces be aware of these dangers and alert to the impact of completing a project with fewer labourers.

Here are a few tips to raise awareness of this hazard:

- *Encourage workers to stay focused on the job at hand*
- *Implement regular weekly meetings to discuss any problems workers might be dealing with*
- *Encourage foremen and supervisors to keep abreast of how their workers are doing throughout the day*
- *If possible, have supervisors directly involved with the daily workload*
- *Try to get workers involved in recreational activities outside the work environment as a means of relieving stress*

Equipment

You should always consider the use of personal fall protection equipment to prevent or minimise the consequences of a fall when collective preventive measures, e.g. scaffolds and cherry pickers, are not practical.

Personal fall protection equipment that prevents a fall, such as a work restraint system, should always take priority over a fall arrest system - personal equipment which only limits the height and/or consequences of a fall.

You should select equipment that:

- *Is suitable for the particular circumstances of the task, e.g. a restraint system*
- *Can be used for the particular task within its design limits, e.g. there is an adequate clearance distance when using fall arrest equipment*
- *Meets the standard relevant to its intended use*
- *Has compatible components so the safe function of any one component is not adversely affected*

You will need to make sure that people using the equipment:

- *Are competent to check their equipment for defects and do this before every use*
- *Are suitably trained and assessed for competency in the use of their personal fall protection systems and equipment for the particular application*
- *Have read and understood the product information before using the equipment*
- *Have checked that the components in the system are compatible*

Horizontal lifeline systems

These should be considered your first choice to prevent falls when access to rooftops is needed. Some flexible systems are designed to operate horizontally, vertically, around corners or up-and-down inclines. They offer complete protection and comply with all current legislation.

Each lifeline system should be designed specifically to fit site requirements and ▸

all should be capable of being fixed not only to solid structures, but to built-up or composite metal roof sheets, single ply membrane roof profiles, concrete or lead-lined roofs.

Horizontal lifeline systems should be based on a steel cable passing through intermediate cable guides with varying corner assemblies. The cable can be terminated at either end using hex swaged fork end or tensioner units connected to end anchorage assemblies.

The systems should be manufactured under the quality control standard ISO 9001.

Guardrail and edge protection systems

The preference for dealing with height safety issues is to eliminate risk at initial conception or planning stage. This, however, is usually only a viable option on new build and major refurbishment projects, and is far less suitable for existing buildings.

The second preference in the hierarchy of measures is passive safety, providing a collective protection solution, such as edge protection in the form of guardrail systems. Such protection solutions require user training for safe access to be obtained, and provide continuous protection to multiple users around the clock.

Ladder systems

Whenever a roof or raised area needs to be accessed, this access must be undertaken in a safe and planned manner. Whatever your access needs or problems, a bespoke vertical ladder system can be designed to give you safe and secure access to any raised elevation, while being:

- *Fully compliant with all relevant company or safety law directives*
- *Designed to meet the most recent standards*
- *Vertical ladders can be constructed with a safety cage or, where a hoop arrangement is not suitable, a fall arrest system*
- *Options can include a solid security panel fitted directly to the base of the ladder, with a padlock facility or a removable lower ladder section to prevent unauthorised access*
- *Finishes can be altered to suit conditions of work, such as wet or dry, with options available in steel, powder coated aluminium and glass fibre for complete corrosion resistance, non-slip factors and no electrical conductivity*

Types of fixed ladder systems

- *Standard fixed vertical ladders with roof hatch access*
- *Walkthrough ladder*
- *Standard fixed vertical ladders with walkthrough guardrail*
- *Fixed vertical ladder only*

Vertical lifeline

Vertical fall arrest systems are configured in a range of combinations and materials, to suit a specific application. The systems range from cable, rail or track based solutions, in either galvanised or stainless steel materials.

Some fall arrest systems are designed for use in vertical/inclined applications. They provide safe access to structures at height, and safe ascent or descent.

Where fixing positions are restricted a unique strengthening rail would be fitted.

The device operates on permanently attached rails designed to be attached to the chest attachment rings or loops of safety harnesses. As the user moves along the rail, the device follows, requiring no manual intervention. If a fall should occur, these devices lock onto the rail. The devices can be installed or removed from the rail at any point.

Such fall arrest systems can be equipped with built-in shock absorber devices made of stainless steel, reducing impact on a worker's body to a minimum, in the event of a fall.

Cable based vertical fall arrest systems offer a cost effective, more discreet and far safer option in comparison to traditional safety systems.

Walkways

For temporary walkways to enable work at heights, non-slip flooring should be provided, avoiding the use of chequerplate where possible.

- *Consideration should be given to activities e.g. chemical drips/spills, or personnel working below to determine suitable flooring*
- *All should conform to safety regulations appropriate to the country of usage. Preferably, minimum width 600mm. Width may be reduced to 500mm when justified by a risk assessment due to machinery or the environment if the platform or walkway is used occasionally and the reduction is made for only a short distance*
- *Headroom over work platforms is advisable to be 2,100mm minimum or 1,900mm minimum if obstructed by environment or machinery, platform is occasional use and justified by risk assessment*

Mobile man anchor

When required in a location where it's not viable to fit guardrails, a mobile man anchor provides an easy, cost effective solution, without compromise to safety.

The mobile man anchor offers a simple, cheap solution and is ideal for such jobs as surveying, remedial and maintenance work. ▸

"SOME FALL ARREST SYSTEMS ARE DESIGNED FOR VERTICAL OR INCLINED APPLICATIONS"

It is characterised by the following:

- *Easily assembled by one operative in just 90 seconds*
- *Takes one man's weight*
- *Conforms to all appropriate legislation*
- *For use on concrete, steel cladding, asphalt, stone chippings, felt or single ply membrane*
- *Can be used on flat or pitched roofs up to 15 degrees*
- *Allows one man quick and easy access*
- *Comes in parts for easy transportation to the installation area*

Skylights - worth looking into

Over the years roof lights become brittle due to weathering and are prone to cracking.

Falls through unguarded skylights result in serious injury or death, and while this prospect does not bear thinking about, it is important to remember that the full responsibility of your employees and contractors lies with you.

Danger exists, since roofers, workers, and even children have been seriously injured and killed by a multitude of falls through unguarded skylights. Below are a couple of such instances.

- *A 13-year-old boy died when he fell through a plastic skylight on the roof of a farm building*
- *A 42-year-old employee fell through a fragile skylight as he walked across the roof of an agricultural building carrying out general maintenance*

You may feel that you have adequate safety provisions on your roof to prevent falls, but have you also considered a rescue plan should a fall occur?

In particular, a recent investigation carried out after a fatal fall through a skylight found that there were no coverings in place on any of the roof's skylights to prevent the fall. Furthermore, no handrail was installed and resulted in this fatal fall. These are very serious health and safety breaches. The measures in place at the time simply did not amount to a safe system of work.

In reality, one fall could cost millions of pounds in a court of law if prosecuted for Corporate Manslaughter and non-compliance.

Every skylight should be guarded by a standard skylight cover or fixed standard railing on all exposed sides

The employer should determine if the walking/working surfaces on which the employees and contractors are to work have the strength and structural integrity to support them safely, and take immediate action to protect against falls through skylights.

Personnel walking/working surfaces need to be protected from falling through skylights by personal fall arrest systems, skylight covers, or guardrail systems erected around such areas.

Falls from vehicles - why we should watch out

Fall-from-vehicle incidents can cost your company a lot of money. In 2004/05, the human and economic cost of the fall from vehicle incidents we know about in the UK alone was more than £36.5 million.

Death and serious injury resulting from falls from tall vehicles, trailers, HGVs and wagons are an example of situations faced by far too many transport workers on construction and mining sites and their families.

Employers need to consider the full picture of the pain and suffering of the individual worker and the financial and social impact on that worker, their families and of course the employer's business.

- *Transport workers have a rate of injury caused by falling from vehicles that is four times the average for all height workers*
- *The severity of injuries is nearly double that of all other injury claims, and accidents generally occur during trailer maintenance*

The solution

Like any potential risk that threatens life, limb or company viability, the risk of falls from vehicles must be managed.

As with any other fall from height situations, risk must be assessed when considering trailer top maintenance and appropriate methods to control the risk put into practice and reviewed regularly. This approach will not only minimise the likely impact of the risk but it will enable the industry to demonstrate that it is meeting its responsibilities both legally and morally.

"ALL WORKERS MUST BE COMPETENT, TRAINED AND SUITABLY SUPERVISED AGAINST THE ASSESSED RISKS"

Considerations

- *A fall from an elevated workplace such as a vehicle tray, cab, trailer, tanker*
- *A fall through an opening such as an unguarded loading dock or work platform*
- *A fall into a container such as a bin or tanker*

If a person is required to work where there is a risk that they may be injured by a fall, then secure platforms, ladders, guardrails or other forms of safe guarding or appropriate personal protective equipment must be provided, checked, maintained and used. These could include:

- *Physical barriers that prevent a person being placed at risk*
- *Well-constructed work platforms*
- *Edge protection, guardrails and handrails of an appropriate height*
- *Fall Arrest harness and lanyard attached to a rail, static line or anchorage point*

Last but certainly not least - competence

Taking us back to the opening of this feature, employers must be sure that a person is physically and psychologically suitable for working at heights. Basically - the right man for the job. This is important because if someone has a fear of heights no amount of training will make them competent for working at height.

So all of the above will only work if all workers are competent, trained and suitably supervised against the assessed risks and in the safe systems of work.

Some personal factors that might mean that a person might not be considered suitable for work at height would include:

- *Recurring dizziness*
- *Epilepsy*
- *Psychiatric conditions (including fear of heights)*
- *Heart condition*
- *Severe lung conditions*
- *Alcohol and drug abuse*
- *Significantly impaired joint function*
- *Medication that recommends you do not operate machinery could be a problem*

Information and training should be provided on the nature of the hazards and control measures arising from the risk assessment. Levels of supervision should be determined based on the risk assessment and other factors linked to the activity including type of work, equipment used or duration of work. Regular refresher training should be considered in order to prevent 'skill fade'. ■

Author Details

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British Safety Services (BSS) is an international consultancy offering advice and training on health and safety issues. Established in 1990, BSS has gained an international reputation as a major provider of high quality safety training that gets results. The team at BSS also provides guidance on all aspects of public safety, specialising in workplace legislation and best practice.

BSS advise clients on their health and safety strategy and policy and assist in implementing procedures as required. By conducting training needs analysis, BSS help clients identify skills gaps in their workforce and then develop and deliver bespoke training programmes to meet these gaps, to improve safety awareness and performance in the workplace. BSS have been successfully providing these services to companies throughout the world for almost 20 years.

BSS now have offices in Qatar, Dubai, Yemen, China, Libya and Algeria. With a team of specialist staff grounded in a detailed understanding of each country's cultural issues as well as specific industry and country safety requirements.

Instructors are all qualified to NEBOSH standards and have a minimum of 15 years' experience. Most clients are in high risk sectors such as construction, the nuclear industry, oil and gas, together with many service industries including schools and food. Clients include, Qatar Petroleum, Al Futtaim Carillion, Readymix Qatar, PDO, Sabic, Conoco Phillips, Canadian Nexan, Weatherford, Inpex Libya, Al Mansoori, Petro Bras and Misco Libya.

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