

# specifiers guidance notes

safety systems for roofs



because lives depend on it



Workplace falls from height are the biggest cause of fatal injuries and one of the main causes of major injury in a wide variety of work environments. The problem is global and no where is it more relevant than in the roof and building maintenance industry, where on a daily basis workers are exposed to the risk of a slip or fall, which would inevitably have severe and profound consequences for the worker, employer, colleagues and building custodian.

Effective fall hazard risk control, therefore, makes good sense from both a moral and business perspective. To add to the dangers of working at height, competence levels for personnel can often be low and very often people with no experience or formal training at all are sent to carry out work on roofs. For the reasons highlighted above, effectively reducing the risks associated with work at height is a statutory duty and a key target priority of enforcement authorities, insurers and safety professionals worldwide. However, all parties involved in the design, operation and use of a building have a role to play.

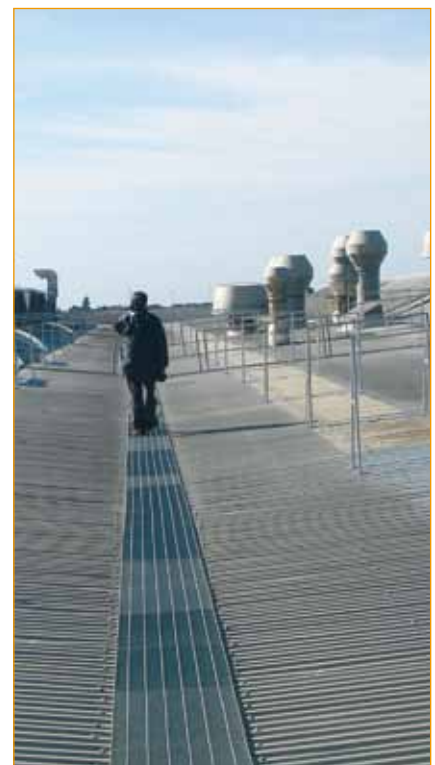
This document aims to provide stakeholders with a reasonable understanding of the areas you need to consider in selecting an appropriate solution for work at height on roofs and guidance in how to make an informed decision about the provision of control methods.

Many regulations, documents and guidance notes exist around the world to advise responsible persons on their legal obligations and on industry best practice.

For further information on specific regulations visit [www.unilinesafety.com](http://www.unilinesafety.com)

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because lives  
depend on it

03

## making good choices

Considering risk mitigation for people working at height can be a daunting prospect, with so many facets to consider. Not least of these is the consequence of making the wrong decision.

Skills in the height safety industry are varied and in some cases, companies with scant or limited knowledge are able to promote themselves as experts, putting workers, decision makers and custodians at risk.

It is essential, that when considering a company to work with to mitigate risks associated with work at height, you choose carefully and ensure the company

you are working with have the depth of knowledge needed and competence required to provide a safe and practical solution, in proportion to the risk.

Such competencies are available through Uniline Safety Systems and its network of International Systems Integrators.

Together we have a sound track record in height and roofwork safety disciplines and employ experienced, well trained and highly skilled people, able to carry out risk assessments and provide solutions that mitigate risk in an appropriate and cost effective manner.

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Uniline prides itself in delivering excellent customer support and sound advice, even if it means the solution not falling within the scope of our product range. Our sense of responsibility towards people working at height is at the core of our business values and shared amongst our employees and partners.

Uniline products surpass international normative performance standards and requirements including EN, OSHA, ANSI, CSA and AS/NZS, whilst offering unique benefits in simplicity of use, aesthetic appeal, choice and performance.

In combination, Uniline's products, its network expertise, service levels and commitment to best value provide a partner that you can confidently place your trust and business with.



## who is responsible?

- Building Owner
- Building Occupier
- Employer
- Client in a Building Project
- Designer/Architect
- Health & Safety Manager
- CDM Coordinator (UK)
- Facilities Manager/  
Building Custodian
- Principal Contractor
- Sub-Contractor.

Any one or a collective group of people can be responsible for ensuring that personnel can work safely at height. This applies both during the construction phase of a building and afterwards to maintain a building or structure.

## what you must do

- Understand your legal obligations
- Identify hazards
- Assess risks
- Eliminate risks where reasonably practicable
- Mitigate the consequences of a fall
- Put in place good management controls
- Provide training, equipment and instruction.

# the name you can always rely on

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“During the past two years the Uniline team has been engaged in assessing, specifying and resolving roof maintenance safety issues on Crown Packaging Plc’s facilities throughout Europe and in doing so has been an invaluable partner in helping us meet with our compliance and risk reduction responsibilities”.

### **Mervyn Bettles**

BSc CEng MICE Construction & Services Manager

# guidance on the selection of an appropriate solution

Uniline recommends and indeed regulations in some countries require a hierarchical approach to the planning of work at height, with collective fall protection measures to be given priority over personal protective measures, and measures that prevent a fall to be given priority over those that minimise the height and consequences of a fall. This is illustrated in the pyramid chart. Each hazard needs to be dealt with in a manner that ideally eliminates the risk, or, if that is not practicable, reduces that risk as far as possible and at least to the highest acceptable level. What is very clear from all of the regulations and guidance in the workplace, is that it is not acceptable to do nothing at all. If you cannot design out the risk and are not providing a fixed means of protection/access for workers, then documentation explaining how maintenance should be carried out should be available as part of a building or structures Operations and

Maintenance file. This provides a clear instruction and leaves nothing to chance.

A work restraint system installed on a non-fragile roof, utilising good management controls and used by competent persons provides an acceptable level of protection for predictable or reasonably foreseeable, short/medium duration works. In some cases it may be more hazardous to choose to provide a collective means of access such as scaffolding/temporary edge protection, as the erection and dismantling of such equipment exposes workers to greater risk. Similarly using mobile elevated work platforms requires a high degree of competence and may not provide the comprehensive access required for many roof related maintenance and inspection tasks.

Access to fragile roof surfaces exposes workers to high levels of risk and requires greater levels of control.



## the role of the roofing manufacturer/contractor

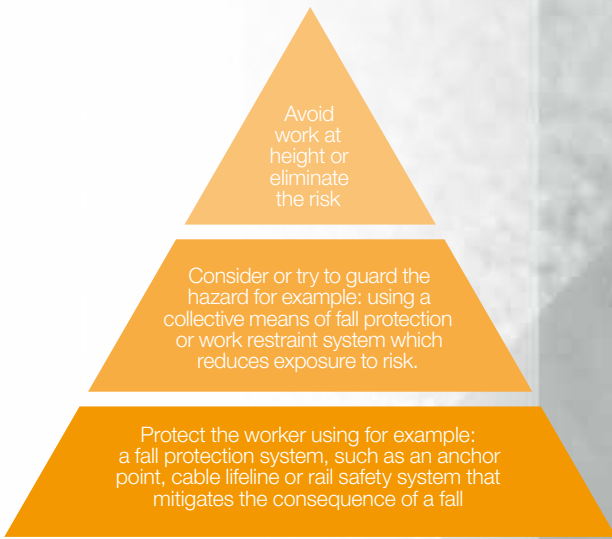
Roofing manufacturers and contractors have a key role to play in the procurement of fall protection systems.

Manufacturers can offer specification guidance to architects, designers and building owners as to the requirements for roof maintenance and therefore design layouts for a fall protection product. They also assist with product testing to ensure safety and compatibility with the roof system.

Contractors are very often involved in the procurement of the fall protection system, working with main contractors, giving clients advice and often making the final decision as to which product the customer will use. In addition, they can also be involved in the installation of the fall protection system and almost certainly weatherproofing the system where this is a requirement.

It is therefore necessary that the roofing sector have a clear understanding of the relationship between the fall protection system and the roof system and take in to consideration the following points when making decisions and advising clients.

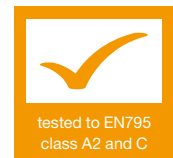




# helping you achieve your safety objective

## guidance for decision makers

- Is the system compliant with current regulations
- Has the system been tested with representative examples of the roof structure
- Where necessary does the fall protection product carry approval from the roof manufacturer
- Have calculations for the performance of the system been carried out
- Can the chosen system support the number of workers required to maintain the roof
- Is a safe means of access to the system available
- Does the design of the system mitigate the risks associated with roof work and maintenance requirements
- Does the system carry the CE Mark
- Can the manufacturer provide a declaration
- Can the product be waterproofed to an acceptable level
- Does the manufacturer offer a guarantee and product traceability through a QA System
- Does the product meet the clients aesthetic requirements for the building
- Are the installation teams trained to work safely at height
- Are the installation teams authorised by the manufacturer to install the fall protection system
- Can proof of training/competence be provided
- Are user instructions available for the building maintenance folder
- Does the product offer uncompromising levels of safety for the people that will use it



HAVE ANY OF YOUR ACTIONS OR DECISIONS LEFT THE COMPANY OR CLIENT EXPOSED TO UNNECESSARY RISK?

## advice on design and integration

You will go to a great deal of trouble to select your fall protection solution and ensure that you are providing the building owner with a safe solution for future maintenance and inspection tasks.

Unfortunately specifications are easily broken, often with both sub-standard and badly performing products. Miraculously it is also possible to be provided with product which has not been tested by a Notified Body, meets the requirements of the wrong standard and does not carry the CE Mark.

In addition work restraint systems will be changed to fall arrest systems to save money, thereby compromising worker safety.

Your role is to specify and ensure provision of a safety system that is designed to prevent serious injury or even death, so when you are challenged to reduce costs or offered a "similar or approved" product ensure that you follow the correct procedures before committing to the changes requested.

This is especially important when systems are being specified for installation on roof structures, where the structure forms part of the system.



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If you are considering something different to the original specification, which changes performance characteristics, then you should revisit the process of risk assessment to satisfy yourself as to its suitability.

This is extremely important as in the event of an incident or problem in the future you may be liable for any consequences of an unjustifiable or incorrect decision.

The information contained in this folder is designed to help you to make informed decisions, but we recommend that you seek expert advice if you are at all in doubt. Uniline and its partners are able to provide this service.

The following information provides an overview of the key areas for consideration during design and decision mapping process.





### mapping out your system design

Design for work restraint as this offers a higher level of worker safety than fall arrest. Position the system at least 2m away from a fall hazard, whilst ensuring the worker can safely reach equipment and structure that requires maintenance and inspection.

### fixing points and design verification

Contact the manufacturer or review their technical specifications to understand the maximum permissible distances between structural supports. Then identify potential structural fixing points along the area that the system you have selected to use is to be installed. Before finalising your system design get a manufacturers simulation in order to establish fall clearance requirements and system loads. This allows you to confirm that the structure can support the loads in the event of a fall. If necessary you will then have an opportunity to strengthen the structure before attempting an installation.

Work restraint systems should be certified to the fall arrest standard EN795 and be designed so that they can arrest a fall in the event of misuse.

# safe and practical solutions

### fall factors

If a fall arrest system is necessary, try to position the anchors above the users head or in a way that reduces the free fall to a minimum. The further a worker can fall, the higher the forces in the system will be, the more trauma they are likely to suffer, the higher the risk of injury from collisions and the more difficult it will be to rescue them.





### number of users

This must be built in to the manufacturers simulation and specified in the operation instructions and at the entry point to the system. If too many users are attached to the system, there may be catastrophic consequences in the event of a fall.

### system compatibility

Ask for information and test data that proves a products compatibility with the roof structure to which it is being installed.

### safe access to the system

Think carefully about how the maintenance worker will gain safe access to the fall protection system. This may involve incorporating other types of access and safety equipment in your specification, such as a roof access hatch or fixed ladder and a safe walking surface. This is particularly important on sloped roofs or where the walking surface may be wet and slippery.

Try to eliminate as much risk as possible during the design process.

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# the highest levels of safety

## signage and instructions for use

Remember to include signs and system ID tags in your specification to provide essential guidance and information to the user. It is a legal requirement that the manufacturer provides user instructions in accordance with the requirements of the PPE Directive.



## personal protective equipment

A system without the appropriate safety harness and fall arrest device is of no use to anyone that needs to use it. Include this in the specification and gain input from the equipment manufacturer or installer as to what is required in conjunction with the system design and maintenance requirements.



## management controls

Operate a permit to work system for anyone working on a roof. This should check for work method statements, safety equipment provision, competence levels and how the work will be supervised. Do not allow lone workers on to roofs and where a risk of falling exists, ensure you have a rescue plan.



# frequently asked questions

## When do I need to consider using a fall protection system?

If a roof requires regular access for maintenance or inspection of a short duration, such as cleaning gutters, checking and cleaning roof lights or attending to roof mounted plant and equipment.

Also on big roofs it may be necessary to provide access over a large surface area, that requires continual movement. Using a temporary access solution might be impractical and or very expensive in proportion to the risk. Fall protection systems can also be used in conjunction with other means of protection for longer duration works.

## When should I specify a fall protection system?

Once you have been through the hierarchy of controls and decided that a fall protection system offers an appropriate means of risk mitigation. You should also have conducted a risk assessment and documented your decisions for future reference.

## How can I specify a fall protection system?

Contact Uniline Safety Systems or our System Integration Specialist and we will provide you with all of the necessary information and help you through the process. Uniline are also a RIBA CPD provider and have full specifications available through NBS Plus in the UK. Specifications can also be downloaded from our website.

## When should an installation be permanent?

If roof access is predictable or has a certain pre-determined frequency associated with it, then installations should be permanent. For example a caretaker in a school might expect to have to fetch balls down from the roof once a week. The duration of the work is short, but is predictable. Erecting scaffolds or hiring Mobile Elevated Work Platforms is not practicable and may in fact carry a greater risk. Similarly, roof inspections may be carried out at a pre-determined frequency and today many roofs may contain solar panels or small wind turbines for energy production that require regular maintenance.

## Why can't I use temporary fall protection?

You can, but temporary fall protection systems require a lot of discipline and management controls to ensure that they are used and rigged correctly. The owner will be required to maintain certain skill levels within their business. Suitable anchor points need to be installed for the attachment of the temporary solution, usually a rope or cable system. Alternatively edge protection such as scaffolding can be erected, but this can carry a greater risk than using a permanently installed safety system.

## Is it acceptable to use a fall arrest/work restraint system in isolation?

Yes, providing that a risk assessment has been conducted and the system effectively mitigates the risks associated with the work to be undertaken. Other products such as walkways, temporary walking boards, demarcation systems and roof ladders may need to be used to further reduce the risk. Personnel should always be trained and management controls should be put in place. But if you can avoid work at height, you should do so.

## What is a work restraint system?

A restraint system is intended to restrict access, egress and work, to areas that do not present a risk of falling from height. This is achieved by positioning the anchor point at least 2m from the fall hazard and providing a lanyard of a fixed length of < 2m in length. It should normally be considered as the preferred option for a roof top installation.

# frequently asked questions

## What is a fall arrest system?

A fall arrest system is positioned so that when the user is attached to the anchor point with a lanyard or other fall arresting device, access to the fall hazard is possible. The selection, design and installation of a fall arrest system should be clearly justifiable; and the reasoning behind it should be recorded via a formal risk assessment process.

## How would you rescue a worker if they fell and their fall was arrested?

If there is a risk that a person can fall from the roof, a rescue plan needs to be put in to place and responsible persons trained in how to affect a rescue. Rescues can be affected in many ways and it is best to seek expert advice. Uniline and a number of its Systems Integration Specialists can offer assistance and provide equipment and training in this area.

## What loads might be applied to my structure if someone falls on a system?

This is influenced by a number of factors including;

- How many workers fall
- How heavy they are
- What PPE they are wearing
- How far they fall
- How long the safety system is

Uniline's Force Management Systems limit the forces to within tolerable levels for the roof structure. Typically less than 1kN/sq.m distributed load. Where Force Management Anchors are not used, Uniline provides detailed calculations that accurately predict the forces that the system and structure will be subjected to. The maximum force at the anchor point in an 8mm wire system will not exceed 19kN and this can be reduced further by using energy absorbing components.

## Where should I position the fall protection system?

On a roof it is best practice to position the system in such a way that it offers a restraint solution.

For example, if a wide gutter needed to be cleared regularly, a system should be positioned 2m from the centre of the gutter. The roof worker would then be issued with a 2m lanyard, which would allow access to the work area, but prevent access to the fall hazard.

It is also good practice to never take the system right up to a leading edge, unless it is an area of dedicated access, with additional safeguards.

Uniline Safety Systems or it's System Integration Specialists can advice on design layouts for specific projects.

## How many people can use the fall protection system?

System designs should always allow for a minimum of two workers and additional workers can be accommodated following verification by Uniline's system simulation software.

# frequently asked questions

## What controls should I put in place with regard to the use of the fall protection system?

- Only use competent persons trained specifically to work at height on roofs
- Produce a risk assessment and method statement for the tasks required to be carried out and implement it thoroughly
- Operate a safe system of work and permit to work system
- Only use specified harnesses and lanyards with the safety system
- If necessary have a rescue plan in place
- Managers and supervisors should familiarise themselves with the systems instructions for use and ensure personnel using the system are trained
- Guard beneath the work area to protect others in the event of a fall or equipment being dropped
- Supervise work at height

## How should workers gain access to the fall protection system in safety?

It is extremely important that means for safe access to the roof is provided. This could be by way of;

- A temporary ladder suitably tied in to the building and stabilised
- A permanent ladder
- A roof access hatch
- Scaffolding
- Opening through a plant room or similar

When advocating the use of ladders other control means such as vertical climbing systems to arrest a slip or fall should be used. Hooped ladders do not offer any means of protection from a fall.

## How often does the fall protection system need to be maintained?

Depending upon the frequency of use and the environment in which the system is installed the minimum requirement is for an annual inspection by a competent person approved by the manufacturer. If a system is going to be used very infrequently, then inspections could be made before each occasion of use, thereby reducing exposure to then risk of working at height for no good reason

## How long will the fall protection system last for?

In a normal environment, where the system will get washed down by rainwater, a good quality system could last for 25 years, providing that it is maintained and looked after. If the system is very near to the coast, this will reduce to around 15 years. In adverse environments advice should be sought from Uniline Safety Systems. Further details on system maintenance are provided in the users instruction manuals for Uniline's products.

## When should I not use a fall protection system?

A fall protection system is not always appropriate and if you are at all in doubt, contact Uniline Safety Systems Ltd, where you will receive expert unbiased advice.

Uniline Safety Systems is a leading international manufacturer of fall protection products and systems. Through a combination of expert knowledge and practical experience, we can help our customers reduce risk and increase safety when working at height.

Uniline's comprehensive range of products offers fully compliant, practical solutions for structures of all types, in all industries. Our ethos of delivering quality, service, training and support for our customers has earned Uniline a deserved reputation for excellence around the world.

Operating through specialist safety companies in over 25 countries, Uniline provides local support and installation services to meet the specific safety objectives of all our customers.



The best vertical fall protection systems in the world won't let you down. The extensive development of the EasyClimber range of products for vertical structures including masts, towers, pylons, wind turbines, silos, bridges and chimney stacks ensures customers will enjoy the safest and most functional climbing experience possible.



If you need a safety solution for roof access during maintenance and inspection tasks, then look no further than Uniline's RoofSafe product range. Our products, including roof anchors, horizontal lifelines, horizontal rail systems and walkways offer comprehensive protection for workers on all types of roofs.



MultiSafe comprises three of the best known brands in fall protection safety: Uni-8, Uni-16, and UniRail. The versatility of these products combined with Uniline's expertise in fall protection ensures we can solve even the most complex of height safety problems in industry, construction, façade access and for all manner of building maintenance and inspection tasks.



A range of intuitive rescue and access products to aid recovery of workers after a fall or in an emergency at height. The diversity of Uniline's Rescue range ensures we can provide a solution for all types of rescue situations whilst keeping safety the top priority.



because lives depend on it

[www.unilinesafety.com](http://www.unilinesafety.com)

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