

GD 10 WORKING AT HEIGHTS: A FALL PREVENTION AND SAFETY CHECKLIST

INTRODUCTION

Roofing technologies, material guarantees and new trends in the marketplace such as the current growth in the use of renewable energy technology systems for example, photovoltaic panels (PVs) make it important to understand specific requirements for access, inspection and maintenance at roof level. Safe work at height must be considered and, just like the roof itself, safe access needs to be designed-in as part of the building from the outset.

This bulletin sets out the main factors that should be considered; whilst the list is not exhaustive, it provides a good starting point.

LEGISLATIVE REQUIREMENTS

- The Construction (Design and Management) Regulations CDM 2015 cover all construction work including maintenance of buildings, placing direct responsibility on building owners, as well as designers.
- This requirement links to the 2005 Work at Height Regulations (WAHR) which applies to all work at height where there is any risk of a fall liable to cause injury. It places duties on employers, the self-employed and any person who controls the work of others, such as facilities managers or building owners.

FALL RESTRAINT AND FALL ARREST SYSTEMS

Where collective solutions such as guardrails are not suitable for perimeter protection (for architectural or technical reasons), cable-based fall restraint or fall arrest systems offer the least invasive solution. The cables are secured to the structure by fixed anchor points. The anchor points, or posts are often top-fixed to the roof (rather than fixed back to the building structure).

- Fall restraint is the preferred design; as it does not allow the end user to fall at any point.
- Fall arrest is an acceptable solution if the fall restraint cannot be achieved however; it involves the end user falling and has a major impact on the design which greatly increases the load absorption on the horizontal life line (HLL) cable system.
- Certification: the HLL specialist company will issue 12 months certification on completion of their works. The system will require annual certification in accordance with BS EN 795 and this information should be set out in the operations and maintenance schedule by the HLL installer.

Note:

Cable systems should be designed by specialist HLL companies, in accordance with the guidance given in the ACR [CP] 007:2008 publication *Best practice for use of horizontal safety lines in roofwork*, BS EN 795 and BS 7833.

The ACR publication covers, testing, standards, design, and most requirements for HLL cable restraint systems.



Cable system and walkway

WORK AT HEIGHT BEST PRACTICE

If work at height cannot be avoided, measures should be employed to prevent falls – this is normally referred to as work **restraint** situation. Then, if the risk of falling cannot be eliminated, measures to minimise the distance and consequence of any fall should be employed – known as designing to **arrest** a fall. These points are well documented in the HSE's hierarchy of safety model which sets out the responsibilities of the 'duty holder'.

1 Collective solutions

'Collective' measures such as guardrails, particularly where more frequent access is needed by a variety of workers with limited high-level operational experience or training, should be considered as a priority.

Different types are available including some that aim to meet architectural design requirements offering straight, curved or inclined uprights, as well as a folding upright version which can be concealed from below when not in use.

Such guardrail systems are also used to contain designated access ways for more frequent use, for example to services, antennae, photovoltaic zones or wind turbines. For this type of application, proprietary anti-slip roof walkways offer a firm footing and they also protect the roof finish.

WARNING Where the facility to gain access to the majority of the roof is required, fixed collective solutions may create limits and temptation for users to deviate from the designed system.

Note:

Freestanding guardrails are available which do not penetrate the roof. This solution is also available in a 'fold back' version which is available where aesthetics are a consideration.

2 Fall prevention systems

Systems that are designed to protect the user from any risk of a fall are generally classed as **work restraint** or work positioning systems. Such systems normally come in the form of a stainless steel perimeter line mounted on brackets and anchors, on top of the outer roof substrate. When designed correctly, in conjunction with relevant personal protection equipment (PPE) that is, fixed length restraint lanyard, these 'restraint' systems ensure that the user will never be at risk of any type of fall from height.

Insurance companies are now aware of this classification and will soon be offering a legitimate reduction in building insurance premiums where roofs feature a 'fall prevention' system. The building owner or occupier has a legal obligation to protect people that go on their roof and should insist on a fall prevention only strategy – a restraint system.

Nowadays it is possible to deploy restraint themed life line safety systems that allow access to most of the roof area. Once the user is inside the wire perimeter system, by definition, he is classed as working in a safe environment, with no risk of a fall provided **always that the roof is non-fragile**. This is the safest horizontal life line design option and should be the default applied to roofs that can accommodate it. Working over fragile roof areas should always be avoided.

3 Fall arrest systems

Where collective solutions are not suitable for perimeter protection (for architectural or technical reasons), a similar cable-based fall **arrest** system offers the least invasive solution.

The wire cables are secured to the structure by fixed anchor points, just like restraint systems (see above). The anchor points, or posts, are often top-fixed to the roof (rather than fixed back to the building structure) and contain energy-absorbing components that limit any load transfer to the roof – therefore avoiding any roof damage in the event of a fall.

Additionally, as they are top-fixed, the roof's integrity is protected and the issue of cold-bridging is avoided. Corrosion of post base plates and other components can be avoided by specification of a fully stainless steel system.

4 General

All such life line systems should be accessible at the roof edge via a wire 'strop' to ensure that the user is safe when switching between the access point (stairway, scaffolding or MEWP etc) and the line system. Access to attach to the wire system should be made possible at any point, using a purpose designed personal attachment device. This enables hands-free movement around the roof area as needed without disengaging the lanyard.

Note:

- It is essential that cable safety systems are specifically designed for, and tested in conjunction with each roofing build up that they are intended to be used on, and accepted by the roofing systems manufacturer.
- It is crucial that consideration is also given to how many people are to be connected to a safety system at one time. Good practice generally requires a minimum of two people on the roof. There are systems available which accommodate more than two workers at once and that allows users to pass each other on the line while still being attached to the system. Proof of such loadings should be made available at the design stage.
- In addition to this a prescribed level of user training, setting out the procedures for rescue and detailed signage will help increase the safety level for the user. A simple restraint design means no risk of a fall, it is easier to use and safer for anyone who has to go on a roof.
- Systems should be fitted with a weatherproof tag at the strop access point that gives details of the validity of the current test certification and the next due date for re-certification.

CHECKLIST

- Does the designer know the full extent of where the system is needed to provide access and why?
- Is the system fully compatible with all roof substrates, including posts? (*Note: if the location is a coastal one then the posts will need to be 316 marine grade stainless steel*).
- Has the system been tested and proven to work on the intended roof build up?
- Does the manufacturer offer a warranty that covers the roof safety system?
- Is there test data available to prove that the system complies with required testing standards?
- Is the system's annual maintenance check up to date?
- How many people does the system need to provide fall protection for?
- Will the correct PPE for the desired number of users be purchased with the system?
- If using an HLL cable system, has the system been inspected to ensure that it is in-test/in-date prior to usage?
- What accreditation does the specialist installer of the HLL system? Given the safety critical nature of the works, an accredited QA scheme of works is recommended.
- Does the specialist installer have professional indemnity (PI) insurance to a minimum £2 million? This is important as there is a design element in their work.
- The HLL manufacturer will offer a warranty; it is therefore essential that the HLL installer also offers an installation warranty.



Collective fall protection of guardrail and walkway with accompanying cable system providing access to restricted areas

MCRMA SAFETY LINES GROUP

The MCRMA Safety Lines Group has been formed to address industry concerns that the specific requirements for safe work at height; that is, access, inspection and maintenance, is still not fully understood in certain sectors of the market place.

The members of the Group take an active role in the Advisory Committee for Roofsafety (ACR) and support the aim to make working on roofs safer through involvement on the ACR committee and endorsement of the recommendations contained within the Magenta Book which can be downloaded from the Roof Safety section at www.mcrma.co.uk

Members of the Safety Lines Group have more than 35 years of experience in fall protection and provide a wide range of safety solutions. Information about the Safety Lines Group can be found at <http://www.mcrma.co.uk/safety-lines.htm>

REFERENCES

- Working at Height Regulations (WAHR) 2005 (including 2007 updates)
- Advisory Committee for Roof work ACR(CP) 007:2007 *Recommended practice for use of horizontal safety lines in roof work*
- Advisory Committee for Roof work ACR(M) 002:2009 *Testing of roof anchors on roof systems*
- The Construction (Design and Management) Regulations 2015

DISCLAIMER

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