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Risk control

Working at Height Toolkit: Fall Arrest



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Introduction

The Work at Height Regulations 2005¹ require that priority be given to equipment that provides collective protection as opposed to equipment that is 'personal' and protects only the person using it.

Therefore, equipment used to arrest falls should be used only when consideration of other methods of fall protection that prevent falls have been exhausted (e.g. a working platform with guardrails or work positioning equipment, such as rope access).

Fall arrest equipment comes in several forms and includes personal fall arrest equipment (safety harnesses etc.), and collective fall arrest equipment, such as safety nets and soft-landing systems (air bags or other similar cushioned products).

Personal protective measures rely upon the use of personal fall protection equipment (PFPE), and they only protect the user. The most common example of PFPE is safety harnesses. It is important to note that only the individual user is protected by PFPE and that an elevated level of personal discipline is required to ensure the equipment is worn and used correctly.

When using equipment to arrest falls, it is important to remember that equipment of this nature allows a fall to occur but aims to prevent injury by preventing the usual impact that that would follow a fall. Therefore, forms of protection that limit the distance of the fall should always be considered as preferable to equipment that does not limit fall distance.

Fall Arrest Harnesses

Fall arrest harnesses have the benefit of allowing the user a degree of movement to conduct their work. At one end, the lanyard is attached to a secure anchor point, i.e. a structural component that has been assessed as being capable of withstanding the loads that might be applied in the event of a fall, and at the other end, it is usually attached to the rear of the user's harness on a 'D-Ring' which is often located centrally, between the user's shoulder blades by means of a securely fastened karabiner. When the user falls, a shock absorbing device on the lanyard reduces the impact of a fall and will prevent the user from falling the full distance to the ground, thereby limiting the extent of any injuries that the casualty may suffer. In a 'prone' position, a casualty will typically be suspended in a position that is tilted slightly forward, with their head uppermost.

For all types of fall arrest systems, a clear space must be maintained in the fall area, i.e. the area beneath where the work is taking place, so potential falls can be unimpeded and the equipment can have optimum impact in terms of preventing injury, i.e. limiting the distance and consequences of the fall.

As an example, a 2 metre lanyard anchored at foot level will require approximately 6.75 metres of clear space beneath the anchorage point to prevent injury. This distance is made up of the 2 metre lanyard, 1.75 metres of energy absorber maximum travel, approximately 2 metres of body height and a 1 metre safety margin.

Anchor point selection is critical as death or severe injury can occur if they are not correctly selected. Anchor points must always be secure and capable of withstanding the load that a falling person may impose on them, and they should also be located as high as possible above the user's point of work, to limit the distance of a fall.

Anchor points must also be as close to vertical as possible. This will help to avoid the pendulum effect, whereby the casualty swings in an uncontrolled manner from the point of work to the point of attachment and increases the risk of injury by swinging into objects.

Selecting PFPE

All working platforms from which a fall from height is possible must be fitted with guardrails and toe boards to protect against falls and falling materials.

Key considerations include:

- The PFPE must be manufactured to the relevant British or equivalent European standards
- All PFPE must be uniquely identifiable, with a legible ID or serial number
- Users must be trained in the safe use and care of personal fall protection equipment. This should extend to being able to adjust the equipment so that it fits correctly
- Users must be trained on any rescue or emergency procedures that may be implemented
- Equipment must be inspected by a competent person at intervals not exceeding 6 months, and the result of the inspection should be recorded. This frequency should be reduced for equipment that is heavily used or used in arduous conditions – a risk assessment will help in establishing the most suitable frequency of inspection
- To supplement the documented checks, the user should conduct a pre-use check to ensure that the equipment is in good condition and is fit for purpose

- A suitable and secure anchor point must always be available
- An elevated level of personal discipline must be maintained at all times

Safety Nets

Safety nets are very commonly used for activities that involve steel frame construction work and other similar roofing activities. They provide a collective method of arresting falls and can cushion the impact of a fall, and for this reason, they are often preferred to other types of fall arrest systems.

As with all other forms of work at height safety equipment, it is important that the correct processes are implemented to ensure that nets are correctly installed and used.

Potential fall distances should be minimised and the area beneath safety nets must be free from obstructions, including plant, machinery, and even structural steelwork, as the net must form an open area into which someone can fall without experiencing injury.

Nets must only be installed by those who are suitably trained and competent. The most widely known and reputed qualification for Safety Net Riggers is operated and administered by the established trade association and training body for the safety net rigging and temporary safety systems industry called Fall Arrest Safety Equipment Training² (FASET).

A competent person will usually hold a Construction Skills Certification Scheme³ (CSCS) Safety Net Rigger Card. Any card issued can be verified using the card checker on their website. Using the services of appropriately qualified riggers who are part of a reputable installation organisation will go a long way towards ensuring that nets will be installed correctly and that they will subsequently be fit for purpose.

Key considerations:

- Safety nets must conform to appropriate British standard⁴ BS 8411:2019 and equivalent European standards (as set out in SG14:10 by NASC⁵)
- End users of nets should satisfy themselves that the nets have been evaluated to ensure energy absorption capability
- Safety nets must be installed by competent riggers
- The maximum permissible gap from the edge of a net should be no more than 225 millimetres, but ideally this should be 100 millimetres
- The maximum centres for attachment of a fall arrest safety net is 2.5 metres when rope ties are used

- Check the suitability of the structure that safety nets are attached to

Safety Nets - Record Keeping

All safety nets must be supplied with a permanently attached label that contains, as a minimum, the following information:

- The name or mark of the manufacture or importer
- The designation, identity number and year and month of manufacture
- The manufacturer's withdrawal from service criteria of the safety net
- The manufacturer's article code

Any nets that are not provided with a label or where the essential information is missing should not be considered fit for use.

Safety Nets - Inspection and Testing

It is vitally important that all newly installed netting is inspected and handed over by the installers prior to being brought into service. This will involve a thorough check of the netting and the issuing of a handing over certificate which will serve as confirmation that a pre-use inspection was conducted.

After the nets have been handed over and placed into service further inspections are required and these should take place at periods not exceeding seven days or any event that may have reduced the capability of the nets, for example after arresting a fall or after accidental contact by heavy machinery. The inspection record should detail any faults found and any required actions and must be maintained on site for future reference.

The supplier of the safety netting is responsible for the inspection and testing of netting before being installed.

Soft Landing Systems

Soft landing systems are used in areas where low-level falls are possible. Typical examples are for bricklayers when laying bricks from the first lift of scaffold, when internal collective fall protection cannot be installed, or for lorry drivers who are required to access their vehicle decks.

Systems of this nature allow the fall to take place and do not limit the fall distance but mitigate the consequence of a fall. Their use is gradually becoming less common as organisations seek to implement systems that do limit fall distances and offer a solution that is a safer alternative.

Rescue

Rescue must be considered at the planning stage for all working at height activity, and a rescue plan should be drawn up that clearly describes the methods of executing a rescue for any casualties. It is not acceptable to rely totally on the emergency services to conduct a rescue and local arrangements must be made.

The complexity of a rescue plan will match the complexity of the work that is being conducted and, in most cases, rescue plans are simple. However, for work at height that is more complex in nature, it will sometimes be the case that specialist rescue equipment and training is required.

References

1. Work at Height Regulations 2005. Available here: <https://www.legislation.gov.uk/uksi/2005/735/contents/made>
2. Fall Arrest Safety Equipment Training. Available here: <https://www.faset.org.uk/>
3. Construction Skills Certification Scheme. Available here: <https://www.cscs.uk.com/>
4. BS 8411:2019 'Safety nets on construction sites and other works' Code of Practice. Available here: <https://knowledge.bsigroup.com/products/safety-nets-on-construction-sites-and-other-works-code-of-practice>
5. SG14:10 'Safety Nets' National Access and Scaffolding Confederation Available here: <https://nasc.org.uk/product-category/health-and-safety-guidance/>

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Further information

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