



Don't let them fall for it!

Most contracts involve working at height. This poses a risk of falling, which you can help mitigate by designing protection into your project.

Falling from height is the most common cause of fatal accidents on construction sites. This is, in part, because most designs require at least some work to be completed at height.

Even low-rise buildings have features like chimneys and roofs that need work. So it pays to be aware of the risks, and incorporate ways of minimising them in your design.

Life outside the tick box.



A hierarchy of control

It may not be possible to eliminate the need for work to be completed at height. But you should help to minimise the hazard, by:

- **Facilitating the provision of fall-protection measures**
- **Allowing for the use of temporary access equipment, such as scaffolds and Mobile Access Towers (MATs)**
- **Facilitating the provision of fall-arrest systems**
- **Allowing for the use of suspended or mobile access equipment during maintenance**

Fall protection

Workers are at their most vulnerable when they are working around the perimeter of a structure, or close to advancing edges inside a structure.

You cannot easily limit the amount of time workers have to spend on the perimeter of a structure. But you can specify attachments for temporary edge-protection on perimeter members. For example, tubes can be welded to steel members or cast into concrete members. These can be used during the construction phase of a project, and for ongoing maintenance.

Temporary access equipment

If you design stairways that can be installed at an early stage in the construction process, you will reduce the need for temporary access equipment on site.

Where it is necessary for the contractor to use equipment such as scaffolds and towers, this needs to be tied at regular intervals to protect against buckling and overturning. You should make provision for this in your design – something that is especially challenging on façades predominated by glazing.

Further guidance about the use of temporary works equipment is available in CON306 **Temporary works**.

Fall-arrest systems

As a general rule, safety nets are favoured over personal protection equipment (PPE) as a means of protecting workers from falls at height.



Safety nets

Designers should refer to British Standard EN1263: Parts One and Two when making provision for safety nets in projects. Generally speaking, you should:

- **Discuss the use of safety nets with a competent supplier, prior to developing your design**
- **Ensure that, if safety nets are to be attached to a structural grid, the grid is able to resist the lateral loads. This is especially important when nets are attached to steelwork in composite construction, or purlins in roof work**
- **Locate net installation points so that they minimise the fall height. For example, you should detail pre-installed anchors at 1.2-metre centres, attached to the webs of beams a maximum of 100mm beneath the flange**
- **Consider restricting service runs, so that they cannot obstruct a fall into a net or prevent a net from deflecting**
- **Consider restricting the net area enclosed by the grid (e.g. to 45m² with one maximum dimension of nine metres)**
- **Ensure that the story height is at least 3.75 metres. This ensures that nets attached close to the working surface can deflect safely**

It is worth remembering that, when safety nets are used in industrial developments, they are often installed from Mobile Elevating Work Platforms (MEWPs). If this is going to be the case, you should make allowance for the concentrated loads applied by MEWP wheels and outriggers on the structure.

Personal protection equipment (PPE)

Lanyards securing PPE must always be attached to a suitable and sufficient load-bearing anchor. That means you should provide anchor points that are capable of bearing 12kN applied horizontally. The figure will be higher for horizontal lifelines – consult a supplier for specialist advice.

You should also remember that lanyards need to be as short as possible, and that impact forces are lower when the anchor is above the worker. Design your solution to take account of these factors, and try to avoid the lanyard coming into contact with sharp edges that could cut it.

Designers need to indicate the precise whereabouts of anchors for PPE, so that contractors can make the necessary provision for their workforce.

PPE and steelwork

When PPE is used in the erection of steelwork, you should consider specifying holes in the flanges of columns and beams. Holes in columns should be 1.5 metres above the beams, and holes in beams should be at two metres centre-to-centre.

PPE and precast concrete

When using precast concrete in your project, you should specify anchor points:

- **In slots, 50mm x 125mm x 75mm deep**
- **Located as far as possible behind the leading edge**
- **At a spacing of no more than 2.5 metres**



Maintenance

Designers need to think about the maintenance phase of their project, and provide ongoing protection against the risks associated with working at height.

Wherever possible, avoid locating service plant and structures, like air conditioning units, at height. You should also locate system and process pipework at ground level, and avoid installing high maintenance items above stairwells and other deep recesses.

Specify reversible windows over two metres high. If this is not appropriate, make sure you incorporate provision for access equipment (e.g. MATs) in your design.

Use durable materials in the construction process, to minimise the maintenance required on an ongoing basis.

If suspended access equipment is the intended means by which a structure will be maintained, consult MTN502 **Suspended access** for further guidance.

To find out more about the hazards associated with maintaining roofs, see CON308 **Roof working**.

Information

To ensure that contractors and maintenance workers are aware of the hazards you have been unable to eliminate from your design, make certain that they are highlighted in the health and safety plan and file.

Why do people fall?

There are four main reasons why people fall from height on building sites:

- **Poor workplace design**
- **Collapse of access support, such as scaffolds and ladders**
- **Workers being required to operate beyond the confines of the protection provided**
- **Failure by workers to heed restrictions on movement around a site – for example, when those restrictions do not accommodate the construction work**

Reducing the need to work at height

You should consider strategies to help reduce the amount of time workers need to spend at height. For example:

- **Design retaining walls as bored contiguous piles that are installed from existing ground level. This eliminates the need for shuttering and concreting operations at height**
- **Design service runs so that areas needing maintenance can be accessed from the floor above**
- **Design trusses that can be pre-assembled, and lifted into place**
- **Determine floor heights in buildings so that temporary works equipment can be installed from the floor below**
- **Consider specifying composite flooring that is capable of bearing erection loads. This enables permanent formwork to be constructed immediately the support frame is complete, and obviates the need to construct falsework at height**
- **Position splices for steel columns at one metre above floor level, to allow splicing from a completed protected floor**
- **Specify the use of precast slabs and elements**



Useful resources

BS EN1263: Parts One and Two

See elsewhere on SID:

CON306 Temporary works

CON308 Roof working

MTN502 Suspended Access

ADM008 Management of the works: the health and safety plan

ADM009 Management of post-project information: the health and safety file