



Access Design & Safety Ltd

Roof Edge Protection GUIDE

BY ACCESS DESIGN & SAFETY

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Roof Edge Protection: An Introduction

For any individuals engaged in construction, maintenance or any other form of works on roof edges or scaffolding, where there is a risk of a fall, the risks must be managed. This may mean the use of temporary edge protection systems. The design and use of temporary edge protection systems are governed by BS EN 13374:2013.

Designed as a result of collaborative work between several European countries, this standard has been adapted over the years to meet the specific modern requirements of workers, with the last major update taking place in 2013. This guide provides an overview of these changes and the specific requirements that need to be considered for edge protection on roofs.



The Basic Requirements of Roof Edge Protection

As stated by BS EN 13374: 2013, an edge protection system must include:

- A principal guardrail
- An Intermediate guardrail or protection
- A toeboard if possible

As clearly stated within the 2013 update, every component included in this system must be designed to avoid accidental displacement or removal during use. The updated standard also notes that edge protection systems must be designed to prevent any form of injury from laceration or puncturing, and the system should not be created as an integrated unit.

Based on this statement, it's possible to interpret the requirements of the Standard in a variety of ways. In the updated version of the standard, more specifics are included - such as the requirements for a maximum gap of 120mm between the end of an edge protection system and another structure - for example, a wall.

As of 2013, the Standard has defined several distinct classifications of roof edge protection, depending on the gradient of the surface on which work will be carried out, i.e. the pitch angle when working on a roof. These classifications fall under 3 categories, A, B & C, as follows:

Class A, B & C Under BS 13377:2013

If the angle is more than 60° or more than 45° and the falling height is more than 5m, edge protection systems are not appropriate as protection.

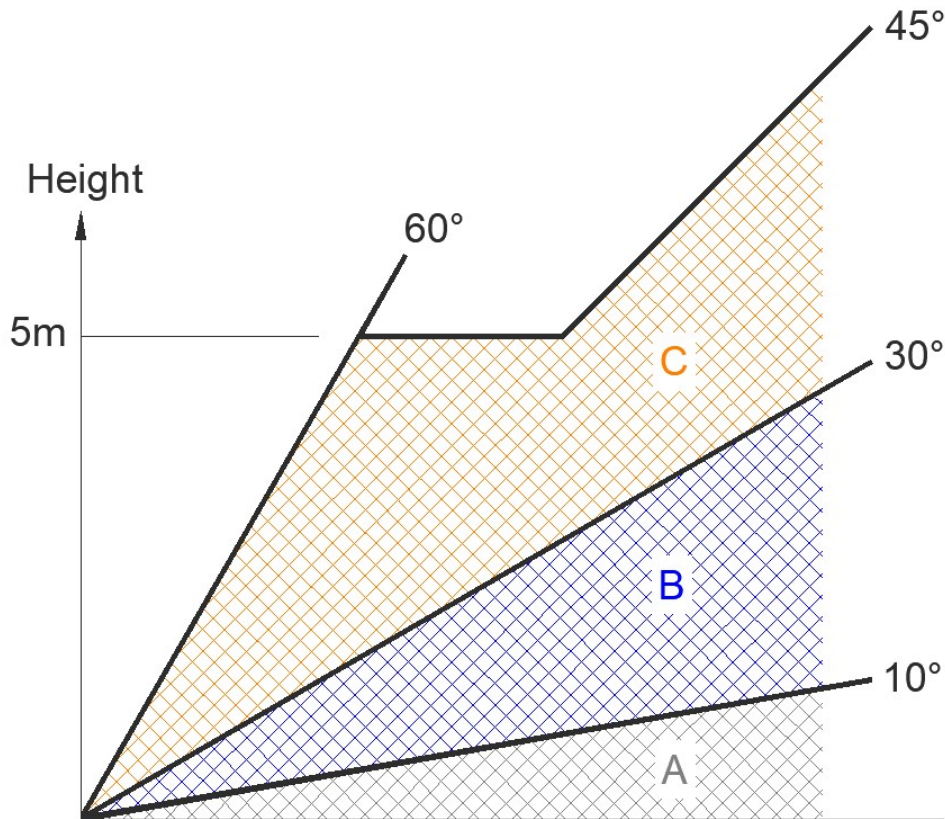


Fig.1

The graph Fig.1 featured above provides more detailed insight into the differing edge protection classes, as based on the requirements of BS EN 13374:2013. While this graph is not a standard requirement, it does provide a useful visual example of how classes can apply.

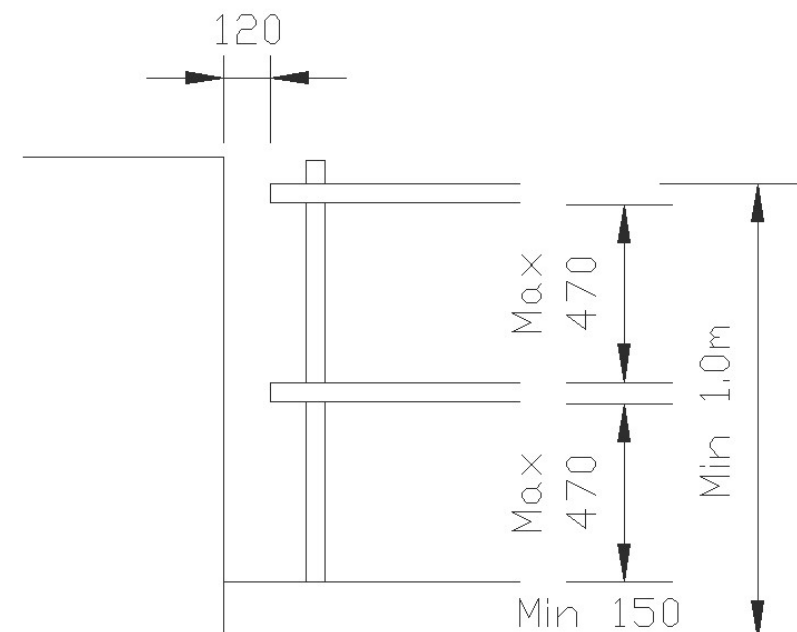
Class A, B & C Under BS 13377:2013

A

Class A Protection for roof surfaces as flat surfaces or slopes less than 10°. This classification covers requirements for workers walking besides, leaning against or stumbling due to roof protection. It also offers resistance for static loads.

According to the BS EN 13374: 2013 the following specifications are required for Class A roof edge protection systems:

- Two handrails plus a toeboard if possible
- Gaps of no more than 470mm between handrails
- Designed to resist forces of 0.30kN (handrail) and 0.20kN (toeboard)
- Capable of withstanding a vertical force of 1.25kN
- The support for a Class A system may come from drilled anchors, counterweights, compression posts or clamping.
- The vertical post must be within 15° of being perpendicular to the working surface.



Class A

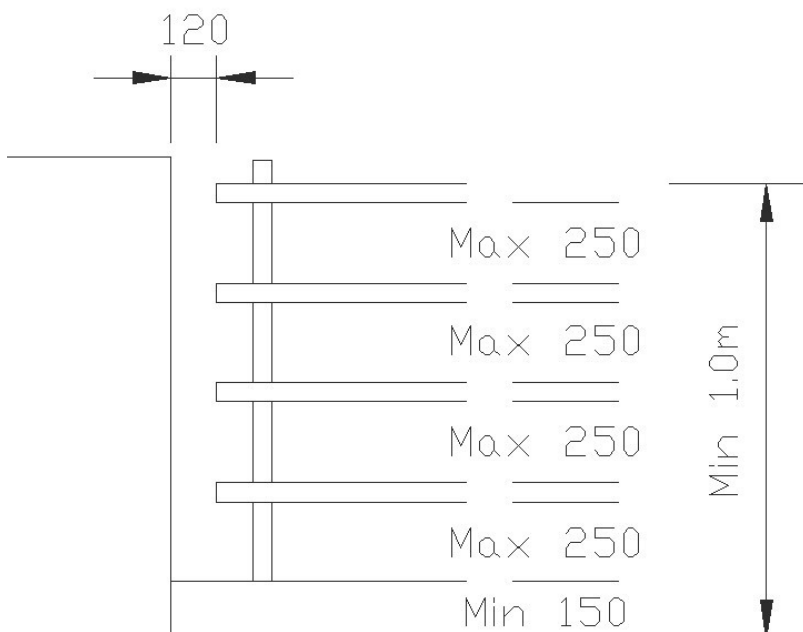
Class A, B & C Under BS 13377:2013

B

Class B Protection for roof surfaces as flat surfaces or slopes up to 30°. This classification covers requirements set out above in Class A for workers, in addition to sliding due to angle. Class B also offers resistance for low dynamic loads.

According to the BS EN 13374:2013 the following specifications are required for Class B roof edge protection systems:

- Two handrails or more plus a toeboard if possible
- Gaps of no more than 250mm between handrails
- Designed to resist forces of 0.30kN (handrail) and 0.20kN (toeboard)
- Capable of withstanding a vertical force of 1.25kN
- Dynamic testing for impact energy forces of 0.50kJ (handrails) and 1.1kJ (lower handrails) must be carried out on site.
- The support for a Class B system must be bolted or clamped.
- The vertical post must be within 15° of being perpendicular to the working surface.



Class B

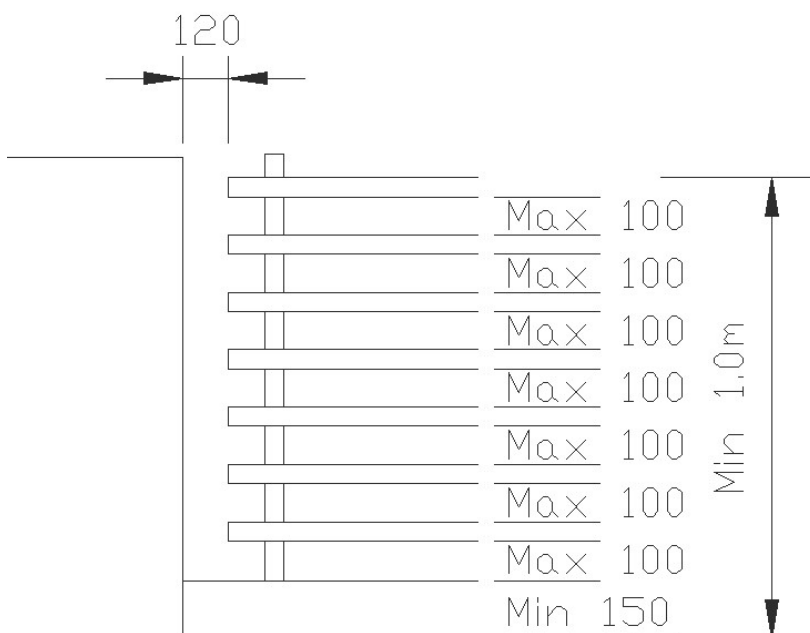
Class A, B & C Under BS 13377:2013

C

Class C Protection for roof surfaces up to 45°, or 60° for slopes with a length of 5m or less. Class C offers resistance for high dynamic loads only and covers the requirements to contain an individual should they slide down the steep slope.

According to the BS EN 13374:2013 the following specifications are required for Class C roof edge protection systems:

- Two handrails or more plus a toeboard if possible
- Gaps of no more than 100mm between handrails
- Designed to resist forces of 0.30kN (handrail) and 0.20kN (toeboard)
- Capable of withstanding a vertical force of 1.25kN
- Dynamic testing for impact energy forces of 2.20kJ must be carried out on site.
- The support for a Class C system must be bolted or clamped.
- The vertical post must be within 15° of being perpendicular to the working surface.

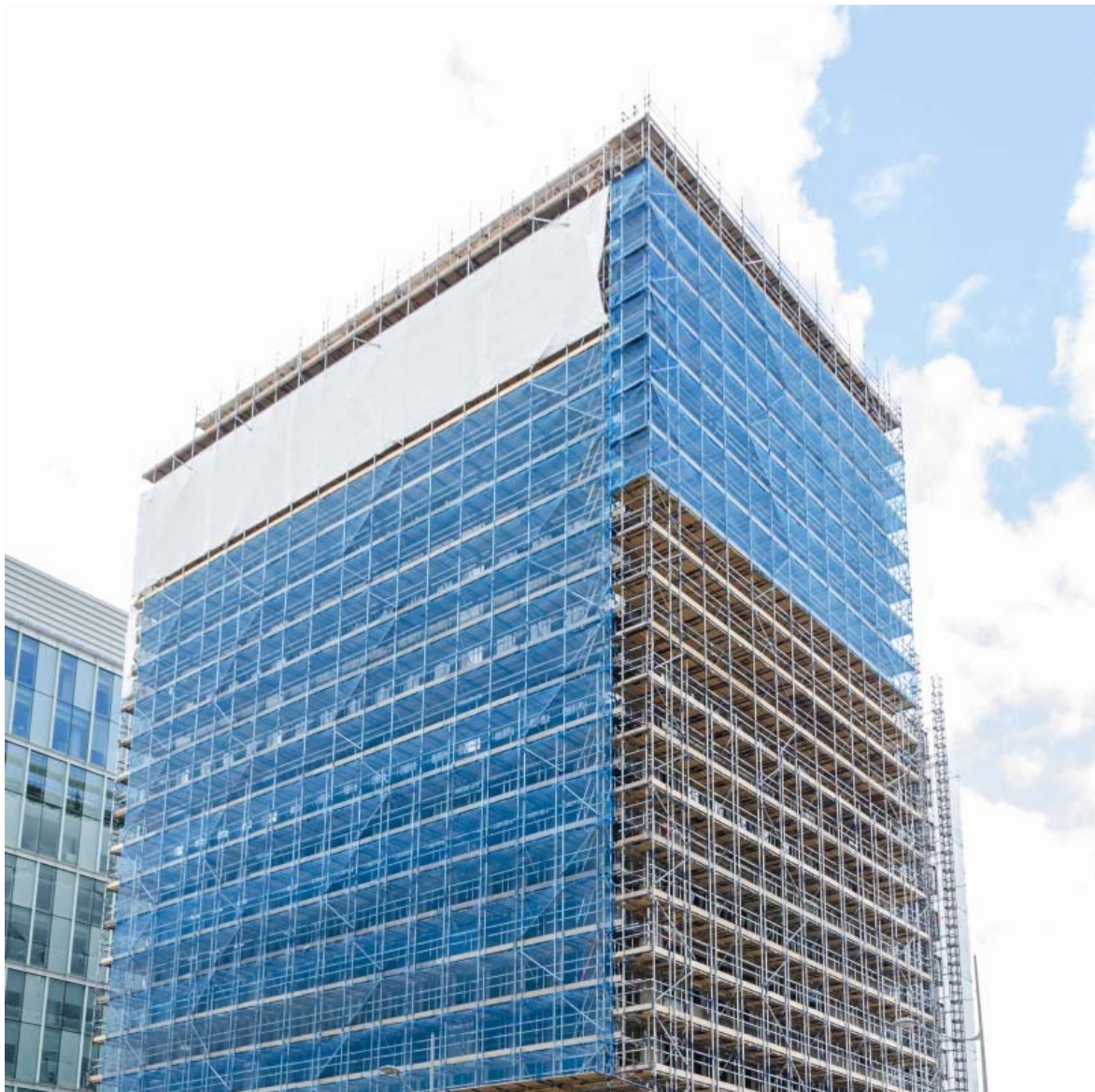


Class C

Class A, B & C Under BS 13377:2013

How To Avoid Dynamic Testing

As dynamic testing is required to meet the Standard for both Classes B and C, it could be suggested that a platform below the base of the roof at eaves level is erected. This would then meet the edge protection requirements of Class A and dynamic testing could be avoided. The platform must be wide enough to ensure that someone falling from the roof could not fall past the outside edge of the platform.



What Is A Principal Guardrail?

The principal guardrail is the top handrail. As defined under the Standard, the distance between the working surface and the principal guardrail must be at least 1000mm when measured perpendicularly to the working surface. This guardrail must be continuous. Any gaps along the length of the primary guardrail must be less than 120mm, as stated in the Standard. Based on these requirements, multiple products and methods are now available as viable protection options. These include:

- Net barrier systems
- Mesh barrier systems
- Counterweight systems for flat roofing
- Screen systems
- Tubular guardrail systems



What Is A Principal Guardrail?

Environmental Considerations

Wind Pressure

Not all edge protection will be affected by wind, but if wind does need to be taken into consideration, wind load is must be calculated. Wind loads should be calculated with a combination of wind loading and one of three possible handrail loads to be considered an accurate evaluation of load capacity. In most cases, however, the combined force of wind load and one handrail load would be less than the sum of all handrail loads (without wind load factored in), unless the edge protection system is clad with sheeting or debris netting. In this case, calculating the wind load becomes more important. Wind loads can vary depending on several factors so every application should be considered based on location, height and duration.

Snow

A build-up of snow can cause many issues to ongoing works, including the effective use of roof edge protection. For example, the use of barriers as defined under Class C may lead to large amounts of snow being built up behind or within a barrier area. For areas where snow is common, this should be considered as a factor when deciding upon the appropriate protection system. It's also vital that the risks and Health & Safety concerns or snow or icy conditions be considered concerning roof protection. Guardrails should be capable of mitigating slips or falls and capable of taking sudden impact due to potential loss of footing.

Additional Requirements Under BS EN 13374:2013

In addition to the more significant factors stated above, the 2013 version of the Standard also included various smaller updates and changes. These are listed as follows:

Nets

All nets used for safety purposes must meet the load requirements and be installed without slackness, per EN 1263-1.

Toe Boards

The toe board must be at least 150mm high, as per Fig 2,3 & 4. Toe boards must also contain as few gaps as possible. Any gaps present must be small enough that a sphere of 20mm cannot pass through.



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