

ADVISORY COMMITTEE FOR ROOFSAFETY
Good Practice Guide

ACR (CP) 006: 2014 REV2
**Practical methods of providing edge
protection for working on roofs**

Practical methods for providing edge protection for working on roofs

PREFACE

This Good Practice Guide has been drawn up to provide information on practical methods that can be used to prevent workers on roofs falling off the edge. It is one of a series of guides that have been drawn up by the Advisory Committee for Roofsafety (ACR). It compliments the other guides in this series, to make working on roofs safer.

The edge protection systems dealt with in this guide are, at the time of writing, generally available and considered good practice when constructed correctly and erected safely. They can be erected using readily available components.

Readers are advised to seek and follow manufacturers' advice, as the use of proprietary systems will, for example, depend on whether the site conditions are suitable. Only suitable persons having appropriate competence, training and physical fitness should be allowed on any roof to work at height and to carry out the task at hand.

Graham Willmott(ACR Chairman)

Consequently, people working on roofs must be protected from falling from any exposed edge. Similarly, those who install the selected protection must also be protected from falling.

Edge protection can be achieved in many ways. Any system in conformity with the BS EN 13374 will provide adequate edge protection for workers on roofs. BS EN 13374 specifies three classes of edge protection: **Class A, Class B** and **Class C**. A brief overview of BS EN 13374 is given in Annex A, at the end of this document, and the various types of edge protection covered by BS EN 13374 are illustrated in **Annexe A, Figure A3**.

Edge protection can take many forms but, traditionally, it has used 'tube and fitting' scaffold components, supplemented where necessary by nets, fencing meshes and tensioned wires. More recently, it has been formed from purpose-made components, manufactured and/or assembled by specialist companies. **Whichever system you propose to use you must be able to demonstrate that the system you specify is 'fit for purpose' This may be by provision of design calculations, evidence of testing, or both if appropriate, or manufactures supporting information..**

SCOPE

This Guide illustrates, and gives advice about some of the ways in which any exposed roof edge can be protected using readily available components and work equipment.

This Guide does not cover the fall protection requirements needed during the erection and dismantling of the edge protection system chosen. This will be site specific and **MUST** be considered during the selection of edge protection, and included in the method statement for the erection and dismantling. Techniques may include the use of mobile elevating platforms (MEWPs) or personal fall protection systems such as industrial rope access and work restraint/work positioning/fall arrest systems¹.

Note¹: see BS 7985, BS 8437.

REFERENCE DOCUMENTS

ACR(M)001 [The Red Book]	Test for Non-Fragility of Profiled Sheeted Roofing Assemblies
ACR(CP)001 [The Orange Book]	Recommended Practice for Work on Profiled Sheeted Roofs
ACR(CP)002	Guidance Note for Safe Working on

CONTENTS

Introduction	1
Scope	1
Reference Documents	1
Choosing an appropriate fall protection system	2
Principles behind selecting and installing suitable edge protection	2
Proprietary Systems	3
Edge protection systems	4
Leading Edge Protection	8
Minor Work	9
Annexe A – Brief overview of BS EN 13374	11
Annexe A – Proprietary edge protection systems	13
Annexe B – Fall protection work for minor work on roofs	14
Annex C -Constitution of the Working Group and revision information	15
Participating organisations	Back cover

Introduction

It is against the law for people to work unprotected close to an edge off which they can fall a distance that will cause injury or harm.

Practical methods for providing edge protection for working on roofs

[The Green Book]	Fragile Roofs
ACR(CP)005 [The Black Book]	Guidance note for competence and general fitness requirements to work on roofs
Work at Height Regulations 2005 [WAHR]	Statutory Instrument 2005 No. 735
SG4	Preventing Falls from Scaffolding and False work - NASC
BS EN 1263-1	Safety nets. Safety requirements, test methods
BS EN 13374	Temporary edge protection systems, product specification, test methods
BS 7985	Code of Practice for the use of rope access methods for industrial purposes
BS 8437	Code of practice for selection, use and maintenance of personal fall protection systems and equipment for use in the workplace
HSG 33	Health and Safety in Roof work (Revised -Fourth Edition 2012)
TG20 : 13	Operational Guide –NASC
SG27	Temporary edge protection on open steel work –NASC
BS EN 12811 – 1	Temporary works equipment – Part 1 - Performance requirements and general design
	Edge Protection – EPF
Guidance Sheet a	Fall protection and prevention for working on roofs (February 2009) – NFRC
Edge Protection	Code of practice – Edge protection - Edge Protection Federation (EPF)

CHOOSING AN APPROPRIATE FALL PROTECTION SYSTEM

1. The legal requirement is for the fall protection equipment to prevent so far as is reasonably practical any person falling a distance liable to cause personal injury or where this is not practical reduce the distance and consequences of the fall.
2. Therefore, it is important that the correct system is chosen. For example, the provision of BS EN 13374 Class A guard-rails, intended for edge protection to roofs slopes up to 10 degrees placed at the edge of a steeply sloping

roof may not provide adequate protection, especially if the work is some distance up the roof slope from the edge, because a person sliding down the roof could:

- a) Cause the guard-rail to fail (because Class A systems are not designed for dynamic forces); or
- b) Injure the person who impacts the guard-rail (because the arresting forces could be significant).

3. In addition, the choice and the extent of protection should fit the job in hand. For example there is nothing to be gained by protecting the complete perimeter of a roof for situations that will only require operatives to work over a small part of the roof, provide edge protection which extends beyond the work area, by at least 2m and ensure adequate controls are in place to prevent them approaching unprotected edges.

PRINCIPLES BEHIND SELECTING AND INSTALLING SUITABLE EDGE PROTECTION

4. A roof from which it is impossible to fall does not need any additional edge protection, because it comes under the legal definition of an 'existing place of work' under Work at Height Regulations (WAHR). For example, a non-fragile 'flat' roof, with a full perimeter parapet at least 950 mm high, will not normally require additional edge protection.
5. Before commencing work on any existing roof it is absolutely essential that you find out whether your roof is fragile, or has fragile elements in it e.g. roof lights in a metal sheet clad roof, or is non-fragile. This is a key decision, which should only be made by persons competent² to do so. If there are any doubts, assume that the roof is fragile².

Note²: See ACR [CP] 005 [The Black Book], ACR [CP]001 [The Orange Book] & ACR[CP]002 [The Green Book].

Providing an effective system

6. In choosing the system of edge protection³, each of the following processes and their risks should be considered:
 - a) Type of Work
 - b) Access and egress;
 - c) Erection;
 - d) Use;
 - e) Dismantling;

Practical methods for providing edge protection for working on roofs

f) Rescue (associated with its provision and removal).

Note³: MEWPs and mobile tower scaffolds may be suitable for carrying out work at the perimeter of a roof from their working platforms. However they are not recommended for use as edge protection for people working at the edge of the roof, from the roof, or further up the roof slope. In the case of MEWPs the length of the working platform may be inadequate, and a person impacting the guard-rail adjacent to the roof edge may cause the platform to sway resulting in a significant gap between the MEWP platform and the roof edge. Single mobile tower scaffolds will have insufficient length to provide adequate edge protection. Multiple towers secured to the building to prevent outward sway if impacted may be required.

7. In accordance with the principles of the Work at Height Regulations 2005 (WAHR)⁴, an edge protection system which can be installed without the need to work at height should be the preferred solution.

Note⁴: If such systems are available but not selected it is advisable to record a justification of the reason for its non-selection.

8. To be effective, edge protection systems must stop people and objects falling off the edge of the surface it is erected to guard. To achieve this, the law requires that all elements be of sufficient strength and rigidity for their purpose and as far as reasonably practical cannot be accidentally displaced.

Additionally, as work on a roof is classed as “work at a height”, the law specifically requires the provision of:

- a) A principal barrier, usually a guard-rail, at least 950 mm above the working surface it is providing protection to;
- b) A barrier at working surface level, commonly called a toe-board; and
- c) Any vertical gap between the protection components must not exceed 470 mm in the case of BS EN 13374 Class A edge protection and 250 mm for Class B and 100mm for Class C.
- d) Due consideration of the principal barrier height should be given to take into account the variation or increase of roof depth as work proceeds.

9. If choosing an edge protection system that is required to meet the requirements of BS EN 13374: 2013, it should

be used within the limitations of the selected class as outlined in Annexe A of that Standard (see Annexe A, Figure A.1).

10. When called into use, the edge protection system itself should be designed to minimise harm to the person being protected, e.g. from sharp edges or, on a sloping roof, a structure that is too stiff.
11. When positioning edge protection systems, the dimensions and location of any gutters or other protrusions should be considered. Failure to do so may result in them fouling the edge protection.
12. Toe-boards must be effective in stopping objects from falling both over and under them, i.e. their height; shape and positioning must be commensurate with the objects being used on the roof and the roof profile⁵. An assessment¹ should demonstrate what is ‘suitable and sufficient’ to prevent the fall of any person, material or object. Where there is the risk of a fall of materials or objects an exclusion zone must be created below any area of work. Where reasonably practical good practice would be to create an exclusion zone below an area of work at height.

Note⁵: See Work at Height Regulations (WAHR: 2005, Reg. 6(1), Risk assessment, and Reg. 10, Falling objects.

PROPRIETARY SYSTEMS

13. A detailed description of the many prefabricated systems that are available is beyond the scope of this good practice guide. herefore, those planning roofwork should consult with manufacturers/suppliers to ascertain what equipment is available currently to meet their particular application.

It should be noted that BS EN 13374 does not cover proprietary edge protection systems, used in those situations listed in Annexe A, Item A3.

14. Where it is intended to use proprietary systems, their use should be discussed with the manufacturer who supplies it. The manufacturer should be made aware of (at least) the following information:

- a) The situation in which the system is to be used, e.g. whether or not the site is exposed and there is any significant topographic feature likely to affect the wind speed and direction;

Practical methods for providing edge protection for working on roofs

- b) The thickness of the floor or roof slab, e.g. when clamped to the edge of a concrete slab;
- c) The width of the flanges, e.g. when clamped to steel beams;
- d) The slope of the roof, e.g. when used on a sloping roof;
- e) Whether the system will be modified, e.g. fixing debris nets or advertising banners to it;
- f) Whether work will be carried out at the edge of the roof, e.g. sections may need to be removed temporarily.

Working safely upon an existing roof

15 Before any work starts, a competent⁶ person must verify whether the roof is ‘fragile’ or has fragile elements in it (e.g roof lights in a metal sheet clad roof) or ‘non-fragile’. Where operatives are required subsequently to work upon a fragile roof⁷ action must be taken to prevent falls of people and materials through or off it.

Note 6: See ACR[C]005 [The Black Book].

Note 7: See ACR[CP]001 [The Orange Book] and ACR[CP]002: [The Green Book].

Using competent people

16. Only people with the competence to do so should install edge protection.

17. A definition of competence is given in the ACR ‘Black Book’⁸. In connection with the installation of edge protection this definition implies:

- a) Where the work involves work at height⁸; being competent to work at a height;
 - b) Understanding and being able to state the correct sequence of erection and positioning of the edge protection components;
 - c) Understanding and being able to state the correct way to maintain their own fall protection equipment during its installation;
- and
- d) being able to state the limitations of any work equipment they use.

Note 8: Described in detail in ACR[CP]005:2012 [The Black Book].

Extent of edge protection

18. The type of edge protection used depends upon the roof

and the work to be done. The edge protection should extend a sufficient distance each side of the physical work area and access should be restricted to the protected area⁹. Where the work is extensive (or adequate control cannot be achieved), all edges of the roof should be guarded. For minor work the extent may be determined using the information in Annexe B Figures B1 and B2 .

Note 9: This should be the case even where the pitch of the roof is less than 10 degrees (i.e. ‘flat’).

EDGE PROTECTION SYSTEMS

Full Scaffolding

19. This type of edge protection combines an eaves level protection meeting the requirements of Figure 1 and 2

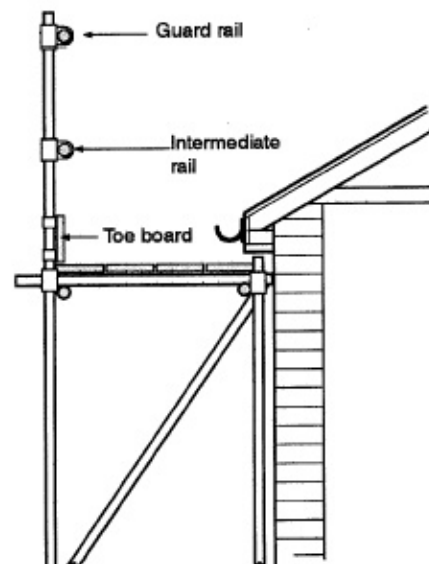


Figure 1: Full Scaffolding

Figure 2: full scaffolding

20. The ACR considers this type of protection is best suited for the following types of work:

- a) Accessing the workplace on the roof;
- b) Slating and tiling;
- c) Delivering materials to their required location; and
- d) Man-handling heavy or large components along the roof, e.g. on curved roofs, trussed-rafter roofs, etc;
- e) Working on steep roof pitches.

21. The ACR considers that if it is intended to store materials on the platform, then the scaffold should be designed for this load (see NASC TG20 : 13).

22. Protection on the outside of the working platform is provided by guard-rails. If there is a chance that people and materials can fall from the inside edge, then this edge must also be protected by guard-rails and toeboards.

Independent Perimeter Edge Protection

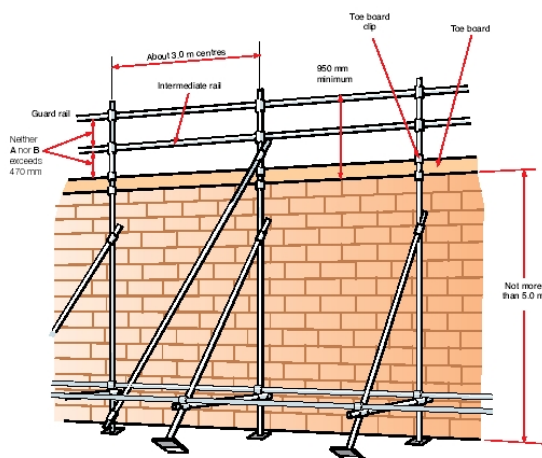
23. This type of edge protection is best suited to low-pitched roofs¹⁰.

Note¹⁰: A pitch up to 10° is normally considered 'flat'.

Typical examples are as follows:

Ground Supported Edge Protection

24. The raking support tubes should connect to the vertical tubes within 300 mm of the eaves. If the work or the gutter dimensions require, stub tubes can be used to space the edge protection off the eaves (see figure 3 and 4). The



gap so created, must be kept to a minimum and no greater

than 225mm .

**Figure 3: Ground Supported Edge Protection**

25. Lateral stability should be ensured by sufficient ties or attachments to the structure and suitable lacing and bracing.

Figure 4: Ground Supported Edge Protection with Access

Edge Protection off the Structure

26. The ACR considers that these are most suitable for use on new steel structures. Edge protection uprights can be secured to prefabricated brackets/sockets on the structural steel work. Where practical the guard-rail system should



be attached to the structural steel work component at ground level. The ACR considers this the safest form of installation of this type of edge protection. The structure

Practical methods for providing edge protection for working on roofs



should be of sufficient strength and rigidity to resist foreseeable forces from the guard-rail system (see figures 5 & 6).

Figure 5: Edge Protection off the Structure

27. The ACR considers that a guard-rail (in tube and fitting scaffold components), that is placed over an existing parapet which is below the stipulated minimum 950 mm above the roof, can be provided to raise the height to that required by the Work at Height Regulations. Consideration must be given to the suitability and strength of the parapet. (see figure 7).



Figure 7 Parapet edge protection using tube and fitting

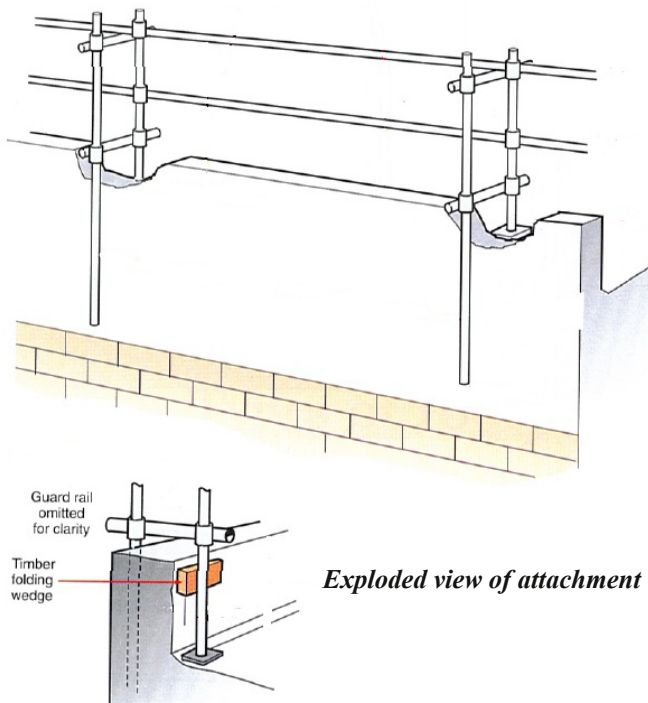


Figure 6: Edge Protection off the Structure (Close up)

Counter Weighted Edge Protection

28. The ACR considers that Counter-Weighted Edge protection should only be used on low roof pitches, within the roof slope recommendations of the manufacturer, and comply with BS EN 13374 Class A edge protection.. This type of protection must be used on non-fragile roofs only (see figure 8). Therefore, before installation is attempted, a competent person must confirm the roof is ‘non-fragile.’

Figure 8: Counter Weighted Edge Protection

29. This type of system is not recommended on closely corrugated roof sheets and should be used with caution on roofs covered with an ACR Class C ‘non-fragile’ assembly¹¹. In addition, it may not be suitable when work is close to the edge of a roof, because it could interfere with the work (requiring it to be moved aside by operatives doing the work). Some proprietary systems have feet which can be raised for work at the roof edge.

Note¹¹ ACR Class C is the minimum non-fragility rating

30. As the effectiveness against the sliding mode of failure of

Parapet Edge Protection

Practical methods for providing edge protection for working on roofs

this system relies on friction between the system and the material of the roof, care should be taken to ensure the system is suitable for use on the specific roof surface.

- 31. The design of the system should ensure that it is possible to erect the protection in modules not exceeding loads that are suitable for the persons to handle, without overloading the roof structure.
- 32. Counter Weighted Edge Protection systems are commonly designed so that they can be erected at least 2 m away from the edge of the roof and then walked into position from a position of safety behind the system. A safe system of work incorporating the manufacturer’s instructions should always be strictly followed.

Extended Scaffolding

- 33. This type of edge protection is connected to a previously erected perimeter scaffold that is positioned too low from the roof level to provide adequate fall protection¹¹ (see Figure 9).

Note¹¹: A guard-rail should be set at a minimum 950mm above the finished roof level. To provide adequate edge protection at the eaves of a sloping roof the top guard-rail may have to be higher than 950mm.

- 34. When planning the work, consideration must be given to the fly-past (over sail) roof projection at the eaves.

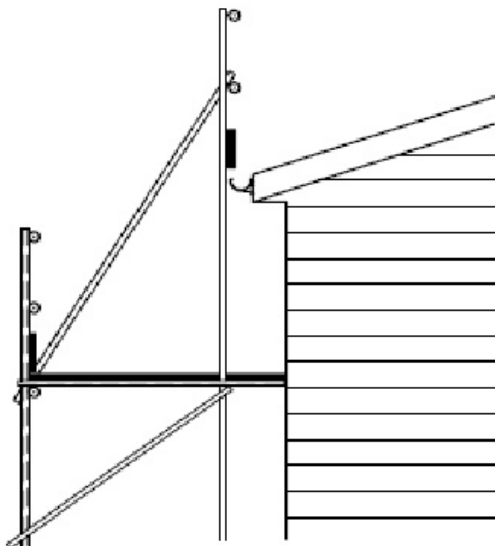


Figure 9 extended scaffold

Net Barrier System

- 35. This type of edge protection system is illustrated in Figure 10. It utilises safety nets provided for fall protection. The net is supported by a bracketing system extending from, and attached, to the stanchions.. The ACR considers these fall protection systems particularly well suited for fall protection on steep roof slopes.
- 36. The roof slope limitations stipulated by the manufacturer/supplier should not be exceeded. The net must conform to BS EN 1263-1.



Figure 10 Net Barrier system

- 37. The gap between the vertical net surface and the edge of the roof structure must be minimised. The angle of the edge protection should not exceed 15° from the line perpendicular to the slope.
- 38. Where it is not possible to create a controlled or exclusion zone under and around work on a roof, the lower section of net, should be ‘close mesh’, i.e. gaps less than 15 mm, to prevent objects falling to ground.
- 39. The net, must be capable of supporting the loads of a person falling into it, which means that the supports, must be able to resist the characteristic loads given in BS EN 1263-1 (see Figure 10 and 11) (Non-designed net barriers

Practical methods for providing edge protection for working on roofs

using tube and fitting supports are unlikely to be adequate).

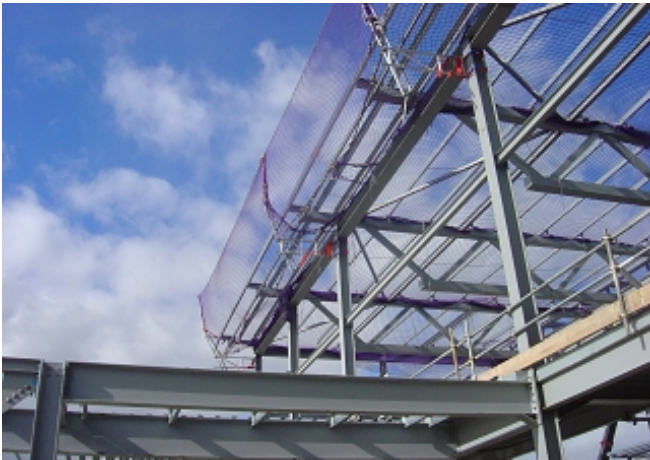


Figure 11: Net Barrier System (Class C) continued under Eaves

Valley Gutter Protection

40. On an existing roof, where a valley has to be used to provide the access to and from the workplace, and the roof sheets either side are either not ACR-classified non-fragile or are missing; workers using it must be protected. If possible safety nets or other collective fall protection systems should be used. When utilised, the nets should be erected in advance of the gutter being used and should extend a distance at least 2 m either side. If safety nets cannot be used the fragile material or missing material should be securely covered with non-fragile material for a distance of 2 m up slope from the valley gutter. Shallow roof slopes may require protective measures to extend further up the slope than 2m.
41. Valley gutter walking frames provide a means of protection for inspection or minor works (see figure 12).



Figure 12 valley gutter protection

LEADING EDGE PROTECTION

42. Where the construction process constantly results in a progressing edge (leading edge), for example laying roof sheets, where edge protection cannot practically be placed, other methods of fall protection are used to protect against internal falls. These include safety netting, birdcage scaffolds, soft landing systems (air bag and 'bean' bags) and the use of safety lines, lanyards and harnesses to provide a system of work restraint and fall arrest.
- 43 Soft landing systems such as air bags and 'bean' bags are typically used to protect against internal falls of less than 2m and are typically used when installing roof trusses, joists and flooring in house building.

The following section, by kind permission of HSE as extracted from HSG 33 (revised) covers the options available to offer protection from internal falls.

44. Take precautions to prevent falls from roof edges and working ('leading') edges. Nets and birdcage scaffolds are the preferred options. However, where these are not reasonably practicable you can consider using work-restraint safety harnesses with running line systems, or temporary barriers at the leading edge, e.g. trolley systems.
45. The preferred solution is to use properly erected safety nets along with edge protection around the perimeter of the roof. Nets give roof workers maximum freedom of movement, provided that they do not work beyond their boundary. They can be installed to minimise fall distances (see Appendix 2, HSG33). They are effective where design details such as hips make other systems complex and difficult to manage. In a fall the chance of injury is reduced, compared to a similar fall in a harness or onto a birdcage scaffold. Nets protect the leading edge and gaps, fragile areas, etc (see Figure 8, HSG 33). When using nets, additional leading edge protection will not usually be required¹².

Note¹²: See ACR [CP]003:2008 Rev1 [The Blue Book] for guidance on the safe use of nets.

46. Where it is not possible to use nets, other fall-arrest systems may be used. Running lines designed to be used with a suitable harness/lanyard can be attached to the structure, to a mobile anchor point or to a working

Practical methods for providing edge protection for working on roofs

- platform. Running line systems should be designed and tested to make sure that they are fit for purpose. The quality of the attachment point is critical; as is the type of harness (belts are not acceptable for fall arrest, see Appendix 3, HSG 33 for further information).
47. Where a running line is attached to the structure, seek advice from the equipment supplier and the structural designer to make sure that the imposed loads can be sustained. Where it is attached to a working platform, the platform must be secured against overturning. Where a mobile anchor is used, minimise the number of workers approaching the leading edge to reduce the risk of tripping and snagging.
48. Remember that most inertia reel devices are designed for use only where the anchor point is directly above the user, i.e. in the vertical plane. This is to avoid problems such as poor inertia reel performance (allowing freefall to occur), the lifeline shearing over an edge, or pendulum swing. Therefore their safe application could be limited.
49. In any case personal fall-protection systems should not be your first choice when considering how to avoid risk from work at height. Avoidance, fall prevention (guard rails, MEWPs, scaffolds etc), collective safeguards for arresting falls (nets, airbags, mats etc) and work-restraint systems should be considered first.
50. Temporary barriers will be needed to control access to areas where harnesses have to be worn. Where running line systems are used, strictly control access to the roof, e.g. during work breaks and at the end of the working day.
51. Temporary leading edge devices (e.g. purlin trolleys) are available and if locked in position they can provide an effective guard rail at the leading edge when work is not in progress. The disadvantage is that installing and moving the systems can be a high-risk operation. When used as a working platform, they often (in practice) provide little protection while laying and fixing sheets, as once the sheets are fixed, trolleys have to be moved, creating another gap in which to lay the next sheet. In addition, on long roofs the trolleys have to be linked and can create a gap for the whole length of the leading edge, which is undesirable.
52. In most situations, additional measures (usually in the form of fall arrest such as safety nets or harness and running line systems) are required to protect workers using trolley systems from failing through the gap created to lay a new sheet or through fragile material such as partially fixed liner sheets. Follow the manufacturer's recommendations on suitable anchorage points for running line systems. Horizontal guard rails on purlin trolleys or stagings are unlikely to be strong enough.
53. Trolley systems rely on the alignment of the supporting steelwork and the quality of the joints between purlins for the trolleys to run freely. Attempting to free trolleys that have jammed can be dangerous. They are not suitable where design details such as hips, dormers etc do not allow adequate support over the full length of the trolley.
- For many reasons, trolley systems are often not practicable and should only be used where there is no safer alternative. However, where trolleys are used:
- There should be a safe system for installing and/or assembling them on the roof specified in the method statement;
 - The trolley attachment/locking system should be suitable for the purlin design;
 - A safe system for moving trolleys should be established;
 - The joints between the purlins must allow the trolley to slide freely. Even minor misalignment can cause the trolley to jam and lead to unsafe systems of work;
 - There should be a safe means of access to the trolley;
 - When used as edge protection, the trolley must always be locked in position;
- and,
- If there is risk of failing from the end of the trolley, e.g. at an unprotected ridge, a suitable barrier should be provided.

MINOR WORK

54. Minor work may be classified as any work over a small area of roof lasting minutes not hours, involving up to two people, taking into account the work to be carried out, the prevailing conditions and type of roof.
55. While it may be expensive to provide any of the edge protection systems described previously, Operatives on minor jobs should not work unprotected (see figure B1

and B2 in Annexe B).

56. For single person working where no mobility over a roof exceeding 15° pitch is required, and the work is short duration, an accepted means of accessing the roof is using a roof ladder which hooks over the ridge, as long as:

- a) The ladder has been manufactured as a roof ladder;
- b) The person does not have to move off the ladder;
- c) Where roof ladders have to be joined, e.g. on long slope roofs, this joint must be adequate in its construction in order to ensure that adjacent ladders do not come apart.

Note: It is strongly recommended that a second person is in attendance.

Note: Safety line and ladder securing systems are available which reduce the consequences of a fall on a leaning or roof ladder.

55. In addition, for minor work requiring 2 people and limited mobility there are lightweight proprietary systems available some based on the use of ladders¹⁴.

Note¹⁴: Whichever system is selected, every consideration should be given to the use of fall protection equipment where practicable.

ANNEXE A**BRIEF OVERVIEW OF BS EN 13374**

A1. British Standard BS EN 13374 specifies the requirements and test methods for temporary edge protection systems for use during construction or maintenance of buildings and other structures. Therefore, it covers edge protection systems that may be used on roofs.

A2. Although, it specifies three classes of temporary edge protection, for edge protection systems with a fall arrest function (e.g. falling or sliding down a sloping roof) the Standard only specifies requirements for energy absorption.

A3. The Standard does not provide requirements for edge protection systems intended for:

- a) Protection against impact from vehicles or from other mobile equipment,
- b) Protection from sliding down of bulk loose materials, snow etc.,
- c) Protection of the general public from falling; or
- d) Side protection systems on scaffolds.

A4. The edge protection specified in BS EN 13374 relates to three classes to use depending on the angle of the working surface from the horizontal and the possible falling height. These are Classes A,B and C.

A5. The Design loads to be supported by each system are:

General:

Each edge protection (and each of its components, except toeboard) shall be designed to withstand 0.3kN applied perpendicular to the post.

Toeboard:

Each toeboard shall be designed to withstand 0.2kN at the most onerous position.

Loads Parallel to the Guard-rail:

Each edge protection (and its components) shall withstand a horizontal force of 0.2kN at the most onerous point.

Accidental Loading:

Any guard-rail or toeboard shall be capable of resisting a downwards (+/- 10o) point load of 1.25kN, on a length of

100 mm.

Elastic Deflection:

The elastic deflection shall not be greater than 55 mm.

Wind:

The wind velocity pressure shall be taken as 0.6 kN/m².

Note: This covers most wind conditions in Europe. More onerous conditions may occur. The wind velocity pressure is based upon a 40-metre height and an exposure period of 6 months and represents a wind speed of approximately 30 m/s.

Note the elastic deflection limit of 55mm is an arbitrary figure and so edge protection which just fails this criterion should not necessarily be condemned.

A6. **Class A** may be used if the angle is less than 10 degrees

Such edge protection systems are designed to withstand only static loads, based on a requirement to:

- (i) Support a person leaning on the protection or provide a handhold when walking beside it,
- and
- (ii) Stop a person who is walking or falling towards the protection.

A7. **Class B** may be used if the angle is less than:

- 30 degrees without limitation of the falling height, or
- ;60 degrees and the falling height is less than 2m

The edge protection systems, which are designed to withstand static loads and low dynamic forces, based on a requirement to:

- (i) Support a person leaning on the protection or provide a handhold when walking beside it.
- (ii) Stop a person who is walking or falling towards the protection.

Class B systems are checked by a low dynamic impact test (refer to BS EN 13374 for test procedure).

Note This standards allows Class 'B' edge protection to be used on roof pitches up to 30° with no limitation on the fall height, we recommend that on roof pitches above 15° the fall height is restricted to no more than 2m.

A8. **Class C** may be used if the angle is between

- 30 and 45 degrees without limitation of the falling height, or;

Practical methods for providing edge protection for working on roofs

45 and 60 degrees and the falling height is less than 5m.

The edge protection systems are designed to withstand high dynamic forces (refer to BS EN 13374 forttest procedure) based on the requirement to:

- (i) Stop the fall of a person sliding down a steeply sloping surface.

Class C systems are checked by a high dynamic impact test only.

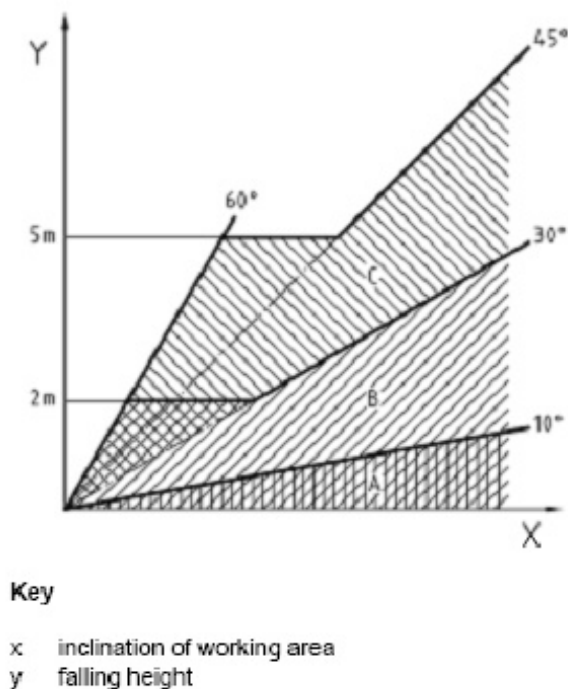


Figure A.1 (BS EN13374 fig A1): Classes for the use of different inclinations and falling heights

Note:-

If the angle is more than 60 degrees or more than 45 degrees and the falling height is more than 5m, edge protection systems are not appropriate as protection. At greater falling heights the system can be placed higher on the sloping area, for example every 2m and 5m of falling height for system class B and C respectively. (see figure 3)

Annex A

PROPRIETARY EDGE PROTECTION SYSTEMS

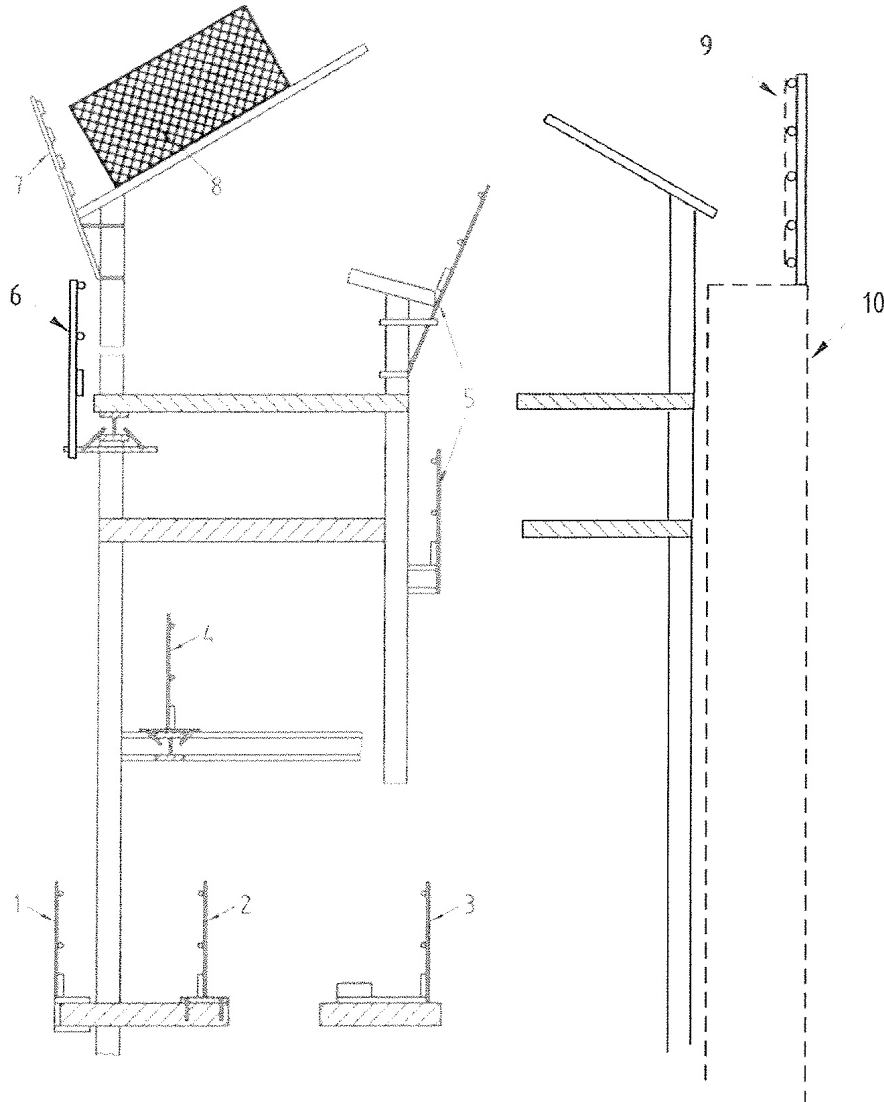


Figure A3 –

Diagrammatic examples of different types of temporary edge protection

[Abstracted from EN 13374 Fig 1]

Key to Figure A1

- | | |
|--|---|
| 1 Slab edge clamp system | 6 Beam bottom flange clamp system |
| 2 Fixed to floor type system | 7 Column clamp system – sloping roofs |
| 3 Counterweighted system | 8 Fencing system |
| 4 Beam top flange clamp system | 9 Edge protection on temporary structure |
| 5 Column clamp system – Slabs and flat/low sloping roofs | 10 Temporary structure (not defined in this standard) |

Note: Not all systems are suitable for use on roofs as edge protection. The ones that can be adapted for use on roofs are highlighted

Annex B

FALL PROTECTION REQUIREMENTS FOR MINOR WORK ON ROOFS

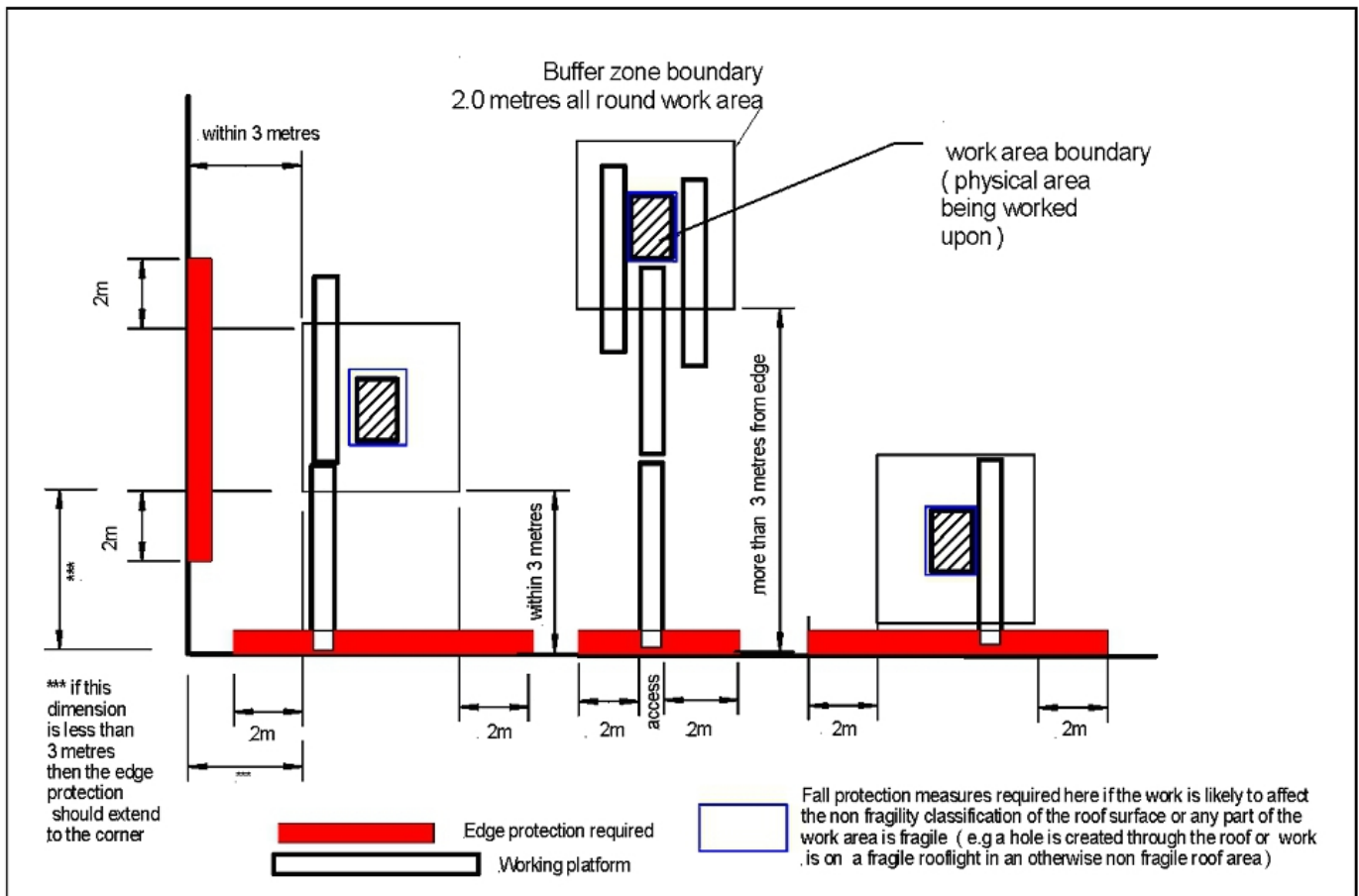


Figure B1 Illustrating Extent of Edge Protection on non fragile roofs (Figure 10,

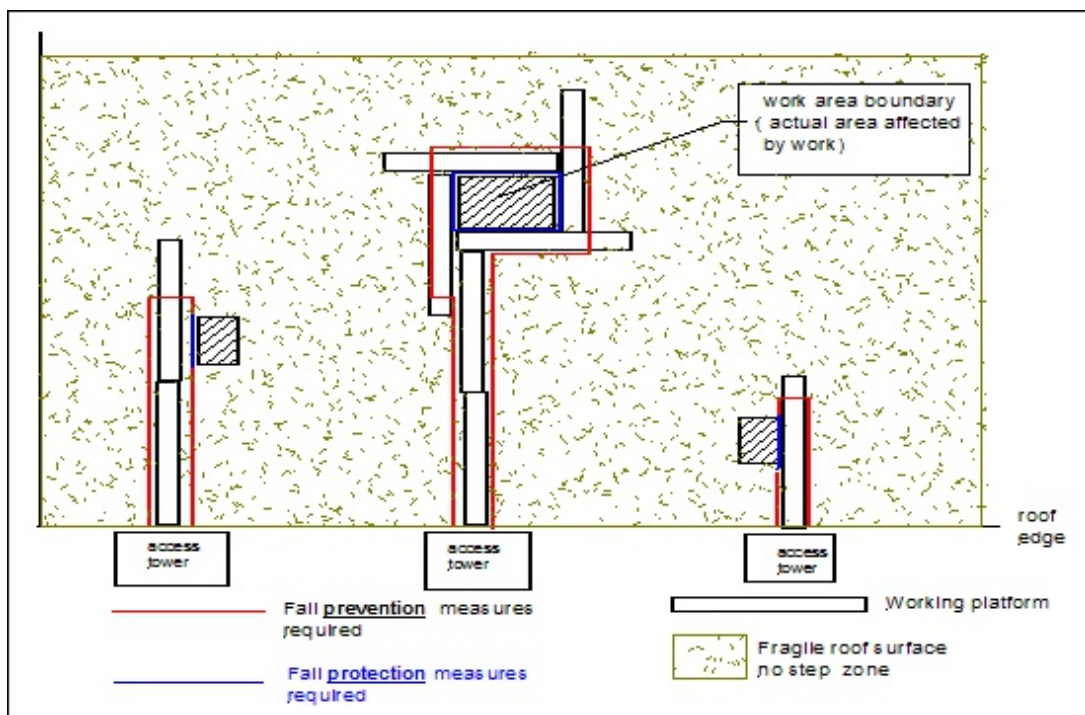


Figure B2 Illustrating Fall protection requirements for fragile roofs Figure 11 ACR(CP)002 [The Green Book]

Annex C**CONSTITUTION OF THE WORKING GROUP****Original Document 2009**

The Associations represented on this Working Group were:

Rural Industrial Design and Build Association (RIDBA),

Fibre-cement Manufacturers' Association (FCMA),

National Federation of Roofing Contractors (NFRC),

Health and Safety Executive (HSE),

by the following people:

Mr M Long NFRC Chairman

Mr A Hutchinson FCMA

Mr A Lowther RIDBA

Mr B Green Co-opted

Mr D Thomas William Hare Ltd

(Formerly HSE)

Mr A Maitra FaberMaunsell

(Formerly HSE)

Para 12

Para 15

Para 19

Figure 4

Para 25,26,

Para 27 , 29

Para 34, 35

Para 41

Para 54

Note 14

Appendix A

Annex B

Annex c

Rear Page

updated BSEN 13374

Included exclusion zones

Clarified fragile areas

Included reference to BSEN13374

updated

reworded

Minor rewording

Minor clarification

Reworded and included limitations of soft landing systems

Reworded

New note

Updated to reflect latest requirements of BSEN13374

New diagram added

New annex

Disclaimer updated

Nov 2014 : 2nd Edition revision

Mr Graham Willmott BSIF (HSG)

Mr J Grieve HSE

Revision Information

This second edition of the document contains the following technical changes:

Section	Revision
Introduction	Reference to BSEN 13374
Working group	Moved to Annex C
Scope	Included reference to dismantling
Reference documents	Added NASC and NFRC documents Updated BSEN13374
Para1	Clarified legal requirements
Para 2,3,5	Minor text change
Note 3 & Para 8c	Reworded to take account of

Practical methods for providing edge protection for working on roofs

This document can be downloaded free of charge from the ACR website at www.roofworkadvice.info

Where the up to date list of members can also be found

BRITISH CONSTRUCTIONAL STEELWORK ASSOCIATION [BCSA]

4 Whitehall Court
Westminster
London, SW1A 2ES
Tel: 020 7839 8566
www.steelconstruction.org
Contact: Mr P Walker

BRITISH SAFETY INDUSTRY FEDERATION, HEIGHT SAFETY GROUP

93 Bowen Court
St. Asaph Business Park
St. Asaph
Clwyd, LL17 OJE
Tel: 01745 585600
www.bsif.co.uk
Contact: Mr G Hook

ENGINEERED PANELS IN CONSTRUCTION [EPIC]

29 High Street
Ewell
Surrey, KT17 1SB
Tel: 020 8786 3619
www.epic.uk.com
Contact: Mr P Trew

FALL ARREST SAFETY EQUIPMENT TRAINING [FASET]

PO Box 138
Whitchurch
Shropshire, SY13 9AD
Tel: 01948 780652
[e-mail: tony.seddon@faset.org.uk](mailto:tony.seddon@faset.org.uk)
Contact: Mr A Seddon

INSTITUTE OF ROOFING

Roofing House
31 Worship. Street,
London
EC2A 2DX
www.instituteofroofing.org
Contact: Mr T Chiswell

METAL CLADDING & ROOFING MANUFACTURERS ASSOCIATION [MCRMA]

MCRMA Ltd
106, Ruskin Avenue
Rogerstone,
Newport
South Wales, NP10 0BD
Tel: 01633 891584
[Email: mcrma@compuserve.com](mailto:mcrma@compuserve.com)
Contact: Mr C Jones

NATIONAL ASSOCIATION OF ROOFLIGHT MANUFACTURERS [NARM]

43 Clare Croft
Middleton
Milton Keynes, MK10 9HD
Tel: 01908 692325
[e-mail: admin@narm.org.uk](mailto:admin@narm.org.uk)
Contact: Lorraine Cookham

NATIONAL FEDERATION OF ROOFING CONTRACTORS LTD [NFRC]

Roofing House
31 Worship Street
London, EC2A 2DY
Tel: 020 7638 7663
[e-mail: info@nfrc.co.uk](mailto:info@nfrc.co.uk)
Contact: The Technical Officer

ROOF TILE ASSOCIATION [RTA]

Federation House
Station Road
Stoke on Trent
ST4 2SA
Tel: 01782 744631
[Email: John.Mercer@weinerberger.com](mailto:John.Mercer@weinerberger.com)
Contact: Mr J Mercer

RURAL INDUSTRIAL DESIGN AND BUILDING ASSOCIATION [RIDBA]

5a The Maltings
Stowupland Road
Stowmarket
Suffolk, IP14 5AG
Tel: 01449 676049
[e-mail: secretary@ridba.org.uk](mailto:secretary@ridba.org.uk)
Contact: Mr A M Hutchinson

WORK AT HEIGHT SAFETY ASSOCIATION [WAHSA]

3 Sherwood Road
Aston Fields Industrial Estate
Bromsgrove
Worcestershire, B60 3DU
Tel: 01527 577665
[email via website: www.wahsa.org.uk](http://www.wahsa.org.uk)

DISCLAIMER

NOTE Although care has been taken to ensure, to the best of our knowledge, that all data and information contained herein are accurate to the extent that they relate to either matters of fact or accepted practice or matters of opinion at the time of publication, the ACR, the authors and the reviewers assume no responsibility for any errors in or misrepresentations of such data and/or information or any loss or damage arising from or related to their use. Elements of this guidance may go further than the minimum needed to comply with health and safety law.

The Advisory Committee for Roofsafety (ACR) is a body dedicated to making working on roofs safer. Its membership is made up of nominees from the major roof working Federations and Associations and the Health and Safety Executive, who provide the experience of many years of involvement in working on roofs in the advice given in their documents.
