THE ORANGE BOOK COMMENTARY

ACR [COM] 001:201

Orange Book Commentary

[First edition]

BCSA
BSIF
HSG
EPIC
FACET
HSE
MCRMA
NAMR
NFRC
RIDBA
RTA
SPRA
WAHSA

Advisory Committee for Roofsafety

www.the-acr.org

FOREWORD

ACR[CP]001 Recommended Practice for work on Profiled Sheeted Roofs (the Orange Book - currently Rev 4 published 2014) has made a significant contribution to safety in roof work in the UK since its introduction.

Since its publication, the Advisory Committee for Roofsafety (ACR) has received many requests for clarification of the recommendations contained in the Orange Book. This commentary has been drawn up by the ACR and is intended to provide informative guidance on the recommendations the "Orange Book".

Users are reminded that all advice or information contained in publications by the ACR is intended for users who will evaluate the significance of the advice or information, including its limitations, and take responsibility for its use and application.

Graham Willmott BSIF (HSG) (Chairman of ACR) December 2014

CONTENTS

INTRODUCTION

ACR[CP]001 Recommended Practice for work on Profiled Sheeted Roofs "The Orange Book" was adopted by the ACR in 2003. It sets out how the ACR considers work on roofs should be planned and executed. However, the ACR still gets a significant number of requests for clarification about the requirements in the document. Therefore, this commentary discusses some of the considerations of the ACR in developing the clauses in the "Orange Book".

This commentary is not intended to cover the discussions in detail. Instead, it emphasises the main issues that prompted the inclusion of a clause. In addition, it attempts to explain issues that readers may be unfamiliar with.

SCOPE

This document provides additional information to help persons(s) planning and executing work on roofs to understand better the requirement set out in ACR[CP]01.

REFERENCE DOCUMENTS

ACR[CP]001 "Recommended Practice for work on Profiled Sheeted Roofs" - (The Orange Book)
ACR[CP]005 "Guidance note for competence and general fitness requirements to work on roofs" - (The Black Book)
ACR Information Sheet No 1 "Selecting a Competent Roofing Contractor"
The Manual Handling Operations Regulations 1992 (as amended) (S.I. 2793) see HSE books

ORANGE BOOK PARAGRAPH	COMMENTARY
Fragile Surface 4. Before commencing any work on any existing roof it is absolutely essential that you find out whether your roof is fragile or non fragile. This is a key decision, which should only be made by persons competent to do so. If there are any doubts, assume that the roof is fragile. 5. If the roof is identified as fragile or suspected of being fragile, systems ofwork, which protect the worker from the hazards of working on or close to fragile roof areas, must be put in place, see ACR[CP]002 Guidance Note for Safe Working on Fragile Roofs or Roofs with Fragile Elements. 6. For new roofs, establish with your professional designer and/or the manufacturer or supplier of the roofing products to be used, the performance of the roof assembly. For any system claiming to be non-fragile a specification must be provided/backed up with documentary evidence 7. Assemble all the existing information you have about the roof and pass it to the company you have selected for the work, and place copies in the Health and Safety File..	**Commentary on Paragraphs 4 to 6** The purpose of this section is to draw attention to an extremely significant hazard. If a person falls through a fragile roof, the consequence is, at the least, a major injury and quite often fatal. Fragile surfaces are so hazardous that they are covered specifically in the Work at Height Regulations. Paragraph 4 and 5:The ACR agrees with HSE's assessment that fragile roofs are about the most hazardous surface a person can work on; an assertion which is supported by the statistics: every year a significant number of people fall through fragile roofs either because they do not know the roofs are fragile or because they do not understand how hazardous such roofs can be. Hence the position of these paragraphs at the start of this Code of Practice, which are meant to emphasise the hazardous nature of working on fragile roofs. Paragraph 6: Roofs that look non-fragile often turn out to be fragile. The importance of having the roof assessed by a person competent to do so cannot be over-stressed. For a definition of a competent person, the reader is referred to ACR publication ACR:CP 005 Guidance note for competence and generalfitness requirements to work on roofs (the Black Book) Paragraph 7 No comment .
Choose a competent company 8. The only way to start the job off properly is to choose a company competent to carry out roof work, who should demonstrate at least the following: a) A knowledge and understanding of the work and the health and safety laws covering roof work; b) That it can manage/eliminate the risks involved in working on roofs; c) It has been assessed for competence and employs a trained	**Commentary on Paragraph 8** Paragraph 8: It is also a requirement in law now to make competent appointments. In addition, it is illegal to accept an appointment to undertake construction work unless you are competent to do so. The ACR fully supports the aspirations set out in law as regards competency and is adamant that the best way to ensure that work on a roof is as safe as it can be is to appoint a competent roofing company. Hence the introductory sentence:" the only way to start the job off….." . You can expect competent companies to spend the requisite amount of time planning the work and to supply the right equipment at the right time.

workforce, preferably holders of a CSCS skills card; d) It understands the methods of use and mechanical properties of all the roof materials and systems involved in the installation; e) Is a member of a relevant trade association, e.g. one of those listed on the back cover. See also ACR Yellow advisory sheet No1 and the ACR Black Book	The ACR considers competency important enough to have supplemented the information in this code with Information sheet and a Code of Practice.(*See ACR[CP]005 -Guidance note for competence and general fitness requirements to work on roofs and ACR Information Sheet No 1 "Selecting a Competent Roofing Contractor" available for download free of charge from the ACR website* www.roofworkadvice.info)
Insist on a methods statement 9. Before letting any person work on a roof, insist that there is a project specific Method Statement [see Annex A] with appropriate Risk Assessments and that they understand it. If necessary, let someone who understands roof working read it and act on their advice. If you subsequently see work being carried on in an unsafe way or not in accordance with the Method Statement, STOP THE WORK. See Annex A and D	**Commentary on Paragraph 9** Paragraph 9: Clients for construction work have a duty in law to make sure that any arrangements for construction work are suitable to ensure that workers safety is adequately guarded. The sentence commencing: " If necessary, let someone who understands roof working…" is, in the ACR's opinion a fundamental point; clients should not be encouraged to make these decisions from a position of ignorance. Several fatal accidents have occurred through client ignorance of the hazards associated with working on roofs: (add in some case studies) The ACR considers that this can only be achieved by adherence to an adequate method statement.
Accommodate the roof worker 10. Discuss the roof work company's requirements for access with them. You may have to shut down areas of production because of the inherent dangers of letting people work under a roof being worked on. 11. Plan any shut down. Remember, the roof workers' access requirements could obstruct passage around your site, affecting your daily operations. 12. Make all your employees aware that roof work is being carried out on your premises and warn them of the dangers associated with such work. 13. Allow adequate time for the company to carry out the work safely. Do not compromise safety by forcing people to rush high-risk work. You will also gain from this decision, because it will ensure that the work on your roof is of the required quality.	**Commentary on Paragraphs 10 to 13** Paragraphs 10 to 12 deal with arrangements that are made to assist the roof workers. Many of the accidents associated with roof work can be attributed to poor planning leading to objects being dropped on persons not associated with the work but who happen to be in the vicinity (or, in the worst case under) roof work. Unless people are aware that roof work is going on above them, they may not appreciate the reasons for temporary closures of areas, etc. and may stray into danger areas, which may put a the owner of the building in breach of the Work at Height Regulations. Paragraph 13 stresses the importance of allowing adequate time for roof work to be carried out. The ACR is aware that not allowing adequate time often leads to ad-hoc provisions for safety that do not always protect the workers to the extent that they should be. The ACR's opinion on the need to provide adequate time for the completion of a project is supported by the CDM Regulations 2007, which require a client to ensure the "allocation of sufficient time and other resources" for a project.
14. All roof work must be preceded by a method statement, which sets out in detail how the job in question is to be done. Therefore, the roofing company should be able to provide at least the following: a) A risk assessment covering the work, which	**Commentary on Paragraphs 14 and 15** Paragraph 14 is a clear statement of The ACR's belief that a method statement is essential documentation for roofwork. ACR considers this to be an important part of planning the work, which is supported by the CDM Regulations 2007. Items (a), (b) and (c) are integral parts of any method statement, which any client procuring roofwork should examine, because a

should include managing the risks to people carrying out the work, your employees and others who will be in the vicinity while the work is being carried out; b) A viable programme for the work; and c) A statement of their requirement for power, ancillary structures associated with roof work and delivery schedules. 15. In addition, they should supply you with a list of those who will be working on the roof, accompanied by proof that they are competent to do so - paragraph 8c. Do not accept untrained workers unless they are trainees to be closely supervised by competent roofworkers. [see paragraph 29].	Client is not allowed to let work start until an adequate construction phase plan is in place. In arriving at the final text for this paragraph, ACR considered the problems this could create for one-off, "amateur" clients. However, it felt unable to lessen the requirements, because they are fundamental to ensuring safety with roof work. If clients are unsure about their ability to examine method statements, they should employ someone who is competent to do so on their behalf. Paragraph 15 is linked to paragraph 8: Clients must make competent appointments. The ACR supports this unequivocally.
16. Before letting the contractor start work, ensure that they have supplied what they have undertaken to provide for the safety of all concerned. Do not let work start until every necessary safety item is in place. 17. If the roof materials need to be fitted by a specialist contractor, or by a contractor approved by the material manufacturer, check the contractor has the necessary approvals and skills to fit the materials and work on your type of roof. 18. It is recommended that you operate a permit-to work system for any one who will access the roof. The system should ensure that everyone: a) Is competent to work on a roof; b) Is given safety induction training relevant to your site and specific to the work being undertaken before commencing work on the site.	**Commentary on paragraphs 16 and 17** Paragraph 16: No comment. Paragraph 17: Allowing a person not trained to install a specialist roofing component to do so inevitably leads to problems in the future. ACR is aware of several instances when this has led to the abrogation of guarantees applying to the product – see also paragraph 42. Paragraph 18: Permit-to-work systems are recommended by the ACR, because they allow clients to set out any constraints that may apply to work on a roof. For example, it may be necessary to limit deliveries to a certain time. They provide assurance, as far as this can be assured, that the work will be planned and carried out by competent people.

c) Is properly briefed about hazards associated with a particular roof and safe access to it; d) Has access to and is competent to use suitable safety equipment.	
19. Like any other product, roofs will perform better and for longer if you maintain them properly. But remember, the hazards in maintaining a roof can be greater than for constructing them. Do not allow any company to inspect and maintain your roof without vetting their skills and safety methods first. Do not allow untrained employees to "pop up" for a quick look or to carry out quick repairs.	**Commentary on paragraph 19** Paragraph 19: If you allow a non-competent company on to your roof you could be in breach of the CDM Regulations 2007. Similarly, if you do not examine their safety methods, you could also be in breach of the CDM regulations 2007. The last sentence in this paragraph is paramount: too many people who have fallen through a roof have just "popped up for a look". As stated earlier, the ACR cannot put enough emphasis on the fact that roofs are extremely hazardous places on which to work. Therefore, only people who recognise this should be allowed on to a roof.
Power Cables 24. Before work commences it must be checked by your electricity supplier that there is no danger posed by overhead electric cables. If there are power lines within the vicinity of the work then specific provisions must be made to ensure that the work can be carried out safely. This may include delaying the work until the power can be turned off.	**Commentary on paragraph 24** Paragraph 24: **Very few people survive contact with electric cables**. The ACR is very aware of the fact that a roof is an elevated work place and places you closer to overhead power cables than you would normally be. The inclusion of this aspect as a separately headed paragraph indicates the ACR's opinion that this is a significant hazard. Great care must be exercised in these situations, especially when using components that are long, eg, while erecting edge protection. The hazard posed by overhead cables must **never** be underestimated. While recognising that it may not always be possible, the ACR would always recommend making the cables dead before commencing work. In its deliberations ACR was aware of other methods of making power cables safer, but did not include them in the paragraph to prevent people making these their first option before giving serious consideration to the elimination of the hazard.
Removal of materials from the roof 25. Often and particularly during renovation work, materials, tools and plant will need to be removed from the roof. This must be planned in advance to ensure that the correct method is used to carry out the task safely. 26. Removal methods required will depend on the	**Commentary on paragraphs 25 to 29** Paragraph 25: No comment

weight, size, quantity and shape of the materials to be removed and whether the materials are to be reused. Methods to consider are:	Paragraph 26: No comment
27. Mechanical – hoist, crane, forklift, MEWP, etc. Particular caution must be taken when using MEWPs as most boom type machines are only designed for lifting people and tools and so have very limited lifting capacity. Rubbish chute – correctly covered and erected [but are of limited use with large element roofs]	Paragraph 27No comment
28. Materials should not be removed from the roof by an operative using a ladder, unless the materials are light enough and small enough to be carried in such a way that the operative can retain three points of contact on the ladder at all times.	Paragraph 28: The ACR supports HSE's view that ladders are meant primarily for access. Their safe use relies on users being able to grip the stiles to steady themselves as their feet ascend the rungs sequentially. Research has shown that many falls from ladders are caused by persons trying to use ladders with less than three points of contact, ie, their hands are not available to grip the stiles. Work equipment that can be carried up a ladder includes light hand tools, small tool boxes, etc, because this leaves one had free to grip the ladder stiles. The wide availability of stair towers compelled ACR to support their use in preference to ladders as a means of access to a roof (and especially when it was necessary to transport materials and equipment up to the roof).
29. As sheeting materials, insulation, gutters etc are inevitably large items relative to their weight dropping materials from a roof is rarely likely to be acceptable practice. If, after a rigorous risk assessment of all of the options, this is deemed to be the safest option, the area below should be fenced off or protection methods put in place to ensure that no one can access the landing area[2]. The protection needs to be far enough away from the impact area to ensure that materials that are blown by the wind, break up or bounce cannot reach the fencing/protection. Wind conditions must also be reviewed during the work because of the effect that they will have on the safe distances that materials can be dropped. Edge protection must also have more frequent inspection if roofers are leaning on it whilst dropping materials.	Paragraph 29: Objects that fall from height on to people below figure prominently in HSE's annual accident statistics. This is why the concept of danger zones is introduced in the Work at Height Regulations. The area under a roof having work carried out on it could come under the definition of dangerous zones in the Work at Height regulations, because there is a chance that objects may fall off the roof on to any person who may (inadvertently) enter the danger zone. You have a duty under section 3 of the Health and Safety at Work Act to ensure that persons not employed by you are not harmed by your work activity.

[2] *Note As a guide only, the minimum distance for any exclusion zone should be at least half the drop height or 6 metres (whichever is the greater)* ***Other hazards*** 30. Other hazards which must be taken into account include: the use of power tools, sharp edges, swarf, dust [when cutting roofing products], materials stored on a roof, manual handling, etc. 31. In addition, you are responsible for providing measures to protect other people who are in the vicinity of the roof you are working on.	**Commentary on paragraphs 30 and 31** Paragraph 30 : No Comment Paragraph 31: No Comment
Risk Assessments 32. It is not acceptable to provide cover-all generic risk assessments. While certain parts of generic assessments may apply to all jobs, each job should be looked at on its own, to identify the hazards and assess the risks, to develop systems of work which will remove or reduce these hazards and manage the residual risks.	**Commentary on paragraph 32** Paragraph 32: The ACR is unequivocally against generic risk assessments. Each job is a different site with its own risks, which must be assessed and procedures put in place to manage them. This should mean that risk assessments are shorter and deal only with site-specific significant issues. For example, constraints on delivery may be significant on one site but not an issue on another. This difference in significance cannot be dealt with generically. ACR also subscribes to the view that site specific risk assessments provide for proper planning of any job, because it makes the planners focus on the issues that apply to the project in question. The ACR supports the HSE's definition of a significant health and safety issue as being one that is: (a) not obvious to a competent roofing contractor; or (b) unusual; or (c) difficult to manage, with most roof work falling into this last category.
Planning the work ***Choosing the team*** 33. Choose the team that will work on the roof carefully. In particular, ensure that the person who will supervise the work is competent to do so, as that person will set the standards for the other workers to follow.	**Commentary on paragraphs 33 and 34** Paragraph 33: This is related to the issue of competence – see paragraph 8.

34. If introducing inexperienced workers ensure that they are given formal training on health and safety before they go on a roof, particularly with regard to the type of roof and work involved, and that they always work in an area where the supervisor can see them and speak to them.. Never allow inexperienced people to work on roofs unsupervised.	Paragraph 34: Never allow inexperienced people to work on roofs unsupervised. While this is self-explanatory, ACR cannot stress too strongly the importance of following this advice. ACR is very aware that too many accidents on roofs involve lay people "just sent up there to have a look". Recently, directors of companies have been given custodial sentences for sending untrained people on to roofs.
Gather Information 35. If there is a Health and Safety File, read it. 36. Always assume existing roofs are fragile unless a competent person decides that it is non-fragile.	**Commentary on paragraphs 35 and 36** Paragraph 35. The Health and Safety File is a statutory document required by the Construction (Design and Management) Regulations 2007 (and 1994 before this) and has legal status. Its purpose is to provide information on residual hazards in a structure, in this case a roof, which should assist any person carrying out construction-related or maintenance work on the structure in the future. ACR believes that at least the following should be available in the File: ▪ As-built drawings of (at least): o Site layouts, o Utilities identified (with approximate locating dimensions); ▪ Material Safety Data Sheets for any hazardous materials used; ▪ Information about any site constraint that has not been foreseen; ▪ List of suppliers & materials used on the project; ▪ Information about any site constraints that interfered with or prevented conventional construction processes from being carried out; Paragraph36: this is a restatement of the important paragraphs 4, 5 & 6. ACR would wish to stress the point that a fragile roof is a death trap.
Control access to and movement over the roof 37. Provide dedicated and safe access onto the roof, and ensure that all persons access the roof from these point(s) only. Whenever possible, access should be via a stair-tower. However, if ladders are used: a) They should be tied at the top and extend sufficiently past the access point to provide an	**Commentary on paragraphs 37 to 42** In ACR's opinion, this is a very important part of planning any work on a roof because, as already stated at the start of this document, roofs are about the most hazardous surface a person can work on. Paragraph 37. ACR is aware that stair towers are widely available and endorse their use, as the safest means of accessing a roof. Their provision also allows (indirect) control of where a roof is accessed, allowing more control on the site of where a roof is accessed.

adequate hand hold; b) They should not be more than 9m long, without a rest platform; and c) The person using it should have both hands free to climb the ladder.	Paragraph 37(a), (b) and (c) is a statement of what ACR believes is good practice with the use of ladders.
38. It is not good practise to allow people to walk on roofs for safety reasons and to prevent roof damage. Where it is necessary to protect roofs or gain access over fragile surfaces Stagings[3] or other forms of work platforms should always be provided. [3] *Stagings should be secured to prevent accidental displacement, including by the wind. Remove them when they are not in use.*	Paragraph 38. Note 6 is a warning that wind uplift on roofs can be severe, especially close to the eaves. The ACR is aware of much anecdotal evidence of stagings having been blown off roofs. These are substantial items of work equipment which, if they struck a person, would cause serious injury.
39. If walking over large areas of roof is unavoidable, provide obviously demarcated dedicated walking areas and enforce their use. Ensure that persons on the roof cannot approach fragile areas or unprotected edges by an effective means: either by covering or by providing an effective barrier. High visibility tapes, used on their own, are not acceptable.	Paragraph 39. Although this paragraph is included in this code of practice, it should not be taken as an endorsement that avoidable pedestrian traffic over roofs is condoned by the ACR. The key word in this paragraph is "unavoidable" and should be taken to mean "not reasonably practicable to avoid". In other words, it would require a robust argument to defend walking across roofs. Implicit in this clause is the ACR's view that fragile areas should be treated as gaps. Again, ACR cannot stress strongly enough the danger that fragile areas present to people on roofs. This danger is exacerbated by the fact that fragile areas are not always obvious – see commentary paragraph 32, a point stressed in paragraphs 41 and 42 below.
40. Minimise the amount of walking on roofs, by ensuring that materials necessary for the work are deposited as close as possible to the point at which they will be required. Provide dedicated walkways for carrying materials to their point of use.	Paragraph 40. Roof assemblies are made up of thin steel sections, which when complete and acting together provide a roof that is as stiff as it needs to be. However, walking on roofs exposes the roof to forces that it may not have been designed for, eg, a stumble, dropping a sharp tool on it, etc, all of which could combine to render a roof not fit for purpose. By limiting the amount of traffic over a roof, the chances of occurrences of the type listed above are minimised, which is the rationale for the text in this paragraph.
41. Never allow people to walk on rooflights, even those categorised as non-fragile as this can damage protective coatings and lead to premature deterioration and potentially becoming fragile earlier in their service lives.	Paragraph 41. ACR cannot stress too strongly the risks associated with allowing people to walk on rooflights. Rooflights are sometimes made of materials that are more susceptible to the effects of weather than other components of roof assemblies. Therefore, ACR would always recommend that, like fragile areas, rooflights should be treated as gaps through which a person can fall and be protected accordingly.
42. Remember, non-fragile assemblies can be rendered fragile if they are not fixed down in accordance with the manufacturers' instructions.	Paragraph 42. This is a very important point. ACR is aware of roofing practice which uses methods like "stitch-fixing" and would never recommend their use, because non-fragility is based on assemblies being (properly) fixed down, as they would have been when tested to establish their ACR classification. ACR cannot stress strongly enough that the non-fragility classification is dependant on the test conditions being achieved on site therefore, a decision to fix down an assembly in

	ways other than those recommended by the manufacturer **cannot** be supported.
Storing materials 43. While individual components may be light, in packages they may be quite heavy. Provided a means of spreading the load where they are placed/stacked. 44. When stacking materials on the roof, make sure that you find out the maximum load that the roof can support. If in doubt, consult a structural engineer and never exceed the maximum load allowed on a roof 45. Ensure that all materials stored on the roof are secured against displacement by wind or accident[4] [4]. *Materials on the ground may also be subject to wind uplift.* 46. Arrange the stacks of material so that the item to be used first is at the top of the stack and so on. This will stop roof workers having to separate the delivered items to find the one that they need to use. In addition, ensure that workers are supplied with sufficient fixings to allow them to fix the sheets as specified as they are laid.. 47. Remember, even non-fragile roof assemblies may be rendered fragile by heavy loads or constant traffic.	**Commentary on paragraphs 43 to 47** Paragraphs 43 & 44: Typically, a pack of 20 steel roof sheets, 0.4 mm thick, would weigh 62 kg/m^2. This is a significant load to put on a structure. While the ACR is aware that sheets have to be placed on the roof in bundles, it urges caution in respect of the load that these may apply to the supporting structure. It is worth remembering that a concentrated load produces higher bending moments than a distributed load. *Note: The total load of a pack of 20 sheets x 1.2 m wide x 6 m long would weigh 452 kg (4.5 kN)* Paragraphs 45 & 46: These clauses restate what has already been said in 41. ACR has no hesitation in stating that the planning of work on a roof must give adequate consideration to how pedestrian traffic across a roof could be minimised. Much of the traffic across a roof is to retrieve and then transport roof sheets from their place of storage to their place of installation. The more this can be minimised, the safer will be the work on the roof. Paragraph 47: This is especially true during the construction phase, when heavy traffic on incomplete assemblies could cause partial failure of the fixings, which becomes full failure the next time a similar load passes across the area.
Limiting loads carried by people 48. Regulations covering manual handling[4] have been in place since 1992. These Regulations require you to avoid, so far as is reasonably practicable, the need for manual handling of heavy or awkward loads. The amount that can safely be handled will also vary according to weather conditions. [4]*Note The Manual Handling Operations Regulations 1992.*	**Commentary on paragraph 48** Paragraph 48: The carrying of heavy loads has a cumulative effect on the human body. Continued exposure to lifting and handling heavy (& unwieldy) loads can cause long-term musculo-skeletal problems, which can be debilitating. Unfortunately, the Regulations do not prescribe a maximum load, because there are too many variables involved in the assessment of what a person can carry. Nevertheless, ACR is aware that metal roof sheets are significant items and agreed that this health issue should be mentioned in this code, in spite of the fact that it could not be more than a brief overview. However, the brevity of coverage in this standard does not mean that manual handling is an issue that is not relevant to roofwork. On the contrary, ACR believes that roof workers deserve protection from this hazard. Therefore, it recommends that readers of this code obtain and read the Approved Code of Practice that supports these Regulations and try to apply the

	advice given therein, when planning work on a roof.
Fixing the assembly 49. Always fix roof assemblies in accordance with the manufacturers' recommendations, e.g. sequence of laying down the sheets, number of fixings, etc. 50. Never allow partial fixing only of roof sheets. Complete all work as you go. Each sheet should be securely fixed, allowing progress of the work as it is laid down, with the correct number of fixings as required. Remember wind can lift unfixed sheets therefore, at the end of each day; ensure that all sheets are securely fixed. ***Scheduling deliveries*** 51. Avoid material deliveries at ends of shifts, because workers may hurry to finish the job and, inadvertently, take risks they may not normally take. ***Provision of fall protection*** 52. To prevent people and materials from falling from the roof, edge protection must be provided at the eaves and gable of roofs and at any other roof edge off which workers on the roof can fall. ***Nets*** 53. The Advisory Committee for Roofwork considers that properly erected safety nets should be the preferred method of additional fall protection. Where nets are provided you must ensure that they are erected as close as possible under the working area and that: a) They satisfy the current relevant standards; b) They are erected properly by competent people, trained and assessed to FASET standards, who are able to prove their competence through a	**Commentary on paragraphs 49 to 53** Paragraph 49: This is the only way to guarantee non-fragile performance. Paragraph 50: ACR is aware that there have been a number of people who have fallen through roofs because they walked across partially fixed roof assemblies. It felt that this practice was sufficiently widespread and hazardous as to merit highlighting in the text. The number of fixings in a roof is arrived at through a complex procedure of design and testing and there is no way to ascertain the strength of partially fixed roof components. Paragraph 51: No comment Paragraph 52: No comment 53: ACR acknowledges the fact that properly erected safety nets have made a significant contribution to safety with working on roofs. Consequently, it endorses their use and has written a Code of Practice on their use for roof work. While this subject is included in this document for completeness, the reader is referred to ACR (CP) 003:2007, in which the provision and use of safety nets provided for work on roofs is covered in much greater detail. The reader is asked to note the use of the word “additional” in the first sentence. This brings this code of practice into line with the hierarchy in the Work at Height regulations, which require the fall to be prevented when it is reasonably practicable to do so. Items (a) to (d) are a simple restatement of the requirements in the Work at Height Regulations that require any work equipment used to protect workers from the effects of a fall must be fit for purpose.

FASET safety net riggers card; (c) There are no obstructions within the nets arresting distance; and d) Competent people regularly inspect them. *Note See ACR[CP]003 – Recommended Practice for Use of Safety nets for Roofwork – (the Blue Book)* 54. Nets may be removed when a non-fragile roof is in place (minimum ACR[M]001:2000 class C), but see Annex B.	Paragraph 54: No comment
Personal Protective Equipment [PPE] 55. Collective fall arrest systems (such as safety nets) are to be preferred to personal fall protective systems such as safety harnesses and lanyards. However, where, following a risk assessment, such equipment is considered the most effective means of fall protection, you must issue this to your workers. There are two main types: Work Restraint: which physically prevents a person from reaching any position from where a fall is possible. Fall Arrest: which allows a person to reach a position from where a fall is possible but limits the distance and consequence of a fall should it occur. It is essential that the correct type of equipment is selected for the job and where there is a choice of which system to use Work Restraint should always be selected in preference to Fall Arrest In addition, you must: a) Train operatives in its proper use, including fault recognition and storage; b) Ensure that there is a rescue plan in place so that fallers can be rescued immediately; c) Ensure that the certificates showing that the equipment is in working order and meets the requirements of the Regulations[5] accompany	**Commentary on paragraphs 55 to 57** Paragraph 55. The Work at Height Regulations recognises the use of PPE and the ACR acknowledges that in certain situations, eg, sloping roofs, this may be the most appropriate method of protecting workers on a roof. Therefore, after much discussion, it was decide to include it in this code. However, The ACR supports the view that PPE is a "last resort", because of the problems it brings with it; not least of which is the question of the fitness for purpose of the anchors. The ACR draws attention to the fact that it is aware that there have been situations when lack of planning or incorrect use has turned work restraint systems into fall arrest systems. If PPE is meant to be work restraint, care should be taken to ensure that it cannot become a fall arrest system. ACR draws readers' attention to (a). It is paramount that potentially faulty PPE is not available for use. "Not available for use" should be construed as impossible to acquire on the site. What, on the face of it, seems like insignificant or superficial damage may be sufficient to render the PPE unsafe to use. HSE has produced a guidance note on the inspection of PPE and ACR recommends that this is obtained and understood by any person planning for its use for work on a roof.

the PPE. [5]. *Personal Protective Equipment at Work Regulations 1992.*	
56. Before using Personal Fall Protective equipment ensure that there are no obstructions within the arresting distance.	Paragraph 56: Although beyond the scope of this code, ACR is aware of Personal fall protection being used in situations where it is not appropriate. To function effectively, PPE needs to "open up", to ensure that it is capable of absorbing energy therefore; the distances that a person can fall can be up to 6 m. While there was discussion about putting actual figures to the height above which these should be used, ACR felt that such a specification went beyond its expertise. Nevertheless, the importance of this paragraph should not be overlooked, especially by designers. The ACR recommends that any person planning to use PPE as the method of protection familiarise themselves with the requirements of the Work at Height regulations.
57. Anchorage systems for both types must have a valid certificate of inspection. Remember the removal of roof sheets may affect the integrity of systems. If in doubt consult the installer of the system.	Paragraph 57: At the time of writing this paragraph, the Work at Height Regulations 2007 were in draft. Since their publication, the requirement is for anchors to be 'fit for use' **at the time they are being put into use**. A valid certificate of inspection may not be sufficient.
Construction Drawings 58. If the safety of the workers depends on a set pattern of fixing roof sheets ensure that a drawing, which sets out in detail the sequence of operations, is kept on the site. Whatever method is used to transmit this information to the workers, it must be in a form that is understood by all operatives and should be referred to in the method statement.	**Commentary on paragraphs 58 and 59** Paragraph 58: No comments
59. If the sequence of the work is altered, do not restart until you are sure that the new work sequence does not increase the risks to the roof workers and, if necessary, that the method statement has been amended.	Paragraph 59: No comments.
Reporting Incidents 60. Today's "near miss" is tomorrow's accident so it is essential to set up a system for roof workers to	**Commentary on paragraphs 60 to 62** Paragraph 60: The important issue in this paragraph is in the last sentence: "A heavy stumble could make a non-fragile assembly fragile". While, at first glance, this may appear to be an overstatement of the facts, the ACR does not

report any accidents and incidents, regardless of how minor they think they are. A heavy stumble could make a non-fragile assembly fragile.	consider it as such. Readers are reminded that sheets used in roofing assemblies are made from thin sheets of steel, fixed to the supporting members quite close to their edge. When this is combined with the fact that the forces from a heavy stumble are significant – see FAQs on www.roofworkadvice.info, it is easy to see how the ability of the system to support the weight of a person may be compromised. This explains the rationale behind the recommendation in paragraph 61 – to report occurrences like heavy stumbles.
61. After any such report, the area of roof in question should be inspected by a competent person, to ensure its non-fragility has not been affected. You must act on the competent person's advice.	61 & 62: Focus on the fact that unplanned for episodes can adversely affect the efficacy of safety devices. ACR wishes to draw attention to the fact that once a safety device has been brought in to use, its performance in future episodes cannot be guaranteed. It also wishes to highlight the use of the word "competent" in these clauses: inspections of safety equipment that has been brought in to use must NOT be left to lay people.
62. Similarly, if safety equipment, e.g., nets or harnesses are used to arrest a fall, they should be taken out of use until they have been inspected by a person competent and passed as fit for reuse. Any equipment deemed as not safe to use must be quarantined and destroyed.	
The Law	**Commentary on paragraphs 64 to 77**
64. Whoever designs the roof assembly assumes the responsibilities of a designer under the Construction (Design and Management) Regulations 2007 which require you to give due consideration to removing the hazards at source. Only when this is not possible, you must reduce the risk from the hazard and inform the Contractor of the residual risk, so it can be included in the Health and Safety Plan.	Paragraph 64: Although the Construction (Design and Management) Regulations are due to be revised in 2015 this responsiblity is unlikely to change
Designing in fall protection	
65. Workers require protection from falls when they construct and maintain roofs. Therefore, consider this at the design stage, by thinking about how temporary edge protection could be fixed to the structure during roof construction. For safety during maintenance, consider the provision of a permanent parapet or barrier at the eaves and along the gable.	Paragraph 65: No Comment
66. Consider the spacing and layout of any	

rooflights to minimise the risk of accidental foot traffic. In addition, avoid locating rooflights too close to the edge of a roof.	Paragraph 66: ACR cannot emphasise strongly enough the hazards posed by roof lights. Every year a number of people fall through roof lights, either while replacing them or while walking on them while proceeding to their workplace on the roof. Similarly, ACR recommends that items of plant that are unavoidably located on a roof, should be located as far away from roof lights as it is possible to do so.
Provision of access to maintain the roof	
67. People who have to work on roofs must be able to access the roof safely. Therefore, consider designing in systems that will minimise the risks associated with getting on to the roof. For example, you might consider [a] the provision of permanent protected lockable ladders, or [b] permanent ladder stops at the eaves, above a solid and even hardstanding, or [c] a level hardstanding, which can be used for towers or to position suitable powered access equipment, or [d] an internal access hatch.	Paragraph 67: No Comment
Specifying Roof Assemblies	
68. You should specify a non-fragile assembly. Tests for determining non-fragility are given in The ACR "Red Book" [6]. [6]. *ACR[M]001, Test for Non-Fragility of Large Element Roofing Assemblies*	Paragraph 68:No Comment
69. If you mix and match products you could end up with a fragile construction. Always seek advice from a competent person before you mix and match products if it is not possible to discuss the proposed change with the relevant manufacturers.	Paragraph 69: ACR stresses that the configuration of roof assemblies is arrived at through a complex procedure of design and testing of the components that are **specified** for the assembly by the design. To change these configurations would invalidate this development work. *Note: The ACR would advise organisations that changing a configuration could confer the status of manufacturer on the organisation making the change and, in the case of an incident; such an organisation may be called upon to justify their actions.*
70. The supplier of any roof assembly specified should be able to advise you of the classification of this assembly and, on request, provide the test data to support the classification.	Paragraph 70: No Comment
71. Remember, the preferred method of fall protection may be nets. In this case you must ensure that any supporting	Paragraph 71: No Comment

structure, which will support nets, can carry the loads that it will be subjected to. Discuss the requirements for nets with a competent supplier of nets.	
72. Remember, also, that the environment in which roofs exist can change. Such changes may have a dramatic effect on the mechanical properties of the assembly you specify for the roof. Changes in condition, which would cause this, should be given prominence in the Health and Safety File.	Paragraph 72 : No Comment
73. When incorporating roof lights, find out how weathering will change the colour of the roof and the rooflights. Specify rooflights, which do not discolour to become indistinguishable from the rest of the roof. It is advisable to specify weatherproof caps to the rooflight fixings of a distinctly different colour to the other fixings.	Paragraph 73: This is an important property often overlooked by designers. If the rooflights discolour so that they become indistinguishable from the rest of the roof, they will become a hazard because people on the roof may not notice their existence. And if the roof is old enough for this to happen, there is a good chance that the roof lights will, over time, have become fragile. The risk of people falling through them is exacerbated. ACR subscribes to the idea that every bit helps: if people can see a hazard, they might take more care around it.
NOTE : Conventionally, poppy-red fixings are used.	
74. To take account of the maintenance of the roof, specify one of the following programmes, which will fulfil the requirements of your roof:	Paragraph 74: No comment
Low maintenance roofs	
75. Low maintenance roofs are those, which require very infrequent access, e.g. simple duo-pitched roofs , or low pitched roofs requiring infrequent access for roof maintenance only, by experienced roofworkers. The minimum standard for this type of roof is a Class C assembly to ACR[M]001	Paragraph 75: Infrequent access may be classified as (a maximum) access once every three months.
Medium maintenance roofs	
76. Medium maintenance roofs are those, which require regular access for maintenance of the roof only, by experienced roof workers. The minimum standard for this type of roof is a Class B assembly, to ACR[M]001	Paragraph 76: Medium maintenance roofs could be construed as roofs that require people to access them at least once a month.

High maintenance roofs 77. High maintenance roofs are those, which require frequent access for maintenance, e.g. roofs with penetrations for plant exhausts, etc. The minimum requirement for this type of roof is a Class B assembly to ACR[M]001. In addition, provide dedicated walkways with handrails, if required, to reach the item of plant to be maintained. **THE MANUFACTURER** 78. Manufacturers of sheets for use in roof assemblies also have responsibilities: a) They should test their sheets to be non-fragile in accordance with ACR[M]001, in which the components are tested as part of an assembly and, as such, the type of and number of fixings, size of washers and the skills with which contractors apply these are relevant to the non-fragile performance of the assembly. b) For new roofs, the conditions affecting guarantees of non-fragility should be clearly stated [and given prominence in the Health and Safety File, which would be handed over to the building owner at the end of the contract]; c) Any claims for non-fragility of roofing assemblies for a given period of time will depend on each component performing to the required level throughout that period. If any component fails to perform for the required period, it is likely that the assembly will become fragile during the period; d) They should provide specific information to be included in the Health and Safety File relating to the maintenance of their product and information about any issue, which is relevant to non-fragility and safety;	Paragraph 77: High maintenance roofs could be construed as roofs that require people to access them at least once a week. **Commentary on paragraph 78** Paragraph 78a) The ACR would draw attention to the (important) fact that the non-fragility of roof assemblies is provided by a combination of the impact strength of the sheet and on how it is fixed to the sub-structure. Therefore, the recommendation is to test the assembly as it would be installed. Where the impact resistance is sensitive to the workmanship (contractor skills), then the test should consider how workmanship may fall below the required standards and model this in the test, e.g., fixings at non-specified centres. Paragraph 78b) The ACR would also draw a specifier's/buyer's attention to the fact that many guarantees of non-fragility are dependent upon caveats, e.g., annual inspections, etc. Where this is the case, this should be given prominence in the data sheets that are supplied with the roof sheets because it will: a) allow a buyer to decide between different manufacturer's products; and b) allow the designing in of provisions to ensure that the conditions of the guarantee can be fulfilled. Paragraph 78c) This follows from the advice under (a). However, the ACR advises that this will become more important where existing sub-structures are reused to support a new roof assembly. Therefore, the ACR advises that before recovering a roof, the manufacturer's advice about the suitability of the existing sub-structure is sought and taken into account, especially where the intention is for the roof to have a long service life. Paragraph 78d) The ACR is aware that, in many cases, the condition of a roof is not given the prominence it deserves because it appears to be performing or the conditions affecting its performance are not passed on to the eventual owner; as long as it is not leaking, it is ignored. Often, this leads to reactive maintenance and the ACR is aware that this is carried out without giving sufficient thought to how it will be carried out. This has led to many accidents because a roof that should be non-fragile becomes fragile (totally or in parts) through neglect. The Health and Safety File is an important (legal) document and any caveats must be given prominence, to allow for planning of future guarantee-related maintenance and to alert any person who inherits the roof to be aware of what is required to maintain the roof's non-fragility classification.

APPENDIX A
CONSTITUENTS OF THE WORKING GROUP

A1. The original working group responsible for this document was chaired by Mr A Maitra and comprised all the ACR members representing the organisations that comprised the ACR in November 2011

Namely:

British Constructional Steelwork Association	[BCSA]
British Safety Industry Federation, Height Safety Group	[BSIF,HSG]
Concrete Tile Manufacturers Association	[CTMA]
Engineered Panels in Construction	[EPIC]
Fall Arrest Safety Equipment Training	[FASET]
Fibre Cement Manufacturers' Association	[FCMA]
Metal Cladding & Roofing Manufacturers Association	[MCRMA]
National Association of Rooflight Manufacturers	[NARM]
National Federation of Roofing Contractors Ltd	[NFRC]
Rural Industrial Design and Building Association	[RIDBA]
Single Ply Roofing Association	[SPRA]
Work at Height Safety Association	[WAHSA]

A2 This version of Guide was revised and updated in December 2014 by the following ACR members:

Mr A Lowther	RIDBA
Mr G Willmott	BSIF-HSG, Chairman
Mr M Holden	Co-opted Member
Mr A Maitra	Co-opted Member

REVISION INFORMATION

A3 The fourth edition of the document contains the following technical changes.

Foreword	updated by chairman	Book 2014 rev 4
Contents	updated	reordered to match paragraphs
Constituents of the working group	moved to appendix A	updated to reflect forthcoming change to CDM regs.
Orange Book Text	updated to match Orange	
Commentary text		new text added
Commentary para 64		new appendix : revision Information added
Commentary para 78		organisations and disclaimer updated
Appendix A		
Rear Cover		

For the latest edition of this publication, refer to the ACR website www.roofworkadvice.info

This document may 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.

PARTICIPATING ORGANISATIONS

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
Denbighshire
Clwyd, LL17 OJE
Tel: 01745 585 600
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 780 652
e-mail: tony.seddon@faset.org.uk
Contact: Mr A Seddon

Institute of Roofing [IoR]
Roofing House
31 Worship. Street,
London
EC2A 2DX
www.instituteofroofing.org
Contact: Mr T Chiswell

Metal Cladding & Roofing Manufacturers Association [MCRMA]
06,Ruskin Avenue
Rogerstone,
Newport
South Wales, NP1 0 0BD
Tel: 01 633 891 584
Email: mcrma@compuserve.com
Contact: Mr C Jones

National Association of Rooflight Manufacturers [NARM]
43 Clare Croft
Middleton
Milton Keynes, MK10 9HD
Tel: 01908 692 325
e-mail: admin@narm.org.uk
Contact: Lorraine Cookham

National Federation of Roofing Contractors Ltd [NFRC]
Roofing House
31 Worship St
London, EC2A 2DY
Tel: 020 7638 7663
e-mail: info@nfrc.co.uk
Contact: The Technical Officer

Roof Tile Association [RTA]
Federation House
Station Road
Stoke on Trent
ST4 2SA
Tel: 01 782 744631
Email: 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
Contact: Mr A M Hutchinson

Work at Height Safety Association [WAHSA]
3 Sherwood Road
Aston Fields Industrial Estate
Bromsgrove
Worcestershire, B60 3DU
Tel: 01527 577 665
email via website 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 & Safety Executive, who provide the experience of many years of involvement in working on roofs in the advice given in their documents.