ADVISORY COMMITTEE FOR ROOFWORK
Best Practice Guide

ACR[CP]001:2003
Recommended Practice for Work on Profiled Sheeted Roofs

FASET FCMA FRA HSE MCRMA NARM NFRC RDBA

PREFACE

One of the main causes of deaths and injuries at work each year is falling from height, particularly through or from roofs. To ensure safety during roofwork requires the commitment of all those involved in the procurement process. This publication aims to give advice on how this can be achieved, by addressing:

- The planning of, and safe systems of work for, work at height;
- The selection and use of work equipment for work at height;
- The management and supervision of work at height;
- The competence of workers performing work at height; and
- The role designers can play in limiting hazards.

The delivery of improvements in the prevention of falls from height will only be achieved with the full involvement of all those with a role to play, i.e. employers, workers, trades unions, trade associations, manufacturers, trainers and others.

This Best Practice Guide gives practical advice on the duties placed on clients, contractors, designers and manufacturers and includes recommendations for good practice while working on roofs. It concentrates on profiled roofs. Nevertheless, those engaged in other similar activities would benefit from the advice given, as many of the principles do apply and offer good practice.

I thank those involved for their valued input, and the often lively and wide-ranging debate.

Paul Franklin (Chairman)

CONSTITUTION OF THE TASK GROUP

The following Associations were represented on the task group:

- Fall Arrest Safety Equipment Training (FASET);
- Fibre-Cement Manufacturers Association (FCMA);
- Flat Roofing Alliance (FRA);
- Health and Safety Executive (HSE);
- Metal Cladding and Roofing Manufacturers Association (MCRMA);
- National Association of Rooflight Manufacturers (NARM);
- The National Federation of Roofing Contractors (NFRC); and
- Rural Design and Building Association (RDBA)

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CONTENTS

FOREWORD

This Code of Practice was drawn up by The Advisory Committee for Roofwork [ACR], to assist in making roof working a safer occupation. It draws on the experience of people who have spent many years in the roofing industry and, as such, the advice given in the document is a statement of good practice, which has been achieved. While this document concentrates on safe working practices on industrial roofs, much of the advice is applicable to work on other types of roof.

Working on roofs is an extremely hazardous activity. This is confirmed by the Health and Safety Executive's (HSE's) accident statistics, which also show that many of these accidents happened because the people carrying out the work were not competent to do so. Consequently, the work was carried out without the necessary planning or management and, often, without suitable equipment.

In addition, many designers of roofs do not do enough to design out risks. Neither do they consider how roofs will be built, the needs of the persons working on roofs nor future maintenance needs. Often, this results in the specification of inappropriate designs.

Some clients who have inadequate knowledge of their duties when commissioning roof work exacerbate the hazards, which exist when working at height.

This Code of Practice provides a source of essential information, by addressing the roles and responsibilities of all who may be concerned with working on roofs. It draws on existing good practice, which is already being followed by informed clients, competent designers and roofing companies. The recommendations in this document are intended to reduce the level of accidents by encouraging clients, designers and roofers to recognise their responsibilities and co-operate, to make working on roofs a less hazardous occupation.

INTRODUCTION

Roofs need to be constructed and then maintained. Managing the hazards connected with working on roofs is just as important as managing any other hazards that people at work are exposed to. The proper management of the hazards associated with roof working can only be achieved if all those responsible for this work undertake their duties conscientiously.

The failure of any roof while it is being worked on can have devastating effects. Consequently, **it is a legal requirement to ensure the safety of persons working on a roof.** It is, therefore, essential to plan working on a roof carefully and to recognise that the key to safety of those working on roofs lies in:

- Clients employing competent practitioners;
- Designers designing out risks;
- Proper planning and control of the work;
- Employing a competent roofing company;
- Ensuring that all workers on roofs are properly trained in the necessary skills and in safety procedures and appropriately managed; and
- Providing the building owner with good advice about the essential maintenance and advice about a safe system of work to be applied every time access to the roof is required.

This document gives advice on how these requirements can be met; starting with the preliminary decisions to be made and going on to give guidance on particular provisions to make working on roofs safer.

HOW THE LAW APPLIES

1. The erection, dismantling and repairing of roofs come under health and safety law. The specific requirements of the Acts and Regulations [1,2,3] are well documented in other guidance notes, to which the reader is referred.

1.Construction (Health, Safety & Welfare) Regulations 1996;
2.Health and Safety at Work, etc. Act 1974;
3.Construction (Design and Management) Regulations 1994.

2. UK Health and Safety Law requires hazards to be identified and, where possible, eliminated. Any residual risks should be assessed and safe systems of work developed to minimise them. If there is an accident on the roof on which you are working, you may be asked to prove that you applied these principles.

3. Remember, having a safe system of work when undertaking work on a roof is a legal duty and should be a co-operative effort between the Client, the Contractor and the Designer. If each of these parties carries out their duties properly, the risks associated with roof working will be minimised.

THE CLIENT

Preliminaries

Is the roof fragile?

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 of work, which protect the worker from the hazards of working on or close to fragile roof areas, must be put in place.

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.

Choose a competent company

8. A good way of starting the job off properly is to choose a company competent to carry out roof work, which 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 workforce, preferably holders of a CSCS/SCORE certificate;
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.

Insist on a method statement

9. Before letting any person work on a roof, insist that there is a project specific Method Statement [see Annex A] and that they understand it. If necessary, let someone who understands roof working read it and act on his/her advice. If you see work being carried on in an unsafe way or not in accordance with the Method Statement, **STOP THE WORK.**

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.

Getting Started

Essential Documentation

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 should include managing the risks to people 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 [see paragraph 29].**

Pre-start checks

16. Before letting the contractor start work, ensure that he has supplied what he has undertaken to provide for the safety of all concerned. **Do not let work start until every necessary safety item is in place.**

17. Give every job of working on your roof to a company recommended by the roofing supplier or by a person competent to do so. In some cases, they may have to be approved by the supplier.

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 a safety induction course before commencing work;
c) Is properly briefed about hazards associated with a particular roof and safe access to it; and
d) Has access to and is competent to use suitable safety equipment.

Post-construction maintenance

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 employed to inspect and maintain your roof without vetting their skills and safety methods. Do not allow untrained employees to "pop up" for a quick look or to carry out quick repairs.

THE CONTRACTOR

20. It is your job as a roofing contractor to assess the risks associated with working on roofs and, as far as reasonably practicable, to minimise them.

Hazards associated with roofworking

Falls

21. The two major hazards associated with working on roofs are: people and objects falling off and through fragile roofs.

22. People fall during roof work because:

a) There are unguarded openings or edges;
b) They slip on roof coverings, which are wet or covered in frost;
c) They step on to incompletely fixed sheets or panels, which are invariably fragile; or
d) They step on old assemblies, which have become fragile, over time.

Asbestos

23. If you encounter Asbestos, or materials, which may contain Asbestos, there will be serious hazards associated with all such materials, which are covered by their own set of Regulations. You must follow the statutory requirements. Get advice from competent persons, if you do not feel confident about dealing with it yourself.

24. Do not take chances with asbestos and never walk on asbestos or fibre cement.

Other hazards

25. Other hazards which must be taken into account include: the use of power tools, sharp edges, dust [when cutting roofing products], materials stored on a roof, etc

26. In addition, you are responsible for providing measures to protect other people who are in the vicinity of the roof you are working on.

Risk Assessments

27. 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.

Planning the work

Choosing the team

28. 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. He/she will set the standards for the other workers to follow.

29. If introducing inexperienced workers, ensure that they are given formal training on health and safety **before** they go on a roof 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.**

Gather Information

30. If there is a Health and Safety File, read it.

31. Always assume existing roofs are fragile unless a competent person decides that it is non-fragile.

Control access to and movement over the roof

32. 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 at least 1.1m past the access point;
b) They should not be more than 9m long, without a rest platform; and
c) The person using it should have both hands free.

33. It is not good practise to allow people to walk on roofs for safety reasons and to prevent roof damage. Stagings [4] or other forms of work platforms should always be provided.

4.Stagings should be secured to prevent accidental displacement, including by the wind. Remove them when they are not in use.

34. 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,** by an effective means: either by covering or by providing an effective barrier. High visibility tapes, used on their own, are not acceptable.

35. 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.

36. **Never allow people to walk on rooflights**.

37. Remember, non-fragile assemblies can be rendered fragile if they are not fixed down in accordance with the manufacturers' instructions.

Storing materials

38. While individual roofing components may be light, in packages they may be quite heavy. Provide some means of spreading the load.

39. 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

40. Ensure that all materials stored on the roof are secured against accidental displacement [5].

5. Materials on the ground may also be subject to wind uplift.

41. 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.

42. Remember, **even non-fragile sheets may be rendered fragile by heavy loads, constant traffic or inadequate fixing sequences.**

Limiting loads carried by people

43. Regulations covering manual handling [6] have been in place for ten years. These Regulations require you to avoid, so far as is reasonably practicable, the need for manual handling of loads.

6.The Manual Handling Operations Regulations 1992.

Fixing the assembly

44. Always fix roof assemblies in accordance with the manufacturers' recommendations, e.g. sequence of laying down the sheets, number of fixings, etc.

45. **Never allow partial fixing only of roof sheets.** Each sheet should be fully 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 fully fixed.

Scheduling deliveries

46. 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

47. 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 edge off which workers on the roof can fall.

Nets

48. The Advisory Committee for Roofwork considers that 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 FASET/CITB safety net riggers card;
c) There are no obstructions within the nets arrest ing distance; and
d) Competent people regularly inspect them.

49. Nets may be removed when a non-fragile roof is in place (minimum ACR[M]001:2000 class C), but see Annex B.

Personal Protective Equipment [PPE]

50. Where PPE is considered the most effective means of fall protection, you must issue this to your workers. In addition, you must:

a) Train them in its proper use, including fault recognition and storage;
b) Ensure that fallers can be rescued immediately;

c) Ensure that certificates showing that the PPE is in working order and meets the requirements of the Regulations [7] accompany the PPE.

7.Personal Protective Equipment at Work Regulations 1992.

51. Before using PPE, ensure that there are no obstructions within the arresting distance.

52. Anchorage systems for PPE must have a valid certificate. Remember the removal of roof sheets may affect the integrity of systems. If in doubt consult the installer of the system.

Construction Drawings

53. 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.

54. 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.

Reporting Incidents

55. It is essential to set up a system for roof workers to report any accidents and incidents, regardless of how minor they think they are. A heavy stumble could make a non-fragile assembly fragile.

56. 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.

57. Similarly, if safety equipment, eg, PPE, is used to arrest a fall, it should be taken out of use until it has been inspected by a person competent and passed as fit for reuse. Any equipment deemed as not safe to use **must** be destroyed.

Method statements

58. Having considered all the points in paragraphs 21 to 57, write a job-specific method statement - also see Annex A.

DESIGNERS OF NEW ROOFS

The Law

59. Whoever designs the roof assembly assumes the responsibilities of a designer under the Construction (Design and Management) Regulations 1994, 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, which should be included in the Health and Safety Plan.

Designing in fall protection

60. 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.

61. Consider the spacing and layout of the rooflights, to minimise the risk of accidental foot traffic. In addition, avoid locating rooflights too close to the edge of a roof.

Provision of access to maintain the roof

62. 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.

Specifying Roof Assemblies

63. You should specify a non-fragile assembly. Tests for determining non-fragility are given in Document ACR(M)001:2000 [8].

8.ACR[M]001:2000, Test for Fragility of Roofing Assemblies

64. 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.

65. To take account of the maintenance of the roof, specify one of the following programmes, which will fulfil the requirements of your roof:

Low maintenance roofs

66. Low maintenance roofs are those, which require very infrequent access, e.g. simple duo-pitched roofs requiring only maintenance that can be done from ladders, or 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]001:2000.

Medium maintenance roofs

67. 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]001:2000.

High maintenance roofs

68. 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]001:2000. In addition, provide dedicated walkways with handrails, if required, to reach the item of plant to be maintained.

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. And never change a fixing specification for a product without discussing the proposed change with the manufacturer.

70. Remember, the preferred method of fall protection may be nets. In this case you must ensure that any supporting 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.

71. 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.**

72. 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. Conventionally, poppy-red fixings are used.

THE MANUFACTURER

73. 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]001:2000, 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) If you are providing a guarantee of performance you must state very clearly the conditions under which the guarantee is supplied;

e) 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;

BIBLIOGRAPHY

Some useful references include:

1. **HS(G)33:** Health and Safety in Roofwork [HSE]
2. **ACR[M]001:2000** Test for Fragility of Roofing Assemblies
3. **Profiled Sheet Roofing and Cladding** - A Guide to Good Practice [NFRC]
4. **Technical Guides** [various] - MCRMA
5. **BS 5427** Code of Practice for Performance and loading criteria for profiled sheeting in building
6. **Building Regulations** - Approved Documents B, F and L
7. Cladding Manufacturers' Literature [various]

The Advisory Committee for Roofwork [ACR] is a body dedicated to making working on roofs safer. Its membership is made up of nominees from the major roofworking 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.

ANNEX A - ROOFWORK ON PROFILED SHEETED ROOFS: Writing an effective method statement

A1. Working on a roof is high-risk work, which requires the closest attention to detail at all times. There should be a **job specific** method statement in writing, agreed and understood by all parties before the work starts. Rigorous supervision is needed to ensure that the agreed method is followed in practice, but there should also be a system to allow necessary changes to be made and validated.

A2. Safety method statements should be clear, concise and include simple sketches.

A3. The following general questions are particularly relevant to a low-pitched industrial roof consisting of inner sheet, insulation layer and profiled metal top sheet. It is not an exhaustive checklist, but is intended to act as a prompt when method statements are prepared and reviewed.

A4. The equipment required to carry out the work safely should be clearly specified, and there should be a system of inspection and training to ensure that the equipment used is in good condition and fit for its purpose.

A5. Non-standard or unusual systems will require special consideration. There may also be risks specific to an individual site, which will need to be addressed (e.g. the presence of overhead power lines).

Some of the issues, which need to be addressed by a method statement, are given below, in Table A1.

Table A1 - Important hazards to be addressed in Method Statements

HAZARD	PROVISION TO CONTROL HAZARD
FALLING when getting on and off ladders at eaves	**1. Access to roof:** have access points been discussed with the roofing gang in order to reduce travel over the roof to a minimum? If ladders are used (as opposed to towers) are means available for hoisting smaller components not craned up? Has the stability of long ladders been considered, e.g. will they need staying to reduce whip?
FALLING when walking past open edges to fetch materials	**2. Materials handling**: how are roofing packs loaded out onto the roof? Is this planned so as to reduce travel when fetching sheets and does it allow for protected routes/safe means of access? Splitting packs of different sheet size and reassembling them at ground level can save travel at height. Back loading onto the completed roof can reduce travel past open edges.
FALLING from steel frame when unslinging	**3. Unloading cranes:** if a crane is being used, who will accept the load/unslinging of it? How will they be protected from falling? Has the use of mobile access equipment been considered for this task?
FALLING from outside building frame at all stages of work. Gable ends are particularly hazardous	**4. Edge protection:** is it provided at eaves, gable ends and other open edges and programmed in before the roofers start work? Protection will also be required at ridges unless work progresses at the same rate on both roof slopes. What are the access arrangements for scaffolders installing edge protection? Is effective edge protection provided at the gable end of the ridge?
FALLING from both sides of gutter i.e. inside and outside building frame	**5. Gutter fixing**: how will workers be protected from falling? Peripheral edge protection erected for roofers will not be sufficient at this phase. Has the use of mobile access equipment been considered as the first priority? If the use of a temporary horizontal and fall arrest system is specified, who will erect and test the line?
FALLING from a partly completed roof	**6. Leading edge protection:** how will this be achieved? Has the use of safety nets been considered in the light of the legal duties/risk assessment for the total roofing operation? Stagings used as working platforms should be stable and of adequate width with handrails/running lines specified to suit the working practices. Work, which requires kneeling or bending needs careful attention as the operator's centre of gravity can extend over the leading edge. What method is specified for moving stagings?

FRAGILE ROOFS	**7. Roofs should be non-fragile.** Have all assemblies comprising, eg, metal liner panels, rooflights, etc, been specified to be non-fragile by the designer? If not, the design decision should be reviewed as a matter of urgency in terms of the designer's duties under the Construction (Design and Management) Regulations 1994. The total number and exact type of fixings specified should be installed. Until this is achieved, assemblies must be treated as fragile. **8. For refurbishment work on existing roofs,** are there any fragile areas on the roof, e.g. roof-lights? These will have to be protected as soon as laid. How will this be achieved? If the covers are to be used, are they strong enough, taking account of the span required. How will they be fixed, and what is the system for their removal? **9. Zoning of the roof** into working and non-working areas can reduce the number of fragile areas, which need to be protected. The system for marking out the zones and progressing the work should be specified. If the barriers marking the edge of the zones are within 2m of fragile material, then they must be strong and rigid enough to support the weight of a person who loses his balance. Zoning should take account of travel to the working area by the roofers and also the need for materials to be moved around the roof. The system should ensure that all fragile areas within the working zones and adjacent to access routes are protected.
SYSTEMS FAILURES	**10. Methods of work are important.** Is the method of work to be adopted when laying the first sheet specified? Some architectural features, e.g. hip ends, will require modifications to the working methods. These should be fully described. Has the fixing of ridge capping/flashing been included in the system of work? **11. When is a roof non-fragile?** Does the method statement make it clear at what stage of construction an assembly, such as a lining panel installation becomes load bearing? The number and type of fixings should be stated and installed; until this is achieved, they **must** be treated as fragile **12. Communications:** what are the arrangements for ensuring the method statement is communicated to and agreed with the roofing gang? **13. Supervision:** what are the arrangements for ensuring that the work proceeds according to the method statement? **14. Modifications:** what are the arrangements for agreeing modifications to the method statement and ensuring that these are communicated to the roofing gang? **15. Validation:** what are the arrangements for ensuring that the company safety adviser or other nominated competent person has reviewed and is satisfied with the system of work proposed?

ANNEX B: CLASS C ASSEMBLIES
Moving of nets under Class C assemblies

B1. Roofing assemblies classified as class C under ACR[M]001:2000 are non-fragile. To obtain Class C, the assembly has to survive a single impact applied in the worst possible position on that assembly. Thus whilst being a single drop of exactly the same magnitude as the SIR 30 test, it is actually a more onerous test[1], which has been demonstrated by testing. An assembly just attaining Class C is, therefore, likely to be safer than a material just attaining non-fragility under SIR 30.
Note 1: The SIR 30 test was a single drop into the centre of a sheet. Experience shows that the worst location is invariably elsewhere because of the influence of the fixings, sheet profiles, etc.

B2. That Class C is non-fragile means the following:

a) Once a Class C assembly [sheet or liner] is **fully** fixed, safety nets may be withdrawn from under them and moved on [leapfrogged]. But note:
   (i) The netting, which remains in place, must protect at least 2.5m behind the leading edge and 2.5m in front of the leading edge, unless alternative leading edge protection is provided. In practice, because of the way nets are supplied, this will usually mean that the netting remaining in place would be 1[one] full bay behind the leading edge and the full bay containing the leading edge.
   (ii) Special consideration needs to be given to the 1st tier [strip] at the gable eaves, as the edge supports are different. Therefore, evidence that the installation achieved Class C in the support condition adopted at this location should be provided.

b) In a built up roof assembly [with a Class C liner assembly], if the top sheet is subsequently removed, no additional precautions need to be taken whilst working alongside the Class C liner assembly, provided it is still **fully** fixed, undamaged and was unaffected by the removal process of the top sheet (or the reason for it's removal).

B3. Class C is the lowest class of non-fragile assembly and, particularly if engineered to pass the test criteria, may be close to the boundary between fragile and non-fragile. Its classification and use therefore requires the following to be taken into account:

a) Normal industry recommended best practice is that Class 'C' assemblies should **never** intentionally be walked upon[2] and appropriate temporary access equipment, such as crawling boards, etc, should always be used. Note 2: Accidental damage to such assemblies might render the classification void.

b) A Class C assembly **must** be treated like any other safety critical item, eg, a safety net. Therefore, any adverse occurrence that could affect its fitness for purpose should trigger an inspection. If an assembly has been subjected to an impact load (such as a tripor stumble), it **and** the adjoining fitted panels **must,** subsequently, be treated as a fragile area and identified and protected accordingly, until it has been replaced and the adjoining fitted panels inspected by a competent person and replaced if necessary. Procedures to ensure this happens **must** be in place.

c) The workforce **must** be aware of these limitations, as required by Regulations 3 and 8 of the Managing Health and Safety at Work Regulations [MHSWR].

d) Any person falling on a class C assembly may make it fragile for subsequent loads. While persons may be capable of self-recovery from a fall or stumble, where they are unable to, the additional weight of a rescuer may cause the assembly to fail. And, because all non-fragility classifications depend on the fixings of assemblies, any adjoining assemblies may also have become fragile[3]. In such situations the incident panel and all adjoining panels **must** be treated as **fragile.** This is a foreseeable risk of selecting Class C assemblies. Therefore, where class C assemblies are being used, rescue plans **must** be developed in advance of work starting. Again, in accordance with Reg. 5 and 8 of the MHSWR, the workforce needs to be aware of the Rescue Procedures.
Note 3. This includes adjoining Class B assemblies.

B4. All current non-fragility classifications depend upon correct workmanship during installation. In particular the manufacturer's specification for fixings and other components is of absolute importance and must not be altered, without the manufacturer's written agreement. The type, number, location and spacing of fixings must be clear and **completely unambiguous** in their meaning. An assembly **must** be fully fixed before the assembly may be treated as non-fragile. In particular partially fixing of sheets (commonly known as 'stitching') to progress the work quickly, followed on by fully fixing later, is dangerous. Any roof found in such a state must be treated as fragile regardless of the classification of the components being used in its construction.

ANNEX C PROVISION OF NON-FRAGILE ROOFS

Aide memoir for designers specifiers and inspectors

Designers of roofs and others who specify roofs should be aware that any doubt[1] about the non-fragility of a roof assembly could lead to the roof being classed as **fragile**, and extra costs may be associated with the additional risks that have to be managed while it is being constructed. Some of the points that need to be addressed are given below and, in taking them into consideration, the views of the manufacturer and/or the Competent Person[s] should be taken into account. The answers to many of these questions should be included in the Health and Safety File.

[1] Lack of documented evidence to support claims for non-fragility may cast doubt about claims.

Points to be considered

The points listed below apply to the whole roof and not just the rooflights.

1. Is the whole roof a non-fragile assembly in accordance with ACR[M]001:2000?

2. If the roof is **not** non-fragile, why not?

3. If the roof is **non-fragile**, what ACR[M]001:2000 classification does it achieve?

4. For a **non-fragile** assembly, documented evidence of the test data relating to the assembly should be available. If it is not, why not?

5. What are the maximum and minimum purlin or other support spacings that the ACR[M]001:2000 non-fragile classification applies to? Does this cover all purlin or support spacings on this roof?

6. If the roof is a curved or barrel-vaulted roof, what are the maximum and minimum radii that the ACR[M]001:2000 non-fragility classification applies to? Does this cover the radius of this roof?

7. If the roof incorporates hips or valleys what is the maximum angle on the hip or valley that has been tested? Has adequate support been provided at the hip or valley?

8. Have the end and side lap dimensions been determined and adhered to on the installation?

9. Have the locations of rooflights been clearly marked[2] with the use of poppy-red headed fasteners?

   [2] This is recommended best practice, for ease of identification during future maintenance.

10. Roof assemblies can be made up of different materials, eg, steel, fibre-cement, GRP, aluminium, polycarbonate, PVC, single plies, bitumen felt etc. Is there an issue regarding different rates of expansion and contraction?

11. In insulated sandwich panel roofs, is there adequate bearing for each panel and rooflight at the end lap? Is there sufficient bearing to accommodate site erection and material tolerances?

12. Can effective fall prevention measures be erected correctly in the appropriate areas?

    If not, does the design include for the provision of safety nets? And have the nets been installed correctly below any fragile or open areas?

    If not, what alternative fall protection measures have been provided?

13. What has been provided in the way of fall protection for workers who will maintain the roofs in the future? If nothing, why not?

14. Does the roof have fixed dedicated means of access at fixed points, to provide safe access in the future? If not, why not?

15. Is signage arranged to identify any risk[s]? In addition, is all signage easy to read, unambiguous and durable?

This document can be obtained from any of the participating organisations at the addresses printed below.

Fall Arrest Safety Equipment Training [FASET]
Association House
99 West street
Farnham
Surrey
GU9 7EN
Tel 01252 739141
Fax 01252 739140
e-mail info@associationhouse.org.uk
Contact Mr J Fairley

Fibre Cement Manufacturers Association [FCMA]
ATSS House,
Station Road East,
Stowmarket,
Suffolk,
IP14 1RQ
Tel 01449 676053
Fax 01449 770028
e-mail fcma@ghyllhouse.co.uk
Contact Mr A Hutchinson

Flat Roofing Alliance [FRA]
Fields House,
Gower Road,
Haywards Heath,
West Sussex,
RH16 4PL
Tel 01444 440027
Fax 01444 415616
e-mail info@fra.org.uk
Contact Mr P Franklin

Metal Cladding & Roofing Manufacturers Association [MCRMA]
18, Mere Farm Road,
Prenton,
Birkenhead,
Merseyside,
CH43 9TT
Tel 0151 652 3846
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Contact Mr C Dyer

National Association of Rooflight Manufacturers [NARM]
1 Gadsden Close,
Cranfield,
Bedfordshire,
MK43 0HF
Tel 01234 752248
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24, Weymouth Street,
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W1G 7LX
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Contact The Technical Officer

Rural Design and Building Association [RDBA]
ATSS House,
Station Road East,
Stowmarket,
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Tel 01449 676049
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