

OVER-ROOFING PROFILED FIBRE CEMENT SHEETED ROOFS

1. INTRODUCTION

Due to problems in old asbestos cement and latterly fibre cement profiled roofs and their roof-lights, it has become common place to "over sheet" the existing roofs with a spacer system and profiled metal sheets or GRP sheets that can match the existing roof profile. While the new roof coverings may be non-fragile they hide a roof covering that is fragile and contains asbestos which at some point will need to be dealt with – even if only at demolition. Reasons are threefold: expensive and hazardous roof removal and disposal is avoided, additional insulation can be installed and it is not necessary to stop production internally if the work is planned and executed carefully.

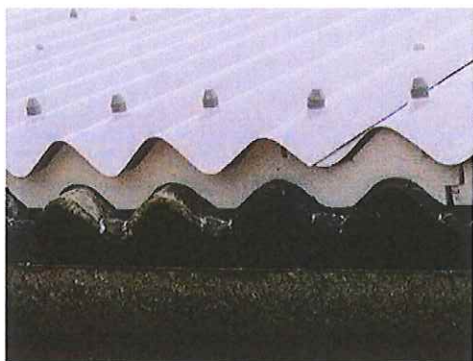
2. EXPLANATORY NOTE

It has been established from much consultation with industry colleagues that as with most roofing activities there are different views on how tasks should be carried out for particular situations, and for many reasons over-roofing existing fragile roofing materials is no exception. These include the roof configuration, pitch, shape, inclusion of valleys, hips etc and the actual construction of the existing roof i.e. double skin asbestos, single skin, plasterboard liner and sheet profile. We have therefore looked at all the methods currently employed and tried to highlight the options available. However, as with most guidance documents we cannot be prescriptive. It is therefore essential that all companies embarking on this type of work make themselves aware of the hazards likely to be encountered and implement the control measures necessary to reduce the risks to the minimum possible.

3. OPTIONS

There are a number of different ways of achieving the intended outcome of fitting a new roof over the existing and most require fixing through the old sheets into the building structure. These include those identified below:

- Rigid spacer profiled to match old and new sheets that are manufactured from GRP in picture 1.
- Spacer bar and bracket system with added insulation See pictures 2 & 3.
- Pre-formed steel 'zed shaped' pressing fixed through the top of the existing sheet corrugations using a high thread fixing or hook bolts and support brackets to prevent crushing the existing material. See pictures 3 & 4 below.



Picture 1
GRP over roof



Picture 2
Bar & bracket with sheet and insulation



Pictures 3 & 4
Zed spacer fixed through top of sheet corrugation

4. PLANNING

A comprehensive survey of the existing roof and its location must be undertaken to establish its suitability for over-roofing.

Factors to be considered include:

- Testing to determine presence of asbestos fibres, type and quantity.
- Condition of asbestos cement sheets (friable or damaged), roof-lights and glazing.
- Suitability of roof and gutters to accept selected system.
- Adequacy of existing structure to accept additional load of selected system.
- Internal access for installation of safety and debris nets.
- External access for installation of scaffolding, loading platforms and edge protection.
- Presence of over-head high power electricity cables.
- Suitability of access and ground conditions for crane or other means of hoisting materials to roof level.

5. SAFETY MEASURES

Before work commences a comprehensive risk assessment must be carried out to identify the specific hazards and control measures required to ensure the health & safety of both roof workers and others in the vicinity who may not be involved, but might be affected.

These will include:

- Prevention of exposure to asbestos fibres in the unlikely event they are released during the fixing of spacer-bar or brackets through the roof sheet.
- Prevention of falls through fragile roof surfaces for people, equipment and replacement materials.
- Prevention of persons falling from roof edges or into the building.
- Prevention of debris arising from work, falling from roof edges or into the building.
- Hoisting and distribution of materials to, along and over the roof.
- Means of rescuing persons as a result of falls into nets or suspension from harnesses.
- Measures to protect other below or in the vicinity of the work.
- Establish and ensure the ability of the operatives to carry out the work safely, their experience, qualifications and training received.
- Ensure materials to be installed are classified non-fragile (see ACR Red Book).

NOTE: This is not an exhaustive list, the onus remains with the contractor to ensure that all possible precautions to minimise risk are considered.

6. ACCESS & EGRESS TO AND FROM ROOF

It is vital that a safe means of access and egress is established for the roof work. The most effective means of providing a safe working environment and ease of access around a fragile roof is a fully boarded perimeter scaffold positioned no more than 300mm below eaves level that includes additional lifts at gable ends. The preferred method of access and egress to and from the scaffold platform is via a purpose-fitted staircase.

This scaffold should provide perimeter edge protection and ideally means of manoeuvring materials into position and fixing the initial row of 1 metre long spacers from the gable and the first tier of sheets without accessing the roof.

The scaffold should incorporate purpose-designed loading bays for mechanically-hoisted roof sheets and materials. These should be strategically positioned to reduce as much as possible unnecessary manual handling of the new roof materials at roof level. All hoisting arrangements must be subject to prior planning and be initiated and supervised by competent persons.

Prior to roofing materials being loaded directly onto the roof structure, the adequacy of the roof to accept the additional loads must be verified as acceptable by a qualified structural engineer.

All hoisting arrangements must be subject to prior planning, initiated and supervised by a competent person.

7. SAFE SYSTEMS OF WORK

It is essential that a method statement/safe working system is devised in consultation with the client/building occupant that will take into account the factors above and that appropriately supervised, trained, qualified and experienced operatives are used for the work.

The preferred option to prevent injury from falls should be the safety nets which are established as an effective form of fall protection. They should preferably be installed internally close to the underside of the existing roof to provide collective protection. Due consideration must be given to ensuring sufficient clearance over racking and other equipment to allow for the deflection of

the safety net when arresting a persons fall. See pictures 5 & 6 below.



Picture 5
Close hung internal safety nets



Picture 6
Racking that could interfere with the net

It should be noted that safety nets will not relieve the contractor from his duty to minimise the risk of falls through the existing fragile roof during the over roofing-work and crawling boards or similar items of equipment must be used if operatives need to traverse the existing fragile roof.

Where it is not practical or possible to install nets internally, alternative steps must be taken to prevent falls through the existing fragile roof material, these can include the use of sacrificial safety nets that are left in position over the existing roof and below the new sheets. However, due consideration must be given to the additional risks the net installers will encounter before deciding to use this system and the controls necessary when working over fragile roofs to install these nets.

These must be adequately secured around the perimeter of the roof and to each other. However, it should be noted that this option is generally only suitable for profiled sheets used with a bracket and bar or a top fix zed bar over cladding system. See *picture 7 below*.

Safety nets for all applications must be installed by trained and competent installers in a manner that does not pose additional risks to the installer or building occupants.



Picture 7
Sacrificial safety nets

Other options include the use of lightweight timber crawling boards, a minimum of 600mm wide positioned strategically and spanning at least three purlins at the leading edge and utilising the new roof as a working platform. Where practical and possible, a system that incorporates means of attaching safety harnesses should be utilised, when working from crawling boards without the safety nets. If not utilised, sufficient crawling boards must be used to safely manoeuvre enough of them in turn to ensure continuity of fall protection for the whole leading edge. Some longer crawling boards are manufactured to provide harness securing points. However, their size can make them heavy and difficult to move over a profiled sheet safely and this can create an additional hazard. Typical crawling board with harness attachment indicated in picture 8 overleaf.

The decision to implement any process will be governed by a number of site-based factors and the need to provide the optimum protection for those working on roofs or below roof work. Below are examples of equipment available and further advice can be obtained.



Picture 8
Staging with hand rail and safety line

Short lightweight boards spanning no more than three purlins are easier to move and will always provide a platform from which to move the one adjacent to it as work progresses if utilised correctly. Where a GRP sheet is used in conjunction with profiled spacers, sacrificial nets cannot be used. In the first instance, it must be confirmed that the replacement sheets are non-fragile. A safe system of work must be established and maintained. Due to the nature of the lightweight material being fitted crucial factors include the length of roof slope and pitch as the GRP is not designed to be walked on without crawling boards. It is therefore recommended that the crawling boards are positioned either side of the leading edge to prevent damage to the new sheets and protect against falls through the fragile asbestos cement sheets. See *picture 9 below*.



Picture 9

8. RESCUE PLAN

Where fall arrest systems such as nets and harnesses, rather than fall prevention methods are utilised, members are reminded that a specific rescue plan must be established in accordance with the **Work@Height Regulations**.

9. DEBRIS AND DUST RESULTANT FROM INSTALLATION

To provide adequate fixing positions for spacer systems that will support the new roof, holes will be drilled through the existing asbestos/fibre cement profiled sheet and in some cases a lining sheet as well. It is essential that steps are taken to prevent the dust emanating from this process from releasing fibres into the building or atmosphere.

The use of self-drilling/tapping screws to form the holes provides an opportunity to apply a light grease or similar substance to the screws before use. Alternatively, a coating of wallpaper paste or similar substance may be applied to the original roof along the spacer fixing line. The substance used will collect dust emanating from the drilling process aided by the spiral thread on the screws and will prevent it being released into the atmosphere when the holes are drilled.

Advice can be obtained from The Advisory Committee for Roofsafety (ACR) Green book, Appendix 3
www.roofworkadviceinfo.com.

Any debris created through accidental breakage must be treated as hazardous waste thoroughly damped down and placed in sealed bags for disposal at a licensed site. More details on disposal and clearing of debris is available from NFRC Health and Safety Guidance document j.

10. PERSONAL PROTECTION

It is unlikely that asbestos fibres of any significant quantity will be released into the air during this type of work. However, extra precautions to protect the people carrying out the work must be considered and subject to risk assessment. These will include the use of disposable overalls and FFP3 filter masks appropriate for the wearer.

NOTES

These advisory measures are not exhaustive; they are intended to provide advice on methods that can be adopted or adapted to ensure that the work is carried out as safely as possible.

Roofing contractors are free to select any method that is safe to use and supported by a robust risk assessment and is compliant with all current legislation.

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