MATERIALS CONTAINING ASBESTOS
IDENTIFICATION, REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS FROM ROOFS AND WALLS OF BUILDINGS

1. INTRODUCTION
During the course of re-roofing, cladding or carrying out of repairs to buildings constructed pre-2000, it is likely that materials containing asbestos fibres will be encountered. Some of these materials are likely to be more hazardous than others. This guide is intended to provide examples of best practice and precautions that are necessary to reduce the risk of exposure beyond the control limits set in the approved Code of Practice.

This guidance note has been revised to take into account the latest changes to the Control of Asbestos regulations that came into force in April 2012. The revised regulations introduce a new category of asbestos containing materials and the controls required to deal with them.

2. TRAINING
The Regulations require mandatory training for anyone liable to be exposed to asbestos fibres at work (see regulation 10 ‘Work with materials containing asbestos’ ACOP to Control of Asbestos Regulations 2006 L143 ISBN 0-716-6206-3 HSE Books). This includes maintenance workers and others who may come into contact with or who may disturb asbestos (eg cable installers, roofers, plumbers) as well as those involved in asbestos removal work. See new task manual HSG 210 ISBN 978-0-7176-6263-0 for the asbestos awareness.

It is essential that operatives carrying out the removal and disposal of products containing asbestos fibres, especially at height, are trained and competent to carry out the work. They must appreciate the hazards and potential risks to themselves and all others. They must be carefully instructed in the methods and measures that will be required to ensure that all precautions are taken and that the correct equipment is utilised.

It should be noted that in addition to health problems, a significant risk of falling through profiled asbestos cement roofs exists and every precaution must be taken to eliminate this risk.

3. SUPERVISION
All operatives must be adequately supervised with conditions and progress being monitored to ensure precautions and systems are maintained.

4. COMMON TYPES OF ASBESTOS FOUND IN OR ON BUILDINGS

- White (Chrysotile)
- Brown (Amosite)
- Blue (Crocidolite)

Those products containing white chrysotile asbestos fibres are considered to be least harmful and can be removed or worked on without an asbestos removal licence if treated correctly. Products containing either brown (Amosite) or blue (Crocidolite) asbestos are treated differently and generally require work to be carried out by a licensed contractor.

This guide only relates to materials containing white (Chrysotile) asbestos fibres firmly bonded into a matrix which has not changed and the new category covering friable materials which has to be given more attention and requires additional measures to be taken to prevent exposure to asbestos fibres.

Prior to the changes being introduced there were basically two categories, which had to be notified to the Health and Safety Executive (HSE) and required a license to remove materials predominantly containing blue and brown asbestos fibres known as licensed work.

Material which do not require a license to be removed are generally with white asbestos fibres firmly bonded into a cement or other matrix known as non-licensed work.

A third category that takes into account products that do not require a license to be removed as above, which are friable and likely to emit fibres if not treated correctly this is known as notifiable non-licensed work. This type of work requires contractors to

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A third category that takes into account products that do not require a license to be removed as above, which are friable and likely to emit fibres if not treated correctly this is known as notifiable non-licensed work. This type of work requires contractors to
take additional measures that include health monitoring and record keeping.

Please see HSE Guidance AO - Advice on Non-licensed work with Asbestos for more details.

There is a need to be able to differentiate between these materials, as most roofing contractors are not licensed to remove brown and blue asbestos, the only positive method of determining the quantity and type of fibre within a given material is by laboratory analysis. It is essential that samples are taken in an appropriate manner and that the constituents of the material are established by a registered laboratory before commencing removal and disposal.

5. ROOFING AND CLADDING MATERIALS MOST LIKELY TO CONTAIN ASBESTOS
Asbestos containing materials include, but are not limited to man-made products, profiled roof sheets, slates, insulating boards, fire resistant boards, soffitte and fascia boards, gutters, rainwater pipes, roofing felt and coatings to some profiled metal cladding generally referred to as Galbestos. When initially manufactured all asbestos fibres are encapsulated within the cement or other base product. In this condition they are relatively harmless unless the material is broken, cut or abraded in its dry form.

6. REMOVAL AND DISPOSAL
Once established that the material contains only white (Chrysotile) asbestos fibres at normal levels the next step is to produce a risk assessment and method statement. It is necessary to take note of the points listed below, in addition to the type of building, proximity of others, occupation of premises, members of the public, access and egress, and method of removal and disposal to be adopted. The risk assessment will take into account the condition of the asbestos containing material and the appropriate notifications will be made if required. Further information is available from the HSE website and in particular document ao asbestos essentials task sheets and the decision flow chart annex A of this guidance sheet.

The essence of safe removal of materials containing Chrysotile (white) asbestos is to prevent or minimise the amount of asbestos fibre released into the air to the accepted level below the control and action limits. This will afford protection to all, not just the operatives carrying out the work.

7. ASSESSMENT OF RISK CONSIDERATIONS
• The hazards that are present and how they can be avoided or minimised.
• Who will be affected and to what degree will they be affected (the risk involved).
• The ability of the operatives to carry out the work safely, their experience, qualifications and training received.
• Protection measures that will be necessary after all other considerations to reduce risk have been taken into account.

8. SAFE WORKING METHODS AND SYSTEMS OF WORK
Regulations concerning the permissible quantity of Chrysotile (white) only asbestos fibres allowable during removal and repair are set out as follows:

Worker exposure must be below the airborne exposure limit (control limit). The Asbestos Regulations have a single control limit for all types of asbestos of 0.1 fibres per cm³. A control limit is a maximum concentration of asbestos fibres in the air (averaged over any continuous four hour period) that must not be exceeded.

In addition, short term exposures must be strictly controlled and worker exposure should not exceed 0.6 fibres per cm³ of air averaged over any continuous ten minute period using respiratory protective equipment if exposure cannot be reduced sufficiently using other means.

Compliance with these limits can be confirmed by air monitoring by laboratories that comply with EN 45001, the HSE have produced a list of activities and the projected fibre release when engaged in these activities (HSG 189/2: Working with asbestos cement). Monitoring is not always necessary unless large amounts of asbestos containing materials are being removed or disturbed, data collected when carrying out similar activities in the past as an indication as to the precautions that will be required.

Independent tests carried out in Europe and by UK roofing companies indicate that if the correct procedures are followed the control limits should not be exceeded and as a consequence of this the action level should not be reached. However, this will not relieve any company of their responsibility to take the necessary precautions.

However, the HSE must be notified if you are planning to work with asbestos cement for the first time and or the exposure limits are likely to be exceeded.

A system must be devised that will detail how the work will be carried out, the methods to be utilised and the precautions that will be taken to ensure that the project is carried out in the most efficient and safe manner, taking into account the risks and controls highlighted in the risk assessment.
9. PRACTICAL CONSIDERATIONS AND SAFE METHODS FOR REMOVAL

PROFILED ROOF AND WALL SHEETS
It must be remembered that these sheets are fragile and the relevant fall protection precautions must be in place before any work commences.

All sheets must be wetted both externally and internally. It must be noted that this procedure will result in the sheets becoming very slippery, by a suitable means depending on the area of application, the preferred method is a mixture of water and wetting / sealing agent. Single skin sheets secured by hook or crook bolts can be removed internally by using suitable access equipment and cropping the securing bolts and lowering the sheets carefully in one piece onto a platform (this method is preferred by the HSE as it avoids having to walk on the fragile material) and any dust on the purlins and inside of the sheet can be wetted as well as the exterior of the sheet. A large scissor lift can be useful provided it is not overloaded as it can be used to lower the materials to floor level.

Double skin profiled systems, or underlined systems have to be removed from above. In these incidences it is strongly recommended that (unless there are good reasons why they should not) safety nets and possibly debris nets are to be used.

NOTE: If nets are used and likely to be contaminated, a procedure for their removal and cleaning should be devised.

A perimeter working platform complete with handrails and toe boards erected in accordance with the correct code of practice for the whole extent of the area to be worked on (unless divided by physical barriers) must be established as close to eaves and verge levels as practical. Arrangements should be made for the stacking and removal of redundant materials by introducing loading and unloading bays or platforms.

Safe access over the existing roof from the perimeter platform must be established by the use of crawling boards at least 600mm wide with safety harness attachment points extending the whole length of the roof slope to be removed (steep slopes may require specialist access equipment). It is beneficial to start removing sheets from original finish point to avoid disturbing under-lapped sheet corrugations.

Once safe access and egress has been established the removal process can begin. As stated previously the primary aim is to prevent or minimise the amount of asbestos fibre released to the air thus protecting everyone. The sheets must be wetted either with plain water or water mixed with a wetting / selling agent this can be achieved by the use of garden sprays.

The sheets should be removed whole and undamaged. Hook or crook bolts can be either undone or carefully cropped, especially if fitted with substantial sealing washers (note: means of retaining or catching cropped bolts must be established or areas below must be segregated.

SHEETS SECURED BY DRIVE SCREWS
Drive screws into timber purlins can be removed with difficulty by unscrewing with mole grips or similar tools but this is time consuming, alternatively their heads can be carefully cropped with bolt cutters. The shanks can then be extracted or cut off after sheet removal. Fixing bolts or screws should only be removed on a sheet-by-sheet basis and on no account should a large amount of sheets be released at the same time.

Sheets should be released individually starting at the ridge and working down each slope tier by tier, as each sheet is removed the previously covered sheet underlap and exposed support should be wetted to prevent possible release of fibres contained in dust or debris trapped between the two materials.

ANY ACCIDENTAL BREAKAGES SHOULD BE WETTED AND THE PIECES PLACED IN THE APPROPRIATE BAGS FOR TRANSPORTATION TO THE MAIN DISPOSAL CONTAINER.

ANY RESIDUAL DUST MUST BE WIPED FROM SURFACES WITH WET RAGS THAT WILL THEN BE PLACED IN CONTAINERS OR BAGS FOR DISPOSAL WITH SHEETS OR ALTERNATIVELY CLEANED WITH A VACUUM CLEANER WITH A CLASS H FILTER.

NOTE: All fixing bolts or screws should be treated as contaminated material and disposed of accordingly.

REMOVAL OF GUTTERS AND RAINWATER PIPES
Valley gutters and the like, that are supported by independent brackets must be kept wet and dismantled after the roof sheets have been stripped and lowered to ground level whole before being placed in the appropriate container. Eaves gutters can usually be removed prior to stripping the roof sheets once eaves closures have been released and they must be disposed of in the same manner. Rainwater pipes should be removed in sections provided they are carefully separated.
REMOVAL OF MAN MADE SLATES MANUFACTURED FROM ASBESTOS CEMENT
The same procedure for providing perimeter edge protection, as specified for sheeting must be applied for the removal of slates. Where crawling boards would have been used for sheets suitable roof ladders can be utilised to gain access to the ridge or abutment.

Slates must be wetted with plain water or water containing a wetting / sealing agent, this can easily be applied by a garden type spray, to prevent the release of dust containing asbestos fibres. If plain water is used it must be applied at regular intervals during the removal operation. Slates must be carefully levered apart and nails extracted to prevent breakage, they must then be passed carefully from roof to be stacked preferably on pallets before removal to ground level. Stacks must be covered or kept moist until they are ready to be lowered.

Any accidental breakages must be wetted and pieces placed in appropriate bags immediately, any residue should be wiped up with wet rags as stated in previous section.

REMOVAL OF PROFILED STEEL SHEETS WITH BITUMEN BASED COATING CONTAINING ASBESTOS FIBRES (E.G. GALBESTOS)
Edge protection and working platforms complete with safety nets must be installed as with profiled cement sheets as it is common for this type of sheet to become fragile over a period of time.

The asbestos fibres are encapsulated within a bitumen based coating on the outside of the sheet. It is far more flexible than cement based products and is therefore more difficult to break to allow fibres to be released. Wetting of the surface has little benefit and can create an increased risk of slipping. It is therefore important that sheets are removed whole, simply by unscrewing or if necessary cutting the fixing bolts and lifting clear of purlins or sheeting rails before lowering to the ground in similar fashion to cement based sheets and disposed of in the same manner. Cutting sheets should be avoided where possible but if considered vital a wet procedure must be established.

Exposed surfaces that might harbour dust containing asbestos fibres should be wiped with wet rags as previous sections.

REMOVAL OF ROOFING FELT CONTAINING ASBESTOS FIBRES
Having established edge protection and working platforms as required, the felt should be cut when wet and removed in as large sections as possible. These can be lowered to ground level or dispatched through rubbish chutes direct to containers. Large quantities of debris must be wetted before being shovelled into waste container. Any material adhered to surface should be wetted before being gently scraped off and deposited in waste container.

Exposed surfaces harbouring dust likely to contain asbestos fibres should be wiped with wet rags, as stated in the previous section.

OVER ROOFING OR CLADDING OF ASBESTOS CONTAINING MATERIALS
It is important to remember that materials to be covered will be fragile, therefore a system has to be devised to gain access, provide edge protection and prevent falls through these materials. In addition to the fall prevention precautions, the use of safety nets below the existing roof is the preferred option to arrest falls. Once the safe system of work is established the penetration of the existing roof and the dust emanating from this process has to be considered.

There are various systems of existing roof, ranging from two skins of asbestos containing material to different lining systems, over and under purlin as well as single skin sheets. The over roof support system has to be installed externally, it generally requires a minimum of two 5mm diameter holes drilled through the outer sheet and liner where fitted, at approximately 1m centres to each purlin. Dust caused through the penetration of the outer sheet can be reduced to an acceptable level by wetting, local extraction processes when drilling. Further measures that can be taken to reduce the amount of dust produced can include coating the screws in light grease before insertion so that the minimal amount of dust produced adheres to the grease. On large contracts air monitoring should be introduced to ensure measures are effective. See guidance sheet ‘r’ for further information.

10. HANDLING, STORAGE AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS
All materials containing asbestos are designated as special waste and require specific action for transportation and disposal. The procedure of burial on private land is no longer an option.

Once removed from roof or wall, materials have to be stacked safely before being lowered to ground. Providing they are kept whole and undamaged no increased risk will exist. Small pieces, dust and used overalls should be wetted placed in double thickness bags that are sealed and marked as containing asbestos. Large quantities, sealed bags and other debris should then be deposited carefully into larger containers that can be covered for onwards transportation to a designated licensed waste site. (Please consult your carrier to ensure you have the appropriate container).

It must be transported by a licensed carrier and at least three working days notice must be given to the waste disposal authority.
The following information should be provided:

1. Address of premises from which material has been removed
2. Address of licensed site at which waste is to be deposited
3. Nature and composition of waste
4. Quantity of waste to be deposited
5. Size number and type of waste container
6. Name and address of waste producer on site.

NOTE: These records must be kept for at least two years.

II. PROTECTION TO INDIVIDUALS CARRYING OUT REMOVAL AND OTHERS IN THE VICINITY

Even when control levels are unlikely to be exceeded it should be considered best practice to take additional precautions that will protect everyone in the vicinity as well as the operatives carrying out the work.

Only essential personnel should remain in the work area, non-essential personnel should be prevented from entering the working area by barricades or bunting. Clear notices should be displayed stating that asbestos removal is in progress warning that access is prohibited. Although only necessary when control limits are exceeded personal protective equipment and clothing should be utilised to afford additional protection for, the removal and disposal operatives.

Type 3, CAT 5 disposable overalls that have elasticated wrists and ankles with integral hoods are essential as they reduce the risk of fibre release, during transportation to laundry, these must be disposed of as waste at the end of each shift. Boots without lace holes are easier to clean and overalls can be placed over them.

A disposable particulate respirator (FFP3) will normally be adequate providing, that it fits tightly to the wearer who will need to be clean shaven to ensure airtightness, the straps fitted correctly under the overall hood and spectacles are put on after it is fitted. It must not be removed or left lying around in a potential contaminated area. It should be disposed of at the end of each shift with other contaminated materials.

NOTE: It is essential that respirators are suitable for each individual and face fit tests should be carried out to ensure compatibility.

II. FURTHER INFORMATION

This guidance is not intended to be exhaustive but to contain the main criteria that should be followed to ensure the health safety and welfare of operatives and others involved in the removal of materials containing white (Chrysotile) asbestos. Further information on specific materials not mentioned can be obtained from the HSE publication Introduction to Asbestos Essentials and its task manual both numbered HSG213 and Control of Asbestos Regulations 2006 ACOP L143. Further Health and Safety Best Practice guidance can be found in the ACR Best Practice Guide ACR [CP] 002:2005 “Safe Working on Fragile Roofs” on the ACR website at http://www.roofworkadvice.info/publications.

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