

Conducting Asbestos Surveys



OCTOBER 2016



These guidelines are for PCBUs conducting asbestos surveys, workers carrying out asbestos surveys and PCBUs that need to identify asbestos in a workplace.

ACKNOWLEDGEMENTS

WorkSafe New Zealand would like to acknowledge and thank the stakeholders who have contributed to the development of this guidance.

CONDUCTING ASBESTOS SURVEYS KEY POINTS:

Under the Health and Safety at Work (Asbestos) Regulations 2016 there are a number of situations where the presence of asbestos and asbestos-containing material (ACM) in a workplace must be identified.

One means of identifying asbestos and ACM is to have a survey carried out by an asbestos surveyor.

An asbestos surveyor needs to have sufficient training, qualifications, knowledge, experience and ability to sample and identify asbestos, have sufficient knowledge of the tasks required and the risks the work will involve, demonstrate independence and use a quality management system.

TABLE OF CONTENTS

01	INTRODUCTION	4
1.1	Background	5
1.2	Who should read this guidance?	5
1.3	How to use this guidance	6
1.4	The purpose of an asbestos survey	8
1.5	Key points about surveys	8
02	IDENTIFYING ASBESTOS IN WORKPLACES	9
2.1	Assuming ACM is present	10
03	IDENTIFYING ASBESTOS BEFORE REFURBISHMENT OR DEMOLITION OF A WORKPLACE	11
04	ASBESTOS SURVEYOR COMPETENCIES	13
4.1	Demonstrating competency	14
4.2	Relevant accreditations and qualifications	14
05	ASBESTOS SURVEYS	16
5.1	Types of survey	17
5.2	Survey restrictions	20
5.3	Survey strategy	21
06	SURVEY PLANNING	22
6.1	Introduction	23
6.2	Information the asbestos surveyor may need from the client PCBU	23
6.3	Information the asbestos surveyor should provide to the client PCBU	23
6.4	Survey planning procedure	23

07 CARRYING OUT THE SURVEY (SURVEYING) 30

7.1	Introduction	31
7.2	Systematic surveys	31
7.3	Bulk sampling strategy	35
7.4	Bulk sampling procedures	36
7.5	Material assessment	37

08 MANAGEMENT SURVEY REPORT 39

8.1	The survey report	40
8.2	Conclusions and actions	45
8.3	Bulk analysis results	45
8.4	Checking the report	45

APPENDICES 46

Appendix A: Types of ACM in buildings	47
Appendix B: Material assessment algorithm	62
Appendix C: Example of a survey and sampling equipment checklist	63
Appendix D: Quality assurance and quality control	64
Appendix E: References	66
Appendix F: Glossary	67

TABLES

1	Asbestos duty holders	6
2	Other terms	7
3	Information to be collected by the asbestos surveyor	24
4	Summary of survey results	42

FIGURES

1	Asbestos label	26
2	Example of asbestos building plan	44

01/

INTRODUCTION

IN THIS SECTION:

- 1.1 Background
- 1.2 Who should read this guidance?
- 1.3 How to use this guidance
- 1.4 The purpose of an asbestos survey
- 1.5 Key points about surveys

These guidelines set out good practice in conducting surveys to identify asbestos in workplaces.

1.1 BACKGROUND

WorkSafe New Zealand has prepared these guidelines for PCBUs and people who will identify the presence of asbestos or asbestos-containing material (ACM) (known as asbestos surveyors).

Large amounts of ACM were used for a wide range of construction purposes in new and refurbished buildings until 2000. This means there are many buildings in New Zealand that contain asbestos or ACM. If the ACM is in good condition, and unlikely to be disturbed, it may not present a significant risk. However, if the ACM is in poor condition, disturbed or damaged, asbestos fibres are released into the air. If breathed in, these fibres can cause serious lung diseases, including cancers.

Workers who disturb the fabric of buildings during maintenance, refurbishment, repair, installation and related activities are exposed to asbestos every time they unknowingly work on ACM, or carry out work without assessing and managing the risks

The purpose of identifying asbestos in buildings is to prevent, or if this is not reasonably practicable, minimise exposure for workers and other people on the premises. To achieve this, PCBUs need information about whether asbestos is, or is likely to be, present in the buildings. This will help the PCBU assess the risks it presents and work out how to manage those risks.

1.2 WHO SHOULD READ THIS GUIDANCE?

This guidance is for:

- > asbestos surveyors – people (self-employed PCBUs, employer PCBUs and workers) who conduct asbestos surveys
- > others, including architects, designers, building surveyors and people doing refurbishment, demolition and work involving asbestos
- > client PCBUs – people who commission asbestos surveys.

ASBESTOS SURVEYORS

These guidelines set out how to survey premises for asbestos and ACM. They specify the methodology to use when carrying out surveys, and how to report and present the results. They also give advice on how to recognise and sample suspected ACM.

OTHER PEOPLE

These guidelines will be useful for building professionals such as architects, designers, building surveyors, and particularly demolition workers and asbestos removalists.

For example, architects and building surveyors can advise on the need for an asbestos survey before refurbishment and demolition projects start. Architects and building surveyors should also understand the various types of surveys and be able to review completed surveys.

Contractors need to interpret asbestos surveys so they can plan and carry out refurbishment or demolition safely.

These guidelines do not cover airborne sampling or surveying asbestos-contaminated land. More information on these topics is available in the approved code of practice *Management and Removal of Asbestos*.

PCBUs WHO COMMISSION ASBESTOS SURVEYS

These guidelines may help client PCBUs to:

- > decide what type of survey is appropriate
- > assess surveyor competencies
- > know what the asbestos surveyor should provide
- > know what they should provide to the asbestos surveyor.

These guidelines also identify issues which can reduce the survey’s effectiveness and have serious implications for managing asbestos.

They also explain what the client PCBU should check to make sure the survey report is valid and accurate.

1.3 HOW TO USE THIS GUIDANCE

DUTY HOLDERS

Various duty holders, identified in the Asbestos Regulations, are referred to in these guidelines. A description of these duty holders is given in Table 1.

DUTY HOLDER	KEY DUTIES
<p>PCBU with management or control of a workplace</p> <p>Note: In these guidelines, and in relation to duties, usually means the PCBU of the workplace where asbestos is located</p>	<p>They have a duty to make sure, so far as is reasonably practicable, that all asbestos or ACM in a workplace is identified if they know, or ought reasonably to know, that there is a risk of exposure to respirable asbestos fibres in the workplace.</p>
<p>PCBU with management or control of a workplace where a structure or plant is to be demolished or refurbished</p> <p>PCBU with management or control of a structure or plant that is to be demolished or refurbished at a workplace</p>	<p>They must make sure:</p> <ul style="list-style-type: none"> > that all asbestos that is likely to be disturbed by the demolition or refurbishment is identified; and > so far as is reasonably practicable, that the asbestos is removed before the demolition or refurbishment is commenced.
<p>PCBU that intends to carry out demolition or refurbishment of a structure or plant at a workplace</p>	<p>They must:</p> <ul style="list-style-type: none"> > make sure that a competent person determines whether asbestos or ACM is present before work commences. > inform the workplace PCBU, if asbestos or ACM is determined or assumed.

DUTY HOLDER	KEY DUTIES
PCBU that intends to carry out demolition or refurbishment of a structure or plant at a home	They must: <ul style="list-style-type: none"> > make sure that a competent person determines whether asbestos or ACM is present before work commences; and > inform home owners/occupiers if they discover asbestos in the home.
PCBU that intends to carry out the demolition or refurbishment of a home	They must make sure: <ul style="list-style-type: none"> > that all asbestos that is likely to be disturbed by the demolition or refurbishment is identified; and > so far as is reasonably practicable, that the asbestos is removed before the demolition is commenced.
Asbestos removalist This is a PCBU who removes asbestos or ACM.	They have a duty to remove asbestos or ACM in accordance with the Asbestos Regulations.
Licensed asbestos removalist This is a PCBU that has either a Class A or Class B licence for asbestos removal.	

Table 1: Asbestos duty holders

OTHER TERMS

To simplify these guidelines, a number of terms have been used to refer to different parties that have responsibilities in relation to asbestos surveys. These are described in Table 2.

TERM	NOTES
Asbestos surveyor	The business or person that conducts an asbestos survey. This includes a competent person who identifies asbestos before refurbishment or demolition.
Client PCBU	A PCBU that commissions a survey. Usually this will be a workplace PCBU but may be a PCBU who carries out, or intends to carry out, work at a workplace.
Competent person who identifies asbestos before refurbishment or demolition	The person that conducts a refurbishment or demolition asbestos survey. They must have the knowledge, experience, skills, and qualifications to determine whether asbestos or ACM is present.
Workplace PCBU	PCBU with management or control of a workplace.

Table 2: Other terms

For a more detailed explanation of PCBUs and their legal obligations, see WorkSafe's *Introduction to the Health and Safety at Work Act 2015*.

SURVEYORS

Asbestos surveyors are not specifically mentioned in the Asbestos Regulations. The regulations place a duty on workplace PCBUs and PCBUs that carry out demolition and refurbishment work to identify the presence of asbestos or ACM in the workplace.

Engaging an asbestos surveyor is one way to identify the presence of asbestos or ACM.

INTERPRETING THE REQUIREMENTS IN THE GUIDELINES

'**Must**' indicates a legal duty or obligation that duty holders must comply with.

The term '**should**' indicates a recommendation that a practice or approach be adopted. However, following the recommendation is not mandatory, or the only way, to comply with a legal duty or obligation.

The expression '**needs to**', or a direction for a duty holder do something, indicates that a duty holder must take the relevant action or approach in order to comply with these guidelines.

1.5 THE PURPOSE OF AN ASBESTOS SURVEY

An asbestos survey will:

- > help the client PCBU manage asbestos in the workplace
- > provide accurate information about the location, amount and condition of asbestos and ACM
- > help decide if remedial action is required.

The client PCBU can use the survey information to prepare a record of the location of any asbestos, as well as an asbestos management plan for the workplace.

The asbestos survey can identify all the asbestos and ACM that needs to be removed before starting refurbishment or demolition work.

1.5 KEY POINTS ABOUT SURVEYS

The asbestos surveyor needs to:

- > make sure that all asbestos is located and identified as appropriate for the type of survey
- > make sure the appropriate survey is conducted for the client PCBU's needs
- > present the survey in a format that can be used to prepare an asbestos management plan, where applicable
- > inform the client PCBU about how the survey fits into the process for managing asbestos risks.

02/

IDENTIFYING ASBESTOS IN WORKPLACES

IN THIS SECTION:

2.1 Assuming ACM is present

A workplace PCBU who knows, or ought reasonably to know, that there is a risk of exposure to respirable asbestos fibres in the workplace must make sure, so far as is reasonably practicable, that all asbestos or ACM giving rise to the risk at the workplace is identified.

More information on this requirement is available in the approved code of practice *Management and Removal of Asbestos*.

An asbestos surveyor can help the workplace PCBU to identify the presence of asbestos or ACM.

2.1 ASSUMING ACM IS PRESENT

The asbestos surveyor can help the workplace PCBU decide when it is appropriate to assume that material contains asbestos.

For instance, material may be assumed to contain asbestos in the following circumstances:

1. The material looks like it is an ACM, or might contain asbestos. This conclusion can be reached through visual inspection by a person familiar with the range of asbestos products. Examples are where:
 - > laboratory analysis has confirmed the presence of asbestos in similar looking material
 - > asbestos was known to be commonly used in the manufactured product at the time of installation
 - > materials look like asbestos but no sample has been taken.
2. Where a part of the workplace is inaccessible to workers and likely to contain asbestos or ACM, the workplace PCBU must assume that asbestos is present in that part of the workplace.
3. The workplace PCBU must also assume that material is asbestos if the material cannot be identified but the PCBU reasonably believes that the material is asbestos or ACM.

Materials cannot be assumed to be asbestos-free (ie contain no asbestos) unless there are reasonable grounds to believe that they do not contain asbestos. There are obvious materials which do not contain asbestos (eg wood, glass, metal and stone). However, there are also many examples of asbestos being present inside materials (eg a sandwich layer inside doors, inside columns or under column casings), and on the 'hidden' side of items like wood panelling, ceiling tiles and under veneers.

Reasons to conclude that a material does not contain asbestos are:

- > non-asbestos substitute materials were specified in the original architect's or quantity surveyor's plans, or in subsequent refurbishments
- > the product is very unlikely to contain asbestos or have had asbestos added.

It is not always straightforward to conclude that asbestos and ACM are absent. The Asbestos Regulations require the workplace PCBU to have reasonable grounds for believing that ACM is not present. While original building specifications may not have included asbestos or ACM, workers may have used them for their convenience.

For example, ACM off-cuts may have been used as filler or packing and support items in places where their presence was not recorded. There are also examples of poor removal practices that have left asbestos-containing debris and dust behind. Therefore, areas where asbestos has been previously removed should be re-inspected as part of the survey.

03/

**IDENTIFYING
ASBESTOS
BEFORE
REFURBISHMENT
OR DEMOLITION
OF A WORKPLACE**

If a structure or plant at a workplace is going to be refurbished or demolished, the PCBU intending to carry out the work must determine whether there is any asbestos or ACM present in the structure or plant.

The PCBU may engage an asbestos surveyor to make this determination.

If a structure or plant at a workplace is to be demolished or refurbished, the workplace PCBU or the PCBU with management or control of the structure or plant must make sure that:

- > all asbestos that is likely to be disturbed by the demolition or refurbishment is identified; and
- > so far as is reasonably practicable, the asbestos is removed before the demolition or refurbishment is commenced.

More information on the requirement to identify asbestos before refurbishment or demolition at a workplace is available in the approved code of practice *Management and Removal of Asbestos*.

04/

ASBESTOS SURVEYOR COMPETENCIES

IN THIS SECTION:

- 4.1 Demonstrating competency**
- 4.2 Relevant accreditations and qualifications**

People identifying asbestos should have the knowledge and skills to identify or assume the presence of asbestos through training, qualifications and experience.

For asbestos identification, an asbestos surveyor needs to:

- > be trained to take and handle uncontaminated asbestos samples safely
- > have the knowledge and experience to identify suspected asbestos and work out the risk and control measures
- > be familiar with building and construction practices to help work out where asbestos is likely to be present
- > be able to confirm that material may be friable or non-friable asbestos, and evaluate its condition.

The asbestos surveyor should be knowledgeable and experienced in:

- > the types and locations of ACM
- > eliminating and minimising asbestos exposure risks
- > correctly using, maintaining and storing personal protective equipment (PPE)
- > safely using the plant and equipment needed for taking samples.

4.1 DEMONSTRATING COMPETENCY

The asbestos surveyor should be able to provide the following information to a prospective client PCBU:

- > Details of any relevant accreditations or qualifications.
- > Copies of their written procedures (including risk management and quality control policies) and references or other evidence of recent similar work.

- > A written declaration which states that the surveyor can operate with independence, impartiality and integrity
- > A written declaration that personnel carrying out the work are adequately trained for all aspects of the work taking place.
- > Information on their limitations.

4.2 RELEVANT ACCREDITATIONS AND QUALIFICATIONS

There are no mandatory qualifications for asbestos surveyors. However, organisations or individuals may be able to demonstrate their competency through accreditation or by holding qualifications as discussed below.

ACCREDITATION

Organisations can demonstrate that they are technically competent to conduct surveys and sampling for asbestos through accreditation to ISO/IEC 17020:2012. Laboratories that are accredited to ISO 17025 may have 'asbestos surveys and sampling' added to their existing ISO/IEC 17025 scope of accreditation.

Accreditation gives an assurance that an independent and authoritative body has assessed the technical competence of an organisation, including its underpinning management system, methods, equipment, records and personnel. Accreditation ensures that accredited organisations can provide reliable services for the activities specified in their schedule of accreditation.

QUALIFICATIONS

Individuals may be able to demonstrate that they have sufficient competency to conduct specified surveys through a combination of qualifications and experience. In this situation, experience (ie extent and range) is particularly important.

The most widely-held training qualification is the BOHS¹ Proficiency Module P402: *Surveying and Sampling Strategies for Asbestos in Buildings*. The P402 is a basic minimum qualification for individuals carrying out asbestos surveys and on its own it does not demonstrate competency. Therefore, in addition, individuals should also have a minimum of six months practical experience of carrying out asbestos surveys under the supervision of experienced and suitably qualified personnel.

The Proficiency Module P402 can be supplemented with two refresher modules, P402R, relating to management surveys, and refurbishment and demolition surveys respectively.

The BOHS W504 course *Asbestos and other Fibres* is also a relevant starting qualification, but again on its own does not demonstrate an individual's competence. The qualification must still be supplemented by a minimum of six months supervised field experience.

SAFE WORK INSTRUMENT

Under the Asbestos Regulations, a competent person is defined as a person who has the knowledge, experience, skills, and qualifications to carry out a particular task, including any knowledge, experience, skills, and qualifications prescribed in a safe work instrument.

Asbestos surveyors should check the WorkSafe website for a safe work instrument prescribing qualifications for competent persons who determine the presence of asbestos or ACM before refurbishment or demolition takes place in a workplace.

¹ BOHS: British Occupational Hygiene Society

05/

ASBESTOS SURVEYS

IN THIS SECTION:

- 5.1** Types of survey
- 5.2** Survey restrictions
- 5.3** Survey strategy

Asbestos surveys can be used to locate and identify where asbestos and ACM may be found in a workplace.

5.1 TYPES OF SURVEY

These guidelines describe three different surveys:

- > management surveys
- > refurbishment surveys
- > demolition surveys.

The type of survey required will vary during the premises' lifespan, and several may be needed over time.

A management survey is recommended during normal occupation and use of the building to make sure the existing asbestos and ACM is being managed.

A refurbishment or demolition survey may be necessary when the building (or part of it) is going to be refurbished or demolished.

At larger premises, a mixture of survey types may be appropriate. For example, a boiler house due for demolition will require a demolition survey, while offices at the same site may have a management survey. In later years, refurbishment surveys may be required in rooms or floors which are being upgraded.

In situations where there are large numbers of internal units (eg hotel rooms) only particular rooms may be upgraded, such as kitchens, bathrooms and bedrooms. Refurbishment surveys will only be necessary in these locations.

It is important that the client PCBU and the asbestos surveyor know exactly what type of survey will be carried out and where. Therefore, there should be a clear statement

and record of the type of survey to be carried out, including the reasons for selecting that type of survey, and where it will be carried out.

MANAGEMENT SURVEY

The purpose of the asbestos management survey is to help the workplace PCBU to systematically identify and manage all asbestos in their workplace. The survey has to provide sufficient information for the workplace PCBU to indicate the presence and location of asbestos or ACM, carry out a suitable risk assessment, and develop an asbestos management plan.

In most cases, the survey will have three aims.

1. To find and record the location, extent and product type of any assumed or known asbestos and ACM.
2. To inspect and record information on the accessibility, condition² and surface treatment of any assumed or known asbestos and ACM.
3. To determine and record the asbestos type, either by collecting representative samples of suspect materials for laboratory identification, or by making an assumption based on the product type and its appearance, etc.

A management survey is the standard survey carried out to support the workplace PCBU in identifying asbestos in the workplace. Its purpose is to identify, so far as is reasonably practicable, the presence and location of any asbestos or assumed ACM in a building

² The exception is the refurbishment and demolition survey, where information on the condition of the asbestos is usually not needed, since the ACM will, so far as is reasonably practicable, be removed before the demolition or refurbishment starts. However, if the removal will not take place for some time after the survey (eg more than three months), the ACM must be managed during this period. In this case, the condition of the ACM should be determined and remedial action taken as appropriate.

which could give rise to a risk of exposure to respirable asbestos fibres. This includes ACM that could be damaged or disturbed during normal occupancy, including foreseeable maintenance and installation.

Management surveys will often involve minor intrusive work and some disturbance. The extent of intrusion will vary between premises and depend on what is reasonably practicable for individual properties. It may depend on factors such as the type of building, the nature of construction, accessibility etc.

A management survey should include an assessment of the ACM's condition and its ability to release fibres into the air if it is disturbed in some way. This '**material assessment**' (see section 7.5) will give a good initial guide to the priority for managing ACM because it will identify the materials which will most likely release airborne fibres if they are disturbed.

SAMPLING, ANALYSIS AND ASSUMING IN A MANAGEMENT SURVEY

The survey will usually involve sampling and analysis to confirm the presence or absence of asbestos or ACM. However, a management survey can also assume the presence or absence of asbestos.

A management survey can be completed using a combination of sampling and assuming the presence of ACM or, just assuming. Any materials assumed to contain asbestos should also have their condition assessed (ie a material assessment).

Alternatively, doing sampling and analysis can confirm or refute the presence of asbestos. The results will determine the work methods and contractors to be used.

The 'assumption' approach has several disadvantages: it is less rigorous, it can lead to obstructions and delays before work can start,

and it is more difficult to control. 'Default' assumptions may also lead to unnecessarily removing non-ACM and disposing of it as asbestos waste.

POSITIVELY IDENTIFYING ACM IN A MANAGEMENT SURVEY

Asbestos surveyors should always try to positively identify ACM. The asbestos surveyor should take a sufficient number of samples to confirm the location and extent of ACM. Sample numbers can be reduced if materials are assumed to contain asbestos.

When sampling is carried out as part of a management survey, a competent person should collect samples from each type of suspected ACM for analysis. If the sampled material contains asbestos, other similar materials used in the same way in the building can be assumed to contain asbestos. Less homogeneous materials (eg different surfaces/coating, evidence of repair etc) should have a greater number of samples taken. The sample number should be sufficient to establish whether asbestos is present or not in the particular material.

ACCESSING AND INSPECTING ALL AREAS

All areas should be accessed and inspected so far as is reasonably practicable. Areas should include:

- > under floor coverings
- > above false ceilings (ceiling voids)
- > lofts
- > inside risers
- > service ducts and lift shafts
- > basements
- > cellars
- > underground rooms.

(This list is not exhaustive).

Surveying may also involve some minor intrusive work, such as accessing behind fascia, panels and other surfaces or superficial materials. The extent of intrusion will depend on the degree of disturbance that is necessary for foreseeable maintenance and related activities, including installing new equipment/cabling. People carrying out surveys should come prepared to access such areas (ie with the correct equipment).

Management surveys usually involve the use of simple tools like screwdrivers and chisels. Any areas not accessible and which are likely to contain asbestos or ACM must be assumed to contain asbestos. The areas assumed to contain asbestos should be clearly stated in the survey report and managed on this basis (ie maintenance or other disturbance work should not be carried out in these areas until further checks are made).

REFURBISHMENT AND DEMOLITION SURVEYS

The purpose of asbestos refurbishment and demolition surveys is to help PCBU's locate all the asbestos in a workplace (or the relevant part) before work commences. It is a disruptive and fully intrusive survey which may need to penetrate parts of the building structure.

Aggressive inspection techniques are used to lift carpets and tiles, break through walls, ceilings, cladding and partitions, and open up floors. In these situations, the asbestos surveyor needs to put controls in place to prevent the spread of debris.

Refurbishment and demolition surveys should only be conducted in unoccupied areas to eliminate or minimise risks to the public or workers on the premises. Ideally, the building should not be in service and all furnishings should be removed. For minor refurbishment, this would only apply to the room involved or

even part of the room if the work area is small and the room is large. In these situations, the asbestos surveyor must isolate the survey area (eg full floor to ceiling partition) and move furnishings, including carpet, away as far as possible or protect them with sheeting.

The surveyed area must be fit for reoccupation if people are to move back in. This will require a thorough visual inspection and, if appropriate (eg if there was significant destruction), air monitoring. Under no circumstances should workers remain in rooms or areas of buildings when sampling occurs.

There may be some circumstances where the building is still in use at the time a refurbishment or demolition survey is carried out. For example, in the educational sector, refurbishment/demolition surveys may be conducted in schools or colleges during a closure period (eg holidays), and the demolition or refurbishment work is not conducted until the next holiday period.

A demolition survey may be conducted to establish the economic future or viability of a building. The survey results would determine the outcome. The survey will need careful managing, with personnel and equipment/furnishings being moved or protected (as necessary) while the survey progresses through the building. Again, the survey areas must be isolated, and the surveyed areas must be fit for reoccupation before people move back in.

Refurbishment and demolition surveys are technically more challenging than management surveys, as their purpose is to identify all ACM within a particular building area or within the whole premises, so this can be removed. Many buildings have been individually designed with their own layout and materials. There may have been refurbishments and modifications

over the years, with changes and alterations to the building structure and appearance (eg false floors, ceilings and walls, concealed and hidden areas, and surface treatments). Building drawings may not have been updated.

The level of competency and knowledge needed for refurbishment and demolition surveys is greater than for management surveys, and the intrusive nature of these surveys presents more health and safety risks.

WHY ASBESTOS SHOULD BE IDENTIFIED AND REMOVED

The Asbestos Regulations require all asbestos likely to be disturbed by refurbishment or demolition work to be removed, so far as is reasonably practicable, before the work commences.

The survey information may be used to help in the tendering process for removing asbestos and ACM from the building before the work starts. The client PCBU should supply the survey report to designers and contractors who may be tendering for the work, so they can address the asbestos risks. If the asbestos is being identified so it can be removed, the survey does not normally assess the condition of the asbestos, other than to indicate areas of damage or where additional asbestos debris may be present. If the asbestos removal may not take place for some time, the ACM's condition will need to be assessed and managed (see section 7.5).

5.2 SURVEY RESTRICTIONS

The value and usefulness of the asbestos survey can be undermined if either the client PCBU or the asbestos surveyor puts restrictions on the survey's scope or on the techniques or method used to carry out the survey. Any restrictions to the survey's

scope will reduce the extent to which ACM is located and identified, cause delays and make managing asbestos more complex, expensive and potentially less effective.

In management surveys, the asbestos surveyor should be properly prepared to access all areas of the building, so far as is reasonably practicable. Potentially difficult-to-enter areas should be identified in the planning stage with the workplace PCBU and arrangements made for access (eg mobile elevating work platforms for work at height, rooms unlocked, doors and corridors unblocked etc). In situations where the asbestos surveyor cannot enter the building or area on the day of the survey, they should revisit when access will be possible.

If there are health and safety risks associated with some building activities, the asbestos surveyor should adequately assess them and make arrangements to eliminate or minimise them (see section Survey planning four-step procedure – step 4).

In refurbishment surveys, the area and scope of the work should be agreed between the client PCBU and the asbestos surveyor. Any area not accessed, and likely to contain asbestos or ACM, must be assumed to contain asbestos and be managed on that basis.

The level of intrusion for refurbishment and demolition surveys will be significantly greater than with management surveys. It is likely to include accessing structural areas, between floors and walls and underground services. Some areas may be difficult to gain entry to or may need specialist assistance or equipment. Access arrangements can be discussed in the planning stage and form part of the contract, particularly if assistance is required.

Even with 'complete' access demolition surveys, all asbestos and ACM may not be identified and this may only become apparent during demolition itself.

Asbestos surveyors need to be competent to do all the relevant work and tasks in this class of surveys (see section 4). They will need to have some knowledge of construction, to be able to carry out the work safely and without risk to their health and safety and the health and safety of others, and to have the correct equipment to do the work.

If any restrictions are imposed on the scope or extent of the survey, these must be agreed by both parties and clearly documented in the contract before work starts. If, during the survey, the asbestos surveyor cannot access any location or area for any reason, the client PCBU must be informed as soon as possible and arrangements made for later access. If access is not possible, the survey report should clearly identify these areas. For management surveys, any area that is inaccessible to workers, and likely to contain asbestos or ACM, must be assumed to contain asbestos and be managed on that basis. For refurbishment and demolition surveys, the PCBU who is to carry out the work must assume that asbestos or ACM is fixed to, or installed in, a structure or plant if part of the structure or plant is inaccessible and likely to be disturbed.

Limitations should be kept to an absolute minimum by making sure staff are adequately trained, insured and have the appropriate equipment and tools.

5.3 SURVEY STRATEGY

There is an expectation that every building that is a workplace where the workplace PCBU knows, or ought reasonably to know, that there is a risk of exposure or respirable asbestos fibres will be individually surveyed to identify the presence and location of asbestos. However, if the workplace PCBU has reasonable grounds to believe that asbestos or ACM is not present, a survey is not required.

In premises where there are large numbers of similar or near-identical rooms (eg offices or hotels) a survey strategy can be adopted which reflects the scale and nature of the buildings. All rooms should be visually inspected, as there can be differences due to location (eg presence of risers or services) or function/facilities.

Rooms with similar locations or facilities rooms can be placed into groups, such as next to lifts or containing risers. There is likely to be greater uniformity in these groups for the presence of asbestos and ACM. Within these groups, there should be less need for sampling in all rooms. Sampling can be conducted in a representative number of rooms and, if ACM is identified, the same items in other rooms in this group can be assumed to contain asbestos.

06/

SURVEY PLANNING

IN THIS SECTION:

- 6.1 Introduction**
- 6.2 Information the asbestos surveyor may need from the client PCBU**
- 6.3 Information the asbestos surveyor should provide to the client PCBU**
- 6.4 Survey planning procedure**

6.1 INTRODUCTION

The key to an effective survey is planning. The degree of planning and preparation will depend on the extent and complexity of the building. Single, one-storey factory buildings will have different requirements from a school or a large hospital complex.

Surveys on sites with many and variable types of buildings will need considerable planning and prioritising. However, the principles for planning and carrying out the survey will be similar in all cases. The survey is not about just turning up and taking samples. There needs to be a sufficient initial exchange of information between the client PCBU and the asbestos surveyor, and both parties should have a clear understanding of what is required.

In this regard, it is noted that the asbestos surveyor and the client PCBU must, so far as is reasonably practicable, consult, co-operate and co-ordinate activities relating to the health and safety of workers and others. More information on overlapping duties is available in the special guide: *Introduction to the Health and Safety at Work Act 2015*.

In preparing information about the site, the client PCBU must, so far as is reasonably practicable, talk to workers, and others, who are likely to be directly affected by the survey work about the risks of the survey work.

6.2 INFORMATION THE ASBESTOS SURVEYOR MAY NEED FROM THE CLIENT PCBU

The asbestos surveyor should find out the following information from the client PCBU:

- > why they need the survey
- > the type(s) of survey needed
- > details of buildings, or parts of buildings to be surveyed
- > details of building(s) use, processes, risks, priority areas for surveying

- > plans, reports and surveys on the building's design, structure and construction
- > safety and security information, such as fire alarm testing, special clothing areas
- > access arrangements and permits
- > contacts for operational or health and safety issues.
- > the information the survey report should provide
- > the report format (drawings, electronic, printed etc).

6.3 INFORMATION THE ASBESTOS SURVEYOR SHOULD PROVIDE TO THE CLIENT PCBU

The asbestos surveyor should provide the following information to the client PCBU:

- > the surveyor's identity
- > the surveyor's qualifications and accreditation (if any)
- > references from previous work
- > a quote
- > proposed scope of work
- > work plan, including plans for sampling or asbestos disturbance
- > risk assessment and plans for managing risks
- > timetable for sampling, testing and report-back
- > any restrictions or limitations
- > a report, including areas not accessed/not surveyed.

6.4 SURVEY PLANNING PROCEDURE

The asbestos surveyor should establish what type of survey is required in consultation with the client PCBU. More than one survey type might be needed: perhaps a management survey for most of the premises, and a refurbishment survey for one building or part of a building.

The survey plan should be structured and include the four steps outlined as follows. These steps are listed separately, but in practice they will overlap or run concurrently. There may be some situations where not all of the steps are not necessary or possible (eg small or simple premises, fire-damaged premises and pre-purchase surveys). If the survey involves sampling or asbestos disturbance, a site-specific assessment and work plan should be prepared.

SURVEY PLANNING FOUR-STEP PROCEDURE

- Step 1: Collect all the relevant information to plan the survey.
- Step 2: Consider the information (conduct a desk-top study).
- Step 3: Prepare a survey plan, including how data will be recorded.
- Step 4: Conduct a risk assessment for the survey.

STEP 1: COLLECT ALL THE RELEVANT INFORMATION TO PLAN THE SURVEY

It is essential that the asbestos surveyor collects all the relevant information to make sure the survey is completed efficiently, effectively, safely, and meets the client PCBU's requirements.

The information should be gathered as early as possible to help with thorough planning. The ideal situation would be to arrange a preliminary site meeting and have a walk-through inspection. This is recommended for large and complex premises. However, pre-survey site visits may not always be possible (eg small surveys where the cost of a second visit outweighs advantages) or where there are multiple premises (eg chain stores and it is not practical to visit them all). In these cases, the asbestos surveyor should gather the information through other means (eg by correspondence or preliminary meeting and walk-through immediately before the survey).

The information the asbestos surveyor needs is listed in Table 3.

INFORMATION TO BE COLLECTED		
A description and use of property (ie industrial, office, retail, domestic)	The number of buildings: age, type and construction details	The number of rooms
Any unusual features or underground sections	Details about whether the buildings have been extended, adapted or refurbished, and if they have, when the work was done	Any installed plant or equipment
Whether the site is a listed building, conservation area etc	The extent or scope of survey required (mark details on a site plan or architects' drawings)	Whether the surrounding ground and associated buildings or structures are included in the survey scope
Current site plans or drawings	Previous plans, including architects' original drawings and specifications and subsequent plans for major changes and refurbishment	Whether the premises are vacant or occupied
Presence of underground ducts or shafts etc	Any restrictions on access	Responsibility and arrangements for access
Special requirements or instructions	Whether survey damage has to be fixed	Site-specific risks
Responsibility for isolating services, power, gas, chemicals etc	Working machinery or plant (including lifts) to be made safe (these are covered in greater detail in step 4)	If photos are needed

INFORMATION TO BE COLLECTED		
The location of all services, heating and ventilation ducts, plant rooms, riser shafts and lift shafts	Details of previous asbestos surveys, current asbestos records and records of asbestos removal or repairs	Information on any repairs to ACM (eg pipe/thermal insulation)
Site history: any buildings previously demolished on the site	Preliminary site meeting and walk-through inspection	

Table 3: Information to be collected by the asbestos surveyor

For complex premises, the asbestos surveyor should have building plans that:

- > show the main features of each room, corridors, stairs etc
- > are marked with unique floor and room numbers to help identify individual locations
- > are checked for accuracy and completeness.

If plans are not available, the asbestos surveyor should make an accurate drawing of the premises before starting the survey.

For small or uncomplicated premises, a simple drawing showing the prominent features may be suitable.

The asbestos surveyor should use these plans and drawings to locate and record:

- > the position of any suspect material
- > where any samples have been taken for identification
- > any sensitive or restricted areas and risks.

A walk-through inspection will be valuable for planning the survey and identifying potential issues. The inspection will let the asbestos surveyor become familiar with the layout of the premises, including the location of equipment or things that may impede access or sampling.

It will also let the asbestos surveyor appreciate the size of the project and to estimate the extent of sampling required. The inspection also identifies specific risks and discussions about how to minimise the risks can happen. It will also enable other potential issues to be identified or raised and resolved.

Possible issues include:

- > entry or access restrictions, such as ceiling voids, high areas and crawl spaces
- > sampling matters, such as sampling only when the area is unoccupied, materials or decorations which cannot be disturbed, labelling sample locations, where future asbestos warning labels could be placed (see Figure 1)
- > how to reduce dust release and clean-up
- > the potential need for a licensed asbestos removalist, for example, to gain access through ceiling tiles.

If the asbestos surveyor needs access to high areas, they should make arrangements with the client PCBU for a safe way of accessing them.

A walk-through inspection can also help check the accuracy of the building plans.



Figure 1: Asbestos label

If a pre-survey site meeting and walk-through are not possible, the asbestos surveyor should collect the information in Table 3 by discussion with the client PCBU.

Any information not collected will need to be obtained at the site before the competent person starts the survey. They should also check plans and drawings at this time.

STEP 2: CONSIDER THE INFORMATION (DESK-TOP STUDY)

The asbestos surveyor should consider all the collected information so they can properly plan the survey. This ‘desk-top’ exercise is helpful for reviewing the information, planning the survey strategy and identifying any gaps in the information.

The asbestos surveyor should consider:

- > their competency to undertake the work
- > available resources
- > intended work programme
- > expected equipment for access:
 - into the structure
 - to high levels
 - into contaminated areas or confined spaces
 - through known ACM
- > the need for additional tradespeople to gain access during the survey or to fix areas after completion
- > bulk sampling strategies and expected number of samples with reference to the site plan.

Many premises will be simple and straightforward – usually one or two buildings, no additional land or ground, no machinery, lifts and outbuildings, and no previous refurbishment or demolition. The ‘desk-top’ review is the time to focus on the nature of the premises and the type of survey. Refurbishment and demolition surveys in particular will need much consideration.

STEP 3: PREPARE A SURVEY PLAN (INCLUDING HOW DATA WILL BE RECORDED)

After collecting the relevant information and completing the preliminary site inspection and desk-top study, the asbestos surveyor can prepare a written plan for the main survey. The plan sets out the content of the survey and can form the basis of the contract with the client PCBU.

The plan will normally specify:

Scope

- > the scope of the survey
- > any external areas for inclusion

- > any excluded areas
- > type of survey
- > possible or known asbestos or ACM **not** to be included in the survey.

Survey procedure

- > anticipated number of samples and sampling methods
- > anticipated numbers of photographs
- > procedures for fixing disturbed area
- > agreed survey times of work
- > agreed signage
- > access
- > agreed start and completion dates
- > the material assessment method and the parameters for assessment, including:
 - product type
 - location
 - extent
 - condition
 - accessibility of asbestos or ACM
- > the information to be recorded and the method and format to be used
- > quality assurance checks and procedures
- > any known areas where access is not possible.

Personnel and safety issues

- > names of the people carrying out the surveys for security purposes
- > safety precautions, including steps to minimise asbestos disturbance and prevent asbestos spread
- > site safety procedures for emergencies, including decontamination.

Report

- > report format
- > what data will be reported
- > how the data will be presented – each room or area should be individually recorded

- > how the survey data will be stored, accessed and updated
- > how photographic or video records and marked-up plans will be stored and reported
- > how to record asbestos look-alike materials if they have not been sampled
- > other information the client PCBU requires.

The survey report should contain a summary of the results in a format that can be incorporated in an updatable asbestos management plan, including a diagram showing where asbestos and ACM are located (see Section 8).

STEP 4: CONDUCT A HEALTH AND SAFETY RISK ASSESSMENT FOR THE SURVEY

Surveying can create health and safety risks for people carrying out the survey and others present at the workplace, including sampling personnel and building occupants.

In many cases, the asbestos surveyor will only see the site for the first time at the survey, so they will have little chance to evaluate the site-specific risks. They have to rely on the risk assessment based on information collected at step 1.

Before commencing work, the asbestos surveyor must:

- > identify and assess any risks to their health and safety, and the health and safety of others
- > discuss potential risks with the survey workers
- > plan how they will eliminate these risks so far as is reasonably practicable. If they can't eliminate a risk they need to minimise it so far as is reasonably practicable
- > provide suitable, adequate information, training and supervision to survey workers
 - everyone receiving the information, training and instruction must be able to readily understand it.

For large sites, the asbestos surveyor should prepare a written risk assessment. It should identify **all** the risks at the premises and record the correct controls and procedures in a plan of work for the survey.

Risks arising from the presence of asbestos

The risk assessment should look at the risks arising from disturbing asbestos and ACM and spreading asbestos.

In doing so, the asbestos surveyor should:

- > identify safe work procedures, such as controls to be used while taking samples, arrangements for entering contaminated areas
- > decontamination and disposal arrangements
- > required PPE.

Controls

To protect the health and safety of workers, the asbestos surveyor must:

- > make sure a survey worker who does sampling or is involved in physical work with asbestos (eg moving asbestos ceiling tiles) is trained in how to identify, handle and safely control asbestos and ACM
- > give the following information to a person likely to be engaged to carry out survey work for the asbestos surveyor before the person is engaged to carry out the work:
 - the health risks and health effects associated with exposure to asbestos
 - requirements for health monitoring of a worker carrying out the work.

More information on health monitoring is available in the approved code of practice *Management and Removal of Asbestos*.

To protect the health and safety of others at the workplace, the asbestos surveyor must make sure that the survey work area is separated from the rest of the workplace and is signposted clearly indicating the asbestos survey work is being carried out.

The asbestos surveyor must make sure, if there is uncertainty about whether the asbestos airborne contamination standard is likely to be exceeded, a competent person carries out air monitoring of the area where survey work is being carried out.

In addition, the client PCBU must make sure that:

- > decontamination facilities are available
- > nothing that is likely to be contaminated with asbestos is removed from the asbestos-related work area without being decontaminated or placed in a sealed container
- > any asbestos waste and decontaminated personal protective equipment is dealt with according to the Asbestos Regulations.

More information on these requirements is available in the approved code of practice: *Management and Removal of Asbestos*.

Checking the controls

The asbestos surveyor should regularly check that the controls in place are effectively eliminating or minimising the exposure of workers and others to asbestos and improve them if possible.

Other risks in the workplace

Other risks may also be present. The asbestos surveyor should get information on the site from the client PCBU and carry out a risk assessment before starting work on site. The risk assessment should be discussed with survey workers and should include any risks and record any controls to be observed on site as well as emergency procedures.

The types of non-asbestos risks which may be associated with surveys include:

- > working at heights, in ceiling voids or on a fragile roof
- > working on operable machinery or plant
- > working in confined spaces
- > chemical risks

- > electrical risks
- > biological risks
- > noise risks
- > working alone.

There may be other specific risks in certain premises. For example, hospitals have radiological risks.

More information on identifying and managing these risks is available on the WorkSafe website: www.worksafe.govt.nz

SAFE WORK PROCEDURES

A survey should ideally be conducted by two people. This has a number of advantages, for example: helping with carrying equipment, labelling sample bags, and documentation.

In cases of remote or dangerous locations, such as derelict buildings or risks identified in step 4, a team of two people should be specified as a safety requirement.

Team working allows new people to undergo field training in a supervised, practical environment, and provides better opportunities to find asbestos and ACM.

More information on safe working procedures is in Section 7.4 Safe work systems.

PPE

Asbestos surveyors should wear disposable coveralls and overshoes if there is a likelihood of asbestos contaminating their clothing during surveying. More information on PPE is available in the approved code of practice *Management and Removal of Asbestos*.

VACUUM CLEANERS

Asbestos vacuum cleaners may be used for collecting small pieces of asbestos dust and debris. More information on vacuum cleaners is available in the approved code of practice *Management and Removal of Asbestos*.

DECONTAMINATION AND DISPOSAL ARRANGEMENTS

If the asbestos surveyor has to enter areas where there is significant contamination, such as crawl tunnels or ceiling voids, there is a greater potential for clothing and footwear contamination. The risk assessment must take these conditions into account, because the asbestos surveyor may need more safety precautions and decontamination procedures. This may require a higher standard of personal protection and more comprehensive decontamination procedures.

If entering these locations is necessary, the asbestos surveyor must be trained using respiratory protective equipment (RPE) safely and in decontamination procedures. More information on RPE is available in the approved code of practice *Management and Removal of Asbestos*.

The asbestos surveyor should not wear their own clothes under coveralls in these circumstances. There should be a discussion between the asbestos surveyor and the client PCBU to make sure decontamination procedures are put in place. If the asbestos surveyor experiences significant or unexpected contamination, they should leave the area after decontaminating using the most effective method available.

07/

CARRYING OUT THE SURVEY (SURVEYING)

IN THIS SECTION:

- 7.1 Introduction**
- 7.2 Systematic surveys**
- 7.3 Bulk sampling strategy**
- 7.4 Bulk sampling procedures**
- 7.5 Material assessment**

Surveys should be carried out methodically, systematically and diligently to make sure all relevant areas of the premises are inspected and no asbestos or ACM is missed.

7.1 INTRODUCTION

Surveys should be carried out methodically, systematically and diligently to make sure all relevant areas of the premises are inspected and no asbestos or ACM is missed. The asbestos surveyor should use building plans for checking progress through the premises. Plans should be inspected to make sure building features and services (eg voids, cavities, risers, ducting) are included.

7.2 SYSTEMATIC SURVEYS

There are various options for conducting systematic surveys.

However, asbestos surveyors should:

External areas:

- > work downwards from high to low
- > work from the periphery inwards.

Internal areas:

- > work downwards from the roof to the basement
- > inspect each area individually
- > work around each area clockwise from the entry door
- > inspect each component inside each compartment in the following order: ceiling, walls, floors, fixtures and fittings, equipment and services.

General:

- > check and inspect every item that may contain asbestos or ACM
- > sample and take photographs as they go along

- > re-check areas which are complex or have many items
- > do a final walk-through, checking notes against plans.

Large premises will require more detailed survey procedures, particularly if several people are involved in carrying out the survey. For example, it may be appropriate to carry out a separate survey on the building services, machinery and any large floor and ceiling voids.

AREAS FOR EXAMINATION

INDUSTRIAL SITES, FACTORIES AND PLANT

Industrial sites like refineries, power stations, warehouses and factories often contain substantial amounts of asbestos. Higher-performance ACM was usually specified to cope with the higher temperatures and pressures prevalent at industrial sites. Some machinery may also incorporate asbestos gaskets and friction products (eg clutches, brake pads, drive belts and conveyor belts). Higher power requirements for industry also meant asbestos was used to insulate electrical cables and switchgear.

OLDER INDUSTRIAL MACHINERY AND PLANT

Older equipment is more likely to contain asbestos due to its age or higher performance requirements. The equipment is also likely to need servicing and maintenance. The asbestos surveyor should inspect the accessible parts of machinery and plant which provide heat and electrical insulation, high-performance seals and frictional performance.

The asbestos surveyor should not sample or work on any machinery unless they are qualified to do it. Engineers or maintenance personnel may be able to help in these situations. If the person conducting the survey does not take a sample, the equipment should be assumed to contain asbestos unless there is evidence that it contains non-asbestos materials.

OLDER CONSUMER ELECTRICAL PRODUCTS

Older consumer electrical products may also contain some asbestos or ACM.

Common examples are hairdryers, irons, washing machines, dishwashers and tumble dryers. Because the asbestos in this type of equipment is not readily accessible and only presents a low risk of asbestos fibre release, it is not practical to inspect or sample for it.

However, products used for or needing significant heat insulation should be inspected during the survey. These will include simmering mats, iron stands, fire curtains and blankets, catalytic gas heaters, all types of older warm air, storage or radiant heaters, and cooker door seals.

TYPES OF ASBESTOS AND ASBESTOS-CONTAINING BUILDING PRODUCTS

Appendix A provides information about asbestos and ACM in buildings. It summarises the main types and uses of ACM in the fabric of a building and in fixed installations such as heating, water and electrical systems. It lists the main product types, their location and use, asbestos content, and the date last used. It also includes guidance on the ease of fibre release, inspection and sampling.

The product types are listed approximately in order of their ability to release fibres assuming that surface treatments have not been applied.

WHAT TO ASSESS AND RECORD

The management survey assesses the condition of the asbestos and ACM and their ability to release fibres. This is called a material assessment. Therefore, for a management survey, the asbestos surveyor should obtain and record the following information for each ACM or assumed/suspected ACM:

- > asbestos product type(s)
- > location of the material(s)
- > extent (or quantity) of the material(s)
- > asbestos type(s)
- > accessibility and vulnerability of the material(s)
- > amount of damage or deterioration
- > surface treatment, if applicable.

Refurbishment and demolition surveys normally need less information because the condition of the ACM is not required. The asbestos surveyor should obtain and record the following information for each ACM or assumed/suspected ACM:³

- > asbestos product type(s)
- > location of the material(s)
- > extent (or quantity) of the material(s)
- > condition of ACM
- > asbestos type(s).

ASSUMED ACM

If the asbestos surveyor does not take a sample, they must make an assumption about whether the material is asbestos or non-asbestos.

Some materials, like textured plasters, paints and vinyl floor tiles, may contain very fine dispersed chrysotile asbestos. These materials should be assumed to contain asbestos unless they are sampled and analysed by an accredited laboratory.

³ If the refurbishment or demolition work will not take place for some time after the survey (eg three months), then the person conducting the survey should obtain the information required for a management survey.

Characteristics, such as: surface texture, the sound it makes when knocked, how warm it is to touch, surface hardness/deformation with a probe, etc may be used by experienced people carrying out surveys to help compare the material with other materials they have previously encountered and sampled.

However, unless the asbestos surveyor is convinced there is enough evidence to conclude the material is asbestos-free, they should assume it is an ACM.

ASBESTOS TYPE

The material assessment requires information on the type of asbestos. In the absence of analytical data, and if similar products have not been identified in the survey, the most likely asbestos type should be allocated based on the product types and age in Appendix A.

It may also be possible to get information about the type of asbestos from close inspection of the material. For example, if fibrous material is present in the product, these can give some additional clues to the type of asbestos.

ADDITIONAL GUIDANCE FOR REFURBISHMENT AND DEMOLITION SURVEYS

This section provides additional guidance to help complete refurbishment and demolition surveys. It contains details of specific areas which should be inspected in a refurbishment or demolition survey (but note that the list is not exhaustive). It also tries to describe these areas and illustrate how to collect samples.

These items are in addition to those normally found in a management survey.

In many cases, the asbestos surveyor will require access into the fabric of the building and various items such as brickwork, timber, boards and panels. They may have to be removed or broken into. In these cases, the

asbestos surveyor could seek professional help from a joiner, builder, maintenance worker, engineer or other appropriate person. In some situations, if concrete is being sampled or brickwork is being removed, the asbestos surveyor should get advice from a competent person, such as a structural engineer.

'NO ACCESS' AREAS FROM PREVIOUS SURVEY

The asbestos surveyor should access all previous 'no access' survey areas on (if available) with suitable access equipment and procedures.

SUSPENDED CEILINGS

The asbestos surveyor should enter suspended ceilings not previously accessed (eg tiles screwed to wooden battens).

Suspended ceiling voids are often cluttered and full of ventilation ducting, pipework and cables. The ceiling void may contain asbestos debris and other ACM such as sprayed coating, pipe insulation, older ceilings, damaged fire breaks etc.

The asbestos surveyor should consider the need for an enclosure for this entry.

APERTURES (DOORS, WINDOWS ETC)

Cavity closers are sometimes found around air bricks windows etc. All apertures should be considered and examined thoroughly.

Window frames commonly had packers or spacers where the window frame was attached to the brick wall. Asbestos rope seals as fire breaks are also found.

Window putty on metal-framed windows should be examined.

Door frames (particularly around fire doors) should be inspected for packers where the frame is fitted into the doorway. The architraves will need to be removed.

FLOORS

Carpets and tiles need to be lifted. The floor tile adhesives also frequently contained asbestos.

Floor ducts or trenches need to be accessed and inspected for shuttering, services, pipe insulation, fire stops, debris etc. The inspection includes the duct cover itself, which may have ACM shuttering. The full length of each duct will need to be inspected, unless it is clear that asbestos pipe insulation is present throughout, when the entire run can be treated as containing asbestos.

Floor boards need to be lifted to examine the void below. Sufficient boards should be lifted to ensure that the whole floor void is examined for loose asbestos, debris, packers, fire protection, electric cables etc. It may be necessary to inspect the ends of the joists for packing.

Slab (poured concrete) floors are known to contain ACM which was used as an expansion joint or shuttering below the surface. These may only be found by drilling core samples through the slab. This will need specialist advice on the structural considerations and on the equipment needed to carry out this type of investigation.

Asbestos cement sleeves were used where cables or pipes run through a slab floor, although these should be visible at the surface.

DUCTS

Service risers, including fire stops between floors, if not investigated under a previous survey, need to be inspected. Lift shafts need to be inspected, including the pit at the bottom of the shaft. Ventilation shafts or ducts have been seen with asbestos acoustic attenuators and with debris from assorted ACM. Ventilation trunking should also be examined.

CLADDING

External cladding of tiles or slates (which may or may not be asbestos) will usually conceal a moisture membrane based on a bituminous ACM panels.

DEBRIS IN BOILER ROOM AREAS

In boiler rooms it may be necessary to look closely at where pipes pass through walls, in sumps and gulleys, behind and underneath tanks and other plant. In particular, the walls and floors should be inspected for insulation debris, which may have been painted over. All plant and electrical equipment must be investigated, but see the note on consumer electrical equipment in Areas for examination.

It may not be possible to locate some or all of the debris until the plant has been removed. It will be necessary to remove the plant under controlled conditions with an appropriate work plan. Cast iron sectional boilers with asbestos between the sections (or as a plinth under the boiler) will need to be disassembled under controlled conditions.

DEBRIS UNDERNEATH NON-ASBESTOS RE-INSULATION

If the desk-top study reveals that asbestos insulation has been stripped and replaced, a portion of the new insulation should be removed to examine the extent of any asbestos debris on the pipes, bolt-heads and flanges. If any of the pipes have frequent occurrences of asbestos debris, it is likely that the pipes will have to be removed as ACM.

ROOF VOIDS

If insulation is present in a roof void, the areas underneath it should be inspected, particularly if there is evidence of other ACM.

PREVIOUSLY DEMOLISHED AREAS: FROM THE DESK-TOP STUDY

The desk-top study can show if any previous structures (including underground structures) remain or may have released asbestos debris into the soil.

Whether the desk-top study information is available or not, the site should be inspected visually to identify obvious signs of demolition and associated surface asbestos debris. It may be necessary to treat the external area as a contaminated site for investigation purposes, in which case, trenches and pits may need to be excavated to establish the extent of the debris.

The desk-top study should reference old plans, such as from historical archives.

OVERSPRAY DEBRIS FROM SPRAYED COATINGS

If a sprayed asbestos coating is present or known to have been present at some time in the past, the area needs to be inspected carefully for debris and to establish the extent and location of any overspray.

USE OF ACM AS PACKING AND SHUTTERING

The asbestos surveyor should look out for the use of asbestos insulating board (AIB) as packing and shuttering in buildings constructed in the 1960s and 1970s. This was frequently used simply as a convenient piece of board.

7.3 BULK SAMPLING STRATEGY

The asbestos surveyor should carry out sampling when conducting the survey. However, for large premises or occupied areas, the asbestos surveyor can conduct sampling later.

The asbestos surveyor should visually examine each area and room in the premises thoroughly to identify the materials and locations for sampling. The asbestos surveyor should conduct the visual inspection systematically (see section 7.2). Materials should be inspected for apparent differences and variation in appearance. They should take samples of about 3–5 cm² in surface area and through the entire depth of the ACM (including any backing paper) with the aim of collecting one or more samples that are representative of the whole material.

The asbestos surveyor should not carry out sampling if there is an electrical hazard, or if it will damage the critical integrity of a structure.

An equipment checklist for sampling is in Appendix C.

The sampling strategy should be based on several factors, including:

- > the size and numbers of premises/rooms
- > the extent, types and variation in materials.

Visually inspecting and checking (eg tapping and prodding) each material will specify the sample numbers and locations. In general, for homogeneous manufactured products containing asbestos, the asbestos should be uniformly distributed throughout the material. One or two samples should be enough for this type of product.

Insulation materials are usually less homogeneous as they were applied on site, and their composition depended on the availability of supply. Repairs and patching may add to this variability and increase the number of required samples. Repaired and replaced materials should always be sampled as well as the original items.

Asbestos debris may have been produced at the time of installation. A favourite practice was to drop off-cuts into voids and sweep debris into lift shafts and other risers.

For homogeneous material, the asbestos surveyor may only need a single sample to confirm the presence of asbestos and to assume it applies to other material of the same type. However, for non-homogeneous materials and for some assumed non-asbestos materials, further sampling may be needed to reduce the possibility of false negatives, which could lead to incorrect conclusions.

7.4 BULK SAMPLING PROCEDURES

SAFE WORK SYSTEMS

The asbestos surveyor needs to complete a site risk assessment and carry out the work according to the risk assessment procedures (see Survey planning four-step procedure - Step 4).

The work should minimise disruption to the client PCBU's operations, and must, so far as is reasonably practicable, not put the health and safety of others at risk. People collecting samples must wear appropriate PPE (see PPE).

The person taking the samples should control airborne emissions by pre-wetting the material with water or a suitable wetting agent. This may involve spraying the surface or injecting. The person taking a sample should shadow vacuum if wetting might not be effective or unsafe (eg near electrical installations).

The person taking the samples should use special sampling precautions for pipe insulation (see Appendix A).

The sampling area must be separated from other work areas at the workplace. Sampling should not be done in normally occupied areas, but if the area is in constant use, the person taking the sample should work in periods of minimal occupation.

The nature of the area, the likely release of dust and the proximity and nature of future work will influence the precautions required by the person taking the samples to prevent the spread of asbestos. Other people entering the sampling area should be restricted and suitable warning signs must be posted.

The person taking the samples should take care to minimise asbestos disturbance. Surfaces onto which asbestos debris may fall should be protected with a sheet of polythene which can be easily cleaned by wet-wiping or using a suitable Class H vacuum cleaner.

The person taking the samples should individually seal all samples in their own container or a sealable polythene bag. This should be sealed in a second container or polythene bag.

The person taking the samples should clean the sampling tools between each sample to avoid cross-contamination. Cleaning materials must be disposed of as asbestos waste.

The person conducting the sampling should leave the sample area clean with no evidence of debris from the sampling operation. They should seal sampling points to prevent asbestos fibre release. Various methods are used to reseal the sampling point, such as tapes and fillers.

SAMPLE LABELLING

The person taking the samples should label each sample with a unique identifier. The person should record the identifier in survey documentation, records and site plans so the sample's origin can be traced later. The person taking the samples can label the sampling position with the same identifier.

Visual records, like marked-up plans or photographic records that show the samples' location and extent are useful for recording the sampling position and the location of ACM.

AIR MONITORING

Collecting asbestos samples can cause asbestos fibres to become airborne, even when precautions are taken to minimise the release of fibres from the material being sampled. Asbestos-contaminated dust may also be stirred up by movement in the area causing a rise in airborne fibres. Where there is uncertainty about whether the airborne contamination standard is likely to be exceeded, air monitoring is required. Refer to the approved code of practice *Management and Removal of Asbestos* for more information about air monitoring.

SAMPLE ANALYSIS AND REPORTING

The asbestos surveyor must send the collected samples to an accredited laboratory⁴ for analysis and reporting. For each sample, the report should clearly state if asbestos was found, and what type it is. The laboratory results should be attached to the report.

Sampled materials that do not contain asbestos should be recorded as No Asbestos Detected (NAD).

The asbestos surveyor should present the survey report in a form the workplace PCBU can use to base an asbestos record on (see section 9).

7.5 MATERIAL ASSESSMENT

As outlined in section 6, the management survey should include an assessment of the ACM's condition and its ability to release fibres. This lets the workplace PCBU assess each ACM's potential for fibre release and prioritise action as part of the plan for managing asbestos.

The asbestos surveyor should do a material assessment as part of the survey. (See the next section for a standardised assessment tool suitable for a management survey.) This is based on a simple additive algorithm

for assessing the potential for fibre release. It is not designed to calculate absolute differences in potency or fibre release or risk potential between ACM. However, it ranks ACM in a simple numerical order.

An assessment of the condition of ACM is not normally necessary for refurbishment and demolition surveys but if there is a significant gap between the survey and the event (eg more than three months), the asbestos surveyor should do a material assessment so the workplace PCBU can put interim management arrangements in place.

MATERIAL ASSESSMENT ALGORITHM

In the material assessment process, the main factors influencing fibre release are scored and added together to form a material assessment rating. The four main factors affecting how much fibre is released from an ACM when subject to disturbance are:

1. product type
2. extent of damage or deterioration
3. surface treatment

Each factor is scored between 1 and 3. A score of 1 indicates a low potential for fibre release, 2 = medium and 3 = high. Two factors can also be given a nil score (equivalent to a very low potential for fibre release). The value assigned to each of the three factors is added together to give a total score of between 1 and 9.

Assumed or strongly assumed ACM is scored as the most harmful form of asbestos, unless there is evidence to show otherwise.

Examples of scoring for each factor are given in Appendix B.

ACM with an assessment score of 7 or more has a high potential to release fibres, if disturbed. Scores between 4 and 6 have a medium potential, and between 1 and 3 is a low potential. Non-asbestos materials are not scored.

⁴ Refer to Appendix F, Glossary.

RISK ASSESSMENT AND ASBESTOS MANAGEMENT PLANS

The material assessment identifies high-risk ACM, or materials which will release airborne fibres the most if disturbed. ACM assigned the highest score may not necessarily be the priority for remedial action. The priority should be determined by carrying out a risk, or priority, assessment which should consider:

- > the ACM's location
- > the extent of the ACM
- > the use or function of the location
- > the area's occupancy
- > the activities carried out in the area
- > the likelihood or frequency of maintenance.

The asbestos surveyor can help with the risk assessment by getting information which will contribute to the priority assessment. However, the workplace PCBU must make sure that a written asbestos management plan is prepared using their knowledge of the activities carried out in the premises.

The workplace PCBU can use the combined material and priority assessment results to establish the priority for ACM needing remedial action, and what the type of action is required.

Various options are available: the ACM could be protected or enclosed, sealed or encapsulated, or repaired. If the ACM is in a poor condition, it should be removed. Further information about managing asbestos is available in the approved code of practice *Management and Removal of Asbestos*.

08/

MANAGEMENT SURVEY REPORT

IN THIS SECTION:

- 8.1 The survey report
- 8.2 Conclusions and actions
- 8.3 Bulk analysis results
- 8.4 Checking the report

The management survey report will form the basis of the workplace PCBU's asbestos management plan.

8.1 THE SURVEY REPORT

The survey report is a record of information about the presence and location of asbestos and ACM. The asbestos surveyor should pay care and attention to producing the report, particularly with data, because it will be the formal record of the survey. The report will contain information the workplace PCBU will use to prepare the asbestos management plan and to decide on the need for action. Errors in the report could lead to incorrect conclusions and inappropriate decisions.

The report should:

- > be in a written format
- > be supplied as a hard copy or electronic document, or both
- > be understandable by the workplace PCBU
- > be easy for the workplace PCBU to use to prepare an asbestos management plan by presenting the results in format that can be directly used to form the asbestos plan
- > contain the results of analysed samples.

The survey report should include these sections:

- > executive summary
- > introduction, covering the scope of work
- > general site and survey information
- > survey results, including material assessment results
- > conclusions and recommended actions for the workplace PCBU
- > bulk analysis results.

The design, layout, content and size of the report are important. Large reports can be unwieldy and intimidating. The workplace PCBU is likely to be most interested in the summary, results, conclusions and actions. In hard copy documents, separate the report into different parts, particularly if displayed with accompanying photographs contained in separate appendices.

EXECUTIVE SUMMARY

The executive summary should describe the scope, type and extent of the survey. It should summarise the most important information, including:

- > the locations of identified (or assumed) asbestos or ACM
- > areas not accessed, which should be specific to the survey
- > ACM with a high material assessment score
- > clear notes on any recommended actions and priorities.

INTRODUCTION

The introduction should explain the scope of the work and the purpose, aims and objectives of the survey. It should also contain a description of the nature and age of the building(s) (or other structures) plus construction type.

GENERAL SITE INFORMATION

General site and survey information should include:

- > the name and address of the PCBU conducting the asbestos survey
- > names of the people carrying out the survey
- > name and address of the workplace PCBU
- > name and address of the surveyed premises
- > report date
- > survey date
- > a description of the areas included in the survey
- > a description of any areas excluded in the survey
- > the survey method
- > the type of survey undertaken and, if more than one type is used, where they apply within the premises
- > variations or deviations from the method
- > agreed exclusions and inaccessible areas (with reasons) which should be specific to the survey.

SURVEY RESULTS

The survey results should be summarised both in table format and as a set of marked-up diagrams showing where asbestos, ACM and assumed asbestos or ACM is located.

The summary table should contain the following information:

- > locations of asbestos and ACM (eg building identifier, floor number or level, room identifier and position)
- > extent of the asbestos or ACM (area, length, thickness and volume, as appropriate)
- > product type (see Appendix A)
- > level of identification - assumed, or identified
- > asbestos type in the ACM.

For a management survey (and refurbishment and demolition surveys if work is not imminent) the asbestos surveyor should include the following information:

- > accessibility of the asbestos or ACM
- > amount of damage or deterioration
- > surface treatment, if any
- > material assessment score or category
- > any actions recommended from the material assessment.

Table 4 is a presentation of survey results. Figure 2 shows an example of a marked-up building plan.

The information in the results table should be presented by individual rooms. Any rooms or areas not accessed and assumed to contain asbestos should be included in the results table. For priority assessment, the asbestos surveyor should list the priority scores and highlight recommended actions. (**Note:** the priority assessment should only be carried out in consultation with the workplace PCBU, who should provide accurate information about all the activities carried out on the premises.)

If suspect material is proved not to be asbestos, this should be recorded in a separate table. This will help in any future discussion over the nature of these materials.

Address:											Date:
LOCATION	PRODUCT TYPE	EXTENT	ACCESSIBILITY	CONDITION	SURFACE TREATMENT	ASBESTOS TYPE	SAMPLE NO.	SAMPLED/ ASSUMED	MATERIAL ASSESSMENT SCORE AND ACTION	PRIORITY SCORE ACTION	
Store room 2, BC408 ceiling	AIB	Whole ceiling 120 m ²	Medium	Good	Painted one face only	Amosite	1	Sampled 4 samples	5	12	
Store room 2, BC408 fire door	Asbestos board on door carcass (AIB)	21 m ²	Medium	Good	Encapsulated by wood in door	Amosite	2	Sampled 1 sample	5	12	
Meeting room 2, BC412, ceiling	Asbestos ceiling tiles (AIB)	5 m ²	Medium	Good	Painted one face only	Amosite	3	Sampled 1 sample	5	13	
Canteen, BC410, lino on floor	Cushion floor (paper)	5 m ²	Easy	Good - damage to edge	Covered by vinyl	Chrysotile	4	Sampled 1 sample	4	11	
Corridor, BC411, electrical switch box	Woven cloth	Possibly four items	Medium	Medium	Unsealed	Chrysotile	5	Assumed	8	14 remove during next campaign	

LOCATION	PRODUCT TYPE	EXTENT	ACCESSIBILITY	CONDITION	SURFACE TREATMENT	ASBESTOS TYPE	SAMPLE NO.	SAMPLED/ ASSUMED	MATERIAL ASSESSMENT SCORE AND ACTION	PRIORITY SCORE AND ACTION
Plant room 2, BC416, lift motor	Brake shoes	2 items	Difficult	Medium	Unsealed	Chrysotile	6	Assumed	4	10 'H' Vac dust
Plant room 2, BC416, pipe lagging	Pipe insulation	24 linear metres	Easy	Good	Sealed and labelled	Crocidolite Amosite Chrysotile	7	Sampled 6 samples	8	14 remove during next campaign
Plant room 2, BC416, wall panels	Asbestos panels (AIB)	43 m ²	Easy	Good	1 face sealed and labelled	Chrysotile	8	Sampled 4 samples	5	14 monitor weekly

Material scores above 10 have high potential to release fibres

Table 4: Summary of survey results

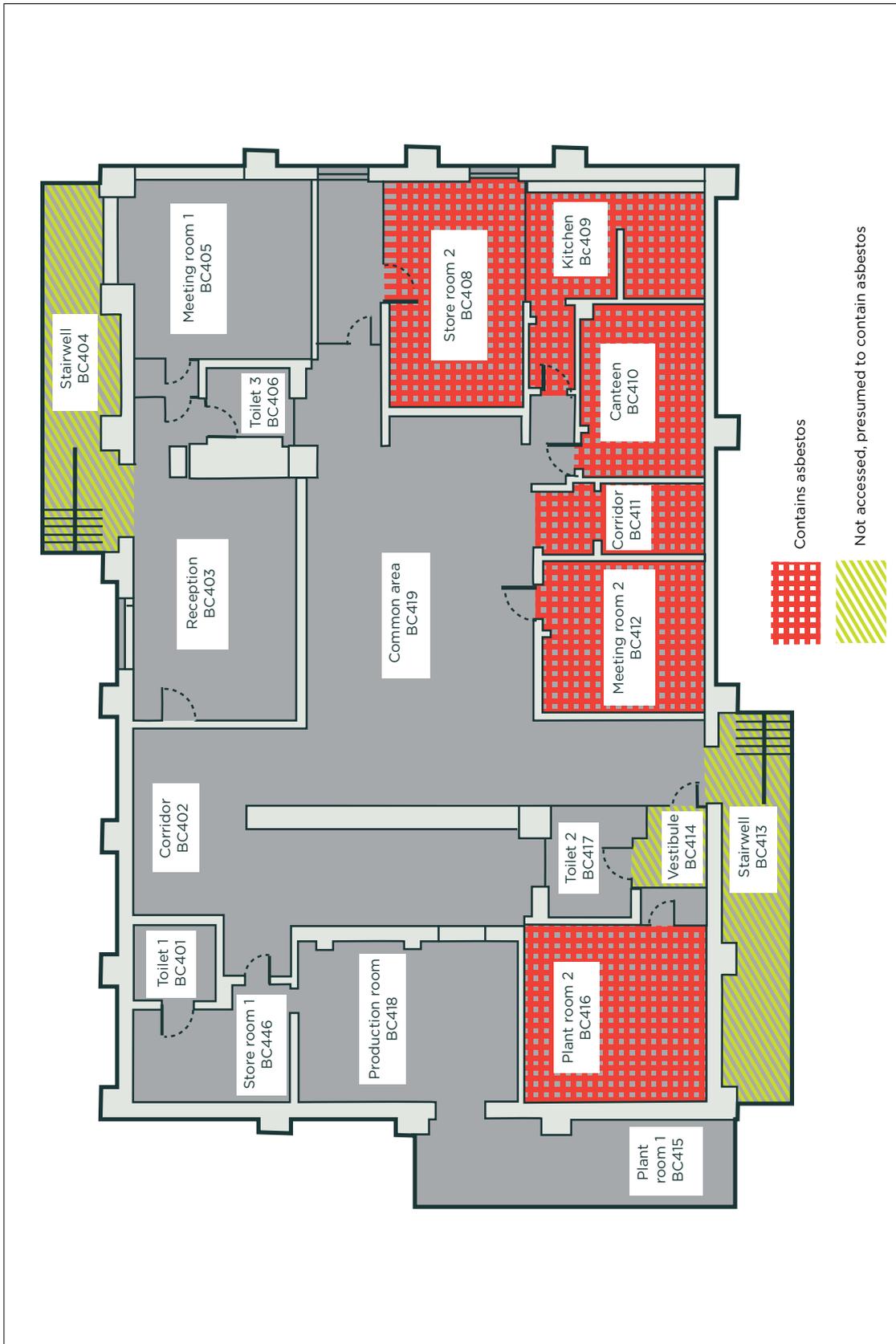


Figure 2: Example of asbestos building plan

8.2 CONCLUSIONS AND ACTIONS

The conclusions section should summarise the rooms where asbestos is present and the products or items which contain asbestos. It should also contain a list of any recommended actions identified in the material or priority assessment and indicate their urgency.

8.3 BULK ANALYSIS RESULTS

The survey report should include the certificate of analysis for the analysed samples. Locate it in an appendix with the following information:

- > name and address of the laboratory carrying out the bulk identification
- > information about the method used
- > evidence of the laboratory's accreditation
- > a table or appendix summarising the bulk analysis results, including asbestos found or not found, and types of identified asbestos, by sample identifier
- > date the bulk analysis was carried out and reported by the laboratory
- > names and signatures of the analyst and any countersigner.

Photographs are informative and should be included in the report. Photographs can show the sampled material, its condition, location and surrounding environment. They provide a context for the sample and can help the workplace PCBU manage their asbestos, for example by providing a benchmark for comparing condition over time. Photographs can also be used to identify the actual sampling points. **Note:** photographic detail can be obscured in photocopied reports.

8.4 CHECKING THE REPORT

The survey report needs to meet the workplace PCBU's requirements, comply with the contractual obligations and be fit for purpose. The workplace PCBU should examine the report and check to make sure the survey was adequate and the report is suitable and accurate.

Check:

- > the report outcomes against the original agreement
- > for restrictions or disclaimers
- > the survey type is as requested
- > diagrams and plans are clear and accurate
- > all rooms and areas have been accessed
- > for obvious discrepancies and inconsistencies.

APPENDICES

IN THIS SECTION:

**Appendix A: Types of ACM
in buildings**

**Appendix B: Material assessment
algorithm**

**Appendix C: Example of a survey
and sampling equipment checklist**

**Appendix D: Quality assurance
and quality control**

Appendix E: References

Appendix F: Glossary

APPENDIX A: TYPES OF ACM IN BUILDINGS

This appendix provides information about asbestos and ACM in buildings. It summarises the main types and uses of ACM in the fabric of a building and in fixed installations such as heating, water and electrical systems. It lists the main product types, their location and use, asbestos content, and the date last used. It also includes guidance on the ease of fibre release, inspection and sampling.

LOOSE INSULATION	
Bulk loose fill, bulk fibre-filled mattresses, quilts and blankets.	<p>Location/use</p> <ul style="list-style-type: none"> > Bulk loose fill insulation is now rare but may be encountered unexpectedly, such as do-it-yourself (DIY) loft insulation and fire-stop packing around cables between floors. > Some fire doors have loose asbestos insulation sandwiched between the wooden or metal facings to give them the appropriate fire rating. > Mattresses and quilts used for insulating industrial boilers. > Paper bags/sacks were loose-filled and used for sound insulation under floors and in walls. > Loose asbestos was packed around electrical cables, sometimes using chicken wire to contain it. > Loose asbestos was used as loft insulation.
Also 'jiffy bag'-type products used for sound insulation	<p>Asbestos and type/date last used</p> <ul style="list-style-type: none"> > Usually pure asbestos except for lining/bag. > Mattresses and quilts usually contain crocidolite or chrysotile. > Acoustic insulation may contain crocidolite or chrysotile.
	<p>Ease of fibre release</p> <p>Loose asbestos may readily become airborne if disturbed. If dry, these materials can give rise to high exposures. Covers may deteriorate or be easily damaged by repair work or accidental contact.</p>
	<p>Inspection</p> <p>Although loose asbestos was not known to be used as a cavity insulation material, wall cavities should be inspected with an endoscope to check for the presence of any asbestos materials or debris such as AIB. Entry points should be agreed with a competent person (eg a builder, joiner or structural engineer).</p> <p>Walls should also be examined thoroughly where insulated heating pipes pass through brick or breeze block walls. Check for insulation or residues within the wall cavity itself.</p>
SPRAYED COATINGS	
Sprayed or trowelled onto reinforced concrete or steel columns or beams as fireproofing	<p>Location/use</p> <ul style="list-style-type: none"> > Thermal and anti-condensation insulation on the underside of roofs and sometimes on the sides of industrial buildings and warehouses. > Acoustic insulation in theatres, halls etc. > Fire protection on steel and reinforced concrete beams/columns and on the underside of floors. > Overspray of target areas was common.

<p>In some larger spaces, sprays were also applied to walls and ceilings for acoustic and decorative purposes (theatres, cinemas, studios, halls etc)</p>	<p>These are normally homogeneous coatings sprayed or trowelled onto reinforced concrete or steel columns or beams as fireproofing. Sprays were also used on the underside of ceilings for fireproofing and sound and thermal insulation in high-rise premises. Warehouses and factories sprayed asbestos to walls, ceilings and metal support structures for fireproofing and thermal/anti-condensation insulation.</p> <p>The depth of the spray depended on the fire rating and substrate, and may vary from 10 to 150 mm thick. The wet sprayed/trowelled coatings are usually denser. Those with higher proportions of well-tamped Portland cement can be quite hard. Surfaces may be sealed with an elasticised paint or proprietary encapsulant, sometimes reinforced with calico or fibre mesh, or left completely unsealed. Spray coatings are vulnerable to accidental damage and delamination due to water leakage releasing debris onto the floor and other horizontal surfaces. Spray coatings may have deteriorated significantly since installation and needs to be treated with caution.</p>
<p>Asbestos and type/date last used</p>	<ul style="list-style-type: none"> > Sprayed coatings usually contain 55%-85% asbestos with a Portland cement binder. > In UK: Crocidolite was the major type until 1962. > Mixture of types including crocidolite until mid-1971. > Asbestos spray applications were used up to 1974.
<p>Ease of fibre release</p>	<ul style="list-style-type: none"> > The surface hardness, texture and ease of fibre release will vary depending on a number of factors. > Sprays have a high potential for fibre release if unsealed, particularly if knocked or the surface is abraded or delaminates from the underlying surface. > Dust may accumulate on false ceilings, wiring and ventilation systems.
<p>Inspection</p>	<p>The spray coating may be concealed by over-cladding with a non-asbestos board, wood or metal sheet. Inspect all columns.</p> <p>These are usually, but not always, homogeneous (under any encapsulate). Different mixtures may have been used and material may have been removed, repaired or patched.</p>
<p>Sampling</p>	<p>If the material appears uniform and consistent, two samples should usually be enough, if taken at either end of the sprayed surface. If the installation is large (eg >100 m²), one sample should be taken approximately every 25-30 m². Samples should be taken from all patches of repairs or alterations.</p> <p>If the coating is encapsulated, it can be pre-injected with liquid around the sampling area then carefully cut with a sharp knife to lift a small flap to retrieve a sample. If the spray coating is not covered, both wetting (spraying surface and injection) and shadow vacuuming may be necessary to reduce airborne asbestos. As spray coatings are generally homogeneous, a surface sample should be sufficient.</p>

THERMAL INSULATION	
<p>Hand-applied thermal lagging, pipe and boiler lagging, Pre-formed pipe sections, slabs, blocks.</p> <p>Also tape, rope, corrugated paper, quilts, felts, and blankets.</p>	<p>Location/use</p> <p>Thermal insulation of pipes, boilers, pressure vessels, calorifiers etc.</p> <p>Pipe insulation composition is often highly variable, especially if there is a change in colour, size, texture or evidence of repairs or modifications. For example, asbestos may have been stripped from long runs of pipes but left around pipe elbows, taps and valves.</p> <p>Asbestos was widely used to insulate pipes, boilers and heat exchangers. There are several types and forms of insulation, often with multi-layer construction. Pre-formed sections of asbestos insulation were made to fit the diameter of the pipe. These would be strapped on and calico-wrapped and sometimes painted (eg 'Decadex' finish), or sealed with a hard plaster (often asbestos-containing) to protect against knocks and abrasion.</p> <p>Other types of asbestos-containing felts, blankets, tapes, ropes and corrugated papers were also used. For bends, joins, small sections of pipe and repairs, an asbestos-containing plaster was wet-mixed on site and hand-applied to the areas. Larger installations were also insulated with asbestos-containing plaster. Larger thicknesses of insulation would use pre-formed blocks wired in place, then other coatings or layers were applied, depending on the insulation required.</p> <p>Very hard-wearing coatings were called 'Bulldog' finishes and may contain metal sheets and/or chicken wire reinforcement beneath a hard plaster finish. External pipes may also be clad with sheet metal or painted with bitumen for additional weatherproofing. Installers often used whatever materials were available to hand or in stock, so it is common to find variations on the same pipe or boiler.</p> <p>Pay particular attention to bends and valves, or where it is evident that repairs have been made.</p>
<p>Asbestos and type/date last used</p>	<p>All types of asbestos have been used.</p> <p>In UK Crocidolite used in lagging until 1970.</p> <p>Amosite was phased out by the manufacturers during the 1970s.</p> <p>Asbestos content varies from 6-85%. Various ad hoc mixtures were hand-applied on joints and bends and pipe runs. Pre-formed sections were widely used (eg '85% magnesia' contained 15% amosite), 'Caposil' calcium silicate slabs and blocks contained 8-30% amosite while 'Caposite' sections contained approximately 85% amosite.</p> <p>Blankets, felts, papers, tapes and ropes were usually approximately 100% chrysotile.</p>
<p>Ease of fibre release</p>	<p>The ease of fibre release often depends on the type of lagging used and the surface treatment.</p> <p>Often it will be encapsulated with calico and painted (eg PVA, EVA, latex, bitumen or proprietary polymer emulsions or PVC, neoprene solutions).</p>

Sampling

In general, take one sample per 3 m run of pipe, paying particular attention to different layers and functional items (valves etc). For long runs of pipes (eg >20 m), one sample per 6 m will usually be enough. It can be difficult to demonstrate that individual pipes are asbestos-free so all pipes should be sampled even when they appear similar.

Take samples from all patches of repairs or alterations.

The area to be sampled should be fully wetted first: injection techniques are recommended. Take samples with a core sampler which should penetrate to the full depth of the pipe insulation. Proprietary types are available, but laboratory cork borers are also suitable. It should include a plunger to remove the sample from the borer.

The sample point hole should be made safe after sampling (eg covered with tape or filled with a suitable inert filler), if the pipe is to remain in place and the surface was originally intact. This helps to keep the insulation in good condition and to prevent asbestos fibres dispersing.

The borer should have a wet wipe pushed down to form a plug inside the borer and another wrapped around the outside. Use the borer to take a full-depth sample of the insulation. The inner wet wipe is used to seal the surface of the insulation where the borer enters and disturbs the insulation. The outer wet wipe is used to clean the outside of the borer as it is withdrawn, and can be placed in the sample bag. Remove the sample by using the plunger to push the sample out into the sample bag, complete with the wet wipe.

Completely clean the sampling equipment between samples.

An alternative approach is to use core sampling tubes which retain the sample. Withdraw the core tube through a wet wipe, cap it at both ends and place in a sample bag.

Chicken wire was often included within pipe insulation. This may hamper sampling, and a thin core sample may need to be taken. If there is obviously new and non-asbestos pipe insulation, investigate the possibility of debris from an earlier asbestos strip beneath the new insulation.

ASBESTOS BOARDS

Millboard

Location/use	Millboard was used for general heat insulation and fire protection. It was also used for insulating electrical equipment and plant.
Asbestos and type/date last used	In UK Crocidolite was used in some millboard manufacture between 1896 and 1965; usually chrysotile. Millboard was used when a low-cost, softer low-density board with modest mechanical properties but with good fire, insulation, thermal and electrical properties was specified. It is generally found in industrial premises, and was used as exterior lining for ventilation ducts and inside fire doors. Millboards may contain 37–97% asbestos, with a matrix of clay and starch.

	Ease of fibre release	Asbestos millboard has a high asbestos content and low density so is quite easy to break. The surface is subject to abrasion and wear.
Insulating board (AIB)		
	Location/use	<p>Used for fire protection, thermal and acoustic insulation, resistance to moisture movement and general building board.</p> <p>Found in service ducts, firebreaks, infill panels, partitions and ceilings (including ceiling tiles), roof underlay, wall linings, soffits, external canopies and porch linings.</p> <p>Widely used in premises for internal partition walls and linings and for fire protection, acoustic and thermal insulation. Suspended ceiling tiles were often made from AIB. Insulating boards came in a range of densities and are subject to damage using moderate force such as kicking.</p> <p>There may be variations due to later redevelopments or refurbishment. All kinds of combinations are found and the asbestos surveyor should be alert to all possibilities.</p> <p>Areas around lift shafts, stairwells and service risers in multi-storey buildings were commonly lined or faced with AIB or composites. Areas around gas fires and central heating boilers were also constructed from AIB. Fire doors were faced with AIB to achieve the appropriate fire rating.</p> <p>AIB is usually found inside premises, but weather-protected exterior areas such as porches and soffits, may contain AIB.</p> <p>Insulating board is usually homogeneous but repairs and replacement boards and tiles may have been fitted. Boards and tiles may also have been painted.</p>
	Asbestos and type/date last used	<p>Crocidolite used for some boards up to 1965, amosite up to 1980, when manufacture ceased.</p> <p>Usually 15-25% amosite or a mixture of amosite and chrysotile in calcium silicate.</p> <p>Older boards and some marine boards contain up to 40% asbestos.</p>
	Ease of fibre release	<p>AIB can be readily broken, giving significant fibre release. Surface release is possible by abrasion, but the surface is usually painted or plastered.</p> <p>Sawing and drilling will also give significant releases.</p>
	Inspection	<p>Walls may not be uniform and may have undergone partial replacement. All sections of a partition wall will need to be examined, unless documentary evidence confirms that they were erected at a time when ACM would not have been used or the original specification confirms that ACM was not to be used.</p> <p>Visual inspection will not be enough on its own. If the evidence shows the walls were erected at a specific time and no refurbishment or alteration has taken place, then an appropriate proportion of the sections should be examined.</p>

		<p>The joints between partition panels may contain asbestos rope fire seals. The rope may only be apparent when the outer trim (eg aluminium) is removed.</p> <p>Materials such as ceiling tiles or wall panels should be inspected for areas of existing damage, where a sample can be collected more easily.</p> <p>Ceilings and walls should be thoroughly inspected to check for variation and differences.</p> <p>If there is evidently more than one type of tile (based on colour, pattern, design, size etc) take representative samples of each. Larger installations completed at the same time may require only a few tile samples. Some replacement tiles may look the same. Inspect the hidden side of the board or tile which may, where access permits, reveal the trade name of the materials and/or differences in colour which indicate variations.</p> <p>Insulating board or tiles may have been manufactured with asbestos paper on one or both sides.</p>
	<p>Sampling</p>	<p>Take a small sample from a discrete location at the corner or edge of the panel, with a sharp knife or chisel blade to lever off a sample. Include any paper, on one or both sides.</p> <p>Insulating board is usually homogeneous but repairs and replacement boards and tiles may have been fitted. Boards and tiles may also have been painted. One sample per room or every 25 m² is usually adequate. If there is more than one type of tile (eg based on colour, pattern, design, size etc) take representative samples of each.</p> <p>Larger installations completed at the same time may require only a few tile samples.</p>
<p>Insulating board in cores and linings of composite products</p>		
	<p>Location/use</p>	<p>Found in fire doors, cladding infill panels, domestic boiler casings, partition and ceiling panels, oven linings and suspended floor systems.</p> <p>Used as thermal insulation and sometimes as acoustic attenuators.</p> <p>May be sandwiched between or surfaced with non-asbestos products such as strawboard, plywood, metal mesh, sheet metal and plasterboard.</p>
	<p>Asbestos and type/date last used</p>	<p>In UK: Crocidolite used for some boards up to 1965, amosite up to 1980, when manufacture ceased. 16-40% amosite or a mixture of amosite and chrysotile.</p>
	<p>Ease of fibre release</p>	<p>Can be broken by impact. Significant surface release is possible by abrasion, but usually painted or plastered. Sawing and drilling will also give significant releases.</p>

PAPER, FELT AND CARDBOARD	
Location/use	Used for insulating electrical equipment. Also used in some air-conditioning systems as insulation and acoustic lining. Asbestos paper was used to reinforce bitumen and other products and as a facing/lining to flooring products, combustible board and flame-resistant laminate. Corrugated cardboard was used for duct and pipe insulation. Air-conditioning trunking may be insulated internally or externally with asbestos-containing felt, cardboard and paper for acoustic and heat insulation. Asbestos papers were widely used to line the surfaces of other boards, ceiling tiles and sheet materials. Asbestos paper can contain ~100% chrysotile asbestos but may be incorporated as a lining, facing or reinforcement for other products, such as roofing felt, DPCs, steel composite wall cladding and roofing and vinyl flooring. Asbestos paper is also sometimes found under Man-Made Mineral Fibres (MMMF) insulation on steam pipes.
Asbestos and type/date last used	
Ease of fibre release	Paper materials, if not encapsulated/combined within vinyl, bitumen, or bonded in some way, can easily be damaged and release fibres when subject to abrasion or wear (eg worn flooring surface with paper backing).
Sampling	Take samples with a sharp knife to cut a representative portion from the material.
TEXTILES	
Ropes and yarns	
Location/use	Used as lagging on pipes, jointing and packing materials, and as heat/fire-resistant boiler, oven and flue sealing. Caulking in brickwork. Plaited asbestos tubing in electric cable. Asbestos textiles were manufactured for primary heat (eg insulation tapes and ropes).
Asbestos and type/date last used	Crocidolite and chrysotile were widely used due to length and flexibility of fibres. Other types of asbestos have occasionally been used in the past. In UK Chrysotile alone since at least 1970. Asbestos content approaching 100% unless combined with other fibres.
Ease of fibre release	Weaving reduces fibre release from products, but abrading or cutting the materials will release fibres, degrade if exposed, and become more friable with age. If used with caulking, fibres will be encapsulated and less likely to be released.
Sampling	Take samples using a sharp knife to cut a representative portion from the material.

Cloth	
Location/use	Thermal insulation and lagging, including fire-resisting blankets, mattresses, protective curtains, gloves aprons and overalls. Curtains and gloves were sometimes aluminised to reflect heat. Asbestos textiles were manufactured for fire protection uses (eg fire blankets, fire curtains, fire-resistant clothing). All types of asbestos were used. Since the mid-1960s the vast majority have been chrysotile.
Asbestos and type/date last used	
Ease of fibre release	Asbestos content approaching 100%.
Sampling	Take samples using a sharp knife to cut a representative portion from the material.
Gaskets and Washers	
Location/use	Used widely in domestic and industrial plant and pipe systems, ranging from hot water boilers to industrial power and chemical plant. A wide range of asbestos gaskets were produced and used for sealing pipe and valve joints in industrial plant, but they may also be found in some older domestic boilers. Plumbers used asbestos string for sealing screw thread joints. Variable but usually around 90% asbestos, crocidolite used for acid resistance and chrysotile for chlor-alkali.
Asbestos and type/date last used	
Ease of fibre release	May be dry and damage easily when removed. Mainly a problem for maintenance workers.
Sampling	Take samples using a sharp knife to cut a representative portion from the material.
Strings	
Location/use	Used for sealing hot water radiators.

	Asbestos and type/date last used	Strings have asbestos content approaching 100%.
FRICION PRODUCTS		
Resin-based materials		
	Location/use	Transport, machinery and lifts, used for brakes and clutch plates.
	Asbestos and type/date last used	30 – 70% chrysotile asbestos bound in phenolic resins.
	Ease of fibre release	Normal handling will produce low emissions. Minor emissions when braking. Dust may build up with friction debris. Grinding brake and clutch components to fit and brushing or blowing clean can produce significant peak airborne levels.
Drive belts/conveyor belts		
	Location/use	Engines, conveyors.
	Asbestos and type/date last used	Chrysotile textiles encapsulated in rubber. Textiles were also used widely as a reinforcing material in friction products/composites.
	Ease of fibre release	Low friability, except when worn to expose textile.
CEMENT PRODUCTS		
Profiled sheets		
	Location/use	Roofing, wall cladding. Permanent shuttering, cooling tower elements. These are homogeneous materials commonly encountered as corrugated and flat sheets or as various moulded products. Asbestos cement (AC) was extensively used for roofing and exterior cladding on industrial, public and some domestic premises.

	<p>Asbestos cement (AC) was also widely used in low-cost housing as wall and ceiling panels, and in schools in fume cabinets and kick boards. It was also used as fireproofing and is found in places where AIB is expected, as well as on office partition walls. It does not always look like AC in these situations.</p> <p>Corrugated/profile sheets are commonly found, but flat sheets have also been widely used for exterior and some interior cladding (eg panels below windows and on walls in older prefabricated housing).</p>
<p>Asbestos and type/date last used</p>	<p>In UK: 10–15% asbestos (some flexible sheets contain a proportion of cellulose).</p> <p>Crocidolite (1950–1969) and amosite (1945–1980) have been used in the manufacture of asbestos cement, although chrysotile is by far the most common type found.</p>
<p>Ease of fibre release</p>	<p>Likely to release increasing levels of fibres if abraded, hand sawn or worked on with power tools.</p> <p>Exposed surfaces and acid conditions will remove cement matrix and concentrate unbound fibres on surface and sheet laps. [App 2]</p> <p>Cleaning asbestos-containing roofs may also release fibres.</p>
<p>Inspection</p>	<p>Asbestos cement can usually be identified by visual inspection.</p> <p>In older buildings, most pre-formed exterior cement sheets can be strongly assumed to be asbestos. Only limited sampling can confirm the assumption.</p>
<p>Sampling</p>	<p>The risk of falling through asbestos cement roofs usually means that sampling is restricted. If sampling is required, take one sample of each type of sheet or product.</p> <p>Repeated sampling is not necessary unless areas of replaced sheets are found. Asbestos cement sheets are visually very similar to their non-asbestos (fibre cement) replacement.</p> <p>If sampling is necessary (eg to distinguish between AC and AIB), look for a damaged portion where it will be easier to remove a small sample (AC is usually very hard). The sample size should be about 5 cm² as it will be necessary to search for traces of amphibole asbestos such as crocidolite and amosite. Obtain the sample using pliers or a screwdriver blade to remove a small section from an edge or corner.</p> <p>Do not take samples from roofs without safety precautions to prevent falls through the fragile sheets.</p> <p>If the analysis is still inconclusive (eg chrysotile and amosite are detected), conduct the definitive water absorption test (the material will be AC if it absorbs <30% water) (see Health and Safety Executive (HSE): approved code of practice <i>Work with material containing asbestos</i> (L143)).</p>

Semi-compressed flat sheet and partition board	
Location/use	Partitioning in farm buildings and infill panels for housing, shuttering in industrial buildings, decorative panels for facings, bath panels, soffits, linings to walls and ceilings, portable buildings, propagation beds in horticulture, domestic structural uses, fire surrounds, composite panels for fire protection, weather boarding.
Asbestos and type/date last used	As for profiled sheets. Also 10-25% chrysotile and some amosite for asbestos wood used for fire doors etc. Composite panels contained ~4% chrysotile or crocidolite.
Ease of fibre release	Release as for profiled sheets. Flat building sheets, partition board.
Fully compressed flat sheet used for tiles, slates, board	
Location/use	As for semi-compressed flat sheets and partition board, but where stronger materials are required. Also as slates, board cladding, decking and roof slates (eg roller-skating rinks, laboratory worktops). Higher asbestos content sheets produced for industrial applications as a high grade arc and heat-resistant material.
Asbestos and type/date last used	As for profiled sheets. Up to 50% chrysotile.
Ease of fibre release	Release as for profiled sheets.
Pre-formed moulded products and extruded products	
Location/use	Cable troughs and conduits. Cisterns and tanks. Drains and sewer pressure pipes. Fencing. Flue pipes. Rainwater goods. Roofing components (fascias, soffits etc).

		<p>Ventilators and ducts. Weather boarding. Window sills and boxes, bath panels, draining boards, extraction hoods, copings, promenade tiles etc. A wide range of moulded compressed AC products have been used inside premises. Many other items have been moulded from asbestos cement. Asbestos cement pipes are also used underground (eg from local drainage to regional water supply systems).</p>
<p>Asbestos and type/date last used</p>	<p>As for profiled sheets.</p>	
<p>Ease of fibre release</p>	<p>Release as for profiled sheets.</p>	
<p>OTHER ENCAPSULATED MATERIALS</p> <p>Textured coatings</p>		
<p>Location/use</p>		<p>Decorative/flexible coatings on walls and ceilings. These were often manufactured containing up to a few per cent of asbestos. 'Glamatex' and 'Whisper' are examples of typical trade products, which usually contained a few per cent of chrysotile asbestos.</p>
<p>Asbestos and type/date last used</p>	<p>UK: 3–5% chrysotile asbestos. Chrysotile. Non-asbestos versions were available from the mid-1970s.</p>	
<p>Ease of fibre release</p>	<p>Generally fibres are well contained in the matrix but may be released when old coating is sanded down or scraped off.</p>	
<p>Inspection</p>	<p>Remove ACM before demolition if it is reasonably practicable. In many cases, it will not be reasonably practicable because their removal is resource-intensive, time consuming and involves other risks (eg where textured coatings are attached directly to substrates such as concrete or lath). However, if textured coatings are attached to materials which can be essentially removed intact or whole, removal may be practicable (eg by removing whole sheets intact). The survey should identify the nature of the substrate and whether textured coating removal will be required. Textured coating removal will be necessary where refurbishment is taking place.</p>	

Bitumen products	
Sampling	Obtain samples by carefully scraping the coating with a screwdriver or narrow scraper, directing the material into the sample container held below the sampling point.
Location/use	Roofing felts and shingles, semi-rigid asbestos bitumen roofing, Gutter linings and flashings, Bitumen DPC. Asbestos/bitumen coatings on metals (eg car body underseals). Bitumen mastics and adhesives (Used for floor tiles and wall coverings). Bitumen-based roofing felts and DPCs have been widely reinforced with added asbestos, usually with chrysotile paper. Bitumen-based wall and floor coverings were also produced. Some mastics used to stick the bitumen products had asbestos added to them to provide flexibility. Other sealants also had asbestos added to improve the product's performance.
Asbestos and type/date last used	Chrysotile fibre or asbestos paper (approximately 100% asbestos) in bitumen matrix, usually 8% chrysotile. Used in UK up to 1992. Adhesives may contain up to a few per cent chrysotile asbestos. Used in UK up to 1992.
Ease of fibre release	Fibre release unlikely during normal use. Roofing felts, DPC and bitumen-based sealants should not be burnt after removal. See felts and papers.
Flooring	
Location/use	Black and brown thermoplastic tiles containing large amounts and often visible clumps of asbestos. Polyvinyl chloride (PVC or vinyl) tiles were manufactured with added asbestos. Sheet floor coverings were sometimes backed with a thin layer of chrysotile paper. Underfelts for carpets and linoleum were also manufactured containing asbestos. Magnesium oxychloride flooring used in toilets, staircases and industrial flooring. Hard-wearing composite floors (eg magnesium oxychloride).
Asbestos and type/date last used	Thermoplastic floor tiles - up to 25% chrysotile. PVC vinyl floor tiles and unbacked PVC flooring - normally 5-7% very fine chrysotile. Paper backing approximately 100% chrysotile asbestos. Used in UK up to 1992. Magnesium oxychloride flooring - about 2% asbestos.

	Ease of fibre release	<p>Fibre release is unlikely to be a risk under normal services conditions.</p> <p>Fibre may be released when material is cut, and there may be substantial release where flooring residue, particularly paper backing, is power sanded.</p> <p>Very hard, fibre release is unlikely.</p>
	Inspection	<p>Lift up carpets and tiles. The floor tile adhesives also contained asbestos.</p> <p>Include floor screeds and the possibility of hardfill in/under concrete slabs.</p>
	Sampling	<p>Cut out samples with a sharp knife, taking one sample from tiles of each type or colour present.</p> <p>Clean the area after sampling but fibre release is likely to be very low, unless the asbestos is present as a lining or backing material.</p>
Reinforced PVC		
	Location/use	<p>Panels and cladding.</p>
	Asbestos and type/date last used	<p>1-10% chrysotile asbestos.</p>
	Ease of fibre release	<p>Fibre release is unlikely.</p>
Reinforced plastic and resin composites		
	Location/use	<p>Used for toilet cisterns, seats, banisters, window seals, lab bench tops.</p> <p>Asbestos-reinforced plastics and resin composite material were used for windowsills, capping for banisters, school and laboratory worktops, toilet cisterns etc. The material is often black and has a high density and scratch resistance. Asbestos textiles were used as a reinforcing material in friction products (eg conveyor and fan belts, brake and clutch linings).</p> <p>Older asbestos-containing components may still be in use or present in vehicle repair and maintenance workshops and stores.</p>
	Asbestos and type/date last used	<p>Plastics usually contain 1-10% chrysotile asbestos.</p> <p>Some amphiboles were used to give improved acid resistance (eg car batteries. Resins were reinforced with woven chrysotile cloth usually contain 20-50% asbestos).</p>

	Ease of fibre release	Fibres unlikely to be released, limited emissions during cutting.
Metal-asbestos composites		
	Location/use	Flues for wood-burning stoves were commonly constructed from a metal-asbestos where the asbestos was added as insulation between the inner and outer layers of stainless steel to prevent sudden cooling of the flue gases. Metal panels were used to provide a strong construction with a certain degree of insulation by incorporating a layer of asbestos paper.
Wall jointing tapes and fillers		
	Location/use	Chrysotile textile tapes and webbing were used to reinforce wall joints before plastering. Several types of wall plugs and some wall repair fillers had asbestos added to give additional strength and flexibility. These are difficult to locate as they are integrated into the plaster finish.

APPENDIX B: MATERIAL ASSESSMENT ALGORITHM

SAMPLE VARIABLE	SCORE	EXAMPLES OF SCORES
Product type (or debris from product)	1	Asbestos-reinforced composites (plastics, resins, mastics, roofing felts, vinyl floor tiles, semi-rigid paints or decorative finishes, asbestos cement etc).
	2	AIB, millboards, other low-density insulation boards, asbestos textiles, gaskets, ropes and woven textiles, asbestos paper and felt.
	3	Thermal insulation (eg pipe and boiler lagging), sprayed asbestos, loose asbestos, asbestos mattresses and packing.
Extent of damage/deterioration	0	Good condition: no visible damage
	1	Low damage: a few scratches or surface marks, broken edges on boards, tiles etc.
	2	Medium damage: significant breakage of materials or several small areas where material has been damaged revealing loose asbestos fibres.
	3	High damage or delamination of materials, sprays and thermal insulation. Visible asbestos debris.
Surface treatment	0	Composite materials containing asbestos: reinforced plastics, resins, vinyl tiles.
	1	Enclosed sprays and lagging, AIB (with exposed face painted or encapsulated) asbestos cement sheets etc.
	2	Unsealed AIB, or encapsulated lagging and sprays.
	3	Unsealed lagging and sprays.
TOTAL		

SCORE	POTENTIAL TO RELEASE FIBRES
7-9	High
4-6	Medium
1-3	Low

Non-asbestos materials have no potential to release asbestos fibres.

APPENDIX C: EXAMPLE OF A SURVEY AND SAMPLING EQUIPMENT CHECKLIST

SURVEY EQUIPMENT	
<input type="checkbox"/> Site plan	<input type="checkbox"/> Torch
<input type="checkbox"/> Log book, organiser, computer	<input type="checkbox"/> Access keys to rooms and covers
<input type="checkbox"/> Step ladder	<input type="checkbox"/> Screwdrivers
<input type="checkbox"/> Camera with flash and preferably with a date and number facility	
PPE FOR SAMPLING	
<input type="checkbox"/> Disposable overalls (hooded)	
<input type="checkbox"/> Disposable overshoes or gumboots	
RPE	
<input type="checkbox"/> A disposable P2 respirator or a half mask fitted with a P2 filter	
<input type="checkbox"/> Face-fit tests to be conducted	
BULK SAMPLING EQUIPMENT	
<input type="checkbox"/> Warning signs: 'Asbestos sampling: Keep clear'	
<input type="checkbox"/> Pliers	
<input type="checkbox"/> Screwdrivers	
<input type="checkbox"/> Core samplers or cork borers	
<input type="checkbox"/> Aluminium foil or cloth tape	
<input type="checkbox"/> Stanley knife with spare blades	
<input type="checkbox"/> Hand-spray with diluted PVA or surfactant	
<input type="checkbox"/> Sample bags (polythene self-seal bags)	
<input type="checkbox"/> Sample point labels	
<input type="checkbox"/> Type H vacuum cleaner	
<input type="checkbox"/> Wet wipes and tissues	
<input type="checkbox"/> Polythene sheeting	
<input type="checkbox"/> New heavy-duty 200 µm (minimum thickness) polythene bags (with a maximum size of 1200 mm long and 900 mm wide)	
<input type="checkbox"/> Bag for the sampling equipment for transport to another job or decontamination	

APPENDIX D: QUALITY ASSURANCE AND QUALITY CONTROL

All PCBUs providing an asbestos surveying service (including sole traders) should have an adequate quality management system that includes survey quality control.

The following paragraphs outline three essential components of a quality management system. Sole traders should put self-checking versions (or other working arrangements) in place for quality assurance and checking survey reports.

Asbestos surveyors should engage an independent organisation to conduct an annual audit of completed surveys. They should have written quality management procedures and keep records of their audits and checks.

QUALITY ASSURANCE FOR SITE WORK

A proportion of surveys should be re-inspected while the survey is still in progress. It is recommended that about 5% of all surveys are re-inspected.

The process of site selection is at the discretion of the asbestos surveyor, but the system should make sure the selected sites:

- > represent the different types of survey the surveying PCBU does
- > represent the different types of premises surveyed
- > cover all the workers conducting the surveys.

The surveying PCBU should inspect or audit newly qualified or recently employed persons carrying out surveys more frequently until they can consistently work to the required standards.

In some situations it may not be practical to re-inspect the whole site. In these cases, the asbestos surveyor should re-examine a representative part of the site.

The survey re-inspection involves checking all aspects of the site work using the recorded data, samples and photographs to make sure:

- > no asbestos or ACM or suspected ACM were omitted
- > all recorded asbestos and ACM and suspected ACM was valid
- > if suspected ACM has been 'assumed' or 'strongly assumed', the assumption of asbestos type is valid
- > all identifiers for records, sample numbers and photograph numbers correspond and are unique
- > all areas inspected were correctly and unambiguously identified
- > all 'no access' areas were valid and were correctly and unambiguously identified
- > all material types for ACM and suspected ACM are correctly listed
- > all recorded asbestos and ACM and suspected ACM were correctly and uniquely located
- > all quantities of ACM and suspected ACM were correctly assessed
- > the correct assessments were made and recorded for:
 - asbestos product type
 - surface treatment
 - damage
 - accessibility (vulnerability)
- > adequate numbers and sizes of samples were collected, correctly labelled and individually double-bagged

- > the area were cleaned after sampling
- > sampling sites have been made good in the agreed manner and in accordance with the work plan.

If omissions, deficiencies or errors are identified, the asbestos surveyor should rectify the situation, including retraining and supervising personnel where appropriate.

AUDIT OF COMPLETED SURVEYS

The asbestos surveyor should conduct an annual audit of the management systems and procedures. Usually it is a desk-top audit as the site may have changed from the original survey (eg undergone refurbishment). However, a full site resurvey may be necessary if, for example, significant anomalies were discovered.

The audits should include reviewing:

- > report formats, structure and content
- > raw data transposition into report
- > authorisation or approval of report checker, person carrying out the survey, including their authorisations, training records and qualifications etc
- > contract review to make sure the report meets the conditions in full
- > records and storage of raw data, site logs etc, as well as compiled reports.

SURVEY REPORTS

Every management survey report should be checked by an authorised person before being issued to the client PCBU. The checks should make sure the report contents are technically consistent, accurate and complete.

In particular, check:

- > the client PCBU's instructions for the survey and report were followed
- > all site notes agree with the final report
- > no observed ACM was left out
- > all appendices are included as required
- > all titles, reference numbers and descriptions are correct
- > the assessments and recommendations for any remedial work are appropriate
- > the report summary is included.

APPENDIX E: REFERENCES

WORKSAFE NEW ZEALAND

Approved code of practice *Management and Removal of Asbestos*

UK HEALTH AND SAFETY EXECUTIVE

Asbestos *The Survey guide* HSG264

Approved code of practice *The management of asbestos in non-domestic premises* (L127)

Approved code of practice *Work with material containing asbestos* (L143)

Asbestos *The analysts' guide for sampling, analysis and clearance procedures* (HSG248)

Accreditation of bodies surveying for asbestos in premises Edition 3 RG8 UKAS 2010
(for the application of ISO/IEC 17020)

APPENDIX F: GLOSSARY

This glossary lists terms used in these guidelines that either come from legislation, or benefit from an explanation.

In cases where there is a legal definition and a plain English explanation, the legal definition takes preference.

TERM	PLAIN ENGLISH EXPLANATION	LEGAL DEFINITION
Accredited laboratory		means a laboratory that is— (a) accredited by International Accreditation New Zealand (IANZ); or (b) accredited under another accreditation regime recognised by WorkSafe; or (c) approved by WorkSafe to test samples under these regulations for up to 12 months while the laboratory is in the process of obtaining accreditation under paragraph (a) or (b).
The (or this) Act	Refers to the Health and Safety at Work Act 2015.	
AIB (Asbestos Insulating Board)	AIB was commonly used as fireproofing material but it had many other uses such as: > partition walls > fireproofing panels in fire doors > lift shaft linings > ceiling tiles > soffits > panels below windows.	
Air monitoring	means measuring airborne asbestos fibres by sampling and analysing them in accordance with a method based on a membrane filter method (in air).	
Airborne contamination standard for asbestos		means an average concentration over any eight-hour period of 0.1 respirable asbestos fibres per millilitre of air.
Asbestos	means a term describing naturally occurring fibrous silicate minerals (rock-forming minerals). There are two groups, and six common types: (a) actinolite (b) grunerite (or amosite) (brown) (c) anthophyllite asbestos (d) chrysotile asbestos (white) (e) crocidolite asbestos (blue) (f) tremolite asbestos.	means the asbestiform varieties of mineral silicates belonging to the serpentine or amphibole groups of rock-forming minerals, including the following: (a) actinolite asbestos: (b) grunerite (or amosite) asbestos (brown): (c) anthophyllite asbestos: (d) chrysotile asbestos (white): (e) crocidolite asbestos (blue): (f) tremolite asbestos: (g) a mixture that contains 1 or more of the minerals referred to paragraphs (a) to (f).

TERM	PLAIN ENGLISH EXPLANATION	LEGAL DEFINITION
Asbestos management plan	<p>means a written plan that has the following information:</p> <ul style="list-style-type: none"> > where asbestos or ACM is identified and located within the workplace > decisions, with reasons, about how the asbestos is managed in the workplace > how incidents and emergencies involving asbestos will be managed in the workplace > about the workers who carry out work involving asbestos. 	<p>an asbestos management plan must include information about the following:</p> <ul style="list-style-type: none"> (a) the identification of asbestos or ACM: (b) decisions, and reasons for decisions, about the management of the risk arising from asbestos at the workplace: (c) procedures for detailing incidents or emergencies involving asbestos or ACM at the workplace: (d) the workers who carry out work involving asbestos, including— <ul style="list-style-type: none"> (i) information and training that has been and will be provided to the workers: (ii) roles and responsibilities of the workers: (iii) any health monitoring of the workers that has been or will be undertaken.
Asbestos Regulations	<p>means the Health and Safety at Work (Asbestos) Regulations 2016.</p>	
Asbestos removal work		<p>means—</p> <ul style="list-style-type: none"> (a) except in Part 6 [of the Asbestos Regulations], work involving the removal of asbestos or asbestos-contaminated soil or asbestos-containing material; or (b) in Part 6 [of the Asbestos Regulations], Class A or Class B asbestos removal work.
Asbestos removalist		<p>means a PCBU who carries out asbestos removal work.</p>
Asbestos waste		<p>means asbestos or asbestos-contaminated soil or asbestos-containing material removed, and disposable items used during asbestos removal work, including plastic sheeting and disposable tools.</p>
Asbestos-containing material (ACM)		<p>means any material or thing that, as part of its design, contains asbestos.</p>
Asbestos-related work	<p>refer to section 21 of the Approved Code of Practice: Management and Removal of Asbestos.</p>	<p>means work involving asbestos (other than asbestos removal work to which Part 3 applies) that is permitted under the exceptions set out in regulation 7(2), (3), and (4) [of the Asbestos Regulations].</p>
Competent person		<p>means a person who has the knowledge, experience, skills, and qualifications to carry out a particular task under these regulations, including any knowledge, experience, skills, and qualifications prescribed in a safe work instrument.</p>

TERM	PLAIN ENGLISH EXPLANATION	LEGAL DEFINITION
Decontamination facilities	means the equipment and materials the asbestos removalist or PCBU doing asbestos-related work needs to decontaminate: <ul style="list-style-type: none"> > the asbestos removal area > equipment used in the removal area > workers that worked in the removal area > the people that may have accessed the removal area. 	
Demolition	means destroying or dismantling all or part of a building or plant.	<p>(a) means work to demolish or dismantle a structure, or part of a structure that is loadbearing or otherwise related to the physical integrity of the structure; but</p> <p>(b) does not include—</p> <ul style="list-style-type: none"> (i) the dismantling of formwork, falsework, or other structures designed or used to provide support, access, or containment during construction work; or (ii) the removal of power, light, or telecommunication poles. <p>For the purposes of subpart 4 [Part 2 of the Asbestos Regulations], demolition does not include minor or routine maintenance work, or other minor work.</p>
Friable		means, in relation to asbestos or ACM, in a powder form or able to crumbled, pulverised, or reduced to a powder by hand pressure when dry.
Hazard	means anything that could harm someone. Includes situations and a person's behaviour (eg an unguarded machine, chemicals, assault, etc).	includes a person's behaviour where that behaviour has the potential to cause death, injury, or illness to a person (whether or not that behaviour results from physical or mental fatigue, drugs, alcohol, traumatic shock, or another temporary condition that affects a person's behaviour).
Health monitoring		in relation to an individual, means monitoring of the individual to identify any changes in his or her health status because of exposure to certain health hazards.
Home		<p>(a) means a place occupied as a dwelling-house; and</p> <p>(b) includes any garden, yard, garage, outhouse or other appurtenance of a home.</p>
Licensed asbestos removal work		means asbestos removal work for which a Class A asbestos removal licence or a Class B asbestos removal licence is required.

TERM	PLAIN ENGLISH EXPLANATION	LEGAL DEFINITION
Licensed asbestos removalist	means a PCBU with a Class A or Class B licence.	means a PCBU who is licensed under these regulations to carry out Class A asbestos removal work or Class B asbestos removal work.
Non-friable		in relation to asbestos or ACM, means not friable (and, for the purposes of this definition, asbestos and ACM include material containing asbestos fibres reinforced with a bonding compound).
Personal protective equipment (PPE)		<ul style="list-style-type: none"> (a) means anything used or worn by a person (including clothing) to minimise risks to the person's health and safety; and (b) includes air-supplied respiratory equipment.
Plant		<p>includes—</p> <ul style="list-style-type: none"> (a) any machinery, vehicle, vessel, aircraft, equipment (including personal protective equipment), appliance, container, implement, or tool; and (b) any component of any of those things; and (c) anything fitted or connected to any of those things.
PCBU (person conducting a business or undertaking)		<ul style="list-style-type: none"> (a) means a person conducting a business or undertaking— <ul style="list-style-type: none"> (i) whether the person conducts a business or undertaking alone or with others; and (ii) whether or not the business or undertaking is conducted for profit or gain; but (b) does not include— <ul style="list-style-type: none"> (i) a person to the extent that the person is employed or engaged solely as a worker in, or as an officer of, the business or undertaking; (ii) a volunteer association; (iii) an occupier of a home to the extent that the occupier employs or engages another person solely to do residential work; (iv) a statutory officer to the extent that the officer is a worker in, or an officer of, the business or undertaking; (v) a person, or class of persons, that is declared by regulations not to be a PCBU for the purposes of this Act or any provision of this Act.

TERM	PLAIN ENGLISH EXPLANATION	LEGAL DEFINITION
PCBU who manages or controls (the) workplace	<p>in the case of these guidelines, and in relation to duties, usually means the PCBU of the workplace where asbestos is located.</p> <p>Otherwise known in these guidelines as the 'workplace PCBU.'</p>	<p>(a) means a PCBU to the extent that the business or undertaking involves the management or control (in whole or in part) of the workplace; but</p> <p>(b) does not include—</p> <ul style="list-style-type: none"> (i) the occupier of a residence, unless the residence is occupied for the purposes of, or as part of, the conduct of a business or undertaking; or (ii) a prescribed person.
Reasonably practicable	<p>means actions that are (or were at a particular time) reasonably able to be done to ensure health and safety.</p> <p>In deciding what actions to take, the PCBU must consider the hazards and associated risks, how serious the harm could be, and their knowledge of ways to eliminate or minimise the risk of this harm occurring. As a final step, the cost of implementing the action is considered, and whether that cost is grossly disproportionate to the risk.</p>	<p>in relation to a duty of a PCBU set out in subpart 2 of Part 2 (of the Act), means that which is, or was, at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters, including—</p> <ul style="list-style-type: none"> (a) the likelihood of the hazard or the risk concerned occurring; and (b) the degree of harm that might result from the hazard or risk; and (c) what the person concerned knows, or ought reasonably to know, about— <ul style="list-style-type: none"> (i) the hazard or risk; and (ii) ways of eliminating or minimising the risk; and (d) the availability and suitability of ways to eliminate or minimise the risk; and (e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.
Refurbishment work	<p>means partially dismantling buildings or plant for renovation.</p>	<p>(for the purposes of subpart 4 of Part 2 of the Asbestos Regulations) does not include minor or routine maintenance work, or other minor work.</p>
Residential work		<p>means work done by a person employed or engaged by the occupier of a home of either or both of the following kinds:</p> <ul style="list-style-type: none"> (a) domestic work done or to be done in the home; (b) work done or to be done in respect of the home.
Respirable asbestos fibre		<p>means an asbestos fibre that—</p> <ul style="list-style-type: none"> (a) is less than 3 micrometres wide; and (b) is more than 5 micrometres long; and (c) has a length-to-width ratio of more than 3:1.

TERM	PLAIN ENGLISH EXPLANATION	LEGAL DEFINITION
Risk	means the possibility that death, injury or illness might occur when a person is exposed to a hazard.	
Safe work instrument	safe work instruments define terms, prescribe matters, or make other provision in relation to any activity or thing, including listing standards, control of substances, and competency requirements.	the purposes of safe work instruments are to define terms, prescribe matters, or make other provision in relation to any activity or, including (without limitation) listing standards, control of substances, and competency requirements.
Structure		<p>(a) means anything that is constructed, whether fixed, moveable, temporary, or permanent; and</p> <p>(b) includes—</p> <ul style="list-style-type: none"> (i) buildings, masts, towers, frameworks, pipelines, quarries, bridges, and underground works (including shafts or tunnels); and (ii) any component of a structure; and (iii) part of a structure.
Training record		means a written record of the training undertaken by the worker that is relevant to asbestos removal, including details of the training provider and the dates on which the training took place.
Worker		<p>Unless the context otherwise requires, a worker means an individual who carries out work in any capacity for a PCBU, including work as—</p> <ul style="list-style-type: none"> (a) an employee; or (b) a contractor or subcontractor; or (c) an employee of a contractor or subcontractor; or (d) an employee of a labour hire company who has been assigned to work in the business or undertaking; or (e) an outworker (including a homeworker); or (f) an apprentice or a trainee; or (g) a person gaining work experience or undertaking a work trial; or (h) a volunteer worker; or (i) a person of a prescribed class. <p>(2) For the purposes of subsection (1),—</p> <ul style="list-style-type: none"> (a) a constable is— <ul style="list-style-type: none"> (i) a worker; and (ii) at work throughout the time when the constable is on duty or is lawfully performing the functions of a constable, but not otherwise:

TERM	PLAIN ENGLISH EXPLANATION	LEGAL DEFINITION
		<p>(b) a member of the Armed Forces is—</p> <ul style="list-style-type: none"> (i) a worker; and (ii) at work throughout the time when the member is on duty or is lawfully performing the functions of a member of the Armed Forces, but not otherwise: <p>(c) a PCBU is also a worker if the PCBU is an individual who carries out work in that business or undertaking.</p>
Workplace PCBU	means a PCBU who manages or controls a workplace	
WorkSafe		means WorkSafe New Zealand established by section 5 of the WorkSafe New Zealand Act 2013.

DISCLAIMER

WorkSafe New Zealand has made every effort to ensure the information contained in this publication is reliable, but makes no guarantee of its completeness. WorkSafe may change the contents of this guide at any time without notice.

This document is a guideline only. It should not be used as a substitute for legislation or legal advice. WorkSafe is not responsible for the results of any action taken on the basis of information in this document, or for any errors or omissions.

ISBN: 978-0-908336-68-5 (print)

ISBN: 978-0-908336-67-8 (online)

Published: October 2016 Current until: 2018

PO Box 165, Wellington 6140, New Zealand

www.worksafe.govt.nz



Except for the logos of WorkSafe, this copyright work is licensed under a Creative Commons Attribution-Non-commercial 3.0 NZ licence.

To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc/3.0/nz/>

In essence, you are free to copy, communicate and adapt the work for non-commercial purposes, as long as you attribute the work to WorkSafe and abide by the other licence terms.

WorkSafe New Zealand

Level 6
86 Customhouse Quay
PO Box 165
Wellington 6140

Phone: +64 4 897 7699

Fax: +64 4 415 4015

0800 030 040

www.worksafe.govt.nz

[@WorkSafeNZ](https://twitter.com/WorkSafeNZ)

ISBN: 978-0-908336-68-5 (print)

ISBN: 978-0-908336-67-8 (online)