



# **Abu Dhabi EHSMS Regulatory Framework (AD EHSMS RF)**

**EHS Regulatory Instrument**

**Code of Practice**

**EHS RI - CoP 1.10 – Management of  
Asbestos Containing Materials**

**Version 2.0**

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## ACKNOWLEDGEMENTS

With gratitude Abu Dhabi EHS Center acknowledges the great support provided by the Executive Council in facilitating the issuance of Abu Dhabi Emirate Environment, Health and Safety Management System (AD EHSMS) and its implementation at Emirate level.

The issuance of the system would not have been possible without the supervision, diligent efforts and productive recommendations of the AD EHS Center Board of Directors.

These documents (Regulatory Instruments) constitute the efforts of the Abu Dhabi EHS Center and the concerned Sector Regulatory Authorities who worked together to integrate all relevant regulatory requirements under *AD EHSMS RF*. The input, contribution and constructive views of all sectors is highly appreciated.

May these documents prove to be beneficial and helpful in system implementation and in expanding the knowledge in the EHS field.



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ABU DHABI TOURISM AUTHORITY

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## Preface

This Abu Dhabi EHS Regulatory Instrument was developed by the AD EHS Center as the primary Competent Authority for this topic to set the minimum mandatory requirements.

Every effort was made in developing this document so that it does not conflict with existing local or federal laws and regulations. In case of conflict, requirements of the existing local and federal laws and regulations shall prevail, and all concerned are obliged to bring the same to the attention of AD EHS Center for resolution.

This AD EHS Regulatory Instrument has been developed, reviewed and approved, following the process as described in *AD EHSMS Implementation Guideline: The Integration of EHS Requirements in the Emirate of Abu Dhabi*, by the following stakeholders:

- Abu Dhabi EHS Higher Committee;
- Abu Dhabi EHS Center;
- Environment Agency Abu Dhabi;
- Department of Municipal Affairs;
  - Abu Dhabi Municipality;
  - Al Ain Municipality;
  - Western Region Municipality;
- Department of Transport – Abu Dhabi;
- Abu Dhabi Water and Electricity Authority;
- Health Authority - Abu Dhabi;
- Higher Corporation for Specialized Economic Zones (ZonesCorp);
- Center for Waste Management – Abu Dhabi;
- Abu Dhabi Tourism Authority;
- Abu Dhabi Food Control Authority;
- Abu Dhabi Education Council;
- Regulation and Supervision Bureau; and
- Other Relevant Federal and Local Competent Authorities.

The AD EHSMS consists of the following hierarchy of documents:

AD EHSMS RF Elements - Mandatory System Requirements

EHS Regulatory Instruments:

- Standards and Guideline Values - Mandatory EHS threshold and exposure levels
- Codes of Practice - Mandatory EHS technical requirements – subject specific
- Mechanisms - Mandatory system implementation processes and procedures

Guidelines:

- Technical Guidelines - Non-mandatory guidance on how to implement an EHS Regulatory Instrument
- AD EHSMS Guidance Documents - Non-mandatory guidance and interpretation of EHSMS concepts and principles

Further, this document is not intended to conflict with any contractual obligations in effect at the time of its issuance. However, all future contracts shall adhere to applicable requirements stated herein, and existing long term contracts shall be brought into compliance with its requirements as soon as reasonably practicable as stipulated by relevant subject authorities.

This document will be reviewed periodically as part of the continual improvement cycle.

## 1. Introduction

- (a) This Code of Practice (CoP) is to provide all persons who work with asbestos or have a duty to manage premises where Asbestos Containing Material(s) (ACM) have been identified or presumed to be present the technical information they require to meet Federal and Local legislative requirements.
- (b) The ultimate goal for all duty holders shall be to have a workplace totally free of asbestos; however priorities need to be set to control the risks from asbestos in the short to medium term.
- (c) Asbestos is a naturally occurring mineral. It can be amphibole asbestos which includes crocidolite (blue) and amosite (brown) asbestos, or serpentine asbestos which is chrysotile (white) asbestos. These are the main types of asbestos used in building and construction materials. Exposure to amphibole asbestos poses a greater health hazard than exposure to serpentine, but all types can cause asbestos-related diseases.
- (d) Asbestos-containing materials have been widely used in buildings as construction materials, fireproofing, thermal insulation, electrical insulation, sound insulation, decorative plasters, roofing products, flooring products, heat resistant materials, gaskets, friction products etc. When asbestos is disturbed or damaged, the fibers are released into the air and people inhale them, which creates a risk to human health. The types of work that release fibers include, for example, drilling holes with power tools, sawing or sanding material. Simply working near to material containing asbestos might result in disturbance, particularly if it is in poor condition. Accidental damage, wear and tear or vandalism can release fibers from the ACMs, for example in walls, ceilings and floor coverings. It is known that all forms of asbestos may cause asbestosis, lung cancer, or mesothelioma. Therefore, where exposure to asbestos cannot be prevented entirely, exposures need to be controlled.
- (e) Employers of construction, building maintenance and repair employees are required to carry out a risk assessment before undertaking any work which exposes, or is liable to expose, employees to asbestos. They shall then take the appropriate steps to prevent or reduce these risks. However, in many cases, the employers and their employees have little or no information about the premises where they are going to undertake work, and are not aware if ACM's are present.

### 1.1 Roles and Responsibilities Interpretation

- (a) A Duty Holder is defined as the person(s) who owns or is in control, through contract or tenancy, of non-domestic premises.
- (b) With regard to multiple tenanted premises, the duty holder shall be the person who owns or is in control of the building, including access and egress.
- (c) All other persons shall cooperate with the duty holder to allow them to comply with their duties and requirements under this CoP.

## 1.2 Phased Implementation

- (a) The requirements of this CoP shall apply from the date of issue to all new building permits issued by the relevant municipality.
- (b) For buildings that are over ten years in age (from date of practical completion), a two year period shall be allowed for compliance to the requirements of this CoP.
- (c) For buildings that are under ten years of age (from date of practical completion) a 5 year period shall be allowed for compliance to the requirements of this CoP.
- (d) All demolition or decommissioning projects, that require a building permit to be issued from the relevant municipality, shall comply with all the requirements as stated in this CoP.

## 2. Training and Competency

- (a) Employers shall ensure that EHS training complies with the requirements of:
  - (i) *AD EHSMS RF – Element 05 – Training and Competency;*
  - (ii) *AD EHS RI – Mechanism 7.0 – AD EHS Professional Entity Registration; and*
  - (iii) *AD EHS RI – Mechanism 8.0 – AD EHS Practitioner Registration.*
- (b) The duty holder shall ensure that the results of the asbestos management plan are communicated to all employee's that work within the building / facility. The communication shall include:
  - (i) overview of asbestos and the risks;
  - (ii) types of asbestos;
  - (iii) locations asbestos has been identified or presumed present;
  - (iv) control measures adopted;
  - (v) ongoing actions; and
  - (vi) safe working procedures (including those for contractors visiting the building).
- (c) Further to training for all staff, the duty holder shall ensure that all areas where asbestos has been identified are clearly marked through recognized signage. The type of signage used shall be reflective of that described within the asbestos management plan and shall conform to the standards set for safety signage within the *AD EHS RI – CoP 17.0 – Safety Signs and Signals.*
- (d) Contractors shall be informed that the building / facility contains asbestos as soon as is reasonably practicable, preferably during the tendering stage. Further to this, the duty holder shall erect signage at a prominent area where contractors would enter the building to inform them that asbestos is present and prior to any further works being undertaken, the asbestos management plan shall be reviewed.
- (e) The duty holder shall also ensure that each building / facility under their control, either through ownership or contract, has a competent person in place to manage the requirements of the management plan. This person shall also be the focal point for

contractors when they are engaged to work in the building / facility. The duty holder shall ensure that this person is given appropriate training to fully understand the risks posed by asbestos and to implement the requirements of the management plan.

## 3. Requirements

### 3.1 Legal Requirements

- (a) Listed below are the main legislative requirements related to asbestos within the United Arab Emirates. All the requirements listed within these documents shall be adhered to, however compliance with this document and those referenced within, shall ensure compliance with the requirements stated within the legal standards listed below:
- (i) Federal Cabinet Resolution No. (39) of 2006 on banning the import and production of Asbestos;
  - (ii) Federal Ministerial Decision No. (32) of 1982 on Protecting Employees from Hazards at Work;
  - (iii) Federal Ministerial Decision (4/1) of 1981 Determination of Hazardous Works;
  - (iv) Federal Labour Law (8) of 1980 concerning Labour Regulations (Schedule 1);
  - (v) Federal Law No. 24 of 1999 for the Protection and Development of the Environment – Regulation for Handling Hazardous Materials, Hazardous Wastes and Medical Wastes; and
  - (vi) Abu Dhabi Emirate: Law 21 of 2005 for Waste Management.

### 3.2 Permits and Licensing

- (a) Listed below are the specific licensing and permitting requirements relevant to this CoP. It must be noted that other, more general permitting requirements, such as a building permit, shall also be adhered to. The duty holder is required to ensure that all licensing and permitting requirements have been satisfied prior to any work commencing.
- (b) Asbestos Supervising Consultant:
- (i) shall be registered and approved by the AD EHS Center as per *AD EHS RI – Mechanism 8.0 – AD EHS Practitioner Registration*.
- (c) Testing Facilities:
- (i) all testing facilities shall be approved by Emirates Standardization and Metrology Authority (ESMA).
- (d) Asbestos Removal Contractor:
- (i) to be approved by the Center for Waste Management – Abu Dhabi (CWM-AD).
- (e) Asbestos Waste Carriers / Transporters:
- (i) to be approved by the CWM-AD.

- (f) Asbestos Waste Facilities:
- (i) to be approved by the CWM-AD.

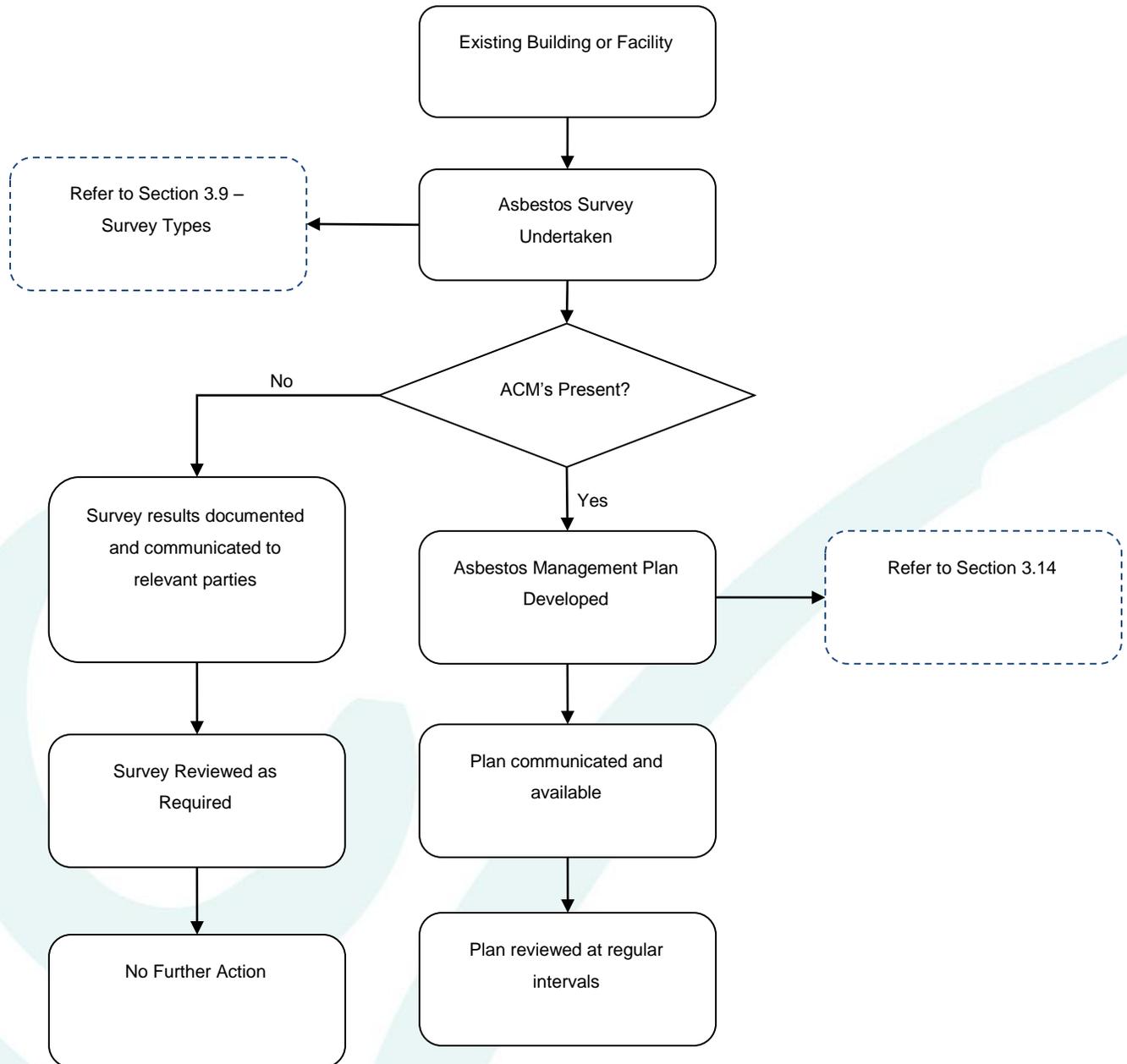
### 3.3 Roles and Responsibilities

- (a) Duty Holder shall:
- (i) ensure that all buildings under their control have been surveyed by a licensed Asbestos Supervising Consultant to identify any potential asbestos containing materials;
  - (ii) ensure that the findings of any such survey are communicated to all relevant parties;
  - (iii) ensure that each building, where ACM have been identified or is assumed to be present, has a competent person in place to manage the requirements of this CoP;
  - (iv) have the ability, through contractual arrangements, to delegate the responsibility of managing the requirements of this CoP to their building managers or relevant person(s), however the duty holder shall take reasonable steps to ensure that the requirements of this CoP have been implemented and managed;
  - (v) ensure that where ACM is present or is assumed to be present, an Asbestos Management Plan is developed to ensure that the risk from exposure is managed and controlled;
  - (vi) ensure that for any works that may involve ACM or bring employee's or other persons into possible contact with ACM, an independent competent licensed Asbestos Supervising Consultant is engaged directly by the duty holder to manage and oversee any such works; and
  - (vii) ensure that any works that may involve ACM or bring employees or other persons into contact with ACM are undertaken by a Licensed Asbestos Contractor.
- (b) Independent Licensed Asbestos Supervising Consultant (ASC) shall:
- (i) ensure that prior to any works being undertaken, the duty holder is fully aware of his statutory duties;
  - (ii) ensure that prior to any works commencing, the relevant authorities are informed and approvals (where required) in place;
  - (iii) ensure that any sampling / identification being undertaken is done in strict accordance with the requirements of this CoP;
  - (iv) ensure that where ACM is identified, a management plan is developed that clearly identifies the future requirements for the building;
  - (v) ensure that the results of the management plan are clearly communicated to the duty holder and other relevant stakeholders; and
  - (vi) monitor any works involving ACM and ensure the requirements of the plan of works and/or the management plan are adhered to. The ASC shall report findings to the duty holder on a regular basis.

- (c) Licensed Asbestos Contractor (AC) shall:
- (i) prior to undertaking any works, the AC shall request from the duty holder a copy of the asbestos management plan for the building / facility;
  - (ii) prior to any works being undertaken the AC shall inform the duty holder of the need to engage a licensed ASC. No work shall be undertaken unless both these parties are in place;
  - (iii) prior to any works being undertaken the AC shall develop a plan of works in strict accordance with the requirements of this CoP;
  - (iv) prior to any works being undertaken the AC, in conjunction with the ASC shall ensure that all notifications and approvals from relevant authorities are in place; and
  - (v) the AC shall undertake all works in strict accordance with the requirements agreed in the management plan and/or the plan of works.

### **3.4 Identification**

- (a) Each duty holder shall ensure that an appropriate survey is undertaken in every premise they are in control of to determine if ACM is present or not.
- (b) The survey shall include the type and condition of any ACM that is found, along with future maintenance requirements.
- (c) The survey shall be undertaken by a competent Asbestos Supervising Consultant, who is licensed and registered by the AD EHS Center.
- (d) The findings of the survey shall be recorded and communicated to all relevant stakeholders.
- (e) When determining the level of identification survey to be undertaken, the age of the building and the likelihood of it containing ACM's shall be considered.
- (f) The survey shall be reviewed where it is considered to be no longer valid or significant changes have been made to the building.



**Figure 1 - Identification of Asbestos –All Non Domestic Buildings / Facilities**

### 3.5 Requirement to Complete an Asbestos Survey

- (a) All non-domestic buildings within the Emirate of Abu Dhabi shall have an asbestos survey undertaken. The level of survey that is completed shall be dependent on the risk(s) that are present and the likelihood of asbestos being present. A licensed ASC shall advise on the type of survey that is required for the building / facility.

- (b) A non-domestic building has been defined as any building with a primary use for commercial / industrial activities on behalf of the duty holder. This would include a block of residential apartments as the primary use for the duty holder would be the rental values. A domestic premise(s) is a private dwelling in which a person(s) lives.
- (c) The Duty Holder for the Building / Facility shall, as soon as is reasonably practicable, engage the services of a licensed ASC. The ASC role shall be to undertake a risk assessment of the building, and from this assessment, advise the duty holder of the type and level of survey required.

### **3.6 Asbestos in Domestic Properties**

- (a) Domestic properties are very unlikely to have a full asbestos register or have been surveyed prior to starting any works, despite many domestic properties containing ACM's.
- (b) Any work that is being undertaken in domestic premises which requires an application for a building permit from the relevant municipality, shall comply with the requirements of this CoP.
- (c) Prior to any works being undertaken, a survey shall be completed to identify, or not, ACM. Following completion of the survey, any identified ACM shall be removed, regardless of condition or type.
- (d) The owner of the property shall present the completed asbestos survey to the relevant municipality, along with the clearance certificate when applying for a building permit.

### **3.7 Presuming that Materials Contain Asbestos**

- (a) There are many circumstances where it is not reasonably practicable for duty holders to undertake sampling to determine the presence of asbestos. In these situations, rather than taking samples to determine whether a material contains asbestos, the duty holder shall simply presume the material contains asbestos. Once such a presumption has been made, the material shall be treated as an ACM, with work practices and disposal criteria as required for the presence of asbestos, until the material is removed or testing has confirmed that it does not, in fact, contain asbestos.
- (b) A list of common areas / materials where asbestos can be commonly found is included in Appendix B. This Appendix may be used as an aid in determining which materials, if any, may be presumed to contain asbestos.
- (c) As indicated above, if there are inaccessible areas that are likely to contain ACM the duty holder shall presume that asbestos is present in these areas. For example, it may be reasonably practicable to presume that wall cavities or ceiling spaces contain ACM such as asbestos insulation. It may also be more cost effective in other circumstances to apply the presumption instead of sampling and analyzing suspected ACM, as would otherwise be required to rule out the presence of asbestos.

- (d) The asbestos register shall state all the presumptions made about materials in the workplace. This can be done through a simple, generic statement relating to all occurrences of a specific type of product or situation. For example, a generic presumption statement in the register might read, 'All wall cavities are presumed to contain asbestos' or 'all underground conduits are presumed to contain asbestos'.

### 3.8 Asbestos Surveys Types

- (a) There are three levels of survey that can be undertaken to identify if asbestos containing materials are present.
- (b) Asbestos Survey Type 1 - Presumptive (Location and Assessment):
- (i) The purpose of the survey is to locate, as far as reasonably practicable, the presence and extent of any suspect ACMs in the building and assess their condition. This survey essentially defers the need to sample and analyze for asbestos (or the absence thereof) until a later time (eg. prior to demolition or major refurbishment). The duty holder bears potential additional costs of management for some non-asbestos-containing materials. All areas shall be accessed and inspected as far as reasonably practicable (eg. above false ceilings and inside risers, service ducts etc.) or shall be presumed to contain asbestos. Any material, which can reasonably be expected to contain asbestos, shall be presumed to contain asbestos, and where it appears highly likely to contain asbestos, there shall be a strong presumption that it does. All materials, which are presumed to contain asbestos, shall be assessed.
- (c) Asbestos Survey Type 2 - Sampling survey (Standard sampling, identification and assessment):
- (i) The purpose and procedures used in this survey are the same as for Type 1, except that representative samples are collected and analyzed for the presence of asbestos. If the material sampled is found to contain ACM, similar materials used in the same way in the building shall be strongly presumed to contain asbestos.
- (d) Asbestos Survey Type 3 - Pre-demolition/major refurbishment (Full access sampling and identification survey):
- (i) This type of survey is used to locate and describe, as far as reasonably practicable, all ACMs in the building and may involve destructive inspection, as required, to gain access to all areas, including those that may be difficult to reach. A full sampling program is undertaken to identify possible ACMs. This survey is designed to be used as a basis for tendering the removal of ACMs from the building prior to demolition or major refurbishment, so the survey does not normally assess the condition of the asbestos.
- (e) As part of the surveying process, the ASC may also undertake air sampling or dust sampling. This will help to identify if damage has previously occurred. This information will be helpful when undertaking a risk assessment.

### 3.8.1 Sample Testing

- (a) As part of an Asbestos survey, there may be a need for samples to be tested to determine the type of materials present. If this is required, only licensed laboratories can be used to undertake these sample tests. The ASC will normally provide this service as part of the survey they are undertaking, however the duty holder shall ensure that the requirements of this guide are implemented.

### 3.9 Asbestos Supervising Consultant

- (a) An Asbestos Survey can only be undertaken by a licensed Asbestos Supervising Consultant (ASC). The ASC is licensed by the AD EHS Center and has to demonstrate that he has appropriate qualifications and experience to undertake a survey and develop a robust and comprehensive Asbestos Management Plan.
- (b) The duty holder shall demonstrate that he has undertaken appropriate checks on the ASC to ensure they are competent and have appropriate resources to undertake the tasks.

### 3.10 Asbestos Register

- (a) Following the completion of the asbestos survey, a register of the building shall be developed that clearly shows all the location(s) in which asbestos containing materials were identified or presumed to be present, along with supporting evidence that will assist the ASC to undertake a full risk assessment of the building.
- (b) The register shall contain as a minimum the following information:
  - (i) General:
    - 1) The date on which the survey was undertaken;
    - 2) Details of the ASC;
    - 3) Restrictions on the survey;
    - 4) Assumptions made on the survey;
    - 5) Details of areas where indicative samples taken; and
    - 6) Details of inaccessible areas where ACM's likely to exist.
  - (ii) Location:
    - 1) Location of any ACMs present (presumed or otherwise) – Photos of locations will benefit the register;
    - 2) Product / Type; and
    - 3) Type of ACM (presumed or otherwise) present.
  - (iii) Quantity:
    - 1) Amount of ACM present;
    - 2) Surface coating; and
    - 3) What, if any surface coatings have been applied.

- (iv) Condition of the ACM:
- (v) Accessibility:
  - 1) How accessible is the ACM;
  - 2) How likely are people going to access the general area; and
  - 3) Other works in the area.

### 3.11 Risk Assessment

- (a) Following the completion of a survey and an asbestos register, a risk assessment shall be undertaken to identify control measures and prioritize actions. The ASC will undertake the risk assessment, using the information identified within the asbestos survey. If air sampling or dust sampling has not already been undertaken as part of the survey, the ASC may require this to be completed at this point. The analysis of dust or air in the location may provide information on previous damage or exposure.
- (b) The purpose of the risk assessment is to identify the areas where exposure to asbestos is more likely and then introduce control measure(s) to prevent exposure.
- (c) The risk assessment process will consider the following issues as a minimum:
  - (i) The condition of the ACM:
    - a. *Indicates the level of damage to the material.*
  - (ii) Surface treatment:
    - a. *How is the ACM protected from damage and by what material?*
  - (iii) Type:
    - a. *The type of asbestos present.*
  - (iv) Material type:
    - a. *The material that is presumed or confirmed to contain asbestos, eg. floor tile adhesive, cement board etc.*
  - (v) Accessibility:
    - a. *How accessible is the material.*
  - (vi) Surrounding environment:
    - a. *What factors, such as the nature or type of work, in the surrounding environment is likely to disturb the asbestos.*
- (d) Based upon the findings of the assessment, each material with presumed or identified asbestos fibers shall be given a given a control measure. The purpose of the control measure shall be to reduce the risk of exposure to asbestos to the lowest reasonable level.
- (e) When assigning control measures the following criteria shall be considered;
  - (i) If the ACM is friable and not in a stable condition, and there is a risk to health from exposure, they shall be removed by a licensed Asbestos Removal Contractor as soon as reasonably practicable;

- (ii) If the ACM is friable but in a stable condition and is accessible, serious consideration shall be given to their removal. If removal is not immediately reasonably practicable, short-term control measures, such as sealing and enclosure, shall be used until removal is reasonably practicable;
  - (iii) If the ACM is not friable and in a good, stable condition, minimizing disturbance and encapsulation may be appropriate controls;
  - (iv) Any remaining ACM shall be clearly labelled and regularly inspected to ensure they are not deteriorating or otherwise contributing to an unacceptable health risk; and
  - (v) ACM shall to be removed before demolition, partial demolition, renovation or refurbishment if they are likely to be disturbed by those works. Refer to the document titled “Technical Guide: Safe Removal of Asbestos Containing Material” for guidance on safe removal techniques.
- (f) It shall be noted that the control measures listed above, only relate to actions directly related to ACM’s and do not include secondary control measures such as training, communication, PPE etc as these would be specific to the building or facility. The ASC shall consider relevant control measures when undertaking a risk assessment.
- (g) An action plan shall be developed for each material that is known or presumed to contain asbestos. The action plan shall include;
- (i) location;
  - (ii) product;
  - (iii) immediate actions;
  - (iv) timescales;
  - (v) on-going / future actions, including monitoring or removal; and
  - (vi) owner.

### 3.12 Management Plan

- (a) All premises, which contain or are presumed to contain asbestos, shall develop an Asbestos Management Plan. The Asbestos Management plan is a broad ranging document that contains all the information required to manage any identified or presumed asbestos in the building / facility.
- (b) The management plan shall be developed by a competent Asbestos Supervising Consultant, who is licensed and registered by the AD EHS Center.
- (c) As a minimum the plan shall include:
  - (i) Section One – Introduction:
    - a. *The date on which the plan was developed;*
    - b. *Details of the ASC;*
    - c. *Details of the building / facility the management plan has been developed for;*
    - d. *Current use / work practices of the building / facility;*

- e. *Review requirements; and*
  - f. *Roles and responsibilities of key stakeholders, including external parties where applicable.*
  - (ii) Section Two - Asbestos Register:
    - a. *The specific asbestos register.*
  - (iii) Section Three - Asbestos Risk Assessment:
    - a. *The specific asbestos risk assessment.*
  - (iv) Section Four - Asbestos Action Plan:
    - a. *An action plan that clearly details each specific control measure for each material identified or presumed to contain asbestos.*
  - (v) Section Five - Information on Management Decisions:
    - a. *What factors were used when making decisions on removing, maintaining or replacing asbestos containing materials?*
  - (vi) Section Six - Consultation and Communication:
    - a. *The mechanisms that will be used to ensure that all relevant parties are informed on the location, type and condition of the ACM, the risks that are posed and the control measures that have been adopted to reduce those risks.*
  - (vii) Section Seven - Training Arrangements:
    - a. *Including all relevant parties such as employees and contractors.*
  - (viii) Section Eight - Details of planned maintenance work on / in close proximity to the ACM.
    - a. *A register of the planned work shall be developed.*
  - (ix) Section Nine - Register of completed works:
    - a. *Name of contractor;*
    - b. *Date;*
    - c. *Works undertaken;*
    - d. *Clearance certificates; and*
    - e. *Specific work procedures / risk assessments.*
  - (x) Section Ten - Procedure to update the Asbestos Management Plan:
    - a. *The asbestos management plan shall be held in a location that is easily accessible at all time within the building / facility and shall be readily available for review. The asbestos management plan shall be reviewed and updated at regular intervals or when the conditions or practices detailed within the plan are no longer reflective of the building / facility. The period between each review shall be no longer than 3 years.*
- (d) The duty holder shall ensure that the plan is reviewed on a regular basis, not to exceed three years, or when it is felt it is no longer valid or significant changes have been made to the structure.

- (e) The duty holder shall ensure that the plan is communicated to all relevant stakeholders/staff in the premises.
- (f) The duty holder shall ensure that the plan is available in the building for review by relevant stakeholders at all times.

### 3.13 Maintenance Work

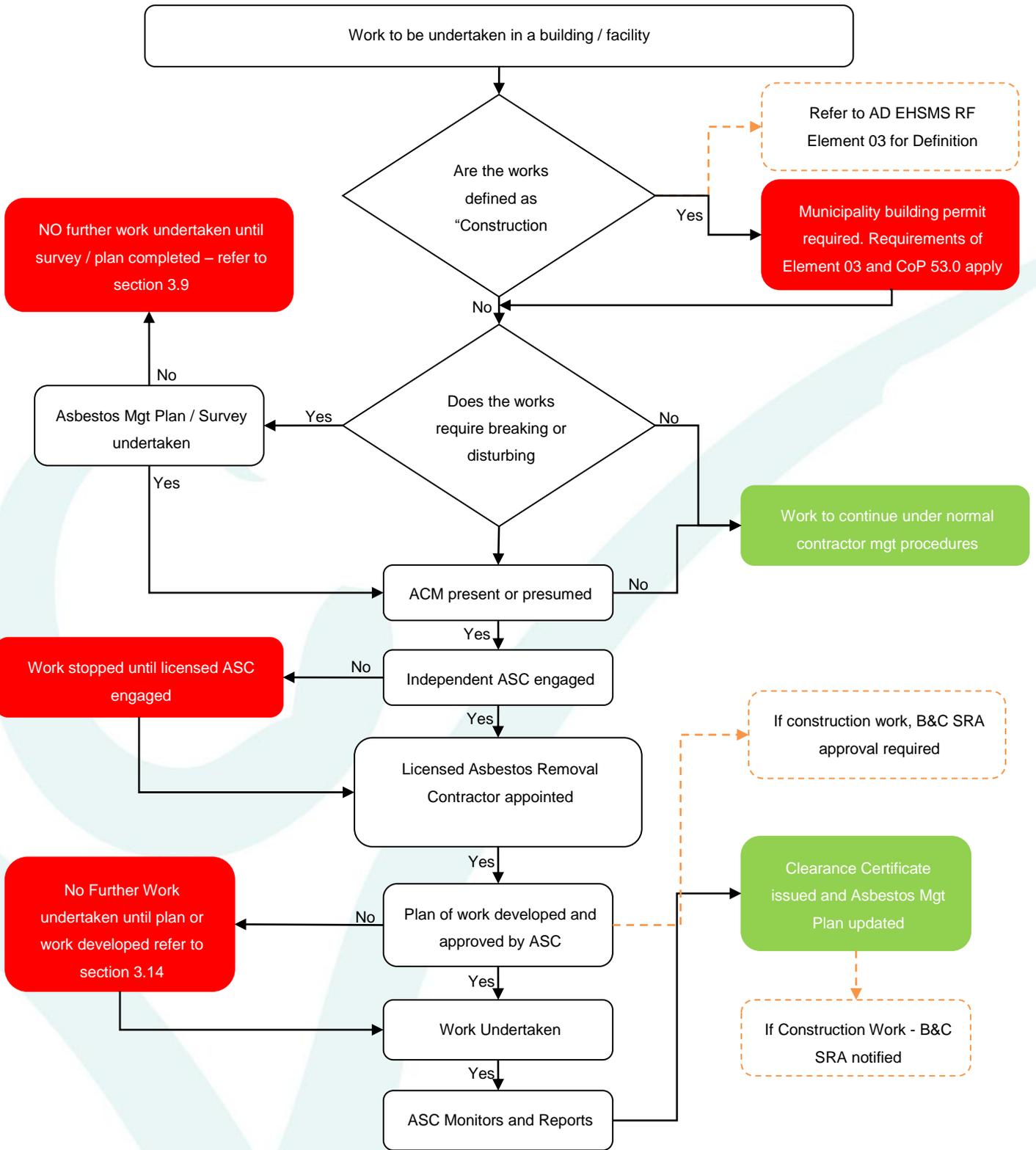
- (a) The duty holder shall ensure that all persons who engage or have an input into the selection procedure for contractors are aware of the contents of the asbestos management plan and how these requirements shall be implemented.
- (b) A contractor management procedure, taking into account the requirements of *AD EHSMS RF – Element 03 – Management of Contractors* and those within this document shall be developed and implemented within the building / facility.
- (c) A Permit to Work system shall be developed for any works on or within the close proximity of ACM(s). The PTW system shall adhere with the requirements of *AD EHS RI – CoP 21.0 – Permit to Work Systems*.

### 3.14 Plan of Work

- (a) No work shall be undertaken unless an assessment has been made as to the risk of exposure to Asbestos to the employees of the building or other persons affected.
- (b) Where demolition or major refurbishment is being undertaken, a full type three intrusive/destructive survey is required to determine the levels and types of asbestos present.
- (c) The duty holder shall officially notify the Building and Construction SRA (B&C SRA) of their intent to undertake works involving asbestos.
- (d) An independent competent ASC shall be appointed to manage the works involving contact with ACM and to ensure that the requirements of the plan of work are adhered to.
- (e) The plan of works shall be developed by a competent asbestos contractor, licensed by the CWM-AD.
- (f) The ASC shall review and approve the plan of works as developed by the asbestos contractor.
- (g) Upon approval, the duty holder, in conjunction with the competent asbestos contractor, shall ensure that all control measures identified and approved within the plan of works are implemented prior to any works being undertaken.
- (h) The plan of work is a key safety document that takes the information about significant risks from the risk assessment and combines them with the job specification, to produce a practical and safe working method for employees to follow on site.

- (i) The plan of work shall aim to control employees' exposure to asbestos and thereby reduce the future incidence of asbestos related disease.
- (j) As a minimum, the plan of work shall include; (an aide-memoir is included as Appendix A of this document):
  - (i) the scope of the work;
  - (ii) the nature and probable duration of the work;
  - (iii) the location of the place where the work is to be carried out;
  - (iv) the methods to be applied where the work involves the handling of asbestos or materials containing asbestos;
  - (v) the number of persons involved in the work;
  - (vi) the characteristics of the equipment to be used;
  - (vii) protection and decontamination of those carrying out the work;
  - (viii) protection of other persons on or near the worksite;
  - (ix) the arrangements for the handling and disposing of asbestos waste;
  - (x) the control measures which the duty holder intends to take in order to prevent or reduce the exposure to asbestos;
  - (xi) the type of equipment, including PPE, used for:
    - 1) *the protection and decontamination of those carrying out the work; and*
    - 2) *the protection of other people present at or near the worksite.*
  - (xii) details of the hygiene facilities, transit route and decontamination arrangements, vacuum cleaners, other equipment, air monitoring, protective clothing and RPE, communication between the inside and outside of the enclosure;
  - (xiii) details of the use of barriers and signs, location of enclosures and airlocks, location of skips, negative pressure units, air monitoring, cleaning and clearance certification, emergency procedures;
  - (xiv) the control measures which the duty holder intends to take in order to ensure the premises, or those parts of the premises where that work is carried out, and the plant used in connection with that work are kept in a clean state; and
  - (xv) details of where such work has been completed, the premises, or those parts of the premises where the work was carried out, are thoroughly cleaned.
- (k) The duty holder shall ensure, so far as is reasonably practicable, that the work to which the plan of work relates is carried out in accordance with that plan and any subsequent written changes to it.
- (l) The asbestos contractor, in conjunction with the duty holder, shall undertake regular monitoring to ensure that the control measures identified and approved in the plan of works are being maintained and are still appropriate to the works being undertaken.
- (m) The ASC shall undertake regular monitoring of the work to ensure that the requirements of the Plan or Work are being adhered to.

- (n) The ASC shall, on completion of the works, review the plan of works and where appropriate, issue a clearance certificate to show the ACM(s) have been fully removed.
- (o) The ASC shall, on completion of the works, update the Asbestos Management Plan to reflect the works undertaken.
- (p) Upon completion of the planned works, the asbestos contractor, in conjunction with the duty holder shall officially notify the B&C SRA.



**Figure 2 - Working with Asbestos**

### **3.15 General Requirements for the Removal of Asbestos Containing Materials**

- (a) ACM shall be removed without consideration to the requirements of section 3.14 of this document.
- (b) The plan of works, developed in line with the requirements of section 3.14, shall be reviewed or updated to ensure that it incorporates any additional requirements for the removal of ACM.
- (c) These requirements will as a minimum include:
  - (i) packaging of any removed ACM;
  - (ii) estimated amount of ACM to be removed;
  - (iii) type of ACM to be removed;
  - (iv) transportation arrangements for ACMs;
  - (v) disposal arrangements;
  - (vi) containment arrangements; and
  - (vii) clean up / decontamination.
- (d) The ASC shall ensure that each site-specific asbestos removal control plan addresses any potential for asbestos-contamination and ensures this risk will be appropriately controlled.
- (e) Notwithstanding this preventive emphasis, the asbestos removal control plan shall also have provisions to ensure that any asbestos-contamination is promptly identified and rectified.
- (f) Decontamination requirements for personnel, tools and equipment, the asbestos work area and any other areas that could become contaminated need to be considered and addressed in the plan.

### **3.16 Determining the Asbestos Removal Boundaries**

- (a) There are two 'asbestos removal boundaries' for asbestos removal work:
  - (i) the boundaries of the asbestos work area; and
  - (ii) the boundaries of the asbestos removal site.
- (b) The asbestos work area is the immediate area in which ACM removal work is taking place.
- (c) The asbestos removal site is the region surrounding, and adjacent to, this asbestos work area.
- (d) The asbestos work area and the asbestos removal site shall be clearly defined.
- (e) The boundaries of the asbestos work area and the asbestos removal site shall be determined by the ASC, in coordination with the Asbestos Removal Contractor and shall be based on the risk assessment(s).

- (f) All stakeholders shall agree on the asbestos removal boundaries before any asbestos removal work may commence.
- (g) In determining the asbestos removal boundaries, consideration needs to be given to;
  - (i) the use and suitability of various types of enclosures and asbestos removal methods; and
  - (ii) the impacts of the asbestos removal work, including potential exposures, in the surrounding region.

### **3.17 Security, Signs and Barriers**

- (a) Responsibilities for the security and safety of the asbestos removal site and asbestos work area shall be specified in the asbestos removal plan of work.
- (b) Site-specific security and emergency plans shall be provided prior to commencement of the works. Maintenance of site security and the prevention of unauthorized access shall be designated in the asbestos removal control plan.
- (c) The responsible person (as defined in the plan of work) shall ensure the security and safety of the asbestos removal site and asbestos work area at all times, particularly if the removal process is to take place over several days or an extended period of time.
- (d) The asbestos removal site shall be clearly defined to ensure that non-essential people do not enter and to clearly delineate the removal site and warn persons that asbestos removal work is being carried out (eg. through the placement of barriers and signs or other warning devices). All barriers and warning signs shall remain in place until a clearance to re-occupy has been granted .
- (e) Potential entry points to the asbestos work area shall be signposted.
- (f) These signs shall be weather-proof, constructed of light-weight material and appropriately secured.
- (g) Tape can be used as a barrier to define an asbestos work area for some types of asbestos removal work of short duration. If a sign is not feasible, tape with the words 'asbestos hazard' along its length can be used instead to communicate the hazard.
- (h) In determining the distance between barriers and the asbestos work area the risk assessment shall take account of:
  - (i) whether the ACM are friable or non-friable;
  - (ii) activity around the asbestos work area (other employees, visitors, the public, etc);
  - (iii) the methods of ACM removal;
  - (iv) any existing barriers (eg. walls, doors, etc);
  - (v) the quantity of ACM to be removed; and
  - (vi) the type of barrier used (eg. boarding or tape).

### 3.18 Preparation

- (a) Preparation activities include minimizing the number of people present and gathering the correct tools, PPE, decontamination materials, barricades, warning signs, etc at the workplace before any work commences.
- (b) Before removal tasks commence plastic sheeting (for containment) may need to be placed on the floor or other surfaces that may become contaminated with asbestos dust. If the removal work is not being carried out in an enclosure, the surfaces to be worked on shall be cleaned, by either wet wiping or vacuuming (refer section 3.25), to minimize exposure from the disturbance of asbestos fibres that might be on the surfaces prior to the commencement of removal tasks.

### 3.19 Wet and Dry Methods for Removing ACM

- (a) Wherever reasonably practicable, dry ACM shall not be worked on. Techniques that prevent the generation of airborne asbestos fibers shall be used. The following methods shall be used for removing ACM, except when cleaning up asbestos-cement debris from soil.

### 3.20 Wet Spray Method (Preferred Method)

- (a) The ACM shall be saturated through its full depth and maintained in a wet condition.
- (b) In many instances it is helpful if a wetting agent (surfactant), such as detergent, is added to the water, as this facilitates more rapid wetting of the ACM.
- (c) A manually controlled, consistent low pressure, coarse spray, such as from an adjustable pistol-grip garden hose, is recommended for this purpose.
- (d) The design of the spraying equipment will depend on the availability of a water supply and access to the area to be sprayed.
- (e) With this method, a water spray shall be applied in a manner that:
  - (i) ensures the entire surface of the ACM is saturated; but
  - (ii) minimises runoff.
- (f) While the water spray shall be copious, it shall not be so forceful that the water droplets generate dust when they hit the surface of the ACM.
- (g) When cutting equipment is being used to remove an ACM that is friable, the water spray shall be directed at the site of the cut and the wetted material shall be removed as the cut progresses.
- (h) The wetted ACM shall be removed in sections, immediately placed in appropriately labelled asbestos waste containers and appropriately sealed. Any small sections that might be dislodged shall be collected and appropriately disposed of as asbestos waste.

- (i) This is the preferred removal method. It shall only be used, however, if:
  - (i) the ACM is not covered with other materials such as calico or metal cladding, which require prior removal;
  - (ii) there is no reinforcing wire or other similar restriction on removal;
  - (iii) the ACM is not coated with paint or mastic;
  - (iv) any rapid temperature drop caused by excessive water will not damage heated metal components; and
  - (v) no live electrical conductors are present and no damage to electrical equipment can arise from the ingress of water.
- (j) Although airborne asbestos fibres are significantly suppressed when the wet spray method is used, they are not entirely eliminated, so effective respiratory protection is also essential.

### **3.21 Dry Removal Method (Least Preferred)**

- (a) The dry removal method shall be used only if:
  - (i) the wet spray method is not appropriate (eg. if there are live electrical conductors or if major electrical equipment could be permanently damaged or made dangerous by contact with water).
- (b) There is a much greater potential for airborne asbestos fibres to be generated with the dry removal method than with the wet spray method.
- (c) Accordingly, if the dry removal method has to be used the following factors shall be considered and employed, as determined by risk assessment:
  - (i) the work area shall be fully enclosed with plastic sheeting (at least 200  $\mu\text{m}$  thick) and maintained at a negative pressure (at least 12 Pa water gauge);
  - (ii) all personnel involved in the removal operation shall wear full-face, positive pressure, supplied air respirators;
  - (iii) the ACM shall be removed in small, pre-cut sections with minimal disturbance, so as to reduce the generation of airborne asbestos fibres as much as reasonably practicable;
  - (iv) waste material shall be immediately placed in appropriate wetted containers; and
  - (v) in some situations HEPA vacuum cleaners can be used to minimise airborne asbestos fibres. If it is reasonable practicable to use HEPA vacuum cleaners, shadow vacuuming techniques shall be employed. In order to achieve the required efficiency, the air speed at the extraction point shall be at least 1 m/sec and the nozzle shall be large enough and placed close enough (at a distance not more than the diameter of the nozzle) to provide efficient collection of airborne fibres.

## 3.22 Asbestos Removal Equipment

### 3.22.1 Tools

- (a) Care shall be taken in selecting tools for asbestos removal tasks.
- (b) In addition to having to be appropriate for these tasks, all tools shall prevent or minimize the generation and dispersion of airborne asbestos fibres as much as reasonably practicable.
- (c) The use of power tools in asbestos removal work shall be avoided because of the possibility of internal contamination, which commonly occurs with such devices. In general, manually operated hand tools shall be used.
- (d) If manually operated hand tools are not appropriate, low-speed battery powered tools, which may be used in conjunction with wet methods for dust control, are preferred.
- (e) Battery-powered tools shall be fitted with a local exhaust ventilation (LEV) dust control hood wherever other dust control methods (eg. use of wet removal methods) are determined to be unsuitable. Consideration shall be given to the use of shadow-vacuuming techniques if a LEV dust control hood cannot be attached and no other dust control method is used.
- (f) At the end of the removal work, all tools shall be:
  - (i) decontaminated (eg. fully dismantled and cleaned under controlled conditions as described in section 3.25.2); or
  - (ii) placed in sealed containers (and used only for asbestos removal work); or
  - (iii) disposed of as asbestos waste.
- (g) Warning: High-speed abrasive power or pneumatic tools such as angle grinders, sanders, saws and high speed drills shall never be used.

### 3.22.2 Spray Equipment

- (a) A constant low-pressure water supply is required for wetting down asbestos. This can be achieved with a mains-supplied garden hose fitted with a pistol grip. If no water supply is readily available, a portable pressurized vessel, such as a pump-up garden sprayer, may be able to be used.
- (b) Warning: High-pressure spray equipment shall never be used.

### 3.22.3 Asbestos Vacuum Cleaners

- (a) Asbestos vacuum cleaners shall comply with the requirements of AS 3544-1988 Industrial Vacuum Cleaners for Particulates Hazardous to Health and AS 4260-1997 High Efficiency Particulate Air Filters (HEPA) – Classification, Construction and Performance.
- (b) Warning: Domestic vacuum cleaners are unsuitable and shall never be used, even if they have a HEPA filter.

- (c) Asbestos vacuum cleaners shall only be used for collecting small pieces of asbestos dust and debris. Larger pieces shall never be broken into smaller sizes so they can be vacuumed.
- (d) Asbestos vacuum cleaners shall not be used for vacuuming wet materials because this can damage the HEPA filter.
- (e) Procedures shall be established for the general maintenance of asbestos vacuum cleaners in a controlled environment. They shall be cleaned externally with a wet cloth after each task, the hose and attachments shall be stored in a labelled impervious bag and a cap shall be placed over the opening to the asbestos vacuum cleaner when the attachments are removed.
- (f) PPE shall be worn whenever an asbestos vacuum cleaner is opened to change the bag or filter or to perform other maintenance or decontamination.
- (g) The emptying of asbestos vacuum cleaners can be hazardous if the correct procedures are not followed. Asbestos vacuum cleaners shall only be emptied by a competent person with the correct PPE, in a controlled environment and in compliance with the manufacturer's instructions.
- (h) Whenever reasonably practicable, asbestos vacuum cleaners shall not be hired, as they can be difficult to fully decontaminate.
- (i) If hiring is required, they shall be hired only from entities that provide vacuum cleaners specifically for work with asbestos.
- (j) The asbestos vacuum cleaner shall be hired out in a sealed storage container, with instructions that it may be removed from the container only when it is inside the asbestos work area and users are wearing appropriate PPE.
- (k) When the work is completed, the asbestos vacuum cleaner shall be decontaminated — with the bag and filter being removed in accordance with the manufacturer's instructions and disposed of as asbestos waste, and the inside and outside of the vacuum cleaner being wet wiped — and the asbestos vacuum cleaner shall be re-sealed in the storage container provided. The sealed storage container shall then be decontaminated by wet wiping before being removed from the asbestos work area and returned to the hire entity.
- (l) Entities that hire out asbestos vacuum cleaners shall ensure that all their asbestos vacuum cleaners, filters and bags are maintained in good working order and that the hirers are competent in their safe use.

#### **3.22.4 Inspection of Equipment**

- (a) All equipment used for the removal of ACM shall be inspected before the commencement of the removal work, after any repairs and at least once every seven days when it is continually being used.
- (b) A register with details of these inspections, the state of the equipment and any repairs shall be maintained.

### 3.23 Personal Protective Equipment (PPE)

#### 3.23.1 Respiratory Protective Equipment

- (a) All persons engaged in asbestos removal work shall wear Respiratory Protective Equipment (RPE) conforming to the requirements of *AD EHS RI – CoP 2.0 – Personal Protective Equipment*.
- (b) Respirators shall be issued to individuals for their exclusive use. A system of regular cleaning, inspection and maintenance shall be provided for respirators on extended personal issue, and records of all respirator issues and uses shall be established and maintained.
- (c) The level of respiratory protection required shall be determined by a competent person in accordance with the asbestos removal task to be undertaken.
- (d) Systems of work shall be established for the cleaning, maintenance and storage of respirators. Respirators shall be maintained in a clean and good working condition by the person designated by the supervisor of the removal job to look after and be responsible for the safe working condition of respiratory equipment.
- (e) Respirator defects shall be reported immediately to the supervisor of the removal job for repair or replacement.
- (f) Employees shall receive instruction and training in the correct method of using their respirators, the importance of a correct facial fit and the requirements of the system of regular cleaning, inspection and maintenance.
- (g) Employees shall undergo a 'fit test' in order to determine their suitability to wear negative pressure respirators. Persons with beards or other facial hair or stubble will not be protected appropriately by 'negative pressure' respirators that require a facial seal, so all asbestos removal employees using respirators that require a facial seal shall be clean-shaven.
- (h) If a medical condition precludes the use of negative pressure respirators, individuals shall be provided with a continuous flow, positive pressure respirator wherever reasonably practicable. The suitability of these individuals for work in the asbestos removal industry shall be assessed by a qualified medical practitioner.
- (i) Persons requiring the use of prescription spectacles may not be able to use full-face respirators, because of the loss of seal around the spectacle arms. If their spectacles cannot be modified so that they do not need the support of the ears, these people shall not use full-face respirators and shall wear air supply hoods instead. It is important, however, to be sure these hoods will provide an appropriate level of protection.
- (j) Where air-lines are used, the air-line shall incorporate a belt mounted back-up filter. Where a failure of the air supply system occurs, employees shall leave the work area using normal decontamination procedures. The use of a back-up belt mounted filter device allows for appropriate respiratory protections during this process.
- (k) If the number of employees wearing air-line respirators inside an enclosure is likely to result in the tangling of air lines, manifolds shall be provided to reduce this tangling and assist employees in moving around the enclosure. The capacity of the compressor shall be

appropriate for the number of air lines, and the location of the compressor's air intake shall be assessed to ensure appropriate air quality and avoid contamination.

- (l) A competent person may change the level of respiratory protection at any stage during the removal process following a thorough assessment of the fibre levels actually experienced inside the asbestos work area. Typically, this may occur during the final clean-up after the removal of friable ACM, when the use of air lines is no longer considered required.
- (m) Filters used while working with asbestos shall be disposed of as asbestos waste (refer section 3.26).

### 3.23.2 Protective Clothing and Footwear

- (a) Protective clothing shall be provided and worn at all times during all work in the asbestos work area prior to the final clearance inspection.
- (b) Protective clothing shall be made from materials which provide appropriate protection against fibre penetration. Coveralls shall not have external pockets or velcro fastenings because these features are easily contaminated and difficult to decontaminate.
- (c) Disposable coveralls are preferred. They shall never be reused, and shall be disposed of as asbestos waste.
- (d) In some limited circumstances — for example, if there is a fire hazard — disposable protective clothing is not appropriate and re-usable types may be used.
- (e) Laundering of asbestos contaminated protective clothing is not recommended, because decontamination cannot be guaranteed. The otherwise reusable coveralls etc shall instead be disposed of as asbestos waste.
- (f) If re-usable protective clothing is to be laundered, notwithstanding these recommendations, the clothing shall be completely wetted before it is double bagged and sent to a laundering facility capable of laundering asbestos contaminated clothing. The laundering of contaminated protective clothing in employees' homes is strictly prohibited.
- (g) Clothing made from wool or other materials that attract fibrous dusts shall not be worn in the asbestos removal site.
- (h) Special attention shall be paid to the risks of heat stress from working in very hot environments. A competent person shall determine the most appropriate protective clothing and decontamination procedures for employees in these situations.
- (i) The use of protective gloves shall be determined by a risk assessment. If significant quantities of asbestos fibres may be present, disposable gloves shall be worn. Protective gloves can be unsuitable, however, if dexterity is required. All gloves used for asbestos removal work shall be disposed of as asbestos waste.
- (j) Regardless of whether gloves are used, asbestos removal employees shall clean their hands and fingernails thoroughly after work.

- (k) Appropriate safety footwear (eg. steel-capped rubber-soled work shoes or gumboots) shall be provided for all asbestos removal employees. This footwear shall be laceless and shall remain inside the asbestos work area or dirty decontamination area for the duration of the asbestos removal work. When not in use, the safety footwear shall be stored upside down to minimise asbestos-contamination inside the footwear. Storage facilities shall be provided to allow this.
- (l) Safety footwear shall be decontaminated at the end of the job and upon leaving the work area, or sealed in double bags for use on the next asbestos removal site (but not for any other type of work). Work boots cannot be effectively decontaminated and shall be disposed of as asbestos waste.

### 3.24 Air Monitoring

- (a) Air monitoring shall be performed whenever ACM are being removed, to ensure the control measures are effective.
- (b) In most cases only control monitoring, rather than exposure monitoring, is required, because the risks to all asbestos removal employees shall already have been assessed and effective control measures shall be established.
- (c) Air monitoring requirements will vary, however, depending on the types of ACM being removed, the location and position of the ACM, the need for and use of enclosures and whether the removal work is within a building or outside.
- (d) A competent person, who is independent from the person responsible for the removal work, shall determine all air monitoring requirements. This shall include:
  - (i) the location, rate and frequency of sampling;
  - (ii) whether it is required to monitor air quality in areas adjacent to, above and below the asbestos work area, taking account of the potential exposures of occupants of these areas; and
  - (iii) whether additional routine air sampling is warranted in (for example) nearby high-occupancy areas.
- (e) Written air monitoring programs shall be developed by this competent person for all indoor removals of friable ACM, and also for all outdoor removals of friable ACM where there might be a risk to other persons.
- (f) The air monitoring program shall include requirements for clearance monitoring (refer section 3.29).
- (g) Asbestos removal work shall not begin until the air monitoring has commenced.
- (h) Static air samplers shall be placed in the middle of the sampling area, away from areas where there may be poor air mixing (eg. close to walls, corners or large objects) or fast air movements (eg. in front of air-conditioning inlets or exhausts).
- (i) If an enclosure is used, air monitoring shall occur:
  - (i) prior to any work (background monitoring);

- (ii) at least daily at the boundary of the asbestos work area;
  - (iii) as part of preliminary clearance monitoring, following a satisfactory visual inspection (refer section 3.29.1 of this CoP);
  - (iv) during dismantling of the enclosure, and
  - (v) as part of the final clearance inspection.
- (j) If an enclosure and a decontamination unit are used, air quality monitoring shall occur at the following locations:
- (i) the clean side of the decontamination unit;
  - (ii) the change area;
  - (iii) the lunch room (where applicable);
  - (iv) the laundry; and
  - (v) the surroundings of the asbestos work area including in the vicinity of the negative air exhaust, where reasonably practicable.
- (k) Note: Air monitoring of the exhaust from the extraction unit is a specialized task. The membrane filter method (MFM) is unsuitable, because the results obtained do not always truly reflect actual fiber concentrations in the exhaust air, and air monitoring devices shall not be positioned at the exit point of a negative pressure exhaust air unit, because this can lead to unwarranted confidence in the filter's integrity. If the exhaust is to be monitored directly, isokinetic sampling techniques shall be used.
- (l) The results of all air monitoring shall be provided to all relevant parties as soon as reasonably practicable.

### 3.24.1 Control Levels for Monitored Airborne Asbestos Fibers

- (a) Control levels are airborne asbestos fiber concentrations which, if exceeded, indicate there is a need to review current control measures or take other action.
- (b) These control levels are occupational hygiene 'best practice', and are not health-based standards.
- (c) The control levels shown in Table 1 shall be used for the purposes of determining the effectiveness of control measures:

Control level ( <i>airborne</i> asbestos fibers/mL)	Control / Action
< 0.01	Continue with control measures
≥ 0.01	Review control measures
≥ 0.02	Stop removal work and find the cause

**Table 2 – Control Levels and Required Actions**

### 3.25 Decontamination

- (a) The type of decontamination required will depend on the type of asbestos (eg. friable or non-friable); the work method used and site conditions.
- (b) Decontamination shall include the asbestos work area, all tools and equipment and personal decontamination.
- (c) All contaminated materials, including cleaning rags, plastic sheeting and PPE etc, shall be disposed of as asbestos waste.
- (d) Some asbestos removal work necessitates the use of decontamination units.

#### 3.25.1 Workplace Decontamination

- (a) Any asbestos dust or debris shall be collected in a safe manner and the asbestos work area decontaminated, paying attention to all walls, ledges, fittings and furnishings.
- (b) Two types of decontamination procedures may be used: wet and dry decontamination:
  - (i) Wet decontamination, or wet wiping, involves the use of damp rags to wipe down contaminated areas. Cleaning rags shall only be used once, although they may be re-folded to expose a clean surface. The rags shall be used flat and shall not be wadded. If a bucket of water is used, the rags shall not be re-wetted in the bucket, as this will contaminate the water. Care shall be taken to avoid any potential electrical hazards when using this procedure; and
  - (ii) Dry decontamination shall only be used where wet methods are not appropriate or pose a risk because of other hazards such as electricity or slipping. Dry decontamination procedures include carefully rolling or folding up and sealing plastic sheeting and/or vacuuming the asbestos work area with an asbestos vacuum cleaner. Large pieces of asbestos debris shall be wetted and picked up by hand rather than vacuumed.
- (c) Whenever the asbestos work area cannot be decontaminated using either the wet or dry method — for example, if there is rough sawn wood that cannot be fully decontaminated by wet wiping or vacuuming — pigmented polyvinyl acetate (PVA) may be used to seal the contaminated sections of the asbestos work area, including any plant or equipment where reasonably practicable.

#### 3.25.2 Decontamination of Equipment and Tools

- (a) Tools and equipment used during the removal task shall be decontaminated using either the wet or dry decontamination procedures described above, before they are removed from the asbestos work area. The method chosen shall depend on its practicality and the presence of any electrical hazards.
- (b) If tools and equipment cannot be decontaminated in the asbestos work area, or are to be reused at another asbestos work area, they shall be tagged to indicate asbestos contamination and double bagged in asbestos waste bags before being removed from the asbestos work area. This equipment and tools shall remain sealed until decontamination or

the commencement of the next asbestos maintenance or service task where the equipment can be taken into the work area and reused under full control conditions.

- (c) PPE shall be worn when opening the bag to clean or re-use the equipment or tools, and decontamination shall only be performed in a controlled environment.
- (d) Bags containing asbestos contaminated equipment and tools shall be clearly labelled with an appropriate warning statement.

### 3.25.3 Decontamination of Soil

- (a) If there is a risk of soil contamination the area shall be visually inspected, and if any ACM are detected the soil shall be decontaminated.
- (b) The methods used for this decontamination shall be based on a risk assessment. The use of professional site remediation advice and/or services shall be considered.
- (c) During soil decontamination the topsoil shall be dampened down, to minimize the generation of dust, and all visible pieces of ACM debris shall be picked up individually, so that the risk of asbestos fibre inhalation is effectively eliminated.
- (d) If this is not reasonably practicable, the contaminated topsoil shall be removed to a depth that has no visible contamination or asbestos debris.
- (e) The contaminated soil shall be disposed of as asbestos waste.

### 3.25.4 Personal Decontamination

- (a) Personal decontamination shall be undertaken each time employees leave the asbestos work area and at the completion of the asbestos maintenance or service work. Personal decontamination shall be done within the asbestos work area where re-contamination cannot occur.
- (b) Asbestos-contaminated PPE shall not be transported outside the asbestos work area except for disposal purposes.
- (c) Before work clothes and footwear worn during asbestos work are removed from the asbestos work area for any reason, they shall be thoroughly vacuumed with an asbestos vacuum cleaner to remove any asbestos fibers, and the footwear shall also be wet wiped.
- (d) Respiratory protective equipment shall be used until all contaminated disposable coveralls and clothing has been vacuum cleaned and/or removed and bagged for disposal, and personal washing has been completed.
- (e) Personal hygiene and careful washing are essential. Particular attention shall be paid to the hands, fingernails, face and head.
- (f) If friable ACM are being removed, the decontamination procedures described in section 3.28 shall be followed.

- (g) If only small quantities of non-friable ACM are being removed, a competent person may decide, on the basis of a risk assessment, that the following personal decontamination procedure can safely be used, instead of a full decontamination unit:
- (i) all visible asbestos dust/residue is removed from protective clothing, using an asbestos vacuum cleaner and/or wet wiping;
  - (ii) the protective clothing is taken off (while still using a respirator) and placed in an asbestos waste bag;
  - (iii) disposable protective clothing is preferred. If non-disposable clothing is used, it shall be completely wetted before double bagging, labelled and sent to a laundering facility capable of laundering asbestos-contaminated clothing. The laundering of contaminated protective clothing in employees' homes is strictly prohibited;
  - (iv) clothing and footwear worn during the removal shall be vacuumed using an asbestos vacuum cleaner and the footwear shall also be wet wiped;
  - (v) disposable respirators shall then be discarded as asbestos waste. Non-disposable respirators shall be removed and thoroughly cleaned; and
  - (vi) after removing the respirator, employees shall wash their face and hands, paying particular attention to their fingernails.

### 3.26 Waste Removal

#### 3.26.1 Waste Disposal Program

- (a) A waste disposal program shall be developed, taking account of:
- (i) waste containment;
  - (ii) the location for waste storage on site;
  - (iii) the transport of wastes within the site and off-site;
  - (iv) the location of the waste disposal site;
  - (v) approvals needed from the CWM-AD;
  - (vi) any CWM-AD requirements that may apply to the amount and dimensions of asbestos waste; and
  - (vii) loose asbestos waste shall not be allowed to accumulate within the asbestos work area.
- (b) Asbestos waste may be collected and disposed of in an asbestos waste bag, a drum or bin or a waste skip.
- (c) If asbestos waste cannot be disposed of immediately (eg. because of volume requirements for disposal), it shall be stored in a solid waste drum, bin or skip and sealed and secured upon the completion of each day's work so that unauthorized access is prevented.

#### 3.26.2 Waste Bags

- (a) Asbestos waste shall be collected in heavy-duty 200  $\mu\text{m}$  (minimum thickness) polythene bags that are no more than 1200 mm long and 900 mm wide.

- (b) The bags shall be labelled with an appropriate warning, clearly stating that they contain asbestos and that dust creation and inhalation shall be avoided.
- (c) An example of a warning statement which might be used is:
 

**CAUTION – ASBESTOS DO NOT DAMAGE OR OPEN BAG DO NOT INHALE DUST  
CANCER AND LUNG DISEASE HAZARD**
- (d) Controlled wetting of the waste shall be employed to reduce asbestos dust emissions during bag sealing or any subsequent rupture of a bag.
- (e) Only unused bags shall be used, and bags marked for asbestos waste shall not be used for any other purpose.
- (f) Hard and sharp asbestos waste requires preliminary sealing or a protective covering before it is placed in the waste bags, to minimize the risk of damage to the bags.
- (g) In order to further minimize the risk of a bag's tearing or splitting, and also to assist in manual handling, asbestos waste bags shall not be filled more than half full and excess air shall be gently evacuated from the waste bag, in a manner that does not cause the release of dust.
- (h) The bags shall then be twisted tightly, folded over and the neck secured in the folded position with adhesive tape or any other effective method.
- (i) The external surface of each bag shall be cleaned to remove any adhering dust before the bag is removed from the asbestos work area.
- (j) All asbestos waste shall be double bagged outside the work area immediately following the decontamination process.
- (k) The routes used for removing waste from the asbestos work area shall be designated in the asbestos removal control plan before the commencement of each removal. The methods used to transport wastes through a building shall be determined by the ASC following discussions with the asbestos contractor. In occupied buildings, all movements of waste bags shall be outside normal working hours.
- (l) Once the waste bags have been removed from the asbestos work area, they shall either:
  - (i) be placed in a solid waste drum, bin or skip; or
  - (ii) be removed from the site by an approved and licensed carrier.
- (m) Waste bags shall only be stored at the asbestos removal site if placed in an asbestos waste drum, bin or skip.
- (n) If a decontamination unit is being used for the asbestos removal, asbestos waste bags shall be removed from the asbestos work area through the decontamination unit using the following 'production line' operation:
  - (i) one employee is located in each section of the decontamination unit;
  - (ii) the waste bags are passed from cubicle to cubicle and 'showered out' to remove any asbestos residue; and

- (iii) once they have been removed from the decontamination unit, the waste bags are double bagged prior to disposal.

### 3.26.3 Asbestos Waste Drums or Bins

- (a) Drums or bins used for the storage and disposal of asbestos waste shall be in a good condition, with lids and rims in good working order, and free of hazardous residues.
- (b) The drums or bins shall be lined with plastic (minimum 200 µm thickness), and labels warning of the asbestos waste shall be placed on the top and side of each drum or bin, with the words, **'Danger: Asbestos. Do not break seal'**.
- (c) If the drum or bin is to be re-used, the asbestos waste shall be packed and sealed so that when the drum or bin is emptied there is no residual asbestos contamination.
- (d) Controlled wetting of the waste shall be used to reduce asbestos dust emissions.
- (e) Where reasonably practicable, the drums or bins shall be placed in the asbestos work area before work on ACM begins. The drums or bins shall have their rims sealed and their outer surfaces wet wiped and inspected before they are removed from the asbestos work area.
- (f) If it is not reasonably practicable to locate the drums or bins inside the asbestos work area, they shall be located as close to the work area as reasonably practicable.
- (g) Drums or bins used to store asbestos waste shall be stored in a secure location when they are not in use.
- (h) Drums or bins shall not be moved manually once they have been filled. Trolleys or drum lifters shall be used.
- (i) Vacuum suction (Super Suckers) may be used to collect removed ACM. A competent person shall assess the process to prevent asbestos-contamination. Air from the vacuum system shall pass through a HEPA filter before it is released outside the asbestos work area.

### 3.26.4 Asbestos Waste Skips and other Disposal Containers

- (a) If it is not feasible to use asbestos waste bags, drums or bins, because of the volume or size of the asbestos wastes, a waste skip, vehicle tray or similar container may be used.
- (b) Skips shall be in good condition.
- (c) The ACM shall be sealed in double-lined, heavy-duty plastic sheeting or double bagged before they are placed in the skip. However, non-friable asbestos waste may be placed directly into a skip or vehicle tray that has been double lined with heavy-duty plastic sheeting (200 µm minimum thickness), provided it is kept damp to minimize the generation of airborne asbestos fibers.
- (d) Once the skip is full its contents shall be completely sealed with the plastic sheeting.

- (e) If the skip is to be used for storing the asbestos waste its contents shall be able to be secured (eg. using a lockable lid).

### **3.26.5 Disposal of Asbestos Waste**

- (a) All asbestos waste shall be removed from the workplace by a competent person, licensed by the CWM-AD and transported and disposed of in accordance with all relevant legislation and guidelines for the transport and disposal of asbestos waste.
- (b) All Asbestos waste will only be disposed of at waste facilities licensed by the CWM-AD.

### **3.27 Recycling of Construction Materials**

- (a) Before any building materials are recycled, procedures need to be established to ensure asbestos-contaminated materials are not reused unless they have been successfully decontaminated.
- (b) These procedures shall include the quarantining of incoming building materials that are intended for recycling to:
  - (i) allow screening these materials for asbestos-contamination before they are distributed within the recycling yard; and
  - (ii) enable the removal of contaminated building products to prevent their re-distribution.

### **3.28 Additional Requirements for the Removal of Friable ACM**

- (a) This part of the CoP describes the control measures commonly required for the removal of friable ACM, in addition to the control measures required for all asbestos removals, already described in previous parts of the CoP.
- (b) ACM that are friable shall be removed using wet methods, wherever reasonably practicable, and within an enclosed area. Methods for enclosing work are described in the following sections.
- (c) In addition:
  - (i) all ventilation and air-conditioning networks servicing the asbestos work area shall be closed down for the duration of the asbestos removal work and all vents thoroughly sealed to prevent the entry of airborne asbestos fibres into the duct network;
  - (ii) upon completion, and after final cleaning of the asbestos work area, all mechanical ventilation filters for recirculated air shall be replaced; and
  - (iii) care shall be taken to ensure that airborne asbestos fibres cannot escape at points where pipes and conduits pass out of the asbestos work area (greater attention to sealing and testing is required in these regions, particularly if service riser shafts pass through the asbestos work area).
- (d) The methods described below are commonly used for the removal of sprayed asbestos thermal and acoustic insulation from buildings and structures and the removal of ACM from plant and equipment, including steam pipes, boilers and other industrial plant.

### 3.28.1 Negative Pressure Exhaust Units

- (a) To prevent the escape of airborne asbestos fibers from an enclosed asbestos work area, an exhaust extraction fan shall be installed so as to create a 'negative' air pressure of approximately 12 Pa (water gauge) within the enclosed asbestos work area.
- (b) Ideally, the negative pressure exhaust unit shall be positioned opposite the decontamination unit to enable laminar (smooth) air flow. In this arrangement, most of the air entering the asbestos work area passes through the decontamination unit or point of entry, while the air extracted by this system passes through a HEPA filter to remove any asbestos dust before it is discharged to the outside atmosphere at a location distant from other working areas, air-conditioning inlets or breathing air compressors.
- (c) The extraction equipment shall be operated continuously (eg. 24 hours a day) until all asbestos removal and decontamination tasks within the enclosure have been completed.
- (d) The filter shall comply with AS 4260:1997 High Efficiency Particulate Air Filters (HEPA) – Classification, Construction and Performance. A coarse pre-filter shall be installed on the air intake side of the negative air unit to prolong the useful life of the HEPA filter.
- (e) Procedures shall be established for changing these HEPA filters so that areas outside of the enclosure are not contaminated.
- (f) The most satisfactory method for assessing the integrity of the HEPA filter and seal fittings is regular inspection, in conjunction with a static pressure alarm to indicate any failure in the system.

### 3.28.2 Enclosures for Large-Scale Asbestos Removal Work

- (a) Wherever reasonably practicable, enclosed 'negative pressure' asbestos work areas shall be established for any large-scale removal of friable ACM.
- (b) Similar large enclosures can also be used for the removal of non-friable ACM, if a risk assessment concludes that enclosure is an effective control for the risks involved.
- (c) The design and installation of the enclosure shall take account of:
  - (i) the methods used to contain the asbestos work area;
  - (ii) the provision and locations of decontamination and changing facilities;
  - (iii) the precautions which shall be implemented to prevent the spread of asbestos-contamination outside the asbestos work area;
  - (iv) air quality within the enclosure (eg. there must always be appropriate oxygen, and machinery emitting any fumes or potentially dangerous gases shall be placed outside the enclosure, well away from any intake for the enclosure);
  - (v) the temperature within the enclosure (especially to avoid heat stress); and
  - (vi) any other hazards in the enclosure (these shall be identified and control measures established before any asbestos removal work commences).

- (d) Work methods may also need to be adapted for the work environment within the enclosure. For example, rest breaks shall be based a risk assessment, taking account of factors such as the weather and heating/cooling requirements.

### 3.28.2.1 The Enclosure

- (a) Heavy-duty plastic sheeting (200 µm minimum thickness) shall be used for lining the enclosure. Re-milled plastic shall not be used.
- (b) Every location where the asbestos work area connects to the outside environment or the rest of the building (eg. windows, ducts, wall cavities, conduits and lift entrances) shall be enclosed, so that an airtight seal is maintained for the duration of the asbestos removal work.
- (c) The plastic sheeting shall enclose all the walls, windows and doors. Wooden cleats may be able to be used to anchor the plastic sheeting to walls.
- (d) Viewing panels shall be placed in appropriate locations.
- (e) Appropriate lighting shall to be provided within the enclosure, either naturally, using clear plastic or perspex panels in the enclosure walls, or artificially, preferably from outside the enclosure and again using clear plastic or perspex panels. Lights within an enclosure can increase the temperature within the enclosure.
- (f) Non-movable items (eg. fixtures and fittings) shall be covered with plastic sheeting and all the joints sealed.
- (g) Movable items shall be removed from the asbestos work area or, if this is not reasonably practicable, moved to a convenient location and covered with two layers of plastic sheeting, with a minimum overlap of 300 mm between the layers. Both of these layers shall be double taped.
- (h) Air locks shall be provided at the entry points to the change area. These air locks shall be constructed using double sets of overlapping plastic, with appropriate control measures ensuring a seal.
- (i) Floors shall be protected with at least one layer of plastic. It is important for penetration to be prevented. The joints shall be lapped 300 mm and sealed with double-sided tape and duct tape.
- (j) Ceiling spaces may be sealed by constructing a plastic-lined frame within the ceiling space. This frame shall be removed only after completion of the final clearance inspection.
- (k) If the asbestos work area is adjacent to areas occupied by unprotected persons, priority shall be given to performing the removal work during periods when these areas are unoccupied or to a greater isolation of the removal area. In addition, hoarding shall be constructed to form a barrier between the asbestos work area and the adjoining occupied areas. A plastic-lined barrier shall be erected within this hoarding. A buffer area shall be reserved between the hoarding and the occupied areas.

- (l) Any platforms and/or fixed scaffolding required for the safe removal of the ACM shall be erected during the early stages of the work. Ideally these structures shall be erected on the outside of the enclosed area. However, where it is required, to construct platforms and or fixed scaffolding within the enclosed area, decontamination and visual inspection of these structures will be required at the end of the removal work.
- (m) All the plastic, tape, etc used for the enclosure shall be disposed of as asbestos waste.

### 3.28.2.2 Testing the Effectiveness of the Enclosure

- (a) When the ASC is satisfied that the enclosure is complete, a competent person shall carry out a visual inspection and smoke test prior to the commencement of the asbestos removal work.
- (b) The ASC shall notify the client before the visual inspection and smoke test, giving them appropriate notice.
- (c) Negative pressure exhaust units shall not be used while the smoke test is being conducted. Only smoke generating devices incorporating non-oil-based, non-toxic smoke fluids shall be used. Flares shall not be used. Smoke (fire) detection devices in the immediate vicinity of the work area shall be isolated for the duration of the smoke test.
- (d) Work shall not proceed if any leaks or other deficiencies in the enclosure are found during the testing.
- (e) The effectiveness of the enclosure shall be regularly monitored while asbestos removal work is underway.
- (f) If air monitoring or visual examinations of the enclosure and items of equipment indicate that asbestos dust might be escaping from the enclosure, asbestos removal work shall be stopped until any defects have been rectified.
- (g) Following any such an incident, before work recommences it is essential to:
  - (i) identify the source of the leak(s);
  - (ii) prevent further release of fibres;
  - (iii) re-test the enclosure;
  - (iv) clean any contaminated areas;
  - (v) conduct a visual inspection;
  - (vi) conduct monitoring tests specific to the incident;
  - (vii) notify the relevant SRA or CA, where applicable; and
  - (viii) reassess the boundaries of the asbestos work area and asbestos removal site.
- (h) Persons investigating a leak shall use appropriate PPE.
- (i) Any leaks in the enclosure shall be sealed and the smoke test repeated until the enclosure is shown to be effectively sealed again.

- (j) A supply of expandable foam sealant, polyester insulation or equivalent shall be maintained on the site to aid in sealing leaks.

### 3.28.2.3 Decontamination Unit

- (a) In many instances, the only satisfactory way of providing appropriate changing facilities is to provide a mobile or specially constructed on-site decontamination unit.
- (b) This decontamination unit shall be immediately adjacent to, and directly connected with, the enclosed asbestos work area.
- (c) It shall be divided into three distinct areas:
  - (i) a dirty decontamination area;
  - (ii) a clean decontamination area; and
  - (iii) a clean changing area.
- (d) These areas shall be separated by appropriate airlocks or buffer zones.
- (e) These airlocks have spring-loaded doors, or two or more overlapping sheets of plastic sheet, positioned so as to define the boundary between each segment of the decontamination unit, while allowing personnel access and airflow towards the asbestos work area. To ensure there is appropriate airflow through the decontamination unit, if doors are used they shall have large openings with a hinged flap operating as a one-way valve.
- (f) No more than six persons shall use any one decontamination unit. A typical layout is shown in Figure 3.
- (g) The dirty decontamination area shall provide for:
  - (i) vacuum cleaning or hosing down of contaminated clothing and footwear;
  - (ii) the storage of contaminated clothing and footwear;
  - (iii) labelled waste bags/bins for disposable protective clothing; and
  - (iv) a shower area with an appropriate supply of warm water.
- (h) The clean decontamination area shall provide for:
  - (i) the storage of individual respirators in containers or lockers;
  - (ii) airflow towards the dirty decontamination area; and
  - (iii) a shower area with an appropriate supply of warm water.
- (i) The clean changing area shall provide for:
  - (i) the storage of clean clothing;
  - (ii) separate storage of clean and dirty towels; and
  - (iii) airflow towards the clean decontamination area.

- (j) All water from the decontamination facility shall pass through a high efficiency particulate filter or other trap before it passes into sewer mains. The filter or trap shall be capable of capturing particles down to 5 $\mu$ m.
- (k) Employees shall not smoke, eat or drink in any part of the decontamination unit.

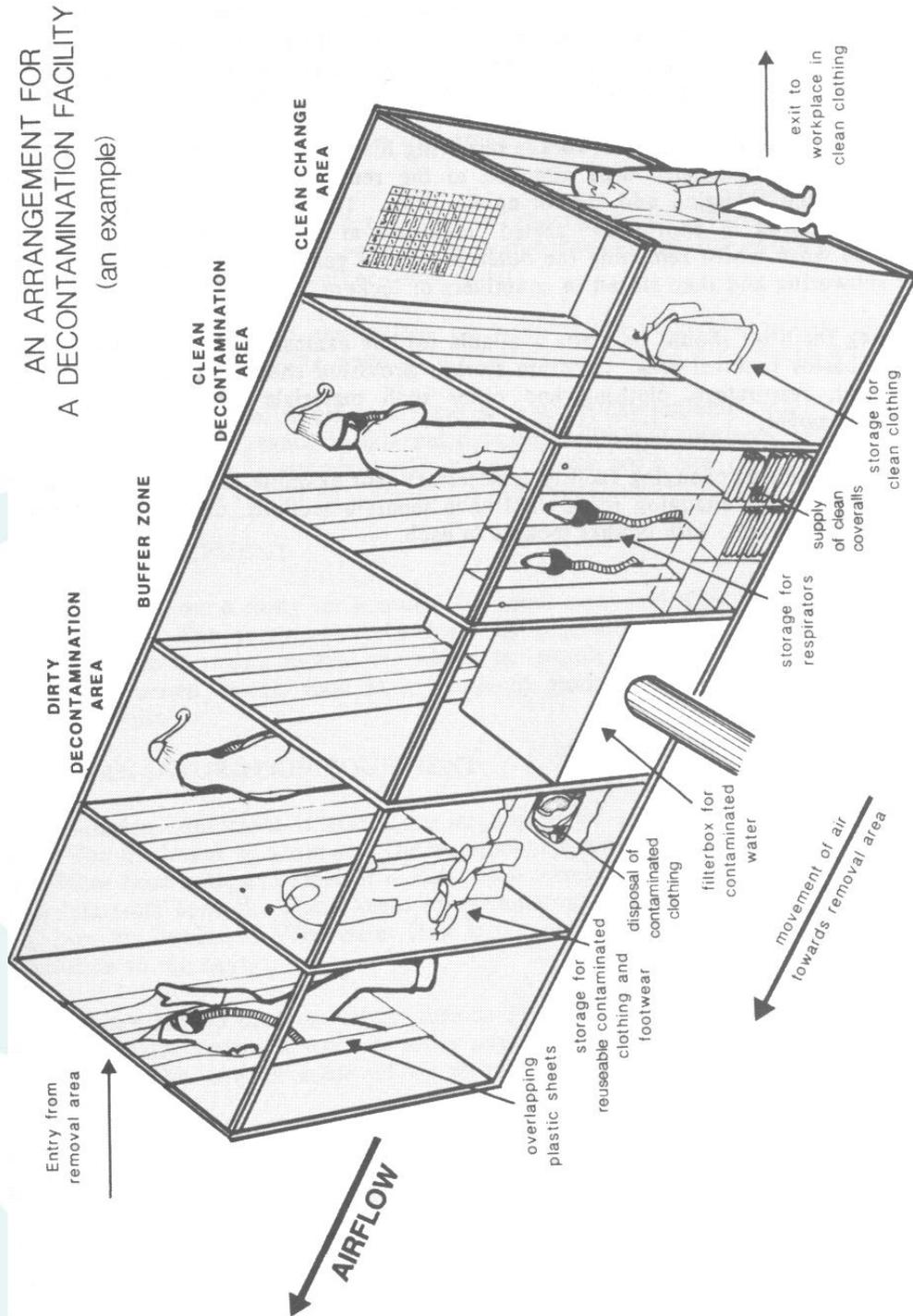


Figure 3 – Typical Decontamination Unit

#### 3.28.2.4 Remote Decontamination Units

- (a) Remote decontamination units are decontamination units that are not located next to the asbestos work area. They shall only be used if a decontamination unit cannot be located immediately adjacent to the asbestos work area.
- (b) When a remote decontamination unit is to be used, the ASC may need to implement additional procedures to minimize asbestos-contamination, including methods for the connection and disconnection of air-line respirators.
- (c) The route of access from the asbestos work area to the decontamination unit shall be appropriately signposted and barricaded to restrict public access.
- (d) Control monitoring shall be conducted in the immediate vicinity of this access route and at other appropriate locations outside the asbestos work area.
- (e) An isolated changing area shall be attached to the asbestos work area. Before employees enter this changing area, all obvious signs of asbestos dust shall be removed from their protective clothing using an asbestos vacuum cleaner. The isolated changing area is then used to discard outer garments, including coveralls and overshoes, and to dress in fresh outer/protective clothing for the journey to the decontamination unit.
- (f) Respiratory protection shall continue to be worn until the appropriate phase of the decontamination procedure within the remote decontamination unit.

#### 3.28.2.5 Entering the Asbestos Work Area

- (a) The procedure for persons entering the asbestos work area shall be as follows:
  - (i) Clean change area: Change into clean work clothes and put on clean protective clothing. Store any removed clothing in a dust-proof container. Pass through the airlock into the clean decontamination area;
  - (ii) Appropriate supplies of undergarments and socks (disposable or reusable) shall be provided for all personnel entering the asbestos work area. Appropriate supplies of shorts and t-shirts shall also be made available to all employees;
  - (iii) Clean decontamination area: Put on respirator. Check that it is working appropriately and there is a good facial seal. Move to the dirty decontamination area; and
  - (iv) Dirty decontamination area: Put on any additional protective equipment that has been stored in the dirty decontamination area, such as footwear. Connect to the air supply. Pass out of the decontamination unit into the asbestos work area.

#### 3.28.2.6 Decontamination Procedures

- (a) The decontamination procedure for persons leaving the asbestos work area shall be as follows:

- (i) Asbestos work area: Use an asbestos vacuum cleaner to remove any obvious signs of asbestos dust from protective clothing. Remove footwear and leave shoes/boots inside the asbestos work area, adjacent to the decontamination unit (footwear shall be stored upside down to minimise further contamination). Proceed into the dirty decontamination area;
- (ii) Dirty decontamination area: If shoes/boots have not already been removed, remove them and store them (upside down) within the dirty decontamination area. Disconnect air-line respirator. Shower while wearing protective clothing and respirator. Leaving the respirator on, remove protective clothing and place it in labelled waste bags. Remove wet underclothing, such as t-shirts or shorts, while showering and place it in the storage unit provided within the dirty decontamination area. Pass through the airlock into the clean decontamination area;
- (iii) Clean decontamination area: Commence showering and remove respirator. Thoroughly wash hands, fingernails, face, head and respirator. Store respirator in an appropriate container within the clean decontamination area. Move to the clean change area; and
- (iv) Clean change area: Change into clean clothing.

### **3.28.2.7 Person Outside the Enclosure**

- (a) The Asbestos Contractor shall ensure an employee is stationed outside the asbestos work area, for the duration of the asbestos removal work, to:
  - (i) liaise with the project supervisor;
  - (ii) communicate with personnel inside the work enclosure; and
  - (iii) instigate emergency/evacuation procedures if required.
- (b) Records about these activities shall be kept on a daily basis.

### **3.28.2.8 Sealing the Enclosure and Decontamination unit upon the Completion**

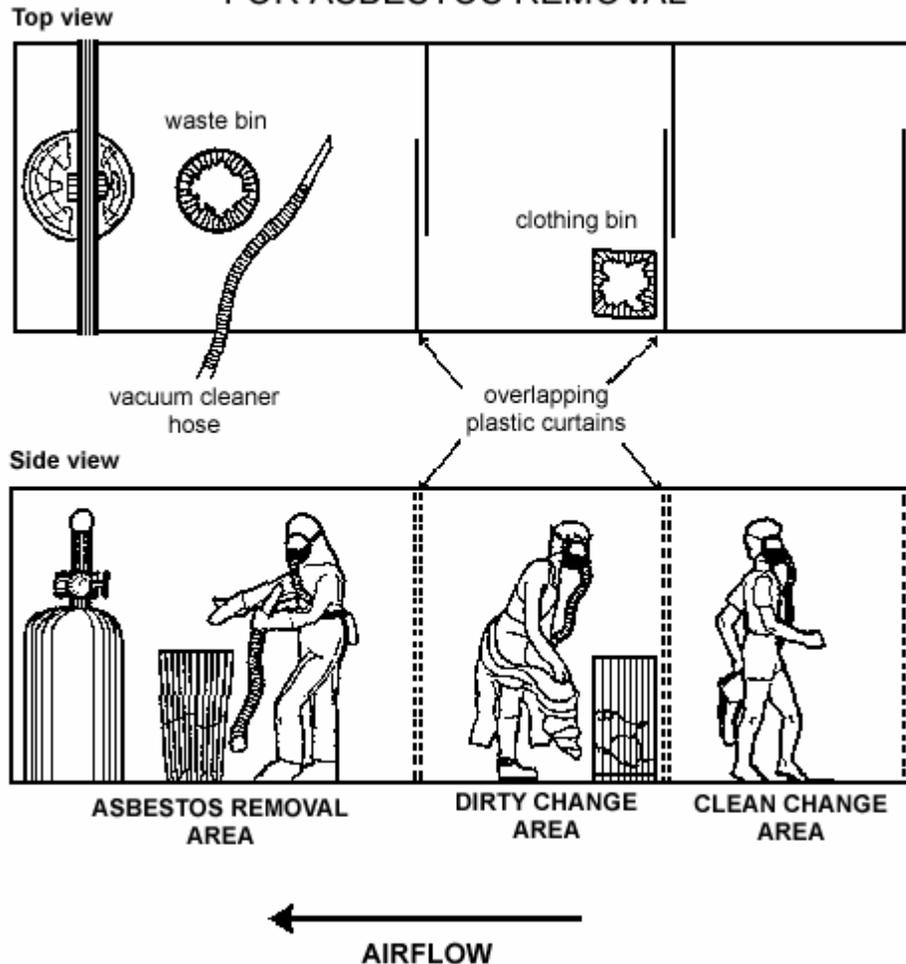
- (a) After the removal work has been completed all plant and equipment within the asbestos work area and the decontamination unit, including any remaining non-movable items, shall be vacuumed and/or wet wiped to remove any residual dust.
- (b) Once a competent person is satisfied that the asbestos work area and decontamination unit are clean, all of the cleaned surfaces shall be sprayed with pigmented PVA using airless spray equipment. Items of equipment that may be damaged by the application of pigmented PVA can be screened with plastic sheeting.
- (c) Any layer of plastic forming the inner surface of the enclosed work area or decontamination unit shall also be sprayed with pigmented PVA.
- (d) After the pigmented PVA has dried, a competent person shall perform control monitoring in the asbestos work area and decontamination unit.

- (e) The final layer of any plastic enclosing the asbestos work area and decontamination unit shall not be taken down until a visual inspection has found no visible asbestos residue and clearance monitoring indicates airborne asbestos fibre levels are below 0.01 fibres/mL. Settled dust sampling may also be considered as an indicator of cleanliness.
- (f) Plastic sheeting and any similar materials used for the enclosure shall be treated as asbestos waste. This need not apply to scaffolding used to add strength to the enclosure, but any such scaffolding shall be vacuumed, damp wiped and sprayed with pigmented PVA as part of the clean-up process.
- (g) Ropes, warning signs and protective plastic isolating public areas shall not be removed until the asbestos work area and decontamination unit have had a satisfactory clearance inspection.

### **3.28.3 Mini-Enclosures for Small-Scale Asbestos Removal Work**

- (a) Mini-enclosures are appropriate for asbestos removal work in areas with restricted access, such as ceiling spaces, and for emergency asbestos removals.
- (b) The mini-enclosure has to be large enough to allow movement inside the enclosure and contain all the equipment needed for the asbestos removal work.
- (c) Machinery that emits exhaust fumes shall not be placed in a mini-enclosure.
- (d) The frame of a mini-enclosure can be made from a variety of materials, but has to be strong enough to support the plastic sheeting that forms the enclosure.
- (e) Heavy-duty plastic sheeting (200 µm minimum thickness) shall be used for making the enclosure. Recycled plastic, including re-milled plastic, shall not be used.
- (f) The tape used to connect the plastic to the frame needs to be strong enough to securely hold the plastic to the frame. A smoke tube shall be used to check the sealing of the plastic sheeting.
- (g) A slit will have to be made in the plastic sheeting to allow entry. This slit can then be taped from inside the enclosure.
- (h) A typical layout is shown in Figure 4.
- (i) The hazards and work procedures that need to be considered for large enclosures, also need to be taken into account for all mini-enclosures.
- (j) Employees leaving a mini-enclosure shall follow the personal decontamination procedures described in section 3.25.4.

## LAYOUT OF A MINI-ENCLOSURE FOR ASBESTOS REMOVAL



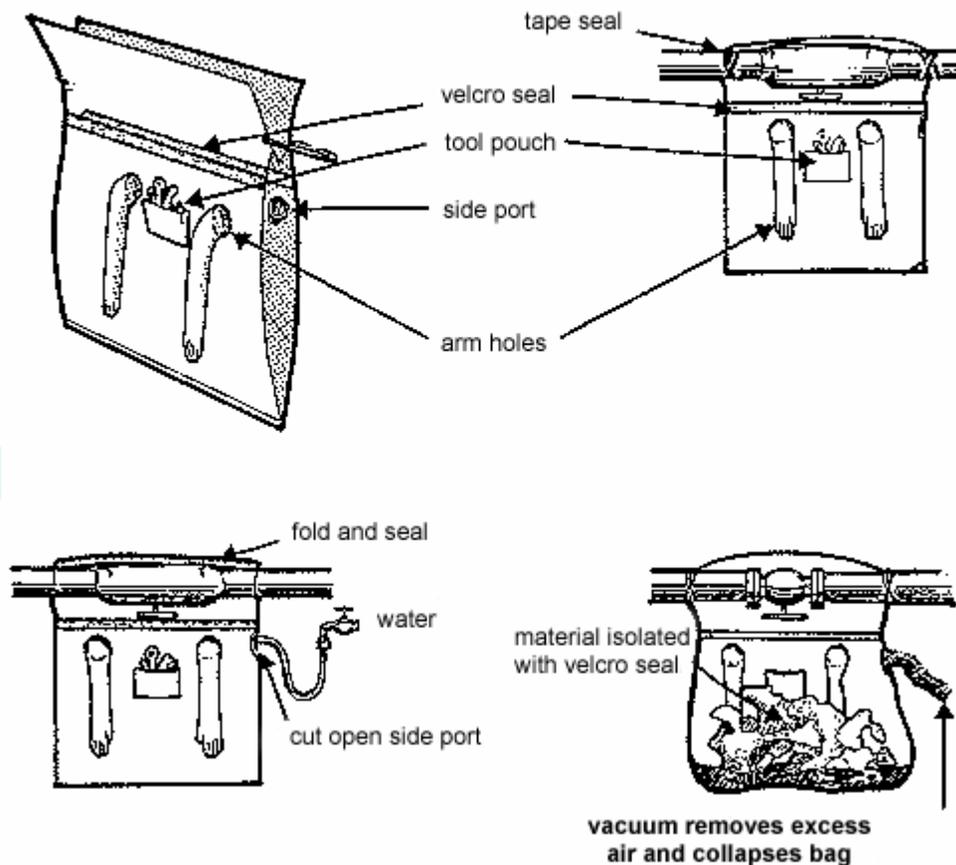
**Figure 4 – Typical Layout of a Mini-Enclosure**

### 3.28.4 Glove Bag Removal Method

- (a) Glove bags are single-use bags, constructed from transparent, heavy-duty plastic, with built-in arms and access ports.
- (b) Generally glove bags are approximately 1 meter wide and 1.5 meters deep.
- (c) Glove bags are designed to isolate small removal jobs from the general working environment. As such, they provide a flexible, easily installed and quickly dismantled temporary enclosure for small asbestos removal jobs.
- (d) The glove bag removal method is especially suited to the removal of asbestos lagging from individual valves, joints, piping, etc.

- (e) A major advantage of glove bags is that they contain all waste and contamination within the bag, thereby eliminating the need for extensive PPE and decontamination.
- (f) The only significant limitation on the use of glove bags is the volume of waste material they are able to contain. Care needs to be exercised to prevent overfilling of the bag with water or waste.
- (g) Glove bags shall be used as follows (refer Figure 5):
  - (i) cutting and removal tools that will be used in the removal shall be placed into the glove bag at the start of the job. When the removal is complete, tools used shall be either disposed of as asbestos waste or sealed for reuse in future removal jobs;
  - (ii) the glove bag shall completely cover the pipe or object on which the asbestos removal work is to be performed. The lagging on either side of the bag must be sound enough to support the weight of the bag and its wet contents;
  - (iii) cut the sides of the glove bag to fit the size of the pipe from which asbestos is to be removed. Attach the glove bag to the pipe by folding the open edges together and securely sealing them with duct tape. Seal all openings in the glove bag with duct tape or an equivalent. The bottom and side seams of the glove bag shall also be sealed with duct tape or an equivalent, to prevent any leakage if there is a defect in a seam;
  - (iv) thoroughly saturate the ACM with a wetting agent and then remove it from the pipe, beam or other surface. The wetting agent shall be applied with an airless sprayer through a pre-cut port, as provided in most glove bags, or through a small hole cut in the bag. ACM that has fallen into the bag shall be thoroughly saturated. The choice of tool to remove the ACM depends on the nature of the material to be removed. ACM are generally covered with painted canvas and/or wire mesh. Any canvas shall be cut and peeled away from the ACM underneath. If this ACM is dry, it shall be re-sprayed with the wetting agent before it is removed;
  - (v) thoroughly clean the pipe or surface from which the asbestos has been removed with a wire brush and wet-wipe it until no traces of the ACM can be seen. Wash down the upper section of the bag to remove any adhering ACM;
  - (vi) seal any edges of ACM that have been exposed by the removal or by any maintenance activity, to ensure these edges do not release airborne asbestos fibres after the glove bag is removed;
  - (vii) once the ACM has been removed and sealed, insert a vacuum hose from an asbestos vacuum cleaner into the glove bag through the access port to remove any air in the bag that might contain airborne asbestos fibres. Once the bag has been evacuated, squeeze it tightly, as close to the top as reasonably practicable, twist it and seal it with tape, keeping the ACM safely in the bottom of the bag; and
  - (viii) remove the vacuum line from the bag, and then remove the glove bag from the workplace for appropriate disposal as asbestos waste.

## USE OF GLOVE BAGS



**Figure 5 – Use of Glove Bags**

### 3.28.5 Wrap and Cut' Removal Method

- (a) This method of removal produces the lowest levels of airborne asbestos fibers and is most appropriate for redundant plant and equipment.
- (b) The plant or equipment to be removed shall be double wrapped with 200  $\mu\text{m}$  thick plastic and taped so that the ACM are totally sealed within the plastic. The wrapped plant or equipment can then be cut from the rest of the plant and equipment using mechanical shears or oxy-cutting tools. Only exposed metal shall be cut, and care shall be taken to ensure the plastic wrapping is not punctured and/or melted.
- (c) If lagging has to be removed to allow a pipe to be cut, the glove bag removal method shall be used to expose the metal at the point to be cut and for an appropriate length on either side. The insulation shall be wet thoroughly, bagged and disposed of as asbestos waste. The pipe shall then be cut at the centre of the exposed section.

### **3.29 Clearance to Reoccupy an Asbestos Work Area**

- (a) Before clearance is granted for an asbestos work area to be re-occupied there shall be a thorough clearance inspection.
- (b) The clearance inspection shall be conducted by the ASC who is independent from the person responsible for the removal work.
- (c) Following the final clearance inspection a clearance certificate shall be issued by the ASC, who is independent from the person responsible for the removal work.
- (d) Any protective barrier between the asbestos work area and public areas shall remain intact until completion of all asbestos removal work and successful completion of the clearance inspection.

#### **3.29.1 Visual Inspections**

- (a) Visual inspections involve an examination of the asbestos work area, prior to the resumption of normal work in the area by unprotected personnel, to confirm that the asbestos removal work has been completed and there is no visual evidence of dust and debris.
- (b) Particular attention shall be paid to ledges, the tops of air-conditioning ducts, cracks in the floor, folds in plastic sheeting and crevices or other areas which may have been overlooked during the initial clean-up.
- (c) A satisfactory visual inspection does not remove the need to perform clearance monitoring.

#### **3.29.2 Clearance Monitoring**

- (a) The need for clearance monitoring shall be assessed as part of the planning and conduct of asbestos removal works.
- (b) Monitoring results and experience with similar removals in the past will assist in determining whether clearance monitoring will be required.
- (c) Clearance monitoring shall be undertaken by a competent person who is independent from the person responsible for the removal work, after cleaning has been completed and the area dried, to check that fiber levels are below 0.01 fibers/mL.
- (d) Air samples shall be taken in the asbestos work area. For jobs involving an enclosed area, this shall be done within the enclosed area, following the completion of the removal work but prior to the removal of the enclosure, and again after the removal of the enclosure (for a final clearance inspection).
- (e) The removal work shall not be considered completed until an airborne fiber level of less than 0.01 fibers/mL has been achieved, as determined by the clearance monitoring.

### 3.29.3 Settled Dust Sampling

- (a) Settled dust sampling may also be useful as part of a clearance inspection.
- (b) Settled dust sampling can, however, only provide an indication of cleanliness.
- (c) Settled dust sampling shall not be used as an indicator of risk to health.
- (d) Settled dust sampling shall be determined by the competent person undertaking the visual inspection.

### 3.30 Emergency Exposure to Asbestos

- (a) Where persons have been exposed to asbestos, the Duty Holder shall notify the B&C SRA and the relevant CA's immediately and within 24hrs a written report shall be submitted.
- (b) The immediate notification shall include the type of exposure and current controls measures being implemented.
- (c) Following any accidental emergency exposure, a full investigation shall be undertaken to determine the root causes of the exposure and the effects to both human health and the environment.
- (d) The investigation shall identify further control measures to be implemented.
- (e) The employer of persons affected or the duty holder in cases where persons are not in direct employ of the building shall implement a program to monitor the effects of the emergency exposure, both in terms of human health and the environment.

### 3.31 Health Surveillance and Monitoring

- (a) Prior to employment, or commencement of asbestos work, employers shall have a physician evaluate employees for any lung related diseases, or other health factors, that could pose serious injury or harm to employees working with, or removing asbestos.
- (b) Medical surveillance and monitoring shall be conducted in accordance to *AD EHS RI – CoP 5.0 – Occupational Health Screening and Medical Surveillance*.
- (c) Any occupational exposures to asbestos shall be documented in the employee's medical records and the employee placed in a health monitoring program as defined by *AD EHS RI – CoP 5.0 – Occupational Health Screening and Medical Surveillance*.

## 4. References

- *AD EHSMS RF – Element 03 – Management of Contractors*
- *AD EHS RI – CoP 2.0 – Personal Protective Equipment*
- *AD EHS RI – CoP 5.0 – Occupational Health Screening and Medical Surveillance*

- *AD EHS RI – CoP 17.0 – Safety Signs and Signals*
- *AD EHS RI – CoP 21.0 – Permit to Work Systems*
- *AS 3544-1988 Industrial Vacuum Cleaners for Particulates Hazardous to Health*
- *AS 4260-1997 High Efficiency Particulate Air Filters (HEPA) – Classification, Construction and Performance.*
- *Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC:2002(2005)]*
- *NFDC (UK) – ALG Memo 06/08 – Plan of Work*
- *L143 – Work with Asbestos Containing Materials – HSE Books ISBN 978 0 7176 6206 7*
- *L127 - The Management of Asbestos in Non-Domestic Premises – HSE books ISBN 978 0 7176 6209 8*

## Appendix A – Plan of Work Aide-Memoir

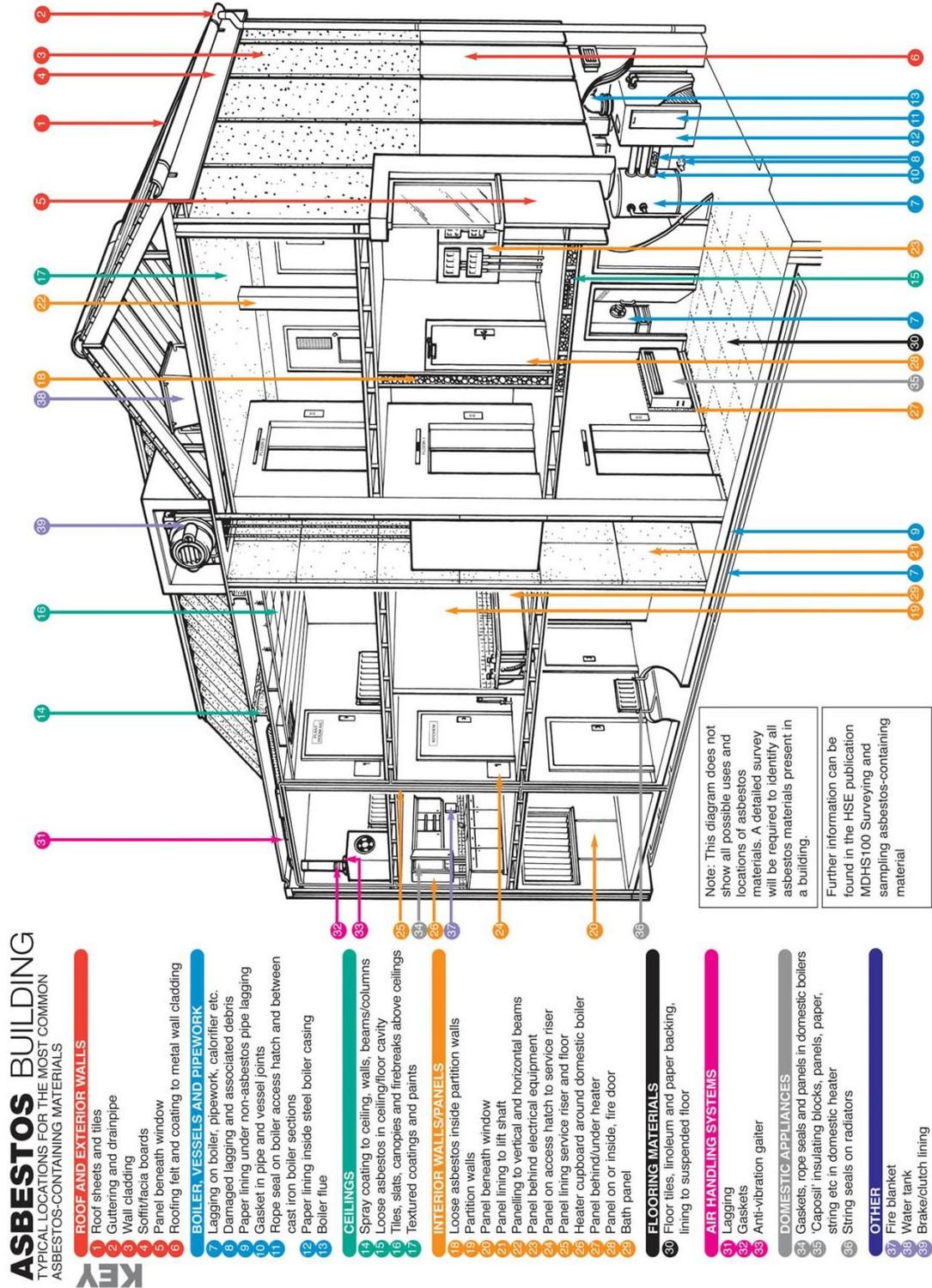
		Written Details, Photographs or Diagrams	Completed or Not Applicable
<b>Details of Contract:</b>			
1.1	The name and local address of the persons to whom you are contracted (including the site address if different).		
1.2	The names, job titles, and telephone numbers of all relevant contacts, including the site supervisor, manager or director responsible for the site.		
1.3	The number of employees on the job at any time and names.		
1.4	When the work is going to take place eg. dates and times (nights, week end work, etc), the dates for set up, removal and clearance.		
1.5	The name(s) of any other asbestos license holders involved.		
1.6	Who will carry out the 4 stages of the clearance process and issue the certificate of reoccupation.		
<b>2. Management of the Job:</b>			
2.1	How often the following will be on site:		
	Supervisors:		
	Managers:		
	Directors:		
2.2	How viewing panels and or CCTV will be used.		
2.3	The names and contact telephone numbers of the supervisor, manager or director responsible for conditions on site.		
2.4	Who will consider departures from the Plan of Work and how will these be communicated to the employees on site?		

<b>3. Scope of Work and Risk Assessment:</b>			
3.1	Provide brief details of any asbestos survey, the level (Type 1, 2 or 3) who did this and when.		
3.2	Provide a description of the work, its location and the removal method.		
3.3	State the type and form of asbestos, the quantity, extent and condition.		
3.4	Provide details of any access and fire risk and precautions to be taken. Include details of how safe places of work shall be provided and maintained.		
3.5	Provide details of any other risks and precautions.		
<b>4. Control Measures:</b>			
4.1	State the expected exposure using the controls specified.		
4.2	Describe the steps taken to reduce exposure as low as reasonably practicable and to control release into the environment.		
4.3	Provide a sketch(es) showing:		
	size of enclosure(s);		
	location of viewing panels, and/or CCTV		
	negative pressure units;		
	H-type vacuum cleaners;		
	DCU, (include the positions from which the water and electrical supplies to the DCU are to be fed);		
	transit routes (if applicable - include explanation why direct connection between DCU and air lock is not being used);		
	bag locks;		
	waste routes;		
	and skips etc.		
4.4	State the volume of enclosure, size and numbers of NPU s and number of air changes per hour.		

4.5	State the type of respirators used		
4.6	Describe the air monitoring arrangements for duration of the work		
4.7	Describe the arrangements for smoke testing and witnessing.		
4.8	Describe how control measures are to be maintained on site and what checks.		
<b>5. Method of Work:</b>			
5.1	State any additional precautions to reduce exposure.		
5.2	Provide detailed site information and a site specific description of the working method to be used with reasons		
5.3	Describe which fibre suppressant technique is to be used		
5.4	For wet strip system – describe injection technique, including: needle type; needle pattern; dilution factor; what indicator shall be used to check material is fully saturated; and time allowed for penetration.		
5.5	State what tools and other equipment are to be used and whether they meet the PAS 60 standards.		
5.6	For AIB work, describe the practical measures to minimize dust release.		
<b>6. Other Site-Specific Information: (not in company procedures) Relating to:</b>			
6.1	DCUs (including clearance testing).		
6.2	Entry and exit procedures.		
6.3	Welfare facilities.		
6.4	Waste disposal.		
6.5	Emergency procedures (including asbestos disturbance during enclosure erection, etc		



## Appendix B – Asbestos Building



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