| Eskom | Standard | |
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Title: **Requirements for the Safe Processing, Handling, Storage, Disposal and Phase-out of Asbestos**

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|---|---|---|---|
| **H Botha** | **K Modiole** | **M Moahlodi** | **K Pather** |
| Senior Advisor: Occupational Hygiene and Safety | Senior Advisor: Occupational Hygiene and Safety | Senior Manager: Corporate: Occupational Hygiene and Safety | General Manager: Risk and Sustainability |
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## Contents

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# 1. Introduction

Eskom and its subsidiaries are committed to Zero Harm and will conduct business with respect and due care for the environment and people.

This standard specifies the requirements for the identification, evaluation, and control of any work activities and conditions that expose, or are likely to expose, any person to asbestos fibres and the requirements for compliance with the provisions of the Asbestos Abatement Regulations, 2020, framed under the Occupational Health and Safety (OHS) Act 85 of 1993. Further environmental and Eskom requirements for asbestos management plans are also outlined in the standard.

# 2. Supporting clauses

## 2.1 Scope

This standard specifies the requirements for the identification, evaluation, and control of any work activities and conditions that may expose any person to asbestos fibres and the requirements for compliance with legal and Eskom requirements and the effective management of asbestos.

### 2.1.1 Purpose

The purpose of this standard is to give practical expression to Eskom's commitment to protecting people and the environment against the harmful effects of regulated asbestos fibres by doing the following:

- Preventing the exposure of persons to uncontrolled airborne asbestos fibres.
- Complying with all requirements and best practices pertaining to asbestos.
- Ensuring the effectiveness and efficiency of all asbestos management interventions.
- Ensuring that all asbestos is disposed of in an environmentally sound manner.

### 2.1.2 Applicability

This document applies throughout Eskom Holdings SOC Limited, its groups, divisions, subsidiaries, and contractors, including any joint ventures in which Eskom has a controlling interest, where exposure to asbestos fibres may occur and where asbestos-containing material (ACM), equipment, and articles are used.

### 2.1.3 Effective date

This document is effective from the authorisation date.

## 2.2 Normative/Informative references

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

### 2.2.1 Normative

[1] Occupational Health and Safety Act 85 of 1993

[2] Asbestos Abatement Regulations, 2020, as promulgated under the Occupational Health and Safety Act 85 of 1993

[3] Construction Regulations 2014, as promulgated under the Occupational Health and Safety Act 85 of 1993

[4] National Environmental Management Waste Act (NEMWA) 59 of 2008

[5] Environment Conservation Act 73 of 1989

[6] National Environmental Management Act 107 of 1998

[7] National norms and standards for the storage of waste, GNR 926 of 2013

[8] Regulations for the prohibition of the use, manufacturing, import, and export of asbestos and asbestos-containing materials, GNR 341 of 2007

[9] HSG248: Asbestos: The analysts' guide for sampling, analysis, and clearance procedures of the Health and Safety Executive of the United Kingdom, as revised from time to time

[10] SANS 17020: General criteria for the operation of various types of bodies performing inspection

[11] SANS 10228: The identification and classification of dangerous goods for transport by road and rail modes

[12] SANS 10229-1: Transport of dangerous goods – Packaging and large packaging for road and rail transport, Part 1: Packaging

[13] SANS 10229-2: Transport of dangerous goods – Packaging and large packaging for road and rail transport, Part 2: Large packaging

[14] 32-95: Occupational Health and Safety Incident Management Procedure

[15] 32-249: Eskom Environmental Indicator Reporting Standard

[16] 32-245: Eskom Waste Management Standard

[17] 240-84733329: Eskom Medical Surveillance Procedure

[18] 240-44175132: Eskom PPE Specification

[19] ISO 9001 Quality Management Systems

[20] 240-165016139 Asbestos Management Plan – Guideline

[21] UN Transport of Dangerous Goods (UN Orange Book)

### 2.2.2 Informative

[1] HSG173: Monitoring strategies for toxic substances, 2006, of the Health and Safety Executive of the United Kingdom, as revised from time to time

[2] HSG264: Asbestos: The survey guide of the Health and Safety Executive of the United Kingdom, as revised from time to time

[3] SANS 17025: General requirements for the competence of testing and calibration laboratories

[4] 240-75567900: Manual for Internal Quality Assurance Management of the Eskom Occupational Hygiene Approved Inspection Authority

[5] Requirements for Approval as an Approved Inspection Authority: Occupational Health and Hygiene, Department of Employment and Labour

[6] 32-520: Occupational Health and Safety Risk Assessment Procedure

[7] 240-114036246: Occupational Hygiene Hazard Identification and Risk Assessment (HIRA), Work instruction

[8] ISO 45001: Occupational Health and Safety Management Systems

## 2.3 Definitions

| Term | Definition/Explanation |
|---|---|
| Approved Asbestos Inspection Authority (AIA) | A SANAS-accredited inspection authority, approved by the Chief Inspector for Occupational Health and Safety of the Department of Employment and Labour, for monitoring asbestos concentrations in the air and examining and testing engineering control measures for asbestos. |
| Approved plan of work | A written site-specific methodology as contemplated in Regulation 15 (AAR) that is at least co-signed by the asbestos client, registered asbestos contractor, and approved inspection authority. |
| Asbestos | Any of the following minerals: grunerite (amosite), chrysotile, crocidolite, fibrous actinolite, fibrous anthophyllite, and fibrous tremolite, or any mixture containing any of these fibrous silicates. |
| Asbestos Compliance Officer | The person formally allocated the duties to manage asbestos work at an OU/BU to ensure compliance with the relevant requirements. Note that the responsible person in terms of the Occupational Health and Safety Act 85 of 1993 shall, nevertheless, still be responsible. |
| Asbestos cement products | A range of building materials manufactured using moulding and compression techniques, consisting of a hardened mixture of asbestos fibres, cement, and water. |
| Asbestos clearance certificate | A written document verifying that the regulated asbestos fibre concentration in the air meets the clearance indicator. |
| Asbestos client | Any person for whom asbestos work is performed. |
| Asbestos coating | A surface coating that contains asbestos for fire protection, heat insulation, or sound insulation, but does not include textured decorative coatings. |
| Asbestos-containing material (ACM) | Asbestos and any material that contains asbestos, and includes asbestos cement products (ACPs), asbestos coating, asbestos insulation board, asbestos insulation, asbestos textured decorative coatings, asbestos-contaminated soil, and other ACMs. |
| Asbestos disposal site | A site specifically designated for asbestos disposal in terms of the Environment Conservation Act, 1989, and the National Environmental Management: Waste Act 59 of 2008. |

| Term | Definition/Explanation |
|---|---|
| Asbestos dust | Airborne or settled dust that contains, or is likely to contain, regulated asbestos fibres. |
| Asbestos in place | Includes any asbestos, ACPs, asbestos coatings, ACM, asbestos dust, asbestos insulation, asbestos insulation board, and asbestos waste at the regulated asbestos area. |
| Asbestos insulation | Any ACM that is used for thermal, acoustic, or other insulation purposes, including fire protection, except:<br>(a) asbestos cement, asbestos coating, or asbestos insulating board; or<br>(b) any article of bitumen, plastic, resin, or rubber that contains asbestos and whose thermal and acoustic properties are incidental to its main purpose. |
| Asbestos insulating board | Any flat sheet, tile, or building board consisting of a mixture of asbestos and cement or any other material, but that is not:<br>(a) asbestos coating; or<br>(b) an article of bitumen, plastic, resin, or rubber that contains asbestos and whose thermal and acoustic properties are incidental to its main purpose. |
| Asbestos inventory | Document used for the recording of all asbestos and ACM in the area of responsibility. The asbestos inventory and asbestos phase-out plan refer to the same document, i.e. Eskom Asbestos Inventory and Phase-out (Template). |
| Asbestos Management Plan | Specifies the required actions, resources, and time frames for identifying, evaluating, and controlling of any work activities and conditions that may expose any person to asbestos fibres to ensure compliance with legal and Eskom requirements and the effective management of asbestos. |
| Asbestos phase-out plan | An authorised management plan that directs the timely removal of asbestos products and ACM from Eskom-owned areas in a formalised manner to ensure total phase-out by the set due date. |
| Asbestos removal site | A regulated asbestos area where asbestos removal work is performed. |
| Asbestos risk assessment | A risk assessment and risk categorisation of potential exposure to asbestos dust. |
| Asbestos waste | An undesirable or superfluous asbestos or asbestos-containing product or by-product or the undesirable or superfluous asbestos or asbestos-containing emission or residue of any process or activity that has been:<br>(a) discarded by any person; or<br>(b) accumulated and stored temporarily with the purpose of discarding it, with or without prior treatment connected with its discarding. |
| Asbestos work | Work that exposes, or is likely to expose, an employee to asbestos dust, including transporting, storing, removing, handling, treating, repairing, and disposing of asbestos. |
| Auditing | A systematic, independent, and documented process for obtaining audit evidence and evaluating the asbestos management plan objectively, to determine the extent to which the management plan is implemented and maintained, to ensure compliance with the requirements of the Asbestos Standard. |

| Term | Definition/Explanation |
|---|---|
| Bulk sampling | Bulk asbestos sampling is carried out to:<br>• Determine whether a material contains asbestos.<br>• Determine the type of fibre(s) in ACM.<br>• Comply with the Regulations with regard to identifying, assessing, labelling, and recording ACMs (asbestos inventory). |
| CAS No. | The Chemical Abstracts Service Registry Number. |
| Chief Director: Provincial Operations | The provincial director as defined in Regulation 1 of the General Administrative Regulations, 2003, published as Government Notice R.929 in *Gazette* No. 25129 of 25 June 2003. |
| Clearance indicator | The measured airborne concentration of regulated asbestos fibres is less than 0,01 fibres per millilitre (f/mℓ) as measured in accordance with HSG248 or an equivalent method. |
| Competent person | (a) Has, in respect of the work or task to be performed, the required knowledge, training, experience, and – where applicable – qualifications specific to asbestos, provided that, where appropriate, qualifications and training are registered in terms of the National Qualifications Framework Act 67 of 2008, those qualifications and that training must be regarded as the required qualifications and training; and<br>(b) Is familiar with the Act and the applicable regulations made under the Act. |
| Demolition work | A method to dismantle, wreck, break, pull down, or knock down a structure or part of it through manual labour, machinery, or the use of explosives. |
| Environmental air monitoring | Includes static air monitoring for regulated fibres conducted downwind from outdoor type 2 asbestos work or outside asbestos enclosures where type 3 asbestos work is performed or in any area where there is the potential for asbestos contamination. |
| Environmental Inspectorate | An Eskom-established body in the Environmental Department of Risk and Sustainability (R&S), with the main responsibility of assuring that all Eskom sites adhere to South African environmental statutory requirements, SANS standards, and other requirements, as applicable to Eskom, where non-compliances might result in harm to property, equipment, systems, and the environment. |
| Eskom AIA | Eskom Holdings SOC Limited Approved Inspection Authority |
| Exposed to asbestos | Exposed, or likely to be exposed, to asbestos dust while at the regulated asbestos area, and “exposure” has a corresponding meaning. |
| Formalised manner | According to an approved documented procedure, in line with an existing quality management system. |
| HSG248 | Health and Safety Guidance 248: Asbestos – The analysts’ guide for sampling, analysis, and clearance procedures, published in 2005, or the latest update. |
| Incidental asbestos exposure | Unintentional exposure to airborne asbestos at a regulated asbestos area where asbestos is present. |

| Term | Definition/Explanation |
|---|---|
| Measurement programme | A programme according to the monitoring strategy as contemplated in HSG173. |
| Monitoring | The planning and carrying out of a measurement programme as well as the recording of its results. |
| Non-asbestos-related work | Includes work performed in the vicinity of ACMs or ACPs but excludes work performed on or with ACMs or ACPs. |
| Occupational exposure limit (OEL) for asbestos | A limit value of 0.1 regulated asbestos fibres per millilitre of air, averaged over any continuous period of four hours, measured in accordance with HSG248. |
| OHS Inspectorate | An Eskom-established body in the OHS Department of R&S, with the main responsibility of assuring that all Eskom sites adhere to South African occupational health and safety statutory requirements, SANS standards, and other requirements, as applicable to Eskom, where non-compliances might result in serious injury or harm to people. |
| Phase-out | The total removal of asbestos and ACM from business use. |
| Registered asbestos contractor (RAC) | Either a contractor, a mandatory, or an employer who conducts Type 2 asbestos work or Type 3 asbestos work or asbestos removal work, registered with the chief inspector. |
| Regulated asbestos area | An area demarcated and controlled as contemplated in Regulation 18 (AAR). |
| Regulated asbestos fibre | A particle of asbestos with a length-to-diameter ratio greater than 3 to 1, a length greater than 5 micrometres, and a diameter less than 3 micrometres. |
| Removal of asbestos | All tasks included in removing asbestos from the location specified in the inventory of asbestos in place to the final disposal site. |
| Repair of asbestos-containing materials | Restoring ACMs to a safe condition after damage, using non-destructive methods in a manner that does not cause the release of asbestos fibres. |
| Respiratory protective equipment | A device worn over at least the mouth and nose to control the inhalation of air that is not safe. |
| Risk categorisation | The grouping and ordering of potential asbestos exposure risks as contemplated in Regulation 5(3) (AAR). |
| Routine asbestos maintenance | Where routine maintenance work is performed on asbestos material, asbestos cement sheeting, and related products, where the work does not result in structural changes or the removal or demolition of ACM, for example, painting and sealing of the surfaces of the material. |
| Similar exposure group | A group of employees who experience pollutant exposures similar enough that monitoring exposures of any representative subgroup of employees in the group provides data useful for predicting exposures of the remaining employees. |
| Phase-out | The total removal of asbestos and ACM from business use. |

| Term | Definition/Explanation |
|---|---|
| Registered asbestos contractor | A mandatory person or employer conducting demolition work who is registered with the Chief Inspector. |
| Regulated asbestos fibre | An asbestos particle with a length-to-diameter ratio greater than 3 to 1, a length greater than 5 µm (micrometres or microns), and a diameter of less than 3 µm. |
| Short-term exposure limit | A short-term exposure limit of 0.6 regulated asbestos fibres per millilitre of air, measured over a continuous 10-minute period. |
| Sustainability Systems | The delegated employees from R&S of the OHS and Environmental Management Departments. |
| The Act | The Occupational Health and Safety Act 85 of 1993. |
| Type 1 asbestos work | (a) Painting of ACPs in a manner that does not require surface preparation and does not cause the release of asbestos fibres; or<br>(b) The removal of less than 10 square metres of ACPs or equivalent gutters and piping or asbestos insulating board, where removal work may not be repeated on the same site within six months and does not require registration with the chief inspector as a RAC. |
| Type 2 asbestos work | (a) The repair or encapsulation of ACPs in a manner that does not require surface preparation; or<br>(b) The removal of ACPs or asbestos insulating board; and requires registration with the chief inspector as a Type 2 RAC. |
| Type 3 asbestos work | The removal, repair, or encapsulation of any asbestos and ACM and requires registration with the chief inspector as a Type 3 RAC. |
| UN Transport of Dangerous Goods | The UN Recommendations on the Transport of Dangerous Goods – Model Regulations, Volumes 1 and 2, which are guidance documents developed by the United Nations to harmonise dangerous goods transport regulations, which may be updated from time to time, and are commonly known as the UN Orange Book. |

## 2.4 Abbreviations

| Abbreviation | Explanation |
|---|---|
| AAR | Asbestos Abatement Regulations |
| ACM | asbestos-containing material |
| ACP | asbestos cement product |
| AIA | approved inspection authority |
| A&F | Assurance and Forensic |
| AL | action level |
| BU | business unit |
| ECA | Environment Conservation Act 73 of 1989 |
| f/mℓ | fibres per millilitre |

| Abbreviation | Explanation |
|---|---|
| GCE | Group Chief Executive; also refers to the relevant appointed person in terms of section 16.1 of the OHS Act |
| GE | Group Executive; also refers to the relevant appointed persons in terms of section 16.2 of the OHS Act |
| HEG | homogenous exposure group |
| HEPA | high-efficiency particulate air |
| HIRA | Hazard identification and risk assessment |
| HSE | Health and Safety Executive |
| HSG | Health and Safety Guidance |
| ISO | International Organisation for Standardisation |
| Mancom | Management Committee |
| mm | millimetre |
| N/a | not applicable |
| NEMWA | National Environmental Management Waste Act 59 of 2008 |
| NIOSH | National Institute of Occupational Safety and Health |
| OEL | occupational exposure limit |
| OHMAG | Occupational Hygiene Management Action Group |
| OHS | occupational hygiene and safety |
| OHS Steercom | Occupational Hygiene and Safety Steering Committee |
| OHWG | Occupational Hygiene Work Group |
| OHS&E | occupational hygiene, safety, and environmental |
| OHS Act | Occupational Health and Safety Act 85 of 1993 |
| OU | operating unit |
| PPE | personal protective equipment |
| PCM | phase contrast microscopy |
| RA | risk assessment |
| RAC | registered asbestos contractor |
| RPE | respiratory protective equipment |
| R&S | Risk and Sustainability |
| SAIOH | Southern African Institute for Occupational Hygiene |
| SANAS | South African National Accreditation System |
| SANS | South African National Standards |
| STEL | short-term exposure limit |

| Abbreviation | Explanation |
|---|---|
| TWA | time-weighted average |
| WI | work instruction |

## 2.5 Roles and responsibilities

### 2.5.1 Approved asbestos inspection authority (AIA)

The responsible AIA will perform an oversight role to ensure compliance with the Asbestos Abatement Regulations. The responsible AIA must:

- Review and endorse asbestos inventories and risk assessments (≤ six-yearly) provided that the review and endorsement of asbestos inventories and risk assessments are not required if the work was carried out by an AIA (AAR – Regulation 5).
- Conduct oversight of RAC duties and responsibilities (AAR – Regulation 13).
- Approve and submit all asbestos work plans (AAR – Regulation 15).
- Conduct air monitoring and issue a written report, which includes findings and, where necessary, recommendations (AAR – Regulation 16).
- Conduct asbestos clearance functions and issue a clearance certificate (AAR – Regulation 22).
- Assist in settling disputes, if required and where asbestos work is to be carried out, by means of a decision concerning the type of asbestos work (AAR – Regulation 14).

### 2.5.2 Asbestos Compliance Officer

The Asbestos Compliance Officer will co-ordinate/manage asbestos activities on site according to AAR and Asbestos Standard requirements, including the following:

1) Operational management of asbestos.
2) Identification and assessment of asbestos.
3) Compiling and maintaining the asbestos inventory, phase-out plan, and management plan applicable to the site of responsibility.
4) Information, instruction, and training.
5) Oversight of duties of persons who may be exposed to asbestos.
6) Control of asbestos exposure.
7) Labelling of asbestos.
8) Repair and removal of asbestos.
9) Ensuring that asbestos work is performed according to approved asbestos work plans.
10) Phasing out existing asbestos.
11) Disposal functions of asbestos.
12) Appointment of an AIA.
13) Oversight of air-monitoring duties.
14) Oversight of RAC, that is, compliance and competence functions.
15) Oversight of asbestos clearance duties.
16) Regulated asbestos area functions.

17) Personal protective equipment and facilities duties.
18) Incidental asbestos exposure management, including reporting of incidents.
19) Prohibition of the use, manufacturing, import, and export of asbestos.
20) Recording of information on the applicable templates.
21) Submission of reports and/notifications to relevant authorities, according to required timelines.
22) Consult with R&S OHS or an Eskom SAIOH-registered Occupational Hygienist/ Occupational Hygiene Technologist for any assistance, where required.

### 2.5.3 Assurance and Forensic Department (A&F)

A&F or anyone appointed to do so on its behalf will audit and monitor the business compliance and implementation of this asbestos management plan at random intervals as determined by its agreed audit schedule. A&F will audit different BUs, including R&S, to give assurance to the ARC that the system of internal controls is in place and that it functions as planned.

### 2.5.4 Environmental practitioners

The Eskom and/or contracted environmental practitioners are responsible for the following:

- Ensuring disposal from the cradle to the grave.
- Keeping records of all documentation regarding disposal according to the requirements stipulated in the applicable asbestos work plan and legal requirements.
- Reporting on the disposal figures and the practices followed to the responsible manager of the BU of concern.

### 2.5.5 Group Chief Executive (GCE)

The GCE/CEO takes ultimate accountability for compliance with the Asbestos Abatement Regulations and this standard.

### 2.5.6 Group Executive (GE)

The GE must maintain effective oversight of all asbestos risks and appropriate controls for the division.

### 2.5.7 Business unit (BU) responsible manager

The BU responsible manager is responsible for assuring to Eskom management that the requirements of this standard have been fulfilled and that all Eskom sites adhere to South African occupational health and safety, environmental, and other requirements applicable to Eskom, where non-compliances might result in serious injury or harm to people, property, equipment, systems, and the environment. The onus is on the BU responsible manager (for example, Risk and Assurance Manager or OHS Manager) to ensure that no persons, including those other than employees, are exposed to asbestos from any asbestos work performed.

The BU responsible manager must ensure the following:

- A person's exposure to asbestos must be adequately controlled as contemplated in this standard and the AAR.
- The status and outcomes of asbestos risk assessments every two years or immediately where changes/updates have occurred are evaluated and those changes and outcomes are communicated to the business.
- This standard is implemented and maintained effectively.
- Training is conducted by a competent person to ensure awareness and understanding of the AAR and this standard among employees and contractors.
- The implementation of this standard is monitored.
- An Asbestos Compliance Officer is appointed by the responsible manager in writing according to the applicable appointment letter and reviewing the effectiveness of the functions and duties of the asbestos compliance officer.
- Reviewing the asbestos inventory and phase-out plans regularly (for example, every six months), or at intervals not exceeding 24 months or whenever there is a need to, and signed off before submission to relevant parties, before asbestos work takes place.
- Reviewing the effectiveness of the control programmes regularly (for example, every six months) or whenever there is a need to, including approved asbestos work plans.
- That the BU fulfils all the requirements of this standard.
- That appropriate corrective action is taken where deviations are reported to him/her.

### 2.5.8 Risk and Sustainability OHS Department and Environmental Management Department

The R&S OHS and Environmental Management Departments will ensure compliance to these standard and applicable legal requirements by fulfilling its functional leadership, assurance, and oversight mandate.

### 2.5.9 R&S OHS Inspectorate

Inspectors from the OHS Inspectorate, R&S OHS Department, will do OHS compliance and assurance inspections to test and ensure OHS compliance with the legal and Eskom requirements at random intervals as determined by their agreed inspection schedule.

## 2.6 Process for monitoring

Compliance with the requirements of this standard shall be audited according to the first- third-tier audit process, as defined under section 2.3 of this document. The BU is responsible for its own monitoring. All other assurance providers will monitor compliance with this plan.

The respective BU will audit and monitor the business compliance and implementation of this standard annually (or according to legislative prescription), and that audit report shall be directed to R&S, which will then communicate with the legislative authority on whether Eskom is complying or not.

### 2.7 Related/Supporting documents

[1] 240-47175987: Eskom Asbestos Inventory and Phase-out Template

[2] 240-64724984: Appointment of Responsible Persons for OHS and Environmental Responsibilities

[3] 240-70044602: Occupational Health and Safety Baseline Risk Assessment Template

[4] 240-154823534: OH-HIRA Tables

[5] 240-154266980: Asbestos Compliance Officer Appointment Template

[6] 240-163492991: Asbestos Management Plan – Template

[7] 240-165207139: Asbestos Clearance Certificate – Template

## 3. Asbestos standard content

### 3.1 Asbestos – Background information

Asbestos has a fibrous form that is often clearly visible as straight colourless to grey/brown fibres or curly white to grey fibres that are difficult to separate, straight dark blue fibres, or a finely powdered fibre dust.

Asbestos and ACMs were historically used for lagging and insulation purposes, especially at power stations. Asbestos work may vary among tasks and could include handling asbestos-containing lagging or insulation material that might be disturbed by the demolition of, or structural alterations to, buildings or structures and the cleaning of large asbestos spills. It includes work performed on ACPs, for example, sheeting, other related products, and asbestos that forms part of the structure of a regulated asbestos area, building plant, or premises.

Possible sources of asbestos dust that becomes airborne could be the result of air movement, or the vibration of plant/equipment, or incorrect work practices such as dry sweeping and de-dusting. Examples include asbestos-containing dust that collects on top of surface areas such as ceilings, beams, work surfaces, or structures, which dust could become airborne owing to disturbances caused by wind, vibration, cleaning, or work processes.

The inhalation of regulated asbestos fibres may cause serious lung diseases, including asbestosis, cancer of the lungs, and mesothelioma. These diseases usually become apparent only some years after asbestos exposure, sometimes up to 40 or more years after the first exposure. Cigarette smokers exposed to asbestos have a marked increase in the incidence of lung cancer compared to non-smokers. Research has shown that smoking increases the risk of contracting asbestosis by approximately 25%.

Asbestos in water systems might be carried by water to other areas, where it could accumulate and become dry and airborne in an uncontrolled manner.

## 3.2 Risk assessments

The BU responsible managers shall ensure that the exposure of their employees to hazardous conditions relating to the condition of the asbestos, ACM, and/or asbestos work in the regulated asbestos area is assessed by a competent person, for example, a suitably qualified and experienced risk assessor for asbestos.

Baseline risk assessments and/or task-specific HIRAs shall be conducted at regular intervals, that is, immediately and thereafter at least once every two years (24 months), provided that reassessment is not required (for example, change of activity and/or exposure conditions). Baseline risk assessment is to be conducted according to Procedure 32-520 and HIRA according to Work Instruction 240-114036246.

Where this assessment indicates a risk or a possibility of exposure, the air should be sampled or monitored for airborne regulated asbestos fibres and then compared with the prescribed standards, and relevant control measures should be taken.

The hierarchy of control measures should be considered, applying these to be based on “reasonable, practicable” principles, according to the definition and requirements contained in the OHS Act. It is, therefore, the responsibility of the BU responsible manager to provide reasons for what he/she regards as reasonably practical in each situation.

The purpose of the assessment is to recognise any hazards or potential hazards and evaluate the extent of the risk that asbestos work holds to the health of the exposed and potentially exposed persons. Assessment results must be recorded in a report format. The assessment findings should assist the BU responsible manager to make decisions about taking any further action.

The risk assessment must, as an outcome, have a risk categorisation based on the potential for exposure to asbestos for each item of ACM, according to criteria stipulated in the AAR (Regulation 5 (3)).

During the assessment, the assessor, in consultation with the BU responsible manager, should consider various options. If it is obvious that a health hazard does, or is likely to, exist, control measures should be taken as soon as reasonably possible. Where there is uncertainty about whether a particular situation may or may not be hazardous, it should be dealt with as hazardous to health until it has been confirmed as not hazardous by means of air-sampling results.

An AIA could verify the assessment results by means of occupational hygiene monitoring and has the right to change the outcome of an assessment, provided that the AIA gives a written motivation for the change in the assessment result and that such change is recorded.

The assessor should complete the relevant risk assessment documentation, that is, OHS Baseline Risk Assessment Template (240-70044602) and/or OHS RA (HIRA) Report Template (240-70044602), and use the information gathered during an assessment to complete the Eskom Asbestos Inventory and Phase-out Template (240-47175987).

The risk assessment for asbestos repair work must include the minimum criteria, as stipulated in the AAR (Regulation 5 (5)).

As part of the plan of work, the risk assessment for asbestos removal work must include the minimum criteria, as stipulated in the AAR (Regulation 5 (6)).

The focus is on the prevention/control of asbestos exposure. The steps to reduce exposure shall be based on the principle of preventing/controlling exposure at the source and controlling such exposure to the lowest level (concentration) that is reasonably practicable.

The BU responsible manager or his/her delegated representative shall prepare an asbestos work plan, which includes an asbestos phase-out plan for managing the risk, where the risk assessment indicates a need to establish and maintain a system and/or where such system is required by regulation, for example:

- occupational hygiene monitoring of regulated asbestos fibres
- medical surveillance.

More information about the requirements of an asbestos work plan and the phase-out plan is given in this standard.

### 3.3 Asbestos inventory

The BU responsible manager shall ensure that all asbestos and ACM are identified and recorded in an inventory by a competent person, that is, competent in the identification and applicable techniques of asbestos and ACM and in the formulation of the relevant inventories and phase-out plans. If such material does not belong to the BU responsible manager's area of responsibility, the owner of the asbestos or ACM should provide the inventory, but the onus is on the BU responsible manager to verify the correctness and applicability of the information in the inventory in such a case. The BU responsible manager must ensure that a competent person reviews and, if necessary, revises the inventory at intervals not exceeding 24 months. The inventory must be kept at the regulated asbestos area or premises of concern, with a copy readily accessible and made available where required (AAR, Regulation 7).

An asbestos inventory has the following purpose:

- To establish the exact locations of asbestos or ACM on site.
- To assess the condition of the material.
- To provide an estimate of the quantity of asbestos or ACM on site.
- To provide an estimate of the number of asbestos structures occupied by Eskom employees.
- To provide a historical record of the movement of asbestos in the business (especially regarding the management of the phase-out of asbestos).
- To provide supporting information for an asbestos phase-out plan.

If one is not sure whether a particular material is asbestos or contains asbestos, it shall be handled as if it was asbestos material until it has been confirmed as not containing asbestos, that is, to arrange for a sample of that material to be analysed for the presence of asbestos by a laboratory competent to carry out such analyses. If part of the regulated asbestos area is inaccessible and considered by a competent person as likely to contain asbestos, assume that asbestos is present in that area.

Regarding any disagreement as to whether any substance is in fact asbestos, the health and safety representative, health and safety committee or a person nominated by the employees may require that a sample (bulk sample) of that substance be taken and definitive identification of the substance be determined by an AIA, provided that the cost of the identification is borne by the employer (AAR, Regulation 4(2)). Refer to Appendix E for criteria stipulated for bulk asbestos sampling.

Careful consideration should be given to where visual inspection is applied for asbestos identification purposes, as cases are known where the insulation or lagging has been painted over or bound with cotton or some other textile. In other cases, the insulation or lagging may already have been treated with specialised encapsulation materials.

Nationally or internationally recognised survey methodology/techniques shall be used by a competent person to identify, sample, and analyse material to confirm the presence of asbestos or ACM (for example, HSG264, HSG248, and HSG173), with the analysis to be done by a competent laboratory (SANS 17025-accredited for asbestos analysis), as required.

The inventory shall be specific regarding the date of identification, location, material description, the extent of deterioration and estimated amount of asbestos or ACM, confirmation of labelling and signage (AAR, Regulation 20), risk categorisation derived from the asbestos risk assessment (baseline RA and/or HIRA) as detailed in Regulation 5(3) (AAR), and potential exposure scenarios as required in Regulation 6(2)(b) (AAR). The type of asbestos should be recorded, where this information is available, to assist with prioritising the phase-out process for material of concern.

It is advisable to check and verify all the calculations made in the inventory to ensure that the correct amounts of all asbestos and ACM in the applicable areas are included.

The Eskom Asbestos Inventory and Phase-out Template (240-47175987) should be completed or updated, as required, that is, where further ACM is identified or where ACM has deteriorated significantly or is removed, damaged, sealed, coated, or encapsulated. Where significant changes to the initially identified risks are noted, the risk assessment should be updated to reflect the new risk status.

The inventory shall be kept on record for a minimum of 50 years and shall be maintained for the lifetime of the plant (until the point of demolishment and/or total asbestos phase-out).

If no asbestos is identified, ensure that the asbestos-free status of the regulated asbestos area is substantiated in writing by a competent person, according to requirements stipulated in Regulation 3 (d) of the AAR.

### 3.4 Management and control of asbestos

The onus is on the BU responsible manager to ensure that the exposure of employees and the environment to asbestos is prevented or adequately controlled. The BU responsible manager should have an asbestos management strategy dealing with asbestos and ACM in his/her area of control, to manage asbestos exposure effectively. Appendix C provides an outline of the elements/components of this asbestos management process (strategy). Where ACM has been identified, the responsible BU manager must ensure that a competent person prepares a written asbestos management plan for the regulated asbestos area, according to minimum criteria stipulated in Regulation 6 (AAR). This strategy must be based on the findings made in the risk assessment and the available information in the asbestos inventory. The risk categorisation contemplated in clause 3.2 must be used to determine the need for keeping in place, repairing, or removing the ACM. The policy, procedure, and implementation plan for phasing out existing ACMs at the regulated asbestos area must consider the following:

- The principle of 'reasonably practicable'; and
- Reasons for decisions.

This requires taking proactive steps to (a) eliminate or phase out asbestos and ACM and to replace them with non-asbestos-containing materials, (b) manage existing asbestos structures/materials/equipment and safely perform asbestos work to prevent/control the potential for asbestos exposure, (c) follow the correct procedures to prevent asbestos fibres from becoming airborne, and (d) prohibit the use of asbestos and ACM in new buildings.

The responsible BU manager person must review and, if necessary, revise the asbestos management plan at intervals not exceeding eight years or if any information in the plan changes.

The Asbestos Management Plan Template (240-163492991) should be completed or updated for this purpose, with reference to guidance provided in the Asbestos Management Plan – Guideline (240-165016139).

### 3.4.1 Phase-out plans and plans of work

#### 3.4.1.1 Aim of the asbestos phase-out plan

An asbestos phase-out plan aims to remove all asbestos and ACM (management by elimination of the asbestos risk) to prevent future exposure.

These plans require the development and implementation of asbestos phase-out plans of work for the different projects/phases of the phase-out process, according to the Eskom Asbestos Inventory and Phase-out Template (240-47175987).

The phase-out plan must address the following:

- All the high-risk activities that may potentially cause exposure to regulated asbestos fibres
- All the high-risk areas involving raw asbestos material (lagging)
- If reasonably practicable, the use of low-risk material and conducting of activities where there may potentially be a risk of inhaling regulated asbestos fibres

#### 3.4.1.2 Development of asbestos phase-out plans

Each BU responsible manager is required to develop an asbestos phase-out plan to be implemented over a period as specified by the BU to remove asbestos and ACM and/or replace it with non-asbestos-containing material. BU responsible managers need to ensure that the phase-out of asbestos is in line with the corporate plan and that dates are assigned and tracked to comply with phase-out. The development, structure, and timelines of the asbestos phase-out plan should follow a risk-based approach, with priority allocated to high-risk exposure conditions.

The development of an asbestos phase-out plan is required when:

- The material creates an immediate risk and should be removed (where the risk of exposure is identified).
- The phase-out of asbestos is planned as part of the normal maintenance schedule.
- All raw asbestos material that forms part of plant must be removed and replaced with safer non-asbestos material, where reasonably practicable.
- Raw asbestos is present in the natural environment or where it has been introduced in the natural environment, and there is a potential risk of regulated asbestos fibres becoming airborne because of work activities, the movement of vehicles or persons, or any disturbance because of natural environmental conditions such as the movement of water and wind.
- All asbestos cement material in an unsafe condition must be made safe or removed in a controlled manner.

The asbestos phase-out plan should be drawn up in a formalised and proactive manner, broken down into projects/phases, with the time periods for these reasonably practicable. Where the removal of asbestos or repair of ACM is planned, information in the inventory phase-out plan must be adequately detailed with respect to the work to be carried out.

### 3.4.1.3 Asbestos phase-out plan contents

The asbestos phase-out plan shall include the following as minimum information:

- The OU's/BU's proposed alternatives to the use of asbestos and ACM
- The time periods within which the BU intends removing/replacing the currently used asbestos or ACM
- The current total amount of asbestos
- The areas where asbestos occurs
- The types of asbestos
- The condition of the asbestos
- The maintenance plan for the asbestos in use
- The amount of asbestos in storage
- The amount of asbestos already removed
- Target time frame(s) for total asbestos removal and the dates for commencing and completing the phase-out
- The plan shall spell out the procedure(s) for:
  - the phase-out of asbestos;
  - the disposal of asbestos; and
  - the reasons why and where phase-out is not possible.
- Reference to recommended control measures, for example, asbestos plan of work.

A detailed template for developing the asbestos phase-out plan is available and should be used, that is, Eskom Asbestos Inventory and Phase-out Template (240-47175987).

### 3.4.1.4 Approval and authorisation

The sites where asbestos and ACM are in use shall have an asbestos phase-out plan, approved by the BU responsible manager, and this plan must be available for auditing purposes at any time.

### 3.4.1.5 Implementation

The asbestos phase-out plan should be completed by the end of **2033** and will achieve the following milestones:

- All raw asbestos material will have been removed and replaced with safer material.
- All unsafe asbestos cement structures/articles will have been removed or made safe.
- All ACM used for backfilling or other uses, where there was a potential risk of regulated asbestos fibres becoming airborne, will have been rehabilitated and made safe.

In cases where there are no alternatives available, or where asbestos cannot be removed, or where some OUs/BUs find that the asbestos phase-out plan is not reasonably practicable within the initially indicated time frames (according to the phase-out plan), a detailed formal letter signed by the

divisional GE and BU responsible manager has to be submitted to the SM from R&S OHS. The letter needs to justify the reasons for deviating from the time frame(s) of concern, with detailed comments and/or phase-out plan amendments to be included.

The asbestos phase-out or any removal of asbestos and ACM shall be performed after normal working hours, or under controlled conditions, to limit the number of persons who might be exposed. The BU responsible manager shall obtain the relevant permit for asbestos phase-out or removal. The communiqué regarding asbestos phase-out or removal shall be circulated to all employees or contractors on site to make them aware of the hazard and to restrict unnecessary movement in such areas.

#### 3.4.1.6 Progress reports

Asbestos inventories and phase-out plans are to be reviewed and authorised annually.

Annual progress reports on asbestos phase-out should be compiled and submitted to R&S OHS on or before **31 March** each year. The updated and authorised asbestos inventory and phase-out plan (according to Template 240-47175987) must be used for reporting purposes and referred to in correspondence regarding the completion of the projects/phases in the implementation of the asbestos phase-out plan.

These reports must be accessible and made available to R&S OHS and/or the applicable auditor/inspector from time to time for auditing purposes, as requested.

### 3.4.2 Asbestos maintenance plans

#### 3.4.2.1 Aim of routine asbestos maintenance

Routine asbestos maintenance aims to ensure that the current asbestos and ACM are kept intact, with limited risk of exposure to asbestos fibres.

#### 3.4.2.2 Basic principles

The onus is on the BU responsible manager to ensure that all asbestos and asbestos-containing structures and articles are kept in a safe condition.

Where routine maintenance work is performed on asbestos material and asbestos cement sheeting and related products, which work does not result in structural changes to, or the removal or demolition of, ACM (for example, painting and sealing of the surfaces of materials), this work shall only be regarded as purely routine maintenance work and not as asbestos work as such.

A safe work procedure must be available for the work to be performed. A standardised asbestos plan of work is required for such work and should be readily available on site.

### 3.4.3 Asbestos plan of work

#### 3.4.3.1 General requirements and notification

The term “asbestos work” refers to any work involving asbestos, regardless of the extent of the work, where the potential exists for exposure to asbestos dust. This includes, for example, work conducted at sites where there are substandard conditions in relation to asbestos, the painting or cleaning of asbestos roofs, the removal of seals and packing, and areas with naturally occurring asbestos. It also includes the repair/encapsulation of asbestos-containing cement material and where asbestos-containing cement products (such as roof sheets or wall partitions) are removal/dismantled intact (without breakage).

Refer to the AAR – Regulation 14 for applicable provisions if uncertainty exists regarding, or if a dispute arises concerning, the classification of Type 1, 2, or 3 asbestos work.

At least **seven days** before the commencement of the asbestos work, the written plan of work should be compiled by the AIA in consultation with the RAC, according to AAR – Regulation 15 and Appendix A.

At least **seven days** before the commencement of any asbestos work (Types 1, 2, and 3), every BU responsible manager shall notify the relevant Chief Director: Provincial Operations (DEL) for acknowledgement, by means of a written notification (AAR – Annexure 2, or Appendix G of this document) of such work, together with an AIA-approved and signed asbestos work plan. The latter plan is to be submitted by the responsible AIA to the Chief Director, with submission (notification) to be verified by both the BU responsible manager and the asbestos contractor of concern (AAR – Regulation 13(d)). The asbestos plan of work must be signed by the following:

- Asbestos client (BU responsible manager)
- RAC
- AIA

Note that a shorter period for notification may be allowed by the Chief Director: Provincial Operations in the event of an emergency, according to the AAR – Regulation 10(3).

The relevant Chief Director: Provincial Operations must acknowledge receipt in writing to the employer/asbestos client and AIA within the seven-day notification period.

The notification must give a specific description of the location, venue, and contact details of where the asbestos work will be done, including details of the RAC, details of the asbestos client, details of the AIA, type and volume of asbestos to be removed/repaired, and the expected commencement and completion dates of the work). The minimum contents of the plan of work requirements are summarised in Appendix A.

Copies of notification correspondence shall be kept on site for AIA verification and auditing purposes.

#### 3.4.3.2 Maintenance work

If the maintenance work (for example, Type 2 or Type 3 asbestos work) constitutes the disturbance or removal of the asbestos material, an asbestos plan of work shall be formulated, describing the measures necessary to ensure the health and safety of the persons at the regulated asbestos area and to prevent the emission of, and/or exposure to, asbestos fibres.

### 3.4.3.3 Demolition and asbestos work

No person may carry out any demolition work before all asbestos, and asbestos-containing building material has been identified in the inventory of asbestos in place, safely removed or otherwise controlled, as far as is reasonably practicable, to eliminate the uncontrolled release of asbestos and asbestos dust.

An RAC approved by, and registered with, the Department of Employment and Labour, shall conduct all asbestos work and/or the removal of any asbestos and ACM.

### 3.4.3.4 Use of compressed air and high-pressure water jetting

No person may use compressed air or permit compressed air to remove asbestos dust from any surface or person.

High-pressure water jetting may lead to a significant disturbance of fibres, increasing the risk of exposure to airborne asbestos. This practice should be prohibited, where reasonably practicable. When high-pressure water jetting is used, it must be under controlled conditions, according to requirements stipulated in the Asbestos Abatement Regulations.

### 3.4.3.5 Emergency response

Ensuring the containment of, and the minimised exposure of people and the environment to, asbestos fibres in emergencies requires the following:

- The identification of potential emergencies that may result in the unplanned release of asbestos fibres.
- The preparation, in advance, of emergency plans (including asbestos work plans), addressing each identified potential situation (asbestos risk) and taking into consideration the applicable legal requirements and best practices.

### 3.4.3.6 Transportation of asbestos and ACM

Asbestos and ACM must be transported in accordance with the minimum requirements of this standard and in accordance with SANS 10228 and SANS 10229.

### 3.4.3.7 Disposal and storage

Asbestos must be disposed of in accordance with the minimum requirements according to the Asbestos Abatement Regulations – Regulation 20 and the applicable environmental requirements, that is, the Environment Conservation Act 73 of 1989 and the National Environmental Management Act 107 of 1998.

No person may:

- Temporarily store any asbestos or ACMs for longer than three months after completion of asbestos removal work before final disposal.
- Temporarily store ACMs destined for disposal, which are uncovered or unprotected or stored in a manner that may contaminate ground or water systems or may cause the release of asbestos dust.

#### 3.4.3.8 Asbestos cement sheeting

It should be noted that reasonable caution should be taken in handling asbestos cement sheeting because of the inherent risk of release of, and exposure to, asbestos fibres.

Asbestos cement sheeting must be handled in accordance with the requirements of this standard as well as the minimum requirements of the Asbestos Abatement Regulations.

No person may clean or prepare surfaces of asbestos cement materials.

#### 3.4.3.9 Plan of work requirements

The minimum contents of the plan of work are summarised in Appendix A.

Asbestos work requires the use of, and compliance with, international best practices and/or methodologies. Some of these are summarised in Appendix B. It is advisable to check all calculations made in the plan of work to ensure that all asbestos and ACM in applicable areas are included.

At least four copies of the asbestos plan are required and should be distributed as follows:

- Copy 1 – record of the AIA, as required by the Department of Employment and Labour in terms of the quality system
- Copy 2 – record of the provincial office of the Department of Employment and Labour
- Copy 3 – record of the responsible Eskom BU manager or applicable subsidiary's SHEQ/SHE/OHS manager on site
- Copy 4 – applicable mandatory (for example, approved asbestos contractor) involved in the asbestos work, where relevant

All of the above copies shall be signed in full on the relevant approval page, and all other pages shall be initialled by the person representing the AIA approving the plan, a BU representative (for example, the Eskom BU manager or Asbestos Compliance Officer), and the applicable mandatory person.

Each plan, including annexes, shall be issued with a unique reference number, as well as a revision number, printed on each page.

#### 3.4.3.10 Execution of work

Where the nature of the work involves repairs or alterations to, or the removal of, asbestos/ACM, the BU responsible manager shall take the following precautions:

##### 3.4.3.10.1 Regulated asbestos area isolation and preparation

The RAC, on behalf of the BU responsible manager, shall do the following:

- Isolate the regulated asbestos area for the duration of the work by completely sealing off all openings and fixtures in the regulated asbestos area, such as doors, windows, ventilation ducts, and lighting. Strong plastic sheeting, with a thickness of not less than 250 µm, with all joints carefully sealed and securely taped in place, provides an effective form of isolation.

- Provide double barriers of plastic sheeting or other suitable means (for example, airlocks) at all entrances to, and exits from, the regulated asbestos area so that the regulated asbestos area is always closed off by one barrier when employees enter or leave.
- Post the relevant warning, prohibition, and compulsory safety signs conspicuously, providing information about the requirements pertaining to the management of the site (for example, access control, safe practices, the use of personal protective equipment (PPE), etc.).
- Vacuum-clean all removable items and equipment not attached to asbestos/ACM with HEPA filtration vacuum cleaners. Remove these items and equipment from the regulated asbestos area, and only return them to the regulated asbestos area after the work has been completed. Follow best practices for the vacuum cleaning of all removable items and equipment to minimise the risk of re-exposure after vacuuming (for example, vacuum at regulated asbestos area exits).

#### 3.4.3.10.2 Decontamination facilities and personal hygiene

Where asbestos work is performed, the BU responsible manager shall set up a decontamination facility outside the regulated asbestos area for the exclusive use of the employees exposed to asbestos. The requirements for this decontamination facility must fulfil the provisions of the Facilities Regulations as well as the Asbestos Abatement Regulations as stipulated in the OHS Act.

These facilities shall consist of a “clean” changing room, toilet/shower facilities, and a “dirty” decontamination changing room with vacuum cleaners (HEPA filters) for the preliminary vacuum cleaning of protective clothing.

Decontamination facilities should be provided for the employees involved in asbestos work at a reasonable distance from the regulated asbestos area of concern. More information about the requirements for the decontamination facility is provided in Appendix D.

The run-off water from the decontamination facility shall be handled in a manner that does not cause the contamination of any water source or pose a threat to the public.

All employees entering the regulated asbestos work area, without exception, shall:

- remove personal clothing in the “clean” changing room and put on clean protective clothing, gumboots, and respirators before entering the regulated asbestos area;
- vacuum-clean the protective clothing before the removal of any protective clothing and gumboots in the “dirty” decontamination changing room when leaving the regulated asbestos area. While still wearing their respirators, the employees should proceed to the showers and only remove their respirators while showering. All such employees shall use soap and water during showering; and
- not eat, drink, or smoke in the regulated asbestos area or keep food or beverages in a regulated asbestos area. Before eating, drinking, or smoking, employees shall comply with the decontamination procedure and again (after eating, drinking, or smoking) before re-entering the regulated asbestos area.

All other persons not involved in asbestos work entering the asbestos regulated asbestos area shall wear approved respirators for asbestos and required protective clothing and footwear. Before leaving the asbestos regulated asbestos area, they shall comply with the decontamination procedure.

All contaminated clothing and footwear shall be left in the decontamination changing room and stored in suitable (sealed) containers immediately before disposal or laundering. Contaminated respirators shall first be rinsed off and then removed in the showers and disposed of in the designated asbestos waste bags or made fit for reuse. Only specific types of respirators designed for this purpose should be reused, for example, reusable face masks with particulate filter cartridges. The collection of protective clothing, footwear, and respirators shall be strictly controlled.

As discussed in this standard, additional requirements for the decontamination of the regulated asbestos area shall also be fulfilled.

### 3.4.4 Prohibition on use, import and export of asbestos, ACM, and equipment

The Environment Conservation Act of 1989 prohibits the use, manufacturing, import, and export of asbestos and ACM. Eskom Holdings SOC Limited and its subsidiaries may not use asbestos, ACM, or asbestos-containing equipment in new infrastructure, and no asbestos, ACM, or asbestos-containing equipment shall be exported. No asbestos, ACM, or asbestos-containing equipment shall be imported into, or hired/rented/borrowed by, Eskom sites or the sites of its subsidiaries. It is the responsibility of the BU responsible manager to communicate this requirement to the relevant procurement staff and to ensure compliance in this regard.

## 3.5 Strategy for monitoring, analysis, and control of airborne asbestos

### 3.5.1 Monitoring of airborne asbestos

In the case of Type 2 and Type 3 asbestos work, the BU responsible manager must ensure that personal and environmental air monitoring of the concentration of airborne regulated fibres is performed by an AIA.

The AIA shall remain accountable for the entire monitoring process and take full responsibility for the validity, accuracy, and correctness of the measurement results. A person certified competent by the Eskom or external AIA to conduct asbestos air monitoring should conduct all air sampling. That person shall be registered with SAIOH and have a valid legal knowledge certificate for asbestos.

Air monitoring must be carried out only after the relevant health and safety representative or relevant health and safety committee has been consulted and given a reasonable opportunity, as mutually agreed, to comment thereon.

Air monitoring is to be carried out in terms of HSG 248 and should be representative of employee exposure and/or environmental conditions. The decision about the air-monitoring strategy, for example, frequency, number and duration of samples, personal versus static samples, sample population and location, etc., and air-monitoring type, vests in the risk assessor in conjunction with the AIA, based on the site-specific asbestos risk assessment. Guidance is provided in the HSE documents:

- HSG248: Asbestos: The analysts' guide for sampling, analysis, and clearance procedures
- HSG173: Monitoring strategies for toxic substances

The air-monitoring strategy should be based on the principle of controlling the concentrations of airborne asbestos fibre exposure to levels as low as reasonably practicable. This should be based

on the results of personal exposure, and/or static sampling results, and/or previous results derived from similar work.

In terms of HSG248, various sampling applications should be followed. These applications are as follows:

- **Compliance sampling** is used to assess whether the personal exposure of workers complies with the four-hour time-weighted average (TWA) OEL of 0.1 regulated asbestos fibres per millilitre of air or the 10-minute TWA short-term exposure limit (STEL) of 0.6 regulated asbestos fibres per millilitre of air.
- **Background sampling** is used to establish asbestos fibre concentrations before any activity that may lead to airborne asbestos contamination. The background sampling should be conducted a day before the commencement of any asbestos work or, where this is not feasible, on the morning of the day on which asbestos work is to be conducted.
- **Leak/Enclosed check sampling** is used to determine whether the environmental control systems are adequate. This measurement is taken outside the enclosed area during the performance of asbestos work.
- **Assessment of the suitability of respiratory protection**: this measurement is taken inside enclosures, during the performance of asbestos work, to assess the effectiveness of the dust suppression measures and the suitability of the respiratory protection in use.
- **Clearance indicator sampling** is used to determine (indicate) the extent to which an area has been cleared of asbestos fibres after completing Type 2 and Type 3 asbestos work. Note: For the purposes of issuing the clearance certificate, the result of the clearance sample should not exceed the result of the background sample, and that at the time of monitoring, the clearance indicator of 0.01 f/mℓl was met.

  The AIA must also, together with air sampling:

  - Conduct a thorough visual inspection of the relevant work area.
  - Ensure that all asbestos waste has been removed in accordance with the requirements of AAR – Regulation 21.
  - Issue a written declaration for clearance certification, according to Asbestos Clearance Certificate – Template (240-165207139).
- **Reassurance sampling** is used to confirm that the residual (remaining) asbestos fibre concentrations are < 0, 01 f/mℓ of air sampled. The monitoring may be conducted in certain circumstances, such as when an enclosure has been removed.

All monitored asbestos samples must be analysed/counted by a SANAS 17025-accredited facility, according to method HSG248.

All reports and results shall be kept, together with applicable records of the asbestos work, for a minimum period of 50 years.

The results of air monitoring must be compared with the OEL or the OEL STEL to ensure that no employee is exposed to asbestos more than the prescribed OELs.

Asbestos monitoring and reference to OEL shall be based solely on HSG248 and the Asbestos Abatement Regulations 2020. This also applies to international contractors for asbestos work, that is, demolition and/or maintenance work, including the handling, removal, and disposal of asbestos and ACM.

Requirements for the asbestos work (including monitoring) to be done by international entities are addressed in the asbestos clauses for foreign contractors in the applicable commercial contracts, that is, 'asbestos Z clause' for NEC contracts of concern.

### 3.5.2 Independence of the AIA

To ensure impartiality and to protect any Eskom employee or contractor involved in asbestos-monitoring practices, any work conducted by an external AIA (external to Eskom Holdings SOC Limited and its subsidiaries) shall be conducted in full by that AIA, and the AIA may not contract the work out to any Eskom employee or contractor; nor may the external AIA instruct any such employee or occupational hygiene practitioner to conduct work on its behalf.

### 3.5.3 Control of airborne asbestos exposure

As mentioned in this standard, the management of asbestos describes a long-term management approach focusing on the prevention of asbestos exposure by means of the elimination of asbestos, the maintenance of existing asbestos to keep it intact, and the plans to be implemented during asbestos work.

This section of the document deals with the short-term management of asbestos and ACM, where proactive steps have been proven (through monitoring) to be ineffective, resulting in potential exposure to airborne asbestos fibres. It also addresses cases where there is an immediate risk of exposure because of unplanned emergencies.

The control of exposure to asbestos and ACM implies preventing exposure and possible occupational diseases by controlling asbestos dust and lowering the concentrations of airborne asbestos fibres.

**According to the AAR –**

Regulation 9(1): Control of exposure is regarded as adequate if the measured airborne concentration of regulated fibres is—

*(a)* at or below the OEL for asbestos; or

*(b)* above the OEL for asbestos, but the reason has been identified, and action is taken, as soon as is reasonably practicable, to lower airborne concentrations to a level as low as reasonably practicable below the OEL for asbestos.

Regulation 9(2): Where reasonably practicable, an employer or self-employed person must control exposure to asbestos—

*(a)* by limiting the number of persons who will be exposed or may be exposed;

*(b)* by limiting the period during which persons will be exposed or may be exposed;

*(c)* by limiting the amount of asbestos dust that may contaminate the working environment;

*(d)* by introducing engineering control measures for the control of exposure to asbestos, which include the following:

(i) process separation or enclosure;

(ii) bonding of asbestos fibres with other materials to prevent the release of asbestos dust;

(iii) the use of wet methods, where appropriate; and

(iv) the provision of a negative pressure unit with a filtration efficiency of at least 99 per cent for particles one micrometre in size, in the case of Type 3 asbestos work, with a fault indicator to provide early warning of a failure of the negative pressure unit; and

*(e)* by complying with the requirements of Regulation 19 – Personal protective equipment and facilities.

Regulation 9(3): Regarding the contamination of water with asbestos, an employer or self-employed person must ensure that—
*(a)* any water that is contaminated with asbestos as a result of work being performed is passed through a filtration system before being released into any environment or water system;

*(b)* a suitable water filtration system is used, which will ensure that the quantity of asbestos being released or entering into any environment or water system is reduced as far as is reasonably practicable; and

*(c)* contaminated parts of the filtration system, when discarded, are disposed of as asbestos waste.

Regulation 9(4): By introducing appropriate written work procedures that an employee must follow, an employer or self-employed person must ensure that—
*(a)* ACMs are safely handled and disposed of appropriately; and

*(b)* installations, equipment, tools and negative pressure units are safely used, decontaminated and maintained.

Regulation 9(5): An employer or self-employed person must report to the Chief Director: Provincial Operations, by telephone, electronic mail or similar means of communication, any spill, disturbance or uncontrolled release of asbestos, which may be considered a health hazard.

#### 3.5.3.1 Demarcation and barricading of areas and PPE requirements

All areas where Type 1, Type 2, or Type 3 asbestos work is performed or where ACM is temporarily stored shall be clearly demarcated and identified as a regulated asbestos area by the relevant asbestos warning, prohibition, and compulsory safety signs.

Any regulated asbestos area must be clearly demarcated using the pictograms and signs specified in Annexure 1 of the AAR (or Annexure F of this document).

Any asbestos-contaminated soil or land contaminated with asbestos waste must be clearly demarcated and signposted using the asbestos warning signage specified in Annexure 1 of the AAR (or Annexure F of this document).

Prohibition signs must include, as a minimum:

- “no eating and no drinking”;
- “no smoking”; and
- restricted access signs.

Access to areas where asbestos work is performed or where ACM is temporarily stored should be controlled to ensure that no person enters, remains or comes close to such areas unless he/she has been authorised to do so and has taken the necessary protective measures, that is, wearing the appropriate type and correctly fitting respiratory protective equipment and protective clothing as contemplated in AAR – Regulation 19.

Compulsory signs must include, as a minimum, the compulsory wearing of respiratory protection. The wearing of protective clothing and respiratory protective equipment shall be enforced. The BU responsible manager shall ensure that the respiratory protective equipment and protective clothing issued to any person for protection against regulated airborne asbestos fibre exposure:

- is the type suitable for asbestos;
- provides the appropriate level of protection;
- is approved by the SABS; and
- is in line with Eskom's requirements according to the Eskom PPE Specification.

#### 3.5.3.2 Asbestos labelling, hazard communication, and training information

All asbestos and ACM in place listed in the inventory of asbestos in place shall be clearly and legibly identified using the pictogram specified in AAR – Annexure 1 (or Annexure F of this document). This is intended to ensure that all persons are warned of the presence of, and possible exposure to, asbestos fibres. All asbestos waste shall be clearly labelled—

- using the label specified in AAR – Annexure 1 (or Annexure F of this document);
- as far as is reasonably practicable, using clearly visible and enough labels that would adequately serve as a warning of potential exposure; and
- ensuring that a container or vehicle in which asbestos is transported is clearly identified in accordance with the UN Transport of Dangerous Goods or UN Orange Book.

Employees must be informed of the meaning of the warnings on these labels and the preventive measures that must be taken.

Each employee (including any mandatory, contractor, casual worker, or person provided by agents, if applicable) involved in any asbestos work, where he/she could be exposed to asbestos dust, shall be adequately and comprehensively informed and trained before such person starts performing the asbestos work.

The competent trainer shall have adequate practical experience and theoretical knowledge of all aspects of the work being carried out.

The BU responsible manager must ensure that the training includes practical aspects and theoretical knowledge, for example, requirements of the Asbestos Abatement Regulations, risks and possible health effects, control measures and monitoring requirements, etc., in relation to the asbestos work to be performed.

Information, instruction, and training to persons who have incidental asbestos exposure must be conducted according to the minimum criteria, as stipulated in the AAR (Regulation 7(1)).

Where an employee undertakes non-asbestos-related work, where there is a potential for exposure to asbestos dust, the employer must ensure that the employee is adequately and comprehensively informed, instructed and trained in both practical and theoretical knowledge, according to the minimum criteria, as stipulated in the AAR (Regulation 7(2)).

In the case of removal of asbestos or repair of ACMs, the responsible BU manager must ensure that all supervisors and employees are adequately and comprehensively informed, instructed and trained in both practical and theoretical knowledge, according to the minimum criteria, as stipulated in the AAR (Regulation 7(3)). The latter training must—

(a) be provided by a person deemed competent by the chief inspector;

(b) have a minimum contact duration of eight hours; and

(c) as an outcome, provide employees with asbestos training certificates.

Refresher training, with a minimum contact duration of two hours, must be provided at least annually or at more frequent intervals if—

(a) work methods change;

(b) the type of work carried out changes significantly;

(c) the type of equipment used to control exposure changes; or

(d) deemed a requirement by the occupational health and safety committee.

Current employee asbestos training certificates must be provided to employees upon termination of employment.

The BU responsible manager shall ensure availability of up-to-date records of theoretical and practical asbestos training for 50 years or for as long as the employee remains employed at the regulated asbestos area where he/she is being exposed to asbestos, whichever is the longest.

#### 3.5.3.3 Personal protective equipment

Only SABS-approved asbestos dust/particulate masks (respiratory protection devices), capable of keeping the exposure level below the OEL for asbestos, are permitted to be used for asbestos inhalation protection.

Employees expected to wear the issued respiratory protective devices shall be trained in their correct use, storage, and maintenance.

The BU responsible manager shall provide regular visual inspections of the employees to ensure the correct usage, maintenance, and condition of the PPE. No respiratory protection device may be left lying on the surface where it could accumulate asbestos fibres. The issued disposable respiratory protective device (particulate filter) shall be used once only.

Where reusable respirators are used, the requirements indicated for decontamination facilities and personal hygiene in this standard should be complied with.

PPE issued to an employee shall be cleaned, decontaminated (asbestos-free), and, where appropriate, sterilised. Separate containers or storage facilities shall be provided for storage of PPE when not in use, and all PPE, when not in use, may only be stored in the place provided.

No person shall be allowed to remove dirty or contaminated PPE from the premises. Where contaminated PPE must be disposed of, it shall be treated as asbestos waste. Supervisors responsible for the asbestos work must ensure compliance with these requirements.

Where PPE contaminated with asbestos dust is cleaned on the premises:

- Care must be taken to prevent contamination during handling, transport and cleaning; and
- Water used for decontamination or cleaning of equipment must be filtered in accordance with AAR – Regulation 9(3) before being released into any water system.

The BU responsible manager must—

- provide employees involved in Type 1 and Type 2 asbestos work with adequate personal washing facilities, which are readily accessible and located in an area where the facilities will not become contaminated;
- provide employees involved in Type 3 asbestos work with a decontamination facility, as contemplated in this standard.

#### 3.5.3.4 Decontamination of the regulated asbestos area

After asbestos work has been completed, the BU responsible manager shall ensure that all surfaces in the regulated asbestos area are cleaned, preferably by first using vacuum-cleaning equipment with a HEPA filtration efficiency of 99.97% for particles of 1 µm in size and then wet-cleaning techniques (for example, mops). After cleaning the regulated asbestos area, 24 hours shall be allowed for the dust to settle before repeating the wet cleaning of all surfaces. If the clean-up seems satisfactory, the BU responsible manager shall ensure that two static air samples are taken inside the area, after the clean-up has been completed and within a reasonable time after the area is deemed to be dry, to ascertain whether the regulated asbestos area is clear of asbestos fibres.

If it is found that the regulated asbestos area is still contaminated, the BU responsible manager shall ensure that the cleaning and air sampling are repeated until the concentration of regulated asbestos fibres is less than, or equal to, the background concentration (clearance indicator sampling) or less than 0.01 f/mℓ of air (reassurance sampling).

If the regulated asbestos area is found to comply with the above, all contaminated materials, for example, isolation sheeting, tape, barriers, and other debris, shall be carefully placed in double impermeable plastic bags for asbestos waste and properly sealed off, for example, with a cable tie, and disposed of as asbestos waste.

### 3.6 Medical surveillance programmes

To protect, monitor, and promote employees' health status, an occupational health programme is required where exposure to significant risks occurs.

Each employee, including any mandatory, contractor, casual worker, or person provided by agents, if applicable, who is involved in asbestos work shall be enrolled in a medical surveillance programme, based on the opinion and recommendation of an occupational medicine practitioner. The medical surveillance programme shall comply with the applicable legal requirements (AAR – Regulation 17) and the Eskom Medical Surveillance Procedure (240-84733329).

The employer must appoint an occupational medicine practitioner to document the medical surveillance system of employees, according to AAR – Regulation 17(2).

The appointed occupational medicine practitioner must notify the employer in writing of the outcomes of the health evaluation by issuing the certificate of medical surveillance, subject to the provisions of the AAR – Regulation 17(3).

An employee who was certified by an occupational medicine practitioner as medically unfit to work in a regulated asbestos area may not work in such an area provided that the employee may return to perform that work after being certified fit by an occupational medical practitioner, subject to the provisions of the AAR – Regulation 17(4).

The certificate of medical surveillance must be provided by the employer to the employee upon termination of employment and may be used for subsequent asbestos work for the full duration of its validity period.
The employer must record, investigate, and report an occupational disease in compliance with section 25 of the Act and Regulation 8 of the General Administrative Regulations, 2003.

The employer must ensure that the employee provides written informed consent for inclusion in the medical surveillance programme, which forms part of the medical surveillance record.

The applicable BU responsible manager shall keep a record of the person's exposure history, together with the medical surveillance records, for a minimum period of 50 years.

### 3.7 Selling, donation or reuse of asbestos-containing structures, material, or equipment (including occupation of Eskom-owned buildings)

No person may sell, donate, reuse, reinstall, or recycle any asbestos or ACMs.

All asbestos-containing structures, material, and equipment pose a possible health risk, and appropriate asbestos management will mitigate the risk. No buildings or equipment owned by Eskom or its subsidiaries that could create a possible health risk should be occupied by any person or business. No material, equipment, or buildings owned by Eskom or its subsidiaries that contain asbestos may be sold or hired out/rented out/lent to a third party.

Eskom, or its subsidiaries, shall be responsible for conducting assessments of all buildings, as well having such buildings on a planned maintenance and inspection programme, unless it has been agreed on, in writing, that the occupants shall comply and that the occupants have the means to comply with the relevant legislation.

The transfer of any asbestos-containing structures, buildings, articles, or materials, etc., shall not be approved by Eskom if intended for resale purposes. No asbestos or ACM, equipment, plant, or article should be sold, donated, marketed, advertised, or displayed.

## 3.8 Environmental control

### 3.8.1 Transportation of asbestos and ACM

Asbestos and ACM will be transported in accordance with best practices to limit the risk of the potential exposure of people and the environment to asbestos fibres. The requirements and details of the following elements must be well defined, practised, and recorded to ensure safe transportation practices:

- Names of the responsible persons and relevant contact details
- Instructions issued by the Eskom responsible person
- Safe handling practices for asbestos and ACM
- Approved waste contractor registration and certificates
- Route description of the transportation and disposal
- Hazardous waste site registration and certificates
- Temporary waste storage site and security requirements
- Identification and classification of vehicle(s) used, including the labelling of the vehicle(s)
- Safety notices
- Requirements for waste removal containers and bags, including their labelling
- Cleaning of waste spillages
- Permit/Certificate of removal
- Certificate of safe disposal
- Training requirements and records
- PPE requirements and records

### 3.8.2 Asbestos waste management

The BU responsible manager concerned with the storage, collection, transport, and disposal of asbestos waste is responsible for complying with the provisions of the OHS Act, Asbestos Abatement Regulations, ECA, NEMWA, and this standard. As far as is reasonably practicable, the BU responsible manager must ensure that steps are taken to prevent the release of asbestos. These should include:

- The premises, structure, or area of concern are thoroughly checked to ensure that all asbestos waste intended for disposal has been removed.
- All vehicles, reusable containers, or any other similar articles, that have been in contact with asbestos waste, are cleaned and decontaminated after use so that such vehicles, containers, or similar articles do not cause a hazard inside or outside the regulated asbestos area concerned.
- Attention should be given to transport practices to prevent the release of asbestos fibres into the environment arising from the transport of asbestos. All asbestos waste shall be transported in accordance with SANS 10228 and SANS 10229.

- All asbestos waste is placed in containers that will prevent exposure during handling.
- Liquids or sludge containing asbestos shall be collected in collecting tanks, from which it may be pumped into sealable drums or a closed-type tanker for transit to the waste disposal site. Transport and disposal shall take place in such a way that there is no risk of the material drying out before it has been disposed of and that it is covered to minimise dust dispersal.
- Any substance that forms part of the filtration system, when discarded, must be disposed of as asbestos waste.
- All used PPE and air filters from vacuum cleaners, air conditioners, and ventilation equipment shall be placed in impermeable bags or similarly effective containers. These containers shall be sealable for disposal, with the outside of all containers to be cleaned before leaving the regulated asbestos area.
- No person may temporarily store any asbestos or ACMs for longer than three months after completion of asbestos removal work before final disposal in line with Regulation 21 (AAR).
- Waste shall be disposed of only on sites specifically designated for this purpose in terms of the Environment Conservation Act 73 of 1989 or the National Environmental Management Waste Act 59 of 2008 (NEMWA 2008). The permit conditions for each site shall be adhered to. Details of the registered asbestos disposal site for any waste disposal during and after removal should be kept on record.
- All contracts with the transport and disposal contractor shall meet the requirements of these Regulations.
- The drivers of vehicles carrying asbestos waste are provided with written instructions on safety precautions and emergency procedures.
- Waste shall be deposited so that it does not cause a hazard on or outside the site concerned, that is, by minimising dust dispersal and the need for further disturbance of the waste. The waste should be covered with at least 200 mm of topsoil, sand, or other suitable material capable of forming a seal to prevent dust dispersal. Eskom OUs/BUs with asbestos dumping sites should ensure that no asbestos waste is left uncovered at the end of a workday.
- High-density materials, such as ACPs and sheets containing asbestos, are not likely to release asbestos dust when handled by hand. However, a hazard may arise if the waste is subjected to pounding by vehicles passing over it or is tipped from a vehicle, and such waste should, therefore, also be covered.
- All persons involved in collecting, transporting, and disposal of asbestos waste, who may be exposed to that waste, are provided with suitable PPE.

### 3.9 Investigation of incidents

If the applicable OEL is exceeded or there is a significant negative change in the trend of the results that are not in line with the principle of controlling the asbestos to levels (concentrations) as low as reasonably practicable, the reasons should be identified, investigated, and recorded. All findings must be recorded and communicated to the relevant BU Health and Safety Committee and the employees/contractors involved.

Steps should immediately be taken, by means other than respiratory protective equipment, to lower the concentration of asbestos fibres in the air so that it does not exceed the OEL.

All cases of asbestos-related diseases shall be investigated and recorded in terms of the Occupational Health and Safety Incident Management Procedure (32-95).

If an employee or ex-employee at any time alleges that he/she or any other person was, or could have been, exposed to asbestos dust while working for Eskom or its subsidiaries, the allegation must be investigated in full by the BU in question. The Occupational Health and Safety Incident Management Procedure (32-95) must be consulted for the protocol for investigating occupational diseases. All records, including updated inventories, assessments, and survey reports (exposure results), must be made available for the investigation.

### 3.10 Legal process and management of the media

Any adverse publicity related to any asbestos exposure or allegations of possible asbestos exposures must be referred to the Corporate Affairs Division.

In cases where international/national contractors are required to work on asbestos, asbestos-containing structures, ACMs, etc., the contract between Eskom and these contractors shall not be signed if the Eskom AIA has not been consulted for comments.

The contract should stipulate that all asbestos work shall be governed by this standard and the Asbestos Abatement Regulations stipulated under South African law. The contract must address aspects of effective management of asbestos work, which include items such as:

- prescribed occupational exposure limits;
- assessment requirements;
- the monitoring and analysis methodology;
- control measure requirements;
- the asbestos work plan;
- the use of an approved asbestos inspection authority; and
- project timeline requirements.

Requirements for the asbestos work to be done by international entities are addressed by the asbestos clause for foreign contractors in the commercial contracts, that is, the asbestos Z clause for NEC contracts of concern.

### 3.11 Document and records management

The following must be in place in the Eskom OUs/BUs for all facilities where asbestos and/or ACM has/have been determined to be present:

- Risk assessment reports
- Asbestos inventories
- Asbestos phase-out plan
- Asbestos labelling details
- AIA accreditation and approval certificates
- Approved asbestos work plans
- Asbestos work area access control

- Asbestos-monitoring reports and results
- Asbestos clearance certificates
- Calibration certificates of the asbestos-monitoring equipment
- Accreditation certificates of equipment calibration facilities
- Accreditation certificates of analytical facilities
- Asbestos contractor registration certificates
- Approved waste disposal site certificates
- Waste disposal permits and/or licences
- Safe disposal certificates
- Person job specifications
- Medical surveillance (available to only an occupational health practitioner)
- Training

All other documents and records mentioned in this standard must be maintained according to the relevant document and record-keeping system and should be available for inspection by an inspector or to the health and safety representative or relevant health and safety committee. Personal records should also be available to any other person subject to formal written consent by the employee.

All records must be kept for at least 50 years.

Hand over or forward by registered post all records to the relevant Chief Director: Provincial Operations if the employer ceases activities relating to asbestos work.

Keep records of training given to an employee for as long as the employee remains employed at the regulated asbestos area where the employee is potentially exposed to asbestos.

## 4. Acceptance

This document has been seen and accepted by:

| Name | Designation |
|---|---|
| Kerseri Pather | General Manager, Risk and Sustainability |
| Miranda Moahlodi | Senior Manager, Corporate Health and Safety, Risk and Sustainability |
| Risk and Sustainability Management Committee (Mancom) | N/a |
| Risk and Sustainability Occupational Hygiene Management Committee (OHS Mancom) | N/a |
| Occupational Hygiene and Safety Steering Committee (OHS Steercom) | N/a |
| Occupational Hygiene Work Group (OHWG) | N/a |
| Occupational Hygiene Management Action Group (OHMAG) | N/a |

## 5. Revisions

| Date | Rev. | Compiler | Remarks |
|---|---|---|---|
| September 2021 | 3 | H Botha | A detailed revision was done for alignment with the newly promulgated AAR requirements. |
| July 2020 | 2 | H Botha | A detailed revision was done for alignment with Eskom's business requirements. |
| September 2014 | 1 | H Botha | The previous procedure (32-303) was reviewed and changed to a standard. The contents were updated to align them with Eskom's business requirements. |

## 6. Development team

The following people were involved in the development of this document:

- Hannes Botha
- Itumeleng Motlhamme
- Bohlokoa Matshiane
- Esme Breedt

## 7. Acknowledgements

- Generation Waste Centre of Excellence
- OHS Steering Committee

# Appendix A – Contents of the plan of work

## A.1 Contents of the plan of work (specific plans for routine work)

The plan of work shall contain the following minimum information:

1. Name, contact details, responsibilities, and address of the RAC, approved inspection authority, asbestos waste transporter, asbestos waste disposal site, and asbestos client, where applicable.
2. Certificate of approval, as an asbestos contractor, issued by the Department of Employment and Labour.
3. Name and contact details of the asbestos removal supervisor for the asbestos work site.
4. List of employees' names and identification numbers with verification of valid asbestos training and medical surveillance records for the asbestos work site.
5. Air-monitoring method used and strategy, including frequency, in accordance with Regulation 16 (AAR).
6. Details of the asbestos to be done, including the location (interior vs exterior), type, estimated quantity, surface types, and condition of the asbestos.
7. Details of how the asbestos work will take place, including methods of work, tools, and equipment, and the appropriate PPE to be used
8. Expected commencement and completion dates.
    - regulated asbestos area.
9. Details relating to the requirements of decontamination facilities, with detailed procedures that shall be employed, describing step by step how the decontamination facility and processes for a specific application shall apply. (See Appendix D for a diagram and more information.)
10. Procedure for decontamination of the work area, tools, and equipment.
11. Details of demarcation, labelling, and signage requirements for regulated asbestos areas, asbestos waste, and temporary on-site storage areas.
12. Emergency procedures in the event of an uncontrolled asbestos release.
13. Description of first-aid arrangements/points and a list of the names of trained first-aid staff members.
14. Indication of the fire or emergency escapes.
15. Temporary transit site for asbestos waste and/or temporary storage arrangements and time frames for temporary transit/storage.
16. The method that shall be employed to collect and dispose of asbestos-containing waste, with specific reference to the collection, transport, and disposal procedures, as well as procedures for the protection of employees and the environment. Arrangements for checking and controlling of waste. This will include acquiring and presenting:
    - The name, address, and registration certificate of the disposal site; and
    - Disposal certificates.

17. Details on the means of draining run-off water.
18. Routes to be followed on and off site to prevent asbestos contamination of other working areas, people, and the environment.
19. Details of asbestos clearance certification.
20. Specific relevant prohibitions. According to the standard, prohibitions on the selling or donation of asbestos-containing structures/materials/equipment should be adhered to.
21. Details for logging any comments, complaints, or incidents and access control is to be kept and made available for anyone to use.
22. Arrangements on certified copies of vacuum cleaner equipment, with filter specifications (HEPA filter with a filtration efficiency of 99.97% for particles of 1 µm in size), to be attached.

A.2 Authorisations and approvals

The approved plan of work must contain the signatures of:

a. The asbestos client (BU responsible manager) accepting the duties as contemplated in Regulation 11(2) and (3) (AAR);
b. The RAC accepting the duties as contemplated in Regulation 12 (AAR); and
c. The approved inspection authority for asbestos (AIA) accepting the duties as contemplated in Regulation 13 (AAR).

# Appendix B – Methods for the handling of asbestos and ACM (lagging or insulation)

## B.1 General comments

The removal of lagging or insulation is not advised if this is removed for no other reason than containing asbestos. Where adhesion to the substrate is good and the exposed surface is also in good condition and sufficiently compacted, sealing with a suitable polymeric or bituminous coating is often an equally acceptable solution.

Sometimes a portion of the surface may become exposed, potentially releasing asbestos fibres because of impact. In such a case, it may be more effective to repair the damage and seal/encapsulate the surface to prevent further release of fibres instead of attempting removal.

To ensure that asbestos fibres are contained during and after repairs, alterations, or removal of ACM, certain methods can be used under controlled conditions as outlined in the Asbestos Abatement Regulations and summarised below:

- Sealing/Encapsulation
- Wet removal is a better practice than dry removal
- Removal by use of high-pressure water jets
- A combination of the above methods

## B.2 Sealing or encapsulation

Encapsulation refers to coating the asbestos or ACM with oil-based paint, a bonding agent, or a sealing agent, or creating a permanent casing covering the affected area (for example, false ceilings and walls). This should not be considered a permanent solution, as the sealing agent used may deteriorate or become damaged. When the building is renovated or demolished, the containment and/or removal of the asbestos fibres must be given careful attention. Depending on the risk, sealing should preferably be done on both sides of structures/panels.

Selection of the appropriate encapsulation method depends on the following:

- The degree of protection required (for example, is the area vulnerable to impact or abrasion?)
- The toughness and flexibility required (for example, does the surface have to be decorated?)
- The temperature and humidity conditions to which it will be exposed
- The chemical agents to which it will be exposed
- Whether the adhesion of the asbestos or ACM to the substrate is adequate
- Whether the surface of the insulation or lagging material is suitable for the adhesion of the sealing agent

### B.3 Wet removal

Wet removal, that is, the suppression of dust with water containing a wetting agent is the most used method for removing asbestos.

The asbestos or ACM shall be wetted throughout its entire depth and maintained in a wet condition. The most effective means of controlling asbestos dust is by completely saturating the asbestos with water, using a special device. The water injection device, which one can make oneself, is inserted into the asbestos material beforehand. Water that has been treated with a wetting agent can seep into the material at low pressure. Once the material is thoroughly saturated, the device is moved to the next point. Several injection devices may be used simultaneously to save time.

The saturated asbestos or ACM should be lifted off in sections, immediately placed in properly labelled containers, and sealed. Abrasive techniques such as sanding should not be used, as this allows regulated asbestos fibres to become airborne.

A water spray is useful as a supplementary means of wetting the asbestos if it has not been saturated properly by the first method or if smaller jobs must be done. This method should be used for demolishing any prefabricated building structures. Once again, the water shall be treated with a wetting binding agent beforehand, and the spray shall be directed straight onto the work.

During the removal process, all power to electric circuits must be isolated, and plugs, switches, and other sources of electric current should be sufficiently covered with waterproof protection, so that water cannot penetrate them. A means of draining run-off water from the regulated asbestos area into containers for safe disposal, or a suitable water filtration system, is also necessary.

### B.4 Dry removal

Dry removal should only be considered when wet removal is impractical (for example, in regulated asbestos areas where water can damage equipment). This type of removal releases excessively high concentrations of regulated asbestos fibres and may contaminate “clean” areas. For this reason, very strict control measures, for example, protection and decontamination, are necessary. No person may use compressed air or permit the use of compressed air to remove asbestos dust from any surface or person.

The following measures are recommended:

- Fully isolate the regulated asbestos area where the material is to be removed.
- Keep the regulated asbestos area under slightly negative pressure by means of local air extraction, filtration, and dust collection to minimise the release of regulated asbestos fibres into surrounding areas outside the isolated regulated asbestos area.
- The removal procedure consists of pre-cutting and then lifting the small pre-cut sections of asbestos-containing lagging/insulation off the surface of the structure.
- High-speed power tools, such as angle grinders or similar high-speed cutting tools, may **not** be used (AAR) because of the large quantities of dust that such equipment creates.
- For general cleaning, use vacuum-cleaning equipment with a filtration efficiency of at least 99% for particles of 1 µm in size. No vacuum-cleaning equipment with lower efficiency may be used.

- The waste should be enclosed in two impermeable bags (one inside the other) or similarly effective containers that are properly sealed to prevent the dust from escaping during handling.

### B.5 Removal by high-pressure water jets

This practice should be prohibited, where reasonably practicable. When high-pressure water jetting is used, it must be under controlled conditions, according to the requirements stipulated in the Asbestos Abatement Regulations.

This method employs water jets operating at high pressures and is usually employed for large-scale operations and at regulated asbestos areas where other techniques may not be satisfactory. The regulated asbestos area shall be fully isolated, and very strict protection and decontamination measures are necessary.

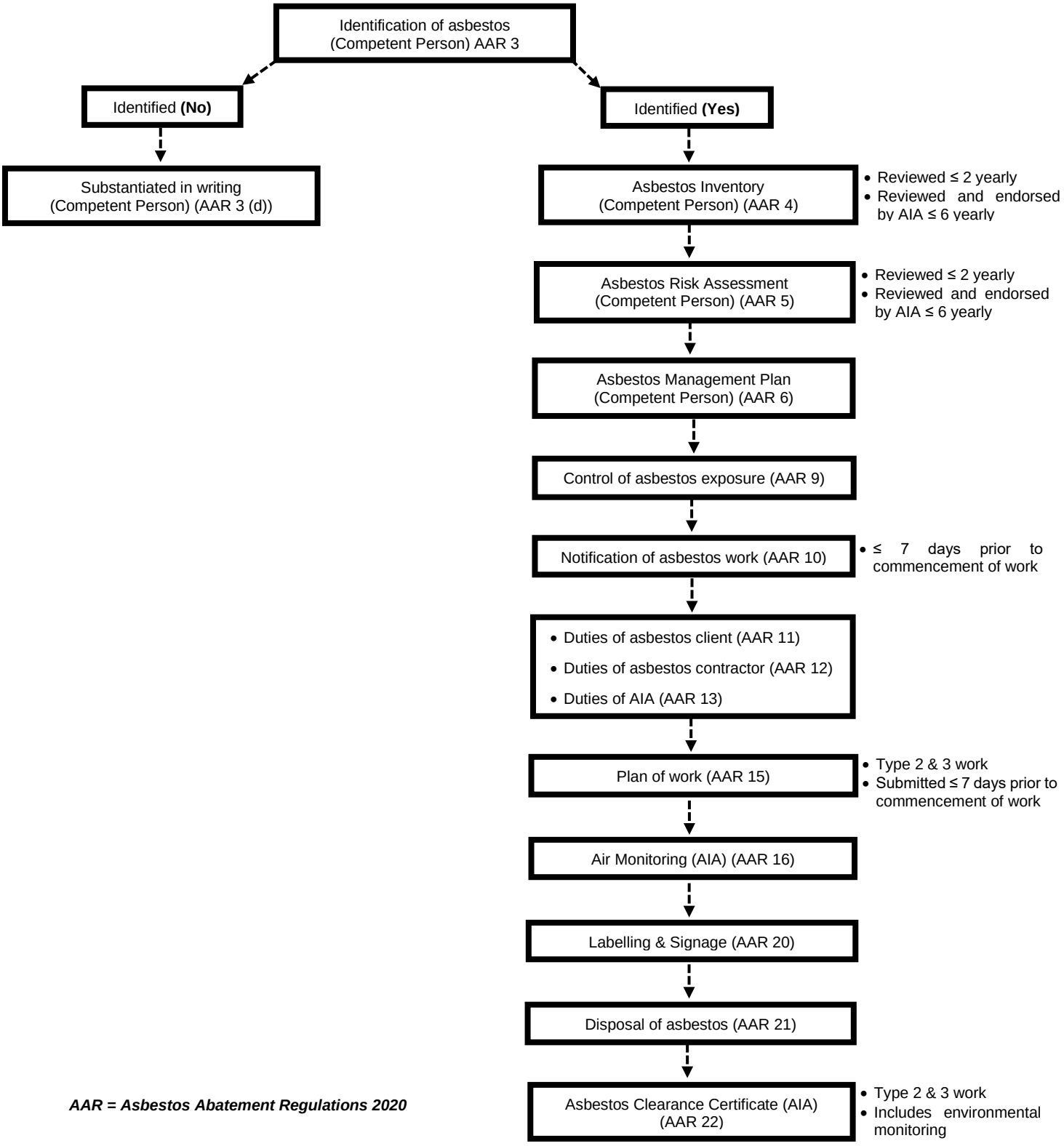
It is important to soak the asbestos or ACM through its entire depth by introducing water through appropriate applicators before applying the water jets.

Since high-pressure spraying is dangerous, a manual pressure control valve should control the jet so that the pressure is shut off on release.

A means of draining run-off water and slurry from the regulated asbestos area into containers for safe disposal or a suitable water filtration system is required. Run-off water shall be diverted away from drains.

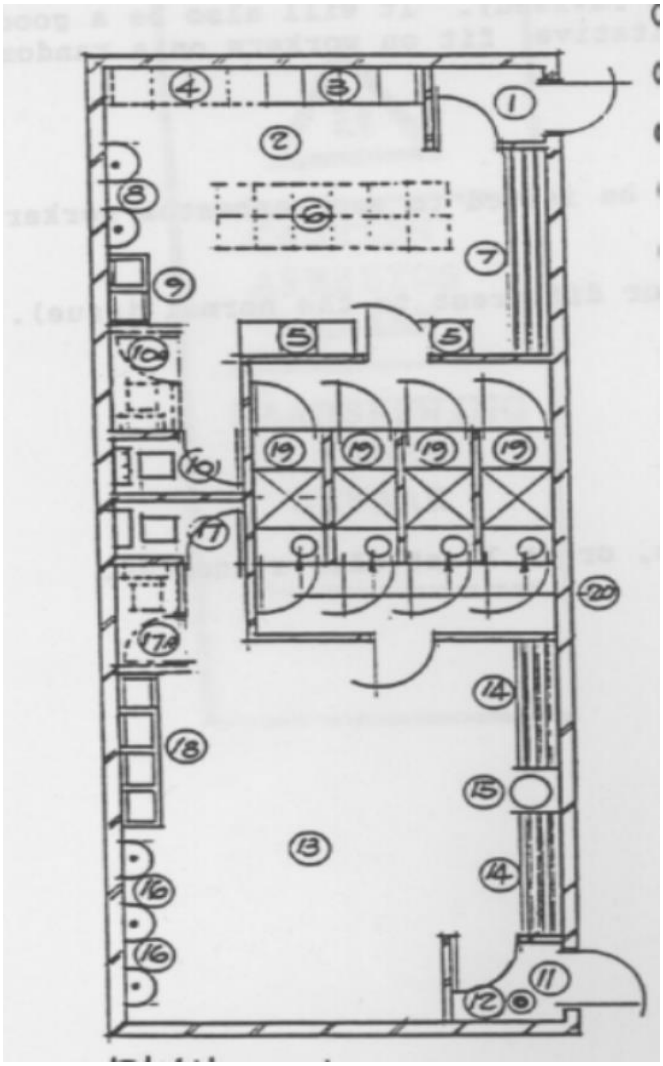
## Appendix C – Asbestos management process (strategy)

The following diagram describes the overall asbestos management process and applicable options pertaining to requirements stipulated in the Asbestos Abatement Regulations 2020.




***AAR = Asbestos Abatement Regulations 2020***

## Appendix D – Decontamination facility



**Legend:**

1. Clean entrance
2. Clean area with positive air pressure
3. Lockers for clean personal clothes
4. Position for future lockers, such as 3
5. Lockers for clean overalls
6. Position for future lockers, such as 5
7. Slatted bench to standard
8. Vitreous wall-mounted urinals
9. Fireclay lavatory basins with overlaps
10. Vitreous low-level WC unit (toilet)
11. Dirty entrance
12. Vacuum area
13. Dirty area with slightly negative air pressure
14. Solid benches
15. Drum for dirty clothes
16. Same as 8
17. Same as 10
18. Same as 9
19. Showers
20. Drums for masks

Plan scale 1:100

**NOTE:**

1. Design specifications shall comply with the requirements of the Department of Employment and Labour and the National Building Regulations. All doors must be fitted with automatic door closers.
2. The number of toilets, showers, and urinals depends on the number of workers. The above is merely an illustration.
3. No asbestos material may be used as part of the construction of the facility.
4. The facility may be an existing unit, modified to suit the requirements, a specially erected structure, or a temporary or mobile structure.

## Appendix E – Bulk asbestos sampling

**Refer to HSG248: Asbestos: the analysts' guide for sampling, analysis and clearance procedures, sections 4.4–4.20**

(4.4) Inspectors performing the sampling must wear adequate personal protective equipment.

(4.5) The areas to be sampled inside buildings should as far as possible be unoccupied and entry restricted during the sampling. The work should minimise the disruption to the clients' operations. The nature of the area and the likely release of dust will dictate the precautions required to prevent the spread of asbestos.

(4.6) The sample of the ACM must truly **represent** the location and the material from which it is taken. After assessing the extent of the material and any variations or repairs, representative samples of about **3-5 cm$^2$** area and through the entire depth of the suspect material should be taken.

The samples must be representative of the whole material.

Particular attention should be paid to ensure that the full inner edge or remote side are captured. Samples should normally be collected from the less conspicuous areas or from where it causes the least additional damage, e.g., the edges of tiles, boards and sheets or areas which have already been damaged.

(4.7-4.8) The **sampling strategy** will be based on the types of ACM present.

A list is available in the HSG248 (page 12) as a guide to sample numbers and locations. However, a decision on the appropriate number of samples per location should be made after closely inspecting the materials involved.

The number of samples collected will depend on the extent and range of materials present and the extent of variation within the materials. More information is given in the HSG248, sections 4.8–4.9.

Refer to HSG248: Asbestos: the analysts' guide for sampling, analysis and clearance procedures**,** sections 4.10–4.19 for guidance on bulk **sampling method(s),** for example,

- Spray bottle and detergent, core sampler (if needed), knife, scraper, pliers
- Hand drill
- Camera
- Plastic bags, bottles, sealable containers

**Avoid cross-contamination**

(4.10) Surfaces onto which asbestos debris may fall should be protected with a sheet of impervious material, such as polythene, to prevent the spread of contamination and for the ease of clean-up.

As ACMs are *defined as any material containing any asbestos*, it is vitally important that any cross-contamination between samples is avoided by adopting careful procedures and ensuring that any sampling equipment is thoroughly cleaned before reuse. After sampling, all samples must be individually sealed in their own uniquely labelled container/bag, which is then sealed in its own second container or polythene bag.

(4.11) Adequate record-keeping should be maintained during bulk sampling practices to note down all the relevant information. Information may include the unique identification and location/position of

the sample taken, the extent of the installation, and the location of the ACMs, the condition of ACM, as well as the spread and condition of debris, if present.

Guidance on specific methods can be found in Paragraphs

4.12 Spray coatings

4.13 Thermal/Pipe insulation

4.14 Insulation board

4.15 Asbestos cement

4.16 Gaskets, rope, seals, paper, felt, and textiles

4.17 Floor and wall coverings

4.18 Textured coatings

4.19 Debris and dust samples

Small fragments of debris released because of damage to ACMs or poor cleaning after removal of ACMs can be picked up with a smooth pair of tweezers and placed directly into a sealable container or plastic bag. Dust samples can be collected in several ways. For example, by turning a sealable plastic bag inside out and wiping it along the surface, before reversing and sealing the dust collected inside; by scraping the dust layer into a pile and transferring it into a container; by sampling onto adhesive tapes and damp filter papers (**Note,** however, that once the asbestos fibres are attached to the collection media, identification of the types of the asbestos present is often not possible).

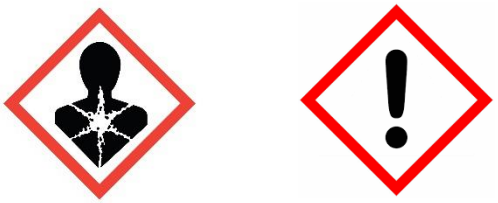
# Appendix F – Asbestos signage

## Asbestos warning labels and signs, according to AAR – Annexure 1

### 1.1 Asbestos warning sign


### 1.2 Asbestos warning labels

**ASBESTOS**



**DANGER**
**MAY CAUSE CANCER THROUGH INHALATION**
**CAUSES SKIN IRRITATION**

**Do not handle until all precautions described in the Asbestos Regulations and Safety Data Sheet have been read and understood. Do not breathe asbestos dust. Wear the correct type of respirator that fits properly. When showering, take off the disposable gloves and your overall before removing the respirator. Dispose of asbestos waste in line with the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).**

## Appendix G – Notification of Asbestos (According to AAR – Annexure 2)

**NOTIFICATION OF ASBESTOS WORK**
**Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)**
**(Regulation 10 of the Asbestos Abatement Regulations, 2020)**

1 (a) Name and registration number of the registered asbestos contractor**:

_____

_____

(b) Physical address of the registered asbestos contractor:

_____

_____

(c) Name and phone number of the contact person of the registered asbestos contractor:

_____

_____

2. (a) Name of asbestos client: _____

_____

(b) Name and phone number of the contact person of the asbestos client:

_____

_____

3. (a) Name of approved asbestos inspection authority (AIA)** and its Department of Employment and Labour AIA registration number: _____

_____

(b) Name and phone number of the contact person of the approved inspection authority:

_____

_____

4. Exact location/address of where the asbestos work will be done: _____

_____

GPS co-ordinates: S_____ E _____

5. Type and volume of asbestos to be removed/repaired (as applicable):

_____

6. Expected commencement date: _____

7. Expected completion date: _____

_____ _____

**Registered Asbestos Contractor**** Date

_____ _____

**Asbestos Client** Date

**The completed document must be sent to the Chief Director: Provincial Operations of the province where asbestos work is to take place, seven days prior to commencement of asbestos work.**

**** Not applicable in the case of Type 1 asbestos work.**