

REHABILITATION OF ASBESTOS MINES IN THE LIMPOPO AND MPUMALANGA PROVINCES

Generic Health and Safety Specification

17 November 2018

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Appendix A: Generic Baseline Risk Assessment

1 INTRODUCTION

Health and Safety Specifications is the documentation of all the health and safety requirements pertaining to the construction works so as to ensure health and safety of affected persons.

The Health and Safety Specifications are prepared to discharge The Employer's responsibilities in terms of the Mine Health and Safety Act (Act 29 of 1996, as Amended). And of particular importance to the scope of this project the Asbestos Regulations (GNR 155 of 10 February 2002).

2 DEFINITIONS

Apart from the definitions set out in the MHS Act ("the Act") and the accompanying Regulations, the following definitions apply:

Client: The Client is seen as the employer for whom construction work is performed.

Employer: Any person who employs or provides work for any person and remunerates that person or expressly or tactically undertakes to remunerate him, but excludes a labour broker (as defined in section 1(1) of the Labour Relations Act (Act 28 of 1956))

Engineer: A competent person appointed by the Client to design, supervise and monitor construction on their behalf.

Designer:

- a. A competent person who:
 - i. Prepares a design;
 - ii. Checks and approves a design;
 - iii. Arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is an employer; or
 - iv. Designs temporary work, including its components
- b. An architect or engineer contributing to, or having overall responsibility for a design;
- c. A building services engineer designing details for fixed plant;
- d. A surveyor specifying articles or drawing up specifications;
- e. A contractor carrying out design work as part of a design and building project; or
- f. An interior designer, shop fitter or landscape architect.

- Agent:** The Agent is any person who acts as a representative for the Client.
- Principal Contractor:** The principal contractor is an employer, as defined in Section 1 of the Act who performs construction work and is appointed by the client to be in overall control and management of a part of or the whole of a construction site.
- Registered Asbestos Contractor:** Means a mandatory employer conducting demolition work, who is registered with the Chief Inspector, who performs asbestos construction work and includes Principal Contractors.
- Health and Safety Specification:** Means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to the construction work.
- Health and Safety Plan:** Means a site, activity or project specific documented plan in accordance with the client's health and safety specification.
- Health and Safety File** Means a file, or other record containing the information in writing requirement by the Mine Health and Safety Act.
- Site:** The area in the possession of the Contractor for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Contractor, and approved for such use by the Engineer.
- Demolition Work (Asbestos)** Demolition work includes demolition, alteration, stripping, removing, repair, gleaning of any spilt asbestos, or high-pressure water jetting of any structure containing asbestos lagging or insulation, but does not include work performed on asbestos cement sheeting and related products and asbestos cement products that form part of the structure of a workplace, building, plant or premises;
- Asbestos Dust** Means airborne or settled dust, which contains or is likely to contain regulated asbestos fibres.
- Asbestos Waste** Means an undesirable or superfluous asbestos containing by-product, emission or residue of any process or activity that has been-
- a) Discarded by any person;
 - b) Accumulated and stored by any person with the purpose of eventually discarding it with or without prior treatment connected with the discarding thereof; or
 - c) Stored by any person with the purpose of recycling, re-using or extracting a usable product from such matter.

Asbestos Work	Means work that exposes or is likely to expose any person to asbestos dust;
Exposed to Asbestos	means exposed or likely to be exposed to asbestos dust while at the workplace, and “exposure” has a corresponding meaning;
Regulated Asbestos Fibre	Means a particle of asbestos with a length-to-diameter ratio greater than 3 to 1, a length greater than five micrometres and a diameter less than 3 micrometre.
ACM	Asbestos Containing Material

3 PROJECT DESCRIPTION

Mintek has been appointed by the Department of Mineral Resources (DMR) to undertake the rehabilitation of various Asbestos Mines in the Limpopo and Mpumalanga Provinces.

4 SCOPE OF WORK

This Health and Safety Specification is not specific to any mine site as it provides generic health and safety measures applicable to the rehabilitation of Asbestos Mines in general and is therefore not site specific. This generic Health and Safety Specification has been developed on behalf of Mintek for the rehabilitation of various Asbestos Mines situated in the Limpopo and Mpumalanga Provinces.

The generic scope of work for the rehabilitation of Asbestos Mines consist of the following tasks:

- Closure of old mine shafts through filling the shafts with discard material containing Asbestos where after the shaft will be covered with a concrete slab.
- Closure of adits through the filling of the adits with discard material containing Asbestos where after the adits will be sealed with a 1m wide rock and mortar wall.
- Consolidating asbestos material in dumps.
- Capping of asbestos waste rock dumps (topsoil + hydroseeding).
- Transporting and backfilling asbestos material in adits and shafts.

- Construction of temporary roads.
- Clearing of roads and other areas that contain loose asbestos fibres or asbestos embedded in rock.
- Construction of stormwater channels.
- Constructing gabion walls.
- Removing rock containing asbestos from gabion channels.
- Demolishing buildings containing asbestos material.

5 MHS RESPONSIBILITIES

5.1 The Employer's Responsibilities

In terms of the Mine Health and Safety Act, Act 29 Of 1993 (MHS Act) the Client (i.e. The Employer) is responsible for inter alia the following:

- Preparing a Baseline Risk Assessment MHS Act, Section 11 Sub sect. 1-8) for an intended work project;
- Preparing a documented site specific Health and Safety Specification for the intended construction work based on the Baseline Risk Assessment, and provide any principal contractor who is making a bid or appointed to perform construction work for the Client with the same;
- Provide the designer with the Health and Safety Specification and to ensure that the designer takes it into consideration during the design stage;
- Must ensure that potential principal contractors to be appointed have made adequate provision for the cost of health and safety measures and has the necessary competencies and resources to carry out the construction work safely;
- Taking necessary steps to ensure co-operation between all contractors appointed to ensure compliance with the Mine Health and Safety Act.;
- Ensuring before any work commences on site that every principal contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer;
- To appoint every principal contractor in writing for the project or part thereof on the construction site;
- Discussing and negotiating with the principal contractor the contents of the Health and Safety Plan and thereafter finally approve the Health and Safety Plan for implementation;

- Ensuring that a copy of the principal contractor's Health and Safety Plan is available on request to an employee, inspector or contractor.
- Taking reasonable steps to ensure that each principal contractor's Health and Safety Plan is implemented and maintained on the construction site: Provided that the steps taken shall include periodic audits at intervals mutually agreed upon between the Client and principal contractor, but at least once every 30 days;
- To ensure a copy of the health and safety audit report is issued to the contractor within seven days after the audit;
- To stop any contractor from executing a construction activity which poses a threat to the health and safety of persons which is not in accordance with the Client's health and safety specifications and the principal contractor's health and safety plan for the site; and
- Where changes are brought about to the design or construction work, make sufficient health and safety information and appropriate resources available to the principal contractor to execute the work safely.

Where a fatality or permanent disabling injury occurs on a construction site, the Client must ensure that the contractor report the accident to the Chief Inspector immediately. The SAMRAS documents will be completed with the investigation and send to the Chief Inspector of Mines.

Duties of persons who may be exposed – Any person who is or may be exposed to asbestos in the workplace, shall obey any lawful instruction given by or on behalf of the employer or self-employed person, regarding –

- (a) The prevention of asbestos dust from becoming airborne;
- (b) The wearing and use of personal protective equipment and clothing;
- (c) The wearing of monitoring equipment to measure personal exposure to asbestos;
- (d) The reporting for medical surveillance as required by Regulation 9;
- (e) The cleaning up and disposal of any material containing asbestos;
- (f) Housekeeping at the workplace, personal hygiene, good environmental and health practices, including eating, drinking and smoking in designated places provided; and
- (g) Information and training received contemplated in regulation 5.

5.2 The Designer's Responsibilities

The Designer of the permanent structure is the Client's appointed Design Engineer, whilst the design of the temporary works will be the responsibility of the appointed principal contractor. The Client's Design Engineer will therefore be required to approve and signoff the Permanent Design Drawings prior to issue to the principal contractor for construction, whilst the principal

contractor's appointed Temporary Works Designer will be responsible to review and approve the temporary works designs.

The Designer of a structure is responsible for inter alia the following:

- Ensure that the applicable safety standards incorporated into the Regulations are complied with.
- Take into consideration the health and safety specification submitted by the Client;
- Before the contract is put out on tender, make available in a report to the Client:
 - i. All relevant health and safety information about the design of the relevant structure that may affect the pricing of the construction work;
 - ii. The geotechnical-science aspects, where appropriate; and
 - iii. The loading that the structure is designed to withstand.
- Inform the Client in writing of any known or anticipated dangers of hazards relating to the construction work, and make available all relevant information required for the safe execution of the work upon being designed or when the design is subsequently altered;
- Refrain from including anything in the design of the structure necessitating the use of dangerous procedures or materials hazardous to the health and safety of persons, which can be avoided by modifying the design or by substituting materials;
- Take into account the hazards relating to any subsequent maintenance of the relevant structure and must make provision in the design for that work to be performed to minimise the risk;
- When mandated by the Client to do so, carry out the necessary inspections at appropriate stages to verify that the construction of the relevant structure is carried out in accordance with the design: provided that if the designer is not so mandated, the client's appointed agent in this regard is responsible to carry out such inspections;
- When mandated as contemplated above, stop any contractor from executing any construction work which is not in accordance with the relevant design's health and safety aspects: provided that if the designer is not so mandated, the Client's appointed agent in that regard must stop that contractor from executing that construction work;
- When mandated as contemplated above, in his or her final inspection of the completed structure in accordance with the National Building Regulations, include the health and safety aspects of the structure as far as is reasonably practicable, declare the structure safe for use, and issue a completion certificate to the Client and a copy thereof to the contractor; and
- Take cognisance of the ergonomic design principles during the design stage, in order to minimize ergonomic related hazards in all phases of the life cycle of the structure.

The designer of temporary works must ensure:

- All temporary works are adequately designed so that it will be capable of supporting all anticipated vertical and lateral loads that may be applied;
- The designs of temporary works are done with close reference to the structural design drawings issued by the contractor, and in the event of any uncertainty consult the contractor;
- All drawings and calculations pertaining to the design of temporary works are kept at the office of the temporary works designer and are made available on request by an inspector; and
- The loads by the temporary works and any imposed loads are clearly indicated in the design.

5.3 The Registered Asbestos Contractor(s) Responsibilities

Demolition - Any person who intends to have demolition work carried out, shall -

(a) before the commencement of that work, take steps to ensure that -

- (i) demolition work is carried out by a person who is a registered asbestos contractor;
- (ii) all asbestos materials likely to become airborne are identified;
- (iii) a plan of work is submitted for approval at least 30 days prior to the commencement of that work to an approved asbestos inspection authority who may at its discretion allow a shorter period of time for such submission and may approve standardised procedures for routine alterations or repairs: Provided that the stipulated time period shall not apply if the plan of work is drawn up by an approved asbestos inspection authority;
- (iv) a copy of the approved plan of work, which has been signed by the approved inspection authority, the employer and, if the person performing that work is not the employer or self-employed person, the mandatory of the employer or self-employed person, is submitted to the provincial director at least 14 days prior to commencement of such demolition work: Provided that an inspector may allow a shorter period for such submission; and
- (v) copies of approved standardised procedures for demolition work are submitted to the provincial director at least 14 days prior to commencement of that work; and

(b) during and after the completion of demolition work, take steps to ensure that -

- (i) all asbestos and materials containing asbestos are handled and disposed of in accordance with these regulations;

- (ii) all persons exposed to or likely to be exposed to asbestos are issued with appropriate personal protective equipment and that such equipment is used properly; and
- (iii) the premises, structure or area are thoroughly checked to ensure that all asbestos waste has been removed.

No contractor may allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on site at the time of entry;

Must ensure all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site and must ensure that such visitors have the necessary personal protective equipment.

Contractors who are making a bid for construction work are required to make provision for the cost of health and safety requirements set out in these specifications and in the MHS Act and accompanying Regulations. In addition, the aforesaid Contractors shall submit a declaration indicating that they have the necessary competencies and resources to carry out the work safely.

Note that compliance to these Health and Safety Specifications does not absolve the Contractor to comply with the minimum legal requirements in terms of the MHS Act or any other applicable Regulations or amendments thereto.

In terms of the MHS Act, the principal contractor as the Employer shall provide and maintain, as far as reasonably practicable, a working environment that is safe and without risk to the health of his employees.

6 GENERAL HEALTH AND SAFETY PROVISIONS

This section of the document provides the general health and safety requirements imposed on the principal contractor for the construction work to be performed. Note that although these provisions do not provide an all-inclusive interpretation and repetition of the applicable sections of the MHS Act and accompanying Regulations, the principal contractor is obligated to comply with the aforementioned legislation in full.

6.1 Occupational Health and Safety Policy

The principal contractor and all other contractors shall submit to the client and to the engineer, a copy of their organisation's health and safety policy statement signed by their chief executive

officer. Each policy must include a description of the organisation and state the health and safety objectives and how they will be achieved and implemented by the organisation. Copies of these policies shall be attached to the health and safety plan.

6.2 AIA requirements

- The Contractor and his Sub-Contractors must have a Service Level Agreement with the company responsible for AIA.
- A comprehensive AIA plan needs to be developed that must include (general monitoring on site, air monitoring, etc.).
- Following appointment, the Contractor must furnish proof of the appointment of the approved AIA.

6.3 Appointments

The following appointments (where applicable), as required by the MHS Act and the Asbestos Regulations, shall be made in writing by the principal contractor and his sub-contractors:

- Assistant to CEO (MHS 4.1)
- Contractors Appointment 2.6.1 (subordinate Manager)
- Safety Officer (Regulation 17.2;
- Risk Assessor
- Fall Protection Plan Developer
- Temporary Works Designer
- Temporary Works Supervisor
- Excavation Supervisor
- Supervisor 2.9.2
- Demolition Work Supervisor
- Scaffolding Supervisor
- Scaffolding Erector
- Bulk Mixing Plant Supervisor
- Bulk Mixing Plant Operator
- Operators of Construction Vehicles and Mobile Plant As Per Mandatory TMM COP)
- Electrician 2.13.2
- Hazardous Chemical Substance Supervisor
- Stacking and Storage Supervisor
- Fire Equipment Inspector
- Health and Safety Representative (MHS Act 6.9);
- Health and Safety Committee Member;
- First Aid Attendant

- Confined Space Work Supervisor
- Incident Investigator
- Lifting Tackle Inspector
- Lifting Activity Supervisor/ Master Rigger
- Rigger
- Asbestos Supervisor (Asbestos Regulations);
- Mine Manager (MHS Act Section 3(1)a);
- Electrical Contractor (Electrical Installation Regulations 6(1));
- Traffic Management Supervisor
- Flag Persons

The principal contractor shall ensure that the employees appointed in the above positions are competent and that valid proof of such competencies are kept available on site. An organogram with the candidates to be appointed in the above positions must be included in the Health and Safety Plan and submitted to the employer. To be noted is that further appointments to the above may also be relevant therefore this only serves as a list of minimum appointments to be made.

The persons appointed in the above-mentioned positions must complete a register (where relevant) for each appointment. Details for the frequency of completion of each register are included in Table 1.

Table 1 Register Frequency

Aspect	Completion Frequency	Reporting Medium
Safety Officer	On-going	Monthly Safety Report
H&S Representative	Monthly	Register
Risk Assessments	On-going	Continuous RA form
Excavations	Daily	Register
Excavation entry/ exit register	entry/ exit	Register
Portable Electrical Equipment	Daily	Register
Construction Vehicle and Mobile Plant	Daily	Register
Confined Space	Daily	Register
Hand Tools	Weekly	Register
Firefighting Equipment	Monthly	Register
First Aid Box	Monthly	Inventory Register
Stacking and Storage	On-going	Register
Ablution Facilities (Safety Officer)	Weekly	Register
Safety Harnesses	Daily	Register
Scaffolding	Weekly	Register

Aspect	Completion Frequency	Reporting Medium
Temporary Works	Material used prior to erection. Structure during erection; pre-, during- and after pouring; daily during curing and prior to removal of temporary works.	Register
Structures	Quarterly	Register
Traffic Management	Daily	Register
Temporary Electrical Installations	Weekly	Register
Earth Leakages	Monthly	Register
Ergonomics	Monthly	Register
Hazardous Chemical Substances	Monthly	Register
Public Safety	Daily	Register
Lifting Tackle	Quarterly	Register/ Certificate

All registers must be kept in the Health and Safety file on site.

6.4 Health and Safety Organogram

The principal contractor shall submit an organogram, outlining the health and safety site management structure including those of all other contractors. In cases where appointments have not been made, the organogram shall reflect the intended positions, and the names shall be filled in as and when the appointments are made. The organogram shall be updated whenever there are any changes in the site management structure and/or personnel. A copy shall be attached to the health and safety plan.

6.5 General Management of Health and Safety

The person legally responsible for ensuring that the provisions of the MHS Act and the Asbestos Regulations are implemented on behalf of the employer is the Principal Contractor.

The necessary enforcement measures to assure the health and safety of employees are effected through a chain of command structure.

The Principal Contractor must ensure that a health and safety management system is in place to give effect to the provisions of the Act and the Regulations.

In order to ensure that the above mentioned management system is affective the following must be implemented;

1. The principal contractor must have his own full time safety manager on site whose services among other things will be utilised to give input at the early design stage and during the compilation of the safety plan.

2. A detailed Process Flow must be drawn up to determine all the inputs and outputs for each activity to be performed during the project, which will ensure that the subsequent risk assessment done is very thorough and detailed.
3. Objectives and targets must be determined for the mitigation of each risk.
4. Procedures and work instructions must be drawn up for each task to be done during the project.
5. Every worker must be inducted and given training for their particular job and carry proof of induction on their person.
6. On a daily basis supervisors and managers must meet with employees and brief them on the job for the day regarding the specific risks to be encountered during their work as well as the mitigation measures and safe working methods for those risks.
7. Bi weekly meetings are to be held by the safety officer with all the foremen, the contracts manager and the resident engineer on site, to re-evaluate the effectiveness of the safety plan and safe work procedures.
8. All employees responsible for monitoring health and safety as mentioned in section 6.2 of these specifications must present the findings of their inspections to the contracts manager on a monthly basis who will sign off their reports.
9. All employees must be issued with the required PPE and must be identifiable.

6.6 Health and Safety Committees

The principal contractor shall undertake monthly health and safety committee meetings and that minutes are kept on record. Meetings must be convened and chaired by the principal contractor's construction manager, unless otherwise agreed by the appointed Safety Agent. Health and safety committee members should include SHE Representatives, Site Safety Officers and site management representatives. All of the principal contractor's and other Contractors' responsible persons and health and safety representatives shall attend the monthly health and safety meetings.

Should the Contractors not participate in the principal contractor's Health and Safety Committee Meeting then they shall have their own internal health and safety committees as required, and copies of their agendas and minutes of their meetings shall be forwarded to the principal contractor on a monthly basis. Copies of all health and safety committees' agendas and minutes are to be kept in the project health and safety file. The dates scheduled for the principal contractor's monthly meetings must be submitted to the client, the engineer and the appointed Safety Agent in advance.

6.7 Washing Facilities

The contractor will ensure that proper washing facilities is available on site. No contaminated clothing to leave the site. Worker must dress in clean clothing before every shift. The runoff

water from the washing facility may also not be allowed to run off into drains or dams. A proper filtration system must be in place.

6.8 Notification of Asbestos Work

(Asbestos Regulation 3)

Before any asbestos work is carried out, the Provincial Director of the Department of Labour needs to be notified in writing prior to the commencement of such work. The contact details are as follows.

Limpopo.

Telephone Number(s): (015) 290 1744

Fax Number(s): (015) 290 1670

Department of Labour (Limpopo)

Street Address: 42A Schoeman Street

Polokwane

Private Bag X9368

Postal Address: Polokwane

0700

Email Address: lp.customercare@labour.gov.za

6.9 Management and Supervision of Construction Work and Asbestos Work

The principal contractor shall in writing appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

The principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of the regulations.

The principal contractor shall appoint in writing a full-time construction health and safety manager and if required, additional safety officers, to assist the safety manager with the implementation of an effective health and safety management system on the project.

A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

The principal contractor must upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor. Every assistant construction supervisor shall to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: provided that the designation of any such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties in terms of the Mine Health and Safety Act..

Where exposure to asbestos is in excess of half the Occupational Exposure Limited (OEL) for asbestos, the principal contractor shall ensure that a measurement programme of the concentration of airborne regulated asbestos fibres to which an employee is exposed is developed and effectively implemented.

The management of existing asbestos is important to ensure asbestos materials are not damaged or deteriorate to such an extent that employees, learners, external contractors or visitors are unnecessarily exposed to airborne asbestos fibres. Ensuring that the contractors and other non-employees receive site induction training will aid the management in the control procedure of ACM's.

The condition of the ACM's must be monitored. The ACMs that are in good condition, sealed and repaired and are likely to be undisturbed will initially be left in place. The condition of the ACMs must be monitored regularly and the results recorded. When conditions of the ACMs start to deteriorate, remedial action must be taken. Monitoring involves a visual inspection, looking for signs of disturbance or deterioration, scratches, broken edges, cracked or peeling paint and debris. If any of this may be the case resealing will be necessary. An Appropriate warning sign must be displayed. Encapsulation or sealing refers to the coating of the outer surface of the asbestos bearing material and reduce the risk of exposure.

Removal of asbestos must be performed under appropriate controlled conditions; the removal process does pose an increased risk and may result in increased airborne fibre levels. If asbestos needs to be removed such works will have to be undertaken by registered licensed removal contractors. As stipulated in the Act.

6.10 Risk Assessment

The principal contractor shall before the commencement of any construction work and during construction work, cause risk assessments to be performed by a competent appointed person (appointed in writing).

The risk assessments shall be completed in an acceptable format, agreed with the Safety Agent.

The risk assessments shall form part of the Health and Safety Plan to be applied on the site and shall include at least-

- The identification of the risks and hazards to which persons may be exposed;
- The analysis and evaluation of the risks and hazards identified based on a documented method;
- A documented plan and applicable safe work procedures to mitigate, reduce or control the risks and hazards that have been identified;
- A monitoring plan; and
- A review plan (at least annually).

In order to ensure compliance with the Mine Health and Safety Act. the principal contractor will be required to undertake three forms of risk assessments, namely:

6.10.1 Baseline risk assessment:

Before the undertaking of construction work the principal contractor is required to undertake a baseline risk assessment for inclusion in the Health and Safety Plan. The baseline risk assessment must include any risk or hazard that people, vehicles, machinery and facilities may be exposed to during construction. Mitigation measures for the identified risks must be defined during the assessment. The baseline risk assessment and mitigation measures must be periodically reviewed during the construction work to ensure that it remains relevant.

6.10.2 Activity specific risk assessments:

The principal contractor will be required to undertake activity specific risk assessments for all activities planned. Each activity specific risk assessment must be linked to and be accompanied by a method statement and where required, a safe work procedure. Activity specific risk assessments must at a minimum be reviewed annually, or when:

- New machinery is brought onto site,
- Incidents or near misses occur,
- Designs or layouts are amended, or
- Type of work changes.

6.10.3 Continuous risk assessments:

In order to maintain a safe and risk free environment continuous risk assessments (e.g. Daily Safety Task Instructions (DSTIs) or Mini Risk Assessments) must be undertaken on a daily basis for all activities undertaken.

The principal contractor shall ensure all his employees and his sub-contractors are informed, instructed and trained by a competent person regarding any hazard and the related work procedures and or control measures before any work commences, and thereafter at the times determined in the risk assessment monitoring and review plan of the relevant site.

The principal contractor shall ensure copies of the relevant risk assessments and safe work procedures are always available on the construction site.

The principal contractor shall ensure risk assessments are reviewed:

- Where changes are effected to the design and or construction that result in a change to the risk profile; or
- When an incident has occurred.

After all risks have been identified, the principal contractor is required to analyse the risks identified by determining the risk probability, severity and frequency.

The principal contractor will be required to keep an updated Risk Matrix available showing all risk assessments prepared, approved (date), amended (date) and date communicated.

The person or group of people appointed to undertake the risk assessment must be competent. Activity specific risk assessments should be undertaken by a combination of appointed competent person's representative of not only the Safety Department but also Construction Department (i.e. Site Engineer's, Construction Manager and Supervisors). This means that the person must have the knowledge, training, experience and qualifications specific to the work or task being performed.

The principal contractor is referred to Appendix A for the Baseline Risk Assessment forming part of this Project Specific Health and Safety Specification. The principal contractor is to ensure that safe work procedures, work instructions as well as emergency procedures are prepared for all identified risks and that all relevant employees are trained thereon.

The principal contractor shall implement a formal Risk Assessment review and approval procedure and ensure all risk assessments are first approved in writing prior to issue to site. Where specialised sub-contractors are appointed who performs their own risk assessments the principal contractor shall ensure that their risk assessments are reviewed through his Risk Assessment review and approval procedure, prior to such activities being undertaken on site.

Work method statements shall be prepared for all planned work activities which will then be used to guide the development of suitable activity specific risk assessments for each activity.

All work method statements and risk assessments shall be communicated to the relevant employees undertaking such activities, or being exposed to such activities e.g. high noise activities.

6.11 Legislation

The principal contractor is required to adhere to at all times and have available the following Legislation on site for this project:

- Explosives Regulations
- Mine Health and Safety Act., 2014
- Asbestos Regulations
- Mine Health and Safety Act (Act 29 of 1996, as Amended)
- SADC Road Traffic Signs Manual Volume 2 Part 13
- Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993) (COID Act) as amended.
- South African Hazardous Substances Act (Act 15 of 1973)
- National Road Traffic Act, 1996
- Municipal By-laws
- National Environmental Management Act (Act No 107 of 1998)
- Minerals and Petroleum Resource Development Act (Act No 28 of 2002)

6.12 Sub-Contractors

In accordance with Regulation 2.6.1, a principal contractor shall undertake *inter alia* the following with regard to Sub-Contractors:

- (a) Provide any Sub-Contractor who is making a bid or appointed to perform construction work for the principal contractor, with the relevant sections of the Health and Safety Specifications contemplated in Regulation 5(1)(b);
- (b) Take reasonable steps to ensure that each Sub-Contractor's Health and Safety Plan contemplated in sub-regulation 2(a) is implemented and maintained on the construction site: Provided that the steps taken shall include periodic audits at intervals mutually agreed upon between the principal contractor and Sub-Contractor(s), but at least once every month;
- (c) Stop any Sub-Contractor from executing construction work, which is not in accordance with, the principal contractor's and/or Sub-Contractor's Health and Safety Plan for the site or which poses a threat to the health and safety of persons;
- (d) Ensure that every Sub-Contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to work commencing on site;
- (e) Ensure that potential Sub-Contractors submitting tenders have made provision for the cost of health and safety measures during the construction process; and

- (f) Ensure all his employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the prescribed format.

6.13 Copy of MHS Act

Each principal contractor or Sub-Contractor with 5 or more employees shall have copies on site of the MHS Act and relevant Regulations and Basic Conditions of Employment Act (1977) and amendments thereto, which will be made readily available for perusal by the employees.

6.14 Personal Safety Equipment and Facilities

For those situations or conditions which cannot be prevented or safeguarded, the principal contractor shall take steps to reduce the risk as much as is practicable, and shall provide free of charge and maintain in a good and clean condition such safety equipment (e.g. safety harnesses, guardrails, guards, etc) and facilities (e.g. portable water tank, eye wash fountains, etc.) as may be necessary to ensure that any person exposed to any such condition or situation at a workplace or in the course of his employment or on premises where machinery is used is rendered safe.

Since the asbestos work will be undertaken the principal contractor shall ensure all employees and visitors to the site are issued with appropriate dust masks (FFP2) and respiratory equipment as prescribed in SANS 275/2004 (ED. 1.00). Where dust masks are used, clean masks must be issued on a daily basis to each employee. Where the nature of the work requires more regular issuing of dust masks such masks must be issued more frequently.

All used PPE or components thereof (e.g. respirator filters) must be stored in marked containers and disposed off as asbestos waste.

Where respiratory equipment is provided the principal contractor shall ensure:

- The relevant equipment is capable of keeping the exposure limit at or below the OEL for asbestos;
- The relevant equipment is correctly and properly used;
- Information, instruction, training and supervision that are necessary with regard to the use of the equipment are provided to the persons (employees, visitors and Client Representatives to the site); and
- The equipment is kept in a good condition and efficient working order.

No PPE are allowed to be issued to any person unless such equipment is cleaned, decontaminated and, where appropriate, sterilised. Also, the principal contractor shall provide separate containers or storage facilities for PPE when not in use and to ensure such PPE not in use are stored therein.

6.15 First Aid, Emergency Equipment and Procedures

In case of injury or emergency the principal contractor shall take all reasonable steps that are necessary under the circumstances, to ensure that persons at work receive prompt first aid treatment.

The principal contractor shall, in the instance where more than 5 employees are employed at a work area, provide a first aid box or boxes at or near the workplace, which shall be available and accessible. The principal contractor must therefore ensure for an adequate number of first aid boxes to be available along the pipeline construction route.

The first aid box shall contain suitable first aid equipment, which includes at least the first aid equipment listed in the Annexure of the General Safety Regulations.

Where more than 10 employees are employed at a work area, the principal contractor shall take steps to ensure that for every group of up to 50 employees at the site, at least one person is readily available during normal working hours, who is in possession of a valid certificate of competency in first aid. The principal contractor must therefore ensure for an adequate number of qualified and appointed first aid attendants to be available along the pipeline construction route.

The principal contractor shall prepare a detailed Emergency Procedure prior to commencement of work on site and it shall be included in, and form part of, the Health and Safety Plan. The procedure shall be updated whenever changes occur and it shall detail the emergency response plans. The Emergency Procedures shall not be limited to, but shall include, the following key elements:

- List of key competent personnel on site;
- Details of the nearest emergency services, including their physical addresses and phone numbers;
- Actions or steps to be taken in the event of each specific type of emergency;
- Information on hazardous materials/situations that may be encountered on site.

The purpose of the Emergency Procedure includes:

- To generate, enforce and give effect to rules or guidelines that protect human health and property;
- To provide for efficient reaction to emergency situations; and
- To designate key personnel to participate in the emergency procedure.

Emergency Procedures shall include, but shall not be limited to, fire, spills, accidents to employees, use of hazardous substances, labour and community unrest, working at height rescue, floods, excavation collapse, bomb threats, and major incidents/accidents. A contact list of all service providers (fire department, ambulance, police, medical and hospital, etc.) must be maintained and be readily available to site personnel at all times i.e. it must be located and displayed in areas (e.g. site offices and notice boards) where it is clearly visible and which is accessible outside of normal working hours.

The principal contractor shall also ensure no work is carried out during severe weather conditions e.g. rain, lightning, strong winds, etc.

The principal contractor shall advise the Employer, the Engineer and the appointed Safety Agent in writing forthwith, and thereafter at the project and Health and Safety Meetings, of any emergencies that occurred, together with a record of the action taken. Copies of all reports on emergencies shall be kept in the project Health and Safety file.

The Emergency Procedure shall include a list of emergency telephone numbers (Fire Department, Ambulance, Police, Hospital, Services, Department of Labour, etc.), which is kept and clearly displayed at the site.

Emergency drills on the relevant identified emergency scenarios to be practiced and recorded at least every three months.

Suitable emergency rescue provisions to be provided for the possible rescue of persons from adits or shafts. Relevant confined space access measures and rescue from heights provisions would be required in the emergency plan and procedures.

6.16 Letter of Good Standing

The principal contractor shall provide a letter of good standing with the compensation fund (WCA) or with a licensed compensation insurer to the Employer, prior to work commencing on site. He will further be required to ensure a valid letter of good standing for himself, and all of his Sub-Contractors, is always available on the site throughout the construction project phase.

6.17 Health and Safety File

The principal contractor shall ensure that a Health and Safety File, which shall include all documentation required in terms of the provisions of the MHS Act and the accompanying Regulations, is opened and kept on site and made available to an inspector from the Department of Labour, the Employer, the Employer's Agent or Sub-Contractor upon request.

At minimum the following must be included in the Health and Safety file:

- Health and Safety Plan;
- Asbestos work plan;
- Copy of the Construction Work Permit/ or Proof of notification of the Department of Labour;
- Letter of good standing from the compensation insurer;
- Appointment letters, proof of competency and organogram;
- Fall Protection Plan;
- Emergency Plan and Procedures;

- Emergency Contact Numbers;
- Proof of training;
- Proof of registration as an Asbestos Contractor;
- Risk Assessments;
- Method Statements and Safe Work Procedures;
- Rigging Studies;
- Checklists and Registers;
- Training matrix;
- Traffic Management Plan;
- Proof of inductions;
- PPE records;
- Construction design drawings, sequences and alterations;
- Demolition Plan including sequences;
- Specifications of materials used;
- Site Rules;
- Material Safety Data Sheets (MSDSs);
- Particulars of Sub-Contractors;
- Blasting Certificates, Plan and Notices;
- Work Permits; and
- Master Register of Lifting Plant and Equipment.

The principal contractor shall hand over a consolidated Health & Safety File to the Employer on completion of the construction work.

6.18 Consultation, communication and liaison

The following arrangements will apply-

- 1) Occupational health and safety liaison between the Employer, the Engineer, the principal contractor, the Sub-Contractors, the Designer and other concerned parties will be through the occupational Health and Safety Committee. In the absence of a Health and Safety Committee, the Employer and principal contractor will agree on an alternative communication forum to be implemented.
- 2) In addition to the above, communication may be directly to the Employer or his appointed Agent, verbally (followed up in writing within 14 days) or in writing, as and when the need arises.
- 3) Consultation with the workforce on occupational health and safety matters will be through their supervisors, occupational Health and Safety Representatives, the occupational Health and Safety Committee and their elected trade union representatives, if any.
- 4) The principal contractor will be responsible for the dissemination of all relevant occupational health and safety information to the other Contractors, for example design changes agreed with the Employer and the Designer, instructions by the Employer

and/or his Agent, exchange of information between Sub-Contractors, the reporting of hazardous and/or dangerous conditions and/or situations etc.

- 5) Principal contractor will be required to do site safety inspections with the Employer and/or his Agent on a basis to be determined and agreed between the parties.
- 6) The principal contractor and sub-contractors will be required to conduct toolbox talks with their employees on a weekly basis and records of these must be kept on the occupational Health and Safety file. Employees must acknowledge the receipt of toolbox talks which record must, likewise be kept on the occupational Health and Safety File.
- 7) The principal contractor's most senior manager on site will be required to attend all the Employer's occupational Health and Safety Meetings.
- 8) The Employer or his Agent and the principal contractor will agree of the dates, times and venues of the occupational Health and Safety Meetings.

6.19 Induction and Training

The principal contractor shall ensure that all employees are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment. Further, the principal contractor shall ensure that all Sub-Contractors are informed regarding the hazards, before work commences.

The principal contractor shall not allow any employee to enter the site unless that employee has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

The principal contractor shall ensure that all visitors to the site undergo health and safety induction pertaining to the hazards prevalent on the site and shall be provided with the necessary personal protective equipment: Provided that where visits are made only to the site office which is not in direct contact with the construction work activities, those health and safety instructions and the provision of personal protective equipment may not apply.

Each employee must carry proof of induction on him-/herself at all times while on the construction site.

The principal contractor shall prepare and implement a Training Register making provision for all required training for each employee e.g. flagmen, SHE Representative, First Aid, Scaffolding Erector/ inspector, etc.

The following information must form part of the general induction of employees on the project:

- SHE Policy;
- Health and Safety File;
- Site Rules;
- Emergency Plan and Procedures;
- Fall Protection Plan;
- Incident Reporting Procedure;
- Baseline Risk Assessment; and

- Any further relevant documentation e.g. Activity Specific Risk Assessments; Fall Protection Plan, etc.

With reference to Asbestos Work the principal contractor as the Employer shall ensure before any employee is exposed or maybe exposed to Asbestos Dust, after consultation with the Health and Safety Committee established for that section of the workplace, ensure that the employee is adequately and comprehensively informed and trained, on both practical aspects and theoretical knowledge with regard to:

- a) The contents and scope of the Asbestos Regulations;
- b) Potential sources of exposure, including the recognition of derelict asbestos-containing materials;
- c) The potential health risk caused exposure to asbestos, including the health risks to employees' families and others, which could result from taking home asbestos contaminated equipment and clothing, and the dramatically increased risk of lung cancer for asbestos workers who smoke;
- d) The measures taken by the Employer to protect an employee against any risk from exposure;
- e) The precautions to be taken by the employee to protect himself or herself against the health risks associated with the exposure, which precautions include the wearing and use of protective clothing and respiratory protective equipment;
- f) The necessity, correct use, maintenance and limitations of protective equipment, facilities and engineering control measures provided;
- g) The assessment of exposure, the purpose of air sampling, the necessity for medical surveillance and the long term benefits and limitations thereof;
- h) The occupational exposure limit and its meaning;
- i) The importance of good housekeeping at the workplace and personnel hygiene;
- j) The safe working procedures regarding the use, handling, processing, and storage of any material containing asbestos, which procedures include the correct use of control measures to limit the spread of asbestos dust outside the work area, and to limit the spread of asbestos dust outside the work areas far as reasonably practicable;
- k) Procedures to be followed in the event of an accidental spillage or any other similar emergency situation likely to result in the release of asbestos dust;
- l) Procedures for reporting and correcting defects likely to result in the release of asbestos dust;
- m) Safe disposal of asbestos waste;
- n) Procedures for record keeping; and
- o) Matters contemplated in Asbestos Regulation 6, Duties of persons who may be exposed.

Asbestos training shall be provided by a person/s competent to provide such training and having adequate personal practical experience and theoretical knowledge of all aspects of the work being carried out.

The Principal Contractor shall ensure that as far as reasonably practicable, that his/ her mandatory or any person other than employees who may be exposed to asbestos at the workplace are given adequate information, instruction and training.

Records of both practical and theoretical training that was given to each employee must be kept.

The Principal Contractor shall give instructions in writing of the procedures to follow in the event of an accidental spillage or any other similar emergency situation likely to result in the release of asbestos dust, to the drivers of vehicles carrying asbestos or asbestos-containing material, that has the potential of causing environmental pollution or affecting human health.

6.20 Health & safety audits, monitoring and reporting

The Health and Safety Agent shall conduct monthly Health and Safety Audits of the construction work operations including a full audit of physical site activities as well as an audit of the administration of health and safety. The principal contractor is obligated to conduct similar audits himself as well as on all Sub-Contractors that he has appointed. Detailed reports of the audit findings shall be reported on at all levels of project management meetings/forums. Copies of all audit reports shall be kept in the project Health and Safety File.

6.21 Housekeeping

Suitable housekeeping must be continually implemented. Materials and equipment must be properly stored. Scrap debris and waste must be removed at appropriate intervals. Loose materials required for use may not be placed or allowed to accumulate on the construction site so as to obstruct the access to and egress from workplaces and passageways.

Specific attention must be given to maintain safe and demarcated passage ways for pedestrians through the works area.

6.22 Structures

The principal contractor shall ensure:

- All reasonable practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is a temporary state of weakness or instability due to the carrying out of the construction work.
- No structure or part thereof is loaded in a manner which would render it unsafe.
- All design drawings of the relevant structure are kept on site and are available on request.

The principal contractor shall ensure that the required inspections are done on the elevated steel water tank's structure throughout its construction and that the structure has been

inspected and approved (signed off) by a professional engineer prior to placing any load thereon or filling it with water.

6.23 Temporary Works

The principal contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use. Such appointee shall have the relevant qualifications and competency to review and sign-off on temporary designs. Should the principal contractor not have a competent temporary works designer in his employ then he will be required to outsource this function. Temporary Work method statements to be available for all temporary works, inclusive of design calculations and construction sequences to be implemented.

All temporary work shall be carried out under the supervision of a competent person who has been appointed in writing for this purpose.

All formwork and support work must be strong enough to support any loads that may be imposed on them.

The designs of the formwork and support work must be done with close reference to the design drawings and the Designer shall be consulted for any uncertainties.

Detailed activity specific design drawings pertaining to the design of temporary works structures are kept on the site and are available on request to the inspector, Sub-Contractors, the Employer, the Employer's Agent or any employee.

The temporary works drawing or any other relevant document shall include construction sequences and method statements.

A competent person must inspect all temporary work structures immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the results have been recorded in a register and made available on site.

Upon casting concrete, the temporary work structure must be left in place until the concrete has acquired sufficient strength to support safely not only its own weight but also any imposed loads, and not removed until authorisation has been given by the competent person mentioned above.

The foundation conditions must be suitable to withstand the weight caused by the formwork and support work structure and any imposed loads.

The employees erecting the formwork and support work must be given adequate training and instruction.

All equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used. For reference purposes such proof of inspections needs to be clearly linked to the structures being erected.

The principal contractor shall ensure that all temporary works inspection registers and checklists are clearly labelled to the specific structure inspected.

Where temporary works might be required so cover shafts the principal contractor shall insure safe access are provided to the shaft area for the installation of the required formwork and concrete pouring (in-situ casting) or for the installation of precast slabs over the shaft. To be noted is that should in-situ casting of the slab be required then the temporary works designer shall ensure adequate safe work platforms are designed and erected for access to/ over the shaft and that all required weight calculations are considered.

6.24 Demolition

Without derogating from any specific duty imposed on the contractor special attention needs to be given to the following aspects regarding demolition.

A competent person must be appointed in writing to supervise demolition work

A competent person must carry out a detailed structural engineering survey in order to ascertain the method of demolition to be done and to draw up a method statement prior to commencement of demolition.

During the demolition a competent person shall check the structural integrity of the structure at intervals determined in the method statement mentioned above.

Ascertain as far as possible the location and nature of electricity, water, gas or other similar services, which may be affected by the demolition and the necessary steps to render the circumstances safe for all persons involved.

The contractor shall ensure that no person works under overhanging material or a structure which has not been adequately supported, shored or braced.

The contractor shall ensure where the stability of an adjoining building, structure or road is likely to be affected by the demolition work on a structure that the necessary steps are taken to ensure the stability of such structure or road and the safety of persons.

The contractor shall ensure that no material falls outside the exterior walls of the structure unless that area is adequately protected.

All asbestos related work must be carried out in accordance with the provisions made in the Asbestos Regulations, 2001, promulgated by Government Notice No. R. 155 of 10 February 2002.

All lead related work must be carried out in accordance with the provisions made in the Lead Regulations, 2001, promulgated by Government Notice No. R. 236 of 28 February 2002.

Where explosives are used as part of the demolition work carried out the contractor shall ensure a method statement is developed in accordance with the applicable explosives legislation, by an appointed person who is competent in the use of explosives for demolition work and all persons involved in the demolition works must adhere to these demolition procedures issued by the competent person.

The contractor is required to submit a demolition method statement, including a risk assessment, prior for any planned demolition work. Such method statement must be submitted to the engineer and safety agent for comment prior to commencement.

6.25 Excavation Work

Without derogating from any specific duty imposed on the principal contractor special attention needs to be given to the following aspects regarding excavations:

All excavation work shall be carried out under the supervision of a competent person who has been appointed in writing for this purpose.

The excavation supervisor will inspect excavations:

1. Daily (prior to each shift);
2. After every blasting operation;
3. After an unexpected fall of ground;
4. After substantial damage to supports; and
5. After rain,

The findings of these inspections shall be recorded on excavation registers.

The principal contractor shall cause every excavation that is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be adequately protected by a barrier or fence of at least one metre in height and as close to the excavation as is practicable. In addition, these excavations shall be provided with clearly visible boundary indicators at night.

The principal contractor shall ensure that all precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with by any person entering any excavation.

The principal contractor shall erect warning signs next to an excavation within which persons are working or carrying out inspections or tests.

No person shall enter an excavation that is deeper than 1.5m which has not been adequately shored or braced or gunnited unless the sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane, or permission is given in

writing by the appointed competent person mentioned above that it is safe to do so after upon evaluation of the site conditions by the said appointed person.

Shoring and bracing must be designed and constructed in such a manner that it is strong enough to support the sides of the excavation in question.

No plant, load, material or equipment may be moved or placed near the edge of the excavation.

Where the stability of an adjoining building, structure or road may be affected by making an excavation suitable, steps must be taken to ensure the stability of such a structure, building or road and safety of persons.

Suitable and safe means of access must be provided to excavations.

The principal contractor must ascertain the location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed. Before the commencement of excavation work that may affect any such services the necessary steps to render the circumstances safe for all persons involved must be implemented.

Upon entering an excavation the requirements of General Safety Regulation 5, work in confined spaces, must be observed:

- Any confined space may only be entered after the air quality has been tested to ensure that it is safe to breathe and does not contain any flammable or noxious air mixture.
- The confined space must be purged and ventilated of any hazardous or flammable gas, vapour, dust or fumes.
- The safe atmosphere must be maintained and, where necessary.
- Employees are to be provided with breathing apparatus and must wear a safety harness with a rope with the free end of the rope being continuously attended to by a person outside the confined space.
- Furthermore, an additional person, trained in resuscitation, to be in full-time attendance immediately outside the confined space.
- Additional serviceable breathing and rescue apparatus is kept immediately outside the confined space for rescue purposes.
- All pipes, ducts etc. that may leak into the confined space to be blanked off sufficiently to prevent any leakage or seepage.
- The employer must ensure that all employees have left the confined space after the completion of work.
- Where flammable gas is present in a confined space no work may be performed in close proximity to the flammable atmosphere.

Where excavations are backfilled and compacted the principal contractor shall ensure for the continues inspection of the excavation walls whilst compacting and that all compacting equipment used are in a safe condition and that the operators thereof are trained in the safe use of such equipment.

6.26 Scaffolding

A competent person shall be appointed to supervise the scaffolding work. Proof of his competency will be kept on site. Proof of competency of scaffold erectors, team leaders and inspectors will be kept on site. A copy of SANS 10085 shall be kept on site and scaffolding must be built according to this. Scaffolding shall be inspected after erection, weekly thereafter and after changes have been made to it as well as after bad weather. Registers of the inspections shall be kept on site.

All erected scaffolding structures shall be numbered for reference on inspection registers. "Safe to use/ Not Safe to Use" scaffolding tags shall be displayed on all access points onto scaffolding. Where scaffolding is declared safe for use but still requires employees to wear their safety harnesses when accessing such scaffolding, relevant signage needs to be displayed to inform them thereof.

All scaffolding used must be of sound and safe material, must have base plates, sufficient braces, safe working platforms, guard rails, inspection tags and toe boards as a minimum, in accordance with SANS 10085.

The principal contractor shall ensure that all scaffold works inspection registers and checklists are clearly labelled to the specific structure inspected.

6.27 Construction Vehicles and Mobile Plant

The principal contractor shall ensure that all construction vehicles and mobile plant are kept, used, maintained and inspected as required by the Mine Health and Safety Act., so as to protect the health and safety of the principal contractor's employees and the public, and to ensure proper care of the plant and vehicles.

Without derogating from any specific duty imposed on the principal contractor special attention needs to be given to organizing the construction site in such a way that pedestrians and vehicles can move safely and without risks to health, due to the magnitude of this project.

Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried. All construction vehicles and mobile plant travelling, working or operating on public roads shall comply with the requirements of the National Road Traffic Act, 1996.

Vehicles should as far as reasonably possible not be parked on steep slopes. Where such parking is necessary, such vehicles should park at a diagonal position to the slope with chock blocks installed underneath its wheels.

Flag persons to be used where construction vehicles and mobile plant is reversing on site.

The principal contractor shall ensure that all construction vehicles and mobile plant to work on the project is inspected by a competent person to confirm that such plant are received in a safe operational condition in order to operate safely on site. Proof of such inspections and approval must be kept in writing.

The principal contractor and his subcontractors shall provide written instructions of the procedures to be followed in the event of an accidental spillage or any other similar emergency situation likely to result in the release of Asbestos Dust to all drivers of vehicles carrying Asbestos or Asbestos containing material, that has the potential of causing environmental pollution or affecting human health.

All construction vehicles and mobile plant operators (and passengers where relevant) to wear the required PPE at all times.

Continuous dust suppression must be implemented throughout the construction/ rehabilitation phase to ensure the risk of windblown asbestos dust is mitigated. Further relevant risk reduction measures should also be considered and implemented through the relevant risk assessments.

Stockpiles to be managed to ensure no risk of engulfment of construction vehicles and mobile plant or employees below stock piles.

Construction vehicles and mobile plant working on stockpiles to always from a safe position not to be at risk of falling off steep slopes.

Safe loading methods to be implemented and trucks are not to be overloaded.

Where tipper trucks have to drive though clean areas and public roads tarpaulin covers should be installed to contain possible spreading of asbestos dust.

6.28 Use and storage of flammables

The principal contractor to ensure that:

- a. No person is required or permitted to work in a place where there is the danger of fire or an explosion due to flammable vapours being present unless adequate precautions are taken;
- b. No flammable material is used or applied e.g. in spray painting, unless in a room or cabinet or other enclosure specially designed and constructed for the purpose unless there is no danger of fire or explosion due to the application of adequate ventilation;
- c. The workplace is effectively ventilated. Where this cannot be achieved:
 - Employees must wear suitable respiratory equipment
 - No smoking or other source of ignition is allowed in the area
 - The area is conspicuously demarcated as “flammable”
- d. Flammables stored on a construction site are stored in a well-ventilated, reasonably fire-resistant container, cage or room that is kept locked with access control measures in

place. Sufficient fire fighting equipment is installed and fire prevention methods practiced. Proper housekeeping may achieve this;

- e. Flammables stored in a permanent flammable store are stored so that no fire or explosion is caused.
 - Stored in a locked and well-ventilated reasonably fire resistant container, cage or room conspicuously demarcated as “Flammable Store – No Smoking or Naked Lights”
 - The flammables store to be constructed of two-hour fire retardant walls and roof and separated from adjoining rooms or workplaces by means of a two-hour fire retardant fire wall
 - Adequate and suitable fire fighting equipment installed around the flammables store and marked with the prescribed signs
 - All electrical switches and fittings to be of a flameproof design
 - Any work done with tools in a flammable store or work areas to be of a non-sparking nature
 - No Class A combustibles such as paper, cardboard, wood, plastic, straw and the like to be stored together with flammables
 - The flammable store to be designed and constructed such that in the event of spillage of liquids the store is able to contain the full quantity + 10% of the liquids stored
 - A sign indicating the capacity of the store to be displayed on the door
- f. Only one day’s quantity of flammable is to be kept in the workplace;
- g. Containers (including empty containers) to be kept closed to prevent fumes/vapours from escaping and accumulating in low lying areas;
- h. Metal containers to be bonded to earth whilst decanting to prevent build-up of static forces; and
- i. Welding and other flammable gases to be stored segregated according to the type of gas and empty and full cylinders

6.29 Stacking and storage on construction sites

The principal contractor shall ensure that adequate, demarcated storage areas are provided. In addition, these areas shall be kept neat and under control. No stacking is allowed in access roads.

6.30 Fire prevention and protection

The principal contractor must ensure that:

- a. The risk of fire is avoided;
- b. Sufficient and suitable storage for flammables is provided;

- Sources of ignition are removed wherever flammable or highly combustible material is present in the workplace, for example Notices prohibiting smoking are displayed and enforced
- Welding and flame cutting is only allowed under controlled conditions that includes written hot work permits
- Only spark-free hand and power tools are used
- No grinding, cutting and shaping of ferrous metals is allowed using electrically driven power tools that produce sparks
- Flameproof switches and fittings are to be used in the flammable atmosphere
- Good housekeeping is maintained to prevent the accumulation of unnecessary combustibles
- Adequate ventilation is maintained
- Adequate and suitable fixed and portable fire fighting equipment is provided and maintained in good working order.
- c. Maintenance must include:
 - Regular inspection by a competent person appointed in writing and keeping a register
 - Annual inspection and service by an accredited service provider
- d. All employees are instructed in the use of the fire fighting equipment and know how to attempt to extinguish a fire;
- e. A sufficient number of employees are appointed and trained to act as an emergency team to deal with fires and other emergencies;
- f. Employees are informed regarding emergency evacuation procedures and escape routes;
- g. Emergency escape routes are kept clear at all times and clearly marked;
- h. Evacuation assembly points are demarcated;
- i. Evacuation is practiced to ensure that all persons are evacuated timeously;
- j. Roll call is held after evacuation to account for all personnel and ensure that no-one has been left behind; and
- k. A siren or alarm is fitted which is clearly audible to all persons on site.

6.31 Welfare Facilities

The principal contractor shall, depending on the number of workers and the duration of the work, provide the following clean and maintained facilities (at or within reasonable access of the construction site):

- Sanitary facility (1 for every 30 workers);
- Changing facilities for each sex;
- Sheltered eating areas;
- Potable drinking water source.

Principal contractor and sub-contractors to inform their employees which water sources are potable clean drinking water and which are dirty water. No drinking of any water shall be allowed of which the quality has not been tested and confirmed safe for consumption.

Employees shall wash their hands before eating or drinking. Also, sheltered eating facilities shall be provided away from the contaminated construction works area where employees will not be exposed to asbestos dust.

For asbestos work the Principal Contractor shall provide employees who use personal protective equipment with the following:

- Adequate washing facilities (i.e. showers) which are readily accessible and located in an area where the facilities will not become contaminated, in order to enable the employees to meet a standard of personnel hygiene consistent with the adequate control of exposure, and to avoid the spread of asbestos dust;
- Two separate lockers labelled “protective clothing” and “personal clothing” respectively, and shall ensure that the clothing is kept separately in the lockers concerned; and
- Separate change rooms labelled “Clean Change Room” and “Dirty Change Room”, with suitable barrier and bathing facilities between to prevent the contamination of personal clothes with asbestos.

All employees working on the project shall be required to enter and exit the site through a personal decontamination procedure and facility developed by the principal contractor. Such procedure shall ensure all employees to shower at the end of shift and leave the site in their clean personal clothing. Dirty/ contaminated clothing in the decontamination facility shall be collected daily from the “dirty changeroom” and washed before reissue to the employees. Clean clothing shall be left in employee’s “protective clothing” lockers on a daily basis for them to change into when arriving on site. Each employee must be issued with at least two sets of overhauls.

The decontamination facility shall be inspected on a daily basis and daily cleaning schedule must be implemented for the facility. Also, separate facilities must be provided for Men and Woman working on the site.

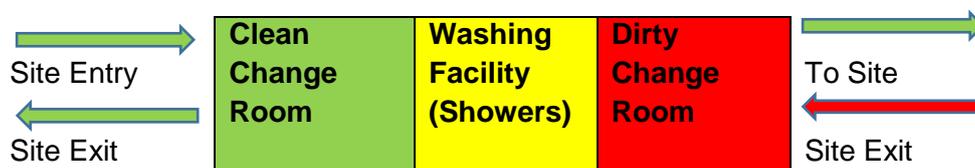


Figure 1: Employee Decontamination Procedure

The principal contractor shall ensure that all Personal Protective Equipment contaminated with asbestos dust is cleaned and handled in accordance with the following prescribed procedures:

- a) Where the equipment is cleaned on the site being rehabilitated care shall be taken to prevent contamination during handling, transport and cleaning;
- b) Where equipment is sent off the premises to a contractor for cleaning purposes-

- i. The equipment shall be packed in impermeable containers;
 - ii. The container shall be tightly sealed and clearly labelled in the form of Annexure 1; and
 - iii. The relevant contractor shall be informed of the Asbestos Regulations, the relevant measures prescribed in the Health and Safety Specification and the precautions to be taken for the handling of asbestos contaminated equipment.
- c) Water that is used for decontamination or cleaning of equipment shall be filtered through a suitable asbestos filtration system before being released into any water system.
- d) The principal contractor shall submit for approval a suitable equipment cleaning method statement on his/ her proposed equipment cleaning approach prior to implementing such measures.

6.32 Blasting

(RSA Explosives Regulations 2003 and Explosives Act, Act 15 of 2003)

When performing blasting activities the Explosives Regulations, 2003 and the Explosives Act, Act 15 of 2003 shall be followed in every respect.

The principal contractor will be required to submit a blasting method statement and the appointment and proof of competency and registration of the blaster to the engineer for approval where after a blasting permit should be issued for each blast. The principal contractor shall ensure all required blasting permits are in place prior to each blast undertaken.

Consideration must also be taken to the close proximity of other infrastructure as well as private property.

The principal contractor shall undertake pre-blast inspections at all structures in the vicinity of the blast. Adjacent landowners shall also be notified at least 24 hours in advance prior to each blast.

The principal contractor shall be required to use an electrically operated siren of sufficient volume which can be heard within a 1km radius from the blast area whilst other construction noise activities are carried out. Access control personnel and relevant warning and road closure signage shall be posted on all access roads leading to the blast area to ensure no access to the site.

Cognizance must also be taken of the possibility of blasted rocks or other loose objects rolling from heights to other areas adjacent to the blast. Relevant mitigation measures to be provided in the Blasting Plan to be submitted for approval.

All blasting activities to be supervised by a competent appointed blasting supervisor with at least 5 year blasting experience.

6.33 Occupational Health and Safety Signage

The principal contractor shall ensure that the necessary signage is displayed, as is required by the MHS Act and the accompanying Regulations. The signage shall be displayed at all entrances to the construction site and at strategic points on the site. Relevant signage shall also be displayed on all approaching roads.

6.34 Reporting and Investigation of Incidents and Occupational Diseases

The principal contractor shall ensure that, where necessary, accidents and incidents are reported to the Department of Labour. This must be done by completing Annexure 1 of the General Administrative Regulations (2003).

The principal contractor must investigate all incidents and a formal incident investigation report must be submitted to the Employer within 7 working days of the incident occurring.

Apart from reporting all injuries to the Employer, the Contractor must report all incidents where an employee is injured on duty to the extent that he/she:

- dies
 - becomes unconscious
 - loses a limb or part of a limb
 - is injured or becomes ill to such a degree that he/she is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he/she was usually employed
- or,
- a major incident occurred
 - the health or safety of any person was endangered
 - where a dangerous substance was spilled
 - the uncontrolled release of any substance under pressure took place
 - machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
 - machinery ran out of control

to the Chief Inspector of Mines within seven days from date of incident, **except** that, where a person has died, has become unconscious for any reason or has lost a limb or part of a limb or may die or suffer a permanent physical defect, the incident must be reported to both the Employer and the Chief Inspector Of Mines forthwith by telephone or e-mail immediately. All other reports should still be completed and provided as required.

The Contractor is further responsible for:

- The investigation of all accidents and/or incidents where employees and non-employees were injured to the extent that he, she and/or they had to be referred for medical treatment by a doctor, hospital or clinic.
- The results of the investigation to be entered into the Incident register.

- Ensure that the incident report and investigation outcome (including new/ additional control measures, etc.) be communicated to all employees;
- The investigation of all minor and non-injury incidents as described, a record of the results of such investigations shall be kept, including the steps taken to prevent similar accidents in future.
- The investigation of all road traffic accidents, related to the construction activities, and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.
- The Employer reserves the right to hold its own investigation into an incident or call for an independent external investigation.

The principal contractor shall further develop and maintain an updated Incident Register.

6.35 Fall Protection

A designated person will prepare and maintain a fall protection plan, and the plan will be implemented and will be adhered to. The fall protection plan must document all risks relating to working from an elevated position (considering the nature of work undertaken) and set out the procedures and methods to be applied in order to eliminate the risk. In addition, the plan must include the processes for evaluating the physical and psychological fitness of the employees that are to work at elevated positions, and the training of these employees, as well as the inspection and maintenance of fall protection equipment.

The principal contractor shall further ensure that:

- all unprotected openings in floors, edges, slabs, hatchways and stairways are adequately guarded, fenced or barricaded or that similar means are used to safeguard any person from falling through such openings;
- no person works in an elevated position, unless such work is performed safely as if working from a scaffold or ladder;
- notices are conspicuously placed at all openings where the possibility exists that a person might fall through such openings;
- fall prevention and fall arrest equipment is-
 - suitable and of sufficient strength for the purpose or purposes for which it is being used having regard to the work being carried out and the load, including any person, it is intended to bear; and
 - securely attached to a structure or plant and the structure or plant and the means of attachment thereto is suitable and of sufficient strength and stability for the purpose of safely supporting the equipment and any person who is liable to fall;
- fall arrest equipment shall only be used where it is not reasonably practicable to use fall prevention equipment. The principal contractor shall ensure where the risk of falling is present such risk is as far as reasonably practical mitigated by engineering designs prior to reliance on personal protective equipment such as fall arrest harnesses.

- suitable and sufficient steps shall be taken to ensure, as far as is reasonably practicable, that in the event of a fall by any person, the fall arrest equipment or the surrounding environment does not cause injury to the person,
- that there is suitable and sufficient guard-rails or barriers and toe-boards or other similar means of protection to prevent, so far as is reasonably practicable, the fall of any person, material or equipment;
- No person is walks or drives under overhanging material or a structure which has not been adequately supported, shored or braced to a strength which is strong enough to hold the overhanging material;
- Erect catch platforms or nets above all entrances, passage ways or above places where persons work or pass under;
- Ensure no material is dropped to any point, which falls outside the exterior walls of the structure, unless the area is effectively protected;
- All waste at heights are either removed in an enclosed waste skip or by a waste chute as prescribed in Construction Regulation 14(6 - 7), which discharges in a container or enclosed area surrounded by barriers.

6.36 Portable Electrical Equipment

Portable electrical tools and equipment includes every unit that takes electrical power from a 15 ampere plug point and is moved around for use in the workplace for example; drills, saws, grindstones, portable lights, etcetera.

Other electrical appliances such as fridges, hotplates, heaters, etc. must be inspected and maintained to the same standards as portable electrical tools and appliances.

The use, inspection and maintenance of portable electrical tools and equipment shall be as follows:

- Regular inspections must be carried out by a competent person appointed in writing;
- Inspection results must be recorded in a register;
- Only competent authorised persons are allowed to use portable electrical tools and equipment; and
- The correct protective equipment must be worn or used whilst operating portable electrical tools and equipment.

This equipment -

- Must be maintained in good condition at all times to prevent an electrical shock to the user;
- The main power source should incorporate an earth leakage protection device or receive power through a double wound transformer or be double insulated and clearly marked as such; and

- All equipment must be fitted with a switch to allow for safe and easy starting and stopping.

Portable electrical tools and equipment, inclusive of extension cables should not be used in wet conditions.

6.37 Pneumatic Equipment

The principal contractor shall ensure all pneumatic equipment are inspected daily, prior to use, and that it is maintained in a safe working condition. Anti-whip lash devices need to be installed on all high pressure pipe connection points.

The principal contractor will be required to have safe work procedures in place for all pneumatic equipment and all relevant employees will need to be trained thereon prior to use.

6.38 Lifting Machinery and Equipment

Lifting machinery and equipment must be designed and constructed in accordance with the manufactures/ Designer's specifications as well as generally accepted technical standards and operated, used, inspected and maintained in accordance with the manufactures requirements and the Mines COP for Trackless Mobile Machinery TMM's

- a. Lifting equipment must be clearly and conspicuously marked with the maximum mass load (MML) that it is designed to carry safely. When the MML varies with the conditions of use a table showing the maximum mass load with respect to every variable condition shall be posted up by the user in a conspicuous, place easily visible to the operator and the table shall be used by the driver/operator;
- b. Each winch on a lifting machine must at all time have, at least, three full turns of rope on the drum when the winch has been run to its lowest limit;
- c. Lifting equipment shall be fitted with a brake or other device capable of holding the MML. This brake or device shall automatically prevent the downward movement of the load when the lifting power is interrupted;
- d. Lifting equipment shall be fitted with a load limiting device that automatically arrest the lift when the load reaches its highest safe position or when the mass of the load is greater than the MML;
- e. Every chain or rope on a lifting machine that forms an integral part of the machine must have a factor of safety as prescribed by the manufacturer of the machine. Where no standard is available the factor of safety must be:
 - chains – 4 (four)

- steel wire ropes - 5 (five)
 - fibre ropes- 10 (ten)
- f. Every hook or load attaching device must be designed to prevent the load from slipping off or disconnecting;
- g. Every lifting machine must be inspected and load tested by a competent person every time it has been dismantled and re-erected and every 12 months after that. The load test must be in accordance with the manufacturer's requirements or to 110% of the MML. In addition, all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices forming an integral part of a lifting machine must be inspected every 6 months by a competent person;
- h. All maintenance, repairs, alterations and inspection results must be recorded in a log book and each lifting machine must have its own log book; and
- i. No person may be lifted by a lifting machine not designed for lifting persons unless in a cradle approved by the inspector of the Department of Labour.

The following requirements will apply to lifting tackle:

- a. Manufactured of sound material, well-constructed and free from patent defects;
- b. Clearly and conspicuously marked with an identity number;
- c. Steel wire ropes must be examined by a competent person every three months and the results recorded in a designated log book. The ropes must be discarded (not used any further for lifting purposes) when wear and corrosion is evident;
- d. A table showing the safe working loads of every kind and size of chain, rope or lifting tackle in use must be prominently displayed on the premises except if these loads are plainly marked upon it.

The principal contractor must keep a register containing the particulars set out in the Third Schedule (Annexure C) for all chains, ropes or lifting tackle (except fibre rope slings) and lifting machines.

Each component of each set of lifting equipment must be marked with a unique colour code. This colour coding will be required from the principal contractor to ensure that the parts of the lifting equipment are not interchanged.

Every lifting machine (whole installation and all performance parts) must be thoroughly examined and given a performance test as prescribed by the standard to which the machine was manufactured, by a competent person, after re-erection and every 12 months thereafter.

All hooks, chains, ropes, or other attaching devices, sheaves, brakes and safety devices forming an integral part of the lifting machine must be thoroughly inspected by a competent person every 6 months.

A competent appointed person must inspect all lifting tackle every 3 months.

The principal contractor shall prepare and maintain an updated lifting machine, tackle and equipment register whereon the dates for load testing and inspections are captured in order to monitor compliance.

Adequate control and mitigation measures must be included in the relevant risk assessments and work method statements for the use of a mobile crane at the reservoir construction activities to ensure clear and unhindered communication between the mobile crane operator and the rigger e.g. rigger to be visible and the use of two-way radios. Where lifting activities are taking place the rigger shall be equipped with a load and clear whistle (or similar) to warn bystanders of lifts in progress.

The rigger shall always maintain a clear right of way for suspended loads to ensure no personnel are entering into this zone.

The direct vicinity surrounding the mobile crane and its operating radius shall be inspected daily to identify the presence of any structures which might pose a risk to the operation thereof e.g. overhead power lines, anchor cables, scaffold structures, built structures, excavations, etc.

6.39 Admittance of persons

An Employer, principal contractor, Sub-Contractor or user as the case may be shall not permit a person to enter a workplace where the health and safety of such a person is at risk or may be at risk, unless such person enters the workplace with the express or implied permission of and subject to the conditions laid down by such an Employer, principal contractor, Sub-Contractor or user.

6.40 Personal Protective Equipment (PPE)

The following PPE will be compulsory for all employees working on the project:

- foot protection including gumboots for concrete or wet work and no slip shoes for roof work;
- Overalls;
- Reflective vests;
- Hard hats;
- FFP2 Dust masks and Respiratory equipment suitable for asbestos work; and
- Safety gloves.

Eye and face protection is to be used when operating the following:

- Jack hammer
- Angle grinder
- Electric drill

- Explosive powered tools
 - Hammer and chisel
 - Cutting and welding torches
 - Bench saw
 - Spray painting equipment
- Any other equipment, which may cause harm to the eyes and face.

Hearing protection must be used for the following:

- Jack hammers
- Explosive powered tools
- Wood or aluminum working machines (saws, planners, routers)
- With any other equipment that may cause hearing loss.

Hand protection must be used for the following

- Cement, steel or chemical work
- Welding equipment
- Hammer and chisel
- Jack hammer
- With any other equipment, which may cause harm to the hands or may cause infection

Respiratory protection must be used when working with the following

- Asbestos work
- Dry cement
- Dusty areas
- Hazardous chemicals
- Angle grinders
- In any other condition, which may cause harm to the respiratory system.

Where required, employees shall also wear safety harnesses when working at heights.

Where employees are to enter adits they shall wear hard hats at all times.

Any other PPE pertaining to the work not mentioned here must be worn at all times. There must be a record of PPE issued on site. A commitment must be made by the employee in writing to wear the PPE issued to him/her.

Visitors to wear safety boots, hard hats, reflective vests and FFP2 dust masks/ suitable respiratory equipment as a minimum.

6.41 Health and Hygiene

Include risks to health in the risk assessment mentioned in section 6.9 above, taking into consideration:

- Occupational Exposure Limits to airborne hazardous agents
- Chemical stressors - (Any toxic, harmful, corrosive, irritant or asphyxiate substance or mixture – dust, smoke, fume, mist, gas, vapor)
- Physical stressors - (Illumination, noise, vibration, thermal conditions, radiation, ventilation, indoor air quality)
- Ergonomic stressors – (Improperly designed tools or work areas, improper lifting or reaching, poor visual conditions, repeated motions in an awkward position)
- Biological agent stressors – (Insects, rodents, viruses, bacteria, parasites)
- Psychological stressors – (Overloading the senses)

All employees must have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the prescribed form. All employees should be on a medical surveillance program developed based on the specific work they are to perform as well as the hazards associated with such work.

All persons to be working at height shall undergo medical examination by a qualified occupational health practitioner who shall issue them with a certificate deeming them fit or unfit to work at height, before commencing with their work.

Medical examinations shall be done before commencing with work (pre placement), periodically, after illness or injury and at the end of the project.

All first aiders shall have access to Material Safety Data Sheets and the emergency procedures to prevent further injury or harm until professional help arrives.

6.42 Traffic Control

When working in or near the road where change of traffic flow or warning of motorists is needed, the SADC Road Traffic Signs Manual Volume 2 Part 13 must be used, in order to warn oncoming traffic with the appropriate display of signage.

The principal contractor shall submit a Traffic Management Plan indicating relevant measures for all construction work areas. Such Plan must be approved before any road works may commence. Specific emphasis to be placed on vehicle- as well as pedestrian traffic and signage. Prior to commencement of any road works the principal contractor shall have all the required road traffic warning signage available as stipulated in his approved traffic management plan. Such measures shall also include warning signage, reflectors and signals at night.

Where needed water filled Yellow Jersey Barriers/ steel barriers or concrete barriers shall be used.

Where required flagmen/ ladies to be trained and appointed.

The implementation of the Traffic Management Plan must be monitored continuously and daily inspections needs to be carried out by a competent appointed person.

6.43 Security

The principal contractor shall make the necessary provisions for security (day and nights) at his site camp as well as at the construction areas, especially where there are material and plant.

Security guards at entrance points to the site shall be issued access control registers for completion of all parties entering. Thought must also be given of signage, signalling devices, etc. on site that will be at risk of being stolen.

6.44 Public Safety

Relevant and effective measures to be identified and incorporated into risk assessments to ensure for the safeguarding of the site to prevent any likely injury or property damage to members of the public as well as employees. Such measures shall be implemented and may include amongst others, fencing, barricading, signage, notifying adjacent property owners, etc.

An Issues and Complaints Register shall also be implemented for capturing all issues and complaints reported.

6.45 Monthly report and site meeting

The principal contractor will use the monthly site meeting as a platform to report on all health and safety issues. The principal contractor will ensure that the most senior manager attends all Health and Safety Meetings with the Employer. During the monthly site meeting the principal contractor will submit a monthly safety report, including incident and labour statistics.

6.46 Working in confined spaces (such as adits, shafts, etc.)

All confined space work to be performed in accordance with an approved safe work procedure and risk assessment. In addition to confined space work measures provision must also be made for safe access into/ from confined spaces as well as access inside confined spaces.

a. Ventilation

Compressed air or a portable blower must be used to ventilate the confined space while personnel are inside it. Due to the risk of the presence of asbestos dust in the adits or shafts employees should wear suitable safety glasses to also prevent any possible asbestos dust from getting into contact with their eyes. Ensure that exhaust fumes from blower do not enter the confined space.

Before entering any confined space, the atmosphere must be tested by the Contractor's competent person (trained by the supplier of the gas monitoring equipment). A register must be kept indicating that the atmosphere has been tested and that the area is fit to work in. The contractor's construction supervisor must check and co-sign this register every time he visits the site to ensure that the atmosphere is continuously being monitored.

Fumes must be extracted from the confined space while welding or doing coating, or should there be a likelihood of hazardous gasses, vapours, dust or fumes.

It is important that gas monitoring equipment be procured capable of testing all the relevant parameters (e.g. LEL's, CO, CO², O, Temperature, etc.) inside the confined space. This should be guided by the Contractor's risk assessment for confined space work.

b. Entering confined spaces

When entering a confined space where hazardous gasses, vapours, dust or fumes might be present, such confined spaces needs to be isolated and the person entering must wear a safety harness as well as the gas detector. A lifeline must be attached to the safety harness and a person on the surface must be in continuous contact with the person in the manhole. At least one person on the surface must be trained in basic first aid and resuscitation.

In no circumstances shall any person remain within a confined space for a period of more than one hour at a time. A five-minute rest on the surface must be taken after this period before re-entering.

Should the alarm sound when a person is in the confined space, the area must be evacuated immediately and the atmosphere re-tested and certified safe before re-entry into the confined space.

c. General

All employees working in confined spaces must be issued with gas monitoring equipment and safety harnesses and self-rescuers where applicable. All these employees must be trained in their use. Effective equipment for breathing and resuscitation to be kept available at the entrance to the confined space and there should be a person trained on the use thereof.

Under no circumstances may any confined space be entered unless it has been certified safe to work in.

Safety harnesses and attachments must be checked for damage to webbing, metal fittings and ropes on a monthly basis and the findings recorded in a register. Should a harness be damaged, it must be reported to the construction supervisor immediately.

The following records shall be taken and maintained by the Contractor:

- i. Confined space entry permits
- ii. Confined space entry registers
- iii. Safety harness registers
- iv. Valid calibration certificates of gas testing equipment

6.47 Batch Plant

The principal contractor shall ensure that a competent supervisor is appointed and assigned to ensuring the operation of the batch plant is safe.

Only competent appointed operators will be allowed to operate the batch plant.

All moving parts of the batch plant must be out of the reach of persons. No person shall be allowed to remove any guard or safety equipment relating to the batch plant. Records shall be kept of all maintenance and repairs on the batch plant.

Start and stop devices shall be conspicuously positioned at easily accessible positions and shall be constructed in a manner to prevent accidental starting.

All authorised persons operating the batch plant must undergo health and safety induction prior to commencement of work and must be familiar with all precautionary measures.

6.48 Mine Shafts and Adits

a) Adit Entry

No person shall be allowed to enter any adit unless a condition assessment has been conducted and approval for safe entry has been given by a suitable qualified and competent person.

The principal contractor shall ensure safe access is developed and maintained for person and machine entry (where relevant) into adits and that adits are adequately supported to prevent collapse or fall of material.

The contractor shall submit to the Engineer, and Health and Safety Agent a method statement, risk assessment and safe work procedure for approval for its planned procedure of filling the shaft or adit. Effective measures shall be provided to ensure for safe access into the adit which shall include for the structural integrity of the adit, adequate ventilation, adequate illumination, safe means of transport of material to dumping zones, uninterrupted communication between work teams on the surface and in the adit, etc. All employees to enter adits to be provided with a safety harness, multi-level gas detector, a self-rescue pack and flame-proof lighting devices. The principal contractor shall not permit any naked lights, smoking or unprotected electrical apparatus which may cause sparks in any adit.

Confined space access requirements shall be enforced for entry into adits therefore:

- An adit entry permit system must be implemented for each adit to be entered.
- Adit access registers to be kept at the access point and signed by all persons entering and exiting. Such registers would also be used for roll call purposes.

b) Shaft Entry:

Person entry into shafts are not allowed and shafts may only be filled from above by dumping asbestos contaminated material into the shaft. Should any need for entry into the shaft arise such entry may only be undertaken if a condition assessment has been conducted and approval for safe entry has been given by a suitable qualified and competent person. Such entry is however highly unlikely.

Safe access must be provided for persons as well as machinery to access the shaft opening to e.g. dump asbestos containing material therein. Where the shaft opening's ground conditions are not safe for machinery to access the shaft area alternative measures of conveying contaminated material into shaft (e.g. use of conveyor system, bulldozers, etc) should be considered and implemented.

The contractor shall submit to the Engineer, and Health and Safety Agent a method statement, risk assessment and safe work procedure for approval for its planned procedure of filling the shaft or adit. Effective measures shall be provided in the form of a physical concrete barrier for preventing any construction vehicle or mobile plant from driving into the shaft or person from falling into the shaft. Suitable safe access provisions such as spotters, no steep ramps, adequate illumination where required, etc. to be provided.

6.49 Cleaning of Premises and Plant

Workplaces should be maintained and kept free of asbestos waste. This project intends to rehabilitate existing asbestos mines meaning the external work area will be contaminated with asbestos dust however the principal contractor shall ensure all interior work facilities (e.g. site offices, change rooms, wash rooms, sheltered eating areas, ablution facilities, etc. at kept clean and free from any asbestos materials and dust.

Machinery, plant and equipment, as well as external surfaces of ventilation equipment should be kept free of asbestos dust.

Cleaning should be carried out by vacuum-cleaning equipment with a filtration efficiency of at least 99% for particles 1 micrometre in size, or in such other manner that asbestos dust neither escapes nor is discharged into the air to such an extent that it contaminates any workplace or the environment.

The vacuum-cleaning equipment should be regularly serviced and its external surfaces kept in a clean state and free from asbestos dust. Where the use of vacuum-equipment is impracticable the relevant surfaces should first be dampened and the persons undertaking such cleaning wearing appropriate protective clothing and respiratory protective equipment.

Any material or equipment contaminated with asbestos which has to be disposed off site shall be handled, stored and disposed as asbestos waste at a suitable licensed hazardous waste disposal facility by a registered asbestos work contractor.

6.50 Labelling, packaging, transporting and disposal of asbestos waste and products

The principal contractor shall ensure in order to avoid the spread of asbestos dust, take steps, as far as reasonably practicable, to ensure that-

- a) The asbestos in storage or being distributed is properly identified, classified and handled in accordance with SABS 0228;
- b) A container or vehicle in which asbestos is transported is clearly identified, classified and packed in accordance with SABS 0228 and SABS 0229; and
- c) Any article or substance which contains asbestos is clearly labelled, in the form of Annexure 1 (Asbestos Regulations).

All employees must be trained on the relevant asbestos identification, classification and packing requirements.

6.51 Control of exposure to asbestos of persons other than employees

The principal contractor shall ensure that the release of asbestos dust into any environment or water system complies with the provisions of the Asbestos Regulations the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), the Environment Conservation Act, 1989 (Act No. 73 of 1989), the National Water Act, 1998 (Act No. 36 of 1998), and the National Environmental Management Act, 1998 (Act No. 107 of 1998).

Where asbestos dust may be released from a workplace into the environment or water system the principal contractor shall ensure suitable and effective control measures are implemented to control as far as reasonably practicably possible airborne emissions. Where water may become contaminated with asbestos as a result of the work being performed such water must first be passed through a filtration system before release into environment.

Further, appropriate measures shall be implemented to prevent the release of asbestos dust into the environment arising from transport of asbestos materials. Earth works activities in asbestos areas shall not be undertaken during high wind conditions to prevent to possible windblown spreading of asbestos dust.

6.51 Medical Surveillance

- All employees that may be exposed to asbestos dust must be under medical surveillance programme.
- Initial health evaluation must be done which include documenting medical and occupation history; medical examination and tests which include chest X-rays, pulmonary function testing and physical examination.
- Exit medicals must done at the end of the project.

6.52 Asbestos Decontamination Unit

The asbestos work area must be decontaminated from all asbestos dust.

- All tools, equipment and reusable respirators during maintenance must be dismantled and cleaned by using a damp cloth.
- All tools that cannot be decontaminated should be tagged with signage indicating asbestos contamination and double bagged in asbestos waste bags before being removed from the work area. These equipment or tools must remain sealed until they can be decontaminated or until the next asbestos work/maintenance commences. PPE must be worn when opening the asbestos waste bags.
- If plastic sheeting was used, then roll it up carefully within the asbestos work area and dispose of asbestos waste.
- If there is still remaining asbestos debris, then a wet cloth or an asbestos vacuum cleaner can be used to remove any remaining contamination.
- All debris, used rags, plastic sheeting and other waste must be placed in asbestos waste bags.
- All asbestos waste bags must be cleaned on the outside surface area with a wet cloth and clearly labelled with appropriate signage.
- A wet cloth must be used to clean the contaminated surface. The cloth must only be used once, folded in order to expose the clean surface on cloth, wiped again and then discarded into asbestos waste bag.
- Cleaning cloths should only be used flat and not wobbled. Cloths may not be rinsed in a bucket filled with water, due to water contamination.

6.53 Personal

- Workers must be decontaminated each time they leave the asbestos work area for lunch, end of shift or end of maintenance work.
- Decontamination must be done in the Decontamination Unit (Figure 1 and 2). The Decontamination Unit must consist of three areas, namely: dirty decontamination, clean contamination and clean changing area.
- These areas must be separated by suitable airlocks or buffer zones.
- All asbestos-contaminated PPE must be placed in asbestos waste bags.
- All work clothes and footwear worn during asbestos work must be thoroughly vacuumed with an asbestos vacuum cleaner to remove any debris or asbestos dust before they remove the coveralls.
- Employees must continue to wear respirators during decontamination of coveralls with the vacuum cleaner. PPE should then be removed, with dirty PPE being bagged into asbestos waste bags before the respirator is removed.
- All PPE worn during asbestos work may not be taken home.
- Employees must take care of personal hygiene, with special attention given to hands, fingernails, face and head that could have been in direct contact with asbestos dust.

Figure 2: Typical Layout For Clean And Dirty Area as per Code of Practice for the Safe Removal of Asbestos [NOHSC: 2002 (2005)]

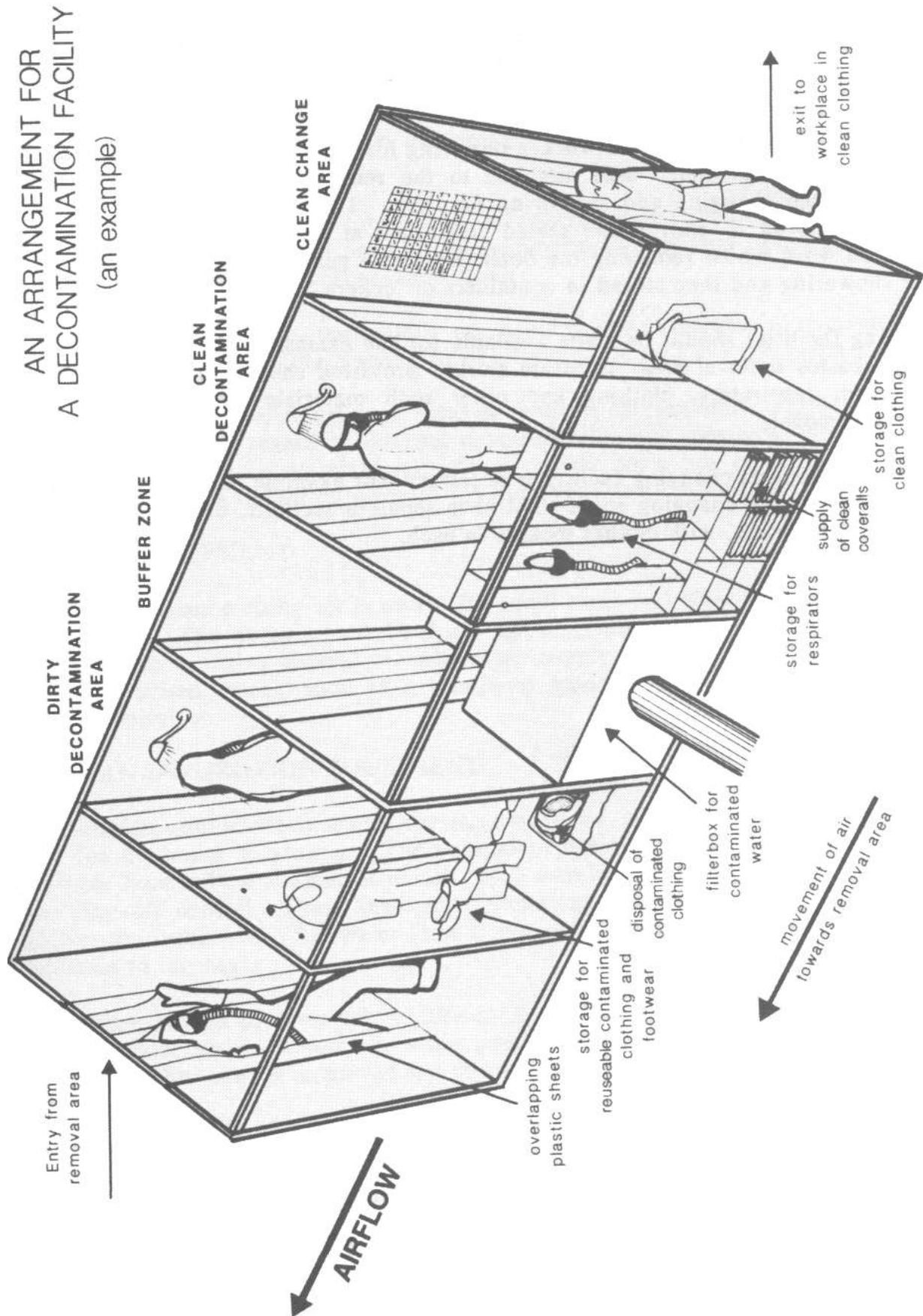
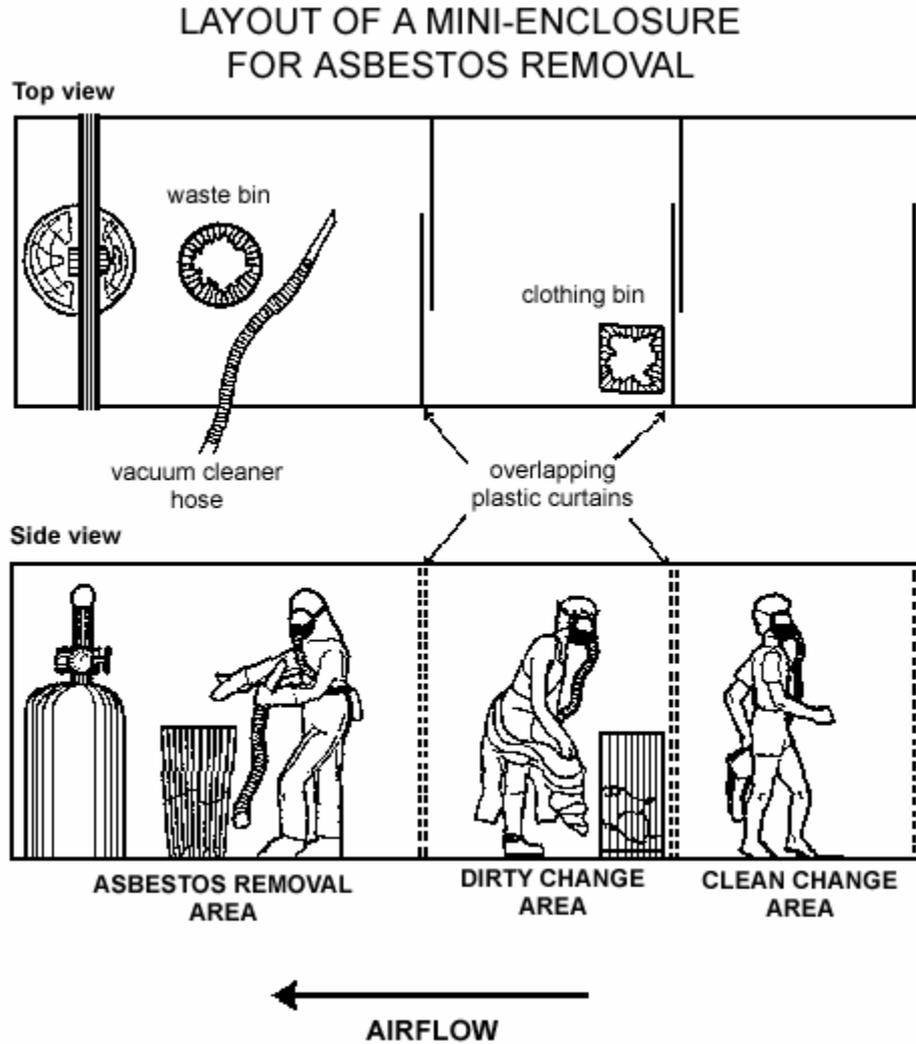


Figure 3: Layout of a Mini-Enclosure for Asbestos Removal as per Code of Practice for the Safe Removal of Asbestos [NOHSC: 2002 (2005)]



6.54 Asbestos Work Reporting to the Dept. of Labour

Before any asbestos work is carried out, the Provincial Director of the Department of Labour needs to be notified in writing prior to the commencement of such work. Notification for asbestos work must be done to the applicable region Dept. Of Labour.

APPENDIX A: GENERIC BASELINE RISK ASSESSMENT