



**CONSTRUCTION OF A 50
TON PER DAY
BIODIGESTER PILOT
PLANT AT ROBINSON
DEEP LANDFILL SITE,
JOHANNESBURG AND
OPERATING AND
MAINTAINING IT FOR A
PERIOD OF 3 YEARS**



BASELINE OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

DEVELOPMENT BANK OF SOUTHERN AFRICA LIMITED

Implementing Agent:

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1. Introduction

The Development Bank of South Africa (DBSA) entered a partnership, signed, and concluded a Memorandum of Agreement (MoA) with the City of Johannesburg and University of Johannesburg in June 2018, to assist carry out the full implementing agent role for infrastructure building programme for design, construction, and operation of the Biodigester Plant on behalf of the City of Johannesburg for a period of 3 years.

The aim of the Baseline Occupational Health and Safety Specification is to make built environment specialists/ Professionals/ Contractor/s and suppliers (otherwise referred to as parties) aware of the risks relating to the scope of work, the project site as well as the project specific health and safety and the Development Bank of South Africa (DBSA) requirements that they need to adhere to in order to demonstrate their commitment towards the zero harm of the environment and persons working on all our projects (renovation, construction) and/or visiting the site.

The above-mentioned parties are expected to develop an Occupational Health and Safety plan which meets these requirements as well as the relevant applicable legislation. This specification may not thoroughly address all hazards and aspects associated with any specialised activity or operation. In such situations, contractors shall be responsible for developing their own health and safety plans/procedures/manuals/work instructions to adequately address their specialised activities and scope of operation.

2. Definitions

Biogas: Gaseous fuel, especially methane, produced by the fermentation of organic matter.

Microorganism: a microscopic organism, especially a bacterium, virus, or fungus.

Agent: means a competent person who acts as a representative for a client.

Baseline risk assessment: baseline operational risks refer to the health and safety risks associated with all standard processes and routine activities in the business.

Client: any person for whom construction work is being performed.

Competent Person: means a person who has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and is familiar with the Act and with the applicable regulations made under the Act;

Contractor: means an employer as defined in section 1 of the Act who performs construction work and includes principal contractors. In relation to this document, where the word “contractor” is used, it will mean all or some of the following: principal contractors, appointed contractors, suppliers, vendors, service providers and consultants.

Construction Work: means any work in connection with:

The construction, alteration, renovation, repair, demolition or dismantling of, or addition to, Building or any similar structure.

The construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runaway, sewer or water reticulation system, or the moving of earth, clearing of land, the making of excavation, piling or any similar civil engineering structure or type of work.

Construction site: means a workplace where construction work is being performed.

Designer: means any of the following persons:

A competent person who:

- Person who prepares a design
- Person who checks and approves a design.
- Person who arranges for any person at work under his/her control to prepare a design, including an employee of that person where he or H&S is the employer, or designs temporary work, including its components,
- An architect or engineer contributing to, or having overall responsibility for, the design.
- A Building services engineer designing details for fixed plant.
- A Surveyor specifying articles or drawing up specifications.
- A Contractor carrying out design work as part of a design and building project, or an interior designer, shopfitter, or landscape architect.

DBSA Requirements: DBSA requirements developed from instructions, policies, standards, procedures, specifications, work instructions, guidelines, or manuals.

Fall Protection Plan: means a documented plan which includes and provides for: All risks relating to working from a fall risk position, considering the nature of work undertaken, the procedures and methods to be applied to eliminate the risk of falling, and a rescue plan and procedures.

Hazard: means a source of, or exposure to danger.

Hazard identification: means the identification and documenting of existing or expected hazards to the health and safety of persons, which are normally associated with the type of construction work being executed or to be executed.

Medical surveillance: means a planned programme or periodic examination (which may include clinical examinations, biological monitoring, or medical tests) of employees by an occupational health practitioner or, in prescribed cases, by an occupational medicine practitioner.

Method Statement: is a written document detailing work procedures and sequences of operations.

On Site/Site: Any workplace where the contractor or his employees performs contract related work.

Planned Task Observation: is an independent observation made during the planned period in which the task is being executed.

Pre-Task Risk Assessment (DSTI): a meeting which is held prior to the commencement of the day's work with all relevant personnel associated with the work task in attendance.

Risk: the probability that injury or damage will occur.

Risk Assessment: means a programme to determine any risk associated with any hazard at a construction site to identify the steps needed to be taken to remove, reduce, or control such hazard.

Safety Health and Environmental file: means a file or other record in permanent form, containing the information on the H&S management system during construction including all information relating to construction phase after the handover to the Client.

Safety, Health and Environmental Plan: means a written plan that addresses hazards identified during the risk assessment process as well as the identified impacts in the Occupational Health and Safety Specification. This would typically include safe work procedures to mitigate, reduce or control the hazards identified and is specific to each construction project undertaken. This is usually compiled by the Principal Contractor or contractor and approved by the Client/Agent for which contracting work will be performed.

Health and Safety Specification: including the base line risk assessment means a documented specification of significant residual H&S requirements for a construction site, which a competent and resourced Principal Contractor or sub-contractor would not have been aware of. This is to ensure the health and safety of employees and the direct and indirect communities, as well as duty of care for the environment. The Client/Agent compiles the Occupational Health and Safety Specification which shall be specific to each construction project.

Safe Work Procedures: Safe work procedures are a series of specific steps that guide a worker through a task from start to finish in a chronological order. Safe work procedures are designed to reduce the risk by minimizing potential exposure.

Adequate space: means not more than one person per square meter of floor space.

COVID-19 means the Novel Coronavirus (2019- Cov) which is an infectious disease caused by a virus, which emerged during 2019 and was declared a global pandemic by the WHO during the year 2020.

Decontaminating: Use of chemicals to kill the virus after cleaning

Self-isolation: Anyone who is showing any mild symptoms of the COVID-19 or has had contact with someone that has tested positive for the virus must not be permitted on site and should follow procedures on self-isolation.

3. Scope of specification

This specification sets out the minimum legislative and organisational requirements for construction work that is specific to the scope of work, site and type of project.

4. Purpose

Indicate to all potential types of contractors the H&S requirements on the project, upon which their planning for the management of H&S will be based on and thus produce their Occupational Health and Safety Plan.

5. Applicability

This specification is applicable to all Principal Contractors, Contractors, Service Providers, Suppliers and all the activities and processes carried out for and on behalf of Development Bank of South Africa (DBSA) where construction work is performed. For best practice reasons, where the work scope does not fall within the definition of Construction Regulations 2014 this specification shall also apply as a minimum.

6. Location

The Robinson Deep landfill on the property RE/81-IR Robinson Deep.



Image 1: Robinson deep aerial view

7. Effective date

This specification shall be implemented from date of appointment.

8. Available resources

- Sewer
- Water supply
- Electrical supply
- Natural gas (Egoli Gas)
- Road access through the main entrance managed by PIKITUP for Robinson Deep
Landfill on to an intersection with Turffontein road and Marlborough Road with a traffic light.

9. Roles and Responsibilities

9.1. Commitment

Development Bank of South Africa (DBSA) management takes ultimate responsibility for ensuring Safety Health and Environment compliance in all their projects. Contractors Senior Management commitment is essential in providing a safe work environment for all their employees. Managers, supervisors and employees at all levels must demonstrate their commitment by being proactively involved in the day-to-day operations, particularly H&S aspects of any project / contract. Legislation requires that each employee must take reasonable care of

themselves and their fellow workers, being it senior management down to the lowest level employee.

9.2. Designers

Development Bank of South Africa (DBSA) will ensure that designers when they design for construction work, they consider foreseeable health and safety risks during construction and eventual maintenance and cleaning of the structure in relation with other design considerations, such as aesthetics and cost.

They should apply the hierarchy of risk control. This means designers need to identify the hazards inherent in carrying out the construction work and where possible alter the design to avoid them. If the hazards cannot be removed by design changes, the designer should minimize the risks and provide information about the risks that remain.

They should describe any matters that require attention by a contractor. Enough information should be provided to alert contractors and others to matters which they could not be reasonably expected to know about.

9.3. Principal Contractor's accountabilities for their Contractors

If the Principal Contractor needs to introduce a new contractor, the Principal Contractor must first inform the Client. Such contractors must, in every respect, meet the Client's H&S requirements.

Should the Principal Contractor appoint a contractor, the principal contractor would then have the same role and responsibility in relation to the contractors, in a similar way as the Client has in relation to the principal contractor.

The Principal Contractor is directly accountable for the actions of his contractors. The Principal Contractor will also be responsible for initiating any remedial action (recovery plan) that may be necessary to ensure that the contractor complies with all requirements.

The Principal Contractor shall ensure that the contractors appointed have the necessary competencies and resources to perform the work safely.

The Principal Contractor shall provide any contractor who is making a bid or appointed to perform construction work, with the relevant sections of the documented Occupational Health and Safety Specification, who would in turn provide the client/agent with an Occupational Health and Safety Plan for review. The Principal Contractor shall carry out audits on the contractor at least monthly to ensure that their Occupational Health and Safety Plan is being implemented and maintained.

The Client/Agent and/or the Principal Contractor shall stop any contractor from executing construction work which poses a threat to the safety and health of

persons or the environment or if it does not comply with the approved Occupational Health and Safety Plan.

The Principal Contractor shall have a disciplinary process and an organisational structured procedure to deal with employees who have transgressed organisational and legal requirements.

The Principal Contractor's Construction Manager/Supervisor shall provide a list of names and contact telephone numbers of all his employees as well as the contractor employees on site. This list shall be updated as and when new contractors commence on site.

The Principal Contractor's Construction Manager/Supervisor shall keep a record of all employees including the contractor employees, including date of induction, relevant skills and competences, and be able to produce this list at the request of the relevant officials. These records shall be filed in the H&S File.

The Principal Contractor shall ensure that his managers and supervisors give clear and definite instructions for the work in hand to the personnel for whom they are responsible for. The instructions shall include, but not necessarily be limited to:

- description of the objective/scope of work
- sequence of work/method statements
- hazard identification and risk assessment (prior to commencement of work)
- Precautionary/preventative measures that are to be taken.
- Identification of sensitive features that may be impacted upon by the project.

Employees are responsible for their own health and safety and that of their co-workers in their respective areas of work on the project. They must be made aware of their responsibilities during induction and awareness sessions some of which are:

- Familiarising themselves with their workplaces and health and safety procedures.
- Working in a manner that does not endanger them or cause harm to others.
- Keeping their work area tidy.
- Reporting all incidents/accidents and near misses
- Protecting fellow workers from injury.
- Reporting unsafe acts and unsafe conditions.
- Reporting any situation that may become dangerous.
- Carrying out lawful orders and obeying health and safety rules.

Every employee must undergo site induction provided by the Client before commencement of the contracted work. Only once this induction has been received, will each employee receive a site access permit.

It must be highlighted to all employees, that anyone who becomes aware of any person disregarding a health & safety notice, instruction or regulation shall immediately report this to the person concerned. If the person persists, stop the person from working and report the matter to the Development Bank of South Africa (DBSA) Health and Safety Agent/ Project Manager/ Principal Agent and the Principal Contractor Supervisor/ H&S Officer immediately.

10. Management and Supervision of Construction Work

The Principal Contractor shall ensure that the performance of all specified work is managed and supervised in accordance with the requirement of OHS Act CR 8 throughout the contract period.

The number of appointed persons shall be determined by the size and the risk of the project.

11. Construction Health and Safety Manager/ Officer/

The Principal Contractor and contractor shall appoint a Construction Health and Safety Manager (> 5-year relevant industry experience) and 2 x officers considering the nature and the scope of work being performed in accordance with the requirement of CR 8 (6) and these appointees shall be registered with the SACPCMP.

For this project, the Principal Contractor shall appoint 2 x full time safety officers who has at least the necessary competencies and 3 years' post qualification practical experience in the type of construction work associated with the Project and who shall be responsible for overseeing overall compliance of H&S issues on the project.

12. Principal Contractors / Contractors/ Service providers

The Occupational Health and Safety Specifications are Development Bank of South Africa (DBSA) minimum requirements. The contractor is expected to develop an Occupational Health and Safety Plan before commencement which meets these requirements as well as all the relevant applicable legislation. Development Bank of South Africa (DBSA) in no way assumes the Contractors legal responsibilities. The Contractor is and remains accountable for the quality and the execution of his health and safety program for his employees and contractor employees. This Occupational Health and Safety Specification reflect minimum requirements and should not be construed as all encompassing.

13. Project Scope of Work

PART 1: Engineering, Procurement and Construction portion

- a. Detailed design finalization based on review of concept design (provided). HAZOP and design review with client.
- b. Compilation and submission of contractors final site plans for Site Development Plan approval and Building Plan approval as well as Fire chief signoff.
- c. Provide all relevant signoffs for gas, pressure, civil, structural, and electrical system designs.
- d. Signing of offtake, supply agreements or technical operational interface memos with identified Municipal Owned Entities (drafts prepared).
 - i. Metrobus – for Biomethane offtake into busses.
 - ii. PIKITUP – for access to utilities, site, landfilling of residues, water for dust suppression.
 - iii. Johannesburg Fresh Produce Market (JFPM) – for supply of waste.
 - iv. Johannesburg City Parks and Zoo (JCPZ) – for digestate utilization.
 - v. CoJ Social Development – for digestate utilization.
 - vi. Energy Systems – for heat supply, renewable electricity supply and biogas return.
 - vii. Johannesburg Metro Police Department (JMPD) – waste disposal from the neighboring academy (horse and dog manure) and the utilization of their site for digestate maturation and compost storage/packaging.
- e. Submission of Major Hazardous Installation Assessment Report to DoL.
- f. Decommissioning and removal of the old defunct Health Care Risk Waste Incinerator that is onsite.
- g. Removal of old in ground diesel tanks (2 off).
- h. Removal of rubble and waste from site.
- i. Removal of old weighbridge and parts.
- j. Renovation and height increase of waste processing building to allow for tipping of waste vehicles.
- k. Removal of lean-to structures to the waste processing building.
- l. Removal and de-stumping of trees.
- m. Renovation of parking area pavement and allow for parking of a suitable number of Roro bins for excess waste storage during waste supply surges.
- n. Renovation of old offices to include.
 - i. Reception
 - ii. Office for two desks
 - iii. Boardroom (min 20-seater)

- iv. Infirmary
- v. Ablutions
- vi. Kitchenette
- o. Removal of south facing prefab concrete wall.
- p. Supply and installation of security perimeter fencing, and gates as required for access for busses, waste management vehicles, pedestrians, and staff vehicles.
- q. Supply and Install a new weighbridge for waste management vehicles (Rear End Loaders, Front End Loaders, and up to 30m³ Hooklift Roro Skip trucks).
- r. Construction of access roads for buses as per own detailed design based on concept layout.
- s. Repaving in select areas where trucks are to articulate as per own detailed design based on concept layout.
- t. Construction and furnishing of weighbridge office with office looking out on weighbridge, induction room and both internally and externally accessible ablutions for security and staff.
- u. Construction of new double story annexure to waste the processing building for control room, ablutions, washrooms, laboratory, and mess area.
- v. Furnish a laboratory with suitable analytical equipment for biogas plant operation and sample management.
- w. Upgrade the onsite substation to allow for:
 - i. Improved access and storm water runoff and prevention of flooding.
 - ii. Certification of existing electrical panels, with add-ons for new plant tie-in.
 - iii. Connection to the Energy Systems waste heat to electricity connection.
 - iv. Ensure an electrical connection is established through which electricity can be exported from site while ensuring compliance with national and local regulations (including Small Scale Embedded Generator regulations)
 - v. Supply and installation of electricity metering for usage control. This means, measuring power produced by Energy Systems's Waste heat to Energy plant, power consumed by the Biogas project, power consumed by the rest of the Pikitup site as a whole, power generated by the rooftop Solar PV plant and power exported from site.
- x. Supply and install a biogas vent line from the biogas plant (post desulphurization and dehumidification) for diversion of biogas to the Joburg Landfill Gas project inlet.
- y. Supply and install hot water reticulation and a duty and standby hot water plate-frame heat exchanger at the Joburg Landfill Gas CHP's, connecting at-least two units to allow for switchover when

maintenance is done on a CHP or heat exchanger. Hot water flow and temperature metering for billing is essential.

- z. Supply and install an emergency flare.
- aa. Supply and install a backup hot water boiler and connect the same to the Egoli gas network.
- bb. Supply and install a backup generator and connect the same to the Egoli gas network or alternatively a diesel backup generator (for critical loads only).
- cc. Put up signage for project including project name, names and logos of all parties involved with the project implementation, directions for vehicles, statutory health and safety signage.
- dd. Supply and install 3 off automatically fast opening polymer roller doors (suitable for odour control) of adequate size to allow the reversing of waste management vehicles and for them to discharge on the waste processing building floor.
- ee. Provide a suitable loader vehicle to function in the limited space on the inside of the waste processing building to pick up waste and to discharge into the feed hopper of the picking line. Preferably a CNG fueled loader.
- ff. Construct suitable channels and slopes for managing leachate on the waste processing floor building and collect it for addition to the biogas plant feed system. It is essential that the leachate be washed off periodically to prevent odors.
- gg. Supply and install a liquids and sludge receiving pit (with lid) in the waste processing building to discharge to the macerator and into the buffer tank, care should be taken for removal of debris and contaminants from the pit. The pit should allow for vehicle discharge of up to 20 m³ by tipping motion without spillage.
- hh. Supply and install an odor management system in the building for suppressing odors. Manage ventilation odors to the out-side to prevent odor nuisance.
- ii. Supply and install adequate ventilation to ensure OSHA compliance of the facility.
- jj. Supply and install an elevated picking line with chutes to wheelie bins to allow for manual separation of packaging contaminants in waste.
- kk. Supply and install a magnet for removal of any dangerous metal parts before the organic waste pulper.
- ll. Supply and install a buffer tank feed pump and inline macerator with digestate recycle and blending system.
- mm. Supply and Install a buffer tank (and mixers) to ensure adequate waste buffering to ensure stable plant operations.
- nn. Construct a pump room in-between the digester tanks to provide platform access on its roof to the digesters for maintenance and monitoring. Internally the pump room must allow for pumping between digesters and into each digester individually from the buffer tank. Heat

- reticulation and management will be based here as well as digester sampling and online monitoring systems for temperature, pH and other online measurements.
- oo. Connect effluent to sewers and install a retention pit and testing area suitable for sewer connection requirements.
 - pp. External rainwater runoff to be channeled to a retention pond/swale adjacent to the leachate pond.
 - qq. Installation of an elevated dewatering system in a refurbished building demarcated for this function for decanting liquid digestate into a liquid digestate tank and spreading thickened solid digestate into a Roro-bin without spillage below it. A diversion system or two bin system needs to be included to allow for periods of bin exchange on site.
 - rr. Installation of a digestate liquid fraction tank (with stirring functionality to suspend settleable solids).
 - ss. Installation of tanker filling point for bottom or top filling of tankers with flow metering.
 - tt. Supply of a digestate liquid fraction tanker (10-20 kL) for use as distribution of digestate liquid to clients and to Pikitup for dust suppression.
 - uu. Supply and installation of insulated and clad digester tanks with adequate heating and mixing capacity (to be configurable in series or in parallel).
 - vv. Supply and install gas storage capacity is required in at least one of the digester roofs.
 - ww. Supply and install desulphurization equipment (which can be done externally or internally but requires that the process meets the upgrading plant section input specification for hydrogen sulfide and does not add any additional nitrogen to the biogas).
 - xx. Supply and install dehumidification are to be installed to ensure biogas humidity complies with the upgrading system (including all condensate traps as required)
 - yy. Supply and install biogas blower (s) may be needed for ensuring adequate pressure for the inlet of the contractor selected upgrading plant.
 - zz. Supply and install a biogas upgrading plant from a reputable vendor utilizing either, water scrubbing, amine scrubbing, membrane or pressure swing absorption technology. Care should be taken that the upstream input spec is achievable for the plant and that the technology is suitable for achieving the downstream biomethane specification for vehicle use.
 - aaa. Supply and install a system downstream from the biomethane plant for the stanching of the biomethane.
 - bbb. Supply and install a biomethane dehumidifier if required (water scrubbing technology requirement).

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- ccc. Supply and install a biomethane compressor station that runs in tandem with the biomethane upgrading plant to compress biomethane to 250 barg.
 - ddd. Supply and install a supply line from the Egoli Gas connection to the CNG compression station to act as an alternative fuel source for filling vehicles when the biogas plant is down or when it is starting up.
 - eee. Supply and install a high pressure biomethane gas storage system that allows for priority filling of vehicles.
 - fff. Supply and install a 2-lane vehicle filling station with RFID card readers for billing and NGV1 and NGV2 filling connectors. Metrobus vehicles need to fill within 10 min of connection.
 - ggg. Establish a composting operation at the demarcated area on the neighboring JMPD Academy grounds for digestate maturation and addition of other manures for composting. This should include compost loading, turning, watering, screening and bagging capabilities. Electrical connection would be provided. On site JMPD ablutions to be used by staff.
 - hhh. Supply and install a 20kW roof mounted solar PV system for power generation.
 - iii. Supply and install a UPS for control system and security system backup.
 - jjj. Establish internet connectivity.
 - kkk. Connect to utilities.
 - III. Commission the facility.
 - mmm. Perform performance tests on completion based on throughput over 1 week of feedstock and average output of on specification biomethane and digestate cake.
 - nnn. Supply suitable digester seeding material.
 - ooo. General:
 - i. Area lighting as required for safe operations.
 - ii. Earthing and bonding
 - iii. Provide electrical and water outlets for maintenance and cleaning,
 - iv. Install a workshop area and outfitting with suitable tools for operations.
 - v. Provide consumables and spares storage area.
 - vi. Provide security personnel hut at gate.
 - vii. Provide lightning protection.
 - viii. Provide compressed and conditioned air where and when required (could centralize).
 - ix. Install public announcement system.
 - x. Install fire detection and protection system (incl. fire water tanks and pumps).
 - xi. Reject waste collection bins for disposal to landfill.

- xii. Provide functioning Information Technology system for monitoring plant performance, capturing data from weighbridge, gas supply, level, temperature, pressure and flow sensors for an overall reporting package.
- xiii. Implement a comprehensive plant wide SCADA system that is remotely accessible and displayed on multiple computer screens in the control room.
- xiv. Provide all waste bins.
- xv. Supply startup chemicals and critical spares

PART 2: Operations and Maintenance portion

- a. Daily operations of the waste processing facility (7 days a week). The facility should be open for the filling of gas for 16 hours per day and for processing of waste a minimum of 8 hours per day.
- b. Scheduling of waste deliveries with JFPM and performing this function as per the agreed schedule.
- c. Scheduling of Metrobus filling schedules as shunters drive busses to the filling point after peak times.
- d. Scheduling of digestate liquid removal to dust suppression on Robinson deep landfill using own tanker and coordinating with Pikitup and performing this function as per the agreed schedule.
- e. Scheduling digestate liquid offtake by JCPZ and Social Development for irrigation purposes.
- f. Scheduling of digestate solids removal to composting at JMPD Academy site.
- g. Scheduling of compost offtakes from JMPD Academy site to Social Development and JCPZ.
- h. Managing compost sales from JMPD Academy site once compost is registered.
- i. Excess liquid digestate management preferably for nutrient use and irrigation.
- j. On site separation at source at JFPM to remove bulk contaminants.
- k. Removal of waste from facility.
- l. Disposal of excess or unsuitable waste to Robinson Deep.
- m. Composting of digestate at neighboring JFPM academy site.
- n. Utilization of digestate liquor for nutrient use and/or dust suppression on Robinson Deep landfill.
- o. Filling of Metrobus busses and other onsite vehicles with biomethane. The operators should be able to fill vehicles as a backup but Metrobus drivers will be trained to fill their own busses.
- p. Cleaning of facility and housekeeping.
- q. Service and Maintain equipment.
 - a. As per service schedules of OEM's.
 - b. Unplanned and emergency servicing and maintenance.
- r. Managing staff involved in all activities on site.

- s. Manage and report on SHEQ.
- t. Reporting monthly on performance, events and activities in a mutually agreed reporting format.
- u. Data capturing to keep record of:
 - a. Plant performance and uptime
 - b. Identified vehicles delivering waste and collecting products and wastes (RFID card filling system for busses)
- v. Maintain laboratory capabilities for digester monitoring and additional waste selection from time to time.
- w. Provide 24-hour site security.
- x. Managing sales of products to 3rd parties.
- y. Recordkeeping of all deliveries, receipts and bills.
- z. Procurement of all services, spares and consumables required for the operation of the plant.
- aa. Facilitating visitors from the public based on a booking system that allows visits from Schools, Universities and interest groups (up to 20 people).
- bb. Venting of biogas to Energy Systems when biomethane storage is full and biogas is produced at <100 ppm H₂S and at >50% methane. Otherwise, excess biogas must be flared by the biomethane plant flare.
- cc. Managing facility finances and invoicing client reimbursable costs, namely:
 - a. Procurement of hot water at 75-85 deg C from Energy Systems at R 9.5/GJ for heating the digesters and returning of cold water <65 deg C to Energy Systems. (reimbursable)
 - b. Procurement of all the produced electricity from Energy Systems produced from its waste heat generation system (maximum 170 kW) at R 1.50 / kWh. (reimbursable). Any shortfall will be supplied through the existing Pikitup connection to City Power free of charge.

14. Client and Principal Contractor: Details, Accountabilities and Responsibilities:

Principal Contractor shall specify all the details for their projects appointment and should enclose their accountabilities in terms of their legal appointment.

14.1. The Development Bank of South Africa (DBSA) Project Organogram

Name	Position	Role
Niraj Naamdew	Senior Programme Manager	Technical
Divan le Roux	Quantity Surveyor	Technical
Nonhle Dlamini	Civil/Structural Engineer	Technical
Simon / Tender	Procurement & Tender Officer	SCM
Cindie Venter	OHS Specialist	OHS
Mxolisi Maome	Legal	Legal/ Contract
Attie Ferreira	Project Manager: Project Prep.	Technical
Darius Boshoff	Energidrop: Owner's Engineer	Technical
Nandipha Rambau	OHS Agent	OHS

14.2. Principal Contractor Organogram

The Principal Contractor shall provide an organisational organogram related to this project, listing all the levels of responsibility from the Chief Executive down to the supervisors responsible for the project. The diagram must list the names of appointees and their roles and responsibilities. The Principal Contractor is responsible for keeping copies of all of the organograms' as well as submitting those of their appointed contractors, with the Occupational Health and Safety Plan. All organograms shall be updated timeously when appointments are changed and filed in the project H&S file.

15. Principal Contractors

The Principal Contractor carries primary accountability and responsibility for the health and safety of his/her employees and his/her contractors within his/her working area, as contemplated by Section 37(2) of the OHS Act. None of the additional safety requirements specified by the Client reduces the Principal Contractor's accountability and responsibility for the health and safety of his employees and contractor employees within his working area.

The Principal Contractor shall be appointed by Development Bank of South Africa (DBSA) on the awarding of the contract and shall be responsible and accountable for all legislative and Development Bank of South Africa (DBSA) requirements for the duration of the contract. The Principal Contractor may appoint contractors to assist in the contract. All appointments shall be done in writing.

16. Compliance and Non-Conformances

As legislation forms part of any country's legal system, the Client requires all its Contractors to comply with legislation as part of the contract. All expenses to the Contractor, which result from compliance with this legislation as well as special requirements specific to the site, will be for the Contractors account.

Should the Principal Contractor appoint a contractor, the Principal Contractor would then have the same role and responsibility in relation to the contractors, in a similar way as the Client has in relation to the Principal Contractor.

The Client/Agent's representative reserves the right to stop work and issue a non-conformance report whenever safety, health or environmental violations are observed for both Principal Contractors and/or their contractors. Expenses incurred as a result of such work stoppage and standing time shall be for the Principal Contractors account. Any non-conformances/findings/observations found in these audits/inspections on contractors shall be raised and discussed with the relevant Principal Contractor (with whom the contractor is contracted with).

The requirements within this specification should not be considered to be exhaustive and the Client reserves the right to add, delete or modify conditions where it is considered to be appropriate.

No claim will be accepted as a result of any costs or delays being incurred due to the Principal Contractor or his contractors not complying with legislation, this Occupational Health and Safety Specification or their Occupational Health and Safety plan approved by the Client.

17. Legal and Other Requirements

It is required that all Contractors on site comply with the relevant applicable legislation, specifications, and standards in accordance with the scope of the project:

As a minimum but not limited to the following:

No	Legal reference	Purpose
1	Occupational Health and Safety Act 1993 (Act 85 of 1993) and Regulations (As amended).	OHS compliance
2	SANS 10400-NBR (SA)	Technical
3	COID Act	Compensation (Occupational injuries and diseases)
5	OHSAS 18001, ISO 9001 and ISO 14001-Contractor shall use this as guidelines.	International standards for health and safety, quality and environmental compliance
6	Local Authority by Laws	Applicable to OHS (ie. Public health)
7	The Constitution of the Republic of South Africa (particularly Section 24 of the Bill of Rights)	Overall
17	SANS 329	Safety requirements for combustion and fuel-handling systems.
18	SANS 347	Categorization and conformity assessment criteria for all pressure equipment.
19	SANS 208	The design and installation of compressed natural gas (CNG) vehicle filling stations.
20	SANS 10142	Wiring of premises: medium voltage installations
21	SANS10019	Transportable pressure receptacles for compressed, dissolved and liquefied gases - Basic design, manufacture, use and maintenance.
22	SANS13631	Packaged reciprocating gas compressors.
23	Gas Act 48 of 2001	<ul style="list-style-type: none"> • Storage License • Production Activity Registration • Trading License

24	National Environmental Management Act No. 107 of 1998	<ul style="list-style-type: none"> • Air Quality • Water Usage Licenses • Waste Management • Production Requirements and Thresholds
34	Relevant DBSA Procedures and standards	Applicable to OHS

It is the duty of the Principal Contractor and contractor to ensure that they are familiar with the necessary Occupation Health and Safety Legislation required. The Principal Contractor shall compile a legal register listing all applicable legislation and standards that may have an impact on the scope of work that they are performing on the construction project. The register shall be updated biannually.

10. Section 37 (2) (Legal) Agreement

A section 37(2) agreement and Construction Regulation 5 (1) (k) must be signed between Development Bank of South Africa (DBSA) and the principal contractor at the time of awarding the contract.

The principal contractor must ensure that a section 37(2) agreement is compiled between the principal contractor and all their appointed contractors for the contract.

The original copy of the section 37(2) agreement must be retained by the contractor and a copy retained by the Development Bank of South Africa (DBSA) responsible Project manager/ Programme Manager.

Copies of all agreements must form part of the respective contractor's H&S file.

11. Hazardous Work by Children (Child Labour)

The constitution of the Republic of South Africa, in the "Bill of Rights" is clear on the rights of children, especially when it comes to:

- a) *being protected from exploitative labour practices.*
- b) *not to be required or permitted to perform work or provide services that.*
 - are inappropriate for a person of that child's age; or
 - place at risk the child's well-being, education, physical or mental health or spiritual, moral or social development; and the Basic Conditions of Employment Act, Chapter six Section 43 "Prohibition of employment of children".
 - Before resorting to the use of child labour, due consideration must be given to the rights of the child in terms of the constitution.

- Where work is being performed which is not prohibited in terms of the constitution, then such work must be conducted in terms of the OHS Act “Regulations on Hazardous Work by Children in South Africa” with emphasis on paragraph 2 Purpose and Interpretation.
- Development Bank of South Africa (DBSA) does not condone the use of child labour and therefore all efforts must be exercised to avoid it.

12. Construction work permit

The Client will apply for the construction work permit to the Provincial Director of the Department of Labour, in the form of annexure 1 of the Construction Regulation (3), 2014 and the approved permit to be displayed at the site office.

All contractors shall have an up-to-date copy of the OHS Act and Regulations at all work sites which will be available to all employees. (Reference GAR 4).

13. Construction Professional Registration

The Principal Contractor and all his/her appointed contractors shall be registered in their respective levels as professionals in terms of the requirements of the SACPCMP. Registered Construction Health and Safety Officer or Construction Health and Safety Manager with SACPCMP upon award. No candidate registration will be accepted. The CHSO/CHSM must have proven record of years of experience as follows –

13.1. CHSM:

- CIDB grading 7 = > 3 but < 5 years
- CIDB grading 8 = > 5 but < 10 years

13.2. CHSO:

- CIDB grading 7 = > 2
- CIDB grading 8 = > 3

Project Managers may be required to Register (depending on the Size and Risk involved)

14. H&S/Q Policy

The Principal Contractor and the contractor companies shall each have a H&S/Q Policy authorised by their Chief Executive (OHS Act Section 16(1) appointee) that clearly states overall H&S/Q objectives and commitment to improving Safety, Health, Environment and Quality performance and must be displayed and shared with all stakeholders.

DBSA has a H&S Policy that clearly states the guiding principles by which Development Bank of South Africa (DBSA) operates and the commitment to H&S excellence and is authorised by the DBSA CEO.

15. Costing for H&S

The Principal Contractor/contractor shall ensure that the submitted tender adequately made provision for the cost of Health, Safety and Environmental measures.

Note: the costing for H&S must be itemised based on the overall scope of the project (i.e.) Training, provision of PPE, safety equipment purchases etc.

16. Appointment of a Principal Contractor

The Principal Contractor will be appointed by Development Bank of South Africa (DBSA) Project Manager on the awarding of the contract and shall be responsible and accountable for all legislative and DBSA requirements for the duration of the contract.

Contractors shall not commence with the project work until such times as he/H&S has been appointed in writing in terms of OHS Act Construction Regulation 5(1)(k), by Development Bank of South Africa (DBSA) Programme Manager/ Director.

17. Appointment of Contractors

The Principal Contractor may appoint contractors to assist in the contract. All appointments shall be done in writing and will form part of the Occupational Health and Safety Plan that is required to be submitted to DBSA. Adequate training and instruction must be given to the appointees and the principal contractor must ensure that all appointed contractors understand their roles and responsibilities.

18. Appointments and Competencies/ Training

The Principal Contractor shall ensure that all their appointees are made aware of their accountabilities and responsibilities in terms of their appointment and advise and assist these appointees in the execution of their duties.

The Principal Contractor shall ensure that competent persons are appointed in writing in accordance with the applicable appointments.

Copies of all the appointments shall be kept in the H&S File, and Competence certificates attached to the appointment.

The aim of this section is to outline DBSA's expectations with respect to the scope of the training which the Principal Contractor and contractor employees receive. The scope of the training includes but is not limited to the type of work being performed and the relevant procedures. In addition to the requirements, the Principal Contractor and contractor employees would require the appropriate qualifications, certificates,

and be under competent supervision. (See Annexure B for training requirements per legal appointment)

19. Site Induction

General construction site induction carried out by the Principal Contractor.

The Principal Contractor shall ensure that all his employees and contractor employees undergo their company induction with regard to the approved Occupational Health and Safety Plan, general hazards prevalent on the construction site, construction risk assessment, rules and regulations, and other related aspects. Proof of client site specific induction signed by Inductor and trainee must be kept on site.

20. Visitors to Site

All visitors must remain in the care and custody of a person (host) who has been properly inducted. No visitors are permitted to undertake any construction work, of any nature and walk on site unaccompanied.

21. Access and Security Control

Access and Security control shall be done Employees, contractors and visitors shall be subjected to induction training and substance abuse tests when entering sites, or as and when required whilst on sites substance test must be done.

The following are prohibited items and shall not be allowed on Development Bank of South Africa (DBSA) sites unless the necessary authorisation for possession has been obtained:

- Firearms
- Liquor/ Alcohol
- Dangerous weapons
- Drugs (excludes items/ substances authorised for use and possession of medical centres or in possession under doctor's prescription)
- Any other items that may be declared prohibited.

22. Contractor's Site Facilities

Site facilities shall be established and maintained by the contractor or be maintained as agreed with the Site Manager and/or in accordance with the contractual agreement. The facilities include, but are not limited to the following: (refer to OHS Act Construction Regulation 30)

- Temporary Facility Layout Plan
- Sheltered eating facilities.

- Ablution facilities
- Site Offices and Amenities
- Lay down and Storage.
- Temporary Site Services
- Storages
- Covid 19 Isolation room
- First aid room

The Principal Contractor must develop their site establishment procedure.

23. Public Safety

Legislation requires that employers shall be responsible, as far as reasonably practicable, for safeguarding persons other than those in their employment who may be directly affected by their activities so that they are not exposed to hazards to their health and safety (Section 9 of the OHS Act).

Contractors shall factor in, in their safety plan, how they intend safeguarding/controlling any members of the public against their activities during the project.

24. Project and Site Rules (Zero Harm to People and the Environment)

Any non-compliance to any health and safety requirement in this Occupational Health and

Safety Specification is subject to discipline/removal of person from the project site. No person shall enter the construction site without undergoing Covid-19 screening.

No person shall damage, alter, remove, render ineffective, or interfere with anything that has been provided for the protection of the site, or for the health and safety of persons.

No person under the influence of alcohol, drugs or medication (in a state of intoxication) or any other condition that may render him incapable of controlling himself or of other persons under his charge shall be allowed to enter the site.

All safety and warning signs shall always be obeyed.

Entering or leaving the site will only take place at official access control points and may only be done via the official designated walkways.

All employees shall adhere to the H&S and other site-specific rules.

The Principal Contractor must have a process in place to address employees that have contravened Health and Safety Requirements.

24.1. Smoking

Smoking is only permitted at designated areas in accordance with the requirements of the Principal contractor smoking policy. Smoking area should be designated with a sign and fire extinguishers next to it.

24.2. Cellular Phones

Do not use Cellular phones in areas where cell phone usage is prohibited, when driving or operating Construction vehicles, and when busy with High-risk activities like climbing the scaffolding.

24.3. Fire Extinguishers

All fire extinguishers shall be:

- Clearly labelled.
- Conspicuously numbered
- Entered in a register.
- Inspected monthly by a competent person.
- Tested and serviced at recommended intervals by an accredited supplier.
- Results shall be entered in the register and signed by competent person.
- No open or unattended fires are allowed within the construction site.
- A Principal Contractor shall have a layout plan of a site indicating where all his firefighting equipment is located.

25. Vehicles and Traffic Rules

Provide a site-specific traffic management plan in line with the overall site traffic management plan.

Ensure that all drivers and passengers wear seatbelts, where fitted, while travelling in a motor vehicle. Vehicles not fitted with seatbelts must be retrofitted according to the vehicle manufacturer's specifications.

Ensure that no employees, including contractor employees, when performing work for DBSA, will be transported in the back of open vehicles.

26. Substance and Drug Abuse Management

The Principal Contractor shall provide a Substance Abuse management policy.

27. Disciplinary Process

The Principal Contractor shall have a disciplinary process and an organisational structured procedure to deal with employees who have contravened organisational and legal requirements.

28. Hazard Identification and Risk Assessment

DBSA Has to prepare and provide a Baseline Risk Assessment for an intended construction work project to the contractor / service providers as part of the contract package.

The Principal Contractor/ service providers shall develop a Risk Assessment in line with Construction Regulation 9 (1) (a-e).

Emerging risks and hazards must be managed during construction work. This means that if there are significant changes to a process or activity, or any new process, then these should also be subjected to risk assessment.

All risks must be rated.

Activity based risk assessments shall be conducted by an appointed and competent person of the Principal Contractor.

29. High Risk Activities

When the Principal Contractor and/or his contractors are working in an area where a high health and safety hazard exists, the Principal Contractor shall:

- Ensure that permanent and adequate on-site supervision is available for the entire duration of the work that is being conducted.
- Ensure the use of safety standbys in areas of high-risk activities, and activities that fall within the scope of the permit to work system.
- Provide, erect and maintain all the required barricading, lighting, flags, flashing lights, or other safety control equipment to enable operations to proceed in a safe manner.
- Maintain, at all times, defined access ways, which are clear of objects or obstructions, so as to allow for emergency vehicle entry; and
- Speeding Trucks; speed limits to be maintain at 20 KM Per Hr.

The following main hazards and risks were identified on site:

- Fire and explosion
- Confined space hazards
- Working at heights
- Risk of Asphyxiation
- Risk of gas poisoning (H₂S, CO₂ and NH₃) and chemical hazard
- Risk of high-pressure gas or liquid leaks
- Risks associated with rotating mechanical equipment.
- Risks associated with pathogens (diseases)
- Risks of hydraulic and construction failure
- Structural failure rarely happens when the tank is being filled or the high-pressure pipes are being tested.
- Accidental hydraulic discharge during the pre-operation test of the pumps and valves.
- Lack of calibration of the health and safety equipment.

30. Pre-Task Risk Assessment (DSTI)

The Contractor shall daily and for every task to be performed, conduct a pre-task risk assessment with all employees involved with the task(s). The pre-task risk assessment will form the basis of the daily pre-job brief/toolbox talks prior to the start of work. This will highlight critical steps from the safe work procedure to ensure that work is performed in a safe manner. Proof of communication as well as confirmation that it was received and understood by all will be noted on a standard form, which will be kept at the job site during the job execution. The completed signed pre-task risk assessment form shall be filed in the Principal Contractor's safety file.

31. Safe Work Procedures and Practices

There must be approved method statements and or Safe Work/Operating Procedures for all the high-risk activities as identified in the risk assessment. No work shall be carried out without an approved method statement.

The supervisor / team leader shall ensure that all employees are trained on all applicable Method Statements Records of training/ awareness shall be kept on site.

32. Planned Task Observations (PTO)

The Principal Contractor shall provide the planned task observation procedure or process covering but not limited to the following:

Persons responsible for monitoring the task and carrying out the Planned Job Observation must be the supervisor.

Planned job observations should be conducted in such a way that the employee is observed against the actual steps (of the written Method Statements) to be followed when performing a task and be marked against compliance with each step. This will assist in determining employee competence and compliance. Record should always be kept.

The supervisor who conducts the PTO must have a copy of the PTO to ensure that the employee is following the steps.

Where the employee did not comply or did not follow the required steps, this should be indicated on the report and actions be taken to correct the deviation.

33. Fall protection (work carried out at heights)

A competent person must be appointed for the management of work carried out at heights is carried out safely as per CR 10 which includes carrying out the following:

A risk assessment will be required for any work to be carried out above two (2) meters from the ground or any floor level. This work will be classified as “work carried out at heights”.

As far as is reasonably practicable, any person working at heights will work from a platform, ladder or other device that is at least as safe as if he is working at ground level. Whilst working in this position he shall be wearing a single belt with lanyard to prevent the person falling from the platform, ladder or other device. This safety belt will be, as far as is possible, secured to a point away from the edge over which the person might fall and the lanyard must be of such a length and strength that the person will not be able to move over the edge.

Alternatively, any platform, slab, deck or surface forming an edge over which a person may fall may be fitted with suitable guard rails at two different heights as prescribed in the relevant South African National Standard for the design, erection, use and inspection of access scaffolding.

Where the requirement in the paragraph above is not practicable, the person will be provided with a full body harness that will be worn at all times and shall be attached above the wearer’s head at all times. The lanyard must be fitted with a shock-absorbing device or the person must be attached to a fall arrest system (anchorage connector; body wear; and connecting device) approved by the Client. Where the requirements in the paragraph above are not practicable, a suitable catch net must be erected.

Employees working in at heights must be trained to work without risk to their health and safety or to the health and safety of others and be declared medically and psychologically fit to perform work at elevated positions.

Where work on roofs is carried out, the risk assessment must take into account the possibility of persons falling through fragile material, i.e., skylights and openings in the roof.

34. Structures

The Contractor must ensure the following-

- 34.1. Only skilled employees are allowed to erect structures and that the skills of these.
- 34.2. Employees are verified at regular intervals.

Steps are taken to ensure that no structure becomes unstable or collapses due to-

- Construction work being performed on it or in the vicinity of it.
- No structure is overloaded to the extent that it becomes unsafe.
- He has received from the designer the following information:
 - i. Information on known or anticipated hazards relating to the construction work and the relevant information required for the safe execution of the construction work.
- A geo-scientific report (where applicable)
- The loading structure is designed to bear.
- The methods and sequence of construction process

35. Temporary works

A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.

A contractor must ensure that –

-
- a) all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand.
 - b) all temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted.
 - c) detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee.
 - d) all persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely.
 - e) all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used.
 - f) all temporary works structures are inspected by a competent person 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.
 - g) detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee.
 - h) all persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely.
 - i) all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used.
 - j) All temporary works structures are inspected by a competent person 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 end of shift.

36. Excavations

Excavation work must be carried out under the supervision of a competent person, who has been appointed in writing. Before excavation work begins the stability of the ground must be evaluated.

Whilst excavation work is being performed, the contractor must take suitable and sufficient steps to prevent any person from being buried or trapped by a fall or dislodgement of material.

No person may be required or permitted to work in an excavation that has not been adequately shored or braced.

Where the excavation is in stable material and where the sides of the excavation are sloped back to at least the angle of repose of the excavated material, shoring or bracing may be left out but only after written permission has been obtained from the appointed competent person.

Shoring and bracing must be designed and constructed to safely support the sides of the excavation.

Where uncertainty exists regarding the stability of the soil the opinion of a competent professional engineer or professional technologist must be obtained whose opinion will be decisive. The opinion must be in writing and signed by the engineer or technologist as well as the appointed competent person.

No load or material may be placed near the edge of an excavation unless suitable shoring has been installed to be able to carry the additional load.

Neighboring/adjoining buildings, structures or roads that may be affected or endangered by the excavation must be suitably protected.

Every excavation must be provided with means of access that must be within 6 meters of any worker within the excavation.

The location and nature of any existing services such as water, electricity, gas etc. must be established before any excavation is commenced with and any service that may be affected by the excavation must be protected and made safe for workers in the excavation.

The appointed competent person must inspect every excavation, including the shoring and bracing or any other method to prevent collapse, as follows:

- a) Daily before work commences.
- b) After every blasting operation
- c) After an unexpected collapse of the excavation
- d) After substantial damage to any supports
- e) After rain

The results of any inspections must be recorded in a register kept on site and in the safety file.

Every excavation accessible to the public or that is adjacent to a public road or thoroughfare or that threatens the safety of persons, must be adequately barricaded or fenced to at least one meter high and as close to the excavation as practicable, regardless of the depth of the excavation.

Every excavation must be provided with warning lights or visible boundary indicators after dark or when visibility is poor.

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

- a) 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.
- b) The confined space must be purged and ventilated of any hazardous or flammable gas, vapour, dust or fumes.
- c) The safe atmosphere must be maintained and, where necessary.
- d) 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.
- e) Furthermore, an additional person, trained in resuscitation, to be in full-time attendance immediately outside the confined space.
- f) Additional serviceable breathing and rescue apparatus is kept immediately outside the confined space for rescue purposes.
- g) All pipes, ducts etc. that may leak into the confined space to be blanked off sufficiently to prevent any leakage or seepage.
- h) The employer must ensure that all employees have left the confined space after the completion of work.
- i) Where flammable gas is present in a confined space no work may be performed in close proximity to the flammable atmosphere.

Excavations and other openings must be provided with sufficient barriers to prevent construction vehicles and mobile plant from falling into them.

Excavations left open for extended periods of time (exceeding 48 hours) must be approved the relevant Engineer / Construction Supervisor.

37. Scaffolding

Access scaffolding must be erected, used and maintained safely in accordance with Construction Regulations and relevant SANS Code of Practice. Detailed consideration must be given to all scaffolding to ensure that it is properly planned to meet the working requirements, designed to carry the necessary loadings and maintained in a sound condition. Sufficient material must be available to erect the scaffolding properly.

Scaffolding must only be erected, altered or dismantled by persons who have adequate training and experience and are competent in this type of work and under the continuous supervision of such a person.

38. Suspended platform

A competent person to be appointed in writing to ensure that all suspended platforms work operations are carried out under supervision and that the rest of the team is competent. No contractor may allow the use of the suspended platforms unless they comply with the requirements of the construction regulation 17 of 2014.

39. Material hoist, lifting and rope access.

Lifting equipment must be designed and constructed in accordance with the manufactures/designers' specifications as well as generally accepted technical standards and operated, used, inspected and maintained in accordance with the manufactures requirements as well as that of the of Driven Machinery Regulations promulgated in terms of the Occupational Health and Safety Act (Act no 85 of 1993).

The Driven Machinery Regulations requires that:

- a) Lifting equipment is clearly and conspicuously marked with the maximum mass load.
(MML)
- b) 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.

Each winch on a lifting machine must at all times have, at least, three full turns of rope on

- i. the drum when the winch has been run to its lowest limit.

-
- ii. Lifting equipment shall be fitted with a brake or other device capable of holding the MML.
 - iii. This brake or device shall automatically prevent the downward movement of the load when the lifting power is interrupted.
 - iv. Lifting equipment shall be fitted with a load limiting device that automatically arrest the lift.
 - v. when the load reaches its highest safe position or when the mass of the load is greater than the MML.
 - c) 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:

- i. chains – 4 (four)
- ii. steel wire ropes 5 (five)
- iii. fiber ropes- 10 (ten)
 - a) Every hook or load attaching device must be designed to prevent the load from slipping off or disconnecting.
 - b) 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.
 - c) All maintenance, repairs, alterations and inspection results must be recorded in a logbook and each lifting machine must have its own logbook; and
 - d) 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.

40. Demolition

A contractor must appoint a competent person in writing to supervise and control all demolition work on site.

A contractor must ensure that before any demolition work is carried out, and in order to ascertain the method of demolition to be used, a detailed structural engineering survey of the structure to be established is carried out by a competent person and that a method statement on the procedure to be followed in demolishing the structure is developed by that person.

During a demolition, the competent person contemplated in sub-regulation (1) must check the structural integrity of the structure at intervals determined in the method statement contemplated in sub-regulation (2), in order to avoid any premature collapses.

A contractor who performs demolition work must-

- a) with regard to a structure being established, take steps to ensure that-
 - i. no floor, roof or other part of the structure is overloaded with debris or material in a manner which would render it unsafe.
 - ii. all reasonably practicable precautions are taken to avoid the danger of the
 - o structure collapsing when any part of the framing of a framed or partly.
 - o framed building is removed, or when reinforced concrete is cut; and
 - iii) precautions are taken in the form of adequate shoring or other means that.
may be necessary to prevent the accidental collapse of any part of the structure or adjoining structure.

- iv) ensure that no person works under overhanging material or a structure which has not been adequately supported, shored or braced.
- v) ensure that any support, shoring or bracing contemplated in paragraph (b), is designed and constructed so that it is strong enough to support the overhanging material.
- vi) where the stability of an adjoining building, structure or road is likely to be affected by demolition work on a structure, take steps to ensure the stability of such structure or road and the safety of persons.
- vii) ascertain as far as is reasonably practicable 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 and must before the commencement of demolition work that may affect any such service, take the steps that are necessary to render circumstances safe for all persons involved.
- viii) cause every stairwell used and every floor where work is being performed in a building being established, to be adequately illuminated by either natural or artificial means.
- ix) cause convenient and safe means of access to be provided to every part of the demolition site in which persons are required to work; and
- x) erect a catch platform or net above an entrance or passageway or above a place where persons work or pass under or fence off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe where there is a danger or possibility of persons being struck by falling objects.

A contractor must ensure that no material is dropped to any point, which falls outside the exterior walls of the structure, unless the area is effectively protected.

No person may dispose of waste and debris from a high place by a chute unless the chute-

- i. is adequately constructed and rigidly fastened.
- ii. if inclined at an angle of more than 45 degrees to the horizontal, is enclosed on its four sides.
- iii. if of the open type, is inclined at an angle of less than 45 degrees to the horizontal.
- iv. where necessary, is fitted with a gate at the bottom end to control the flow of material; and
- v. Discharges into a container or an enclosed area surrounded by barriers.

A contractor must ensure that every chute used to dispose of rubble is designed in such a manner that rubble does not free-fall and that the chute is strong enough to withstand the force of the debris travelling along the chute.

A contractor must ensure that no equipment is used on floors or working surfaces, unless such floors or surfaces are of sufficient strength to support the imposed loads. Where a risk assessment indicates the presence of asbestos, a contractor must ensure that all asbestos related work is conducted in accordance with the Asbestos Regulations, 2001, promulgated by Government Notice No. R. 155 of 10 February 2002.

Where the demolition work involves the use of explosives, a method statement must be 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 demolition procedures issued by the appointed person.

A contractor must ensure that all waste and debris are as soon as reasonably practicable removed and disposed of from the site in accordance with the applicable legislation.

41. Working in confined spaces

Enclosed space work necessitates a Confined Space Permit. This may only be obtained from the authorized person nominated in writing. The responsibility for safe procedure, both at the time of entry and during the entire operation of entering and working in confined spaces, rests with the Contractor. The Contractor shall be sure

that adequate steps have been taken to eliminate or control hazards. Before working in an area that contains dust, the area is to be ventilated and hosed down to settle and dampen the dust.

The Contractor shall provide all necessary equipment to manage confined spaces, including all necessary monitoring and rescue equipment (such as tripods, breathing equipment and the like). The Contractor shall ensure all persons working in a confined space or managing entry to a confined space are appropriately trained. Compulsory - Continuous monitoring, trained rescue teams, radio communication & adequate ventilation.

42. Construction vehicles and mobile plant

The Client will inspect construction vehicles and mobile plant prior to being allowed on a project site. Suppliers of hired vehicles, plant and equipment will be required to comply with this specification as well as the Occupational Health and Safety Act (Act no. 85 of 1993) and its Regulations.

Construction vehicles and mobile plant to be:

- a) Of acceptable design and construction.
- b) Maintained in good working order.
- c) Used in accordance with their design and intention for which they were designed.
- d) Operated and/or driven by trained, competent and authorised operators/drivers. No unauthorised persons are to be allowed to drive construction vehicles and mobile plant.
- e) Provided with safe and suitable means of access.
- f) Fitted with adequate signalling devices to make movement safe including reversing.
- g) Provided with roll-over protection (where applicable).
- h) Inspected daily before start-up by the driver, operator and/or user and the findings recorded in a register/logbook.
- i) Fitted with two head and two taillights that are in good working condition and must be used whilst operating under poor visibility conditions.
- j) When used for transporting persons must have seats firmly secured and sufficient for the number of persons being transported.

Operators and drivers of construction vehicles and mobile plant must be in possession of a valid medical certificate of fitness issued by an occupational health practitioner in

the form of Annexure 3 of the regulations declaring the operator and/or driver fit to operate or drive construction vehicles and mobile plant.

No loose tools, materials etc. are allowed in the driver and/or operators compartment/cabin or in the compartment in which any other persons are transported.

No person shall ride on any construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose. Employees shall only be transported if provision for seating and safety belts has been provided with an adequate canopy or rollover protection.

All construction vehicles and mobile plant left unattended at night, adjacent to a freeway in normal use or adjacent to construction areas where work is in progress, must have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of the vehicles or plant.

Bulldozers, scrapers, loaders, and other similar mobile plant must, when being repaired or when not in use, be fully lowered or blocked with controls in a neutral position, motors stopped, and brakes set.

Self-Propelled Mobile Machinery

All Self-Propelled Mobile Machinery must be inspected daily, and the findings recorded in a register. Pre-use inspection checklist shall identify critical items that would stop the operator from operating machinery should a defect be detected.

All operators shall be tested on their ability to operate machinery and equipment inspected prior to be used on any of the premises by the Client Project Inspectors and Responsible Engineer. Relief drivers shall be made available for mobile machinery where there is a need for on-going operations and the contractor shall establish a rotation schedule.

All Drivers/Operators shall be appointed under the applicable legislation prior to operating any type of mobile equipment or machinery:

- a) If Driver/Operator does not adhere to the rules and regulations his Appointment as operator shall be cancelled and he shall not be able to carry on with his duty.
- b) No Driver/Operator shall be appointed without proof of training, driver's licence or letter of competency.
- c) No training of Drivers/Operators on Site.
- d) No passengers on dump truck, Loaders or Excavators.
- e) No eating or drinking allowed while operating equipment.

- f) No vehicle shall be left unattended with engine running or key in ignition.
- g) Drivers may use no cellular phones during operations.

43. Occupational Health, Rehabilitation and Hygiene

All contractors are required to develop an Occupational Health, Hygiene and Rehabilitation program. The program is intended to ensure that the risks to health are identified and controlled. This Program will manage all employees awarded fitness certificates with restriction and having chronic illness e.g., high blood pressure.

44. Compensation of Occupational Injuries and Diseases Act (COIDA)

The Principal Contractor shall submit proof of registration and letter of good standing with the compensation fund or with an approved licensed compensation insurer for his company and each of his contractors'. This must remain valid for the duration of the contract. The Letter of Good Standing shall reflect the name of the Principal Contractor and/or Contractor Company.

45. Employee Health and Wellness Programme

Principal Contractor shall submit details of their Employee Health and Wellness Programme as part of their Health and Safety Plan which should include a Medical Surveillance Program and an Employee Assistance Program.

45.1. Medical Surveillance Programme

The Principal Contractor shall ensure that all employees are registered on a medical surveillance programme and are in possession of a valid medical fitness certificate. The certificate of fitness Conducted by the registered Occupational Medicine Practitioner/Occupational Health Nurse Practitioner in the form of Annexure 3 of Construction Regulations 2014. should be relevant to the type of work (risk based) that the employee will be exposed to. This will require each employee to have a risk-based person job specification that will be used as a basis for medical examination.

The Principal Contractor must ensure that his employees and contractor employees have undergone pre-entry medical examination before starting work on site, ***no employee will access site without a valid medical fitness certificate.***

On completion of the project an exit medical examination shall be conducted.

45.2. Emergency Care

A list of emergency numbers must be posted and contact numbers in the site office. The Principal Contractor shall ensure that his employees and contractor employees are familiar with the emergency numbers.

Contractors shall have one first aid box for the first 5 persons and thereafter one for every 50 or team of workers on site or part thereof. More first aid boxes shall be provided if the risks, distance between work teams or workplace requirements require it (it should be available and accessible for the treatment of injured persons at that workplace).

Minimum contents of a first aid box: (Refer to GSR 3 Annexure of the OHS Act)

A prominent notice or sign shall be erected in a conspicuous place at a workplace (SANS1186 approved signs to indicate location of first aid boxes), indicating where the first aid box or boxes are kept as well as the name and contact details of the First Aider of such first aid box or boxes.

45.3. Rehabilitation

Where any contractor's employee is injured at work to the extent that they require rehabilitation, then this must be given, using the services of an appointed rehabilitation organisation.

46. Emergency Preparedness and Response

The Principal Contractor shall provide a site-specific emergency response plan.

Principal Contractor, together with his contractors, shall develop their own emergency response plan. The Principal Contractor will ensure that his employees and his contractor employees are trained on this plan.

Quarterly emergency drills shall be undertaken, and this must be recorded and provided on request.

Emergency procedures shall include but not limited to, fire, spills, accidents to employees, use of hazardous substances, damage of vital resources such as water, electricity, etc. **NB.** A separate risk assessment and safe work procedure for the identification, location and exposure and protection of existing services is required for submission, review and approval by the DBSA health and safety project manager/ health and safety agent.

47. Fire hazard

The Contractor shall prepare a detailed fire risk assessment, ensure that staff are educated in fire prevention and will be held responsible to avoid the risk of fire. No area is to be denuded of vegetation to create firebreaks, to prevent or make fires. No open fires are allowed on site. The contractor shall ensure that operations are in compliance with statutory requirements at all times. The Contractor H&S Officer shall ensure that in areas with a high fire danger rating, staff are made aware thereof. Smoking shall be restricted to designated areas or shall not be allowed, particularly in areas that have a high fire danger rating.

48. Dust and Noise

The Contractor shall monitor dust and noise caused by mobile equipment, generators and other equipment during construction. Factors such as wind can often affect the intensity to which these impacts are experienced. Issue employees with the Ear plugs or Earmuffs depending on the Noise created.

To ensure that noise does not constitute a disturbance during construction activities, all construction works shall occur between specific working hours. Dust suppression measures shall be in place to reduce the dust caused by the movement of heavy vehicles.

49. Construction Vehicles and Mobile Plant

All construction vehicles and equipment shall meet the legislative requirements pertaining to the OHS Act Construction Regulations 23, the National Road Traffic Act, National Environmental Act.

The following requirements are applicable to the use and operation of construction vehicles:

- A Principal Contractor/ contractor shall ensure that all construction vehicles and mobile plant are operated by a person who has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate those construction vehicles and mobile plant.
- Designated drivers shall be in possession of an appropriate valid driver's licence, valid for the class of vehicle and authorised in writing to operate the Construction vehicles and mobile plants. The driver's license shall be kept by the person so authorised and shall produce such card on request.
- Drivers or operators and construction vehicles at identified high-risk sites and construction projects should have a permit system for operating in that particular area.
- Reverse beepers shall be fitted on all construction vehicles.
- All drivers of construction vehicles and mobile plant shall have medical certificates of fitness to operate those construction vehicle and mobile plant, issued by an occupational health practitioner in the form of Annexure 3 of the Construction Regulations.
- The speed limit within the bounds of the construction site is 25 km/h.
 - The Principal Contractor shall ensure that his employees and those of his contractors do not:
 - o Ride on back of bakkies, or other mobile plant equipment.
 - o Leave vehicles unattended with the engine running.

- The Contractor shall maintain his vehicles in roadworthy condition and a valid license. These vehicles shall be subject to inspection by the Client representative. Vehicles which are not roadworthy will not be allowed onto the site.

50. Housekeeping

The Principal Contractor and his contractor shall maintain a high standard of housekeeping within the site. Prompt disposal of waste materials, scrap and rubbish is essential.

The Principal Contractor shall carry out regular safety/housekeeping inspections (at least weekly) to ensure maintenance of satisfactory standards. The Principal Contractor shall document the results of each inspection and shall maintain records for viewing.

Note: Nails protruding through timber shall be bent over or removed so as not to cause injury.

51. Signage

All symbolic safety signs that the Principal Contractor or his /her Contractors are to use/display shall comply with the requirements of SANS 1186.

The display of the following signage is mandatory:

- For Contractors with Site Establishment: The Contractor Company sign must be posted at their site offices to reflect the name and contact details of the: Construction Manager; Health and Safety Manager/Practitioner; First Aider; Health and Safety Representative and Evacuation warden.
- The Contractors shall provide the signage where work is conducted and where unauthorised entry is prohibited and/or where alerting and cautioning passers-by to be aware of potential dangers.
- The Contractors shall provide the signage in accordance with the scope and work area.

52. Hazardous Materials/Chemicals Management

HCS shall be managed in accordance with HCS Regulations of the OHS Act 85 OF 1993. Prior to any HCS being brought onto the site or produced on the site, the Principal Contractor/contractor shall keep the following on site:

- Material Safety Data H&S (MSDS) in accordance with the requirements of the OHS Act –
- Regulations for Hazardous Chemical Substances.
- Proposed arrangements for safe storage.

- Proposed methods for handling/usage.
- Proposed method of disposal.
- Hazard communication / training plan.

53. Flammable and Combustible Liquids

Use and temporary storage of flammable and combustible liquids shall be managed in accordance with Construction Regulations (CR 25) and GSR 4 of the OHS Act 85 OF 1993.

54. Compressed Gas Cylinders

Use and temporary storage of Compressed Gas Cylinders shall be managed in accordance with the General Safety Regulation 9 of the OHS Act 85 of 1993 and SABS 1548

55. Personal Protective Equipment (PPE)

In terms of Section 8 of the OHS Act, the duty of the employer is to take steps to eliminate or mitigate (hierarchy of control measures) any hazard or potential hazard to the safety or health of employees before resorting to PPE.

Principal Contractor's employees and his contractor employees at the construction site, including visitors, shall use the relevant internationally recognised authority approved risk-based PPE at all times, as a minimum:

- Head protection hard hat (with chin straps)
- Steel toe capped safety boots.
- Eye protection. Wearing of impact Safety Spectacles with side shields. Prescription glasses must comply with the same standard or cover impact safety spectacles must be worn over them.
- Long sleeved and long pants protective clothing.
- High visibility vests.
- Ear protection when working in a noisy area or operating a machine that creates noise.
- Dust Masks

*****Refer to General Safety Regulation 2 of the OHS Act.**

The Contractor shall ensure that his employees understand why the personal protective equipment is necessary and that they use them correctly. Strict non-compliance measures must be administered to any employee not complying with the use of PPE and that employee shall be removed from the Site.

55.1. Issue, Replacement and Control of PPE

The Principal Contractor must provide a detailed procedure with a matrix on the issuing, maintenance and replacement of PPE for all his employees and contractors on site.

The Principal Contractor is required to keep an updated register of all PPE issued, including that of his employees and contractors.

56. Machinery, Tools and Equipment

- The Principal Contractor shall ensure that all machinery, tools and equipment shall be listed on an inventory list and handed to security with a copy kept on site.
- All machinery, tools and equipment to be regularly inspected at least monthly or as required by legislation and risk assessments, registers of tools shall be kept on the safety file. The equipment should be numbered or tagged so that it can be properly monitored and inspected.
- All fuel driven equipment shall be properly maintained in accordance with the manufacturer's recommendations and legal requirements.
- All employees operating or using machines and tools shall:
 - o Be competent.
 - o Have a valid certificate.
 - o Have proof of any form of task related training.

57. Hand Tools and Pneumatic Tools

All pneumatic tools shall be numbered, recorded and inspected at least monthly as well as by users prior to use. The revolutions per minute measured shall be in accordance with the manufacturer specifications. All hand tools should be inspected at least weekly as well as by users prior to use.

Tools with sharp points in toolboxes must be protected with a cover.

57.1. Records

- Check list for hand tools.
- Check list for air tools including records of the measurement of revolutions on grinders.
- Gas cylinder trolley checklist Register

58. Pressurised Systems and Pressure Equipment

The Principal Contractor shall ensure that all pressure equipment is inspected by an Approved Inspection Authority in accordance with the Pressure Equipment Regulations 7.

All pressure equipment shall be provided with at least one safety valve and such safety valve should be kept locked or sealed in accordance with the Pressure Equipment Regulations 10.

The pressure equipment shall be provided with a manufacturer's plate in accordance with the Pressure Equipment Regulations 9.

The pressure equipment should be fitted with a pressure gauge in Pascal and the maximum permissible operation pressure marked with a red line on the dial.

58.1. Records

- Inspection registers for pressure vessel
- The certificate from the manufacturers
- Registration certificate of an Approved Inspection

59. Lifting Machines (Mobile Cranes)

The user shall not require or permit any person to operate such a lifting machine unless the operator is in possession of a certificate of training, issued by a service provider registered by the Department of Labour and TETA.

60. Fire Safety

The Principal Contractor/Contractor shall develop a fire safety procedure for the specific construction site prior to commencing work. The procedure must take into consideration the size of the site, type of work being done (e.g., cutting, welding, grinding, etc.) and number of combustible materials. Development Bank of South Africa (DBSA) Fire Risk Management requirements and all other applicable Regulations. All workers entering and working in the construction site need to be trained in fire safety and any duties they are required to perform. Pre-existing fire systems in buildings shall be maintained during construction whenever possible. Any changes must be approved by the Client.

51.1. Fire Safety Plan

The fire safety plan shall include:

- Fire risk assessment

- The designation and organization of site personnel to carry out fire safety duties, including fire watch service if applicable.

The emergency procedures to be used in the case of fire, including.

- Sounding the fire alarm.
- Notifying the fire department
- Instructing site personnel
- Firefighting procedures
- And integrating with existing emergency procedures.
- The control of fire hazards in and around the building.
- Maintenance of firefighting facilities.

51.2. Cutting, Welding, and Hot Work

When welding or cutting work is performed, an adequate number of approved fires extinguishers shall be provided by the contractor. Employee must be competent. All oxy-acetylene welding equipment shall be fitted with a flash back arrestor. All oxy-acetylene pipes must be clamped with the correct clamps to separate it in an emergency.

52. Construction Sites

Fire Safety Plan: Prior to the commencement of construction or building alterations, a fire safety plan and risk assessment shall be prepared for the construction site.

Fire Warning: A suitable means of alerting site personnel to a fire shall be provided, and capable of being heard in all areas of the building.

Portable Extinguishers: suitable extinguishers must be available on the construction site and in cases of hot work, be readily available at the location.

Combustible Liquid and Flammable Liquid Storage: storage of combustible and flammable liquid on the construction site is not permitted unless stored in approved flammable cabinets or outdoors away from the buildings.

53. Barricading (Guarding of Excavations, Trenches and Floor Openings)

In areas where the restriction or prevention of unauthorised persons/members of public/passers- by is required, barricading requirements shall be adhered to.

Requirements for Barricading (if risk assessments require more stringent mitigation measures, then those stringent measures shall apply): -

- All barricading shall be of the firm type.
- All openings and edges must be barricaded with solid barricading to withstand an impact of at least 200 kg.

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- Only solid (scaffolding or stand-alone) barricading with Orange “Snow Netting” will be allowed.
 - Physical barriers to prevent persons falling into openings in floors, stairwells, staircases, open-sided buildings and any structure in the course of erection, where dangerous openings exist.

No danger tapes are allowed for barricading purposes.

The contractors barricading standard must accompany the Occupational Health and Safety Plan.

54. Electrical Installations and Machinery on Construction sites

The Principal Contractor shall ensure that electrical installations and machinery on construction sites conform to the requirements of the OHS Act and the relevant SANS standards.

Before construction commences and during the progress thereof, adequate steps are taken to ascertain the presence of, and guard against, danger to workers from any electrical cable or apparatus which is under, over or on the site.

The Principal Contractor shall ensure that all parts of electrical installations and machinery are of adequate strength to withstand the working conditions on construction sites.

The control of all temporary electrical installations on the construction site is designated to a competent person who has been appointed in writing for that purpose.

All temporary electrical installations used by the contractor are inspected at least once a week. This must be done by a competent person and the inspection findings must be recorded in a register that's kept on the construction site; and

55. Excavations, Trenches and Floor Openings

- Requirements in Construction Regulation 13 of the OHS Act, shall apply.
- Digging, excavation, or driving a peg, pile or spike into the ground operations by the Contractor may not commence without the written authorisation from the Client.
- Prior to commencing work on any excavation or trench, utility owners shall be contacted and advised of the proposed work and to determine the location of all underground installations, i.e., sewer, telephone, water, fuel, electrical, etc.
- Adequate precautions shall be taken by the Contractor to prevent slumping of excavations, as well as to prevent rocks and loose material falling onto workers.

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- All excavations done by the Contractor are to be clearly demarcated and barricaded to prevent accidental access.
 - Only solid barricading will be used at areas where a fall hazard is present. Solid barricading and / or hole covers shall be provided around all holes or openings to prevent any person being injured as a result of a fall. Danger tape may only be used as a pre-warning to make the solid barricading more visible and to prevent persons from coming close to the danger area.
 - Barricading must be placed as close (500mm from the edge) as possible to the excavation.
 - If an excavation or trench endangers the stability of buildings or walls, shoring, bracing, or underpinning will be provided. Excavations and trenches that are adjacent to backfilled excavations or trenches, or which are subject to vibrations from railroad traffic, road traffic, the operation of machinery (e.g., trucks), must be secured by a support system, shield system or other protective systems (i.e., Sheet pile shoring, bracing).
 - Where it is impracticable to provide fixed guard railing, effective removable barriers shall be provided at all unguarded openings in guard railing or floors and shall be always maintained in position until the hazard no longer exists.
 - Warning signs and flashing warning lights at night shall be displayed in suitable positions to warn any persons approaching the area of the location and extent of any excavation.
 - No material shall be placed within 3m of the excavation edges.
 - All excavations must be on the register and inspected daily and declared safe by the contractor's appointed competent person before work.
 - There shall always be a supervisor present while work is being performed in an excavation.
 - There shall be an escape ladder every twelve meters in all excavations.
 - No work shall commence in an excavation unless the excavation has been declared safe in writing by the appointed competent person.

56. Working near Public Road

The Principal Contractor shall ensure that the area where is performed near the public road is fenced off and no community is allowed.

Work areas must be adequately barricaded so as to prevent unauthorised access.

57. Work Stoppage

The aim of the section is to outline the conditions under which work will be stopped and the process to be followed to ensure that the worksite is rendered safe.

The temporary stoppage of an activity/activities or task(s) may be because H&S concerns, including the following circumstances which shall not warrant any financial compensation:

The process to be followed is:

- The relevant activity must be stopped.
- The Development Bank of South Africa (DBSA) Representative and/or Principal Contractor and his contractors shall immediately remove the workforce from the work area and correct the health and safety deficiencies by allowing only the people in the area that are competent to make the area safe.

The Development Bank of South Africa (DBSA) Representative shall review the affected parts/sections of the Occupational Health and Safety Specification with the purpose of providing sufficient H&S information to the Principal Contractor.

The Principal Contractor shall then revise the relevant sections in the Occupational Health and Safety Plan to accommodate the changes.

- Before the workforce is allowed back in the area, Principal Contractor and his subcontractors shall ensure:

Refer to requirements of Construction Regulation 4(q) of the OHS Act.

NOTE: Work stoppages that are initiated because of H&S related incidents shall not warrant any financial compensation claim lodged against DBSA.

58. Compliance and Approval of Contractor Occupational Health and Safety Plan

The Contractor's Occupational Health and Safety Plan will be audited against a compliance checklist to confirm compliance to the requirements in the Development Bank of South Africa (DBSA) Occupational Health and Safety Specifications. Once compliance is confirmed, only then will the contractor's Occupational Health and Safety Plan be approved by the Client.

59. Contractor H&S Performance Evaluation

Development Bank of South Africa (DBSA) shall evaluate contractor H&S performance on an ongoing basis against the Development Bank of South Africa (DBSA) requirements.

60. Internal Audits

Contractors are required to conduct internal audits on both their employees and their contractors on the implementation of their Occupational Health and Safety Plan on a monthly basis or when the scope of work changes. A summary of the findings and the proposed corrective actions shall be submitted to the Development Bank of South Africa (DBSA) Representative on the last day of the audit. The report shall be submitted within one week after completion of the audit.

61. Occupational Health and Safety Plan Audits

There will be monthly audits conducted by Development Bank of South Africa (DBSA) on the Principal Contractor/s and/or contractors. These audits shall be attended by the contractor's site manager or his representative.

Development Bank of South Africa (DBSA) reserves the right to conduct unannounced audits on contractors.

62. Investigation of Fatalities / Injuries / Diseases / Near Misses (Principal Contractor and Contractors)

- The Principal Contractor shall report all incidents/accidents as required in terms of legislation including near miss incidents, first aid, medical treatment, lost time incidents (lost time injuries and fatalities); Section 24 and 25 incidents; electrical contact; major equipment damage; chemical spillage and other environmental incidents within 24 hours or before the end of the work shift.
- All incident reporting, recording, classification and investigation will be done according to the requirements set out in the DBSA.
- All fatal incidents, employee and contractor incidents, shall be reviewed by the committee within one week after the incident. Preliminary investigation information shall be shared.
- If it is found that the Principal Contractor or his contractor are hiding/not reporting incidents, then steps (which may include disciplinary action) shall be taken against the Line Management of the Principal Contractor and contractor.

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- A comprehensive and detailed investigation report shall be submitted to the Development Bank of South Africa (DBSA) project manager within 7 -14 days after the incident.
 - The Principal Contractor shall ensure that all accidents/incidents are investigated by him/her and are discussed at the Project Executive H&S committee meeting held on site.
 - Accidents/incidents shall be investigated and recorded in terms of the requirements of the Occupational Health and Safety Act, the Mine Health and Safety Act, the National Environmental Management Act and National Water Act as applicable.
 - The Client/Agent shall be allowed to participate in any accident/incident investigation if the accident/incident is directly linked to any activity within the scope of the construction project.
 - The Principal Contractor shall keep on site/workplace a record of all accidents and incidents reported in the form of the OHS Act Annexure B investigation form as referenced in the OHS Act. (Incident Investigation Report)
 - The Principal Contractor shall provide H&S related statistics to the Client at the end of each month.
 - Development Bank of South Africa (DBSA) reserves the right to conduct an independent investigation in any incident.
 - All investigation teams must include at least 1 person (from both the Development Bank of South Africa (DBSA) and Principal Contractor) that is competent in Root Cause Analysis Technique.
 - Contractors shall also review and analyse all incidents; to establish trends that may indicate deviations from established work standards and safe working procedures/practices. The Contractor shall take appropriate corrective action and submit report to DBSA.
 - The Contractor shall investigate all incidents immediately and give the Development Bank of South Africa (DBSA) a report within the specified time frame, which shall include:
 - o Date, time and place of incident.
 - o Description of incident.
 - o Root cause of incident/accident.
 - o Type of injury (if any).
 - o Medical treatment provided (if any).
 - o Persons involved.
 - o Names of witness/s.

63. Monthly H&S Statistical and Non-Statistical Reports

The aim of this section is to outline all the incidents the Contractors must report to DBSA. Reporting must not be later than the 2nd of every month.

- Incidents: Lost time, medical; first aid, near misses reported
- Manpower numbers per Principal Contractor and Contractor Company
- Actual man-hours worked.

64. Contractors Occupational Health and Safety Plan

All Contractors must use the applicable H&S information herein to develop a suitable and sufficient Occupational Health and Safety Plan, submitted with tender documents, which will indicate to the Client/Agent the level of compliance to the H&S requirements. The safety, health and environment plan shall identify each construction activity to be undertaken by the Contractor, the foreseeable internal and external hazards, the specific precautions and controls that shall be necessary to ensure that the works proceeds safely and without risks to health or adjacent operations.

Upon discussions with the Principal Contractor, a final accepted Occupational Health and Safety Plan would be signed and approved. The Principal Contractor is thereafter required to do the same when procuring other contractors. The Principal Contractor will not be allowed to commence work on site until the Occupational Health and Safety Plan has been approved.

When a Principal Contractor intends appointing a contractor, the Principal Contractor shall Occupational Health and Safety Specification based on the Job/ Activities is issued to the subcontractor.

The plan shall demonstrate management's commitment to H&S and shall, the safety plan shall be reviewed to ensure that it fully addresses all the issues and complies with the requirements of the Occupational Health and Safety Specifications and contract. If necessary, the Contractor shall amend the Occupational Health and Safety Plan as required by the Client.

65. Omissions of this Occupational Health and Safety Specification

By drawing up this Occupational Health and Safety Specification Development Bank of South Africa (DBSA) has strived to address the most critical aspects relating to H&S issues in order to assist the contractor in adequately providing for the health and safety of employees on site.

Should Development Bank of South Africa (DBSA) have not addressed all H&S aspects pertaining to the work that is tendered for, the contractor needs to include it in the Occupational Health and Safety Plan and inform Development Bank of South Africa (DBSA) of such issues when submitting the tender.

66. H&S File

The Contractor must have a H&S file in which records of this specification and the Occupational Health and Safety Plan are kept. All information required in the specification and plan, for the duration of the Principal Contractor and contractors' contract, is to be recorded in the file.

- The H&S file that will be maintained will be per construction site.
The file must be kept on site and must be available on request for audit and inspection purposes.
The H&S file shall be handed over to the Client at the end of the Principal Contractor's contract.

The minimum contents of the health and safety file will be as follows:

- Contractor appointment letter. (Construction Regulation 5(3)(f) of the OHS A)
- Scope of works
- Project location
- Site establishment layout plan
- Client's details
- Organogram
- 37(2) Agreement between client and contractor
- Construction work permit
- Copy of the OHS Act
- Occupational Health and Safety Plan (Including waste management plan and traffic management plan)
- Company Occupational Health and Safety Policy (Including Covid -19 policy)
- Letter of Good Standing (COID)
- Public liability insurance
- Material Safety Data Sheets for hazardous materials used.
- Risk Assessments
- Safe work procedures (Site Specific)
- Fall Protection plan
- Legal appointment with proof of training (Ex. Chief Executive Officer, Risk Assessor, First Aider etc.)
- Incident reporting procedures
- Incident reports (General Administrative Regulation 9 (3) – Annexure 1)

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- Incident registers
 - Reports of accidents
 - Emergency preparedness documents
 - First aid documents
 - Induction records
 - Medical surveillance records
 - COVID-19 documents
 - Mechanical and electrical lockout procedure
 - Safety communication (e.g., Toolbox talks)
 - Minutes of safety meetings
 - Inspection registers
 - Health and safety budget

67. Hours of Work

All work conducted on site shall fall within the legal requirements in accordance with the Basic Conditions of Employment Act.

68. Employees' right of refusal to work in an unsafe situation.

Employees have a duty to take reasonable care of their own as well as other person's health and safety at work and to cooperate with the employer, carry out lawful orders, including reporting unsafe situations and incidents.

69. Close Out Requirements

On completion of the project, all appointed contractors shall close out their project documentation and H&S Files and submit such to the Principal Contractor. The Principal Contractor shall likewise close out his/her project documentation and H&S files and handover it to the Development Bank of South Africa (DBSA) Project Manager.

The following summary of information is required in the file, but not limited to:

- Monthly H&S audit reports
- Minutes of the monthly Health and Safety Committee meetings
- Incidents & IOD
- WCA Claims

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- Total Man-hours and DIFR
 - Monthly internal H&S audit report
 - Copies of Pre and Post Employment Medical Certificates of all employees that worked on the project.
 - H&S Non-conformances ((current /outstanding)
 - Copies of all Hazardous Waste Disposal Certificates (where applicable)

70. COVID-19 Requirements to be meet by DBSA Service Providers

Before commencement of any work on the new construction site all DBSA service provider will be required to.

- Principal Contractor will be required to appoint a designate a COVID -19 compliance officer who will be responsible to oversee the implementation of COVID 19 rules at the workplace.
- All DBSA appointed service provider this include professional team should adherence to the standards of hygiene and health protocols relating to COVID -19 at all DBSA Project.
- DBSA Contractors are required to develop measures to ensure that the workplace meets the standards of health protocols,
Contractors in all the projects that are accessed by the public, should ensure adequate space for employees and social distancing measures for the public and service providers, as required.\

71. Construction Site COVID -19 Screening

Access to site must always be managed.

Site access and egress points should enable social distancing and screening of all workers must be done daily before entering and when leaving site. Please refer to questionnaire Annexure B.

The principal contractor should ensure a suitable screening questionnaire be developed for used on site.

Screening should be conducted prior to entering site and well as when leaving site.

Screening Methods

- Visual assessment-Prior to entering the site gate, employers should conduct a visual assessment verifying and checking symptoms of the virus. If symptoms are evident go ahead to conduct infrared temperature testing
- The average normal body temperature is generally accepted as (37°C).

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- The infrared beam sensor is placed approximately 0 - 5 cm's from the person's forehead, the thermometer will beep twice if within range. The thermometer will record the temperature and light green, displaying the temperature of the person.
 - At no stage must the infrared beam be directed to the eyes of the employees, as there is a risk of injury and damage to the eyes.
 - Any person displaying a temperature between 37.1°C and 37.9°C will be isolated and placed either next to the Security Guardhouse or in his/her vehicle until second temperature testing is done.
 - The person's temperature will be taken again after 15 min. If the temperature has increased the person will be required to leave, access to site will be denied.
 - If the person's temperature has decreased to an acceptable/normal level, access will be granted.
 - Any person with a temperature of 37.5°C or above will be denied access and will be required to leave immediately and be advised to visit a Doctor.
 - All cases where persons were denied access a detailed register kept on site of the date, name of contractor, name of employee, contact number.

The screening table must be made of a washable surface that can easily be disinfected— no linen is to be used to cover the table.

Face Shields and masks will be made available to screening personnel.

All required items to operate safely must be available at the screening desk, these includes, hand sanitizers, pens for filling in registers, employee/visitor's questionnaire for screening and determination of symptoms, perspex sheet separating screening where possible. Should employees or visitors fail the questionnaire to be completed they should not be allowed to enter site.

A site access control attendance register must be complete, it is recommended that lists of various company employees be kept at security to tick off the attendance as and when entering site.

Allow plenty of space between people waiting to enter site.

Use signage:

- Such as floor markings, to ensure 2 metre distance is maintained between people when queuing.
- Reminding workers not to attend if they have symptoms of Coronavirus (Covid-19) and to follow guidelines.
- Require all workers to wash their hands for 20- 40 seconds using soap and water when entering and leaving the site.

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- Regularly clean common contact surfaces in reception, office, access control and delivery areas e.g., scanners,
 - Telephone handsets and desks, particularly during peak flow times
 - Reduce the number of people in attendance at site inductions and consider holding them outdoors.
 - Where loading and offloading arrangements on site will allow it, drivers should remain in their vehicles. Where drivers are required to exit their vehicle, they should wash or sanitise their hands before handling any materials.
 - Consider arrangements for monitoring compliance on site by principal contractor.

72. Appropriate Personal Protective Equipment:

It is a duty of an employer to ensure that all his employees are provided with a correct PPE that meet all the requirements prescribed by minister of Health, this include but Face Cloth Masks, surgical Gloves, Facial shields/ Safety Glasses.

Provide each employee with hand sanitizers, soap and clean water to wash their hands and disinfectants to sanitize their workstations.

All employees will be required to sanitize or wash hand at the entry and exit point of the site.

Employer is responsible to issue the appropriate PPE as per the job description to each employee.

No employees are allowed to share any of their PPE.

Employers should consider locations of works to be performed strategically and arrange for specific work intervals.

PPE must be worn at all times on site.

PPE such as face masks is required by all employees or member entering the site, the said masks are to be worn on site.

- Masks should fit properly, completely covering the face from bridge of nose to chin.
- Always clean hand before putting on of removing face masks.
- Only touch the cord or elastic at the back when removing the masks.

73. Washing hands

Allow regular breaks to wash hands. Breaks should be divided between employee groups.

Provide additional hand washing facilities (e.g., pop ups) to the usual welfare facilities. Ensure adequate supplies of soap and fresh water are readily available and kept topped up at all times.

Provide hand sanitiser (minimum 70% alcohol based) where hand washing facilities are unavailable.

Regularly clean the hand washing facilities on site.

Provide suitable and sufficient bins with to dispose hand paper towels.

74. Toilet facilities

Restrict the number of people using toilet facilities at any one time.

Use signage, such as floor markings, to ensure 2 metre distance is maintained between people when queuing.

Wash or sanitise hands before and after using the facilities.

Enhance the cleaning regimes for toilet facilities, particularly door handles, locks and the toilet flush.

Portable toilets should be avoided wherever possible, but where in use these should be cleaned and emptied more frequently.

Provide suitable and sufficient rubbish bins with lids for hand paper towels with regular removal and disposal.

75. Eating areas:

Where possible, workers should be encouraged to bring their own food. They should also be required to stay on site once they have entered it and avoid using local shops.

Consider increasing the number or size of facilities available on site if possible.

The capacity of each eating area should be clearly identified at the entry to each facility, and where necessary attendants provided to supervise compliance with social distancing measures.

Break times should be staggered to reduce congestion and contact at all times. Employees should not all be taking at the same time. The principal contractor should specify different intervals for breaks and ensure limited number of employees are specified as well.

Drinking water should be provided with enhanced cleaning measures of the tap mechanism introduced.

Frequently clean surfaces that are touched regularly, using standard disinfecting products e.g., kettles, refrigerators, microwaves.

Hand cleaning facilities or hand sanitiser should be available at the entrance to any room where people eat.

A distance of 2 metres should be maintained between users, wherever possible

76. Cleaning:

Enhanced cleaning procedures should be in place across the site, particularly in communal areas and the contractors should ensure a dedicated employee is assigned to perform the activity on site and be issued with the correct PPE.

- Taps and washing facilities.
- Toilet flush and seats
- Door handles and push plates
- Handrails on staircases and corridors
- Lift and hoist controls
- Machinery and equipment controls
- All areas used for eating must be thoroughly cleaned at the end of each break and shift, including chairs, door handles, vending machines and payment devices.
- Telephone equipment
- Keyboards, photocopiers and other office equipment
- Rubbish collection and storage points should be increased and emptied regularly throughout and at the end.

77. Social distancing measures

Every employer must arrange the workplace to ensure minimal contact between workers and as far as practicable ensure that there is a minimum of one and a half.

Metres between workers while they are working. Reducing the number of workers present in the workplace at any time.

Appointed Site Manager & the CHS Officer must ensure that Construction Activities are arranged at least one and a half metres apart.

All shared construction Site offices must be arranged; physical barriers can be placed between workstations or Maintain 1 m distance.

78. Covid -19 Emergency response:

The primary responsibility is to preserve life and first aid should be administered if required and until the emergency services attend.

- When planning site activities, the provision of adequate first aid resources must be agreed.
- Provision for fast-track emergency service providers must be agreed.
- Emergency plans including contact details should be kept up to date.

- Consideration must also be given to potential delays in emergency services response, due to the current pressure on resources.
- Consider preventing or rescheduling high-risk work or providing additional competent first aid or trauma resources.

79. Covid19 Waste Management

All waste generated in respect to COVID-19, shall be managed as isolation health care risk waste.

It is preferable to use box sets/waste bin for all COVID 19 response waste generated.

When the box set is $\frac{3}{4}$ full it should be closed with a biohazardous waste tape and placed in designated storage area.

- The waste handler is required to be dressed in proper PPE, such as latex or rubber gloves and dust masks, before moving waste to the storage area.

80. Reporting of COVID-19 Cases

Appointed Principal Contractor is required to immediately inform the DBSA should one of its employee experience any of the COVID-19 symptoms while at work.

Principal Contractor is also required to immediately contact the COVID-19 hotline: 0800 02 9999 for instruction and direct the employee to act in accordance with those instructions.

If a worker has been diagnosed with COVID-19 and isolated in accordance with the Department of Health Guidelines, an employer may only allow a worker to return to work if the worker has undergone a medical evaluation confirming that the worker has been tested negative for COVID-19.

81. Employees Induction, Training, Communications

Employer will be required to give induction to his/her employees upon returning to site. Induction syllabus to be included on Employer's plan on how they are going to manage COVID-19 on site. Employer should train employees daily before work commences on how COVID 19 is spread, and the preventative measures related to COVID – 19. During the inductions, trainings social distance between the employees should be observed.

DOCUMENT CONTROL

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	Signature:	Signature:
Distribution:		

REVISION CHART

REVISION 1	Name: Nandipha Rambau	Name:
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CHANGE CONTROL REGISTER

<u>DATE</u>	<u>DOCUMENT VERSION</u>	<u>CHANGES MADE</u>	<u>AUTHOR</u>
		-	

82. ACKNOWLEDGEMENT OF COMPLIANCE BY CONTRACTOR

I, _____ representing _____ (Principal contractor) have satisfied myself with the contents of this health and safety specification and shall ensure that the personnel and other people visiting the construction site comply with all relevant obligations in respect thereof.

Date: _____