



Specification:

**PROJECT ENVIRONMENTAL
SPECIFICATION FOR THE
NDPW INFRASTRUCTURE PROJECTS
IN
VARIOUS PROVINCES ACROSS
THE COUNTRY**

Specification N^o
CDC-SBU-SPEC-105-24

Classification: Public

11 July 2024



DOCUMENT INFORMATION SHEET

Title of Document : *Environmental Specification*
Type of Document : *Project Environmental Specification for the NDPW
Infrastructure projects in various Provinces across
the Country*
Document Number : *CDC-SBU-SPC-105-24*
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Date of Issue : *11 July 2024*

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PROJECT NAME : *NDPW Infrastructure projects in various Provinces across the Country*

DOCUMENT TITLE : *Environmental Specification*

DOCUMENT No. : *CDC-SBU-SPEC-105-24*

SIGNING OF THE ORIGINAL DOCUMENT

We, the undersigned, accept this document as a stable work product to be placed under formal change control as described by the Procedure for Control of Documented Information.

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ENVIRONMENTAL SPECIFICATION

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1. SCOPE

This Project Environmental Specification (PES) covers the requirements for controlling the impact on the environment of construction activities. The PES is applicable to all construction activities undertaken in the various Districts construction projects that are undertaken in the Eastern Cape Province.

2. INTERPRETATION

2.1 Supporting Specifications

Where the PES is required for a project, the following supporting specifications shall, where applicable, form part of the Contract Documents where necessary:

- (a) EMPr
- (b) JBCC, GCC or Fidic Equivalent Specification
- (c) EA/RoD

2.2 Application

This PES contains clauses that are generally applicable to the undertaking of built or engineering works as it is necessary to impose pro-active controls on the extent to which the construction activities impact on the environment. Interpretations and variations are set out in this Project Environmental Specification. In the event of any difference or discrepancy between the provisions of this Project Environmental Specification and the provisions of the Project Specifications then the provisions of the Project Specification shall prevail.

2.3 Definitions

For the purposes of this PES, the definitions and abbreviations given in the applicable specifications listed in 2.1 and the following definitions and abbreviations shall apply:

2.3.1 CDC:

Means Coega Development Corporation (Pty) Ltd.

2.3.2 Cement laden water:

Means water containing cement or concrete arising from the Contractor's activities.

2.3.3 Contaminated water:

Means water contaminated by the Contractor's activities such as with hazardous substances, hydrocarbons, paints, solvents and runoff from plant, workshop or personnel wash areas but excludes water containing cement/ concrete or silt.

2.3.4 Environment:

Means the surroundings within which human beings exist and these comprise of:

- (i) The land, water and atmosphere of the earth;
- (ii) Micro-organisms, plant and animal life;
- (iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- (iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

2.3.5 His:

Means his or her, as applicable.

2.3.6 Method Statement:

Is a written submission by the Contractor to the Engineer in response to the Specifications or to a request by the Engineer, setting out the plant (construction equipment), materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting the Method Statement. The Method Statement shall be in such detail that the Engineer is able to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications. The Method Statement shall cover applicable details with regard to:

- Construction procedures;
- Materials and equipment to be used;
- Getting the equipment to and from Site;
- How the equipment/ materials will be moved while on Site;
- How and where materials will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Compliance/ non-compliance with the Specifications; and
- Any other information deemed necessary by the Engineer.

2.3.7 Potentially hazardous substance:

Is a substance, which, in the reasonable opinion of the Engineer, can have a deleterious effect on the environment. Hazardous Chemical Substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act.

2.3.8 Reasonable:

Means, unless the context indicates otherwise, reasonable in the opinion of the Engineer, after he has consulted with CDC Safety, Health & Environment Business Unit.

2.3.9 Silt laden water

Means water containing sand and silt arising from the Contractor's activities and/or as a result of natural run-off.

2.3.10 Site:

This is the area in the possession of the Contractor for the construction of the Works. Where the area is not demarcated, it will include all adjacent areas, which are reasonably required for the activities for the Contractor and approved for such use by the Engineer.

2.3.11 Solid waste:

Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

3 MATERIALS

3.1 Materials handling, use and storage

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications. Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

All manufactured and/ or imported material shall be stored within the Contractor's camp, and, if so required by the Project Specification, out of the rain. All lay down areas outside of the construction camp shall be subject to the Engineer's approval. Imported gravel, fill, soil and sand materials shall be free of weeds, alien invasive seed matter, plant material, litter and contaminants and shall be obtained from sources approved by the Engineer. A Method Statement detailing the source and methods to ensure compliance with this specification shall be submitted to the Engineer.

3.2 Stockpiling

Any stockpiling of gravel, cut, fills or any other material including spoil shall be in areas approved by the Engineer within the defined working area. The Contractor shall ensure that the material does not blow or wash away. If the stockpiled material is in danger of being washed or blown away, the Contractor shall spray it with material that is not detrimental to the environment or cover it with a suitable material, such as hessian or plastic. Stockpiles of topsoil shall not be covered with plastic. No stockpiling of any material shall be allowed within the 100m of any residential areas or 20m of any "no go" area. Stockpiles will not be stacked higher than 2 meters.

3.3 Solid waste management

No on-site burning, burying or dumping of any waste materials, litter or refuse shall occur. The Contractor shall provide vermin and weatherproof bins with lids of sufficient number and capacity to store the solid waste produced daily.

The lids shall be always kept firmly on the bins. Bins shall not be allowed to become overfull and shall be emptied at least once a day. A designated area shall be established, enclosed with signage always provided. The waste from bins may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, and which the Engineer has approved. Recyclable waste shall be disposed of into separate skips/bins and removed off-site for recycling. All solid waste shall be disposed off site at an **approved landfill Site**. The Contractor shall supply the Engineer with the appropriate disposal certificates and kept in the Environmental File.

The Contractor must facilitate the re-use of cleared trees and bush (e.g. by allowing controlled wood cutting and removal of wood). Cleared vegetation may only be burnt when no other form of re-use (e.g. **chipping or composting**) is practical or economical. Burning of cleared vegetation may only take place in a safe area (e.g. borrow pit) after permission has been obtained from all the relevant authorities and the Fire Department has been informed. The Contractor must ensure that cleared trees and wood are removed from the Site within **45 days** of Site clearance. The Contractor shall submit a solid waste management Method Statement to the Engineer. The contractor shall provide Certificates of safe disposal for all waste removed site.

3.4 Water use

All sources of water for construction purposes must be approved by the Engineer in writing before any such sources can be used to obtain water. Water collection must be kept in the form of registers and record all water cotted per day.

3.5 Hazardous substances

The transportation and handling of hazardous substances must comply with the provisions of the Hazardous Chemical Substances Act (Act No. 85 of 1993) and associated regulations as well as SABS 0228 and SABS 0229. The Contractor shall also comply with all other applicable regional and local legislation and regulations regarding the transport, use and disposal of hazardous substances. Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Safety Data Sheets (SDS) shall be available on Site. Procedures detailed in the SDSs shall be followed in the event of an emergency.

The Contractor shall be responsible for the training and education of all personnel on Site who will be handling hazardous materials about their proper use, handling and disposal. If potentially hazardous substances are to be stored or used on Site, the Contractor shall submit a Method Statement to the Engineer detailing the substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

3.6 Contaminated water

Potential pollutants of any kind and in any form shall be kept, stored, and used in such a manner that any escape can be contained and that the water table is not endangered. Water containing such pollutants as chemicals, washing detergents, sewerage, fuels, paints and solvents and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site or for recycling. This particularly applies to runoff from fuel depots/workshops/truck washing areas. The Contractor may direct contaminated water into a sewerage main, provided that authorisation has been obtained from the local authority and that the Engineer has provided written permission for this action.

Wash down areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted. The Contractor shall notify the Engineer immediately of any pollution incidents on Site. The Contractor shall submit a Method Statement to the Engineer detailing how the contaminated water will be managed on Site.

3.7 Cement and Bulk Mixing Plant

The proposed location of bulk mixing plant (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the Site layout plan and approved by the Engineer. All wastewater generated from the operation and cleaning of concrete mixing equipment and other sources of concrete shall be passed through a concrete wastewater settlement system as depicted in the appropriate drawing. The water from this system shall not be allowed to flow into any “no go” area or water course but must permeate through the ground before it reaches any such water course. The accumulated sludge in the settlement system must be regularly cleaned out and appropriately disposed of as solid waste.

The Contractor shall ensure that minimal water is used for washing of concrete mixing equipment. Used cement bags shall be disposed of in weatherproof bins on site to prevent the generation of wind-blown cement dust and the bags from blowing away. During construction, the contractor must ensure that concrete is mixed on mortar boards, all visible remains of concrete are removed and disposed of as waste and that all surplus aggregate is removed. A Method Statement detailing all actions to be taken to comply with the cement and mixing requirements shall be submitted to the Engineer.

4 PLANT

4.1 Fuel – Petrol, Diesel, Oil Etc

4.1.1 Fuel Storage

Fuel can be stored on site. The location of the fuel storage area will be approved by the Engineer and will be situated at least 100m away from any major drainage systems, residential areas or “no go” areas. All necessary approvals with respect to fuel storage and dispensing shall be obtained from the appropriate authorities. Symbolic safety signs depicting “No Smoking”, “No Naked Lights” and “Danger” conforming to the requirement of SABS 1186 shall be prominently displayed in and around the fuel storage area. There shall be adequate fire-fighting equipment at the fuel storage area. The Contractor shall ensure that all liquid fuels and oils are stored in tanks with lids, which are kept firmly always shut and under lock and key. The capacity of the tank shall be clearly displayed, and the product contained within the tank clearly identified using the emergency information system detailed in SABS 0232 part 1. Fuel storage tanks shall have a capacity not exceeding **9000 litres** and shall be kept on site only for as long as fuel is needed for construction activities, on completion of which they shall be removed.

Tanks on site shall not be linked or joined via any pipe work but shall remain as separate entities. The tanks shall be situated on a smooth impermeable base with a bund. The volume inside the bund shall be 110% of the total capacity of the largest storage tank. The base may be constructed of concrete, or of plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The impermeable lining shall extend to the crest of the bund. The floor of the bund shall be sloped to enable any spilled fuel and/or fuel-contaminated water to be removed. Appropriate material, approved by the Engineer that absorbs/ breaks-down or encapsulates minor hydrocarbon spillage and which is effective in water shall be installed in the sump.

The tanks and bunded areas shall be covered by a roofed structure, as detailed in the appropriate drawing, to prevent the bunded area from filling up with rainwater. This structure shall be constructed in such a way, and to the approval of the Engineer, to ensure that it is not dislodged by wind. If any water does collect in the bunded area it shall be removed within a day of this occurring and taken off Site to a disposal site approved by the Engineer, and the material that absorbs/ breaks-down or encapsulates minor hydrocarbon spillage shall be replenished.

Only empty and externally clean tanks may be stored on the bare ground. Empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected. Adequate precautions shall be provided to prevent spillage during the filling of any tank and during the dispensing of the contents. The dispensing mechanism for the fuel storage tanks shall be stored in a waterproof container when not in use. A Method Statement shall be submitted to the Engineer detailing the design, location and construction of the fuel storage area as well as for the filling and dispensing from storage tanks and for the type of absorbing/ breaking-down or encapsulating material to be used.

4.1.2 Refuelling

Where reasonably practical, plant shall be refuelled at a designated re-fuelling area/depot or at a workshop as applicable. If this is not reasonably practical, then the surface under the refuelling area shall be protected and appropriately bunded against pollution to the reasonable satisfaction of the Engineer prior to any refuelling activities.

If fuel is dispensed from **200 litre** drums, the proper dispensing equipment shall be used, and the drum shall not be tipped to dispense fuel. The Contractor shall ensure that the appropriate fire-fighting equipment is present during refuelling operations. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials shall be able to handle a minimum of **200 l** of hydrocarbon liquid spill. Prior to any refuelling or maintenance activities, the Engineer must approve this material.

4.1.3 Used oil and hydrocarbon contaminated materials

Used oil shall be stored at a central location on Site prior to removal off Site for disposal at an approved disposal or recycling site. Old oil filters and oil, petrol and diesel-soaked material shall be treated as hazardous waste. The Contractor shall remove all oil, petrol, and diesel-soaked sand immediately and shall dispose of it as hazardous waste or treat it on site with material that breaks-down or encapsulates such spillages as approved by the Engineer.

4.2 Ablution Facilities

Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited other than at the facilities provided. The Contractor shall provide the necessary ablution facilities for all his personnel prior to the commencement of work and shall ensure that his personnel make use of the facilities. Toilet facilities shall be supplied by the Contractor for the workers at a ratio of at least **1 toilet per 15 workers** in areas approved by the Engineer. Every 1-man urinal will be taken as supplying the equivalent of 5 men in addition to the 15 men per toilet on site. No toilets will be erected within 100m of any residential areas, within 20m of the edge of the Site, within 50m of any “no go” areas or any major drainage systems. Toilets shall be situated within 200m of any area where work is taking place in numbers sufficient to meet the ratio depicted above for the workers in the area. Mobile toilets (e.g. trailer mounted) should be considered for Sites, where workers may be expected to cover large distances every day.

The facilities shall be maintained in a hygienic state, good state of repair and serviced regularly. Toilet paper, soap, sanitizer, form of towels shall be provided. Temporary/portable toilets shall be secured to the ground to prevent them toppling due to wind or any other cause, to the satisfaction of the Engineer. Discharge into the environment and burial of waste is strictly prohibited. The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the Site. Toilets shall be emptied before the Contractors' holidays or any other temporary site closure.

4.3 Eating Areas

The Contractor shall designate eating area/s, subject to the approval of the Engineer. The facilities shall be maintained in a hygienic state, good state of repair and serviced regularly. No cooking is allowed outside of the Contractor's camp area on Site. At mealtimes all workers must eat in designated eating areas. More than one area may be required for large Sites and to accommodate issues of Social Distancing. These areas shall have shade for the workers. The eating areas may be in existing structures or in temporary/ transportable structures that shall be well constructed using wood or metal for the frame and screened on the top and sides with shade cloth/ canvas or other material to the satisfaction of the Engineer. These areas shall be well demarcated and in locations approved by the Engineer and shall not be within 100m of any "no go" areas or any major drainage systems, on or adjacent to the Site. There must be Sanitizer Stations at each eating areas and sufficient bins shall be present in these areas. All disposable food packaging must be disposed of in the bins after every meal. The feeding or leaving of food for animals is strictly prohibited.

4.4 Site Structures

All site establishment components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of the land area disturbed. The type and colour of roofing and cladding materials to the Contractor's temporary structures shall be selected to reduce reflection. The Contractor shall supply and maintain adequate and suitable sheds for the storage of materials. Sheds for the storage of materials that may deteriorate or corrode if exposed to the weather shall be weatherproof, adequately ventilated and provided with raised floors.

4.5 Lights

The Contractor shall ensure that any lighting installed on the Site for his activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area.

4.6 Workshop, equipment maintenance and storage

Where practicable, all maintenance of equipment and vehicles on Site shall be performed in a workshop. If it is necessary to do maintenance outside of the workshop area, the Contractor shall obtain the approval of the Engineer prior to commencing such activities. No maintenance, including emergency maintenance, of plant can take place within 50m of any "no go" area or drainage system.

The Contractor shall ensure that in his workshop and other plant maintenance facilities, including those areas where, after obtaining the Engineer's approval, the Contractor carries out emergency plant maintenance, there is no contamination of the soil or vegetation. The workshop shall have a smooth impermeable (concrete or thick plastic covered with sand) floor. The floor shall be bunded and sloped towards an oil trap or sump to contain any spillages. When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. Drip trays shall also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles) always.

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the Site. The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. All washing shall be undertaken in the workshop or maintenance areas, and these areas must be equipped with a suitable impermeable floor and sump/oil trap. The use of detergents for washing shall be restricted to low phosphate and nitrate containing and low sudsing-type detergents. A Method Statement must be submitted to the Engineer detailing the design of the bunding of the workshop and how run-off from the workshop will be managed as well as how drip trays used under plant will be managed.

4.7 Noise

The Contractor shall take precautions to minimise noise generated on Site (e.g. Install and maintain silencers on machinery). The Contractor shall comply with the Noise Induced Hearing Loss Regulations published under the Occupational Health and Safety Act. Appropriate directional and intensity settings are to be maintained on all hooters and sirens. No amplified music shall be allowed on Site. The use of radios, tape recorders, compact disc players, television sets etc shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range. The Contractor shall not use sound amplification equipment on Site unless in emergency situations.

4.8 Dust Control

The Contractor shall be responsible for the continued control of dust arising from his operations. The Contractor shall inform the Engineer 48 hours in advance of anticipated 'unavoidable' dust generating activities. The Contractor shall take all reasonable measures to minimize the generation of dust because of construction activities to the satisfaction of the Engineer.

Appropriate dust suppression measures include spraying or dampening with water, using a commercial dust binder, rotovating straw bales, planting of open cleared space and the scheduling of dust-generating activities.

If the conditions are such that the Contractor cannot satisfactorily dampen the dust, then the Engineer may halt operations until such time as the conditions are more suitable for lower dust generating construction.

Damping of all gravel haul and access roads with water must be ongoing and special attention must be given to roads close to residential areas. Should dust still be a problem on any specific road, the allowable speed will be reduced to 20km/h. If dust is still a problem the road should be treated with a commercial dust binder, as required, to form a cohesive layer that will control the dust on the road. Areas that are to have the topsoil stripped for construction purposes must be limited and only stripped when work is about to take place.

Other activities and situations that may result in a dust nuisance include site clearance and other earth moving operations, open cleared space, stockpiles of topsoil or sand and activities associated with concrete batching plants. A Method Statement detailing how dust will be managed for different operations on the site must be submitted to the Engineer for his approval before any work that could result in dust being generated is undertaken.

5 CONSTRUCTION

5.1 Method Statements

The following Method Statements, as well as any required by the Project Specification, shall be provided by the Contractor and submitted with the Environmental File for reviewing and approval upon to the awarding of a Contract and prior commencement of construction work.

5.1.1 Solid waste management (Clause 3.3)

Expected solid waste types, quantities, methods and frequency of collection and disposal as well as location of disposal sites.

5.1.2 Contaminated water (Clause 3.6)

Methods of minimising, controlling, collecting and disposing of contaminated water.

5.1.3 Contractors SHE Officer (Clause 5.2)

The name and letter of appointment of the Contractors SHE Officer must be given to the Engineer and the terms of reference for the work to be undertaken by the SHE Officer must be detailed including time on site, CV, roles and responsibility, interaction with the Contractor and environmental offices, etc.

5.1.4 Site division (Clause 5.4)

The location, layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, bulk mixing plant and other infrastructure required for the running of the project)

5.1.5 Emergency procedures (Clause 5.10)

Emergency procedures for fire and accidental leaks and spillages of hazardous substances (including fuel and oil). Include details of risk reduction measures to be implemented including firefighting equipment, fire prevention procedures and spill kits (materials and compounds used to reduce the extent of spills and to breakdown or encapsulate hydrocarbons). Other Method Statements that will be required during construction are to be provided by the Contractor a minimum of 20 days prior to commencement of the works or activities to which they apply (no work can commence on site before these Method Statements have been approved):

5.1.6 Importing of material (Clause 3.1)

Detail the source of any gravel, soil, aggregate or sand imported onto site and precautions taken to ensure no vegetative contamination.

5.1.7 Hazardous substances (Clause 3.5)

Details of any hazardous substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

5.1.8 Cement and bulk mixing plant (Clause 3.7)

Location, layout and preparation of cement/ concrete mixing areas including the methods employed for the mixing of concrete and particularly the containment of runoff water from such areas and the method of transportation of concrete.

5.1.9 Fuel storage and use (Clause 4.1)

The design, location and construction of the fuel storage area as well as for the filling and dispensing from storage tanks.

5.1.10 Workshop and drip trays (Clause 4.6)

Location, layout, design and pollution control for Workshop as well as management of drip trays under plant.

5.1.11 Dust (Clause 4.8)

Details on the methods for managing dust on the site.

5.1.12 Environmental awareness training (Clause 5.3)

Number, dates, trainer and logistics for the initial awareness courses for the Contractor's employees and for the management Staff.

5.1.13 Access Routes (Clause 5.7)

Details, including a drawing, showing where and how the access points and routes will be located and managed. Any additional Method Statements as required by the Engineer, or the Project Specification must be provided by the Contractor. The Contractor shall not commence the activity until the Method Statement has been approved in writing and shall, except in the case of emergency activities, allow a period of 20 working days for approval of the Method Statement.

The Engineer may require changes to a Method Statement if the proposal does not comply with the specification or if, in the reasonable opinion of the Engineer, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment more than that permitted by the Specifications or any legislation. Approved Method Statements shall be readily available on the Site and shall be communicated to all relevant personnel and subcontractors. The Contractor shall carry out the Works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract. No claim for delay or additional cost incurred by the Contractor shall be entertained due to inadequacy of a Method Statement.

“Details of the following appointments are required within 7 days before commencing work on site”:

5.1.14 Assistants to the Contractor’s SHE Officer (Clause 5.2) (if applicable)

The name and appointment letter of the assistants to the Contractor’s SHE Officer must be given to the Engineer and the work to be undertaken by these assistants must be detailed including time allocated to these roles and their responsibility and interaction with the Contractors SHE Officer.

5.1.15 Fire Officer/Marshall (Clause 5.9)

The name and appointment letter of the Fire Officer/Marshall must be given to the Engineer.

5.2 Contractor’s SHE Officer

The Contractor shall appoint a Contractor’s SHE Officer who shall be responsible for undertaking a daily site inspection to monitor compliance with this Specification and the relevant Project Specification. The Contractor shall submit the name of the Contractor’s SHE Officer as well as a Method Statement detailing his CV, roles and responsibilities to the Engineer for his approval before work can commence on site.

The Contractor will also appoint reliable staff, who will assist and report to the Contractor’s SHE Officer, to the following positions:

- Litter Assistant to ensure that the site is cleaned every day and that dustbins are not overflowing, and litter does not blow off the site into the surrounding areas.
- Hydrocarbon and Contaminated Water Assistant to ensure that any hydrocarbon spills or leaks are dealt with immediately, vehicles are not leaking hydrocarbons on site, there is no pollution of any water course/ drainage system on or adjacent to site due to any construction activities, all stationary plant has bunds around them that are kept in good working order, the fuel storage and refuelling area is free of spills and leaks of hydrocarbons and any other issues to do with hydrocarbon housekeeping on site. He will also ensure that no contaminated water is escaping onto the site and that the toilets are kept in a clean and good working condition.

- Demarcation and Dust Assistant to ensure that all fencing and demarcation is in place when it is required and that such fencing or demarcation is in good order daily. This person will also be responsible to ensure that excessive dust is not generated from the construction area and will ensure that the roads are watered, and other areas dampened where necessary and any other actions taken to limit dust generation from site.

These appointments will be made within 7 days before commencing of work on site and will be given to the Engineer in writing.

5.3 Environmental awareness training

Environmental awareness training courses shall be run for all personnel on site. Two types of course shall be run, one for the Contractor's and Subcontractor's management and one for all site staff and labourers. Courses shall be run in the morning during normal working hours at a suitable venue provided by the Contractor. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names, a copy of which shall be handed to the Engineer.

The size of each session shall be limited to **30** people. The Contractor shall allow for sufficient sessions to train all personnel. Subsequent sessions shall be run for any new personnel coming onto site. A Method Statement with respect to the organisation of these courses shall be submitted. Notwithstanding the specific provisions of this clause it is incumbent upon the Contractor to convey the sentiments of the EMP to all personnel and Subcontractors involved with the Works.

5.3.1 Training course for management and foremen

The environmental awareness training course for management shall include all management staff and foremen. The course, which will be presented by the Engineer's SHE Coordinator, will be of approximately one-hour duration. The initial course shall be undertaken not less than 7 days prior to commencement of work on site. Subsequent courses shall be held as and when required.

5.3.2 Training course for site staff and labour

The environmental awareness training course for site staff and labour shall be presented by the Contractor's SHE Officer from material provided by the Engineer unless otherwise required by the Project Specification. The course will be approximately one-hour long. The course shall be run not more than 7 days after commencement of work on site with sufficient sessions to accommodate all available personnel. Subsequent courses shall be held as and when required.

5.4 Site division

The Contractor shall restrict all his activities, materials, equipment and personnel to within the area specified. A Method Statement detailing the location, layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, bulk mixing plant and other infrastructure required for the running of the project) shall be submitted to the Engineer. No accommodation for any staff is permitted on the Site.

5.5 Site demarcation

As required by the Project Specification, the Contractor shall erect and maintain permanent and / or temporary fences of the type and in the locations directed by the Engineer. Such fences shall, if so specified, be erected before undertaking designated activities.

5.6 "No go" areas

If so required by the Project Specification, certain areas within or next to the Site shall be "no go" areas. The Contractor shall ensure that, insofar as he has the authority, no person, machinery, equipment or materials enter the "no go" areas at any time.

5.7 Access routes/ haul roads

On the Site and, if so required by the Project Specification, within such distance of the Site as may be stated, the Contractor shall control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition, such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site.

On gravel or earth roads on Site and within 500m of the Site, the vehicles of the Contractor and his suppliers shall not exceed a speed of 45 km/hr or as directed by the Engineer. The Contractor shall supply the Engineer with a Method Statement detailing the location and management of all access points and roads.

5.8 Construction personnel information posters

The Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with the Environmental Specifications. Construction personnel information posters shall be laminated and erected in all eating areas, workshops and site offices. The Contractor shall ensure that the construction personnel information posters are not damaged in any way, and shall replace them if any part becomes illegible. Examples of these posters will be supplied to the Contractor by the Engineer in electronic format.

5.9 Fire control

The Contractor shall take all the necessary precautions to ensure that fires are not started as a result of his activities on Site. No open fires shall be permitted on the Site, with the exception of burning of cleared vegetation after approval by the Engineer and relevant authorities. Any fires that occur shall be reported to the Engineer immediately. Smoking shall not be permitted in those areas where there is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to support the rapid spreading of an initial flame.

The Contractor shall appoint a Fire Marshall who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed. The Contractor shall forward the name of the Fire Marshall to the Engineer for his approval within 7 days of being on site. The Contractor shall ensure that there is basic fire-fighting equipment available on Site at all times. This shall include at least rubber beaters when working in urban open spaces and natural areas, and at least one fire extinguisher of the appropriate type when welding or other “hot” activities are undertaken. The Contractor shall be liable for any expenses incurred by any organisations called to assist with fighting fires that were started as a result of his activities or personnel, and for any cost relating to the rehabilitation of burnt areas, or consequential damages.

5.10 Emergency procedures

Emergency procedures, including the names and contact details of responsible personnel and emergency services shall be made available to all staff and shall be clearly displayed at relevant locations at the Site. The Contractor shall advise the Engineer of any emergencies on Site, together with a record of action taken, within 24 hours of the emergency occurring. Telephone numbers of emergency services shall also be posted conspicuously in the Contractor's office near the telephone. The Contractor shall submit a Method Statement covering the procedures for the following emergencies:

5.10.1 Fire:

The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it. The Contractor shall ensure that his employees are aware of the procedures to be followed in the event of a fire.

5.10.2 Accidental leaks and spillages:

The Contractor shall ensure that his employees are aware of the procedures to be followed for dealing with spills and leaks, which shall include notifying the Engineer and the relevant authorities. The Contractor shall ensure that all the necessary materials and equipment for dealing with spills and leaks are always available on Site. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials shall be able to handle a minimum of 200 l of hydrocarbon liquid spill. Any spills must be cleared, and the contaminated soil/sludge disposed of in an appropriate manner, approved by the Engineer, or at a licensed hazardous waste disposal site.

5.11 Community relations

If so, required by the Project Specification, the Contractor shall erect and maintain information boards in the positions, quantities, designs and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the Engineer. The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself and note the date and time that the complaint was resolved. The Engineer shall be responsible for responding to queries and/or complaints and may request assistance from the Contractor's Management Staff.

5.12 Protection of natural features

The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer. Any features affected by the Contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the Engineer. The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

5.13 Protection of species

5.13.1 Flora

Except to the extent necessary for the carrying out of this Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted. The search and rescue of rare, endemic or endangered species prior to Site clearance must be carried out in accordance with the Vegetation Specifications by the competent service provider. Where the site has dense vegetation the Contractor must at the same time perform bush clearing with the presence of flora search and rescue service provider, depending on the provisions made for this activity and approval by the appointed Engineer. The removal and stockpiling of topsoil must also be carried out in accordance with the Vegetation Specifications.

5.13 2Fauna

Except to the extent necessary for the carrying out of this Works, fauna shall not be removed, injured or disturbed nor shall be killed. Trapping, poisoning and/or shooting of fauna is strictly forbidden. No domestic pets or livestock are permitted on Site. The search and rescue of fauna, endemic or endangered species prior to Site clearance must be carried out in accordance by the competent Service Provider. Where the site has dance vegetation the Contractor must at the same time perform bush clearing with the presents of fauna search and rescue Service Provider, depending on the provisions made for this activity and approval by the appointed Engineer. Trapping or capturing and removal of fauna from site will only be performed by the approved competent Service Provider.

5.14 Stormwater management

Natural run-off must be diverted to stormwater drains where these are available. The Contractor shall take appropriate measures to prevent sand, silt and silt-laden waters from entering stormwater drains, or any surface water course. The Contractor shall take reasonable measures to control the erosive effects of stormwater runoff particularly where excavation and construction activities form temporary channels. Suitable energy breaking devices, cut-off drains, diversions and retention ponds shall be employed to ensure that storm water runoff from the Site is dissipated and does not exceed the capacity of the surrounding stormwater system and excessive suspended solids are settled before they enter the stormwater system or any surface water course. If required in the Project Specification, the Contractor shall submit a Method Statement to the Engineer detailing how stormwater will be managed on Site.

5.15 Erosion and sedimentation control

The Contractor shall take all reasonable measures to limit erosion and sedimentation due to construction activities and shall, in addition, comply with such detailed measures as may be required by the Project Specification. Where erosion and/or sedimentation, whether on or off the Site, occurs despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the Engineer. Where erosion and/or sedimentation occurs due to the fault of the Contractor, rehabilitation shall be carried out to the reasonable requirements of the Engineer and at the expense of the Contractor.

5.16 Aesthetics

The Contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

5.17 Recreation

If so, required by the Project Specification, the Contractor shall take measures to reduce disruption to recreational users of the area abutting the Site.

5.18 Temporary site closure

If the Site is closed for a period exceeding 5 days, the Contractor's SHE Officer in consultation with the Engineer shall carry out the following checklist procedure and ensure that the following conditions pertain and report on compliance with this clause:

5.18.1 Fuels / flammables / hazardous materials stores

- Fuel stores are as low in volume as practicable.
- There are no leaks.
- The outlet is secure and locked.
- The bund is empty.
- Fire extinguishers are serviced and accessible.
- The area is secure from accidental damage through vehicle collision and the like.
- Emergency and contact numbers are available and displayed.
- There is adequate ventilation in enclosed spaces.
- There are no stores or containers within the 1:50 year flood line.

5.18.2 Safety

- Site safety checks have been carried out in accordance with the Occupational Health and Safety Act (No. 85 of 1993) prior to site closure.
- An inspection schedule and log for use by security or contracts staff is developed.
- All trenches and manholes are secured.
- Applicable notice boards are in place and secured.
- Emergency and Management contact details are prominently displayed.
- Security personnel have been briefed and have the facilities to contact or be contacted by relevant management and emergency personnel.
- Night hazards such as reflectors, lighting, traffic signage etc have been checked.
- Fire hazards identified and the local authority notified of any potential threats e.g. large brush stockpiles, fuels etc.
- Pipe stockpiles are wedged / secured.
- Scaffolds are secure.
- Structures vulnerable to high winds secure.

5.18.3 Erosion

- Wind and dust mitigation measures such as straw, brush packs, irrigation etc are in place.
- Excavated and filled slopes and stockpiles are at a stable angle and capable of accommodating normal expected water flows.
- Re-vegetated areas have a watering schedule and the supply to such areas is secured.
- There are sufficient detention ponds or channels in place.

5.18.4 Water contamination and pollution

- Hazardous fuel stores are secure.
- Cement and materials stores are secure.
- Toilets are empty and secured.
- Refuse bins are empty and secured.
- Bunding is clean and treated with appropriate material that will absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage.
- Drip trays are empty & secure.

5.19 Protection of archaeological and palaeontological sites

If any possible palaeontological/archaeological material is found during excavation work, including shell middens, Stone Age tools, fossil bones and other artefacts, graves and wrecked vessels, the Contractor shall stop work immediately and inform the Engineer. The Engineer will inform the South African Heritage Resources Agency (SAHRA) and arrange for a palaeontologist/archaeologist to conduct inspection and studies, and if necessary, excavate, the material, subject to acquiring the requisite permits from SAHRA at the following address:

111 Harrington St,
Zonnebloem,
Cape Town,
8001
Postal Address: PO Box 4637
Email: info@sahra.org.za
Telephone: [0214624502](tel:0214624502)

6 TOLERANCES

Refer to Contract document.

7 TESTING

Void

8 MEASUREMENT AND PAYMENT

8.1 Basic Principles

Except as noted below and in the Project Specification as Scheduled Items, no separate measurement and payment will be made to cover the costs of complying with the provisions of this Specification and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his Tender.

8.2 Scheduled Items

8.2.1 Protection of stock piles from blowing or washing away:

The spraying or covering of stockpiles, including the supply of the spray or cover material, as required, shall be measured as a lump sum.

8.2.2 Storage of fuel and oils:

The supply, construction, installation, transport, upkeep and removal of all facilities required for storage and management of fuel and oils will be measured as a lump sum.

8.2.3 Cement laden water management:

The supply, construction, installation, transport, upkeep and removal of all facilities required for the management of wastewater from concrete operations will be measured as a lump sum.

8.2.4 Contaminated water management:

The supply, construction, installation, transport, upkeep and removal of all facilities required for managing contaminated water will be measured as a lump sum.

8.2.5 Storm water management:

The supply, construction, installation, transport, upkeep and removal of all facilities required for managing storm water run-off from the site will be measured as a lump sum.

8.2.6 Bunding and management of run-off from workshop areas and supply of drip trays for stationary and “parked” plant:

The supply, construction, installation, transport, upkeep and removal of all facilities required for bunding and managing the run-off from workshop areas as well as all drip trays required will be measured as a lump sum.

8.2.7 Dust management:

The supply, application, transport, upkeep and removal of all materials required to ensure that dust is adequately controlled will be measured as a lump sum.

8.2.8 Fire Control:

The supply, transport, upkeep and removal of all material required for fire control will be measured as a lump sum.

8.2.9 Provision of venue and staff attendance at the environmental awareness training course:

The provision of a venue and staff attendance at the environmental training course will be measured as a lump sum. The sum shall cover all costs incurred by the Contractor in providing the venue and facilities as detailed in the Specifications and in ensuring the attendance of all relevant employees and sub-contractors and their employees, at the training.

8.2.10 Eating areas:

The supply, construction, installation, transport, upkeep and removal at the end of the construction of all eating areas structures shall be measured as a sum.

8.2.11 Ablutions:

The supply, maintenance, regular emptying and removal of toilets shall be measured as a sum.

8.2.12 Site demarcation:

The supply, installation and removal at the end of the construction of all temporary fences shall be measured by length for each type of fence scheduled.

8.2.13 Construction personnel information posters:

The supply, installation and removal at the end of the construction of all construction information posters shall be measured by number of posters for each type of poster scheduled.

8.2.14 Solid waste (including hazardous waste) management

The supply of bins and skips as well as transport of waste to appropriate waste disposal facilities shall be measured as a sum.

8.2.15 Spill kits

The supply, use and replenishment of spill kits, to be used at fuel storage areas and refuelling areas shall be measured as a sum.

8.2.16 Method Statements: Additional Work:

No separate measurement and payment will be made for the provision of Method Statements but, where the Engineer requires a change beyond the requirements of the Specification on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the environment, then any additional work required, provided it could not reasonably have been foreseen by an experienced Contractor, shall be valued in accordance with the Contract document.

A stated sum is provided in the Schedule of Quantities to cover payment for such additional work.

8.2.17 Work "required by the Project Specification":

Where a clause in this Specification includes a requirement as "required by the Project Specification", measurement and payment for compliance with that requirement shall be in accordance with the relevant measurement and payment clause related to the Project Specification.



ANNEXURE C

Acknowledgement:

I, _____ representing

____ Principal Contractor have satisfied myself with the content of the Project Environmental Specification (PES) and shall ensure that the personnel and other people visiting site comply with all relevant obligations in respect thereof.

Signature of Principal Contractor

Date

Signature of Agent

Date