



# **SPECIFICATION FOR THE REMEDIATION OF BURIED ASBESTOS AT SITE 5 IN KOEDOESPOORT DEPOT**




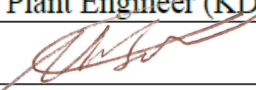
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## Scope of Work

### 1. WORKS INFORMATION

#### 1.1 Description of the works

Remediation of Buried Asbestos at Site 5 in Koedoespoort (KDS) Depot of Transnet Engineering, Gauteng Province.

#### 1.2 Employer's objective

The objective of the Employer is to remediate buried asbestos at Site 5 in accordance with the Technical Specification and Drawings, Remediation Action Plan and Site Assessment Report and in full compliance with the Remediation Order issued by the Department of Forestry, Fisheries and Environment (DFFE) in terms of Section 79(1) of the National Environmental Management: Waste Act, 2008, (the Framework for the Management of Contaminated Land compiled in support of Part 8 of the said act) and the Occupational Health and Safety Act, 85 of 1993, Asbestos Abatement Regulations, 2020 and any other Asbestos and related Regulations.

Site 5 at KDS Depot is continuing to impose major health risks to our employees and clients (e.g. Asbestosis, Cancer of lungs, Mesothelioma) and environmental risks (e.g. groundwater and soil pollution) and hindering the progress of expanding the depot. In order for Transnet Engineering to create safe and asbestos free environment in and around Site 5, the site should be well remediated. This site is highly contaminated with different types of hazardous waste and asbestos contaminated material and it was used as an unlicensed landfill site in the past. The anticipated potential future land usage for site 5 is container yards, parking of trucks, waste recycling facility, freight trucks and spares and components facilities.

**The specification must be read in conjunction with the drawings and BOQ (See attached tender drawings and BOQ)**

**The Remediation Order, Remediation Action Plan, Site Assessment Report, Engineering design report, Stormwater Management plan, Wetland Delineation Study, geotechnical investigation report, hydrogeological report and geological report will be shared with the successful contractor at the award stage for the verification and development of construction drawings by their own Design Team where required.**

#### 1.3 Extent of works

**The professional services works include:**

- Verification of designs issued by the employer, development of the construction drawings and the supervision and management of the remediation works by supporting specialists (Inspections, testing, verifications and Stage Sign offs etc.)
- Client approvals before commencement of any remediation works on site. This includes providing any additional information that may be required by Authorities regarding remediation activities verification and approvals DFFE, Department of Water and Sanitation (DWS) and Department of Employment and Labour (DoEL)).
- The Application for Water Use License (WUL) in line with the National Water Act (36 of 1998) is currently in process additional information such as a Wetland Rehabilitation Plan may be required over and above the hard engineering intervention proposed in the stormwater management plan.

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- Conduct contamination soil verifications by taking samples for screening and laboratory analysis (Accredited laboratory must be used).
- Setting-out of the boundary fence and remediation activity works on site.
- Compliance with the Occupational Health and Safety requirements (In accordance to OHSA 85 of 1993), Construction Regulations 2014, and Transnet specific Contractor SHE Compliance requirements.
- Overall responsibility for the Environmental Management during execution.
- All As-built drawings and quality records to be submitted at completion of the project.

**In summary the remediation works will focus mainly on the following:**

**Site Clearance and Stockpile of Asbestos Contaminated Materials**

- Clearing and stripping of asbestos contaminated material, non-hazardous waste and dumped building rubble at surface and stockpile the materials in a designated area as directed by the Project Manager.
- Remove topsoil to a minimum depth of 200mm that is contaminated with buried asbestos, this topsoil consists mainly of loose soil, vegetation and organic matters, unsuitable soil, rubble material and asbestos blankets and stockpile the materials in a designated area as directed by the Project Manager.
- Clearing and removal activities shall be performed under a water sprinkler to minimize airborne dust which may contain asbestos fibres.
- Final grading of all the cleared area.

**Construction of Remediation Cell**

- Remediation cell setting out and site preparation.
- Undertake excavation and earthworks for the engineered containment cell as per engineering design drawings and approved method statement.
- All materials resulting from above operations shall be stockpiled in a designated area as directed by the Project Manager.
- Import from stockpile and construct 150mm thick base preparation layer (Basin floor) over the in-situ soil and the cell berms.

**Construction of Remediation Cell Lining System**

The lining system for the remediation cell floor shall be constructed in accordance to the manufacturer's specification, using the following specific liners (bottom to top):

- Supply and lay Bentofix NSP4300 geosynthetic clay liner or similar approved.
- Supply and lay 1.5mm thick HDPE geomembrane liner or similar approved.
- Supply and lay Fibertex F1000M heavy duty protection geotextile filter layer or similar approved.
- Supply and lay 8mm thick HDPE cuspatd sheet to act as leakage detection system or similar approved.
- Supply and lay Bentofix NSP4000 geosynthetic clay liner or similar approved.
- Supply and lay 2mm thick HDPE geomembrane liner or similar approved.
- Supply and lay Fibertex F1000M heavy duty protection geotextile filter layer or similar approved.
- Supply and lay 8mm thick HDPE cuspatd sheet to act as leakage collection system or similar approved.
- Supply and lay Fibertex F34 geotextile filter layer or similar approved.

**Placement and Compaction of Asbestos Contaminated Material into the Cell**

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- Asbestos contaminated soil placed and compacted in 150mm layers using a front-end loader.
- Lime shall be used as a binding agent and placed over the contaminated material spoil before it is compacted.
- A filter bidim fabric shall be placed on each compacted layer before another layer is added and the sequence shall be repeated until all contaminated material spoil has been placed in the containment area.

### **Capping Lining System**

The lining system for the capping of the remediation cell shall be constructed in accordance to the manufacturer's specification, using the following specific liners (bottom to top):

- Supply and lay Fibertex F1200M heavy duty protection geotextile liner or similar approved placed on top of the compacted asbestos contaminated soil.
- Supply and lay 1.5mm thick HDPE geomembrane liner or similar approved.
- Supply and lay Bentofix NSP4000 geosynthetic clay liner or similar approved.
- Supply and lay 200mm thick topsoil layer.
- Supply and plant indigenous vegetation.

### **Stormwater Diversion System**

- Construct anchor trench as per the engineering design drawings.
- Construct drains and anchor trench berms as per the engineering design drawings.
- Construct stormwater V-channel drains as per the engineering design drawings.
- Construct 2 x Reno Mattress for leachate management as per details.
- Spreading of topsoil back over berm.
- Grassing of berms and channels.
- Localized erosion protection.

### **Firebreak**

- Grading and construction of firebreak as per the engineering design drawings.
- Firebreak to be maintained on a regular basis, grass to be short at all times within the 10m of firebreak area.

### **Fencing and Access Control**

#### **Remediation Cell Area**

- Erect Remediation Cell perimeter fence as per details.
- Erect 5m wide x 2m high sliding access control gate as per details.

#### **Wetland Area**

The Wetland area should be rehabilitated as per the storm water management plan that is being developed. Full details will be shared with the contractor and supporting specialist before the commencement of the construction activities on site. The following engineering intervention is being considered:

- Construction of 4.0m v-shaped channel.
- Construct stormwater retention dam complete with lining.
- Provision is also made for erection of a perimeter fence around the wetland area as per details.

### **Property Boundary Fence**

- Erect Site 5 boundary precast concrete palisade perimeter fence as per details.
- Erect 2 x 6m wide x 2m high steel palisade sliding gates as per details.

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## Site Finishes

- Construct a minimum of 150mm thick stabilised base layer from stockpile material on the buried asbestos clean-up area.
- Trimming of banks and sloping of the surface towards the stormwater channels wherever practical.
- Creating erosion protection berms on large banks.
- Planting grass to designated areas.

## Employer's Specification

### 2. GENERAL

- All material used to be SABS approved and or must comply with SANS requirements.
- All rubble to be removed from site on a daily basis and dumped at the designated areas.
- Before work commences, a Compliance File (SHE File) completed with project specific risk assessment and the Valid Letter of Good Standing must be handed to the Project Manager/SHE Office for approval.
- The method of works should be pre-planned so that risks to workers, occupants and the public can be assessed and minimized. Appropriate site preparations may include the creation of a Safe Work Method Statement (SWMS), Health and Safety Plan (H&SP) and Environmental Management Plan (EMP).
- The SWMS should discuss the objectives and order of the works, the equipment and procedures to be adopted and the potential for exposure.
- The H&SP should include as a minimum the safe working procedures, supply of appropriate PPE for personnel undertaking the work (including respirators/dust masks, etc.), dust control measures (i.e. water sprays) and take into consideration the health risks associated with a hazard and mitigations thereof.
- The EMP should include soil, water, waste, noise and dust management, monitoring and emergency response.
- Notification of type 3 asbestos work to the Chief Director: Provincial Operations at the DoEL in accordance to Regulation 10 of the Asbestos Abatement Regulations, 2020.
- Notification of construction work to the Provincial Director at DoEL in writing in accordance to Regulation 4 of the Construction Regulations, 2014 if the intended construction works will:
  - ✓ include excavation work;
  - ✓ include working at a height where there is risk of falling;
  - ✓ include the demolition of a structure; or
  - ✓ include the use of explosives to perform construction work.

The principal contractor shall ensure that a copy of notification is kept in the Compliance file on site for inspection by the Department of Employment and Labour Inspector and TE representatives (Project Managers and SHE personnel).

- The appointed contractor shall undergo a two (2) hour TE SHE induction on site before commencement of any works or construction activities. Contractors must have valid permits when entering Transnet Engineering Depots. These shall be issued by the permit / Security office in Koedoespoort Centre.

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- The contractor to have a SHE/ Compliance File and Triplicate Site Instruction Book on site at all times
- All measurements shown on the drawings to be confirmed and discussed on site before commencement of the works.
- All storm water drainage to be free from any materials.
- This specification should be regarded as the minimum requirements and should be fully complied to.
- **Attending the scheduled site clarification and inspection meeting is compulsory and any alterations made on site to this specification will take preference to this specification and shall be recorded as such.**
- No deviation from this specification will be accepted unless approved by the Project Manager and supporting technical team. Only the Project Manager assisted by the technical team will approve or disapprove the workmanship.

### 3. PERSONAL PROTECTIVE EQUIPMENT (PPE)

- All personnel working on this site must wear the appropriate PPE to protect employees or anyone entering the site from the identified risks, as outlined in regulation 19 of the asbestos regulations (2020). In situations in which there is a risk of exposure to asbestos fibres, as a minimum this would include a respiratory protective equipment that provides the appropriate level of protection for the type of asbestos work to be undertaken (P2 dust mask).
- Used disposable PPE shall be disposed off within plastic bags and disposed of at the approved licenses asbestos disposal site as described in regulation 21.

### 4. SITE ESTABLISHMENT, ACCESS TO SITE AND SERVICES ON SITE

- At the site handover meeting Transnet Engineering will identify areas where the site camp can be established by the contractor. The Contractor shall make his own arrangements to establish a site office and other storage facilities at the site as required in SANS 1200A. The Contractor shall maintain the office for the duration of the contract.
- Contractor's name board must be erected on site and must be visible at all times on site during the execution of the project.
- It is important that activities are conducted within a limited area to facilitate control and to minimize the impact on the existing natural environment and the surroundings landowners.
- Contractor shall demarcate the boundaries of the site and control all access in order to restrict remediation activities to the site. The method of demarcation and the location of the demarcated area and implementing procedures for entering and leaving the site shall be determined by the Contractor and approved by TE prior to any remediation work being undertaken.
- The Contractor shall ensure that all his plant, labour and materials remain within the fenced off boundaries of the site.
- The contractor is responsible for the safeguarding of his/her own equipment and material while on site.
- Unauthorised personnel must be restricted from entering the boundaries of the remediation work area, temporary asbestos contaminated material (ACM) stockpiles and ACM disposal bins. These areas should be clearly demarcated and contain warning signs to indicate asbestos

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works. All barriers and warning signs are to remain in place until intrusive works have been completed and all ACM has been removed off-site.

- Where possible, the number of personnel working in an impacted area should be kept to a minimum.
- There are bulk municipal services in the vicinity of the site. The Contractor to make its own arrangements for temporary power, water, sewer, waste disposal, telecommunications etc services on site.

## 5. ASBESTOS WASTE HANDLING, REMOVAL AND DISPOSAL

- Asbestos contaminated soils and materials are classified as a hazardous waste products. The handling, removal and disposal thereof may only be done by a "registered asbestos contractor" with the Department of Employment and Labour (DoEL).
- The project scope of work consists of handling, removal and disposal of "asbestos-containing material". This type of work is classified as "asbestos work" meaning works that exposes or is likely to expose an employee to asbestos dust, including transporting, storing, removing, handling, treating, repairing and disposing of asbestos. All the "Asbestos work" for the project will be done in-situ (On-site treatment) and the Service Provider will be exposed to asbestos throughout the execution of the project. Therefore, it is mandatory that the work be undertaken by a **"type 3 registered asbestos contractor"**.
- The removal of any ACM must be done in strict accordance with the Asbestos Regulations 2020. ACM disposal shall be in conformance with the National Norms and Standards for Disposal of Waste to Landfill Published under Government Notice R636 in Government Gazette 36784, dated 23 August 2013. Commencement date: 23 August 2013.
- Any encountered asbestos waste material shall be stockpiled on site and shall be covered and or wetted down to prevent exposure. The asbestos demarcated area shall be labelled with an appropriate warning signs to the effect that dust creation and inhalation of dust shall be avoided.
- In cases where the asbestos contamination cannot be isolated, appropriate measures should be taken to minimize the generation of airborne fibres during the transfer, packaging, transport and disposal of the waste.
- If required asbestos material must be transported in a covered, leak-proof or lined vehicle to prevent any release of airborne fibres. The vehicles used to transport asbestos should be cleaned before leaving the site at which asbestos material is removed from the vehicle to avoid transportation of contamination.
- The remediation process of asbestos contaminated material will be carried out on-site. Disposal at the registered hazardous waste disposal site (approved/licensed landfill site) shall not be permitted, except in the case of disposal of the PPE.
- The registered asbestos contractor must ensure that the approved asbestos plan of work is submitted to the Chief Director: Provincial Operations at least seven days prior to commencement of asbestos work in accordance with regulation 15.
- The plan of work must be compiled by the Approved Inspection Authority (AIA) in consultation with the registered asbestos contractor. The approved plan of work, as contemplated in regulation 12(3), must contain the signatures of the asbestos client accepting the duties as contemplated in regulation 11(2) and (3); the registered asbestos contractor accepting the duties as contemplated in regulation 12; and the approved inspection authority for asbestos accepting the duties as contemplated in regulation 13.

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- Notify the Department of Employment and Labour of your intention to remove and remediate asbestos.
- Contract the services of an AIA required for the project in line with Asbestos Regulations 2020 and ensure that an AIA has been appointed in writing by the asbestos client before commencement of asbestos work.
- Set up a decontamination unit with a clean water, and shower, and put the necessary showering procedures in place for all staff handling the asbestos.
- Contractor to ensure that only medically fit staff will work with asbestos. Medical test reports to be included as part of Compliance file.

## 6. AIR MONITORING

- Environmental air monitoring must be performed by an AIA during type 3 asbestos work on a daily basis or at a frequency determined by the AIA based on the site-specific asbestos risk assessment in accordance with regulation 16.
- The reports of the AIA to be shared with TE Project Managers and SHE representative for review and satisfaction that controls put in place are working.
- An Asbestos air sampling programme shall be implemented during the remediation programme. Air sampling shall provide confidence in dust control measures, can be used to allay concerns in sensitive situations and may also be necessary for occupational purposes.
- If required for public health reasons, then para-occupational sampling is considered the most practical method for the evaluation of airborne asbestos at contaminated sites. Suitable guidance on relevant sampling and assessment strategies is provided by the asbestos regulations (2020). It is recommended that dust levels should remain sufficiently low for measured asbestos concentrations to be below the practical lower detection limit of 0.01f/mL".
- Air sampling results should not be used to support conclusions that asbestos fibre release from impacted soils has not occurred or to justify the use of less stringent site management measures.

## 7. DUST CONTROL PROCEDURES

Dust control measures shall be implemented to minimize dust creation and its movement off-site. For the intention of dust control the following measures should be implemented if feasible:

- Wetting down ACM soils where safe to do so;
- Constant wetting down and/or coverage of temporary ACM stockpiles;
- Covering or wetting down the soil to be transported on site;
- Regulating the speed of vehicles on-site to minimize disturbance;
- Minimizing access to contaminated areas, especially by vehicles; Monitoring meteorological conditions and halting works if adverse weather conditions are predicted; The placement of wind barriers; and the creation of an enclosed space for excavations in or around the impacted works area.

## 8. STOCKPILING

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Stockpiles of asbestos impacted material must be clearly labelled as such and covered to minimize dust generation.

It is a requirement that stockpiles of potentially contaminated soils:

- Are temporary;
- Be covered and/or wet down to minimize dust generation;
- Signs erected clearly labelling it as ACM; and
- Follow the correct waste removal and disposal procedures, as detailed in Sections 5 and 9 of the specification.

## **9. DETAILED SPECIFICATION**

### **9.1 CIVIL ENGINEERING SERVICES**

#### **9.1.1 Existing Services**

Existing underground services to be identified before any excavations and earthworks can take place. All known services are provided on the drawings. However, due to the lack of adequate As-built records, the contractor will be required to prove services prior excavations. The contractor shall take the necessary precautions to ensure that the services are not damaged.

As soon as any underground service not shown on the drawings is discovered, it shall be brought to the attention of the Project Manager. The contractor must in collaboration with the /Plant Engineer, ascertain whether or not the service is live. The contractor shall not uplift any such services unless he is instructed to do so.

The contractor shall be held responsible for any damage to known services (i.e. services that are within the site of the works and are shown on the drawing) and he shall take all necessary measures to protect them. In the event of a service being damaged, the contractor shall immediately notify the Plant Engineer. The contractor shall not repair any such service unless he is instructed to do so.

#### **Existing Wetland, storm water drainage and Boreholes**

The Contractor shall protect the existing wetland and stormwater drainage on site. The wetland delineated area shall be rehabilitated as per the storm water management plan upon approval by DWS.

There are also monitoring boreholes on the site and these shall be protected and shall not be used by the contractor.

#### **Excavation**

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For the purposes of uplifting and or deviation of underground pipes, a trench width of 1m shall be used and existing material to be excavated according to (SANS 1200DA Clause 3.1.2)

### **Compaction of in-situ material**

The in-situ material shall be trimmed, levelled out and compacted to 93% MOD AASHTO density.

### **9.1.2 Site Clearance, Earthworks & Layer works**

The works for the site clearance, earthworks and layer works include the following:

- Clearing of site and stockpiling of asbestos contaminated material.
- Bulk excavation and treatment of in-situ material. The basin floor shall be excavated down to 2.5m below grade on the one end and 3.5m below grade on the other end and must slope 1:143 towards the northern boundary.
- Construct of sub-base layers from in-situ materials.
- Construct 150mm thick base preparation layer over the in-situ soil. The layer shall be compacted to 95% MOD AASHTO density respectively.

### **Berm specifications:**

- All berms constructed must be as per height, length and slope as shown on the drawings.
- Berms will be constructed from G8 material from site.
- Berms must be compacted to a minimum of 90% Mod AASHTO.
- Layers of 150mm must be laid and compacted.

And any other work arising out of or incidental to the above, or required of the Contractor for the proper completion of the works.

### **Site Clearance**

Digging up and removal of rubbish, debris, vegetation, hedges, shrubs and trees. All vegetation, trees and asbestos contaminated material resulting from site clearance shall be stockpiled at the designated area as directed by the Project Manager and no off-site disposal will be required. Upon completion will be placed on the newly constructed remediation basin.

### **Material Sources and Spoil Areas**

- Topsoil will be obtained from designated excavations and stockpiled to the designated stockpile.
- Material for the screening berms will be of the decomposed dolerite material sources from the bulk excavations and finished with some of the topsoil from the topsoil stockpile.
- Excess material will be stockpiled to the designated stockpiles.
- Any sourced material will be sourced from commercial sources. The Contractor shall submit samples from the sources indicated in his tender to an independent laboratory for testing to ensure compliance with the requirements of the specification.

### **Construction of Earthworks and Layer works**

#### **Layer works**

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The backfilled layer works shall comply with the specifications as detailed in the drawings for specific areas.

### **Imported backfill material**

Backfill material shall be selected in accordance with the stipulated layer works design from uncontaminated stockpile and or commercial sources and placed in 150mm layers compacted to 95% and 93% MOD AASHTO density as stipulated in the discipline specific requirements. No clay shall be used as backfill.

### **Testing**

Material removed on site must be tested by an engineering geologist to see if it will be appropriate for the construction of the terrace berms.

Compaction tests needs to be done randomly on the berms created. If a compaction of 90% Mod AASHTO is not achieved the berm must be recompacted.

### **9.1.3 Buried Asbestos Clean-up Area Backfilling Construction**

The backfilling construction consist of the following layer works and surfacing:

- 150mm In-situ material compacted to 95% MOD AASHTO density

### **Base Layer**

150mm G5 sub-base layer conforming to the requirements of SANS 1200 MF shall be from the in-situ stockpile and or imported from commercial sources. The layer shall be compacted to 95% MOD AASHTO density respectively.

### **9.1.4 Remediation Cell and Capping Lining System**

As the lining is the most crucial element of the entire design, all materials has to comply with design specifications. A certificate from the supplier is required verifying the product adheres to the product specifications.

The lining system for the remediation cell floor and capping of the remediation cell shall be constructed in accordance to the manufacturer's specification, using the specific liners stipulated under the scope of works.

### **Testing**

After each layer of lining has been placed, it should be inspected by the supplier of the product. A signed certificate is required, from the supplier, stating that the geosynthetic clay liner,

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geomembranes and geotextiles that was placed complies with the appropriate standards of the design and product.

Welding done on the geomembranes needs to be inspected by a specialist before it could be signed of as appropriate.

The index tests to be carried out on the Geosynthetic Clay Liner geosynthetic shall relate to the material and the method of manufacture, and are used mainly to ascertain that the correct Geosynthetic Clay Liner geosynthetic is supplied, and that the material is equivalent to that selected and specified for use in the works. The Contractor will be required, on the request of the Engineer, to submit a certificate by an accredited ISO/IEC 17025 geosynthetics laboratory to prove compliance with the specified qualities without additional cost to the Employer.

#### **9.1.5 Storm water Management**

Stormwater on-site should be directed away from impacted areas during remediation process to minimize the potential for fibers to migrate off-site.

All the works must be carried out as stipulated under the scope of work and engineering design drawings. And any other work arising out of or incidental to the above, or required of the Contractor for the proper completion of the works.

#### **9.1.6 Indigenous Vegetation Requirements**

- The site shall be cleared of all loose debris, rubbish and foreign matter of any kind.
- Supply and plant instant grass/indigenous vegetation suitable for the area. Preparation and the works shall be carried out in accordance with the requirements of general landscape operations.
- Minimum depth of topsoil required for grass seeding areas is 150mm.
- The topsoil in areas to be seeded shall be ploughed or disc harrowed to a depth not exceeding 150mm, care to be taken not to bring the sub-soil to the surface.
- The area shall be cultivated to produce a fine tilth suitable for seeding and firmed by lightly rolling.
- Fertiliser shall be granular fertilizer, obtained from the approved reputable horticultural supplier, stored in approved dry building until required for use.
- Finished grass levels are to be same height as existing. The addition of imported topsoil shall be undertaken where required.
- Turfs shall be clean meadow.

#### **9.1.8 Precast Concrete Palisade Boundary Fence Specification**

- Supply and install new precast concrete palisade fencing around Site 5 boundary as shown on the drawings.
- The fence must consist of 2.4m precast concrete palisade fence shown on drawing.
- Fencing poles to be 150 x 200 x 3000mm precast concrete poles. All poles to be level and be spaced 2.0m from center to center. The poles to be reinforced with wires. The top of the posts to be angled at 45 degrees as per details.
- The poles to be slotted to take the horizontal load bearing rails. Poles to be embedded 600mm in the ground.

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- Fence panels to be 85 x 140 x 2400mm precast concrete. The panels to have 2 x 10mm holes to take 8mm carriage type bolts. The pales to be spaced at 200 mm center to center with a gap of 100mm between panels and to be stepped in order to follow natural ground level contours. The top of the panels to be angled at 45 degrees.
- Fence horizontal rails to be 75 x 150 x 1990mm precast concrete.
- On completion of the erection of the concrete palisade fence a concrete plinth shall be cast on inside between the posts. The concrete plinth shall be at least 150mm below ground level. The width shall be at least 200mm wide with a wooden float finish.
- Concrete plinth will be 30 MPA in strength.
- All bolts, nuts and washers supplied to be high tensile steel.
- All bolts used for the erection to have their ends burred over.
- All bolts, nuts and washer to be closed and the holes to be filled with a plaster mix to have a good finish.
- Supply and install flat wrap barbwire to top of fence and secure it properly to the fence.

#### **9.1.9 Boundary Fence Access Gates Specification**

- Manufacture and erect 2 x sliding gate as per drawing specifications 2 000mm high x 6 000mm wide without electrical motors.
- Gate rails to be concreted into a beam as per drawing specifications.
- All gates to be installed with locking facilities as indicated on drawing.
- All flux on welding to be removed before coating with one coat of red oxide primer.
- All post to be treated inside with rust protection.
- Palisade gates to be painted one coat red oxide primer and two coats enamel paint, colour Transnet Engineering green.
- All welding to be done by a qualified welder

#### **9.1.10 Remediation Cell Perimeter Fence and Access Control Specification**

- Supply and install welded mesh fence as shown on drawing.
- Perimeter fence must consist of 1.8m galvanized welded mesh fence.
- Fencing poles must be 100 x 100 x 3000mm concrete poles with a 3m spacing from center to center.
- 0.5m flatwrap is to be mounted above the mesh.
- 4 mm diameter hot dip galvanized wire is to be used as stiffening wire.
- 2 mm diameter hot dip galvanized binding wire is to be used.
- Manufacture and erect sliding gate as per drawing specifications 2 000mm high x 5 000mm wide without electrical motors.
- Gate rails to be concreted into a beam as per drawing specifications.
- The gate to be installed with locking facility as indicated on drawing.

#### **9.1.11 Wetland Perimeter Fence**

- Supply and install welded mesh fence as shown on drawing.
- Perimeter fence must consist of 1.8m galvanized welded mesh fence.
- Fencing poles must be 100 x 100 x 2500mm concrete poles with a 3m spacing from center to center.
- 0.5m flatwrap is to be mounted above the mesh.
- 4 mm diameter hot dip galvanized wire is to be used as stiffening wire.
- 2 mm diameter hot dip galvanized binding wire is to be used.

## **9.2 LIST OF DRAWINGS ISSUED BY THE EMPLOYER**

The drawings listed below are issued by the Employer for tender purposes only.

Signature of Bidder/s: \_\_\_\_\_

Date: \_\_\_\_\_

The drawings were reduced in size and should not be used to scale off.

Drawing Number	Description
CL18-D000	Site 5 General Locality Plan
CL18-D011	Site Development Plan
CL18-D012	Site Development Plan Section Details
CL18-D010	Basin Lining, Capping Lining and Anchor Trench Details
CL18-D009	Storm water Channel and Firebreak Details
CL18-D008	Reno Mattress Details
CL18-D001	Fence Details-1
CL18-D002	Fence Details-2
CL18-D003	Fence Details-3
CL18-D004	Wetland Perimeter Fence Details-4
CL18-D005	Wetland Perimeter Fence Details-5
CL18-D006	Wetland Perimeter Fence Details-6
CL18-D007	Access Control Details
CL18-D013	Precast Concrete Palisade Fence Details-1
CL18-D014	Palisade Sliding Gate Details-2

### 9.3 SUPPORTING SPECIFICATIONS

The specification must be read in conjunction with the following South African National Standards (SANS) codes and standards as applicable:

- **Standardized Specification for Civil Engineering Construction (SANS 1200)**

**Standard No. Description**

SANS 1200A – General

SANS 1200AB – Engineer's Office

SANS 1200C – Site Clearance

SANS 1200D – Earthworks

SANS 1200DA – Earthworks (Small Works)

SANS 1200G – Concrete

SANS 1200 GA – Concrete (Small Works)

SANS 1200H – Structural Steelwork

SANS 1200HC – Corrosion Protection of Structural Steelwork

SANS 1200LE – Stormwater Drainage

SANS 1200MF – Base

Signature of Bidder/s: \_\_\_\_\_

Date: \_\_\_\_\_



#### 9.4 SPECIFICATION COMPLIANCE MATRIX

ITEM	REQUIREMENTS	COMPLYING	
		Yes (if complying)	No (if not complying)
		Yes	No
<b>1.</b>	<b>Works Information</b>	<i>Heading</i>	<i>Heading</i>
1.1	Description of the works		
1.2	Employer's objective		
1.3	Extent of works		
<b>2.</b>	<b>General</b>		
<b>3.</b>	<b>Personal Protective Equipment (PPE)</b>		
<b>4.</b>	<b>Site Establishment and Access Control</b>		
<b>5.</b>	<b>Asbestos Waste Handling, Removal and Disposal</b>		
<b>6.</b>	<b>Air Monitoring</b>		
<b>7.</b>	<b>Dust Control Procedures</b>		
<b>8.</b>	<b>Stockpiling</b>		
<b>9.</b>	<b>Detailed Specification</b>	<i>Heading</i>	<i>Heading</i>
9.1	Civil Engineering Services		
9.2	List of Drawings Issued by the Employer		
9.3	Supporting Specifications		
9.4	Specification Compliance Matrix		

Signature of Bidder/s: \_\_\_\_\_

Date: \_\_\_\_\_